Section 4
SPECIALIST REPORTS

Zone Planning Group

Section 4 - SPECIALIST REPORTS

Engineering Infrastructure Report
Prepared by OSKA

Zone Planning Group

OSKA CONSULTING GROUP

ENGINEERING INFRASTRUCTURE REPORT

Proposed High Rise Development

99-101 Old Burleigh Road, Broadbeach

Lot 70 on B8383, Lot 0000 and Lot 0 on BUP104138

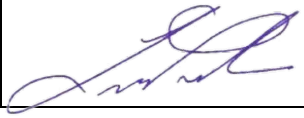
For Sunland Group

18 May 2026

Document No: OSK7218-0002

DOCUMENT CONTROL SHEET

Title:	Engineering Infrastructure Report
Document No:	OSK7218- 0002
Original Date of Issue:	18 May 2026
Project Manager:	Trent Purdon
Author:	Azam Mohiuddin Mohammed
Client:	Sunland Group
Client Contact:	Ms Katharina Ovens-Brown
Client Reference:	99-101 Old Burleigh Road, Broadbeach
Synopsis:	This report examines the existing infrastructure and future engineering impacts for the proposed development of the site, including the availability of services and the provision of water and sewerage servicing the development site and determines the demand on these systems from the proposed development.

Reviewed by RPEQ	Reg. No.	Signed	Date
Trent Purdon	12190		18 May 2026

Revision/Checking History			
Revision No	**Date**	**Checked By**	**Issued By**
A	15 May 2026	Thomas Watt	Azam Mohiuddin Mohammed

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Recipient	**No of Copies**	**Method**
Sunland Group - Ms Katharina Ovens-Brown	1	PDF

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CONTENTS

1.0 INTRODUCTION....1
1.1 Background....1
2.0 SITE DESCRIPTION....1
2.1 Location....1
2.2 Site Topography....2
2.3 Vegetation and Land Use....2
2.4 Proposed Development....3
3.0 EARTHWORKS....3
4.0 ROADWORKS....3
5.0 STORMWATER....3
6.0 SEWERAGE....3
7.0 WATER....4
8.0 ELECTRICAL AND TELSTRA....5
9.0 CONCLUSIONS....5

TABLES

Table 1: Site Description....1
Table 2: Proposed Development Sewerage Demand....4
Table 3: Proposed Development Water Demand....4

FIGURES

Figure 1: Locality Plan (Source: Nearmap)....1
Figure 2: Aerial Image of the Site (Source: Nearmap – Image taken 07 December 2025)....2

APPENDICES

Appendix A: Bennett & Bennett, Verification Plot of BUP10438 and Lot 70 on B8383, 99 and 101 Old Burleigh Road Broadbeach (Ref: 210762_002_VER)
Appendix B: Contreras Earl Architecture, Site Plan (Ref: DA-7.04)
Appendix C: OSKA Engineers; Preliminary Sewer and Water Connection Plan (Ref: OSK7218/P008/A)
Appendix D: Before You Dig Australia Plans

1.0 INTRODUCTION

1.1 Background

OSKA Engineers has been commissioned by Sunland Group to prepare an Engineering Infrastructure Report (EIR) to support a Development Application (DA) to City of Gold Coast Council for the proposed High Rise Development situated at 99-101 Old Burleigh Road, Broadbeach. The subject site is described as Lot 70 on B8383, Lot 0000 and Lot 0 on BUP104138.

The purpose of this report is to demonstrate that the proposed development can be connected to Council's existing stormwater drainage, sewerage, water systems and other utility services.

2.0 SITE DESCRIPTION

2.1 Location

The subject site is located at 99-101 Old Burleigh Road, Broadbeach. The site fronts Old Burleigh Road to the east, Armrick Avenue to the south and is surrounded by residential properties to the north and west. The site covers a total combined area of 0.128ha, with details as summarised in *Table 1* and as located in *Figure 1*.

Table 1: Site Description

Client	Lot and Property Description	Street Address
Sunland Group	*Lot 70 on B8383, Lot 0000 and Lot 0 on BUP104138*	*99-101 Old Burleigh Road, Broadbeach*

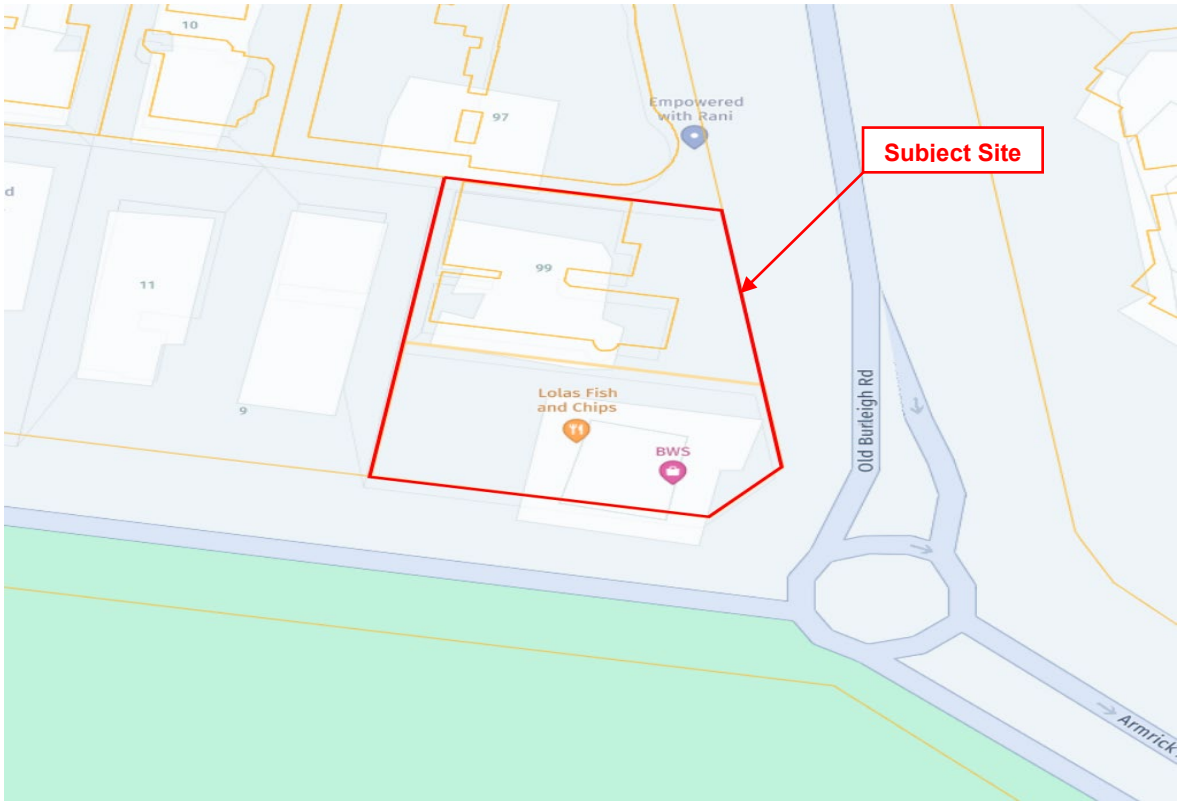


Figure 1: Locality Plan (Source: Nearmap)

2.2 Site Topography

The existing site has gradual slope with spot heights ranging from approximately RL 5.52m AHD to 5.20m AHD. The site generally slopes towards the southwestern boundary. Based on the provided survey and aerial information, any stormwater runoff from site surfaces drains to the gully pits on Armrick Avenue and Old Burleigh Road.

Further information of the site survey has been provided by Bennett & Bennett, Verification Plot of BUP10438 and Lot 70 on B8383, 99 and 101 Old Burleigh Road Broadbeach (Ref: 210762_002_VER) included as Appendix A.

2.3 Vegetation and Land Use

The subject site currently consists of a single storey building used for commercial purposes with carpark towards the western boundary on Lot 70. Access to this part of the site is gained from south via Armrick Avenue. Additionally, the site also consists of a Multi Storey Residential Building with access to it from East via Old Burleigh Road.

An aerial photograph taken on the 07 December 2025 of the subject site is included in *Figure 2.*

Figure 2: Aerial Image of the Site (Source: Nearmap – Image taken 07 December 2025)

2.4 Proposed Development

The subject site is proposed to be a forty-two-storey high rise development with three (03) levels of basement car parks, four (04) levels of podium car parks and two (02) levels of amenities. The proposed development will have a total of eighty-one (81) units over thirty-five (35) levels. Vehicle access to the basement car park will be gained via Armrick Avenue to the south and access to the ground level car park will be gained via Old Burleigh Road to the east.

Refer to Appendix B for the proposed architectural details prepared by Contreras Earl Architecture, Site Plan (Ref: DA-7.04).

3.0 EARTHWORKS

Earthworks will be required across the site to facilitate the development. The proposed site grading will require a combination of cut and fill to construct the proposed development and direct overland flow to the stormwater network of the site.

Retaining walls will be required within the development site to facilitate the construction of basement car parks.

4.0 ROADWORKS

The proposed development will be accessed from south via Armrick Avenue and east via Old Burleigh Road in accordance with Gold Coast City Council standards and specifications and IPWEA Standard Drawings RSD-102. The external roadworks proposed for this development includes decommission of the existing VXO, proposed new vehicle crossover, proposed new ramp and new footpath to tie into the existing.

5.0 STORMWATER

Stormwater collected from the roof, carpark and ground areas shall be conveyed via an internal network of pits and pipes to the proposed Atlan system for treatment. The captured flows within the tank are drained to the existing manhole along Old Burleigh Road. (the site's LPOD).

For further details, see OSKA Engineers, Conceptual Stormwater Management Plan (Ref: OSK7218-0003).

6.0 SEWERAGE

The subject site will be serviced by the existing 150mm AC sewer main located at the front of the proposed development along Armrick Avenue. It is proposed to decommission the existing property connection and propose a new upgraded property connection for the residential development.

For further details, see schematic drawings showing the existing sewer infrastructure and the proposed modifications to the existing network as illustrated in the OSKA Engineers; Preliminary Sewer and Water Connection Plan (Ref: OSK7218/P008/A) included as Appendix C.

In accordance with the SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code), the proposed sewerage demand has been calculated based on low density residential zone demand rates.

Table 2: Proposed Development Sewerage Demand

Land Use Category	Number of Apartments	Loading (EP/apartment)	Total EP	Total ET
2 Bedroom Apartment	17	1.76	29.92	10.72
3 Bedroom Apartment	55	2.51	138.05	49.48
4 Bedroom Apartment	09	2.51	22.59	8.09
		Total	190.56	68.30

EP / ET Conversion Rate = 2.79 EP / ET
Total EP = 190.56
Total ET = 68.30
= 2.205 L/s

The proposed development will create an Average Dry Weather Flow (ADWF) of 0.441 L/s, a Peak Dry Weather Flow (PDWF) of 1.195 L/s and a Peak Wet Weather Flow (PWWF) of 2.205 L/s. The sewer infrastructure required to service the proposed development will need to be of sufficient capacity to cater for these flows.

Council have advised that a sewer capacity assessment is not required for the proposed development.

7.0 WATER

There is an existing 100mm DICL water main along Armrick Avenue to the south. It is proposed to connect into this main with a new upgraded property connection for the residential development and decommission the existing connections.

The existing water infrastructure and available water connections are illustrated in OSKA Engineers; Preliminary Sewer and Water Connection Plan (Ref: OSK7218/P008/A) included as Appendix C.

The proposed demands upon the existing water network due to the proposed development have been calculated in accordance with the SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code) using the parameters detailed in *Table 3.*

Table 3: Proposed Development Water Demand

Land Use Category	Number of Apartments	Loading (EP/apartment)	Total EP	Total ET
2 Bedroom Apartment	17	1.76	29.92	10.72
3 Bedroom Apartment	55	2.51	138.05	49.48
4 Bedroom Apartment	09	2.51	22.59	8.09
		Total	190.56	68.30

EP / ET Conversion Rate	= 2.79 EP / ET
Total EP	= 190.56
Total ET	= 68.30

The proposed development will create a total Average Day Demand (AD) of 0.5293 L/s, a Peak Day Demand (PD) of 0.7477 L/s and a Peak Hour Demand (PH) of 1.4852 L/s.

Council have advised that a water capacity assessment is not required for the proposed development.

The firefighting requirements for this development area are 15L/s for 2 hours (Urban Area Flows: Residential). The water infrastructure required to service the proposed development will need to be of sufficient capacity to cater for these flows.

8.0 ELECTRICAL AND TELSTRA

Telecommunications services and electrical services are available along the verges of Armrick Avenue and Old Burleigh Road. Load requirements and any necessary upgrades will need to be investigated by an electrical consultant as part of the detailed design for the proposed development.

Included is Before You Dig Australia Plans in Appendix D.

9.0 CONCLUSIONS

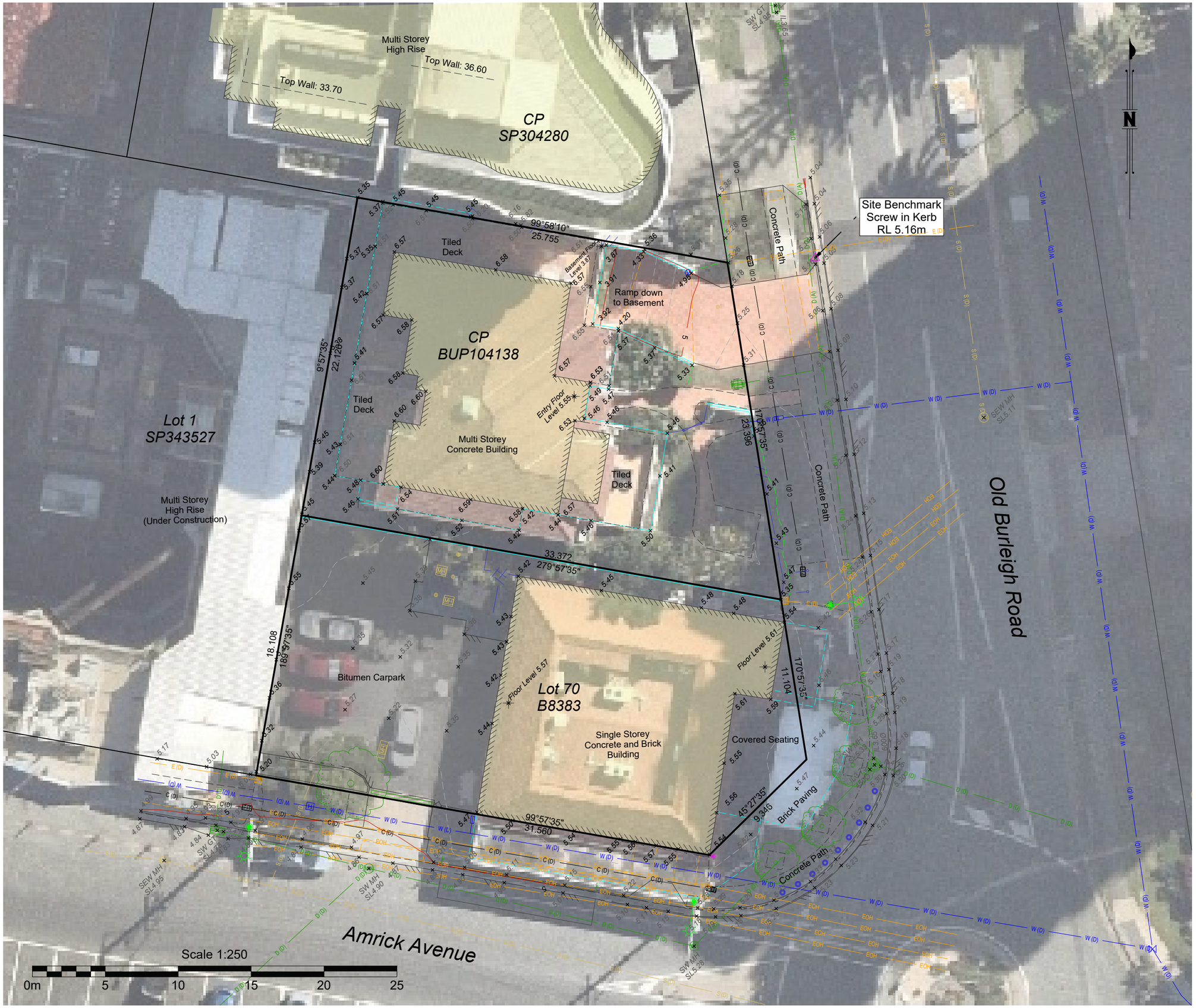
OSKA Engineers has been commissioned by Sunland Group to prepare an Engineering Infrastructure Report (EIR) to support a Development Application (DA) to City of Gold Coast Council (CoGC) for the proposed High Rise Development situated at 99-101 Old Burleigh Road, Broadbeach. The subject site is described as Lot 70 on B8383, Lot 0000 and Lot 0 on BUP104138.

This Engineering Infrastructure Report has detailed the existing infrastructure and the provision of services to the proposed development and determined the proposed demand on the existing water and sewerage infrastructure. The location of the existing water and sewerage reticulation infrastructure as well as the proposed connection points for the development have been shown on the servicing plans in addition to the proposed roadworks.

APPENDIX

A

Bennett & Bennett, Verification Plot of BUP10438 and Lot 70 on B8383, 99 and 101 Old Burleigh Road Broadbeach (Ref: 210762_002_VER)



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LEGEND:

Road
- Kerb Back
- Kerb Invert
- Edge of Bitumen
- Edge of Gravel
- Road Crown
- Traffic Park Meter
- Traffic Light
- Traffic Pit
- Traffic Sign
- Traffic Post Box

Structures
- Building Line
- Roof Ridgeline
- Fence Line
- Gate
- Hand Rail
- Cattle Grid
- Bollard

Sewer
- Sewer Line
- Valve
- Inspection Opening
- Manhole

Electrical
- Electricity Line
- Overhead Line
- Pits/Manholes
- Pole
- Street Light
- Light In-Ground

Water
- Water Line
- Meter
- Valve
- Fire Hydrant
- Tap
- Sprinkler

Fuel
- Fuel Line
- Fitting

Terrain
- Driveway
- Footpath
- Slab Edge
- Retaining Wall Base
- Retaining Wall Top
- Change of Grade
- Top of Bank
- Toe of Bank
- Waterline
- Garden Edge
- Creek Toe of Bank
- Creek Top of Bank
- Creek Invert
- Creek Waterline
- Tree
- Tree Canopy
- Control Point/PSM

Drainage
- Drainage line
- Open Drain
- Manhole
- Field Inlet
- Downpipe

Communications
- Communication Line
- Overhead Line
- Pits/Manholes
- Pillar

Gas
- Gas Line
- Valve
- Marker

General
- Pothole

Subsurface Utility - QL
- * QL-A (H±50mm,V±50mm)
- * QL-B (H±300mm,V±500mm)
- * QL-C (H±300mm,2D)
- * QL-D (Exist Record)

NOTES:

1. Drawn to scale on an A3 sheet.
2. Contour Interval... 0.25m
3. All levels are in metres on the Australian Height Datum referred to PSM77919 - RL 5.668 AHD situated in Second Ave/Broadbeach Blvd.
4. All Boundaries are vide recent adjoining surveys (IS271995 & DP324368). Site Boundaries subject to confirmation by survey.
5. Underground services were not investigated. The Location of Underground services are in accordance with AS5488:2019, the Australian Standard for classification of Subsurface Utility Information (SUI). The exact nature and location of these services should be confirmed prior to construction.
6. Area vide title : BUP104138 - 653m²
   Lot 70 on B8383 - 630m²
7. Field Survey Completed on 8/12/2025

Level datum: AHD Derived (PSM77919)
Horiz datum: MGA Derived DCDB (IS271995)
Coord Origin: DCDB (NE Cnr Subject Lot (BUP104138))
GDA System: GDA2020 Coordinate System: Plane 1:1
Meridian: + 9°58'39" IS271995

Title:

VERIFICATION PLOT

of BUP104138 and Lot70 on B8383
99 and 101 Old Burleigh Road
Broadbeach

Client:	**Abedian & Co**		
Locality:	Broadbeach		
Local Gov:	Council of the City of Gold Coast		
Surveyed By:	SD	Approved:	LJC
Date Created:	10/12/25	Scale:	1:250
File Ref:			210762
Plan No:	**210762_002_VER**	Rev:	**A**

APPENDIX

B

Contreras Earl Architecture, Site Plan (Ref: DA-7.04)

REVISION		
A	Development Application Draft	2026.05.13
Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: GROUND FLOOR

Drawing Number: DA-7.04

Scale/Format: 1 : 250

NOTES

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Sunland Group

ARCHITECT **CONTRERAS EARL Architecture**

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Southport
QLD 4215
info@contrerasearl.com
www.contrerasearl.com

CONTRERAS EARL
Architecture

PLOT DATE 13/05/2026 12:34:05 PM

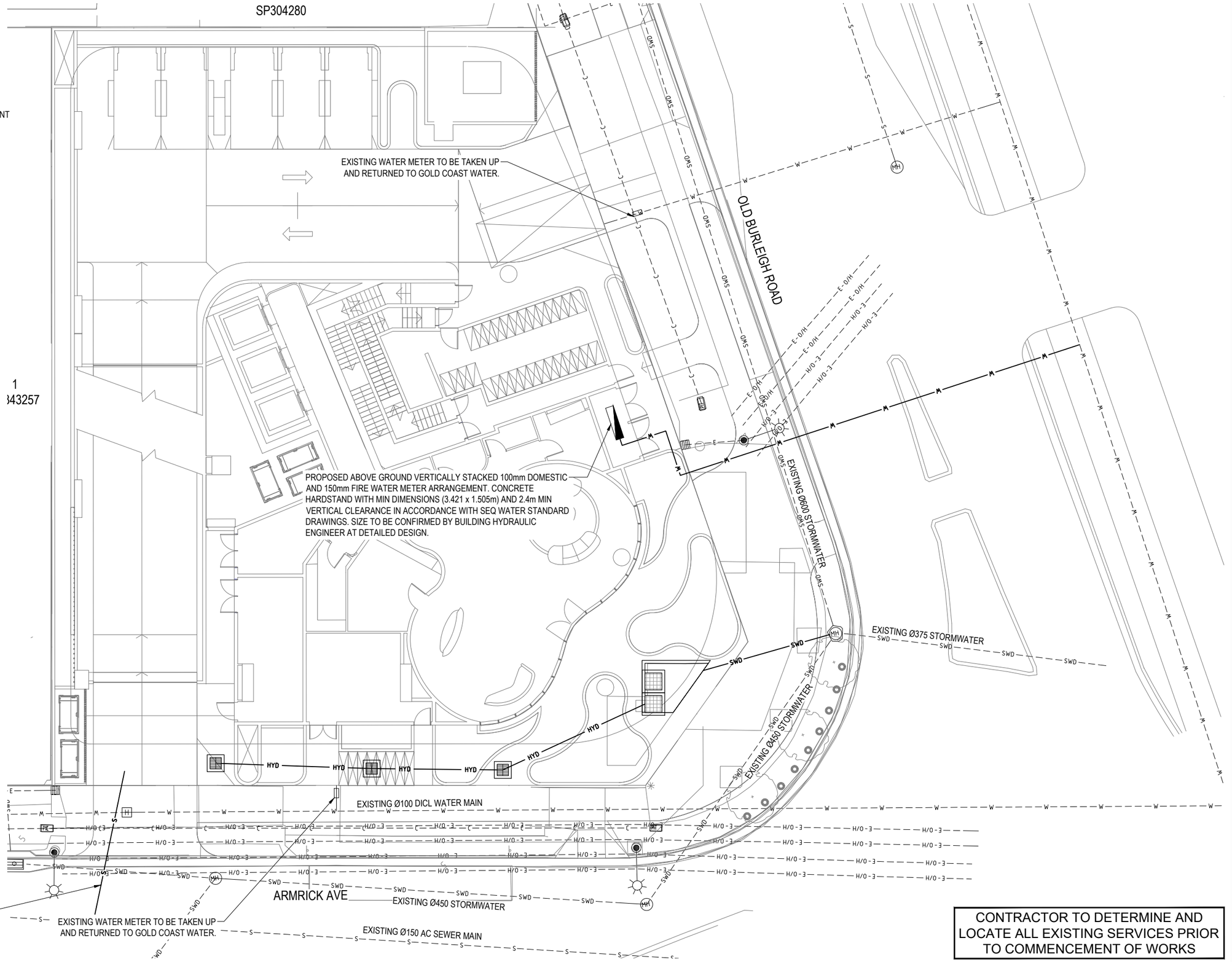
APPENDIX

C

OSKA Engineers; Preliminary Sewer and Water Connection Plan (Ref: OSK7218/P008/A)

LEGEND

- S — PROPOSED SEWER CONNECTION
- W — PROPOSED WATER CONNECTION
- PROPOSED WATER METER
- SWD — PROPOSED STORMWATER PIPE
- HYD — PROPOSED INTERNAL STORMWATER TO BE CONFIRMED AT DD BY HYDRAULIC CONSULTANT
- SITE BOUNDARY
- S — EXISTING SEWER MAIN
- W — EXISTING WATER MAIN
- SWD — EXISTING STORMWATER
- COM — EXISTING COMMS CABLE
- E-O/H — EXISTING OVERHEAD ELECTRICAL



CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REV	DESCRIPTION	DRAWN	DATE
A	FOR INFORMATION	A.M.	15.05.26

DRAWN	DESIGN	APPROVED
A.M.	S.W.	T.P.

SIGNED

DATE

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DRAWING IS NOT TO BE SCALED

SCALE
1:100 AT A1 0 2 4m
1:200 AT A3

CLIENT
Sunland Group

PROJECT
99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

STAGE / PHASE
FOR INFORMATION ONLY NOT FOR CONSTRUCTION

TITLE
PRELIMINARY SERVICES AND CONNECTIONS PLAN

DRAWING NUMBER
OSK7218-P008

REVISION
A

APPENDIX

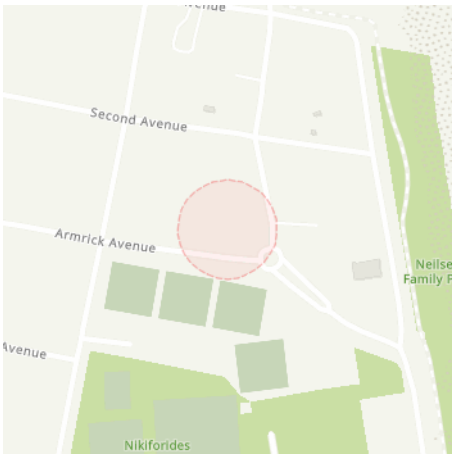
D

Before You Dig Australia Plans

Job ID 52808618

101 Old Burleigh Road

Review responses online



Received 8 of 8 responses

All responses received

101 Old Burleigh Road, Broadbeach QLD 4218

Job dates
07/04/2026 → 07/04/2026

These plans expire on
4 May 2026

Lodged by
Azam Mohiuddin Mohammed

Authority	Status	Page
BYDA Confirmation		2
APA Group Gas Networks (90073)	Received	4
City of Gold Coast	Received	56
Energex QLD	Received	59
NBN Co Qld	Received	102
OptiComm Ltd (QLD)	Received	113
Optus Qld	Received	118
Telstra QLD South East	Received	132
TPG Telecom (QLD)	Received	141

Job No 52808618

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Contact Details

Contact	Contact number	Company	Enquirer ID
Azam Mohiuddin Mohammed	0455 809 777	-	3737381

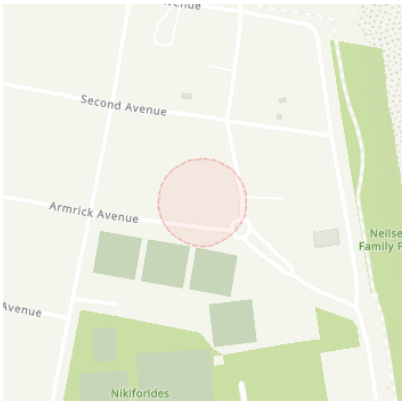
Email
amohiuddin@oska.net.au

Address
155 Varsity Parade
Varsity Lakes QLD 4227

Job Site and Enquiry Details

WARNING: The map below only displays the location of the proposed job site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

Enquiry date	Start date	End date	On behalf of	Job purpose	Locations	Onsite activities
07/04/2026	07/04/2026	07/04/2026	Private	Design	Both Road, Footpath, Nature Strip	Planning & Design



Check that the location of the job site is correct. If not, you must submit a new enquiry.

If the scope of works change or plan validity dates expire, you must submit a new enquiry.

Do NOT dig without plans. Safe excavation is your responsibility. If you don't understand the plans or how to proceed safely, please contact the relevant asset owners.

User Reference	Address	Notes/description
101 Old Burleigh Road	101 Old Burleigh Road Broadbeach QLD 4218	-

Your Responsibility and Duty of Care

- **Lodging an enquiry does not authorise project commencement.** Before starting work, you must obtain all necessary information from all affected asset owners.
- If you don't receive plans within 2 business days, contact the asset owner & quote their sequence number.
- Always follow the 5Ps of Safe Excavation (page 2), and locate assets before commencing work.
- Ensure you comply with State legislative requirements for Duty of Care and safe digging.
- If you damage an underground asset, you MUST advise the asset owner immediately.
- By using the BYDA service, you agree to the Privacy Policy and Term of Use.
- For more information on safe digging practices, visit www.byda.com.au

Asset Owner Details

Below is a list of asset owners with underground infrastructure in and around your job site. It is your responsibility to identify the presence of these assets. Plans issued by Members are indicative only unless specified otherwise. Note: not all asset owners are registered with BYDA. You must contact asset owners not listed here directly.

Referral ID (Seq. no)	Authority Name	Phone	Status
270835217	APA Group Gas Networks (90073)	1800 085 628	NOTIFIED
270835214	City of Gold Coast	1300 465 326	NOTIFIED
270835218	Energex QLD	13 12 53	NOTIFIED
270835212	NBN Co Qld	1800 687 626	NOTIFIED
270835216	OptiComm Ltd (QLD)	1300 137 800	NOTIFIED
270835213	Optus Qld	1800 505 777	NOTIFIED
270835219	Telstra QLD South East	1800 653 935	NOTIFIED
270835215	TPG Telecom (QLD)	1800 786 306	NOTIFIED

END OF UTILITIES LIST

The 5Ps of Safe Excavation

Plan

Plan your job. Use the BYDA service at least one day before your job is due to begin, and ensure you have the correct plans and information required to carry out a safe project.

Prepare

Prepare by communicating with asset owners if you need assistance. Look for clues onsite. Engage a skilled Locator.

Pothole

Potholing is physically sighting the asset by hand digging or hydro vacuum extraction.

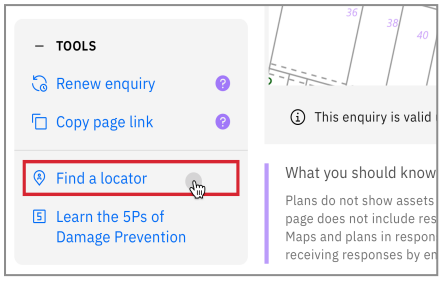
Protect

Protecting and supporting the exposed infrastructure is the responsibility of the excavator. Always erect safety barriers in areas of risk and enforce exclusion zones.

Proceed

Only proceed with your excavation work after planning, preparing, potholing (unless prohibited), and having protective measures in place.

Engage a skilled Locator



When you lodge an enquiry you will see skilled Locators to contact

Visit the Certified Locator website directly and search for a locator near you

certloc.com.au/locators

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3. The local contractors will contact you directly with quotes

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blog.iseekplant.com.au/byda-isp-get-quotes

Book a FREE BYDA Session

BYDA offers free training sessions to suit you and your organisation's needs covering safe work practices when working near essential infrastructure assets. The free sessions are offered in two different formats - online and face-to-face.

To book a session, visit:
byda.com.au/contact/education-awareness-enquiry-form

BOOK NOW

Lodge your FREE enquiry online any time at byda.com.au

APA Group Gas Networks (90073)

Referral
270835217

Member Phone
1800 085 628

Responses from this member

Response received Tue 7 Apr 2026 8.57am

File name	Page
Response Body	5
270835217.pdf	6
400-STD-AM-0001_2 Guidelines for Works Near Existing Gas Assets.pdf	15

PLEASE NOTE: This is an automated response. Please **DO NOT REPLY to this email**. If you require further information in relation to this Before You Dig response, please contact

BYDA_APA@apa.com.au

Enquiry Details:

Impact	affected
Sequence Number	270835217
Enquirer Id	3737381
Activity	Planning and Design
Job Number	52808618
User Reference	101 Old Burleigh Road
Message	

Site Details:

Address	101 Old Burleigh Road Broadbeach QLD 4218

Enquirers Details:

Contact	Azam Mohiuddin Mohammed
Company	
Email	amohiuddin@oska.net.au
Phone	+61455809777
Address	155 Varsity Parade Varsity Lakes QLD 4227

APA Group

APA
Australia's energy infrastructure partner

BEFORE YOU DIG
www.byda.com.au

Before You Dig Australia

Classification: Networks

Enquiry date	07/04/2026
Sequence number	270835217
Work site address	101 Old Burleigh Road Broadbeach QLD 4218

For your immediate information

THERE IS A GAS PIPELINE OR GAS ASSETS

located in close vicinity to your works.

Enquiry Date:	07/04/2026
Enquirer:	Azam Mohiuddin Mohammed
Sequence Number:	270835217
Work Site Address:	101 Old Burleigh Road Broadbeach QLD 4218

Thank you for your Before You Dig enquiry regarding the location of gas assets.

We confirm there are Gas Assets located in close vicinity of the above location.

Caution: Damage to gas assets may result in explosion, fire and personal injury.

Please ensure you read all the relevant information contained in this response to your BYDA enquiry including reviewing the **APA Guidelines for Works Near Existing Gas Assets** and clearly understand and comply with all requirements relating to your scope of work.

If you have any queries relating to this information, or you are unable to comply with requirements of the APA Guidelines for Works Near Existing Gas Assets contact the APA Before You Dig Officer

- **Phone 1800 085 628**
- **Email BYDA_APA@apa.com.au**

for clarification before proceeding with any work.

Before You Dig Checklist

1. Plan

- Review maps provided with this BYDA response and confirm the location of your work site is correct.
- Review the **APA Guidelines for Works Near Existing Gas Assets** and clearly understand requirements relating to my scope of work.

2. Prepare

- Electronically locate gas assets and mark locations.
- Note: Look for visible evidence of gas assets at the worksite which may not be shown on plans.

3. Pothole

- Physically confirm ('prove') the location of gas assets by potholing by hand excavation or non- destructive vacuum excavation methods in accordance with **APA Guidelines for Works Near Existing Gas Assets**.
- Road authorities, councils, utilities and their authorised contractors and agents are responsible to pothole or use other suitable methods to verify the location and depth of all gas assets, including gas (inlet) services, prior to commencing any works.

4. Protect

- Protect gas assets by maintaining clearances whilst excavating and following conditions provided by APA.
- Where required by APA, only conducting work in proximity to gas assets while Site Watch is on site.
- Where applicable, APA Authority To Work permit conditions are clearly understood and complied with.
- Strap and support exposed mains and inlet services. Cover exposed mains to prevent damage until the excavation can be permanently restored.

5. Proceed

- Only proceed with your work once you have completed all the planning, preparation, potholing and protection requirements.
- APA BYDA response (including maps) are on site for reference at all times, and less than 30 days old.

Contacts

Contacts APA Group	
Enquiry	**Contact Numbers**
General enquiries or feedback regarding this information or gas assets.	APA – Before You Dig Officer Phone: 1800 085 628 Email: BYDA_APA@apa.com.au
Gas Emergencies	Phone: 1800 GAS LEAK (1800 427 532)

Site Watch

Site Watch is where an APA field officer attends your work site to monitor and ensure controls are in place to protect critical gas assets from damage during work.

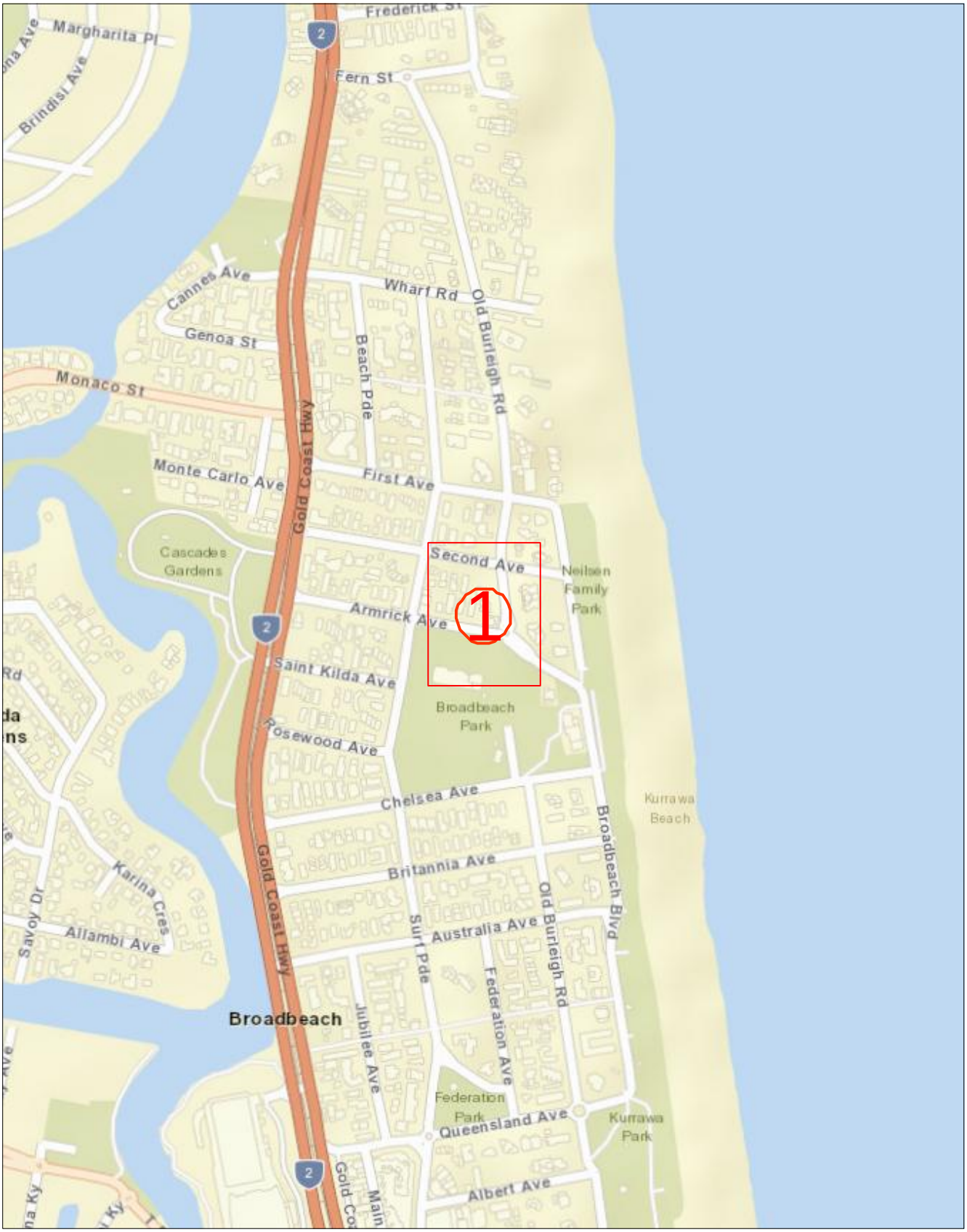
The following rates* apply for this service (1 hour minimum charge):

Item	Rate (excl. gst)
Site Watch – Business Hours	$143.42 per hour
Site Watch – After Hours	$175.06 per hour
Cancellation Fee *Fee applies where cancelations received after 12pm (midday), 1 business day prior to the booking.*	$286.84

Contact APA – Before You Dig officer for state specific hours of business.

**The specified rates do not apply to Origin Energy LPG assets. All charges and invoicing related to these assets will be administered directly by Origin Energy. For further information contact Origin Energy.*

Site Address:	101 Old Burleigh Road Broadbeach QLD 4218	**Sequence Number:**	270835217



Scale 1: 6000

Map Sources: Esri, Garmin, HERE, FAO, NOAA, USGS,
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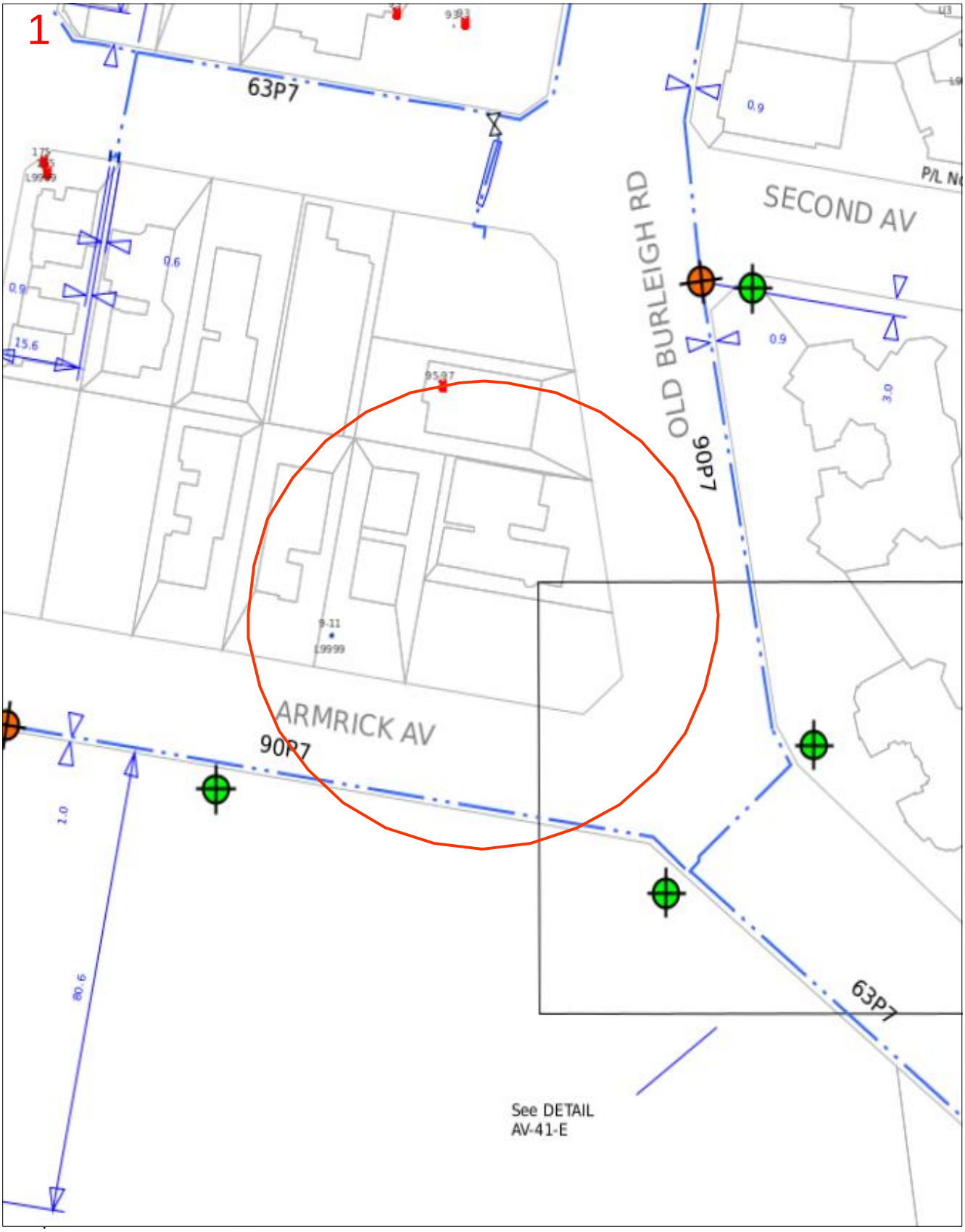
Enquiry Area

Map Key Area

Site Address:	101 Old Burleigh Road Broadbeach QLD 4218	**Sequence Number:**	270835217



Scale 1: 700

Map Sources: Esri, Garmin, HERE, FAO, NOAA, USGS,
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Enquiry Area

Map Key Area

Legend

PIPE LEGEND: GAS TYPE AND PRESSURE

	Low pressure	Medium pressure	High pressure	Transmission
Natural gas				
Natural gas – proposed				
LPG (yellow dash)	*not applicable*			*not applicable*
Hydrogen blended (aqua dash)	*not applicable*			*not applicable*

PIPE LEGEND: SPECIAL DESIGNATION

	Low pressure	Medium pressure	High pressure	Transmission
Critical main (yellow highlight)				
Casing (grey highlight)				*not applicable*

These designations typically apply to any pipe type and pressure

PIPE LEGEND: OTHER STATUS

- Abandoned pipe
- Idle or inactive pipe

ABBREVIATION

BoK	Back of kerb	FoK	Front of kerb
C	Depth of cover	NTI	Not tied in
CP	Cathodic protection		

OBJECT SYMBOLS

- Valve
- Buried valve
- Regulator station
- Gas connected property
- CP test station
- CP anode
- CP bond wire
- CP rectifier terminal
- Syphon
- Marker
- Part service^

^A live gas service terminated underground within the property boundary, available for future extension to the gas meter.

PIPE CODE AND MATERIAL

P*	Polyethylene (PE)	CU	Copper
P3	Polyvinyl chloride (PVC)	N2	Nylon
S*	Steel	W2	Wrought galv iron
C*	Cast iron	W3	PE coat wrought galv iron

INTERPRETATION EXAMPLE

40P6 in 80C2 — High pressure, 40 mm polyethylene in an 80 mm cast iron casing

63S8 — Medium pressure, 63 mm steel

Pipe diameter in millimetres is shown before pipe code.
40P6 = 40 mm nominal diameter

This map was created in colour and should be printed in colour

Important information

- Refer to requirements relating to construction, excavation and other work activities in the **APA Guidelines for Works Near Existing Gas Assets** document with this BYDA response.
- BYDA enquiries are valid for 30 days. If your works commence after 30 days from the date of this response a new enquiry is required to validate location information.
- For some BYDA enquiries, you may receive two (2) responses from APA. Please read both responses carefully as they relate to different assets.
- Gas (inlet) services connecting Gas Assets in the street to the gas meter on the property are not marked on the map. South Australia Only – if a meter box is installed on the property, a sketch of the gas service location may be found inside the gas meter box. APA does not guarantee the accuracy or completeness of these sketches.

Free Gas Pipeline Awareness Training and Information

PROFESSIONALS

APA offers online and in-person toolbox forums to support safe work near underground gas assets. Topics include distribution and transmission pipelines, the permit process, and gas emergencies, with content suited for companies of all sizes. A Continuing Professional Development certificate is available upon completion.

Scan the QR code to register for an online toolbox, or email **damageprevention@apa.com.au** to request an in-person presentation.

HOMEOWNERS

If you're working near your home's gas pipes stay safe and view APA's video guide **'Working Safely Near Gas Lines: A DIY Homeowner's Guide'** which offers simple tips to avoid damaging gas pipes.

Scan the QR code to view the video, or for more information email **damageprevention@apa.com.au**

Disclaimer and legal details

- This information is valid for 30 days from the date of this response.
- This information has been generated by an automated system based on the area highlighted in your BYDA request and has not been independently verified.
- Map location information is provided as AS5488-2022 Quality Level D, as such supplied location information is indicative only.
- Whilst APA has taken reasonable steps to ensure that the information supplied is accurate, the information is provided strictly on the condition that no assurance, representation, warranty or guarantee (express or implied) is given by APA in relation to the information (including without limitation quality, accuracy, reliability, completeness, currency, sustainability, or suitability for any particular purpose) except that the information has been disclosed in good faith.
- Any party who undertakes activities in the vicinity of APA operated assets has a legal duty of care that must be observed. This legal obligation requires all parties to adhere to a standard of reasonable care while performing any acts that could foreseeably harm these assets.

APA
Australia's energy infrastructure partner

Guidelines for Works Near Existing Gas Assets

400-STD-AM-0001

Revision 2

OWNER NAME:	Alan Creffield
OWNER TITLE:	Manager of Integrity
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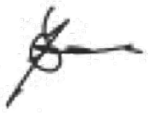
APPROVAL SIGNATURE:	
APPROVAL DATE:	18/08/2023

always powering ahead

DOCUMENT CONTROL & APPROVAL INFORMATION

Summary of Changes

Below is a brief summary of the changes made to the document since the previous issued version.

Revision	Description	Date	Author
0.0	Issue for Use	29.06.2018	Matthew Read
1.0	Issued for Use – document periodic update / major overhaul	01.03.2022	Kahil Parsons
2.0	Removal of incorrect table 2 references to 1. proximity of HV cables 2. Updating separation distances to AS2885.3 BYDA reference update Table 4 Note	16.08.2023	Dale Russell

Printed Working Copy

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It is the responsibility of those with printed copies to ensure that the document is current.

Responsibility

Any amendments to this document will be the responsibility of the document owner.

Control

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All native copies of published controlled Networks documents are managed by NetworksDocLibrary@apa.com.au in accordance with 400-PR-QM-0001, Networks Controlled Documents Development and Review procedure.

Table of Contents

DOCUMENT CONTROL & APPROVAL INFORMATION 2
Summary of Changes 2
Printed Working Copy 2
Responsibility 2
Control 2
TERMS OF USE 5
1 INTRODUCTION 6
1.1 Scope of this Document 6
1.2 Asset Types 6
1.2.1 Natural Gas Transmission 6
1.2.2 Natural Gas Distribution 7
1.2.3 LPG Distribution 7
1.3 Damage and Emergencies 7
1.4 General Duty of Care and Responsibility to Obtain Information 8
1.4.1 Additional Transmission Pressure Pipeline Requirements 8
2 PROTECTION PROCESS 9
2.1 Assessment Information 9
3 PART 1 - APA NOTIFICATION AND AUTHORISATION REQUIREMENTS 11
3.1 BYDA Request 11
3.2 Provings and Site Identification 11
3.3 APA Notification and Authorisation Process 11
3.4 Commercial Agreement and Service Delivery 13
3.5 Decommissioned Gas Assets 13
4 PART 2 - DESIGN AND ASSET PROTECTION REQUIREMENTS 15
4.1 Standard Clearances 15
4.2 Third Party Assets and Structures 19
4.3 Landscaping Plans 19
4.4 Surface Levels and Conditions 21
4.5 Casings Vent Stacks 22
4.6 Earthing and Electrical Effects 23
4.7 Temporary and Permanent Vehicle Crossings 24
5 PART 3 - CONSTRUCTION AND LAND USE REQUIREMENTS 25
5.1 Land Use Change 25
5.2 Permits and Site Watch 25
5.3 Coating Surveys and Leakage Surveys 26
5.4 Pipeline Repairs, Recoating and Slabbing 26
5.5 Exposure of Buried Gas Assets 27
5.5.1 General 27

5.5.2 Physically Proving Gas Assets 27
5.5.3 Hydro-Vacuum Excavation 28
5.5.4 Mechanical Excavation 29
5.5.6 Protection During Exposure 30
5.5.7 Backfill and Reinstatement 31
5.6 Trenchless Excavation 31
5.7 Piles, Piers or Poles 32
5.8 Hot Works for Construction Activities 32
5.9 Vibration Limits 32
5.10 Compaction Limits 33
5.11 Blasting / Seismic Survey / Explosives 33
5.12 Suspended Materials above Gas Assets and No Go Zones for Cranes 34
5.13 Temporary Materials 34
6 PART 4 - ALTERATION OF EXISTING GAS ASSETS 34
7 GLOSSARY OF TERMS AND ABBREVIATIONS 35
8 DOCUMENT REFERENCES 40

APPENDIX A GENERAL BYDA RESPONSE PROCESS 41

TERMS OF USE

The "Guidelines for Works Near Existing Gas Assets Standard" is used for APA Networks excavations or third party excavations near APA Network operated assets. This guideline must only be used by the person or entity who received it directly from APA ("You") to ensure the latest version is used.

APA Networks has provided this document to You subject to the terms of use set out below. By retaining possession of this document, You acknowledge and agree to the following conditions;

1. The information contained in this document relates only to APA Networks operated assets (as defined in this document) and does not relate to any other utility assets owned or operated by APA, such as APA Gas Transmission Pipelines.
2. This Guidelines document is provided to You to assist in the development of design plans, construction and land use activities.
3. This Guidelines document does not override or supersede APA's Permit to Work (**PTW**) or Excavation policies and procedures.
4. Any proposed works in the vicinity of APA Networks operated assets may also require approval from other utility providers or government agencies. APA Networks has no responsibility for, and makes no representation in relation to, any requirements that may be necessary to obtain such approvals.
5. This document does not relieve any person from the requirement to make appropriate Before You Dig Australia (**BYDA**) enquiries, and otherwise discuss any proposed works with APA Networks, either for initial or subsequent works.
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8. APA Networks reserves its right to modify, amend, supplement, delete or withdraw any part of this document or any reference contained in this document, at any time without notice.
9. You must make your own independent enquiries in relation to any works that are proposed to be undertaken in the vicinity of any APA Networks operated assets (including obtaining all necessary express written consents and approvals from APA Networks). The information contained within is intended as a guide only.
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The purpose of this document is to provide guidelines for third parties planning to install new infrastructure or conduct works near existing APA Networks (**APA**) operated assets.

It is intended that this document will be provided to third parties proposing works around existing gas assets for their use during the design and planning phase following initial planning BYDA enquiries. This document does not provide authorisation to undertake the works but provides APA requirements to ensure that any review and acceptance of proposed works is completed as quickly as possible.

1 INTRODUCTION

1.1 Scope of this Document

This document addresses APA's requirements for considering how a third party's proposed works and APA managed works may impact APA Networks operated assets under the following parts:

Part 1 – APA Notification and Authorisation Requirements

Part 2 – Design and Asset Protection Requirements

Part 3 – Construction and Land Use Requirements

Part 4 – Alteration of Existing Gas Assets

APA Networks acts as the asset operator on behalf of entities Australian Gas Networks (**AGN**), Allgas, APA, Origin and Queensland Nitrates (**QNP**) and operates in New South Wales, Northern Territory, Queensland, South Australia and Victoria. The criteria provided in this document only applies to the assets managed by APA Networks on behalf of these companies.

APA also owns and operates natural gas transmission infrastructure on all mainland states and territories of Australia. These assets are operated by a separate APA entity and are out of scope for this document.

A glossary of all terms and abbreviations used in this document is contained in **Section 7**.

A list of all relevant external standards and APA reference documents is contained in **Section 8**.

1.2 Asset Types

APA Networks' operated gas assets include buried pipe, above and below ground stations (e.g. pressure regulation, valves, meters), electrical cables, cathodic protection systems (e.g. test points, anode beds), pits and electrical cabinets. Depending on the gas type and the operating pressure, gas assets are classified as natural gas transmission, natural gas distribution and Liquefied Petroleum Gas (**LPG**) distribution as shown in **Figure 1**.

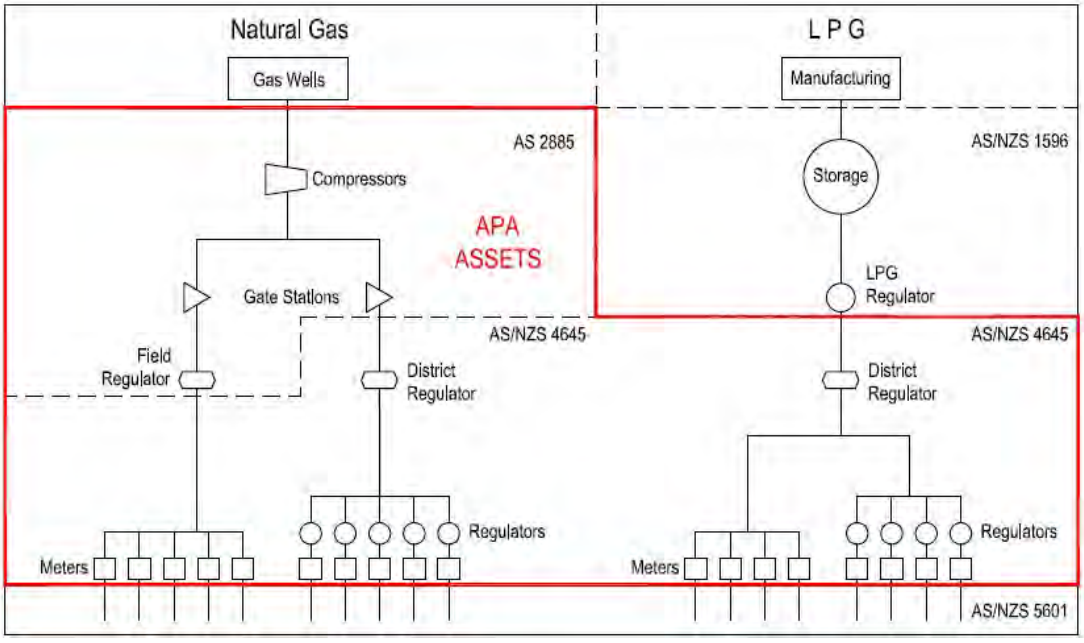


Figure 1 Asset Types and Standards Operated by APA Networks

1.2.1 Natural Gas Transmission

Natural gas transmission pressure assets operate at pressures above 1,050 kPag, and are generally used for transporting large quantities of gas across country. Design, construction and operation of these assets is governed by the AS 2885 suite of Australian Standards (**AS**).

Due to the higher pressure and energy density, there are severe safety, supply and environmental consequences which can result from third party interference. Hence, more stringent requirements and controls are applied to third party works in the vicinity of these assets.

Buried transmission pipelines are constructed from coated steel pipe where the appearance can vary depending on the year of construction, but will generally appear as yellow, black or grey when physically exposed.

1.2.2 Natural Gas Distribution

Natural gas distribution pressure assets operate at pressures below or equal to 1,050 kPag from offtakes of transmission pressure assets, and are generally used to supply consumers such as businesses and homes. Design, construction and operation of these assets is governed by the AS/NZS 4645 suite of Australian Standards.

Due to the lower energy density compared to transmission assets, less stringent requirements and controls are applied to distribution assets. Some distribution assets are deemed critical by APA Networks due to the safety and supply implications that may arise due to a third party strike. These critical distribution assets will be defined on BYDA responses, and some of the controls which are applied to transmission pressure assets (e.g. permit and site watch) will be required.

Buried distribution pressure pipes may be constructed from the following materials and physical appearances when exposed:

- Cast Iron (black);
- Polyethylene (**PE**) (yellow or black with yellow stripes);
- Steel coated or uncoated (generally yellow, black or grey); and
- Other plastic such as Polyvinyl Chloride (**PVC**) or nylon (yellow).

Some legacy materials such as cast iron and nylon may require additional protection during construction works due to the unpredictable nature of the materials.

1.2.3 LPG Distribution

LPG distribution pressure assets operate at pressures below 140 kPag from storage compounds and are generally used to supply consumers such as businesses and homes in parts of Queensland, South Australia and Northern Territory. Design, construction and operation of these assets is governed by the AS/NZS 4645 suite of Australian Standards.

Additional safety considerations are required in addition to the requirements for natural gas, as LPG is heavier than air and will pool at the leak point and can accumulate in a trench or excavation.

The same materials used for buried distribution pressure pipes (**Section 1.2.2**) may be used on LPG distribution networks.

1.3 Damage and Emergencies

If you smell gas or damage has occurred, or is suspected, on any gas asset call APA emergency number **1800 GAS LEAK (1800 427 532) or 1800 808 526 for LPG assets**.

Any unreported damage has the potential to escalate and endanger public safety.

Where damage has resulted in a release of gas, you are advised to take the following immediate action:

- Clear the area of all people. Do not under any circumstance re-enter the damage area;
- Where safe to do so, shut off or remove all ignition sources and devices in the area e.g. naked flames, vehicle engines, power tools, mobile phones;
- Do not attempt to stop the flow or repair the damage:
- Allow the gas to vent to air; and
- Once clear of the area, contact the emergency number **1800 427 532** or **1800 808 526 for LPG assets**.

The conditions in this document or as provided by APA Networks are intended to protect the gas assets as well as keep safe any construction crews or general public in the vicinity. Depending on the circumstances, some variation to the conditions in this document may be required or may be provided by an approved APA Networks site watch representative. It is legislated in all jurisdictions that the direction provided by APA is followed.

1.4 General Duty of Care and Responsibility to Obtain Information

Anybody working near a gas asset, or responsible for such work, has a duty of care to exercise caution, to maintain a safe working environment and to meet requirements of all relevant laws and Occupational Health and Safety legislation.

For general enquiries about results from BYDA please contact:

- DBYDNetworksAPA@apa.com.au for Northern Territory, South Australia, Southern New South Wales and Victoria, and;
- PermitsQLD@apa.com.au for Queensland and Northern NSW (incl. Tamworth).

The third party shall make contact with APA through the BYDA process if any clarification is required to determine the approval processes for any proposed land use changes (within the Measurement Length), design works and construction activities within 3 m of a gas asset or within a pipeline easement.

Any works proposed by the third party will only be authorised if APA is satisfied that the works will not affect the integrity of the APA Networks operated assets.

Any person undertaking work near an APA Networks operated asset, or responsible for such work, must ensure that they familiarise themselves with APA requirements.

Working around any gas asset, especially transmission pressure pipelines, without appropriate planning and controls as specified by APA Networks can be extremely dangerous. Damage to a gas asset could result in:

- Possible explosion and fire with the risk of loss of equipment, property, personal injury, and death;
- Loss of gas supply to thousands of customers;
- Substantial repair and gas restoration liability costs to the authority or principal responsible; and,
- Prosecution under the relevant laws governing pipeline and gas safety.

Prior to the commencement of any works within the Protected Zone of transmission pressure or critical gas assets, the Contractor performing the work must receive an Authority to Work Permit (ATWP).

Any works within the Protected Zone of critical assets must comply with any conditions attached to an ATWP and depending upon the nature of the asset and works supported by an approved construction methodology.

Written authorisation in the form of the ATWP must be kept on site at all times, and the holder of the authorisation must comply with all the conditions of the ATWP. The performance of any works near critical APA Networks operated assets without a valid ATWP and full compliance with its conditions will constitute a safety incident and may also result in an infringement notice and associated penalties issued by the regulator of the APA Networks asset.

1.4.1 Additional Transmission Pressure Pipeline Requirements

Where the works proposed by the third party may result in a change in land use within the Measurement Length for a transmission pressure pipeline (as defined in AS/NZS 2885.6 for Pipelines – Gas and Liquid Petroleum), such works may also be subject to formal approval requirements through APA Networks and applicable local and state government planning processes. This may also require a Safety Management Study (**SMS**) Report to be completed and approved by APA Networks. The SMS Report is generated from an SMS workshop involving an SMS facilitator, the third party and APA Networks. APA Networks is the owner of the SMS Report and any resulting recommendations/ actions must be implemented to the satisfaction of APA prior to the commencement of any physical works.

Certain categories of development/ land use change are not appropriate to be located within the Measurement Length of transmission pressure pipelines. In certain circumstances, the otherwise unacceptable risks associated with such developments may be alleviated with the aid of installing protective slabbing over the asset or undertaking other protection and mitigation measures.

2 PROTECTION PROCESS

APA is committed to working cooperatively with third parties to ensure that existing gas assets will be appropriately protected from any proposed works.

The process to be followed for any proposed works is outlined in **Table 1**. This table cross references the relevant section of this document which provides any specific requirements for each gas asset classification. The steps in this table are to be followed in conjunction with the process outlined by BYDA[1], a flow chart is also provided in **APPENDIX A**.

Table 1 Protection Process Summary

Section	Step	Purpose
3	**Notification and Authorisation**	**Identify and locate existing gas assets in the vicinity of any proposed works.** Submit BYDA requests to obtain indicative plans of gas assets. Notify APA Networks and obtain approval to verify the exact position by physically proving the position of gas assets at the cost of the third party.
4	**Design and Protection Requirements**	**Review APA Networks design and protection requirements for any proposed infrastructure near gas assets.** If acceptable clearance is available in accordance with this section review impact of construction methodology on existing gas assets. If acceptable clearance is not available in accordance with this section and the proposed infrastructure cannot be modified, alteration or protection of the existing gas assets will be required at the cost of the third party.
5	**Construction and Land Use Requirements**	**Review construction methodology for adverse impact to existing gas assets.** Some additional protection measures may be required depending on the existing gas assets, the construction methodology and whether land use changes are required. If works meet the requirements of this document, submit work package to APA Networks for review and approval. If approval is given, then undertake works in accordance with APA Networks conditions/ permits. If approval is not given modify work package accordingly. If works do not meet the requirements of this document or APA Networks approval cannot be reached, alteration or protection of the existing gas assets will be required.
6	**Alteration**	**Request alteration of existing gas infrastructure if there is insufficient clearance or construction methods will adversely impact existing gas assets.** Alteration of existing gas assets are fully recoverable and may result in delays if not identified early.

2.1 Assessment Information

Throughout the protection process, APA Networks assessment may be required to determine if the proposed works/ installation has sufficient separation or if work can be undertaken with a suitable construction methodology. If APA Networks assessment is required, the following information must be provided to enable an efficient and comprehensive review.

- Due dates or a work program;
- The location / address and extent of proposed works;

[1] BYDA process is available at https://www.1100.com.au/safety-information/digging-safely/

- Scope / description of the work impacting APA assets;
- A work package containing detailed design or construction issue drawings with the location of APA assets and the extent of works marked and / or georeferenced. Sufficient details must be provided on the plans to verify locations against APA information, which is typically measured from property boundaries. Plan and cross sectional drawings are typically required, including any proving locations;
- The proposed construction methodology (if available); and
- For critical assets only, a completed permit request form. This form is automatically provided in response to a BYDA enquiry when it is required, with direction for this form included in the BYDA response (refer to **Section 5.2**).

If the information provided is incomplete, or irrelevant information is provided, it may result in a delay of the assessment process and provision of a response. Due to the varying nature of potential works, it is not possible to develop a comprehensive listing of information that will be required for each work type, but the above is provided as a general guideline for what will normally be required.

3 PART 1 - APA NOTIFICATION AND AUTHORISATION REQUIREMENTS

3.1 BYDA Request

The fastest method for obtaining APA Network gas asset locations is to lodge a BYDA request. A response can be expected from APA within two business days, and may include one of three responses as outlined in **APPENDIX A**, depending on the location of the works in relation to existing APA operated gas assets in the vicinity.

For some BYDA requests, APA Networks may provide different responses to different assets affected by the proposed works. In all instances it is the responsibility of the third party to review and follow the direction of all BYDA responses.

The information provided by APA Networks in response to a BYDA request, along with any other plans or subsequent information provided by APA, show only the indicative location of the asset at the time and are a guide only. In most instances it will be necessary to prove the location of all buried assets within the proposed work area.

The following items must be considered when using asset information provided by APA Networks:

- Gas service lines from buried distribution pressure supply mains to consumers may not be shown on plans. Service lines are usually laid at right angles from main to a meter position, except where road conduits are provided; and
- Plans become rapidly outdated and so should be used within 30 days and then destroyed. It is the responsibility of the third party to contact APA Networks to seek the updated or renewal of any information after this time.

APA shall not be liable or responsible for the accuracy of any information supplied.

3.2 Provings and Site Identification

Electronic location (e.g. ground penetrating radar, pipe locators) of gas assets is required to verify the onsite locations and any plans that have been provided.

Physical proving of existing gas assets is required at key locations to verify that the separation and protection criteria provided in this document have been achieved. The location and quantity of provings will depend on the scope of proposed work, but provings will at least be required at infrastructure crossing points or where changes to surface level condition are planned.

Additional verifications are required for works parallel and in close vicinity to existing gas assets. Physical provings at maximum 10 m intervals along straight sections of pipe, along with all bends, branch lines and customer service offtakes to verify asset locations.

Note: Live service offtakes which no longer supply consumers may protrude from the gas asset and are not traceable or identifiable from records.

Note: The maximum physical proving intervals for straight sections of pipe may be adjusted based upon the discretion of APA personnel for extenuating circumstances.

The following items must be considered when proving the location of an existing gas asset:

- Provings must be conducted safely and in accordance with the requirements of **Section 5.5.2.** If damage to a gas asset does occur it should be reported immediately to APA as described in **Section 1.3**.
- Permit and site watch by an APA Networks representative may be required for some proving activities in accordance with **Section 5.2**.

3.3 APA Notification and Authorisation Process

Prior to the third party undertaking any works/ activities or as part of the planning and design phase, the third party shall ensure a BYDA request is submitted. The automated response received from the BYDA system will be tailored based on the criticality of the assets.

For assets operated at distribution pressures and not considered critical mains, a Duty of Care Notice is provided with the BYDA response for the third party to consider. Site watch may be necessary under a duty of care notice where additional protection or other integrity concerns require it.

In the event that works are conducted within the Protected Zone of a transmission pipeline and/ or critical distribution main, these works will require a review approval received from APA prior to commencement of works. Works subject to this requirement are deemed to include, but not limited to, the following activities that fall under **Table 3**;

- Non Destructive Digging (**NDD**);
- Mechanical excavation including trenchless excavation i.e. drilling (boring, horizontal direction drilling (**HDD**), pipeline bursting and tunnelling) for installing infrastructure such as the following; o Roadways, driveways, railways, pavements;
    - o Electrical equipment (cables, overhead transmission lines, telecommunication cable or power poles);
    - o Installation of culverts/ pipes (water, drainage, sewer or reticulation); o Landscaping.

APA will not approve certain activities and structures in the transmission pipeline easement (if applicable), including the following;

- Permanent storage;
- Installation of billboard structures;
- Use and storage for explosives, flammables or corrosives;
- Blasting;
- Structures forming part of any house, house extensions, carports or entertainment areas;
- Dams and other manmade water features. Locations of dams off the pipeline easement/ protected zone must not create run off or drainage towards the pipeline easement;
- Chemically treated effluent coming in contact with the pipeline easement/ protected zone;
- Garbage, sand fill, refuse disposal;
- Airstrips.

The Third Party must submit an enquiry to APA at the earliest possible stage to allow sufficient time for assessment. Submissions should include the following information;

- Land description and map identifying location of the proposed works;
- Types of works to be carried out;
- Intended future use of the land (where relating to change in land use)
- Type and weight of machinery that will be used;
- Any plans or diagrams of the works;
- Timeframe for the works.

The sequence of obtaining APA approval is as follows;

a) Submit enquiry for Initial Review – The Third Party submits the request prior to works commencing and APA Networks will complete an ‘Initial Review’. The third party must not progress any works on site until they receive a response from APA Networks. The two possible outcomes of this stage are a ‘No Impact’ response or;

b) Enquiry Escalated for Standard Assessment – The request will be forwarded to APA Networks Field or System Operations personnel for a more detailed appraisal, which may involve contacting the third party, site visits, locating of assets of site, and/or request for additional information. The third party must not progress any work on site until they receive a response from APA Networks. The two possible outcomes of this stage are a ‘No Objection under standard conditions’ response or;

c) Enquiry Escalated for Engineering Assessment – The request has been forwarded to the Integrity Third Party Engagement team for additional appraisal and determination of specific conditions. The third party must not progress any works on site until they receive a response from APA Networks. The two possible outcomes of this stage are a ‘No Objection under special conditions response’ or;

d) Enquiry Escalated for Alteration – The Integrity Third Party Engagement team triggers the alteration process for this enquiry. The third party will be contacted for additional information and must not progress any work on site until they receive a response from APA Networks.

e) No Impact – The third party receives a 'No Impact' response and can proceed with the works under appropriate APA Networks requirements e.g. Duty of Care, Authority to Work Permit and/or Site Watch.

f) No Objection Under Conditions – The third party will receive a No Objection under standard or special conditions response and can progress with the planning of the works under the conditions specified in the response and appropriate APA Networks requirements e.g. Duty of Care, Authority to Work Permit and/or Site Watch.

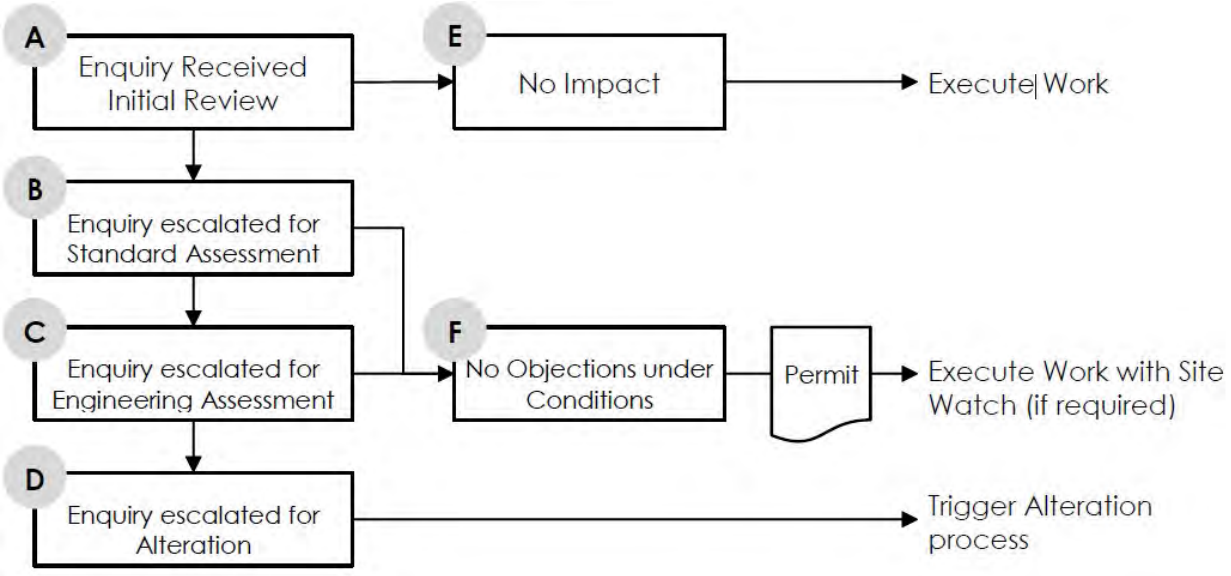


Figure 2 Stages for Third Party Works Authorisation Request

For works around APA Networks transmission pipelines or critical mains the documents take precedence in the following order;

- APA Authority to Work Permit (**ATWP**)
- APA accepted Third Party Construction Drawings
- APA accepted Third Party Construction Methodology
- APA Networks Guidelines for Works Near Existing Gas Assets (this document)
- APA accepted Third Party Safe Work Method Statement (**SWMS**) (if applicable)

3.4 Commercial Agreement and Service Delivery

APA will undertake a review of Third Party Works, as required. At APA's discretion cost recovery for these works may be required. Where APA Networks requires cost recovery a commercial service agreement in the form of a Works Agreement will be required.

Note: Any third party works requiring blasting, seismic and/or tunnelling work near APA Networks operated assets will not be considered "low risk" and cost recovery for detailed review maybe required.

3.5 Decommissioned Gas Assets

Decommissioned gas assets that remain in the ground are not always shown on BYDA plans.

Where unknown assets are identified or suspected on site but are not on APA plans, they must be treated as being live. In this instance, the third party must contact all utility owners and operators in the area of the BYDA and notify them of the findings.

Following review, if APA accepts that it is a decommissioned gas asset, the asset must be treated as per the requirements of this document. APA will take no further action where it is not considered to be a decommissioned gas asset.

In some cases, decommissioned gas assets are required for future use by APA (sometimes noted as “Idle” on APA plans). These assets must be treated as live using the same criteria outlined in this document, and must not be removed or altered without APA’s express written approval.

Where APA confirms there is no future use of a decommissioned gas asset (sometimes noted as “Abandoned” on APA plans), removal of the asset can be undertaken by the third party under the following conditions:

- For assets considered by APA to be decommissioned gas assets, APA must be engaged to verify that the asset is gas free;
- End caps must be permanently sealed, using an APA approved methodology, on any decommissioned sections that are to be left in place to prevent future water ingress into the remaining sections of the decommissioned gas asset;
- An as-built drawing must be submitted by the third party for any section(s) of a decommissioned gas asset removed by the third party or its sub-contractors to ensure BYDA can be updated accordingly; and
- Payment for costs associated with any verification or alteration activities must be provided prior to APA undertaking works.

4 PART 2 - DESIGN AND ASSET PROTECTION REQUIREMENTS

4.1 Standard Clearances

Minimum clearance dimensions outlined in this section must be met to allow for safe future maintainability and protection of existing gas assets. If separation clearances cannot be achieved, APA will review the proposed infrastructure on a case-by-case basis to determine whether a resolution can be achieved before alteration of any existing gas assets is considered. Authorisation of works by APA is still required, regardless of being able to achieve the required separation distances.

Clearances specified in **Table 2** are measured from the closest edges of the existing gas asset to the proposed infrastructure. Depending on the exact nature of proposed infrastructure, additional clearance may be required.

Note: Clearances specified herein are from gas assets, third party utilities may have their own standard separations that exceed APA's minimums specified in **Table 2.**

The future access zone required around a gas asset depends upon a number of factors such as size, operating pressure, depth and soil conditions, but typically this access zone is at least 1000 mm either side and 700 mm below the gas asset. As an aid for design and / or installation, the minimum clearances presented in **Table 2** are provided to allow for safe future access to gas assets. These minimum clearances assume that the asset have been proven and the location verified. There may be circumstances where additional clearances are required.

Table 2 Minimum Clearances

Clearance Type (Note 2, 9)	Minimum Transmission Pressure Asset Clearance	Minimum Distribution Pressure Asset Clearance
Any installation up to 0.6 metres wide which is crossing the gas asset	500 mm Vertical **(Note 2)**	300 mm Vertical **(Note 2)**
Any installation over 0.6 metres wide which is crossing the gas asset	500 mm Vertical	300 mm Vertical **(Note 2)**
Any installation laid by trenchless excavation e.g. HDD, boring, etc.	3000 mm Vertical	600 mm Vertical
	Refer to **Section 5.6** for minimum horizontal separation distances	
Any installation laid parallel to a steel gas asset	600 mm Horizontal **(Note 2, 3)**	
Any installation laid parallel to any gas asset other than steel	N/A	300 mm Horizontal **(Note 2, 3)**
Trenching separation from edge of gas asset to edge of trench **(Note 4)**	500 mm Horizontal	300 mm Horizontal
Underground electrical cables laid parallel to any gas asset other than steel	N/A	300 mm Horizontal
Electrical conduits and cables (<11 kV) laid parallel to a steel gas asset	Engineering assessment required **(Note 2, 3)**	
Electrical conduits and cables (≥ 11kV) laid parallel to a steel gas asset	**(Note 2, 3)** Engineering assessment required **(Note 7)**	

Electrical earthing systems near a steel gas asset	High Voltage: Engineering Assessment Required Low Voltage: 300 mm Horizontal **(Note 7)**	
Electrical earthing system near any gas asset other than steel	N/A	300 mm Horizontal
Clearance Type (Note 2, 9)	**Minimum Transmission Pressure Asset Clearance**	**Minimum Distribution Pressure Asset Clearance**
Undisturbed cover from the top of the gas asset to the underside of trenching or road pavement boxing	500 mm Vertical	300 mm Vertical **(Note 1)**
Distance from predominant building line	3000 mm Horizontal Where applicable outside pipeline easement	Refer to **Section 4.2**
Distance from Sensitive Use Locations (Refer **Section 7** for Glossary of Terms and Abbreviations)	APA Engineering Assessment Required **(Note 8)**	N/A
Canopies longer than 15 m parallel to the edge of the gas asset	3000 mm Horizontal **(Note 10)**	Refer to **Table 4** **(Note 10)**
Any installation that could add excessive loads to the gas asset or restrict access to the gas asset	3000 mm Horizontal **(Note 2)**	
Any installations that may need require underpinning were APA to expose the gas asset	3000 mm Horizontal	
Any temporary stake, e.g. star picket	300 mm Horizontal	
Electrical poles including street lighting and traffic signals	3000 mm Horizontal Where applicable outside pipeline easement	1000 mm **(Note 3, 5, 6, 7)**
Fence post, including road safety barriers	3000 mm Horizontal when installed per APA requirements	500 mm Horizontal when installed per APA requirements
Pile or pier	3000 mm Horizontal when installed per APA requirements	500 mm Horizontal when installed per APA requirements
Permanent Heavy Vehicle Loads (Greater than 4.5T)	Refer to **Section 4.7** Temporary and Permanent Vehicle Loads	
Tree Root Barrier	3000 mm Horizontal	1000 mm Horizontal Refer to **Section 4.3** Landscaping Plans
Separation distances for vegetation	Refer to **Section 4.3** Landscaping Plans	

Note 1: For distribution main crossings, where the vertical separation distance is less than 300 mm physical protective slabbing, e.g. HDPE or concrete, shall be installed where the other utility is crossing beneath the APA pipeline/distribution main.

HDPE or concrete, shall be installed where the other utility is crossing above the APA pipeline/distribution main.

No protective slabbing is required for utility crossings greater than 500 mm separation.

Note 2: Structures and large utilities crossing APA Networks operated assets need to be self-supporting so that future repairs or maintenance of the asset can occur as per **Section 4.2 Third Party Assets and Structures**.

Note 3: Horizontal separation includes utility surface access pits, thrust blocks and/ or footings.

Note 4: Additional horizontal separation may be required depending on the extent of the planned works, local soil conditions and trench stability of the existing gas asset. This is particularly relevant where works occur within the angle of repose of the existing gas asset (e.g. parallel trenching that is deeper than the existing gas asset) and may result in undermining.

Note 5: In accordance with 'AS/NZS 4853 – Electrical hazards on metallic pipelines' without further information and APA engineering assessment, no electrical power poles for 66kV or above are permitted within the following separation distances of steel gas assets;

- If the power line has an Overhead Earth Wire (**OHEW**) – 15 m;
- If power line does not have an OHEW – 100 m;

Note 6: Where electrical poles (including street lighting and traffic signals) are proposed which place the gas asset within the no dig zone specified by the electrical authority either of the following shall occur;

a) The poles shall be designed with deeper foundations to be self-supporting if the gas asset needs to be excavated. Or;

b) For non-metallic assets relocated into a conduit that extends past the no dig zone.

Note 7: Clearance for electrical cables and earthing systems from steel gas assets must be reviewed in accordance with **Section 4.6 Earthing and Electrical Effects**. Electrical cables, substations and/or earthing systems installed in the vicinity of steel gas assets require an Earth Potential Risk (**EPR**) and Low Frequency Induction (**LFI**) assessment to AS/NZS 4853.

Note 8: Requires a setback distance to stay away from the Measurement Length (refer to **Table 14 Glossary of Terms and Abbreviations**). Alternatively, the setback distance may be reduced if protection slabbing is installed along the Sensitive Use Location where interaction with the Measurement Length occurs. This may also be limited to the development area subject to APA engineering assessment.

Note 9: Pipeline protection needs to be assessed and shown on the design plans with design clearances. This includes recoating, bridge slab or asset strike protection slab.

Note 10: Clearance may be dependent on demonstrating that there is sufficient continuous ventilation.

For construction and land use activities around gas assets the minimum horizontal clearances referenced in **Table 3** must be followed.

Table 3 Minimum Clearances for Construction Works and Land Use Activities

Construction and Land Use Activities	Minimum Horizontal Clearance	
	Transmission Pressure & Critical Distribution Mains	Non-Critical Distribution Pressure Mains
Excavation without APA representative present **(Note 1)**	3000 mm	N/A
Trenchless Excavation **(Note 1)**	3000 mm Refer to **Section 5.6**	1000 mm Refer to **Section 5.6**
Temporary Heavy Vehicle Traffic (greater than 4.5T)	If the load has not been assessed, maintain a Horizontal separation of 3000 mm. APA engineering assessment must be completed if crossing asset. Refer to **Section 4.7** Temporary and Permanent Vehicle Crossings	Refer to **Section 4.7** Temporary and Permanent Vehicle Crossings
Installation of Piles, Piers or Poles	Refer to **Table 2** and **Section 5.7**	
Hot Works from Construction Activities	Any hot works within 5000 mm of an open trench containing gas asset or where cover is less than 300 mm. Refer to **Section 5.8**. **(Note 2)**	
Compaction	**Section 5.10** for Compaction Limits Maximum Compaction Limits	
Vibration Limits	No vibration within 3000 mm of the pipeline and greater distance to comply with **Section 5.9**	
Blasting, Seismic Survey or the use of Explosives	Approval required for works within 100m. Refer to **Section 5.11**.	
Lifting over exposed gas asset	Not permitted over the gas asset. Refer to **Section 5.12** for Suspended Materials above Gas Assets and No Go Zones for Cranes.	
Clearance of crane outriggers to gas assets	Not permitted within 3000 mm of gas asset. Refer to **Section 5.12** for Suspended Materials above Gas Assets and No Go Zones for Cranes.	
Clearance of temporary material from pipeline	Not permitted within 3000 mm of gas assets. Refer to **Section 5.13** for Temporary Materials.	

Note 1: Excavation covers NDD, mechanical excavation and trenchless excavation (boring, HDD, pipeline bursting and tunnelling).

Note 2: Horizontal separation distance also applies to any pits or valve covers.

4.2 Third Party Assets and Structures

Structures, including but not limited to buildings, walls, canopies, footings, pile caps or retaining walls, must not transfer any load to or be installed over any gas asset.

The design of any third party asset or structure must take into account future safe access of any gas assets in the vicinity. The proposed third party asset or structure must be installed in a way that prevents the angle of repose from encroaching into the future access zone as specified in **Section 4.1** around the existing gas asset.

Any third party asset or structure installed within proximity to a transmission pipeline or critical distribution pressure main must be designed to be self-supporting and allow for a minimum excavation window 1m on either side of the asset and 700 mm below the edge of the asset, for maintenance of the asset. This self-supporting design information is required to be shown on the construction drawings supported by geotechnical data and calculations. Construction of structures on pipeline easements are not permitted without explicit consent from APA.

Distribution pressure gas mains must be offset from the expected predominant building line at a distance in accordance with **Table 4**. Transmission pressure gas assets shall be per **Table 2**.

Table 4 Minimum Building Offset Distances for Distribution Pressure Gas Mains

Diameter (DN)	MAOP (kPag)			
	≤210	>210 ≤ 420	>420 ≤ 600	>600
≤110	0.5 m	0.5 m	1.0m	3 m
>110 ≤ 160	0.5 m	0.5 m	3 m	5 m
>160	0.5 m	3 m	3 m	8 m

Gas assets may be located underneath curbing or strip footings for road safety barriers for short sections up to 10 m to allow for tapers. The integrity of the gas asset to be located underneath the curbing or strip footing may require inspection, repair, recoating and / or slabbing depending on the existing condition and extent of proposed works.

Posts or poles which are located in road reserve, or otherwise exposed to vehicle impact, must be designed such that there will be no damage to the gas asset in the event of a vehicle impact.

For works in Victoria, consent from the relevant State Minister is required under Section 120 of the *Pipelines Act 2005* (VIC) for the erection of structures or buildings within 3,000 mm of a transmission pressure asset. Ministerial consent must be arranged through Energy Safe Victoria (**ESV**) following review and acceptance of the proposed designs by APA Networks.

4.3 Landscaping Plans

Vegetation may limit line of site, access and passage along an existing gas asset alignment, while the associated roots may damage existing buried pipe, coating or other ancillary equipment (e.g. cables). Above ground gas infrastructure may also be exposed to hazards from falling vegetation and increased fire risk. Additionally, trees and tree roots may limit access to the gas asset in an emergency, during normal operations and when make new connections or modifications.

Landscaping plans which include vegetation should select tree species which do not have vigorous root activity and do not exceed above 5m in height when fully mature when planted within 3m of gas assets. The pre-selection of trees considered suitable for planting within road reserves and near gas assets should also consider interference with, or damage to, other underground and overhead services.

For all landscaping works within 3 m of transmission pressure or critical distribution pressure gas assets the following details must submitted to APA for review and approval prior to planting.

- Tree species – botanical and common name
- Mature tree buttress and canopy diameter
- Mature tree height

- Maximum root ball diameter
- Offset from gas asset
- Method of protection to gas asset

Trees to be planted within 3 m of transmission pressure or critical distribution pressure gas assets, should also adhere to **Table 5** below.

Note: Horizontal separation is measured from pipe edge to edge of mature trunk or mature drip line, whichever is the greater.

Strata cells are not considered an appropriate protection from tree roots. If strata cells are to be installed in the vicinity of existing buried gas assets, the controls identified in **Table 5** must be used for protection.

Table 5 Protection of Distribution Gas Assets from Vegetation

Vegetation Types	Requirements	Horizontal Separation from Pipe Edge to Vegetation			
		Greater than 3 m	1.5 to 3m	1.5 to 0.5 m	<0.5 m
Trees or Large Shrubs	Min. separation of 3 m is required between trees and pipe if no protection methods are utilised.				
Medium and Small Shrubs	Within 1.5 m – 0.5 m protection methods must be utilised.				
Ground cover and grasses	No protection methods required.				

Gas Protection Methods	
	No protection methods required, provided separation limits are followed.
	Within 3 m, tree species which have mature buttress diameters less than 0.15 m and do not have invasive or deep roots may be accommodated without protection methods after consultation with APA Networks **(Note 1)**. For trees with mature buttress diameters greater than 0.15 m one of the following gas protection methods must be implemented; 1. Lowering or relocation of the gas asset to a minimum of 1.2 m cover. 2. Installation of new gas conduit beyond the structural root zone (**SRZ**) of the mature tree species for future use. **(Note 2)** 3. Installation of a root barrier system. System to be 1 m deep or extend 250mm below the gas asset, whichever is the greater.
	Within 1.5 m installation of a root barriers system is mandatory and gas protection methods are as follows; 1. Installation of a robust root barrier system. System to be 1 m deep or extend 250 mm below the gas asset, whichever is the greater. **AND** 2. Lowering or relocation of the gas asset to a minimum of 1.2 m cover. **OR** 3. Installation of new gas conduit beyond the SRZ of the mature tree species for future use. **(Note 2)**
	Planting directly over gas assets is not permitted in any location, as it prevents emergency and maintenance access. Tree roots can damage gas asset resulting in gas leaks.

Note 1: Refers to the minimum 1.5 m structural root zone for a mature buttress diameter less than 0.15 m mandated under AS 4970 – Protection of trees on development sites.

Note 2: Suitable protection method for PE mains only. Conduits to be recorded in Geographic Information System (**GIS**) for future referencing.

Note 3: On transmission pressure assets vegetation must not limit line of site along the buried gas assets alignment, all signage must remain each in sight of the other.

4.4 Surface Levels and Conditions

Decreases or increases to surface levels must consider depth of cover requirements for gas assets specified in **Table 6**. This is in addition to maintaining a minimum working cover from the top of the gas asset to the underside of trenching or road box out works during construction as specified in **Table 2**. Vehicles must not cross gas assets at covers less than those specified in **Table 6** unless in accordance with **Section 5.10** for Compaction Limits or **Section 4.7** for Temporary and Permanent Vehicle Crossings.

Where existing surfaces are to be modified, finished cover levels are not to be reduced to less than existing levels, unless meeting the minimum requirements of **Table 6**. The requirement for, and the extent of, protective slabbing over any APA Networks operated asset will be determined by APA at its sole discretion with adherence to minimum depth of cover without physical protection as the preference. Depending on the location, local councils and relevant road/ rail authorities may have minimum depth of cover requirements that APA are required to meet which are more stringent than those listed in **Table 6**. Depth of cover requirements for individual consumer offtakes (service connections) are also provided in **Table 7**.

Details of any additional fill proposed to be placed on or within 3 metres of a gas asset, or within any applicable easement, must be clearly shown on plans and must be approved by APA Networks in writing. A maximum depth of cover of 2,500 mm for transmission pressure assets and 2000 mm for distribution assets apply in all locations; however, it is preferred not to exceed 1500 mm for both types of assets.

Table 6 Minimum Depth of Cover Requirements for Pipelines and Mains

Asset Location	Minimum Depth of Cover (Note 3)	
	Transmission Pressure Asset	Distribution Pressure Asset
Under Minor Road Pavement **(Note 1)**	• 1,200 mm • 1,200 mm to 1,000 mm with physical protection slabbing and APA engineering load assessment	• 750 mm • 750 mm to 600 mm with physical protection slabbing and APA engineering load assessment
Under Major Road Pavement **(Note 2)**	• 1,200 mm • 1200 mm to 1,000 mm with bridging slabs **(Note 4)**	• 1,200 mm • 1200 mm to 750 mm with bridging slabs **(Note 4)**
In Road Reserve but not Under Road Pavement	• 900 mm • 900 mm to 750 mm with protective slabbing contingent upon pipeline location class	• 750 mm • 750 mm to 600 mm with protective slabbing
Not in Road Reserve	• 900 mm • 750 mm with protective slabbing contingent upon pipeline location class	• 750 mm for > 210 kPa • 600 mm for ≤ 210 kPa
Railway Reserve	2000 mm **(Note 5)**	
Large Open Drain or Major Water Crossing	2000 mm **(Note 6)**	

Note 1: Minor road pavements typically are owned by local councils.

Note 2: All roads owned by state and federal authorities are major roads. Roads owned by council may be major or minor roads. Covers less than 1200 mm may require dispensation from the relevant road authority.

Note 3: Protective slabbing must be installed where minimum depth of cover requirements cannot be met or are required to meet specific safety requirements. Bridging slabbing for transmission pressure assets may be replaced with protection slabbing following APA engineering assessment.

Note 4: The requirement for bridging slabs can be downgrade to physical protection slabbing where APA engineering assessment is completed and approved.

Note 5: Installation within railway reserve shall be in accordance with both AS 4799 and the respective operating standard for the gas assets i.e. AS 2885 and AS 4645.

Note 6: The minimum depth of cover of 2,000 mm shall consider future scour of the drain or waterway crossing. For man-made drains the depth of cover can be reduced to 1200 mm if sealed (i.e. concreted) and appropriately designed. For transmission pressure assets, waterway crossings shall be designed in accordance with AS 2885.1 – 2018 Clause 5.8.6.2. For all assets, as a minimum the following shall be considered;

a) A hydrological investigation to determine the stream power under peak stream, watercourse or waterway flows. The investigation shall determine the 1 in 100 year flood and the probable maximum flood and intermediate (optional) flood conditions.

b) A geotechnical investigation to determine the physical parameters of the crossings, and using the information from the hydrological investigation, the erosion potential. This assessment should also consider the meander potential of the watercourse so that the limits of special construction can be defined.

Table 7 Minimum Depth of Cover Requirements for Customer Offtakes (Services)

Asset Location	Customer Offtake size	
	≤ DN50	> DN50 and ≤ DN110 (Note 1)
Roadway	450 mm	600 mm
Private Property	300 mm	450 mm

Note 1: Customer offtakes (services) with diameters greater than DN110 shall have depth of cover in accordance with **Table 6**.

Changes to surface conditions (e.g. changing from nature strip to road pavement) or which place the gas asset in an inaccessible position (e.g. with excessive cover) may require slabbing, recoating and / or relocation. Changes to surrounding surface levels or conditions must also consider drainage and the potential to result in erosion of cover for gas assets. Additionally, gas fittings such as valves, stopple fittings or flanges must not be located underneath road pavement. An APA Engineering assessment will be required if this is not feasible, refer to **Section 6**.

Where a new hardstand surface is installed on non-metallic distribution pressure mains (e.g. a painted concrete driveway), consideration should be given to including a casing or enveloper pipe to APA requirements for insertion of future gas assets. This will ensure that the new hardstand surface is not modified as part of the future gas installation. Where a casing or enveloper pipe is installed for future insertion works surveyed as-constructed records are to be provided to APA Networks for incorporation into the GIS records.

For transmission pressure gas assets, any landscaping material should be level within the easement or a minimum of 3 m (but preferably 6 m) to each side of the pipeline, to permit excavating equipment to operate without having to destroy the adjacent landscaping.

4.5 Casings Vent Stacks

Casings provide mechanical protection and protection to gas assets from external loadings. Some cased crossings are sealed and fitted with a casing vent stack, which gas leaks are identified via.

The following APA requirements are to be applied for works near casing vent stacks:

- Casing vent stacks cannot be removed unless an alternative arrangement has been approved by APA Networks or they have been assessed as being redundant;
- Unfettered access is to be maintained to casing vent stacks; and
- Minimum distance from casing vent stack discharge point to any electrical installation or overhead structure must be 1000 mm.

4.6 Earthing and Electrical Effects

Steel gas assets are susceptible to adverse effects from electrical sources such as above and below ground cables, substations, transformers, earth rods, cathodic protection systems or electrified tram / train lines.

Without any further information or engineering assessment, earthing systems for distribution (≥11kV) and transmission (≥66kV) power lines must satisfy the Earth Potential Rise (**EPR**) Level 1 (Conservative) compliance of AS/NZS 4853 – 2012 Table 4.3 & 4.5 which specifies separation distances from pipe appurtenances (e.g. valves, regulators, isolation joints), access points or earth points (including cathodic protection test points). For the potential hazards to be accepted as low risk on the basis of a Level 1 assessment the separation between a conductive structure or substation and pipeline subject to EPR shall be greater than the values given in **Table 8** below.

Table 8 Separation Distances for Pipeline Subject to EPR from Power Lines (Level 1 Assessment)

Fault Current or Actual Current (A) (Note 2, 3)	Separation Required (m) - Note 1			
	Distribution Power Line (≥11kV)		Transmission Power Line (≥66kV)	
	100 Ω.m	500 Ω.m	100 Ω.m	500 Ω.m
150	40	190	N/A	N/A
300	80	390	N/A	N/A
500	130	660	N/A	N/A
750	200	1,000	N/A	N/A
1,000	270	1,300	60	310
3,000	N/A	N/A	190	940
6,000	N/A	N/A	380	1,900
10,000	N/A	N/A	635	>3,500

Note 1: Earth resistivity of 500 Ω.m shall be used for dry sand or rock and 100 Ω.m for all other cases.

Note 2: If the fault current is unknown for a distribution power line (≥11kV), a fault current of 1000 A shall be used for the first pass assessment.

Note 3: If the transmission power line (≥66 kV) uses an OHEW, uses values up to 3,000 A (this assumes a current split of 30% of 10 kA). For lines without an OHEW, use values up to 10,000 A for current going down the structure.

Without any further information or engineering assessment, distribution (≥11 kV) and transmission (≥66 kV) power lines parallel to steel gas assets must satisfy the Low Frequency Induction (**LFI**) Level 1 (Conservative) compliance of AS/NZS 4853 – 2012 Table 4.2 & 4.4 which specifies maximum acceptable power line to pipeline exposure length.

Per AS/NZS 4853 – 2012 the pipeline expose length (average separation for the parallel section) under LFI conditions shall be less than the values given in **Table 9** below.

Table 9 Exposure Length for Pipeline Subject to LFI from Power Lines (Level 1 Assessment)

Power line to pipeline separation (m)	Exposure Length (m) – Note 1	
	Distribution Power Line (≥11kV) – 100 Ω.m	Transmission Power Line (≥66kV) – 100 Ω.m
5	180	95
10	210	110
20	240	127
50	310	165
100	400	210
200	550	290
500	950	500

Note 1: Without soil resistivity data, assessments are to be completed assuming 100 Ω.m. If soil resistivity data is available refer to AS/NZS 4853 – 2012.

Where AS/NZS 4853 Level 1 EPR or LFI requirements cannot be achieved a Level 2 and/or 3 assessment will be required.

The third party must provide to APA detailed plans of any source(s) of earthing and/ or electrical effects proposed to be located in the vicinity of steel gas assets, with an assessment report compliant with AS/NZS 4853 Electrical Hazards on Metallic Pipelines. This assessment report is to determine any effects to existing cathodic protection or induced voltage mitigation systems from these types of installations. The third party must address any relevant requirements and any recommendations and/or actions must be implemented to the satisfaction of APA Networks. All cost association with the study, and implementing its recommendations and/ or actions are to be borne by the third party. The third party must also complete validation testing upon completion of construction and provide all findings/ reports to APA Networks.

Hazards which may arise due to electrical systems located in the vicinity of steel gas assets include the following:

- Accidental contact between gas assets and electrical systems;
- Capacitive coupling;
- Conductive coupling;
- Electromagnetic induction;
- Low Frequency Induction (LFI);
- Earth Potential Rise (EPR), including due to fault current or lightning discharge; and,
- Adverse cathodic protection interference in excess of those allowed under AS 2832.1 or relevant state regulations

4.7 Temporary and Permanent Vehicle Crossings

Vehicle crossings over existing gas assets are limited to light vehicles (Gross Vehicle Mass not greater than 4.5 tonnes unless advised otherwise by APA Networks in writing) on unsealed surfaces or Heavy Vehicles (compliant General Access Vehicles) on established road pavements.

Any proposed new crossings must be assessed and authorised in writing by APA Networks.

A maximum surface pressure of 400 kPa is allowable directly above buried gas assets. However, any surface pressure exceeding this limit or where cover over the gas asset has been reduced from **Table 6** will require an APA Engineering Assessment and approval.

Where soil conditions exhibit poor compaction and load bearing characteristics, such as wet soil conditions, equipment is not permitted to cross the gas asset irrespective of weight without establishing a stable sealed surface or road plates.

Crane footings or bog mats must not be placed where the angle of repose can influence an existing gas asset without express written approval by APA. Where the existing gas asset is within the angle of response, the maximum surface pressure due to the crane must be provided.

5 PART 3 - CONSTRUCTION AND LAND USE REQUIREMENTS

Extreme care should be exercised at all times when working around existing gas assets, as repair works will be fully chargeable and may result in delays to any works. Refer to the duty of care outlined in **Section 1.4** and the requirements of this section when selecting construction methods.

5.1 Land Use Change

Where works proposed by a third party may result in a change in land use within the Measurement Length (as defined in AS/NZS 2885.6 for Pipelines – Gas and Liquid Petroleum) of transmission assets, such works may also be subject to formal approval requirements through APA Networks and applicable local and state government planning processes.

This may also require a Safety Management Study (SMS) report be completed and approved by APA Networks. This SMS report is generated from an SMS workshop involving an independent SMS facilitator, third party and APA Networks. APA Networks is the owner of the SMS report and any resulting recommendation/ actions must be implemented to the satisfaction of APA Networks prior to the commencement of any physical works.

Certain categories of development, such as Sensitive Use Locations (refer to **Table 14 Glossary of Terms and Abbreviations**), are not appropriate to be located with the Measurement Length. In certain circumstances, the otherwise unacceptable risks associated with such developments may be alleviated with the aid of installing protective slabbing over the transmission pipeline or undertaking other protection and mitigation measures.

Sensitive Use Locations near transmission pipelines are designated under AS/NZS 2885.6 and identify land where the consequences of a Failure Event may be increased because it is developed for use by sectors of the community who may be unable to protect themselves from the consequences of a pipeline Failure Event.

Sensitive uses are defined as follows;

- Schools, which includes colleges
- Hospitals and aged care facilities such as nursing homes, elderly people's homes
- Prisons and jails
- Sheltered housing
- Buildings with five or more stories
- Large community and leisure facilities, large open air gatherings
- Day care facilities
- Other potentially difficult to evacuate facilities
- Other structures as defined by relevant local councils.

For further information regarding the SMS process, refer to APA Networks Encroachment and Land Use Change SMS Trigger Procedure, **400-PR-L-0003**.

5.2 Permits and Site Watch

Transmission pressure assets and critical distribution pressure assets, must have a permit issued prior to proposed works in the vicinity of the existing assets, including any proving activities. Following the issue of a permit, a site watch inspector may be required to verify that the activities are carried out appropriately.

Other distribution pressure assets not considered critical will only require site watch as determined by APA Networks.

Where a permit is required, the response provided to the BYDA enquiry will include the relevant forms and process to be followed for submitting a permit request.

While BYDA recommends completing the request two business days prior to undertaking works, this is to ensure that the location information is obtained. This may not allow sufficient time for APA Networks to supply site watch. Further delays may be experienced if the proposed works are significantly complicated, do not meet the requirements of this document or if insufficient information is provided.

It is an offence in all jurisdictions to undertake activities in the vicinity of transmission pipelines without prior authorisation by the operator.

5.3 Coating Surveys and Leakage Surveys

Where proposed works have potential to indirectly damage pipe coating (i.e. due to compaction) or result in a leak of the gas asset (e.g. vibration of cast iron pipes), additional monitoring activities such as Direct Current Voltage Gradient (**DCVG**) or leakage surveys may be required.

If required, chargeable DCVG surveys will be conducted prior to works to establish any existing coating faults which exist on the gas asset. A subsequent DCVG survey will be conducted at the conclusion of works, and where new faults have developed on the gas asset, repairs shall be made with costs charged to the works owner. Surveys can be conducted prior to finalising road surfaces to avoid costly repairs.

A similar chargeable survey program can be applied where leakage surveys are required. However, additional surveys may be necessary throughout works to ensure work crews do not operate in a gaseous environment once leaks are caused.

5.4 Pipeline Repairs, Recoating and Slabbing

Buried steel assets operated by APA Networks are coated to provide protection from corrosion.

Where the surface conditions above a buried steel pipe are changed which may limit future access to the existing gas asset an assessment of the coating condition will likely be triggered.

The requirement for pipeline recoating is assessed by APA Networks on a case by case basis, based on the proposed works, but will generally be dependent on the following:

- The asset class;
- The existing coating type, age and condition;
- Increase in loading that can bring forward any pipeline anomalies; and,
- Changes limiting access to the existing asset(s), such as the installation of slabbing, road pavement, culverts, embankment ramps or any other feature.

A chargeable coating survey carried out in accordance with **Section 5.3** may be required to assess the condition of the existing gas asset coating.

Recoating and/ or associated slabbing works over any gas asset will be determined by APA Networks Engineering Assessments and any applicable risk assessments (Safety Management Study or Formal Safety Assessment).

Pipeline repairs, recoating and slabbing that form part of any third party commercial agreement will be charged to the third party.

The requirement for, and the extent of, slabbing over any APA Networks operated asset will be determined by APA at its sole discretion and may depend on factors other than only changes in depth of cover discussed in **Section 4.4**. Slabbing may be required for the following reasons:

- Removable protective slab to provide protection from third party mechanical excavation;
- Bridging slab to provide protection from external loadings e.g. insufficient depth of cover combined with vehicle traffic.

Slabbing must be installed with adequate separation from the pipe, which may impact the undisturbed cover requirement, and cannot be installed directly underneath road pavement or at surface level.

Any bridging slab designs prepared by a third party must be accompanied by certification from the registered practising structural engineer (Registered Professional Engineer Queensland (**RPEQ**) required for works in Queensland, and so on as required for other States and Territories) confirming that the design is adequate to prevent pipeline loading.

5.5 Exposure of Buried Gas Assets

5.5.1 General

Excavation works covers Non-Destructive Digging (**NDD**) and mechanical excavation. All such excavations must be completed in accordance with APA's direction.

The Third Party or its Contractor can perform exposure works on APA Networks operated assets via NDD using vacuum excavation and subsequent mechanical excavation works under the following conditions:

- **A current BYDA request is available for the works.**
- An approved Authority to Work Permit (**ATWP**) is issued for works near transmission pipelines or critical mains.
- APA Site Watch Officer is present for works near transmission pipelines or critical mains as outlined on the ATWP.
- The Third Party (or its Contractor) shall ensure they have their own SWMS, Risk Assessment, Environmental Management Plan, Tool Box Talk, Traffic Management and Pre-Start in line with their own corporate policy in place prior to works commencing.
- All underground assets have been identified by surface marking where within or close to the excavation area prior to proceeding with planned proving works (i.e. hand or NDD (e.g. Hydro-Vacuum Excavation). Any non-recorded assets should be identified prior to breaking ground (e.g. excavation or cutting).
- A check for gas leaks has been conducted prior to the commencement of work.
- If the mechanical excavation operator cannot see the spotter (where applicable, APA Site Watch Officer), he or she must stop moving immediately and not resume movement until contact has been established. Spotters must be aware of their surroundings and should never walk into the path of a vehicle, moving equipment or a swinging load. They need to scan the ground to become aware of any trip or fall hazards.
- If excavations are greater than 1.5 m or ground conditions are considered unstable benching/ battering/ shoring must be utilised. Additionally, appropriate ladders/ ramps or steps must be utilised to ensure safe access and egress.
- **Under no circumstances is mechanical equipment to be used within 300 mm of any gas asset.**

5.5.2 Physically Proving Gas Assets

Prior to mechanical excavation of the gas assets, the asset shall be physically proven by NDD or through the use of hand excavation. The method used will vary based on the criticality of the asset. The requirements in **Section 5.5.1** shall be implemented prior to physically proving the gas asset.

Technique 1 – Vacuum Excavation (Critical and Non-Critical Gas Assets)

A vacuum truck can be used to prove and expose the gas asset. Please ensure the requirements detailed in **Section 5.5.3** are adhered to.

Technique 2 – Hand Excavation (Critical and Non-Critical Gas Assets)

If the anticipated depth of cover of the gas asset is less than 1m (measured from the top of pipe) then hand excavation shall be used to expose the gas asset. The use of round edge shovels should be used to avoid damage to the pipe or coating. In the event that the anticipated depth of cover of the gas asset is greater than 1m then mechanical excavation can be undertaken in accordance with the requirements of **Section 5.5.4** but must stop when within 1m of the gas asset (i.e. 1.3m anticipated depth means that 300 mm of cover can be removed by mechanical excavation and the

remainder by hand excavation as described above. The anticipated depth shall be based on the shallowest result from BYDA or pipe locator.

Technique 3 – Hand + Excavation (Non-Critical Gas Assets ONLY)

If the gas asset is deemed non-critical then a combination of hand digging and excavation can be used. This technique requires the third party to hand excavate 300 mm then mechanically excavate the first 150 mm. In this technique the hand excavation shall always lead the mechanical excavation by 150 mm. Once within 300 mm of the gas asset then only hand excavation is allowed.

5.5.3 Hydro-Vacuum Excavation

Where hydro-vacuum excavation is used in the vicinity or to expose existing gas assets, the following conditions must be applied:

- Ensure the general requirements in **Section 5.5.1** are adhered to prior to the works commencing.
- Root cutting heads shall not be used at any time.
- When locating pipelines and mains, a maximum water pressure of 2500 PSI (17200 kPa) may be used to a depth no greater than 450 mm. Below this depth, the maximum water pressure shall be set in accordance with **Table 10** for the asset type in the vicinity.
- When locating customer offtakes (services), a maximum water pressure of 2500 PSI (17200 kPa) may be used to a depth no greater than 300 mm. Below this depth, the maximum water pressure shall be set in accordance with **Table 10** for the asset type in the vicinity.
- Where air is used in place of water the air pressure shall not exceed 175 PSI (1200 kPa).
- A minimum distance of 200 mm shall be maintained between the nozzle tip and subsoil and vertical movements avoided (i.e. nozzle shall not touch or be inserted into soil).
- The wand shall never remain motionless during excavation. Aiming directly at the gas asset shall be avoided at all times.
- NDD vacuum equipment must not come into contact (impact) with the pipe or coating.
- Once a gas asset has been exposed via hydro-vacuum methods, a visual check must be undertaken to ensure no damage has occurred to the pipe or its coating. Damage caused to the pipe coating by the third party will be chargeable.
- A dead man trigger or similar, shall be installed and used on the wand.
- If conduits are to be installed for identification of the gas assets location the conduit shall be offset to one side and recorded or a flexible conduit installed over the gas asset. The placement of PVC pipes directly on the gas asset may cause damage to the pipe coating and require repair at the contractor's expense.
- Vacuum excavated holes shall be cleaned of any rocks and debris and backfilled with a minimum 300 mm of sand.

Personnel operating NDD equipment shall monitor ground conditions to determine and adjust for the lowest water pressure setting and vacuum used to adequately expose the gas asset. The objective shall be to use the lowest possible pressure and vacuum required to adequately excavate in order to minimise risk of coating and/or pipe damage. **Table 10** provides the maximum water pressure to be used for various pipe and coating types.

Table 10 Maximum Water Pressure for Hydro-Vacuum Excavation

Pipe / Coating Type		Max. Water Pressure (PSI)	Pipe / Coating Type	Max. Water Pressure (PSI)
Steel	Coal Tar Enamel Coated	1,000	**Steel – Mummified fittings** (e.g. valves, flanges)	Not Permitted
	Polyethylene Tape Coated	1,000	**Cast Iron**	1,000
	Polyethylene Coated	2,000	**Polyethylene**	2,000
	Trilaminate Coated	2,000	**Nylon or PVC**	1,500
	FBE or HBE Coated	2,000	**Unknown Material or Steel Pipe Coating**	1,000
	Uncoated	2,500		

5.5.4 Mechanical Excavation

Prior to commencing any excavation works the general requirements in **Section 5.5.1** must be adhered to.

Where works are to be carried out within 3 m of the gas alignment and to 1 m of the known gas main depth, the contractor is required to pothole and expose the gas asset as outlined in **Section 5.5.5**.

Prior to the mechanical excavation commencing ensure the excavator is in working order and all pre-start equipment checks are completed.

Excavators with general purpose buckets (e.g. mud bucket, general purpose teeth) up to 30 tonnes are permitted to conduct mechanical excavations in the vicinity of existing APA gas assets in accordance with APA requirements. Any variation of excavator size or bucket type will require assessment and approval by APA Networks. Buckets with any type of tiger or penetration teeth are not permitted unless explicitly approved by APA Networks.

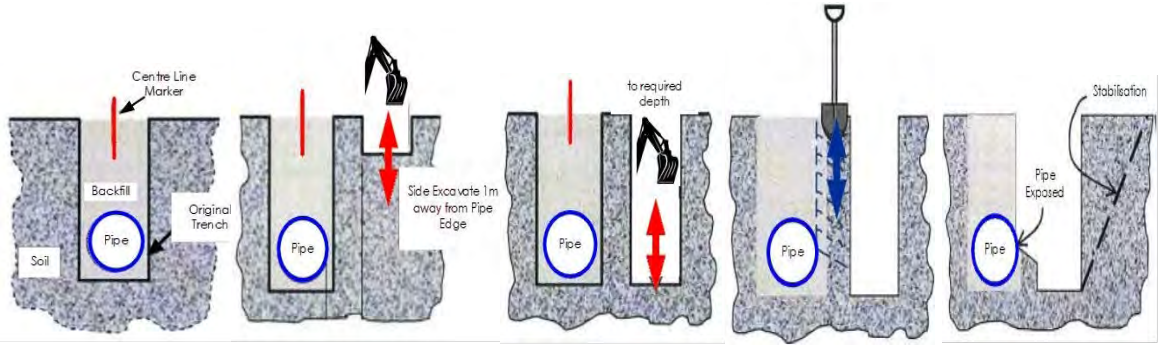
Critical Gas Assets

No mechanical equipment shall be used within 1 m of the potholed depth of the critical gas asset, except under explicit on site direction from an APA representative (i.e. APA Site Watch).

Under no circumstances is mechanical equipment to be used within 300 mm of any gas asset.

Once the gas asset has been positively proven, as outlined in **Section 5.5.2**, mechanical excavations can commence at a minimum of 300 mm offset from the outer edge of the pipe. The third party shall not mechanical excavate directly over a critical gas asset, with hand excavation only directly over the alignment or to expose the asset.

Figure 3 Gas Asset Side Excavation Method



Non-Critical Gas Assets

Mechanical excavation is permitted directly over the top of non-critical gas assets however **under no circumstances is mechanical excavation equipment to be used within 300 mm of any gas asset.** If the third party is in doubt with regards to the criticality of the gas asset, then the excavation method outlined for critical gas assets shall be used.

Prior to the mechanical excavation commencing, the asset shall be physically proved as outlined in **Section 5.5.2**. Once the depth has been physically proven the third party can proceed with excavating around the gas asset until within 300 mm. From this point hand excavation or NDD is required.

5.5.6 Protection During Exposure

Additional protection measures are required where an exposed gas asset may be subject to impact from construction activities, sagging of exposed pipe and trench instability. Any works requiring exposure and protection of the gas asset should have an accompanying methodology and approval by APA Networks.

Physical protection (e.g. structural steel protection, sandbags, wrapped with split PVC pipe) should be installed around the exposed gas asset when exposed, particularly when new infrastructure is planned to be installed crossing below the gas asset. If the gas asset is to be exposed for longer than one day or otherwise left unattended, suitable barricades, security fencing and/ or steel plates will be required to provide protection from vehicles, dropped objects (such as construction materials) or vandalism.

Unsupported exposed pipe lengths require protection from sagging by using suitable supports such as sandbags or slings. Where slings or other support types come into contact with the gas asset, protection methods must be employed (e.g. wrapped with split PVC pipe) to prevent damage to the existing pipe or coating. Exposed unsupported joints must also be identified and supported during works. The maximum allowable length of exposed pipe without support is provided in **Table 11**.

Table 11 Maximum Unsupported Lengths of Exposed Pipe

Gas Asset Diameter (mm)	Steel Maximum Unsupported Length (mm)	Polyethylene Maximum Unsupported Length (mm)	Other Material Maximum Unsupported Length (mm)
≤20	2,000	1,500	1,500 **(Note 1)**
>20 & ≤63	2,800	2,000	
>63 & ≤100	3,600	3,000	
>100 & ≤150	4,200		
>150 & ≤250	5,000		
>250	5,700		

Note 1: Particular care should be taken for other materials include cast iron, PVC or nylon due to the unpredictable nature of the joints.

Additional protection and support during trench or bell-hole excavation works to minimise ground instability may also be necessary to protect the integrity of existing gas assets during exposure works. Trenches are to be inspected prior to commencing works each day and monitored by the onsite party responsible for the excavation. APA shall be notified of any condition likely to affect the stability of trench.

Any deep excavations, within 3 m of a gas asset, shall be designed and constructed such that the effects of subsidence, collapse or extreme weather will not affect the gas asset. Any such excavations prepared by a third party must be accompanied by certification from a registered practising engineer (RPEQ required for works in Queensland, and so on as required for other States and Territories) confirming that the design is adequate to protect the gas asset.

5.5.7 Backfill and Reinstatement

Prior to backfilling, a minimum of 150 mm of bedding sand must be placed around all gas assets. Bedding sand shall be in accordance with APA specification **400-SP-L-0002**, which can be provided to third parties upon request. The bedding must be compacted in accordance with **Section 5.10**, including suitable compaction and backfill of the underside of the gas asset to prevent any further vertical movement during subsequent layers above the asset. APA may require geo-fabric installation between different trench reinstatement products to prevent sand migration in which nonwoven fabric is required and needs to extend 1000 mm past either side of the utility crossing.

The bedding material shall be clean, free from all sharp objects, sandbags, clay material, vegetable matter, building debris and disused road paving material to the specification provided by APA. Recycled bedding material and stabilised sand must not be used unless explicitly approved by APA.

The remainder of the excavation shall be backfilled and compacted in accordance with **Section 5.10**, at maximum increments of 300 mm to a density which is similar to the surrounding sub-grade material. Only clean fill material shall be used, preferably the same as the natural soil in the area, and free from ash, weeds and pest plants, salt or any chemicals which could harm the gas assets. Where required, concrete slabbing shall be installed in accordance with **Section 5.4**.

