NORTHERN CONSULTING engineers

CIVIL & STRUCTURAL ENGINEERS

TRAFFIC IMPACT ASSESSMENT

10-32 LIONEL TURNER DRIVE – COMMERCIAL DEVELOPMENT

FOR
Swanland Group P/L

JOB No: **IPA0002C**

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DOCUMENT CONTROL

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B	Derek Saw	Brendan Blair	Derek Saw (RPEQ 7363)		21/05/2025	Client	For Client Review
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TABLE OF CONTENTS

APPENDICES

APPENDIX A

CPO ARCHITECTS – Site Plan Option - A Drawings

APPENDIX B

Northern Consulting Engineers – Traffic Drawings

APPENDIX C

Northern Consulting Engineers – Miscellaneous Figures

APPENDIX D

Northern Consulting Engineers – Existing Road Safety Audit Spreadsheets

APPENDIX E

Certification Statement and Authorisation

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

Northern Consulting Engineers (NCE) have been commissioned by Swanland Group P/L to undertake an engineering investigation relating to the proposed commercial development, at 10-32 Lionel Turner Drive, Bushland Beach on land described as Lot 2 on SP218628.

This report summarises the analysis and results of the traffic study associated with the proposed development, including the likely impacts and mitigation measures required to ensure the development can proceed whilst maintaining an acceptable level of service within the local government road network.

- Commercial Development – Lionel Turner Drive, Bushland Beach.
    - Development Generated Traffic associated with the use of the proposed commercial development has been assessed and requires the installation of an All-movements intersection inclusive of a CHR(s) and AUL(s) to safety and efficiently move traffic in and out of the development.
    - Sufficient separation distance exists between the adjacent existing roundabout between Lionel Turner Drive and the Access to the nearby shopping centre to allow the construction of the proposed intersection with the recommended AUL(s).
    - Provision of connecting Shared pedestrian / bicycle facilities between the proposed development and existing shared facilities at the above-mentioned roundabout are recommended to facilitate the safe and efficient movement of Pedestrians and cyclists.
    - Utilisation of the existing pedestrian crossing facilities east and west of the development are recommended to limit the number of conflict points along Lionel Turner Drive.
    - An assessment of the on-site parking provisions against AS2890 concluded the proposed facility as detailed is compliant with all design aspects.

1.0 INTRODUCTION

1.1 Background

Northern Consulting Engineers (NCE) have been commissioned by Swanland Group P/L to undertake an engineering investigation relating to the proposed commercial development, at 10-32 Lionel Turner Drive, Bushland Beach on land described as Lot 2 on SP218628.

Specifically, this phase of the engagement is focused on a traffic study for the full operation of the facility. This study will be utilised to support development applications associated with the development.

1.2 Previous work

NCE are not aware of any previous traffic studies relating to the site.

1.3 Scope and study area

The proposed development is located within the Townsville City Council (TCC) Commercial area of Bushland Beach, 4818. The site is over (1) land parcel described as Lot 2 on SP218628 with the land zoned as Low Density Residential under the Townsville City Plan, refer **Figure 2-1** Townsville City Council planning zones.

The site plan can be seen in **Figure 1-1** below.

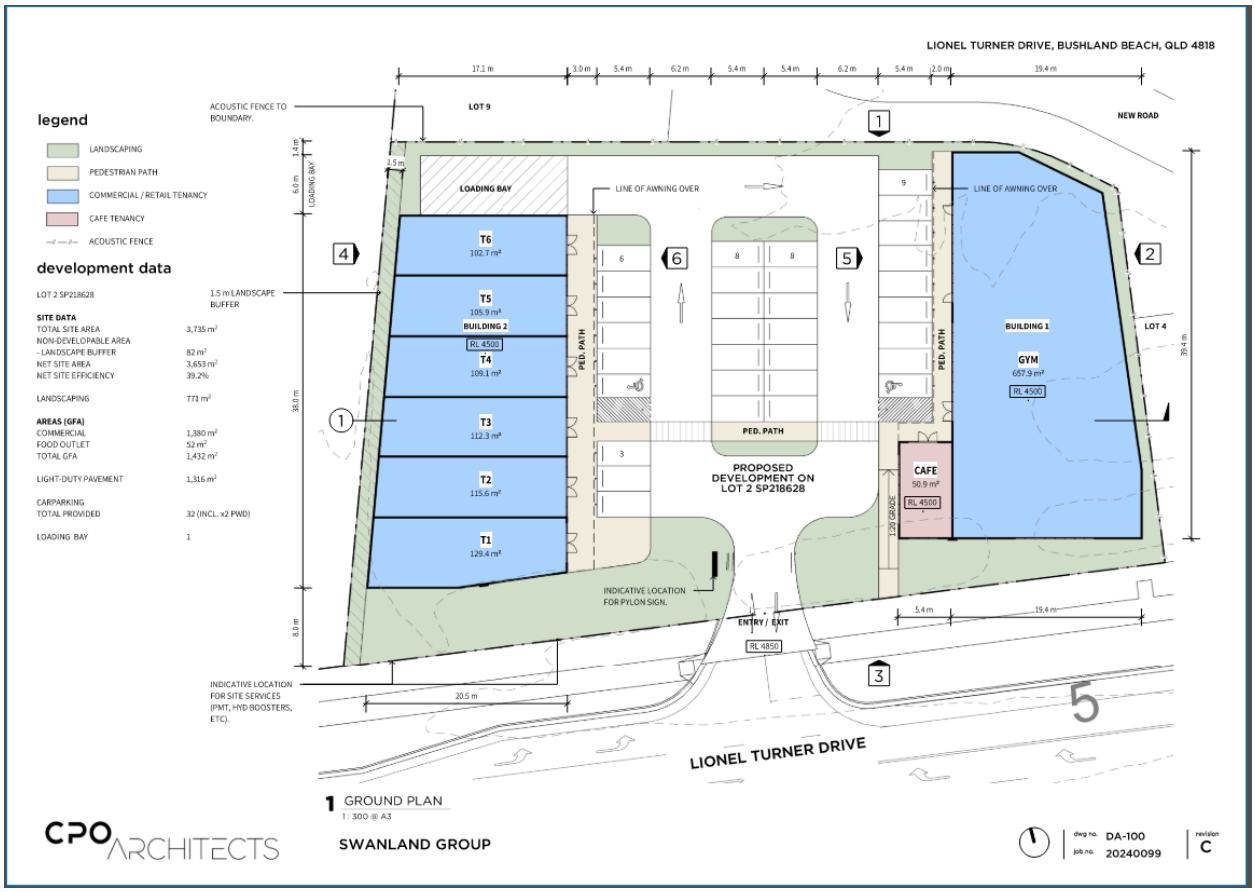


Figure 1-1 Site plan

2.0 EXISTING CONDITIONS

2.1 Land use and zoning

The proposed development is on land zoned as Low Density Residential under the Townsville City Plan as per the Townsville City Plan (2014) mapping available on the TownsvilleMAPS Web Map Service.

Figure 2-1 Townsville City Council planning zones

2.2 Adjacent land uses / approvals

Adjacent land parcels within the immediate area are zoned Local Centre to the west, Low density Residential to the east and Recreation and Open Space to the south.

2.3 Surrounding road network details

The adjacent road network falls under the jurisdiction of the local government. Connections with the State Controlled Road network occur significantly further southward of the development.

2.3.1 Local authority roadways

The impacted local road network consists of Lionel Turner Drive, running parallel with the southern boundary of the proposed development. Lionel Turner Dive is depicted as a Sub-arterial Road in both the current and future mapping.

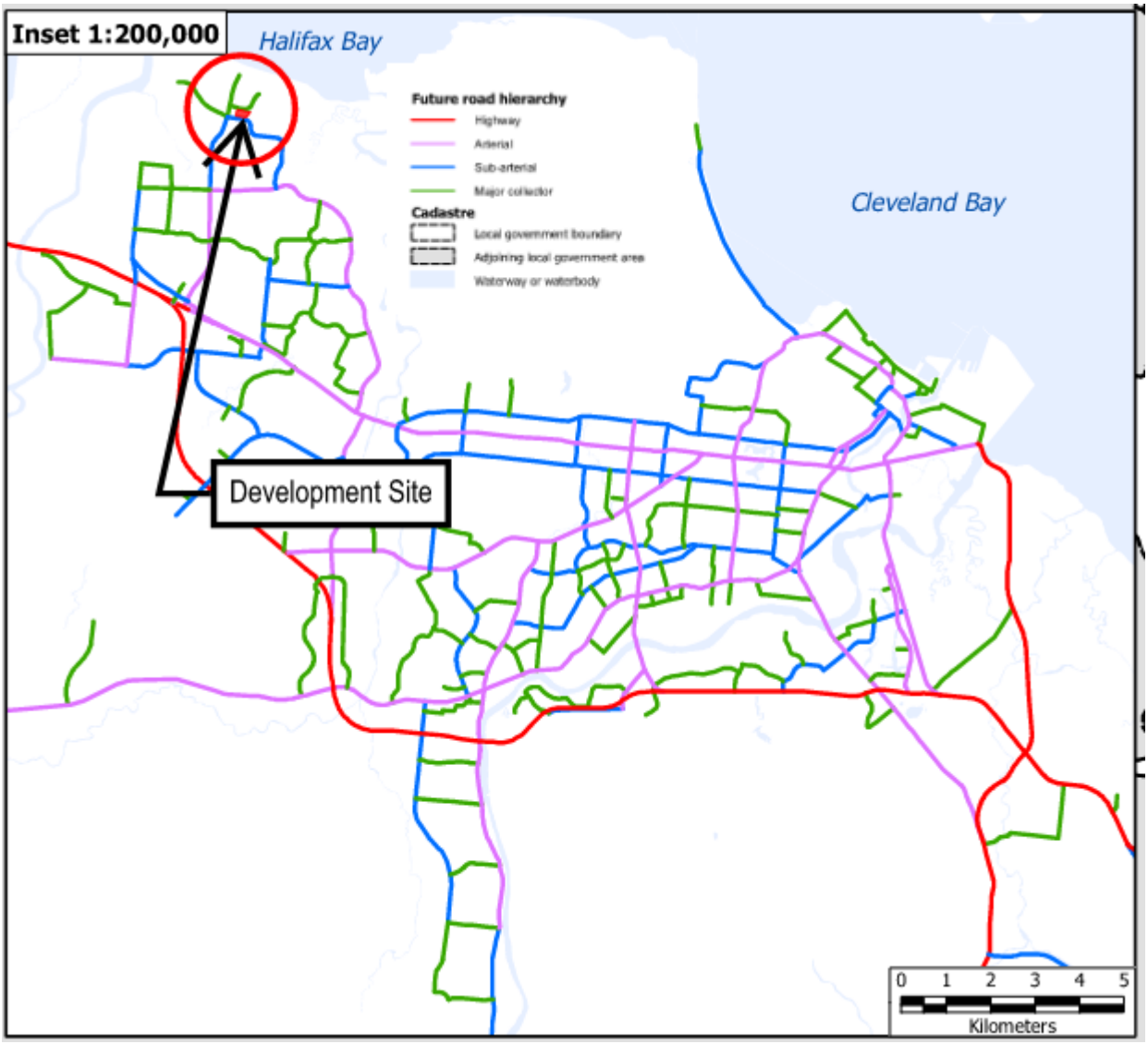


Figure 2-2 TCC Planning Road Hierarchy Map (Future Insert)

2.4 Background traffic volumes

Background traffic volumes utilised within the analysis were derived from the current TCC AIMSUN traffic model

2.4.1 Townsville City Council – AIMSUN volumes

Interrogation of the AIMSUN model via TCC mapping results in the following traffic volumes for the current year 2026 and the design horizon 2036

Figure 2-3 TCC AIMSUN Traffic Model 2026

Figure 2-4 TCC AIMSUN Traffic Model 2026

Figure 2-5 TCC AIMSUN Traffic Model 2036

Figure 2-6 TCC AIMSUN Traffic Model 2036

Townsville AIMSUN Integrated Model 2026 / 2036.