In all circumstances gas warning tape / marker board shall be installed in accordance with the following requirements:

- Gas warning tape installed at 300 mm below finished surface level.
- Gas marker board installed 300 mm above the top of the pipe.

Note, where gas warning tape cannot be installed 300 mm below the finished surface level due to road pavement box out, marker board is to be installed 50 mm below the box out work zone.

In situations where a physical protection slab or bridging slab has been utilised an additional layer of gas marker board must be installed 50 mm above the slabbing.

The excavated area is to be reinstated to the original condition or as approved by APA and the relevant local council, road authority or landowner as applicable. Any marker signs removed during excavation works must also be reinstated in original positions. Additional marker signs may be required at new infrastructure crossings as directed by APA.

5.6 Trenchless Excavation

Trenchless excavation covers horizontal directional drilling (**HDD**), boring, pipe bursting and tunnelling. These activities are considered high risk that require additional controls to prevent damage to existing gas assets. This includes proving the existing gas asset location and depth for all horizontal bores, as well as providing a witness trench to verify that the bore will pass the asset with sufficient separation.

A witness trench must be used in addition to live electronic tracking of the bore head. The witness trench must be prepared to the specification provided in **Table 12**. The progressive measurement of the length of the bore must also be made and plotted along its proposed direction to ensure the bore head has not missed the witness trench. The bore head must be exposed in the witness trench, when the crossing is above the existing gas asset.

For all assets installed via trenchless excavation a vertical separation aligning with the maximum borehole diameter (e.g. reamed diameter) shall be demonstrated. For transmission pressure and distribution pressure assets this vertical separation distance is 1000 mm and 600 mm, respectively.

If the works run parallel to a transmission pressure or critical gas assets a minimum separation distance of 3 m must be maintained. For non-critical gas assets, the minimum separation distance of 1 m must be maintained. For works running parallel to gas assets, proving of the actual location of the gas asset must occur every 4 m.

Note: It is expected that HDD operators working near gas assets hold the national competency RIICCM202 – Identify, location and protect underground service.

Table 12 Minimum Witness Trench Dimensions

Crossing Type	Witness Trench Depth	Witness Trench Dimensions
Crossing Above Existing Gas Asset	To bottom (invert) of gas asset	Witness trench shall be 1000 mm to 2000 mm in front of the gas asset on the approach side. Witness trench shall be min. 1500 mm long and 300 mm wide centred on bore centre line.
Crossing Below Existing Gas Asset	To bottom (invert) of gas asset plus 500 mm	

Dispensation may be considered where detailed long sections are provided for assessment by APA and where depths of existing gas assets or separation to the bore are greater than 2500 mm.

Pipe bursting is not permitted within 1000 mm of an existing gas asset.

5.7 Piles, Piers or Poles

No piling such as pile-driving, sheet-piling or hammer-piling is permitted within 15 m of an existing gas asset unless explicit consent has been provided by APA. In all instances, vertical bored (augured) piles, piers or poles are preferred.

Where installation of piles, piers or poles are proposed between 500 mm and 1000 mm clearance from a gas asset (distribution and transmission pressures, respectively), the area directly below the proposed pile, pier or post location must be excavated to a level equivalent to the bottom (invert) of the existing gas asset, and works started from that depth.

Note: Proving of the gas asset must be completed in accordance with the requirements set out in **Section 5.5.2** prior to the commencement of any works.

Temporary steel plates may also be installed between the gas asset and the proposed pile, pier or post used for vertical bore methods within this clearance to provide extra protection.

Note: Direct vibration monitoring on the gas main may be required depending upon the installation method utilised. Refer to **Section 5.9** for APA Networks vibration limits.

5.8 Hot Works for Construction Activities

Typical hot works include grinding, welding, thermal or oxygen cutting or heating, and other related heat producing or spark-producing operations. Heat sources or hot works must not impact gas assets, taking into consideration that the ground or adjacent structures may also be capable of transmitting heat.

In order to safely undertake hot works, response procedures in the event of fire or flammable gas detection must be prepared and monitoring for flammable gases must be undertaken during works.

APA must approve any hot works where there is less than 300 mm ground cover to buried gas assets, or within 5,000 mm of any exposed gas assets (including any pits or valve covers). A heat shield or barrier may be required to provide protection if it cannot be demonstrated that works can be undertaken without impacting the gas asset.

5.9 Vibration Limits

Significant vibration may arise from activities such as blasting, piling, tunnelling and HDD/boring.

To avoid damage to existing APA Networks operated pipes and coatings, the following vibration limits must not be exceeded at any point on the pipe:

a) For cast iron mains: 5 mm/s maximum Peak Particle Velocity (**PPV**) measured on the pipe.

b) For steel pipe with a coal tar enamel (**CTE**) coating or with poor coating health: 10 mm/s maximum PPV measured on the pipe.

c) For non-coal tar enamel pipe coatings and other pipe materials (i.e. steel, PE, PVC or Nylon): 20 mm/s maximum PPV measured on the pipe.

d) For blasting, the above vibration limits can be increased if supported by calculations in accordance with Design Guidelines for Buried Steel Pipeline – American Lifelines Alliance American Society of Civil Engineers (**ASCE**) and approved in writing by an APA Networks Integrity Engineer.

Note: Cast iron mains are particularly susceptible to damage by vibration. The PPV limit may not prevent leaks from cast iron and may require additional gas leakage survey activities during works in accordance with **Section 5.3**.

For vibration monitoring adopt an alarm at 80% of the acceptable PPV value and when the alarm is activated, the work must stop and be re-assessed. Short incursions up to 100% are acceptable, for sustained periods of vibration longer than 5 minutes, works must be stopped.

The zone of influence for vibration assessment undertaken by the third party is shown below;

- For compaction, refer to **Table 13**.
- For trenchless excavation (HDD/ boring), refer to **Section 5.6**.
- For piling refer to **Section 5.7**.
- For blasting refer to **Section 5.11**.

5.10 Compaction Limits

Compaction activities such as establishing a base course for a road pavement may result in damage to the pipes and coatings of existing gas assets. Compaction limits in the vicinity of existing gas assets are summarised in **Table 13**.

Table 13 Maximum Compaction Limits

Horizontal Separation (m)	Minimum Cover to Top of Gas Asset (mm)	Compaction Limits
≤3 **(Note 1)**	300	Small handheld compactor only
	500	Large handheld compactor Maximum 4 tonne tandem drum static roller
	750	Maximum 8 tonne tandem drum static roller
	1200	Maximum 10 tonne tandem drum static roller subject to APA approval
>3 & ≤10	All	Maximum 8 tonne tandem drum vibrating roller
>10 & ≤15	All	Maximum 10 tonne tandem drum vibrating roller
>15	All	Any compaction method

Note 1: Compaction within 3 m of gas assets is limited to static rollers. If vibration compaction is necessary a robust vibration assessment and construction methodology signed off by an RPEQ for works in Queensland, and so on as required for other States and Territories, will need to be produced by the third party for review and approval by an APA Networks Integrity Engineer.

5.11 Blasting / Seismic Survey / Explosives

Blasting, seismic survey or the use of explosives is not permitted within 100 m of a gas asset unless explicit approval is provided by APA Networks. The size and quantity of the explosives to be used will determine how close to the pipeline blasting will be permitted. In all cases, blasting methods must be arranged to limit ground vibrations so that the peak particle velocity does not exceed acceptable limits. At no stages will blasting be permitted within 3 m of the pipeline.

5.12 Suspended Materials above Gas Assets and No Go Zones for Cranes

Where gas assets are exposed, no cranes, excavators or backhoes are permitted to carry or suspend materials directly over or across a gas asset without an APA Networks approved lifting plan and SWMS.

Outriggers must be set up outside a 3 m radius from gas assets unless otherwise approved by APA Networks in writing.

5.13 Temporary Materials

In all instances it is preferred that temporary materials (e.g. soil, shipping containers) are not stored on top of transmission pressure and critical gas assets. Temporary material must not restrict access and should be placed at least 1,500 mm from the alignment of these assets unless otherwise approved by APA Networks.

6 PART 4 - ALTERATION OF EXISTING GAS ASSETS

Where the proposed third party works do not comply with the requirements of this document, and adequate additional controls or a specialised engineering solutions cannot be developed, alteration of the existing gas assets will be required.

Gas asset alterations will only be undertaken under a Recoverable Works Agreement (**RWA**) appropriate to the scope and extent of the works required.

An Early Works Agreement (**EWA**) may also be required where works are proposed which require proving, engineering design activities or purchase of long lead items. This will allow for completion of these items prior to execution of a RWA and avoid delaying works.

If either or both these agreements are required, then APA Networks will enter negotiations with the relevant third party and any costs will be payable by that third party.

7 GLOSSARY OF TERMS AND ABBREVIATIONS

Table 14 Glossary of Terms and Abbreviations

Term/ Abbreviation	Meaning
AGN	Australian Gas Networks
APA	Each entity that forms part of the APA Group
APA Engineering Assessment	Covers technical assessments which may involve field integrity assessments that may or may not include the use of specialist Consultants managed by APA.
APA Networks Operated Assets	APA Networks acts as the asset operator on behalf of entities Australian Gas Networks (AGN), Allgas, APA, Origin and Queensland Nitrates (QNP) and operates in New South Wales, Northern Territory, Queensland, South Australia and Victoria.
APA Permit Issuing Officer	The APA Permit Issuing Officer is responsible for opening the Permit To Work, validating APA Networks assets have been located and being the Site Watch for works within the gas Easement or Protected Zone.
AS	Australian Standard
ASCE	American Society of Civil Engineers
ATWP	Authority to Work Permit
CTE	Coal Tar Enamel
Damage	Physical damage to and interference with APA's assets. Damage includes reducing design life, coating damage, dents, scratches, rupture, cutting of cathodic protection cables. Damage can also include potential impacts that APA pipelines can have on third party assets.
BYDA	Before You Dig Australia (previously known as Dial Before You Dig (DBYD))
DCVG	Direct Current Voltage Gradient
Depth of Cover	Vertical distance from the existing natural ground surface to the top of the buried gas asset
EPR	Earth Potential Rise
ESV	Energy Safe Victoria
EWA	Early Works Agreement

Excavation	Excavation refers to manual digging or mechanised digging operation with plant or equipment which involves trenching and trenchless excavation. Trenchless excavation covers boring, Horizontal Directional Drilling (HDD), pipe bursting and tunnelling.
FBE	Fusion Bonded Epoxy
GIS	Geographic Information System
HBE	High Build Epoxy
HDD	Horizontal Directional Drilling
Hot Works	Hot works are defined as grinding, welding, thermal or oxygen cutting or heating, and other related heat-producing or spark-producing operations. Heat sources or hot works must not impact pipelines, taking into consideration that the ground or adjacent structures may also be capable of transmitting heat.
LFI	Low Frequency Induction
LPG	Liquefied Petroleum Gas
MAOP	Maximum Allowable Operating Pressure
Measurement Length	The maximum length of pipeline route which presents an extended source of hazard on the basis that an event of failure could affect any part of the development or specific location relevant to the development. The maximum length corresponds to the heat radiation hazard associated with a 4.7 kW/m^2 heat radiation contour for an ignited full bore rupture calculated in accordance with AS/NZS 2885.6. If the pipeline is designed as a no rupture pipe, then the measurement length corresponds to a credible leak size.
NDD	Non-Destructive Digging (NDD) refers to either hand digging or Non-Destructive Pot Holing using a vacuum pipe connected to a vacuum truck with either a water lance or air lance. Hydro-Vacuum Excavation consists of a water lance and vacuum truck and is used to physically prove existing assets.
OHEW	Overhead Earth Wire
PE	Polyethylene
Pipe Bursting	Pipe bursting refers to a pipe being inserted to a larger pipe that results in the larger pipe being damaged. For an example of pipe bursting, refer to the following You-Tube video: https://www.youtube.com/watch?v=HX5beh0ubGY
Pipeline Easement	The pipeline area shown on a survey plan and referenced on the property title.
Predominate Building Line	The expected predominate building line relates to the façade of the building, not necessarily the property boundary.
Protected Zone	A Protected Zone is an area extending both horizontally and longitudinally along a gas asset. It is the area where loads and/or any hot works may potentially cause damage to the gas asset.

	The Protected Zone refers to works near APA Networks gas assets or works within the vicinity of the gas assets that may cause an unacceptable risk to the asset in accordance with Table 2 Minimum Clearances or Table 3 Minimum Clearances for Construction Works and Land Use Activities
PTW	Permit to Work
PPV	Peak Particle Velocity
PVC	Polyvinyl Chloride
QNP	Queensland Nitrates Plant
RPEQ	Registered Profession Engineer Queensland
RWA	Recoverable Works Agreement
Sensitive Use Locations	This is designated as Class “S” as per AS/NZS 2885.6 Pipelines - Gas and liquid petroleum - Pipeline safety management and refers to the sub location class. Sensitive Use Location Class (S) identifies land where the consequences of a FAILURE EVENT may be increased because it is developed for use by sectors of the community who may be unable to protect themselves from the consequences of a pipeline FAILURE EVENT. Sensitive uses are defined as follows: • Schools which includes colleges • Hospitals • Aged care facilities such as nursing homes, elderly people’s homes • Prisons and jails • Convalescent homes • Sheltered housing • Buildings with five or more stories • Large community and leisure facilities, large open air gatherings • Day care facilities • Other potentially difficult to evacuate facilities • Other structures as defined by relevant local councils. The Sensitive Use Location Class “S” must be assigned to any section of a gas transmission pipeline where there is a sensitive development within the applicable Measurement Length.

Site Watch	An APA Site Watch representative can be the Permit Issuing Officer for excavation work within a gas Easement or Protected Zone and is referred to as the primary spotter for excavation works. The secondary spotter is provided by the Contractor. The primary spotter has the ultimate decision regarding works within the gas Easement or Protected Zone which includes the method of excavation, starting and stopping excavation work. The APA Site Watch representative is the nominated competent person responsible for the following; • Making themselves highly visible and everyone on the job site should be aware of the Site Watch's role; • Communication to personnel operating mobile plant and equipment ensuring minimum clearance to above and below ground assets is maintained and the construction methodology is adhered to and complies with APA Networks requirements. Ensuring personnel do not encroach within the swing radius of the operating machinery.
SMS	Safety Management Study
SMWS	Safe Work Method Statement used by APA or Contractors to execute field work. The risks and associated control measures risk assessments should be transferred to SWMS.
SRZ	Structural Root Zone
Structures	Structures refer to third party structures which includes, but is not limited to; temporary or permanent buildings, walls, canopies, footings, pile caps or retaining walls
Third Party	The person or entity and their agents or Contractors that propose to undertake work near APA assets.
Third Party Assets	Third Party Assets include roads, utilities and structures.
Third Party Excavation	Third Party Excavation which is **not** associated with APA (e.g. road works, utility installation, private development, fencing).
Third Party Works Classification	The Third Party Work Classification as shown in **Section 3.3** covers the following three work classifications: 1. No Impact to gas assets 2. No Objection Under Conditions 3. Enquiry Escalated for Alteration
Transmission Pipeline	Gas transmission pipeline which includes all associated equipment such as cathodic protection, earthing grid, instrumentation and electrical cables.
Utilities	Includes water, wastewater, drainage, telecommunications cables, power poles and cables owned by individuals or organisations other than APA Networks.
Voltage	Difference of potential normally between conductors or between conductors and earth as follows: a) Extra-low voltage – Not exceeding 50V a.c. or 120 V ripple-free d.c. b) Low voltage – Exceeding extra-low voltage, but not exceeding 1000 V a.c. or 1500 V d.c.

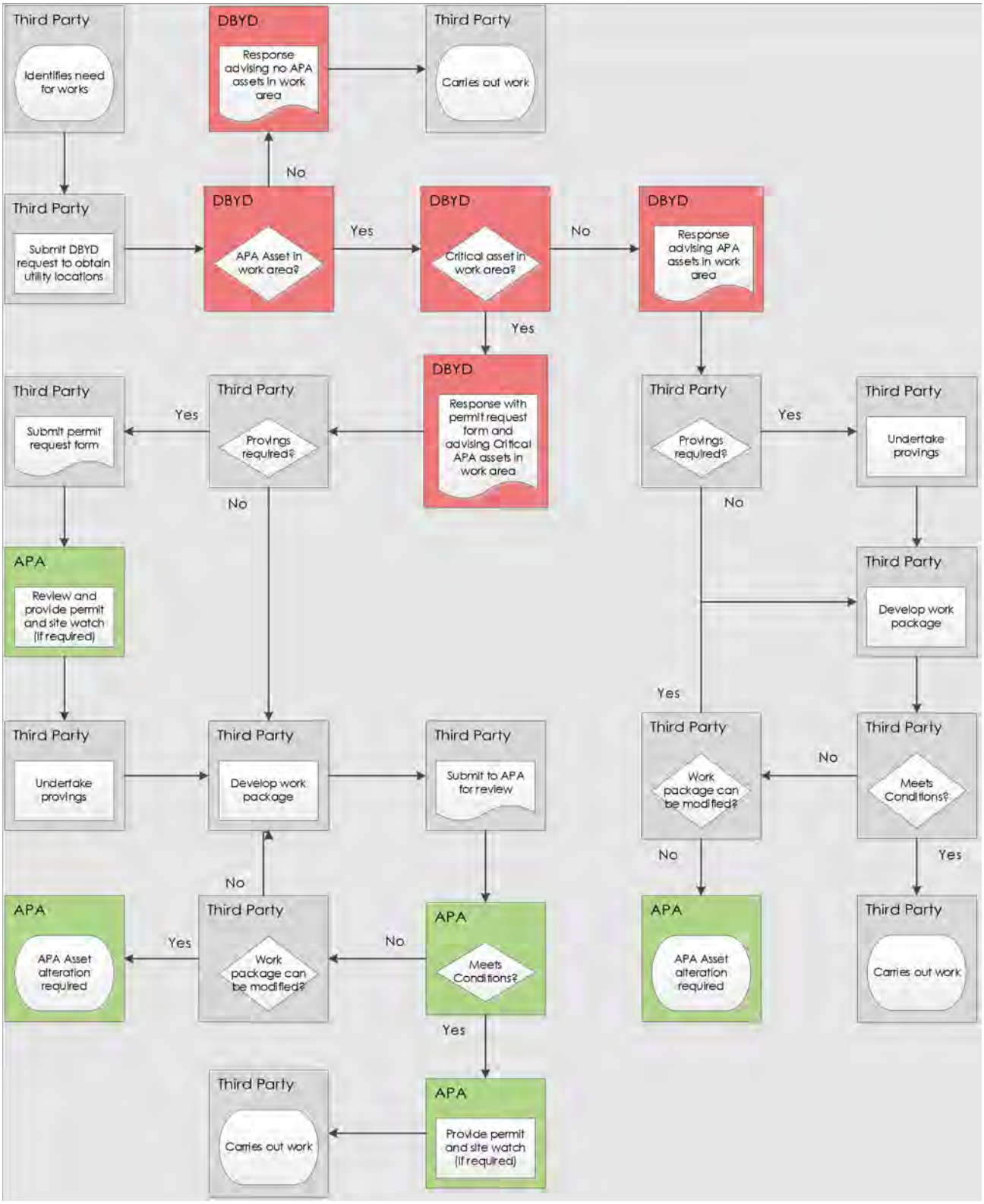
	c) High voltage – Exceeding low voltage.
Works	The development of any type of buildings, structures and other obstructions (including residential buildings, pools, sheds, carports, major developments, transport infrastructure, services, stockpiles, trees), and any work that causes changes to the ground (including movement of heavy vehicles, blasting, tunnelling, pile driving, ground compaction, earthworks, open and trenchless excavations)

8 DOCUMENT REFERENCES

Table 15 Document References

External Standards	
API RP 1102	Steel Pipeline Crossing Railroads and Highways
AS 2832.1	Cathodic protection of metals: Pipes and cables
AS 2885.0	Pipelines – Gas and liquid petroleum: General requirements
AS/NZS 2885.1	Pipelines – Gas and liquid petroleum: Design and Construction
AS/NZS 2885.2	Pipelines – Gas and liquid petroleum: Welding
AS 2885.3	Pipelines – Gas and liquid petroleum: Operations and Maintenance
AS 2885.5	Pipelines – Gas and liquid petroleum: Field Pressure Testing
AS/NZS 2885.6	Pipelines – Gas and liquid petroleum: Pipeline safety management
AS/NZS 4645.1	Gas Distribution Networks - Network Management
AS/NZS 4645.2	Gas Distribution Networks - Steel Pipe Systems
AS/NZS 4645.3	Gas Distribution Networks - Plastics Pipe Systems
AS 4799	Installation of Underground Utility Services and Pipelines Within Railway Boundaries
AS 4827.1	Coating defect surveys for buried pipelines Part 1: Direct current voltage gradient (DCVG)
AS/NZS 4853	Electrical Hazards on Metallic Pipelines
AS 4970	Protection of trees on development sites
Standard Policies, Procedures, Specifications, Guidelines, Forms and Templates	
400-SP-L-0002	Networks Bedding Material Specification
400-PR-L-0003	Encroachment and Land Use Change SMS Trigger Procedure

APPENDIX A GENERAL DBYD RESPONSE PROCESS



City of Gold Coast

Referral
270835214

Member Phone
1300 465 326

Responses from this member

Response received Tue 7 Apr 2026 8.57am

File name	Page
Response Body	57
ASSET 270835214.pdf	58

Attention: **Azam Mohiuddin Mohammed**

Thank you for your Before You Dig (BYDA) enquiry.

Job Number: **52808618**

Sequence Number: **270835214**

Dig Site Location: **101 Old Burleigh Road Broadbeach QLD 4218**

According to our records, your enquiry with the following details **impacts our infrastructure**. Please ensure that you read the attached documents, it contains important information including essential steps that must be undertaken prior to commencing construction activities.

This enquiry is valid for **30 days** from the enquiry date.

If you require further information or assistance with interpretation of plans, please contact **City of Gold Coast** on **1300 465 326.**

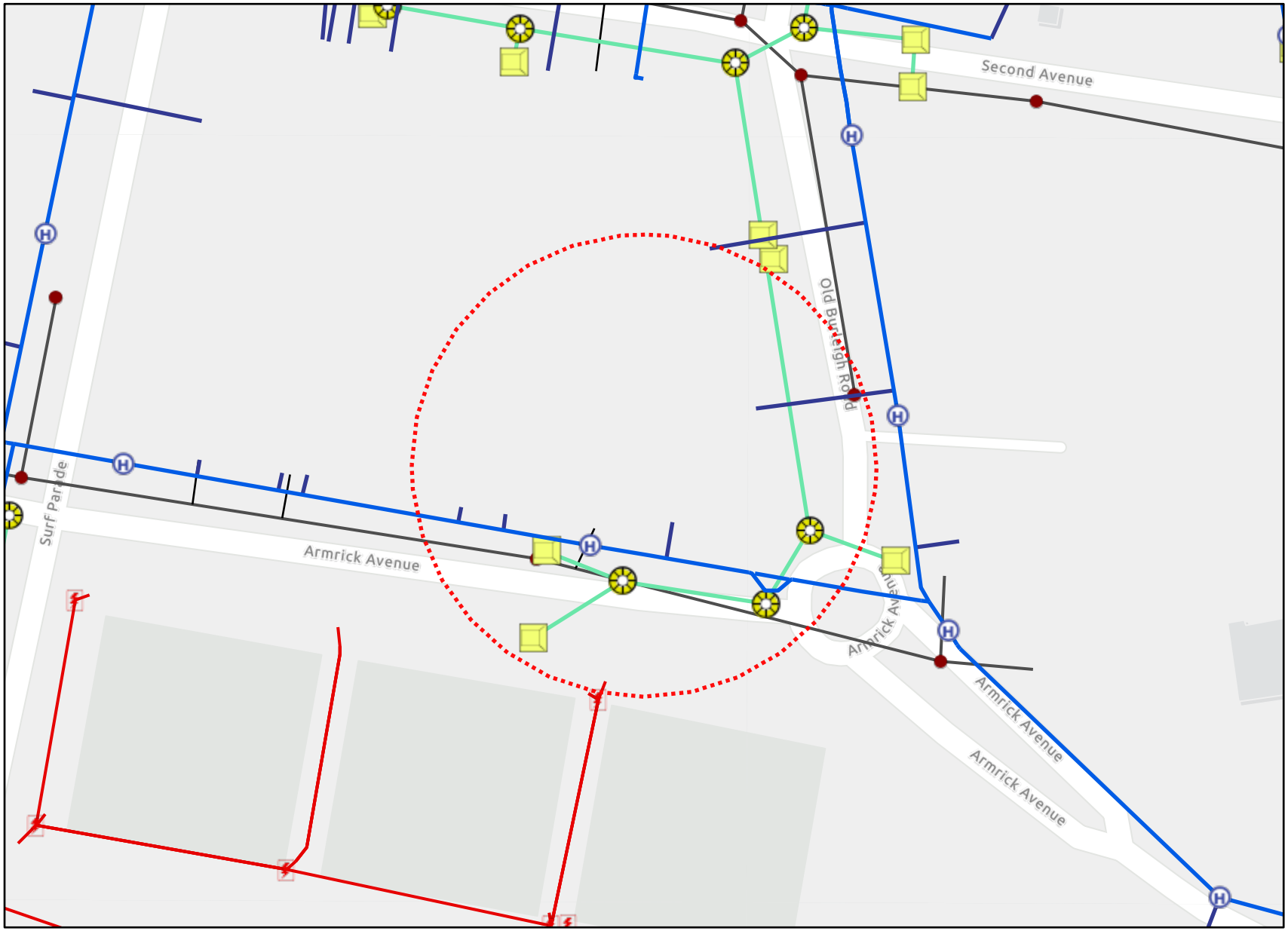
This enquiry response, including any associated documentation, has been assessed and compiled from the information detailed within the BYDA enquiry outlined above. Please ensure that the BYDA enquiry details and this response accurately reflect your proposed works.

For more detailed information visit the City of Gold Coast External Data Portal.

CITY OF GOLDCOAST.

Job # 52808618
Seq # 270835214
Provided by City of Gold Coast

BEFORE YOU DIG www.byda.com.au



Legend

- BYDA Enquiry
- Water Hydrant
- Water Pipe
- Potable Water Connection
- Stormwater Drainage Pipe
- Stormwater Inlet Gully
- Stormwater Manhole
- Sewer Connection
- Sewer Pipe Non Pressure
- Sewer Manhole
- Electrical and Communication Conduit
- Cabling Pit
- Fibre Optic Pit
- Fibre Optic Cable
- GCCC Boundary

Esri Community Maps Contributors, Department of Resources, DESI, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, METI/NASA, USGS

Disclaimer: The Plan is provided in response to a Before You Dig request. While all reasonable care has been taken to ensure the accuracy of the information on this plan, its purpose is to provide a general indication of the location of Gold Coast City Council infrastructure. The information provided may contain errors or omissions and the accuracy may not suit all users. A site inspection and investigation is recommended before commencement of any project based on this data.

In an emergency contact City of Gold Coast on 1300 465 326

07/04/26 (valid for 30 days)

Plans generated by SmarterWX™ Automate

0 10 20 40 m

N

Scale 1:1,000

Energex QLD

Referral
270835218

Member Phone
13 12 53

Responses from this member

Response received Tue 7 Apr 2026 8.59am

File name	Page
Response Body	60
270835218 - Energex Plan.pdf	63
Energex BYDA Terms and Conditions.pdf	66
Working Near Overhead and Underground Electric Lines.pdf	71

Assets and Planned Assets found

Before You Dig Australia (BYDA) Request

Please DO NOT SEND A REPLY to this email as it has been automatically generated and replies are not monitored.

Our search has revealed there is existing and planned Energex Assets within the defined search area.

They are shown on the attached plan.

There is a possibility the planned Assets may have been installed prior to your enquiry.

You:	**BYDA Enquiry No:**
Azam Mohiuddin Mohammed	270835218
Company:	**Date of Response:**
Not Supplied	07 Apr 2026
Search Location:	**Period of Plan Validity:**
101 Old Burleigh Road Broadbeach, QLD 4218	4 Weeks

External Comments (if any):

WARNING: When working in the vicinity of Energex's Assets You have a legal *Duty of Care* that must be observed.

It is important that You note:

1. Immediately report life threatening emergencies to Emergency Services on **000** or to ENERGEX on **13 19 62**.
2. Please read and understand all the information and disclaimers provided - including the Terms and Conditions on the attached pages.
3. We have only searched the area which has been nominated in the request. If this nominated area is not what You require, please resubmit another enquiry with BYDA.
4. Plans provided by ENERGEX are only an indication of the presence of underground assets within the nominated area. Locations provided are approximate and the plans are not suitable for scaling purposes, as exact ground cover and alignments cannot be provided. You must confirm the exact location of underground electrical equipment by use of an electronic cable locator followed by careful, non-mechanical excavation (ie, potholing).
5. Plans provided by ENERGEX do not encompass ENERGEX's overhead Assets.
6. ENERGEX, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and details supplied pursuant to the BYDA Request and You agree to indemnify ENERGEX against any claim or demand for any such loss or damage to You, Your servants or Your agents.

7. You are responsible for any damage to Assets caused by works pursuant to or in any way connected with this BYDA Request.
8. In addition to Assets marked on attached plan, there could be underground earth conductors, underground substation earth conductors, Multiple Earthed Network (MEN) conductors, Single Wire Earth Return (SWER) Substation Earth Conductors, Air Break Switch (ABS) Earth Mats or Consumer Mains in the vicinity or private underground cables (inc. consumers' mains that may run from ENERGEX mains onto private property) in the vicinity of the nominated work area(s) that are not marked on the plans.
9. Independent underground cable locators can be found via the Certified Locator website with LV Cable (up to 1kV), HV Cable (1kV-<33kV) & HV cable (33kV and over) displayed.
10. The ENERGEX Before You Dig Australia (BYDA) information map(s) provide the vicinity of underground cable and will not be adequate for conveyancing purposes. A Request for Search (Property Search) can be arranged through ENERGEX.
11. The attached plans are only valid for a period of four weeks from receipt. If excavation does not commence within four weeks, a new plan must be obtained.
12. The ENERGEX BYDA map (named maps.pdf) may contain shaded area(s), indicating the location of planned work(s). Should You find planned works that You believe may affect Your planned work(s), please contact the ENERGEX BYDA team on the details listed below.
13. ENERGEX may contact You to discuss Your proposed excavation in the vicinity of feeders identified on the attached plan(s).
14. Do not access any Assets, for example conduits, cables, pits or cabinets.
15. Your work will need to comply with:
    - Working near overhead and underground electric lines - Electrical safety code of practice 2020
    - Managing Electrical Risk in Workplace Electrical Safety Code of Practice (2013)
    - Excavation Work Code of Practice (2021)
16. **NOTE**: Where Your proposed work location contains ENERGEX 33kV or greater Underground cables please access the Energex before you dig Website for more information.

General enquiries (7:00am - 5:30pm Mon to Fri)	**13 12 53**
Life threatening emergencies only triple zero (000) or	**13 19 62**

To re-submit or change the nominated search area please visit **BYDA.com.au**

E: **custserve@energex.com.au**

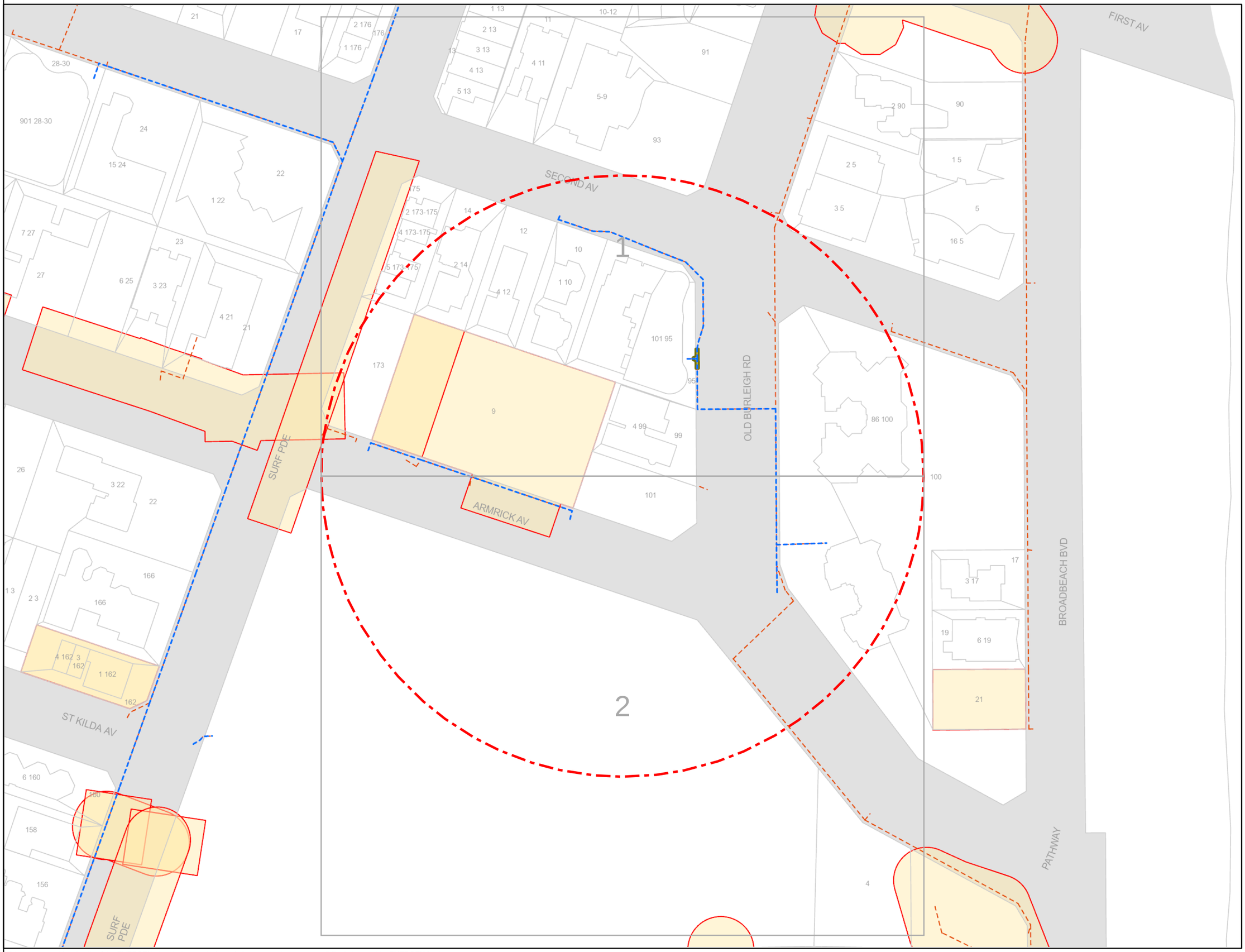
E: **byda@energyq.com.au** ABN: 40 078 849 055

Disclaimer: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

If you are unable to launch any of the files for viewing and printing, you may need to download and install free viewing and printing software such as Adobe Acrobat Reader (for PDF files)

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX BYDA map, then ENERGEX shall be contacted immediately.

For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 270835218
Date: 07/04/2026

Scale: 1:1025
Tile No: **OVERVIEW**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

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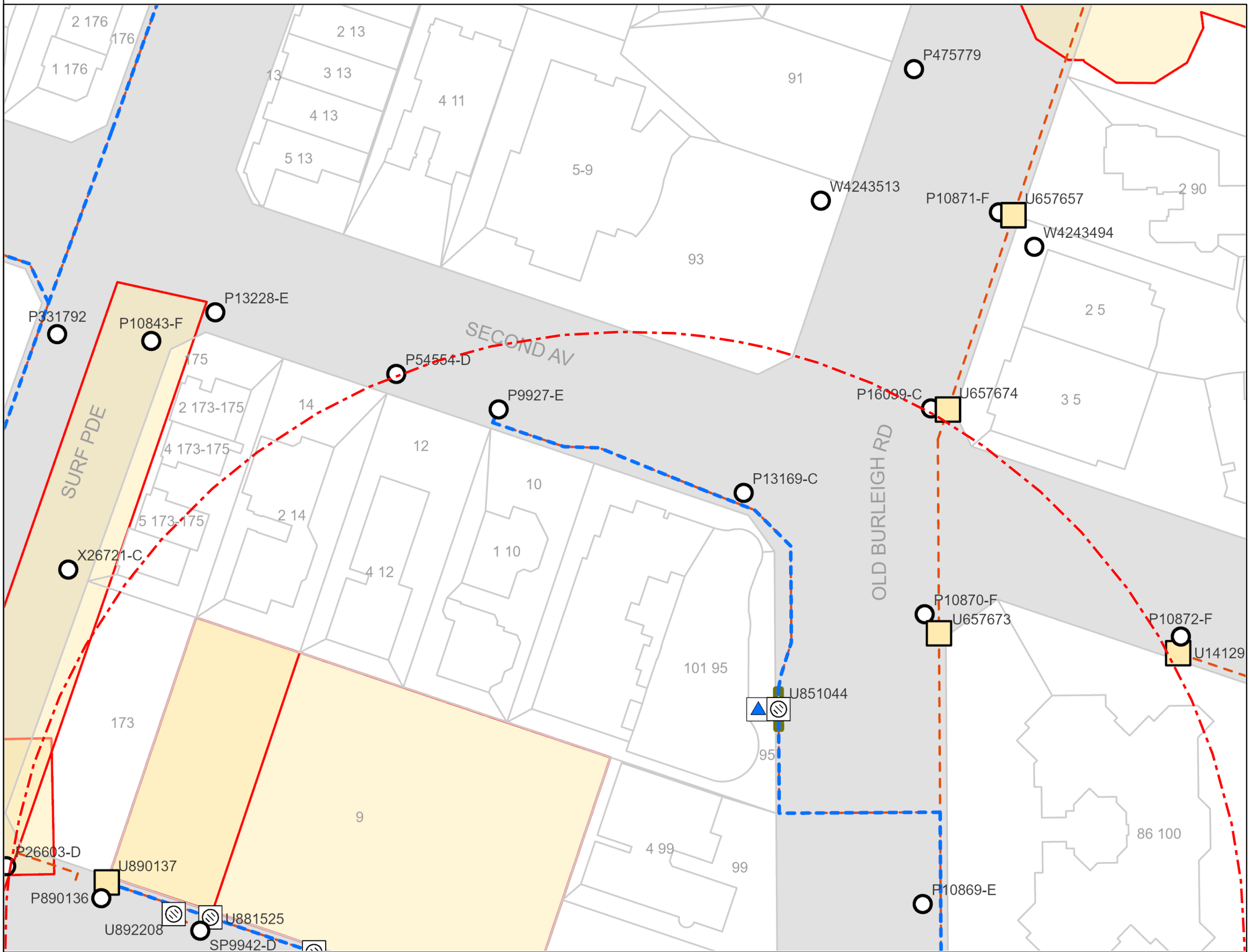
DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor Pelican Corp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX BYDA map, then ENERGEX shall be contacted immediately.

For Emergency Situations
Please Call 13 19 62



BYDA

Sequence: 270835218
Date: 07/04/2026

Scale: 1:500
Tile No: **Tile No: 1**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

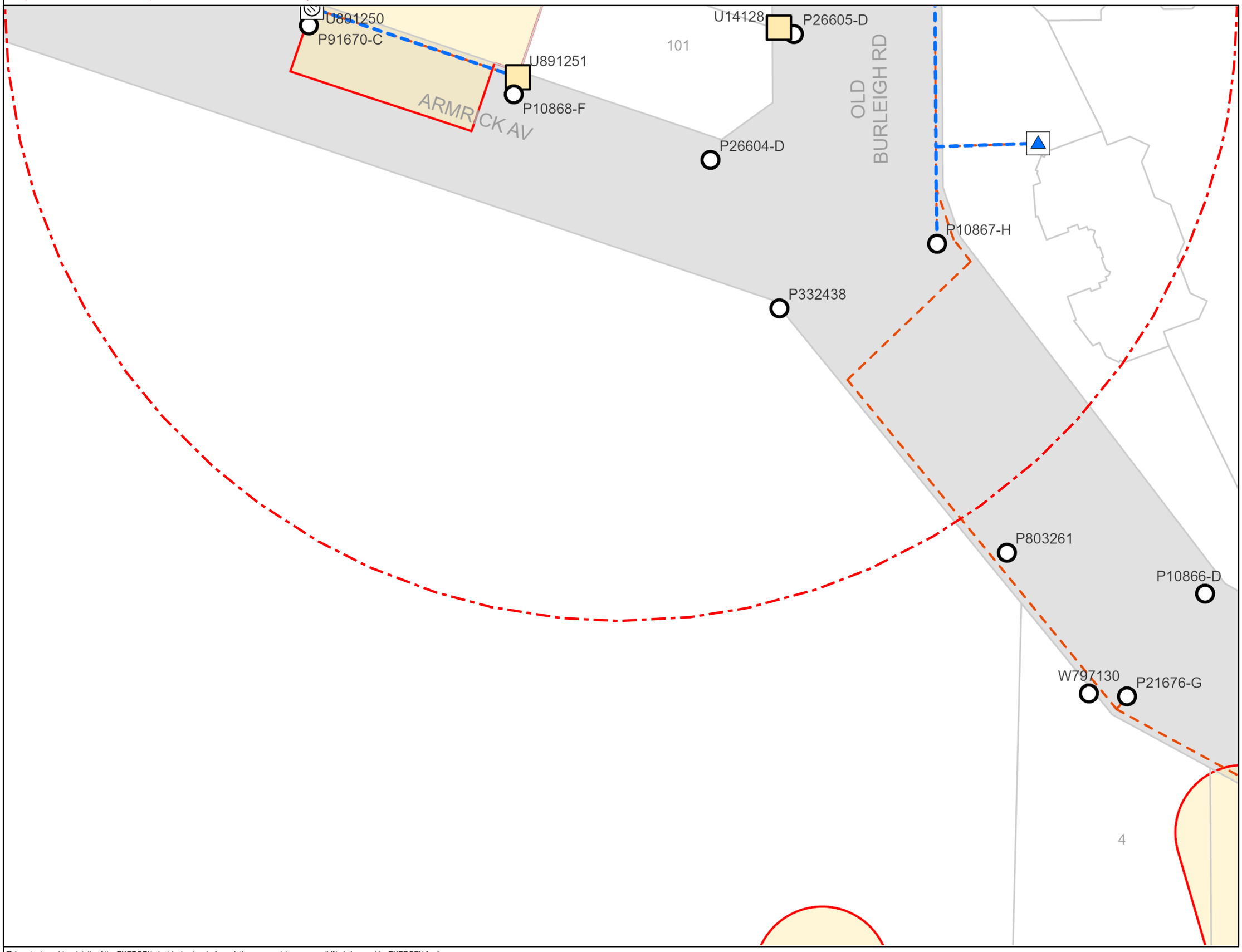
N
W E
S

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor Pelican Corp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

All underground cables shall be treated as being energised. Where a cable is located that is not represented on the ENERGEX BYDA map, then ENERGEX shall be contacted immediately.

For Emergency Situations
Please Call 13 19 62



energex

BYDA

Sequence: 270835218
Date: 07/04/2026

Scale: 1:500
Tile No: **Tile No: 2**

CAUTION - HIGH VOLTAGE

LEGEND

- Substation
- Cable Marker
- Pit
- Pole
- Pillar
- LV Cable (up to 1kV)
- HV Cable (1kV – <33kV)
- HV Cable (33kV and over)
- Pit Boundary
- Planned Work Area

AS5488 Category “D” Plan

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DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Energex nor Pelican Corp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

This output provides details of the ENERGEX electrical network. As variations may exist no responsibility is incurred by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.

Responsibilities – (When Working in the Vicinity of Energex Assets)

Extreme care must be taken during non-mechanical or mechanical excavation as damage to Energex Assets can lead to injury or death of workers or members of the public. Assets include underground cables, conduits and other associated underground Asset used for controlling, generating, supplying, transforming or transmitting electricity.

In accordance with the Electrical Safety Act 2002, a Person Conducting a Business or Undertaking (**PCBU**) must ensure the person's business or undertaking is conducted in a way that is electrically safe. This includes:

a) ensuring that all Assets used in the conduct of the person's business or undertaking are electrically safe;

b) if the person's business or undertaking includes the performance of electrical work, ensuring the electrical safety of all persons and property likely to be affected by the electrical work; and

c) if the person's business or undertaking includes the performance of work, whether or not electrical work, involving contact with, or being near to, exposed parts, ensuring persons performing the work are electrically safe.

In addition, a PCBU at a workplace must ensure, so far as is reasonably practicable, that no person, Asset or thing at the workplace comes within an unsafe distance of an underground electric line.

Workers and other persons must also take reasonable care for their own and other person's electrical safety. This includes complying, so far as is reasonably able, with any reasonable instructions given by Energex to ensure compliance with the Electrical Safety Act 2002

General enquiries (7:00am - 5:30pm Mon to Fri) 13 12 53
Life threatening emergencies only triple zero (000) or 13 19 62

To re-submit or change the nominated search area please visit BYDA.com.au

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E: byda@energyq.com.au ABN: 40 078 849 055

The following matters must be considered when working near Energex Assets:

The PCBU must ensure, so far as is reasonably practicable, that no person, Asset or thing at the workplace comes within an unsafe distance of an underground electric line (see section 68 of the Electrical Safety Regulation 2013)

1. It is the responsibility of the architect, consulting engineer, developer and head contractor in the project planning stages to design for minimal impact and protection of Energex Assets.
2. It is the constructor's responsibility to:
   a) Anticipate and request plans of Energex Assets for a location at a reasonable time before construction begins.
   b) Visually locate Energex Assets by hand or vacuum excavation where construction activities may damage or interfere with Energex Assets.
   c) notify Energex if the information provided is found to be not accurate or Assets are found on site that are not recorded on the Energex BYDA plans.
   d) Read and understand all the information and disclaimers provided.

   Note: A constructor may include but not limited to a PCBU, Designer, Project Manager, Installer, Contractor, Electrician, Builder, Engineer or a Civil Contractor

3. Comply with applicable work health and safety and electrical safety codes of practice including but not limited to:
   a) Working near Assets – Electrical safety codes of practice 2020
   b) Managing electrical risk in the workplace – Managing Electrical Risks in the workplace Code of Practice 2021
   c) Excavation work – Code of practice 2021

IMPORTANT NOTES:

- As the alignment and boundaries of roadways with other properties (and roads within roadways) frequently change, the alignments and boundaries contained within Energex plans and maps will frequently differ from present alignments and boundaries "on the ground". Accordingly, in every case where it appears that alignments and boundaries have shifted, or new roadways have been added, the constructor should obtain confirmation of the actual position of Energex cables and pipelines under the roadways. In no case should the constructor rely on statements of third parties in relation to the position of Energex cables and pipelines. It is the applicant's responsibility to accurately locate all services as part of the design and/or prior to excavation.
- Energex does not provide information on private underground installations, including consumers' mains that may run from Energex mains onto private property. Assets located on private property are the responsibility of the owner for identification and location.
- Energex plans are circuit diagrams or pipe indication diagrams only and indicate the presence of Asset in the general vicinity of the geographical area shown. Exact ground cover and alignments cannot be given with any certainty; as such levels can change over time.
- All underground conduits are presumed to contain asbestos. Refer to the:
  - Electrical safety codes of practice 2020
  - Model Code of Practice: How to manage and control asbestos in the workplace | Safe Work Australia
  - How to manage and control asbestos in the workplace code of practice 2021 (Workplace Health and Safety Queensland (WHSQ)
  - How to safely remove asbestos code of practice 2021 (WHSQ)
- Plans provided by Energex are not guaranteed to show the presence of above ground Assets.
- In addition to underground cables marked on attached plan there could be underground substation, underground earth conductors, Multiple Earthed Neutral(MEN) conductors, Single Wire Earth Return(SWER), substation Earth Conductors, ABS Earth Mats or Consumer Mains in the vicinity or private underground cables (inc. consumers' mains that may run from Energex mains onto private property) in the vicinity of the nominated work area(s) that are not marked on the plans.
- Being aware of Your obligations including but not limited to [ss 304, 305] Excavation work— underground essential services information under the Work Health and Safety Regulation 2011 , Chapter 6 Construction work, Part 6.3 Duties of person conducting business or undertaking. This includes but is not limited to taking reasonable steps to obtain the current information & providing this information to persons engaged to carry out the excavation work. For further information please refer to: - http://www.legislation.qld.gov.au/LEGISLTN/SLS/2011/11SL240.pdf
- Energex plans are designed to be printed in colour and as an A3 Landscape orientation.

General enquiries (7:00am - 5:30pm Mon to Fri) 13 12 53
Life threatening emergencies only triple zero (000) or 13 19 62

To re-submit or change the nominated search area please visit BYDA.com.au

E: custserve@energex.com.au
E: byda@energyq.com.au ABN: 40 078 849 055

Conditions – (When Working in the Vicinity of Energex Assets)

Records:
The first step before any excavation commences is to obtain records of Energex Assets in the vicinity of the work. For new work, records should be obtained during the planning and design stage. The records provided by Energex must be made available to all construction groups on site. Where Asset information is transferred to plans for the proposed work, care must be exercised to ensure that important detail is not lost in the process.

Plans and or details provided by Energex are current for four weeks from the date of dispatch and should be disposed of by shredding or any other secure disposal method after use. A new BYDA enquiry must be made for proposed works/activities to be undertaken outside of the four-week period.

Energex retains copyright of all plans and details provided in connection with Your request.

Energex plans or other details are provided for the use of the applicant, its servants, or agents, and shall not be used for any unauthorised purpose.

On receipt of BYDA plans and before commencing excavation work or similar activities near Energex's Assets check to see that it relates to the area You have requested and carefully locate this Asset first to avoid damage. If You are unclear about any information contained in the plan, You must contact Energex on the General Enquiries number listed below for further advice.

Energex, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Energex against any claim or demand for any such loss or damage.

The contractor is responsible for all Asset damages when works commence prior to obtaining Energex plans, or failure to follow agreed instructions, or failure to demonstrate all reasonable measures were taken to prevent the damage once plans were received from Energex.

Energex reserves all rights to recover compensation for loss or damage caused by interference or damage, including consequential loss and damages to its Assets, or other property.

NOTE: Where Your proposed work location contains Energex 33kV or greater Underground cables please access the Energex BYDA website for more information.

Location of Assets:
Examining the records is not sufficient, as reference points may change from the time of installation. Records must also be physically proven when working in close proximity to them. The exact location of Assets likely to be affected shall be confirmed by use of an electronic cable and pipe locater followed by **careful hand or vacuum excavation to the level of cable protection cover strips or conduits.** When conducting locations, please be aware that **no** unauthorised access is permitted to Energex Assets– including Pits, Low Voltage Disconnection Boxes, Low Voltage Pillars or High Voltage Link Boxes.

Hand or vacuum excavation must be used in advance of excavators. In any case, where any doubt exists with respect to interpretation of cable records, You must contact Energex on the General Enquires number listed below for further advice.

If the constructor is unable to locate Energex underground Assets within 5 metres of nominal plan locations, they must contact the Energex General Enquires number listed below for further advice.

If unknown cables or conduits (i.e. not shown on issued BYDA plans) are located during excavation:
1. Call the ELECTRICITY EMERGENCIES number listed below
2. Treat Assets as if alive, post a person to keep all others clear of the excavation until Energex crew attend to make safe.
3. All work in the vicinity of damaged Asset must cease and the area must be vacated until a clearance to continue work has been obtained from an Energex officer.

General enquiries (7:00am - 5:30pm Mon to Fri) 13 12 53
Life threatening emergencies only triple zero (000) or 13 19 62

To re-submit or change the nominated search area please visit BYDA.com.au

E: custserve@energex.com.au
E: byda@energyq.com.au ABN: 40 078 849 055

Asset Installation Methods:
Energex Assets are installed with a variety of protection devices including:

1. Clay paving bricks or tiles marked “Electricity” or similar (also unmarked)
2. Concrete or PVC cover slabs
3. PVC, A/C or fibro conduit, fibre reinforced concrete, iron or steel pipe
4. Concrete encased PVC or steel pipe
5. Thin plastic marker tape
6. Large pipes housing multiple ducts
7. Multiple duct systems, including earthenware or concrete 2, 4, and 6-way ducts and shamrocks

Note: Some Assets are known to be buried without covers and may change depth or alignment along the route.

Excavating Near Assets:
For all work within 2.5 m of nominal location, the constructor is required to hand or vacuum excavate (pothole) and expose the Assett, hence proving its exact location before work can commence.

Cable protection cover strips shall not be disturbed. Excavation below these cover strips, or into the surrounding backfill material is not permitted.

Excavating Parallel to Assets:
If construction work is parallel to Energex cables, then hand or vacuum excavation (potholing) at least every 4m is required to establish the location of all cables, hence confirming nominal locations before work can commence. *Generally, there is no restriction to excavations parallel to Energex cables to a depth not exceeding that of the cable.* ***Note: Cable depths & alignment may change suddenly***.

Separation from Assets:
Any service(s) must be located at the minimum separation as per the tables below:

Table 1. Minimum Separation Requirements for Underground Services Running Parallel with Energex Assets

(Minimum Separation required in mm)							
Voltage Level	**Gas**	**Communication or TV**	**Water**		**Sanitary drainage**		**Storm Water**
			≤DN 200	**>DN200**	**≤DN 200**	**>DN 200**	
LV	250	100	500	*1000	500	1000	500
HV		300					
*Contact Energex/council to obtain specific separation distances							

Table 2. Minimum Separation Requirements for Underground Services Crossing Energex Assets

(Minimum Separation required in mm)					
Voltage Level	**Gas**	**Communication or TV**	**Water**	**Sanitary drainage**	**Storm Water**
LV & HV	100	100	300	300	100

Where the above table does not list a separation requirement for a particular underground service then 300mm shall be used.

Excavating Across Assets:
The standard clearance between services shall be maintained as set down in Table 2 above. If the width or depth of the excavation is such that the Asset will be exposed or unsupported, then Energex shall be contacted to determine whether the Assets should be taken out of service, or whether they need to be protected or supported. In no case shall an Asset cover be removed without approval. An Asset cover may only be removed under the supervision of an Energex authorised representative. Protective cover strips when removed must be replaced under Energex supervision. Under no circumstances shall they be omitted to allow separation between Energex Assets and other services.

Heavy Machinery Operation Over Assets:
Where heavy "Crawler" or "Vibration" type machinery is operated over the top of Assets, a minimum cover of 450 mm to the cable protective cover mains must be maintained using load bearing protection whilst the machinery is in operation. For sensitive cables (i.e. 33 and 110kV fluid and gas filled cables), there may be additional constraints placed on vibration and settlement by Energex.

Directional Boring Near Assets:
When boring parallel to Assets, it is essential that trial holes are carefully hand or vacuum excavated at regular intervals to prove the actual location of the Asset before using boring machinery. Where it is required to bore across the line of Assets, the actual location of the Asset shall first be proven by hand or vacuum excavation. A trench shall be excavated 1m from the side of the Asset where the auger will approach to ensure a minimum clearance of 500mm above and below all LV, 11kV, 33kV & 110/132kV Asset shall be maintained.

Explosives:
Explosives must not be used within 10 metres of Assets, unless an engineering report is provided indicating that no damage will be sustained. Clearances should be obtained from Energex's Planning Engineer for use of explosives in the vicinity of Energex cables.

Damage Reporting:
All damage to Assets must be reported no matter how insignificant the damage appears to be. Even very minor damage to Asset protective coverings can lead to eventual failure of Assets through corrosion of metal sheaths and moisture ingress.

If any Damaged Asset is found:
1. Call the ELECTRICITY EMERGENCIES number listed below
2. Treat Assets as if alive, post a person to keep all others clear of the excavation until Energex crew attend to make safe.
3. All work in the vicinity of damaged Asset must cease and the area must be vacated until a clearance to continue work has been obtained from an Energex officer.

Solutions and Assistance:
If Asset location plans or visual location of Asset by hand or vacuum excavation reveals that the location of Energex Asset is situated wholly or partly where the developer or constructor plans to work, then Energex shall be contacted to assist with Your development of possible engineering solutions.

If Energex relocation or protection works are part of the agreed solution, then payment to Energex for the cost of this work shall be the responsibility of the, PCBU, principal developer or constructor. Energex will provide an estimated quotation for work on receipt of the PCBU's, developer's or constructor's order number before work proceeds.

It will be necessary for the developer or constructor to provide Energex with a written Safe Work Method Statement for all works in the vicinity of or involving Energex Assets. This Safe Work Method Statement should form part of the tendering documentation and work instruction. Refer Interactive Tool on Safe Work Australia site: Interactive SWMS guidance tool - Overview (safeworkaustralia.gov.au)

Vacuum Excavations (Hydro Vac)

When operating hydro vac equipment to excavate in vicinity of Assets fitted with:

- Nonconductive (neoprene rubber or equivalent) vacuum (suction) hose
- Oscillating nozzle on pressure wand with water pressure adjusted to not exceeding 2000 Pound force per Square Inch(PSI).

Maintain a minimum distance of 200mm between end of pressure wand and underground electrical Assets. DO NOT insert the pressure wand jet directly into subsoil.

Ensure pressure wand is not directly aimed at underground electrical Assets (cables/conduits).

Safety Notices (Underground Work)

It is recommended that You obtain a written Safety Advice from Energex when working close to Energex Assets. For Safety Advice please contact custserve@energex.com.au

Further information on Working Safely around Energex Assets: Working near powerlines | Energex

Thank You for Your interest in maintaining a safe and secure Electricity Distribution network. Energex welcomes Your feedback on this document via email to byda@energyq.com.au.

General enquiries (7:00am - 5:30pm Mon to Fri) 13 12 53
Life threatening emergencies only triple zero (000) or 13 19 62

To re-submit or change the nominated search area please visit BYDA.com.au

E: custserve@energex.com.au
E: byda@energyq.com.au ABN: 40 078 849 055

Part of Energy Queensland

Electricity Entity Requirements - Working Near Overhead and Underground Electric Lines

CONTENTS

1. Purpose and Scope 3
2. Definitions, Abbreviations and Acronyms 3
3. References 4
4. About This Guide 5
   - 4.1. Who does the Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines and Electricity Entity Requirements apply to? 5
   - 4.2. Are you working or planning to work near overhead or underground electric lines? 6
   - 4.3. Obtaining Safety Advice 8
   - 4.4. Authorised Person and how to become one? 9
   - 4.5. Contacting Electricity Entity for Safety Advice or Authorised Person Enquiries 10
5. Overhead Electric Lines 10
   - 5.1. Isolation of supply to customer installation to eliminate exclusion zone around LV service line 13
   - 5.2. Operating Plant 13
   - 5.3. Scaffolding Requirements 14
   - 5.4. High Load transport under Overhead Electric Lines 16
   - 5.5. Additional Details and Fact Sheets on Electricity Entity Requirements 17
6. Underground Electrical Assets 17
   - 6.1. Responsibilities When Working in the Vicinity of Electricity Entity Underground Electrical Assets 17
   - 6.2. Conditions of Supply of Information 18
   - 6.3. When Working in the Vicinity of Electricity Entity Underground Electrical Assets, You Must Observe the Following Conditions 19
   - 6.4. Additional Details and Fact Sheets on Electricity Entity Requirements 21
7. Excavation 22
   - 7.1. Excavating near Poles and Stay Wires 22
   - 7.2. Excavating Near Underground Electrical Assets 24
   - 7.3. Blasting 25
8. Reporting Damage Caused to Overhead or Underground Electric Lines 25
9. Infrastructure near Electric Lines 26
   - 9.1. Easements and Wayleaves 26
   - 9.2. Contact Electricity Entity when planning construction work near electric lines 27
   - 9.3. What clearances must be maintained once construction work is completed? 28
   - 9.4. What about Electric and Magnetic Fields? 31

1. PURPOSE AND SCOPE

The purpose of this document is to set out the Electricity Entity requirements for anyone who may be contemplating working or operating plant near any Ergon Energy or Energex's overhead or underground electric lines.

2. DEFINITIONS, ABBREVIATIONS AND ACRONYMS

Term	Definition
Applicant	A person contacting or submitting an application to the Electricity Entity for Safety Advice.
Authorised Person	For work near an electrical line, means a person who has enough technical knowledge and experience to do work that involves being near to the electrical line; and has been approved by the person in control of the electrical line (Electricity Entity) to do work near to the electrical line.
Authorised Person (Electrical)	An Electrical Mechanic or Electrical Linesperson (holding current Queensland Licence) working on behalf of an electrical contractor, an Electrical Contractor, or a person who holds an electrical mechanic licence and is performing work for the person or a relative of the person at premises owned or occupied by the person or relative, and accredited with the Electricity Entity who is permitted to remove and replace LV service fuse(s) when isolation of customer LV service line is required to eliminate the exclusion zone around the LV service line, or to work on the customer's mains and / or switchboard.
Earthworks	Any digging, penetration or disturbance of ground including but not limited to post hole digging, excavating, trenching, directional boring, bore hole sinking, driving pickets/posts into ground, cut and fill, dam or levee bank construction, blasting.
Electricity Entity	Where Electricity Entity appears throughout this document, it relates to either Energex or Ergon Energy area of responsibility. Refer to respective contact details below. **Energex:** • General Enquiries - ph 13 12 53 • Loss of Supply - ph 13 62 62 • Emergencies - ph 13 19 62 **Ergon Energy:** • General Enquiries - ph 13 74 66 • Loss of Supply - ph 13 22 96 • Emergencies - ph 13 16 70
Exclusion Zone	A safety envelope around an electric line as specified by the Electrical Safety Regulation 2013.
RPA (Drone)	Australia's safety laws for remotely piloted aircraft (RPA) / drones are defined under the Civil Aviation Safety Authority. Under this definition the use of RPA's are not classified as Operating plant (section 5.2) as prescribed in this document.

Term	Definition
Instructed Person	For an electrical line, means a person who is acting under the supervision of an Authorised Person for the electrical line.
Safety Advice	A written notice identifying the known electrical hazards at a specific site and advising the control measures required to be implemented by Responsible Person (person responsible for worksite) to reduce the likelihood of harm to person, plant or vehicle at site.
Safety Observer	A safety observer or "spotter", for the operation of operating plant, means a person who: (a) observes the operating plant; and (b) advises the operator of the operating plant if it is likely that the operating plant will come within an exclusion zone for the operating plant for an overhead electric line. This is a person who has undergone specific training and is competent to perform the role in observing, warning and communicating effectively with the operator of the operating plant.
Untrained Person	For an electrical line, means a person who is not an Authorised Person or an Instructed Person for the electrical line.

3. REFERENCES

Electrical Safety Regulation 2013: Part 5 - Overhead and Underground Electric Lines

Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines

Work Health and Safety Act 2011

Work Health and Safety Regulation 2011

Energex: Safety Advice Request Form

Ergon Energy: Safety Advice Request Form

Copies of the relevant Acts, Regulation and Codes of Practice and any other relevant legislation can be found on the Queensland Government web site - https://www.worksafe.qld.gov.au/.

Disclaimer

This document refers to various standards, guidelines, calculations, legal requirements, technical details and other information and is not an exhaustive list of all safety matters that need to be considered.

Over time, changes in industry standards and legislative requirements, as well as technological advances and other factors relevant to the information contained in this document, may affect the accuracy of the information contained in this document. Whilst care is taken in the preparation of this material, Energex and Ergon Energy do not guarantee the accuracy and completeness of the information. Accordingly, caution should be exercised in relation to the use of the information in this document.

To the extent permitted by law, Energex and Ergon Energy will not be responsible for any loss, damage or costs incurred as a result of any errors, omissions or misrepresentations in relation to the material in this document or for any possible actions ensuing from information contained in the document.

4. ABOUT THIS GUIDE

This guide to working near the Electricity Entity network is designed to assist any person working, contemplating work or operating plant near any Electricity Entity overhead or underground electric lines to meet their duties under the Work Health and Safety Act 2011, Electrical Safety Act 2002, Electrical Safety Regulation 2013 and relevant Codes of Practice including Electrical Safety Code of Practice 2020 Working Near Overhead and Underground Electric Lines and help to identify the steps needed to ensure risks are minimised for all who work or are likely to be affected by the work in these situations.

"The Electrical Code of Practice 2020 Working Near Overhead and Under Ground Electric Lines" provides practical advice on ways to manage electrical risk when working near electric lines including the exclusion zones that apply. An electronic copy of this Code of Practice as well as, Electrical Safety Act and Regulation is available at the Queensland Government Electrical Safety Office web site at https://www.worksafe.qld.gov.au/electricalsafety. You should obtain a copy and read this material, to enable you to fully understand your obligations, and prospective means of complying with them.

4.1. Who does the Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines and Electricity Entity Requirements apply to?

A person, worker or Person Conducting a Business or Undertaking (PCBU) at a workplace is required to comply with the Electricity Entity Requirements and the requirements of Electrical Safety Regulation 2013 Part 5 Overhead and Underground Electric Lines and Electrical Safety Code of Practice 2020 Working Near Overhead and Underground Electric Lines to ensure that no person, plant or thing comes within an unsafe distance (exclusion zone) of an overhead electric line. Compliance with these regulatory requirements is essential to reduce the risk of electric shock and contact with Electricity Entity electric lines and other assets which can have deadly consequences.

Examples of work activities where risk of person, plant or equipment coming near or into contact with overhead electric lines include but are not limited to:

- Pruning or felling trees or vegetation near overhead electric lines, including the service wire into a building.
- Carrying out building work, scaffolding or demolition adjacent to overhead electric lines.
- Painting fascia, replacing roofing, guttering or external cladding near service line point of entry to a building.
- Operating cranes, tip trucks, cane harvesters, elevated work platforms, fork lifts, grain augers, excavators, irrigators, etc near OH electric lines.
- Erecting or maintaining advertising signs or billboards near overhead electric lines.
- Dam or levee bank construction.

Examples of work activities that could involve risk of damage to underground cables or earthing systems include but are not limited to:

- Digging holes, excavating, sawing, trenching, under boring, sinking bore holes, earthworks or laying cables, pipes, etc or driving implements into the ground (e.g. star pickets, fence posts) near where underground cables or earthing systems may be located.

4.2. Are you working or planning to work near overhead or underground electric lines?

Electrical Safety Regulation Section 68 requires that before carrying out any work at a workplace where there is a risk of any person, plant or thing encroaching the exclusion zone of overhead electric lines, the person, worker or PCBU is required to ensure that the potential hazards are identified, a risk assessment conducted and the necessary control measures implemented to minimise electrical safety risks to ensure the safety of all workers and other persons at the workplace. The Electrical Safety Regulation 2013 and Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines detail the Exclusion Zones that must be maintained.

4.2.1 Work near overhead electric lines

Where a risk assessment has been conducted and control measures implemented in accordance with requirement of Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines and Electricity Entity Requirements (this document) and it has identified that exclusion zones from overhead electric lines cannot be maintained, the person, worker or PCBU is then required to contact Electricity Entity and request written Safety Advice (refer Section 4.3 below).

The person, worker or PCBU shall be required to maintain exclusion zones until such times as the Electricity Entity has provided written Safety Advice.

A person, worker or PCBU would not be required to contact the Electricity Entity and request a written Safety Advice where their risk assessment and implemented control measures ensure that exclusion zones from overhead electric lines will be maintained throughout performance of work to be undertaken at a particular site.

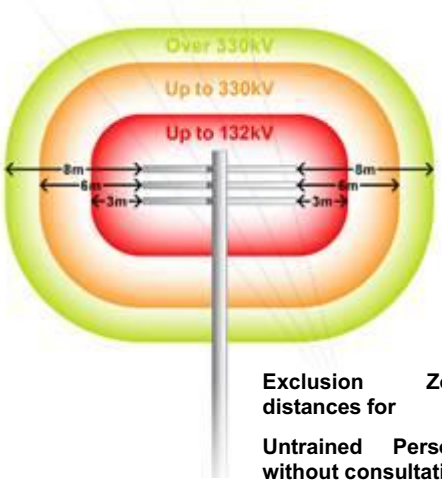
4.2.2 Exclusion Zones

An exclusion zone is a safety envelope around an overhead electric line. No part of a worker, operating plant or vehicle should enter an exclusion zone while the overhead electric line is energised (live).

Exclusion zones keep people, operating plant and vehicles a safe distance from energised overhead lines.

You must keep yourself and anything associated with the work activity out of the exclusion zone (e.g. a safe distance) unless it is not reasonably practicable to do so; and the person conducting a business or undertaking complies with the requirements of Section 68(2) of the Electrical Safety Regulation in relation to:

- conducting a risk assessment.
- implementing control measures
- adhering to any requirements of an Electricity Entity responsible for the line



Exclusion Zone - Untrained Person (distances in mm)

Nominal phase to phase voltage of electric line	Untrained Person		
	Person	Operating Plant	Operating Vehicles
Insulated LV: Consultation with and verified by the Entity	No exclusion zone prescribed	1000	300
LV with NO consultation with Electricity Entity	3000	3000	600
LV With consultation with Electricity Entity	1000		
>LV up to 33 kV with NO consultation with Electricity Entity	3000		900
LV up to 33 kV with consultation with Electricity Entity	2000		
>33 kV up to 132 kV	3000		2100
>132 kV up to 220 kV	4500	6000	2900
>220 kV up to 275 kV	5000		
>275 kV up to 330 kV	6000		3400

(information extracted from Electrical Safety Regulation 2013 Schedule 2)

Exclusion Zone - Instructed Person and Authorised Person (distances in mm)

Nominal phase to phase Voltage of electric line	Instructed Person (IP) & Authorised Person (AP)		
	AP and IP	Operating Plant with Safety Observer or another Safe System of work	Operating of Vehicles
Insulated LV: Consultation with and verified by the Entity	No exclusion zone prescribed	No exclusion zone prescribed	No exclusion zone prescribed
LV	No exclusion zone prescribed	1000	600
>LV up to 33 kV	700	1200	700
>33 kV up to 50 kV	750	1300	750
>50 kV up to 66 kV	1000	1400	1000
>66 kV up to 110 kV		1800	
>110 up to 132	1200		1200
>132 kV up to 220 kV	1800	2400	1800
>220 kV up to 275 kV	2300	3000	2300
>275kV up to 330kV	3000	3700	3000

(information extracted from Electrical Safety Regulation 2013 Schedule 2)

4.2.3 Work near underground electrical lines (underground electrical assets)

Before carrying out any earthworks at a location, the person, worker or PCBU is required to ensure that the potential hazards are identified, a risk assessment conducted, and the necessary control measures implemented to minimise the risk of damaging identified or unidentified underground electrical assets and to ensure the safety of all workers and other persons at the workplace. The Electrical Safety Regulation 2013 and Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines and Electricity Entity Requirements detail the requirement for work near underground electric lines.

4.3. Obtaining Safety Advice

To obtain written Safety Advice where identified as being required in Section 4.2.1 above, complete the Safety Advice Request Form which is accessible via the Electricity Entity website:

Energex: Safety Advice Request Form

Ergon Energy: Safety Advice Request Form

On receipt, the Electricity Entity will contact the Applicant to advise date and time to meet at site to provide written Safety Advice. It is advisable to bring to the meeting your copy of the Electrical Safety Code of Practice 2020 Working Near Overhead and Underground Electric Lines (and Before You Dig Australia Plan for location of underground assets where required), as reference to this will be necessary during the meeting. Control measures provided by the Electricity Entity may incur a fee.

Failure to adhere to the Electrical Safety Regulation Section 68 requirements and mandatory control measures as documented on written Safety Advice as issued will result in written non-compliance advice being sent to the Electrical Safety Office.

Where this work is required to occur on a regular basis at a workplace, the PCBU may consider arranging to have one or more employees trained and subsequently accredited with the Electricity Entity as Authorised Persons.

4.4. Authorised Person and how to become one?

Under the Electrical Safety Regulation 2013, the exclusion zones for working near or operating plant or vehicles near exposed, low voltage or high voltage electric lines vary depending on whether a person is classed as an “Untrained Person”, “Authorised Person” or “Instructed Person”. An Authorised Person is permitted to carry out work closer to the electric lines than an Untrained Person (refer Electrical Safety Code of Practice 2020 Working Near Overhead and Underground Electric Lines Appendix B Exclusion Zones for Overhead Electric Lines).

To become an Authorised Person, the employer / self-employed person must first satisfy the “person in control” of the electric line, in this case the Electricity Entity, that their Applicants possess the required competencies. They must then apply in writing to Electricity Entity for approval.

Removal or replacement of LV service fuse to permit work on consumers’ mains, installation switchboard, consumer’s terminals or eliminate an exclusion that would exist requires the Electrical Mechanic to hold a current Queensland Electrical Mechanic Licence and perform the work in accordance with their documented safe system of work.

An ’Authorised Person’ Electrical **must not**:

a. confirm the insulation properties of Ergon Energy Network or Energex electric lines;

b. work on or have direct contact with the works of an electricity entity (the works of Ergon Energy Network or Energex) including the entities’ electrical lines, electrical installations, electrical equipment or other entity infrastructure unless specifically approved;

c. replace a blown low voltage (**LV**) fuse after loss of supply to a customer’s connection;

d. reinstate an LV service fuse that has been removed by Ergon Energy Network or Energex;

e. alter, remove or relocate an Ergon Energy Network or Energex overhead LV service line or LV pillar connection;

f. perform LV isolation within locked Ergon Energy Network or Energex assets;

g. perform unauthorised work within locked Ergon Energy Network or Energex assets; or

h. climb Ergon Energy Network or Energex electricity poles or other infrastructure.

An Authorised Person’ Electrical **is approved** to undertake the following activities:

i. work on or near the point of attachment of Ergon Energy’s or Energex’s termination;

j. remove and replace LV service fuses when required to isolate a service line to eliminate the exclusion zone around the LV service line, or to work on the Customer’s consumer mains or switchboard;

k. isolate a Customer's LV service line at an underground pillar or service pole by removing a fuse wedge(s) from a service line, in accordance with electricity industry practices; or

l. Safety Observing under schedule 2 of the *Electrical Safety Regulation* 2013 (Qld) for the operation of operating plant, after receiving appropriate training to perform the role.

An 'Authorised Person' Non-Electrical **must not**:

a. confirm the insulation properties of Ergon Energy Network or Energex electric lines;

b. work on or have direct contact with the works of an electricity entity (the works of Ergon Energy Network or Energex) including the entities' electrical lines, electrical installations, electrical equipment or other entity infrastructure unless specifically approved; or

c. climb Ergon Energy Network or Energex electricity poles or other infrastructure.

An 'Authorised Person Non-Electrical' **is approved** to undertake the following activities:

d. Safety Observing under schedule 2 of the *Electrical Safety Regulation 2013 (Qld) for the operation of operating plant*, after receiving appropriate training to perform the role.

Websites

Energex: Authorised person | Energex

Ergon Energy: Authorised person | Ergon Energy

4.5. Contacting Electricity Entity for Safety Advice or Authorised Person Enquiries

By phone: Call Electricity Entity on General Enquiries phone number:

Energex:

- General Enquiries - ph 13 12 53

Ergon Energy:

- General Enquiries - ph 13 74 66

By email

Authorised Persons: AuthorisedPerson@energyq.com.au

Safety Advice: SafetyAdvice@energyq.com.au

Websites

Energex: Safety advice | Energex

Ergon Energy: Safety advice | Ergon Energy

5. OVERHEAD ELECTRIC LINES

The following table sets out preparatory work options that may be required to be performed by the Electricity Entity (or electrical contractor where identified as being permitted who is an Authorised Person - Electrical) to assist a person, worker or PCBU in minimising the electrical safety risks of, encroaching within the exclusion zone or, contact with electric lines.

Category of work		**Description**	**Costing arrangement**
Safety Advice	Base information	Provide Safety Advice (Can only be performed by the Entity)	**Nil cost to customer.**

Category of work		Description	Costing arrangement
LV Service isolation	1. Isolation carried out by customer's electrical contractor	Isolation of overhead or underground service by removal of the service fuse(s). (Preferred option to isolate supply and eliminate the exclusion zone).	No involvement by the Electricity Entity. May be a cost charged by the customer's electrical contractor.
	2. Isolation carried out by Electricity Entity	Customer requested isolation of overhead or underground service by removal of the service fuse(s) or Customer requested physical disconnection and reconnection of overhead or underground service.	**Cost to customer.**
Insulation integrity verification	3. Verification of insulation integrity to reduce exclusion zone to no exclusion zone prescribed e.g. no contact permitted	Verification of insulation integrity to classify as insulated service - Insulation integrity can only be verified at the time of inspection - visual inspection is required before confirmation in all cases. When service insulation integrity verified - no exclusion zone prescribed e.g. no contact permitted. (Can only be performed by the Entity)	**Cost to customer.**
Service replacement	4. Open wire service, service fuse(s) at house/building	Replacement of service with new XLPE service cable and service fuse(s) installed at origin (pole end) of service to allow isolation of service. Insulation integrity can be verified for new XLPE services at the time of installation - visual inspection is required before confirmation.	**Nil cost to customer** for service replacement. Customer responsible for necessary installation, Mains Connection Box and service support bracket upgrade and associated costs if required.

Category of work		Description	Costing arrangement
		Service installations where: a. the consumer's mains cannot be insulated and an exclusion zone must be maintained, and b. the service cannot be isolated at the service fuse. Service to be isolated by breaking the service cable connection to the LV mains at the pole. Service fuse(s) to be installed at origin (pole end) of service prior to reconnection.	**Nil cost to customer** for first disconnection and reconnection. **Cost to customer** for subsequent requests.
	5. All other service replacements	Customer requested replacement of existing service with new XLPE service cable to classify as insulated service, in lieu of isolation, to allow work close (no exclusion zone prescribed e.g. no contact permitted). Service fuse(s) to be installed at origin (pole end) of service.	**Cost to customer** for service replacement. Customer responsible for necessary installation, Mains Connection Box and service support bracket upgrade and associated costs if required.
Tiger Tails	Installation of Tiger Tails (for visual indication only - not for providing electrical insulation of LV mains)	Customer requested coverage of LV mains for visual indication only (not permitted on HV mains). The Entity may also fit tiger tails to LV service line for visual indication only.	**Cost to customer**.
Aerial Markers	Installation of aerial marker flags or rota markers (for visual indication only)	Customer requested temporary or permanent installation of appropriate aerial marker devices on LV or HV mains.	**Cost to customer**.
Switching	Customer requested switching	Customer requested switching to allow customer/contractor to work close (no exclusion zone prescribed e.g. no contact permitted).	**Cost to customer**.

5.1. Isolation of supply to customer installation to eliminate exclusion zone around LV service line

An Electrical Mechanic (holding current Queensland Licence) working on behalf of an electrical contractor and accredited with the Electricity Entity as an Authorised Person (Electrical) is permitted to remove and replace LV service fuse(s) when isolation of customer LV service line is required to eliminate the exclusion zone around the LV service line, or to work on the customer's mains and/or switchboard. Isolation of the customer's LV service line by an Authorised Person (Electrical) is only permitted at an underground service pillar or service pole by removing a fuse wedge(s) from a service line, in accordance with Electricity Industry practices e.g. from ground level using appropriate insulated tools, PPE and insulating mats. In those situations where the service fuse/circuit breaker is not located at supply end of the LV service, contact the Electricity Entity to arrange for Safety Advice where elimination of exclusion zone around LV service line is required.

Any controls used by the Authorised Person (Electrical) to identify and confirm isolation and ensure supply to the customer's installation is not inadvertently re-energised shall comply with Electrical Safety Regulation 2013 Section 14 and 15 requirements.

NOTE: **The Authorised Person (Electrical) will not be permitted to replace a blown LV service fuse(s) after loss of supply to a customer's installation or to alter the Electricity Entity overhead LV services. The low voltage pole top service fuse shall only be removed by use of an approved, in test, insulated telescopic pole device while standing at ground level and wearing class 00 insulating gloves. At no time is it permissible for an Authorised Person (Electrical) to climb or work aloft on the Electricity Entity's poles or assets unless approved by the Electricity Entity.**

5.2. Operating Plant

It can be extremely difficult for operating plant operators to see overhead lines and to judge distances from them. Contact with overhead lines can pose a risk of grounding live conductors and electrocution.

In many cases the likelihood of damage or injury can be reduced by setting up and operating the machinery well clear of overhead electric lines.

In situations where operating plant is operated by an Authorised Person or Instructed Person without a Safety Observer or another safe system, the exclusion zone requirements (refer Section 1) for an Untrained Person applies (refer Electrical Safety Regulation 2013 Schedule 2 or Electrical Safety Code of Practice 2020 Working Near Overhead and Underground Electric Lines).

For an Authorised or Instructed Person and their Operating Plant to approach overhead electric lines closer than the exclusion zone distances for an Untrained Person, a Safety Observer or another safe system shall be used. Refer to the Electrical Safety Regulation 2013 and the Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines for exclusion zone distances for Authorised and Instructed Persons operating plant with a Safety Observer or another safe system.

Where a Safety Observer is used, the Safety Observer shall:

- Be trained to perform the role.
- Not be required to carry out any other duties at the time, and
- Not be required to observe more than one item of plant operating at a time, and
- Attend all times when the item of plant is operating.

Other control measures for operating plant may include, but are not restricted to:

- Constructing physical barriers or height warning indicators either side of the overhead electric line that are lower than the maximum travel height permissible without encroaching within the exclusion zone of the overhead electric line.
- Applying appropriate signage at least 8 to 10 m either side of overhead electric lines.
- Arrange for visual indicators such as Rota Markers, Tiger Tails or aerial markers to fitted to the overhead electric lines - only erected by the Electricity Entity (tiger tails are only permitted on LV mains).
- Ground barriers, where appropriate.
- Informing workers of required work practices.
- Ensuring operators are aware of the height and reach of their machinery in both stowed and working positions.
- Lowering all machinery to the transport position when relocating.
- Providing workers with maps or diagrams showing the location of underground and overhead electric lines, and
- Where possible, directing work away from overhead electric lines not towards them.

5.3. Scaffolding Requirements

The following information provided is for guidance only and shall be read in conjunction with the Electrical Safety Regulation 2013, Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines and AS/NZS 4576:1995: Guidelines for Scaffolding.

Requirements shall be complied with where scaffolding is required to be erected within 4 m of nearby overhead electric lines:

- The scaffolding shall not be erected before contacting and obtaining Safety Advice from the Electricity Entity.
- Erection of scaffolding to comply with requirements of AS/NZS 4576:1995: Guidelines for Scaffolding.

The scaffolding can be either:

- nonconductive material scaffolding; or
- metallic scaffolding with solid nonconductive barriers (with no gaps, holes or cuts) securely fixed to the outside and/or top of the scaffolding to prevent encroachment within exclusion zones or contact with the energised mains.

Where scaffolding is erected within 3 m of nearby overhead electric lines:

- It shall be fitted with fully enclosed non-conductive solid barriers to prevent encroachment within exclusion zones or contact with the energised mains fully enclosed.
- The person required to erect and/or disassemble scaffolding as well as the required solid barrier affixed to the scaffolding should be an Authorised Person (approved in writing by the Electricity Entity - refer requirements of Section 1.4 of this Reference).
- A Safety Observer shall be used during performance of this work where there is a risk of encroachment within 3 m of nearby energised overhead electric lines for voltages up to 33 kV. Additional requirements may apply for voltage levels above 33 kV, contact the Electricity Entity for consultation.

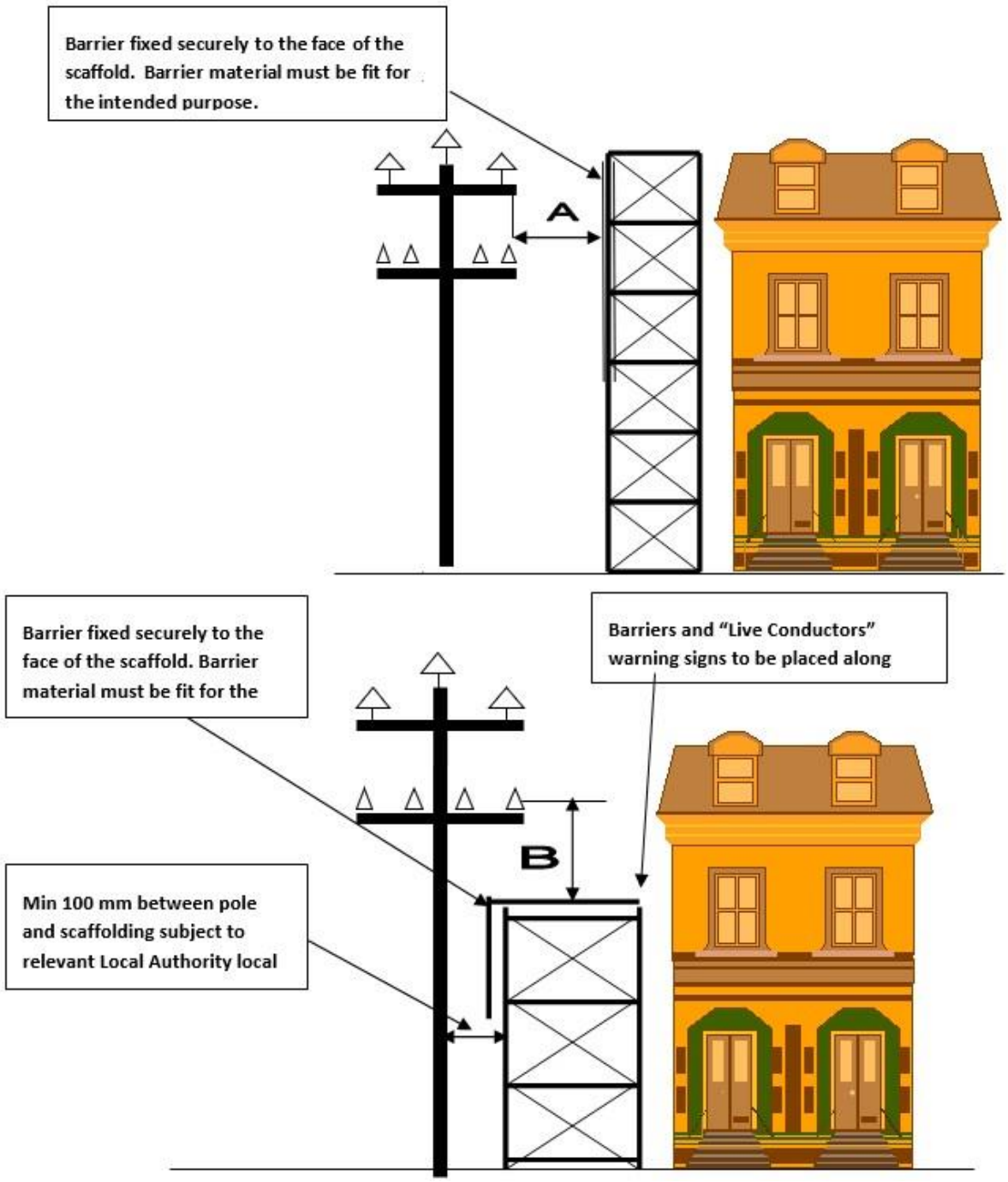
- Alternatively, consideration should be given to the de-energisation of the nearby electric lines where possible for the duration of this work. Additional requirements may apply for voltage levels above 33 kV, contact the Electricity Entity for consultation.
- Comply with the horizontal and vertical statutory clearances from overhead electric lines as set out in Electrical Safety Regulation 2013 Schedule 4.
- Persons are not permitted to go outside of or climb on top of the solid barrier fixed on the outside and/or top of the scaffolding.

Where an insulated low voltage service line passes through the scaffolding, it should either be de-energised for duration of work or be fully enclosed by non-conductive material (e.g. form ply).

Minimum statutory clearances from nearby overhead electric lines for scaffolding erected with barriers affixed.

Voltage Level	**Horizontal Distance "A" (in metres)**	**Vertical Distance "B" (in metres)**
Low voltage conductors (uninsulated)	1.5m	2.7m
Low voltage conductors (insulated) - these distances can only be applied after the integrity of the insulation has been verified by the Electricity Entity	0.3m	0.6m
Above LV and up to 33 kV (uninsulated)	1.5m	3.0m
Above LV and up to 33 kV (insulated)	Contact Electricity Entity for consultation.	
Above 33 kV (uninsulated)	Additional requirements may apply for voltage levels above 33 kV, contact the Electricity Entity for consultation.	

NOTE: **Dimensions "A" and "B" is between the scaffolding and the closest conductor of the overhead electric line. Dimension B is also taken from the lowest part of the mid span sag adjacent to the scaffolding.**



5.4. High Load transport under Overhead Electric Lines

Any person or company transporting a High Load (load in excess of 4.6 m high) under overhead electric lines must comply with Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines and is required to submit a Notification to Transport High Load form to the relevant Electricity Entity of the intended route and details of the high load involved. Before any person or company can transport a high load (load in excess of 4.6 m high), authorisation to travel must be received in writing from the Electricity Entity. Refer details below to contact the Electricity Entity for high load enquiries or to submit Notification to Transport High Load form:

Email: highloads@energyq.com.au

Phone: (07) 4932 7566 (7:30am to 3:00pm, Monday to Friday)

Energex: Vehicles with high loads | Energex

Ergon Energy: Vehicles with high loads | Ergon Energy

The Road Transport Operator has the overarching responsibility of transporting the load and is required to comply with the directions of the police, pilot, High Load Escort, and Energex / Ergon Energy Network.

When arranging the transporting of the high load, the Road Transport Operator shall determine the lowest practicable height that the load can be reduced to.

The Road Transport Operator is to have a Safe System of Work in place that supports the safe transportation of the High Load so as not to breach any exclusion zone to Entity powerlines or assets along the travel route.

5.5. Additional Details and Fact Sheets on Electricity Entity Requirements

Additional details and Fact Sheets on Electricity Entity requirements for working near overhead electric lines are located on the following internet sites

Energex: Working near powerlines | Energex

Ergon Energy: Working near powerlines | Ergon Energy

6. UNDERGROUND ELECTRICAL ASSETS

6.1. Responsibilities When Working in the Vicinity of Electricity Entity Underground Electrical Assets

Everyone has a legal “Duty of Care” that must be observed when working in the vicinity of underground electrical assets which includes underground cables, conduits and other associated underground equipment. When discharging this “Duty of Care” in relation to Electricity Entity underground electrical assets, the following points must be considered:

1. It is the responsibility of the architect, consulting Engineer, developer, and principal contractor in the project planning stages to design for minimal impact and protection of Electricity Entity underground electrical assets. The Electricity Entity will provide plans on request via BYDA showing the presence of the underground electrical assets to assist at this design stage.
2. It is the constructor’s responsibility to:
    a. Anticipate and request BYDA plans of Electricity Entity underground electrical assets for a particular location at a reasonable time before earthworks begins.
    b. Visually locate Electricity Entity underground electrical assets by use of an electronic cable locator followed by careful non-mechanical excavation (potholing using hydrovac or hand tools) when earthworks activities may damage or interfere with Electricity Entity plant.
    c. After completion of steps (a) and (b) above, if there is a risk of the Electricity Entity underground electrical assets being damaged or its structural integrity compromised by your planned earthworks activities, contact the Electricity Entity (General Enquiries phone number - refer page 3) for further advice.

    A constructor may include but not limited to designer, project manager, installer, contractor, civil contractor.
3. The alignments and boundaries contained within BYDA plans and maps will sometimes differ from present alignments and boundaries “on the ground”. Accordingly, in every case, the constructor should obtain confirmation of the actual position of Electricity Entity cables and pipelines under the roadways by non-mechanical excavation (potholing using hydrovac or

hand tools) when earthworks activities may damage or interfere with Electricity Entity underground electrical assets. In no case should the constructor rely on statements of third parties in relation to the position of Electricity Entity underground electrical assets.

6.2. Conditions of Supply of Information

- Plans and details of Electricity Entity underground electrical assets provided by BYDA are only current for 4 weeks from the date of dispatch and should not be referred to after this period, if you go past this time, please re-apply to BYDA as underground services may have been updated.

- The Electricity Entity agrees to provide plans if an Electricity Entity underground electrical assets location request is made to Before You Dig Australia (BYDA) , online at https://www.byda.com.au or the free iPhone Application, only on the basis that at least 2 business day notice is given and the BYDA applicant agrees to the terms of this agreement.

Note that the Electricity Entity only provides information on underground electrical assets it owns. Contact the owner of any privately owned underground electrical assets for details of their assets located at site.

- The Electricity Entity retains copyright of all plans and details provided in connection to your request.
- BYDA plans or other details are provided for the use of the BYDA applicant, its servants, or agents, for the sole purpose of the applicant's responsibilities in relation to the Electricity Entity underground electrical assets and shall not be used for any other purpose.
- BYDA plans are diagrams only and indicate the presence of Electricity Entity underground electrical assets in the general vicinity of the geographical area shown. Exact ground cover and alignments cannot be given with any certainty as such levels can change over time.
- On receipt of BYDA plans and before commencing excavation work or similar activities near Electricity Entity's underground electrical assets, carefully locate this plant first to avoid damage.
- The Electricity Entity, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and of details so supplied to the BYDA applicant, its servants or agents, and the BYDA applicant agrees to indemnify the Electricity Entity against any claim or demand for any such loss or damage to the BYDA applicant, its servants, or agents or to any third party.
- The constructor is responsible for all damages to the Electricity Entity underground electrical assets when work commences prior to obtaining BYDA plans, or at any time after that for failure to follow agreed instructions contained in this document or any other advice provided by the Electricity Entity.
- By undertaking any work, you acknowledge that the Electricity Entity reserves all rights to recover compensation for loss or damage to the Electricity Entity caused by interference or damage, including consequential loss and damage to its cable network, or other property.
- Be aware that some underground conduits may contain asbestos. Refer to "Code of Practice for the Management and Control of Asbestos in Workplace [NOHSC: 2018 (2005)]" for guidance.

6.3. When Working in the Vicinity of Electricity Entity Underground Electrical Assets, You Must Observe the Following Conditions

6.3.1 Records

The first step before any excavation commences is to obtain BYDA plans of Electricity Entity underground electrical assets in the vicinity of the work. For new work, records should be obtained during the planning and design stage. The records provided by BYDA must be made available to all relevant work groups on site. Where underground electrical asset information is transferred to plans for the proposed work, care must be exercised that important detail is not lost in the process.

6.3.2 Location of underground electrical assets

Examining the records is not sufficient, as reference points may change from the time of installation. Records must also be physically proven when working in close proximity to underground electrical assets. The exact location of underground electrical assets likely to be affected shall be confirmed by use of an electronic cable locator followed by careful non mechanical excavation to the level of concrete slabs or conduits. Non mechanical excavation (potholing using hydrovac or hand tools) must be used in advance of excavators. In any case, where doubt exists with respect to interpretation of cable records, contact the Electricity Entity (General Enquiries phone number - refer page 3) for further advice.

If during excavation, cables or conduits are damaged:

- call Electricity Entity (Emergencies phone number - refer page 3) to report damaged cables or conduits.
- treat cables as if alive, post a person to keep all others clear of the excavation until the Electricity Entity crew attend to make safe.

If **unknown** cables or conduits (e.g. not shown on issued BYDA plans) are located during excavation:

- call Electricity Entity (Emergencies phone number - refer page 3) to report.
- treat cables as if alive, post a person to keep all others clear of the excavation until the Electricity Entity crew attend to make safe.

If the constructor is unable to locate Electricity Entity underground electrical assets within 2.5 m of nominal plan locations, they should contact the Electricity Entity (General Enquiries phone number - refer page 3) for further advice.

6.3.3 Remote or On-Site Cable Location conducted by Electricity Entity

This service shall only be provided at Electricity Entity's discretion:

- The Electricity Entity may provide this site visit only when underground cables (33 kV or above) are present.
- Due to remote locations where external cable locator or hydro vac service providers are not readily available, Electricity Entity may attend site and assist with cable location (fees may apply for this service).
- The Electricity Entity may provide either remote over the phone or on-site cable location advice to assist in the location of Electricity Entity underground electrical assets, including how to visually locate and protect the plant when excavating.
- Where the Electricity Entity provides on-site cable location advice, any markings provided for the purpose of identifying cable location are for general guidance only, and the constructor

is still responsible for non-mechanical excavation (potholing using hydrovac or hand tools) to visually locate Electricity Entity underground electrical assets.

- If the constructor is unable to locate Electricity Entity underground electrical assets within 2.5 m of nominal plan locations, they should contact Electricity Entity (General Enquiries phone number - refer page 3) to request further advice.

6.3.4 Electrical Cables

Electricity Entity cables may have warning covers e.g.:

- Clay paving bricks or tiles marked “Electricity” or similar (also unmarked)
- Concrete or PVC cover slabs
- PVC, asbestos or fibro conduit, fibre reinforced concrete, iron or steel pipe
- Concrete encased PVC or steel pipe
- Thin plastic marker tape
- Large pipes housing multiple ducts
- Multiple duct systems, including earthenware or concrete

NOTE: **Some cables are known to be buried without covers.**

6.3.5 Separation from Electricity Entity underground electrical assets

If location plans or visual location of Electricity Entity underground electrical assets by non-mechanical excavation (potholing using hydrovac or hand tools) reveals that the location of Electricity Entity underground electrical assets is situated where the developer or constructor plans to work, then contact the Electricity Entity (General Enquiries phone number - refer page 3) for further advice.

The developer or constructor shall ensure that minimum separation distance from Electricity underground electrical assets (refer Minimum Separation Requirements tables below) is complied with when installing, altering or repairing other underground services located in the vicinity.

If the Electricity Entity relocation or protection works are part of the agreed solution, then payment to the Electricity Entity for the cost of this work shall be the responsibility of the principal developer or constructor. The Electricity Entity will provide an estimate for work on receipt of the developer’s or constructor’s order number before work proceeds.

It will be necessary for the developer or constructor to provide the Electricity Entity with a written Work Method Statement for all works in the vicinity of, or involving Electricity Entity underground electrical assets. This Work Method Statement should form part of the tendering documentation and work instruction. All Work Method Statements shall be submitted to the Electricity Entity prior to the commencement of site earthworks.

Minimum Separation Requirements

Underground Services Running Parallel with Electricity Entity Electrical Assets (Minimum Separation required in mm)							
Voltage Level	Gas	Communication or TV	Water		Sanitary drainage		Storm Water
			≤DN 200	>DN200	≤DN 200	>DN 200	
LV	300 (Ergon) 250 (Energex)	100	500	*1000	500	1000	500
HV		300					
*Contact your local utility/council to obtain specific separation distances							

Underground Services Crossing Electricity Entity Electrical Assets (Minimum Separation required in mm)					
Voltage Level	Gas	Communication or TV	Water	Sanitary drainage	Storm Water
LV	100	100	300	300	100
HV					

Notes:

- These clearances are each Electricity Entity's minimum requirements, additional separation may be required by the Service Owner. The greater of the separation requirements shall apply.
- Where the above tables do not list a separation requirement for a particular underground service type, the following minimum separation from electricity entity electrical assets shall apply:
- LV = 100 mm
- HV = 300 mm
- Compliance with these minimum separation requirements does not guarantee that issues such as Earth Potential Rise (EPR) and Low Frequency Induction (LFI) are managed, where these issues need to be managed, advice will need to be sought from an RPEQ Engineer
- All separation distances are measured from the exterior surface of the conduit / cable not centrelines or inner wall surfaces.

6.4. Additional Details and Fact Sheets on Electricity Entity Requirements

Additional details and Fact Sheets on Electricity Entity requirements for working near underground electrical assets are located on the following internet sites.

Energex: Working near powerlines | Energex

Ergon Energy: Working near powerlines | Ergon Energy

7. EXCAVATION

7.1. Excavating near Poles and Stay Wires

The following requirements are to be compiled with to minimise the risk of compromising the structural integrity of the Electricity Entity poles and stay foundations when excavation or trenching work is performed nearby that could result in the failure of one or more poles and grounding of supported electric lines.

- Excavation and trenching work undertaken by a person, worker or PCBU in the vicinity of poles and stay foundations shall:
- only be commenced after requirements of Section 3 have been complied with for any underground electrical assets located within the work site.
- upon completion of excavation and site earthworks do not restrict the Electricity Entity vehicle access to pole site for purpose of carrying out maintenance activities.
- comply with exclusion zones as detailed in the Electrical Safety Code of Practice 2020 - Working Near Overhead and Underground Electric Lines.
- not be attempted**:**
    - within 5 m (horizontal distance) of **pole stays** where the excavation depth is greater than 250 mm before contacting the Electricity Entity to determine requirements.
    - within 5 m (horizontal distance) of Electricity Entity poles with earth leads or cables running down into the ground before contacting the Electricity Entity to determine requirements.
    - within “Do Not Disturb” zone of pole prior to a certified engineering assessment having been completed by a Registered Professional Engineer Queensland, and then reviewed and approved by the Electricity Entity before proceeding with work. Approval by the Electricity Entity shall not relieve the PCBU of its duties to perform the work in a safe and proper manner and in accordance with all applicable legislation.
    - if the soil is exceedingly wet (saturated) or there is more than minimal wind loading unless additional pole support is provided in accordance with certified engineering assessment and approved by Electricity Entity.
    - when a severe weather event is occurring or expected (e.g. severe weather warning has been issued by Bureau of Meteorology).
- be backfilled as soon as possible (within same day where pole is required to be supported) soil mechanically compacted in layers of 150 mm and all rock and vegetable material excluded from the backfill.
- be backfilled and pole stabilised before removal of additional support required by a certified engineering assessment are permitted to be removed.

The PCBU shall be responsible for arrangement and costs of required certified engineering assessments, approvals by other regulatory bodies (eg councils, Main Roads, pipeline owners, telecommunication owners) and placement and removal of associated pole supporting equipment.

Electricity Entity poles must not be fitted with non-approved pole holding devices.

Only approved mechanical holding devices (e.g. Proline, Borer Lifter, etc) used in accordance with a certified engineering assessment are permitted and shall be:

- only attached and removed by the Electricity Entity or persons approved by the Electricity Entity.

- used to restrain both the pole head and foot to maintain pole stability during nearby excavation work.
- set up and positioned to maximise support effectiveness and minimise impact on traffic, pedestrian, excavation and machinery at site; and maintain exclusion zone from overhead lines. If insufficient clearance exists to maintain exclusion zones to pole supporting equipment, arrangements may be required for de-energising the electric line.

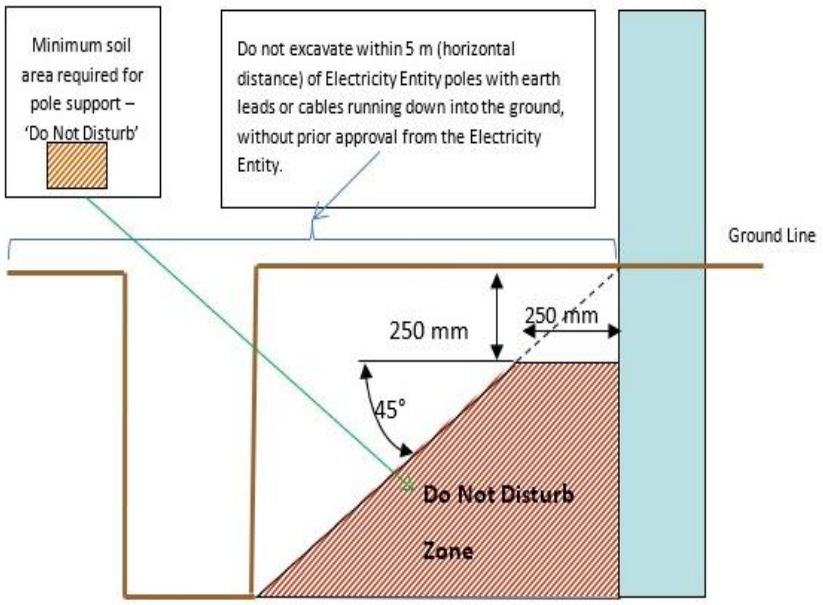


Figure 1 - Do Not Disturb Zone requirements when excavating near poles

Maximum Trench Depth	Minimum Distance from pole without pole support
Not more than 0.25 m (250 mm)	Can trench or hand dig (where cables and leads exist) right up to pole
1.0 m	1.0 m
1.5 m	1.5 m
2.0 m	2.0 m
2.5 m	2.5 m
3.0 m	3.0 m

7.1.1 Certified Engineering Assessment

Where required to be provided by the PCBU, a Certified Engineering Assessment shall:

- Ensure the stability of the Electricity Entity poles and foundations is maintained during and as a result of excavation work completed within the 'Do Not Disturb' zone.
- Include detailed design drawing of pole support method.
- Be completed and certified by a Registered Professional Engineer Queensland.
- Consider and address the following key points as a minimum:
  - Pole loading (vertical and lateral) including line deviation angles, direction of lean (towards or away from resultant loading)

- Direction of pole lean.
- Pole inspection (conducted to meet the Electricity Entity's requirements at customer cost)
- Pole foundation depth
- Proximity of excavation in relation to pole
- Soil condition
- Proposed shoring methods as well as installation and removal process
- Duration and staging of work
- Requirement to independently support pole during work
- Proximity of existing adjacent underground services and excavations
- Proposed backfilling and reinstatement method
- Monitoring and engineering/ geotechnical supervision during excavation work progress
- Other equipment attached to pole (e.g. underground cables, transformer, ACR, ABS.) must be taken into consideration and in some circumstances will prevent the pole being supported.

7.2. Excavating Near Underground Electrical Assets

For all work within 2.5 m of nominal location, the constructor is required to use non-mechanical excavation (potholing using hydrovac or hand tools) and expose the underground electrical assets, hence proving its exact location before earthworks can commence.

7.2.1 Excavating Parallel to Underground Electrical Assets

If excavation work is parallel to the Electricity Entity underground electrical cables, then non mechanical excavation (potholing using hydrovac or hand tools) at least every 4 m is required to establish the location of all cables, hence confirming nominal locations before work can commence. If an excavation exceeds the depth of the cables and it is likely that that the covers or bedding material around the cables/pipes will move causing Electricity Entity cables or conduits to be unsupported, contact Electricity Entity (General Enquiries phone number - refer page 3) for further advice.

NOTE: Be aware that cable depths and directions may change suddenly along the route.

7.2.2 Excavating Across Underground Electrical Assets

Refer Minimum Separation Requirements table in Section 6.3.5 of this document for distances that shall be maintained to prevent inadvertent contact with or damage to underground electrical assets. If the width or depth of excavation is such that the Electricity Entity cables will be unsupported, contact Electricity Entity (General Enquiries phone number - refer page 3) for further advice. In no case shall a cable cover be removed without approval. A cable cover may only be replaced under the supervision of an Electricity Entity officer. Protective cover strips when removed must be replaced under Electricity Entity supervision. Under no circumstances shall protective cover strips be omitted to achieve the minimum separation distance required between Electricity Entity cables and other underground services.

7.2.3 Heavy Machinery Operation Over Underground Electrical Assets

Where heavy "crawler" or "vibration" type machinery is operated over the top of cables, a minimum cover of 450 mm to the cable protective cover must be maintained. Alternatively, subject to a Certified Engineering Assessment, use load bearing protection whilst the machinery is in operation.

7.2.4 Directional Boring Near Underground Electrical Assets

When boring parallel to cables, it is essential that trial holes are carefully dug using non mechanical excavation (pot holing using hydrovac or hand tools) at regular intervals to prove the actual location of the conduits/cables before using boring machinery. Where it is required to bore across the line of cables/conduits, the actual location of the cables/conduits shall be proven by non-mechanical excavation (pot holing using hydrovac or hand tools). A trench shall be excavated 1 m from the side of the cables where the auger will approach to ensure a minimum clearance of 500 mm from cables/conduits can be maintained.

7.2.5 Hydro Vac Operation

When operating hydro vac equipment to excavate in vicinity of underground electrical assets (cables/conduits):

- Fitted with:
  - nonconductive (neoprene rubber or equivalent) vacuum (suction) hose.
  - oscillating nozzle on pressure wand with water pressure adjusted to not exceeding 2000 psi.
- Maintain a minimum distance of 200 mm between end of pressure wand and underground electrical assets. DO NOT insert the pressure wand jet directly into subsoil.
- Ensure pressure wand is not directly aimed at underground electrical assets (cables / conduits).

7.3. Blasting

Explosives must not be used within 5 m of cables/conduits, unless an engineering report is provided indicating that no damage will be sustained. Clearances shall be obtained from the Electricity Entity for use of explosives in the vicinity of cables/conduits. Contact Electricity Entity (General Enquiries phone number - refer page 3) for further advice.

The Electricity Entity will accept the level of 25 mm / sec as a peak component particle velocity upper limit as defined in AS 2187.2 Appendix J for blasting operations in the vicinity of these power lines.

Electric line insulators and conductors are particularly susceptible to damage from fly rock and adequate control measure including the use of blast mats shall be used to manage this. Contact Electricity Entity for consultation and application.

8. REPORTING DAMAGE CAUSED TO OVERHEAD OR UNDERGROUND ELECTRIC LINES

Any damage caused to the Electricity Entity overhead electric lines, poles, stays, underground cables, conduits and pipes must be reported no matter how insignificant the damage appears to be. Even very minor damage to cable protective coverings can lead to eventual failure of cables through corrosion of metal sheaths and moisture ingress.

All work in the vicinity of damaged overhead or underground electric lines shall cease and the area be made safe and vacated until clearance to continue earthworks has been obtained from the Electricity Entity. Call Electricity Entity (Emergencies phone number - refer page 3).

9. INFRASTRUCTURE NEAR ELECTRIC LINES

9.1. Easements and Wayleaves

This information, whilst not a legal document, has been developed to assist the community in answering some commonly asked questions about our easements and wayleaves, and briefly outlines what you can do where land is affected by an easement or where consent to installing electrical infrastructure has been given.

9.1.1 What is an Electricity Easement?

An electricity easement is the authority held by the Electricity Entity to use your land near overhead and underground electric lines and substations (electrical assets). Electricity Entity holds this authority for your own safety and to allow employees access to electrical assets at all times. Whilst it will depend on the terms of the particular grant of easement, electrical easements generally give the Electricity Entity the right to access, maintain, repair, rebuild and to restrict development within a defined area.

The easement, which is registered on the property's title, contains a plan showing the dimensions of the easement and its location on the property together with the rights and restrictions over the easement area. The Department of Natural Resources and Mines https://www.resources.qld.gov.au/ or your solicitor will be able to provide this information. Easements may also exist for telephone lines, water and sewage mains and natural gas supply lines.

9.1.2 Why are easements necessary?

Easements are also created to allow the Electricity Entity clear, 24 hour access to the electric lines. It is important to keep the easement clear at all times so regular maintenance, line upgrades, damage or technical faults can be attended to immediately to provide a safe and reliable supply of electricity. Interference with Electricity Entity's rights and electrical equipment may compromise safety of the public and the occupiers of the property. Therefore, it is essential that Electricity Entity's rights are understood and observed.

9.1.3 How do I know if there are easements on my property?

Contact your solicitor or The Department of Natural Resources and Mines to obtain a Title Search that shows all registered easements on the property.

9.1.4 Who owns the land the easement is on?

The ownership of that land encumbered with the easement remains with the property owner.

9.1.5 How does an easement affect what I can do with my property?

An easement controls what you can build, what size trees you can plant and what outdoor activities you can carry out in the easement area.

An easement affects the use of the property by limiting the development that can be undertaken within the easement area. The exact rights granted to an Electricity Entity under an electricity easement will depend on the wording used in the grant of easement. Property owners and occupiers should also be aware that an Electricity Entity has the right of access to land to undertake certain works (including reading meters and disconnecting supply). These rights of access are granted by Queensland legislation not the easement and so may not be registered on the property's title and therefore may not be revealed in a Title Search.

9.1.6 Who is responsible for maintenance of easement area?

You must provide a continuous, unobstructed area along the full length of the easement to allow an Electricity Entity access to electric lines, transformers, underground cables and other equipment at all times. A width of 4.5 m is typically required for the safe passage of vehicles and heavy plant.

You must NOT place obstructions in the easement within 5 m of any electric lines, transformer, power pole, equipment or supporting wire.

Maintenance of the easement area is generally the responsibility of the property owner and/or occupier, however, complying with regulatory and safety requirements associated with Electricity Entity's electrical assets within the easement area is the responsibility of the Electricity Entity.

9.1.7 What type of maintenance work does Electricity Entity undertake on easements?

To enable Electricity Entity to construct, maintain, repair and rebuild electric lines on some properties, access roads and tracks are required on or adjacent to the easement area. As required, Electricity Entity is able to construct access tracks, retain the right of use of these tracks and maintain them to a suitable level to permit access for its vehicles. Where gates are installed within the easement area, an Electricity Entity lock may be required to enable continual access along the easement corridor.

In addition, periodic vegetation management works are also undertaken by Electricity Entity to ensure that a specified minimum clearance between vegetation and the electric lines is maintained.

Where possible, property owners will be contacted prior to easement maintenance and vegetation works commencing.

9.1.8 Where consent (Wayleave) to installing Electricity Entity infrastructure has been given

Much of Electricity Entity's above ground electricity network is constructed without easements. Instead, the consent of the owner of the affected land is obtained and the electrical infrastructure is installed. Historically this consent has been in the form of a document known as a Wayleave.

This consent (or Wayleave) is a document evidencing the agreement from a particular owner, but it is not registered on the title of the land like an easement.

Once consent is obtained from an owner, Queensland legislation (the Electricity Act 1994) says that the consent of all future owners to the electrical infrastructure is not required.

Queensland legislation grants Electricity Entity rights to access, maintain, repair and replace electrical assets installed with consent.

9.2. Contact Electricity Entity when planning construction work near electric lines

When planning and before commencement (regardless of whether or not local council approval is required), it is essential to confirm that the proposed construction work (e.g. building, structure, sign, crane, scaffold) does not breach the minimum statutory clearance distances that must be maintained from nearby Electricity Entity overhead or underground electric lines. Refer Electrical Safety Regulation 2013, Schedule 4 and 5 for information on statutory clearance distances that must be complied with.

It is extremely dangerous and potentially life threatening to allow anything to come in close proximity to the conductors of an electric line.

We advise not to build **under** or **near** powerlines or add to a structure under or near powerlines. This can cause exclusion zones to be encroached, which may endanger others now and in the future. Please note obligations under section 30 of the Electrical Safety Act 2002 and sections 68 of the Electrical Safety Regulation 2013.

There is an obligation to notify the Electricity Entity, before any work starts, where work is likely to involve a building or other structure coming within clearance requirements for an overhead or underground electric line.

Where it is necessary for an Electricity Entity to relocate electric lines due to statutory clearance breach caused by work performed nearby, the Electricity Entity may be entitled to recover costs from the PCBU, property owner or occupier who caused the breach. Refer Electrical Safety Regulation 2013, Section 209 Building or adding to structure near electric lines.

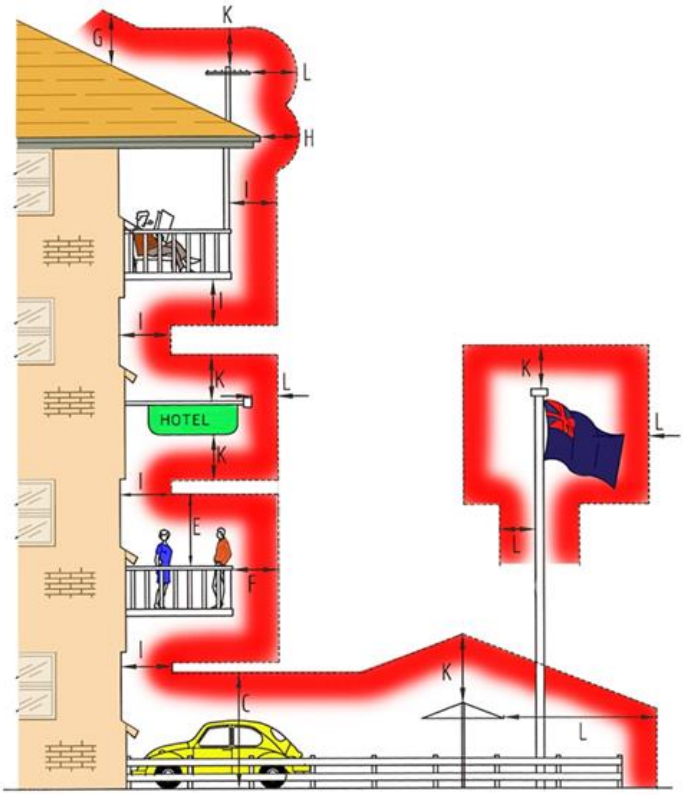
Although it is preferred that the area around Electricity Entity electrical assets (including within an Easement area) is free of development, the following examples provide property owners and occupiers with an indication of what type of development is acceptable and what is not.

NOTE: **Do not assume that your local council approval is sufficient approval for you to proceed with your work. The local council may not check whether or not your proposed construction work will comply with the Electricity Entity's statutory clearance requirements.**

9.3. What clearances must be maintained once construction work is completed?

Electrical Safety Regulation 2013, Schedule 4 - Clearance of overhead electric lines and Schedule 5 - Clearance of low voltage overhead service lines detail the statutory clearances that must be maintained from overhead electric lines for completed buildings and structures. These statutory clearances will need to be taken into consideration during the planning phase of determining the location for a building or structure. The table below sets out the minimum statutory clearances required for voltage levels up to 33 kV. Additional requirements may apply for voltage levels above 33 kV, contact the Electricity Entity for consultation.

Where the Electricity Entity has identified a breach of statutory clearance resulting from erection of a building or structure, the statutory breach will be reportable to the Electrical Safety Office as a Dangerous Electrical Event and any costs incurred in subsequent remedial work to achieve required statutory clearances may be recovered from the person or company who caused the breach of statutory clearance.



CODE	LOCATION	DIRECTION	INSULATED CABLE (ABC) (Note 1)	BARE	MORE THAN 1000 VOLTS BUT NOT MORE THAN 33kV
MINIMUM CLEARANCE FROM ROADS, GROUND, OR BOUNDARIES					
A	Crossing the carriageway, roadway	VERTICALLY	5.5m	5.5m	6.7m
A1	Designated "Over Dimension Routes"	VERTICALLY	7.0m	7.0m	7.5m
B	At other positions, footpath	VERTICALLY	5.5m	5.5m	5.5m
C	Other than roads but trafficable	VERTICALLY	5.5m	5.5m	5.5m
C1	Areas totally inaccessible to traffic or mobile machinery	VERTICALLY	4.5m	4.5m	4.5m
D	Cuttings, embankments, easement boundaries	HORIZONTALLY	1.5m	1.5m	2.1m
X	Real Property Boundaries	HORIZONTALLY	0.0m	0.0m	0.0m
MINIMUM CLEARANCE FROM STRUCTURES AND BUILDINGS					
E F	Unroofed terraces, balconies, sun-decks, paved areas, etc, subject to pedestrian traffic only. A hand rail or wall surrounding such an area and on which a person may stand. (Note)	VERTICALLY AND HORIZONTALLY (Note)	2.7m 1.2m	3.7m 1.5m	4.6m 2.1m
G H	Roofs or similar structures not used for traffic or resort but on which a person may stand. A parapet surrounding such a roof and on which a person may stand. (Note)	VERTICALLY AND HORIZONTALLY (Note)	2.7m 0.9m	3.7m 1.5m	3.7m 2.1m
I	Covered places of traffic or resort such as windows which are capable of being opened, roofed open verandahs and covered balconies.	IN ANY DIRECTION	1.2m	1.5m	2.1m
J	Blank walls, windows which cannot be opened. (Note)	HORIZONTALLY	0.6m	1.5m	1.5m
K L	Other structures not normally accessible to persons. (Note)	VERTICALLY HORIZONTALLY (Note)	0.6m 0.3m	2.7m 1.5m	3.0m 1.5m

NOTE:
The vertical clearance and the horizontal clearance specified shall be maintained.