- **Lionel Turner Drive 2026:**
  - Eastbound:
    - AADT: 1074
    - Peak AM: 191
    - Peak PM: 153
    - %HV: 8.57%
  - Westbound:
    - AADT: 1627
    - Peak AM: 51
    - Peak PM: 288
    - %HV: 7.81%
- **Lionel Turner Drive 2036:**
  - Eastbound:
    - AADT: 1194
    - Peak AM: 222
    - Peak PM: 156
    - %HV: 8.21%
  - Westbound:
    - AADT: 1790
    - Peak AM: 59
    - Peak PM: 305
    - %HV: 7.6%

2.5 Road safety issues

2.5.1 Crash data

Crash data was obtained for the area via the Queensland Globe. Specifically, adjacent to the proposed site and indicates (2) accidents have occurred between 2013 and 2021.

In both cases the vehicle has left the carriageway and hit an object. From the information obtained it is unclear if driver error contributed to each crash, however given they are both single vehicle accidents, it is more likely that driver error contributed to the accidents.

Table 2-1 QLD Globe – Crash Data

Location	Date and Time	Occupancy	Nature of Crash
Lionel Turner Drive	July 2013, Thursday at 12:00 PM	(2) Hospitalisation	Single Vehicle, Hit object, Off Path-Straight: Left Off Cway Hit Obj
Lionel Turner Drive	September 2021, Monday at 8:00 AM	(1) Hospitalisation	Single Vehicle, Hit object, Off Path-Curve: Off Cway Lt Bend Hit Obj

2.6 Public Transport

There are currently several bus stops located along Mount Low Parkway nearby the site. The Queensland Government TransLink website indicates the stops are currently serviced via route 233, refer **Figure 2-7** Translink Townsville Bus Routes

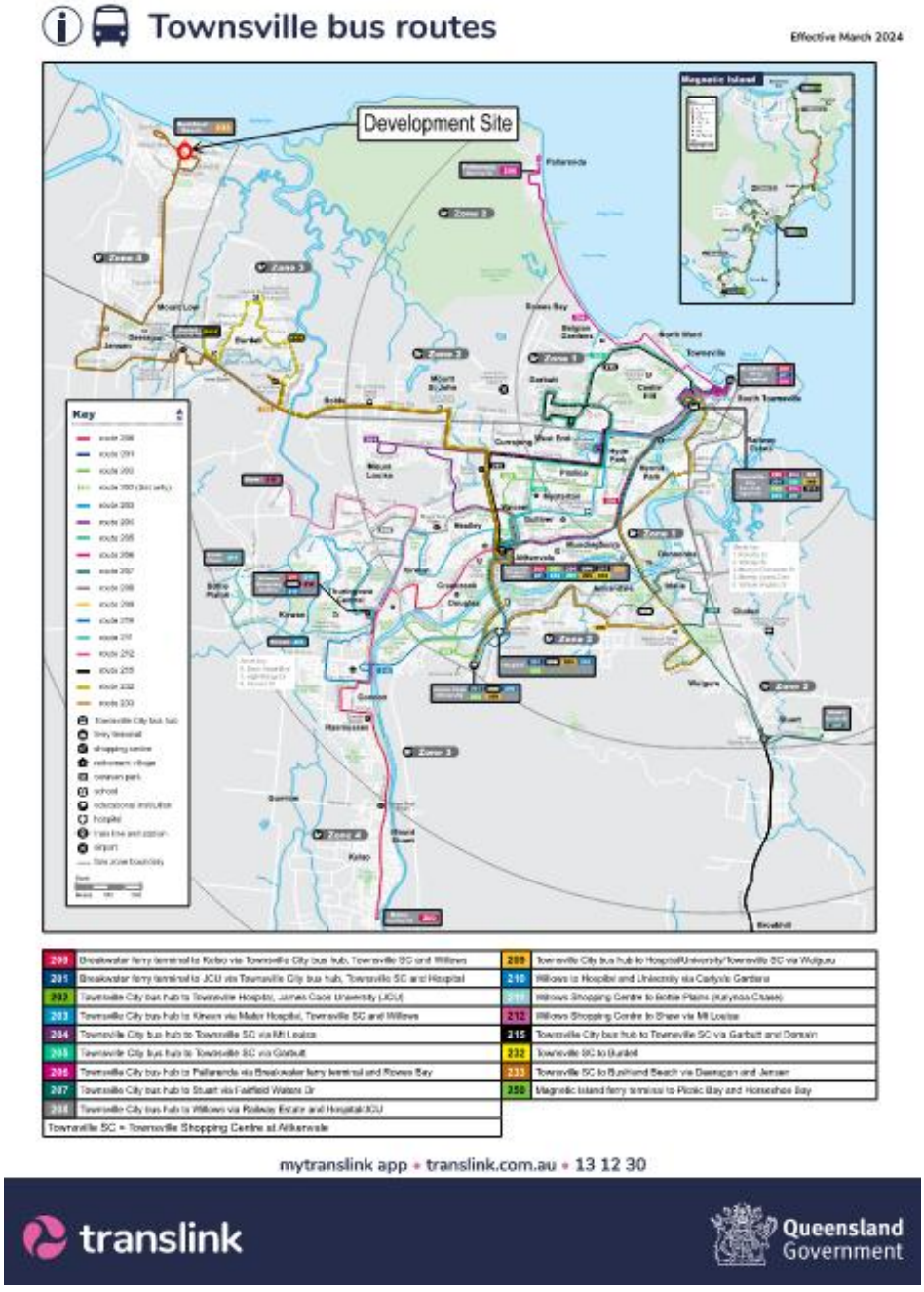


Figure 2-7 Translink Townsville Bus Routes

3.0 PROPOSED DEVELOPMENT DETAILS

3.1 Development site plan

The development proposed is for an commercial development, associated amenities, and parking facilities.

The total expected developed area of the site encompasses approximately (0.3735ha) of the englobo 4.790ha site, and will consist of the following components:

- Driveway and carparks
- Food and Drink Outlet (52.5m^2)
- Gym Tenancy (626.9m^2)
- Commercial Retail (1298m^2)

3.2 Operational details

The development site once amalgamated will include the operation of:

- Food and Drink Outlet (6:00am to 10:00pm)
- Gym Tenancy (24-hour operation)
- Commercial Retail (9:00am to 5:00pm)

Each use is expected to operate at different times during the day as nominated above.

3.3 Proposed access and parking

Access to the site will be via a new driveway off Lionel Turner Drive. Proposed car parking will be designed and constructed to AS2890 guidelines.

4.0 DEVELOPMENT TRAFFIC

4.1 Traffic generation

In accordance with the Department of Transport and Main Roads Guide to Traffic Impact Assessment (GTIA) December 2018, traffic demand was sourced from the following data bases:

- QLD Government - Open Data Portal – Traffic Generation Data 2006-2019
- NSW – Guide to Transport Impact Assessment – TS 00085 / Version 1.1

4.1.1 Traffic generation calculations

Table 4-1 identifies the current uses within the development site in addition to the proposed development generations for each use and calculated traffic volumes expected to be generated.

Utilising the GLFA provided, NCE have assigned likely traffic generation rates from the data sources discussed previously and determined a **weekday peak traffic volume of 229 veh/hr**.

Table 4-1 Trip calculations

Northern Consulting Engineers Project Number	IPA0002C	
Project Description	10-32 Lionel Turner Drive	
Traffic Survey or Construction Commencement Year	2036	
Commencement of Use Year	2026	
Projected 10 year design horizon	2036	
Figure 2.27 (Left Approach)	Lionel Turner Drive	
Figure 2.27 (Right Approach)	Lionel Turner Drive	
Figure 2.27 (Bottom Approach)	Development Access	
Background Growth Factor	0%	
Peak Hour Factor (12% Urban / 16% Rural)	12%	
Site Information		
Food and Drink Outlet	**GLFA**	
10-32 Lionel Turner Drive	52.5	
Gym Tenancy	**GFLA**	
10-32 Lionel Turner Drive	627	
Commercial retail	**GFLA**	
10-32 Lionel Turner Drive	671	
QLD Open Portal (Fast Food with Driveway)	**Vehicle Trips / GLFA**	**Predicted Traffic Volumes**
Average Weekday	5.92	**311**
Average Weekend	3.39	**178**
Weekday Peak hour	0.63	**33**
Weekend Peak hour	0.63	**33**
NSW 2024 - Guide to Transport Impact Assessment TS 00085 V1.1 (Fitness Centre - 2014)	**Vehicle Trips / per 100m^2 GLFA**	**Predicted Traffic Volumes**
Evening Peak (Weekday)	3.6	**23**
Evening Peak (Weekend)	2.9	**18**
Daily trips	16.9	**106**
NSW 2024 - Guide to Transport Impact Assessment TS 00085 V1.1 (Small Shopping Centre - 2018)	**Vehicle Trips / per m^2 GLFA**	**Predicted Traffic Volumes**
AM Peak (Weekday)	0.192	**129**
PM Peak (Weekday)	0.259	**174**
Daily trips (Weekday)	2.022	**1357**
Peak (Weekend)	0.283	**190**
PM Peak (Weekend)		**0**
Daily trips (Weekend)	1.894	**1271**
(Development Traffic)	**Approach Traffic (Peak Hour)**	Public Transport Factor (100%)
Total Weekday peak hour	**229**	100%
Total Weekend peak hour	**241**	100%

Appendix D includes spreadsheets for the calculation of generated traffic.

4.1.2 Traffic composition

The composition of generated traffic is expected to be largely passenger vehicles. A smaller percentage of vehicle will be medium heavy vehicles (8.8m) servicing the operations such as delivery vehicles and waste management vehicles.

4.1.3 Heavy vehicle payloads

Heavy vehicle payloads have been assumed to be the legal payload limits for each vehicle type, i.e. 12.5 tonnes for class 3-5 Medium Heavy Rigid.

4.2 Trip distribution

Trip distribution scenarios documented are based upon (50% In / 50% Out) split scenario with 50% of traffic choosing to utilise the Lionel Turner Extension to North Shore Boulevard in the 2036 design year. Sensitivity assessments utilising alternate in/out splits and network distributions have been completed and confirm the access intersection proposed is suitable for a range of scenarios. It is assumed that the site can and will operate at any given hour of any given day regardless of weekday or weekend.