Electricity Entity Requirements - Working Near Overhead and Underground Electric Lines

The following list of examples is not exhaustive, and it may be necessary to contact the Electricity Entity if doubt exists as to what is permitted around electricity assets.

What is PERMITTED around Electricity Entity overhead or underground electric lines	***What is NOT PERMITTED around Electricity Entity overhead or underground electric lines***
✓ Erection of fences to a maximum height of 2.4 m is generally acceptable, provided they do not affect access to, and work on, the poles, electric lines and/or cables. Trees, shrubs and plants should be located clear of vehicle access. **Note:** Maximum Growth Height of 3 m. ✓ Clothes hoists and barbecues should be located clear of the vehicle access way. **Note:** Maximum Height 2.5 m. ✓ Installation of underground utility services, such as low voltage electricity, gas, telephone and water, is generally acceptable, subject to clearances from Electricity Entity poles and supporting structures, and underground electric mains. ✓ Excavating, filling and altering of nearby land may be acceptable but full details need to be provided to the Electricity Entity for assessment. ✓ Vehicles, mobile plant and equipment within the easement area need to maintain the minimum statutory clearances distances from overhead electric lines. Normal farming, grazing and other agricultural activities can be carried out. Take care when ploughing or operating mobile machinery or irrigation equipment near Electricity Entity's equipment. ✓ Parking of vehicles, trucks, trailers, etc. is normally allowed. **Note:** Maximum Load and Aerial Height of 4 m. Barriers of an approved design (e.g. bollards) may be required to protect poles from vehicle contact damage. Heavy vehicle or operating plant crossings may need a protective concrete cover to ensure underground cables are not damaged.	✗ Build houses, sheds, garages or other large structures. Building of roofed/ unroofed verandas, swimming pools and pergolas are generally not acceptable. ✗ Flying kites or model aircraft within the easement. ✗ Driving fence posts or stakes into ground within easements where there is underground cabling. ✗ Storing liquids such as petrol, diesel fuel, or any flammable or combustible material that will burn. ✗ Installing lighting poles. ✗ Stockpiling soil or garbage within the easement. ✗ Planting trees in large quantities that could create a fire hazard or that grow in excess of the approved maximum height of 3 m. ✗ Storing or using explosives. ✗ Residing in or occupying any caravan or mobile home within an easement. ✗ Placing obstructions within the vicinity of any Electricity Entity assets (e.g. power pole, overhead electric line, equipment or pole stay) that impede access to or work on these assets.

9.4. What about Electric and Magnetic Fields?

The Electricity Entity operates its electric lines within the current guidelines set by the National Health and Medical Research Council for exposure to 50/60 hertz electric and magnetic fields (EMF) and is mindful of some community concern about such fields and health. Contact the Electricity Entity (General Enquiries phone number - refer page 3). Alternatively, further information can be sourced from:

Energy Networks Association (ENA) brochure - "Electric and Magnetic Fields - What We Know", January 2014

http://www.ena.asn.au/sites/default/files/emf-what-we-know-jan-2014-final_1_1.pdf

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) brochure - "Electricity and Health", May 2011

http://www.arpansa.gov.au/RadiationProtection/Factsheets/is_electricity.cfm

NBN Co Qld

Referral
270835212

Member Phone
1800 687 626

Responses from this member

Response received Tue 7 Apr 2026 9.01am

File name	Page
Response Body	103
270835212_20260406_230035124754_1.pdf	104
4678_NBN_Dial_Before_You_Dig_Poster_20170517.pdf	107
Disclaimer_270835212_20260406_230035124754.pdf	109

Hi Azam Mohiuddin Mohammed,

Please find attached the response to your DBYD referral for the address mentioned in the subject line.
The location shown in our DBYD response is assumed based off the information you have provided. If the location shown is different to the location of the excavation then this response will consequently be rendered invalid.
Take the time to read the response carefully and note that this information is only valid for 28 days after the date of issue.
If you have any further enquiries, please do not hesitate to contact us.

Regards,
Network Services and Operations
NBN Co Limited
P: 1800626329
E: dbyd@nbnco.com.au
www.nbnco.com.au

Confidentiality and Privilege Notice
This e-mail is intended only to be read or used by the addressee. It is confidential and may contain legally privileged information. If you are not the addressee indicated in this message (or responsible for delivery of the message to such person), you may not copy or deliver this message to anyone, and you should destroy this message and kindly notify the sender by reply e-mail. Confidentiality and legal privilege are not waived or lost by reason of mistaken delivery to you. Any views expressed in this message are those of the individual sender, except where the sender specifically states them to be the views of NBN Co Limited

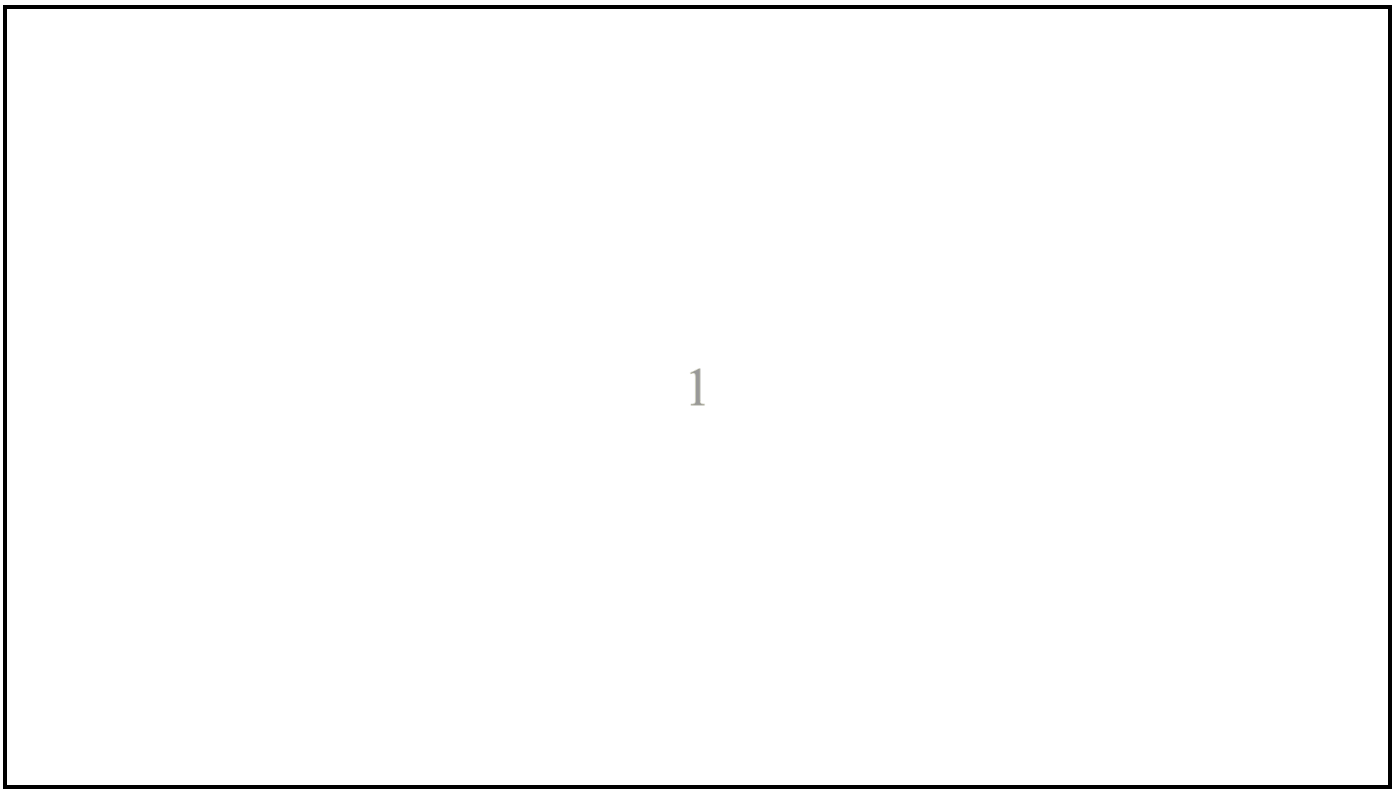
Please Do Not Reply To This Mail

To:	Azam Mohiuddin Mohammed
Phone:	Not Supplied
Fax:	Not Supplied
Email:	amohiuddin@oska.net.au

Dial before you dig Job #:	52808618
Sequence #	270835212
Issue Date:	06/04/2026
Location:	101 Old Burleigh Road , Broadbeach , QLD , 4218

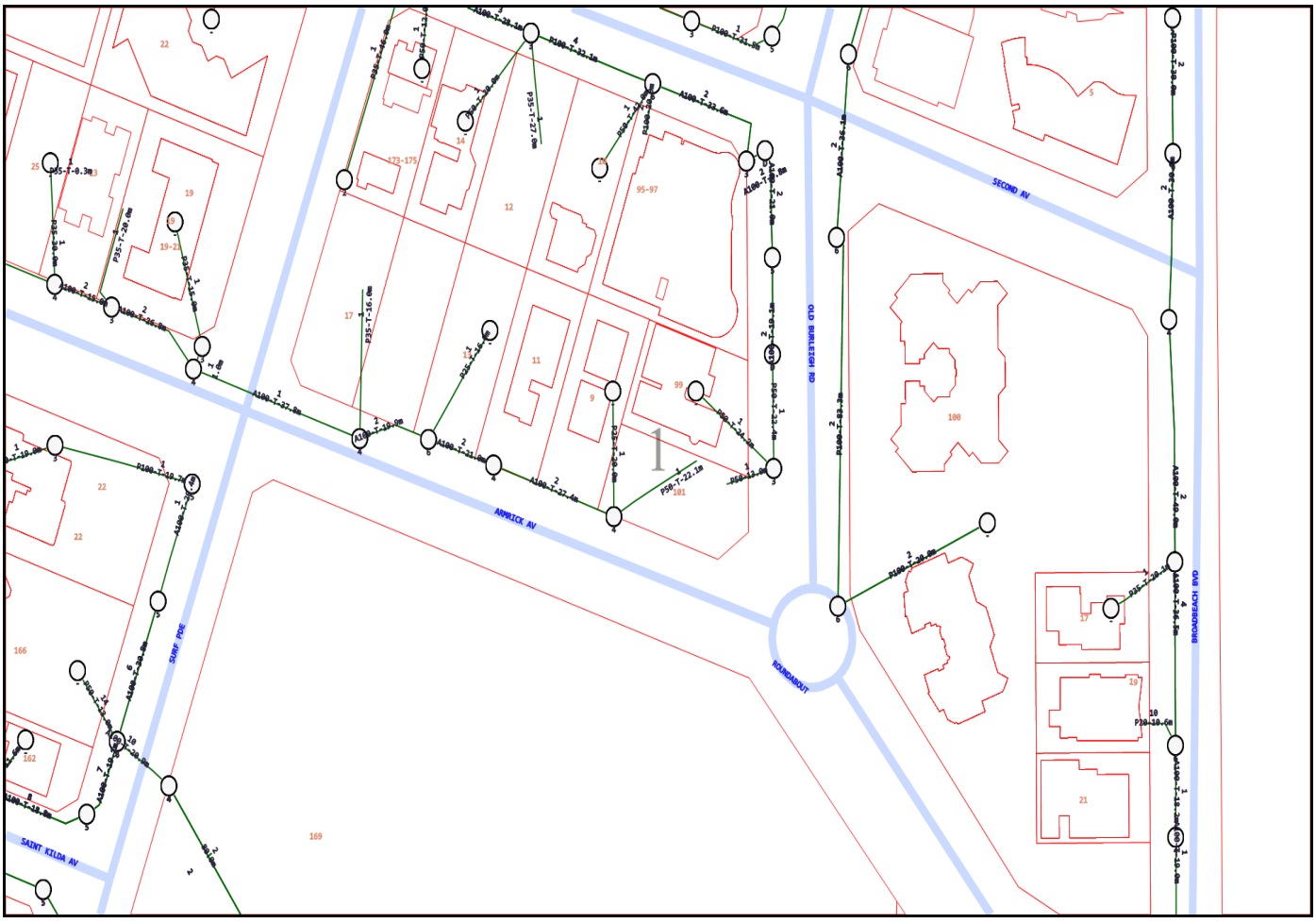
BEFORE YOU DIG www.byda.com.au
Zero Damage - Zero Harm

Indicative Plans are tiled below to demonstrate how to layout and read nbn asset plans



LEGEND

34	Parcel and the location
5	Pit with size "5"
2E	Power Pit with size "2E". Valid PIT Size: e.g. 2E, 5E, 6E, 8E, 9E, E, null.
	Manhole
	Pillar
2 PO – T- 25.0m P40 – 20.0m 5 9	Cable count of trench is 2. One "Other size" PVC conduit (PO) owned by Telstra (-T-), between pits of sizes, "5" and "9" are 25.0m apart. One 40mm PVC conduit (P40) owned by NBN, between pits of sizes, "5" and "9" are 20.0m apart.
2 10.0m 5 9	2 Direct buried cables between pits of sizes ,"5" and "9" are 10.0m apart.
5 9	Trench containing any INSERVICE/CONSTRUCTED (Copper/RF/Fibre) cables.
5 9	Trench containing only DESIGNED/PLANNED (Copper/RF/Fibre/Power) cables.
5 9	Trench containing any INSERVICE/CONSTRUCTED (Power) cables.
BROADWAY ST	Road and the street name "Broadway ST"
Scale	0 20 40 60 Meters 1:2000 1 cm equals 20 m



Emergency Contacts

You must immediately report any damage to the **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.

Working near nbn™ cables

nbn has partnered with Dial Before You Dig to give you a single point of contact to get information about **nbn** underground services owned by **nbn** and other utility/service providers in your area including communications, electricity, gas and other services. Contact with underground power cables and gas services can result in serious injury to the worker, and damage and costly repairs. You must familiarise yourself with all of the Referral Conditions (meaning the referral conditions referred to in the DBYD Notice provided by **nbn**).

Practice safe work habits

Once the DBYD plans are reviewed, the Five P's of Excavation should be adopted in conjunction with your safe work practices (which must be compliant with the relevant state Electrical Safety Act and Safe Work Australia "Excavation Work Code of Practice", as a minimum) to ensure the risk of any contact with underground **nbn** assets are minimised.

Plan: Plan your job by ensuring the plans received are current and apply to the work to be performed. Also check for any visual cues that may indicate the presence of services not covered in the DBYD plans.

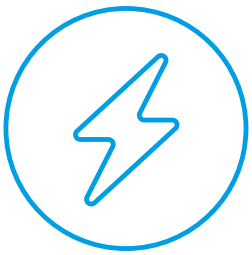
Prepare: Prepare for your job by engaging a DBYD Certified Plant Locator to help interpret plans and identify on-site assets. Contact **nbn** should you require further assistance.

Pothole: Non-destructive potholing (i.e. hand digging or hydro excavation) should be used to positively locate **nbn** underground assets with minimal risk of contact and service damage.

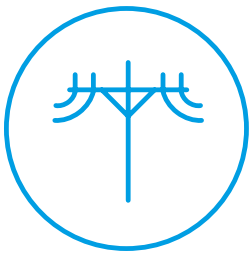
Protect: Protecting and supporting the exposed **nbn** underground asset is the responsibility of the worker. Exclusion zones for **nbn** assets are clearly stated in the plan and appropriate controls must be implemented to ensure that encroachment into the exclusion zone by machinery or activities with the potential to damage the asset is prevented.

Proceed: Proceed only when the appropriate planning, preparation, potholing and protective measures are in place.

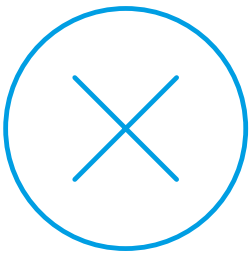
Working near nbn™ cables



Identify all electrical hazards, assess the risks and establish control measures.



When using excavators and other machinery, also check the location of overhead power lines.



Workers and equipment must maintain safety exclusion zones around power lines.

Once all work is completed, the excavation should be re-instated with the same type of excavated material unless specified by **nbn**. Please note:

- Construction Partners of **nbn** may require additional controls to be in place when performing excavation activities.
- The information contained within this pamphlet must be used in conjunction with other material supplied as part of this request for information to adequately control the risk of potential asset damage.

Contact

All nbn™ network facility damages must be reported online here.
For enquiries related to your DBYD request please call 1800 626 329.

Disclaimer

This brochure is a guide only. It does not address all the matters you need to consider when working near our cables. You must familiarise yourself with other material provided (including the Referral Conditions) and make your own inquiries as appropriate.

nbn will not be liable or responsible for any loss, damage or costs incurred as a result of reliance on this brochure.

This document is provided for information purposes only. This document is subject to the information classification set out on this page. If no information classification has been included, this document must be treated as UNCLASSIFIED, SENSITIVE and must not be disclosed other than with the consent of nbn co. The recipient (including third parties) must make and rely on their own inquiries as to the currency, accuracy and completeness of the information contained herein and must not use this document other than with the consent of nbn co. Copyright © 2021 nbn co limited. All rights reserved.

DIAL BEFORE YOU DIG
www.1100.com.au

To:	Azam Mohiuddin Mohammed
Phone:	Not Supplied
Fax:	Not Supplied
Email:	amohiuddin@oska.net.au

Before You Dig Australia Job #:	52808618
Sequence #	270835212
Issue Date:	06/04/2026
Location:	101 Old Burleigh Road , Broadbeach , QLD , 4218

Information

The area of interest requested by you contains one or more assets.

nbn™ Assets	Search Results
Communications	Asset identified
Electricity	No assets

In this notice **nbn™ Facilities** means *underground fibre optic, telecommunications and/or power facilities, including but not limited to cables, owned and controlled by* ***nbn™***

Location of **nbn™** Underground Assets

We thank you for your enquiry. In relation to your enquiry at the above address:

- **nbn's** records indicate that there **ARE nbn™** Facilities in the vicinity of the location identified above ("Location").
- **nbn** indicative plan/s are attached with this notice ("Indicative Plans").
- The Indicative Plan/s show general depth and alignment information only and are not an exact, scale or accurate depiction of the location, depth and alignment of **nbn™** Facilities shown on the Plan/s.
- In particular, the fact that the Indicative Plans show that a facility is installed in a straight line, or at uniform depth along its length cannot be relied upon as evidence that the facility is, in fact, installed in a straight line or at uniform depth.
- You should read the Indicative Plans in conjunction with this notice and in particular, the notes below.
- You should note that, at the present time, the Indicative Plans are likely to be more accurate in showing location of fibre optics and telecommunications cables than power cables. There may be a variation between the line depicted on the Indicative Plans and the location of any power cables. As such, consistent with the notes below, particular care must be taken by you to make your own enquiries and investigations to precisely locate any power cables and manage the risk arising from such cables accordingly.
- The information contained in the Indicative Plan/s is valid for 28 days from the date of issue set out above.You are expected to make your own inquiries and perform your own investigations (including engaging appropriately qualified plant locators, e.g BYDA Certified Locators, at your cost to locate **nbn™** Facilities during any activities you carry out on site).

We thank you for your enquiry and appreciate your continued use of the Before You Dig Australia Service. For any enquiries related to moving assets or Planning and Design activities, please visit the **nbn** Commercial Works website to complete the online application form. If you are planning to excavate and require further information, please email dbyd@nbnco.com.au or call 1800 626 329.

Notes:

1. You are now aware that there are **nbn™** Facilities in the vicinity of the above property that could be damaged as a result activities carried out (or proposed to be carried out) by you in the vicinity of the Location.
2. You should have regard to section 474.6 and 474.7 of the *Criminal Code Act 1995* (CoA) which deals with the consequences of interfering or tampering with a telecommunications facility. Only persons authorised by **nbn** can interact with **nbn's** network facilities.
3. Any information provided is valid only for **28 days** from the date of issue set out above.

Referral Conditions

The following are conditions on which **nbn** provides you with the Indicative Plans. By accepting the plans,you are agreeing to these conditions. These conditions are in addition, and not in replacement of, any duties and obligations you have under applicable law.

1. **nbn** does not accept any responsibility for any inaccuracies of its plans including the Indicative Plans. You are expected to make your own inquiries and perform your own investigations (including engaging appropriately qualified plant locators, e.g BYDA Certified Locators, at your cost to locate **nbn™** Facilities during any activities you carry out on site).
2. You acknowledge that **nbn** has specifically notified you above that the Indicative Plans are likely to be more accurate in showing location of fibre optics and telecommunications cables than power cables. There may be a variation between the line depicted on the Indicative Plans and the location of any power cables.

3. You should not assume that **nbn™** Facilities follow straight lines or are installed at uniformed depths along their lengths, even if they are indicated on plans provided to you. Careful onsite investigations are essential to locate the exact position of cables.
4. In carrying out any works in the vicinity of **nbn™** Facilities, you must maintain the following minimum clearances:
    - 300mm when laying assets inline, horizontally or vertically.
    - 500mm when operating vibrating equipment, for example: jackhammers or vibrating plates.
    - 1000mm when operating mechanical excavators.
    - Adherence to clearances as directed by other asset owner's instructions and take into account any uncertainty for power cables.
5. You are aware that there are inherent risks and dangers associated with carrying out work in the vicinity of underground facilities (such as **nbn™** fibre optic,copper and coaxial cables,and power cable feed to **nbn™** assets).Damage to underground electric cables may result in:
    - Injury from electric shock or severe burns, with the possibility of death.
    - Interruption of the electricity supply to wide areas of the city.
    - Damage to your excavating plant.
    - Responsibility for the cost of repairs.
6. You must take all reasonable precautions to avoid damaging **nbn™** Facilities. These precautions may include but not limited to the following:
    - All excavation sites should be examined for underground cables by careful hand excavation. Cable cover slabs if present must not be disturbed. Hand excavation needs to be undertaken with extreme care to minimise the likelihood of damage to the cable, for example: the blades of hand equipment should be aligned parallel to the line of the cable rather than digging across the cable.
    - If any undisclosed underground cables are located, notify **nbn** immediately.
    - All personnel must be properly briefed, particularly those associated with the use of earth-moving equipment, trenching, boring and pneumatic equipment.
    - The safety of the public and other workers must be ensured.
    - All excavations must be undertaken in accordance with all relevant legislation and regulations.
7. You will be responsible for all damage to **nbn™** Facilities that are connected whether directly, or indirectly with work you carry out (or work that is carried out for you or on your behalf) at the Location. This will include, without limitation, all losses expenses incurred by **nbn** as a result of any such damage.
8. You must immediately report any damage to the **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 329.
9. Except to the extent that liability may not be capable of lawful exclusion, **nbn** and its servants and agents and the related bodies corporate of **nbn** and their servants and agents shall be under no liability whatsoever to any person for any loss or damage (including indirect or consequential loss or damage) however caused (including, without limitation, breach of contract negligence and/or breach of statute) which may be suffered or incurred from or in connection with this information sheet or any plans(including Indicative Plans) attached hereto. Except as expressly provided to the contrary in this information sheet or the attached plans(including Indicative Plans), all terms, conditions, warranties, undertakings or representations (whether expressed or implied) are excluded to the fullest extent permitted by law.

All works undertaken shall be in accordance with all relevant legislations, acts and regulations applicable to the particular state or territory of the Location. The following table lists all relevant documents that shall be considered and adhered to.

State/Territory	Documents
National	Work Health and Safety Act 2011
	Work Health and Safety Regulations 2011
	Safe Work Australia - Working in the Vicinity of Overhead and Underground Electric Lines (Draft)

	Occupational Health and Safety Act 1991
NSW	Electricity Supply Act 1995
	Work Cover NSW - Work Near Underground Assets Guide
	Work Cover NSW - Excavation Work: Code of Practice
VIC	Electricity Safety Act 1998
	Electricity Safety (Network Asset) Regulations 1999
QLD	Electrical Safety Act 2002
	Code of Practice for Working Near Exposed Live Parts
SA	Electricity Act 1996
TAS	Tasmanian Electricity Supply Industry Act 1995
WA	Electricity Act 1945
	Electricity Regulations 1947
NT	Electricity Reform Act 2005
	Electricity Reform (Safety and Technical) Regulations 2005
ACT	Electricity Act 1971

Thank You,

nbn BYDA

Date: 06/04/2026

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OptiComm Ltd (QLD)

Referral
270835216

Member Phone
1300 137 800

Responses from this member

Response received Tue 7 Apr 2026 8.57am

File name	Page
Response Body	114
270835216 - OptiComm Plan.pdf	115
270835216 - OptiComm Response letter.pdf	116
OptiComm - Duty of Care.pdf	117

ATTENTION: Azam Mohiuddin Mohammed

Please DO NOT SEND A REPLY to this email as it has been automatically generated and replies are not monitored.

Thank you for your DBYD enquiry.

Job No: 52808618
Sequence No: 270835216
Enquiry location:
101 Old Burleigh Road
Broadbeach
QLD 4218

Attached are the files containing information relating to your recent DBYD request. Please read and understand all the attached documentation. If you have any queries, you may contact OptiComm on 1300 743 462 or DBYD@OptiComm.net.au.

Note: If you have received this email in error, please advise by calling 1300 743 462 and quote the Sequence Number listed above.

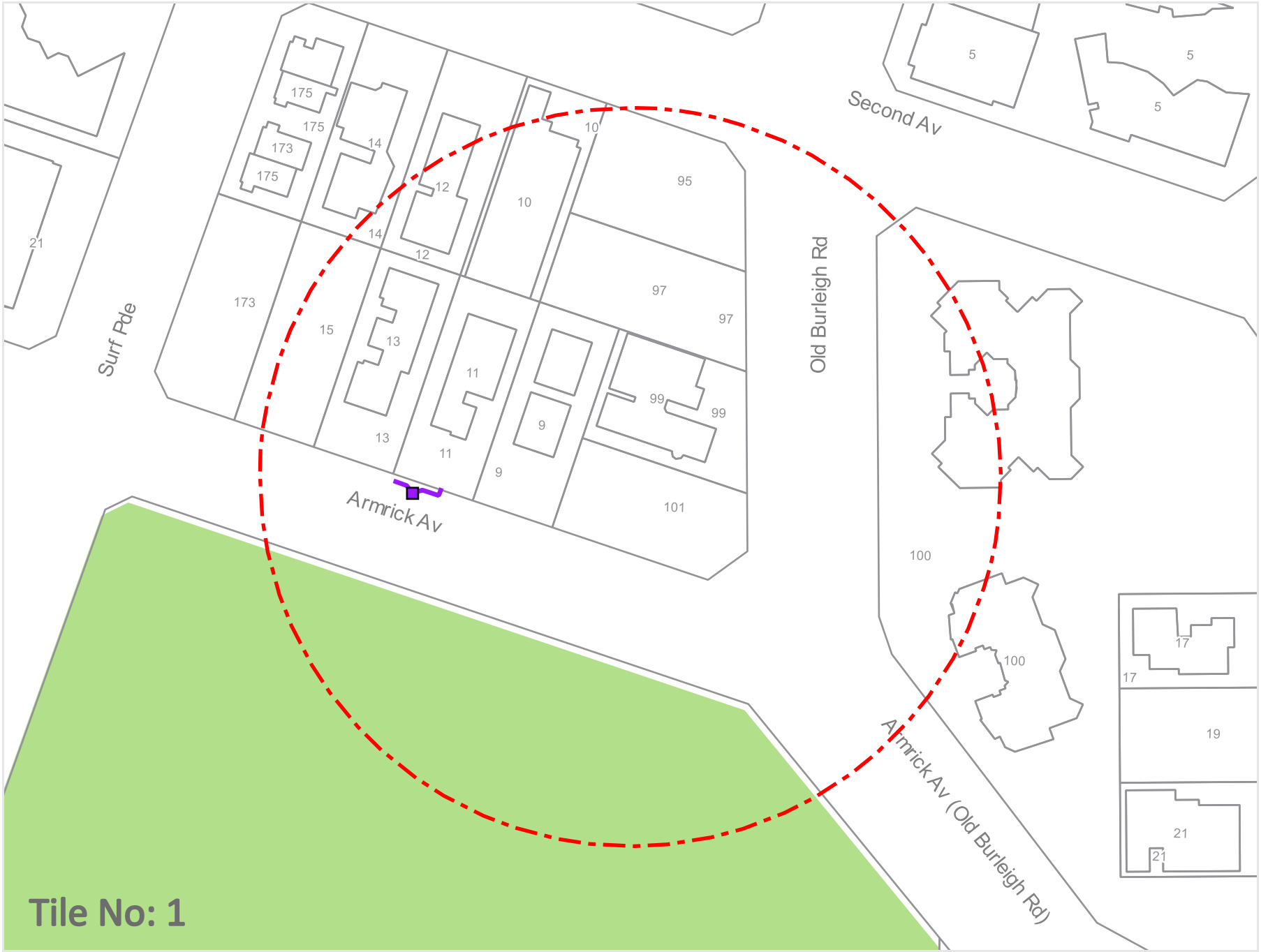
If you are unable to launch any of the files for viewing and printing, you may need to download and install free viewing and printing software such as:

Adobe Acrobat Reader (for PDF files) - http://get.adobe.com/reader

OptiComm
National Broadband Fibre

Sequence No: 270835216
Job No: 52808618
Location: 101 Old Burleigh Road, Broadbeach, QLD 4218

BEFORE YOU DIG www.byda.com.au



Legend
- Pit
- Pipe

N

Scale: 1:1000
Expires: 05 May 2026

DISCLAIMER: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither OptiComm nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

Response Cover Letter

OptiComm

Level 1/22 Salmon Street

Port Melbourne

VIC 3207

Date: 07/04/2026

To:

Azam Mohiuddin Mohammed
Not supplied
155 Varsity Parade
Varsity Lakes QLD 4227

Please find attached our response regarding your enquiry (as detailed below). Ensure you review all other documents included with this response to identify any OptiComm assets in the vicinity of your enquiry.

Sequence No: 270835216

Job No: 52808618

Location: 101 Old Burleigh Road
Broadbeach QLD 4218

If you require further information, please contact the OptiComm on 1300 743 462 or DBYD@OptiComm.net.au

Important Notice: This enquiry response, including any associated documentation, has been assessed and compiled from the information detailed within the DBYD enquiry outlined above. Please ensure that the DBYD enquiry details and this response accurately reflect your proposed works.

This response is intended for use only by the addressee. If you have received the enquiry response in error, please let us know by telephone and delete all copies; you are advised that copying, distributing, disclosing or otherwise acting in reliance on the response is expressly prohibited.

DIAL BEFORE YOU DIG www.1100.com.au The Essential First Step.

While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither OptiComm nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

P 1300 137 800
E info@opticomm.net.au

Level 1, 22 Salmon Street
Port Melbourne VIC 3207
opticomm.net.au

Duty of Care

Our plans indicate that OptiComm owns or operates telecommunications network infrastructure within the area that you have enquired about.

The indicative location of the infrastructure can be found on OptiComm's attached network plan.

This network is vital to OptiComm's operations. It is therefore critical that no works commence within the area of OptiComm's infrastructure until you have put in place measures to locate and prevent damage to OptiComm's infrastructure. This is particularly important regarding underground infrastructure as you will need to locate the exact position of the infrastructure before commencing work.

When working in areas containing telecommunications infrastructure you have a legal obligation to take all necessary steps to avoid damage to the infrastructure, this is referred to as your 'duty of care'.

It is the responsibility of the owner of the affected land and any person undertaking work on the land to perform the work in a manner that minimises the likelihood of damage to the existing infrastructure, including visually locating underground infrastructure such as cables and ducts by hand digging or using non-destructive methods such as water jet excavation where construction may interfere with OptiComm's underground infrastructure.

If you are uncertain about the exact location of underground infrastructure, we strongly recommend that you engage a plant locator.

OptiComm will seek compensation for any damage to its network through negligence or ignorance of your duty of care to avoid damage to our infrastructure.

DISCLAIMER: No responsibility or liability is accepted by OptiComm for any inaccuracy, error, omission or action based on the information supplied in this correspondence. OptiComm's network plans indicate the presence of telecommunications infrastructure in the general vicinity of the location shown, however they are not intended to be exact. The depth of ground cover, alignments, roads, paths and title boundaries can change over time. Underground cables and ducts seldom follow straight lines because of issues that arise during installation. It is therefore important that careful and regular visual location of underground infrastructure is carried out along the length of cable and duct routes and adjacent to cable and duct routes to avoid damage.

Due to continued network expansion, this network information can only be considered valid and accurate for 28 days from its issue.

Optus Qld

Referral
270835213

Member Phone
1800 505 777

Responses from this member

Response received Tue 7 Apr 2026 9.49am

File name	Page
Response Body	119
270835213 - Optus Plan.pdf	120
270835213 - Optus Response Letter.pdf	121

Optus - Before You Dig Australia - REFERRAL NOTIFICATION

This referral has been successfully processed by Optus and the results are contained in the attached files.

Notice: Please DO NOT REPLY TO THIS EMAIL as it has been automatically generated and replies are not monitored.

If you have any queries or attachments missing please contact:
Network Operations Centre
1 Lyonpark Road,
Macquarie Park, NSW 2113
Ph: 1800 505 777
Fax: 1300 307 035

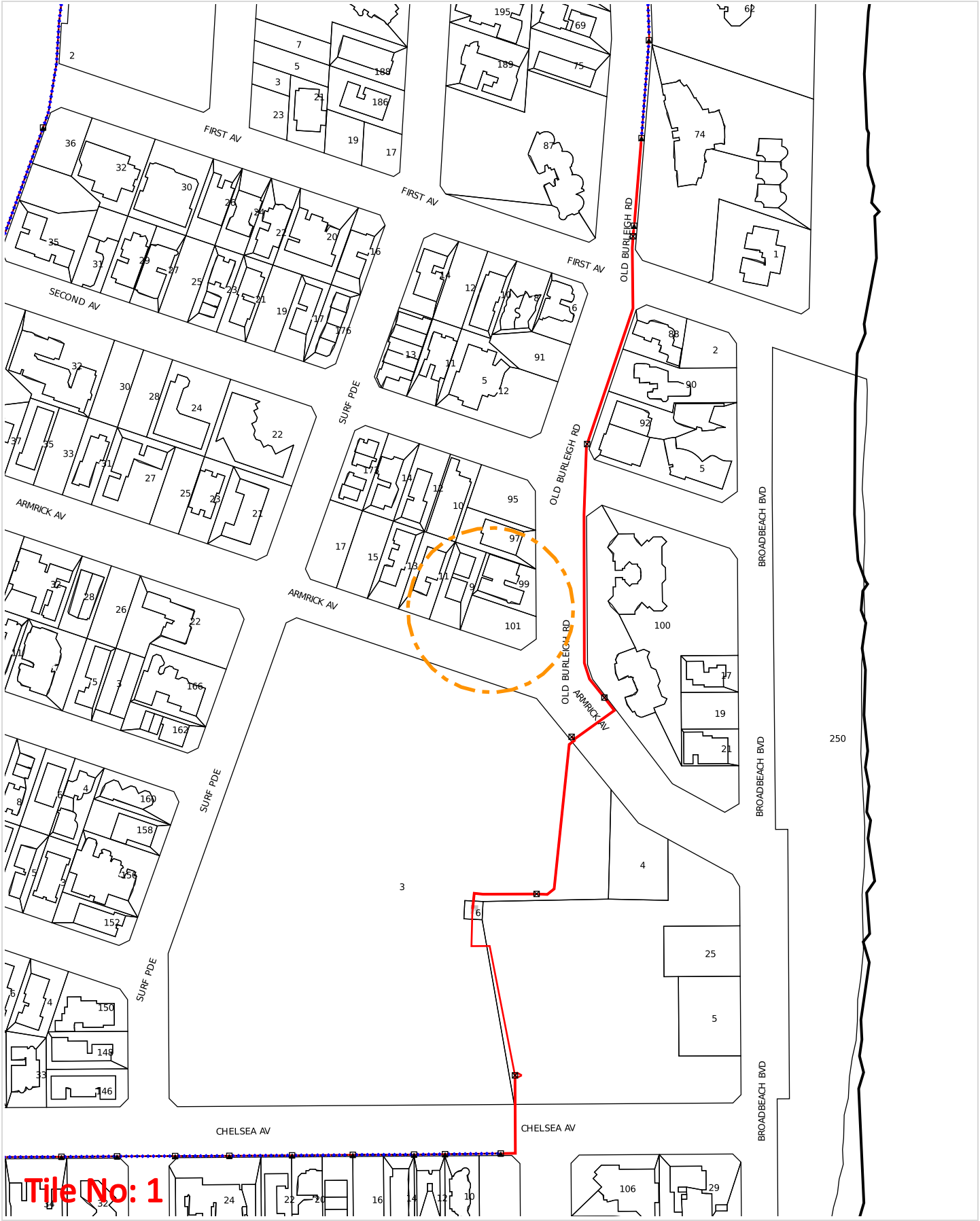
You will require Adobe Reader to view attachments.
http://www.adobe.com/downloads/

We thank you for your enquiry and appreciate your continued use of the “Before You Dig Australia Service” Asset Analysis Service. If you require further information in relation to Optus cables please contact Optus on above.

This reply relates only to the location indicated above and is valid for 30 days from the sent date. Where additional works are planned that have not been specified within this reply, Optus require that an additional enquiry be submitted to Before You Dig Australia enquiry Service: http://www.byda.com.au

In the case of no additional location request being submitted, Optus will hold the relevant party responsible for any damage to Optus plant and all expenses incurred by Optus as a result of asset damage.

This e-mail may contain confidential information. If you are not the intended recipient, please notify Network Operations Centre immediately and delete this e-mail from your system. You must not disclose this e-mail to anyone without express permission from the sender. The contents of all e-mails sent to and received from Optus may be scanned, stored, or disclosed to others at Optus’ discretion.



WARNING: This document is confidential and may also be privileged. Confidentiality nor privilege is not waived or destroyed by virtue of it being transmitted to an incorrect addressee. Unauthorised use of the contents is therefore strictly prohibited. Any information contained in this document that has been extracted from our records is believed to be accurate, but no responsibility is assumed for any error or omission. Optus Plans and information supplied are valid for 30 days from the date of issue. If this timeline has elapsed, please raise a new enquiry.

Sequence Number: 270835213

Date Generated: 07 Apr 2026

For all Optus DBYD plan enquiries –
Email: Fibre.Locations@optus.net.au
For urgent onsite assistance contact 1800 505 777
Optus Limited ACN 052 833 208

OPTUS

BEFORE YOU DIG www.byda.com.au

Optus Contract Management Team
Unit 9, 677 Springvale Road
Mulgrave, Victoria, 3178

Date: 07 Apr 2026
To: Azam Mohiuddin Mohammed
Company: Not Supplied
Address: 155 Varsity Parade
Varsity Lakes, QLD 4227

ENQUIRY DETAILS
Location: 101 Old Burleigh Road, Broadbeach, QLD 4218
Sequence No.: 270835213
BYDA Reference: 52808618

In relation to your enquiry concerning the above location, Optus advises as follows:

Optus records indicate that there ARE underground Optus FIBRE OPTIC TELECOMMUNICATIONS ASSETS in the vicinity of the above location as per the attached drawing(s).

PLEASE NOTE that any interference with these assets may be considered an offence under the Criminal Code Act 1995 (Cth). Optus reserves the right to seek compensation for loss or damage to its assets including consequential loss.

This reply is valid for a period of 30 days from the date above.

IMPORTANT INFORMATION
Asset location drawings provided by Optus are reference diagrams and are provided as a guide only. The completeness of the information in these drawings cannot be guaranteed. Exact ground cover and alignments cannot be provided with any certainty as these may have altered over time. Depths of telecommunications assets vary considerably as do alignments. It is essential to identify the location of any Optus assets in the vicinity prior to engaging in any works.

All Optus assets in the vicinity of any planned works will need to be electronically located to ascertain their general location. Depending on the scope of planned works in the vicinity, the assets may also need to be physically located.

YOU MUST ENGAGE THE SERVICES OF ONE OF THE OPTUS ASSET ACCREDITED LOCATORS TO CARRY OUT ASSET LOCATION (REFER LIST OF ACCREDITED LOCATORS AT THE END OF THIS OPTUS RESPONSE).

Unless otherwise agreed with Optus, where an on-site asset location is required, the requestor is responsible for all costs associated with the locating service including (where required) physically exposing the Optus asset.

DUTY OF CARE
When working in the vicinity of telecommunications assets you have a legal "Duty of Care" and non-interference that must be observed.

It is your responsibility as the requesting party (as a landowner or any other party involved in the planned works) to design for minimal impact to any existing Optus asset. Optus can assist at the design stage through consultation.

It is also your, as the requesting party (or your representative's), responsibility to:

a) Obtain location drawings (through the Before You Dig Australia process) of any existing Optus assets at a reasonable time before any planned works begin;

b) Have an Optus Accredited Asset Locator identify the general location of the Optus asset and physically locate the asset where planned works may encroach on its alignment; and

c) Contact Optus for further advice where requested to do so by this letter.

DAMAGE TO ANY OPTUS ASSET MUST BE REPORTED TO 1800 505 777 IMMEDIATELY

You, your head contractor, and any relevant subcontractor are all responsible for any Optus asset damage as a result of planned activities in the vicinity of Optus assets.

This applies where works commence prior to obtaining Optus drawings, where there is failure to follow instructions or during any construction activities.

Optus reserves the right to recover compensation for loss or damage to its assets including consequential loss. Also, you, your head contractor and any relevant subcontractor may also be liable for prosecution under the Criminal Code Act 1995 (Cth).

ASSET RELOCATIONS

You are not permitted by law to relocate, alter or interfere with any Optus asset under any circumstance. Any unauthorised interference with an Optus asset may lead to prosecution under the Criminal Code Act 1995 (Cth). Enquiries relating to the relocation of Optus assets must be referred to the relevant Optus Damages and Relocations Team (refer to "FURTHER ASSISTANCE").

APPROACH DISTANCES

On receipt of Optus asset location drawings and prior to commencing any planned works near an Optus asset, engage an Optus Accredited Locator to undertake a general location of the Optus asset.

Physical location of the Optus asset by an Optus Accredited Locator will also be required where planned works are within the following approach distances of the general location of the Optus asset:

a) In built up metropolitan areas where road and footpaths are well defined by kerbs or other features a minimum clear distance of 1 meter must be maintained from the general location of the Optus asset.

b) In non-established or unformed metropolitan areas, a minimum clear distance of 3 meters must be maintained from the general location of the Optus asset.

c) In country or rural areas where wider variations may exist between the general and actual location of an Optus asset may exist, then a minimum clear distance of 5 meters must be maintained from the general location of the Optus asset.

If planned works are parallel to the Optus asset, then the Optus asset must be physically located by an Optus Accredited Locator at a minimum of 5 meter intervals along the length of the parallel works prior to work commencing.

Under no circumstances is crossing of any Optus asset permitted without physical location of the asset being carried out by an Optus Accredited Locator. Depending on the asset involved an Optus representative may be required onsite.

The minimum clearances to the physical location of Optus assets for the following specific types of works must be maintained at all times.

Note: Where the clearances in the following table cannot be maintained or where the type of work differs from those listed then advice must be sought from the relevant Optus Damages and Relocations Team (refer to "FURTHER ASSISTANCE").

Type of Works	**Clearance to Physical Location of Optus Asset**
Jackhammers / Pneumatic Breakers	Not within 1 meter.
Light duty Vibrating Plate or Wacker Packer type compactors (not heavy road construction vibrating rollers etc.)	500mm compact clearance cover before a light duty compactor can be used over any Optus conduit. No compaction permitted over Optus direct buried cable without prior approval from Optus.
Boring Equipment (in-line, horizontal and vertical)	Not within 5 meters parallel of the Optus asset location without an Accredited Optus Asset Locator physically exposing the Optus asset and with an Optus representative onsite. Not to cross the Optus asset without an Accredited Optus Asset Locator physically exposing the Optus asset and with an Optus representative onsite.

Type of Works	Clearance to Physical Location of Optus Asset
Heavy vehicle Traffic (over 3 tonnes)	Not to be driven across Optus conduits with less than 600mm of cover. Not to be driven across Optus direct buried cable with less than 1.2 meters of cover. Once off crossings permitted, multiple crossing (e.g. road construction or logging) will require Optus approval. Accredited Optus Asset Locator to physically expose the Optus asset to verify actual depth.
Mechanical Excavators, Farm Ploughing, Vertical Hole installation for water bore or fencing etc.	Not within 1 meter. Accredited Optus Asset Locator to physically expose the Optus asset to verify actual location.

ASSET CLEARANCES AFTER COMPLETION OF WORKS

All Optus pits and manholes must be a minimum of 1 meter from the back of any kerb, 3.5 meters of the road surface without a kerb or not within 15 meters of street intersection.

In urban areas Optus conduit must have the following minimum depth of cover:

- Footway 600mm;
- Roadway 1 meter at drain invert and at road centre crown.

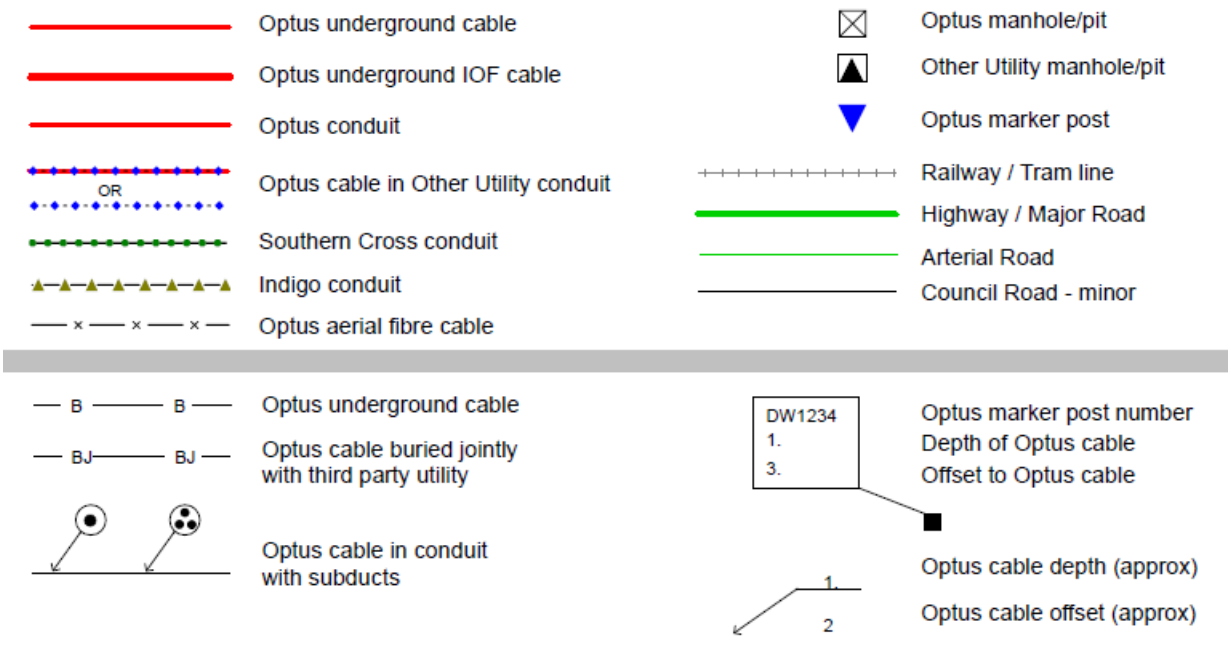
In rural areas Optus conduit must have a minimum depth of cover of 1 meter and direct buried cable 1.2 meters.

In cases where it is considered that the above clearances cannot be maintained at the completion of works, advice must be sought from the relevant Optus Damages and Relocations Team (refer "Further Assistance").

FURTHER ASSISTANCE

Further assistance on asset clearances, protection works, or relocation requirements can be obtained by contacting the relevant Optus Damages and Relocations Team on the following email address:
NFODamages&RelocationsDropbox@optus.com.au
Further assistance relating to asset location drawings etc. can be obtained by contacting the Optus Network Operations Asset Analysis Team on 1800 505 777.

OPTUS ENGINEERING DRAWING SYMBOLS



OPTUS

Optus Accredited Asset Locators

Name	Company Name	Phone	Email	State	Region/Service Area
Drew Misko	Australian Subsurface Pty Ltd	0427 879 600	admin@australiansubsurface.com	ALL	ALL
Andrew Watson	Subsurface Mapping Solutions Pty Ltd	0408 839 723	admin@subsurfacems.com.au	ALL (Not TAS)	South East QLD + Aus wide
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Anthony Emmerson	Taylors Development Strategists	03 9501 2800	a.emmerson@taylorsds.com.au	All	Nation Wide
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Stephen Sanders	Hydro Digga	0427 076 091	admin@hydrodigga.com	NSW	Mid North Coast
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Scott Harrison	Triodia Scanning services PTY LTD	0438 664 196	booking@triodiascanning.com.au	WA	Perth/ Regional
Stuart Speckman	FYFE	08 8944 7888	Stuart.Speckman@fyfe.com.au	NT/SA/NSW	NT/SA/NSW
Wayne Parslow	Danisam	0417 089 865	danisam@westnet.com.au	NT	Darwin NT and Surrounds
Heather Easther	Archers Underground Serveice Pty Ltd	0418 737 299	admin@auslocations.com.au	TAS	Statewide
Scott Crerar	Paneltec Group	0400 895 637	scott@paneltec.com.au	TAS	All
Hayden Stone	Utility Detection & Mapping	03 61712555	admin@udmgroup.com.au	TAS	Statewide

Telstra QLD South East

Referral
270835219

Member Phone
1800 653 935

Responses from this member

Response received Tue 7 Apr 2026 9.05am

File name	Page
Response Body	133
270835219.pdf	135
AccreditedPlantLocators 2025-01-08a.pdf	137
Telstra Duty of Care v32.0c.pdf	138
Telstra Map Legend 4.0b.pdf	140

Attention: Azam Mohiuddin Mohammed

Site Location: 101 Old Burleigh Road, Broadbeach, QLD 4218

Your Job Reference: 101 Old Burleigh Road

Please do not reply to this email, this is an automated message -

Thank you for requesting Telstra information via Before You Dig Australia (BYDA).

This response contains Telstra information relating to your recent BYDA request.

Please refer to all enclosed attachments for more information.
Information for opening Telstra Asset Plans as well as some other useful contact information is noted in the attached documents.

Report Damage to Telstra Equipment: Report damages to Telstra equipment - Telstra

Please note:
When working in the vicinity of telecommunications plant you have a 'Duty of Care' that must be observed.
Ensure you read all documents (attached) - they contain important information.
Please also refer to the **Before you Dig Australia - BEST PRACTISE GUIDES and The five Ps of safe excavation** https://www.byda.com.au/before-you-dig/best-practice-guides/, The essential steps that must be undertaken prior to commencing construction activities.

WARNING - MAJOR CABLES and/or OPTIC FIBRE IN THE AREA.
Phone 1800 653 935 for further assistance.

Note: In some areas Telstra fibre routes may be marked as "Amcom", as Telstra has purchased much of this infrastructure. If in doubt, please contact Telstra Plan services on the number above. Telstra plans and information are only valid for 60 days from the date of issue.

WARNING:
Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. The exact position of Telstra assets can only be validated by physically exposing them. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy. Further on site investigation is required to validate the exact location of Telstra assets prior to commencing work. A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the assets are protected during construction works. See the **Before You Dig Australia - BEST PRACTISE GUIDES and The five Ps of safe excavation** https://www.byda.com.au/before-you-dig/best-practice-guides/.

Please note that:
- it is a criminal offence under the *Criminal Code Act* 1995 (Cth) to tamper or interfere with telecommunications infrastructure.
- Telstra will take action to recover compensation for damage caused to property and assets, and for interference with the operation of Telstra's networks and customers' services.

Telstra's plans contain Telstra's confidential information and are provided on the basis that they are used solely for identifying the location or vicinity of Telstra's infrastructure to avoid damage to this infrastructure occurring as part of any digging or other excavation activity. You must not use Telstra's plans for any other purpose or in a way that will cause Telstra loss or damage and you must comply with any other terms of access to the data that have been provided to you by Telstra (including Conditions of Use or Access).

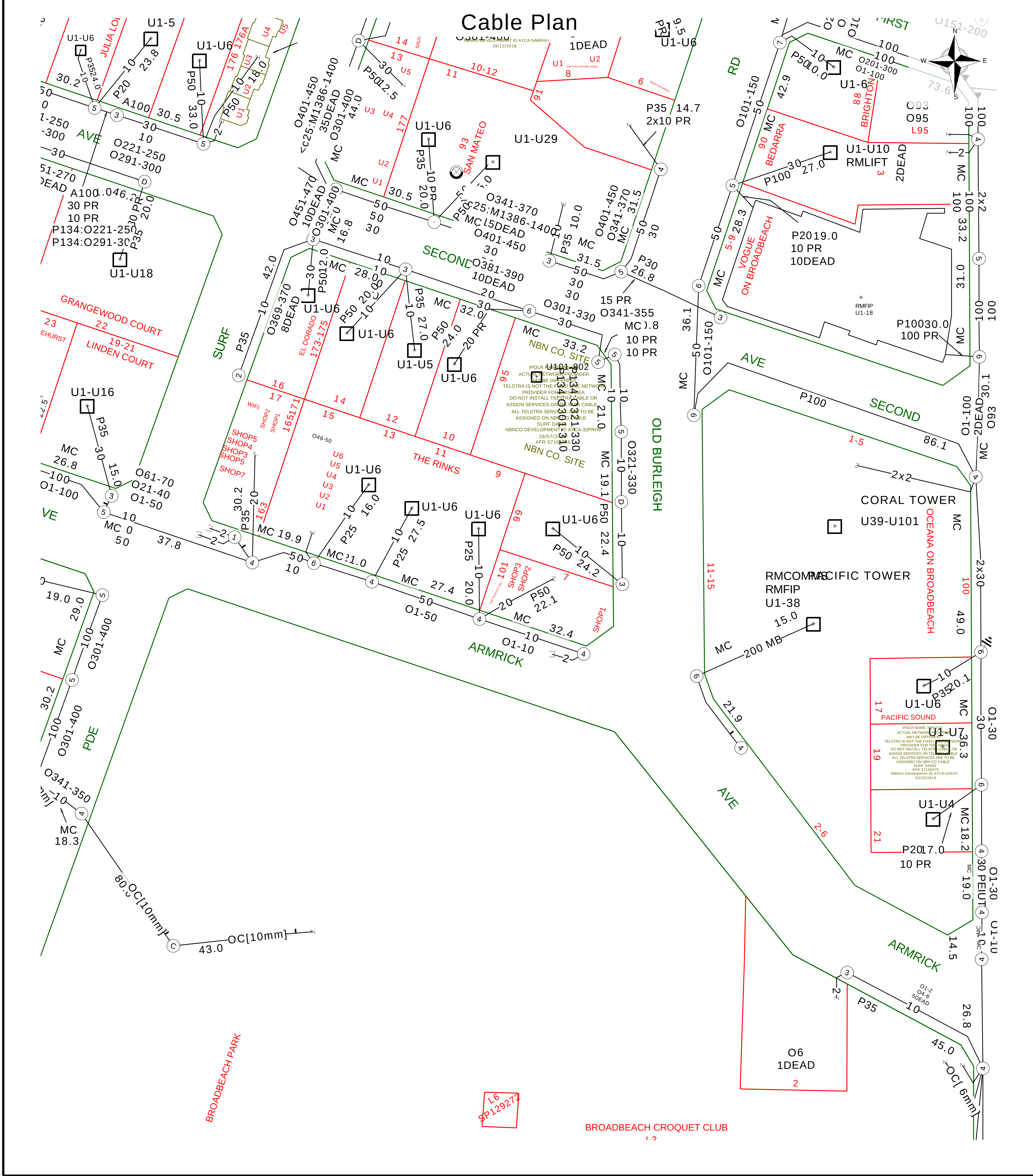
(See attached file: Telstra Duty of Care v32.0c.pdf)

(See attached file: Telstra Map Legend 4.0b.pdf)

(See attached file: AccreditedPlantLocators 2025-01-08a.pdf)

(See attached file: 270835219.pdf)

Cable Plan



Report Damage: https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-
Ph - 13 22 03
Email - Telstra.Plans@team.telstra.com
Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries

Sequence Number: 270835219

CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact InfraCo Plan Services should you require any assistance.

TELSTRA LIMITED A.C.N. 086 174 781

Generated On 07/04/2026 09:02:54

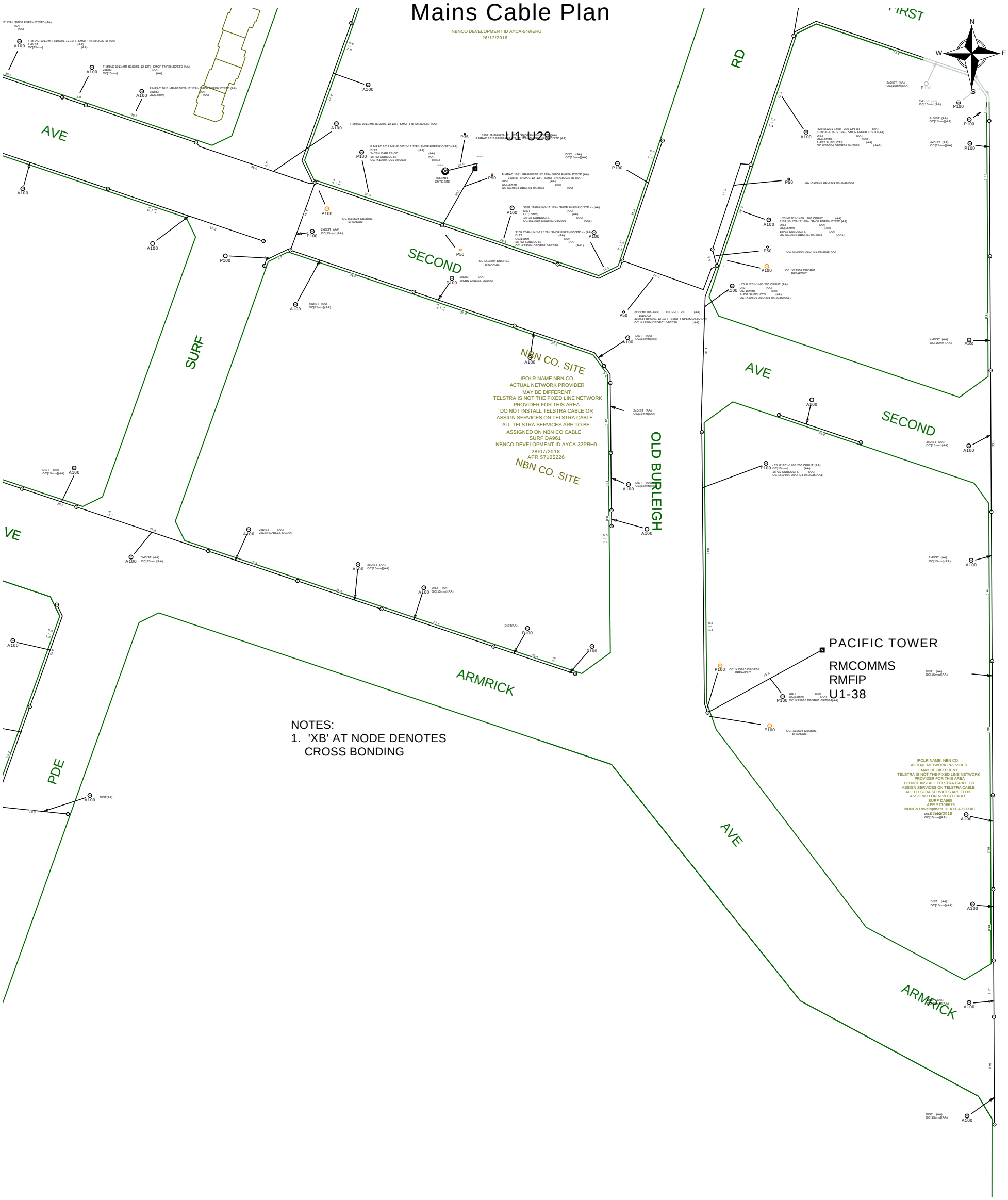
The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

WARNING
Telstra plans and location information conform to Quality Level "D" of the Australian Standard AS 5488-Classification of Subsurface Utility Information.
As such,Telstra supplied location information is indicative only.Spatial accuracy is not applicable to Quality Level D.
Refer to AS 5488 for further details. The exact position of Telstra assets can only be validated by physically exposing it.
Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy.
Further on site investigation is required to validate the exact location of Telstra plant prior to commencing construction work.
A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works.

See the Steps- Telstra Duty of Care that was provided in the email response.

Mains Cable Plan

NBNCO DEVELOPMENT ID AYCA-54WEHU
26/12/2018



NOTES:
1. 'XB' AT NODE DENOTES CROSS BONDING

Report Damage:https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-(
Ph - 13 22 03
Email - Telstra.Plans@team.telstra.com
Planned Services - ph 1800 653 935 (AEST bus hrs only) General Enquiries

TELSTRA LIMITED A.C.N. 086 174 781

Generated On 07/04/2026 09:03:07

Sequence Number: 270835219

CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact InfraCo Plan Services should you require any assistance.

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

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A Certified Locating Organisation is an essential part of the process to validate the exact location of Telstra assets and to ensure the asset is protected during construction works.

See the Steps- Telstra Duty of Care that was provided in the email response.

General Information

Before you Dig Australia – BEST PRACTISE GUIDES

The five Ps of safe excavation
https://www.byda.com.au/before-you-dig/best-practice-guides/

OPENING ELECTRONIC MAP ATTACHMENTS –

Telstra Cable Plans are generated automatically in either PDF or DWF file types.
Dependent on the site address and the size of area selected.
You may need to download and install free viewing software from the internet e.g.

DWF Map Files (all sizes over A3)
Autodesk Viewer (Internet Browser) https://viewer.autodesk.com/ or
Autodesk Design Review http://usa.autodesk.com/design-review/ for DWF files. (Windows PC)

PDF Map Files (max size A3)
Adobe Acrobat Reader http://get.adobe.com/reader/

Telstra BYDA map related enquiries email Telstra.Plans@team.telstra.com
1800 653 935 (AEST Business Hours only)

REPORT ANY DAMAGE TO THE TELSTRA NETWORK IMMEDIATELY
Report online - https://www.telstra.com.au/forms/report-damage-to-telstra-equipment
Ph: 13 22 03
If you receive a message asking for a phone or account number say:
"I don't have one" then say "Report Damage" then press 1 to speak to an operator.

Telstra New Connections / Disconnections
13 22 00

Telstra asset relocation enquiries: 1800 810 443 (AEST business hours only).
NetworkIntegrity@team.telstra.com
https://www.telstra.com.au/consumer-advice/digging-construction

Telstra Aerial Assets Group (overhead network)
1800 047 909

CERTLOC Certified Locating Organisation (CLO)
certloc.com.au/locators/
Only Telstra authorised personnel and CERTLOC Locators can access Telstra's Pit and Pipe Network.

Before You Dig Australia

Think before you dig

This document has been sent to you because you requested plans of the Telstra network through Before You Dig Australia (BYDA).

If you are working or excavating near telecommunications cables, or there is a chance that cables are located near your site, you are responsible to avoid causing damage to the Telstra network.

Please read this document carefully. Taking your time now and following the BYDA's Best Practices and 5 Ps of Safe Excavation https://www.byda.com.au/before-you-dig/best-practice-guides/

can help you avoid damaging our network, interrupting services, and potentially incurring civil and criminal penalties.

Our network is complex and working near it requires expert knowledge. Do not attempt these activities if you are not qualified to do so.

Disclaimer and legal details

*Telstra advises that the accuracy of the information provided by Telstra conforms to Quality Level D as defined in AS5488-2013.

It is a criminal offence under the Criminal Code Act 1995 (Cth) to tamper or interfere with telecommunications infrastructure.

Telstra will also take action to recover costs and damages from persons who damage assets or interfere with the operation of Telstra's networks.

By receiving this information including the indicative plans that are provided as part of this information package you confirm that you understand and accept the risks of working near Telstra's network and the importance of taking all the necessary steps to confirm the presence, alignments and various depths of Telstra's network. This in addition to, and not in replacement of, any duties and obligations you have under applicable law.

When working in the vicinity of a telecommunications plant you have a "Duty of Care" that must be observed. Please read and understand all the information and disclaimers provided below.

The Telstra network is complex and requires expert knowledge to interpret information, to identify and locate components, to pothole underground assets for validation and to safely work around assets without causing damage. If you are not an expert and/or qualified in these areas, then you must not attempt these activities. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers. Construction activities and/or any activities that potentially may impact on Telstra's assets must not commence without first undertaking these steps. Construction activities can include anything that involves breaking ground, potentially affecting Telstra assets.

If you are designing a project, it is recommended that you also undertake these steps to validate underground assets prior to committing to your design.

This Notice has been provided as a guide only and may not provide you with all the information that is required for you to determine what assets are on or near your site of interest. You will also need to collate and understand all information received from other Utilities and understand that some Utilities are not a part of the BYDA program and make your own enquiries as appropriate. It is the responsibility of the entities undertaking the works to protect Telstra's network during excavation / construction works.

Telstra owns and retains the copyright in all plans and details provided in conjunction with the applicant's request. The applicant is authorised to use the plans and details only for the purpose indicated in the applicant's request. The applicant must not use the plans or details for any other purpose.

Telstra plans or other details are provided only for the use of the applicant, its servants, agents, or CERTLOC Certified Locating Organisation (CLO). The applicant must not give the plans or details to any parties other than these and must not generate profit from commercialising the plans or details.

Telstra, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Telstra against any claim or demand for any such loss or damage.

Please ensure Telstra plans and information provided always remains on-site throughout the inspection, location, and construction phase of any works.

Telstra plans are valid for 60 days after issue and must be replaced if required after the 60 days.

Data Extraction Fees

In some instances, a data extraction fee may be applicable for the supply of Telstra information. Typically, a data extraction fee may apply to large projects, planning and design requests or requests to be supplied in non-standard formats. For further details contact Telstra Location Intelligence Team.

Telstra does not accept any liability or responsibility for the performance of or advice given by a CERTLOC Certified Locating Organisation (CLO). Certification is an initiative taken by Telstra towards the establishment and maintenance of competency standards. However, performance and the advice given will always depend on the nature of the individual engagement.

Neither the Certified Locating Organisation nor any of its employees are an employee or agent for Telstra. Telstra is not liable for any damage or loss caused by the Certified Locating Organisation or its employees.

Once all work is completed, the excavation should be reinstated with the same type of excavated material unless specified by Telstra.

The information contained within this pamphlet must be used in conjunction with other material supplied as part of this request for information to adequately control the risk of potential asset damage.

When using excavators and other machinery, also check the location of overhead power lines.

Workers and equipment must maintain safety exclusion zones around power lines

WARNING: Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK. A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the assets are protected during construction works. The exact position of Telstra assets can only be validated by physically exposing them. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

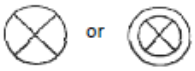
Privacy Note

Your information has been provided to Telstra by BYDA to enable Telstra to respond to your BYDA request. Telstra keeps your information in accordance with its privacy statement. You can obtain a copy at www.telstra.com.au/privacy or by calling us at 1800 039 059 (business hours only).

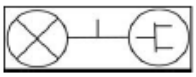
LEGEND

Exchange
(Major Cable Present)

Footway Access Chamber
(can vary from 1-lid to 12-lid)



Pillar / Cabinet
(above ground / free standing)



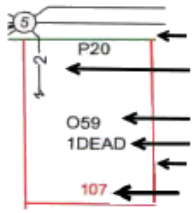
Above ground complex equipment housing (eg RIM)
Please Note: This equipment is powered by 240V Electricity

OC — Other Carrier Telecommunications Cable/Asset

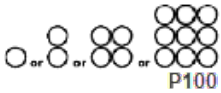
Dist — Distribution cables in Main Cable ducts

MC — Main Cable ducts on a Distribution plan

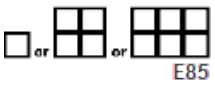
▲ — Blocked or damaged duct.



Roadside / Front Boundary
2 pair lead-in to property from pit in street 1
pair working (pair ID 059)
1 pair dead (i.e. spare, not connected)
Side / Rear Property Boundary
Property Number

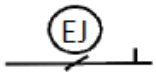


Single to multiple round conduit
Configurations 1,2,4,9 respectively
(attached text denotes conduit type and size)

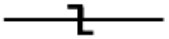


Multiple square conduit
Configurations 2, 4, 6 respectively
(attached text denotes conduit type and size)

Cable Jointing Pit
(number / Letter indicating Pit Type)



Elevated Joint
(above ground joint on buried cable)

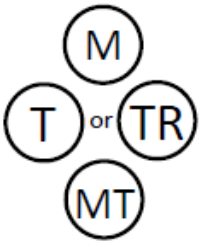


Telstra Plant in shared Utility trench

Aerial Cable

Aerial Cable
(attached to joint Use Pole eg. Power)

Direct Buried Cable



Marker Post Installed

Buried Transponder

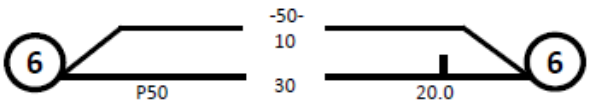
Marker Post, Transponder

Optical Fibre cable direct buried

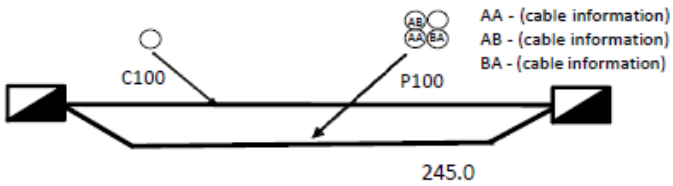
Some examples of conduit type and size:

A - Asbestos cement, P - PVC / Plastic, C - Concrete,
GI - Galanised iron, E - Earthenware
Conduit sizes *nominally* range from 20mm to 100mm
P50 50mm PVC conduit
P100 100mm PVC conduit
A100 100mm asbestos cement conduit

Some Examples of how to read Telstra Plans



One 50mm PVC conduit (P50) containing a 50-pair and a 10-pair cable between two 6-pits. approximately 20.0m apart, with a direct buried 30-pair cable along the same route



AA - (cable information)
AB - (cable information)
BA - (cable information)

Two separate conduit runs between two footway access chambers (manholes) approximately 245m apart A nest of four 100mm PVC conduits (P100) containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along

Protect our Network:

by maintaining the following distances from our assets:

- 1.0m Mechanical Excavators, Farm Ploughing, Tree Removal
- 500mmVibrating Plate or Wacker Packer Compactor
- 600mm Heavy Vehicle Traffic (over 3 tonnes) not to be driven across Telstra ducts or plant.
- 1.0mJackhammers/Pneumatic Breakers
- 2.0m Boring Equipment (in-line, horizontal and vertical)

For more info contact a CERTLOC Certified Locating Organisation (CLO) or Telstra Location Intelligence Team 1800 653 935

TPG Telecom (QLD)

Referral
270835215

Member Phone
1800 786 306

Responses from this member

Response received Tue 7 Apr 2026 8.57am

File name	Page
Response Body	142
270835215.pdf	143

Request: 270835215 Enquirer: - 3737381 Contact: Azam Mohiuddin Mohammed Email: amohiuddin@oska.net.au Phone: +61455809777 Address: 155 Varsity Parade Varsity Lakes QLD 4227 Site Address: 101 Old Burleigh Road Broadbeach QLD 4218 Activity: Planning and Design Job Number: 52808618

PIPE NETWORKS PTY LIMITED
ABN 21 099 104 122
Level 10, 452 Flinders Street
Melbourne VIC 3000
Phone: 1800 786 306 (24hrs)

Date: 07/04/2026

Enquirer Name: Azam Mohiuddin Mohammed
Enquirer Address: 155 Varsity Parade
Email: amohiuddin@oska.net.au
Phone: +61455809777

Dear Azam Mohiuddin Mohammed

The following is our response on behalf of each of the carriers (listed below) to your Before You Dig Australia enquiry – Sequence 270835215
It is provided to you on a confidential basis under the following conditions and must be shredded or securely disposed of after use.

Assets Affected: 101 Old Burleigh Road Broadbeach

Carriers (each a "Pipe Networks carrier") and assets affected:

PIPE Networks

Location:

According to our records, the underground assets in the vicinity of the location stated in your enquiry are **AFFECTED**. Please read the below information and disclaimers in addition to the any attached plans provided prior to any construction activities.

IMPORTANT INFORMATION

- The information provided is valid for 30 days from the date of this response. If your work site area changes or your construction activity is beyond 30 days please contact Before You Dig Australia on 1100 or www.1100.com.au to re-submit a new enquiry.
- Due to the nature of underground assets and the age of some assets and records, our plans are indicative of the general location only and may not show all assets in the location. You should not solely rely on these plans when undertaking construction works. It is also inaccurate to assume depth or that underground network conduit and cables follow straight lines, and careful on-site investigations are essential to locate an asset's exact position prior to excavation. It is your responsibility to locate and confirm the exact location of our infrastructure using non-destructive techniques. We make no warranty or guarantee that our plans are complete, current or error free, and to the maximum extent permitted by law we exclude all liability to you, your employees, agents and contractors for any loss, damage or claim arising out of or in connection with using our plans.
- Please note that some of our conduits carry electrical cables and gas pipes. Please exercise extreme care when working within the vicinity of these conduit and take into account the minimum clearance distances under Duty Of Care below.
- You (and your employee and contractors) must not open, move, interfere, alter or relocate any of our assets without our prior approval.
- **Note** It is a criminal offence under the *Criminal Code Act 1995 (Cth)* to tamper or interfere with communication facilities owned by a carrier. Heavy penalties may apply for breach of this prohibition, and any damages suffered, or costs incurred by us as a result of such unauthorised works may be claimed against you.

DAMAGE

- You must report immediately any damage to our network on **1800 786 306** (24hrs). We will hold you liable and seek compensation for any loss or damage to our network, our property and our customers that is caused by or arises out of your activities.

DUTY OF CARE

You have a duty of care to carefully locate, validate and protect our assets when carrying out works near our infrastructure. For construction activities that may impact on or interfere with our network, you will need to call us on **1800 786 306** to discuss a suitable engineering solution, lead time and cost involved. The below precautions must be taken when working in the vicinity of our network:

- Contact us on **1800 786 306** to discuss and obtain relevant information and plans on our infrastructure in a particular location if the information provided in this response is insufficient.
- Physically locate and mark on-site our network infrastructure using non-destructive techniques i.e. pot holing or hand digging every 5 metres prior to commencing any construction activities. Assets located must be marked to AS5488 standard. **NO CONSTRUCTION WORK IS ALLOWED UNTIL THIS STEP IS COMPLETED**. You must use an approved telecommunications accredited locator, or we can provide a locator for you at your expense. If we provide you with a locator, and this locator attended the site and is proven to be grossly negligent in physically locating and marking our infrastructure, then to the extent any Pipe Networks carrier is liable for this locator's negligence, acts and omissions, the total liability aggregated for all Pipe Networks carriers is limited, at our option, to attend the site and re-mark the infrastructure or to pay for a third party to re-mark the infrastructure.
- If you require us to locate or monitor our infrastructure, please allow five business days' notice for us to respond.
- Ensure all information, including our network requirements and any associated plans provided by us are kept confidential and remain on-site throughout your construction works.

- Use suitably qualified and supervised professionals, particularly if you are working near assets that contain electricity cables or gas pipes.

- Ensure the below minimum clearance distances between the construction activities and the actual location of our assets are met. If you need clearance distances for our above ground assets, or if the below distances cannot be met, call **1800 786 306** to discuss.

  Minimum assets clearance distances.

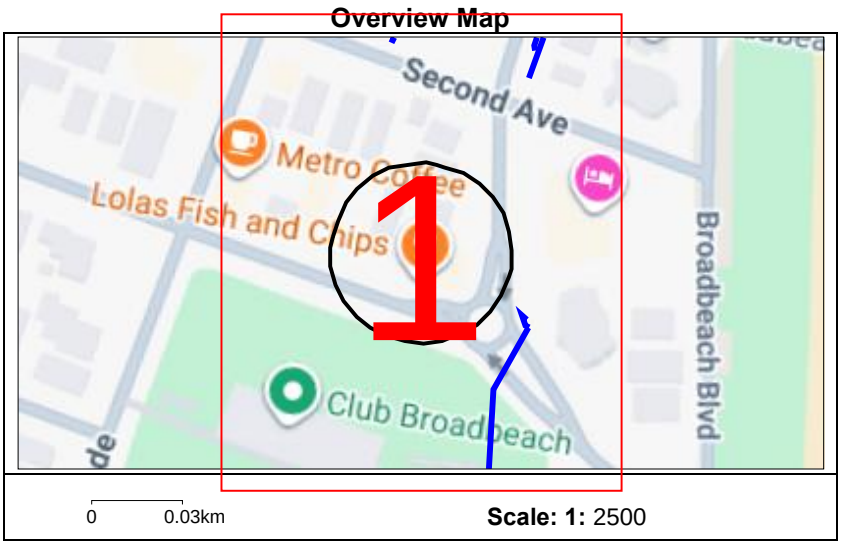
  - 300mm when laying asset inline, horizontal or vertical.
  - 1000mm when operating vibrating equipment. Eg: vibrating plates. No vibrating equipment on top of asset.
  - 1000mm when operating mechanical excavators or jackhammers/pneumatic breakers.
  - 2000mm when performing directional bore in-line, horizontal and vertical.
  - No heavy vehicle over 3 tonnes to be driven over asset with less than 600mm of cover.

- Reinstate exposed Pipe Networks network infrastructure back to original state.

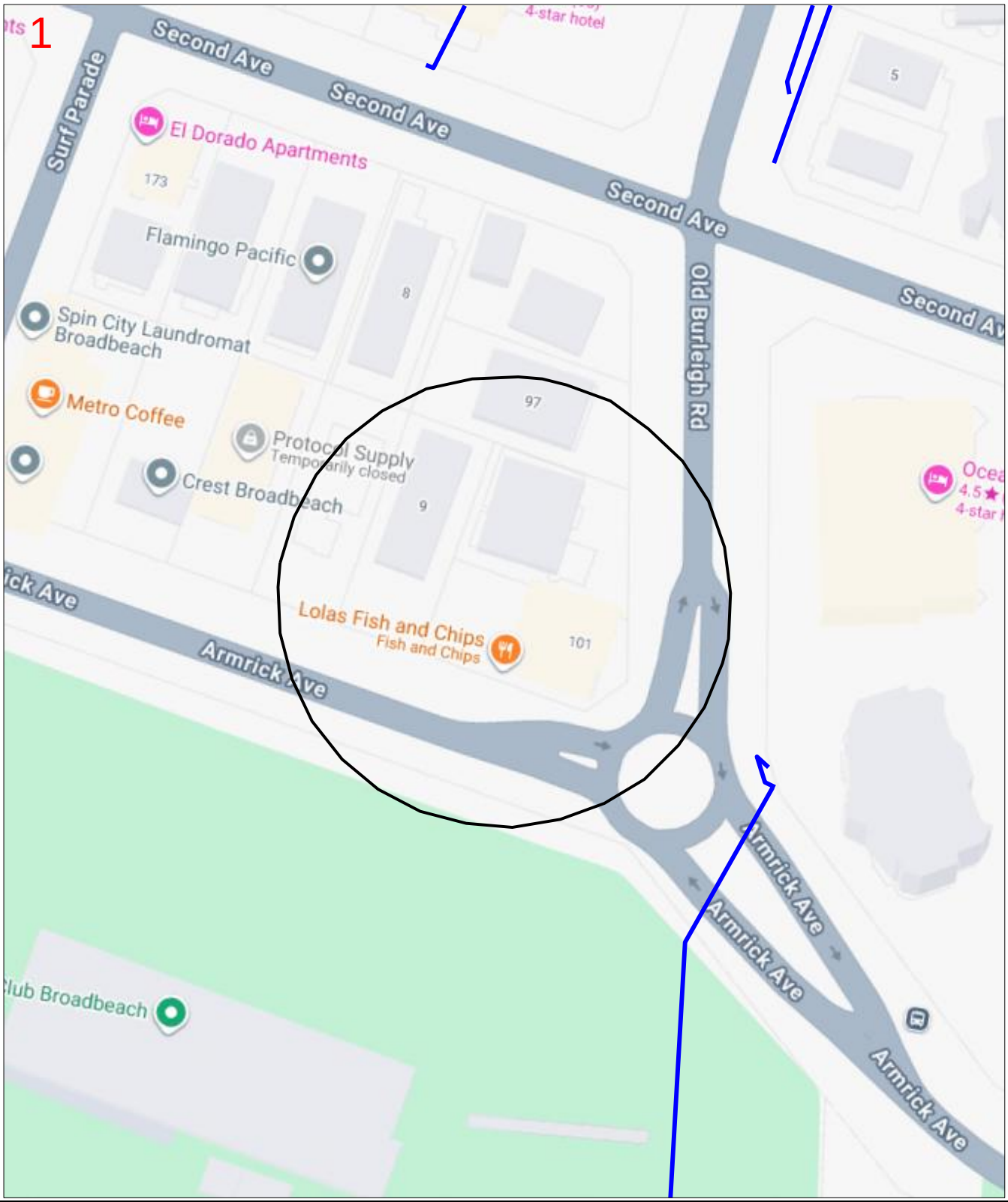
PRIVACY & CONFIDENTIALITY

- Privacy Notice – Your information has been provided to us by Before You Dig Australia to respond to your Before You Dig Australia enquiry. We will keep your personal information in accordance with Pipe Networks's privacy policy.

- Confidentiality – The information we have provided to you is confidential and is to be used only for planning and designing purposes in connection with your Before You Dig Australia enquiry. Please dispose of the information by shredding or other secure disposal method after use. We retain all intellectual property rights (including copyrights) in all our documents and plans.



Pipe Networks Pty Limited



Enquiry Number: 270835215

Map Sheet: 1

Scale: 1: 750

0 0.008km

N

LEGEND

BYDA Work Area

AAPT/PowerTel Pit	TransACT Pit
AAPT/PowerTel Duct	TransACT Duct
DDA Pit	SOUL Pattinson Telecoms Pit
DDA Duct	SOUL Pattinson Telecoms Duct
Agile/Adam Pit	PIPE Networks Pit
Agile/Adam Duct	PIPE Networks Duct

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Section 4 - SPECIALIST REPORTS

Noise Impact Assessment
Prepared by Acoustic Works

Zone Planning Group

acousticworks

Proposed Residential Development
99 & 101 Old Burleigh Road
Broadbeach

ACOUSTIC REPORT

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101 Old Burleigh Road Pty Ltd

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TABLE OF CONTENTS

1.Introduction 5
2.Site Description 5
2.1 Site Location 5
2.2 Proposal 6
2.3 Acoustic Environment 6
3.Equipment 6
4.Receivers and Noise Monitoring 7
4.1 Receiver Locations 7
4.2 Offsite Sources 8
4.3 Unattended Ambient Noise Monitoring 9
4.4 Road Traffic & Ambient Noise Monitoring 9
5.Measured Noise Levels 10
5.1 Meteorological Conditions 10
5.2 Road Traffic Noise Levels 10
5.3 Ambient Noise Levels 11
6.Noise Criteria 12
6.1 Road Traffic Noise Criteria 12
6.2 Environmental Noise Criteria 13
6.2.1 Acoustic Quality Objectives 13
6.2.2 Background Creep 13
6.2.1 Sleep Disturbance Criteria 14
7.Road Traffic Assessment 15
7.1 Traffic Volumes 15
7.2 Road Traffic Noise Verification 15
7.3 Predicted Road Traffic Noise Levels - 2036 16
8.Environmental Assessment 27
8.1 Onsite Activities 27
8.1.1 Acoustic Quality Objectives 27
8.1.2 Background Creep 28
8.1.3 Sleep Disturbance 29
9.Offsite Sources 30
9.1 Acoustic Quality Objectives 30
10. Recommendations 31
10.1 Road Traffic Noise 31
10.2 Onsite Activities 31
10.3 Acoustic Barrier 32
10.3.1 Ground Level 32
10.3.2 Levels 2-5 33
10.3.3 Onsite Mechanical Plant 35
10.4 Offsite Activities 35
11. Conclusion 36
12. Appendices 37
12.1 Development Plans 37
12.2 Noise Monitoring Charts 50

TABLE INDEX

Table 1: Meteorological Conditions – Gold Coast 10
Table 2: Measured Road Traffic Noise Levels 10
Table 3: Measured Ambient Noise Levels 11
Table 4: City of Gold Coast Road Traffic Noise Criteria 12
Table 5: Applicable External Road Traffic Noise Limits 12
Table 5: Acoustic Quality Objectives at Noise Sensitive Properties 13
Table 6: Background Creep Noise Limits 13
Table 7: Traffic Volumes 15
Table 8: Comparison of measured and predicted noise levels 15
Table 9: Predicted Road Traffic Noise Impacts 16
Table 10: Recreation Area Noise Impacts 24
Table 11: Acoustic Quality Objective Noise Levels, 1 hour 27
Table 12: Onsite Background Creep Noise Levels, 15 minute 28
Table 13: Sleep Disturbance from onsite activities – Night-time 29
Table 14: Offsite Activities to Onsite Receivers - Acoustic Quality Objectives 30
Table 15: Recommended Acoustic Barrier Height (Ground Level) 33
Table 16: Recommended Acoustic Barrier Height (Levels 2-5) 35

FIGURE INDEX

Figure 1: Site Location (Not to Scale) 5
Figure 2: Noise Monitoring Location and Sensitive Receiver Locations 8
Figure 3: SoundPLAN verification of noise monitoring location 15
Figure 4: Road Traffic Noise Contours – L10 (18 hour), Level 8 Façade Corrected 23
Figure 5: Road Traffic Noise Contours – L10 (18 hour), Level 15 Façade Corrected 24
Figure 6: Recommended Acoustic Treatments (Ground Level) 33
Figure 7: Recommended Acoustic Treatments (Levels 2-5) 34

1. Introduction

This report is in response to a request by 101 Old Burleigh Road Pty Ltd for an environmental and road traffic noise assessment of a proposed residential development to be located at 99 and 101 Old Burleigh Road, Broadbeach. To facilitate the assessment, unattended noise monitoring was conducted to establish road traffic noise levels in the vicinity of the site and to determine the criteria for onsite activities. Based on the outcomes of the assessment, recommendations for acoustic treatments are specified.

2. Site Description

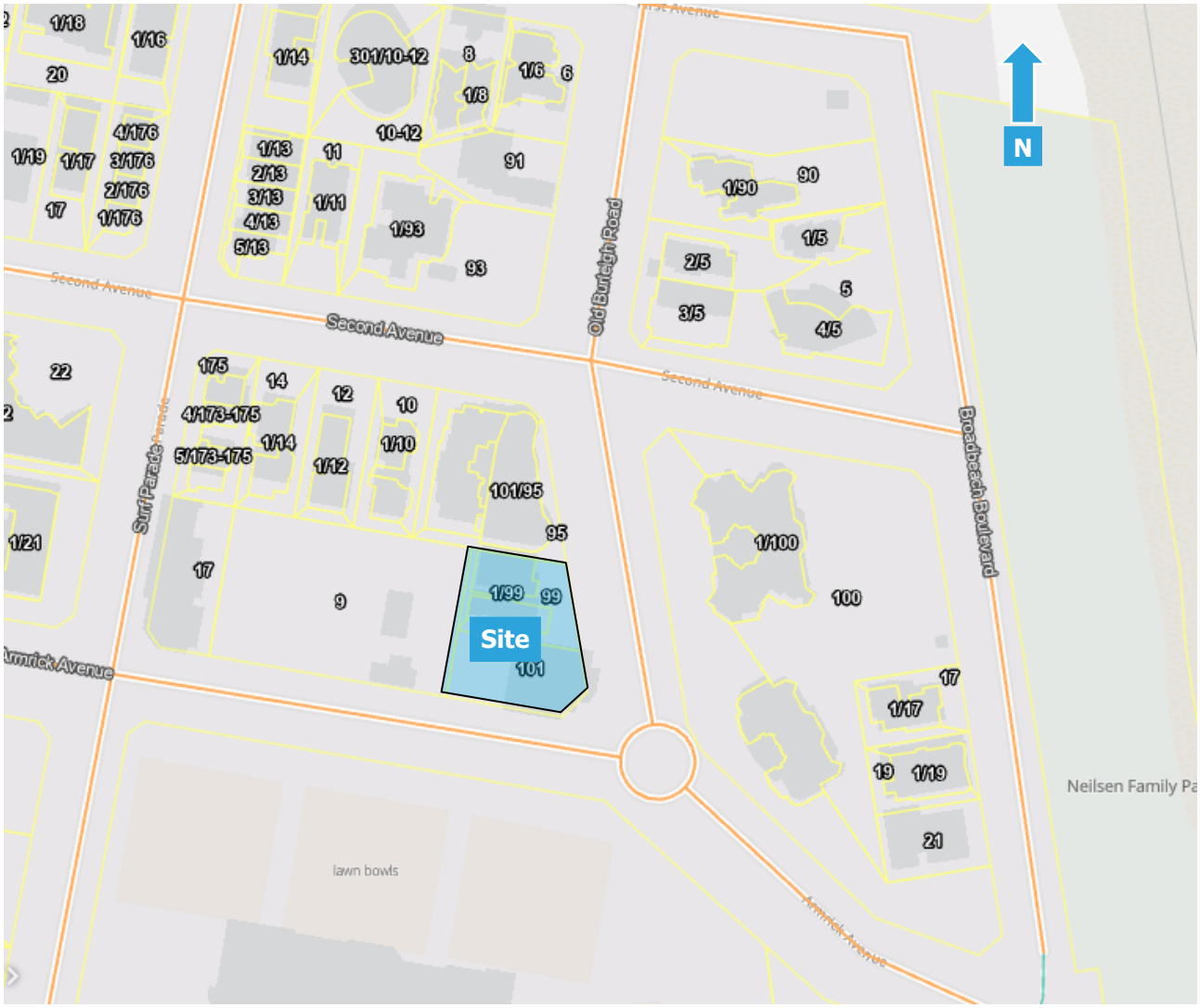
2.1 Site Location

The site is described by the following:

99 & 101 Old Burleigh Road, Broadbeach
Lot 70 on B8383 and CP on BUP104138

Refer to Figure 1 for site location.

Figure 1: Site Location (Not to Scale)



A survey was conducted on 23 February 2026 and identified the following:

a) Single storey commercial premises and a three storey apartment building currently occupy the site and shall be demolished to make way for the proposed development.
b) A multi storey residential building is currently under construction located adjacent the western site boundary.
c) A ten storey apartment building is located adjacent the northern site boundary.
d) Old Burleigh Road separates the site from a high rise apartment building to the east.
e) Armrick Avenue separates the site from a lawn bowls club to the south of the site.

2.2 Proposal

The proposal is to construct a forty-one storey residential building comprised of the following:

- Site area of 1,283m^2.
- 188 car parking spaces over three basement levels and from ground floor to level 5.
- Level 6 - gym, steam room, powder rooms, pool, and communal area.
- Level 7 - lounge, club room, cinema, dining area and meeting rooms.
- 81 apartments are located from level 8 to level 42.
- Site access via Armrick Avenue and Old Burleigh Road.

Refer to the Appendices for development plans.

2.3 Acoustic Environment

The surrounding area is primarily affected by noise from the surrounding road network and surf.

3. Equipment

The following equipment was used to record noise levels:

- 1x Rion NL42 Environmental Noise Monitor
- Pulsar Model 106 Ltd Sound Calibrator

The Environmental Noise Monitor holds current NATA Laboratory Certification and was field calibrated before and after the monitoring period, with no significant drift from the reference signal recorded.

4. Receivers and Noise Monitoring

4.1 Receiver Locations

The nearest sensitive receiver locations were identified as follows;

1. A thirty-five storey apartment building is under construction located to the west of the site at 9 Armrick Avenue.
2. A ten storey apartment building located adjacent the northern site boundary at 95-97 Old Burleigh Road.
3. Old Burleigh Road separates the site from a high rise apartment buildings to the east of the site at 100 Old Burleigh Road.

These locations were chosen as being representative of the nearest sensitive receivers to the proposed development. Refer to Figure 2 for these locations.

Figure 2: Noise Monitoring Location and Sensitive Receiver Locations

4.2 Offsite Sources

The nearest offsite source with the potential to impact the proposal was identified as follows:

A. Broadbeach Bowls Club located on the southern side of Armrick Avenue at 169 Surf Parade. The operating hours are limited to 8am to 10pm Monday, Tuesday, Wednesday, 8am to 11:30pm Thursdays, 8am to 12am Friday, 9am to 12am Saturday and 9am to 10pm Sunday.

Refer to Figure 2 for offsite source location.

4.3 Unattended Ambient Noise Monitoring

Construction noise from 9 Armrick Avenue and 75 Old Burleigh Road were found to be audible at all the nearby receivers to the site. To minimise potential construction noise affecting the monitoring data, ambient noise monitoring was conducted north of the site to conduct noise monitoring not affected by construction noise The location of the monitor is detailed in the following sections.

4.4 Road Traffic & Ambient Noise Monitoring

A Rion NL42 environmental noise monitor was placed at 50 Old Burleigh Road approximately 7m from the nearest lane of Old Burleigh Road to measure existing road traffic and ambient noise levels. This location was selected as it was considered representative of the nearest sensitive receivers. The monitor was located in a free field position with the microphone approximately 2.4 metres above ground surface level. The noise monitor was set to record noise levels between the 23 February and 6 March 2026.

The noise monitor was set to record noise levels in "A" Weighting, Fast response using 15 minute statistical intervals. Ambient noise monitoring was conducted generally in accordance with Australian Standard AS1055:2018 *Acoustics – Description and measurement of environmental noise*. Road traffic noise monitoring was conducted in accordance with Australian Standard *AS2702:1984 'Acoustics – Methods for the measurement of road traffic noise'.*

Refer to Figure 2 for noise monitoring location.

5. Measured Noise Levels

The following tables present the measured existing road traffic and ambient noise levels from the unattended noise survey and meteorological conditions. Any periods of inclement weather or extraneous noise are excluded from the measured data prior to determining the results.

5.1 Meteorological Conditions

Meteorological observations during the unattended noise monitoring survey were obtained from the Bureau of Meteorology website (http://www.bom.gov.au/climate/data), shown in Table 1 below.

Table 1: Meteorological Conditions – Gold Coast

Day	Date	Rainfall (mm)	Wind			
			9am		3pm	
			Speed (km/h)	Direction	Speed (km/h)	Direction
Monday	23/02/26	2	11	W	17	E
Tuesday	24/02/26	0	20	ESE	13	E
Wednesday	25/02/26	1.4	15	SE	19	ESE
Thursday	26/02/26	0.4	31	SSE	30	SSE
Friday	27/02/26	19.2	28	ESE	31	ESE
Saturday	28/02/26	15.2	35	SE	31	SSE
Sunday	1/03/26	0	19	SSE	28	ESE
Monday	2/03/26	6.8	11	SSW	28	ESE
Tuesday	3/03/26	2	13	SSE	17	ESE
Wednesday	4/03/26	3.2	19	E	15	E
Thursday	5/03/26	1	17	SSE	26	SE
Friday	6/03/26	27	28	ESE	26	ESE

5.2 Road Traffic Noise Levels

The measured road traffic noise levels at the monitoring location are as follows:

Table 2: Measured Road Traffic Noise Levels

Day	Date	L10 (18h)	Leq(1h) Day	Leq(1h) Night	L90 (8h)	L90 (18h)
Monday	23/02/26	-	61	-	-	-
Tuesday	24/02/26	63	73*	63	50	53
Wednesday	25/02/26	62	64	60	50	53
Thursday	26/02/26	63	67*	63	51	57*
Friday	27/02/26	64*	64*	64*	52*	55*
Saturday^	28/02/26	62	65	61	52	55
Sunday^	1/03/26	62	65	61	51	54
Monday	2/03/26	62	62	64*	51	53
Tuesday	3/03/26	61	63	60	50	53
Wednesday	4/03/26	62	64	66*	50	52
Thursday	5/03/26	63	63	62	50	53
Friday	6/03/26	-	65	61	-	-
Overall		62	64	61	51	53

*Note rainfall on 24, 26, 27 February and 2 & 4 March 2026 was found to affect the measurements, therefore the data was omitted for the affected time periods.

^The proposed development is located within a council-controlled transport noise corridor overlay. To be consistent with the advice in Section 4.3.1.2 of the Transport Noise Management Code of Practice, road traffic data for weekend periods and public holidays was not utilised in the assessment. The code specifies that measurements of traffic noise shall not be conducted during periods of atypical traffic flows. Periods of atypical traffic flows and patterns generally include weekends, school and public holidays.

Refer to the appendix for a graphical representation of the noise monitoring.

5.3 Ambient Noise Levels

The ambient noise levels measured at the monitoring location are as follows:

Table 3: Measured Ambient Noise Levels

Day	Date	L90 dB(A)		
		Day	Evening	Night
Monday	23/02/26	53	52	51
Tuesday	24/02/26	54	52	51
Wednesday	25/02/26	54	52	51
Thursday	26/02/26	58*	56*	51
Friday	27/02/26	56*	54	52
Saturday	28/02/26	55	55	52
Sunday	1/03/26	54	54	51
Monday	2/03/26	54	52	51
Tuesday	3/03/26	53	52	51
Wednesday	4/03/26	53	52	50
Thursday	5/03/26	54	53	51
Friday	6/03/26	54	-	52
Overall		54	53	51

*Note rainfall on 24, 26, 27 February and 2 & 4 March 2026 was found to affect the measurements, therefore the data was omitted for the affected time periods.

Refer to the appendix for a graphical representation of the noise monitoring.

6. Noise Criteria

6.1 Road Traffic Noise Criteria

The noise criteria are applied by City of Gold Coast under the City Plan Version 10 Regional Infrastructure Overlay Code. The applicable criteria for the development in the year 2030 (ten year planning horizon) requires road traffic noise to be assessed as follows:

Table 4: City of Gold Coast Road Traffic Noise Criteria

Design level road noise criteria	
1m in front of the most exposed part of a proposed sensitive land use	60 dB (A) L10 (18 hour) or less, where existing levels measured at the setback for the zone are greater than 40 dB (A) L90 (8 hour) between 10pm and 6am. (L10 (18 hour) is the arithmetic average of 18 hourly L10 levels measured in dB (A) between the hours of 6am and midnight). 57 dB (A) L10 (18 hour) or less, where existing levels measured at the setback for the zone are less than or equal to 40 dB (A) L90 (8 hour) between 10pm and 6am. Where the above criteria cannot be met, internal maximum design criterion levels specified in Table 1 AS2107-2016 apply, particularly for buildings greater than 1 storey high.
Balconies and formal external open space	60 dB (A) L10 (18 hour) or less, where existing levels measured at the setback for the zone are greater than 45 dB (A) L90 (18 hour). 57 dB (A) L10 (18 hour) or less, where existing levels measured at the setback for the zone are less than or equal to 45 dB (A) L90 (18 hour).
Internal Criteria – AS2107:2016	
Living Areas	Leq 45 dB(A)
Sleeping Areas	Leq 40 dB(A)

Based on the measured noise levels, the applicable road traffic noise limits for the development are as follows:

Table 5: Applicable External Road Traffic Noise Limits

Location	Noise Level dBA
All Facades (free field)	LA10(18hr) 60 dBA
All open spaces and recreation areas of accommodation activities and residential care facilities (free field)	LA10(18hr) 60 dBA

6.2 Environmental Noise Criteria

The noise criteria as applied by the City of Gold Coast are as follows:

6.2.1 Acoustic Quality Objectives

Table 6 below presents the acoustic quality objectives at noise sensitive receptors as detailed in Schedule 1 of the Environmental Protection (Noise) Policy 2008 and 2019.

Table 6: Acoustic Quality Objectives at Noise Sensitive Properties

Sensitive Receptor	Time of Day	Acoustic Quality Objectives, dB(A)		
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$
Dwelling (outdoors)	Day and Evening (7am – 10pm)	50	55	65
Dwelling (Indoors)	Day and Evening (7am – 10pm)	35	40	45
	Night (10pm - 7am)	30	35	40

6.2.2 Background Creep

The Background Creep criteria are as follows:

Time-varying noise:

$$L_{Aeq,adj,T,} \leq \text{Ambient } L_{A90,T} + 5\text{dB(A)}$$

Steady-state noise:

$$L_{A90,T} \leq \text{Ambient } L_{A90,T}$$

The time period (T) is a time interval of at least 15 minutes, or if the noise continues for less than 15 minutes, the duration of the noise source.

Based on the results of ambient noise monitoring, the project specific background creep noise limits are shown in Table 7.

Table 7: Background Creep Noise Limits

Time Period	Noise Level Limits SPL dB(A)	
	$L_{Aeq,T}$	$L_{A90,T}$
Day 7am – 6pm	59	54
Evening 6pm – 10pm	58	53
Night 10pm – 7am	56	51

6.2.1 Sleep Disturbance Criteria

Criteria for sleep disturbance under the WHO Guideline is addressed is as follows:

> *"As a rule for planning for short-term or transient noise events, for good sleep over 8 hours the indoor sound pressure level measured as a maximum instantaneous value should not exceed approximately 45 dB(A) $L_{A,(Max)}$ more than 10 or 15 times per night'.*
>
> *'Where noise is continuous, the equivalent sound pressure level should not exceed 30 dB(A) indoors, if negative effects on sleep are to be avoided'."*

7. Road Traffic Assessment

Road traffic noise associated with Old Burleigh Road for a ten year planning horizon was assessed at the development to determine compliance with City of Gold Coast criteria.

7.1 Traffic Volumes

Traffic volumes are presented below, with a 2% growth rate used to predict future volumes.

Table 8: Traffic Volumes

Location	2017 AADT	2026 Predicted AADT	2036 Predicted AADT	Percentage of Heavy Vehicles
Old Burleigh Road	3,059	3,656	4,456	2%

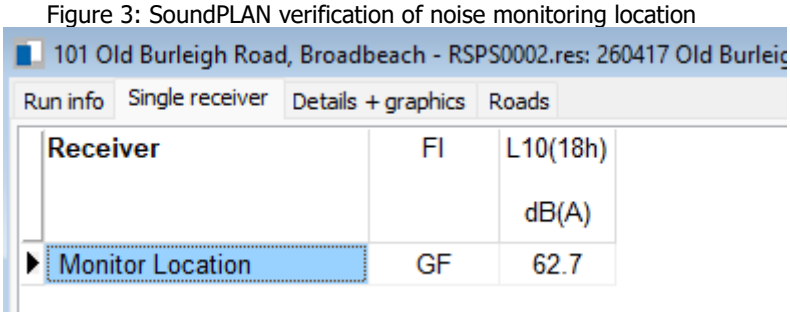
7.2 Road Traffic Noise Verification

To ensure the CoRTN noise model is accurate, a verification model of the predicted $L_{A10(18hr)}$ was created and compared to the measured noise level. The CoRTN method allows a ±2dB(A) variation from the predicted and measured level, if the variation exceeds 2dB(A) a correction to the predicted level is required.

Table 9: Comparison of measured and predicted noise levels

Location	Measured $L_{A10(18hr)}$ dB(A)	Predicted $L_{A10(18hr)}$ dB(A)	Correction
Old Burleigh Road	62.3	63.2	0

Figure 3: SoundPLAN verification of noise monitoring location



Inputs applied in the verification of the noise modelling are as follows:

- Old Burleigh Road speed limit of 50km/h.
- Road Surface correction: 0dBA, as per the Transport Noise Code of Practice the road surface was identified as Dense Grade Asphalt.
- Width of each Lane: 3.5m.
- -0.7dB(A) (Free field) corrections for Queensland Conditions.

7.3 Predicted Road Traffic Noise Levels - 2036

Road traffic noise modelling for the proposed development was based on the following information:

- Site layout and floor plans as provided by Contreras Earl Architecture, revision A, dated 13 May 2026.
- Old Burleigh Road speed limit of 50km/h.
- +2.5dB(A) façade correction.
- Receiver heights were set to 1.5m above finished floor level.

Table 10 presents the predicted road traffic noise impacts for the development.

Table 10: Predicted Road Traffic Noise Impacts

Level	Unit	Location	$L_{A10(18hr)}$ dB(A)	Complies CoGC Criteria ($L_{A10(18hr)} \leq 60$ dB(A))	Leq1hr Day dB(A)	Leq1hr Night dB(A)
8	Unit 1	Bed 1	52	Yes	54	51
8	Unit 1	Bed 2	42	Yes	44	41
8	Unit 1	Bed 3	27	Yes	29	26
8	Unit 1	Kitchen/Living/Dining	58	Yes	60	57
8	Unit 1	Media	39	Yes	41	38
9	Unit 1	Bed 1	53	Yes	55	52
9	Unit 1	Bed 2	27	Yes	29	26
9	Unit 1	Bed 3	27	Yes	29	26
9	Unit 1	Kitchen/Living/Dining	49	Yes	51	48
9	Unit 2	Bed 1	43	Yes	45	42
9	Unit 2	Bed 2	49	Yes	51	48
9	Unit 2	Kitchen/Living/Dining	58	Yes	60	57
9	Unit 2	Media	58	Yes	60	57
9	Unit 3	Bed 1	52	Yes	54	51
9	Unit 3	Bed 2	58	Yes	60	57
9	Unit 3	Bed 2	58	Yes	60	57
9	Unit 3	Kitchen/Living/Dining	58	Yes	60	57
10	Unit 1	Bed 1	53	Yes	55	52
10	Unit 1	Bed 2	26	Yes	28	25
10	Unit 1	Bed 3	26	Yes	28	25
10	Unit 1	Kitchen/Living/Dining	50	Yes	52	49
10	Unit 2	Bed 1	45	Yes	47	44
10	Unit 2	Bed 2	50	Yes	52	49
10	Unit 2	Kitchen/Living/Dining	58	Yes	60	57
10	Unit 2	Media	58	Yes	60	57
10	Unit 3	Bed 1	53	Yes	55	52
10	Unit 3	Bed 2	58	Yes	60	57
10	Unit 3	Bed 2	58	Yes	60	57
10	Unit 3	Kitchen/Living/Dining	58	Yes	60	57
11	Unit 1	Bed 1	52	Yes	54	51
11	Unit 1	Bed 2	26	Yes	28	25
11	Unit 1	Bed 3	26	Yes	28	25
11	Unit 1	Kitchen/Living/Dining	50	Yes	52	49
11	Unit 2	Bed 1	46	Yes	48	45
11	Unit 2	Bed 2	51	Yes	53	50
11	Unit 2	Kitchen/Living/Dining	57	Yes	59	56
11	Unit 2	Media	58	Yes	60	57
11	Unit 3	Bed 1	53	Yes	55	52
11	Unit 3	Bed 2	58	Yes	60	57
11	Unit 3	Bed 2	58	Yes	60	57
11	Unit 3	Kitchen/Living/Dining	58	Yes	60	57

Level	Unit	Location	$L_{A10(18hr)}$ dB(A)	Complies CoGC Criteria ($L_{A10(18hr)} \leq 60$ dB(A))	Leq1hr Day dB(A)	Leq1hr Night dB(A)
12	Unit 1	Bed 1	52	Yes	54	51
12	Unit 1	Bed 2	26	Yes	28	25
12	Unit 1	Bed 3	26	Yes	28	25
12	Unit 1	Kitchen/Living/Dining	50	Yes	52	49
12	Unit 2	Bed 1	46	Yes	48	45
12	Unit 2	Bed 2	51	Yes	53	50
12	Unit 2	Kitchen/Living/Dining	57	Yes	59	56
12	Unit 2	Media	57	Yes	59	56
12	Unit 3	Bed 1	53	Yes	55	52
12	Unit 3	Bed 2	57	Yes	59	56
12	Unit 3	Bed 2	57	Yes	59	56
12	Unit 3	Kitchen/Living/Dining	57	Yes	59	56
13	Unit 1	Bed 1	52	Yes	54	51
13	Unit 1	Bed 2	26	Yes	28	25
13	Unit 1	Bed 3	26	Yes	28	25
13	Unit 1	Kitchen/Living/Dining	49	Yes	51	48
13	Unit 2	Bed 1	46	Yes	48	45
13	Unit 2	Bed 2	52	Yes	54	51
13	Unit 2	Kitchen/Living/Dining	57	Yes	59	56
13	Unit 2	Media	57	Yes	59	56
13	Unit 3	Bed 1	53	Yes	55	52
13	Unit 3	Bed 2	57	Yes	59	56
13	Unit 3	Bed 2	57	Yes	59	56
13	Unit 3	Kitchen/Living/Dining	57	Yes	59	56
14	Unit 1	Bed 1	52	Yes	54	51
14	Unit 1	Bed 2	26	Yes	28	25
14	Unit 1	Bed 3	26	Yes	28	25
14	Unit 1	Kitchen/Living/Dining	49	Yes	51	48
14	Unit 2	Bed 1	46	Yes	48	45
14	Unit 2	Bed 2	52	Yes	54	51
14	Unit 2	Kitchen/Living/Dining	57	Yes	59	56
14	Unit 2	Media	57	Yes	59	56
14	Unit 3	Bed 1	53	Yes	55	52
14	Unit 3	Bed 2	57	Yes	59	56
14	Unit 3	Bed 2	57	Yes	59	56
14	Unit 3	Kitchen/Living/Dining	57	Yes	59	56
15	Unit 1	Bed 1	51	Yes	53	50
15	Unit 1	Bed 2	26	Yes	28	25
15	Unit 1	Bed 3	25	Yes	27	24
15	Unit 1	Kitchen/Living/Dining	49	Yes	51	48
15	Unit 2	Bed 1	46	Yes	48	45
15	Unit 2	Bed 2	53	Yes	55	52
15	Unit 2	Kitchen/Living/Dining	56	Yes	58	55
15	Unit 2	Media	57	Yes	59	56
15	Unit 3	Bed 1	52	Yes	54	51
15	Unit 3	Bed 2	57	Yes	59	56
15	Unit 3	Bed 2	57	Yes	59	56
15	Unit 3	Kitchen/Living/Dining	56	Yes	58	55
16	Unit 1	Bed 1	51	Yes	53	50
16	Unit 1	Bed 2	25	Yes	27	24
16	Unit 1	Bed 3	25	Yes	27	24
16	Unit 1	Kitchen/Living/Dining	49	Yes	51	48
16	Unit 2	Bed 1	46	Yes	48	45
16	Unit 2	Bed 2	53	Yes	55	52
16	Unit 2	Kitchen/Living/Dining	56	Yes	58	55

Level	Unit	Location	$L_{A10(18hr)}$ dB(A)	Complies CoGC Criteria ($L_{A10(18hr)} \leq 60$ dB(A))	Leq1hr Day dB(A)	Leq1hr Night dB(A)
16	Unit 2	Media	56	Yes	58	55
16	Unit 3	Bed 1	52	Yes	54	51
16	Unit 3	Bed 2	56	Yes	58	55
16	Unit 3	Bed 2	56	Yes	58	55
16	Unit 3	Kitchen/Living/Dining	56	Yes	58	55
17	Unit 1	Bed 1	51	Yes	53	50
17	Unit 1	Bed 2	25	Yes	27	24
17	Unit 1	Bed 3	25	Yes	27	24
17	Unit 1	Kitchen/Living/Dining	48	Yes	50	47
17	Unit 2	Bed 1	46	Yes	48	45
17	Unit 2	Bed 2	53	Yes	55	52
17	Unit 2	Kitchen/Living/Dining	56	Yes	58	55
17	Unit 2	Media	56	Yes	58	55
17	Unit 3	Bed 1	52	Yes	54	51
17	Unit 3	Bed 2	56	Yes	58	55
17	Unit 3	Bed 2	56	Yes	58	55
17	Unit 3	Kitchen/Living/Dining	56	Yes	58	55
18	Unit 1	Bed 1	51	Yes	53	50
18	Unit 1	Bed 2	25	Yes	27	24
18	Unit 1	Bed 3	25	Yes	27	24
18	Unit 1	Kitchen/Living/Dining	48	Yes	50	47
18	Unit 2	Bed 1	45	Yes	47	44
18	Unit 2	Bed 2	53	Yes	55	52
18	Unit 2	Kitchen/Living/Dining	56	Yes	58	55
18	Unit 2	Media	56	Yes	58	55
18	Unit 3	Bed 1	51	Yes	53	50
18	Unit 3	Bed 2	56	Yes	58	55
18	Unit 3	Bed 2	56	Yes	58	55
18	Unit 3	Kitchen/Living/Dining	56	Yes	58	55
19	Unit 1	Bed 1	50	Yes	52	49
19	Unit 1	Bed 2	25	Yes	27	24
19	Unit 1	Bed 3	25	Yes	27	24
19	Unit 1	Kitchen/Living/Dining	48	Yes	50	47
19	Unit 2	Bed 1	45	Yes	47	44
19	Unit 2	Bed 2	53	Yes	55	52
19	Unit 2	Kitchen/Living/Dining	56	Yes	58	55
19	Unit 2	Media	56	Yes	58	55
19	Unit 3	Bed 1	51	Yes	53	50
19	Unit 3	Bed 2	56	Yes	58	55
19	Unit 3	Bed 2	56	Yes	58	55
19	Unit 3	Kitchen/Living/Dining	55	Yes	57	54
20	Unit 1	Bed 1	50	Yes	52	49
20	Unit 1	Bed 2	25	Yes	27	24
20	Unit 1	Bed 3	25	Yes	27	24
20	Unit 1	Kitchen/Living/Dining	48	Yes	50	47
20	Unit 2	Bed 1	45	Yes	47	44
20	Unit 2	Bed 2	53	Yes	55	52
20	Unit 2	Kitchen/Living/Dining	55	Yes	57	54
20	Unit 2	Media	55	Yes	57	54
20	Unit 3	Bed 1	51	Yes	53	50
20	Unit 3	Bed 2	55	Yes	57	54
20	Unit 3	Bed 2	55	Yes	57	54
20	Unit 3	Kitchen/Living/Dining	55	Yes	57	54
21	Unit 1	Bed 1	50	Yes	52	49
21	Unit 1	Bed 2	24	Yes	26	23

Level	Unit	Location	$L_{A10(18hr)}$ dB(A)	Complies CoGC Criteria ($L_{A10(18hr)} \leq 60$ dB(A))	Leq1hr Day dB(A)	Leq1hr Night dB(A)
21	Unit 1	Bed 3	24	Yes	26	23
21	Unit 1	Kitchen/Living/Dining	47	Yes	49	46
21	Unit 2	Bed 1	45	Yes	47	44
21	Unit 2	Bed 2	53	Yes	55	52
21	Unit 2	Kitchen/Living/Dining	55	Yes	57	54
21	Unit 2	Media	55	Yes	57	54
21	Unit 3	Bed 1	50	Yes	52	49
21	Unit 3	Bed 2	55	Yes	57	54
21	Unit 3	Bed 2	55	Yes	57	54
21	Unit 3	Kitchen/Living/Dining	55	Yes	57	54
22	Unit 1	Bed 1	49	Yes	51	48
22	Unit 1	Bed 2	24	Yes	26	23
22	Unit 1	Bed 3	24	Yes	26	23
22	Unit 1	Kitchen/Living/Dining	47	Yes	49	46
22	Unit 2	Bed 1	45	Yes	47	44
22	Unit 2	Bed 2	53	Yes	55	52
22	Unit 2	Kitchen/Living/Dining	55	Yes	57	54
22	Unit 2	Media	55	Yes	57	54
22	Unit 3	Bed 1	50	Yes	52	49
22	Unit 3	Bed 2	55	Yes	57	54
22	Unit 3	Bed 2	55	Yes	57	54
22	Unit 3	Kitchen/Living/Dining	55	Yes	57	54
23	Unit 1	Bed 1	49	Yes	51	48
23	Unit 1	Bed 2	24	Yes	26	23
23	Unit 1	Bed 3	24	Yes	26	23
23	Unit 1	Kitchen/Living/Dining	47	Yes	49	46
23	Unit 2	Bed 1	45	Yes	47	44
23	Unit 2	Bed 2	53	Yes	55	52
23	Unit 2	Kitchen/Living/Dining	55	Yes	57	54
23	Unit 2	Media	55	Yes	57	54
23	Unit 3	Bed 1	50	Yes	52	49
23	Unit 3	Bed 2	55	Yes	57	54
23	Unit 3	Bed 2	55	Yes	57	54
23	Unit 3	Kitchen/Living/Dining	54	Yes	56	53
24	Unit 1	Bed 1	49	Yes	51	48
24	Unit 1	Bed 2	24	Yes	26	23
24	Unit 1	Bed 3	24	Yes	26	23
24	Unit 1	Kitchen/Living/Dining	47	Yes	49	46
24	Unit 2	Bed 1	45	Yes	47	44
24	Unit 2	Bed 2	53	Yes	55	52
24	Unit 2	Kitchen/Living/Dining	54	Yes	56	53
24	Unit 2	Media	54	Yes	56	53
24	Unit 3	Bed 1	50	Yes	52	49
24	Unit 3	Bed 2	54	Yes	56	53
24	Unit 3	Bed 2	54	Yes	56	53
24	Unit 3	Kitchen/Living/Dining	54	Yes	56	53
25	Unit 1	Bed 1	49	Yes	51	48
25	Unit 1	Bed 2	24	Yes	26	23
25	Unit 1	Bed 3	24	Yes	26	23
25	Unit 1	Kitchen/Living/Dining	46	Yes	48	45
25	Unit 2	Bed 1	45	Yes	47	44
25	Unit 2	Bed 2	53	Yes	55	52
25	Unit 2	Kitchen/Living/Dining	54	Yes	56	53
25	Unit 2	Media	54	Yes	56	53
25	Unit 3	Bed 1	49	Yes	51	48

Level	Unit	Location	$L_{A10(18hr)}$ dB(A)	Complies CoGC Criteria ($L_{A10(18hr)} \leq 60$ dB(A))	Leq1hr Day dB(A)	Leq1hr Night dB(A)
25	Unit 3	Bed 2	54	Yes	56	53
25	Unit 3	Bed 2	54	Yes	56	53
25	Unit 3	Kitchen/Living/Dining	54	Yes	56	53
26	Unit 1	Bed 1	48	Yes	50	47
26	Unit 1	Bed 2	24	Yes	26	23
26	Unit 1	Bed 3	23	Yes	25	22
26	Unit 1	Kitchen/Living/Dining	42	Yes	44	41
26	Unit 2	Bed 1	49	Yes	51	48
26	Unit 2	Bed 2	53	Yes	55	52
26	Unit 2	Bed 3	52	Yes	54	51
26	Unit 2	Bed 4	47	Yes	49	46
26	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
27	Unit 1	Bed 1	48	Yes	50	47
27	Unit 1	Bed 2	23	Yes	25	22
27	Unit 1	Bed 3	23	Yes	25	22
27	Unit 1	Kitchen/Living/Dining	43	Yes	45	42
27	Unit 2	Bed 1	49	Yes	51	48
27	Unit 2	Bed 2	53	Yes	55	52
27	Unit 2	Bed 3	52	Yes	54	51
27	Unit 2	Bed 4	48	Yes	50	47
27	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
28	Unit 1	Bed 1	48	Yes	50	47
28	Unit 1	Bed 2	23	Yes	25	22
28	Unit 1	Bed 3	23	Yes	25	22
28	Unit 1	Kitchen/Living/Dining	43	Yes	45	42
28	Unit 2	Bed 1	48	Yes	50	47
28	Unit 2	Bed 2	53	Yes	55	52
28	Unit 2	Bed 3	52	Yes	54	51
28	Unit 2	Bed 4	48	Yes	50	47
28	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
29	Unit 1	Bed 1	48	Yes	50	47
29	Unit 1	Bed 2	23	Yes	25	22
29	Unit 1	Bed 3	23	Yes	25	22
29	Unit 1	Kitchen/Living/Dining	43	Yes	45	42
29	Unit 2	Bed 1	48	Yes	50	47
29	Unit 2	Bed 2	53	Yes	55	52
29	Unit 2	Bed 3	52	Yes	54	51
29	Unit 2	Bed 4	48	Yes	50	47
29	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
30	Unit 1	Bed 1	47	Yes	49	46
30	Unit 1	Bed 2	52	Yes	54	51
30	Unit 1	Bed 3	23	Yes	25	22
30	Unit 1	Kitchen/Living/Dining	44	Yes	46	43
30	Unit 1	Media	47	Yes	49	46
30	Unit 2	Bed 1	48	Yes	50	47
30	Unit 2	Bed 2	53	Yes	55	52
30	Unit 2	Bed 3	53	Yes	55	52
30	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
30	Unit 2	Media	53	Yes	55	52
31	Unit 1	Bed 1	47	Yes	49	46
31	Unit 1	Bed 2	52	Yes	54	51
31	Unit 1	Bed 3	23	Yes	25	22
31	Unit 1	Kitchen/Living/Dining	45	Yes	47	44
31	Unit 1	Media	48	Yes	50	47
31	Unit 2	Bed 1	48	Yes	50	47

Level	Unit	Location	$L_{A10(18hr)}$ dB(A)	Complies CoGC Criteria ($L_{A10(18hr)} \leq 60$ dB(A))	Leq1hr Day dB(A)	Leq1hr Night dB(A)
31	Unit 2	Bed 2	53	Yes	55	52
31	Unit 2	Bed 3	53	Yes	55	52
31	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
31	Unit 2	Media	53	Yes	55	52
32	Unit 1	Bed 1	47	Yes	49	46
32	Unit 1	Bed 2	52	Yes	54	51
32	Unit 1	Bed 3	23	Yes	25	22
32	Unit 1	Kitchen/Living/Dining	45	Yes	47	44
32	Unit 1	Media	48	Yes	50	47
32	Unit 2	Bed 1	48	Yes	50	47
32	Unit 2	Bed 2	52	Yes	54	51
32	Unit 2	Bed 3	53	Yes	55	52
32	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
32	Unit 2	Media	53	Yes	55	52
33	Unit 1	Bed 1	47	Yes	49	46
33	Unit 1	Bed 2	51	Yes	53	50
33	Unit 1	Bed 3	23	Yes	25	22
33	Unit 1	Kitchen/Living/Dining	45	Yes	47	44
33	Unit 1	Media	48	Yes	50	47
33	Unit 2	Bed 1	47	Yes	49	46
33	Unit 2	Bed 2	52	Yes	54	51
33	Unit 2	Bed 3	53	Yes	55	52
33	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
33	Unit 2	Media	53	Yes	55	52
34	Unit 1	Bed 1	47	Yes	49	46
34	Unit 1	Bed 2	51	Yes	53	50
34	Unit 1	Bed 3	22	Yes	24	21
34	Unit 1	Kitchen/Living/Dining	45	Yes	47	44
34	Unit 1	Media	48	Yes	50	47
34	Unit 2	Bed 1	47	Yes	49	46
34	Unit 2	Bed 2	52	Yes	54	51
34	Unit 2	Bed 3	53	Yes	55	52
34	Unit 2	Kitchen/Living/Dining	53	Yes	55	52
34	Unit 2	Media	53	Yes	55	52
35	Unit 1	Bed 1	46	Yes	48	45
35	Unit 1	Bed 2	51	Yes	53	50
35	Unit 1	Bed 3	22	Yes	24	21
35	Unit 1	Kitchen/Living/Dining	44	Yes	46	43
35	Unit 1	Media	48	Yes	50	47
35	Unit 2	Bed 1	47	Yes	49	46
35	Unit 2	Bed 2	52	Yes	54	51
35	Unit 2	Bed 3	52	Yes	54	51
35	Unit 2	Kitchen/Living/Dining	52	Yes	54	51
35	Unit 2	Media	53	Yes	55	52
36	Unit 1	Bed 1	46	Yes	48	45
36	Unit 1	Bed 2	51	Yes	53	50
36	Unit 1	Bed 3	22	Yes	24	21
36	Unit 1	Kitchen/Living/Dining	44	Yes	46	43
36	Unit 1	Media	48	Yes	50	47
36	Unit 2	Bed 1	47	Yes	49	46
36	Unit 2	Bed 2	52	Yes	54	51
36	Unit 2	Bed 3	52	Yes	54	51
36	Unit 2	Kitchen/Living/Dining	52	Yes	54	51
36	Unit 2	Media	53	Yes	55	52
37	Unit 1	Bed 1	46	Yes	48	45

Level	Unit	Location	$L_{A10(18hr)}$ dB(A)	Complies CoGC Criteria ($L_{A10(18hr)} \leq 60$ dB(A))	Leq1hr Day dB(A)	Leq1hr Night dB(A)
37	Unit 1	Bed 2	51	Yes	53	50
37	Unit 1	Bed 3	22	Yes	24	21
37	Unit 1	Kitchen/Living/Dining	44	Yes	46	43
37	Unit 1	Media	48	Yes	50	47
37	Unit 2	Bed 1	46	Yes	48	45
37	Unit 2	Bed 2	52	Yes	54	51
37	Unit 2	Bed 3	52	Yes	54	51
37	Unit 2	Kitchen/Living/Dining	52	Yes	54	51
37	Unit 2	Media	52	Yes	54	51
38	Penthouse	Bed 1	49	Yes	51	48
38	Penthouse	Bed 2	46	Yes	48	45
38	Penthouse	Bed 3	44	Yes	46	43
38	Penthouse	Bed 4	33	Yes	35	32
38	Penthouse	Dining	35	Yes	37	34
38	Penthouse	Kitchen	44	Yes	46	43
38	Penthouse	Living	48	Yes	50	47
38	Penthouse	Media	50	Yes	52	49
39	Penthouse	Bed 1	50	Yes	52	49
39	Penthouse	Bed 2	49	Yes	51	48
39	Penthouse	Bed 3	44	Yes	46	43
39	Penthouse	Bed 4	33	Yes	35	32
39	Penthouse	Dining	37	Yes	39	36
39	Penthouse	Kitchen	43	Yes	45	42
39	Penthouse	Living	50	Yes	52	49
39	Penthouse	Media	51	Yes	53	50
40	Penthouse	Bed 1	50	Yes	52	49
40	Penthouse	Bed 2	49	Yes	51	48
40	Penthouse	Bed 3	44	Yes	46	43
40	Penthouse	Bed 4	33	Yes	35	32
40	Penthouse	Dining	39	Yes	41	38
40	Penthouse	Kitchen	43	Yes	45	42
40	Penthouse	Living	50	Yes	52	49
40	Penthouse	Media	51	Yes	53	50
41	Penthouse	Bed 1	51	Yes	53	50
41	Penthouse	Bed 2	50	Yes	52	49
41	Penthouse	Bed 3	44	Yes	46	43
41	Penthouse	Bed 4	33	Yes	35	32
41	Penthouse	Dining	40	Yes	42	39
41	Penthouse	Kitchen	43	Yes	45	42
41	Penthouse	Living	51	Yes	53	50
41	Penthouse	Media	51	Yes	53	50
42	Penthouse	Bed 1	51	Yes	53	50
42	Penthouse	Bed 2	50	Yes	52	49
42	Penthouse	Bed 3	44	Yes	46	43
42	Penthouse	Bed 4	34	Yes	36	33
42	Penthouse	Dining	41	Yes	43	40
42	Penthouse	Kitchen	43	Yes	45	42
42	Penthouse	Living	51	Yes	53	50
42	Penthouse	Media	51	Yes	53	50

Based on the predicted noise impacts, additional treatments is not required to compliance for all internal areas with City of Gold Coast assessment requirements. Refer to Section 9 for recommendations.