5.0 LOCAL AUTHORITY: TRAFFIC IMPACT ASSESSMENT AND MITIGATION

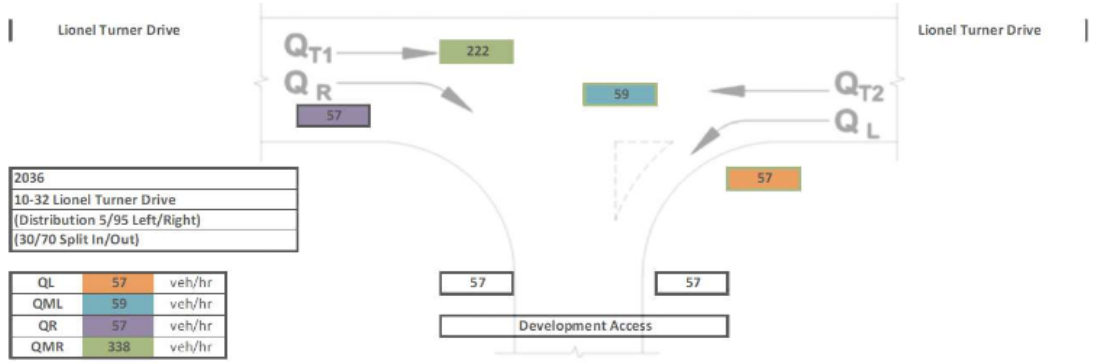
5.1 Development traffic volumes on the network

5.1.1 Intersection warrant assessment

The Development Access / Lionel Turner Drive intersection has been assessed using the intersection warrant method outlined by the TMR Supplement to Austroads Guide to Road Design Part 4A for Unsignalised and Signalised intersections.

The intersection has been assessed for the peak background traffic predicted for 2026 and 2036. **Figure 5-1** shows the warrant for the AM peak in 2036 while **Figure 5-2** shows the warrant for the PM peak in 2036 which represent the Design Horizon year peak periods for the assessment. As can be deduced from the figures, the PM scenario for 2036 requires a CHR(s) / AUL(s) intersection treatment to safely convey right turning traffic from Lionel Turner Drive into the development. The full intersection warrant assessment spreadsheet is contained within Appendices.

Figure 2.27: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	= $Q_{T1} + Q_{T2} + Q_L$
		Yes	= $Q_{T1} + Q_{T2}$
	Left	Yes or no	= Q_{T2}

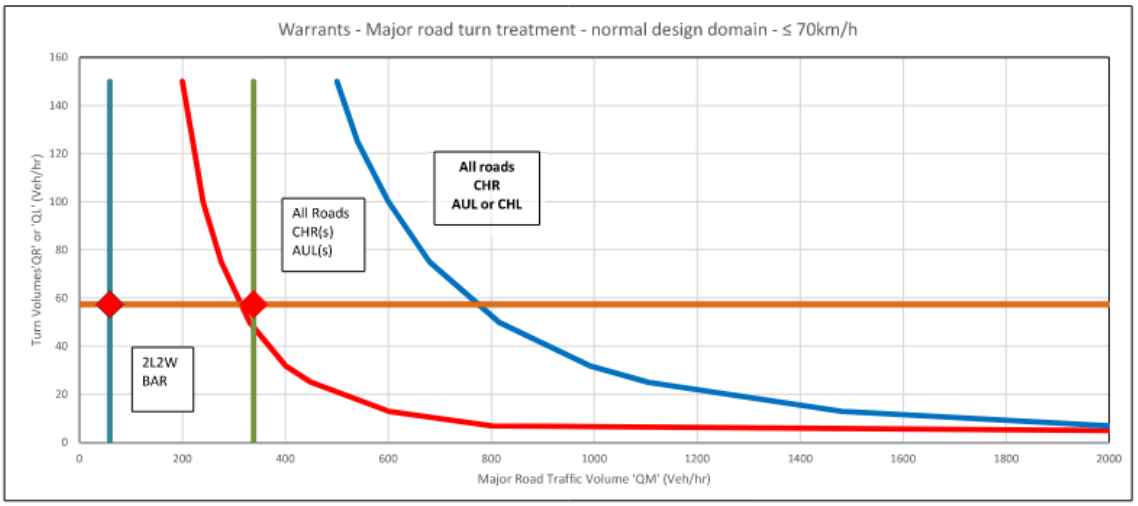
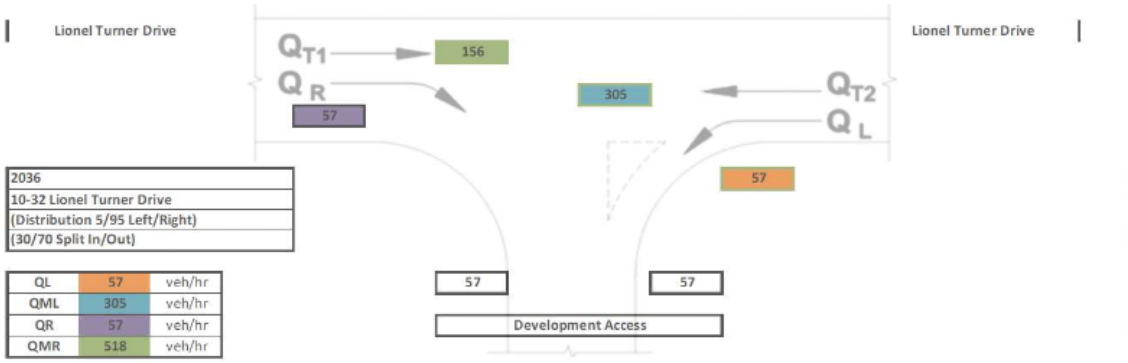


Figure 5-1 2036 AM Peak hr Assessment

Figure 2.27: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	= $Q_{T1} + Q_{T2} + Q_L$
		Yes	= $Q_{T1} + Q_{T2}$
	Left	Yes or no	= Q_{T2}

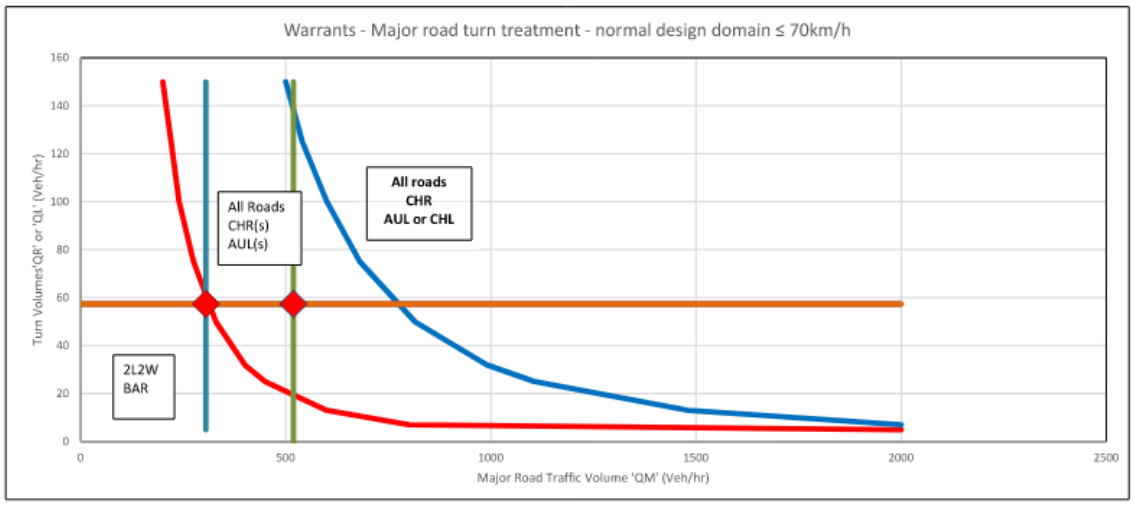


Figure 5-2 2036 PM Peak hr Assessment

5.1.2 Operation of Private Access and interface with parking facilities

The proposed layout provides good opportunity for vehicles wishing to access the site opportunity to exit Lionel Turner Drive and exit the site without restriction.

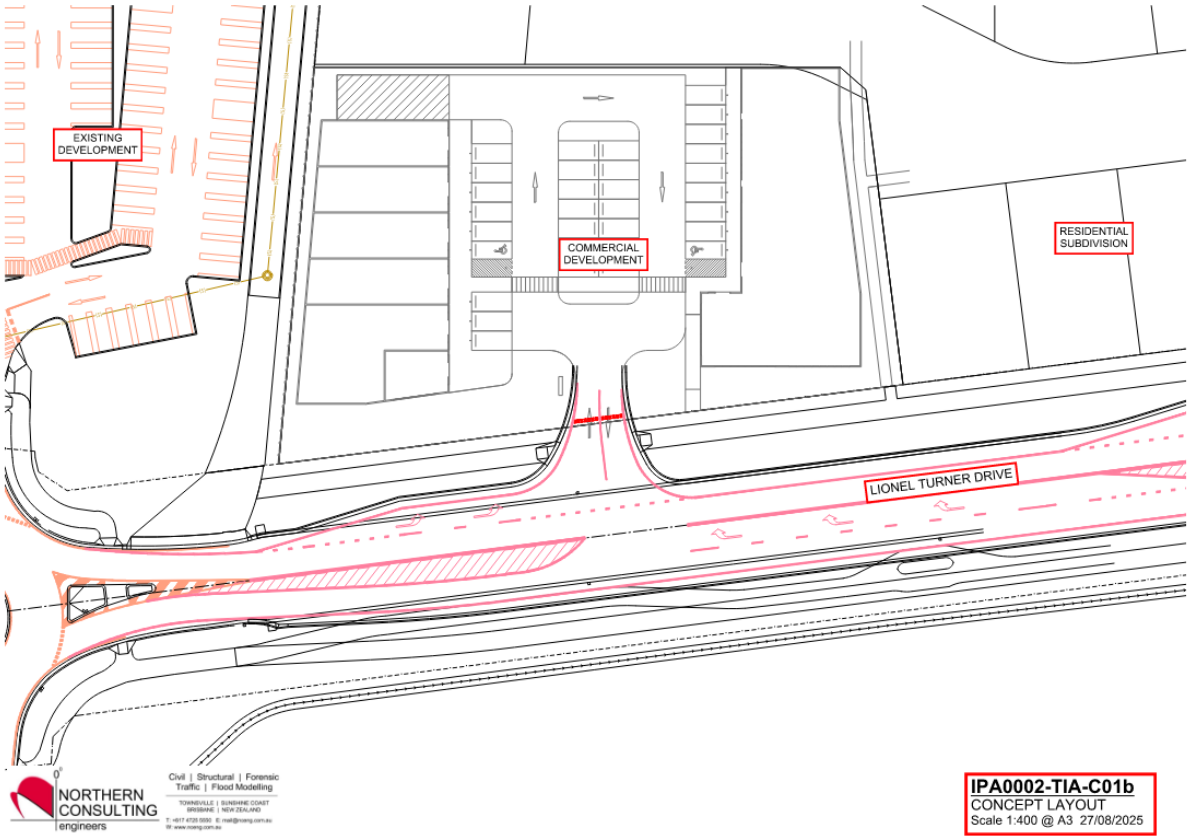


Figure 5-3 Development Site – Concept Layout

5.2 Off-Street Car Parking Facility (Compliance assessment against AS2890.1)

5.2.1 Compliance criteria assessed

- Clause 1.4 Classification of Off-Road car parking facilities
  - User Class 3A
- Clause 2.4 Design Parking Modules 90-degree Angled Parking
  - Angle parking space - 2.6m wide (compliant)
    - 5.4m long (compliant)
    - 6.2m aisle (compliant)
- Clause 2.4.5 Physical controls
  - 2.4.5.4 Wheel stops (compliant)
- Clause 2.5 Design of Circulation Roadways and ramps
  - Two-way roadways – 6.2m wide (compliant)

5.3 Off-Street Car Parking Facility for People with Disabilities (Compliance assessment against AS2890.6)

5.3.1 Compliance criteria assessed

- Clause 2.5 Parking spaces - Dimensions
  - Angle parking space - 2.4m wide (compliant)

- 5.4m long (compliant)
- 6.2m aisle (compliant)

- Shared area - 2.4m wide (compliant)
- 5.4m long (compliant)

5.4 Off-Street Commercial Vehicle Facilities (Compliance assessment against AS2890.2)

5.4.1 Compliance criteria assessed

- Clause 2.2 Description and Dimensions
  - (b) Medium rigid vehicle (MRV)
- Clause 3.3 Circulation Roadway – Table 3.1
  - Single lane - 6.2m wide (compliant)
  - Two-way lane – 6.9m wide (compliant)
- Clause 4.2 Dimensions of Service Bays – Table 4.1
  - MRV bay width – 6.0m wide (compliant)
  - MRV bay length – 15.0m long (compliant)

5.5 Road safety impact assessment (Prelim Design Phase)

5.5.1 Road safety audit – Outcomes

Lionel Turner Drive

- 2.1.2. Drainage
  - *The proposed widening of the carriageway may impact the slope of batters to table drains.*
  - *Recommendation to extend urban verge profile from Coles to Residential access intersection.*
  - *Review table slopes in other areas.*

- 2.5.2. Pedestrians
  - *Increase in pedestrian movements between the development and Peggy Banfield Park will be via footpath connections within the frontage of the development to the existing pedestrian crossing facilities within Lionel Turner Drive.*
  - *Limit pedestrian conflict locations to the safe existing locations.*

- 2.5.3. Cyclists
  - *Any increase in cycle activity will be managed through existing/new infrastructure (2.5m wide shared footpath on the northern and southern sides of Lionel Turner Drive.*

- 2.4 Intersections
  - *Inclusion of an All-movements intersection CHR(s) & AUL(s) to permit access to the development site off Lionel Tuner Drive has been accessed and adequate and suitable.*

5.5.2 Road Safety Risk Assessment Matrix

Table 5-1 Road Safety Risk Assessment

	Job Name: Job No:	Gallerria - Comercial Development			IPA0002C	Designer:			Northern Consulting Engineers		Client:	Swanland	Date:			19/05/2025
	Hazard	Project Life Cycle Stage	Risk	Control Hierarchy	Current Control Measures	Current Risk Rating			Potential Control Hierarchy	Proposed Control Measures	Who is Responsible?	By When	Residual Risk Rating			Are risks eliminated or reduced
						Consequence	Likelihood	Risk Rating					Consequence	Likelihood	Risk Rating	
1	**Changes in the Infrastructure Network**															
1.1	Existing table drain infrastructure within road frontage	Operations	Errant vehicle unable to regain control	Engineering	Batter grades, edge lines	Property Only	Unlikely	L	Eliminate	Remove table drain and modify verge to urban	Design team	Operational Works	Property Only	Very Unlikely (Rare)	L	Yes, removal of the hazard within development frontage.
1.2	Introduction of Commercial access to proposed development.	Operations	Risk of rear end collision due to slowing vehicles	Engineering	Nil	Medical Treatment	Likely	M	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Operational Works	Medical Treatment	Very Unlikely (Rare)	L	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
1.3	ExistingPower Pole near carrageway.	Operations	Risk of vehicle impact including injury to persons and property damage	Engineering	Clearance from through traffic	Hospitalisation	Possible	M	Maintain	Relocate Power Pole adequate clearanc distance from through traffic.	Design Team	Operational Works	Hospitalisation	Possible	M	Risk level Maintained
2	**Introduction or changes to pedestrian or cyclist desire liners**															
2.1	Potential for additional pedestrian traffic across Lionel Turner Drive.	Operations	Conflict between pedestrians and vehicles	engineering	Designated pedestrian crossing at roundabout.	Hospitalisation	Unlikely	M	Maintain	Designated pedestrian crossing at roundabout.	Design Team	Operational Works	Hospitalisation	Unlikely	M	Risk level increased slightly due to increase in probability (volume of pedestrians) potentially using the crossing.
4	**Changes in site operations that may have an external influence**															
4.1	Increased traffic through creation of a commercial development Increased conflicting movements	Operations	Vehicle collisions	Engineering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
6	**Increase in traffic volumes, including additional turn movements**															
6.1	Increased traffic through Lionel Turner Drive accessing the Development	Operations	Vehicle collisions through congestion	Engineering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
7	**Introducing an Access off an existing Roadway**															
7.1	Increase of vehicle to vehicle collisions form vehicles completing turn movements of Lionel Turner Drive.	Operations	Vehicle collisions	Engineering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
10	**Introduction of hours of operation outside daylight hours (including safetuy risk for pedestrians and cyclists)**															
10.1	Introduction of vehicle movements during dark/night times.	Operations	Vehicle collisions	Engineering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s) With V Category lighting.	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision. Improve visibility at night through inclusion of V Category lighting.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Summary of impacts and mitigation measures proposed

NCE have undertaken a traffic study for the proposed commercial development, at 10-32 Lionel Turner Drive, Bushland Beach. The findings of this assessment are summarised below:

- Private Access impact assessment and mitigation
    - Development Generated Traffic associated with the use of the proposed commercial development has been assessed and requires the installation of an All-movements intersection inclusive of a CHR(s) and AUL(s) to safety and efficiently move traffic in and out of the development.
    - Sufficient separation distance exists between the adjacent existing roundabout between Lionel Turner Drive and the Access to the nearby shopping centre to allow the construction of the proposed intersection with the recommended AUL(s).
    - Provision of connecting Shared pedestrian / bicycle facilities between the proposed development and existing shared facilities at the above-mentioned roundabout are recommended to facilitate the safe and efficient movement of Pedestrians and cyclists.
    - Utilisation of the existing pedestrian crossing facilities east and west of the development are recommended to limit the number of conflict points along Lionel Turner Drive.
    - An assessment of the on-site parking provisions against AS2890 concluded the proposed facility as detailed is compliant with all design aspects.

6.2 Certification statement and authorisation

A signed Traffic Impact Assessment Certification can be found in the appendices.