Figure 4: Road Traffic Noise Contours – L10 (18 hour), Level 8 Façade Corrected

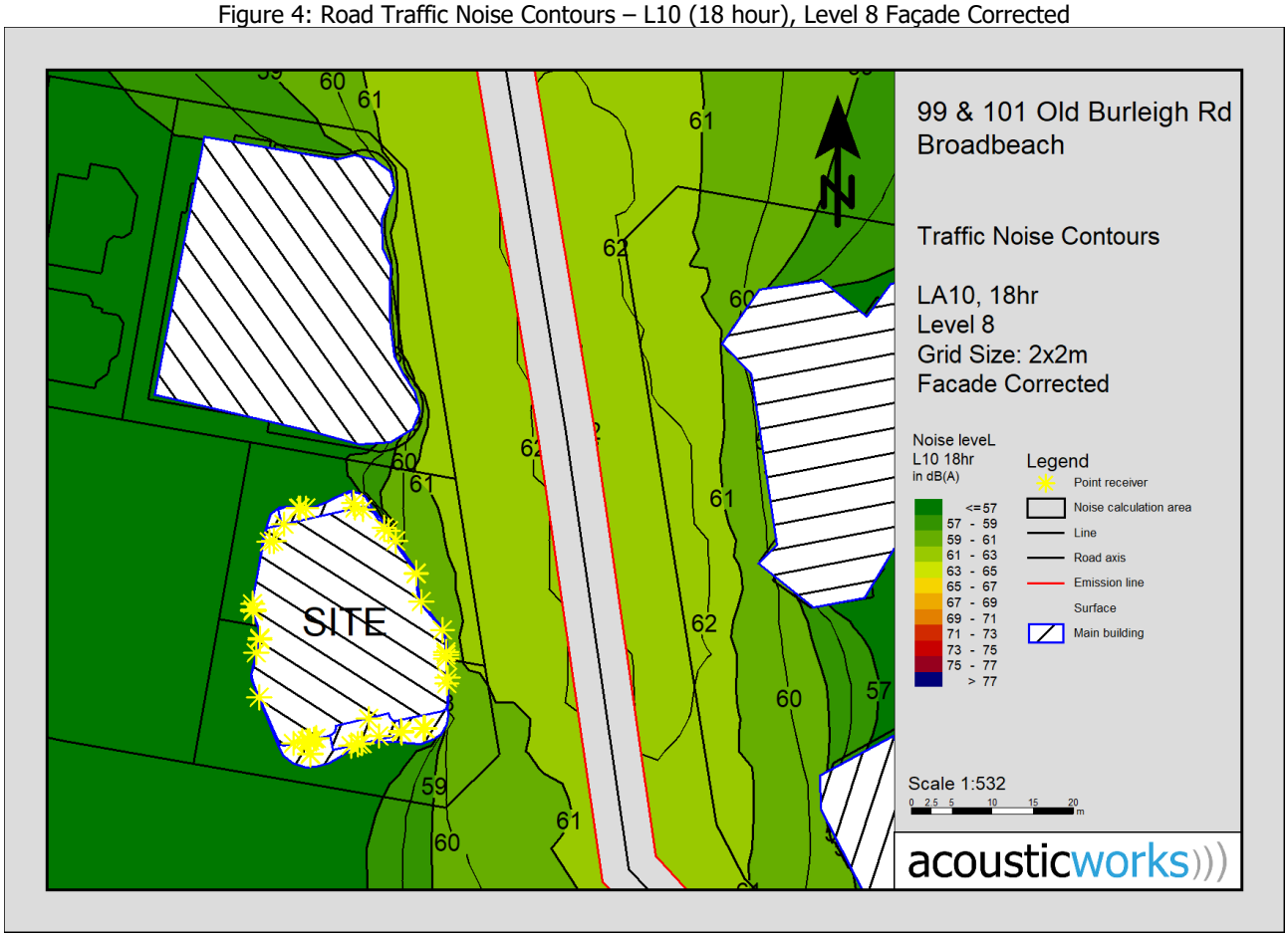
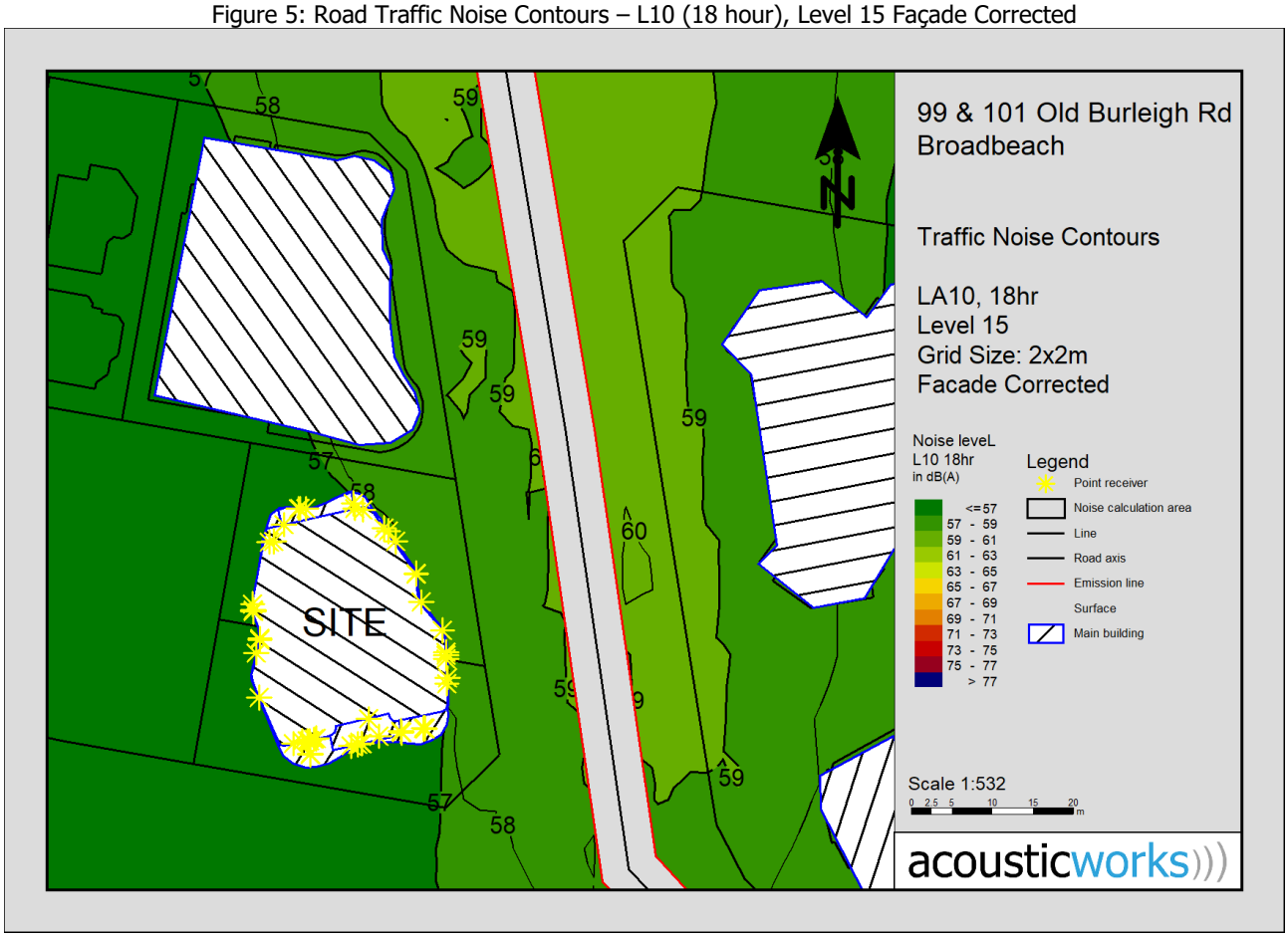


Figure 5: Road Traffic Noise Contours – L10 (18 hour), Level 15 Façade Corrected



Road traffic noise impacts to the worst affected passive recreation areas are presented in Table 11.

Table 11: Recreation Area Noise Impacts

Location			External Predicted $L_{A10(18hr)}$ (free field) dB(A)	Complies External Criteria ($L_{A10(18hr)} \leq 60$ dB(A))
Level	Unit	Location		
6	Communal	Pool Area	55	Yes
8	Unit 1	Balcony	49	Yes
9	Unit 1	Balcony	51	Yes
9	Unit 2	Balcony	52	Yes
9	Unit 2	Balcony	54	Yes
10	Unit 1	Balcony	51	Yes
10	Unit 2	Balcony	53	Yes
10	Unit 2	Balcony	55	Yes
11	Unit 1	Balcony	51	Yes
11	Unit 2	Balcony	53	Yes
11	Unit 2	Balcony	55	Yes
12	Unit 1	Balcony	51	Yes
12	Unit 2	Balcony	53	Yes
12	Unit 2	Balcony	55	Yes
13	Unit 1	Balcony	50	Yes
13	Unit 2	Balcony	53	Yes
13	Unit 2	Balcony	55	Yes
14	Unit 1	Balcony	50	Yes
14	Unit 2	Balcony	52	Yes
14	Unit 2	Balcony	55	Yes
15	Unit 1	Balcony	50	Yes
15	Unit 2	Balcony	52	Yes
15	Unit 2	Balcony	54	Yes

Location			External Predicted $L_{A10(18hr)}$ (free field) dB(A)	Complies External Criteria ($L_{A10(18hr)} \leq 60$ dB(A))
Level	Unit	Location		
16	Unit 1	Balcony	50	Yes
16	Unit 2	Balcony	52	Yes
16	Unit 2	Balcony	54	Yes
17	Unit 1	Balcony	50	Yes
17	Unit 2	Balcony	51	Yes
17	Unit 2	Balcony	54	Yes
18	Unit 1	Balcony	49	Yes
18	Unit 2	Balcony	51	Yes
18	Unit 2	Balcony	54	Yes
19	Unit 1	Balcony	49	Yes
19	Unit 2	Balcony	51	Yes
19	Unit 2	Balcony	53	Yes
20	Unit 1	Balcony	49	Yes
20	Unit 2	Balcony	50	Yes
20	Unit 2	Balcony	53	Yes
21	Unit 1	Balcony	48	Yes
21	Unit 2	Balcony	50	Yes
21	Unit 2	Balcony	53	Yes
22	Unit 1	Balcony	48	Yes
22	Unit 2	Balcony	50	Yes
22	Unit 2	Balcony	53	Yes
23	Unit 1	Balcony	48	Yes
23	Unit 2	Balcony	49	Yes
23	Unit 2	Balcony	53	Yes
24	Unit 1	Balcony	48	Yes
24	Unit 2	Balcony	49	Yes
24	Unit 2	Balcony	52	Yes
25	Unit 1	Balcony	47	Yes
25	Unit 2	Balcony	49	Yes
25	Unit 2	Balcony	52	Yes
26	Unit 1	Balcony	47	Yes
26	Unit 2	Balcony	49	Yes
27	Unit 1	Balcony	47	Yes
27	Unit 2	Balcony	48	Yes
28	Unit 1	Balcony	47	Yes
28	Unit 2	Balcony	48	Yes
29	Unit 1	Balcony	47	Yes
29	Unit 2	Balcony	48	Yes
30	Unit 1	Balcony	46	Yes
30	Unit 1	Balcony	46	Yes
30	Unit 2	Balcony	48	Yes
30	Unit 2	Balcony	48	Yes
31	Unit 1	Balcony	46	Yes
31	Unit 1	Balcony	46	Yes
31	Unit 2	Balcony	47	Yes
31	Unit 2	Balcony	47	Yes
32	Unit 1	Balcony	46	Yes
32	Unit 1	Balcony	46	Yes
32	Unit 2	Balcony	47	Yes
32	Unit 2	Balcony	47	Yes
33	Unit 1	Balcony	46	Yes
33	Unit 1	Balcony	46	Yes
33	Unit 2	Balcony	47	Yes
33	Unit 2	Balcony	47	Yes
34	Unit 1	Balcony	46	Yes
34	Unit 1	Balcony	46	Yes
34	Unit 2	Balcony	47	Yes

Location			External Predicted $L_{A10(18hr)}$ (free field) dB(A)	Complies External Criteria ($L_{A10(18hr)} \leq 60$ dB(A))
Level	Unit	Location		
34	Unit 2	Balcony	47	Yes
35	Unit 1	Balcony	45	Yes
35	Unit 1	Balcony	45	Yes
35	Unit 2	Balcony	46	Yes
35	Unit 2	Balcony	46	Yes
36	Unit 1	Balcony	45	Yes
36	Unit 1	Balcony	45	Yes
36	Unit 2	Balcony	46	Yes
36	Unit 2	Balcony	46	Yes
37	Unit 1	Balcony	45	Yes
37	Unit 1	Balcony	45	Yes
37	Unit 2	Balcony	46	Yes
37	Unit 2	Balcony	46	Yes
38	Penthouse	Balcony	39	Yes
39	Penthouse	Balcony	41	Yes
40	Penthouse	Balcony	42	Yes
41	Penthouse	Balcony	43	Yes
42	Penthouse	Balcony	43	Yes

8. Environmental Assessment

8.1 Onsite Activities

Noise associated with the development was assessed based on previous measurements of similar activities. The calculations assume that the nominated activities are located at the closest representative point within the development site to each receiver location. Any relevant shielding or building transmission loss is taken into account for these activities.

8.1.1 Acoustic Quality Objectives

The average maximum noise source levels and predicted impacts at the receiver locations are shown in Table 12 as follows. Note: L_{A10} and L_{A1} results are not shown in cases where the total duration of the events is less than the minimum time required e.g. $L_{A10(1hr)}$ requires noise events to occur for at least 360 seconds of an hour long period. L_{Aeq} results are not shown where the calculated total is less than 0dBA.

Table 12: Acoustic Quality Objective Noise Levels, 1 hour

Receiver	Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	No. of events per 1hr Day	No. of events per 1hr Eve	No. of events per 1hr Night	Duration per event	Distance (m)	Barrier (height (m)) No	Barrier screening dB	Building TL or shield dB	Topo screening dB	Dist atten. @-6dB/dd	LAeq adj.1hr ext. dB(A) Day	LAeq adj.1hr int. dB(A) Day	LAeq adj.1hr ext. dB(A) Eve	LAeq adj.1hr int. dB(A) Eve	LAeq adj.1hr ext. dB(A) Night	LAeq adj.1hr int. dB(A) Night	LA10 adj.1hr ext. dB(A) Day	LA10 adj.1hr int. dB(A) Day	LA10 adj.1hr ext. dB(A) Eve	LA10 adj.1hr int. dB(A) Eve	LA10 adj.1hr ext. dB(A) Night	LA10 adj.1hr int. dB(A) Night	LA1 adj.1hr ext. dB(A) Day	LA1 adj.1hr int. dB(A) Day	LA1 adj.1hr ext. dB(A) Eve	LA1 adj.1hr int. dB(A) Eve	LA1 adj.1hr ext. dB(A) Night	LA1 adj.1hr int. dB(A) Night	Amenity LAeq Compliance			LA10 Compliance			LA1 Compliance		
	1. 9 Armrick Avenue (W) 2. 95-97 Old Burleigh Rd (N) 3. 100 Old Burleigh Rd (E)																																									
																																		Day / eve	Day / eve indoor	Night indoor	Day / eve	Day / eve indoor	Night indoor	Day / eve	Day / eve indoor	Night indoor
	Receivers																																									
	Criteria																																	50	35	30	55	40	35	65	45	40
	Car door closure (Ground)	75	2	77	12	8	4	2	15	2	-3			-24	28	18	26	16	23	13														Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1	Car on ramp (Ground)	74		74	12	8	4	10	15	2	-3			-24	33	23	31	21	28	18							40	30	40	30	40	30	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby (Ground)	69		69	12	8	4	15	15	2	-3			-24	29	19	27	17	24	14							34	24	34	24	34	24	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Ground)	74	2	76	200	100	40	2	15	2	-3			-24	39	29	36	26	32	22	43	33					45	35	45	35	45	35	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car door closure (Poldium)	75	2	77	200	100	40	2	15	1.2	-2			-24	41	31	38	28	34	24	44	34					47	37	47	37	47	37	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car on ramp (Poldium)	74		74	200	100	40	10	15	1.2	-2			-24	45	35	42	32	38	28	48	38	48	38	48	38	52	42	52	42	52	42	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
	Car passby (Poldium)	69		69	200	100	40	15	15	1.2	-2			-24	42	32	39	29	35	25	45	35	45	35	45	35	47	37	47	37	47	37	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Poldium)	74	2	76	4	4	4	2	15	1.2	-2			-24	23	13	23	13	23	13													Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car on ramp (Basement)	74		74	4	4	4	10	11			-25		-21	8		8		8								14	4	14	4	14	4	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car door closure (Basement)	75	2	77	4	4	4	2	11			-25		-21	4		4		4														Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby (Basement)	69		69	4	4	4	15	11			-25		-21	5		5		5								12	2	12	2	12	2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Basement)	74	2	76	4	4	4	2	11			-25		-21	3		3		3														Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Rec area inc pool (L6)	78	2	80	4	4	4	900	16					-24	55	45	55	45	55	45	60	50	60	50	60	50	67	57	67	57	67	57	No	No	No	No	No	No	No	No	No
	Gym (L6)	79	2	81	4	4	4	900	8			-22		-18	40	30	40	30	40	30	44	34	44	34	44	34	51	41	51	41	51	41	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	Total														56	46	56	46	55	45	61	51	61	51	61	51	67	57	67	57	67	57	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
	Criteria																																	50	35	30	55	40	35	65	45	40
	Car door closure (Ground)	75	2	77	12	8	4	2	6	2	-3			-16	36	26	34	24	31	21														Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Car on ramp (Ground)	74		74	12	8	4	10	12	2	-3			-22	35	25	33	23	30	20							42	32	42	32	42	32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby (Ground)	69		69	12	8	4	15	20	2	-3			-26	27	17	25	15	22	12							32	22	32	22	32	22	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Ground)	74	2	76	200	100	40	2	6	2	-3			-16	48	38	45	35	41	31	52	42					54	44	54	44	54	44	Yes	No	No	Yes	Yes	Yes	No	No	No
	Car door closure (Poldium)	75	2	77	200	100	40	2	6	1.2	-2			-16	50	40	47	37	43	33	53	43					56	46	56	46	56	46	Yes	No	No	Yes	No	No	Yes	No	No
	Car on ramp (Poldium)	74		74	200	100	40	10	12	1.2	-2			-22	48	38	45	35	41	31	51	41	51	41	51	41	55	45	55	45	55	45	Yes	No	No	Yes	No	No	Yes	Yes	No
	Car passby (Poldium)	69		69	200	100	40	15	20	1.2	-2			-26	40	30	37	27	33	23	43	33	43	33	43	33	45	35	45	35	45	35	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Poldium)	74	2	76	4	4	4	2	6	1.2	-2			-16	32	22	32	22	32	22													Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car on ramp (Basement)	74		74	4	4	4	10	20			-25		-26	3		3		3								9		9		9		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car door closure (Basement)	75	2	77	4	4	4	2	6			-25		-16	10		10		10														Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby (Basement)	69		69	4	4	4	15	12			-25		-22	5		5		5								12	2	12	2	12	2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Basement)	74	2	76	4	4	4	2	6			-25		-16	9		9		9														Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Rec area inc pool (L6)	78	2	80	4	4	4	900	26			-5		-28	47	37	47	37	47	37	52	42	52	42	52	42	59	49	59	49	59	49	Yes	No	No	Yes	No	No	Yes	No	No
	Gym (L6)	79	2	81	4	4	4	900	7			-22		-17	42	32	42	32	42	32	46	36	46	36	46	36	53	43	53	43	53	43	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
	Total														55	45	53	43	51	41	58	48	55	45	55	45	63	53	63	53	63	53	**No**	**No**	**No**	**No**	**No**	**No**	**Yes**	**No**	**No**
	Criteria																																	50	35	30	55	40	35	65	45	40
	Car door closure (Ground)	75	2	77	12	8	4	2	42					-33	22	12	20	10	17	7														Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Car on ramp (Ground)	74		74	12	8	4	10	64					-36	23	13	21	11	18	8							30	20	30	20	30	20	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby (Ground)	69		69	12	8	4	15	42					-32	24	14	22	12	19	9							29	19	29	19	29	19	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Ground)	74	2	76	200	100	40	2	42					-32	34	24	31	21	27	17	38	28					40	30	40	30	40	30	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car door closure (Poldium)	75	2	77	200	100	40	2	42					-32	35	25	32	22	28	18	38	28					41	31	41	31	41	31	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car on ramp (Poldium)	74		74	200	100	40	10	64					-36	35	25	32	22	28	18	38	28	38	28	38	28	42	32	42	32	42	32	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby (Poldium)	69		69	200	100	40	15	45					-33	35	25	32	22	28	18	38	28	38	28	38	28	40	30	40	30	40	30	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Poldium)	74	2	76	4	4	4	2	42					-32	17	7	17	7	17	7													Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car on ramp (Basement)	74		74	4	4	4	10	64			-25		-36													6		6		6		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car door closure (Basement)	75	2	77	4	4	4	2	42			-25		-32																			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car passby (Basement)	69		69	4	4	4	15	45			-25		-33													7		7		7		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start (Basement)	74	2	76	4	4	4	2	42			-25		-32																			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Rec area inc pool (L6)	78	2	80	4	4	4	900	50					-34	46	36	46	36	46	36	51	41	51	41	51	41	58	48	58	48	58	48	Yes	No	No	Yes	No	No	Yes	No	No
	Gym (L6)	79	2	81	4	4	4	900	45			-22		-33	26	16	26	16	26	16	30	20	30	20	30	20	37	27	37	27	37	27	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Total														47	37	47	37	46	36	52	42	51	41	51	41	58	48	58	48	58	48	**Yes**	**No**	**No**	**Yes**	**No**	**No**	**Yes**	**No**	**No**

*Correction due to tonality and impulsiveness as per AS1055:2018.

Some exceedances of the acoustic quality objective criteria are predicted at all receivers. However, as these criteria are already exceeded by the background noise levels, the impacts do not necessarily affect the acoustic amenity. Therefore, assessment to the background creep criteria only is recommended.

8.1.2 Background Creep

Based on assessment of all time periods, the noise source levels and predicted levels at the receiver locations are shown as follows:

Table 13: Onsite Background Creep Noise Levels, 15 minute

Receiver	Receivers 1. 9 Armrick Avenue (W) 2. 95-97 Old Burleigh Rd (N) 3. 100 Old Burleigh Rd (E) Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	No. of events per 15min Day	No. of events per 15min Eve	No. of events per 15min Night	Duration per event	Distance (m)	Barrier (height (m)) No	Barrier screening dB	Building TL or shield dB	Building screening dB	Dist atten. @-6dB/dd	Source L10-Leq dB	Source L1-Leq dB	LAeq adj,T ext. dB(A) Day	LAeq adj,T int. dB(A) Day	LAeq adj,T ext. dB(A) Eve	LAeq adj,T int. dB(A) Eve	LAeq adj,T ext. dB(A) Night	LAeq adj,T int. dB(A) Night	LAeq 15 min Compliance Day	Eve	Night
	Criteria																						59	58	56
	Car door closure (Ground)	75	2	77	3	2	1	2	15	2	-3			-24	3	6	28	18	26	16	23	13	Yes	Yes	Yes
1	Car on ramp (Ground)	74		74	3	2	1	10	15	2	-3			-24	3	7	33	23	31	21	28	18	Yes	Yes	Yes
	Car passby (Ground)	69		69	3	2	1	15	15	2	-3			-24	3	5	29	19	27	17	24	14	Yes	Yes	Yes
	Car start (Ground)	74	2	76	50	25	10	2	15	2	-3			-24	4	6	39	29	36	26	32	22	Yes	Yes	Yes
	Car door closure (Poldium)	75	2	77	50	25	10	2	15	1.2	-2			-24	3	6	41	31	38	28	34	24	Yes	Yes	Yes
	Car on ramp (Poldium)	74		74	50	25	10	10	15	1.2	-2			-24	3	7	45	35	42	32	38	28	Yes	Yes	Yes
	Car passby (Poldium)	69		69	50	25	10	15	15	1.2	-2			-24	3	5	42	32	39	29	35	25	Yes	Yes	Yes
	Car start (Poldium)	74	2	76	1	1	1	2	15	1.2	-2			-24	4	6	23	13	23	13	23	13	Yes	Yes	Yes
	Car on ramp (Basement)	74		74	1	1	1	10	11			-25		-21	3	6	8		8		8		Yes	Yes	Yes
	Car door closure (Basement)	75	2	77	1	1	1	2	11			-25		-21	3	5	4		4		4		Yes	Yes	Yes
	Car passby (Basement)	69		69	1	1	1	15	11			-25		-21	3	7	5		5		5		Yes	Yes	Yes
	Car start (Basement)	74	2	76	1	1	1	2	11			-25		-21	4	6	3		3		3		Yes	Yes	Yes
	Rec area inc pool (L6)	78	2	80	1	1	1	900	16					-25	5	12	55	45	55	45	55	45	Yes	Yes	Yes
	Gym (L6)	79	2	81	1	1	1	900	8			-22		-19	4	11	40	30	40	30	40	30	Yes	Yes	Yes
	Total																56	46	56	46	55	45	**Yes**	**Yes**	**Yes**
	Criteria																						59	58	56
	Car door closure (Ground)	75	2	77	3	2	1	2	6	2	-3			-16	3	6	36	26	34	24	31	21	Yes	Yes	Yes
2	Car on ramp (Ground)	74		74	3	2	1	10	12	2	-3			-22	3	7	35	25	33	23	30	20	Yes	Yes	Yes
	Car passby (Ground)	69		69	3	2	1	15	20	2	-3			-26	3	5	27	17	25	15	22	12	Yes	Yes	Yes
	Car start (Ground)	74	2	76	50	25	10	2	6	2	-3			-16	4	6	48	38	45	35	41	31	Yes	Yes	Yes
	Car door closure (Poldium)	75	2	77	50	25	10	2	6	1.2	-2			-16	3	6	50	40	47	37	43	33	Yes	Yes	Yes
	Car on ramp (Poldium)	74		74	50	25	10	10	12	1.2	-2			-22	3	7	48	38	45	35	41	31	Yes	Yes	Yes
	Car passby (Poldium)	69		69	50	25	10	15	20	1.2	-2			-26	3	5	40	30	37	27	33	23	Yes	Yes	Yes
	Car start (Poldium)	74	2	76	1	1	1	2	6	1.2	-2			-16	4	6	32	22	32	22	32	22	Yes	Yes	Yes
	Car on ramp (Basement)	74		74	1	1	1	10	20			-25		-26	3	6	3		3		3		Yes	Yes	Yes
	Car door closure (Basement)	75	2	77	1	1	1	2	6			-25		-16	3	5	10		10		10		Yes	Yes	Yes
	Car passby (Basement)	69		69	1	1	1	15	12			-25		-22	3	7	5		5		5		Yes	Yes	Yes
	Car start (Basement)	74	2	76	1	1	1	2	6			-25		-16	4	6	9		9		9		Yes	Yes	Yes
	Rec area inc pool (L6)	78	2	80	1	1	1	900	26			-5		-28	5	12	47	37	47	37	47	37	Yes	Yes	Yes
	Gym (L6)	79	2	81	1	1	1	900	7			-22		-17	4	11	42	32	42	32	42	32	Yes	Yes	Yes
	Total																55	45	53	43	51	41	**Yes**	**Yes**	**Yes**
	Criteria																						59	58	56
	Car door closure (Ground)	75	2	77	3	2	1	2	42					-33	3	6	22	12	20	10	17	7	Yes	Yes	Yes
3	Car on ramp (Ground)	74		74	3	2	1	10	64					-36	3	7	23	13	21	11	18	8	Yes	Yes	Yes
	Car passby (Ground)	69		69	3	2	1	15	42					-32	3	5	24	14	22	12	19	9	Yes	Yes	Yes
	Car start (Ground)	74	2	76	50	25	10	2	42					-32	4	6	34	24	31	21	27	17	Yes	Yes	Yes
	Car door closure (Poldium)	75	2	77	50	25	10	2	42					-32	3	6	35	25	32	22	28	18	Yes	Yes	Yes
	Car on ramp (Poldium)	74		74	50	25	10	10	64					-36	3	7	35	25	32	22	28	18	Yes	Yes	Yes
	Car passby (Poldium)	69		69	50	25	10	15	45					-33	3	5	35	25	32	22	28	18	Yes	Yes	Yes
	Car start (Poldium)	74	2	76	1	1	1	2	42					-32	4	6	17	7	17	7	17	7	Yes	Yes	Yes
	Car on ramp (Basement)	74		74	1	1	1	10	64			-25		-36	3	6							Yes	Yes	Yes
	Car door closure (Basement)	75	2	77	1	1	1	2	42			-25		-32	3	5							Yes	Yes	Yes
	Car passby (Basement)	69		69	1	1	1	15	45			-25		-33	3	7							Yes	Yes	Yes
	Car start (Basement)	74	2	76	1	1	1	2	42			-25		-32	4	6							Yes	Yes	Yes
	Rec area inc pool (L6)	78	2	80	1	1	1	900	50					-34	5	12	46	36	46	36	46	36	Yes	Yes	Yes
	Gym (L6)	79	2	81	1	1	1	900	45			-22		-33	4	11	26	16	26	16	26	16	Yes	Yes	Yes
	Total																47	37	47	37	46	36	**Yes**	**Yes**	**Yes**

*Correction due to tonality and impulsiveness as per AS1055:2018.

Compliance is predicted for onsite activities on the condition the recommendations presented in Section 10 are implemented.

8.1.3 Sleep Disturbance

The noise source levels and predicted levels of noise at the receiver locations are shown in Table Table 14.

Table 14: Sleep Disturbance from onsite activities – Night-time

Receiver	Receivers 1. 9 Armrick Avenue (W) 2. 95-97 Old Burleigh Rd (N) 3. 100 Old Burleigh Rd (E) Description	Source LAmax @1m dB(A)	Correction dB(A)*	Corrected dB(A)	Distance (m)	Barrier (height (m) No	Barrier screening dB	Building TL or shield dB	Building screening dB	Dist atten. @-6dB/dd	LAmax adj,T int. dB(A)	Complies Night dB(A)
1	Criteria											45
	Car door closure (Ground)	79	2	81	15	2	-3			-24	44	Yes
	Car on ramp (Ground)	77		77	15	2	-3			-24	40	Yes
	Car passby (Ground)	74		74	15	2	-3			-24	37	Yes
	Car start (Ground)	78	2	80	15	2	-3			-24	43	Yes
	Car door closure (Poldium)	79	2	81	15	1.2	-3			-24	44	Yes
	Car on ramp (Poldium)	77		77	15	1.2	-3			-24	40	Yes
	Car passby (Poldium)	74		74	15	1.2	-3			-24	37	Yes
	Car start (Poldium)	78	2	80	15	1.2	-3			-24	43	Yes
	Car on ramp (Basement)	77		77	11			-25		-21	21	Yes
	Car door closure (Basement)	79	2	81	11			-25		-21	25	Yes
	Car passby (Basement)	74		74	11			-25		-21	18	Yes
	Car start (Basement)	78	2	80	11			-25		-21	24	Yes
	Gym (L6)	89		89	8			-22		-18	39	Yes
2	Criteria											45
	Car door closure (Ground)	79		79	6	2	-3			-16	50	No
	Car on ramp (Ground)	77		77	12	2	-3			-22	42	Yes
	Car passby (Ground)	74	2	76	20	2	-3			-26	37	Yes
	Car start (Ground)	78	2	80	6	2	-3			-16	51	No
	Car door closure (Poldium)	79	2	81	6	1.2	-2			-16	53	No
	Car on ramp (Poldium)	77	2	79	12	1.2	-2			-22	45	Yes
	Car passby (Poldium)	74		74	20	1.2	-2			-26	36	Yes
	Car start (Poldium)	78		78	6	1.2	-2		-7	-16	43	Yes
	Car on ramp (Basement)	77		77	20			-25		-26	16	Yes
	Car door closure (Basement)	79		79	6			-25	-16	-16	12	Yes
	Car passby (Basement)	74		74	12			-25		-22	17	Yes
	Car start (Basement)	78		78	6			-25	-14	-16	13	Yes
	Gym (L6)	89		89	7			-22	-18	-17	22	Yes
3	Criteria											45
	Car door closure (Ground)	79		79	42					-32	37	Yes
	Car on ramp (Ground)	77		77	64					-36	31	Yes
	Car passby (Ground)	74	2	76	42					-32	34	Yes
	Car start (Ground)	78	2	80	42					-32	38	Yes
	Car door closure (Poldium)	79	2	81	42					-32	39	Yes
	Car on ramp (Poldium)	77	2	79	64					-36	33	Yes
	Car passby (Poldium)	74		74	45					-33	31	Yes
	Car start (Poldium)	78		78	42					-32	36	Yes
	Car on ramp (Basement)	77		77	64			-25		-36	6	Yes
	Car door closure (Basement)	79		79	42			-25		-32	12	Yes
	Car passby (Basement)	74		74	45			-25		-33	6	Yes
	Car start (Basement)	78		78	42			-25		-32	11	Yes
	Gym (L6)	89		89	45			-22		-33	24	Yes

*Correction due to tonality and impulsiveness as per AS1055:2018.

Exceedances of the sleep disturbance criteria are predicted for the night-time period for receiver 2. Recommendations to reduce noise impacts to nearby sensitive receivers have been recommended in Section 10.

9. Offsite Sources

Assessment of typical noise impacts from the offsite source indicated in Figure 2 to the site was conducted utilising previous measurements of similar activities. The calculations assume nominated activities are located at a representative distance to each receiver location. Any relevant shielding or building transmission loss is taken into account.

9.1 Acoustic Quality Objectives

The average maximum noise source levels and predicted offsite levels at the onsite receiver locations are shown in Table 15. Note: L_{A10} and L_{A1} results are not shown in cases where the total duration of the events is less than the minimum time required e.g. $L_{A10(1hr)}$ requires noise events to occur for at least 360 seconds of an hour long period. L_{Aeq} results are not shown where the calculated total is less than 0dBA.

Table 15: Offsite Activities to Onsite Receivers - Acoustic Quality Objectives

Receiver	Receivers 1. Onsite receivers (southern façade) 2. Onsite receivers (western façade) Description	Source Leq@1m dB(A)	Correction dB(A)*	Corrected Leq@1m dB(A)	No. of events per 1hr Day	No. of events per 1hr Eve	No. of events per 1hr Night	Duration per event	Distance (m)	Barrier (height (m)) No	Barrier screening dB	Building Screening dB	Building Transmission Loss dB	Dist atten. @-6dB/dd	LAeq adj.,1hr ext. dB(A) Day	LAeq adj.,1hr int. dB(A) Day	LAeq adj.,1hr ext. dB(A) Eve	LAeq adj.,1hr int. dB(A) Eve	LAeq adj.,1hr ext. dB(A) Night	LAeq adj.,1hr int. dB(A) Night	LA10 adj.,1hr ext. dB(A) Day	LA10 adj.,1hr int. dB(A) Day	LA10 adj.,1hr ext. dB(A) Eve	LA10 adj.,1hr int. dB(A) Eve	LA10 adj.,1hr ext. dB(A) Night	LA10 adj.,1hr int. dB(A) Night	LA1 adj.,1hr ext. dB(A) Day	LA1 adj.,1hr int. dB(A) Day	LA1 adj.,1hr ext. dB(A) Eve	LA1 adj.,1hr int. dB(A) Eve	LA1 adj.,1hr ext. dB(A) Night	LA1 adj.,1hr int. dB(A) Night	Amenity LAeq Compliance			LA10 Compliance			LA1 Compliance		
																																			Day / eve	Day / eve indoor	Night indoor	Day / eve	Day / eve indoor	Night indoor	Day / eve	Day / eve indoor	Night indoor
	Criteria																																	50	35	30	55	40	35	65	45	40
	Car passby	69		69	44	32	16	15	27				-10	-29	23	13	21	11	18	8	26	16	26	16			28	18	28	18	28	18	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
1	Car door closure	75	2	77	44	32	16	2	27				-10	-29	22	12	21	11	18	8							28	18	28	18			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start	74	2	76	44	32	16	2	27				-10	-29	21	11	19	9	16	6							27	17	27	17			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified Music	90		90	4	4	4	900	79				-16	-38	36	26	36	26	36	26	38	28	38	28	38	28	40	30	40	30	40	30	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Voice conversation	70		70	4	4	4	900	40				-10	-32	27	17	27	17	27	17	29	19	29	19	29	19	31	21	31	21	31	21	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Outdoor dining	75		75	4	4	4	900	85				-10	-39	26	16	26	16	26	16	28	18	28	18	28	18	30	20	30	20	30	20	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Voice crowd (bowling green)	83		83	4	4	0	900	45				-10	-33	39	29	39	29			41	31	41	31			43	33	43	33			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Total														41	31	41	31	37	27	43	33	43	33	39	29	45	35	45	35	41	31	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
	Criteria																																	50	35	30	55	40	35	65	45	40
	Car passby	69		69	44	32	16	15	34				-10	-31	21	11	19	9	16	6	24	14	24	14			26	16	26	16	26	16	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Car door closure	75	2	77	44	32	16	2	34				-10	-31	20	10	19	9	16	6							26	16	26	16			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Car start	74	2	76	44	32	16	2	34				-10	-31	19	9	18	8	15	5							25	15	25	15			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Amplified Music	90		90	4	4	4	900	87				-16	-39	35	25	35	25	35	25	37	27	37	27	37	27	39	29	39	29	39	29	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Voice conversation	70		70	4	4	4	900	47				-10	-33	27	17	27	17	27	17	29	19	29	19	29	19	31	21	31	21	31	21	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Outdoor dining	75		75	4	4	4	900	90				-10	-39	26	16	26	16	26	16	28	18	28	18	28	18	30	20	30	20	30	20	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Voice crowd (bowling green)	83		83	4	4		900	50				-10	-34	39	29	39	29			41	31	41	31			43	33	43	33			Yes	Yes	n/a	Yes	Yes	n/a	Yes	Yes	n/a
	Total														41	31	41	31	36	26	43	33	43	33	38	28	45	35	45	35	40	30	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

*Correction due to tonality and impulsiveness as per AS1055:2018.

10. Recommendations

10.1 Road Traffic Noise

All building treatments were calculated using Australian Standard *AS3671:1989 'Road Traffic Noise Intrusion – Building Siting and Construction'*.

Compliance with Gold Coast City Plan Regional Infrastructure Overlay Code is predicted without the need for building façade treatments.

10.2 Onsite Activities

Based on the predicted noise levels and subjective assessment of the site and surrounds for all time periods, noise impacts at the residential receiver locations are predicted to comply on the condition the following acoustic treatments are implemented:

- We recommend that waste collection is conducted in accordance with existing residential collections in the area to reduce the potential for disturbance.
- Carpark finished surfaces should consist of materials which provide low tyre squeal characteristics. Any traversable drainage grates must be securely fastened.
- Use of the pool and communal area shall be limited to the day and evening periods (7am to 10pm) only.
- The gym shall have external windows and doors shut during use with windows constructed using 6.38mm laminate glass with acoustic seals to achieve a minimum Rw 31. We recommend the gym have provision for an alternative ventilation system similar to air-conditioning or mechanical ventilation to allow windows and doors to be closed during operation.

10.3 Acoustic Barrier

10.3.1 Ground Level

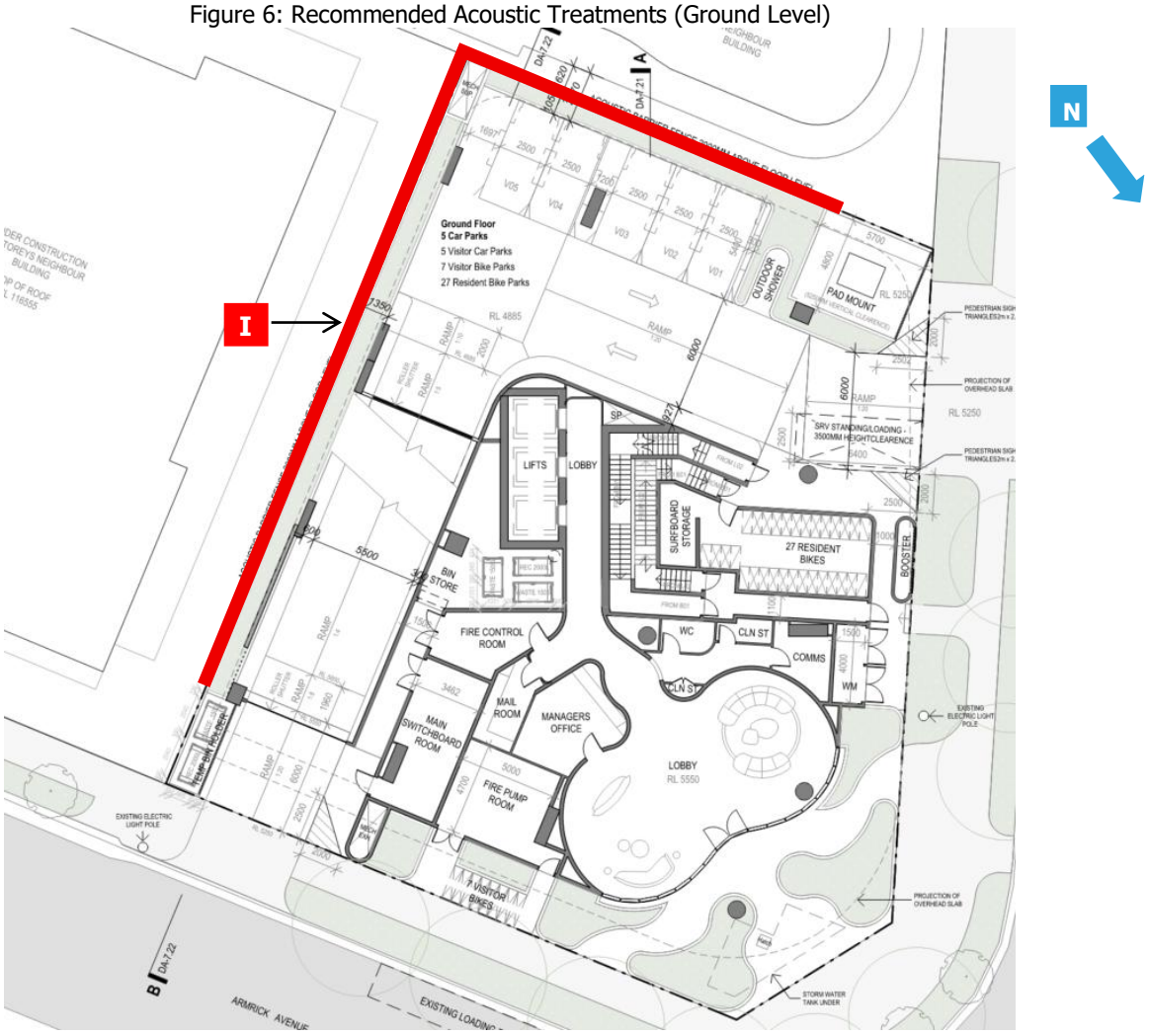
Acoustic barriers shall be constructed along the western and northern boundary on ground level. The barrier is shown in Figure 6.

The acoustic barriers should be constructed using either 16mm thick lapped timber (minimum 40% overlap), masonry, 9mm fibre cement sheet, Hebel, Perspex, plywood, or other materials with a minimum surface density of 11kg/m^2 and shall be free of gaps and holes.

Refer to Figure 6 for a visual representation of the acoustic barrier location requirements and

Table 17 for the height requirements.

Figure 6: Recommended Acoustic Treatments (Ground Level)



2m acoustic barrier above (Top of barrier RL7.5).

Table 16: Recommended Acoustic Barrier Height (Ground Level)

Reference Point	Approximate Finished Level (m)	Approximate Barrier Height (m)	Approximate Finished Barrier Level (m)
I	5.5	2.0	7.5

10.3.2 Levels 2-5

Acoustic barriers shall be constructed along the western and southern boundaries on levels 1 to 5. The barriers are shown in Figure 7.

The acoustic barriers should be constructed using either 16mm thick lapped timber (minimum 40% overlap), masonry, 9mm fibre cement sheet, Hebel, Perspex, plywood, or other materials with a minimum surface density of 11kg/m^2 and shall be free of gaps and holes.

Refer to Figure 7 for a visual representation of the acoustic barrier location requirements and

Table 17 for the height requirements.

Figure 7: Recommended Acoustic Treatments (Levels 2-5)

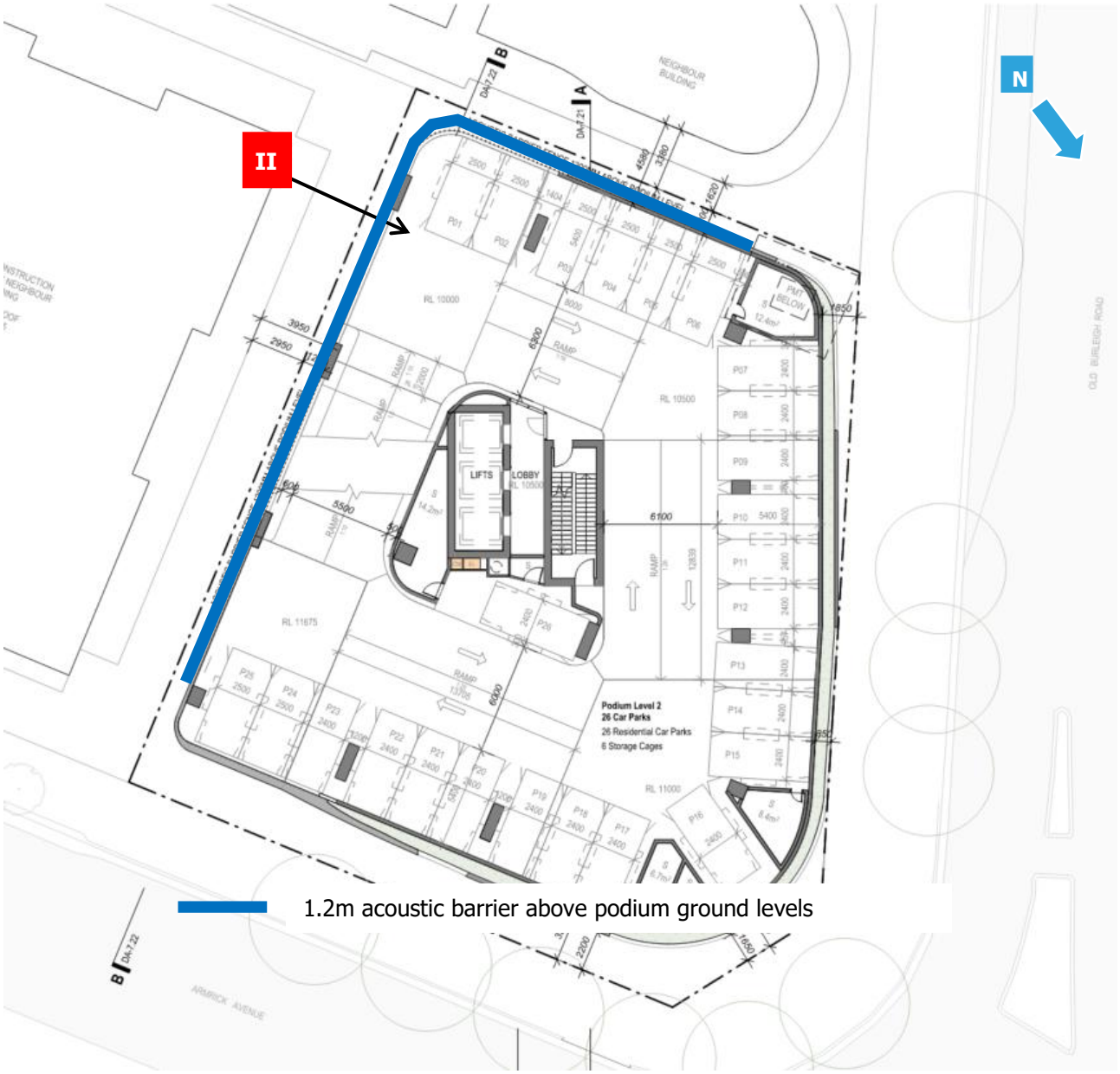


Table 17: Recommended Acoustic Barrier Height (Levels 2-5)

Reference Point		Approximate Finished Level (m)	Approximate Barrier Height (m)	Approximate Finished Barrier Level (m)
II	L2	9.45	1.2	10.65
	L3	12.80	1.2	14.00
	L4	15.60	1.2	16.80
	L5	18.77	1.2	19.97

10.3.3 Onsite Mechanical Plant

No information regarding mechanical services was available at the time of the assessment. We recommend that any new mechanical plant is designed to comply with the criteria stated in Section 6.2.2 with an assessment by a qualified acoustic consultant to be conducted prior to installation.

10.4 Offsite Activities

Based on the predicted noise levels presented in Section 9, compliance is predicted for offsite activities without the need for further acoustic treatments.

11. Conclusion

An environmental and road traffic noise assessment was conducted for the proposed residential development to be located at 99 and 101 Old Burleigh Road, Broadbeach. On the condition the recommendations detailed in Section 9 are implemented.

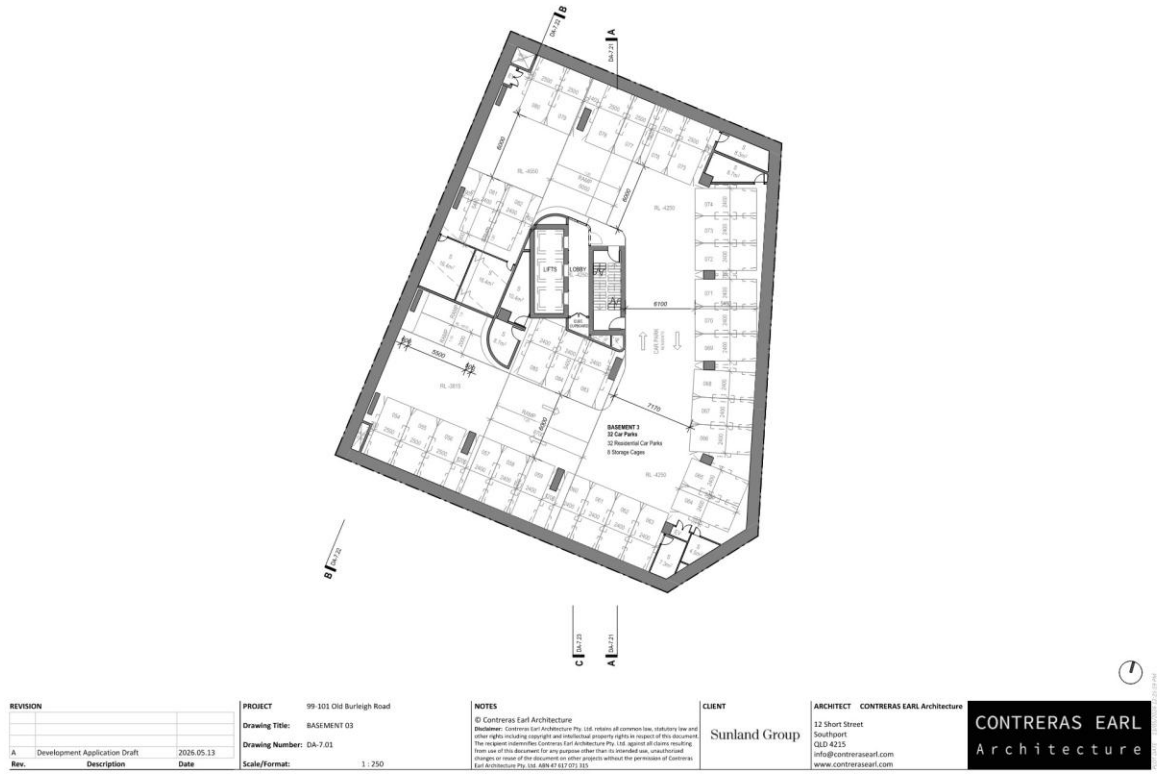
If you should have any queries, please do not hesitate to contact us.

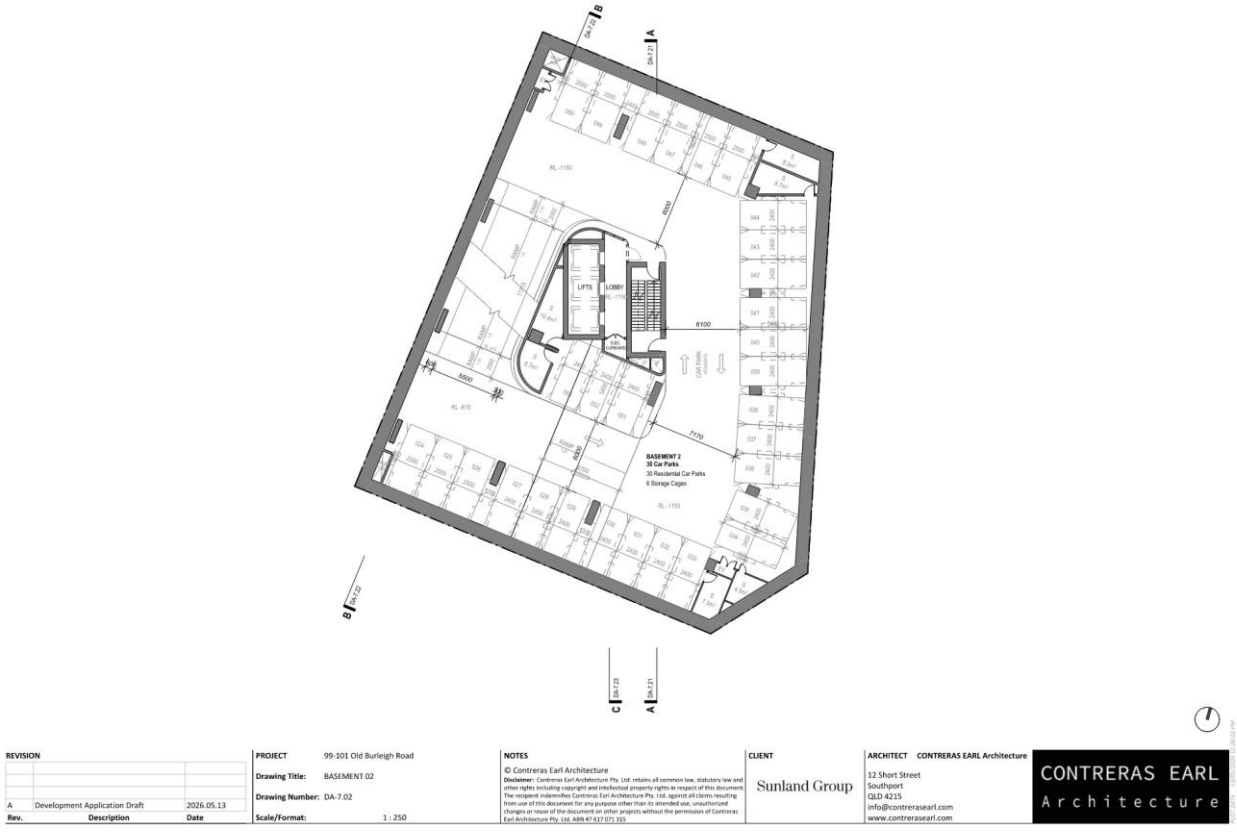
Report Prepared By

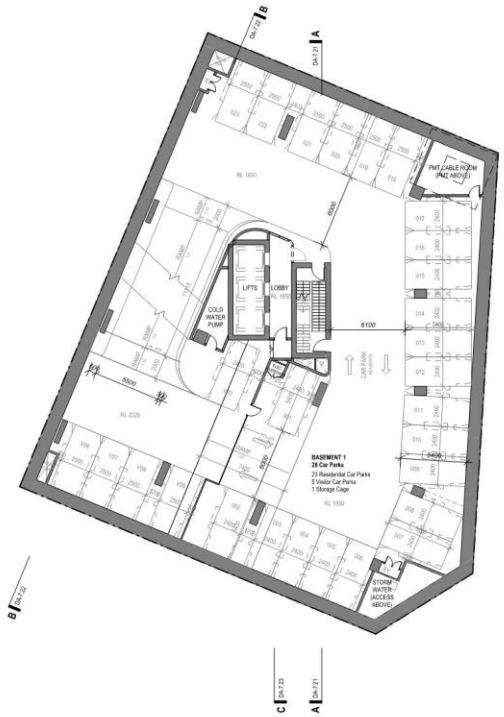
Kayleigh Styles
Acoustic Consultant
acousticworks)))

12. Appendices

12.1 Development Plans







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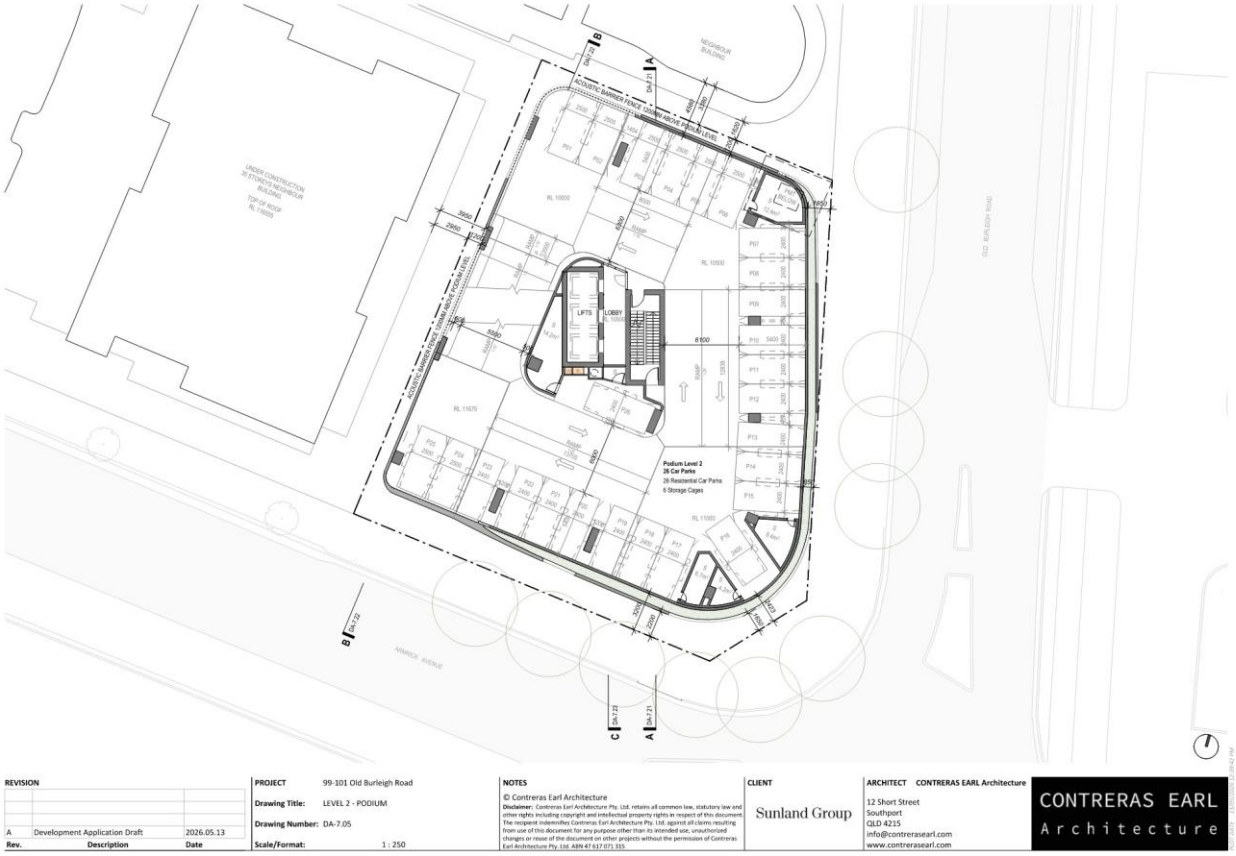
Podium Level 2
26 Car Parks
26 Residential Car Parks
6 Storage Cages
LIFTS
LOBBY
ACOUSTIC BARRIER FENCE 1200MM ABOVE PODIUM LEVEL
NEIGHBOUR BUILDING
UNDER CONSTRUCTION 35 STOREYS NEIGHBOUR BUILDING
TOP OF ROOF RL 116000
ARNHEIM AVENUE
OLD BURLEIGH ROAD
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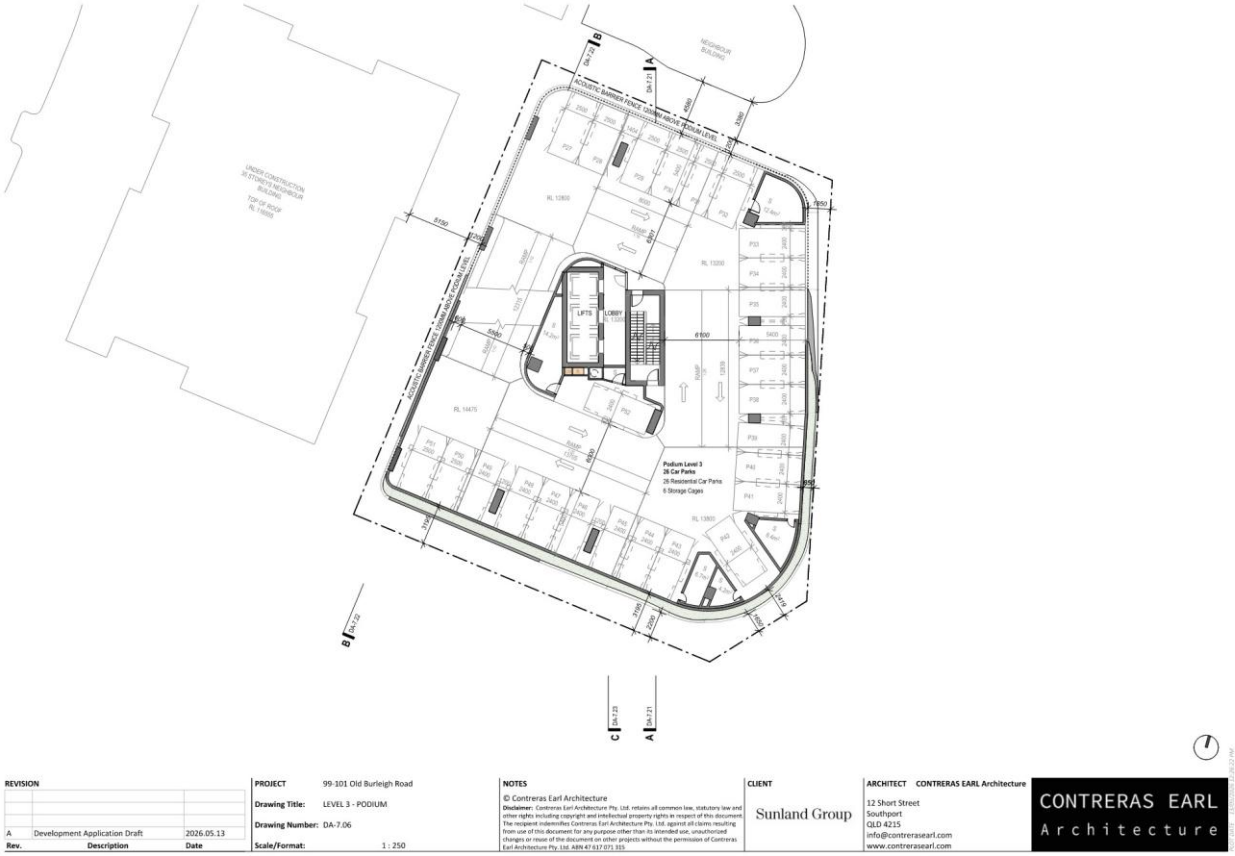
Podium Level 3
26 Car Parks
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NEIGHBOUR BUILDING
UNDER CONSTRUCTION 35 STOREYS NEIGHBOUR BUILDING
TOP OF ROOF RL 116000
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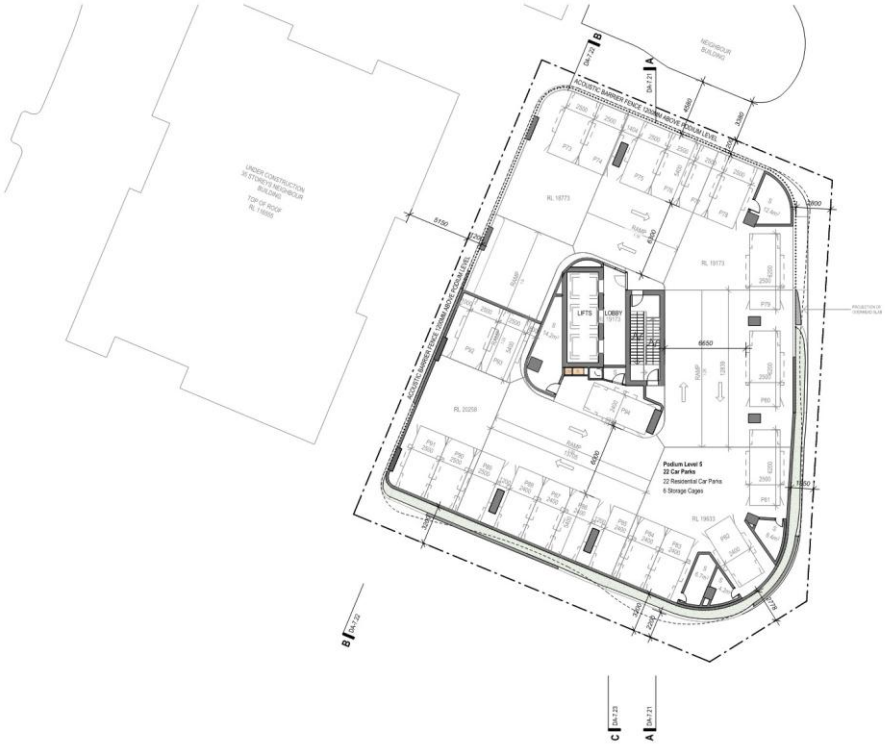

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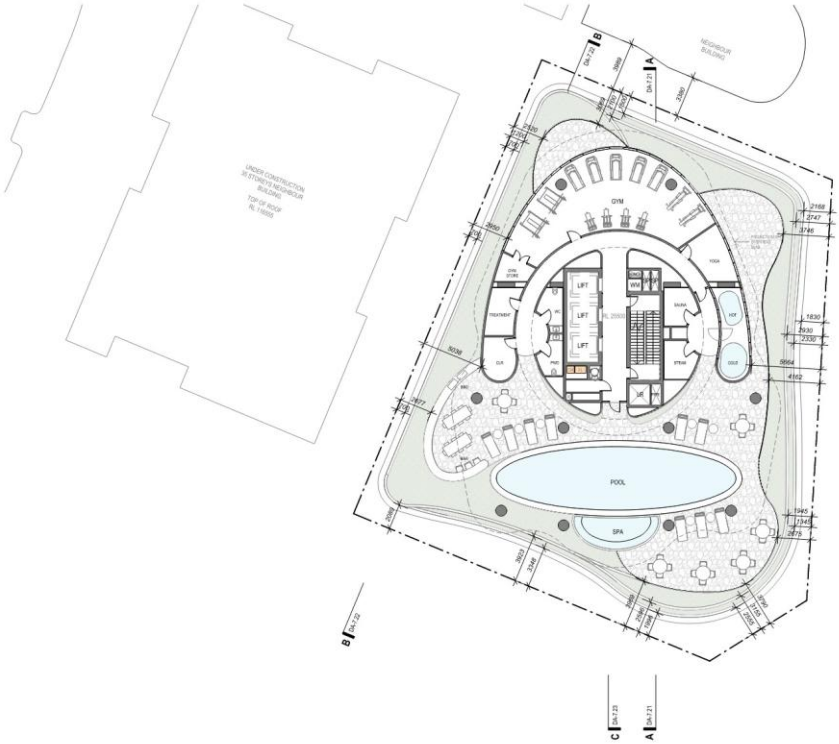

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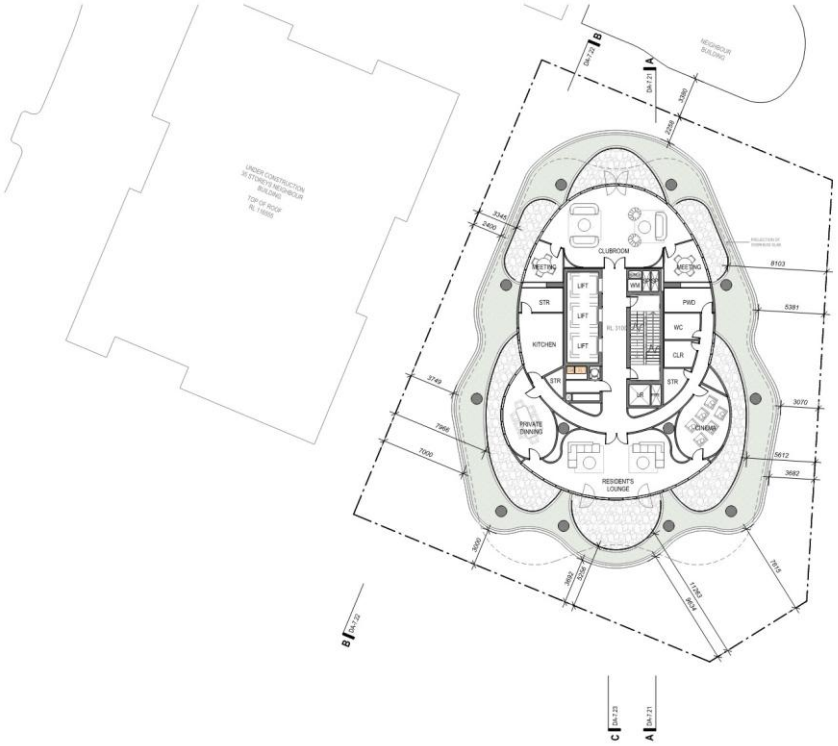

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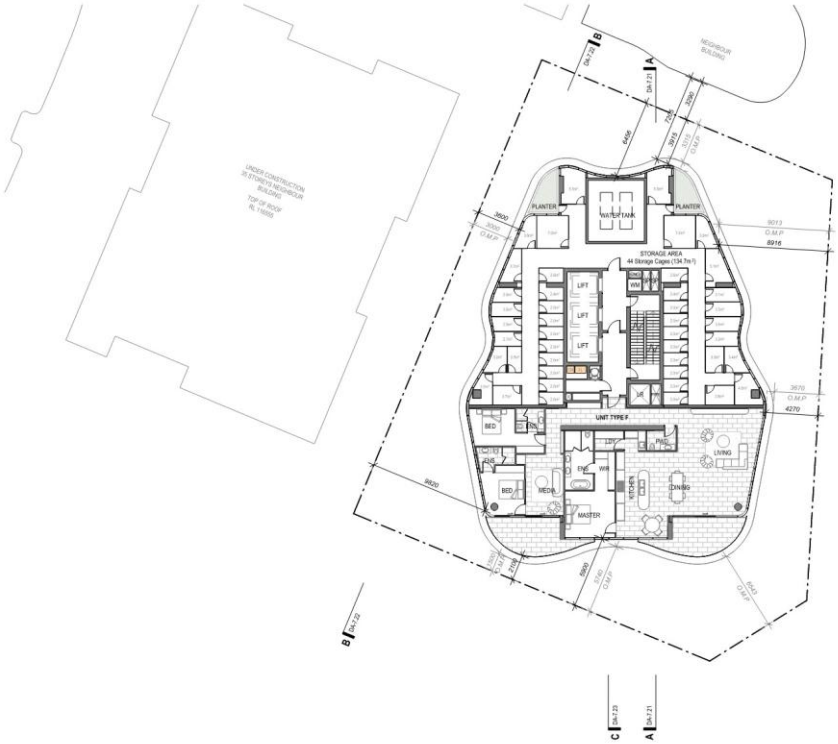

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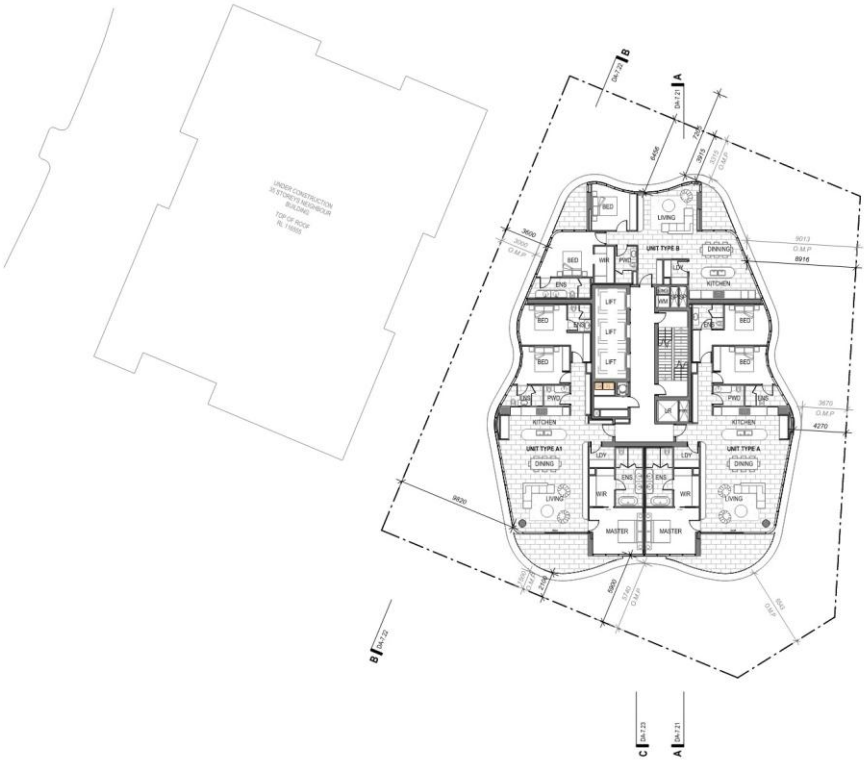

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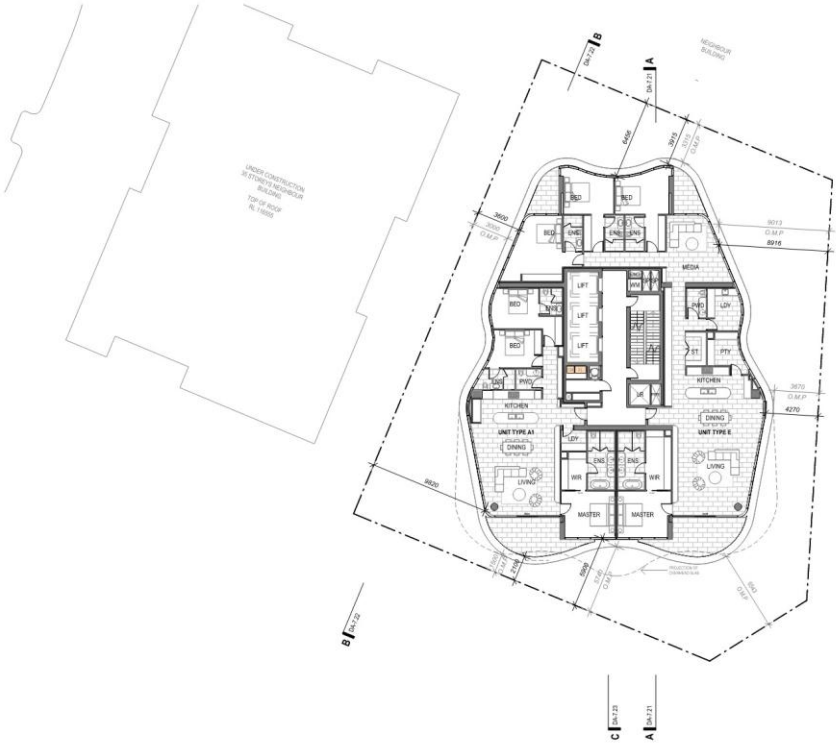

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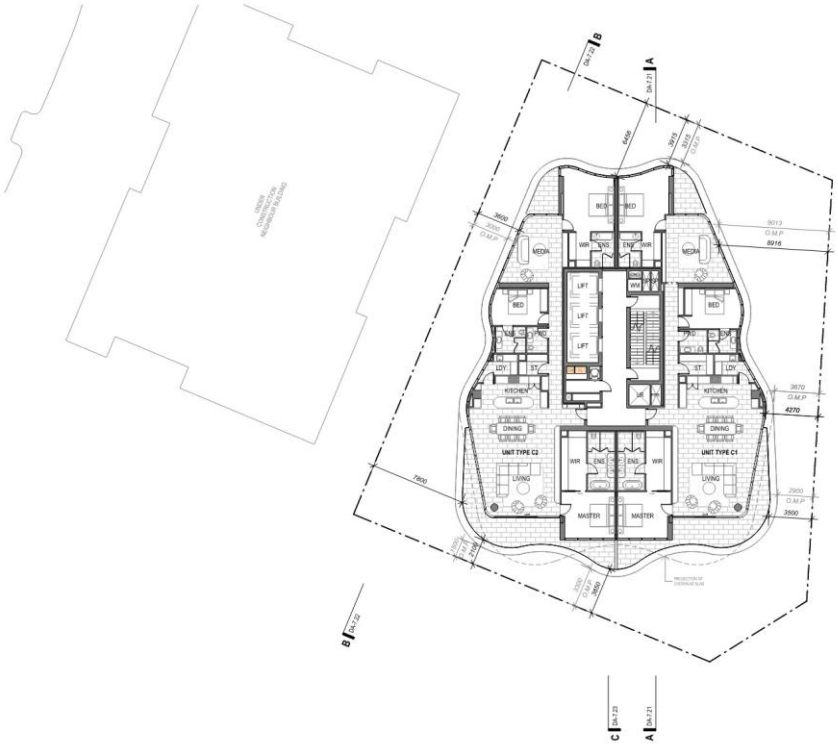

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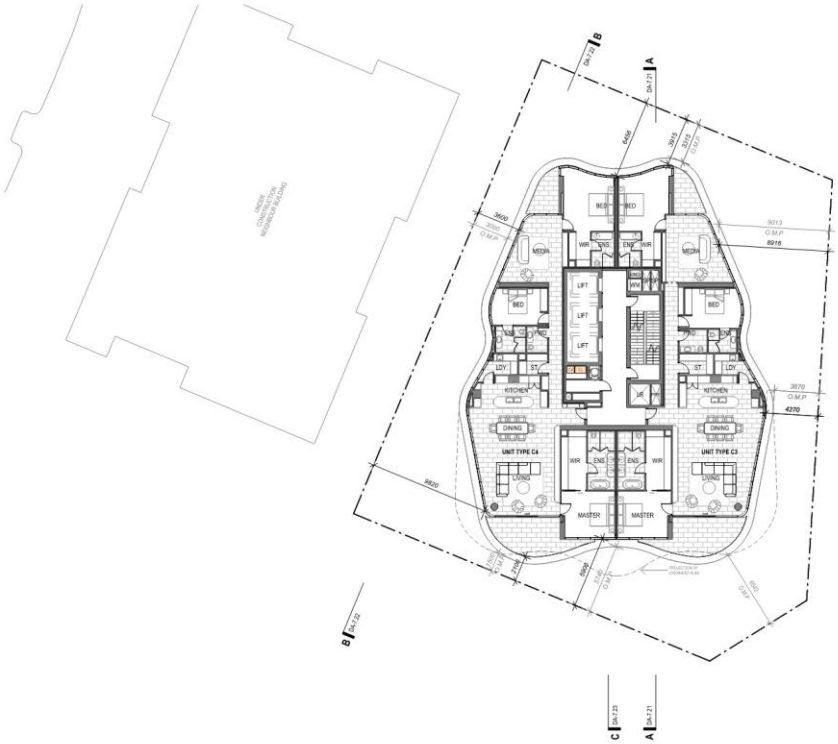

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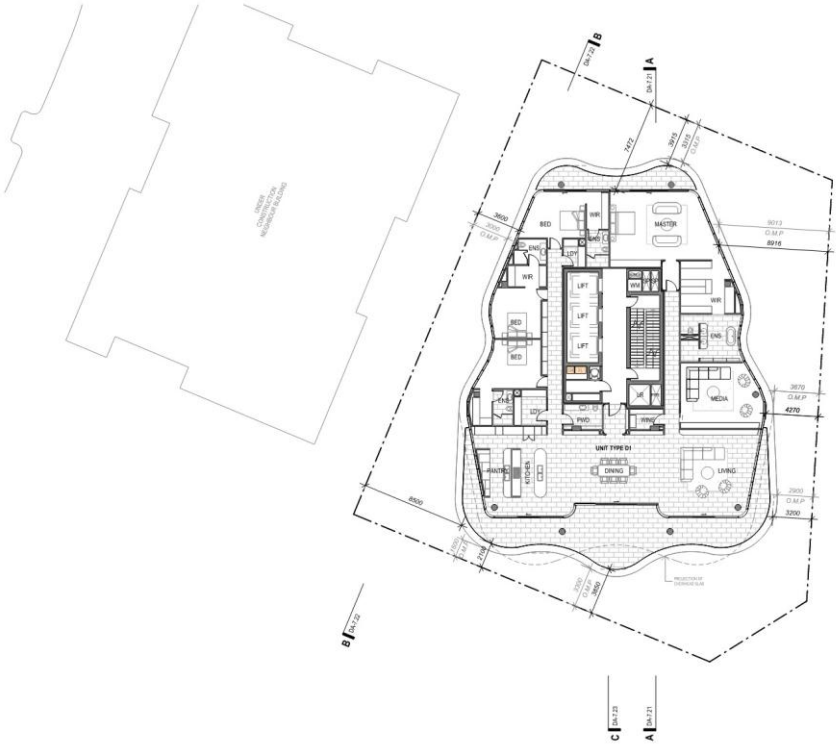

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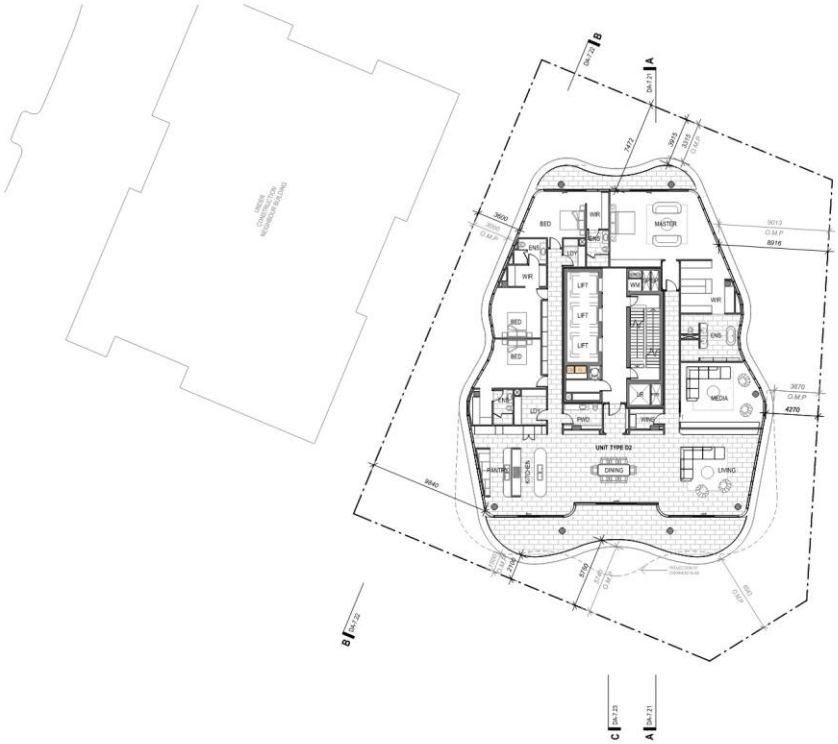

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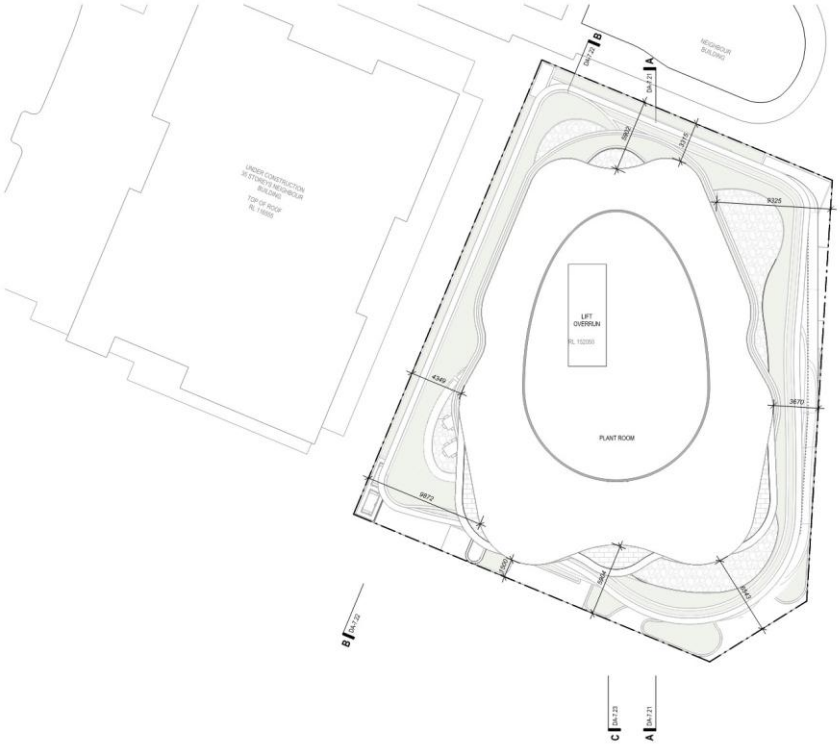

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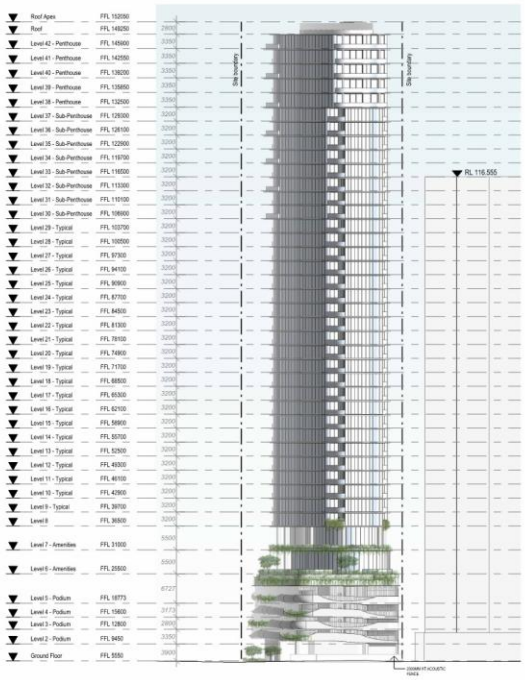
Rev.	Description	Date						



REVISION		
Rev.	Description	Date
A	Development Application Draft	2026.05.13

PROJECT 99-101 Old Burleigh Road
Drawing Title: NORTH ELEVATION
Drawing Number: DA-7.19
Scale/Format: 1 : 700

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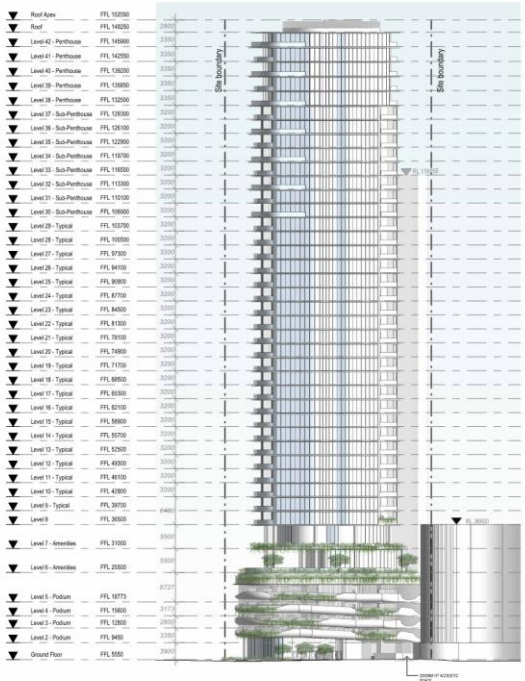

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Rev.	Description	Date
A	Development Application Draft	2026.05.13

PROJECT 99-101 Old Burleigh Road
Drawing Title: EAST ELEVATION
Drawing Number: DA-7.20
Scale/Format: 1 : 700

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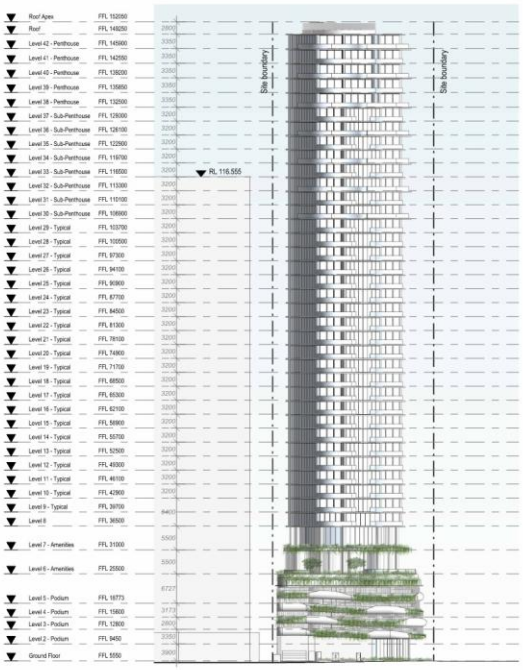

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A	Development Application Draft	2026.05.13
Rev.	Description	Date

PROJECT 99-101 Old Burleigh Road
Drawing Title: SOUTH ELEVATION
Drawing Number: DA-7.21
Scale/Format: 1 : 700

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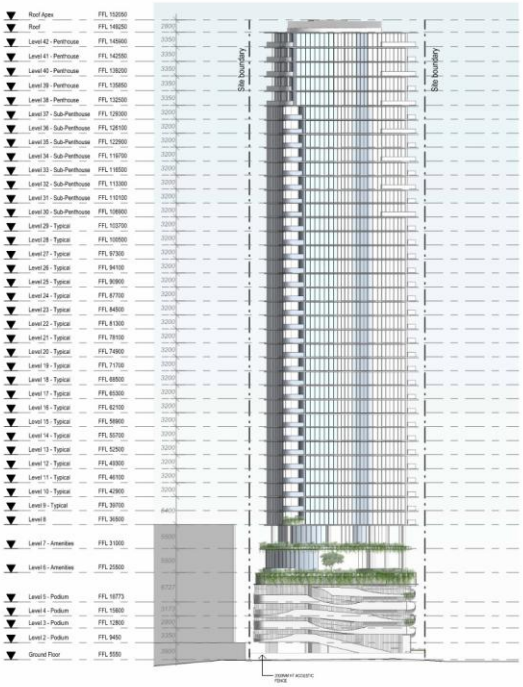

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A	Development Application Draft	2026.05.13
Rev.	Description	Date

PROJECT 99-101 Old Burleigh Road
Drawing Title: WEST ELEVATION
Drawing Number: DA-7.22
Scale/Format: 1 : 700

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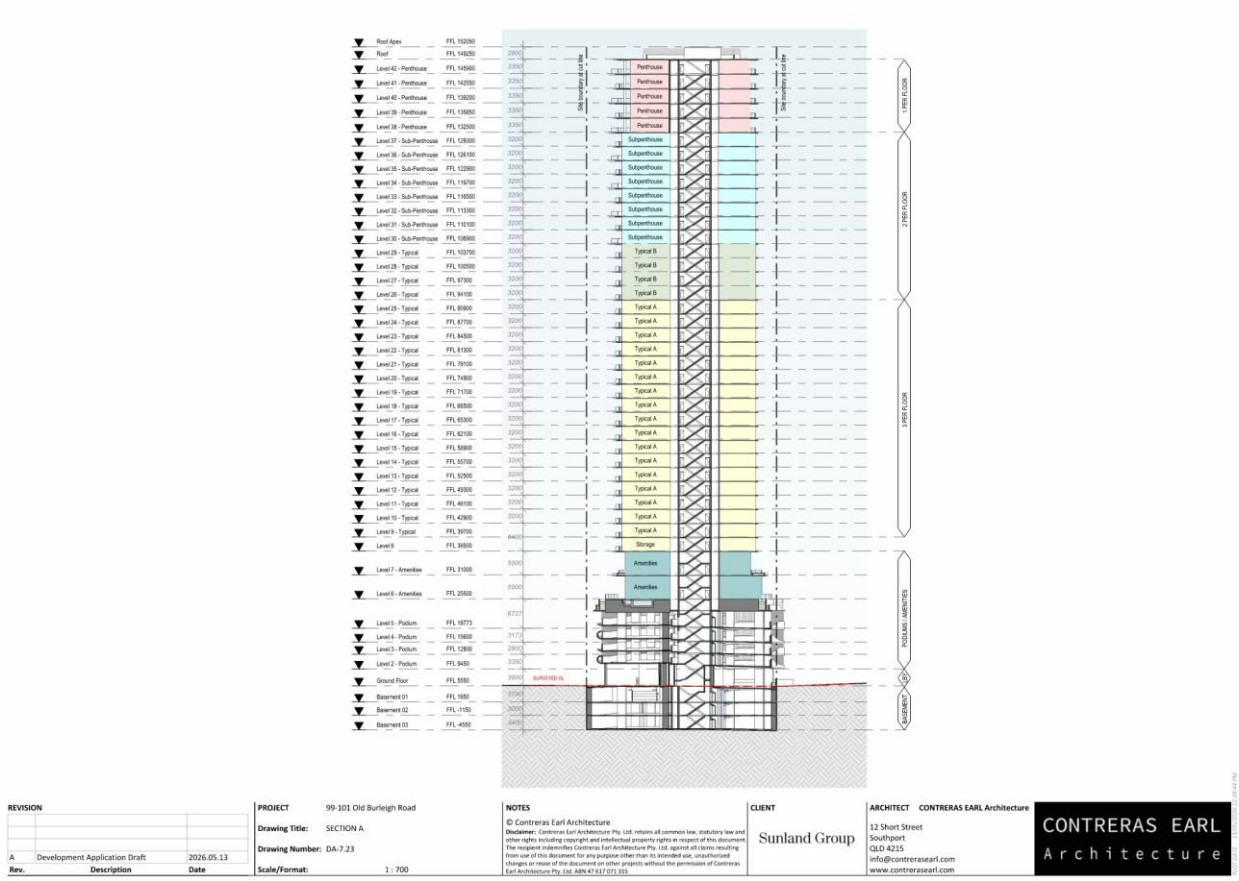

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Rev.	Description	Date
A	Development Application Draft	2026.05.13

PROJECT 99-101 Old Burleigh Road
Drawing Title: SECTION A
Drawing Number: DA-7.23
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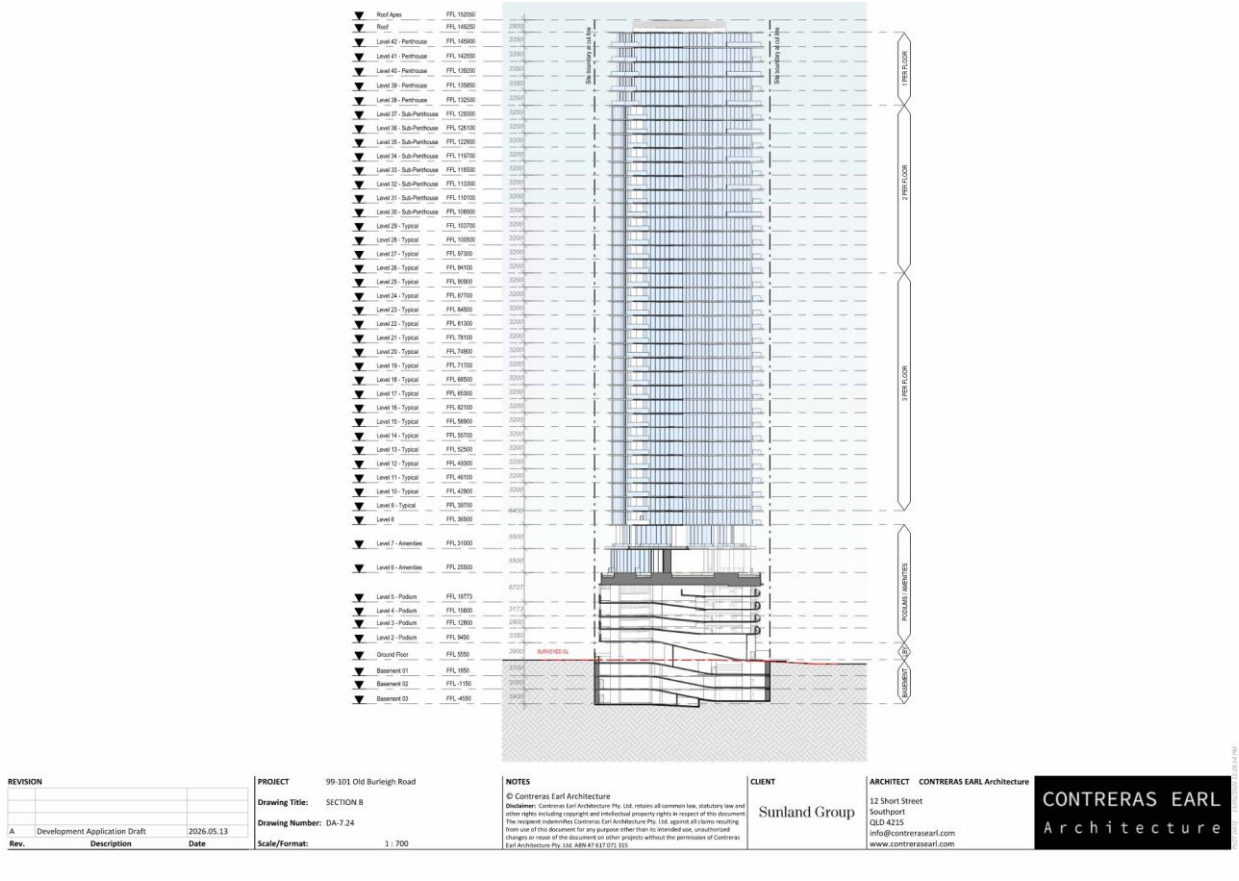

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Rev.	Description	Date
A	Development Application Draft	2026.05.13

PROJECT 99-101 Old Burleigh Road
Drawing Title: SECTION B
Drawing Number: DA-7.24
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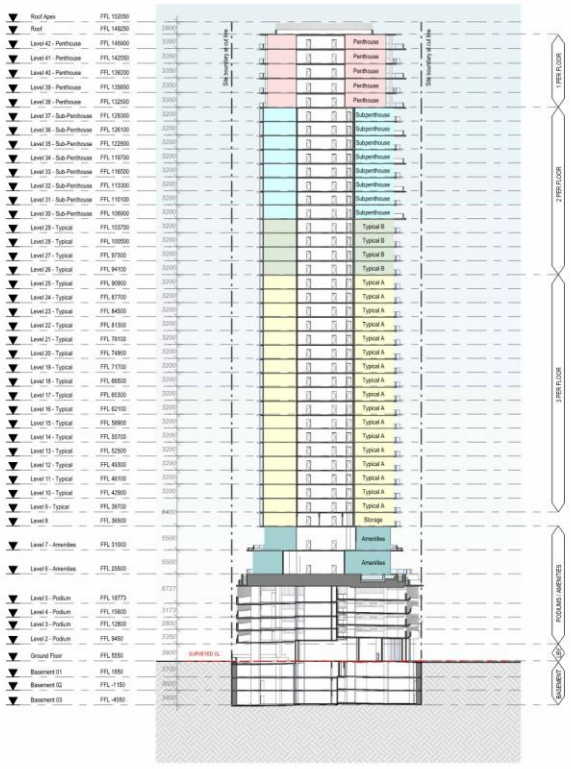

REVISION		
A	Development Application Draft	2026.05.13
Rev.	Description	Date

PROJECT 99-101 Old Burleigh Road
Drawing Title: SECTION C
Drawing Number: DA-7.25
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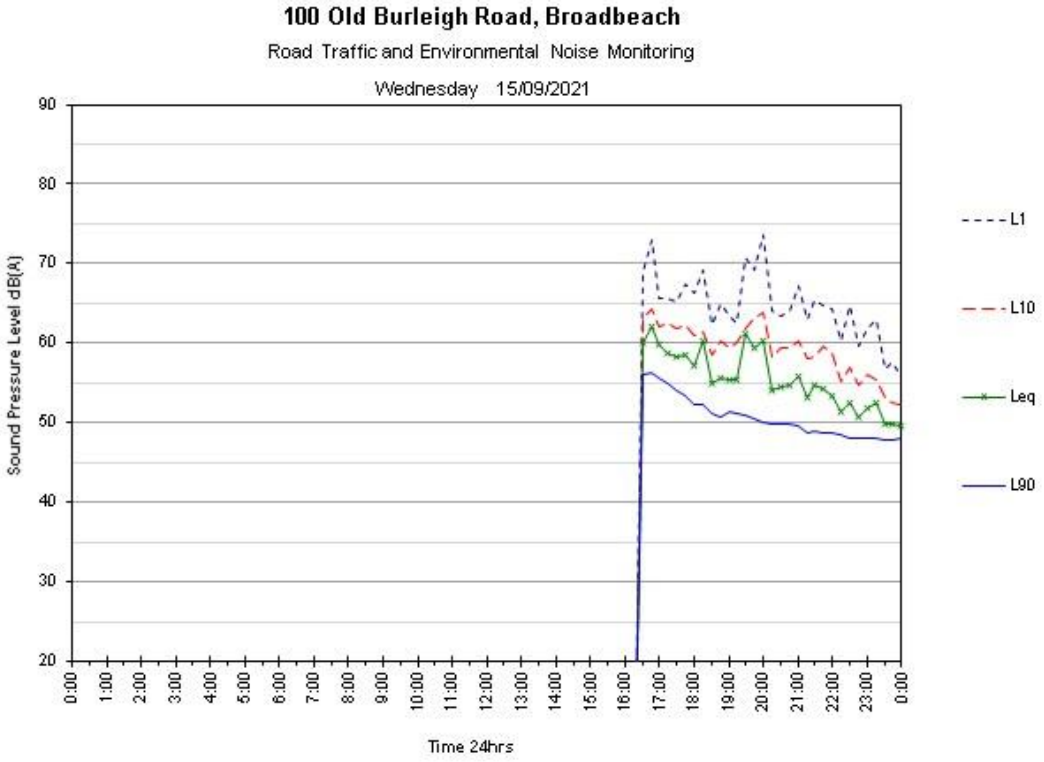
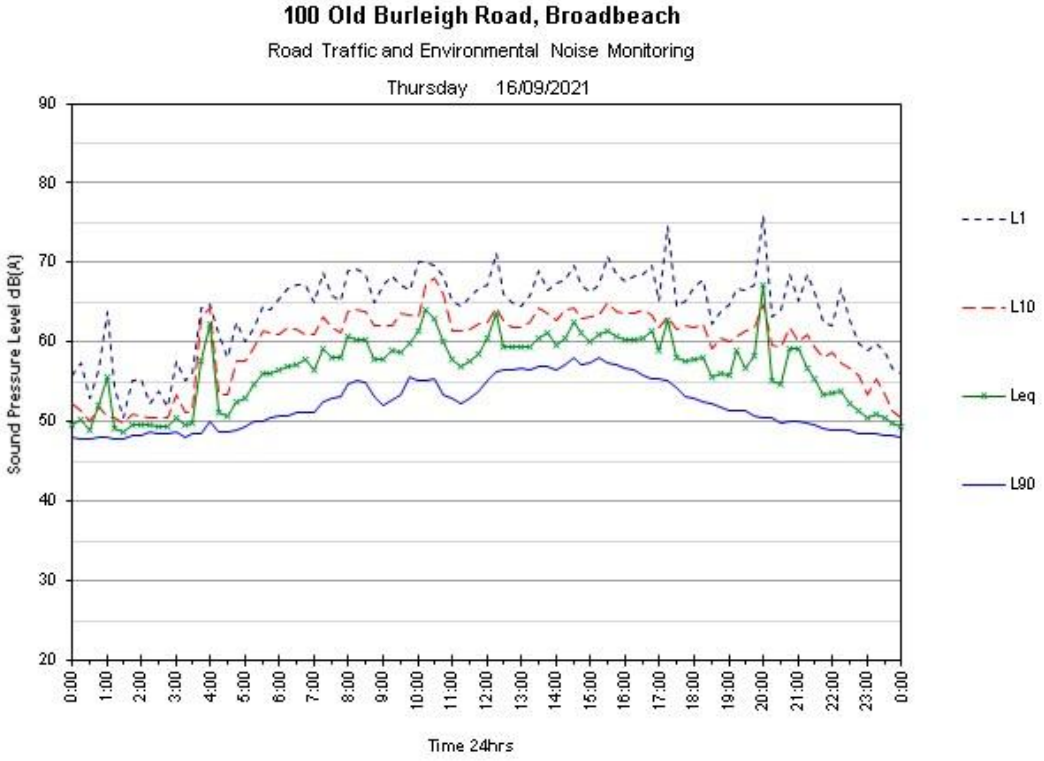
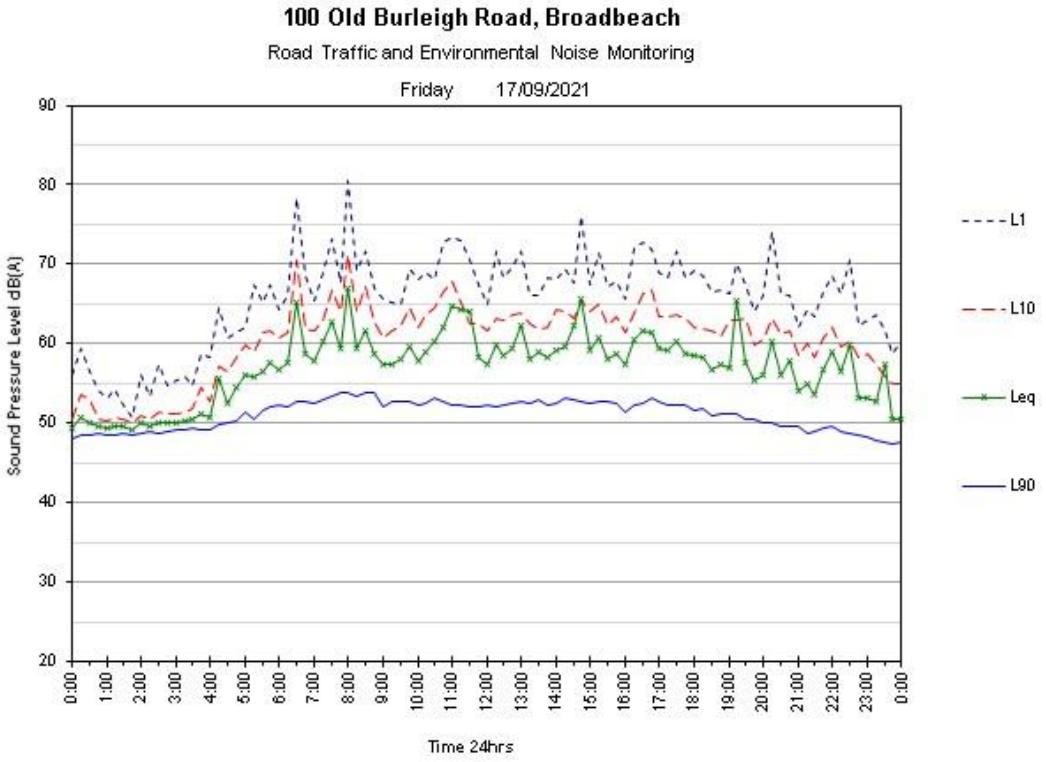
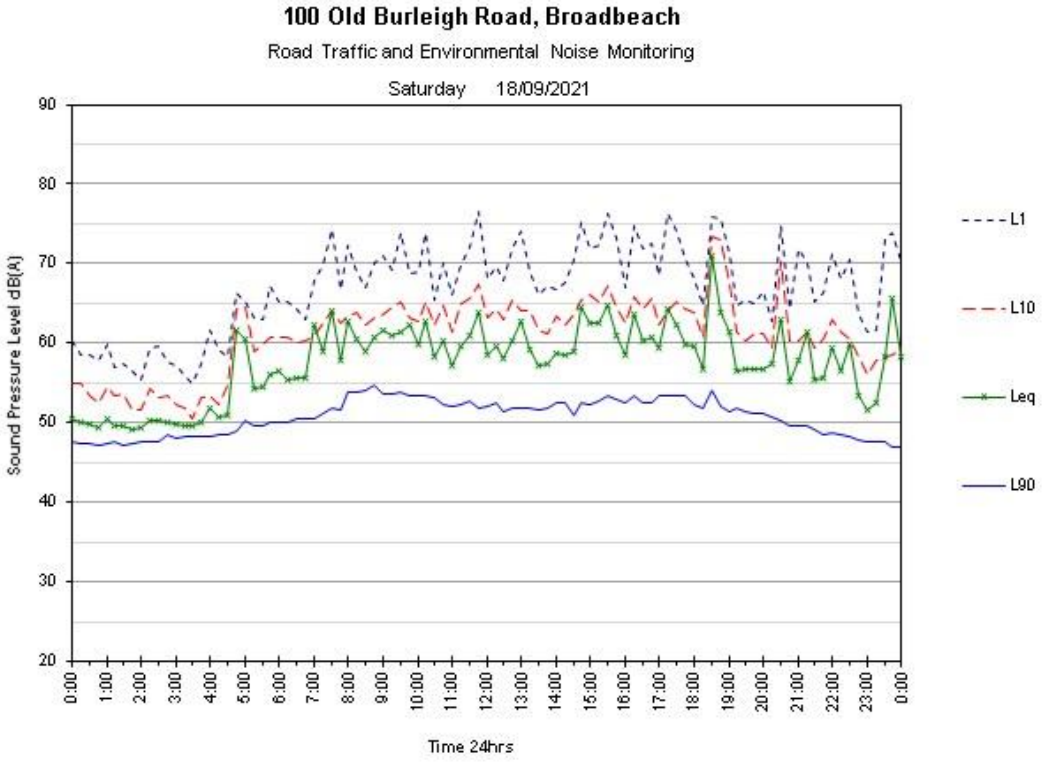
12.2 Noise Monitoring Charts






100 Old Burleigh Road, Broadbeach
Road Traffic and Environmental Noise Monitoring
Friday 17/09/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
Leq
L90


100 Old Burleigh Road, Broadbeach
Road Traffic and Environmental Noise Monitoring
Saturday 18/09/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
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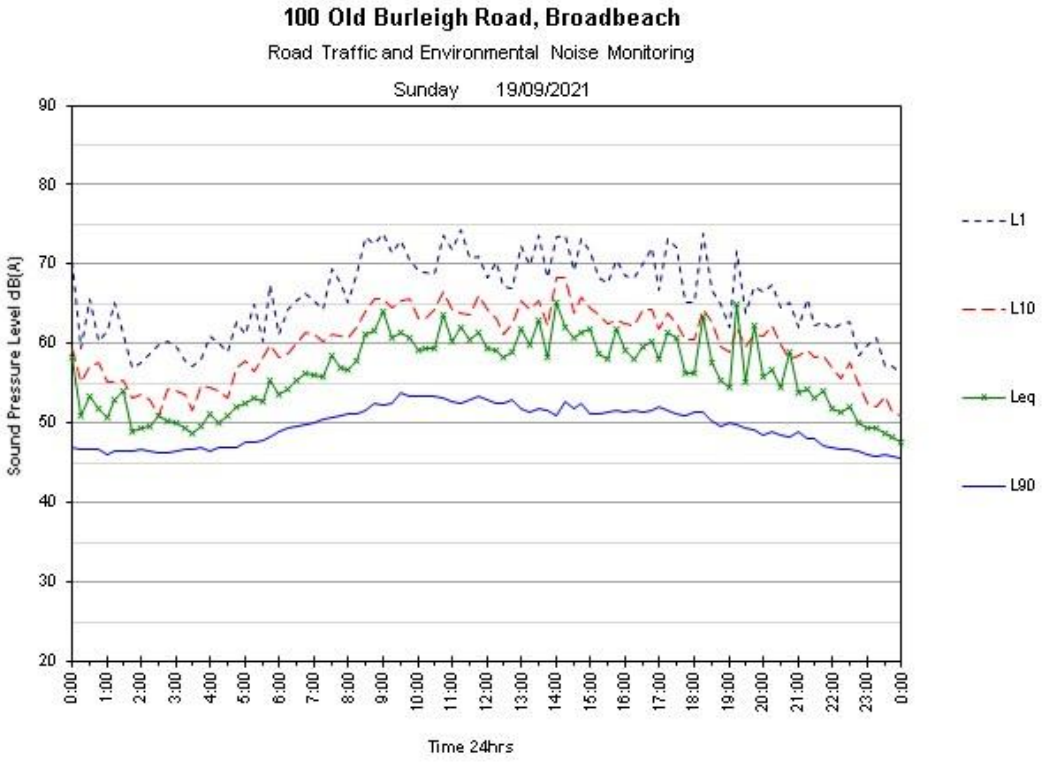
Time 24hrs
L1
L10
Leq
L90


100 Old Burleigh Road, Broadbeach
Road Traffic and Environmental Noise Monitoring
Sunday 19/09/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
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10:00
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14:00
15:00
16:00
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23:00
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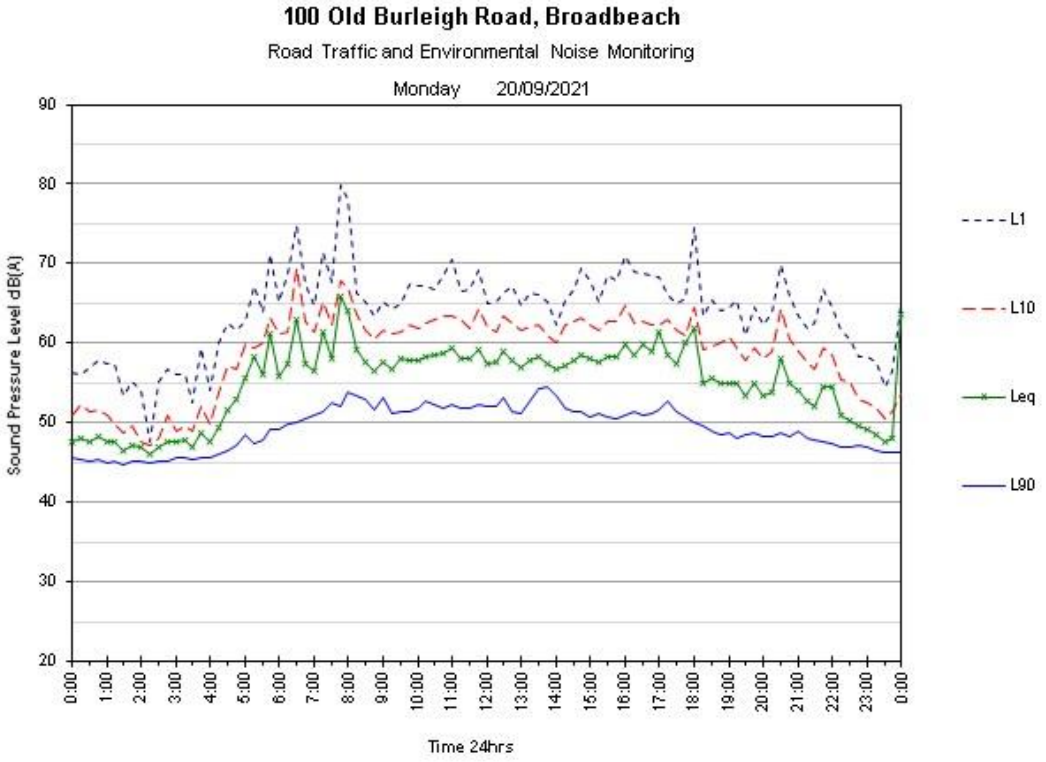
Time 24hrs
L1
L10
Leq
L90


100 Old Burleigh Road, Broadbeach
Road Traffic and Environmental Noise Monitoring
Monday 20/09/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
30
20
0:00
1:00
2:00
3:00
4:00
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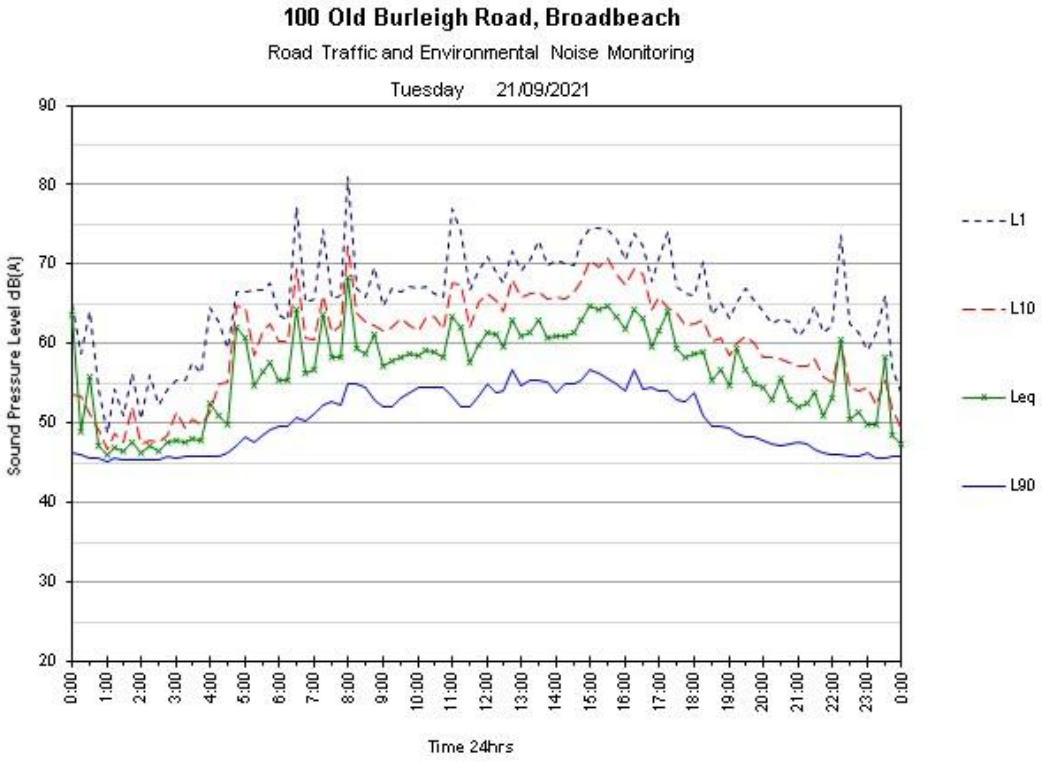
Time 24hrs
L1
L10
Leq
L90


100 Old Burleigh Road, Broadbeach
Road Traffic and Environmental Noise Monitoring
Tuesday 21/09/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
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5:00
6:00
7:00
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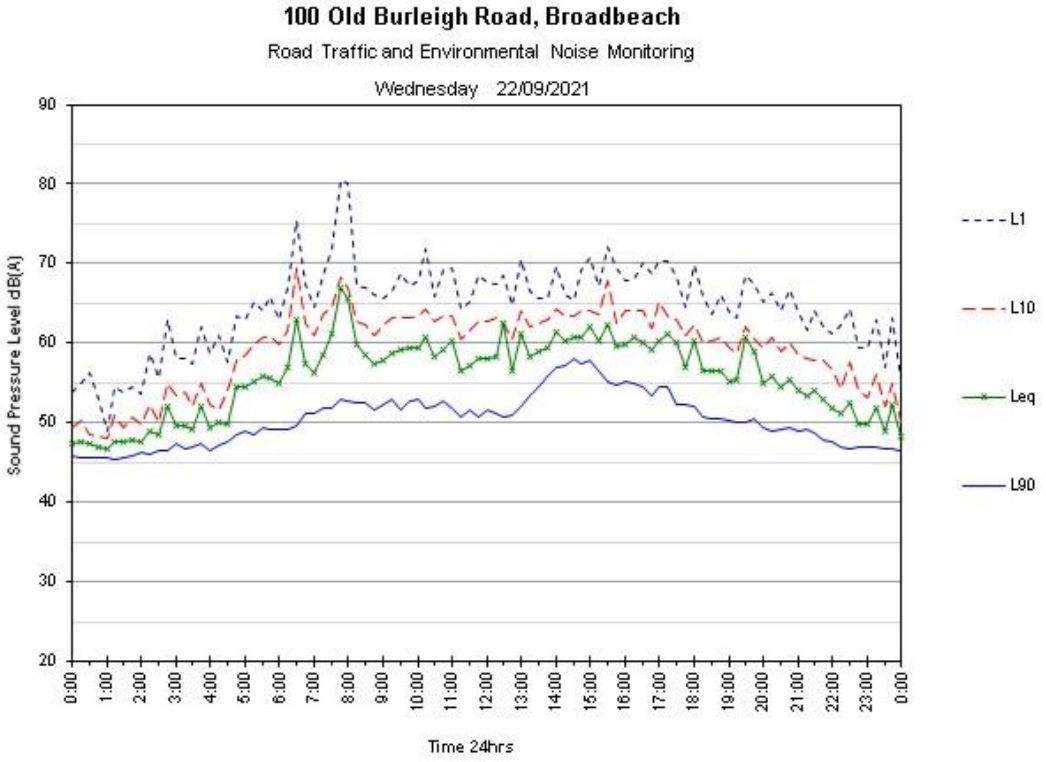
Time 24hrs
L1
L10
Leq
L90


100 Old Burleigh Road, Broadbeach
Road Traffic and Environmental Noise Monitoring
Wednesday 22/09/2021
Sound Pressure Level dB(A)
90
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70
60
50
40
30
20
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1:00
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3:00
4:00
5:00
6:00
7:00
8:00
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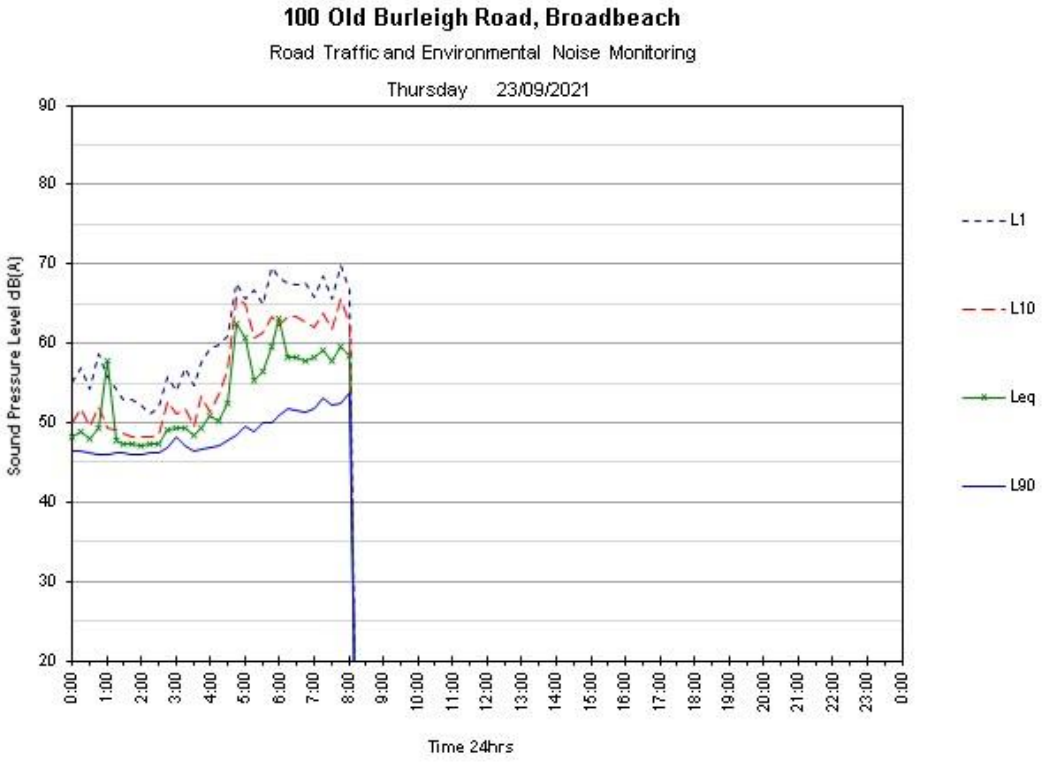
22:00
23:00
0:00
Time 24hrs
L1
L10
Leq
L90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Road Traffic and Environmental Noise Monitoring
Thursday 23/09/2021
Sound Pressure Level dB(A)
90
80
70
60
50
40
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20
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1:00
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3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
Leq
L90

Section 4 - SPECIALIST REPORTS

Statement of Landscape Intent
Prepared by Urbis

Zone Planning Group

101 Old Burleigh Rd

Broadbeach

Statement of Landscape Design Intent

PREPARED FOR:
ABEDIAN & Co.