APPENDIX A

CPO ARCHITECTS – Site Plan Option - A
Drawings

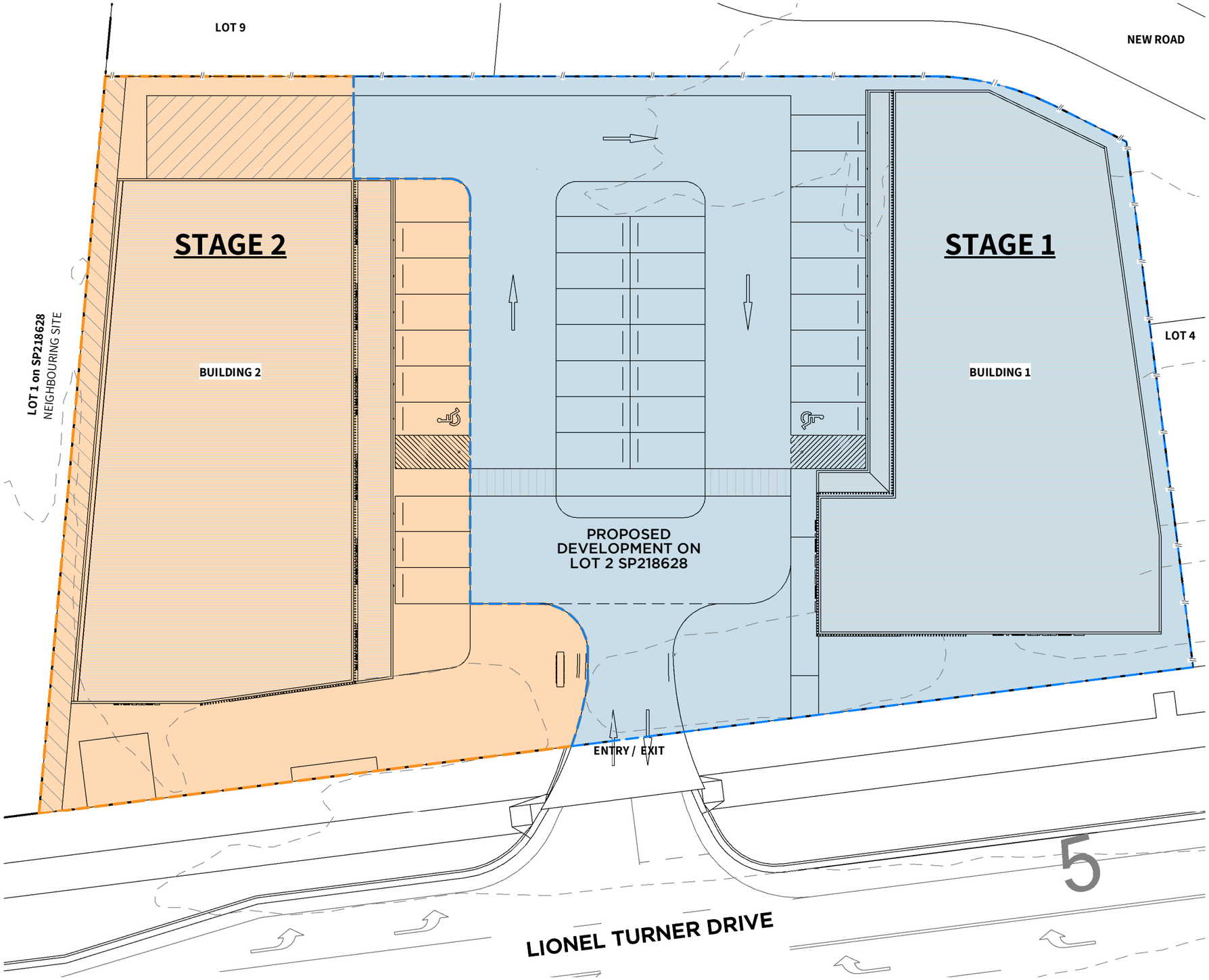
LIONEL TURNER DRIVE

BUSHLAND BEACH

CPO ARCHITECTS

legend

- STAGE 1
- STAGE 2



1 SITE PLAN
1 : 300 @ A3

CPO ARCHITECTS

SWANLAND GROUP

dwg no. DA-080
job no. 20240099
revision A

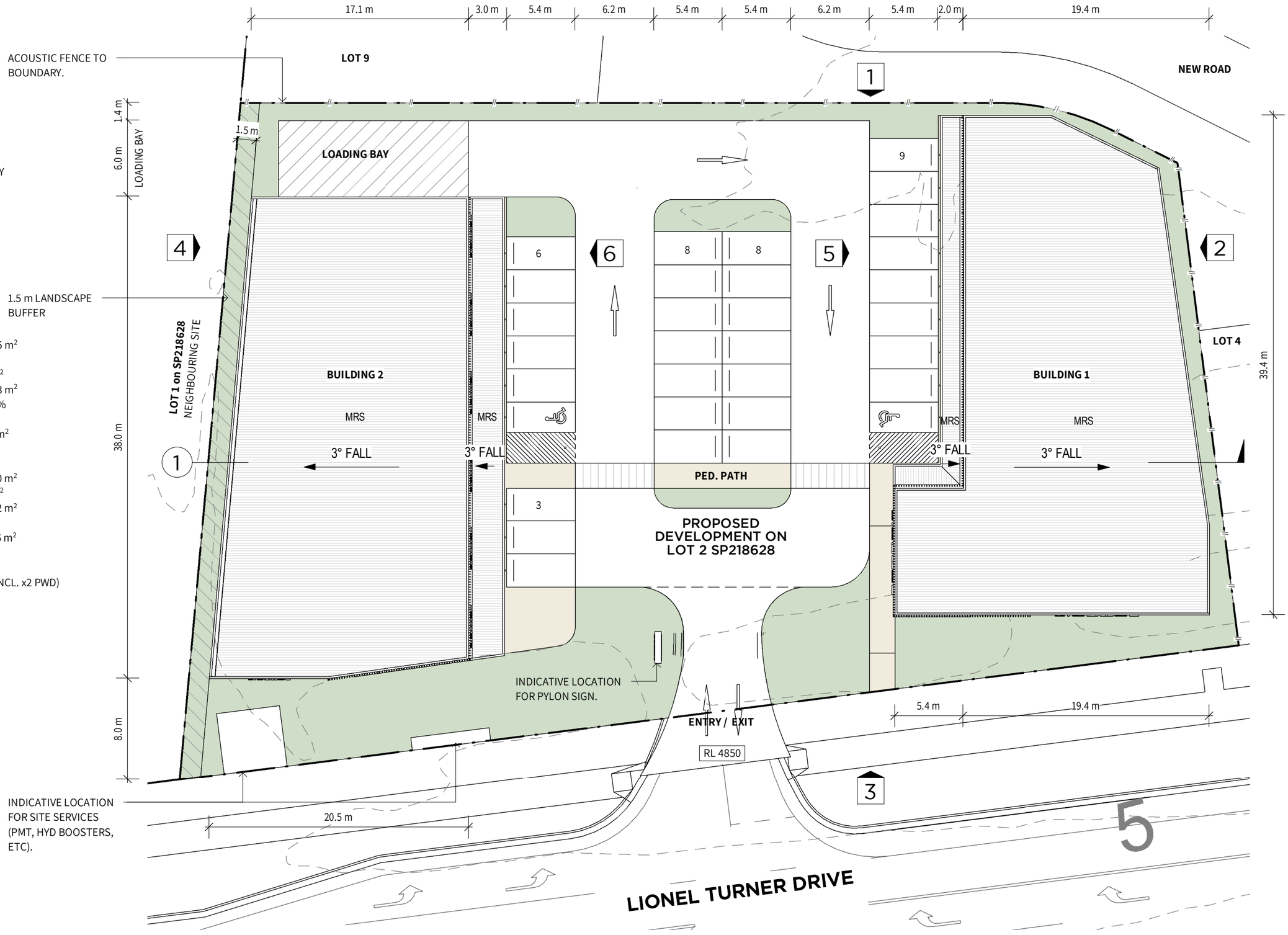
legend

- LANDSCAPING
- PEDESTRIAN PATH
- COMMERCIAL / RETAIL TENANCY
- CAFE TENANCY
- ACOUSTIC FENCE

development data

LOT 2 SP218628

SITE DATA	
TOTAL SITE AREA	3,735 m²
NON-DEVELOPABLE AREA	
- LANDSCAPE BUFFER	82 m²
NET SITE AREA	3,653 m²
NET SITE EFFICIENCY	39.2%
LANDSCAPING	771 m²
AREAS (GFA)	
COMMERCIAL	1,380 m²
FOOD OUTLET	52 m²
TOTAL GFA	1,432 m²
LIGHT-DUTY PAVEMENT	1,316 m²
CARPARKING	
TOTAL PROVIDED	32 (INCL. x2 PWD)
LOADING BAY	1



1 SITE PLAN
1 : 300 @ A3

CPO ARCHITECTS

SWANLAND GROUP

dwg no. DA-090
job no. 20240099

revision C

legend

- LANDSCAPING
- PEDESTRIAN PATH
- COMMERCIAL / RETAIL TENANCY
- CAFE TENANCY
- ACOUSTIC FENCE

development data

LOT 2 SP218628

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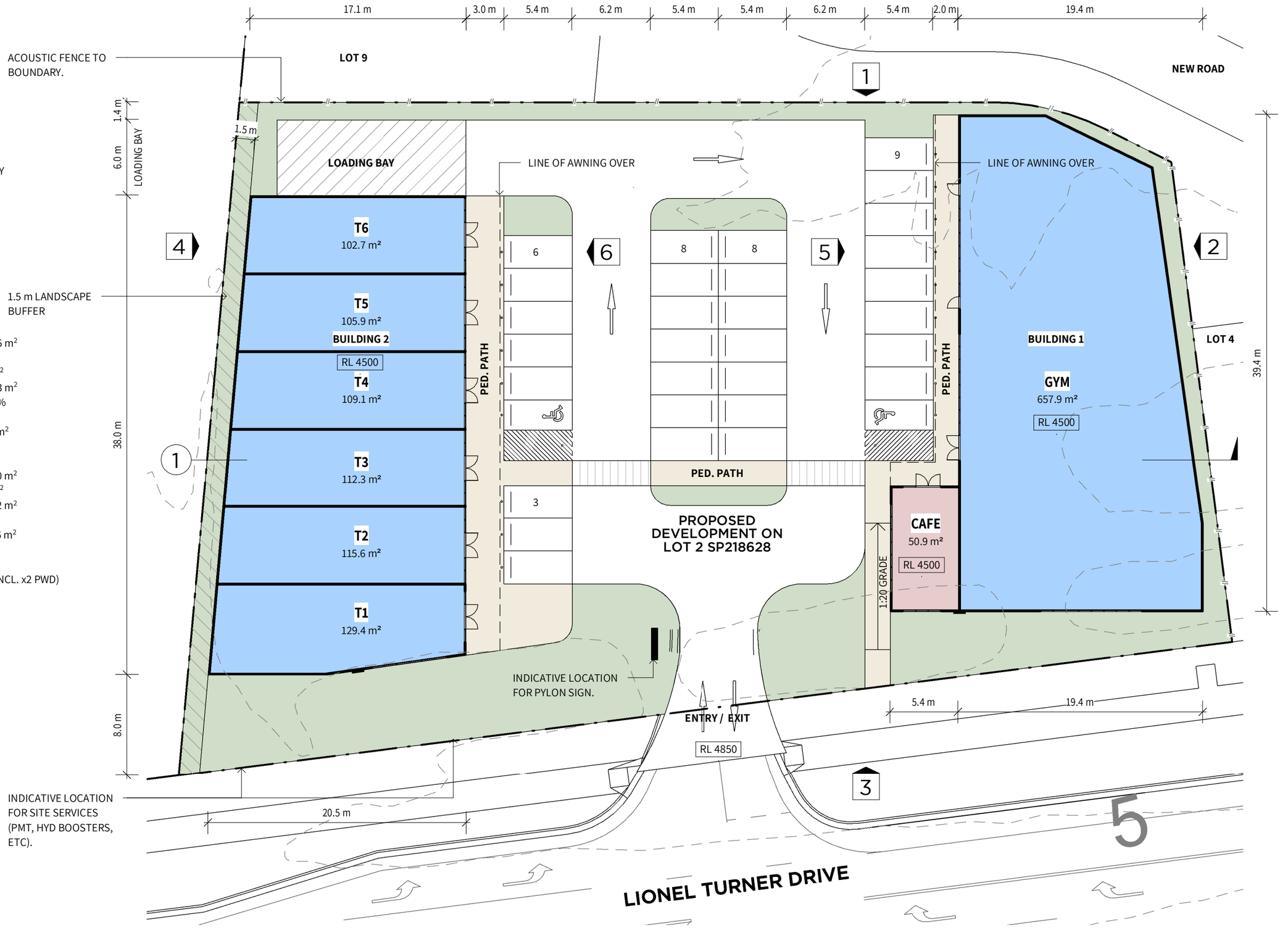


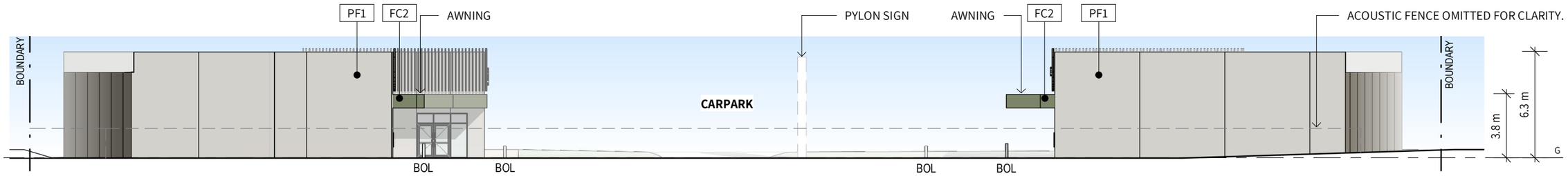
1 GROUND PLAN
1 : 300 @ A3

CPO ARCHITECTS

SWANLAND GROUP

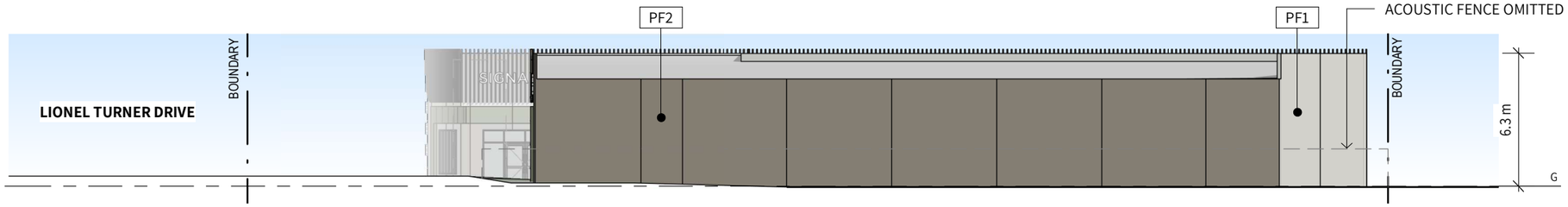
dwg no. DA-100
job no. 20240099

revision C



1 SITE ELEVATION A

1 : 250 @ A3



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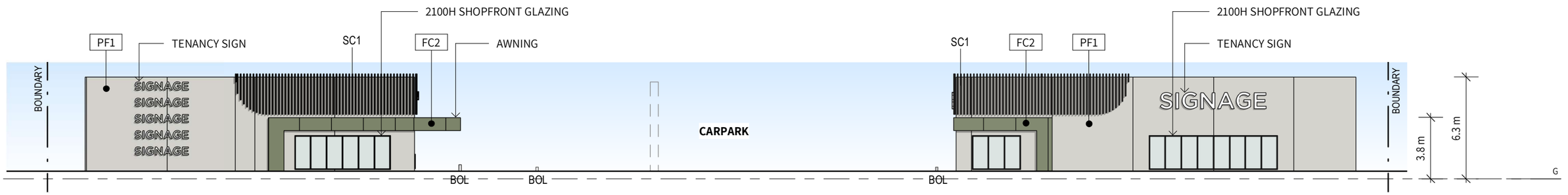