URBIS

Acknowledgement of Country

Urbis acknowledges the Aboriginal and Torres Strait Islander peoples as the traditional custodians of all lands on which we do business and we pay our respects to Elders, past and present. We acknowledge the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

The river is the symbol of the Dreaming and the journey of life. The circles and lines represent people meeting and connections across time and space. When we are working in diff erent places, we can still be connected and work towards the same goal.

Title: Sacred River Dreaming
Artist: Hayley Pigram
Darug Nation
Sydney, NSW

ISSUE AUTHORISATION

Director: Matt Franzmann
Project Team: MF, KM, GR,TA
Project Code: P0059776
Prepared for: ICD Property

Rev	Date	Purpose	Prepared	Reviewed
A	24.04.2026	DA	KM	MF
B	15.05.2026	DA	TA	MF

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Context Analysis

Context

SITE ANALYSIS.

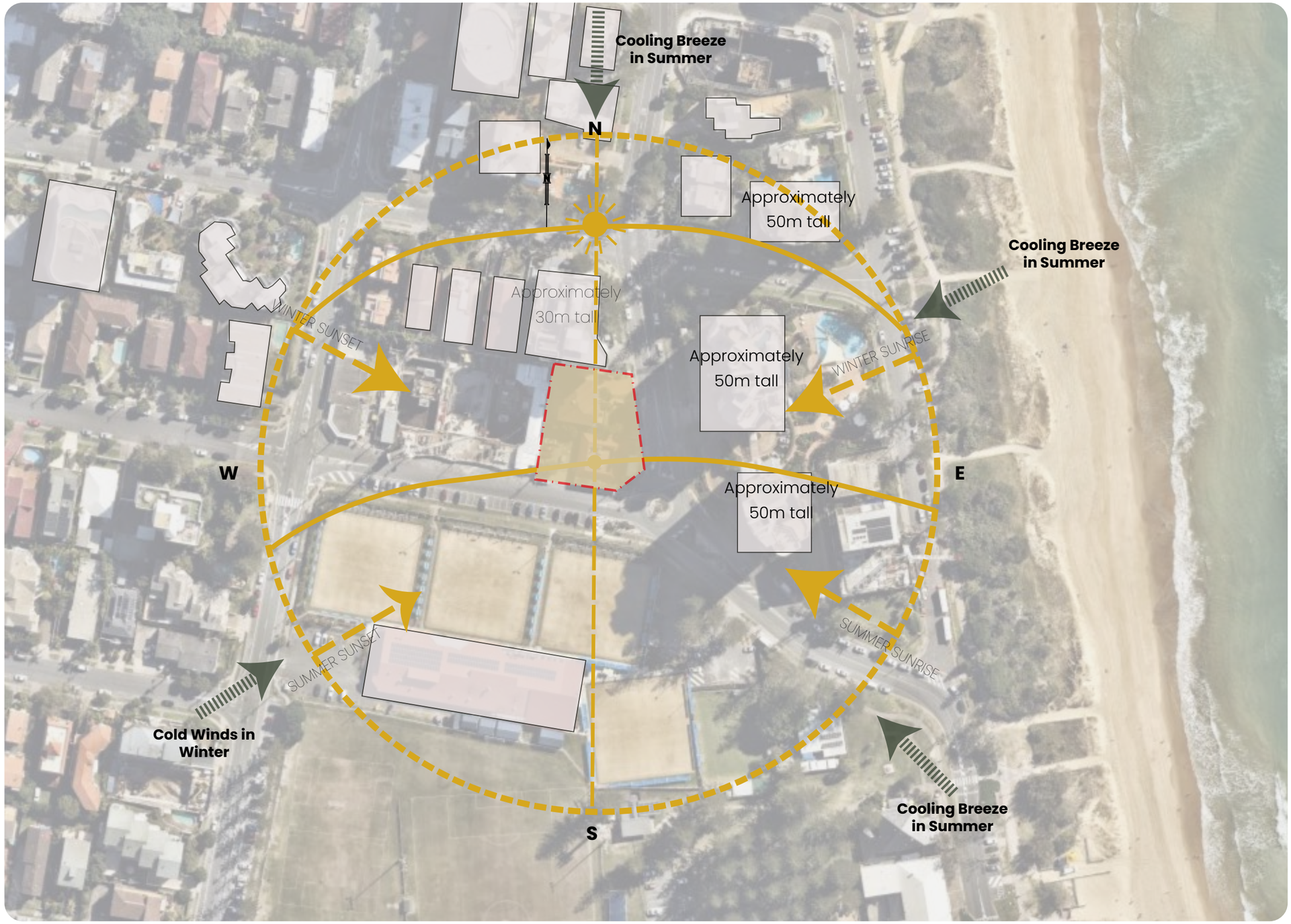
North Scale (NTS)

Climatic Analysis

Legend

Proposed Site

Wind Paths



CLIMATE SUMMARY

BROADBEACH PREVAILING WINDS:
SOUTH-EASTERLY TRADE WINDS COMMON MUCH OF THE YEAR

WIND SPEEDS GENERALLY PICK UP IN THE WARMER MONTHS

AVERAGE WINTER TEMPERTURE : 12 °C

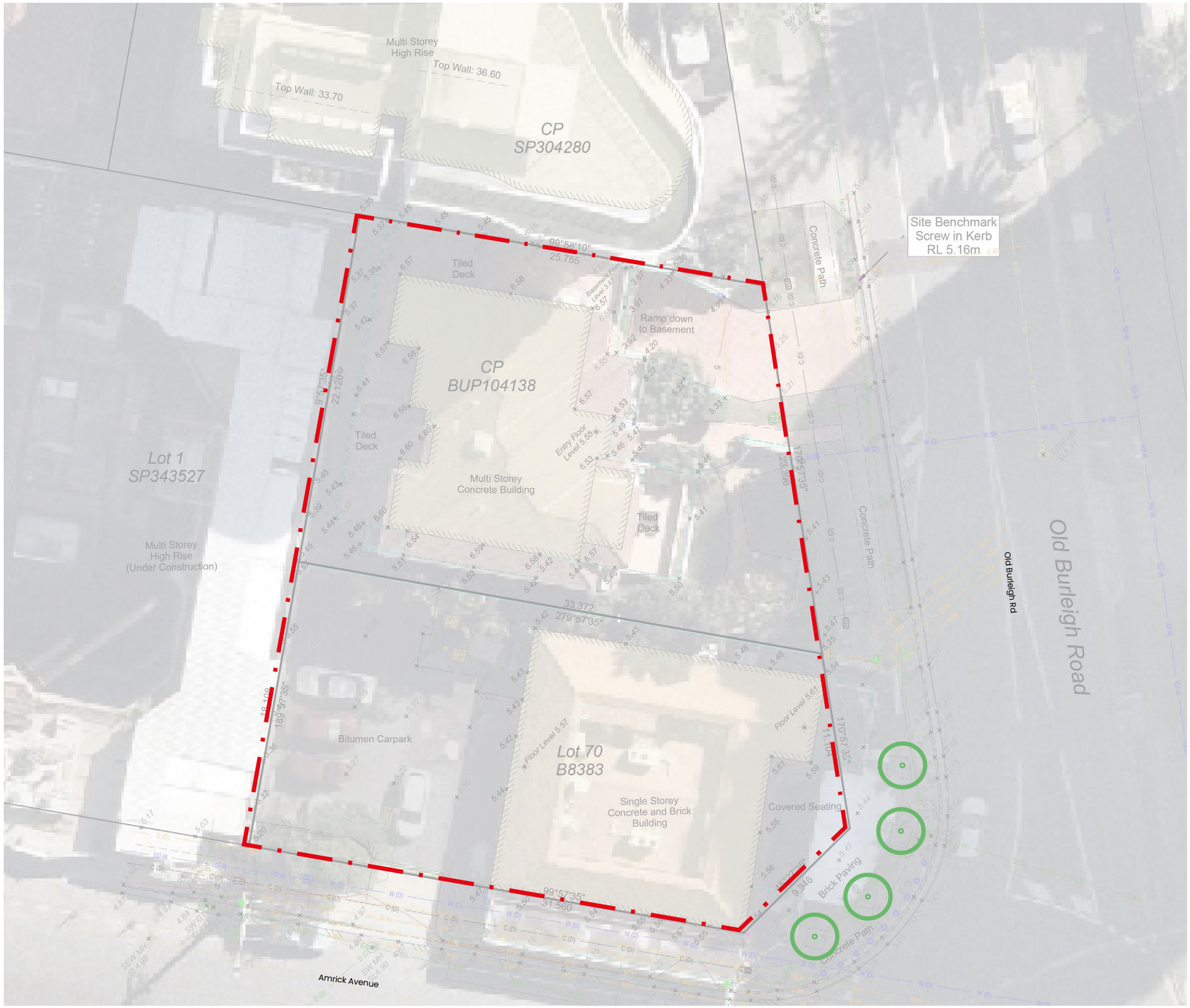
AVERAGE SUMMER TEMPERTURE: 29 °C

North

Survey & Tree Retention

Legend

- Tree to be retained
- Tree to be removed
- Boundary



SITE ANALYSIS.

North Scale 1:250 @ A3

Site Photographs

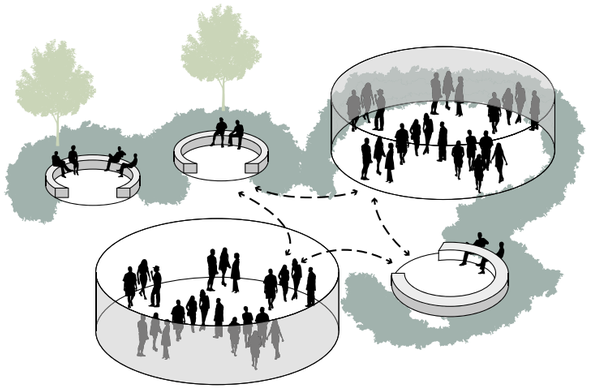
Key Plan

North Scale (NTS)

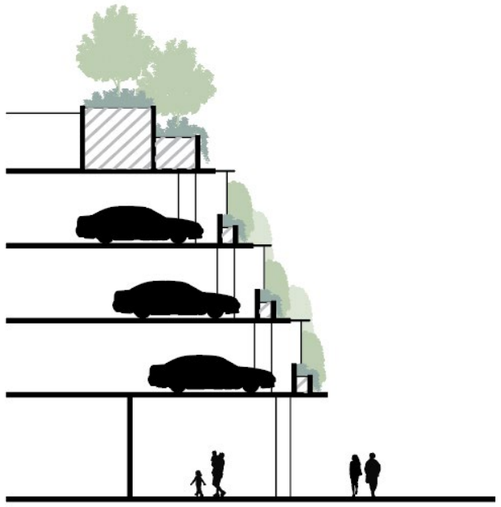
Design Approach

LANDSCAPE PRINCIPLES

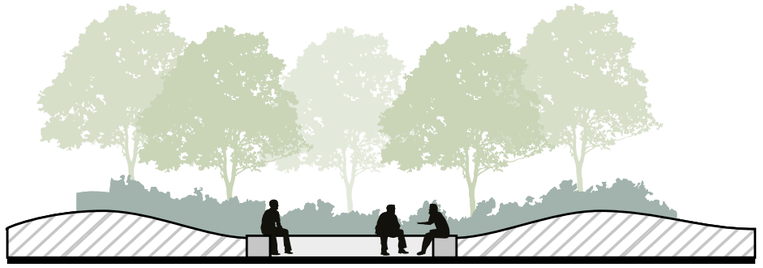
SITE WIDE



Landscape space extension



Soften building interface



Defined landscape rooms

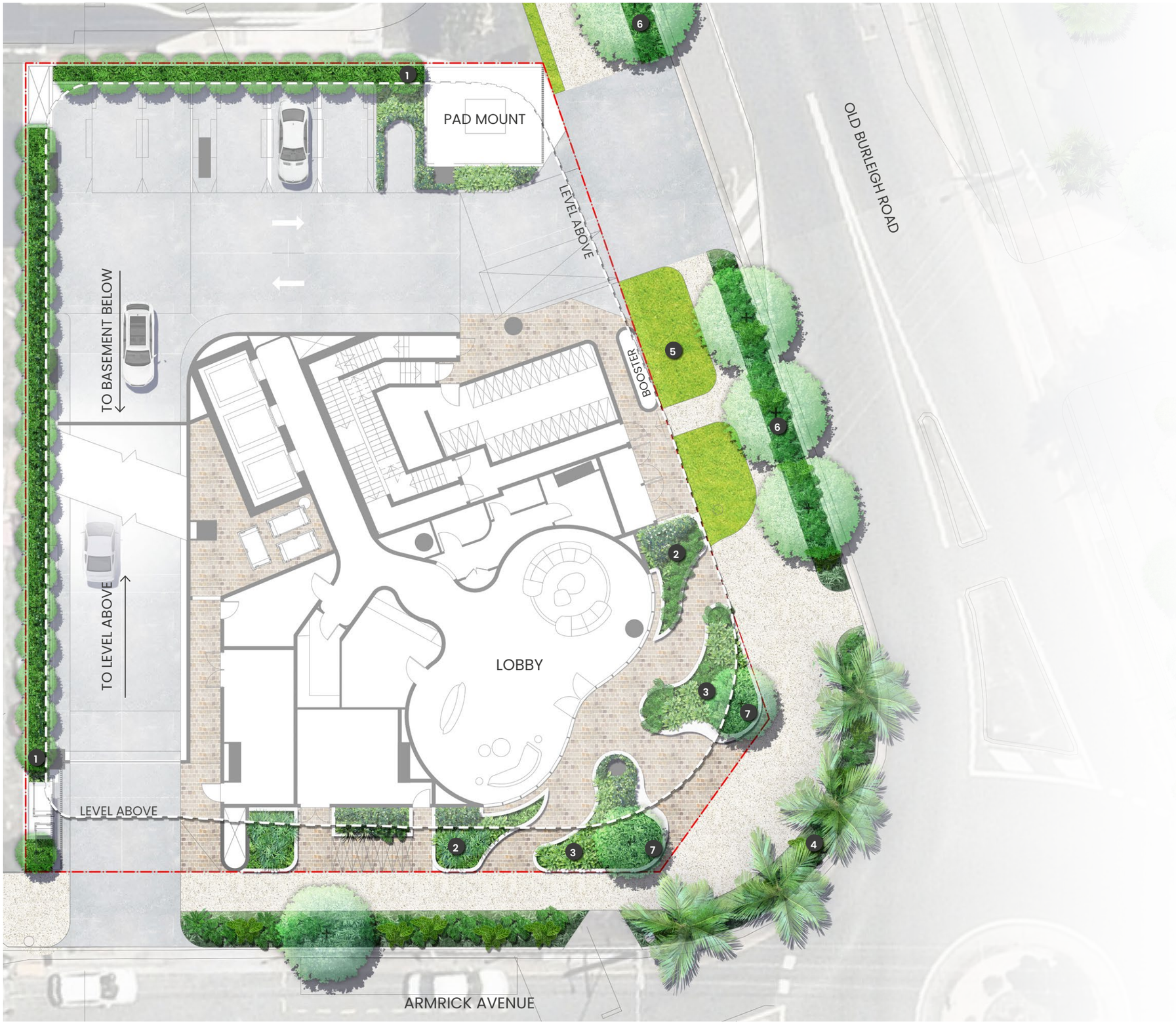
Landscape Design

GROUND FLOOR PLAN

LANDSCAPE DESIGN

LEGEND

1. Screening species to provide privacy and articulate edges
2. Characteristic coastal planting palette with selected hardy species to soften edges and frame filtered views
3. Dense shrub and ground cover planting providing green form and visual enhancment to lobby entrance
4. Existing palms retained to preserve site character and vertical structure
5. Turf
6. Generous streetscape canopy providing contiunous shade and pedestrian comfort
7. Small Randia fitzalanii partially planted under 5m undercroft



North Scale 1:400 @ A3

0 1 2.5 5 10 20

LANDSCAPE DESIGN.

CHARACTER IMAGES

GROUND LEVEL

LEVEL 2 PLAN

LANDSCAPE DESIGN

LEGEND

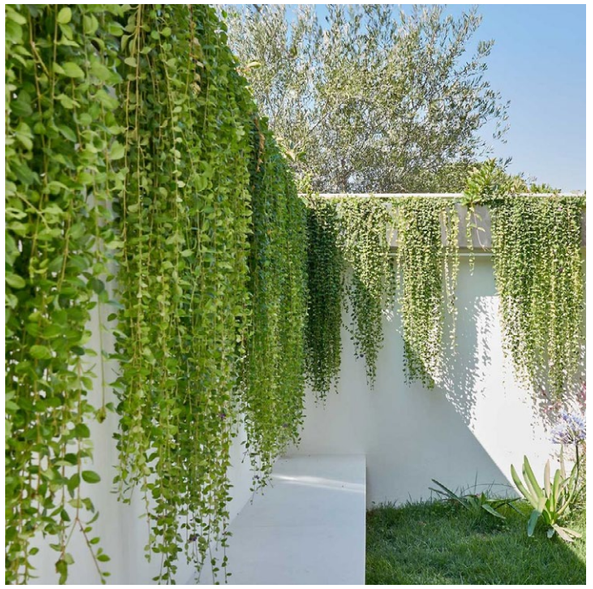
1 Cascading coastal planting enveloping the building edge and accentuating fluid form

North Scale 1:400 @ A3

0 1 2.5 5 10 20

CHARACTER IMAGES

FACADE PLANTING



LANDSCAPE DESIGN.

LEVEL 3 PLAN

LANDSCAPE DESIGN

LEGEND

1 Cascading coastal planting enveloping the building edge and accentuating fluid form

North Scale 1:400 @ A3

0 1 2.5 5 10 20

LEVEL 4 PLAN

LANDSCAPE DESIGN

LEGEND

1 Cascading coastal planting enveloping the building edge and accentuating fluid form

North Scale 1:400 @ A3

0 1 2.5 5 10 20

LEVEL 5 PLAN

LANDSCAPE DESIGN

LEGEND

1 Cascading coastal planting enveloping the building edge and accentuating fluid form

North Scale 1:400 @ A3

0 1 2.5 5 10 20

LANDSCAPE DESIGN.

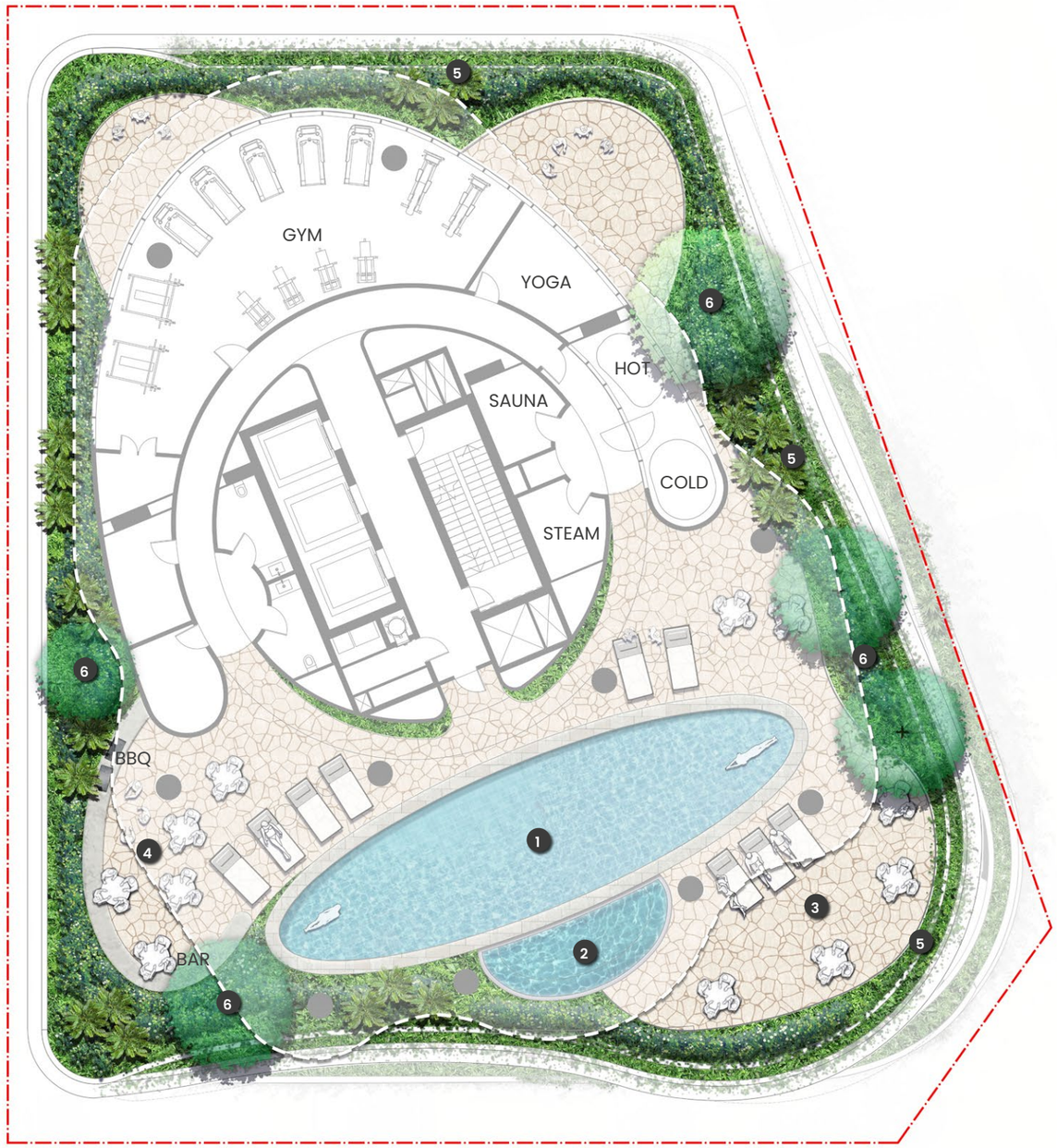
POOL DECK AND RECREATIONAL

LEVEL 6 PLAN

LANDSCAPE DESIGN

LEGEND

1. Resort-style pool integrated within a landscaped setting for relaxation and amenity
2. Spa adjoining pool for integrated relaxation and leisure
3. Extended pool deck with adjacent dining zone for outdoor gathering, oriented to capture expansive coastal views
4. Communal BBQ and dining area encouraging social interaction
5. Low-profile edge planting cascading to frame and maintain view corridors
6. Strategically layered shade planting providing relief from morning and afternoon sun

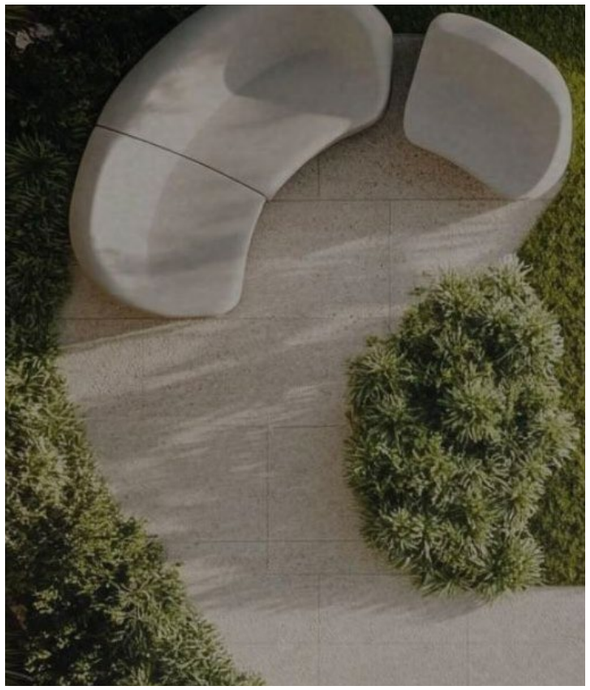


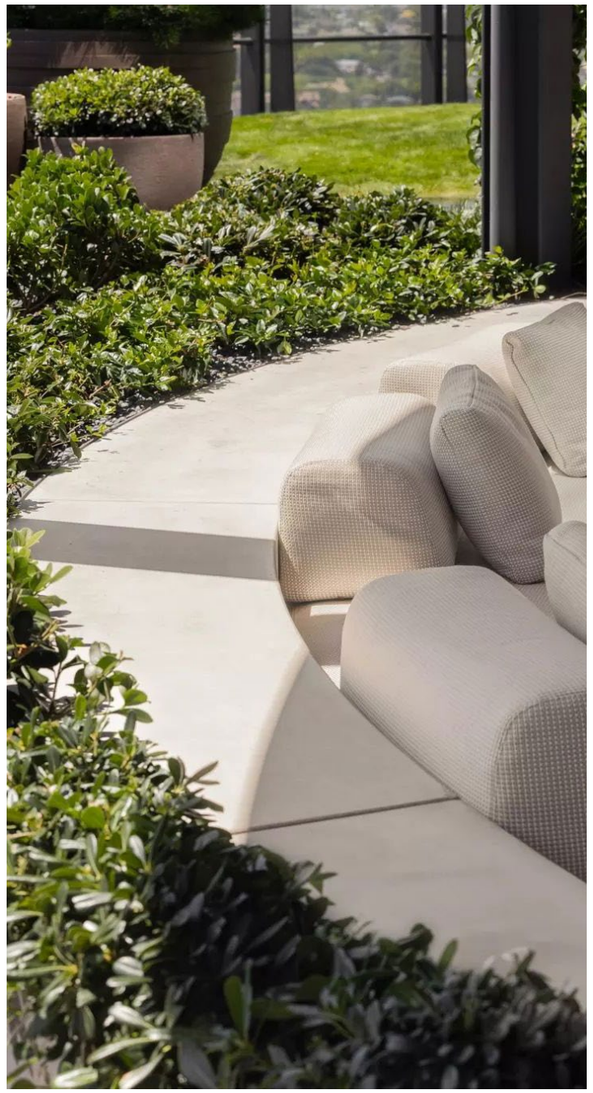
North Scale 1:400 @ A3

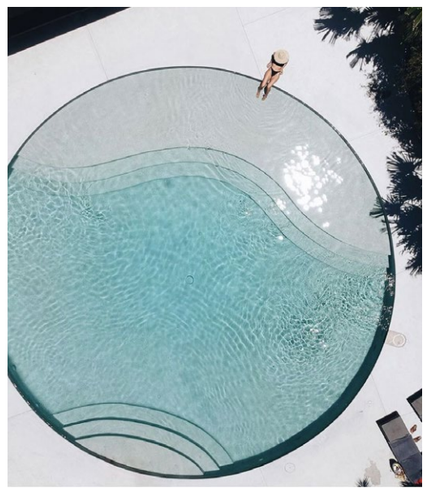
0 1 2.5 5 10 20

CHARACTER IMAGES

POOL DECK AND ROOF







LEVEL 7 PLAN

LANDSCAPE DESIGN

LEGEND

1 Dense subtropical coastal species with cascading plants drapping to level below, creating green terrace softening built edges.

North Scale 1:400 @ A3

0 1 2.5 5 10 20

LANDSCAPE DESIGN.

LEVEL 8 PLAN

LANDSCAPE DESIGN

LEGEND

1 Dense subtropical species with cascading plants drapping to level below, creating green terrace softening built edges with ecological mciroclimates.

North Scale 1:400 @ A3

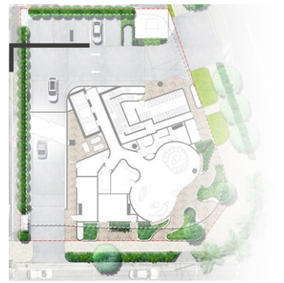
0 1 2.5 5 10 20

SECTIONS

LANDSCAPE DESIGN.

SECTION 1

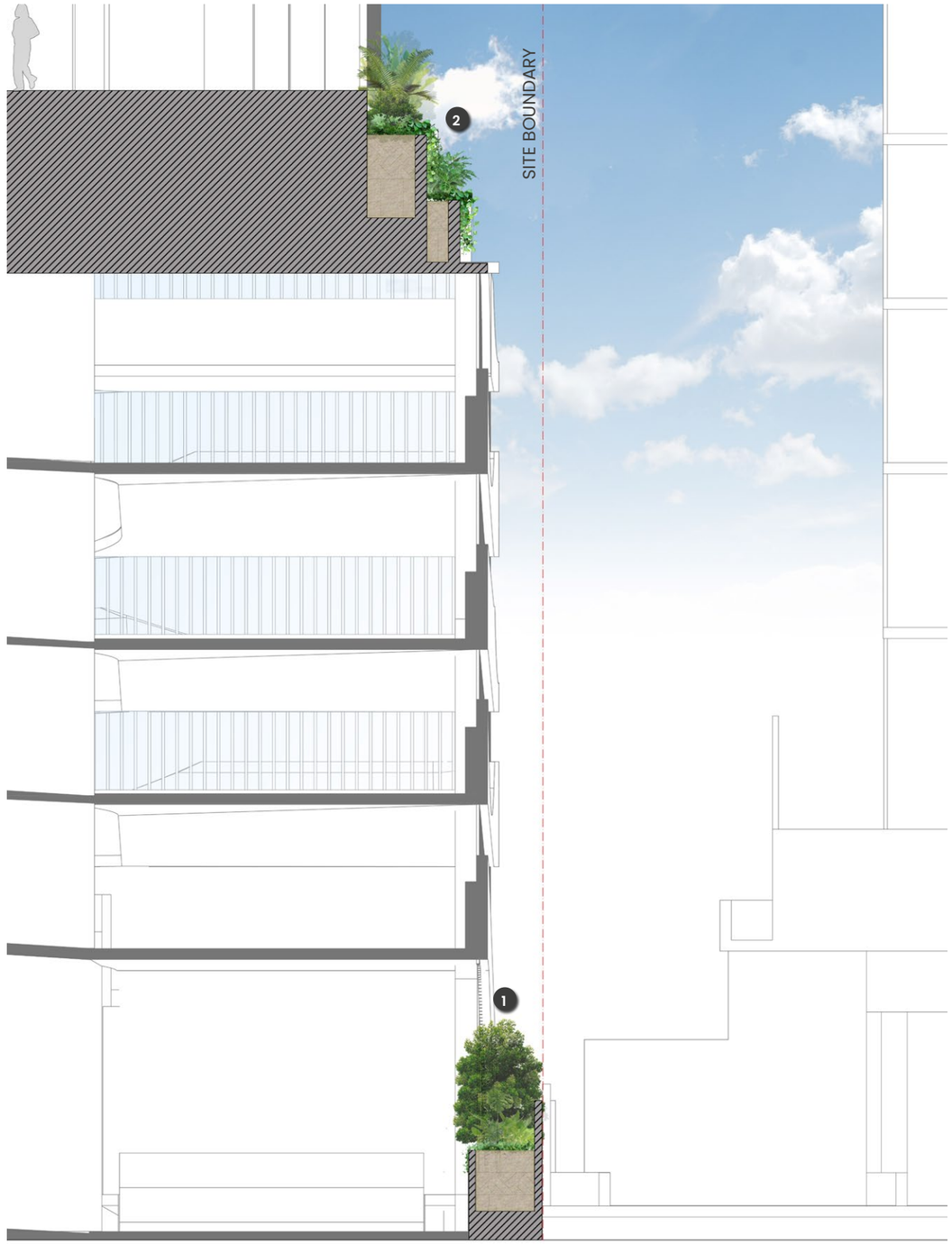
LANDSCAPE DESIGN



LEGEND

1 Screening species to provide privacy and articulate edges

2 Cascading coastal planting enveloping the building edge and accentuating fluid form

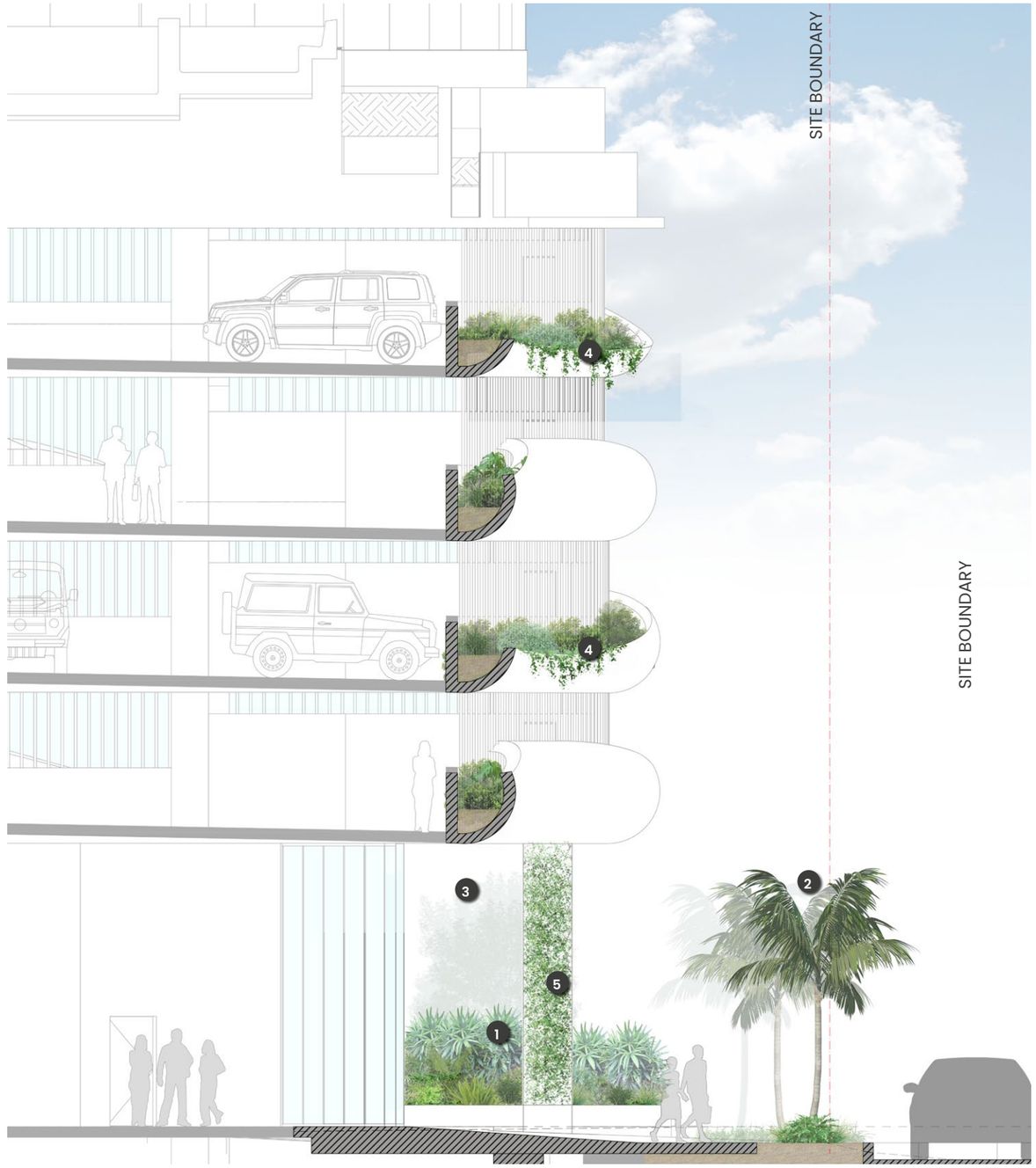


SECTION 2

LANDSCAPE DESIGN

LEGEND

1. Characteristic coastal planting palette with selected hardy species to soften edges and frame filtered views
2. Existing palms retained to preserve site character and vertical structure
3. Generous streetscape canopy providing contiunous shade and pedestrian comfort
4. Cascading coastal planting enveloping the building edge and accentuating fluid form
5. Creeping planting to soften structural column



LANDSCAPE DETAILS

RECREATION CAPACITY DIAGRAM

Proposed development: Residential Apartments
17 x 2 Bedroom
38 x 3 Bedroom
17 x 3 + Media Bedroom
09 x 4 + Media Bedroom

For the purposes of this assessment we have assumed the following:
100% Occupancy
2.5 people x 17 = 42 people
3.5 people x 38 = 133 people
4.0 people x 17 = 68 people
4.5 people x 9 = 40 people
90% Occupancy
283 people x 90% = 254 people

Occupants utilising recreation areas at any one time (assume 33%)
254 people x 33% = 83 people

The Recreation Capacity Plan will need to demonstrate that 83 people can recreate in the communal recreation space area provided in the proposed development. The current Recreational Capacity Plan, based on usable communal recreation space, demonstrates 202 people can recreate comfortably in the area provided and should be viewed as compliant.

		Function Of Space	Area(m^2)	Spatial Requirements (m^2 / Person)	Recreation Capacity
	Spa / Sauna	Passive Recreation, Wellness	38m^2	2	19
	Pool	Passive Recreation, Active Recreation	102m^2	4	26
	Deck	Passive Recreation, Social, Circulation	382m^2	4	95
	Gym	Active Recreation	107m^2	6	18
	Multi-purpose Room	Passive Recreation, Social, Residents Functions	177m^2	4	44
		Total Communal Recreation Space	806m^2		202 people

LANDSCAPE DESIGN.

LEVEL 6 WELLNESS DECK

LEVEL 7 RECREATION

LANDSCAPE DESIGN.

North Scale 1:400 @ A3 0 1 2.5 5 10 20

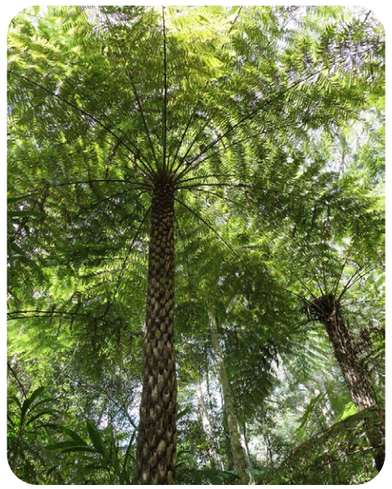
Prepared by **Urbis**

PLANTING PALETTE

GROUND LEVEL

Buckinghamia celsissima
Ivory Curl

Araucaria heterophylla
Norfolk Pine

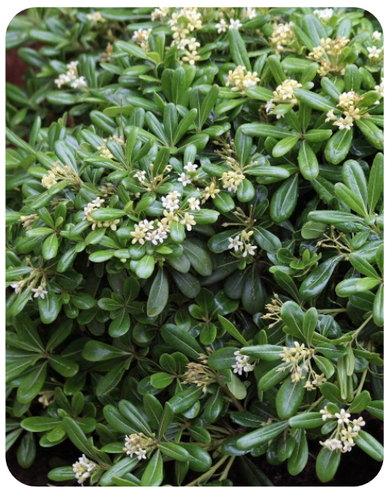


Cyathea australis
Rough Tree Fern

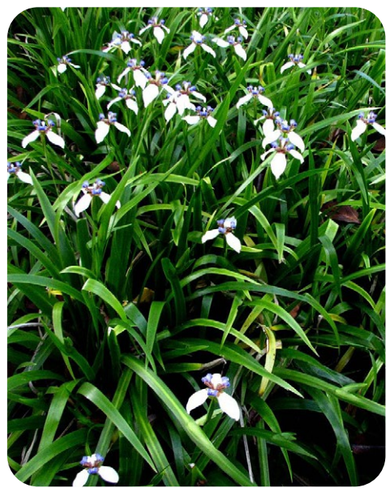
Cupaniopsis anacardioides
Tuckeroo

Strelitzia nicolai
Giant White Bird of Paradise

Calathea zebrina
Prayer Plant



Pittosporum tobira
Miss Muffet



Neomarica longifolia
Walking Iris

Carissa macrocarpa
Desert Star

Cissus antarctica
Kangaroo Vine

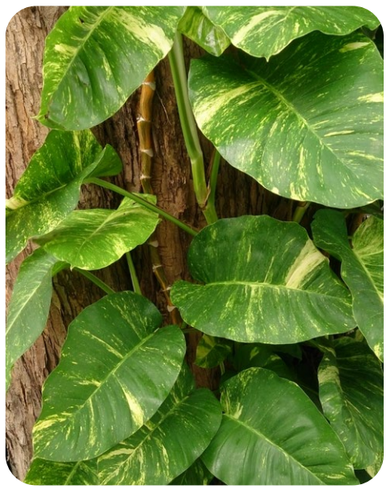
Dichondra repens
Kidney Weed

Zoysia tenuifolia
No Mow Grass

DETAILS.

PLANTING PALETTE

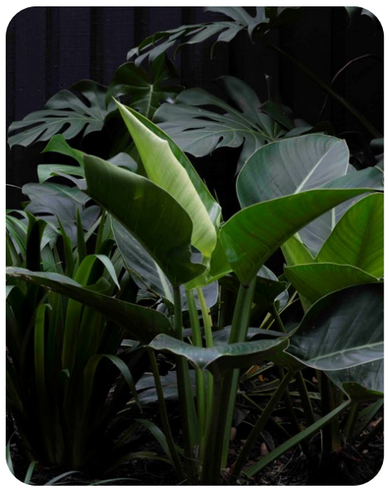
EDGE PLANTING



Epipremnum aureum
Golden Pothos

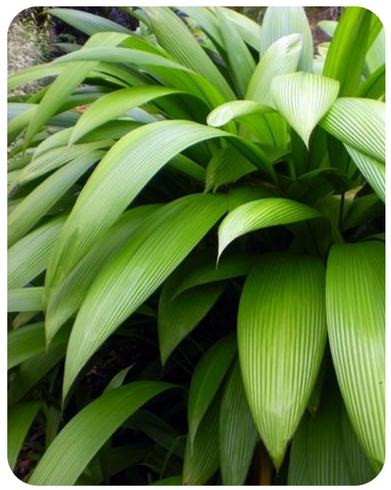
Alocasia brisbanensis
Cunjovi

Acacia cognata 'Limelight'
River Wattle

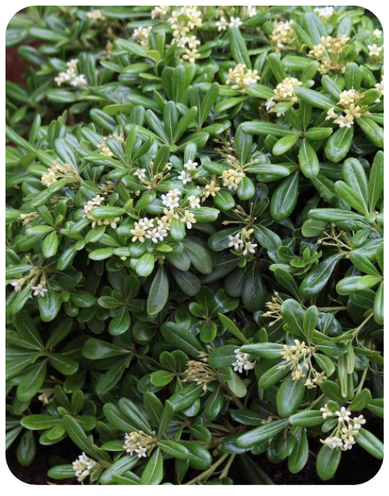


Philodendron Congo
Green Congo

Carissa macrocarpa
Desert Star

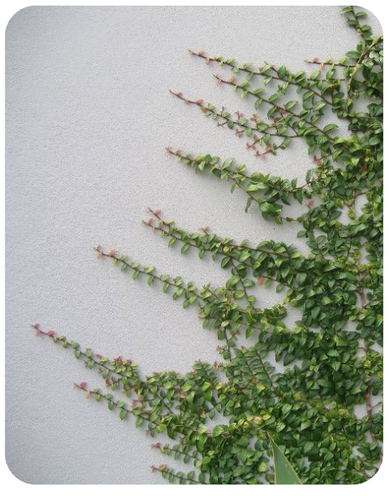


Calathea zebrina
Prayer Plant



Pittosporum tobira
Miss Muffet

Neomarica longifolia
Walking Iris



Ficus pumilla
Climbing Fig

Monstera deliciosa
Fruit Salad Plant

Viola hederacea
Native Violet

Zoysia tenuifolia
No Mow Grass

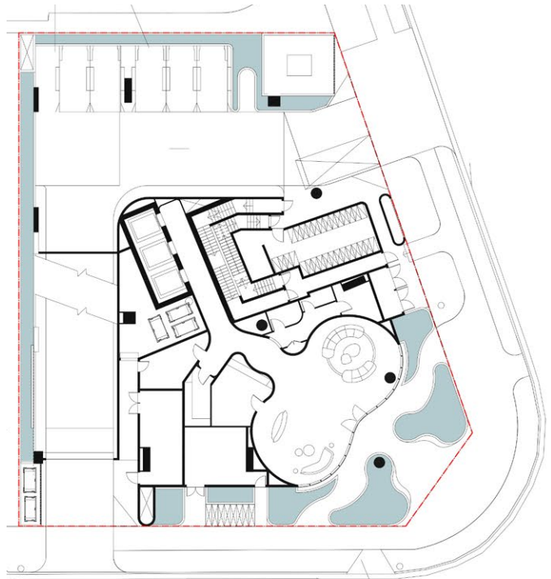
DETAILS.

Planting Depths

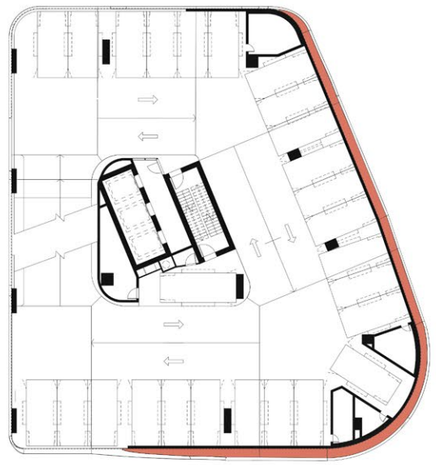
LEGEND

500mm depth

1100mm depth

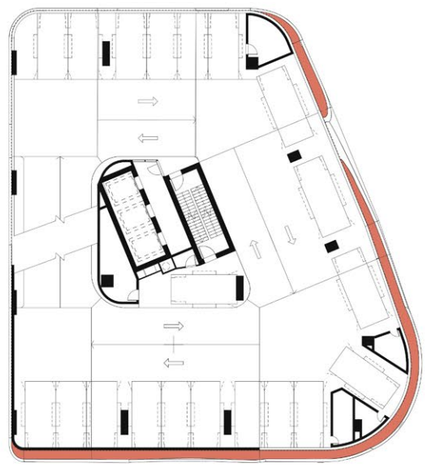


GROUND LEVEL



LEVEL 2

LEVEL 3



LEVEL 4

North Scale 1:500 @ A3

0 1 2.5 5 10 20

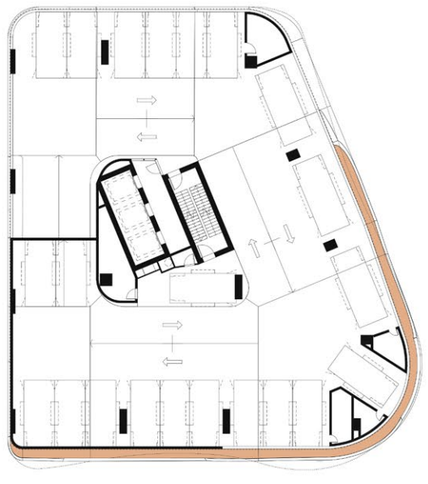
DETAILS.

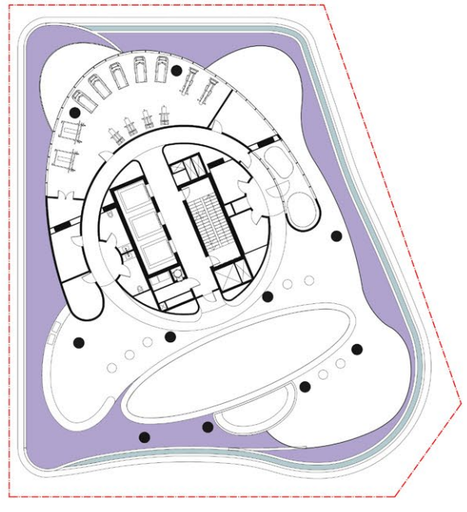
Planting Depths

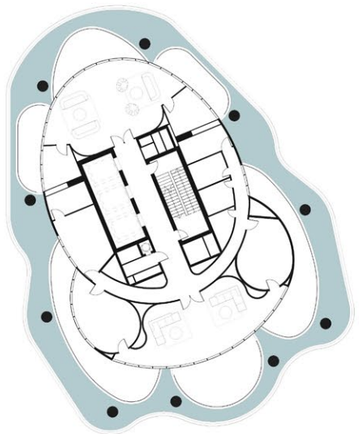
LEVEL 06

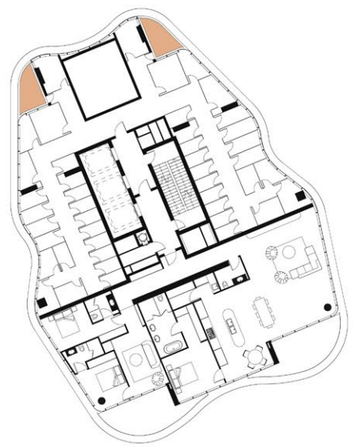
LEGEND

- 500mm depth
- 1100mm depth
- 1500mm depth









North Scale 1:500 @ A3

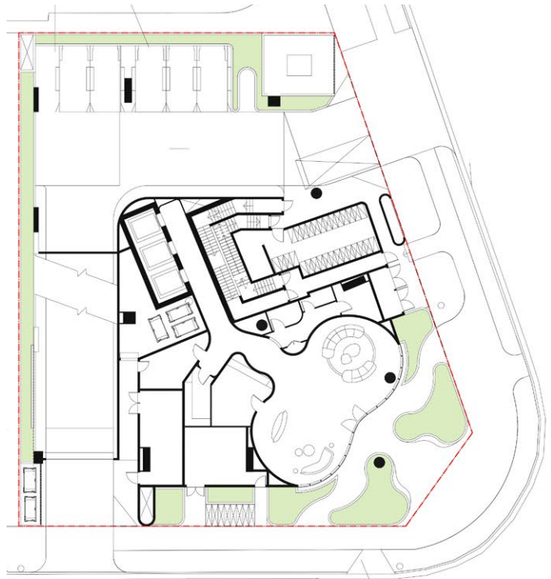
0 1 2.5 5 10 20

Planter Maintenance

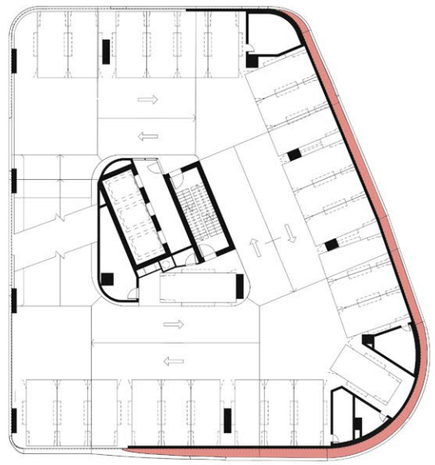
LEGEND

At Level Access

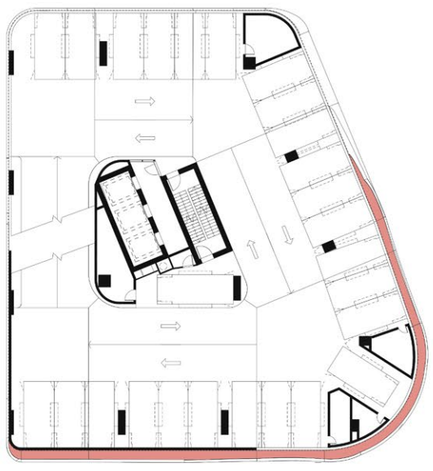
Anchorage Point Access



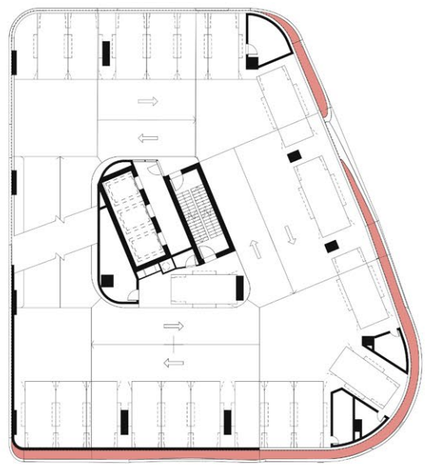
GROUND LEVEL



LEVEL 2



LEVEL 3



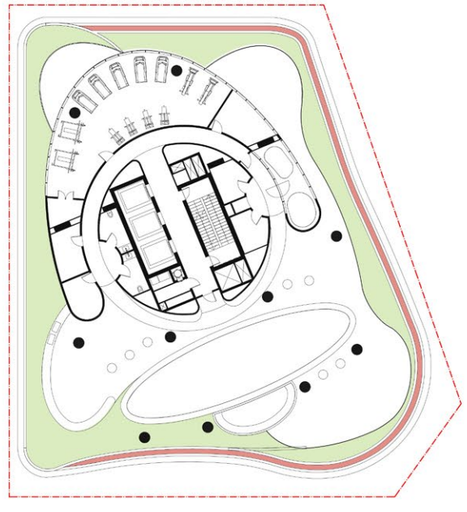
LEVEL 4

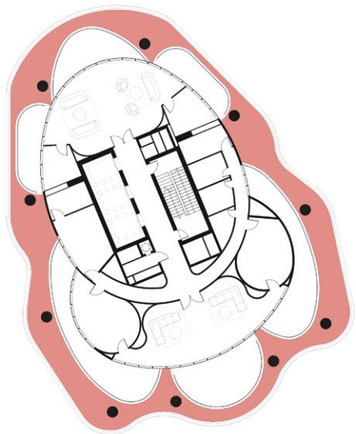
DETAILS.

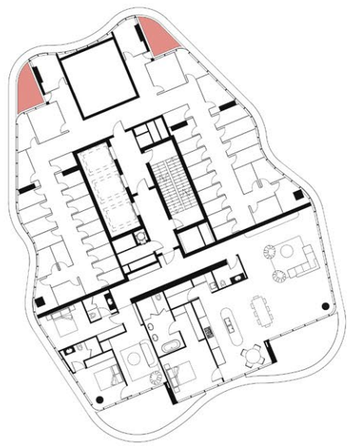
Planter Maintenance

LEGEND

Anchorage Point Access







Soil Strategy

Creating a thriving urban environment requires careful consideration of soil specifications. For structural soils, it's essential to ensure they provide adequate support for infrastructure while allowing for root growth. These soils should have a balanced composition of sand, silt, and clay, with a focus on compaction and load-bearing capacity.

Horizon A, the topsoil layer, should be rich in organic matter and nutrients to support plant health and growth. This layer is crucial for water retention and root development. Horizon B, the subsoil layer, should have a good structure to facilitate drainage and deeper root systems, providing stability and access to nutrients.

For planter boxes on buildings, lightweight soils are necessary to reduce the load on structures. These soils should be a mix of organic materials and lightweight aggregates, ensuring they are both nutrient-rich and well-draining. This combination supports plant growth while maintaining the structural integrity of the building.

By adhering to these soil specifications, we can create sustainable, green urban spaces that enhance the quality of life for all.

On Structure soil media A

Quality – Soil must be free from any 'unwanted materials'

Physical Properties

Property	Units	Target range
Texture, preferred range	n/a	Gravelly loamy sand to organic sandy loam
Air-filled porosity	%	≥ 10
Chloride	%	≥ 40
Permeability (@ 16 drops by McIntyre Jakobsen)	mm/h	> 100
Saturated Density	kg/L	< 2.4
Organic matter	% w/w	< 15
Wettability	min	<5
Dispensability in water		1 or 2 (AS4419) Category
Large particles in the largest dimension		
< 2 mm	% w/w	30–70
2–10 mm	% w/w	10 –20
10–20 mm	% w/w	5–10
20–50 mm	% w/w	< 5
> 50 mm	% w/w	0

Chemical Properties

C2. Chemical properties	Units	Target range
pH in water (1:5) Standard range	pH units	5.4–6.8
Electrical Conductivity (1:1.5)	dS/m	< 2.2
Chloride	mg/L	≤ 200
Ammonium-N (NH4)	mg/L	≤ 100
Ammonium-N + nitrate-N (NH4 + NO3)	mg/L	≥ 50
Nitrogen draw-down index	-	≥ 0.7
Toxicity index	mm	≥ 70
Phosphorus – P standard range	mg/L	8–40
Low phosphorus – P (P-sensitive plants)	mg/L	< 3
Potassium (K)	mg/L	50–250
Sulphate (SO_4)	mg/L	≥ 40
Calcium (Ca)	mg/L	≥ 80
Magnesium (Mg)	mg/L	≥ 15
Ca:Mg ratio	–	1.5–10
K:Mg ratio	–	1–7
Sodium (Na)	mg/L	≤ 130
Iron (Fe)	mg/L	≥ 35
Cooper (Cu)	mg/L	0.4 - 15
Zinc (Zn)	mg/L	0.3 - 10
Manganese (Mn)	mg/L	1 - 15
Boron (B)	mg/L	0.02 – 0.65

On Structure soil media B

Quality – Soil must be free from any 'unwanted materials'

Physical Properties

Property	Units	Target range
Texture, preferred range	n/a	Gravelly loamy sand to organic sandy loam
Air-filled porosity	%	≥ 10
Water-holding capacity	%	≥ 40
Permeability (@ 16 drops by McIntyre Jakobsen)	mm/h	> 100
Saturated Density	kg/L	< 1.8
Organic matter	% w/w	< 5
Wettability	min	≤ 5
Dispensability in water		1 or 2 (AS4419) Category
Large particles in the largest dimension		
< 2 mm	% w/w	30–70
2–10 mm	% w/w	10 –20
10–20 mm	% w/w	5–10
20–50 mm	% w/w	< 5
> 50 mm	% w/w	0

Chemical Properties

C2. Chemical properties	Units	Target range
pH in water (1:5) Standard range	pH units	5.4–6.8
Electrical Conductivity (1:1.5)	dS/m	< 2.2
Chloride	mg/L	≤ 200
Ammonium-N (NH4)	mg/L	≤ 100
Ammonium-N + nitrate-N (NH4 + NO3)	mg/L	≥ 50
Nitrogen draw-down index	-	≥ 0.7
Toxicity index	mm	≥ 70
Low phosphorus – P (P-sensitive plants)	mg/L	< 3
Potassium (K)	mg/L	50–250
Sulphate (SO_4)	mg/L	≥ 40
Calcium (Ca)	mg/L	≥ 80
Magnesium (Mg)	mg/L	≥ 15
Ca:Mg ratio	–	1.5–10
K:Mg ratio	–	1–7
Sodium (Na)	mg/L	≤ 130
Iron (Fe)	mg/L	≥ 35
Cooper (Cu)	mg/L	0.4 - 15
Zinc (Zn)	mg/L	0.3 - 10
Manganese (Mn)	mg/L	1 - 15
Boron (B)	mg/L	0.02 – 0.65

Irrigation Strategy

A comprehensive irrigation strategy for the project is required development (refer to appendices for detail irrigation reports).

This proposal focuses on sustainability and efficiency, aiming to meet 95% of the irrigation water demand through non-potable sources. Key elements include:

Rainwater Harvesting:
Water will be collected from rooftops and hard surfaces, treated via primary filtration, and stored in a basement-level tank.

This rainwater harvesting strategy has the following benefits:

Environmental Benefits:
- Conserves potable water resources by using harvested rainwater for irrigation.
- Reduces storm water runoff, mitigating the risk of flooding and erosion.
- Minimises the carbon footprint associated with water treatment and distribution.

Maintenance Benefits:
- Provides a consistent water source for irrigation, ensuring landscape health.
- Reduces wear and tear on municipal water systems.
- On-site treatment systems are designed for easy maintenance and long-term reliability.

Costs;
- Reduces reliance on potable water, lowering water bills.
- Decreases the need for expensive water supply infrastructure.

Advanced Irrigation System:
A smart Wi-Fi enabled controller will adjust irrigation schedules based on real-time weather data. The system includes low-pressure drip tubes for planted areas and medium-pressure pop-up sprinklers for turf, designed to minimise water wastage.

Fertigation Integration:
Fertilisers and other nutrients will be directly injected into the irrigation water, ensuring optimal plant health.

Fertigation systems in high-rise buildings combine watering and fertilising in one process, making landscape maintenance more efficient and sustainable. By delivering nutrients directly through the irrigation water, plants get exactly what they need, reducing waste and preventing over-fertilisation.

These systems also save water and lower maintenance costs. Smart controllers adjust watering schedules based on weather, ensuring plants receive the right amount of water and nutrients.

In summary, fertigation systems promote healthier plants, conserve resources, and support sustainable urban development.

Efficiency and Safety - Failure early warning detection systems:
A master valve and flow sensor will monitor water flow, shutting down zones with detected faults and notifying operators.
Early warning detection systems have the following benefits:

Environmental Benefits:
- Conserves water by promptly addressing leaks and inefficiencies.
- Ensures optimal water use, supporting sustainable practices.

Maintenance Efficiency:
- Provides real-time alerts, allowing for quick response and resolution of issues.
- Reduces the need for manual inspections, saving time and labour.

Landscape Health:
- Early detection helps to maintain consistent irrigation, ensuring plants receive the right amount of water.
- Prevents over watering or under watering, promoting healthier landscapes.

Cost benefits:
- Detects issues like broken pipes or faulty valves early, preventing water wastage and reducing repair costs.
- Minimises potential damage to property and landscaping, avoiding expensive remediation.

This overall irrigation strategy not only aligns with sustainability goals but also ensures efficient water use and robust landscape maintenance. The proposal has been certified to meet all relevant standards and guidelines, with flexibility to adapt to any project changes.

Landscape Maintenance Management Strategy

The landscape maintenance plan for the project is designed to ensure the landscape remains true to its original design intent, creating a lush, green environment that reflects Brisbane's subtropical nature. This plan outlines the strategies and requirements necessary to maintain the landscape in alignment with the project's vision and Brisbane City Council's standards.

KEY OBJECTIVES:

Adherence to Design Intent:
Maintain the landscape to evoke a pre-colonisation environment, with native and endemic plants creating key habitats - Refer to bio-diversity plan.
Plant Health and Longevity:
Ensure all plants thrive by providing appropriate light levels, soil conditions, water, nutrients and regular maintenance activities.
Sustainable Practices:
Implement eco-friendly practices to support the long-term health of the landscape.

MAINTENANCE STRATEGIES:

Regular Monitoring and Logging:
Maintain a detailed log of maintenance activities, including soil moisture levels, plant health, and climatic conditions. This data will guide tailored maintenance efforts and inform replenishment or replacement needs.
Cleaning and Watering:
Regularly wash down plants to remove dust and contaminants, ensuring optimal photosynthesis. Monitor and adjust watering schedules to prevent overwatering, especially in low-light areas.
Soil and Fertilisation:
Use the specified soil mix to maintain soil health and stability. Fertilise plants during the active growing season (September to April) to support growth.
Composting and Mulching
All greenwaste to be collected and composted on site and re-used for site mulch. This approach will not only achieve a more healthy and sustainable outcome for the landscape, but also reduce costs to export waste and import mulch.
Plant Replenishment and Replacement:
Plan for plant replenishment in the colder months, with installation in September to minimise plant shock. Ensure replacement plants are acclimatised to site conditions.

INSTALLATION AND TIMING:

Optimal Planting Periods:
Schedule planting during the March or September Equinox to avoid extreme weather conditions and reduce plant stress.

COLLABORATION AND COMPLIANCE:

Nursery Coordination:
Work closely with nurseries to ensure plants are acclimatised to the site's light levels. Conduct nursery visits to select suitable stock and review acclimatisation strategies.
Certification and Documentation:
Ensure all maintenance activities and plant installations comply with the original design specifications and are certified by a registered landscape architect.
Authorities Approvals:
The project is under the jurisdiction of Brisbane City Council, with all landscaping details designed in accordance with council standards. Documentation and delivery of softscape works will adhere to BCC approval and to be maintained to BCC standards throughout the development's lifespan.

Design Methodology:
The landscape design considers unique micro-climates and structural loading, ensuring large tree and palm specimens are coordinated with the structural design. Drainage has been meticulously planned with the hydraulic engineer, and soil specifications tailored for on-structure landscapes in Brisbane. Maintenance works to consider the original design methodology.

N**atural Daylight for Planting:**
A high-level lux study will inform the planting design, ensuring areas meet the minimum lux levels required for long-term plant growth.

By following this comprehensive maintenance plan, we aim to preserve the integrity and beauty of the project landscape, ensuring it remains a vibrant and sustainable green space for the community.

Landscape Maintenance Management schedule

Routine Maintenance / Routine Inspections & Reactive Maintenance	JAN				FEB				MARCH				APRIL				MAY				JUNE				JULY				AUGUST				SEPT				OCT				NOV				DEC			
Ground Floor																																																
Activity Description	**Activity Code**	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Cleaning Operations																																															
Graffiti Removal	CGR																																															
Litter Collection	CLC																																															
Clear Gully / Stormwater Pits	CGP																																															
Hardscape																																															
Maintenance and Cleaning of the Pavements, Stairs, ramps, Steppers, and Boulders	HMPB																																															
Re-sealing the Pavers	HRP																																															
Timber Inspection (fixings & cracks)	HTI																																															
Softscape																																															
Garden Maintenance	SGM																																															
Care of Grass and Turf	SGT																																															
Grass Mowing	SMO																																															
Pest Control	SPC																																															
Weed Treatment	SWT																																															
Care of Shrubs, Palms and Trees	SCT																																															
Trellis System Maintenance	STR																																															
Facade planter box maintenance (abseiling)	SPBA																																															
Arbour Maintenance	SAR																																															
Built Environment																																															
Loose Furniture Maintenance	BFM																																															
Signage Maintenance	BSM																																															
Fence Maintenance	BFE																																															
Irrigation																																															
Maintenance of Irrigation System	IM																																															
Adjust the Control by the Respective Season	IC																																															
Flush the System	IF																																															

DETAILS.

Section 4 - SPECIALIST REPORTS

Stormwater Management Plan
Prepared by OSKA

CONCEPTUAL STORMWATER MANAGEMENT PLAN

Proposed High Rise Development

99-101 Old Burleigh Road, Broadbeach

Lot 70 on B8383, Lot 0000 and 0 on BUP104138

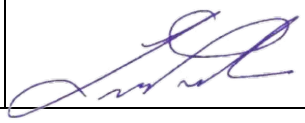
For Sunland Group

18 May 2026

Document No: OSK7218-0003

DOCUMENT CONTROL SHEET

Title:	Conceptual Stormwater Management Plan
Document No:	OSK7218-0003
Original Date of Issue:	18 May 2026
Project Manager:	Trent Purdon
Author:	Azam Mohiuddin Mohammed
Client:	Sunland Group
Client Contact:	Ms Katharina Ovens-Brown
Client Reference:	99-101 Old Burleigh Road, Broadbeach
Synopsis:	This *Conceptual Stormwater Management Plan* describes the existing site characteristics, and corresponding stormwater quantity and quality management controls to be implemented during the construction and operational phase of the development.

Reviewed by RPEQ	Reg. No.	Signed	Date
Trent Purdon	12190		18 May 2026

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CONTENTS

1.0 INTRODUCTION....1
1.1 Background....1
1.2 Scope....1
2.0 SITE DESCRIPTION....2
2.1 Location....2
2.2 Site Topography....3
2.3 Vegetation and Land Use....3
2.4 Proposed Development....4
2.5 Proposed Conceptual Drainage....4
2.6 Rainfall Data....4
3.0 DATA....4
4.0 SITE HYDROLOGY....5
4.1 Background....5
4.2 Pre-Development....5
4.2.1 Catchment Definition and Lawful Point of Discharge....5
4.2.2 Coefficient of Runoff....5
4.2.3 Time of Concentration....6
4.2.4 Design Flow Rates....6
4.3 Post-Development....6
4.3.1 Catchment Definition and Lawful Point of Discharge....6
4.3.2 Coefficient of Runoff....6
4.3.3 Time of Concentration....7
4.3.4 Design Flow Rates....7
4.3.5 Change in Flow Rates....7
5.0 STORMWATER QUALITY ASSESSMENT....8
5.1 Background....8
5.2 Construction Phase....8
5.2.1 Key Pollutants....8
5.2.2 Sediment and Erosion Controls....8
5.2.3 Water Quality Monitoring and Inspections....9
5.2.4 Reporting....10
5.3 Operational Phase....10
5.3.1 Stormwater Quality Objectives....10
5.3.2 Post-Development MUSIC Modelling....11
5.3.3 Stormwater Quality Improvement Devices....11
5.3.4 Design Parameters of the Stormwater Quality Improvement System....12
5.3.5 Post-Development Modelling Results - Mitigated....12
6.0 OPERATIONAL PHASE MAINTENANCE REQUIREMENTS....14
6.1 Atlan Filters....14
6.2 Atlan StormSacks....14
7.0 ASSET HANDOVER....15
8.0 CONCLUSIONS....16

TABLES

Table 1: Site Description 2
Table 2: Pre-Development Coefficient of Runoff 5
Table 3: Pre-Development Peak Flow Estimation – Rational Method 6
Table 4: Post-Development Coefficient of Runoff 7
Table 5: Post-Development Peak Flow Estimation – Rational Method 7
Table 6: Change in Peak Flow Rates Estimation – Rational Method 7
Table 7: Key Pollutants, Construction Phase 8
Table 8: Adopted MUSIC Catchment Areas 11
Table 9: Treatment Train Effectiveness at Receiving Node 13
Table 10: Asset Handover Checklist 15

FIGURES

Figure 1: Locality Plan (Source: Nearmap) 2
Figure 2: Aerial Image of the Site (Source: Nearmap – Image taken 07 December 2025) 3
Figure 3: Operational Phase Treatment Train (Source: MUSIC model) 12

APPENDICES

Appendix A Bennett & Bennett, *Verification Plot of BUP10438 and Lot 70 on B8383, 99 and 101 Old Burleigh Road Broadbeach* (Ref: 210762_002_VER)
Appendix B Contreras Earl Architecture, *Site Plan* (Ref: DA-7.04)
Appendix C OSKA Engineers, Pre-Development Catchment Plan (Ref: OSK7218/P001/A)
Appendix D OSKA Engineers, Post-Development Catchment Plan (Ref: OSK7218/P002/A) & Music Catchment Plan (Ref: OSK7218/P003/A)
Appendix E OSKA Engineers, Conceptual Stormwater Management Plan (Ref: OSK6460/P004/A) & Conceptual Stormwater Management Details (Ref: OSK6460/P005/A)
Appendix F OSKA Engineers, Sediment and Erosion Control Plan (Ref: OSK6460/P006/A) & Sediment and Erosion Control Details (Ref: OSK6460/P007/A)
Appendix G OSKA Engineers, Response to Healthy Waters Code (Ref: OSK6460-0003)
Appendix H Atlan Filter, Operation and Maintenance Manual & Atlan Stormsacks, Operation and Maintenance Manual

1.0 INTRODUCTION

1.1 Background

OSKA Engineers has been commissioned by Sunland Group to prepare a Conceptual Stormwater Management Plan (CSWMP) to support a Development Application for the proposed high-rise development situated at 99-101 Old Burleigh Road, Broadbeach.

The subject site is described as Lot 70 on B8383, Lot 0000 and 0 on BUP104138 and has a total site area of 0.128ha.

1.2 Scope

This CSWMP details the conceptual planning, layout and design of the stormwater management infrastructure for both the construction and operational phases of this development.

This CSWMP aims to:

- Establish the required performance criteria for the proposed stormwater quantity and quality improvement systems;
- Provide a conceptual design of stormwater infrastructure including stormwater quality improvement devices and stormwater quantity management controls;
- Demonstrate the modelled post-development stormwater quality discharging from the site does not adversely impact on the water quality and ecological values of downstream watercourses;
- Demonstrate stormwater runoff is conveyed through the site to a Lawful Point of Discharge (LPOD) in accordance with the Queensland Urban Drainage Manual (QUDM); and
- Provide reporting and monitoring mechanisms whereby the performance of this system can be measured enabling identification of corrective actions/alterations required to ensure the above mentioned objectives are maintained.

This CSWMP has been prepared in accordance with the IEAust Australian Runoff Quality: Guide to Water Sensitive Urban Design, Queensland State Planning Policy 2017, IPWEA Queensland Urban Drainage Manual (QUDM) Fourth Edition (2017), Water By Design MUSIC Modelling Guidelines V1 – 2010, and City of Gold Coast (CoGC), SC6.12 City Plan Policy – Land Development Guidelines.

2.0 SITE DESCRIPTION

2.1 Location

The subject site is located at 99-101 Old Burleigh Road, Broadbeach. The site fronts Old Burleigh Road to the east, Armrick Avenue to the south and is surrounded by residential properties to the north and west. The site covers a total combined area of 0.128ha, with details as summarised in *Table 1* and as located in *Figure 1.*

Table 1: Site Description

Client	Lot and Property Description	Street Address
Sunland Group	*Lot 70 on B8383, Lot 0000 and 0 on BUP104138*	*99-101 Old Burleigh Road, Broadbeach*

Figure 1: Locality Plan (Source: Nearmap)

2.2 Site Topography

The existing site has a gradual slope with spot heights ranging from approximately RL5.52m AHD to 5.20m AHD. The site gradually slopes towards the southwestern boundary. Based on the provided survey and aerial information, any stormwater runoff from site surface drains to the gully pits on Armrick Avenue and Old Burleigh Road.

For further information, the site survey has been provided by Bennett & Bennett, Verification Plot of BUP10438 and Lot 70 on B8383, 99 and 101 Old Burleigh Road Broadbeach (Ref: 210762_002_VER) included as Appendix A.

2.3 Vegetation and Land Use

The subject site currently consists of a single storey building used for commercial purposes with carpark towards the western boundary on Lot 70. Access to this part of the site is gained from the South via Armrick Avenue. Additionally, the site also consists of a Multi Storey Residential Building with access to it from the East via Old Burleigh Road.

An aerial photograph taken on the 07 December 2025 of the subject site is included in *Figure 2.*

Figure 2: Aerial Image of the Site (Source: Nearmap – Image taken 07 December 2025)

2.4 Proposed Development

The subject site is proposed to be a forty-two-storey high rise development with three (03) levels of basement car parks, four (04) levels of podium car parks and two (02) levels of amenities. The proposed development will have a total of eighty-one (81) units over thirty-five (35) levels. Vehicle access to the basement car park will be gained via Armrick Avenue to the south and access to the ground level car park will be gained via Old Burleigh Road to the east.

Refer to Appendix B for further proposed architectural details prepared by Contreras Earl Architecture, Site Plan (Ref: DA-7.04).

2.5 Proposed Conceptual Drainage

It is proposed that the site's captured stormwater be diverted to a stormwater quantity and quality tank. The Stormwater Quality Improvement Devices (SQID) will treat the majority of the site's stormwater runoff with, at minimum, the Q3-month flow rate being treated by the SQID's.

The stormwater connection to the Lawful Point of Discharge (LPOD) is conceptual at this stage. The captured flows within the tank are to be piped to the existing manhole within Old Burleigh Road.

2.6 Rainfall Data

Rainfall intensity data has been obtained from the Australian Bureau of Meteorology's 2016 Design IFD Rainfall System. The data has been extracted for the nearest grid cell at Latitude 28.0125 (S) and Longitude 153.4375 (E). The IFD data and average rainfall intensities used in this report are in accordance with the procedures outlined in Geosciences Australia, Australian Rainfall and Runoff 2019.

3.0 DATA

Data which has been sourced or provided, in order to prepare this report for the site, was gathered from the following sources:

- Detailed site survey provided by Bennett & Bennett, Verification Plot of BUP10438 and Lot 70 on B8383, 99 and 101 Old Burleigh Road Broadbeach (Ref: 210762_002_VER) included as Appendix A;
- Proposed site layout provided by Contreras Earl Architecture, Site Plan (Ref: DA-7.04) included as Appendix B;
- LIDAR data for the subject site sourced from Australian Government Elevation and Depth Foundation Spatial Data (ELVIS), Date Source: 2014, DEM Data;
- Rainfall and Meteorological 2016 IFD Data by the Australian Bureau of Meteorology;
- Information Extracted from CoGC City Plan Interactive Mapping – Version 11;
- Aerial Imagery by Nearmap; and
- MUSIC data sourced from Rainfall Station 40609, Elanora.

4.0 SITE HYDROLOGY

4.1 Background

The following sections define the method and parameters utilised within the hydrologics of the site, in order to establish a simulation of the anticipated flow regime and peak discharge at the Lawful Point of Discharge (LPOD). A Rational Method calculation has been provided for comparison of the pre and post-development peak flow rates.

The Rational Method (Section 4.3 of the Queensland Urban Drainage Manual - QUDM 2017) is a suitable estimation technique, given its flexibility in its data requirements and is able to produce satisfactory estimates of peak site discharges based on the following data input:

Specific intensity frequency duration (IFD) data;

- length/type of flow path;
- contributing catchment areas; and
- coefficient of discharge.

4.2 Pre-Development

4.2.1 Catchment Definition and Lawful Point of Discharge

The pre-development site has been analysed as a singular internal catchment and has a contributing area of 1284m^2. Stormwater captured on the roof is conveyed via downpipes to an existing tank. Any stormwater on ground surfaces are conveyed as sheet flow through the subject site towards the tank before being discharged to an existing pit.

The existing Lawful Point of Discharge (LPOD) for the subject site (for analysis in accordance with QUDM), is the existing stormwater system situated along Old Burleigh Road.

The catchment area and LPOD for the subject site are shown on OSKA Engineers, Pre-Development Catchment Plan (Ref: OSK7218/P001/A) included as Appendix C.

4.2.2 Coefficient of Runoff

The pre-development coefficient of runoff (C year) was determined based on the fraction impervious method specified in QUDM. The pre-development catchment, based on the provided survey information, has 1100m^2 of impervious surfaces, which equates to a fraction impervious (fi) of 0.86. Using a one-hour, ten-year rainfall intensity ($^1I_{10}$) of 71.14 mm/hr, a C_{10} value of 0.87 has been adopted for the pre-development catchment.

The following pre-development coefficients of runoff (as shown in *Table 2*) have been adopted in accordance with QUDM Table 4.5.2, which apply the frequency factors for the standard Annual Exceedance Probability (AEP) design storms of 39%, 18%, 10%, 5%, 2% and 1% (corresponding to the 2, 5, 10, 20, 50 and 100-year Average Recurrence Interval (ARI) storms).

Table 2: Pre-Development Coefficient of Runoff

Catchment	C_2	C_5	C_{10}	C_{20}	C_{50}	C_{100}
Pre	0.74	0.83	0.87	0.91	1.00	1.00

4.2.3 Time of Concentration

The Time Of Concentration (TOC) for the pre-development catchments has been calculated in accordance with QUDM Table 4.6.3 – Recommended roof drainage system travel times.

In accordance with Table 4.6.3 of QUDM, the pre-development catchment will have a time of concentration that will incorporate five (5) minutes of the roof to downpipes time. This equates to a total travel time of five (5) minutes.

4.2.4 Design Flow Rates

Pre-development peak flow rates have been estimated for the adopted storms using design rainfall intensities from the Bureau of Meteorology IFD Data. The Rational Method ($Q = 2.78 \times 10^{-3}$ CIA) has been used to estimate the subject site's design peak flow rates. The pre-development peak flows for the subject site are presented in *Table 3.*

Table 3: Pre-Development Peak Flow Estimation – Rational Method

Pre-Development							
Annual Exceedance Probability	**AEP**	39%	18%	10%	5%	2%	1%
Coefficient of Runoff	**C**	0.74	0.83	0.87	0.91	1.00	1.00
Area of Catchment (ha)	**A**	0.128					
Average Rainfall Intensity (mm/h)	**I**	152.41	190.57	220.78	254.23	300.09	335.85
Peak Flow Rate (m^3/s)	**Q**	**0.040**	**0.056**	**0.069**	**0.083**	**0.107**	**0.120**

4.3 Post-Development

4.3.1 Catchment Definition and Lawful Point of Discharge

The post-development scenario has been analysed as described in the pre-development scenario with a single internal catchment and has a total contributing area of $1284m^2$.

Stormwater collected from the roof, carpark and ground areas shall be conveyed via an internal network of pits and pipes, sized to capture and detain flows up to the 1% AEP, and conveyed to the proposed Atlan system for treatment. The captured flows within the tank are drained to existing manhole within Old Burleigh Road. (the site's LPOD).

The internal building drainage design to facilitate this stormwater strategy is to be coordinated with the building hydraulic engineer at the detailed design phase.

The post-development catchment area and LPOD are detailed on OSKA Engineers, Post-Development Catchment Plan (Ref: OSK7218/P002/A) & Music Catchment Plan (Ref: OSK7218/P003/A) included as Appendix D.

4.3.2 Coefficient of Runoff

The post-development coefficients of runoff (C year) were determined using the fraction impervious method as specified in QUDM.

Based on the supplied architectural plans, the post-development catchment has approximately $1220m^2$ of impervious surfaces which equates to a fraction impervious (fi) of 0.95. Using a one-hour, ten-year rainfall intensity ($^1I_{10}$) of 71.14 mm/hr, a C_{10} value of 0.89 has been adopted for the post-development catchment.

The following post-development Coefficients of Runoff (as shown in *Table 4*) have been adopted in accordance with QUDM Table 4.5.2, which apply the frequency factors for the standard Annual Exceedance Probability (AEP) design storms of 39%, 18%, 10%, 5%, 2% and 1% (corresponding to the 2, 5, 10, 20, 50 and 100-year ARI storms).

Table 4: Post-Development Coefficient of Runoff

Catchment	C_2	C_5	C_{10}	C_{20}	C_{50}	C_{100}
Post	0.76	0.85	0.89	0.93	1.00	1.00

4.3.3 Time of Concentration

The Time of Concentration for the post-developed catchment has been calculated in accordance with QUDM Table 4.6.3 – Recommended roof drainage system travel times.

In accordance with Table 4.6.3 of QUDM, the post-development catchment will have a time of concentration that will incorporate five (5) minutes of the roof to downpipes time including the pipe flow. This equates to a total travel time of five (5) minutes.

4.3.4 Design Flow Rates

Post-development peak flow rates have been calculated for the adopted storms using design rainfall intensities from the Bureau of Meteorology 2016 IFD Data. The Rational Method ($Q = 2.78 \times 10^{-3}$ CIA) has been used to estimate the required design peak flow rates for the subject site. The post-development peak flows for the subject site are presented in *Table 5.*

Table 5: Post-Development Peak Flow Estimation – Rational Method

Post-Development							
Annual Exceedance Probability	**AEP**	39%	18%	10%	5%	2%	1%
Coefficient of Runoff	**C**	0.76	0.85	0.89	0.93	1.00	1.00
Area of Catchment (ha)	**A**	0.128					
Average Rainfall Intensity (mm/h)	**I**	152.41	190.57	220.78	254.23	300.09	335.85
Peak Flow Rate (m^3/s)	**Q**	**0.041**	**0.057**	**0.070**	**0.084**	**0.107**	**0.120**

4.3.5 Change in Flow Rates

The difference in peak flow rates calculated from the total pre and post-developed site as estimated via The Rational Method, is detailed in *Table 6.*

Table 6: Change in Peak Flow Rates Estimation – Rational Method

LPOD							
Annual Exceedance Probability	**AEP**	39%	18%	10%	5%	2%	1%
Pre-Developed Peak Flow Rate (m^3/s)	**Q**	0.040	0.056	0.069	0.083	0.107	0.120
Post-Developed Peak Flow Rate (m^3/s)	**Q**	0.041	0.057	0.070	0.084	0.107	0.120
Change in Peak Flow Rate (m^3/s)	**Q**	**+0.001**	**+0.001**	**+0.001**	**+0.002**	**0**	**0**

The Rational Method assessment has demonstrated that there is negligible increase in peak flow rates discharging to Armrick Avenue and Old Burleigh Road. Therefore, no on-site detention measures will be required for this development.

5.0 STORMWATER QUALITY ASSESSMENT

5.1 Background

The development of the land has the potential to increase the pollutant loads within stormwater runoff and downstream watercourses. During the construction phase of the development, disturbances to the existing ground have the potential to significantly increase sediment loads entering downstream drainage systems and watercourses. The operational phase of the development will potentially increase the amount of sediments and nutrients washing from the site.

The following sections describe the construction and operational phase controls and water quality modelling of the proposed treatment train in compliance with Council guidelines.

5.2 Construction Phase

A high risk of stormwater pollution will occur from the site during the construction phase due to erosion and sediment transportation off-site to the receiving environment. The majority of this risk results from construction activities disturbing the site and exposing areas of soil to the direct erosive influence of the environment.

The following section outlines the procedures necessary to minimise erosion and control sediment during construction in accordance with the International Erosion Control Association (IECA) Best Practice ESC Document.

5.2.1 Key Pollutants

The key pollutants have been identified for the Construction Phase of this development.

Table 7: Key Pollutants, Construction Phase

Pollutant	Sources
Litter	Paper, construction packaging, food packaging, cement bags, material offcuts.
Sediment	Exposed soils and stockpiles during earthworks and building works.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment and temporary car park areas.
Toxic Materials	Cement slurry, asphalt primer, solvents, cleaning agents, and wash waters (e.g., from tile works).
Acids or Alkaline substances	Acid sulphate soils, cement slurry and wash waters.

5.2.2 Sediment and Erosion Controls

Sediment and Erosion Control devices (S&EC) employed on the site shall be designed and constructed in accordance with the International Erosion Control Association (IECA) Best Practice ESC Document as shown on OSKA Engineers, Sediment and Erosion Control Plan (Ref: OSK6460/P006/A) & Sediment and Erosion Control Details (Ref: OSK6460/P007/A) included as Appendix F.

Pre-Construction

- Stabilised site access/exit onto Armrick Ave and Old Burleigh Road to the South and East;
- Sediment fences to be located around the perimeter of the site;
- Sediment trap to be installed if required;
- Dust fencing to be installed if required; and
- Educate site personnel to the requirements of Erosion and Sediment Control Plan.

Initial Construction

- Maintain construction access/exit, sediment fencing, dust fences and all other existing controls as required;
- Construct diversion drains to convey disturbed site run-off to the temporary sediment traps; and
- Confine construction activities to stages to minimise areas of disturbance at any given time.

Second Stage Construction

- Maintain construction access/exit, sediment fencing, dust fences, diversion drain and all other existing controls as required;
- Progressively revegetate finished areas where applicable;
- Divert runoff from undisturbed areas around disturbed areas; and
- Drainage structure protection around field inlets and gully pits.

During construction, all areas of exposed soils allowing dust generation are to be suitably treated. Treatments will include covering the soil and watering. Road accesses are to be regularly cleaned to prevent the transmission of soil on vehicle wheels and eliminate any build-up of typical road dirt and tyre dust from delivery vehicles.

Adequate waste disposal facilities are to be provided and maintained on the site to cater for all waste materials such as litter, hydrocarbons, toxic materials, acids or alkaline substances.

5.2.3 Water Quality Monitoring and Inspections

To ensure that the water quality objectives are being met during the construction phase of the development, water quality monitoring shall be conducted. Water quality monitoring shall use a calibrated probe or sampling and testing at a NATA registered laboratory.

Location: Monitoring Stations shown on OSKA Engineers, Sediment and Erosion Control Plan (Ref: OSK6460/P006/A) & Sediment and Erosion Control Details (Ref: OSK6460/P007/A).

Parameters: Site discharge criteria.

Frequency: Following at least 10 mm of rainfall in a 24-hour period.

The contractor shall be responsible for the inspection and maintenance of all sediment and erosion control devices. Additional controls and review of existing controls shall be undertaken in response to the results of the above-mentioned monitoring program.

5.2.4 Reporting

An inspection report shall be written by a suitably qualified and experienced scientist/engineer following each water quality monitoring episode. The report shall include at least the following information:

- Name, address and real property description for the development site;
- Council file reference number (if known);
- Monitoring locations;
- Performance criteria;
- Results for each monitoring location, identifying any breaches of performance criteria;
- Recommended corrective actions to be taken and additional sediment and erosion controls, if required; and
- Inspection reports shall be provided to the contractor for their action and compilation in an on-site register.

If the above-mentioned performance criteria are exceeded and results from the downstream monitoring stations show significant deterioration from upstream results (if applicable), the contractor shall implement all recommendation of the inspection report within one (1) working day of receipt of the report.

5.3 Operational Phase

The following sections provide details of the Stormwater Quality Improvement Devices (SQID's) proposed for the operational phase of the development. OSKA Engineers, Conceptual Stormwater Management Plan (Ref: OSK6460/P004/A) & Conceptual Stormwater Management Details (Ref: OSK6460/P005/A) in Appendix E illustrates the size and location of the proposed SQID's.

5.3.1 Stormwater Quality Objectives

To protect the water quality of the downstream watercourses, the following Water Quality Objectives (WQO's) have been applied to stormwater runoff from the site in accordance with CoGC SC6.12.4.5.4.2 Stormwater quality objectives (operational phase) and the criteria of the CoGC Healthy Waters Code as addressed in OSKA Engineers, Response to Healthy Waters Code (Ref: OSK6460-0003) included as Appendix G.

Best Management Practices (BMP) are required to be demonstrated for all Development Applications within the City of Gold Coast and are recommended to be implemented by the developer. Where practicable, methods such as first flush devices, and discharging stormwater to landscaped/grassed areas prior to discharge to the LPOD, are to be incorporated into the site's stormwater strategy, where the opportunity is available.

The following load reduction targets must be achieved when assessing the post-development treatment train (comparison of unmitigated developed case versus developed mitigated case).

- 80% reduction in Total Suspended Sediment (TSS).
- 60% reduction in Total Phosphorus (TP).
- 45% reduction in Total Nitrogen (TN).
- 90% reduction in litter (sized 5 mm or greater).

5.3.2 Post-Development MUSIC Modelling

To assess the potential quantities of pollutants anticipated to be discharged from the site, the water quality modelling package 'Model for Urban Stormwater Improvement Conceptualisation' (MUSIC) V6.3 by eWATER has been applied. MUSIC Modelling Parameters and delineated data have been sourced from Water by Design, MUSIC Modelling Guidelines, and where possible, via online MUSIC Link data.

Rainfall data has been sourced from Rainfall Station 40609, (Elanora) using a date range from 1989 to 1998 and a 6 Minute Time Step, in accordance with CoGC requirements.

5.3.3 Stormwater Quality Improvement Devices

An underground propriety Stormwater Quality Improvement Device (SQID) will be utilised to treat stormwater runoff from the site as it is deemed more suitable for the proposed site use. An Atlan system comprising of a StormSack and 2 x StormFilters within a 6m^2 filter chamber have been adopted as the SQID's modelled, to be incorporated into the operational phase development layout.

The proposed SQID has been provided for modelling purposes only and is subject to Council approval. Accordingly, similar alternative devices may be adopted with Council review and approval.

The adopted MUSIC catchment areas for the subject site are as follows:-

Table 8: Adopted MUSIC Catchment Areas

Catchment	Area (m^2)	% Impervious
Roof (Residential)	1,130	100
Road (Residential)	15	100
Ground (Residential)	122	35
Ground Bypass (Residential)	17	100
TOTAL Site	**1,284**	

Stormwater runoff captured from the roof will be directly conveyed to an Atlan StormSack via downpipes to the proposed pit and pipe network by building hydraulics designer before entering the proposed quality underground stormwater tank. Runoff generated from the driveway and ground areas will first be conveyed to the underground quality tank fitted with an Atlan Stormsack and Atlan Filters, prior to being discharged to Council's existing stormwater network.

An illustration of the MUSIC model of the adopted operational treatment train for the post-development site has been provided in *Figure 3.*

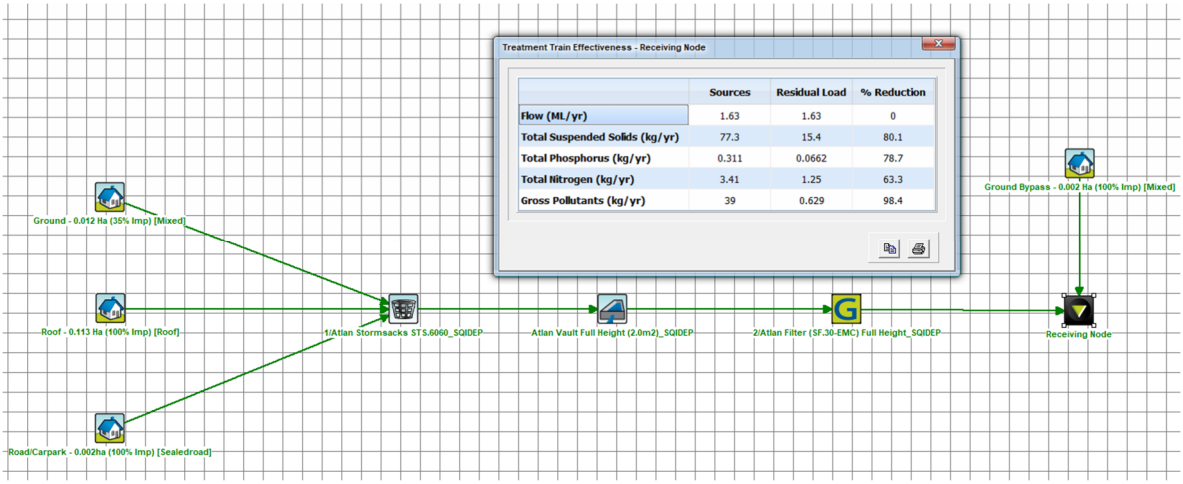


Figure 3: Operational Phase Treatment Train (Source: MUSIC model)

5.3.4 Design Parameters of the Stormwater Quality Improvement System

Detailed design of the stormwater treatment train shall be in accordance with the Water Sensitive Urban Design (WSUD), Technical Design Guidelines for South East Queensland – Version 1 (June 2006).

Atlan Filters

The Atlan Filter is a cartridge filter system that incorporates an upflow treatment process that maximises surface treatment area. Flow through the filter cartridges utilises a self-regulating siphon which results in low maintenance and high-performance stormwater treatment. The automatic backwash at the end of each storm event further lengthens the lifespan of the filter.

Atlan StormSacks

Atlan StormSack filtration solutions are highly engineered water quality devices that are deployed directly in the stormwater system to capture contaminants close to the surface for ease of maintenance. Easily retrofitted into new or existing structures, Atlan StormSack filtration technology is a decentralized approach to stormwater treatment that essentially re-purposes traditional site infrastructure and customizes it to meet specific site water quality goals.

For details of the proposed SQID's refer to *Appendix H* which details *Atlan Filter, Operation and Maintenance Manual & Atlan Stormsacks, Operation and Maintenance Manual.*

5.3.5 Post-Development Modelling Results - Mitigated

The modelled Stormwater Quality Improvement Devices (SQID) have demonstrated a reduction in the amount of sediments and nutrients discharging from the proposed residential development. *Table 9* illustrates the effectiveness of the SQID's in the treatment train for the development.

Table 9: Treatment Train Effectiveness at Receiving Node

Parameter	Post	Post Mitigated	Reduction	Water Quality Objectives
Flow (ML/yr)	1.63	1.63	0	-
TSS (kg/yr)	77.3	15.4	80.1 %	80 %
TP (kg/yr)	0.311	0.0662	78.7 %	60 %
TN (kg/yr)	3.41	1.25	63.3 %	45 %
Gross Pollutants (kg/yr)	39	0.629	98.4 %	90 %

The results demonstrate that the proposed SQID's meet the intended Water Quality Objectives for Gross Pollutants, Suspended Solids, Phosphorous and Nitrogen levels, in accordance with the City of Gold Coast Requirements.

6.0 OPERATIONAL PHASE MAINTENANCE REQUIREMENTS

The proposed stormwater management devices will require maintenance and monitoring to ensure that they function as designed. The following section provides an outline of the necessary maintenance tasks for the proposed devices.

6.1 Atlan Filters

To ensure the optimal and ongoing performance of the Atlan filter, the system requires systematic inspection, cleaning and maintenance. This maintenance regime falls into two categories – ongoing minor inspection and maintenance, and major cleaning and maintenance. The maintenance frequency is largely determined by the conditions of each site, and the amount of sedimentation in the stormwater runoff that flows through the system. Unexpected events such as chemical spills, erosion or extreme storm activity require immediate inspection of the system, together with the removal of debris or contaminated sediment, and where appropriate, replacement of the media cartridges. A maintenance contract with Atlan will include annual servicing of the Atlan filters.

6.2 Atlan StormSacks

Maintenance of the Atlan Stormsack is essential to its operational effectiveness and is to remain clear of litter and debris to perform optimally and not cause blockage to the proposed drainage pits. Maintenance frequencies and requirements of the Atlan StormSacks are dependent on the catchment conditions however the device is to be checked on a regular basis to analyse whether maintenance or cleaning is required. It is also recommended that additional monitoring is conducted following moderate to extreme rainfall events.

Detailed inspection and maintenance instructions for the Atlan filter and Atlan StormSacks are detailed in Atlan Filter, Operation and Maintenance Manual & Atlan Stormsacks, Operation and Maintenance Manual found in Appendix H.

7.0 ASSET HANDOVER

The proposed stormwater quality devices shall be dedicated to the owner/body corporate following the time of practical completion for the proposed development. An Asset Handover Checklist is provided as *Table 10* as a guideline for the necessary steps to be taken prior to the end of the maintenance period.

Table 10: Asset Handover Checklist

Asset Location:		
Construction By:		
Maintenance Period:		
Treatment:	**Y**	**N**
Actual treatment performance equivalent to design:		
Maintenance:		
Maintenance Plans Provided:		
Inspection and maintenance undertaken as per maintenance plan:		
Inspection and maintenance forms provided:		
Asset inspected for defects:		
Asset Information:		
Design assessment checklist provided:		
As constructed plans provided:		
Copies of all permits provided:		
Digital files provided:		

8.0 CONCLUSIONS

OSKA Engineers has been commissioned by Sunland Group to prepare a Conceptual Stormwater Management Plan (CSWMP) to support a Development Application (DA) to the City of Gold Coast (CoGC) for the proposed residential building situated at 99-101 Old Burleigh Road, Broadbeach. This CSWMP intends to provide an optimised stormwater management system that would be compatible and readily integrated into the proposed site use.

This CSWMP details the conceptual planning, layout and design of the stormwater management infrastructure for both the construction and operational phases of this development and satisfies the requirements of the City of Gold Coast's Land Development Guidelines.

A hydrological analysis demonstrated that the anticipated post-development peak flow rates discharging from the site are negligible in difference when compared to the pre-development flow rates. Therefore, onsite stormwater detention will not be required for the site.

OSKA Engineers has adopted a Water Sensitive Urban Design (WSUD) approach in accordance with the State Planning Policy, to manage the stormwater runoff from the proposed development by treating stormwater runoff within an adopted Atlan system consisting of an Atlan Stormsack and 2 x Atlan Filters housed within a $6m^2$ stormwater quality tank. The SQID's utilised within the MUSIC model have been adopted to demonstrate a potential treatment system, pending Council approval.

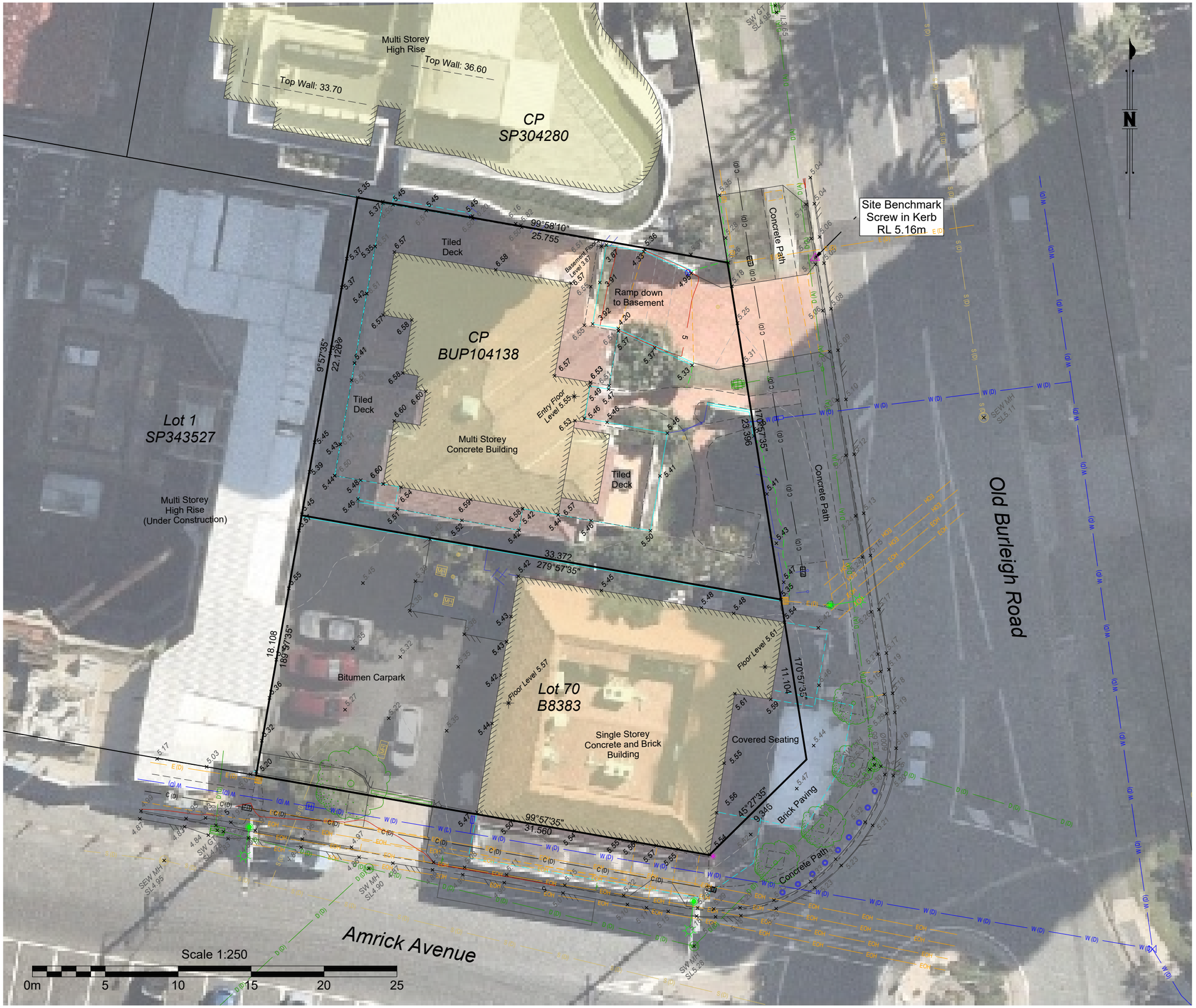
A monitoring and maintenance plan for the proposed infrastructure has been included. A concept sediment and erosion control plan is provided for the construction phase of the development and shall be implemented by the contractor and developer.

This stormwater quality strategy has defined the preliminary requirements and layout of the proposed development to demonstrate compliance with the State Planning Policy 2017 and the CoGC Planning Scheme Stormwater Quality Management requirements.

APPENDIX

A

Bennett & Bennett, Verification Plot of BUP10438 and Lot 70 on B8383, 99 and 101 Old Burleigh Road Broadbeach (Ref: 210762_002_VER)



BENNETT + BENNETT
PO Box 5021, GCMC QLD 9726
Ph: (07) 5631 8000
mail@bennettandbennett.com.au

Surveying, Town Planning, Spatial Services & Titling
GOLD COAST | BRISBANE | SUNSHINE COAST | NORTHERN RIVERS

www.bennettandbennett.com.au

LEGEND:

Road
- Kerb Back
- Kerb Invert
- Edge of Bitumen
- Edge of Gravel
- Road Crown
- Traffic Park Meter
- Traffic Light
- Traffic Pit
- Traffic Sign
- Traffic Post Box

Structures
- Building Line
- Roof Ridgeline
- Fence Line
- Gate
- Hand Rail
- Cattle Grid
- Bollard

Sewer
- Sewer Line
- Valve
- Inspection Opening
- Manhole

Electrical
- Electricity Line
- Overhead Line
- Pits/Manholes
- Pole
- Street Light
- Light In-Ground

Water
- Water Line
- Meter
- Valve
- Fire Hydrant
- Tap
- Sprinkler

Fuel
- Fuel Line
- Fitting

Terrain
- Driveway
- Footpath
- Slab Edge
- Retaining Wall Base
- Retaining Wall Top
- Change of Grade
- Top of Bank
- Toe of Bank
- Waterline
- Garden Edge
- Creek Toe of Bank
- Creek Top of Bank
- Creek Invert
- Creek Waterline
- Tree
- Tree Canopy
- Control Point/PSM

Drainage
- Drainage line
- Open Drain
- Manhole
- Field Inlet
- Downpipe

Communications
- Communication Line
- Overhead Line
- Pits/Manholes
- Pillar

Gas
- Gas Line
- Valve
- Marker

General
- Pothole

Subsurface Utility - QL
- * QL-A (H±50mm,V±50mm)
- * QL-B (H±300mm,V±500mm)
- * QL-C (H±300mm,2D)
- * QL-D (Exist Record)

NOTES:

1. Drawn to scale on an A3 sheet.
2. Contour Interval... 0.25m
3. All levels are in metres on the Australian Height Datum referred to PSM77919 - RL 5.668 AHD situated in Second Ave/Broadbeach Blvd.
4. All Boundaries are vide recent adjoining surveys (IS271995 & DP324368). Site Boundaries subject to confirmation by survey.
5. Underground services were not investigated. The Location of Underground services are in accordance with AS5488:2019, the Australian Standard for classification of Subsurface Utility Information (SUI). The exact nature and location of these services should be confirmed prior to construction.
6. Area vide title : BUP104138 - 653m²
   Lot 70 on B8383 - 630m²
7. Field Survey Completed on 8/12/2025

Level datum: AHD Derived (PSM77919)
Horiz datum: MGA Derived DCDB (IS271995)
Coord Origin: DCDB (NE Cnr Subject Lot (BUP104138))
GDA System: GDA2020 Coordinate System: Plane 1:1
Meridian: + 9°58'39" IS271995

Title:

VERIFICATION PLOT

of BUP104138 and Lot70 on B8383
99 and 101 Old Burleigh Road
Broadbeach

Client:	**Abedian & Co**		
Locality:	Broadbeach		
Local Gov:	Council of the City of Gold Coast		
Surveyed By:	SD	Approved:	LJC
Date Created:	10/12/25	Scale:	1:250
File Ref:			210762
Plan No:	**210762_002_VER**	Rev:	**A**

APPENDIX

B

Contreras Earl Architecture, Site Plan (Ref: DA-7.04)

REVISION		
A	Development Application Draft	2026.05.13
Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: GROUND FLOOR

Drawing Number: DA-7.04

Scale/Format: 1 : 250

NOTES

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CLIENT

Sunland Group

ARCHITECT **CONTRERAS EARL Architecture**

12 Short Street
Southport
QLD 4215
info@contrerasearl.com
www.contrerasearl.com

CONTRERAS EARL
Architecture

PLOT DATE 13/05/2026 12:34:05 PM

APPENDIX

C

OSKA Engineers, Pre-Development Catchment Plan (Ref: OSK7218/P001/A)

LEGEND

- STORMWATER CATCHMENT BOUNDARY
- (A) STORMWATER CATCHMENT I.D.
- 80.0 EXISTING SURFACE CONTOURS
- LPOD LAWFUL POINT OF DISCHARGE
- FLOW DIRECTION
- IMPERVIOUS AREA
- PERVIOUS AREA
- S EXISTING SEWER MAIN
- W EXISTING WATER MAIN
- E-O/H EXISTING ELECTRICAL CABLE
- SWD EXISTING STORMWATER PIPE
- C EXISTING TELECOMMUNICATIONS CABLE

STORMWATER CATCHMENT TABLE

STORMWATER CATCHMENT I.D.	AREA (m²)	IMPERVIOUS %
A	1284	86
TOTAL	1284	

CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REV	DESCRIPTION	DRAWN	DATE
A	FOR INFORMATION	A.M.	15.05.26

DRAWN	DESIGN	APPROVED
A.M.	S.W.	T.P.

SIGNED

DATE

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SCALE
1:125 AT A1 0 5m
1:250 AT A3

CLIENT
Sunland Group

PROJECT
99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

STAGE / PHASE
FOR INFORMATION ONLY NOT FOR CONSTRUCTION

TITLE
PRE DEVELOPMENT CATCHMENT PLAN

DRAWING NUMBER
OSK7218-P001

REVISION
A

APPENDIX

D

OSKA Engineers, Post-Development Catchment Plan (Ref: OSK7218/P002/A) & Music Catchment Plan (Ref: OSK7218/P003/A)

LEGEND

- STORMWATER CATCHMENT BOUNDARY
- (A) STORMWATER CATCHMENT I.D.
- 80.0 EXISTING SURFACE CONTOURS
- LPOD LAWFUL POINT OF DISCHARGE
- FLOW DIRECTION
- IMPERVIOUS AREA
- PERVIOUS AREA
- S EXISTING SEWER MAIN
- W EXISTING WATER MAIN
- E - O/H EXISTING ELECTRICAL CABLE
- SWD EXISTING STORMWATER PIPE
- C EXISTING TELECOMMUNICATIONS CABLE

CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REV	DESCRIPTION	DRAWN	DATE
A	FOR INFORMATION	A.M.	15.05.26

DRAWN	DESIGN	APPROVED
A.M.	S.W.	T.P.

SIGNED

DATE

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SCALE

1:125 AT A1 0 5m
1:250 AT A3

CLIENT

Sunland Group

PROJECT

99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

STAGE / PHASE

FOR INFORMATION ONLY NOT FOR CONSTRUCTION

TITLE

POST DEVELOPMENT CATCHMENT PLAN

DRAWING NUMBER

OSK7218-P002

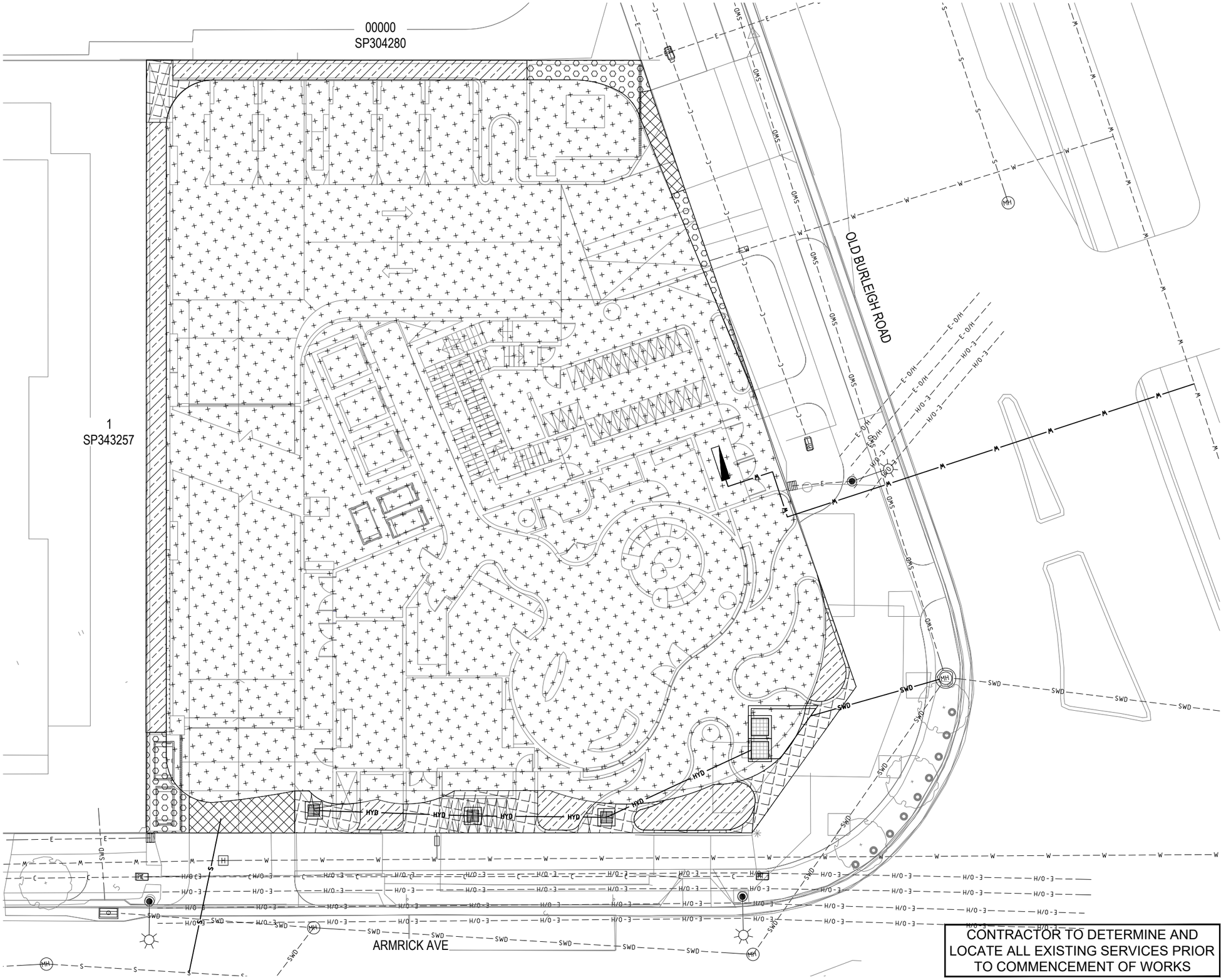
REVISION

A

LEGEND

- SWD — PROPOSED STORMWATER PIPE
- HYD — PROPOSED INTERNAL STORMWATER TO BE CONFIRMED AT DD BY HYDRAULIC CONSULTANT
- S — EXISTING SEWER MAIN
- W — EXISTING WATER MAIN
- E-O/H — EXISTING ELECTRICAL CABLE
- SWD — EXISTING STORMWATER PIPE
- C — EXISTING TELECOMMUNICATIONS CABLE
- PROPOSED ROOF AREA (TREATED)
- PROPOSED PERVIOUS GROUND AREA (TREATED)
- PROPOSED IMPERVIOUS GROUND AREA (TREATED)
- PROPOSED ROAD AREA (TREATED)
- PROPOSED GROUND AREA (BYPASS)

CATCHMENTS		
CATCHMENT	AREA (ha)	IMPERVIOUS %
ROOF (RESIDENTIAL)	0.113	100
GROUND (RESIDENTIAL)	0.012	35
ROAD (RESIDENTIAL)	0.002	100
GROUND (BYPASS)	0.002	100



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A	FOR INFORMATION	A.M.	15.05.26

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SCALE

1:100 AT A1 | 1:200 AT A3 — 0 2 4m

CLIENT: Sunland Group

PROJECT: 99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

STAGE / PHASE: FOR INFORMATION ONLY — NOT FOR CONSTRUCTION

TITLE: MUSIC CATCHMENT PLAN

DRAWING NUMBER: OSK7218-P003

REVISION: A

Saved: 15/05/26 2:51:24 PM By: S.Wood

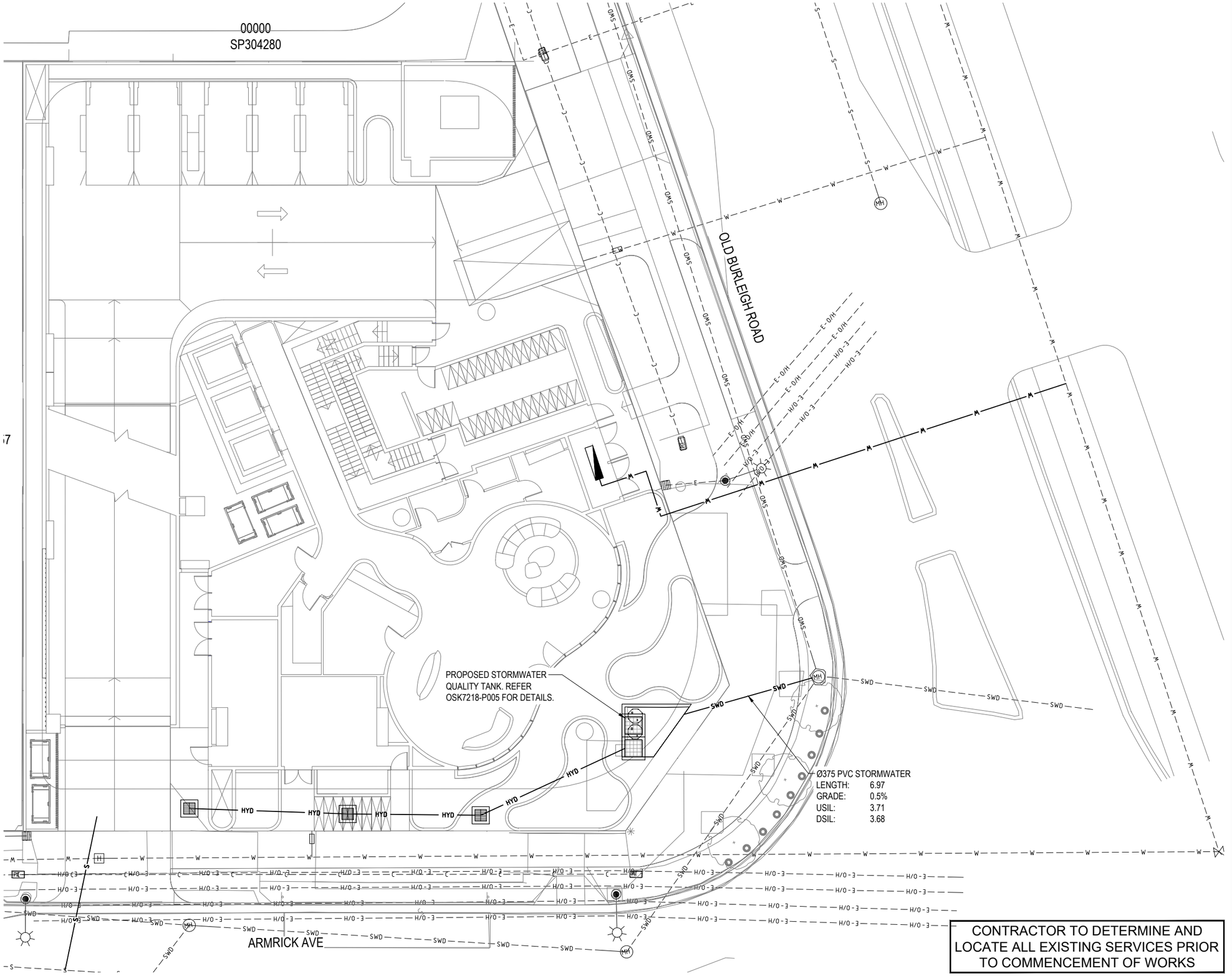
APPENDIX

E

OSKA Engineers, Conceptual Stormwater Management Plan (Ref: OSK6460/P004/A) & Conceptual Stormwater Management Details (Ref: OSK6460/P005/A)

LEGEND

SWD	PROPOSED STORMWATER PIPE
HYD	PROPOSED INTERNAL STORMWATER TO BE CONFIRMED AT DD BY HYDRAULIC CONSULTANT
	PROPOSED FIELD INLET
S	EXISTING SEWER MAIN
W	EXISTING WATER MAIN
E-O/H	EXISTING ELECTRICAL CABLE
SWD	EXISTING STORMWATER PIPE
C	EXISTING TELECOMMUNICATIONS CABLE



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A	FOR INFORMATION	A.M.	15.05.26

DRAWN	DESIGN	APPROVED
A.M.	S.W.	T.P.

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SCALE

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1:250 AT A3

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PROJECT

99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

STAGE / PHASE

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TITLE

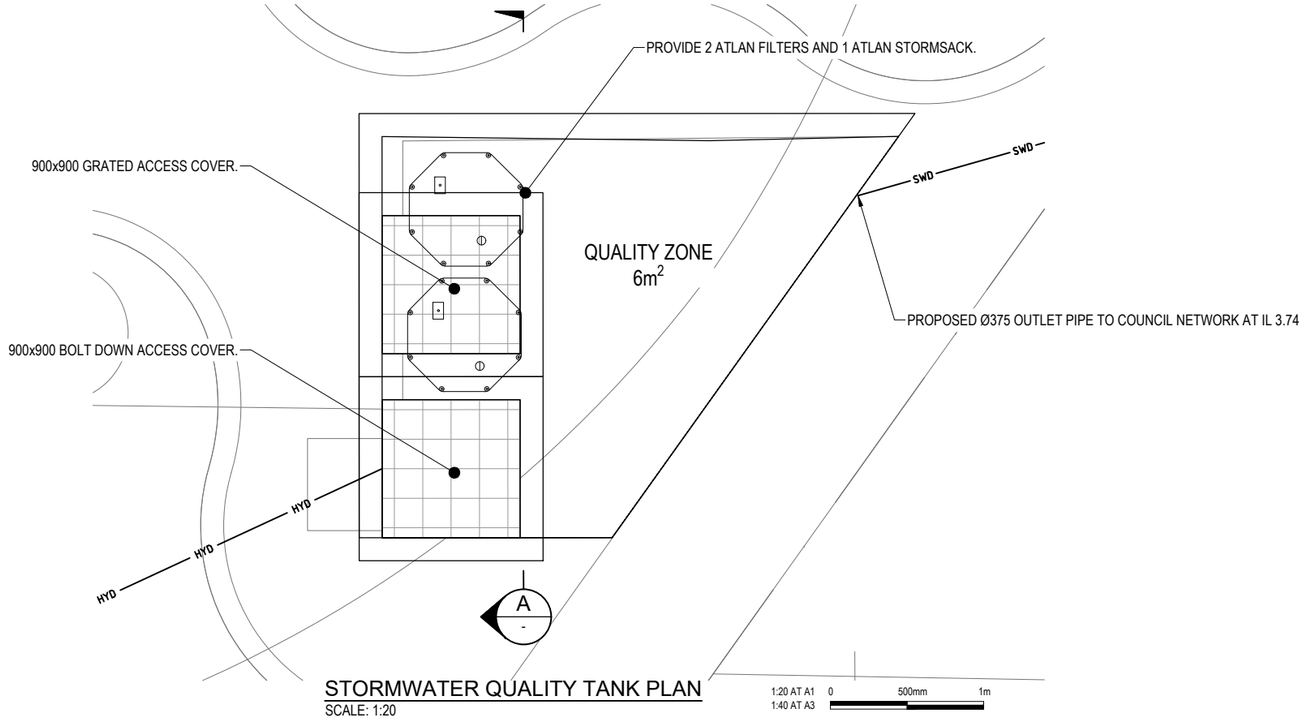
CONCEPTUAL STORMWATER MANAGEMENT PLAN

DRAWING NUMBER

OSK7218-P004

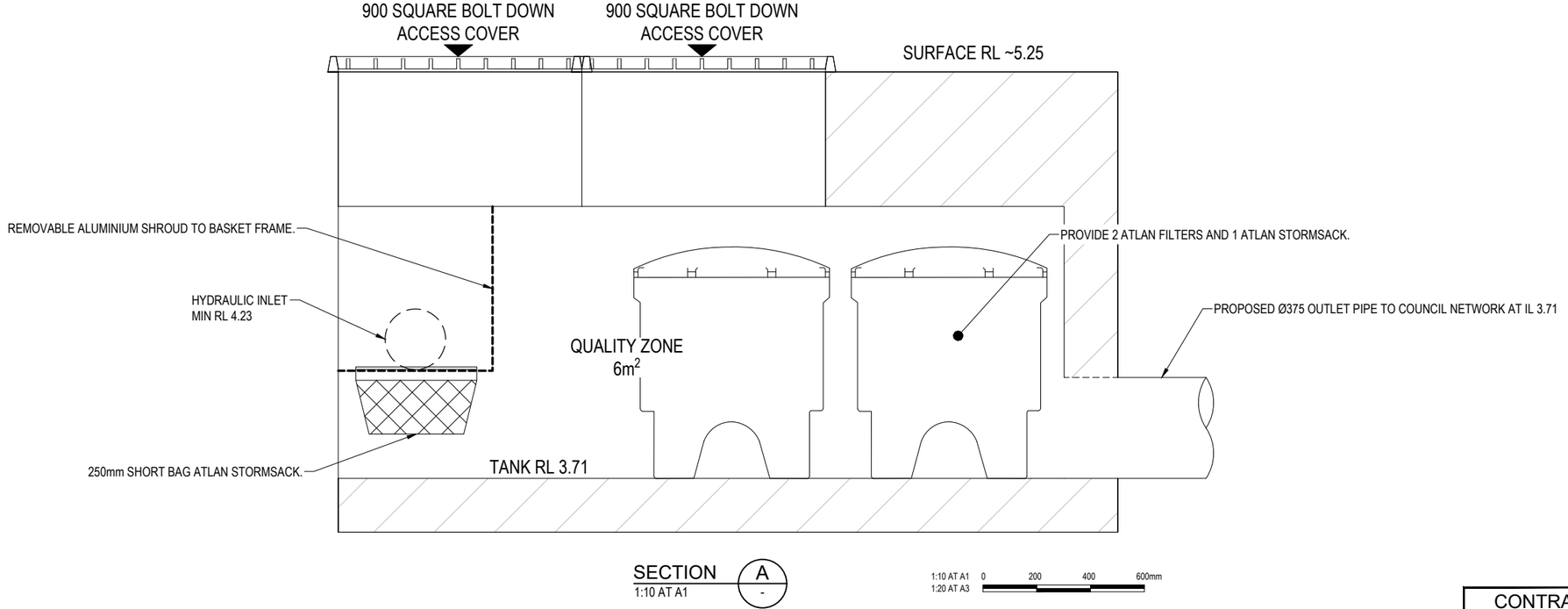
REVISION

A



STORMWATER QUALITY TANK PLAN
SCALE: 1:20

1:20 AT A1 0 500mm 1m
1:40 AT A3



SECTION A
1:10 AT A1

1:10 AT A1 0 200 400 600mm
1:20 AT A3

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DRAWN A.M. | DESIGN S.W. | APPROVED T.P.

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SCALE: AS SHOWN

CLIENT: Sunland Group

PROJECT: 99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

TITLE: STORMWATER MANAGEMENT PLAN DETAILS

STAGE / PHASE: FOR INFORMATION ONLY NOT FOR CONSTRUCTION

DRAWING NUMBER: OSK7218-P005

REVISION: A

Saved: 15/05/2026 4:47:25 PM Last saved by: Samuel Watts

APPENDIX

F

OSKA Engineers, Sediment and Erosion Control Plan (Ref: OSK6460/P006/A) & Sediment and Erosion Control Details (Ref: OSK6460/P007/A)

LEGEND

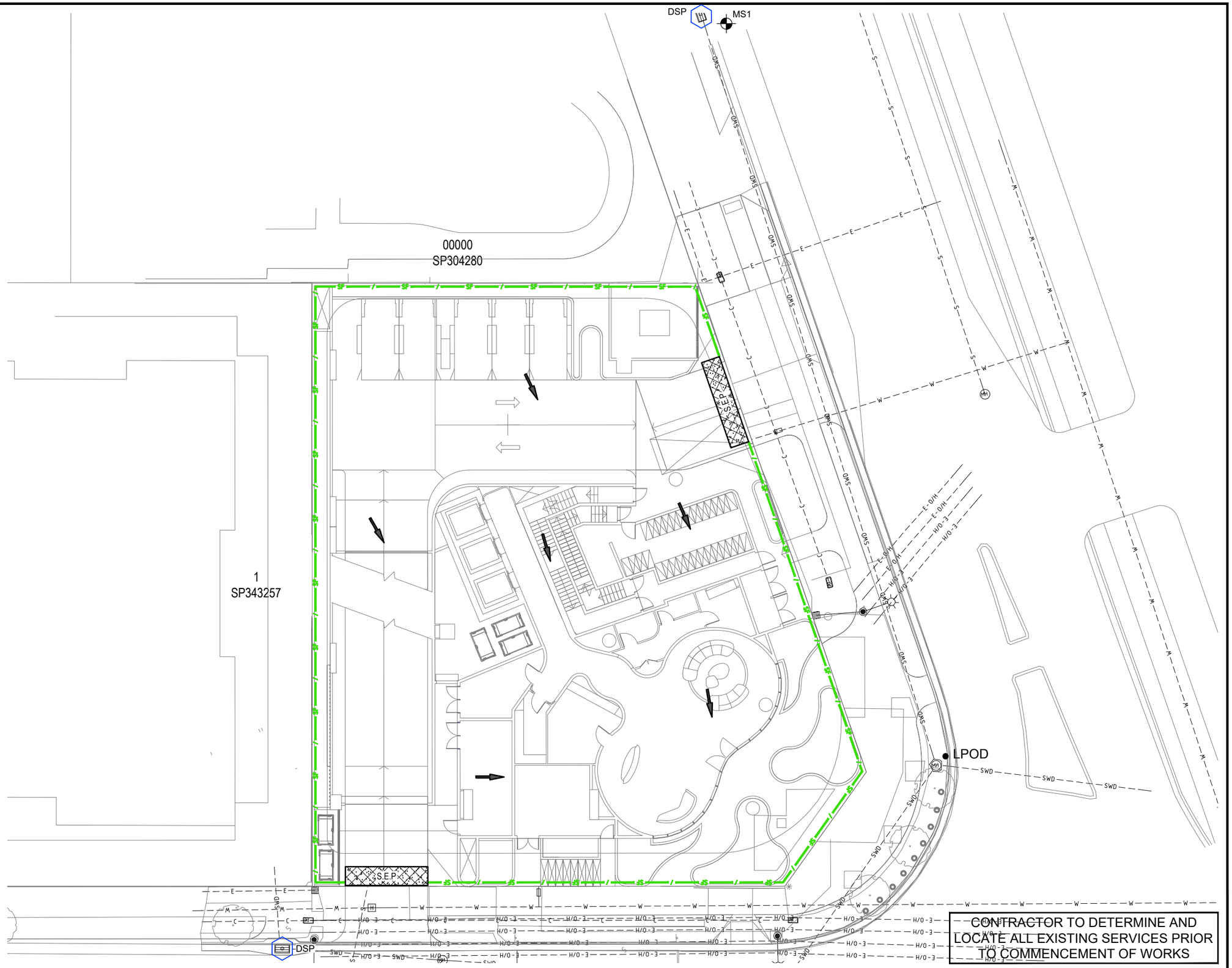
- SEDIMENT FENCE
- S.E.P — LOCATION OF STABILISED ENTRY/EXIT POINT
- DSP — DRAINAGE STRUCTURE PROTECTION
- MS1 — WATER QUALITY MONITORING STATION
- FLOW ARROW
- LPOD — LAWFUL POINT OF DISCHARGE
- EXISTING SEWER MAIN
- EXISTING WATER MAIN
- EXISTING STORMWATER
- EXISTING COMMS CABLE
- EXISTING OVERHEAD ELECTRICAL

NOTES

- FOR SEDIMENT & EROSION CONTROL NOTES REFER TO DWG No. OSK6795-P008.

CONCEPT ONLY

IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ADEQUATE SEDIMENT & EROSION CONTROL DURING ALL PHASES OF CONSTRUCTION TO THE SATISFACTION OF BOTH THE SUPERINTENDENT AND COUNCIL.



CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REV	DESCRIPTION	DRAWN	DATE
A	FOR INFORMATION	A.M.	15.05.26

DRAWN	DESIGN	APPROVED
A.M.	S.W.	T.P.

SIGNED

DATE

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SCALE

1:125 AT A1 0 5m
1:250 AT A3

CLIENT

Sunland Group

PROJECT

99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

STAGE / PHASE

FOR INFORMATION ONLY NOT FOR CONSTRUCTION

TITLE

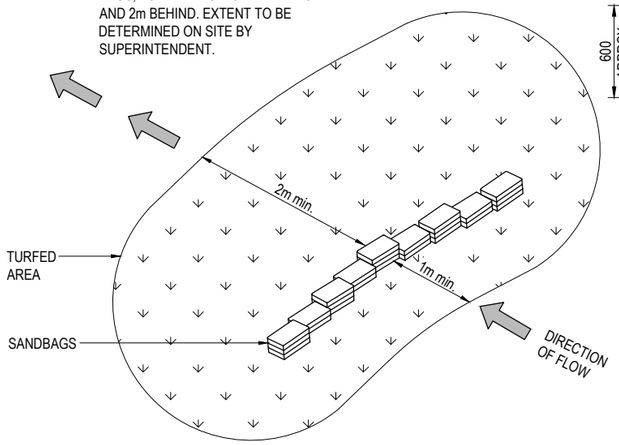
SEDIMENT AND EROSION CONTROL PLAN

DRAWING NUMBER

OSK7218-P006

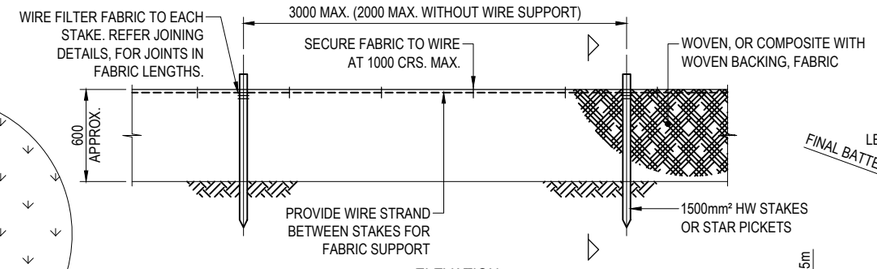
REVISION

A

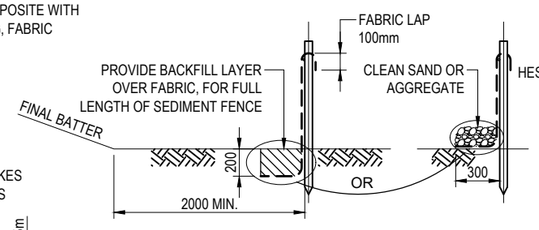


SAND BAG CHECK DAM

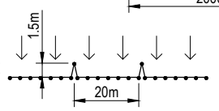
N.T.S.



ELEVATION



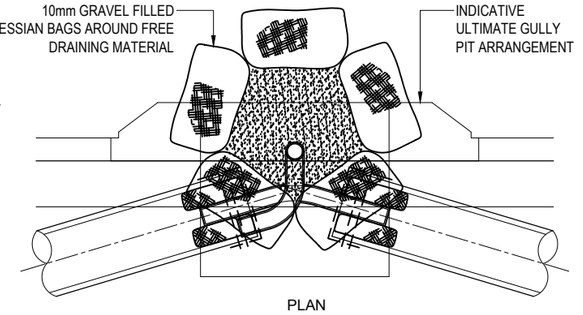
SECTION



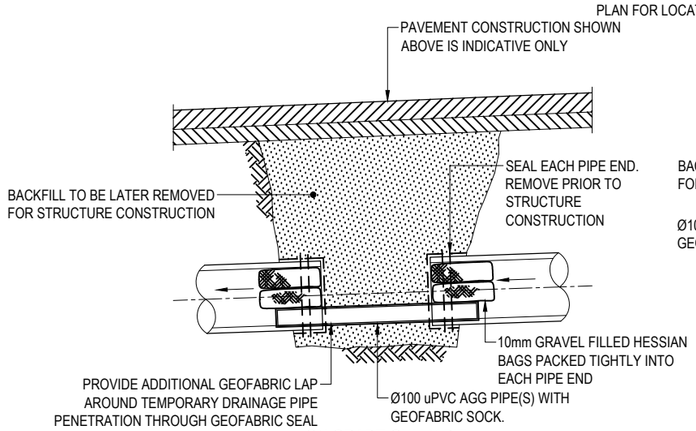
NOTE: INSTALL 1.5m (MIN.) DEEP 'RETURNS' AT 20m SPACING (MAX.) ON UPSLOPE SIDE OF FENCELINE (5-10m MAX SPACING IF FENCE ALIGNED AT ANGLE TO CONTOUR). EG:

SEDIMENT FENCE DETAILS

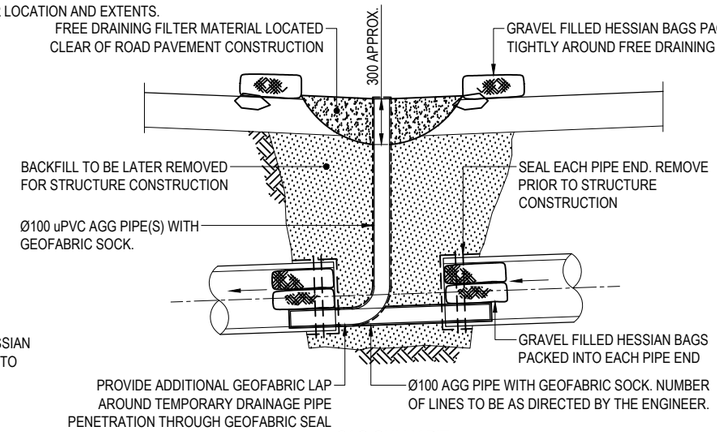
N.T.S. —/—SF— DENOTES SEDIMENT FENCE. REFER PLAN FOR LOCATION AND EXTENTS.



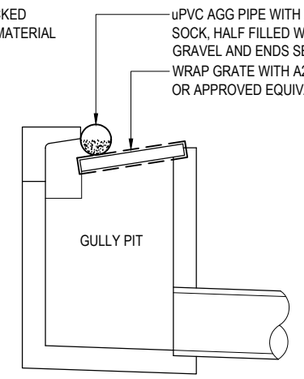
PLAN



ON GRADE GULLY PIT



SAG GULLY PIT

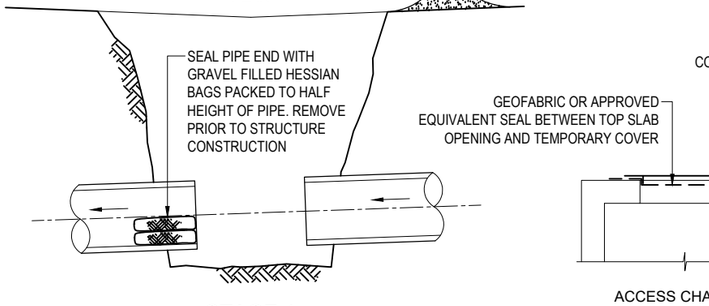


STAGE 2

STRUCTURE COMPLETE

STAGE 1

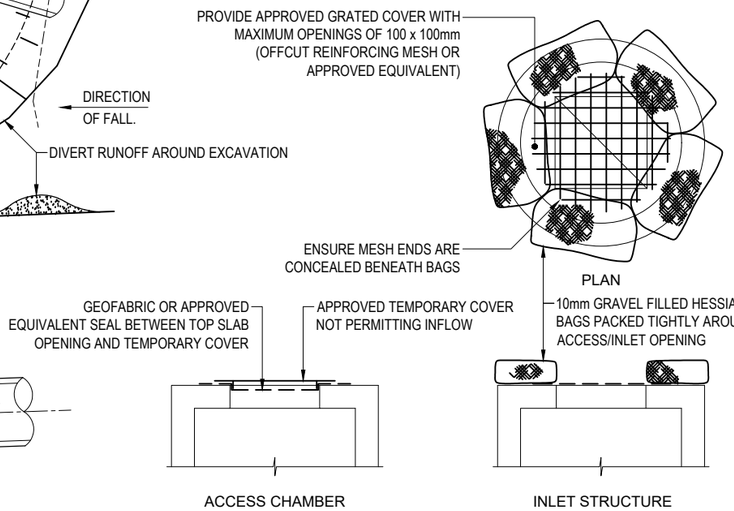
EXCAVATION, PIPE INSTALLATION AND INTERIM BACKFILLING



PLAN

STAGE 1

EXCAVATION AND PIPE INSTALLATION



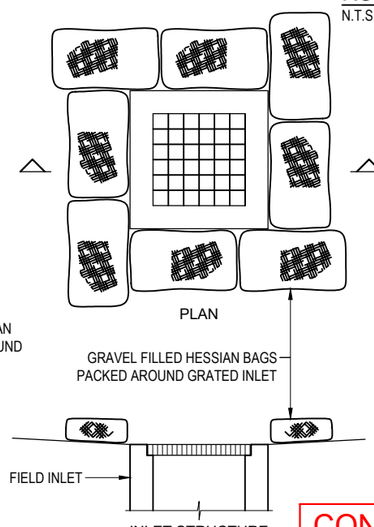
PLAN

ACCESS CHAMBER

INLET STRUCTURE

STAGE 2

STRUCTURE COMPLETE UP TO TOP SLAB



PLAN

INLET STRUCTURE

STAGE 3

STRUCTURE COMPLETE

ACCESS CHAMBER / INLET STRUCTURE

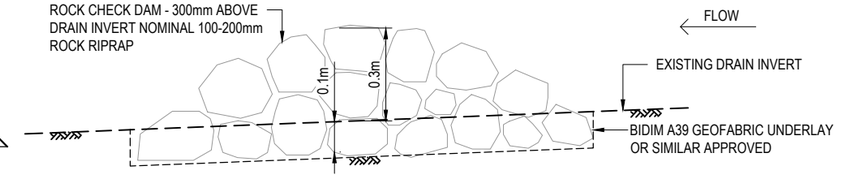
N.T.S.

DSP DENOTES DRAINAGE STRUCTURE PROTECTION, REFER PLAN FOR LOCATION & EXTENTS.

ROADWAY GULLY PIT

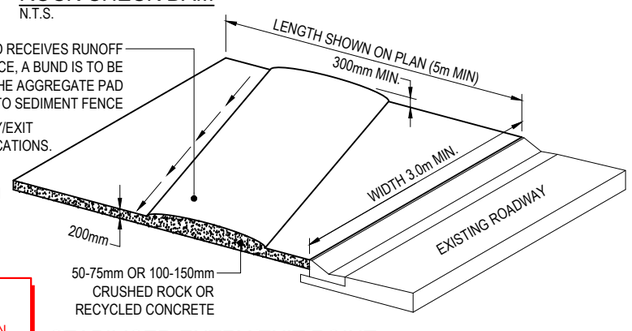
N.T.S.

DSP DENOTES DRAINAGE STRUCTURE PROTECTION. REFER PLAN FOR LOCATION & EXTENTS.



ROCK CHECK DAM

N.T.S.



SEP DENOTES STABILISED ENTRY/EXIT POINT, REFER PLAN FOR LOCATIONS.

NOTE:
ROCK IS TO BE UNIFORM SIZE. IE. MATERIAL IS TO NOT CONTAIN SMALLER ROCKS FILLING VOIDS.

STABILISED ENTRY/EXIT POINT

N.T.S. OR APPROVED EQUIVALENT

CONCEPT ONLY

IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ADEQUATE SEDIMENT & EROSION CONTROL DURING ALL PHASES OF CONSTRUCTION TO THE SATISFACTION OF BOTH THE SUPERINTENDENT AND COUNCIL.

REV	DESCRIPTION	DRAWN	DATE
A	FOR INFORMATION	A.M.	15.05.26

DRAWN A.M. | DESIGN S.W. | APPROVED T.P.

SIGNED

DATE

OSKA CONSULTING GROUP

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DRAWING IS NOT TO BE SCALED

SCALE

1:250 AT A1 0 5 10m
1:500 AT A3

CLIENT

Sunland Group

PROJECT

99-101 OLD BURLEIGH ROAD, BROADBEACH, QLD 4218

STAGE / PHASE

FOR INFORMATION ONLY NOT FOR CONSTRUCTION

TITLE

SEDIMENT AND EROSION CONTROL DETAILS

DRAWING NUMBER

OSK7218-P007

REVISION

A

OSKA Consulting Group Pty Ltd

APPENDIX

G

OSKA Engineers, Response to Healthy Waters Code (Ref: OSK6460-0003)

City Plan code template

This code template supports the preparation of a development application against either the acceptable outcome(s) or performance outcome(s) contained in the code. Development assessment rules are outlined in **Section 5.3.3** of the City Plan.

Please note:

Note: In accordance with Section 2.1 of City Plan, an assessment against State interest - Water quality (policies 4 and 5) of the State Planning Policy 2017 is required as the Healthy water development code does not fully integrate this State interest. A response table for policies 4 and 5 have been included below.

For assessment against the overall outcomes, refer to the appropriate code.

Note: The whole of the planning scheme is identified as the assessment benchmark for impact assessable development. This specifically includes assessment of impact assessable development against this strategic framework. The strategic framework may contain intentions and requirements that are additional to and not necessarily repeated in zone, overlay or other codes. In particular, the performance outcomes in zone codes address only a limited number of aspects, predominantly related to built form. Development that is impact assessable must also be assessed against the overall outcomes of the code as well as the strategic framework.

9.4.5 Healthy waters code

9.4.5.3 Specific benchmarks for assessment

PART B – ASSESSABLE DEVELOPMENT BENCHMARKS

Table 9.4.5-3: Healthy waters code – for assessable development

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
Erosion and sediment control			
PO1 Stormwater discharge from a development site achieves the construction phase water quality objectives of **SC6.12 City Plan policy – Land development guidelines**, **Section 4 – Stormwater drainage and water sensitive urban design standards**.	**AO1** No acceptable outcome provided.	A Conceptual Stormwater Management Plan (CSWMP) has been prepared for the Proposed Residential Development situated at 99-101 Old Burleigh Road, Broadbeach. The CSWMP details the proposed treatment measures to be implemented to ensure compliance with SC6.12 City Plan policy – Land development guidelines. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
PO2 Erosion, sediment and dust is appropriately managed during the construction phase.	**AO2** The level of risk for soil erosion and sediment pollution to the environment is determined by an erosion hazard assessment, completed by a suitably-qualified person in accordance with the criteria in **Table 9.4.5-4: Erosion hazard assessment**. Where the erosion hazard assessment has a risk score of: (a) less than or equal to 10: A deemed to comply report is prepared by a suitably qualified person for Council approval, including conceptual location and design drawings of each treatment measure in plan and section views, in accordance with the *Best Practice Erosion*	An erosion hazard assessment was completed for the development in accordance with Table 9.4.5-4 and the proposed development totalled a risk score of 10. A sediment and erosion control plan is included in OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach. The plan addresses devices and management measures to control erosion and sediment for the pre-construction, construction and post-construction phases of the development, in accordance with the Best Practice Erosion and Sediment Control: International Erosion Control Association, (IECA) 2008.	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
	and Sediment Control: International Erosion Control Association, (IECA) 2008, Australasia Chapter 2008. (b) greater than 10 or developments involving multiple stages of disturbance or more than 1.25 ha of land: (i) For material change of use or reconfiguring a lot, a conceptual erosion and sediment control plan (ESCP) is prepared by a suitably-qualified person for Council approval in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design standards**, and the *Best Practice Erosion and Sediment Control: International Erosion Control Association (IECA) 2008, Australasia Chapter 2008*. (ii) For operational work, a detailed ESCP is prepared by a suitably-qualified person in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design standards**, and *Best Practice Erosion and Sediment Control: International Erosion Control Association (IECA) 2008, Australasia Chapter 2008*. The ESCP is to detail appropriate treatment measures for the construction phase of development, demonstrating how		

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
	the minimum design objectives in **Table 9.4.5-5: Stormwater design objectives** are achieved, including: (a) measures to ensure the release of sediment-laden stormwater for the nominated design storm are minimised when the design storm is exceeded; (b) detailed design, installation, construction, monitoring and maintenance requirements of all approved proprietary products in accordance with local conditions and manufacturer's recommendations; and (c) details of how the ESCP aligns with the approved development staging plan.		
Stormwater quality			
PO3 Development appropriately manages stormwater quality to: (a) protect natural ecosystems; (b) protect water quality; (c) reduce runoff and peak flows; and (d) meet the water quality objectives and environmental values for Queensland waters. **Note: Water quality objectives and environmental values for Queensland waters are contained within *Schedule 1* of the *Environmental Protection (Water) Policy 2009*. Water quality objectives are locally specific and vary between and within river catchments.**	**AO3.1** For post developed sites, the following minimum pollutant reduction targets are achieved: (a) Gross pollutants (>5mm) – 90%; (b) Total Suspended Solids (TSS) – 80%, (c) Total Phosphorus (TP) – 60%; and (d) Total Nitrogen (TN) – 45%.	A Conceptual Stormwater Management Plan (CSWMP) has been prepared for the Proposed Residential Development situated at 99-101 Old Burleigh Road, Broadbeach. The CSWMP details the proposed treatment measures to be implemented to ensure compliance with SC6.12 City Plan policy – Land development guidelines. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
	AO3.2 For development on land less than 1.25ha, a deemed to comply solution for stormwater quality is achieved in accordance with **Table 9.4.5-6: Stormwater quality deemed to comply solutions**.	**N/A**	
	AO3.3	**N/A**	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
Note: A stormwater quality management plan prepared by a suitably qualified person in accordance with SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design standards, is Council's preferred method for addressing this performance outcome.	For development on land greater than 1.25ha, a stormwater quality management plan is to be prepared by a suitably qualified person in accordance with **SC6.12 City Plan policy – Land development guidelines**, **Section 4 – Stormwater drainage and water sensitive urban design standards**, is required.		
Waterway stability			
PO4 In-stream erosion, downstream of urban development is prevented by controlling the rate (or magnitude) and duration of sediment transporting flows.	**AO4** Post-development peak 0.632 Annual Exceedance Probability (AEP) event discharge within receiving waterway is limited to pre-development peak 0.632 AEP event discharge and is in accordance with **SC6.12 City Plan policy – Land development guidelines**, **Section 4 – Stormwater drainage and water sensitive urban design standards.**	**N/A** The development proposes to discharge stormwater to the existing Council Stormwater Drainage System.	
Stormwater quantity control			
PO5 Stormwater quantity management outcomes demonstrate no adverse impact on stormwater flooding or the drainage of properties external to the subject site.	**AO5** The following is achieved external to the development site: (a) no increase in peak flood flow rate from the development site for all events up to and including the 1% AEP; (b) no increase in peak flood velocities from the development site for all events up to and including the 1% AEP; (c) no increase in peak flood level from the development site for all events up to and including the 1% AEP; and (d) stormwater outfalls or discharge is located to avoid conflict with existing	A CSWMP has been prepared for the proposed development. The CSWMP details that peak outflows are negligible compared to the pre-development conditions and that there is a negligible increase in runoff to downstream properties in accordance with SC6.12 City Plan policy – Land development guidelines (Section 4 – Stormwater drainage and water sensitive urban design standards). Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
	usage of downstream land or impacts on existing watercourse or drainage.		
Lawful point of discharge			
PO6 Development ensures the stormwater systems are designed to not cause actionable nuisance that would adversely affect adjoining (upstream or downstream) properties.	**AO6** A lawful point of discharge must be identified and demonstrated that all discharge point/s from the development are in accordance with **SC6.12 City Plan policy – Land development guidelines**, **Section 4 – Stormwater drainage and water sensitive urban design standards**.	A CSWMP has been prepared for the proposed development. The CSWMP details the proposed lawful point of discharge for the runoff from the development in accordance with SC6.12 City Plan policy – Land development guidelines. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
Overland flow paths			
PO7 Development must not obstruct free open surface flow of stormwater through a site.	**AO7** Overland flowing stormwater is allowed free open surface flow between the street and any waterway at the rear or sides of a property, in accordance with the provisions of the *Building Code of Australia.*	**N/A**	
Whole of life costs			
PO8 Stormwater infrastructure is designed and constructed to: (a) remain fit for purpose for the life of the development and maintains full functionality in the design flood event; (b) be cost effective to maintain; and (c) ensure no structural damage to existing stormwater infrastructure.	**AO8** No acceptable outcome provided.	The system proposed is the same or similar to systems proposed through the Gold Coast. The site is unaffected by flood mapping according to CoGC mapping and any damages to CoGC stormwater infrastructure sustained during construction shall be rectified. A SQID Maintenance Management plan will be prepared during the detailed design phase and a maintenance agreement with a suitable body shall be engaged to ensure the SQIDs are meeting the specified performance outcomes. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
Landscape integration			

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
PO9 Stormwater treatment devices and stormwater infrastructure are designed to: (a) integrate with the urban design and landscape outcomes of the development; (b) complement natural environments, wetlands and watercourses; (c) protect environmental values; (d) enhance visual amenity; and (e) incorporate CPTED principles in accordance with **SC6.12 City Plan policy – Land development guidelines, Section 4 – Stormwater drainage and water sensitive urban design standards**.	**AO9.1** Where stormwater treatment devices and stormwater infrastructure are integrated into public open space, a Statement of Landscape Intent is to be prepared by a suitably qualified person, for approval by Council. The plan is to demonstrate that the operation of stormwater infrastructure does not compromise the function of any co-located uses and reflect the design principles within **SC6.12 City Plan policy – Land development guidelines**, **Section 4 – Stormwater drainage and water sensitive urban design standards.** **Note: A Statement of landscape intent is to be prepared in accordance with SC6.13 City Plan policy – Landscape work.**	A Conceptual Stormwater Management Plan (CSWMP) has been prepared for the Proposed Development situated at 99-101 Old Burleigh Road, Broadbeach. The CSWMP details the proposed treatment measures to be implemented and demonstrates that increase in peak outflows are negligible when compared to the pre-development conditions and that there is negligible increase in runoff to downstream properties to ensure compliance with SC6.12 City Plan policy – Land development guidelines. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
	AO9.2 Stormwater treatment devices are located offline to any upstream catchment. **Note: This provision relates to the integration of stormwater treatment devices and stormwater infrastructure into the landscape. Development identified on the Environmental significance – wetlands and watercourse overlay map will still require assessment against the Environmental significance overlay code.**	A Conceptual Stormwater Management Plan (CSWMP) has been prepared for the Proposed Development situated at 99-101 Old Burleigh Road, Broadbeach. The CSWMP details the proposed treatment measures to be implemented and demonstrates that increase in peak outflows are negligible when compared to the pre-development conditions and that there is negligible increase in runoff to downstream properties to ensure compliance with SC6.12 City Plan policy – Land development guidelines. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
	AO9.3 All stormwater outlets that are located adjacent to watercourses, creeks and drainage paths are aligned at a maximum of 45 degrees to the downstream direction of flow, and energy dissipation measures installed to minimise scour.	**N/A**	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
Public safety			
PO10 Stormwater treatment devices and stormwater infrastructure minimise impacts on public health and safety.	**AO10** All stormwater quantity control measures are designed in accordance with **SC6.12 City Plan policy – Land development guidelines**, **Section 4 – Stormwater drainage and water sensitive urban design standards**.	A CSWMP has been prepared for the proposed development. The CSWMP details the proposed on site detention measures to demonstrates that the increase in peak outflows are negligible when compared to the pre-development conditions and that there is negligible increase in runoff to downstream properties in accordance with SC6.12 City Plan policy – Land development guidelines (Section 4 – Stormwater drainage and water sensitive urban design standards). Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
Maintenance access			
PO11 Maintenance access is provided for all stormwater management systems and considers: (a) the type of vehicle or machinery needed to service particular assets; and (b) the need to ensure a safe working environment for maintenance personnel and the public.	**AO11.1** All weather vehicle access is to be provided to inlet zones of the stormwater treatment systems in accordance with **Table 9.4.5-7: Maintenance access requirements (slope).**	Vehicle access from Armrick Avenue is provided to the stormwater treatment system. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
	AO11.2 Maintenance access is to be provided around the perimeter of all stormwater treatment systems in accordance with **Table 9.4.5-8: Maintenance access requirements (size).**	Maintenance access around the perimeter of the treatment is provided. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	
	AO11.3 A maintenance buffer is provided around the perimeter of all stormwater treatment devices and adjoining private property equal to:	**N/A**	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets **either** the performance outcome or overall outcome	Internal use
	(a) 1m in width; or (b) the width of a perimeter maintenance access, as delivered in AO11.2, plus 0.5m. The maintenance buffer is measured from the adjacent allotment boundary to the top of batter around the treatment measure. The maximum slope on the maintenance buffer is 1 in 10.		
Fauna movement			
PO12 Stormwater conveyance structures and channels are designed to ensure the safe movement of native fauna and provide for terrestrial and aquatic passage.	**AO12.1** Stormwater drainage structures and channels minimise impacts on aquatic fauna and associated habitats and provide opportunities for beneficial habitat uses of structures in accordance with the *Department of Primary Industries and Fisheries – Fisheries guidelines for Fish-friendly structures (2006).*	**N/A**	
	AO12.2 Stormwater drainage structures allow for the safe movement of terrestrial fauna in accordance with: (a) the Queensland Government Fauna Sensitive Road Design Manual Volume 2: Preferred Practices; and (b) the Queensland Government Koala-Sensitive Design Guidelines.	**N/A**	

Performance outcomes	Acceptable outcomes	Does the proposal meet the acceptable outcome? If not, justify how the proposal meets either the performance outcome or overall outcome	Internal use
Wastewater management			
PO13 Development does not discharge wastewater to receiving waters or areas external to the site unless demonstrated to be the best-practice environmental management for that site and takes into consideration: (a) the applicable water quality objectives for the receiving waters; and (b) the potential adverse impact on ecosystem health of receiving waters.	**AO13** Where the development involves the discharge of wastewater, a Wastewater Management Plan (WWMP) is prepared, demonstrating compliance with the performance outcome, by a suitably qualified person and submitted to the Council, detailing all of the following: (a) wastewater type; (b) climatic conditions; (c) water quality objectives; (d) best-practice environmental management; (e) waste management hierarchy; and (f) the WWMP provides for the management of wastewater in accordance with a wastewater management hierarchy that: (i) avoids wastewater discharge to watercourses; or (ii) if wastewater discharge to the environment cannot practicably be avoided wastewater discharge to watercourses is minimised through re-use, recycling, recovery and treatment for disposal to sewer, surface water and groundwater.	**N/A** The proposed development does not propose to discharge wastewater into receiving waters. All wastewater will be discharged appropriately into Council's sewerage network.	
Dewatering management			
PO14 Dewatering occurs in accordance with an approved Dewatering management plan.	**AO14** No acceptable outcome provided.	**N/A**	

Woongoolba flood mitigation catchment area			
PO15 In the Woongoolba flood mitigation catchment area, shown on the **Water catchments and dual supply system area overlay map**, peak outflow and its timing for Q2, Q5 and Q10 for rainfall events up to 72 hours does not change as a result of development.	**AO15** No acceptable outcome provided.	**N/A**	

State Planning Policy July 2017

Policies	Demonstrate how the proposal meets the policy?	Internal use
State interest – water quality		
ASSESSMENT BENCHMARK 4 (POLICY 4): At the construction phase, development achieves the applicable stormwater management design objectives in table A (appendix 2) of the State Planning Policy.	A sediment and erosion control plan is included in OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach. The plan addresses devices and management measures to control erosion and sediment for the pre-construction, construction and post-construction phases of the development, in accordance with the Best Practice Erosion and Sediment Control: International Erosion Control Association, (IECA) 2008 to ensure compliance with Assessment Benchmark 4 (Policy 4) of the State Planning Policy.	
ASSESSMENT BENCHMARK 5 (POLICY 5): (5) At the post-construction phase, development: a) achieves the applicable stormwater management design objectives on-site, as identified in table B (appendix 2) of the State Planning Policy; or b) achieves an alternative locally appropriate solution off-site that achieves an equivalent or improved water quality outcome to the relevant stormwater management design objectives in table B (appendix 2) of the State Planning Policy.	A Conceptual Stormwater Management Plan (CSWMP) has been prepared for the Proposed Development situated at 99-101 Old Burleigh Road, Broadbeach. The CSWMP details the proposed treatment measures to be implemented to ensure compliance with Assessment Benchmark (Policy 5) of the State Planning Policy. Refer to OSKA Consulting Group, Conceptual Stormwater Management Plan (Ref: OSK7218-0003) prepared for 99-101 Old Burleigh Road, Broadbeach.	

Table 9.4.5-3: Erosion hazard assessment

Controlling factor	Points	Score
Average slope of the whole site prior to operational works		
Slope less than 2%	0	0
More than or equal to 2% but less than 5%	1	
More than or equal to 5% but less than 10%	2	
More than or equal to 10% but less than 15%	4	
More than or equal to 15%	5	
Soil type (to be disturbed)		
Gravels and sandy soils	1	1
Sandy loam	2	
Clays on flood plains	3	
Shallow soils on slopes	4	
Clays on slopes greater than 5%/imported fill or untested fill	5	
Anticipated duration of site disturbance		
Duration less than 2 weeks	0	
More than 2 weeks but less than 3 months	2	
More than 3 months but less than 6 months	4	4
More than 6 months	5	
Anticipated erosive rainfall risk during site disturbance		
Low (monthly average rainfall less than 45 mm)	0	
Moderate (monthly average rainfall 46 - 100 mm)	1	
High (monthly average rainfall 101 - 225 mm)	2	2
Very high (monthly average rainfall 226 - 1500 mm)	4	
Extreme (monthly average rainfall more than 1500 mm)	5	

Off-site sediment control (down-slope of the soil disturbance)		
Score 1 point if there is no purpose-built sediment trap (e.g. sediment basin, gross pollutant trap or purpose-built wetland).	1	1
Run-off entering the site		
Score 1 point if stormwater run-off is not diverted from entering the site or away from soil disturbance.	1	0
Extent of site disturbance		
Score 2 points if the building works requires reshaping of the ground surface.	2	2
Total Score **Note: High erosion risk - if score 11 or greater, or five for any factor.**		10

This Erosion Hazard Assessment form is adapted from the *Best Practice Erosion and Sediment Control, International Erosion Control Association (Australasia), IECA 2008 Appendix H - Building Sites, the Brisbane City Council Erosion Hazard Assessment Form* and *Attachment 2 to the QDC Draft Part 16 Erosion and Sediment Control*.

APPENDIX

H

Atlan Filter, Operation and Maintenance Manual & Atlan Stormsacks, Operation and Maintenance Manual

OPERATION & MAINTENANCE MANUAL

AtlanFilter

(Formerly SPELFilter)

atlan.com.au

Atlan
STORMWATER

CONTENTS

Introduction..... 3

Features..... 4

Sizes..... 6

System Configuration.....7

Health and Safety..... 8

Maintenance frequency.....10

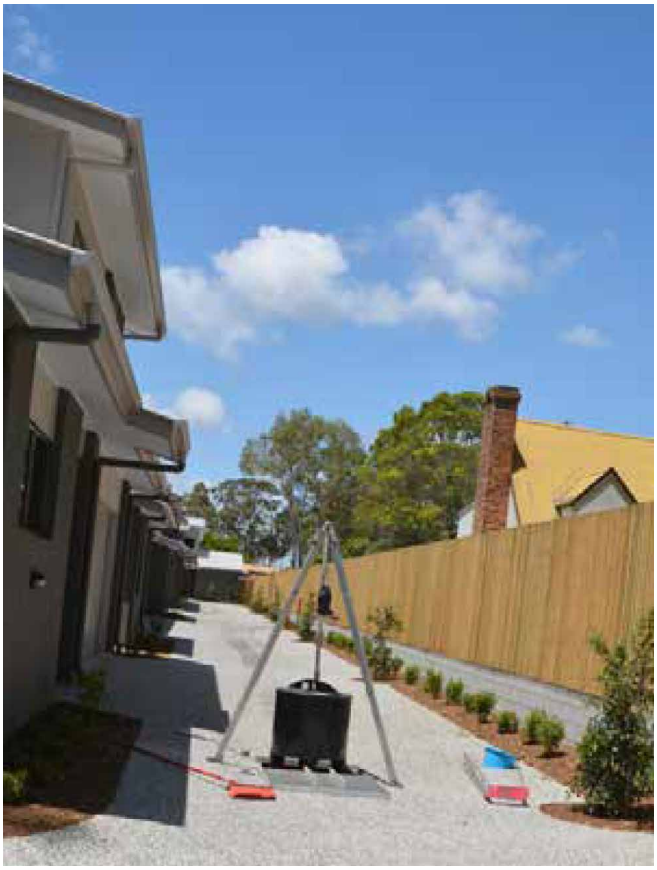
Maintenance Procedure.....11

General Cleaning.....12

Cartridge Recycling and Replacement 13

Standard Drawings 14

Site Exit and Clean Up 16



INTRODUCTION

Understanding how to correctly and safely maintain the AtlanFilter (formerly SPELFilter) is essential for the preservation of the filter's condition and its operational effectiveness. The AtlanFilter is a highly engineered stormwater filtration device designed to remove sediments, heavy metals, nitrogen and phosphorus from stormwater runoff.

The filters can be housed in either a concrete or fibreglass structure that evenly distributes the flow between cartridges.

Flow through the filter cartridges is gravity driven and self-regulating, which makes the AtlanFilter system a low maintenance, high performance stormwater treatment device.

This guide will provide the necessary steps that are to be taken to correctly and efficiently ensure the life of the AtlanFilter product.

Figure 1 - AtlanFilters in a concrete chamber / vault

FEATURES

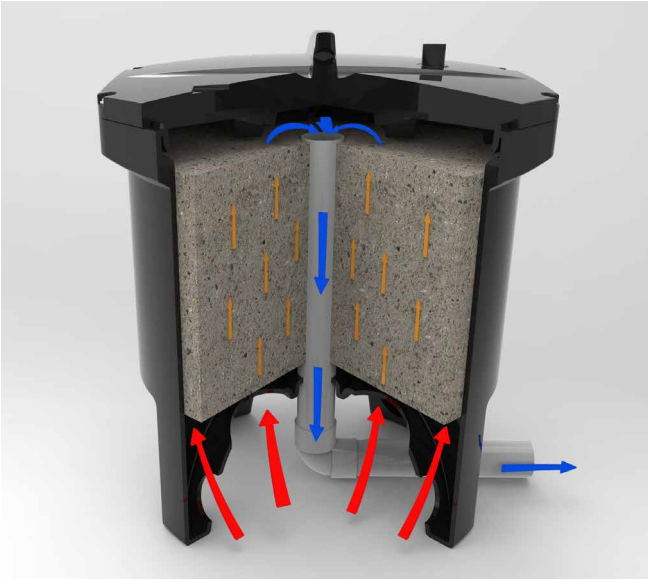


Figure 2 - Diagram of water flow through AtlanFilter

The AtlanFilter has a patented design that facilitates influent flow over the entire surface area of the media, providing consistent pollutant removal within a small footprint.

The AtlanFilter provides highly effective media filtration using gravity flow conditions, without the need for moving parts or floating valves. This eliminates the risk of mechanical failure, such as stuck valves and seizing components during its service life. This provides highly robust treatment performance.

Hydraulic head provided by a suitably sized weir in the filter vault forces stormwater through the filter media via the inlet ports underneath the filter cartridge.

Refer to the table below for minimum head required for the AtlanFilter cartridges to assist in sizing the weir.

The water to be treated enters the AtlanFilter cartridge via an upwards direction as the water level builds up around the AtlanFilter. This ‘up flow’ reduces the amount of sediment that could enter the media cartridge, as the sediment is allowed to drop to the vault floor under gravity. Any remaining sediment in the water is introduced through the filter media under hydraulic pressure and is filtered.

Water is filtered through the media, where dissolved and particulate Total Nitrogen and Total Phosphorus are removed via reaction with the media, in addition to the removal of Total Suspended Solids / sediment.

AtlanFilter Media Self-Backwash feature

A one-way air release valve located at the top of the filter cartridge allows air to escape as the cartridge fills up with water. This creates a siphonic flow condition as the air is completely evacuated from inside the AtlanFilter cartridge. Siphonic flow conditions are maintained until such time the water level outside of the cartridge falls beneath the inlet ports underneath the filter. At this moment, the water level inside the AtlanFilter cartridge is higher than the surrounding water level.

The water inside the AtlanFilter cartridge is then expelled upon the break of the siphon, and the water flows down and out of the inlet ports under gravity, onto the vault floor.

This is a highly effective backwash of the media and allows the expulsion of a high proportion of sediment out from the AtlanFilter media. The expelled sediment can be removed either manually or with a vacuum from the vault floor.

This backwash effect allows the media to remain highly conductive and is the key to the industry leading longevity of the AtlanFilter cartridge system, which does not need replacement for at least 5 years, and typically will achieve up to 6-8years of service, subject to the AtlanFilter being regularly maintained in accordance with this guideline and in accordance with the specific needs of the catchment.

Figure 3 - Typical Outlet Weir Wall

FEATURES

Self Supporting Feet

Each AtlanFilter cartridge stands on 4 feet, which negates the need for the construction of a false floor in the vault. The feet are bolted to the vault floor with the supplied stainless steel angles and M10 bolts. The feet allow a clear height from the vault floor up to the inlet ports of 240mm. The absence of a false floor allows plenty of room for backwashed sediment to evacuate from underneath the cartridges and thereby avoid blocking the inlet ports to the AtlanFilter from sediment buildup. It is for this reason that Atlan recommended the sediment buildup not exceed 150mm above the vault floor, so as to avoid blocking the inlet ports of the AtlanFilter. Blockage of the inlet ports due to sediment accumulation in the vault floor will cause the AtlanFilter to go into bypass and be ineffective. Hence it is important to keep up to date with monitoring and maintaining the AtlanFilter vault.

Figure 4 - Bolting the feet.

Figure 5 - Underside of the AtlanFilter showing the screened inlet ports and the connection for the outlet pipe in the middle.

Figure 6 - the top of the AtlanFilter showing the location of the one way air valve.

SIZES

Atlan Stormwater manufactures two height cartridges for varying site constraints as shown below. Each cartridge is designed to treat stormwater at a flow rate of 1.5 litres per second and 3.0 litres per second for the half height cartridge (model no. FIL-1.5) and full-height cartridge (model no. FIL-3.0) respectively.

	Full Height FIL-3.0	Half Height FIL-1.5
AtlanFilter total height	860mm	660mm
AtlanFilter Diameter	740mm	740mm
Minimum Head required	850mm	550mm
Treatment flow rate	3.0 L/s	1.5 L/s
Height of inlet ports above vault floor	250mm	250mm
Filtered water collection pipe diameter	50mm	50mm

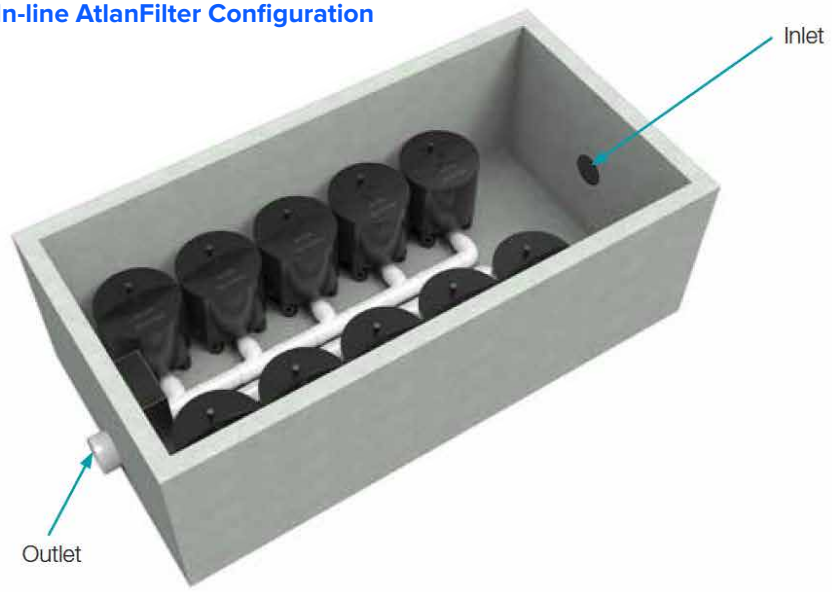
AtlanFilter Full Height - FIL-3.0

AtlanFilter Half Height - FIL1.5

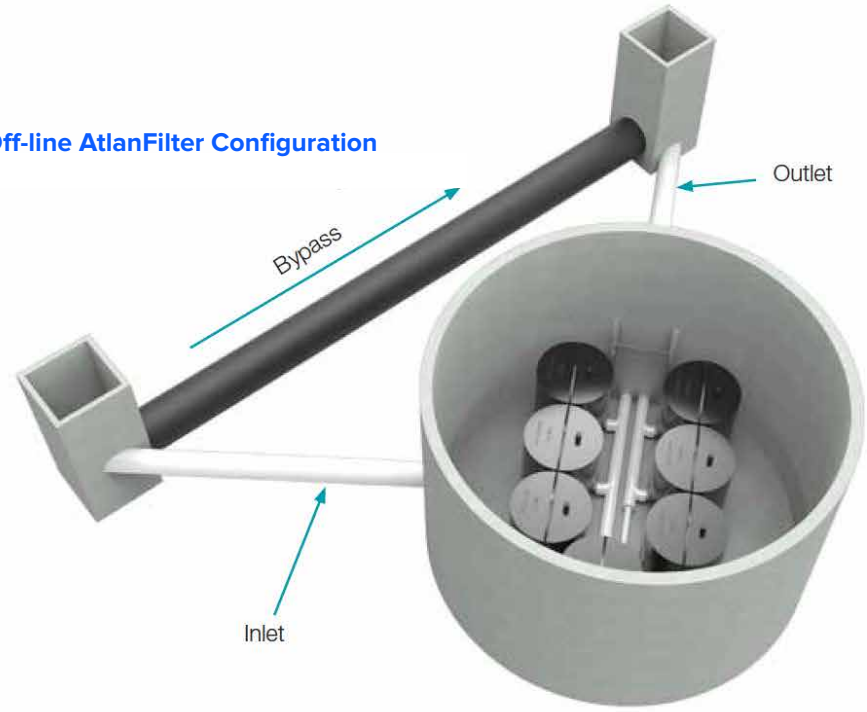
SYSTEM CONFIGURATION

AtlanFilter cartridges are installed in concrete or fibreglass tanks commonly referred to as ‘vaults’. The vault selection and configuration are based on site characteristics and/or constraints; computational stormwater quality modelling; and selected AtlanFilter models. Typical AtlanFilter system configurations are shown below.

In-line AtlanFilter Configuration



Off-line AtlanFilter Configuration



HEALTH AND SAFETY

A. Personal health & safety

When carrying out the necessary installation operations of the AtlanFilter all contractors and staff personnel must comply with all current workplace health and safety legislation.

The below measures should be adhered to as practically as possible.

- Comply with all applicable laws, regulations and standards.
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

B. Personal protective equipment/safety equipment

When carrying out the necessary installation operations of the AtlanFilter, wearing the appropriate personal protective equipment and utilising the adequate safety equipment is vital to reducing potential hazards.

Personal protective equipment / safety equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots
- Ear muffs
- Hard hat/s
- Sunscreen

C. Confined space

In the event access is required into the vault, confined space permits will be required which is not covered in this Guide. Typical equipment required for confined space entry include:

- Harness
- Gas detector
- Tripod
- Spotter

D. Traffic Control

It is not uncommon for Atlan Filter cartridges to be installed underneath trafficable areas. Minimum traffic control measures will need to be put in place in accordance with traffic control plans set out by respective local and state road authorities.

Vaults are to be treated as confined space.

Entry by permit only.

Monitor weather conditions prior to operation maintenance. Do not enter a vault during an episode of heavy rain as this can create a risk of drowning.

MAINTENANCE FREQUENCY

The AtlanFilter's design allows for a greater life span when frequently maintenance. Maintenance is broken up into three categories which include:

- Standard inspection
- General cleaning
- Cartridge replacement.

Standard Inspection

Standard inspections are conducted at regular four month intervals. At this time, an approved trained maintenance officer or Atlan representative shall undertake all measures outlined in Maintenance Procedure, Standard Inspection.

General Cleaning

At the end of each standard inspection, trigger measures will identify if general cleaning is required.

General cleaning will need to be executed immediate during standard inspections if the follow triggers are satisfied:

- Build-up of debris/pollutants within the vault greater than 150mm;
- Accumulation of debris/pollutants on the outlet chamber of the AtlanFilter vault;
- After large storm events, tidal or flooding impacts at the request of the owner;

Cartridge Replacement

Stormwater treatment is dependent on the effectiveness of the AtlanFilter cartridge system. As the AtlanFilter ages, pollutants will inundate the cartridge and ultimately reduce the treatment flow rate. At this point, a AtlanFilter flow test apparatus will be utilities to determine if replacement cartridges are required.

Based on the [site] concept modelling (MUSIC) and previous industry experience, we estimate the life of the AtlanFilter to be between 6 - 8 years. As a minimum requirement, each AtlanFilter cartridge should be replaced within 10 years.

The life cycle of the AtlanFilter can be impacted if standard inspections and general maintenance is not undertaken in accordance with this operation and maintenance Guide.

Other factors that will affect the above life cycle of the AtlanFilter include:

- Installation of cartridge system during construction phase and impacted by construction sediment loads;
- Neglecting to install pre-treatment using an industry approved GPT or a surface inlet pit trash bag such as the Atlan StormSack.
- Unforeseen environmental hazards affecting the AtlanFilter functionality.

MAINTENANCE PROCEDURES

Stormwater pollutants captured and retained by the AtlanFilter system need to be periodically removed to ensure environmental values are upheld. All associated maintenance works is heavily dependent on the site's operational activities and generated stormwater pollutants. To ensure the longevity of the installed AtlanFilter treatment system, it is imperative that the procedures detailed in this Guide are followed and all appropriate measures are actioned immediately.

Standard inspection

The standard inspection requires personal experience of Atlan products to visual inspection the vault and filter conditions.

Confined space requirements may not be required if a full inspection and assessment of each AtlanFilter can be achieved at surface level without being deemed a confined space entry.

The standard inspection requires personal experience of Atlan products to visual inspection the vault and filter conditions.

Confined space requirements may not be required if a full inspection and assessment of each AtlanFilter can be achieved at surface level without being deemed a confined space entry.

Site Inspection Procedures

1. Implement pre-start safety measures

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected.

Area in which work is to be carried out must be clean, safe and hazard free. (Refer to figure 4.)

2. Set-up gantry tripod above manhole

Assemble and position the gantry above the manhole safely and as practically as possible. Attach the winch or chain block to the gantry for lifting the Atlan Filters.

Perform safety procedures ie. Attach harnesses etc. (if confined space).

3. Open manhole lid

Once you have set up the Gantry and ensured that the area is safe to operate in, you can proceed to open the manhole lid, using lid lifters.

4. Conduct gas tests

(If tank is classed confined space)

Once the lids have been removed to a safe distance to prevent tripping, you must then proceed to conduct gas tests. Perform necessary gas tests according to the confined space regulations.

5. Once confined space has been deemed safe to operate in, enter tank safely

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space

6. AtlanFilter system assessment

Perform a review of the AtlanFilter system using the AtlanFilter assessment report/checklist. Sign off and forward a copy of the report to property manager and Atlan representative.

7. Reinstate AtlanFilter system and disposal

At the completion of the site inspection, ensure the site is reinstated back to its initial state and all pollutants are removed from the site in line with pollutant disposal procedures.

8. Sign off and forward a copy of the report to property manager and Atlan representative

GENERAL CLEANING

Vacuum out of Filter tank, removal, and disposal of pollutants at the completion of a standard inspection, general cleaning may be deemed necessary immediately or scheduled for a future date. Steps undertaken for general cleaning should be in general accordance with the procedure outlined below but not limited.

1. Implement pre-start safety measures

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected.

Area in which work is to be carried out must be clean, safe and hazard free. (Refer to figure 4.)

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6. AtlanFilter system assessment

Perform a review of the AtlanFilter system using the AtlanFilter assessment report/checklist.

7. Pollutant removal from tank

Perform clean-up using a licenced vacuum truck contractor or wet/dry vacuum, depending on level of sediment built up and/or tank size.

8. Reinstate AtlanFilter system and disposal

At the completion of the site inspection, ensure the site is reinstated back to its initial state and all pollutants are removed from the site in line with pollutant disposal procedures.

9. Sign off and forward a copy of the report to property manager and Atlan representative

CARTRIDGE RECYCLING AND REPLACEMENT

AtlanFilter cartridges can be swapped out for new cartridges. The spent AtlanFilter cartridges can be collected from site and sent to Atlan Stormwater's facilities, where the spent media will be removed from the cartridge in factory conditions and disposed of in accordance with environmental regulations.

The AtlanFilter cartridge will be recharged with new media, thereby recycling and repurposing the cartridge.

AtlanFilter replacement procedures may vary depending on the configuration of the AtlanFilters, the type of vault and engineers' specs. Replacement instructions for manhole AtlanFilter systems and precast vault AtlanFilter systems are contained in this section.

At the completion of a standard inspection, AtlanFilter replacement may be deemed necessary immediately or scheduled for a future date. Steps undertaken for cartridge replacement should be in general accordance with the procedure outlined below but not limited.

1. Implement pre-start safety measures

Ensure that the area in which operational works are to be carried out is cordoned off, to prevent unauthorised access. Adequate safety barriers must be erected.

Area in which work is to be carried out must be clean, safe and hazard free.

2. Set-up gantry tripod above manhole

Assemble and position the gantry above the manhole safely and as practically as possible. Attach the winch or chain block to the gantry for lifting the AtlanFilters.

Perform safety procedures ie. attach harnesses etc. (if confined space).

3. Open manhole lid

Once you have sent up the gantry and ensured that the area is safe to operate in, you can proceed to open the manhole lid, using lid lifters.

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(If tank is classed confined space)

Once the lids have been removed to a safe distance to prevent tripping, you must then proceed to conduct gas tests. Perform necessary gas tests according to the confined space regulations.

5. Once confined space has been deemed safe to operate in, enter tank safely

Once you have carried out the required gas test and the work area is deemed safe, you may then enter the pit via a ladder or winch system to assess the work area you will be operating in. Ensure all confined space procedures are followed.

6. Remove exhausted cartridges

Disconnect all internal pipe work from inside the vault. Unbolt anti-floatation measures and remove cartridges from the vault using Gantry Tripod method.

7. Pollutant removal

Using a wet/dry vacuum or sucker truck, suck out all the residual pollutant from the vault.

8. Install pipework and AtlanFilters

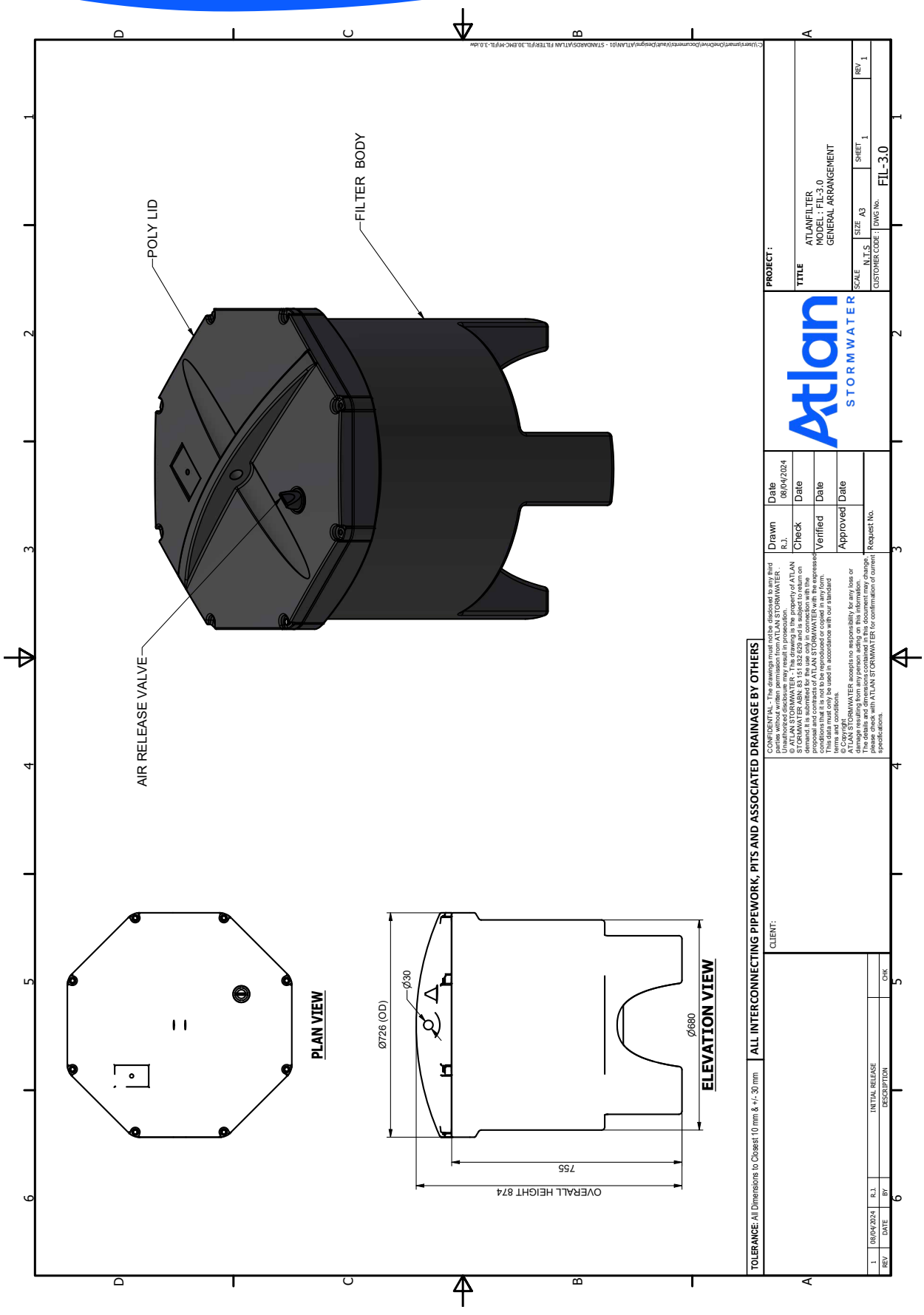
Please refer to the below standard install diagrams for the AtlanFilters. Then refer to your site specific drawings, as site requirements may require something different to the standard layout. Lower filters into tank, position into place, connect filter outlet pipework with the supplied fittings.

9. Install anti–floatation system

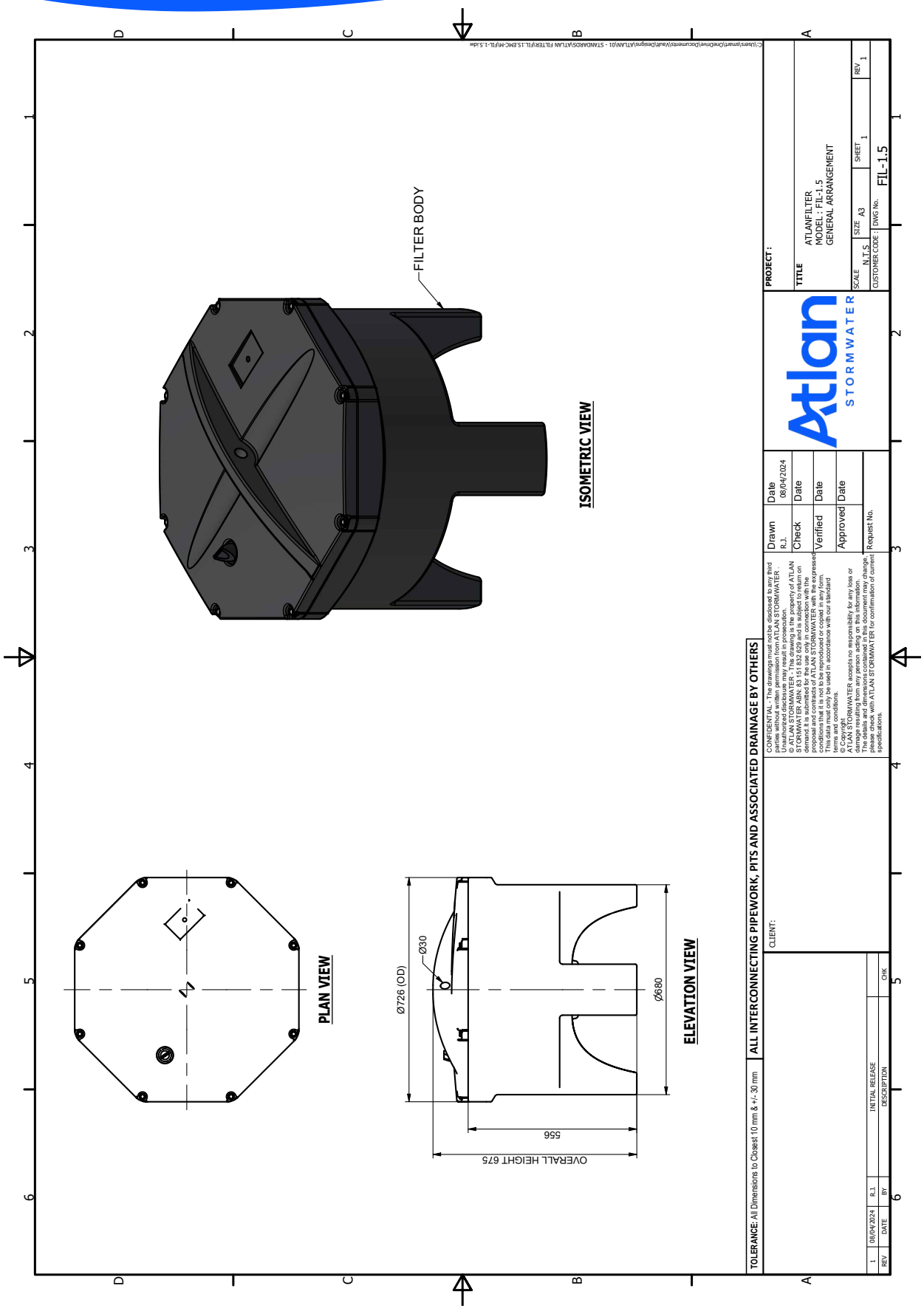
Please refer to the detailed drawings showing how the anti-floatation (anchor) bars are to be installed.

10. Sign off and forward a copy of the report to property manager and Atlan representative

Drawing
Full Height



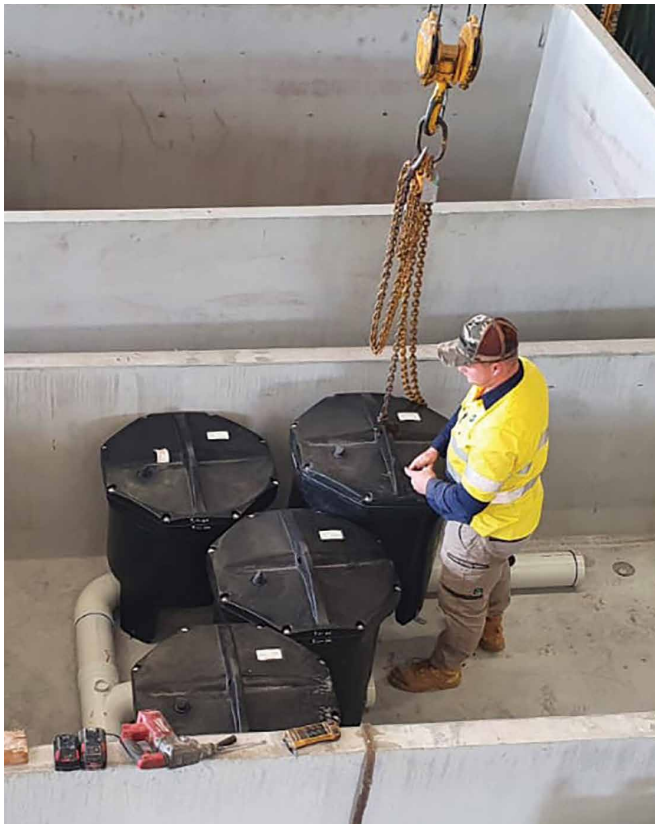
Drawing
Half Height



SITE EXIT & CLEAN UP

At the end of the scheduled maintenance, approved contractors or Atlan maintenance crew are required to reinstate the site to pre-existing conditions. Steps included but limited to are:

- Ensure all access covers are securely inserted back into their frames;
- Remove and dispose collected pollutants from the site in accordance with local regulator authorities;
- Retrieve all traffic control measures and maintenance tools; and
- Return all exhausted and/or damaged Atlan products to Atlan Stormwater to begin recycling program.



Joy in water

‘We believe clean waterways are a right not a privilege and we work to ensure a Joy in Water experience for you, with your children and grandchildren.’

Andy Hornbuckle

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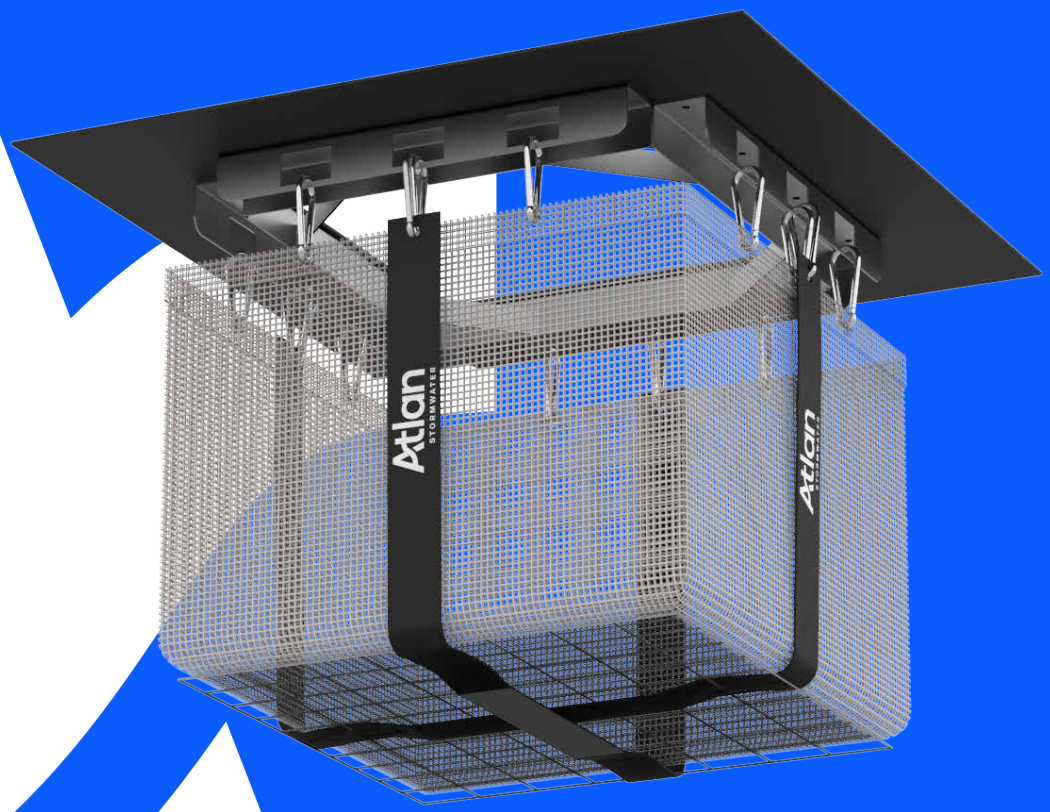
0524

OPERATION & MAINTENANCE MANUAL

StormSack



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Atlan
STORMWATER

INTRODUCTION

Maintenance of the Atlan StormSack is essential to preservation of its condition to ensure lifetime operational effectiveness.

The Atlan StormSack is a highly engineered water quality device that is deployed directly in the stormwater system as primary treatment to capture contaminants close to the surface for ease of maintenance.

To ensure full operational capacity, it is vital to ensure that the pollutants it captures are periodically removed, and filtration components are thoroughly cleaned.

This manual should be used in conjunction with the relevant site traffic management and safety plans, as well as any other provided documentation from Atlan.

The Atlan StormSack provides effective filtration of solid pollutants and debris typical of urban runoff, while utilising the existing or new storm drain infrastructure. The StormSack is designed to rest on the flanges of conventional catch basin frames and is engineered for most hydraulic and cold climate conditions.

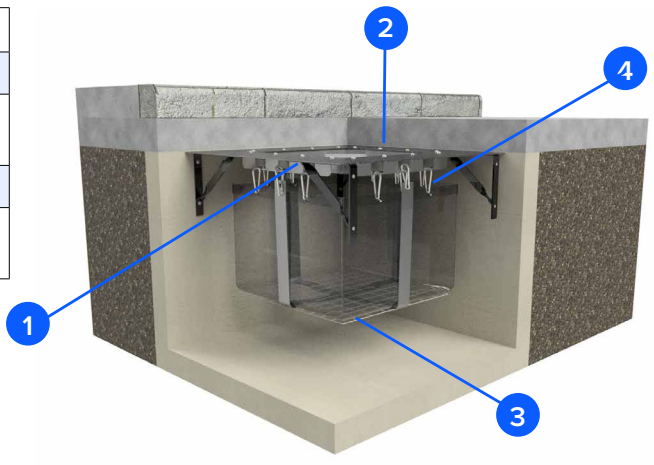
Typically the StormsSack is serviceable from the street level, and therefore maintenance does not usually require confined space entry into the catch basin structure. The unit is designed to be maintained in place with a vacuum hose attached to a sweeper or sucker truck.

COMPONENTS

- Adjustable Flange Deflector: Black HDPE attached to support frame
- Catchment Bag: 200micron woven poly fabric
- Support Hardware: Stainless steel 304
- Bag Support: Stainless steel 304 mesh
- Replaceable Oil Boom: Polypropylene 3 inch (76 mm) diameter (optional add-on)

Application	Regulatory Issue	Target Pollutants
Council Storm Drain Retrofits	At-source litter capture	Sediment, Litter, O&G
Commercial/Retail/Residential	Stormwater Compliance	Sediment, Litter, O&G
Litter Prone Urban Areas	Cost effective litter control	Litter ≥ 5 mm
Scrap Metal/Solid Waste/Oil Storage/Etc	Industrial Multi-Sector General Permit	Gross Pollutants, O&G
Part of Treatment Train	Council Stormwater Quality Improvement Targets	Sediment, Litter, O&G
Construction Sediment/Erosion	Sediment Control Plan	Sediment/Erosion Control

Features	
1.	Aluminium frame
2.	Black poly surround secured to frame • Can be cut to suit on site
3.	Reinforced StormSack bag
4.	Carabiners attach bag to frame for easy service and replacement



Standard StormSack to suit Pit Sizes
450x450mm
600x600mm
900x600mm
900x900mm

Custom sizes (i.e. 1200x900mm) can be manufactured on short lead times.

HEALTH & SAFETY

IMPORTANT: A full site based risk assessment should be completed prior to commencing work on your Atlan StormSack.

PERSONAL HEALTH & SAFETY

When carrying out maintenance operations of the Atlan StormSack all contractors and staff personnel must comply with all current workplace health and safety legislation. The below measures should be adhered as practically as possible:

- Comply with all applicable laws, regulations and standards.
- All those involved are informed and understand their obligations in respect of the workplace health and safety legislation.
- Ensure responsibility is accepted by all employees to practice and promote a safe and healthy work environment.

PERSONAL PROTECTIVE EQUIPMENT

When carrying out maintenance operations of the Atlan StormSack, wearing the appropriate personal protective equipment is vital to reducing potential hazards. Personal protective equipment in this application includes:

- Eye protection
- Safety apron
- Fluorescent safety vest
- Form of skin protection
- Puncture resistant gloves
- Steel capped safety boots

CAPTURED POLLUTANTS

The material captured by the Atlan StormSack can be harmful and needs to be handled correctly. The nature and amount of the captured pollutants depends on the characteristics of the site.

Pollutants can include from organic material such as leaves and sticks through to debris such as plastics, glass and other foreign objects such as syringes.

EQUIPMENT HANDLING

Handling activities such as a removing the drain grate a well as managing pedestrians and other non-worker personnel at the site should be exercised in accordance with specified safety procedures and guidelines.

CONFINED SPACES

Confined space entry procedures are not covered in this manual. It is requested that all personnel carrying out maintenance of the Atlan StormSack must evaluate their own needs for confined space entry and compliance with occupational health and safety regulations. Non trained staff are not permitted to participle in any confined space entries.

When maintenance operations cannot be carried out from the surface and there is a need to enter confined space, only personnel that currently hold a Confined Space Entry Permit are allowed to enter the confined space.

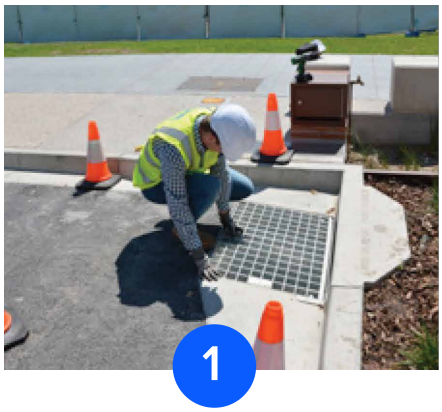
TRAFFIC MANAGEMENT

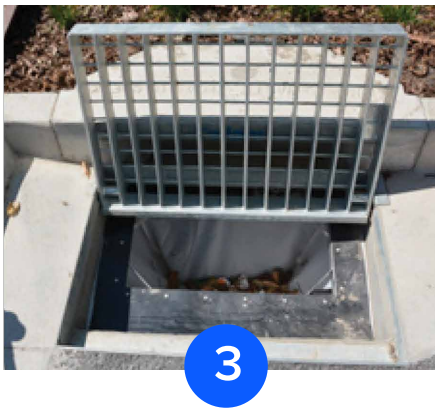
Typically stormwater gully pits are situated on roads and carparks, or adjacent to roads in a footpath or swale. As traffic requirements vary depending on the circumstance of the site, separate traffic control plans should be prepared for each site.

The specific road safety requirements for each site can be obtained from the relevant road authority to ensure all maintenance operations comply with the laws and regulations. State government publications can also be useful to find out the signage requirements, placement of safety cones and barricades that are required when working on public roads.

MAINTENANCE OF THE ATLAN STORMSACKS IS A SPECIALIST ACTIVITY

When carrying out maintenance operations of the Atlan StormSack, factors such as equipment handling methods, pollutants and site circumstances can impose potential risks to the maintainer and nearby civilians.





OPERATIONS

GENERAL MONITORING

The Atlan StormSack must be checked on a regular basis to analyse whether it requires maintenance or cleaning. As gully pit grates are usually quite heavy, it is vital to exercise the correct lifting techniques and also ensure that the area surrounding the open pit is shielded from access of non-work personnel.

To ensure optimal performance of the Atlan StormSack, the material collected by the filter bag should not exceed the level of approximately a half to two thirds of the total bag depth. When this material collected is showing signs of exceeding this level they should be scheduled to be emptied.

It is also recommended that additional monitoring is conducted following moderate to extreme rainfall events, especially when previous months have had little or no rainfall.

GULLY PIT COVER REMOVAL

Opening a hinged pit cover

1. Insert the lifting hooks beneath the grate.
2. Check hinge points are not damaged and debris is not caught in the hinge area.
3. Fully open pit grate, ensuring that the grate will stay in the open position without any external forces applied. Grates that do not remain open without being held, should be removed or secured during maintenance activities.

Opening a non-hinged pit cover

1. Place lifting hooks beneath grate, where possible in the four corners of the grate. Concrete lids may have Gatic lifting points, a key arrangement or holes in the lid, which may require special equipment such as Gatic lifters. Alternatively if safe to do so grip the grade with your hands.
2. Position each person on either side of the grate.
3. Lift the grate, ensuring that good heavy lifting posture is used at all times.
4. Place the grate on angle on the gutter, to allow for the lifting hooks to be removed.
5. For extremely heavy one-piece grates and concrete Gatic covers, insert the lifters in place and slide the lids back.

REPAIRS

Depending on the extent of the damage to the Atlan StormSack unit, it can usually be repaired.

Filter Bag Tears

Small tears to the filter bag can be repaired by either sewing the tear back together with additional fabric to increase the strength of the stitching, or by sewing a patch of filter material onto the filter bag.

Spill Procedures

In the event of a spill discharging into a gully pit, all effected sediment must be removed from the filter bags and the filter bags are to be removed and replaced with new filter bags.

Replacement Parts

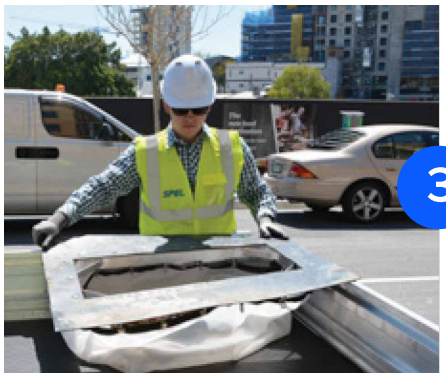
If large tears or irreparable damage to the frame and structure are present, it is advisable to replace the components.

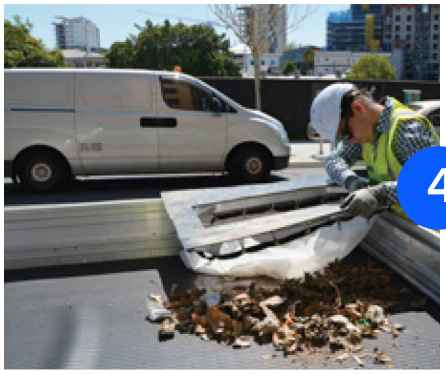
All required spare parts can be sourced directly from Atlan Stormwater.

CLEANING METHODS

CLEANING USING AN VACUUM TRUCK

1. Open gully pit.
2. Place the vacuum hose, suck out all of the sediment, organic leaf material, litter and other materials that were collected in the filter bag.
3. Allow the filter bag to be sucked up in the vacuum hose for a few seconds to allow for the filter mesh pores to be cleaned.
4. Use the vacuum hose to remove any build-up of material around the overflows and in the bottom of the pit.
5. Remove filter back from pit.
6. Remove any sediment and litter caught in the gully pit grate.
7. Back opening channels are to be cleared of any debris to ensure flow is not hindered.
8. Thoroughly examine the structural integrity of the filter bag and frame.
9. Reinstate filter bag and gully pit covers.





CLEANING BY HAND

CAUTION: Correct PPE must be warn - refer to page three. Remain alert for dangerous objects and wildlife.

1. Open gully pit.
2. Using the correct lifting technique, lift the StormSack out by the diagonal lifting corners fitted to the frame. For extremely heavy and overfilled bags either use a hydraulic lifting arm to lift the StormSack, or remove excess material using a shovel or etc. Take care not to damage the bag when removing litter form the bag.
3. Lift the StormSack clear of the stormwater pit and position over the collection bin or vehicle.
4. Lift and empty the bag by holding the bottom lifting loops only.
5. Brush the StormSack with a stiff brush to remove the sediment from the filter pores.
6. Thoroughly examine the structural integrity of the filter bag and frame.
7. Reinstate StormSack and gully pit covers.

MATERIAL DISPOSAL

Collected materials can be potentially harmful to humans and the environment. Once all captured material from the Atlan StormSack has been removed, it must be taken off site and disposed of at a transfer station or a similar approved disposal site.

BLOCKAGE TROUBLESHOOTING

In the unlikely event of surface flooding around a gully pit which has a Atlan StormSack fitted, the following steps should be carried out:

- Check the overflow bypass.
- If overflow is clear and surface flooding still exists remove the Atlan StormSack and check the outlet pipe for blockages.
- Removal of the Atlan StormSack can be difficult if clogged with sediment and holding water.
- If the filter is clogged brush the side walls to dislodge particles trapped at the interface allowing water to flow through the filter.
- If the outlet pipe is blocked a vacuum truck may be required to unblock it. Litter can be removed from the Atlan StormSack using the vacuum truck before removal. If a vacuum truck is not available please follow the hand maintenance cleaning steps prior to unblocking the outlet pipe.

ATLAN STORMSACK MAINTENANCE CHECKLIST

SITE DETAILS	
Client	
Location of system on site	
Site address	
Site contact name and number	

CHECKLIST ITEMS	YES/NO	COMMENTS
Is the pit free from pollutants and debris?	SELECT	
Is there movement or damage to the cage?	SELECT	
Is there movement or damage to the plastic pit seals?	SELECT	
Is structural integrity in good condition including fixings, joints and connections?	SELECT	
Is the filter bag pores clean and not clogged?	SELECT	
Is the filter bag damaged in any way?	SELECT	
Are the inlet and outlet pipes free from debris and damage?	SELECT	
Is the cover grate free from debris and damage?	SELECT	
Does the StormSack need repairs or replacement parts?	SELECT	
Has captured material been disposed of responsibly at an approved disposal site?	SELECT	

MAINTENANCE & REPAIR NOTES

SIGN OFF	
Name of service technician	
Date	

Joy in water

‘We believe clean waterways are a right not a privilege and we work to ensure a Joy in Water experience for you, with your children and grandchildren.’

Andy Hornbuckle

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STORMWATER

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0624

Section 4 - SPECIALIST REPORTS

Traffic Impact Assessment
Prepared by Bitzios

zone
Planning Group

101 OLD BURLEIGH ROAD

Transport Impact Assessment

BITZIOS consulting
traffic engineering ▪ transport planning

Sunland Group

19th May 2026

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CONTENTS

		Page
1.	**INTRODUCTION**	**1**
1.1	Background	1
1.2	Proposed Development	1
1.3	Scope	2
2.	**EXISTING CONDITIONS**	**3**
2.1	Existing Site	3
2.2	Surrounding Road Network	3
2.3	Public Transport	3
2.4	Active Transport	5
2.4.1	Pedestrian Facilities	5
2.4.2	Cycling Facilities	5
3.	**TRAFFIC ASSESSMENT**	**7**
3.1	Overview	7
3.2	Development Generated Traffic	7
3.3	Traffic Distribution	7
3.4	Background Traffic Volumes	7
3.5	Impact Assessment	8
4.	**PARKING ASSESSMENT**	**11**
4.1	Car Parking Provision	11
4.2	Bicycle Parking Provision	11
4.3	Parking Geometric Layout Assessment	11
4.4	Internal Circulation	12
5.	**ACCESS ASSESSMENT**	**13**
5.1	Vehicular Access	13
5.2	Sight Distance	13
5.3	Pedestrian Connectivity	14
6.	**SERVICING ASSESSMENT**	**15**
6.1	Servicing	15
6.2	Refuse Collection	16
7.	**SUMMARY AND CONCLUSIONS**	**17**

Tables

Table 2.2.1: Surrounding Road Network
Table 2.2: Relevant Public Transport Services
Table 3.1: Development Traffic Generation
Table 3.2: Development Traffic Splits
Table 3.3: Surf Parade / Armrick Avenue Results
Table 3.4 Old Burleigh Road / Armrick Avenue Results
Table 4.1: Car Parking Requirements and Provision
Table 4.2: Bicycle Parking Provision
Table 4.3: Parking Geometric Layout Assessment
Table 5.1: Vehicular Access
Table 5.2: Access Sight Distance Review

Figures

Figure 1.1: Subject Site Location
Figure 2.1: Surrounding Tram and Bus Stops
Figure 2.2: Surrounding Pedestrian Pathway Network
Figure 2.3: Cycling Connectivity
Figure 3.1: Surf Parade / Armrick Avenue SIDRA Intersection Layout
Figure 3.2: Old Burleigh Road / Armrick Avenue SIDRA Intersection Layout
Figure 5.1: Sight Line Requirements
Figure 6.1: Existing Loading Bay

Appendices

Appendix A: Proposed Development Plans
Appendix B: Traffic Surveys
Appendix C: Traffic Diagrams
Appendix D: SIDRA Outputs
Appendix E: Swept Paths Assessment

1. INTRODUCTION

1.1 Background

Bitzios Consulting has been engaged by Sunland Group to prepare a traffic impact assessment for a proposed multiple dwelling development located at 101 Old Burleigh Road, Broadbeach. The subject site has frontages to both Old Burleigh Road and Armrick Avenue and is formally described as Lot 0 on BUP104138 and Lot 70 on B8383, located within the City of Gold Coast Council (Council) local government area. The location of the site is shown below in Figure 1.1.

Source: Google Earth

Figure 1.1: Subject Site Location

1.2 Proposed Development

The proposal is for a multiple dwelling development comprised of the following:

- 81 high-density residential units
- Eight levels of parking provided over three basement levels, four podium levels, and ground floor
- Vehicle access provided via Old Burleigh Road and Armrick Avenue
- Pedestrian access provided via Armrick Avenue

A copy of the development plans is provided in **Appendix A.**

1.3 Scope

The scope of this assessment includes:

- Reviewing the existing conditions of the site and its surrounds relevant to traffic and transport
- Estimating the proposed development's traffic generation and distribution onto the surrounding road network
- Reviewing the car and bicycle parking provisions against the City of Gold Coast Council's (Council). Transport Code (version 13)
- Assessing the on-site car and bicycle parking geometric layout against Council's requirements and Australian Standards AS2890
- Reviewing the proposed site access arrangements against Council's requirements and Australian Standards AS2890
- Reviewing the proposed servicing and refuse collection arrangements against Council's requirements and Australian Standards AS2890.

2. EXISTING CONDITIONS

2.1 Existing Site

The existing lots are comprised of a medium-density residential development (approximately six units), and a commercial development. Both lots are zoned High Density and are located within the Transport Hub. The existing buildings will be demolished to accommodate the proposed multiple dwelling development.

2.2 Surrounding Road Network

Details of the road network surrounding the subject site are shown in Table 2.2.1.

Table 2.2.1: Surrounding Road Network

Road Name	Jurisdiction	Hierarchy	No of Lanes	Speed Limit
Gold Coast Highway	Council	Sub-Arterial	4	60km/h
Old Burleigh Road	Council	Local Road	2	50km/h
Armrick Avenue	Council	Local Road	2	50km/h
Second Avenue	Council	Local Road	2	50km/h
Surf Parade	Council	Local Road	2	50km/h

2.3 Public Transport

The subject site is located within 650m walking distance of the Florida Gardens Gold Coast Light Rail (GCLR) station. Additionally, the site is also situated within 400m walking distance of the nearest surrounding bus stops, located along Old Burleigh Road and Armrick Avenue.

Figure 2.1 highlights the location of relevant bus stops and light rail station along with the desired route using formalised paths and crossings.

Source: Google Earth

Figure 2.1: Surrounding Tram and Bus Stops

Table 2.2 summarises the relevant light rail and bus services and their frequencies during peak periods.

Table 2.2: Relevant Public Transport Services

Services	Route	Peak Frequency
GCLR	Broadbeach South to Helensvale	7 minutes
705	Broadbeach, Surfers Paradise, Main Beach, Sea World North	15 minutes
700	Tweed Heads to Broadbeach South Station	10 minutes

The subject site area is particularly well-serviced by the existing public transport network to reduce the reliance on private vehicles by encouraging the shift towards public transport modes. The proposed project does not require additional services or upgrades to existing facilities.

2.4 Active Transport

2.4.1 Pedestrian Facilities

The subject site is situated within a pedestrian-friendly network with well-connected footpaths serving the neighbourhood. The footpath network surrounding the subject site is shown in Figure 2.2.

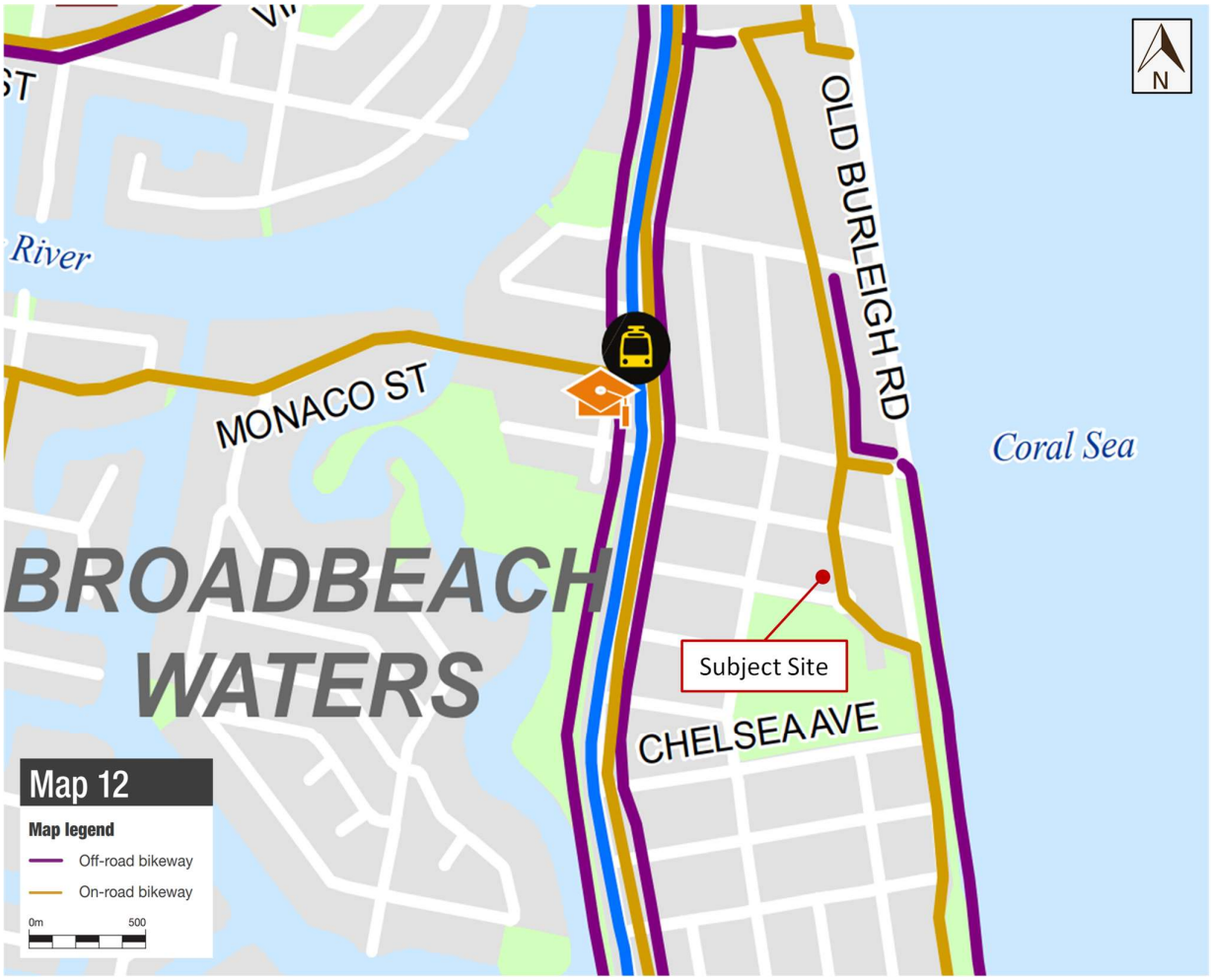
Source: Google Earth

Figure 2.2: Surrounding Pedestrian Pathway Network

2.4.2 Cycling Facilities

The subject site is in proximity to Council's Cycling Pathways network and as such, benefits from the existing on and off-road active transport network.

Figure 2.3 illustrates the on and off-road cycle network within proximity to the subject site.



Source: City of Gold Coast Cycling Guide

Figure 2.3: Cycling Connectivity

The subject site is considered suitably connected to existing cycling infrastructure with on-road bikeways to the north and south along Old Burleigh Road and Gold Coast Highway.

3. TRAFFIC ASSESSMENT

3.1 Overview

The purpose of this traffic assessment is to determine the level of impacts of the proposed development, specifically at the Surf Parade / Armrick Avenue and Old Burleigh Road / Armrick Avenue intersections. To achieve this, development's impacts at the anticipated year of opening and 10-year design horizon will be determined. For the purpose of this assessment, the year of opening is 2027 with the 10-year design horizon being 2037.

3.2 Development Generated Traffic

The proposed development traffic was estimated using the Roads and Maritime Services (RMS) Guide to Traffic Generating Developments Technical Direction (2013) for high-density residential dwellings.

The estimated net traffic generation of the proposed development is outlined in Table 3.1.

Table 3.1: Development Traffic Generation

Land Use	Quantity	AM Rate	Pm Rate	AM Trips (veh/h)	PM Trips (veh/h)
Existing Development					
Medium Density Residential	6 units	0.65 trips per unit	0.65 trips per unit	(-) 4	(-) 4
Proposed Development					
High Density Residential	81 units	0.53 trips per unit	0.32 trips per unit	(+) 43	(+) 26
Net Charge in Trips				**(+) 39**	**(+) 24**

As shown, in comparison to the previously approved development, the proposed development is expected to result in approximately 42 and 24 peak hour vehicle trips in the AM and PM peak hour respectively.

3.3 Traffic Distribution

A typical high density residential 'IN:OUT' split was adopted for this assessment to estimate the distribution of the development generated traffic onto the surrounding road network. The 'IN:OUT' split of development traffic net increase is summarised in Table 3.2.

Table 3.2: Development Traffic Splits

Land Use	AM Trip Split		PM Trip Split		AM Trips (vph)		PM Trips (vph)	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT
High Density Residential	30%	70%	70%	30%	17	36	24	12

3.4 Background Traffic Volumes

Peak hour traffic surveys were undertaken at the proposed access across 7 days, starting on Tuesday 18th of March 2025.

The following peak hour periods were recorded by the surveys:

- Weekday AM Peak Period: 8:00am to 9:00am.
- Weekday PM Peak Period: 5:00pm to 6:00pm.

For traffic analysis purposes, individual intersection peaks were considered, rather than a network peak, which represents a slightly more conservative approach than would be present.

Traffic survey data was then 'grown' to infer year of opening (2027) and 10-year design horizon (2037) road network conditions for SIDRA analyses, adopting 2.43% growth compounding p.a.

Detailed traffic survey data is provided at **Appendix B**. Peak hour traffic flows sourced from the traffic surveys and estimated traffic distribution on the network are provided at **Appendix C**.