3 SITE ELEVATION C

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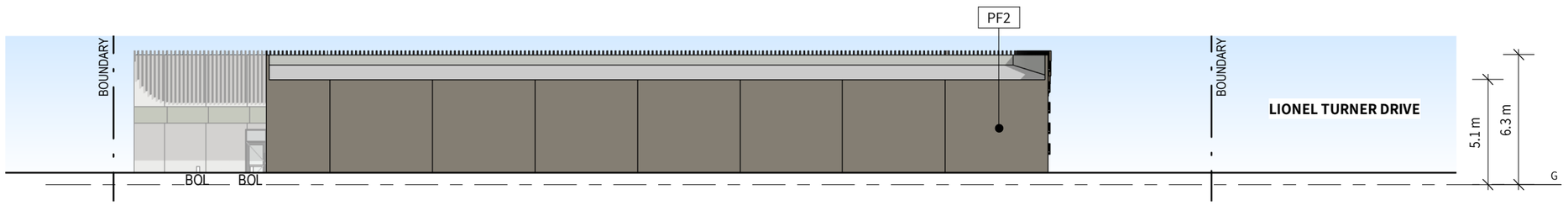


4 SITE ELEVATION D

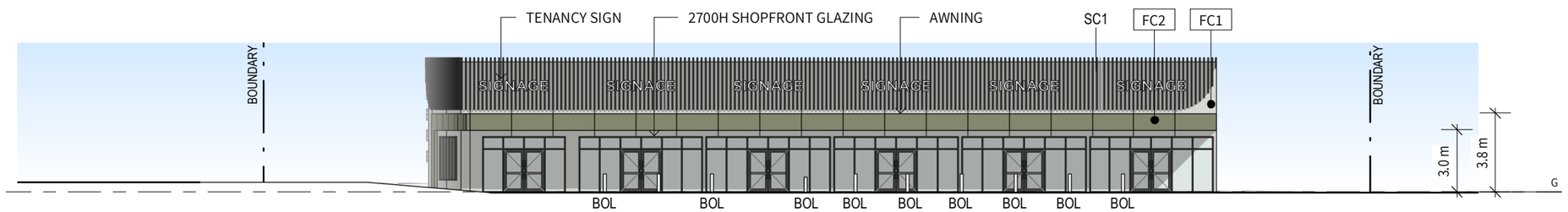
1 : 250 @ A3

legend

FC1	FEATURE CLADDING - TYPE 1
FC2	FEATURE CLADDING - TYPE 2
PF1	CONCRETE TILT PANEL - PAINT FINISH TYPE 1
PF2	CONCRETE TILT PANEL - PAINT FINISH TYPE 2
MRS	METAL ROOF SHEETING
SC1	VERTICAL SCREEN BATTEN

5 INTERNAL SITE ELEVATION A

1 : 250 @ A3

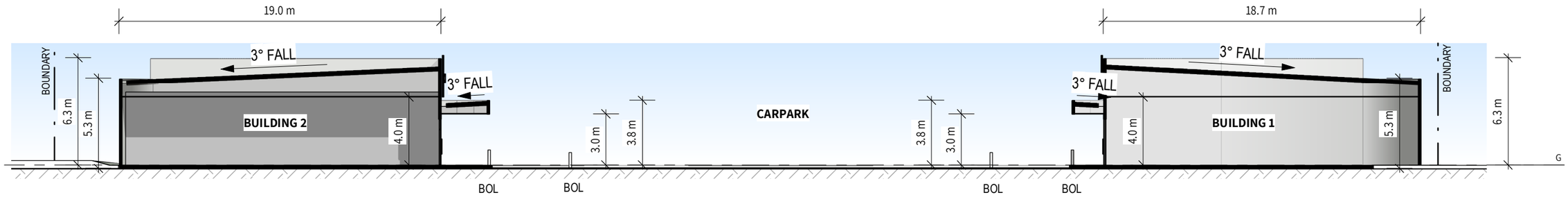


6 INTERNAL SITE ELEVATION B

1 : 250 @ A3

legend

FC1	FEATURE CLADDING - TYPE 1
FC2	FEATURE CLADDING - TYPE 2
PF1	CONCRETE TILT PANEL - PAINT FINISH TYPE 1
PF2	CONCRETE TILT PANEL - PAINT FINISH TYPE 2
MRS	METAL ROOF SHEETING
SC1	VERTICAL SCREEN BATTEN



1 SECTION A

1 : 250 @ A3

CPO ARCHITECTS

SWANLAND GROUP

dwg no. DA-400
job no. 20240099

revision C

VIEW FROM LIONEL TURNER DRIVE

CPO ARCHITECTS

SWANLAND GROUP

dwg no. DA-450
job no. 20240099

revision C

VIEW FROM LIONEL TURNER DRIVE

VIEW FROM LIONEL TURNER DRIVE

VIEW TOWARDS CAFE AND RETAIL

CPO ARCHITECTS

SWANLAND GROUP

dwg no. DA-453
job no. 20240099

revision C

VIEW TOWARDS GYM

GYM FRONT ELEVATION

CPO ARCHITECTS

SWANLAND GROUP

dwg no. DA-455
job no. 20240099

revision C

CAFE AND RETAIL FRONT ELEVATION

CPO ARCHITECTS

SWANLAND GROUP

dwg no. DA-456
job no. 20240099

revision B

APPENDIX B

Northern Consulting Engineers – Traffic Drawings

EXISTING DEVELOPMENT

COMMERCIAL DEVELOPMENT

RESIDENTIAL SUBDIVISION

LIONEL TURNER DRIVE

NORTHERN CONSULTING engineers

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Traffic | Flood Modelling

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BRISBANE | NEW ZEALAND

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W: www.nceng.com.au

IPA0002-TIA-C01b
CONCEPT LAYOUT
Scale 1:400 @ A3 27/08/2025

EXISTING DEVELOPMENT

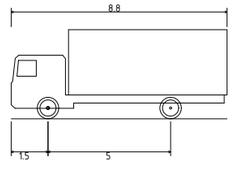
COMMERCIAL DEVELOPMENT

RESIDENTIAL SUBDIVISION

LIONEL TURNER DRIVE

MRV - Medium Rigid Vehicle

MRV - Medium Rigid Vehicle



MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	10.000m

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IPA0002-TIA-C02b

RETAIL ACCESS
VEHICLE MOVEMENTS
Scale 1:400 @ A3 27/08/2025

EXISTING DEVELOPMENT

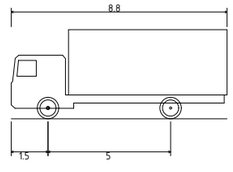
COMMERCIAL DEVELOPMENT

RESIDENTIAL SUBDIVISION

LIONEL TURNER DRIVE

MRV - Medium Rigid Vehicle

MRV - Medium Rigid Vehicle



MRV - Medium Rigid Vehicle

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Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	10.000m

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IPA0002-TIA-C03b

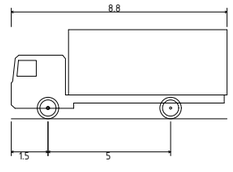
RETAIL ACCESS
VEHICLE MOVEMENTS
Scale 1:400 @ A3 27/08/2025

EXISTING DEVELOPMENT

COMMERCIAL DEVELOPMENT

RESIDENTIAL SUBDIVISION

LIONEL TURNER DRIVE



MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	10.000m

NORTHERN CONSULTING engineers

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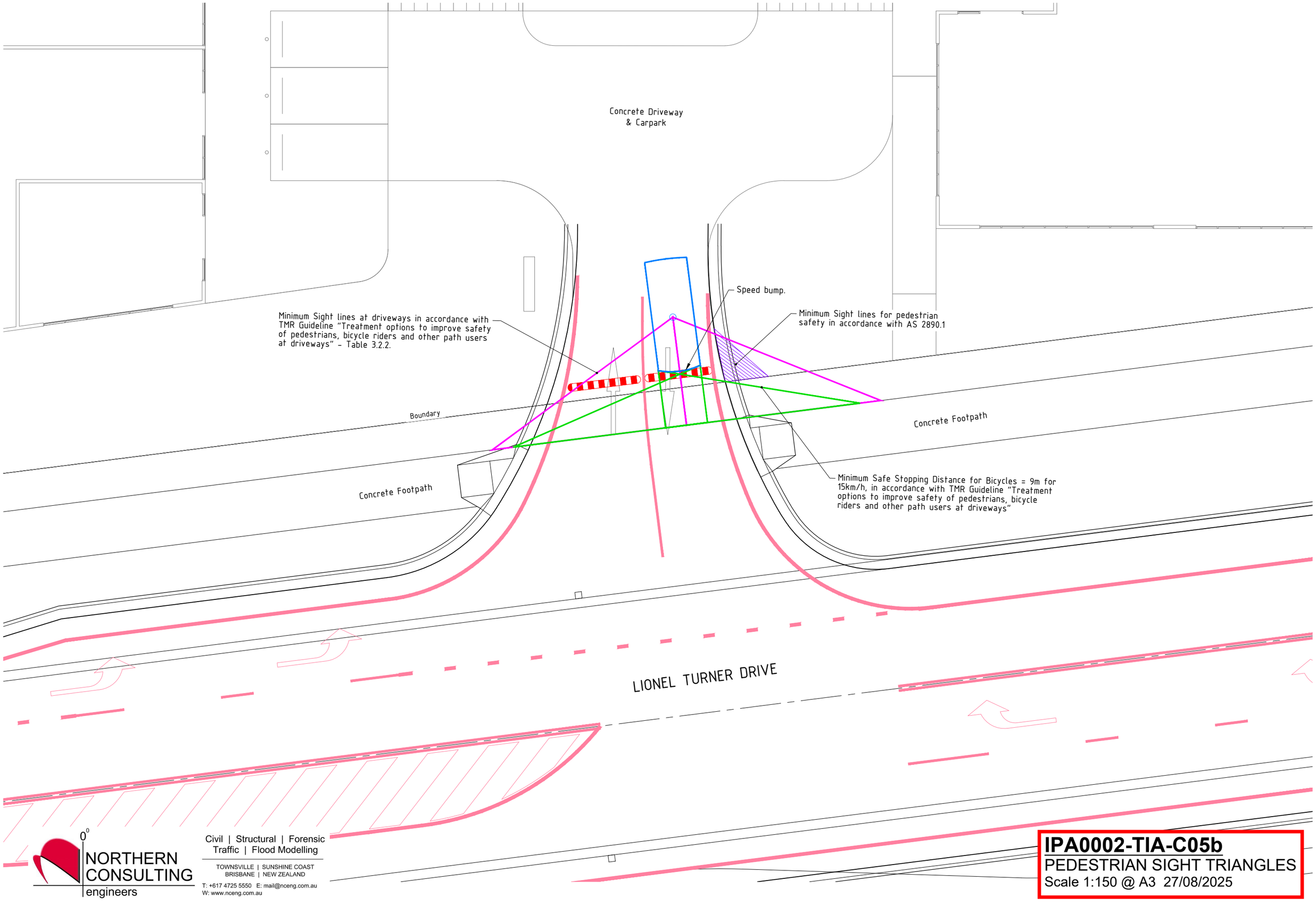
RETAIL ACCESS
VEHICLE MOVEMENTS
Scale 1:400 @ A3 27/08/2025



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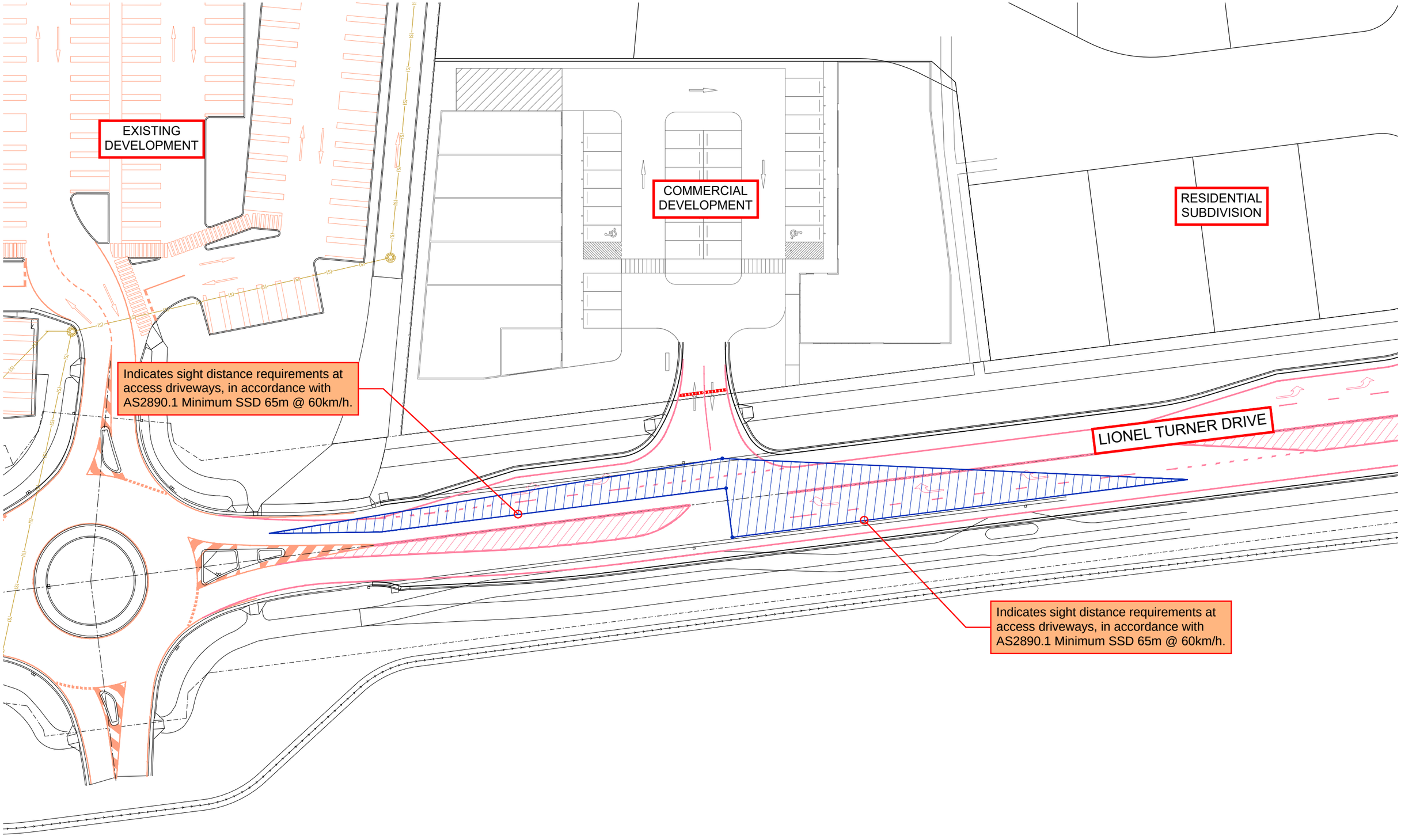
IPA0002-TIA-C05b

PEDESTRIAN SIGHT TRIANGLES

Scale 1:150 @ A3 27/08/2025



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IPA0002-TIA-C06b
SIGHT DISTANCE AS2890
Scale 1:500 @ A3 27/08/2025

APPENDIX C

Northern Consulting Engineers – Miscellaneous Figures

Townsville City Council

TCC Zone Map

Legend

EXT_CORE

CORE - Properties

Properties

CORE - Road Corridor Centreline

Secondary Road

Trafficable Road

CORE - Suburbs

Suburbs

EXT_CityPlanningScheme_Current

Zoning

Low density residential

Local centre

Sport and recreation

Open space

0 50 100

m

Scale 1: 5733

City of Townsville

Townsville City Council Planning Scheme Infrastructure

HINCHINBROOK SHIRE COUNCIL

CHARTERS TOWERS REGIONAL COUNCIL

BURDEKIN SHIRE COUNCIL

CORAL SEA

Halifax Bay

Cleveland Bay

Bowling Green Bay

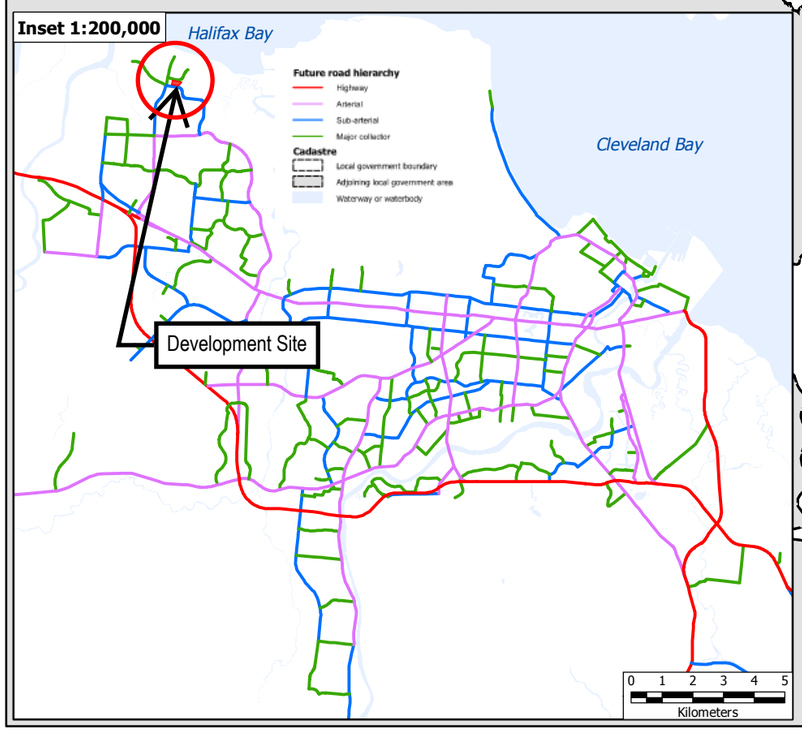
Lake Ross

See Inset

Future road hierarchy
- Highway
- Arterial
- Sub-arterial
- Major collector

Cadastre
- Local government boundary
- Adjoining local government area
- Waterway or waterbody

Inset 1:200,000



Road hierarchy data was supplied by the planning and development division of the Townsville city council.
This data is to be used as a guide only for planning purposes.

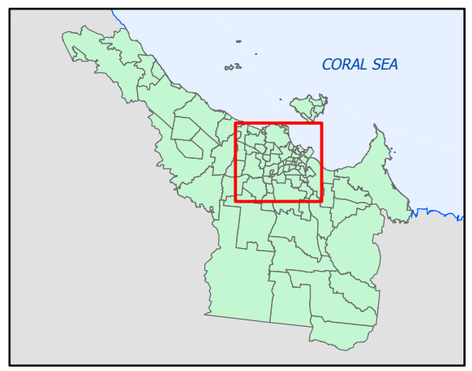
While every care is taken to ensure the accuracy of this product, Townsville City Council makes no representations or warranties about the accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs you may incur as a result of the product being inaccurate or incomplete in any way or for any reason.

Gazettal Date: 27/10/2014

Geocentric Datum of Australia 1994 (GDA94)

Approx Scale @ A3 1:350,000

0 2 4 8 12 16 20
Kilometres




1677780282
Details
FID
4316
id
1677780282
% Heavy Vehicles
7.81
AADT (vpd)
1627
AM Peak Hourly Volume (vph)
51
PM Peak Hourly Volume (vph)
288
AM Peak Speed (km/h)
34.898
PM Peak Speed (km/h)
34.277
Shape
N/A
Shape.STLength()
931.1949
Blank
Townsville City Council | TownsvilleCityCouncil


1677780281
Details
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4554
id
1677780281
% Heavy Vehicles
8.21
AADT (vpd)
1194
AM Peak Hourly Volume (vph)
222
PM Peak Hourly Volume (vph)
156
AM Peak Speed (km/h)
34.49
PM Peak Speed (km/h)
34.661
Shape
N/A
Shape.STLength()
931.7865
Blank
Townsville City Council | TownsvilleCityCouncil


1677780282
Details
FID
4555
id
1677780282
% Heavy Vehicles
7.6
AADT (vpd)
1790
AM Peak Hourly Volume (vph)
59
PM Peak Hourly Volume (vph)
305
AM Peak Speed (km/h)
34.876
PM Peak Speed (km/h)
34.214
Shape
N/A
Shape.STLength()
931.1949
Blank
Townsville City Council | TownsvilleCityCouncil


1677780281
Details
FID
4315
id
1677780281
% Heavy Vehicles
8.57
AADT (vpd)
1074
AM Peak Hourly Volume (vph)
191
PM Peak Hourly Volume (vph)
153
AM Peak Speed (km/h)
34.575
PM Peak Speed (km/h)
34.661
Shape
N/A
Shape.STLength()
931.7865
Blank
Townsville City Council | TownsvilleCityCouncil

Townsville bus routes

Effective March 2024

200	Breakwater ferry terminal to Kelso via Townsville City bus hub, Townsville SC and Willows
201	Breakwater ferry terminal to JCU via Townsville City bus hub, Townsville SC and Hospital
202	Townsville City bus hub to Townsville Hospital, James Cook University (JCU)
203	Townsville City bus hub to Kirwan via Mater Hospital, Townsville SC and Willows
204	Townsville City bus hub to Townsville SC via Mt Louisa
205	Townsville City bus hub to Townsville SC via Garbutt
206	Townsville City bus hub to Pallarenda via Breakwater ferry terminal and Rowes Bay
207	Townsville City bus hub to Stuart via Fairfield Waters Dr
208	Townsville City bus hub to Willows via Railway Estate and Hospital/JCU
209	Townsville City bus hub to Hospital/University/Townsville SC via Wulguru
210	Willows to Hospital and University via Carlysle Gardens
211	Willows Shopping Centre to Bohle Plains (Kalynda Chase)
212	Willows Shopping Centre to Shaw via Mt Louisa
215	Townsville City bus hub to Townsville SC via Garbutt and Domain
232	Townsville SC to Burdell
233	Townsville SC to Bushland Beach via Deeragun and Jensen
250	Magnetic Island ferry terminal to Picnic Bay and Horseshoe Bay

Townsville SC = Townsville Shopping Centre at Aitkenvale

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Queensland Government

Northern Consulting Engineers Project Number	IPA0002C
Project Description	10-32 Lionel Turner Drive
Traffic Survey or Construction Commencement Year	2036
Commencement of Use Year	2026
Projected 10 year design horizon	2036
Figure 2.27 (Left Approach)	Lionel Turner Drive
Figure 2.27 (Right Approach)	Lionel Turner Drive
Figure 2.27 (Bottom Approach)	Development Access
Background Growth Factor	0%
Peak Hour Factor (12% Urban / 16% Rural)	12%

Site Information	
Food and Drink Outlet	**GLFA**
10-32 Lionel Turner Drive	52.5
Gym Tenancy	**GFLA**
10-32 Lionel Turner Drive	627
Commercial retail	**GFLA**
10-32 Lionel Turner Drive	671