3.5 Impact Assessment

Traffic analyses were undertaken using SIDRA Intersection 10 software of the subject access. SIDRA intersection layouts are shown in Figure 3.1 and Figure 3.2 with the results shown in Table 3.3 and Table 3.4.,

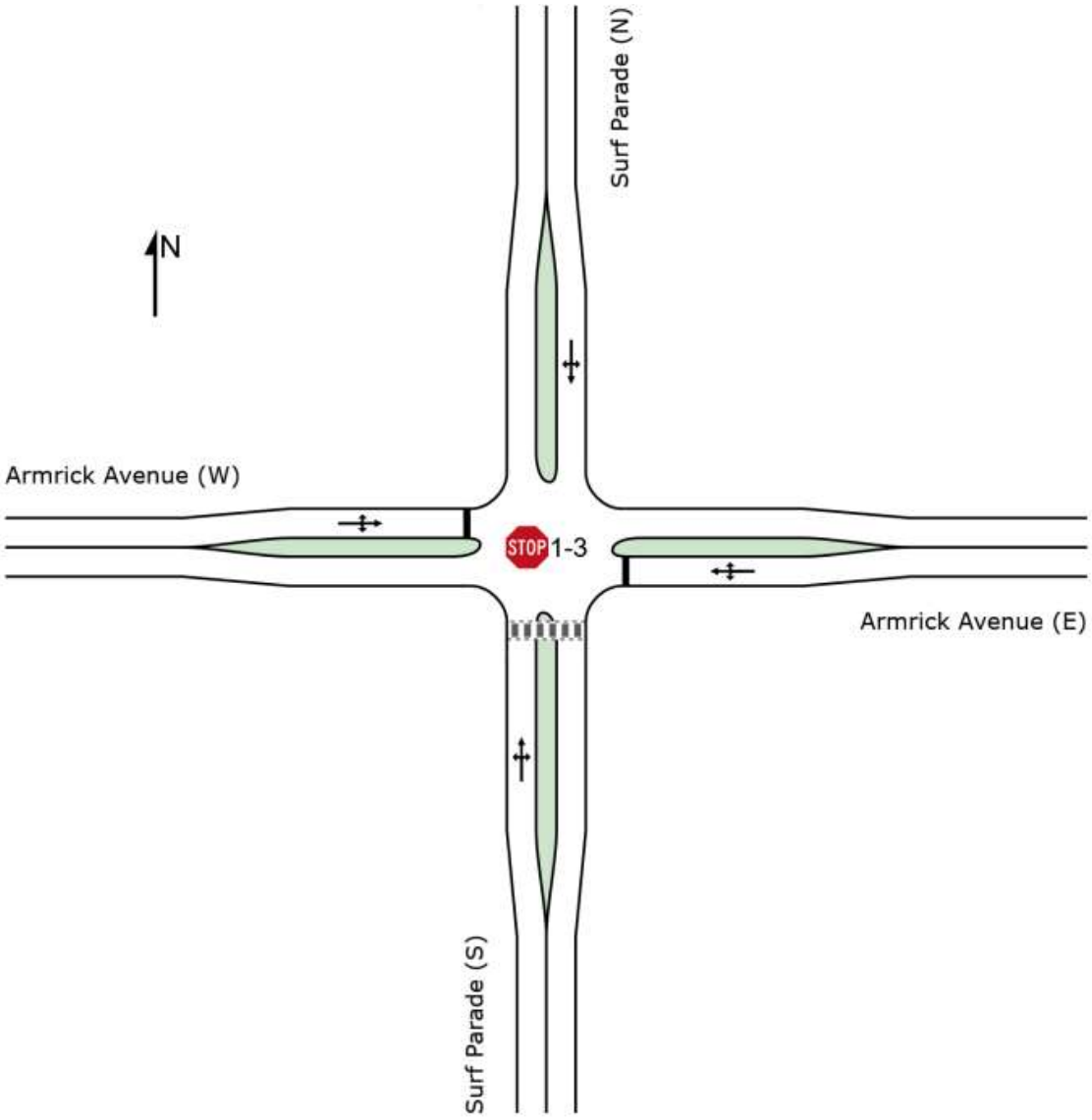


Figure 3.1: Surf Parade / Armrick Avenue SIDRA Intersection Layout

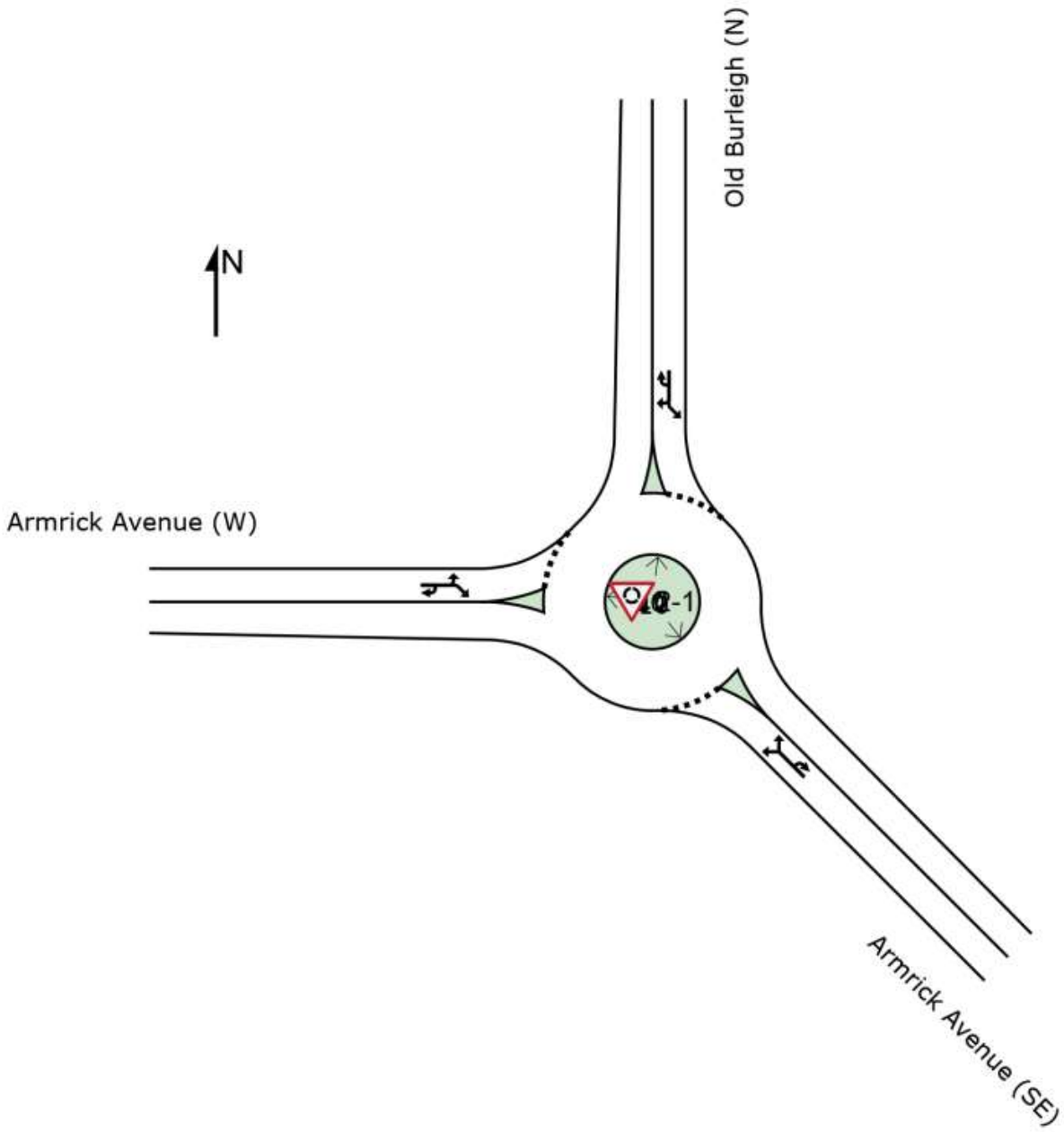


Figure 3.2: Old Burleigh Road / Armrick Avenue SIDRA Intersection Layout

Table 3.3: Surf Parade / Armrick Avenue Results

Year	Scenario	Peak	Degree of Saturation	Avg. Delay	LOS	95th Percentile Back of Queue (m)
2027	Background	AM	0.06	11	A	5
		PM	0.12	12	A	5
	Design	AM	0.09	12	A	5
		PM	0.13	12	A	5

Year	Scenario	Peak	Degree of Saturation	Avg. Delay	LOS	95th Percentile Back of Queue (m)
2037	Background	AM	0.09	13	A	5
		PM	0.17	14	A	5
	Design	AM	0.12	14	A	5
		PM	0.19	16	A	10

The above results demonstrate that the additional traffic generated by the proposed development can be accommodated by the existing Armrick Avenue / Surf Parade intersection without any issues. The intersection will continue to operate with acceptable levels of service, low average delays, and short queue lengths under peak traffic.

Table 3.4 Old Burleigh Road / Armrick Avenue Results

Year	Scenario	Peak	Degree of Saturation	Avg. Delay	LOS	95th Percentile Back of Queue (m)
2027	Background	AM	0.06	15	B	5
		PM	0.10	12	B	5
	Design	AM	0.08	15	B	5
		PM	0.11	12	B	5
2037	Background	AM	0.08	17	B	5
		PM	0.13	12	B	5
	Design	AM	0.10	17	B	5
		PM	0.15	12	B	10

The Old Burleigh Road / Armrick Avenue intersection is expected to operate with no significant issues following the establishment of the proposed development. The additional traffic generated by the development results in only marginal increases in delay and queuing.

No mitigation measures or further analysis are warranted. Both intersections will continue to operate with acceptable levels of service, with only minor changes arising from the proposed development, which complies with PO16 of Council's Transport Code (version 13).

4. PARKING ASSESSMENT

4.1 Car Parking Provision

Council's *Transport Code* (version 13) was used to source car parking rates for the proposed development. Table 4.1 details the car parking requirement and provision.

Table 4.1: Car Parking Requirements and Provision

Land Use	Type	Quantity	Parking Rate	Required	Proposed
Multiple Dwelling	Residential	81 units	1 per unit or dwelling	81 spaces	179 spaces
	Visitor		1 per 10 units or dwelling for visitors	9 spaces	10 spaces
Total				**90 spaces**	**189 spaces**

As shown, the quantity of residential car parking proposed meets the requirements specified in Council's Transport Code. Therefore, the proposal meets the acceptable outcome (AO) from the Transport Code in terms of parking demand.

4.2 Bicycle Parking Provision

Table 4.2 details the bicycle parking requirements for the proposed development based on the bicycle parking rates proposed in the Austroads *Guide to Traffic Management Part 11* (AGTM11) (2020).

Given the observed utilisation of bicycle parking facilities in similar developments, the proposed development has been assessed against the bicycle parking rates outlined in the AGTM11.

Table 4.2: Bicycle Parking Provision

Land Use	Type	Quantity	Parking Rate	Required	Proposed
Multiple Dwelling	Residential	81 units	1 per 3 units	27	27
	Visitor		1 per 12 units	7	7
Total				**34**	**34**

The proposed bicycle parking meets the requirements and complies with PO7 of the Transport Code.

4.3 Parking Geometric Layout Assessment

The on-site parking layout has been assessed in accordance with the relevant requirements of Council's Transport Code (version 13) and Australian Standards AS2890. The outcomes of the assessment are summarised in Table 4.3.

Table 4.3: Parking Geometric Layout Assessment

Design Elements	AS2890.1 Requirement	Proposed	Compliant
Residential Parking Bays (User Class 1A)	2.4m x 5.4m	Min 2.4m x 5.4m	YES
Visitor Parking Bays (User Class 2)	2.5m x 5.4m	2.5m x 5.4m	YES
Parking Aisle Width	5.8m + 0.3 for single sided aisle	6.1m for single sided aisle	YES See Note 1
Internal Road Width (Two-way)	5.5m (+0.3m per side bounded by wall)	6m	YES
Blind Aisle Extension	1.0m	1.0m	YES

Design Elements	AS2890.1 Requirement	Proposed	Compliant
Visitor Turnaround	Turnaround area or turnaround bay for visitors	Turnaround area sufficient for visitors	YES
Grades (Entry)	Max. 1:20 for first 6m into site	Shall be Max 1:20 for first 6m into site	**Shall Comply**
Grades (Car Parking Modules)	Max. 1:20 measured parallel to the angle of parking. Max. 1:16 measured in any other direction	Shall be Max. 1:20 measured parallel to the angle of parking. Max. 1:16 measured in any other direction	**Shall Comply**
Clearance to Vertical Obstructions	0.3	0.3m	YES
Height Clearance (Car Parking)	Min. 2.2m to overhead structure and obstructions	Shall be Min. 2.2m to overhead structure and obstructions	**Shall Comply**
Height Clearance (SRV)	Min. 3.5m to overhead structure and obstructions	Shall be Min. 3.5m to overhead structure and obstructions	**Shall Comply**
Bicycle Parking (horizontal)	1.8m x 0.5m with a 1.5m aisle	1.8m x 0.5m with a 1.5m aisle	YES
Bicycle Parking (vertical)	1.2m x 0.5m with a 1.5m aisle	1.2m x 0.5m with a 1.5m aisle	YES

As shown above, the parking geometric layout of the proposal complies with the relevant requirements of the Council's Transport Code and Australian Standards AS2890. A swept path assessment is provided at **Appendix E** illustrating that a B85 can turnaround in the visitor parking aisle in the unlikely event that all spaces are occupied.

4.4 Internal Circulation

The development proposes two-way two-lane ramps from basement levels to the podium levels. Sufficient space is provided for vehicles to pass in both directions. Swept paths are attached at **Appendix E** to demonstrate manoeuvring throughout the ground, basement, and podium levels. It is noted that this swept path analysis only provides passing on the ramps and adjacent intersections with aisles (i.e. not the western side of any of the parking levels). Given the other sections of the basement and podiums are generally flat, vehicles will be able to give way if required. Swept paths have been shown here to ensure the starting positions of passing vehicles at the ramps is considered realistic. Furthermore, this approach is in accordance with AS2890.1.

It is also noted that on all basement and podium levels, the inside 300mm clearance (represented by an orange solid line) of the inside vehicle conflicts with the wall of a storage area on each level and V10 on Basement 1. These obstructions are to be moved outside the 300mm clearance to allow for adequate circulation.

5. ACCESS ASSESSMENT

5.1 Vehicular Access

The proposed vehicular access has been assessed against the Council's Driveways and Vehicular Access Code (version 13) and AS2890 requirements. The development proposes a single all-movement crossover constructed generally in accordance with Council's standard Drawing RS-051 IPWEAQ Type A. Details of the proposed accesses are summarised in Table 5.1.

Table 5.1: Vehicular Access

Design Element	Details
Access Facility Category	Type 1 as per AS2890.1 (i.e. User Classes 1A, 25-100 parking spaces and local road frontage)
Crossover Form	Generally, as per Council's Standard Drawing RS-051 IPWEAQ Type A (6m width at property boundary).
Pedestrian Sight Line Triangle	A pedestrian sight line triangle is to be provided on the egress side of the driveway at 2.0m along the property boundary and 2.5m into site as per Figure 3.3 in AS2890.1. The area within the triangle is to be kept clear of all obstructions to visibility above 500mm.
Crossover Location	Minimum 3.0m from any adjacent crossovers

The vehicular access complies with the requirements of Council's *Driveways and Vehicular Access Code* (version 13) and AS2890 requirements.

5.2 Sight Distance

A sight distance assessment for the proposed development's vehicular access was undertaken in accordance with AS2890.1 and AS2890.2 as outlined in Table 5.2.

Table 5.2: Access Sight Distance Review

Access	Direction	Posted Speed	Sight Distance		Compliant
			Available	Required	
Old Burleigh Road	North	50km/h	73m	69m	Yes
	South		30m		See below
Armrick Avenue	East	50km/h	30m		See below
	West		88m		Yes

The available sight lines at the proposed development access is shown in Figure 5.1.

Source: Google Earth

Figure 5.1: Sight Line Requirements

The proposed access locations on both Old Burleigh Road and Armrick Avenue are located near a roundabout where the two roads intersect. For both access locations, the sight distance is limited to the roundabout and below the requirement. However, the geometry of the roundabout, vehicles will be limited to speeds below 50km/h and therefore, the available sight distance is considered acceptable.

5.3 Pedestrian Connectivity

A dedicated pedestrian connection is provided to the lobby area via Armrick Avenue. This connection provides safe and efficient access to the development for active transport users, separate from vehicle movements, as per the requirements of Council's Transport Code.

6. SERVICING ASSESSMENT

6.1 Servicing

Council's Transport Code (version 13) prescribes an 8.8m Medium Rigid Vehicle (MRV, i.e removalist truck) to stand on-site for servicing (i.e. no dedicated loading bay required) for a multiple dwelling land use.

Given the constraints of the site (i.e. lot size) to allow for appropriate clearances for circulation and parking aisles on ground and basement levels, providing servicing on-site would be detrimental to the outcome of the proposed development. Therefore, servicing is proposed to occur via the existing on-street loading bay along the frontage of Armrick Avenue, which is considered acceptable due to the following:

- The existing on-street loading bay already accommodates loading activities in the area and given the low servicing demand and lack of primary attractors in the area, additional servicing facilities are not required.
- Outside of the initial occupation period, heavy vehicle servicing frequency will be low, in the order of two vehicles (one in, out) every month based on census data and the scale of the proposed development.
- Existing on-street parking with a 4 hour stay limit is provided along Armrick Avenue and does not interfere with the operation of the loading bay
- SRV servicing is provided on-site to cater for regular servicing as shown in **Appendix E**.

The existing on-site loading bay and on-site parking along Armrick Avenue is shown in Figure 6.1.

Source: Google Earth

Figure 6.1: Existing Loading Bay

Based on the relatively infrequent nature of servicing and the presence of an existing loading bay on-street, the proposed servicing is considered to be in accordance with PO3 and PO4 of the Transport Code. It is noted that the loading bay currently only services the existing developments within the subject site.

6.2 Refuse Collection

Refuse collection is proposed to occur via bulk bin collection on Old Burleigh Road. On collection days, bulk bins will be wheeled out to the eastern side of the access with the front-loading refuse collection vehicle (RCV) temporarily stopping across the eastern development driveway for collection.

It is noted that the collection vehicle will be temporarily stopping within 10 metres of the roundabout. However, as collection point is already servicing the existing development, the proposed arrangement is considered acceptable.

This arrangement is consistent with typical refuse collection arrangements for residential developments in the area.

7. SUMMARY AND CONCLUSIONS

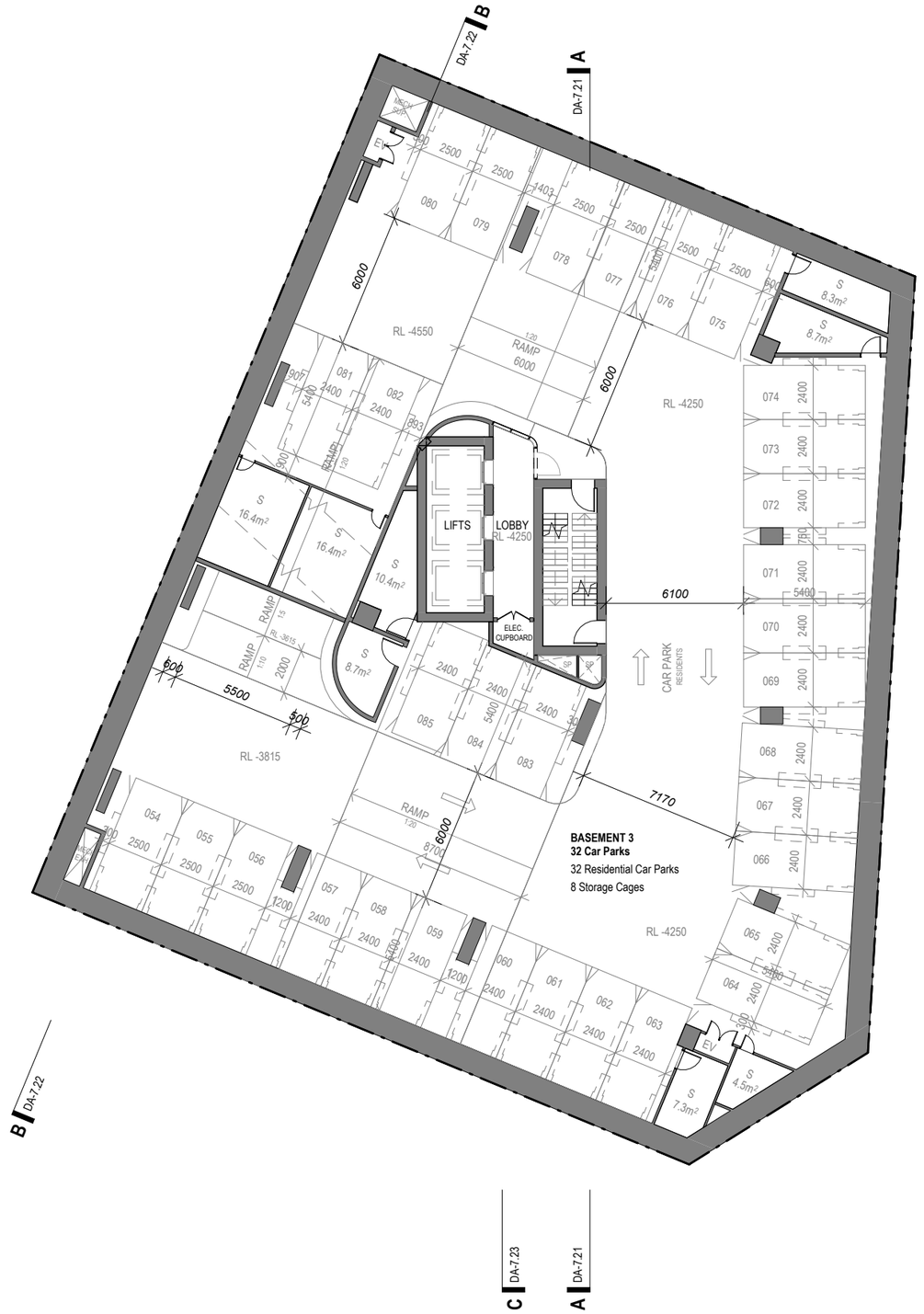
The key findings of the TIA for the proposed development located at 101 Burleigh Road, Broadbeach are as follows:

- The development is proposed as a multiple dwelling comprising a total of 81 units
- The proposed development is serviced by existing public and active transport facilities
- The development meets minimum car parking requirements specified in Council's Transport Code for both residents and visitors.
- Bicycle parking proposed meet the minimum rates specified in the Austroads Guide to Traffic Management Part 11
- The car parking layout complies (or shall comply where details are not available) with the relevant requirements of AS2890 and Council's Transport Code
- The additional traffic generated by the proposed development will not result in any adverse impacts to the surrounding traffic network.
- The proposed crossover locations and design generally comply with the relevant requirements of AS2890 and Council's Transport Code and are consistent with the existing approval for the subject site
- Servicing is proposed to be undertaken on-street in the existing loading bay
- Refuse collection is proposed to occur via bulk bin collection on-street.

Based on the above assessment, we conclude that there are no significant traffic or transport impacts associated with the proposed development to preclude its approval and relevant conditioning on transport planning grounds.

Appendix A

Development Plans



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PROJECT 99-101 Old Burleigh Road

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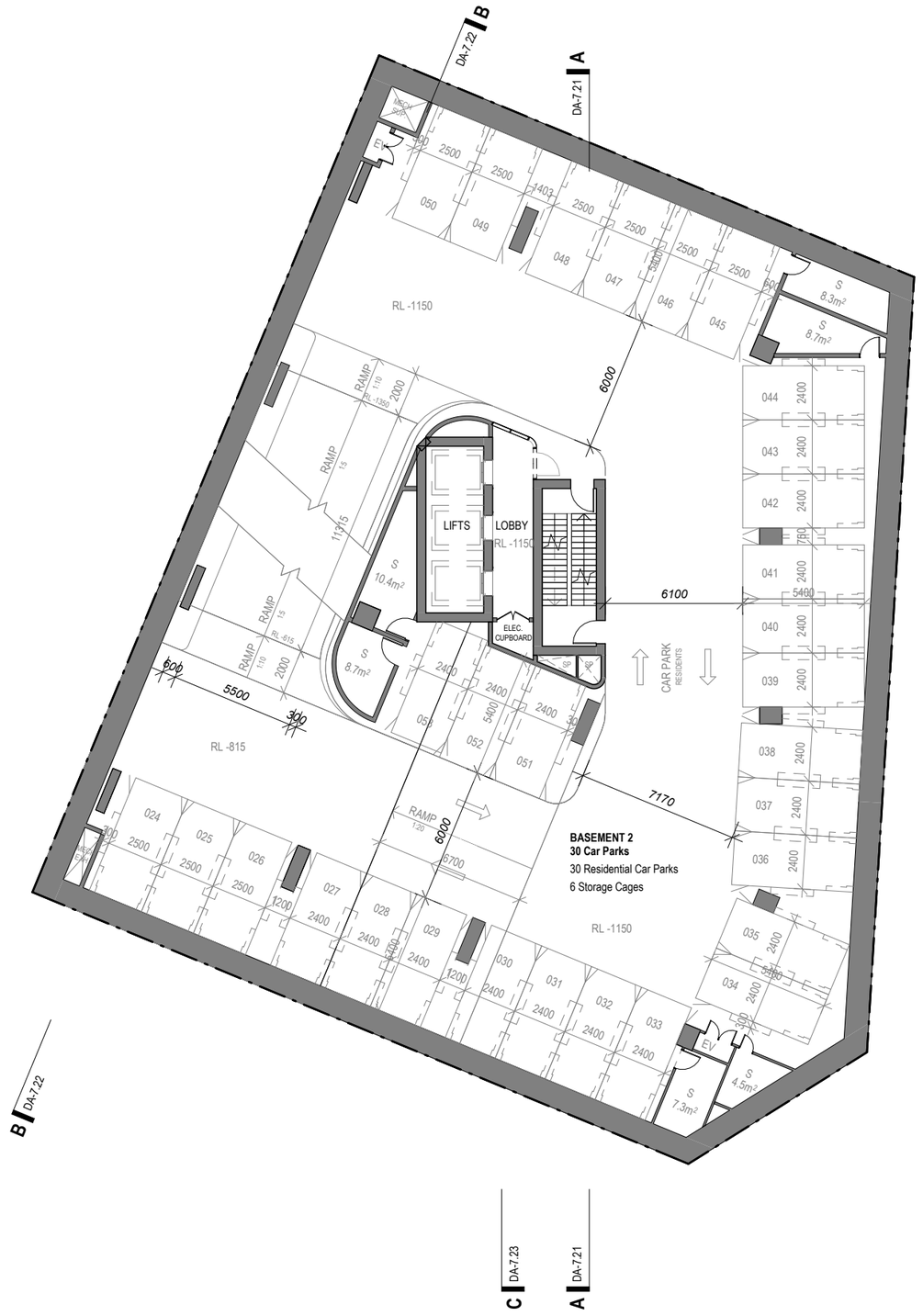

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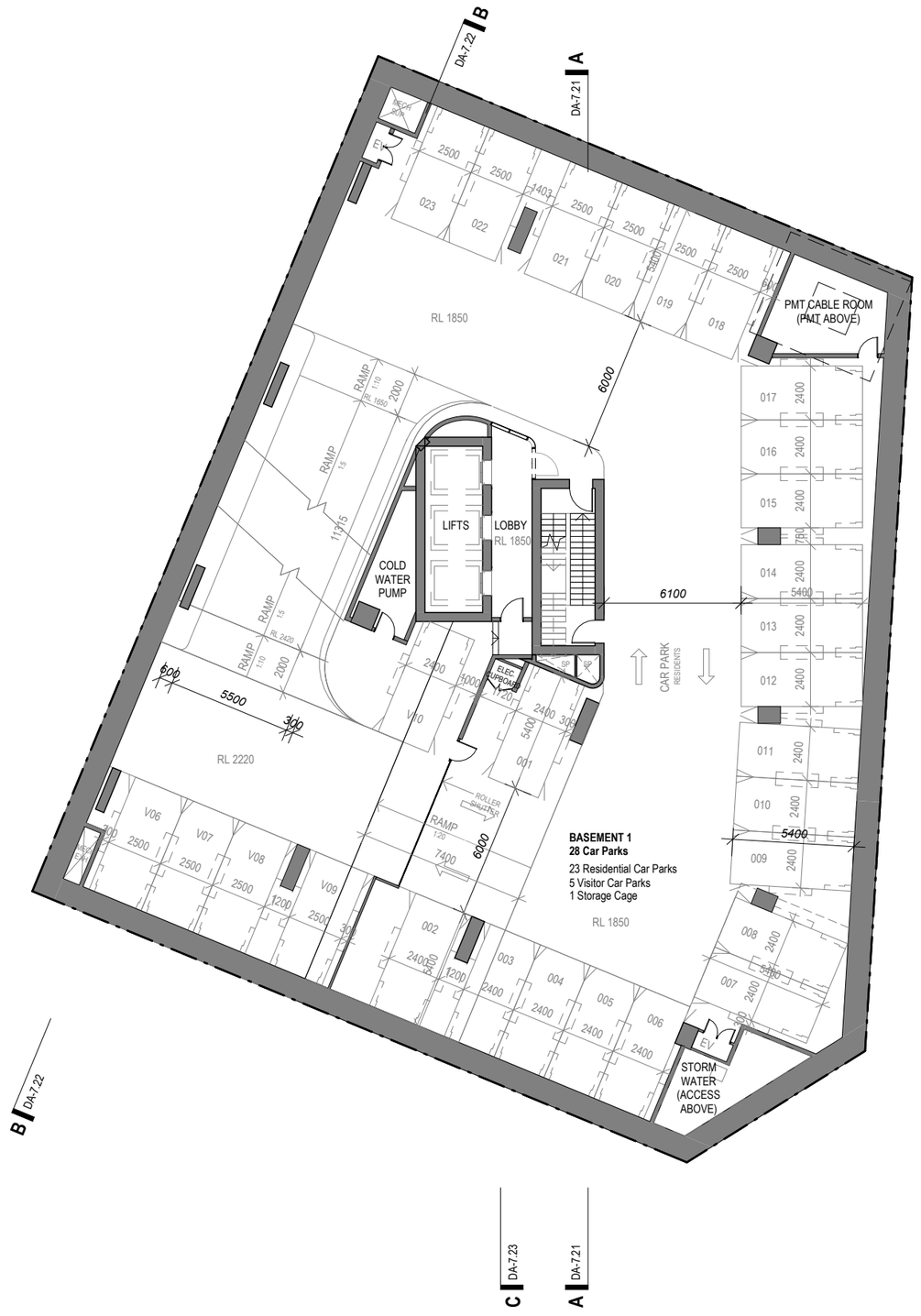

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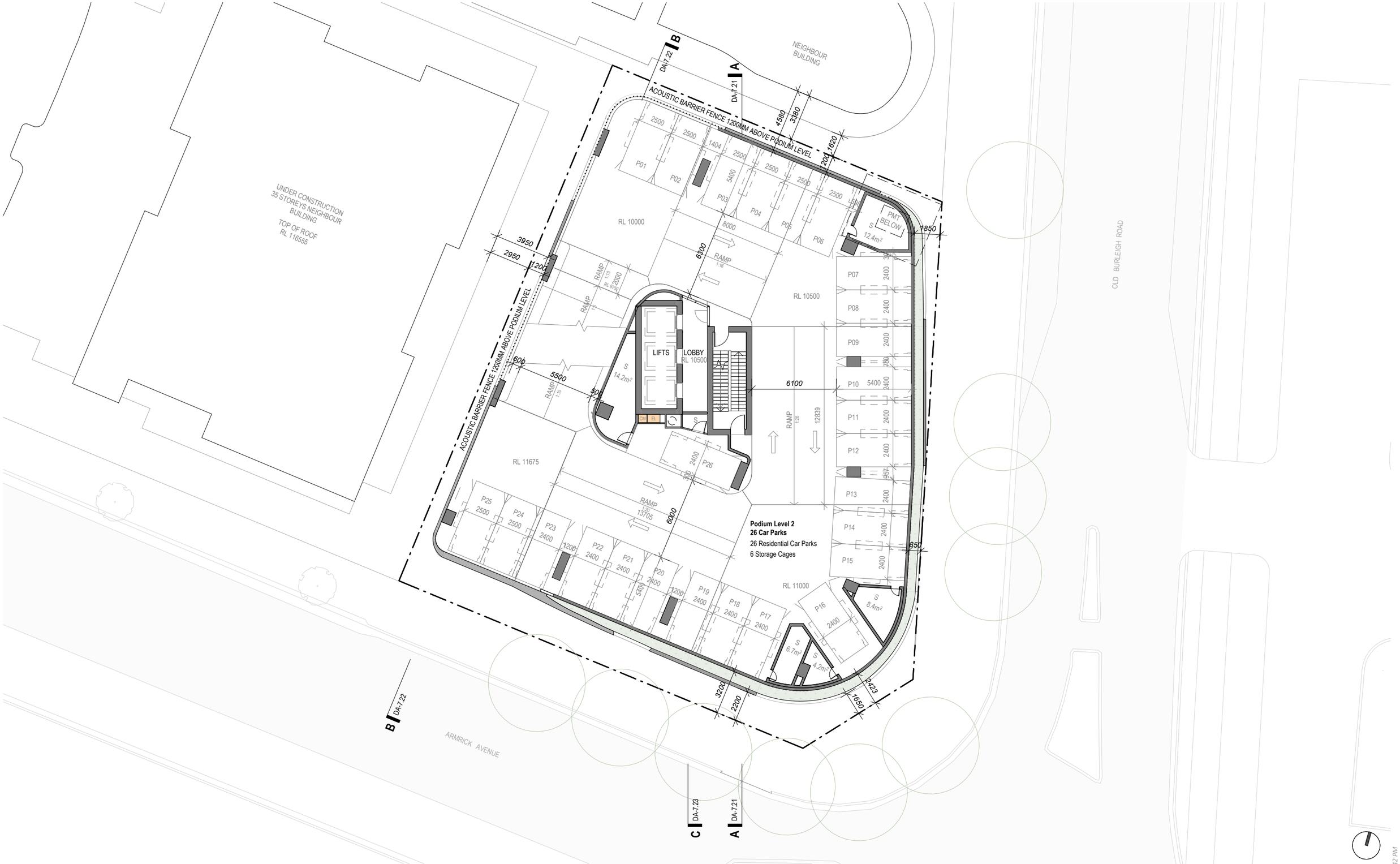

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Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: LEVEL 4 - PODIUM

Drawing Number: DA-7.07

Scale/Format: 1 : 250

NOTES

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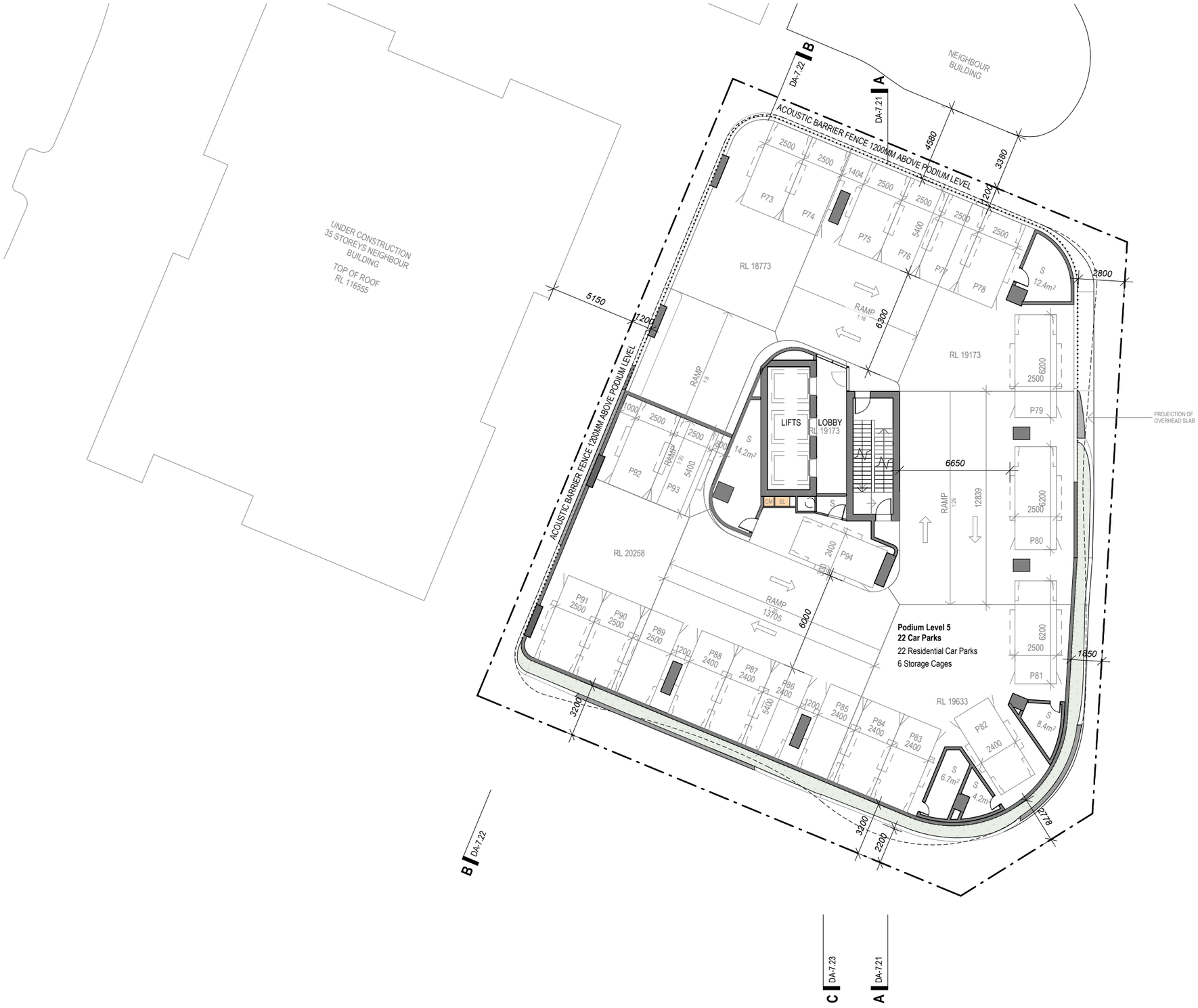
PLOT DATE 13/05/2026 12:26:30 PM



REVISION		
A	Development Application Draft	2026.05.13
Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: LEVEL 5 - PODIUM

Drawing Number: DA-7.08

Scale/Format: 1 : 250

NOTES

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PLOT DATE 13/05/2026 12:26:37 PM

Appendix B

Intersection Surveys

Site ID: 1

Location: Armrick Ave & Surf Parade, Broadbeach

Date: 5/02/2026

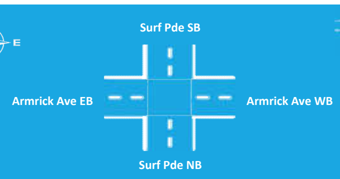
Surveyed Time (AM): 7:00 AM to 9:00 AM (2 hours)

Surveyed Time (PM): 3:00 PM to 6:00 PM (3 hours)

Weather: Fine

Observed AM Peak Hour: 8:00 AM to 9:00 AM

Observerved PM Peak Hour: 5:00 PM to 6:00 PM



TOTALS AND PEAKS

Time Starting	Surf Pde SB Left Light Vehicles (1-2)	Surf Pde SB Left Heavy Vehicles (3-12)	Surf Pde SB Left Bicycles on Road	Surf Pde SB Through Light Vehicles (1-2)	Surf Pde SB Through Heavy Vehicles (3-12)	Surf Pde SB Through Bicycles on Road	Surf Pde SB Right Light Vehicles (1-2)	Surf Pde SB Right Heavy Vehicles (3-12)	Surf Pde SB Right Bicycles on Road	Surf Pde SB U-turn Light Vehicles (1-2)	Surf Pde SB U-turn Heavy Vehicles (3-12)	Surf Pde SB U-turn Bicycles on Road	Surf Pde SB Cross 1 Pedestrians
AM + PM Totals	46	1	0	411	6	9	59	1	0	0	0	0	143
AM Total	23	0	0	162	5	1	33	1	0	0	0	0	67
PM Total	23	1	0	249	1	8	26	0	0	0	0	0	76
AM Peak 1 hr	12	0	0	101	4	1	14	0	0	0	0	0	34
PM Peak 1 hr	10	0	0	87	0	4	14	0	0	0	0	0	28
07:00	2	0	0	9	0	0	2	0	0	0	0	0	8
07:15	4	0	0	13	0	0	6	0	0	0	0	0	14
07:30	4	0	0	24	1	0	5	1	0	0	0	0	9
07:45	1	0	0	15	0	0	6	0	0	0	0	0	2
08:00	1	0	0	27	1	0	2	0	0	0	0	0	3
08:15	4	0	0	28	1	0	5	0	0	0	0	0	9
08:30	4	0	0	27	2	1	5	0	0	0	0	0	10
08:45	3	0	0	19	0	0	2	0	0	0	0	0	12
15:00	5	0	0	20	0	0	3	0	0	0	0	0	14
15:15	2	0	0	21	0	1	0	0	0	0	0	0	3
15:30	0	0	0	20	0	0	3	0	0	0	0	0	2
15:45	2	0	0	27	0	0	0	0	0	0	0	0	16
16:00	1	0	0	22	0	1	2	0	0	0	0	0	1
16:15	0	0	0	12	0	1	2	0	0	0	0	0	5
16:30	2	0	0	19	0	0	1	0	0	0	0	0	5
16:45	1	1	0	21	1	1	1	0	0	0	0	0	2
17:00	3	0	0	24	0	0	3	0	0	0	0	0	5
17:15	5	0	0	17	0	2	5	0	0	0	0	0	7
17:30	0	0	0	27	0	1	2	0	0	0	0	0	9
17:45	2	0	0	19	0	1	4	0	0	0	0	0	7

Time Starting	Armrick Ave WB Left Light Vehicles (1-2)	Armrick Ave WB Left Heavy Vehicles (3-12)	Armrick Ave WB Left Bicycles on Road	Armrick Ave WB Through Light Vehicles (1-2)	Armrick Ave WB Through Heavy Vehicles (3-12)	Armrick Ave WB Through Bicycles on Road	Armrick Ave WB Right Light Vehicles (1-2)	Armrick Ave WB Right Heavy Vehicles (3-12)	Armrick Ave WB Right Bicycles on Road	Armrick Ave WB U-turn Light Vehicles (1-2)	Armrick Ave WB U-turn Heavy Vehicles (3-12)	Armrick Ave WB U-turn Bicycles on Road	Armrick Ave WB Cross 1 Pedestrians
AM + PM Totals	231	4	2	72	5	1	37	4	2	0	0	0	353
AM Total	59	2	0	15	4	0	7	3	0	0	0	0	180
PM Total	172	2	2	57	1	1	30	1	2	0	0	0	173
AM Peak 1 hr	40	2	0	10	0	0	5	1	0	0	0	0	99
PM Peak 1 hr	66	1	1	17	0	1	14	1	2	0	0	0	71
07:00	4	0	0	1	2	0	0	2	0	0	0	0	17
07:15	4	0	0	1	1	0	1	0	0	0	0	0	23
07:30	7	0	0	1	1	0	1	0	0	0	0	0	27
07:45	4	0	0	2	0	0	0	0	0	0	0	0	14
08:00	11	0	0	2	0	0	1	0	0	0	0	0	17
08:15	10	0	0	1	0	0	0	1	0	0	0	0	36
08:30	11	2	0	1	0	0	1	0	0	0	0	0	22
08:45	8	0	0	6	0	0	3	0	0	0	0	0	24
15:00	8	0	0	5	0	0	0	0	0	0	0	0	22
15:15	19	0	0	6	0	0	2	0	0	0	0	0	3
15:30	12	0	0	10	0	0	3	0	0	0	0	0	6
15:45	14	1	1	6	0	0	0	0	0	0	0	0	11
16:00	17	0	0	2	0	0	1	0	0	0	0	0	16
16:15	16	0	0	3	0	0	3	0	0	0	0	0	13
16:30	16	0	0	5	1	0	6	0	0	0	0	0	12
16:45	4	0	0	3	0	0	1	0	0	0	0	0	19
17:00	14	1	0	5	0	1	3	0	0	0	0	0	14
17:15	17	0	1	3	0	0	5	1	0	0	0	0	12
17:30	23	0	0	5	0	0	4	0	2	0	0	0	23
17:45	12	0	0	4	0	0	2	0	0	0	0	0	22

Time Starting	Surf Pde NB Left Light Vehicles (1-2)	Surf Pde NB Left Heavy Vehicles (3-12)	Surf Pde NB Left Bicycles on Road	Surf Pde NB Through Light Vehicles (1-2)	Surf Pde NB Through Heavy Vehicles (3-12)	Surf Pde NB Through Bicycles on Road	Surf Pde NB Right Light Vehicles (1-2)	Surf Pde NB Right Heavy Vehicles (3-12)	Surf Pde NB Right Bicycles on Road	Surf Pde NB U-turn Light Vehicles (1-2)	Surf Pde NB U-turn Heavy Vehicles (3-12)	Surf Pde NB U-turn Bicycles on Road	Surf Pde NB Cross 1 Pedestrians
AM + PM Totals	43	1	0	902	12	20	173	6	0	0	0	0	167
AM Total	11	0	0	312	7	7	48	5	0	0	0	0	56
PM Total	32	1	0	590	5	13	125	1	0	0	0	0	111
AM Peak 1 hr	5	0	0	166	2	4	27	3	0	0	0	0	26
PM Peak 1 hr	15	0	0	202	2	5	49	0	0	0	0	0	49
07:00	2	0	0	33	2	2	10	0	0	0	0	0	10
07:15	1	0	0	42	1	0	6	0	0	0	0	0	9
07:30	2	0	0	36	2	0	2	1	0	0	0	0	7
07:45	1	0	0	35	0	1	3	1	0	0	0	0	4
08:00	2	0	0	35	0	1	10	1	0	0	0	0	6
08:15	2	0	0	47	1	1	5	1	0	0	0	0	10
08:30	1	0	0	46	1	0	7	1	0	0	0	0	4
08:45	0	0	0	38	0	2	5	0	0	0	0	0	6
15:00	3	0	0	59	1	1	6	0	0	0	0	0	15
15:15	4	0	0	56	0	2	14	0	0	0	0	0	5
15:30	5	0	0	47	0	0	11	0	0	0	0	0	5
15:45	0	1	0	44	1	0	10	0	0	0	0	0	9
16:00	2	0	0	34	1	0	9	0	0	0	0	0	6
16:15	1	0	0	52	0	1	12	0	0	0	0	0	0
16:30	1	0	0	50	0	2	8	1	0	0	0	0	10
16:45	1	0	0	46	0	2	6	0	0	0	0	0	12
17:00	2	0	0	57	0	0	12	0	0	0	0	0	10
17:15	5	0	0	41	1	2	8	0	0	0	0	0	10
17:30	4	0	0	57	1	2	12	0	0	0	0	0	10
17:45	4	0	0	47	0	1	17	0	0	0	0	0	19

Time Starting	Armrick Ave EB Left Light Vehicles (1-2)	Armrick Ave EB Left Heavy Vehicles (3-12)	Armrick Ave EB Left Bicycles on Road	Armrick Ave EB Through Light Vehicles (1-2)	Armrick Ave EB Through Heavy Vehicles (3-12)	Armrick Ave EB Through Bicycles on Road	Armrick Ave EB Right Light Vehicles (1-2)	Armrick Ave EB Right Heavy Vehicles (3-12)	Armrick Ave EB Right Bicycles on Road	Armrick Ave EB U-turn Light Vehicles (1-2)	Armrick Ave EB U-turn Heavy Vehicles (3-12)	Armrick Ave EB U-turn Bicycles on Road	Armrick Ave EB Cross 1 Pedestrians
AM + PM Totals	61	2	0	50	6	0	84	1	1	0	0	0	169
AM Total	30	2	0	12	3	0	31	0	0	0	0	0	52
PM Total	31	0	0	38	3	0	53	1	1	0	0	0	117
AM Peak 1 hr	12	1	0	7	1	0	21	0	0	0	0	0	26
PM Peak 1 hr	11	0	0	13	0	0	27	0	0	0	0	0	49
07:00	3	0	0	1	2	0	1	0	0	0	0	0	5
07:15	4	1	0	0	0	0	2	0	0	0	0	0	10
07:30	3	0	0	0	0	0	3	0	0	0	0	0	7
07:45	8	0	0	4	0	0	4	0	0	0	0	0	4
08:00	3	0	0	1	1	0	7	0	0	0	0	0	5
08:15	1	0	0	3	0	0	5	0	0	0	0	0	10
08:30	4	1	0	2	0	0	4	0	0	0	0	0	7
08:45	4	0	0	1	0	0	5	0	0	0	0	0	4
15:00	2	0	0	1	1	0	2	1	0	0	0	0	6
15:15	4	0	0	9	0	0	4	0	0	0	0	0	6
15:30	2	0	0	2	0	0	0	0	0	0	0	0	8
15:45	3	0	0	1	1	0	7	0	0	0	0	0	8
16:00	4	0	0	2	1	0	5	0	0	0	0	0	5
16:15	1	0	0	4	0	0	2	0	0	0	0	0	5
16:30	2	0	0	2	0	0	3	0	0	0	0	0	18
16:45	2	0	0	4	0	0	3	0	1	0	0	0	12
17:00	3	0	0	3	0	0	6	0	0	0	0	0	14
17:15	1	0	0	3	0	0	7	0	0	0	0	0	10
17:30	1	0	0	3	0	0	5	0	0	0	0	0	5
17:45	6	0	0	4	0	0	9	0	0	0	0	0	20

Time Starting	GRAND TOTAL TOTALS	Surf Pde SB TOTAL All Classes	Armrick Ave WB TOTAL All Classes	Surf Pde NB TOTAL All Classes	Armrick Ave EB TOTAL All Classes
AM + PM Totals	2253	533	358	1157	205
AM Total	783	225	90	390	78
PM Total	1470	308	268	767	127
AM Peak 1 hr	439	132	58	207	42
PM Peak 1 hr	542	115	103	273	51
07:00	**78**	13	9	49	7
07:15	**87**	23	7	50	7
07:30	**94**	35	10	43	6
07:45	**85**	22	6	41	16
08:00	**106**	31	14	49	12
08:15	**116**	38	12	57	9
08:30	**121**	39	15	56	11
08:45	**96**	24	17	45	10
15:00	**118**	28	13	70	7
15:15	**144**	24	27	76	17
15:30	**115**	23	25	63	4
15:45	**119**	29	22	56	12
16:00	**104**	26	20	46	12
16:15	**110**	15	22	66	7
16:30	**119**	22	28	62	7
16:45	**99**	26	8	55	10
17:00	**137**	30	24	71	12
17:15	**124**	29	27	57	11
17:30	**149**	30	34	76	9
17:45	**132**	26	18	69	19

Site ID: 2

Location: Armrick Ave & Old Burleigh Rd, Broadbeach

Date: 5/02/2026

Surveyed Time (AM): 7:00 AM to 9:00 AM (2 hours)

Surveyed Time (PM): 3:00 PM to 6:00 PM (3 hours)

Weather: Fine

Observed AM Peak Hour: 8:00 AM to 9:00 AM

Observed PM Peak Hour: 5:00 PM to 6:00 PM

TDC
Traffic Data & Control

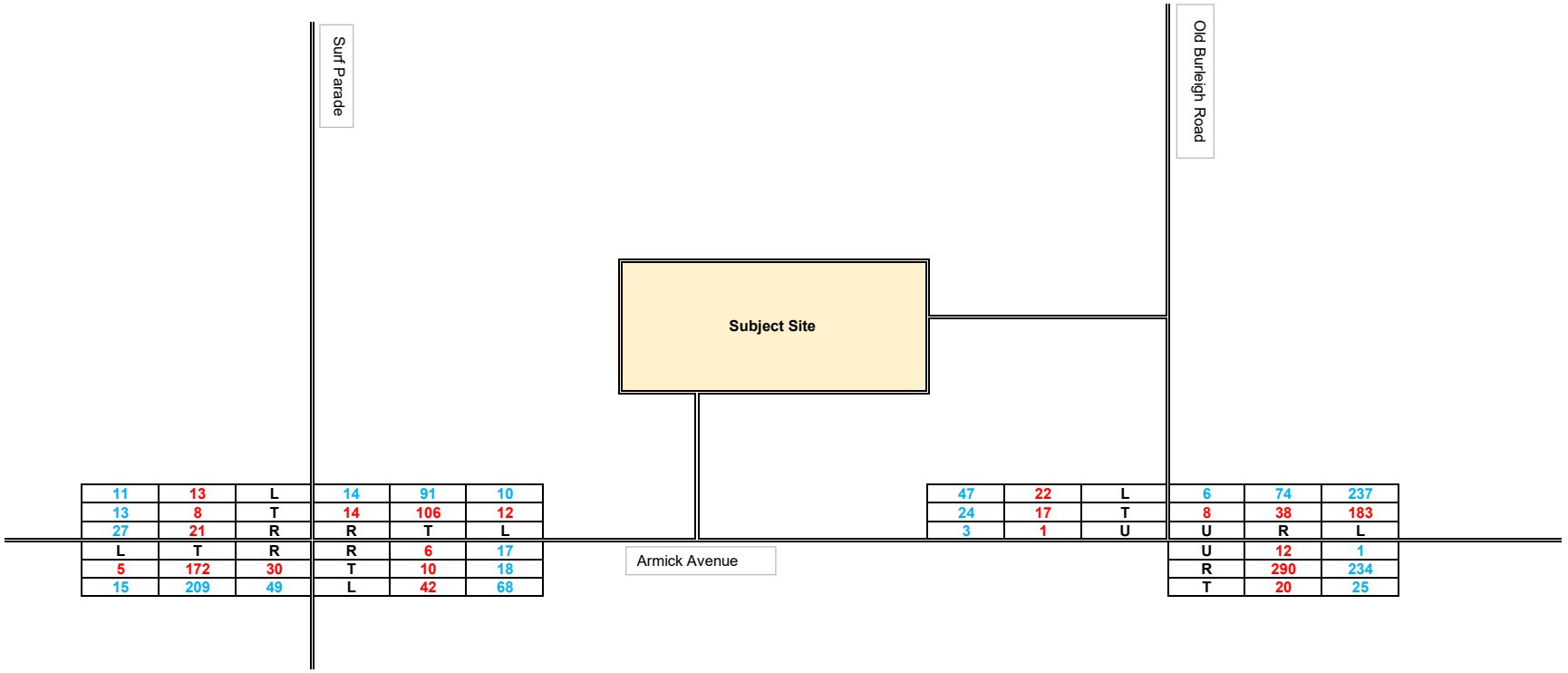
TOTALS AND PEAKS

AM + PM Totals	858	28	36	242	5	1	28	3	0	112	94	7	2	1210	33	36	31	1	0	1	165	7	1	85	5	1	5	3	0	224	2887	1201	1414	272
AM Total	268	13	9	56	4	0	15	3	0	57	26	2	0	501	21	29	21	1	0	0	35	4	1	33	3	0	0	1	0	59	1046	368	601	77
PM Total	590	15	27	186	1	1	13	0	0	55	68	5	2	709	12	7	10	0	0	1	130	3	0	52	2	1	5	2	0	165	1841	833	813	195
AM Peak 1 hr	169	8	6	37	1	0	7	1	0	35	19	1	0	277	8	5	12	0	0	0	20	2	0	15	2	0	0	1	0	34	591	229	322	40
PM Peak 1 hr	219	6	12	73	0	1	6	0	0	27	23	0	2	227	4	3	1	0	0	0	45	2	0	23	0	1	3	0	0	58	651	317	260	74

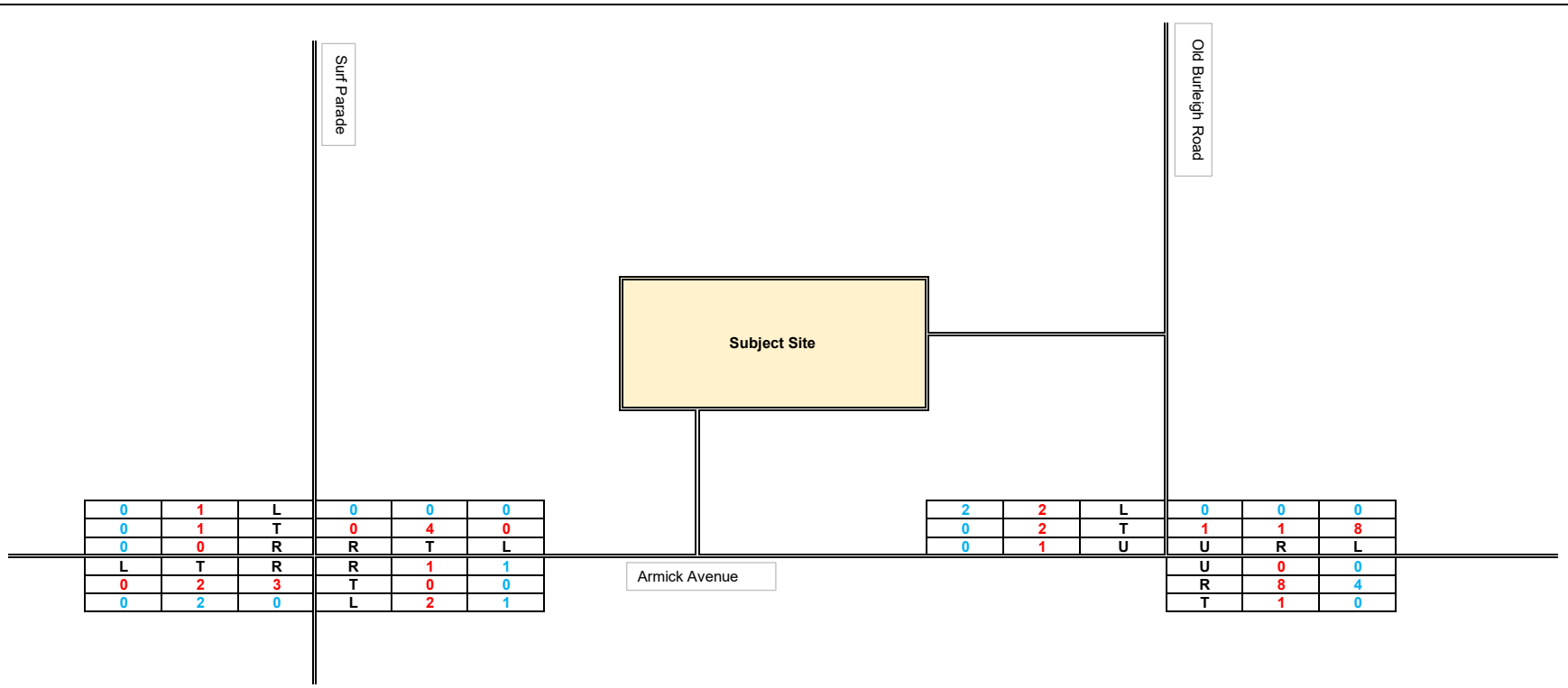
Time Starting	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Old Burleigh Rd SB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave WB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	Armrick Ave EB	GRAND TOTAL	Old Burleigh Rd SB	Armrick Ave WB	Armrick Ave EB
	Left	Left	Left	Right	Right	Right	U-turn	U-turn	U-turn	Cross 1	Through	Through	Through	Right	Right	Right	U-turn	U-turn	U-turn	Cross 1	Left	Left	Left	Through	Through	Through	U-turn	U-turn	U-turn	Cross 1		TOTAL	TOTAL	TOTAL
	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Pedestrians	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Pedestrians	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Light Vehicles (1-2)	Heavy Vehicles (3-12)	Bicycles on Road	Pedestrians	TOTALS	All Classes	All Classes	All Classes
07:00	21	1	1	2	2	0	2	0	0	0	4	0	0	52	4	7	0	0	0	0	7	0	0	5	1	0	0	0	0	2	**109**	29	67	13
07:15	30	1	0	6	1	0	2	2	0	5	1	0	0	50	3	6	3	0	0	0	3	0	0	4	0	0	0	0	0	6	**112**	42	63	7
07:30	26	2	2	7	0	0	2	0	0	11	2	1	0	61	2	2	3	1	0	0	2	2	0	4	0	0	0	0	0	11	**119**	39	72	8
07:45	22	1	0	4	0	0	2	0	0	6	0	0	0	61	4	9	3	0	0	0	3	0	1	5	0	0	0	0	0	6	**115**	29	77	9
08:00	27	3	2	9	0	0	3	0	0	5	2	0	0	64	1	0	1	0	0	0	4	0	0	2	0	0	0	0	0	6	**118**	44	68	6
08:15	45	2	3	9	0	0	3	0	0	14	3	0	0	79	3	3	5	0	0	0	6	1	0	5	2	0	0	1	0	12	**170**	62	93	15
08:30	54	3	0	9	0	0	0	0	0	10	4	1	0	76	2	1	3	0	0	0	5	1	0	4	0	0	0	0	0	10	**163**	66	87	10
08:45	43	0	1	10	1	0	1	1	0	6	10	0	0	58	2	1	3	0	0	0	5	0	0	4	0	0	0	0	0	6	**140**	57	74	9
15:00	48	0	3	11	0	0	2	0	0	2	8	0	0	68	2	0	4	0	0	0	10	0	0	4	0	0	0	0	0	9	**160**	64	82	14
15:15	47	3	1	17	0	0	2	0	0	3	8	0	0	75	0	1	0	0	0	0	19	0	0	4	0	0	0	0	0	10	**177**	70	84	23
15:30	35	2	1	14	0	0	0	0	0	0	6	0	0	64	5	2	2	0	0	0	8	0	0	3	0	0	0	0	0	11	**142**	52	79	11
15:45	50	0	3	20	1	0	1	0	0	0	1	0	0	58	1	0	1	0	0	1	11	0	0	4	1	0	1	0	0	13	**153**	75	61	17
16:00	40	2	3	13	0	0	0	0	0	6	3	1	0	57	0	0	0	0	0	0	10	1	0	2	0	0	0	0	0	12	**132**	58	61	13
16:15	45	1	1	16	0	0	2	0	0	7	9	2	0	59	0	0	0	0	0	0	10	0	0	4	0	0	0	0	0	26	**149**	65	70	14
16:30	57	1	2	13	0	0	0	0	0	9	6	0	0	56	0	1	1	0	0	0	10	0	0	1	1	0	1	1	0	9	**151**	73	64	14
16:45	49	0	1	9	0	0	0	0	0	1	4	2	0	45	0	0	1	0	0	0	7	0	0	7	0	0	0	1	0	17	**126**	59	52	15
17:00	56	2	2	15	0	0	2	0	0	4	6	0	0	62	1	0	0	0	0	0	10	1	0	8	0	0	0	0	0	17	**165**	77	69	19
17:15	60	0	5	22	0	1	1	0	0	7	4	0	0	51	1	0	0	0	0	0	8	1	0	4	0	1	3	0	0	14	**162**	89	56	17
17:30	55	2	4	22	0	0	1	0	0	8	5	0	2	62	1	2	1	0	0	0	11	0	0	2	0	0	0	0	0	12	**170**	84	73	13
17:45	48	2	1	14	0	0	2	0	0	8	8	0	0	52	1	1	0	0	0	0	16	0	0	9	0	0	0	0	0	15	**154**	67	62	25

Appendix C

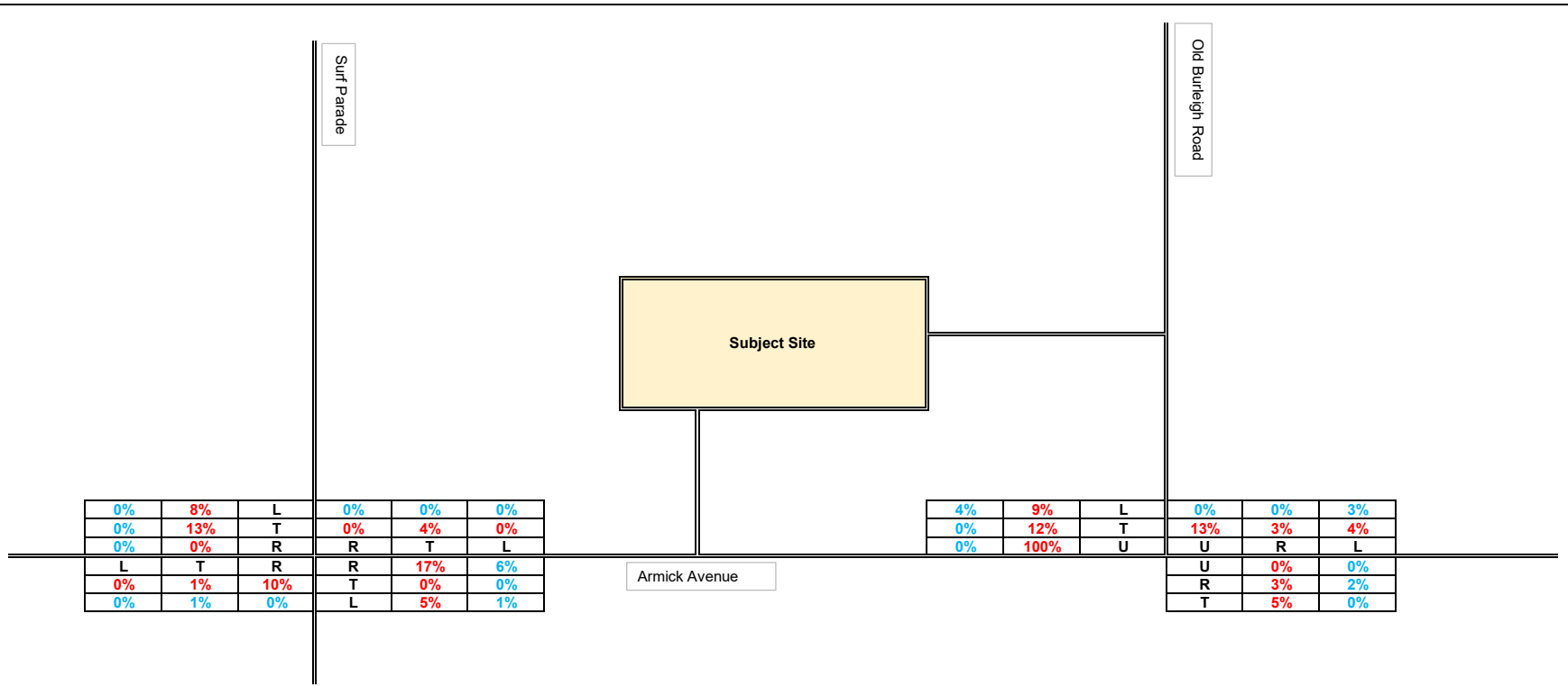
Traffic Diagrams



Project Number:	P7399		**AM Peak:** 8:00 to 9:00	**Sheet:**	1
Project Name:	101 Old Burleigh Road Broadbeach		**PM Peak:** 5:00 to 6:00		
		Author:	A. Stockwell		
		Reviewed By:	A. Stockwell	**Growth Rate:**	**Sheet Name:** 2026 Surveys
		Date:	6/05/2026	**Year:** 2026	



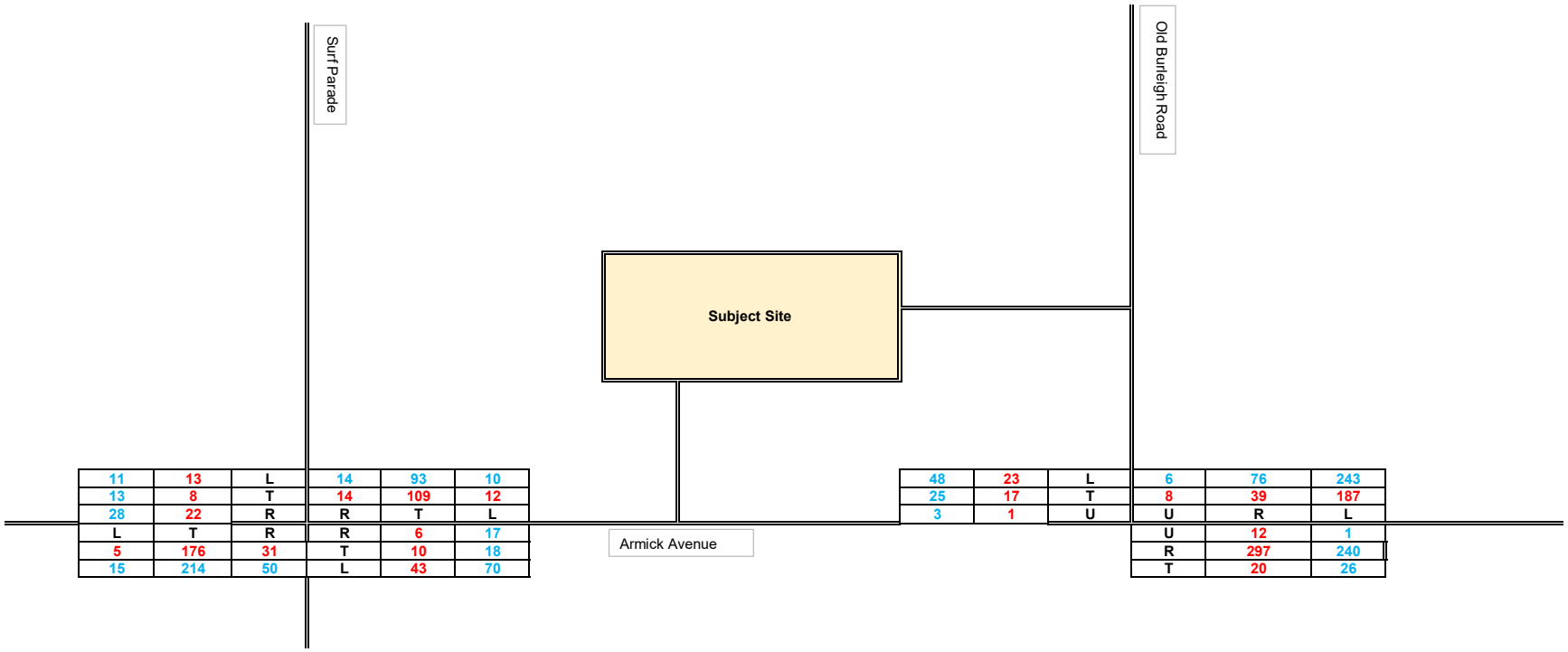
Project Number:	P7399		**AM Peak:** 8:00 to 9:00	**Sheet:**	2
Project Name:	101 Old Burleigh Road Broadbeach		**PM Peak:** 5:00 to 6:00		
		Author:	A. Stockwell		
		Reviewed By:	A. Stockwell	**Growth Rate:**	**Sheet Name:** 2026 HV
		Date:	6/05/2026	**Year:** 2026	



Project Number:	P7399			**AM Peak:**	8:00 to 9:00
Project Name:	101 Old Burleigh Road Broadbeach			**PM Peak:**	5:00 to 6:00
		Author:	A. Stockwell		
		Reviewed By:	A. Stockwell	**Growth Rate:**	
		Date:	6/05/2026	**Year:**	2026

Sheet: 3

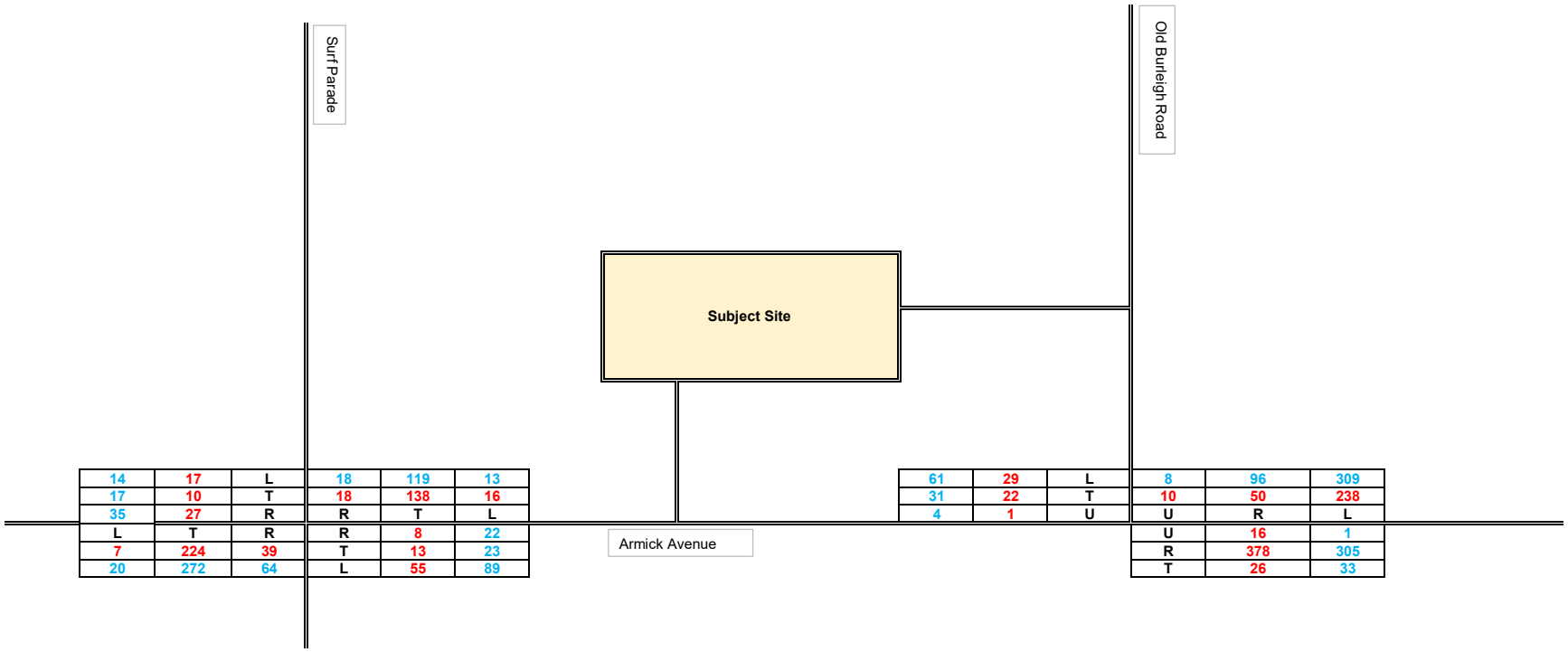
Sheet Name: HV Percentage



Project Number:	P7399			**AM Peak:**	8:00 to 9:00
				PM Peak:	5:00 to 6:00
Project Name:	101 Old Burleigh Road Broadbeach			**Survey Year**	2026
				Built Year	2027
		Author:	A. Stockwell	**Design Year**	2037
		Reviewed By:	A. Stockwell	**Growth Rate:**	2.43%
		Date:	6/05/2026	**Growth Factor**	1.024

Sheet: 4

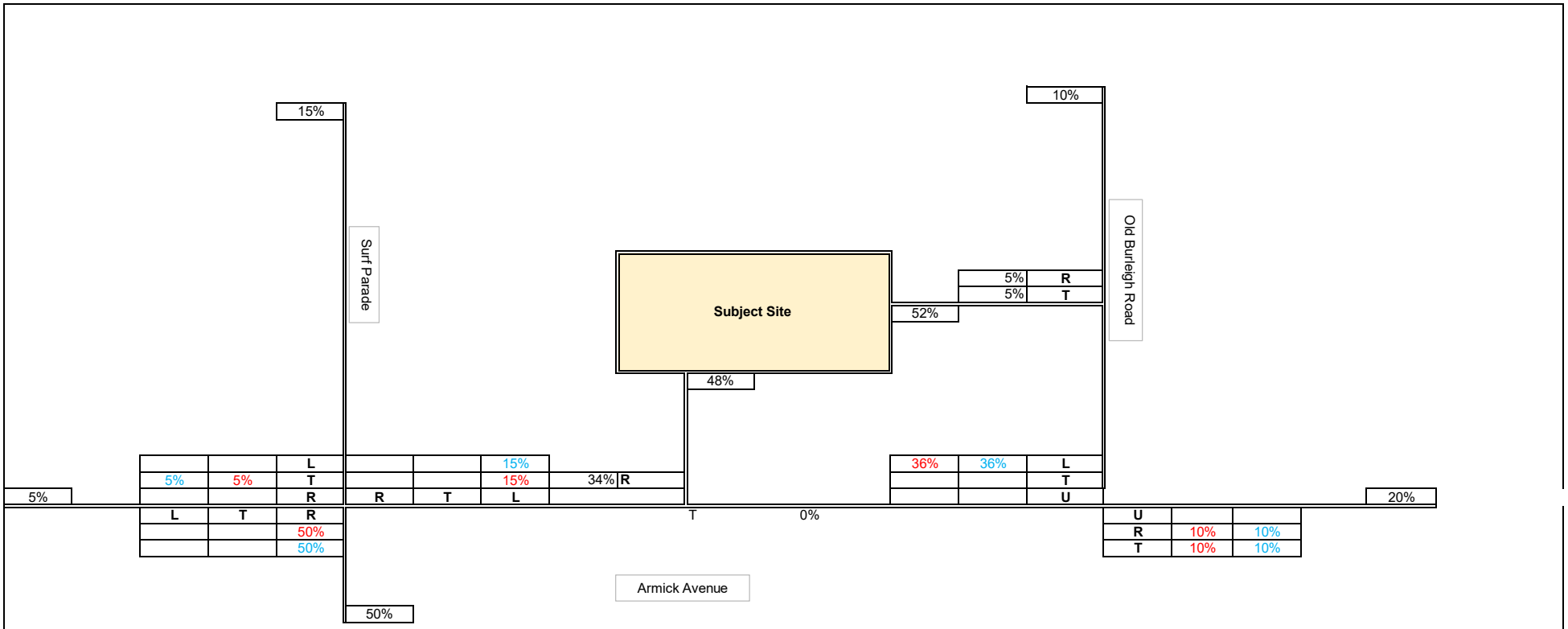
Sheet Name: 2027 Background



Project Number:	P7399			**AM Peak:**	8:00 to 9:00
				PM Peak:	5:00 to 6:00
				Survey Year	2026
				Built Year	2027
Project Name:	101 Old Burleigh Road Broadbeach	**Author:**	A. Stockwell	**Design Year**	2037
		Reviewed By:	A. Stockwell	**Growth Rate:**	2.43%
		Date:	6/05/2026	**Growth Factor**	1.303

Sheet: 5

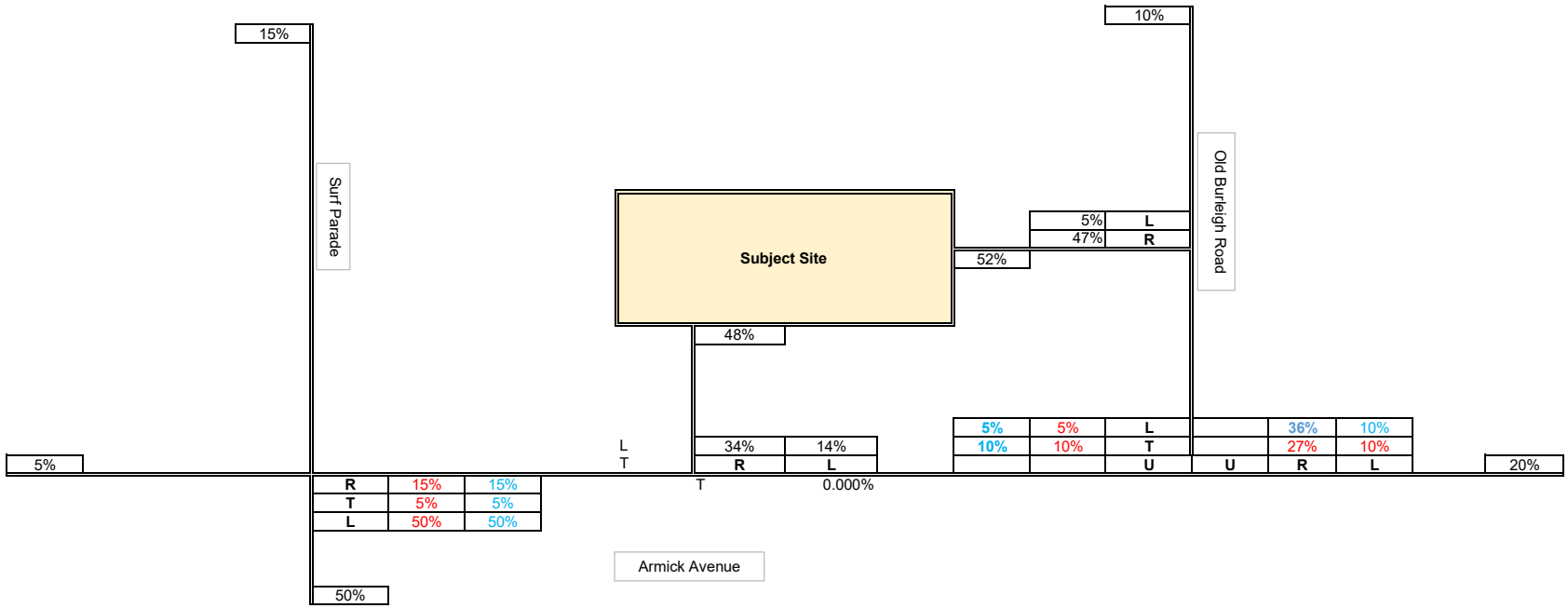
Sheet Name: 2037 Background



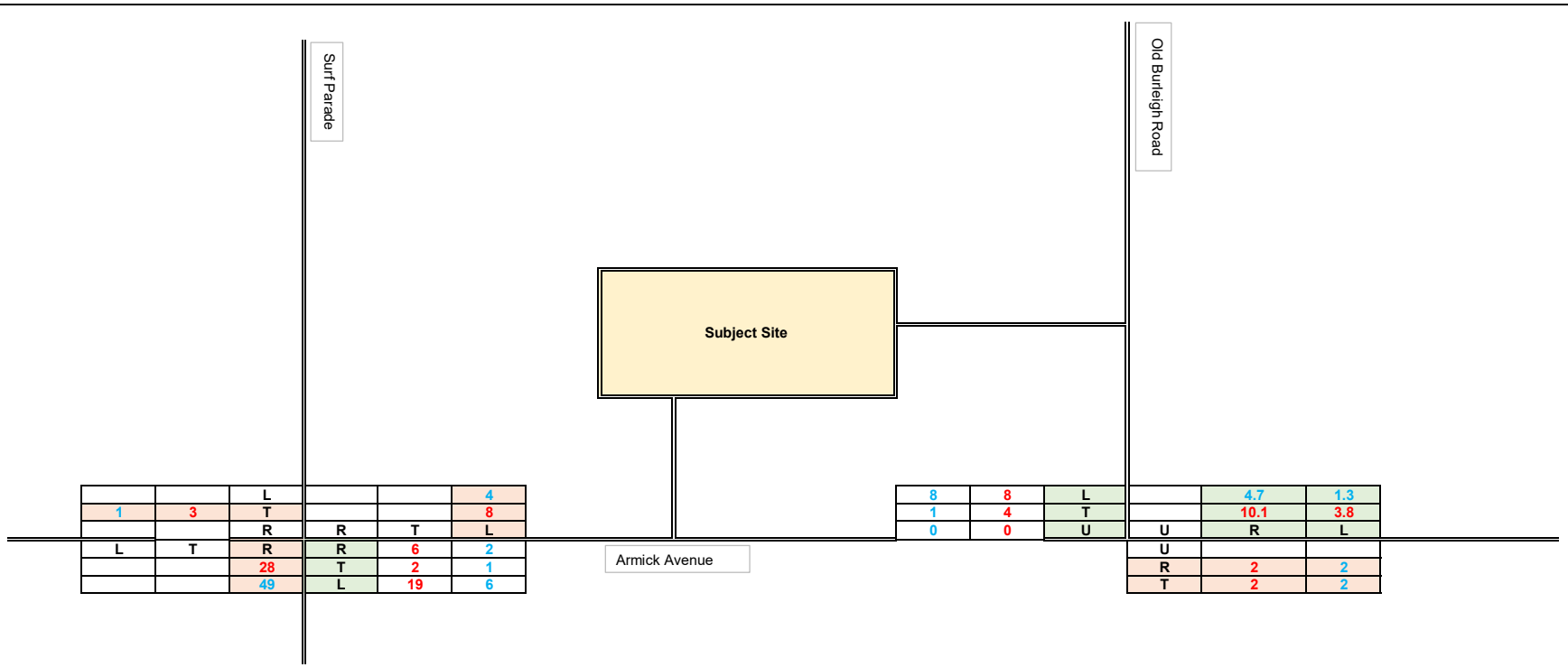
Project Number:	P7399			**AM Peak:**	8:00 to 9:00
				PM Peak:	5:00 to 6:00
				Survey Year	2026
Project Name:	101 Old Burleigh Road Broadbeach			**Built Year**	2027
		Author:	A. Stockwell	**Design Year**	2037
		Reviewed By:	A. Stockwell	**Growth Rate:**	2.43%
		Date:	6/05/2026	**Growth Factor**	1.303

Sheet: 6

Sheet Nam Distribution In



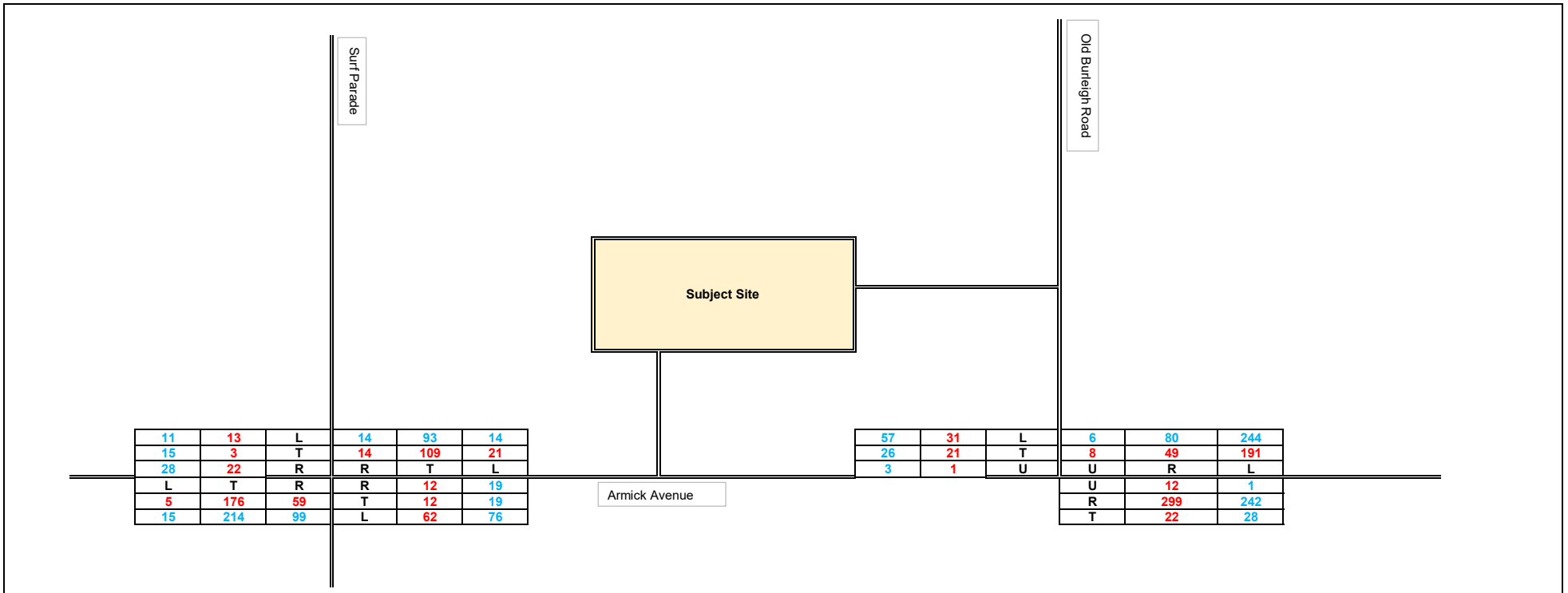
Project Number:	P7399			**AM Peak:** 8:00 to 9:00	
				PM Peak: 5:00 to 6:00	**Sheet:** 7
				Survey Year 2026	
Project Name:	101 Old Burleigh Road Broadbeach			**Built Year** 2027	
		Author:	A. Stockwell	**Design Year** 2037	
		Reviewed By:	A. Stockwell	**Growth Rate:** 2.43%	**Sheet Nam** Distribution Out
		Date:	6/05/2026	**Growth Factor** 1.303	



Project Number:	P7399			**AM Peak:**	8:00 to 9:00
				PM Peak:	5:00 to 6:00
				Survey Year	2026
				Built Year	2027
Project Name:	101 Old Burleigh Road Broadbeach	**Author:**	A. Stockwell	**Design Year**	2037
		Reviewed By:	A. Stockwell	**Growth Rate:**	2.43%
		Date:	6/05/2026	**Growth Factor**	1.303

Sheet: 8

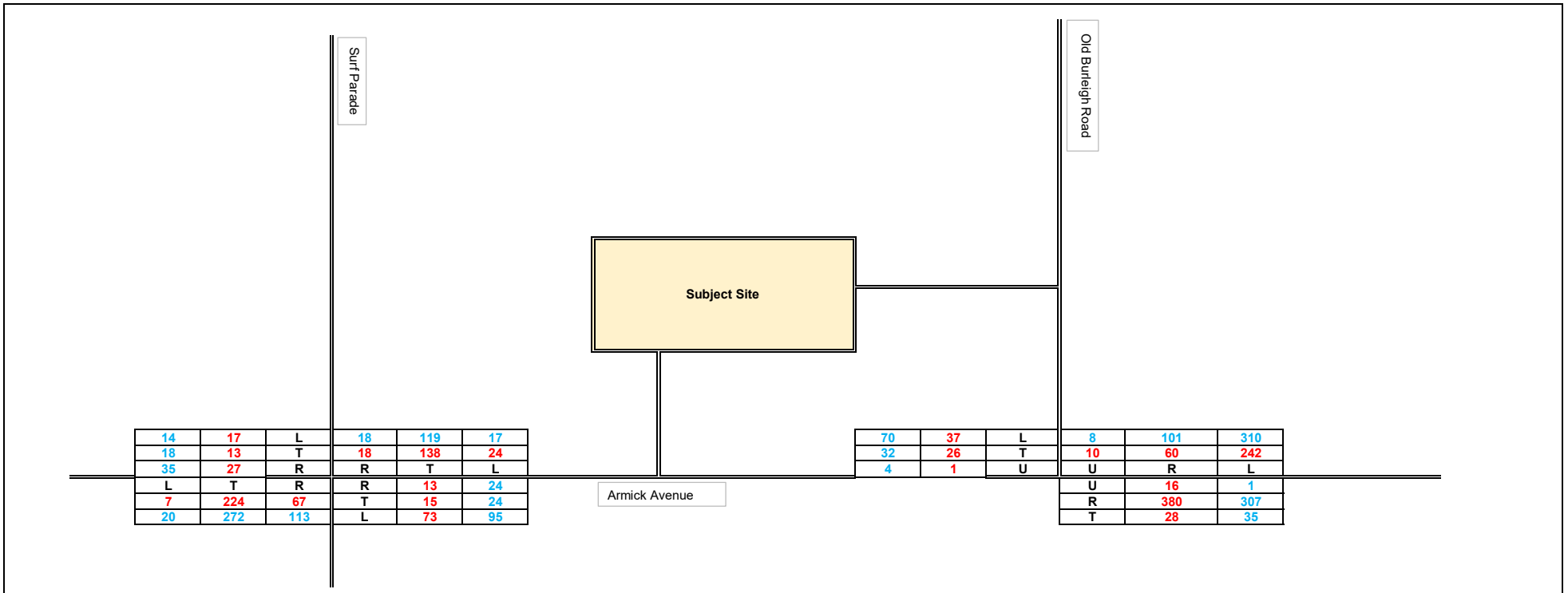
Sheet Name: Development Trips



Project Number:	P7399			**AM Peak:**	8:00 to 9:00
				PM Peak:	5:00 to 6:00
				Survey Year	2026
				Built Year	2027
Project Name:	101 Old Burleigh Road Broadbeach	**Author:**	A. Stockwell	**Design Year**	2037
		Reviewed By:	A. Stockwell	**Growth Rate:**	2.43%
		Date:	6/05/2026	**Growth Factor**	1.303

Sheet: 9

Sheet Name: Design 2027



Project Number:	P7399			**AM Peak:**	8:00 to 9:00
				PM Peak:	5:00 to 6:00
				Survey Year	2026
				Built Year	2027
Project Name:	101 Old Burleigh Road Broadbeach	**Author:**	A. Stockwell	**Design Year**	2037
		Reviewed By:	A. Stockwell	**Growth Rate:**	2.43%
		Date:	6/05/2026	**Growth Factor**	1.303

Sheet: 10

Sheet Name: Design 2037

Appendix D

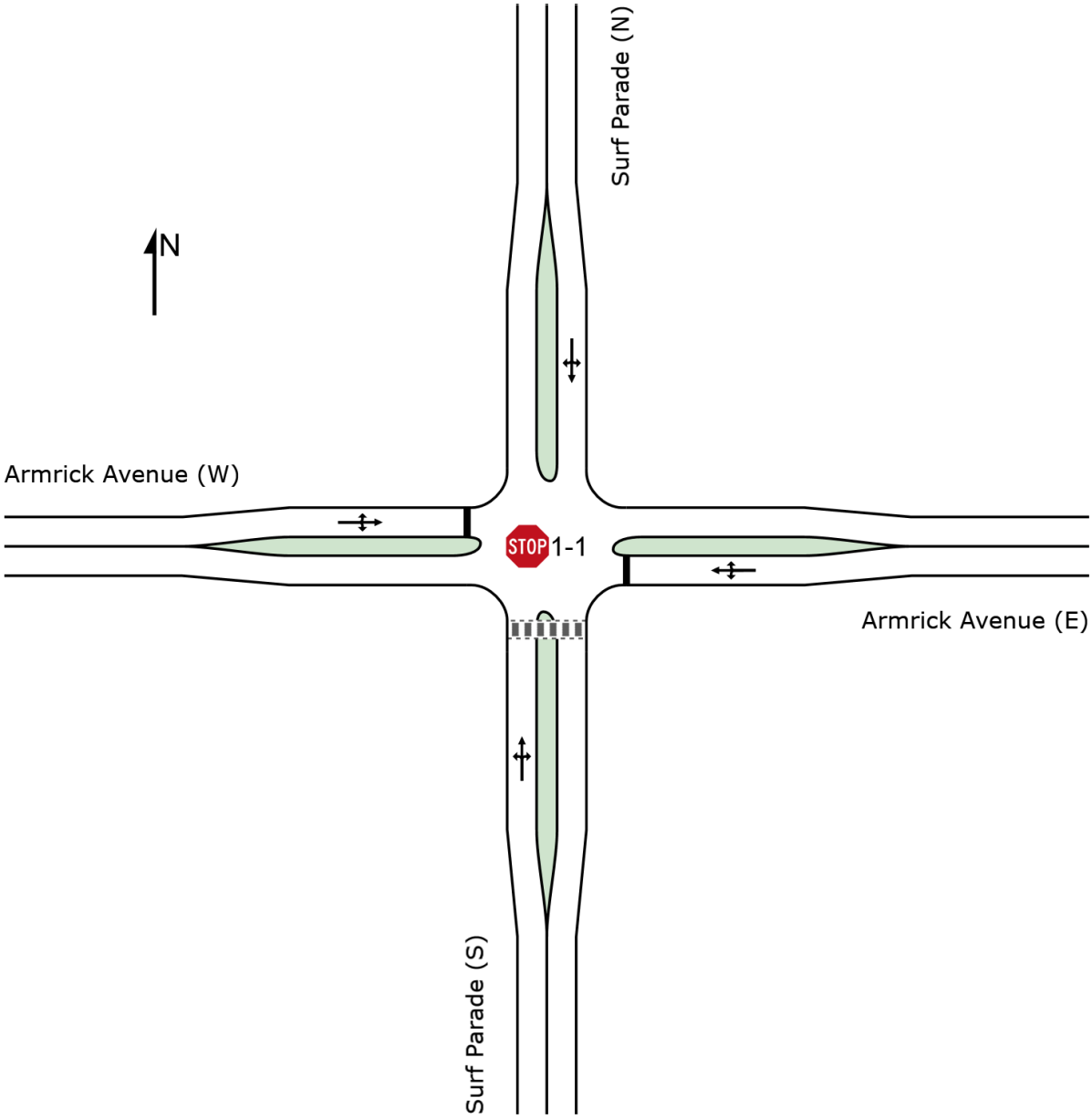
SIDRA Results

SITE LAYOUT

Site: [1-1] AM Base 2026 (Surf Parade / Armrick Avenue)

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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MOVEMENT SUMMARY

Site: [1-1] AM Base 2026 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	5	0.0	5	0.0	0.182	4.7	LOS A	1.0	6.8	0.14	0.12	0.14	45.5
2	T1	All MCs	181	1.0	181	1.0	0.182	0.2	LOS A	1.0	6.8	0.14	0.12	0.14	48.1
3	R2	All MCs	32	10.0	32	10.0	0.182	5.3	LOS A	1.0	6.8	0.14	0.12	0.14	43.9
Approach			218	2.3	218	2.3	0.182	1.1	NA	1.0	6.8	0.14	0.12	0.14	47.5
East: Armrick Avenue (E)															
4	L2	All MCs	44	5.0	44	5.0	0.060	8.2	LOS A	0.2	1.7	0.30	0.87	0.30	37.3
5	T1	All MCs	11	0.0	11	0.0	0.060	9.0	LOS A	0.2	1.7	0.30	0.87	0.30	35.0
6	R2	All MCs	6	17.0	6	17.0	0.060	11.1	LOS A	0.2	1.7	0.30	0.87	0.30	35.3
Approach			61	5.4	61	5.4	0.060	8.6	LOS A	0.2	1.7	0.30	0.87	0.30	36.8
North: Surf Parade (N)															
7	L2	All MCs	13	0.0	13	0.0	0.115	4.8	LOS A	0.6	4.2	0.14	0.13	0.14	43.9
8	T1	All MCs	112	4.0	112	4.0	0.115	0.2	LOS A	0.6	4.2	0.14	0.13	0.14	47.9
9	R2	All MCs	15	0.0	15	0.0	0.115	5.2	LOS A	0.6	4.2	0.14	0.13	0.14	44.5
Approach			139	3.2	139	3.2	0.115	1.1	NA	0.6	4.2	0.14	0.13	0.14	47.3
West: Armrick Avenue (W)															
10	L2	All MCs	14	8.0	14	8.0	0.059	8.5	LOS A	0.2	1.5	0.40	0.89	0.40	36.2
11	T1	All MCs	8	13.0	8	13.0	0.059	10.0	LOS A	0.2	1.5	0.40	0.89	0.40	33.2
12	R2	All MCs	22	0.0	22	0.0	0.059	10.3	LOS A	0.2	1.5	0.40	0.89	0.40	37.6
Approach			44	5.0	44	5.0	0.059	9.7	LOS A	0.2	1.5	0.40	0.89	0.40	36.5
All Vehicles			462	3.2	462	3.2	0.182	2.9	NA	1.0	6.8	0.19	0.30	0.19	44.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1-2] PM Base 2026 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	5	0.0	5	0.0	0.182	4.7	LOS A	1.0	6.8	0.14	0.12	0.14	45.5
2	T1	All MCs	181	1.0	181	1.0	0.182	0.2	LOS A	1.0	6.8	0.14	0.12	0.14	48.1
3	R2	All MCs	32	10.0	32	10.0	0.182	5.3	LOS A	1.0	6.8	0.14	0.12	0.14	43.9
Approach			218	2.3	218	2.3	0.182	1.1	NA	1.0	6.8	0.14	0.12	0.14	47.5
East: Armrick Avenue (E)															
4	L2	All MCs	44	5.0	44	5.0	0.060	8.2	LOS A	0.2	1.7	0.30	0.87	0.30	37.3
5	T1	All MCs	11	0.0	11	0.0	0.060	9.0	LOS A	0.2	1.7	0.30	0.87	0.30	35.0
6	R2	All MCs	6	17.0	6	17.0	0.060	11.1	LOS A	0.2	1.7	0.30	0.87	0.30	35.3
Approach			61	5.4	61	5.4	0.060	8.6	LOS A	0.2	1.7	0.30	0.87	0.30	36.8
North: Surf Parade (N)															
7	L2	All MCs	13	0.0	13	0.0	0.115	4.8	LOS A	0.6	4.2	0.14	0.13	0.14	43.9
8	T1	All MCs	112	4.0	112	4.0	0.115	0.2	LOS A	0.6	4.2	0.14	0.13	0.14	47.9
9	R2	All MCs	15	0.0	15	0.0	0.115	5.2	LOS A	0.6	4.2	0.14	0.13	0.14	44.5
Approach			139	3.2	139	3.2	0.115	1.1	NA	0.6	4.2	0.14	0.13	0.14	47.3
West: Armrick Avenue (W)															
10	L2	All MCs	14	8.0	14	8.0	0.059	8.5	LOS A	0.2	1.5	0.40	0.89	0.40	36.2
11	T1	All MCs	8	13.0	8	13.0	0.059	10.0	LOS A	0.2	1.5	0.40	0.89	0.40	33.2
12	R2	All MCs	22	0.0	22	0.0	0.059	10.3	LOS A	0.2	1.5	0.40	0.89	0.40	37.6
Approach			44	5.0	44	5.0	0.059	9.7	LOS A	0.2	1.5	0.40	0.89	0.40	36.5
All Vehicles			462	3.2	462	3.2	0.182	2.9	NA	1.0	6.8	0.19	0.30	0.19	44.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1-3] AM Base 2027 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	5	0.0	5	0.0	0.186	4.7	LOS A	1.0	7.0	0.14	0.12	0.14	45.5
2	T1	All MCs	185	1.0	185	1.0	0.186	0.2	LOS A	1.0	7.0	0.14	0.12	0.14	48.1
3	R2	All MCs	33	10.0	33	10.0	0.186	5.3	LOS A	1.0	7.0	0.14	0.12	0.14	43.8
Approach			223	2.3	223	2.3	0.186	1.1	NA	1.0	7.0	0.14	0.12	0.14	47.5
East: Armrick Avenue (E)															
4	L2	All MCs	45	5.0	45	5.0	0.061	8.2	LOS A	0.2	1.7	0.30	0.87	0.30	37.3
5	T1	All MCs	11	0.0	11	0.0	0.061	9.1	LOS A	0.2	1.7	0.30	0.87	0.30	35.0
6	R2	All MCs	6	17.0	6	17.0	0.061	11.2	LOS A	0.2	1.7	0.30	0.87	0.30	35.2
Approach			62	5.4	62	5.4	0.061	8.7	LOS A	0.2	1.7	0.30	0.87	0.30	36.8
North: Surf Parade (N)															
7	L2	All MCs	13	0.0	13	0.0	0.117	4.8	LOS A	0.6	4.3	0.14	0.13	0.14	44.0
8	T1	All MCs	115	4.0	115	4.0	0.117	0.2	LOS A	0.6	4.3	0.14	0.13	0.14	47.9
9	R2	All MCs	15	0.0	15	0.0	0.117	5.2	LOS A	0.6	4.3	0.14	0.13	0.14	44.5
Approach			142	3.2	142	3.2	0.117	1.1	NA	0.6	4.3	0.14	0.13	0.14	47.3
West: Armrick Avenue (W)															
10	L2	All MCs	14	8.0	14	8.0	0.061	8.5	LOS A	0.2	1.6	0.41	0.89	0.41	36.1
11	T1	All MCs	8	13.0	8	13.0	0.061	10.0	LOS A	0.2	1.6	0.41	0.89	0.41	33.1
12	R2	All MCs	23	0.0	23	0.0	0.061	10.4	LOS A	0.2	1.6	0.41	0.89	0.41	37.6
Approach			45	4.8	45	4.8	0.061	9.8	LOS A	0.2	1.6	0.41	0.89	0.41	36.4
All Vehicles			473	3.2	473	3.2	0.186	2.9	NA	1.0	7.0	0.19	0.30	0.19	44.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1-4] PM Base 2027 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	16	0.0	16	0.0	0.241	4.7	LOS A	1.4	9.7	0.15	0.16	0.15	45.1
2	T1	All MCs	225	1.0	225	1.0	0.241	0.2	LOS A	1.4	9.7	0.15	0.16	0.15	47.7
3	R2	All MCs	53	10.0	53	10.0	0.241	5.3	LOS A	1.4	9.7	0.15	0.16	0.15	43.4
Approach			294	2.6	294	2.6	0.241	1.4	NA	1.4	9.7	0.15	0.16	0.15	46.8
East: Armrick Avenue (E)															
4	L2	All MCs	74	5.0	74	5.0	0.118	8.2	LOS A	0.5	3.4	0.32	0.88	0.32	37.0
5	T1	All MCs	19	0.0	19	0.0	0.118	9.7	LOS A	0.5	3.4	0.32	0.88	0.32	34.6
6	R2	All MCs	18	17.0	18	17.0	0.118	12.1	LOS A	0.5	3.4	0.32	0.88	0.32	34.9
Approach			111	6.1	111	6.1	0.118	9.1	LOS A	0.5	3.4	0.32	0.88	0.32	36.3
North: Surf Parade (N)															
7	L2	All MCs	11	0.0	11	0.0	0.102	4.8	LOS A	0.5	3.7	0.14	0.14	0.14	43.9
8	T1	All MCs	98	4.0	98	4.0	0.102	0.2	LOS A	0.5	3.7	0.14	0.14	0.14	47.8
9	R2	All MCs	15	0.0	15	0.0	0.102	5.4	LOS A	0.5	3.7	0.14	0.14	0.14	44.4
Approach			123	3.2	123	3.2	0.102	1.2	NA	0.5	3.7	0.14	0.14	0.14	47.2
West: Armrick Avenue (W)															
10	L2	All MCs	12	8.0	12	8.0	0.085	8.8	LOS A	0.3	2.1	0.47	0.92	0.47	35.4
11	T1	All MCs	14	13.0	14	13.0	0.085	10.6	LOS A	0.3	2.1	0.47	0.92	0.47	32.4
12	R2	All MCs	29	0.0	29	0.0	0.085	11.4	LOS A	0.3	2.1	0.47	0.92	0.47	37.0
Approach			55	4.9	55	4.9	0.085	10.6	LOS A	0.3	2.1	0.47	0.92	0.47	35.7
All Vehicles			582	3.6	582	3.6	0.241	3.7	NA	1.4	9.7	0.21	0.36	0.21	43.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1-5] AM Base 2037 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	7	0.0	7	0.0	0.238	4.7	LOS A	1.3	9.5	0.15	0.13	0.15	45.4
2	T1	All MCs	236	1.0	236	1.0	0.238	0.2	LOS A	1.3	9.5	0.15	0.13	0.15	48.1
3	R2	All MCs	41	10.0	41	10.0	0.238	5.5	LOS A	1.3	9.5	0.15	0.13	0.15	43.8
Approach			284	2.3	284	2.3	0.238	1.1	NA	1.3	9.5	0.15	0.13	0.15	47.4
East: Armrick Avenue (E)															
4	L2	All MCs	58	5.0	58	5.0	0.086	8.4	LOS A	0.3	2.4	0.35	0.87	0.35	37.0
5	T1	All MCs	14	0.0	14	0.0	0.086	9.9	LOS A	0.3	2.4	0.35	0.87	0.35	34.7
6	R2	All MCs	8	17.0	8	17.0	0.086	12.7	LOS A	0.3	2.4	0.35	0.87	0.35	34.9
Approach			80	5.4	80	5.4	0.086	9.1	LOS A	0.3	2.4	0.35	0.87	0.35	36.4
North: Surf Parade (N)															
7	L2	All MCs	17	0.0	17	0.0	0.150	4.8	LOS A	0.8	5.7	0.14	0.14	0.14	43.9
8	T1	All MCs	145	4.0	145	4.0	0.150	0.2	LOS A	0.8	5.7	0.14	0.14	0.14	47.8
9	R2	All MCs	19	0.0	19	0.0	0.150	5.5	LOS A	0.8	5.7	0.14	0.14	0.14	44.4
Approach			181	3.2	181	3.2	0.150	1.2	NA	0.8	5.7	0.14	0.14	0.14	47.2
West: Armrick Avenue (W)															
10	L2	All MCs	18	8.0	18	8.0	0.087	8.8	LOS A	0.3	2.2	0.47	0.92	0.47	35.4
11	T1	All MCs	11	13.0	11	13.0	0.087	11.1	LOS A	0.3	2.2	0.47	0.92	0.47	32.4
12	R2	All MCs	28	0.0	28	0.0	0.087	11.6	LOS A	0.3	2.2	0.47	0.92	0.47	36.9
Approach			57	4.9	57	4.9	0.087	10.7	LOS A	0.3	2.2	0.47	0.92	0.47	35.8
All Vehicles			602	3.2	602	3.2	0.238	3.1	NA	1.3	9.5	0.21	0.30	0.21	44.6

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1-6] PM Base 2037 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	21	0.0	21	0.0	0.309	4.7	LOS A	1.9	13.4	0.17	0.16	0.17	45.0
2	T1	All MCs	286	1.0	286	1.0	0.309	0.2	LOS A	1.9	13.4	0.17	0.16	0.17	47.6
3	R2	All MCs	67	10.0	67	10.0	0.309	5.5	LOS A	1.9	13.4	0.17	0.16	0.17	43.3
Approach			375	2.6	375	2.6	0.309	1.4	NA	1.9	13.4	0.17	0.16	0.17	46.7
East: Armrick Avenue (E)															
4	L2	All MCs	94	5.0	94	5.0	0.168	8.3	LOS A	0.7	4.9	0.39	0.87	0.39	36.4
5	T1	All MCs	24	0.0	24	0.0	0.168	11.0	LOS A	0.7	4.9	0.39	0.87	0.39	34.1
6	R2	All MCs	23	17.0	23	17.0	0.168	14.3	LOS A	0.7	4.9	0.39	0.87	0.39	34.4
Approach			141	6.1	141	6.1	0.168	9.8	LOS A	0.7	4.9	0.39	0.87	0.39	35.8
North: Surf Parade (N)															
7	L2	All MCs	14	0.0	14	0.0	0.132	4.9	LOS A	0.7	4.9	0.14	0.14	0.14	43.8
8	T1	All MCs	125	4.0	125	4.0	0.132	0.2	LOS A	0.7	4.9	0.14	0.14	0.14	47.8
9	R2	All MCs	19	0.0	19	0.0	0.132	5.7	LOS A	0.7	4.9	0.14	0.14	0.14	44.4
Approach			158	3.2	158	3.2	0.132	1.3	NA	0.7	4.9	0.14	0.14	0.14	47.1
West: Armrick Avenue (W)															
10	L2	All MCs	15	8.0	15	8.0	0.128	9.2	LOS A	0.4	3.2	0.54	0.97	0.54	34.3
11	T1	All MCs	18	13.0	18	13.0	0.128	11.9	LOS A	0.4	3.2	0.54	0.97	0.54	31.3
12	R2	All MCs	37	0.0	37	0.0	0.128	13.2	LOS A	0.4	3.2	0.54	0.97	0.54	35.9
Approach			69	5.0	69	5.0	0.128	12.0	LOS A	0.4	3.2	0.54	0.97	0.54	34.6
All Vehicles			743	3.6	743	3.6	0.309	4.0	NA	1.9	13.4	0.24	0.37	0.24	43.3

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1--7] AM Design 2027 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	5	0.0	5	0.0	0.207	4.7	LOS A	1.1	8.0	0.15	0.17	0.15	44.9
2	T1	All MCs	185	1.0	185	1.0	0.207	0.2	LOS A	1.1	8.0	0.15	0.17	0.15	47.5
3	R2	All MCs	62	10.0	62	10.0	0.207	5.4	LOS A	1.1	8.0	0.15	0.17	0.15	43.3
Approach			253	3.2	253	3.2	0.207	1.6	NA	1.1	8.0	0.15	0.17	0.15	46.5
East: Armrick Avenue (E)															
4	L2	All MCs	65	5.0	65	5.0	0.093	8.2	LOS A	0.4	2.6	0.32	0.88	0.32	37.1
5	T1	All MCs	13	0.0	13	0.0	0.093	9.4	LOS A	0.4	2.6	0.32	0.88	0.32	34.8
6	R2	All MCs	13	17.0	13	17.0	0.093	11.7	LOS A	0.4	2.6	0.32	0.88	0.32	35.1
Approach			91	6.0	91	6.0	0.093	8.9	LOS A	0.4	2.6	0.32	0.88	0.32	36.6
North: Surf Parade (N)															
7	L2	All MCs	22	0.0	22	0.0	0.122	4.8	LOS A	0.6	4.6	0.14	0.16	0.14	43.6
8	T1	All MCs	115	4.0	115	4.0	0.122	0.2	LOS A	0.6	4.6	0.14	0.16	0.14	47.6
9	R2	All MCs	15	0.0	15	0.0	0.122	5.2	LOS A	0.6	4.6	0.14	0.16	0.14	44.2
Approach			152	3.0	152	3.0	0.122	1.4	NA	0.6	4.6	0.14	0.16	0.14	46.8
West: Armrick Avenue (W)															
10	L2	All MCs	14	8.0	14	8.0	0.057	8.5	LOS A	0.2	1.4	0.43	0.89	0.43	35.8
11	T1	All MCs	3	13.0	3	13.0	0.057	10.4	LOS A	0.2	1.4	0.43	0.89	0.43	32.8
12	R2	All MCs	23	0.0	23	0.0	0.057	10.9	LOS A	0.2	1.4	0.43	0.89	0.43	37.3
Approach			40	3.8	40	3.8	0.057	10.0	LOS A	0.2	1.4	0.43	0.89	0.43	36.5
All Vehicles			535	3.7	535	3.7	0.207	3.4	NA	1.1	8.0	0.20	0.34	0.20	43.9

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1-8] PM Design 2027 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	16	0.0	16	0.0	0.248	4.7	LOS A	1.4	10.0	0.16	0.17	0.16	45.0
2	T1	All MCs	225	1.0	225	1.0	0.248	0.2	LOS A	1.4	10.0	0.16	0.17	0.16	47.5
3	R2	All MCs	62	10.0	62	10.0	0.248	5.3	LOS A	1.4	10.0	0.16	0.17	0.16	43.3
Approach			303	2.8	303	2.8	0.248	1.5	NA	1.4	10.0	0.16	0.17	0.16	46.6
East: Armrick Avenue (E)															
4	L2	All MCs	80	5.0	80	5.0	0.130	8.2	LOS A	0.5	3.7	0.33	0.88	0.33	36.9
5	T1	All MCs	20	0.0	20	0.0	0.130	9.8	LOS A	0.5	3.7	0.33	0.88	0.33	34.6
6	R2	All MCs	20	17.0	20	17.0	0.130	12.4	LOS A	0.5	3.7	0.33	0.88	0.33	34.8
Approach			120	6.2	120	6.2	0.130	9.2	LOS A	0.5	3.7	0.33	0.88	0.33	36.2
North: Surf Parade (N)															
7	L2	All MCs	15	0.0	15	0.0	0.104	4.8	LOS A	0.5	3.8	0.14	0.15	0.14	43.7
8	T1	All MCs	98	4.0	98	4.0	0.104	0.2	LOS A	0.5	3.8	0.14	0.15	0.14	47.7
9	R2	All MCs	15	0.0	15	0.0	0.104	5.4	LOS A	0.5	3.8	0.14	0.15	0.14	44.3
Approach			127	3.1	127	3.1	0.104	1.3	NA	0.5	3.8	0.14	0.15	0.14	46.9
West: Armrick Avenue (W)															
10	L2	All MCs	12	8.0	12	8.0	0.090	8.8	LOS A	0.3	2.3	0.48	0.93	0.48	35.3
11	T1	All MCs	16	13.0	16	13.0	0.090	10.7	LOS A	0.3	2.3	0.48	0.93	0.48	32.3
12	R2	All MCs	29	0.0	29	0.0	0.090	11.6	LOS A	0.3	2.3	0.48	0.93	0.48	36.9
Approach			57	5.2	57	5.2	0.090	10.8	LOS A	0.3	2.3	0.48	0.93	0.48	35.5
All Vehicles			607	3.7	607	3.7	0.248	3.8	NA	1.4	10.0	0.22	0.38	0.22	43.4

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: [1-9] AM Design 2037 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	7	0.0	7	0.0	0.260	4.7	LOS A	1.5	10.6	0.16	0.17	0.16	45.0
2	T1	All MCs	236	1.0	236	1.0	0.260	0.2	LOS A	1.5	10.6	0.16	0.17	0.16	47.6
3	R2	All MCs	71	10.0	71	10.0	0.260	5.6	LOS A	1.5	10.6	0.16	0.17	0.16	43.3
Approach			314	3.0	314	3.0	0.260	1.5	NA	1.5	10.6	0.16	0.17	0.16	46.6
East: Armrick Avenue (E)															
4	L2	All MCs	77	5.0	77	5.0	0.118	8.4	LOS A	0.5	3.3	0.37	0.88	0.37	36.8
5	T1	All MCs	16	0.0	16	0.0	0.118	10.4	LOS A	0.5	3.3	0.37	0.88	0.37	34.4
6	R2	All MCs	14	17.0	14	17.0	0.118	13.5	LOS A	0.5	3.3	0.37	0.88	0.37	34.7
Approach			106	5.8	106	5.8	0.118	9.4	LOS A	0.5	3.3	0.37	0.88	0.37	36.2
North: Surf Parade (N)															
7	L2	All MCs	25	0.0	25	0.0	0.154	4.8	LOS A	0.8	6.0	0.14	0.15	0.14	43.6
8	T1	All MCs	145	4.0	145	4.0	0.154	0.2	LOS A	0.8	6.0	0.14	0.15	0.14	47.6
9	R2	All MCs	19	0.0	19	0.0	0.154	5.5	LOS A	0.8	6.0	0.14	0.15	0.14	44.2
Approach			189	3.1	189	3.1	0.154	1.4	NA	0.8	6.0	0.14	0.15	0.14	46.9
West: Armrick Avenue (W)															
10	L2	All MCs	18	8.0	18	8.0	0.098	8.8	LOS A	0.3	2.5	0.50	0.93	0.50	35.1
11	T1	All MCs	14	13.0	14	13.0	0.098	11.5	LOS A	0.3	2.5	0.50	0.93	0.50	32.0
12	R2	All MCs	28	0.0	28	0.0	0.098	12.3	LOS A	0.3	2.5	0.50	0.93	0.50	36.6
Approach			60	5.4	60	5.4	0.098	11.1	LOS A	0.3	2.5	0.50	0.93	0.50	35.3
All Vehicles			669	3.7	669	3.7	0.260	3.6	NA	1.5	10.6	0.22	0.34	0.22	43.8

Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [1-10] PM Design 2037 (Surf Parade / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

AM Base 2026
Site Category: (None)
Stop (Two-Way)
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
South: Surf Parade (S)															
1	L2	All MCs	21	0.0	21	0.0	0.345	4.7	LOS A	2.2	15.7	0.18	0.21	0.18	44.4
2	T1	All MCs	286	1.0	286	1.0	0.345	0.3	LOS A	2.2	15.7	0.18	0.21	0.18	47.0
3	R2	All MCs	119	10.0	119	10.0	0.345	5.6	LOS A	2.2	15.7	0.18	0.21	0.18	42.7
Approach			426	3.5	426	3.5	0.345	2.0	NA	2.2	15.7	0.18	0.21	0.18	45.7
East: Armrick Avenue (E)															
4	L2	All MCs	100	5.0	100	5.0	0.189	8.4	LOS A	0.7	5.5	0.41	0.87	0.41	36.1
5	T1	All MCs	25	0.0	25	0.0	0.189	11.7	LOS A	0.7	5.5	0.41	0.87	0.41	33.7
6	R2	All MCs	25	17.0	25	17.0	0.189	15.6	LOS B	0.7	5.5	0.41	0.87	0.41	34.1
Approach			151	6.2	151	6.2	0.189	10.1	LOS A	0.7	5.5	0.41	0.87	0.41	35.5
North: Surf Parade (N)															
7	L2	All MCs	18	0.0	18	0.0	0.134	4.9	LOS A	0.7	5.0	0.14	0.15	0.14	43.7
8	T1	All MCs	125	4.0	125	4.0	0.134	0.2	LOS A	0.7	5.0	0.14	0.15	0.14	47.7
9	R2	All MCs	19	0.0	19	0.0	0.134	5.7	LOS A	0.7	5.0	0.14	0.15	0.14	44.2
Approach			162	3.1	162	3.1	0.134	1.4	NA	0.7	5.0	0.14	0.15	0.14	46.9
West: Armrick Avenue (W)															
10	L2	All MCs	15	8.0	15	8.0	0.142	9.2	LOS A	0.5	3.6	0.57	0.98	0.57	33.8
11	T1	All MCs	19	13.0	19	13.0	0.142	12.8	LOS A	0.5	3.6	0.57	0.98	0.57	30.7
12	R2	All MCs	37	0.0	37	0.0	0.142	14.3	LOS A	0.5	3.6	0.57	0.98	0.57	35.4
Approach			71	5.2	71	5.2	0.142	12.8	LOS A	0.5	3.6	0.57	0.98	0.57	33.9
All Vehicles			809	4.0	809	4.0	0.345	4.3	NA	2.2	15.7	0.25	0.39	0.25	42.8

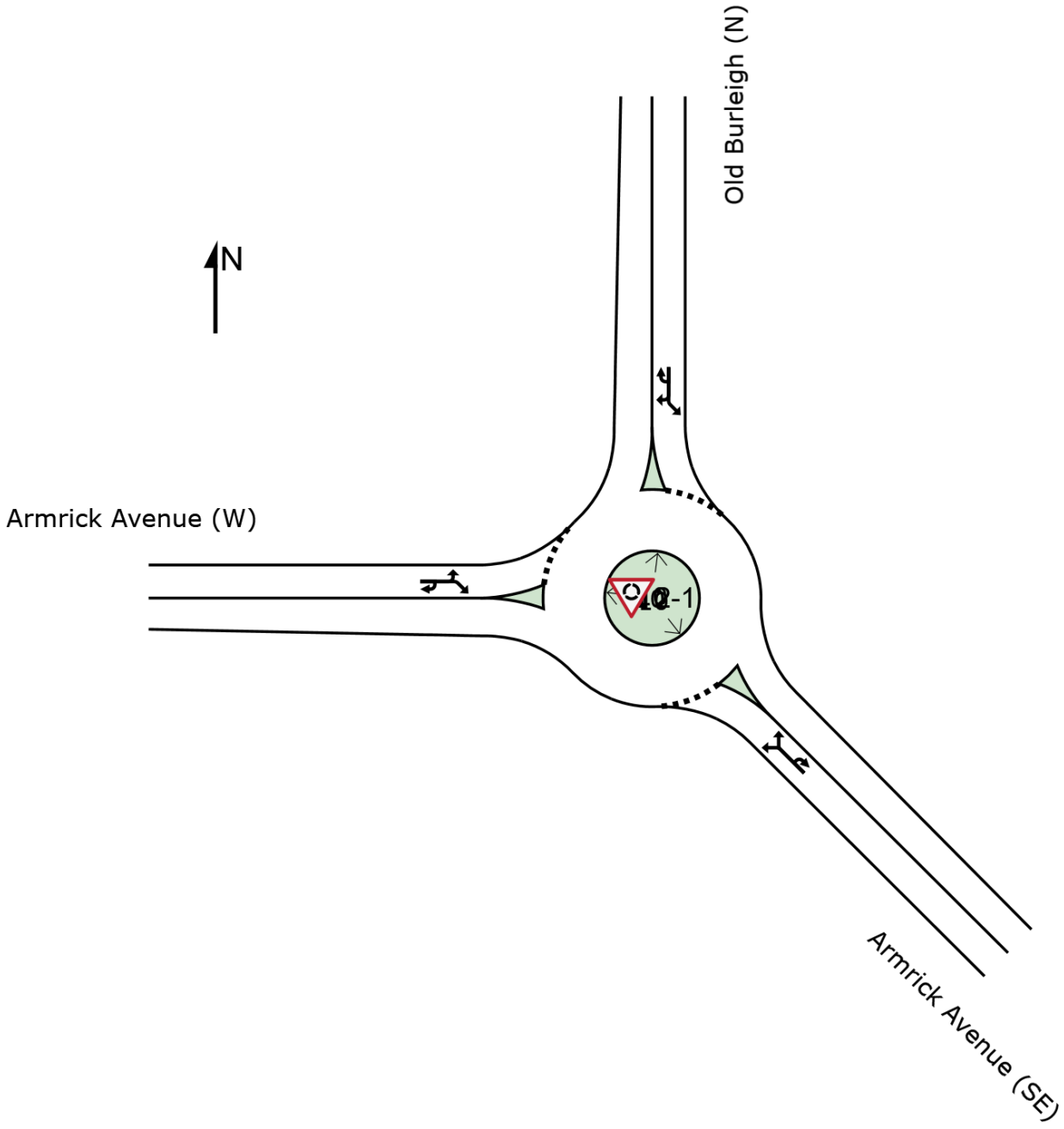
Site Level of Service (LOS) Method: Delay (NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: [2-1] AM Base 2026 (2. Old Burleigh / Armrick Avenue)

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

Site: [2-1] AM Base 2026 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	21	5.0	21	5.0	0.262	4.7	LOS A	1.7	12.4	0.23	0.58	0.23	47.7
5	R1	All MCs	305	3.0	305	3.0	0.262	7.5	LOS A	1.7	12.4	0.23	0.58	0.23	50.9
6	U	All MCs	13	0.0	13	0.0	0.262	9.9	LOS A	1.7	12.4	0.23	0.58	0.23	51.0
Approach			339	3.0	339	3.0	0.262	7.4	LOS A	1.7	12.4	0.23	0.58	0.23	50.8
North: Old Burleigh (N)															
1	L1	All MCs	193	4.0	193	4.0	0.193	4.6	LOS A	1.2	8.9	0.18	0.51	0.18	53.1
2	R2	All MCs	40	3.0	40	3.0	0.193	8.2	LOS A	1.2	8.9	0.18	0.51	0.18	48.8
3	U	All MCs	8	13.0	8	13.0	0.193	10.0	LOS A	1.2	8.9	0.18	0.51	0.18	52.0
Approach			241	4.1	241	4.1	0.193	5.4	LOS A	1.2	8.9	0.18	0.51	0.18	52.6
West: Armrick Avenue (W)															
7	L2	All MCs	23	9.0	23	9.0	0.057	7.3	LOS A	0.3	2.3	0.53	0.65	0.53	46.3
8	R1	All MCs	18	12.0	18	12.0	0.057	10.0	LOS A	0.3	2.3	0.53	0.65	0.53	45.6
9	U	All MCs	1	100.0	1	100.0	0.057	15.1	LOS B	0.3	2.3	0.53	0.65	0.53	21.2
Approach			42	12.5	42	12.5	0.057	8.7	LOS A	0.3	2.3	0.53	0.65	0.53	45.4
All Vehicles			622	4.1	622	4.1	0.262	6.7	LOS A	1.7	12.4	0.23	0.56	0.23	51.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-2] PM Base 2026 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	8	0.0	8	0.0	0.236	4.9	LOS A	1.5	10.7	0.30	0.59	0.30	47.5
5	R1	All MCs	246	2.0	246	2.0	0.236	7.8	LOS A	1.5	10.7	0.30	0.59	0.30	50.6
6	U	All MCs	26	0.0	26	0.0	0.236	10.2	LOS B	1.5	10.7	0.30	0.59	0.30	50.7
Approach			281	1.8	281	1.8	0.236	7.9	LOS A	1.5	10.7	0.30	0.59	0.30	50.6
North: Old Burleigh (N)															
1	L1	All MCs	249	3.0	249	3.0	0.273	4.7	LOS A	1.8	13.1	0.25	0.51	0.25	52.8
2	R2	All MCs	78	0.0	78	0.0	0.273	8.3	LOS A	1.8	13.1	0.25	0.51	0.25	48.5
3	U	All MCs	6	0.0	6	0.0	0.273	10.0	LOS A	1.8	13.1	0.25	0.51	0.25	52.2
Approach			334	2.2	334	2.2	0.273	5.7	LOS A	1.8	13.1	0.25	0.51	0.25	52.1
West: Armrick Avenue (W)															
7	L2	All MCs	49	4.0	49	4.0	0.092	6.9	LOS A	0.5	3.6	0.51	0.63	0.51	47.2
8	R1	All MCs	25	0.0	25	0.0	0.092	9.3	LOS A	0.5	3.6	0.51	0.63	0.51	47.0
9	U	All MCs	1	0.0	1	0.0	0.092	11.7	LOS B	0.5	3.6	0.51	0.63	0.51	24.0
Approach			76	2.6	76	2.6	0.092	7.7	LOS A	0.5	3.6	0.51	0.63	0.51	46.9
All Vehicles			691	2.1	691	2.1	0.273	6.8	LOS A	1.8	13.1	0.30	0.56	0.30	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-3] AM Base 2027 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	21	5.0	21	5.0	0.268	4.7	LOS A	1.8	12.7	0.23	0.58	0.23	47.6
5	R1	All MCs	313	3.0	313	3.0	0.268	7.5	LOS A	1.8	12.7	0.23	0.58	0.23	50.9
6	U	All MCs	13	0.0	13	0.0	0.268	9.9	LOS A	1.8	12.7	0.23	0.58	0.23	51.0
Approach			346	3.0	346	3.0	0.268	7.4	LOS A	1.8	12.7	0.23	0.58	0.23	50.8
North: Old Burleigh (N)															
1	L1	All MCs	197	4.0	197	4.0	0.196	4.6	LOS A	1.3	9.1	0.18	0.50	0.18	53.1
2	R2	All MCs	41	3.0	41	3.0	0.196	8.2	LOS A	1.3	9.1	0.18	0.50	0.18	48.8
3	U	All MCs	8	13.0	8	13.0	0.196	10.0	LOS A	1.3	9.1	0.18	0.50	0.18	52.0
Approach			246	4.1	246	4.1	0.196	5.4	LOS A	1.3	9.1	0.18	0.50	0.18	52.6
West: Armrick Avenue (W)															
7	L2	All MCs	24	9.0	24	9.0	0.059	7.4	LOS A	0.3	2.4	0.54	0.65	0.54	46.2
8	R1	All MCs	18	12.0	18	12.0	0.059	10.0	LOS B	0.3	2.4	0.54	0.65	0.54	45.6
9	U	All MCs	1	100.0	1	100.0	0.059	15.3	LOS B	0.3	2.4	0.54	0.65	0.54	21.2
Approach			43	12.5	43	12.5	0.059	8.7	LOS A	0.3	2.4	0.54	0.65	0.54	45.4
All Vehicles			636	4.1	636	4.1	0.268	6.7	LOS A	1.8	12.7	0.23	0.56	0.23	51.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-4] PM Base 2027 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	27	0.0	27	0.0	0.238	4.9	LOS A	1.5	10.6	0.31	0.58	0.31	47.8
5	R1	All MCs	253	2.0	253	2.0	0.238	7.8	LOS A	1.5	10.6	0.31	0.58	0.31	50.9
6	U	All MCs	1	0.0	1	0.0	0.238	10.2	LOS B	1.5	10.6	0.31	0.58	0.31	51.0
Approach			281	1.8	281	1.8	0.238	7.5	LOS A	1.5	10.6	0.31	0.58	0.31	50.7
North: Old Burleigh (N)															
1	L1	All MCs	256	3.0	256	3.0	0.261	4.5	LOS A	1.9	13.3	0.19	0.51	0.19	53.0
2	R2	All MCs	80	0.0	80	0.0	0.261	8.1	LOS A	1.9	13.3	0.19	0.51	0.19	48.8
3	U	All MCs	6	0.0	6	0.0	0.261	9.8	LOS A	1.9	13.3	0.19	0.51	0.19	52.4
Approach			342	2.2	342	2.2	0.261	5.5	LOS A	1.9	13.3	0.19	0.51	0.19	52.3
West: Armrick Avenue (W)															
7	L2	All MCs	51	4.0	51	4.0	0.095	6.7	LOS A	0.5	3.7	0.49	0.62	0.49	47.3
8	R1	All MCs	26	0.0	26	0.0	0.095	9.2	LOS A	0.5	3.7	0.49	0.62	0.49	47.0
9	U	All MCs	3	0.0	3	0.0	0.095	11.6	LOS B	0.5	3.7	0.49	0.62	0.49	24.1
Approach			80	2.5	80	2.5	0.095	7.7	LOS A	0.5	3.7	0.49	0.62	0.49	46.4
All Vehicles			703	2.1	703	2.1	0.261	6.6	LOS A	1.9	13.3	0.27	0.55	0.27	51.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-5] AM Base 2037 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	27	5.0	27	5.0	0.348	4.9	LOS A	2.5	18.2	0.29	0.58	0.29	47.4
5	R1	All MCs	398	3.0	398	3.0	0.348	7.7	LOS A	2.5	18.2	0.29	0.58	0.29	50.8
6	U	All MCs	17	0.0	17	0.0	0.348	10.1	LOS B	2.5	18.2	0.29	0.58	0.29	50.9
Approach			442	3.0	442	3.0	0.348	7.6	LOS A	2.5	18.2	0.29	0.58	0.29	50.6
North: Old Burleigh (N)															
1	L1	All MCs	251	4.0	251	4.0	0.254	4.7	LOS A	1.7	12.5	0.22	0.50	0.22	53.0
2	R2	All MCs	53	3.0	53	3.0	0.254	8.3	LOS A	1.7	12.5	0.22	0.50	0.22	48.6
3	U	All MCs	11	13.0	11	13.0	0.254	10.1	LOS B	1.7	12.5	0.22	0.50	0.22	51.8
Approach			314	4.1	314	4.1	0.254	5.5	LOS A	1.7	12.5	0.22	0.50	0.22	52.4
West: Armrick Avenue (W)															
7	L2	All MCs	31	9.0	31	9.0	0.083	8.3	LOS A	0.4	3.4	0.60	0.69	0.60	45.4
8	R1	All MCs	23	12.0	23	12.0	0.083	11.0	LOS B	0.4	3.4	0.60	0.69	0.60	44.8
9	U	All MCs	1	100.0	1	100.0	0.083	17.0	LOS B	0.4	3.4	0.60	0.69	0.60	20.7
Approach			55	12.0	55	12.0	0.083	9.6	LOS A	0.4	3.4	0.60	0.69	0.60	44.7
All Vehicles			811	4.1	811	4.1	0.348	6.9	LOS A	2.5	18.2	0.29	0.55	0.29	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-6] PM Base 2037 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	35	0.0	35	0.0	0.310	5.2	LOS A	2.1	14.9	0.38	0.58	0.38	47.6
5	R1	All MCs	321	2.0	321	2.0	0.310	8.1	LOS A	2.1	14.9	0.38	0.58	0.38	50.7
6	U	All MCs	1	0.0	1	0.0	0.310	10.5	LOS B	2.1	14.9	0.38	0.58	0.38	50.8
Approach			357	1.8	357	1.8	0.310	7.8	LOS A	2.1	14.9	0.38	0.58	0.38	50.5
North: Old Burleigh (N)															
1	L1	All MCs	325	3.0	325	3.0	0.335	4.6	LOS A	2.6	18.9	0.23	0.51	0.23	52.9
2	R2	All MCs	101	0.0	101	0.0	0.335	8.2	LOS A	2.6	18.9	0.23	0.51	0.23	48.6
3	U	All MCs	8	0.0	8	0.0	0.335	9.8	LOS A	2.6	18.9	0.23	0.51	0.23	52.2
Approach			435	2.2	435	2.2	0.335	5.6	LOS A	2.6	18.9	0.23	0.51	0.23	52.1
West: Armrick Avenue (W)															
7	L2	All MCs	64	4.0	64	4.0	0.131	7.4	LOS A	0.7	5.2	0.56	0.65	0.56	46.6
8	R1	All MCs	33	0.0	33	0.0	0.131	9.8	LOS A	0.7	5.2	0.56	0.65	0.56	46.4
9	U	All MCs	4	0.0	4	0.0	0.131	12.3	LOS B	0.7	5.2	0.56	0.65	0.56	23.7
Approach			101	2.5	101	2.5	0.131	8.4	LOS A	0.7	5.2	0.56	0.65	0.56	45.8
All Vehicles			893	2.1	893	2.1	0.335	6.8	LOS A	2.6	18.9	0.33	0.55	0.33	50.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-7] AM Design 2027 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	23	5.0	23	5.0	0.278	4.8	LOS A	1.9	13.3	0.26	0.58	0.26	47.6
5	R1	All MCs	315	3.0	315	3.0	0.278	7.6	LOS A	1.9	13.3	0.26	0.58	0.26	50.8
6	U	All MCs	13	0.0	13	0.0	0.278	10.0	LOS B	1.9	13.3	0.26	0.58	0.26	51.0
Approach			351	3.0	351	3.0	0.278	7.5	LOS A	1.9	13.3	0.26	0.58	0.26	50.7
North: Old Burleigh (N)															
1	L1	All MCs	201	4.0	201	4.0	0.210	4.6	LOS A	1.4	9.9	0.20	0.51	0.20	53.0
2	R2	All MCs	52	3.0	52	3.0	0.210	8.2	LOS A	1.4	9.9	0.20	0.51	0.20	48.6
3	U	All MCs	8	13.0	8	13.0	0.210	10.0	LOS B	1.4	9.9	0.20	0.51	0.20	51.8
Approach			261	4.1	261	4.1	0.210	5.5	LOS A	1.4	9.9	0.20	0.51	0.20	52.3
West: Armrick Avenue (W)															
7	L2	All MCs	33	9.0	33	9.0	0.076	7.5	LOS A	0.4	3.1	0.55	0.65	0.55	46.2
8	R1	All MCs	22	12.0	22	12.0	0.076	10.1	LOS B	0.4	3.1	0.55	0.65	0.55	45.6
9	U	All MCs	1	100.0	1	100.0	0.076	15.4	LOS B	0.4	3.1	0.55	0.65	0.55	21.2
Approach			56	11.9	56	11.9	0.076	8.7	LOS A	0.4	3.1	0.55	0.65	0.55	45.6
All Vehicles			667	4.2	667	4.2	0.278	6.8	LOS A	1.9	13.3	0.26	0.56	0.26	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-8] PM Design 2027 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	29	0.0	29	0.0	0.243	5.0	LOS A	1.5	10.9	0.32	0.58	0.32	47.8
5	R1	All MCs	255	2.0	255	2.0	0.243	7.8	LOS A	1.5	10.9	0.32	0.58	0.32	50.9
6	U	All MCs	1	0.0	1	0.0	0.243	10.2	LOS B	1.5	10.9	0.32	0.58	0.32	51.0
Approach			285	1.8	285	1.8	0.243	7.5	LOS A	1.5	10.9	0.32	0.58	0.32	50.7
North: Old Burleigh (N)															
1	L1	All MCs	257	3.0	257	3.0	0.266	4.6	LOS A	1.9	13.7	0.19	0.51	0.19	53.0
2	R2	All MCs	84	0.0	84	0.0	0.266	8.1	LOS A	1.9	13.7	0.19	0.51	0.19	48.7
3	U	All MCs	6	0.0	6	0.0	0.266	9.8	LOS A	1.9	13.7	0.19	0.51	0.19	52.3
Approach			347	2.2	347	2.2	0.266	5.5	LOS A	1.9	13.7	0.19	0.51	0.19	52.2
West: Armrick Avenue (W)															
7	L2	All MCs	60	4.0	60	4.0	0.108	6.8	LOS A	0.6	4.2	0.50	0.62	0.50	47.3
8	R1	All MCs	27	0.0	27	0.0	0.108	9.2	LOS A	0.6	4.2	0.50	0.62	0.50	47.1
9	U	All MCs	3	0.0	3	0.0	0.108	11.6	LOS B	0.6	4.2	0.50	0.62	0.50	24.1
Approach			91	2.7	91	2.7	0.108	7.7	LOS A	0.6	4.2	0.50	0.62	0.50	46.6
All Vehicles			723	2.1	723	2.1	0.266	6.6	LOS A	1.9	13.7	0.28	0.55	0.28	51.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-9] AM Design 2037 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	29	5.0	29	5.0	0.359	5.0	LOS A	2.6	18.9	0.32	0.58	0.32	47.3
5	R1	All MCs	400	3.0	400	3.0	0.359	7.8	LOS A	2.6	18.9	0.32	0.58	0.32	50.7
6	U	All MCs	17	0.0	17	0.0	0.359	10.2	LOS B	2.6	18.9	0.32	0.58	0.32	50.8
Approach			446	3.0	446	3.0	0.359	7.7	LOS A	2.6	18.9	0.32	0.58	0.32	50.5
North: Old Burleigh (N)															
1	L1	All MCs	255	4.0	255	4.0	0.268	4.7	LOS A	1.9	13.5	0.24	0.51	0.24	52.9
2	R2	All MCs	63	3.0	63	3.0	0.268	8.3	LOS A	1.9	13.5	0.24	0.51	0.24	48.5
3	U	All MCs	11	13.0	11	13.0	0.268	10.1	LOS B	1.9	13.5	0.24	0.51	0.24	51.7
Approach			328	4.1	328	4.1	0.268	5.6	LOS A	1.9	13.5	0.24	0.51	0.24	52.2
West: Armrick Avenue (W)															
7	L2	All MCs	39	9.0	39	9.0	0.102	8.4	LOS A	0.5	4.2	0.61	0.69	0.61	45.4
8	R1	All MCs	27	12.0	27	12.0	0.102	11.1	LOS B	0.5	4.2	0.61	0.69	0.61	44.7
9	U	All MCs	1	100.0	1	100.0	0.102	17.2	LOS B	0.5	4.2	0.61	0.69	0.61	20.7
Approach			67	11.6	67	11.6	0.102	9.6	LOS A	0.5	4.2	0.61	0.69	0.61	44.8
All Vehicles			842	4.1	842	4.1	0.359	7.0	LOS A	2.6	18.9	0.31	0.56	0.31	50.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: [2-10] PM Design 2037 (2. Old Burleigh / Armrick Avenue)
Output produced by SIDRA INTERSECTION Version: 10.0.6.236

Am Base 2026
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed km/h
SouthEast: Armrick Avenue (SE)															
4	L1	All MCs	37	0.0	37	0.0	0.316	5.3	LOS A	2.2	15.3	0.39	0.58	0.39	47.6
5	R1	All MCs	323	2.0	323	2.0	0.316	8.1	LOS A	2.2	15.3	0.39	0.58	0.39	50.7
6	U	All MCs	1	0.0	1	0.0	0.316	10.5	LOS B	2.2	15.3	0.39	0.58	0.39	50.8
Approach			361	1.8	361	1.8	0.316	7.8	LOS A	2.2	15.3	0.39	0.58	0.39	50.5
North: Old Burleigh (N)															
1	L1	All MCs	326	3.0	326	3.0	0.340	4.6	LOS A	2.7	19.3	0.24	0.51	0.24	52.9
2	R2	All MCs	106	0.0	106	0.0	0.340	8.2	LOS A	2.7	19.3	0.24	0.51	0.24	48.5
3	U	All MCs	8	0.0	8	0.0	0.340	9.9	LOS A	2.7	19.3	0.24	0.51	0.24	52.2
Approach			441	2.2	441	2.2	0.340	5.6	LOS A	2.7	19.3	0.24	0.51	0.24	52.1
West: Armrick Avenue (W)															
7	L2	All MCs	74	4.0	74	4.0	0.145	7.5	LOS A	0.8	5.8	0.57	0.65	0.57	46.6
8	R1	All MCs	34	0.0	34	0.0	0.145	9.9	LOS A	0.8	5.8	0.57	0.65	0.57	46.4
9	U	All MCs	4	0.0	4	0.0	0.145	12.3	LOS B	0.8	5.8	0.57	0.65	0.57	23.7
Approach			112	2.6	112	2.6	0.145	8.4	LOS A	0.8	5.8	0.57	0.65	0.57	45.9
All Vehicles			914	2.1	914	2.1	0.340	6.8	LOS A	2.7	19.3	0.34	0.55	0.34	50.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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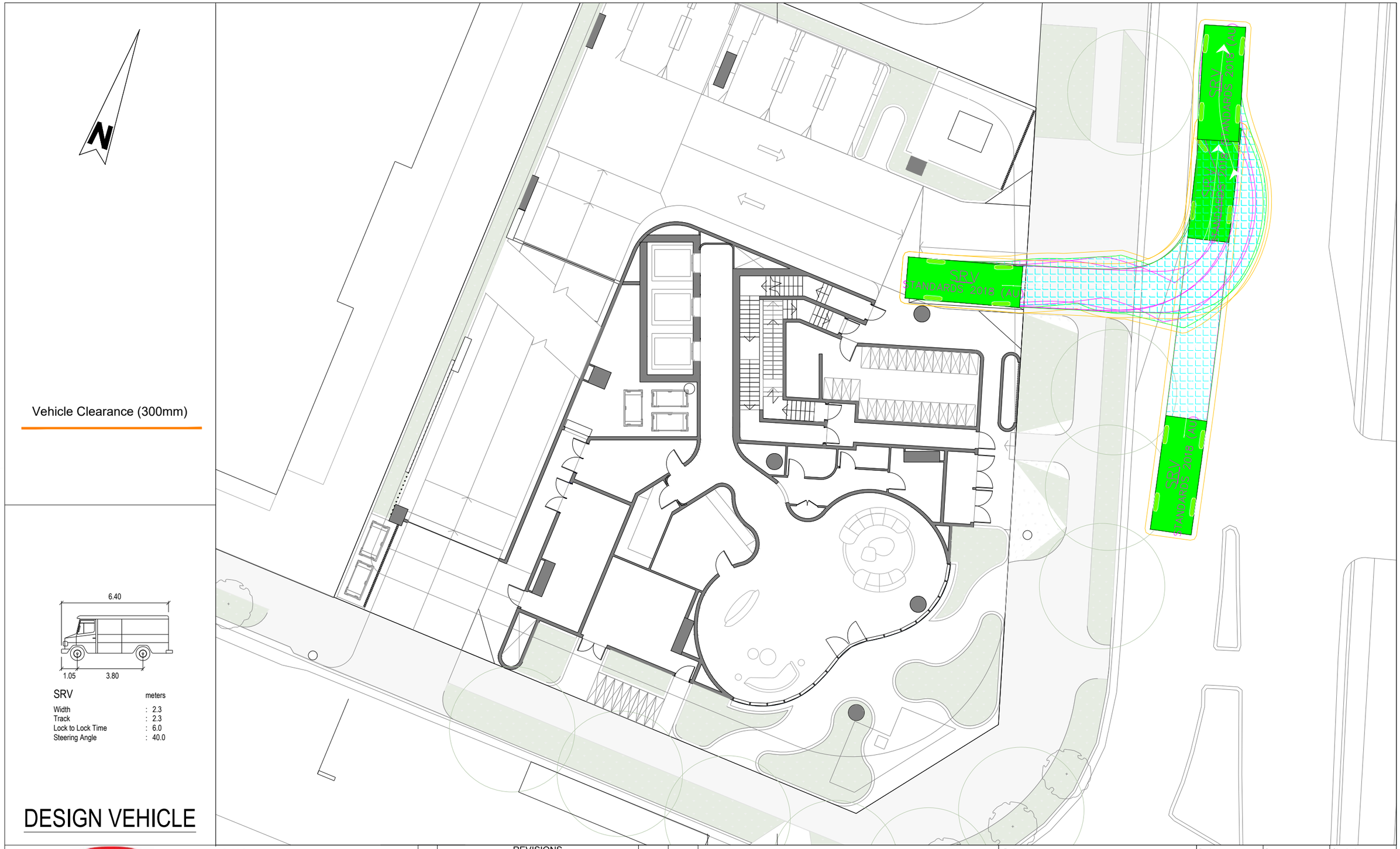
Appendix E

Swept Path Assessment



Vehicle Clearance (300mm)

SRV	meters
Width	: 2.3
Track	: 2.3
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project: 101 Old Burleigh Road Broadbeach TIA

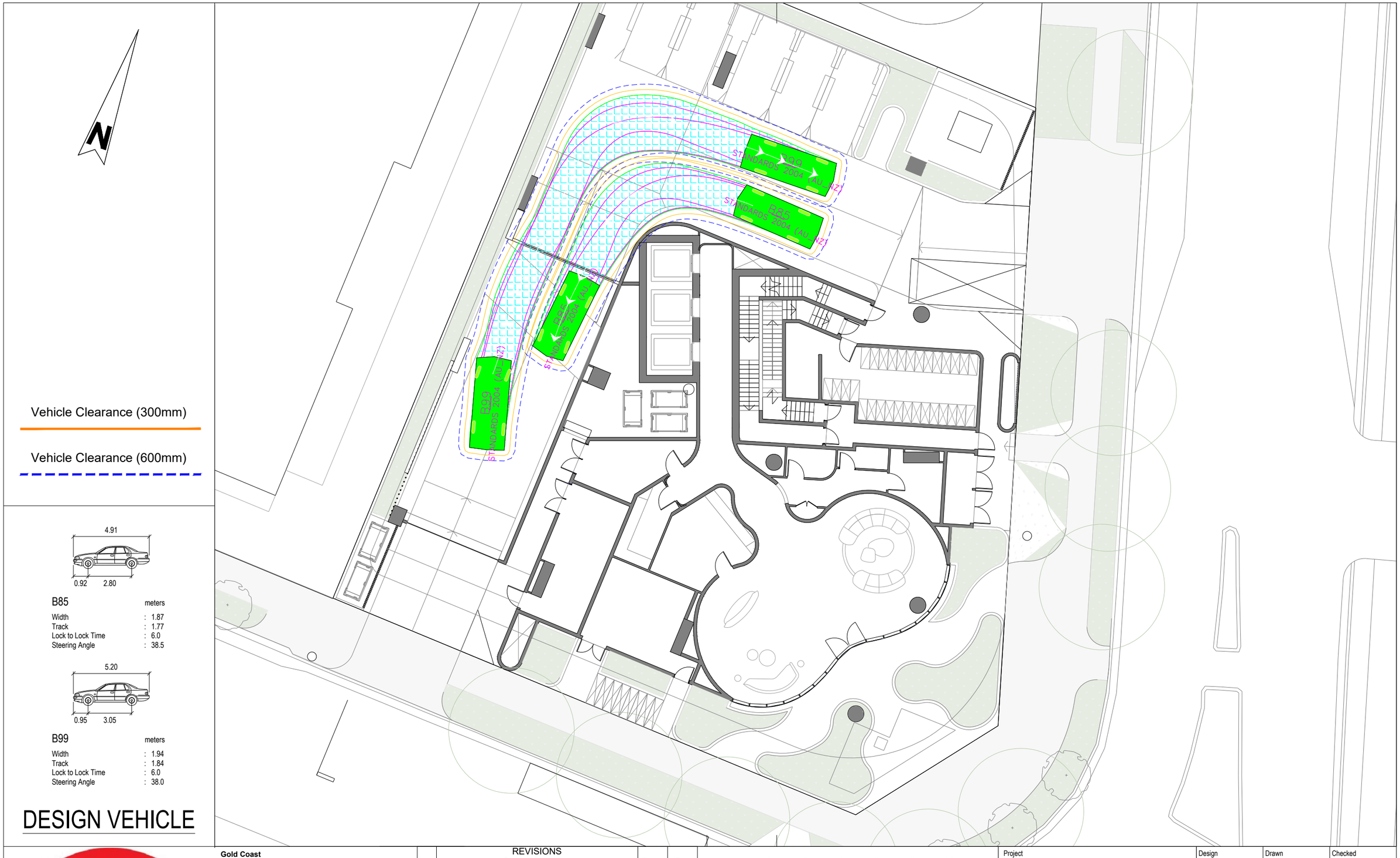
Title: Ground Floor SRV IN and OUT

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

Date: 15.05.2026

Project Number	Sheet Number	Issue
P7399	1	001



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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 — 0 2 4 6 8 10 — 1:200

Project: 101 Old Burleigh Road Broadbeach TIA

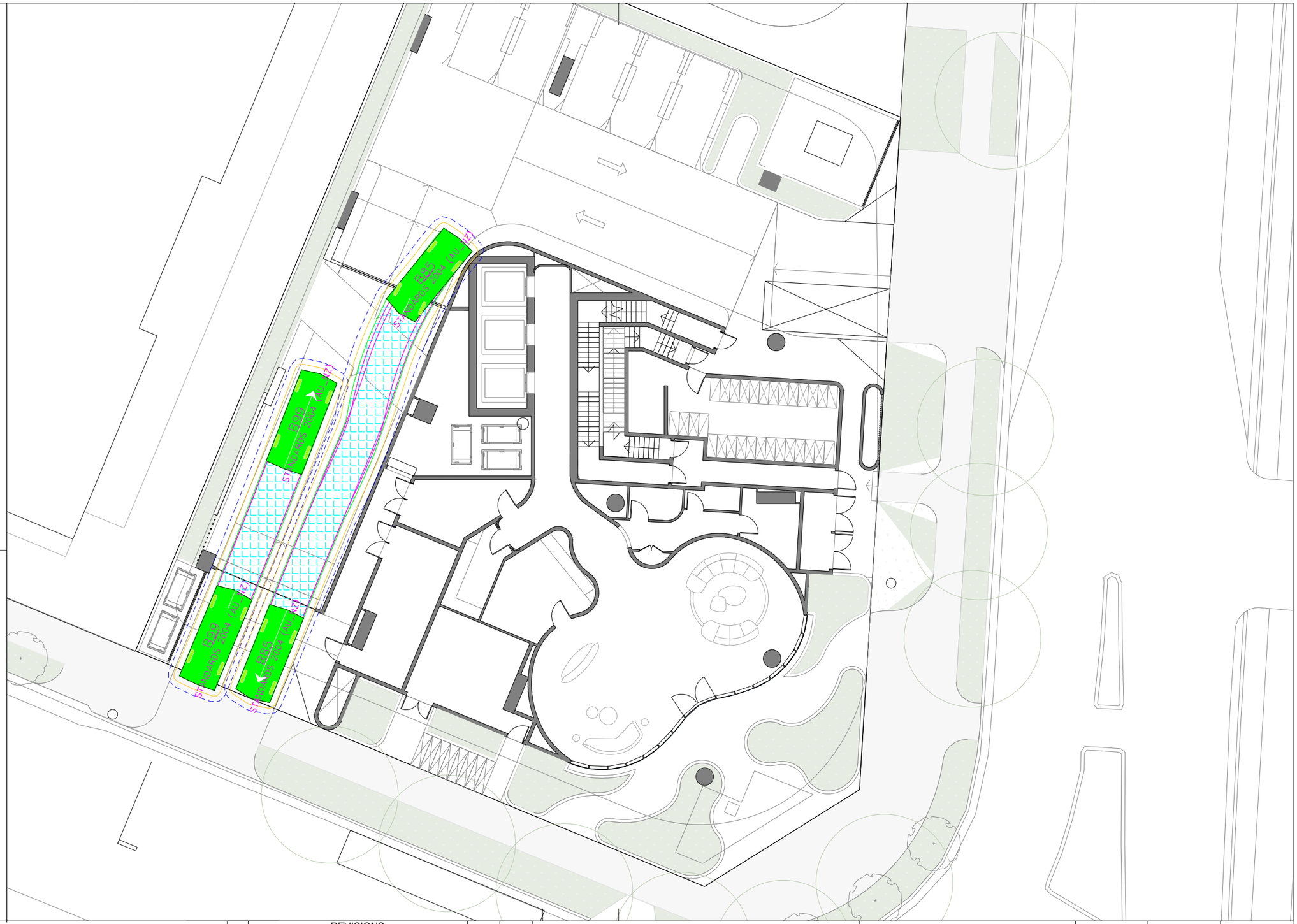
Title: B99 and B85 Basement Passing

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

Date: 15.05.2026

Project Number	Sheet Number	Issue
P7399	2	001



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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project: 101 Old Burleigh Road Broadbeach TIA

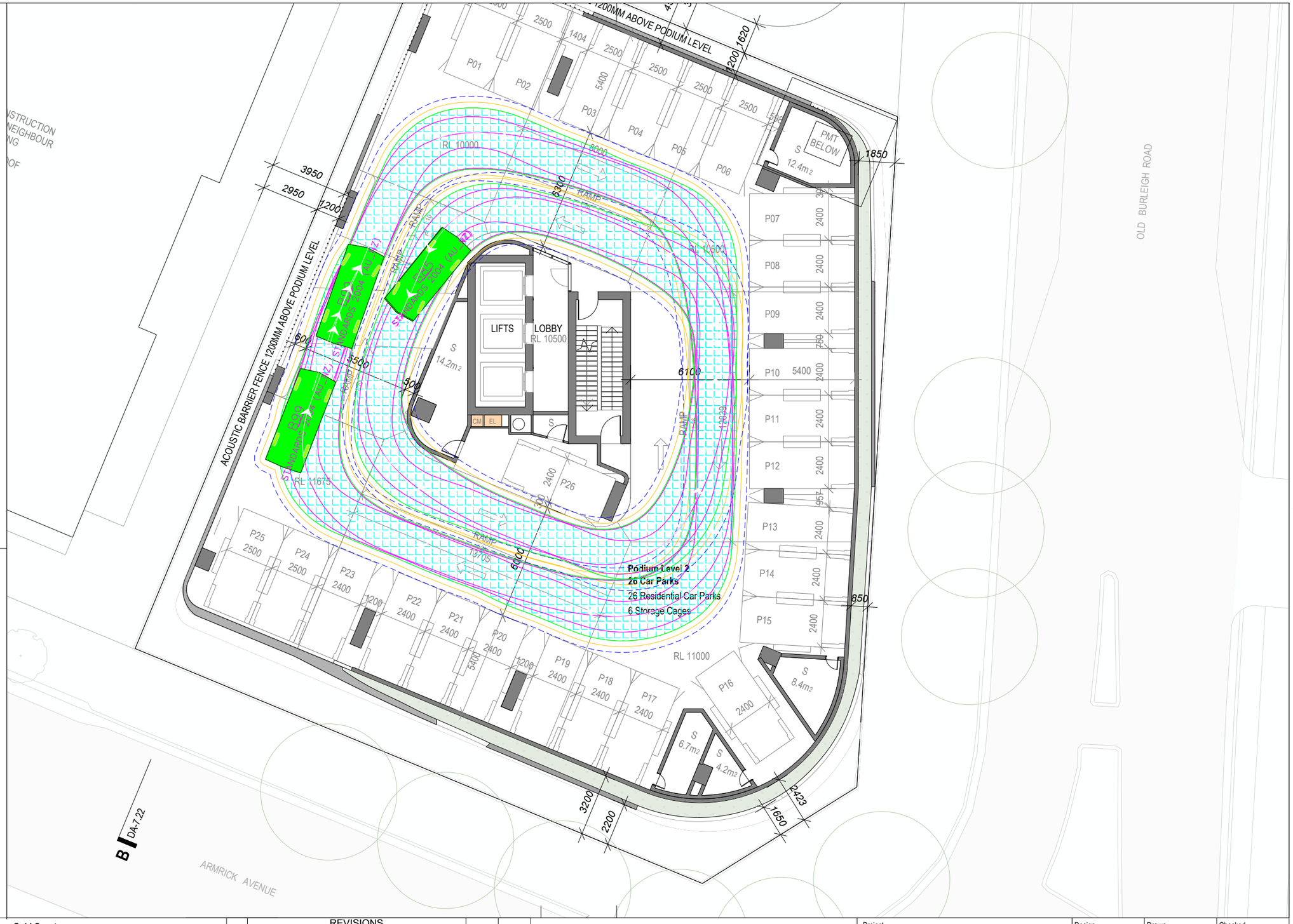
Title: B99 and B85 Podium Passing

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

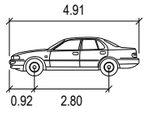
Date: 15.05.2026

Project Number	Sheet Number	Issue
P7399	3	001



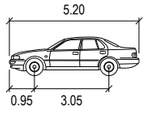
Vehicle Clearance (300mm)

Vehicle Clearance (600mm)



B85 meters

Width	:	1.87
Track	:	1.77
Lock to Lock Time	:	6.0
Steering Angle	:	38.5



B99 meters

Width	:	1.94
Track	:	1.84
Lock to Lock Time	:	6.0
Steering Angle	:	38.0

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REVISIONS

Issue	Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project: 101 Old Burleigh Road Broadbeach TIA

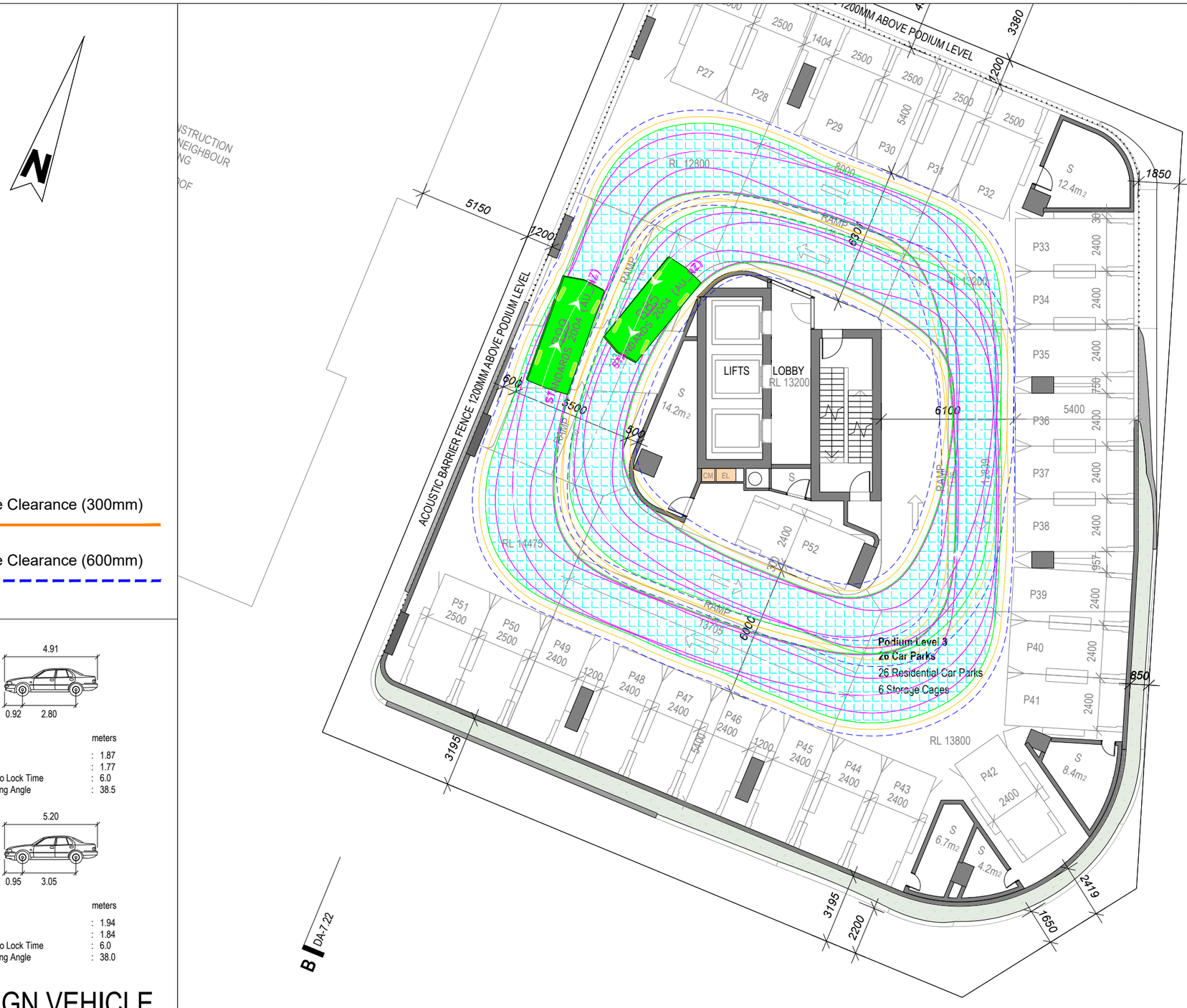
Title: B99 and B85 Podium 2 Passing

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

Date: 15.05.2026

Project Number	Sheet Number	Issue
P7399	4	001



Vehicle Clearance (300mm)

Vehicle Clearance (600mm)

B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 38.5

B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 38.0

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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project: 101 Old Burleigh Road Broadbeach TIA

Title: B99 and B85 Podium3 Passing

Design	Drawn	Checked
A.S	A.S	A.S

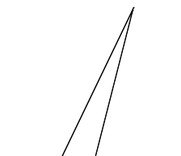
CONCEPT ONLY

Date: 15.05.2026

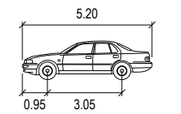
Project Number	Sheet Number	Issue
P7399	5	001

Vehicle Clearance (300mm)

Vehicle Clearance (600mm)

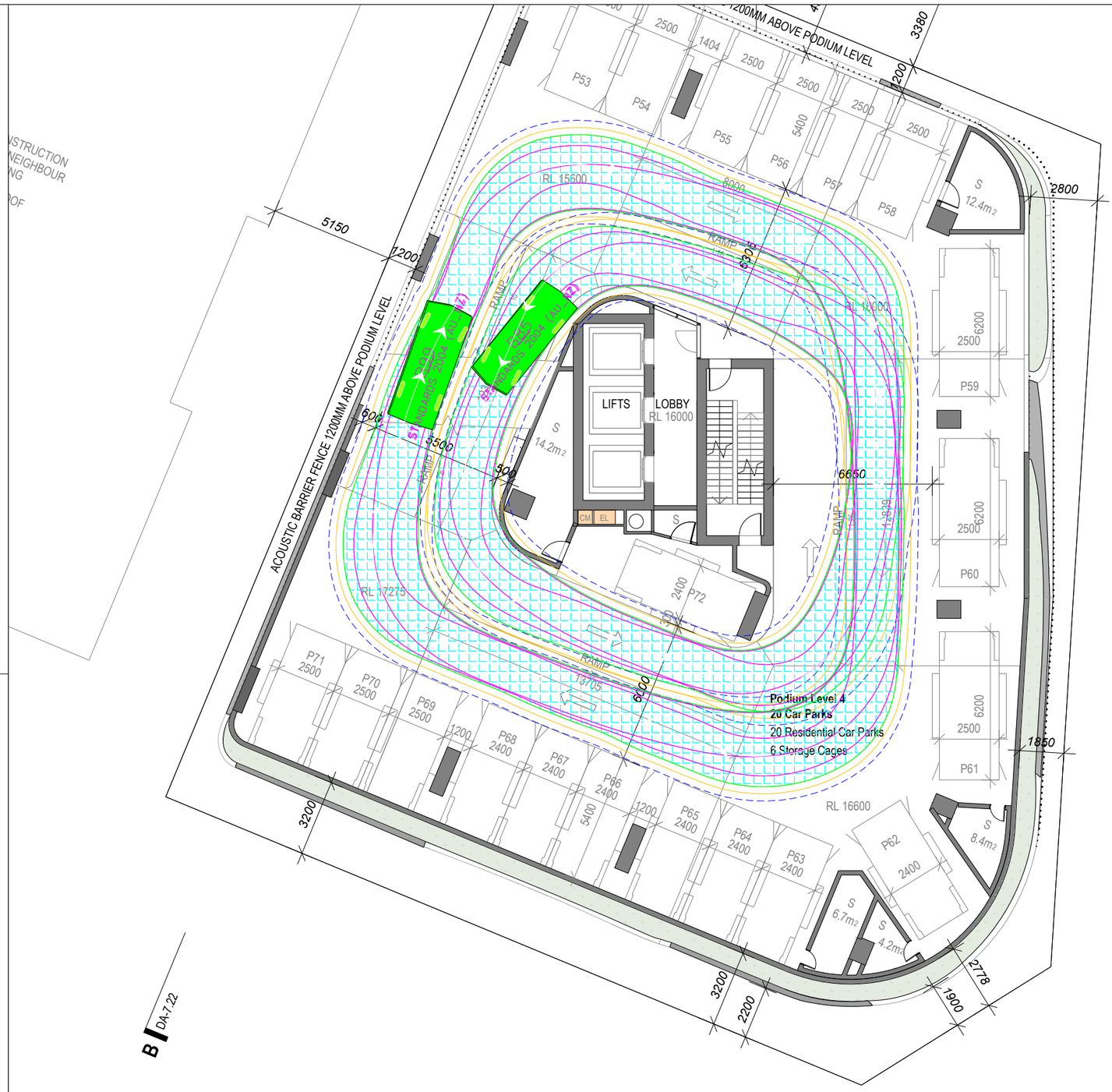


B85	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 38.5



B99	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 38.0

DESIGN VEHICLE



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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project	Design	Drawn	Checked
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	CONCEPT ONLY		Date 15.05.2026
Title: B99 and B85 Podium 4 Passing	Project Number P7399	Sheet Number 6	Issue 001

Vehicle Clearance (300mm)

Vehicle Clearance (600mm)

B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 38.5

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 38.0

DESIGN VEHICLE

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Issue	Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project: 101 Old Burleigh Road Broadbeach TIA

Title: B99 and B85 Podium 5 Passing

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

Date: 15.05.2026

Project Number	Sheet Number	Issue
P7399	7	001

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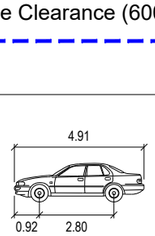
Vehicle Clearance (600mm)



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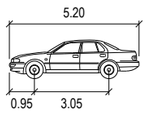

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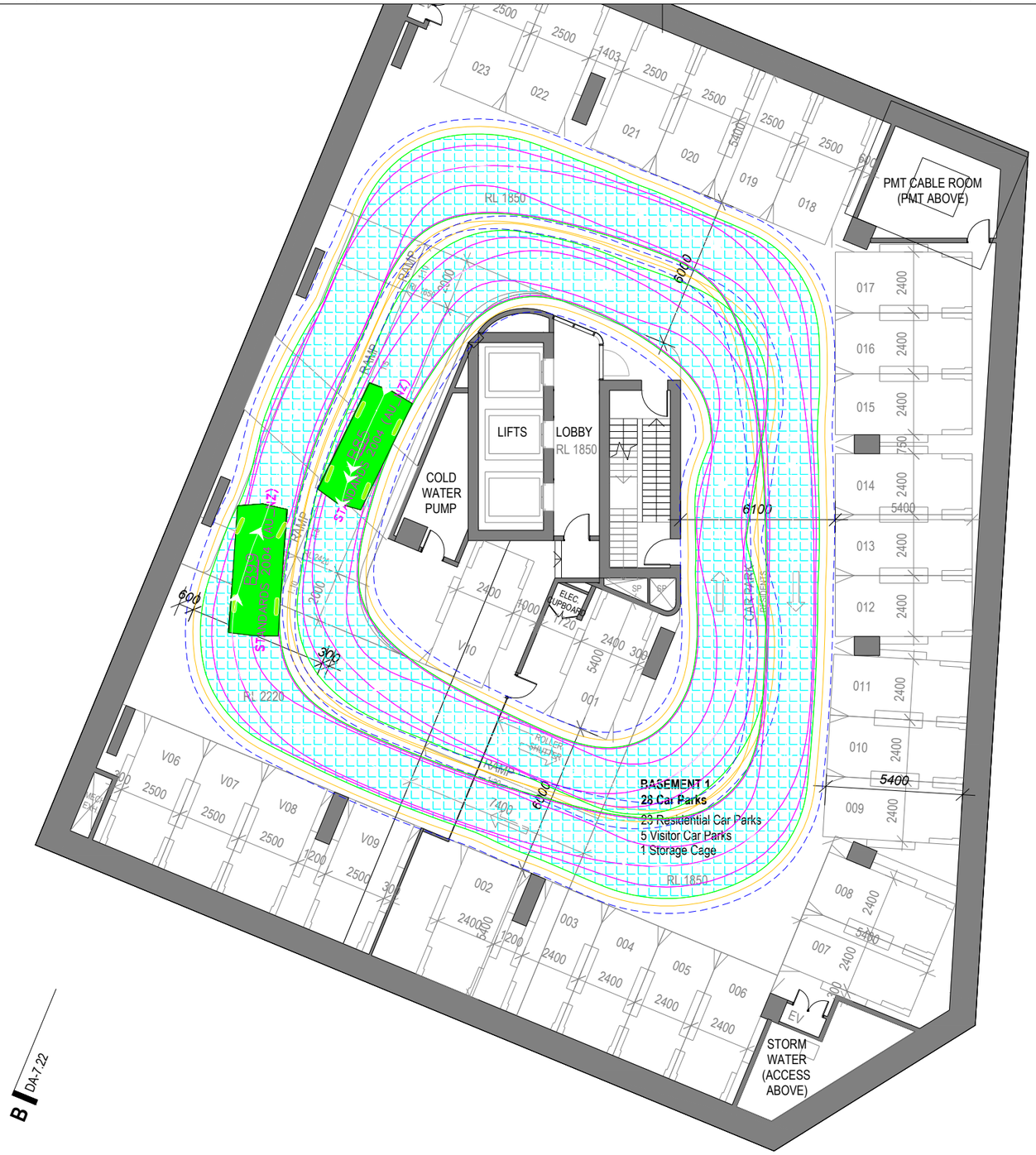

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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project: 101 Old Burleigh Road Broadbeach TIA

Title: B99 and B85 Basement 1 Passing

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

Date: 15.05.2026

Project Number	Sheet Number	Issue
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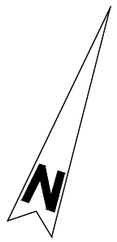

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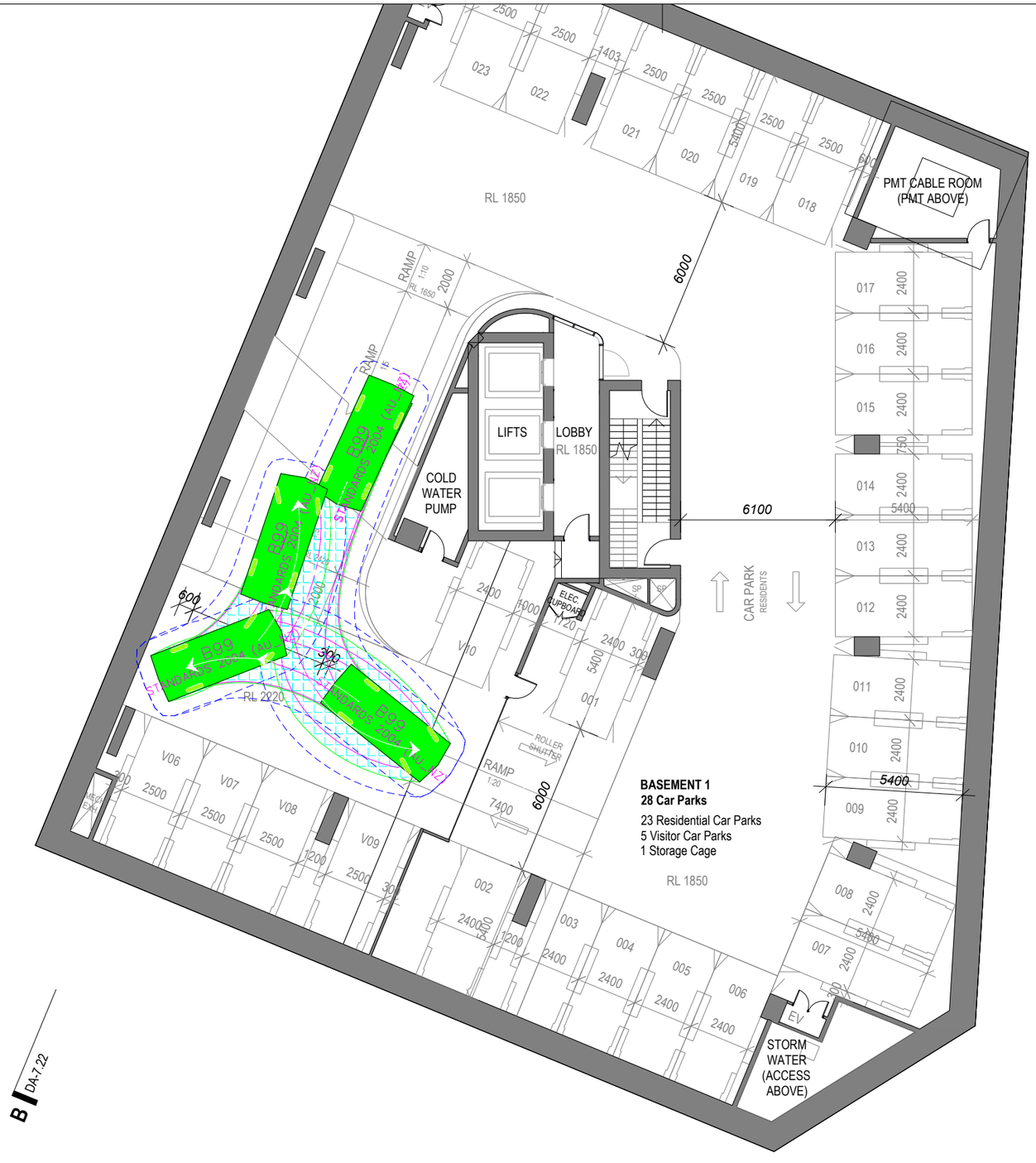

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001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project	Design	Drawn	Checked
101 Old Burleigh Road Broadbeach TIA	A.S	A.S	A.S
	CONCEPT ONLY		Date 15.05.2026
Title: B99 Basement 1 Turnaround	Project Number P7399	Sheet Number 9	Issue 001

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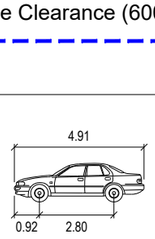

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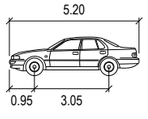

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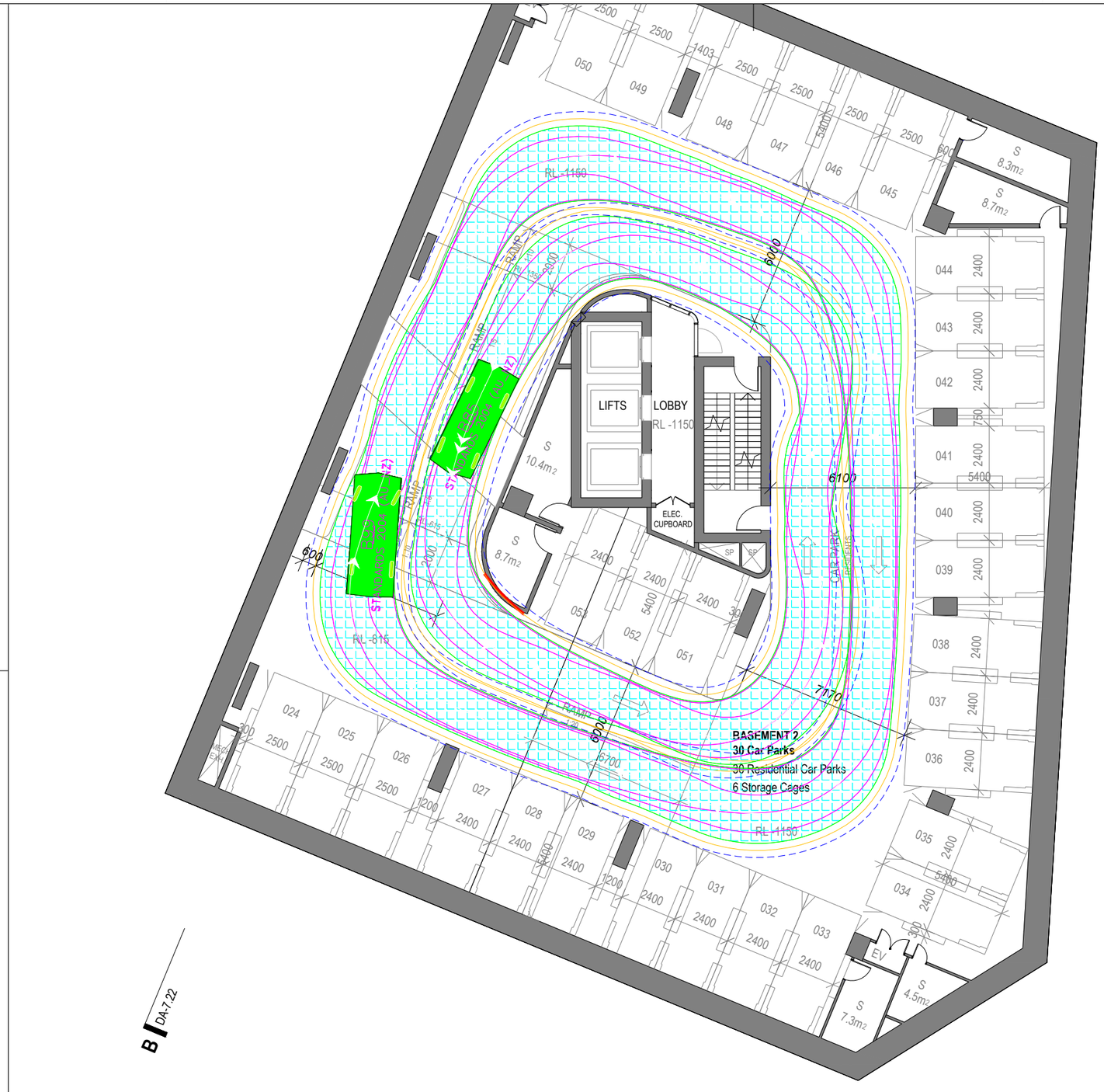

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001	Swept Paths	A.S	15.05.2026

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Project: 101 Old Burleigh Road Broadbeach TIA

Title: B99 and B85 Basement 2 Passing

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

Date: 15.05.2026

Project Number	Sheet Number	Issue
P7399	10	001

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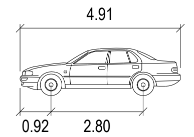

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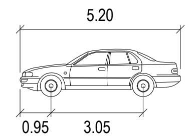

B99 meters

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Lock to Lock Time	:	6.0
Steering Angle	:	38.0

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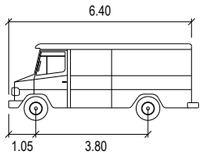
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 1:200

Project	101 Old Burleigh Road Broadbeach TIA
Title	B99 and B85 Basement 3 Passing
Design	A.S
Drawn	A.S
Checked	A.S
	CONCEPT ONLY
Date	15.05.2026
Project Number	P7399
Sheet Number	11
Issue	001



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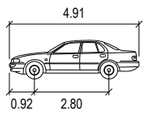

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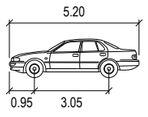

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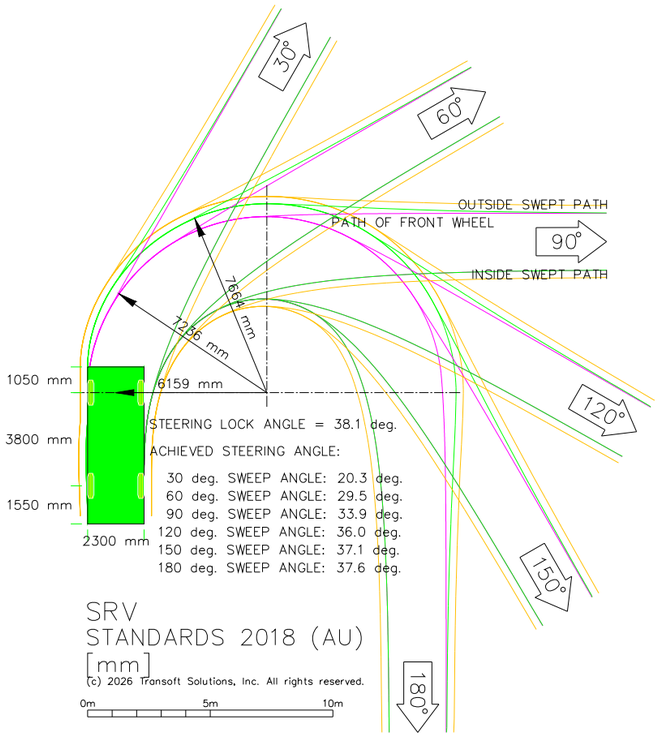

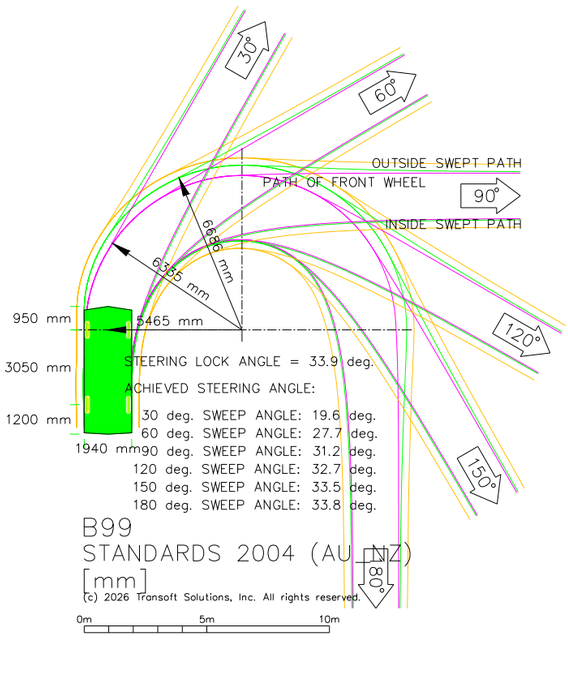

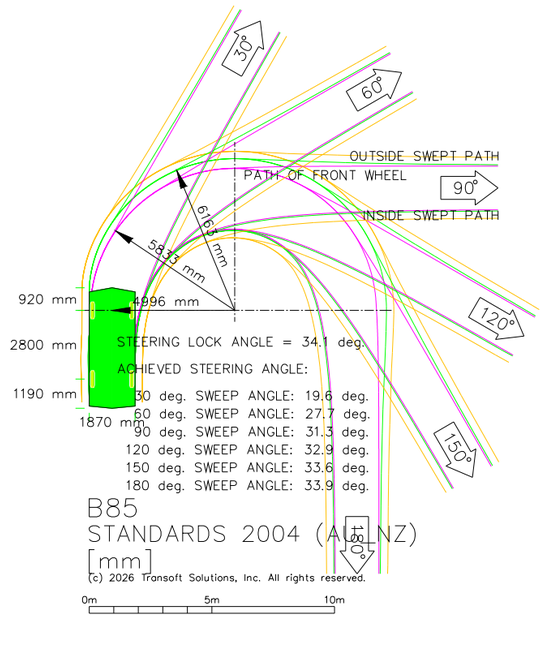

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Issue	REVISIONS Revisions/Descriptions	Drawn	Date
001	Swept Paths	A.S	15.05.2026

Scale @ A3 0 2 4 6 8 10 12 1:250

Project: 101 Old Burleigh Road Broadbeach TIA

Title: Turning Templates

Design	Drawn	Checked
A.S	A.S	A.S

CONCEPT ONLY

Date: 15.05.2026

Project Number	Sheet Number	Issue
P7399	12	001

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Section 4 - SPECIALIST REPORTS

Waste Management Plan
Prepared by Modus

Zone Planning Group

MODUS
Transport & Traffic Engineering

Operational Waste Management Plan

Project:

99-101 Old Burleigh Road Broadbeach

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Document Information

Prepared for Sunland Group	**Job Reference** MOD25581QLD – OWMP
Project: 99-101 Old Burleigh Road Broadbeach	

Document Control

Version	Date	Description of Revision	Prepared by	Reviewed By
A	29/04/26	DRAFT for review and comments	Y.S/A.S	A.S
B	14/05/26	Final	A.S	A.S

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Table of Contents

Definitions			- 5 -
1	Introduction		- 6 -
	1.1	Overview	- 6 -
	1.2	References	- 6 -
	1.3	Limitations	- 6 -
2	Existing Conditions		- 7 -
	2.1	Site Location	- 7 -
	2.2	Existing Development and Refuse Arrangements	- 7 -
3	Proposed Development		- 8 -
4	Refuse Generation		- 9 -
	4.1	Refuse Calculations	- 9 -
	4.2	Bin Numbers	- 9 -
	4.3	Equipment	- 10 -
	4.4	Additional Equipment	- 10 -
5	Refuse Arrangements		- 11 -
	5.1	Refuse Disposal	- 11 -
	5.2	Refuse Storage	- 12 -
	5.3	Refuse Transfer	- 13 -
	5.4	Servicing Arrangements	- 14 -
	5.5	Operational Management	- 14 -
6	Refuse Minimisation		- 15 -
	6.1	Equipment	- 15 -
	6.2	Signage	- 16 -
7	Summary		- 17 -
APPENDIX A – Solid Waste Management Code			- 18 -
APPENDIX B - Development Plans			- 21 -
APPENDIX C – Proposed Refuse Streams			- 24 -
APPENDIX D – Refuse Room Design Requirements			- 26 -
APPENDIX E - Servicing Requirements			- 29 -
APPENDIX F – Operational Management			- 31 -
APPENDIX G – Equipment / Systems Manufacturers and Suppliers			- 34 -
APPENDIX H – Example Signage			- 36 -

Tables

Table 3-1 Development Summary ..... - 8 -
Table 4-1 Refuse Calculations ..... - 9 -
Table 4-2 Bin Requirements ..... - 9 -
Table 4-3 Refuse Bins ..... - 10 -
Table 5-1 Refuse Disposal Process ..... - 11 -
Table 6-1 Refuse Minimisation Equipment ..... - 15 -
Table 6-2 Refuse Management Equipment ..... - 16 -

Figures

Figure 2-1 Site Location ..... - 7 -
Figure 3-1 Proposed Development ..... - 8 -
Figure 5-1 Refuse Storage Room ..... - 12 -
Figure 5-2 Refuse Servicing Room ..... - 13 -

Definitions

In this OWMP, a term has the following meaning unless otherwise specified and is shown below.

Term	Description
Bin carting / transfer route	The proposed route to move bins between the refuse room (storage point) and the servicing point.
Bin (bulk / wheelie)	A container (steel or plastic) use for disposal and storage of refuse items. Bins come in various types and sizes from MGB's to up 360L and bulk from 660L to 4500L.
Collection / Servicing point	The designated area allocated to the temporary storage of waste bins for the period of servicing only. The point may be within or external to a development.
Composter	A container or machine used for composting specific organic material.
General waste	Waste, other than domestic clean-up waste, green waste, recyclable waste, interceptor waste or waste discharged to a sewer, produced as a result of the ordinary use or occupation of domestic or commercial premises.
Hazardous waste	Solid waste that is or contains toxic material, for example light bulbs, fluorescence lights, batteries.
Mobile Garbage Bin (MGB)	A plastic bin used for the storage and collection of refuse that is up to 360L in capacity. MGB's are typically used for kerbside collection for residential dwellings and on-site collection for commercial development.
Organic Waste	Waste that comes from plants or animals that is biodegradable for example green waste and food waste.
Recycling	All material suitable for re-manufacture or re-use, e.g. glass bottles and jars; plastics such as PET, HDPE and PVC; aluminium aerosol and steel cans and lids; milk and juice cartons; soft drink, milk and shampoo containers; paper, cardboard, junk mail, newspapers and magazines.
Refuse	Refuse is material generated and discarded from residential and commercial buildings including general waste, recyclables, green waste and bulky items.
Refuse Chute	Refuse disposal in multi-storey buildings through refuse chutes, which typically includes access at all floors and discharging in bulk bins in ground floor or basement refuse room. Examples include single chute for waste only, or single chute with diverter system or dual chute for disposal of waste and recycling.
Refuse Room / Storage point	The area allocated to the permanent storage of waste bins. This is the normal location of the waste bins and excludes the period when the bin is serviced. A storage point may be a common storage point or an individual bin storage point.
Waste Collection Vehicle (WCV)	A vehicle specifically designed for collecting and emptying refuse bins and refuse compactors.
Front-Loading WCV	A truck specially designed to collect refuse (typically 1500L bins), from a front loading mechanism and haul the collected waste to a solid waste treatment facility.
Transfer	Manual transfer means physical transfer of refuse material and associated bulk bins or trolleys without assistance.

1 Introduction

1.1 Overview

Modus has been engaged by Sunland Group to prepare an Operational Waste Management Plan (OWMP) in support of the proposed multiple dwelling development, located at 99-101 Old Burleigh Road Broadbeach.

This OWMP is to be used as a guide during the operational phase of the development and further requirements for demolition and/or construction phases will need a separate WMP. The OWMP is to satisfy the City of Gold Coast Council's (CoGC) requirements and detail the following information:

- Refuse (type and quantity) likely to be generated during the occupancy of the proposed site.
- Refuse collection arrangements, including disposal, storage and transfer for the site.
- Operational requirements, including equipment and systems, and design requirements.

1.2 References

For the purpose of this assessment, the following references have been utilised:

- Proposed development plans by Contreras Earl Architecture
- CoGC City Plan Policy – SC6.15 Solid waste management
- CoGC Other Development Codes – Part 9.4.12 Solid waste management code

The Solid waste management code has been completed in **Appendix A**.

1.3 Limitations

Modus has completed this OWMP in accordance with the usual care and thoroughness of the consulting profession. The assessment is based on accepted waste management practises and standards applicable at the time of undertaking the assessment. Modus disclaims responsibility for any changes to project planning or equipment requirements that may occur after completion of the assessment.

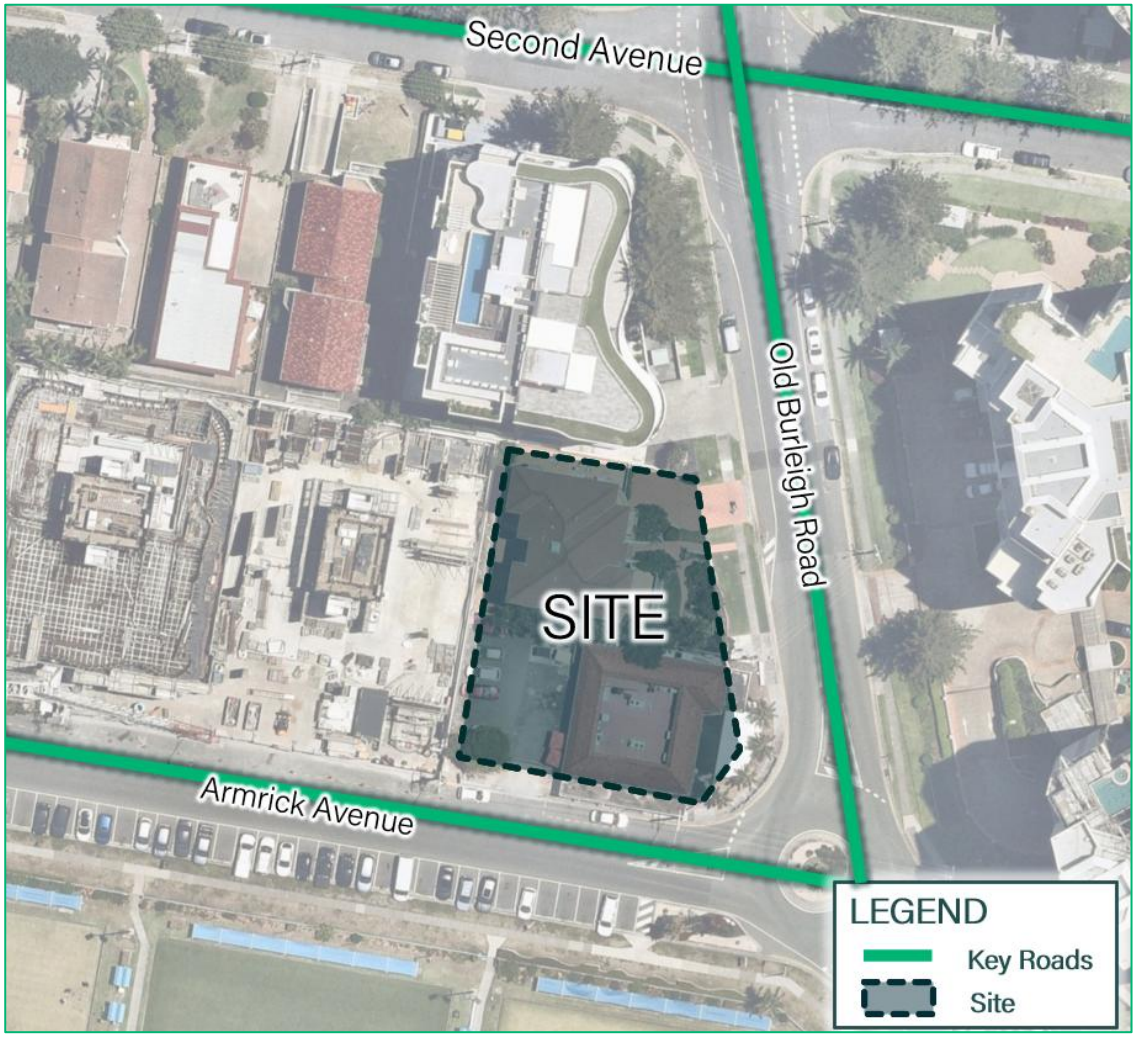
2 Existing Conditions

2.1 Site Location

The development site is located at 99-101 Old Burleigh Road Broadbeach and is immediately bound by Old Burleigh Road to the east, Armrick Avenue to the south and multiple dwelling developments to the north and west.

The site is identified as a High-Density Residential zone and is surrounded by similar zones in all directions with the exception of the sport and recreation zone to the south. The site location is shown in Figure 2-1.

Figure 2-1 Site Location



Source: NearMap

2.2 Existing Development and Refuse Arrangements

The site is currently occupied by an existing commercial (café and BWS) and multiple dwelling development. Currently bulk bins are provided on-site for a kerbside collection arrangement.

3 Proposed Development

The proposed development is a multi-dwelling comprising a high-rise residential building with 81 storeys. The development comprises of 2-, 3- and 4-bedroom units, with the proposed development yield outlined in Table 3-1.

Table 3-1 Development Summary

Dwellings	Proposed Yield (units)
2 bedroom	17
3 bedroom	55
4 bedroom	9
Total	81 units

The proposed site plan is illustrated on Figure 3-1. A copy of the development plans can be found in Appendix B.

Figure 3-1 Proposed Development

Source: Contreras Earl Architecture, Drawing no. DA-7.04, rev A, dated 13/05/26 – Ground Floor

4 Refuse Generation

4.1 Refuse Calculations

The anticipated refuse to be generated by the proposed development may consist of the streams outlined in **Appendix C**.

To assess the waste generation for the proposed site, Modus has applied the current CoGC generation rates, as outlined below in Table 4-1.

Table 4-1 Refuse Calculations

Use	General Waste (L/unit/week)	Commingled Recycling (L/unit/week)	Units	General Waste (L/Week)	Commingled Recycling (L/Week)
2 bedroom	100	60	17	1,700	1,020
3 bedroom	120	80	55	6,600	4,400
4 bedroom	120	80	9	1,080	720
Total	-	-	**81**	**9,380**	**6,140**

The refuse volumes may vary according to the operation of the development and each dwelling. As such, bin numbers and collection frequencies may need to be altered to suit the building operation once operational.

4.2 Bin Numbers

The required equipment for the development is based on the volumes calculated in Table 4-1 and the maximum collection frequency indicated in the Solid waste management code for residential developments. Additional waste management / minimisation equipment may vary depending on the operation of the development and each dwelling.

Table 4-2 shows the bin requirements (number & size) and area required to accommodate the bins.

Table 4-2 Bin Requirements

Description	Units	General Waste	Commingled Recycling
Total	81	9,380	6,140
Daily Volumes (L per day)		1,340	978
Collection Frequency (per week)		3	3
Collection Volumes (L per week)		3,127	2,047
Bin Size (L)		1500	2,000
No. Bins		2	1
Bin Area		4.3m^2	1.98m^2
Refuse Storage Room Area		20.9m^2	
Refuse Servicing Room Area		7.7m^2 (1.54m x 5m)	

4.3 Equipment

The refuse bins to be utilised for the proposed development is outlined below in Table 4-3.

Table 4-3 Refuse Bins

Type	Dimensions	Comments
20-80L	559 x 279 x 635mm (L x W x H)	For general waste and recycling Residents and tenant to supply and position in various locations. Several options and sizes available from numerous suppliers, depending on preference and space available.
1,500L	2040 x 1051 x 1340mm (L x W x H)	For general waste Generally supplied by Council prior to operation. Sizes may vary slightly depending on the contractor.
2,000L	2050 x 965 x 1310mm (L x W x H)	For recycling Generally supplied by Council prior to operation. Sizes may vary slightly depending on the contractor.

Depending on the operation of the development and/or attitude of building management and each dwelling, additional refuse minimisation equipment and procedures can be implemented. Refuse minimisation and recommendations are detailed in Section 6.

4.4 Additional Equipment

The proposed arrangements for additional refuse equipment to be utilised are outlined below.

- Due to the size of the development, refuse chutes are required. The development proposes a diverter chute (for waste and recycling), to terminate into the appropriate bins on the ground floor. A hopper will be located on each residential level for disposal.
- A horizontal discharge attachment to be fitted to the bottom of the chute to provide a manual cut off to moderate the flow under the chutes when bins are required to be serviced.
- Further detail on the proposed arrangements will be reviewed in the detail design stage with the nominated chute manufacturer.

5 Refuse Arrangements

5.1 Refuse Disposal

Further operational details for each stream are provided in Table 5-1.

Table 5-1 Refuse Disposal Process

Stream	Process
General Provisions (Waste and Recycling)	▸ Each dwelling will have at least one day worth of storage capacity for their refuse. ▸ Small bins / receptacles will be provided around various locations within each dwelling, typically under kitchen sinks, in pantries or bathrooms. ▸ As required, residents will dispose of their refuse to the appropriate receptacles / bins within their dwelling during the day. ▸ Residents will collect the refuse from their dwelling after each day of operation, or as required. The refuse material will be disposed of directly to the diverter chutes on each level. ▸ Building management will only have access to the refuse storage room and will be responsible for disposing of any communal refuse, subject to body corporate requirements.
General Waste	▸ Bins should always be lined with bags and tied before removal. ▸ Waste should not exceed 3kg in weight or the dimensions of the receptacles or the diverter chute. ▸ Waste bins should be accompanied by a commingled recycling bin.
Commingled Recycling	▸ Items for recycling must not be bagged and disposed of in loose form. ▸ Recycling waste should not exceed 3kg in weight or the dimensions of the receptacles or the diverter chute. ▸ Larger recycling items that cannot be disposed via the diverter are to be arranged with building management or be provided with a small bin / crate in a communal area to be decanted into the appropriate bin for disposal to the refuse storage room. ▸ Recycling bins should be accompanied by a general waste bin.

5.2 Refuse Storage

The proposed bin storage room arrangements remain per the code approval and are as follows:

- A bin storage room is provided on the ground floor to accommodate all required bins (consisting of 2x 1500L waste bins and 1 x 2000L recycling bin) and associated chute equipment.
- A bin servicing room is provided to accommodate a maximum of one stream at a time (i.e. 2x 1500L bulk bin) for temporary storage of bins on collection day.
- Bin wash facilities will be provided within the refuse storage room.
- The bin servicing room is located within 5m from the property boundary.

The configuration and size of the bin storage room are provided to ensure the bins are accessible to all users and easily rotated. The refuse rooms have been designed to provide all required clearances,.

The bin storage room and servicing room is shown in Figure 5-1 and Figure 5-2. The recommended bin storage room requirements are detailed in Appendix D.

Figure 5-1 Refuse Storage Room

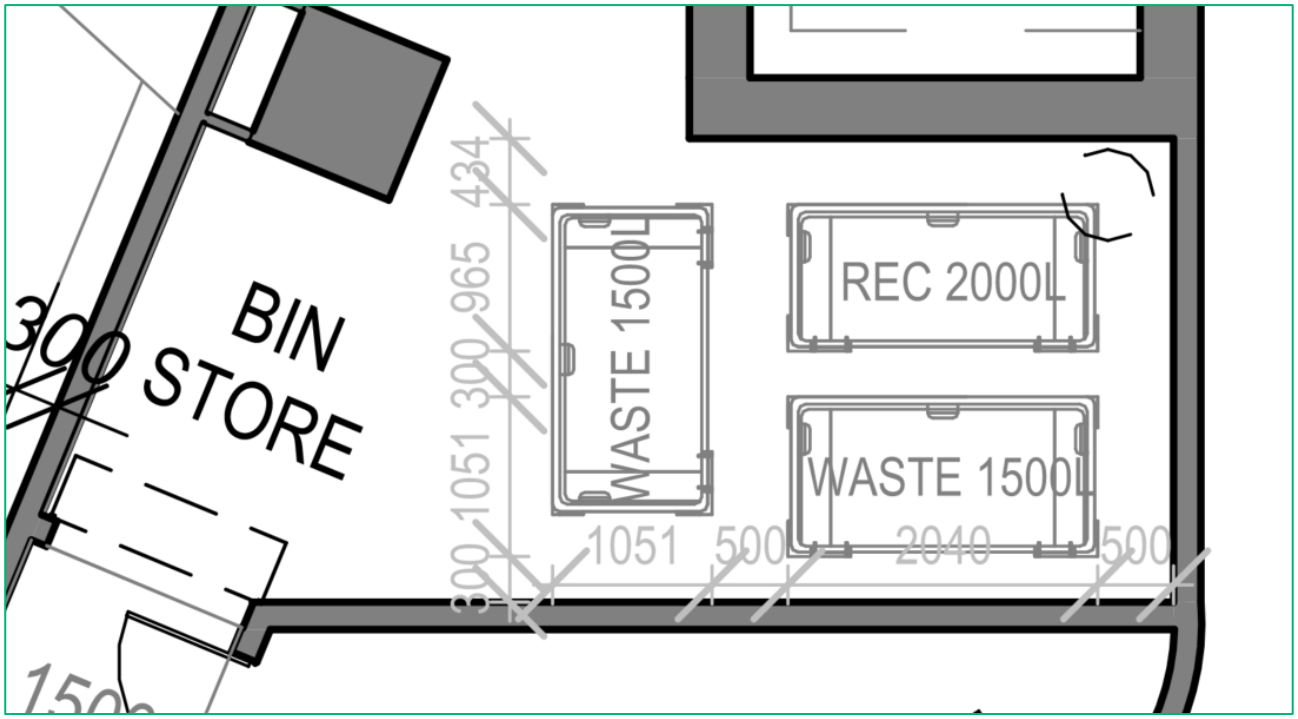
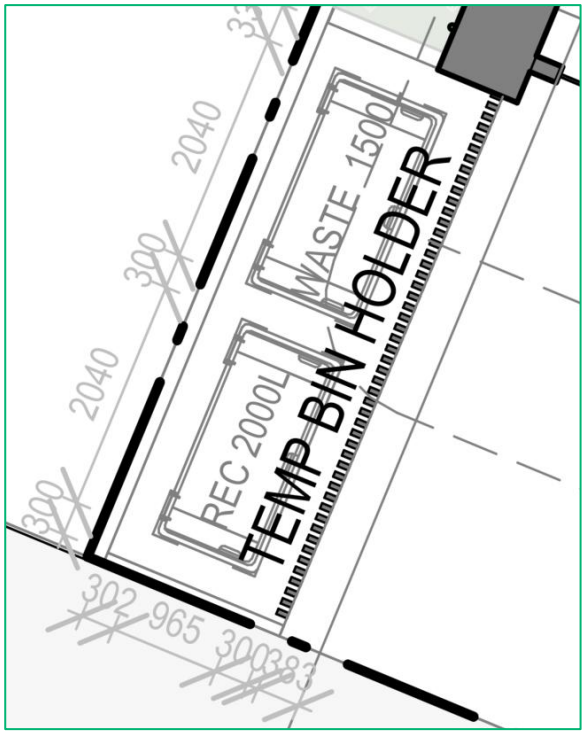


Figure 5-2 Refuse Servicing Room



5.3 Refuse Transfer

The proposed transfer arrangements are as follows:

- As required throughout the week, designated personnel (building management) will rotate full bins under the diverter chute and replace with empty bins.
- Prior to servicing, designated personnel (building management) will be responsible for transferring the bins from the bin storage room to the bin servicing room and return them once serviced.
- It is recommended that management procedures are proposed to ensure bins are not transferred across the driveway during peak periods.
- CoGC contractors will be responsible for collecting bins directly from the bin servicing room to the kerbside for servicing.
- Bins will be transferred along a maximum 1:20 grade and approximately 20 from the bin storage room to the bin servicing room.
- The bin servicing room is located within 5m from the property boundary.
- Contractors will transfer bins along the existing footpath to the existing kerb ramp adjacent to the roundabout to service the bins.

The transfer path requirements are detailed in **Appendix E**.

5.4 Servicing Arrangements

The proposed servicing provisions are as follows:

- Servicing will be conducted on the Armrick Avenue kerbside by CoGC via a front-loading RCV.
- The existing loading zone along the Armrick Avenue frontage will be utilised by the RCV for servicing.
- The bin servicing room is located within 5m of the property boundary, with contractors to directly collect bins and return once serviced.
- An alternative day collection arrangement to accommodate a maximum of one stream at any one time.
- In accordance with the maximum requirements outlined in the Solid waste management policy, general waste and recycling will be serviced with a maximum collection frequency of three (3) times per week. All collections will be coordinated and managed onsite by the building management.

5.5 Operational Management

The operational management and procedures can vary based on the operation of the development and each dwelling.

Appendix F details the minimum recommended arrangements for roles and responsibilities, maintenance and cleaning, training and education, safety, signage and monitoring and review. A blank table is also provided, to be completed by the appropriate personnel as required.

6 Refuse Minimisation

Refuse minimisation is an important part of any site operation and ensuring that diversion from landfill is minimised, to achieve the desired target rates as outlined in the QLD sustainability requirements.

To determine the feasibility of collection volumes and assist with achieving desired landfill diversion targets, it is recommended that a baseline audit is undertaken at various stages of building occupancy (i.e. at a minimum of 50% and 80% dwelling occupancy or 0-1 month, 1-3 months, 3-6 months, 6-12 months and yearly thereafter) by an external contractor.

Based on the audit outcome, a management plan can be developed and implemented for continual improvement of the operational performance of the site and assist with implementation of waste minimisation strategies.

6.1 Equipment

Refuse minimisation is an important part of any site operation. Minimisation systems are summarised in Table 6-1 and are presented as options only. To assess the feasibility, further investigation is required by the developer at the concept stage and/or building management at the operational stage. Additional refuse management equipment is detailed in Table 6-2. The equipment suppliers are further outlined in **Appendix G**.

Table 6-1 Refuse Minimisation Equipment

Type	Streams	Comments
Composter / digestor	Food Waste	Compost bins and piles are a way of processing compostable material and garden organics on-site. This not only reduces the volume of waste but also creates a useful soil enhancer (compost). There are a variety of compost bin arrangements and systems that are commercially available. The footprint area requirement for a typical compost bin is $1m^2$.
Waste Conversion	General waste	Converting waste by reducing its volume and weight means less material to be disposed of, which results in fewer WCV trips. This allows cost savings in logistics and has a positive environmental effect due to less fuel used per amount of waste to be disposed. An example of waste conversion is an OMPECO system, which converts waste into a sterilised, dehydrated material. The final product reduces up to 80% less volume and 50% less weight than the original waste material and can be used in waste to energy systems as it is reasonably dry with a high calorific value. The process involves crushing / grinding of the material and is heated to approximately 100˚C, evaporating moisture from the material.
Container deposit schemes	Eligible plastic / glass / aluminium bottles	Container deposit / refund schemes are currently in place in several states in Australia. Various models exist including bottle return facilities and (automated) reverse vending machines. Tenants, staff and cleaners should be encouraged to separate containers that qualify for the schemes from the waste or recycling streams, and return them to one of the return points. Storage space or dedicated bins within tenancies, apartments or communal areas should be provided.

Table 6-2 Refuse Management Equipment

Type	Streams	Comments
Diverter Chute	General waste, commingled recycling	A hopper will be located on each residential level for disposal of all waste. The diverter will terminate into the appropriate bins on the ground floor.
Refuse Trolley	General waste, recycling, food waste, paper / cardboard	Safety and mobility disposal can be assisted by trolleys for everyday use. Multi-purpose bin trolleys are used to transport bulky and awkward loads and are used widely in hospitals, laundries, manufacturing, and warehouses.

6.2 Signage

Waste signage guidelines are provided by the QLD government. Various signage for the refuse area, safety and facility should be arranged through appropriate signage providers. Example signage for the site including refuse room and equipment, and safety signage is demonstrated in Appendix H.

7 Summary

Modus has been commissioned by Sunland Group to provide an update to previous waste management advice in relation to a proposed multiple dwelling development located at 99-101 Old Burleigh Road Broadbeach. Modus has the following findings:

Refuse Equipment

- 2x 1500L waste bins
- 1x 2000L recycling bin
- 1x diverter chute with discharge attachments

Refuse Disposal

- Receptacles for storage of daily waste and recycling will be provided within each dwelling.
- As required, designated personnel will transfer all refuse materials directly to the diverter chute.

Refuse Storage

- A bin storage room is provided on the ground floor for storage of all required bins.
- A bin servicing room is provided in close proximity to the property boundary, for temporary storage of bins on collection day.
- Bin washing facilities will be provided within the bin storage room.

Refuse Transfer

- Building management will be responsible for rotating all full bins under the chutes and transferring bins between the bin storage room and the servicing room.
- Bins will be transferred approximately 20m from the bin storage room to the bin servicing room along a maximum 1:20 grade.
- CoGC contractors will collect bins from the refuse servicing room and return once serviced.

Refuse Servicing

- Servicing will be conducted on-street by CoGC via a front-loading RCV.
- The RCV will stand on the kerbside along Armrick Avenue via the existing loading zone.
- CoGC contractors will collect the bulk bins directly from the bin servicing room, within 5m of the property boundary.
- Servicing is based on an alternate collection frequency of three (3) times per week for waste and recycling.

APPENDIX A – Solid Waste Management Code

Performance Outcomes	Acceptable Outcomes	Comments
Waste and recycling storage and bin wash-down facilities		
PO1 Development provides waste and recycling storage and servicing facilities that are safe, convenient, efficient, appropriately sized for the type and volume of waste generated	**AO1.1** Development includes waste storage points of sufficient size to accommodate the required number of waste and recyclable bins consistent with SC6.15 City Plan policy – Solid waste management.	**Complies with AO1.1** The storage point is sufficiently sized to accommodate the required number of bins, in accordance with SC6.15 City Plan policy – Solid waste management. Refer to Sections 4 & 5 of the OWMP for further detail.
	AO1.2 Waste and recycling storage points are located, designed and sized consistent with SC6.15 City Plan policy – Solid waste management.	**Complies with AO1.2** The storage point is located, designed and sized generally in accordance with SC6.15 City Plan policy – Solid waste management. Refer to Sections 4 & 5 of the OWMP for further detail.
	AO1.3 Development with a dwelling above the third storey inclu de appropriate waste removal systems which incorporate: (a) waste chutes; (b) hoppers; and (c) separate waste storage rooms. Note: Waste removal system design is to be consistent with SC6.15 City Plan policy – Solid waste management	**Complies with AO1.3** A diverter chute (for waste and recycling), hoopers and separate refuse storage rooms are proposed for the development, consistent with SC6.15 City Plan policy – Solid waste management.
	AO1.4 Development that includes a commercial kitchen or generates clinical or related waste incorporate additional waste facilities consistent with SC6.15 City Plan policy – Solid waste management.	**N/A** Development does not include commercial kitchen or generates clinical waste.
PO2 Development provides a bin wash-down facility that maintains appropriate environmental health and amenity standards.	**AO2** Development includes appropriately sized and located bin wash-down facilities consistent with SC6.15 City Plan policy –Solid waste management.	**Complies with AO2** Refuse storage room will be included with wash-down facilities consistent with SC6.15 City Plan policy –Solid waste management.
Amenity		
PO3 Waste and recycling storage and servicing points are appropriately located and designed for convenient and safe access by all users and to minimise the potential for nuisance to occupants of the development or adjoining properties.	**AO3.1** Direct unobstructed paths exist between waste and recycling storage and servicing points and road frontages.	**Complies with AO3.1** All paths are provided with direct unobstructed access. Refer to Sections 4 & 5 of the OWMP for further detail.
	AO3.2 Waste and recycling storage points are screened by solid fencing or vegetation to ensure they are not visible from a public place or sensitive land use.	**Complies with AO3.2** All refuse storage and servicing points are suitably screened to ensure they are not visible a

		public place or adjacent land uses. Refer to Sections 5 of the OWMP for further detail.
Waste Servicing		
PO4 Waste and recycling servicing points are appropriately located and designed to facilitate safe, unobstructed and efficient servicing of waste containers.	**AO4** Waste and recycling servicing points are located, designed and sufficiently sized consistent with SC6.15 City Plan policy –Solid waste management.	**Complies with AO4** The servicing point is sufficiently sized to accommodate the minimum width of the required bulk bins. Refer to Sections 5 of the OWMP for further detail.
Non-serviced Areas		
PO5 Developments in non-serviced areas have appropriate solid waste management measures to adequately service the development. Note: For Commercial developments a Waste management plan, prepared in accordance with SC6.15 City Plan policy – Solid waste management, is Council's preferred method of addressing the above outcome.	**AO5** No acceptable outcome provided.	**Complies with AO5** Development is not located within the non-serviced area.

APPENDIX B - Development Plans

REVISION		
A	Development Application Draft	2026.05.13
Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: GROUND FLOOR

Drawing Number: DA-7.04

Scale/Format: 1 : 250

NOTES

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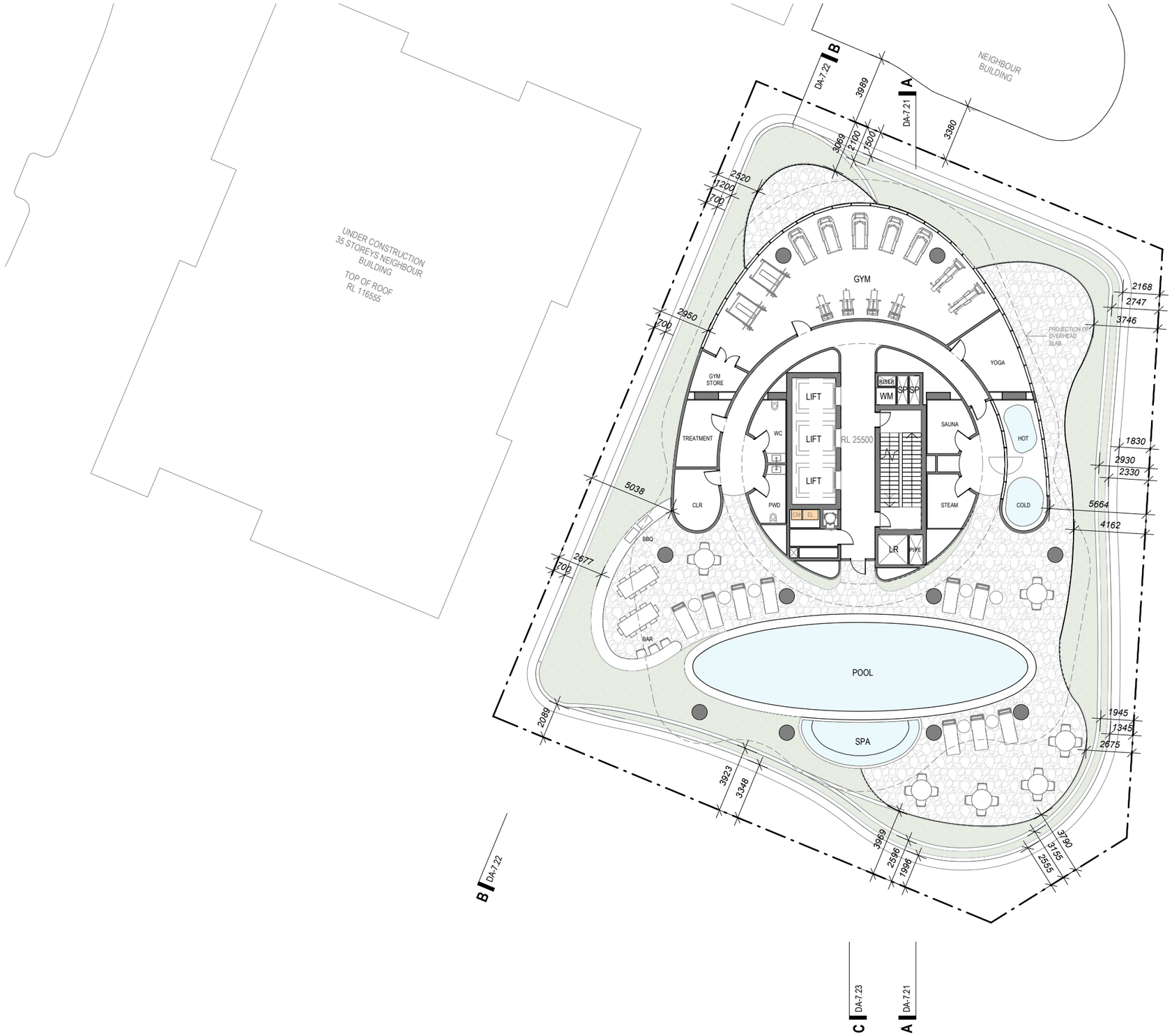

REVISION		
A	Development Application Draft	2026.05.13
Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: LEVEL 6 AMENITIES

Drawing Number: DA-7.09

Scale/Format: 1 : 250

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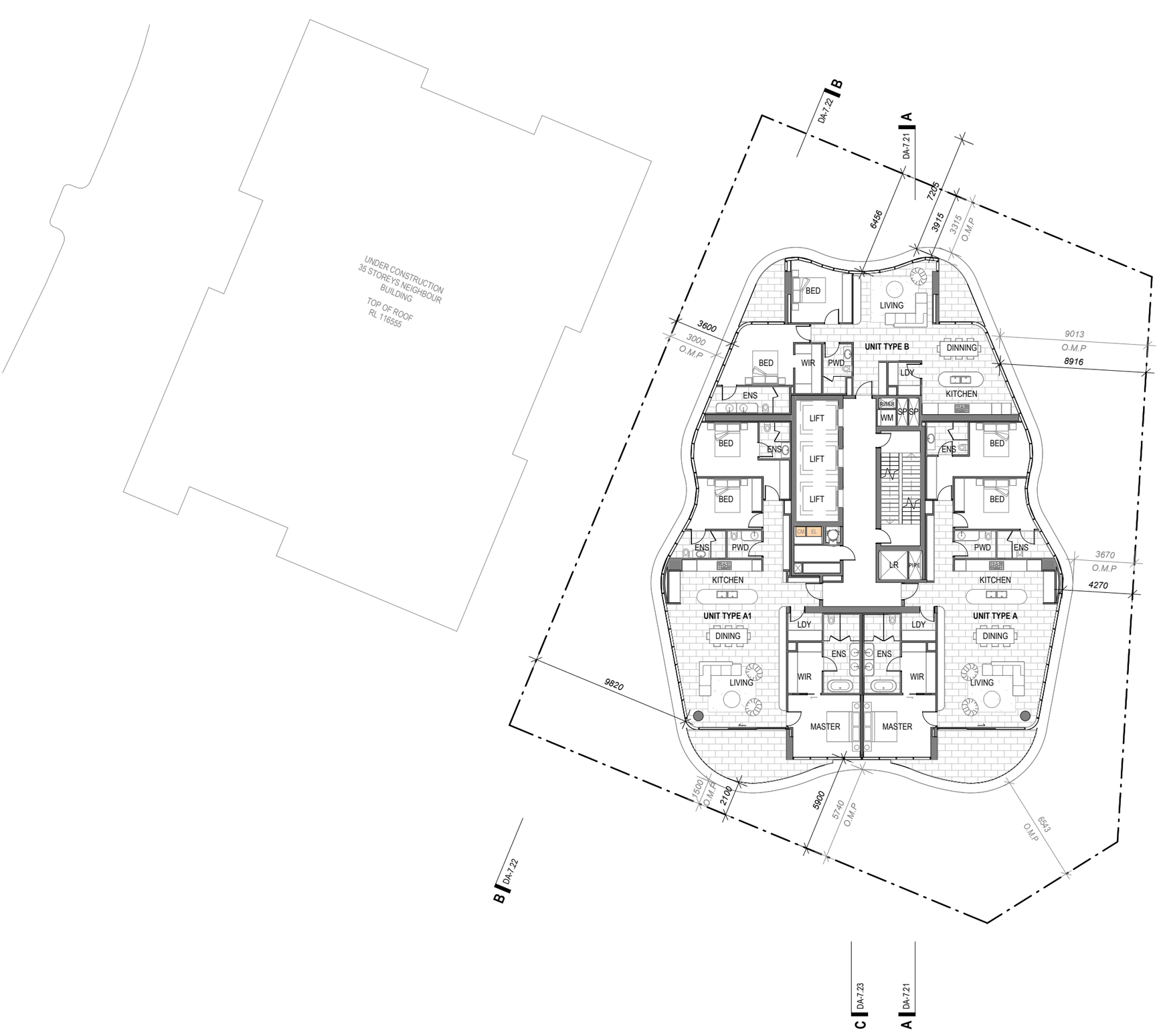

REVISION		
A	Development Application Draft	2026.05.13
Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: LEVEL 9 - 25 TYPICAL A

Drawing Number: DA-7.12

Scale/Format: 1 : 250

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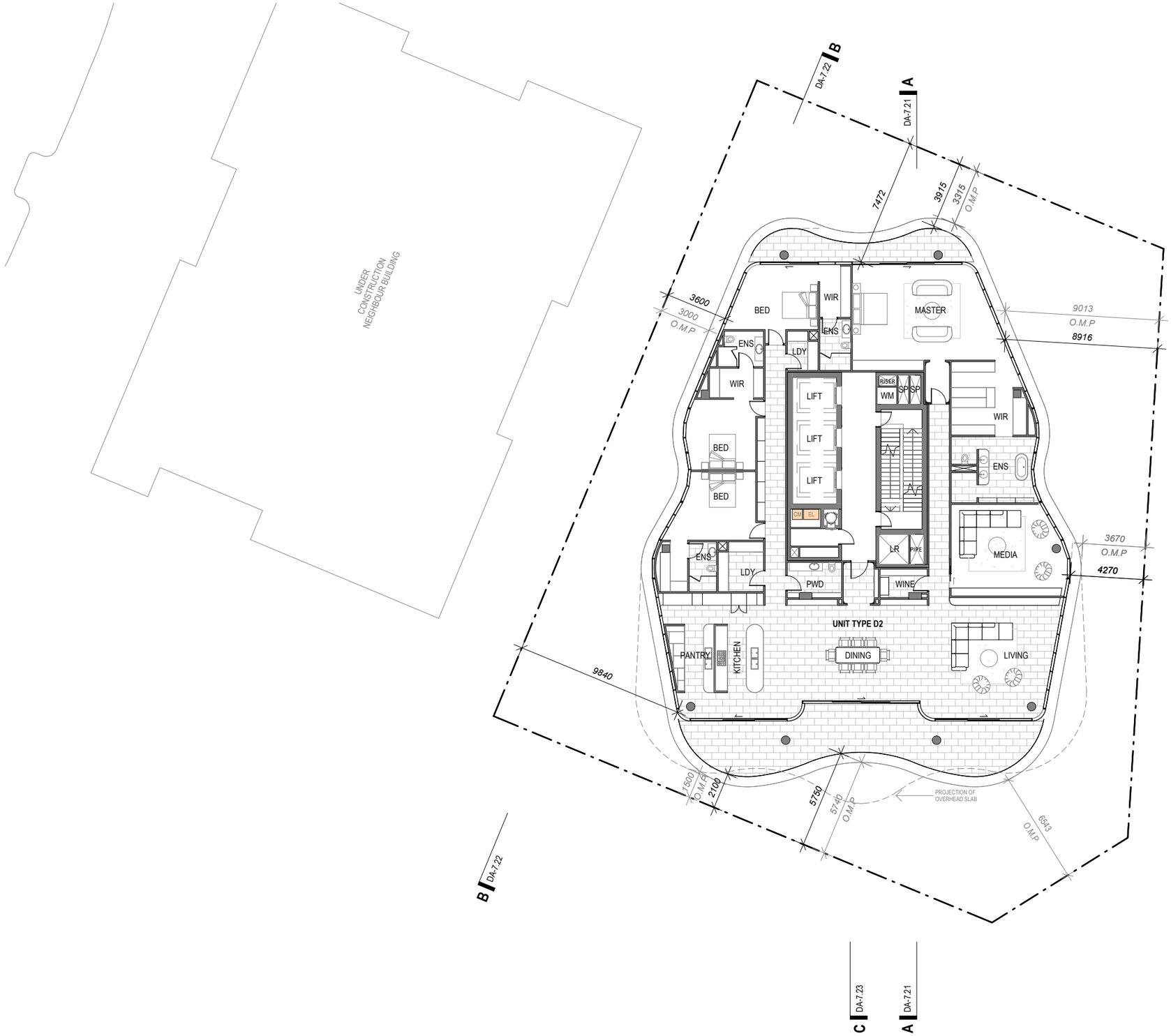

REVISION		
A	Development Application Draft	2026.05.13
Rev.	**Description**	**Date**

PROJECT 99-101 Old Burleigh Road

Drawing Title: LEVEL 39-41 PENTHOUSE

Drawing Number: DA-7.17

Scale/Format: 1 : 250

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APPENDIX C – Proposed Refuse Streams

Stream		Description
Frequently Generated		
General Waste	General Waste, Food Waste	General waste items are non-recyclable and can be putrescible (organic matter which can break down) or non-putrescible (non-organic matter which cannot break down).
Commingled Recycling	Semi-rigid plastics, paper, cardboard, glass, aluminium, steel / tin cans, glass	Commingled recycling includes everyday items that are collected and later processed for recycling into new products and resources. Recycling separation diverts waste to landfills
Infrequently Generated		
Green Waste	Landscaping, trees, potted plants	This development does not generally produce green waste (other than landscaping). Maintenance contractors are typically engaged to remove material and should be directed to send to a resource recovery / composting facility to avoid landfill.
Hard Waste / Bulky Goods	Furniture, white goods, appliances	Storage and collection should be coordinated with building management or designated staff. Where available, space can be provided in the refuse room or within a designated area. When transferring heavy material, it is recommended to utilise assisted transfer. Please refer to local and QLD government websites for further information.
Hazardous Waste	Paints, fluorescent globes, mobiles, batteries and cartridges Electronic Waste (computers, printers, TV's)	Storage and collection should be coordinated with building management or designated staff, and handled with care. Space should be provided in a secure and separate area. Please refer to local CoGC and QLD government websites for further information.

APPENDIX D – Refuse Room Design Requirements

Component	Requirement
Refuse Room / Storage point	▸ Allow the bins to be serviced in-situ or easily transported to a separate servicing point (no steps or lips on bin-carting route). ▸ Waste-carting distance should not exceed 60m and in any case be reasonable to ensure ease of use. ▸ Generally positioned away from entrances to shops or residential premises and located at least 5m from any door, window or fresh air intake within the development (habitable rooms) or any adjoining site (excluding the storage of wheelie bins at each individual dwelling), particularly food preparation areas (including food storage). ▸ Screened to ensure bins are not visible from a public place or sensitive land use. ▸ Safe access to the disposal area. ▸ Of sufficient size to accommodate the required number of bins. Allowance is to be made for a minimum of 0.3m clearance surrounding each container, or for the storage of multiple bins – 1m clearance around the combined bin area (whichever is the lesser). ▸ Provide adequate storage and unobstructed access for all users to safely and easily access via the provision of suitably located bulk bins or wheelie bins. ▸ The floors, walls and ceilings of waste and recycling storage areas and chute room(s) are to be finished with a rigid, smooth-faced impermeable material capable of being easily cleaned. ▸ Is enclosed on all sides except for the entrance door/s to ensure bins are not visible from a public place, neighbouring properties, passing vehicles or pedestrian traffic external to the site. ▸ Doors to the waste and recycling storage rooms are to provide a minimum clearance width of 1.3m. At least one door to the waste and recycling storage area is to have sufficient dimensions to allow the entry and exit of waste containers of a capacity nominated for the development. ▸ The height of the bin storage area to be a minimum of 2.1m in accordance with the National Construction Code and Building Code of Australia, to allow for waste bins to be opened and closed. ▸ Lightweight roller shutter-type doors or grilles should be considered for access to waste and recycling storage areas, as these do not impact on the available storage space. Where required, the refuse room is to be fire rated in accordance with the National Construction Code and Building Code of Australia. ▸ The design shall restrict the entry of trespassers, vermin or other animals into the area. ▸ The waste and recycling storage area is to be provided with an adequate supply of water for cleaning purposes with a hose cock. This does not include within chute rooms. ▸ The storage area is to be adequately ventilated by either: i. Natural ventilation openings to external air. The dimension of the openings are not to be less than 5% of the bin bay or bin room floor area. ii. A mechanical ventilation system in accordance with relevant Australian standards. ▸ Waste and recycling areas are to be provided with artificial light controlled by switches located both outside and inside the storage area. ▸ Any facet of the waste and recycling management system that is visible from outside the building is to be in keeping with the dominant design of the remainder of the development.

Refuse Chutes	▸ Be compliant with the National Construction Code (NCC); ▸ Have adequate strength for its purpose, including additional reinforcing where necessary at joins, bends and hopper intersections; ▸ Be insect and vermin proof; ▸ Be constructed and installed to prevent the following during use and operation of the system: i. transmission of vibration to the structure of the premises; ii. excessive odour – there must not be a noticeable odour beyond the waste disposal and storage points; iii. excessive noise to the occupants of the building; ▸ Comply with the waste chute manufacturer's technical specifications and/or operational limitations, including installation design features and ancillary equipment required to prevent blockages and noise disturbances; ▸ Be fitted with a shutter at the base of the chute for closing off the chute manually during bin exchange and automatically in case of fire; ▸ Have chute pipes with access provided at appropriate levels and a nylon brush or similar appliance on a pulley system, for clearing obstructions and cleansing.
Bin wash-down facility	▸ Constructed hardstand area with a solid concrete base or acceptable equivalent. ▸ Roofed and designed to prevent entry to rainwater. ▸ The floors are graded to fall to a drainage point. The floor is to be provided with a ramp to the doorway where necessary. ▸ Drainage point connected to sewer in accordance with trade waste requirements. ▸ Provided with a hosecock for cleaning. ▸ Not be located within a building structure, unless it is: i. in a purpose-built storage area which is air locked, fly and vermin proofed, and used solely for the storage of waste; ii. in a well-ventilated portion of the ground floor and not within 30m of an opening to a food premises or food handling area; or iii. demonstrated that no / minimal putrescible / organic waste is generated by the proposed development type.

APPENDIX E - Servicing Requirements

Component	Requirement
Bin servicing point	▸ Is of sufficient size to accommodate the bin/s. ▸ Sufficient access and clearance for the collection vehicles to service the bins, including adequate unobstructed overhead space for the swinging arm action of the collection vehicle. ▸ Bins serviced safely while minimising the impediment of traffic flow during servicing. ▸ Separated from car parking bays, loading bays, footpaths and pedestrian access, and any other similar areas. ▸ Clear of speed control devices or similar provisions (including entry and exit to the site) which inhibit direct access to the bins for servicing. ▸ Positioned per architectural plans and devoid of stairs, lips or ramps and allows bins to be manoeuvred easily. ▸ Over 5m from any door, window or fresh air intake within the development (habitable rooms). ▸ Bins to be removed from and returned to the storage point. ▸ Constructed hardstand with a solid concrete base or acceptable equivalent. ▸ If serviced from a public roadway: i. positioned on a level pad within the site, entire pad not more than 5m from the property boundary, level with the kerbside and adjacent to a driveway or other approved crossover on the public roadway. ii. connected to the crossover by a paved path so that the bin can be manoeuvred for servicing without lifting the bin over raised surfaces (pram ramp). iii. not be situated within 10m of an intersection (including opposite a T-intersection) or roundabout. ▸ allow for at least an additional 0.1m clearance surrounding each container and any barrier around the location. The height of the servicing area must all for waste bins to be opened and closed. ▸ Screened to minimise the view of bins from neighbouring properties, or passing vehicles and pedestrian traffic external to the site. ▸ Positioned away from entrances to shops or residential premises.
Bin carting	▸ The route must be via hard stand pathways / internal roads, and can be easily moved to the temporary storage area, and is not stored on a section of the driveway that falls away (e.g. to the basement). The route must occur within the property boundary. ▸ The route must allow bins to be easily manoeuvred and be devoid of steps or steep rises. ▸ The route must not impede traffic flow and extend through habitable parts of a building, or a food premises, and only occur through common property or publicly accessible locations.

APPENDIX F – Operational Management

Process	Procedure
Roles and Responsibilities	Responsibilities have to be assigned for all on-going refuse management operations. This is generally completed by a building manager, staff and / or cleaners. The on-going responsibilities help managing responsibilities and monitor the refuse operations in order to maintain efficient services and a safe environment. These include and are not limited to the following: ▸ Scheduling / organising refuse collections ▸ Transferring bins to and from the refuse area ▸ Washing bins ▸ Ensuring users / occupants are informed of all waste, recycling, organics and bulky waste arrangements ▸ Coordination of contractors, including specialised equipment and cleaning ▸ Monitoring and reviewing all waste management procedures
Maintenance and Cleaning	Regular on-going maintenance and cleaning is required to maintain a clean and hygienic environment for all users, including management / staff, visitors and contractors. This includes, and is not limited to the following: ▸ Refuse storage areas ▸ Refuse transfer areas ▸ Refuse equipment
Training and Education	Training and education is required to ensure operational efficiency and sustainability of the equipment and facilities within the development. Training and on-going education should be conditioned within all body corporate and leasing contracts. It is recommended that building management circulate ongoing recycling rate results to highlight current rate and performance against benchmarked recycling rate target.
Safety	Safety is an important part of all refuse management operations and is the responsibility of all users. A full risk assessment should be conducted by building management and all contractors. Contractors must provide required documentation to appropriate personnel prior to development occupancy and delivery of equipment.
Signage	All receptacles, bins and other refuse management equipment must have adequate signage. Standard signage will be provided in and around waste collection / storage areas and will be colour coded in accordance with AS 4123.7–2006 mobile waste containers and all local government regulations. Signage should be included, and not limited to the following: ▸ Refuse storage and collections areas ▸ Refuse transfer areas ▸ Refuse disposal points ▸ Refuse equipment All signage should be clear, legible and easy to read.
Monitoring and Review	Regular monitoring and reviews will ensure operational efficiency and sustainability of the refuse management arrangements for the development. This includes, and is not limited to the following: ▸ Refuse equipment ▸ Refuse area It is recommended that waste auditing / reviews are conducted a minimum of at least once every 12 months. Audits may be undertaken by external contractor or internally by visual inspection during on-site waste management handling activities. Additionally, refuse weights and movements should be noted to assist with economic feasibility.

A blank operational checklist is provided below to be appropriately filled out as required by building management / staff. This table has been designed to maintain efficient services and a safe environment and help manage responsibilities / monitor the refuse operations.

Task	Responsibility	Checked	Comments

APPENDIX G – Equipment / Systems Manufacturers and Suppliers

Manufacturer / Supplier	Equipment / Systems
Elephants Foot Recycling Solutions http://www.elephantsfoot.com.au	Compactors, Chutes, Bin Rotation, Bin Lifters
Waste Initiatives https://wasteinitiatives.com.au	Compactors and Balers, Shredders, Sorting Equipment
Wastech http://wastech.com.au	Compactors, Chutes, Bin Rotation, Bin Lifters
Miltek http://www.miltek.com.au	Compactors
Closed Loop Organics https://closedloop.com.au/upcycling-products,	Composting
Materials Handling https://www.materialshandling.com.au	Bin Lifters, Spill containment, Bins, Bin Cleaning
Spacepac Solutions http://www.spacepac.com.au	Bin tugs / trailers, trolleys / assisted transfer equipment
Draffin https://draffin.com.au	Bin lifters
Electrodrive / Lift Master http://www.electrodrive.com.au	Bin tugs / trailers, bin lifters
Absorbenviro http://www.absorbenviro.com.au	Spill containment equipment
Trade Environmental http://www.tradeenviro.com.au	Spill containment equipment
Spillstationaustralia www.spillstation.com.au	Spill containment equipment
Compost Revolution https://compostrevolution.com.au	Composting
Urban Composter https://www.urbancomposter.com.au	Composting
Rubbermaid https://rubbermaidcommercial.com.au/products/waste-management	trolleys / assisted transfer equipment, spill containment, bins
Sulo http://www.sulo.com.au	trolleys / assisted transfer equipment, bins, composting
Australian Waste Management https://www.australianwastemanagement.com.au/products	Bin lifters, bins
ReturnIT https://www.returnit.com.au/qld/	Container deposit / refund schemes are currently in place in Queensland. Various models exist including bottle return facilities and (automated) reverse vending machines

APPENDIX H – Example Signage

Standard Signage

Refuse Room

Facility Signage

Safety Signage

Refuse Equipment

Refuse Chute Signage