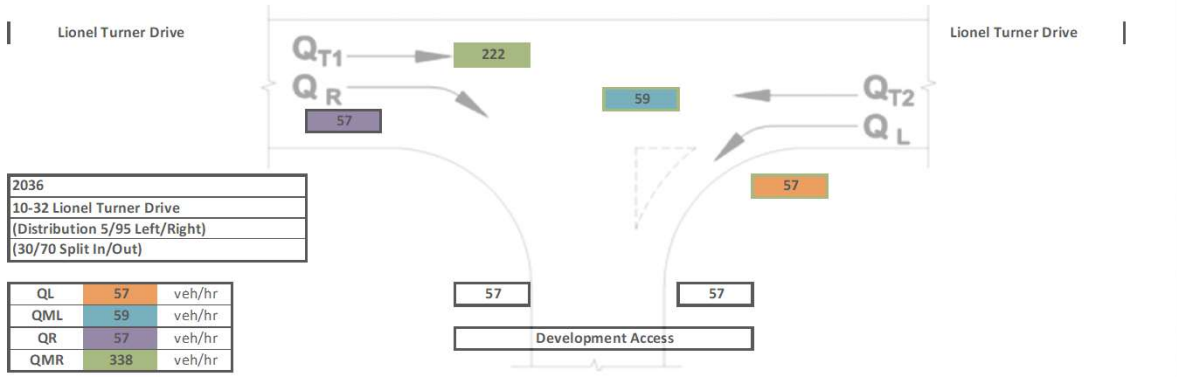
QLD Open Portal (Fast Food with Driveway)	**Vehicle Trips / GLFA**	**Predicted Traffic Volumes**
Average Weekday	5.92	**311**
Average Weekend	3.39	**178**
Weekday Peak hour	0.63	**33**
Weekend Peak hour	0.63	**33**

NSW 2024 - Guide to Transport Impact Assessment TS 00085 V1.1 (Fitness Centre - 2014)	**Vehicle Trips / per 100m^2 GLFA**	**Predicted Traffic Volumes**
Evening Peak (Weekday)	3.6	**23**
Evening Peak (Weekend)	2.9	**18**
Daily trips	16.9	**106**

NSW 2024 - Guide to Transport Impact Assessment TS 00085 V1.1 (Small Shopping Centre - 2018)	**Vehicle Trips / per m^2 GLFA**	**Predicted Traffic Volumes**
AM Peak (Weekday)	0.192	**129**
PM Peak (Weekday)	0.259	**174**
Daily trips (Weekday)	2.022	**1357**
Peak (Weekend)	0.283	**190**
PM Peak (Weekend)		**0**
Daily trips (Weekend)	1.894	**1271**

(Development Traffic)	**Approach Traffic (Peak Hour)**	Public Transport Factor (100%)
Total Weekday peak hour	**229**	100%
Total Weekend peak hour	**241**	100%

Figure 2.27: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	$= Q_{T1} + Q_{T2} + Q_L$
		Yes	$= Q_{T1} + Q_{T2}$
	Left	Yes or no	$= Q_{T2}$

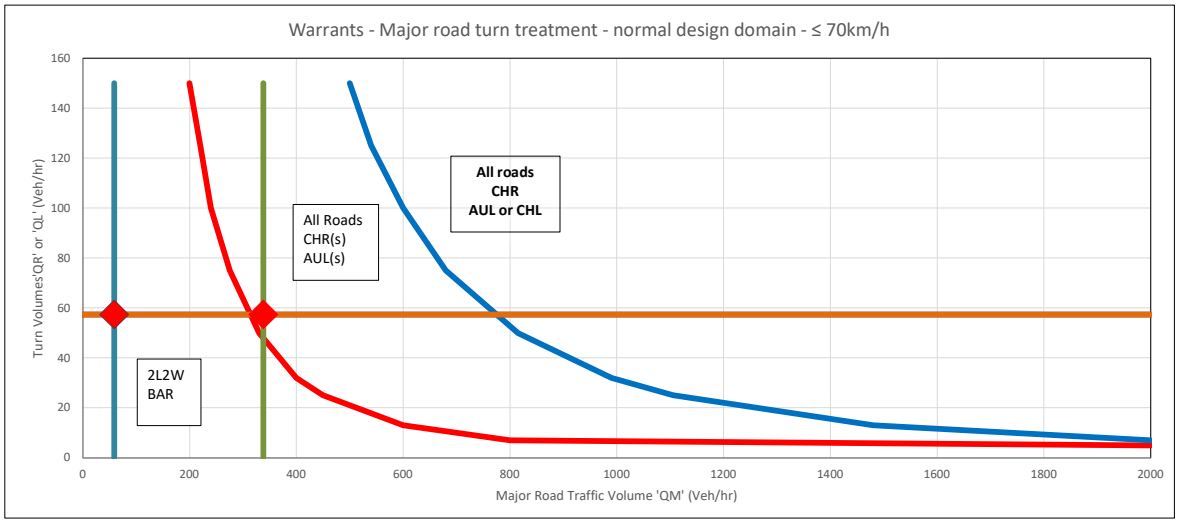
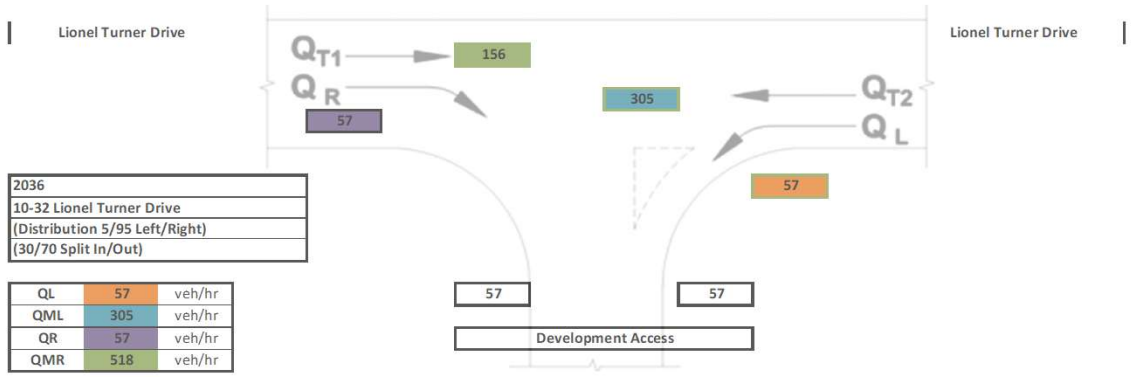
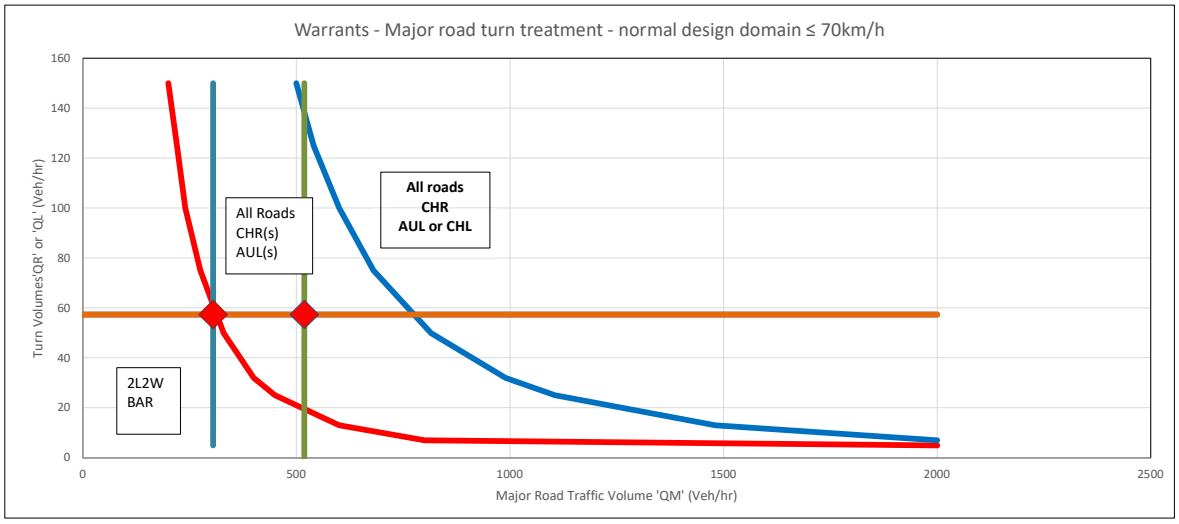


Figure 2.27: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	= Q_{T1} + Q_{T2} + Q_L
		Yes	= Q_{T1} + Q_{T2}
	Left	Yes or no	= Q_{T2}



APPENDIX D

Northern Consulting Engineers – Existing Road Safety Audit Spreadsheets

	Job Name: Job No:	Gallerria - Comercial Development			IPA0002C	Designer:			Northern Consulting Engineers		Client:	Swanland	Date:			19/05/2025
	Hazard	Project Life Cycle Stage	Risk	Control Hierarchy	Current Control Measures	Current Risk Rating			Potential Control Hierarchy	Proposed Control Measures	Who is Responsible?	By When	Residual Risk Rating			Are risks eliminated or reduced
						Consequence	Likelihood	Risk Rating					Consequence	Likelihood	Risk Rating	
1	**Changes in the Infrastructure Network**															
1.1	Existing table drain infrastructure within road frontage	Operations	Errant vehicle unable to regain control	Engineering	Batter grades, edge lines	Property Only	Unlikely	L	Eliminate	Remove table drain and modifiy verge to urben	Design team	Operational Works	Property Only	Very Unlikely (Rare)	L	Yes, removal of the hazard within development frontage.
1.2	Introduction of Commercial access to proposed development.	Operations	Risk of rear end collision due to slowing vehicles	Engineering	Nil	Medical Treatment	Likely	M	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Operational Works	Medical Treatment	Very Unlikely (Rare)	L	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
1.3	ExistingPower Pole near carraigeway.	Operations	Risk of vehicle impact including injury to persons and property damage	Engieering	Clearance from through traffic	Hospitalisation	Possible	M	Maintain	Relocate Power Pole adequate clearanc distance from through traffic.	Design Team	Operational Works	Hospitalisation	Possible	M	Risk level Maintained
2	**Introduction or changes to pedestrian or cyclist desire liners**															
2.1	Potential for additional pedestrian traffic across Lionel Tuner Drive.	Operations	Conflict between pedestrians and vehciles	engineering	Desginated pedestrian crossing at roundabout.	Hospitalisation	Unlikely	M	Maintain	Desginated pedestrian crossing at roundabout.	Design Team	Operational Works	Hospitalisation	Unlikely	M	Risk level increased slightly due to increase in probability (volume of pedestrians) potentially using the crossing.
4	**Changes in site operations that may have an external influence**															
4.1	Increased traffic through creation of a commrcial development Increased conflicting movements	Operations	Vehicle collisions	Engineering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
6	**Increase in traffic volumes, including additional turn movements**															
6.1	Increased traffic through Lionel Turner Drive accessing the Development	Operations	Vehicle collisions through congestion	Engienering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
7	**Introducing an Access off an existing Roadway**															
7.1	Increase of vehicle to vehcile collisions form vehciles completing turn movements of Lionel Turner Drive	Operations	Vehicle collisions	Engienering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s)	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision.
10	**Introduction of hours of operation outside daylight hours (including safetuy risk for pedestrians and cyclists)**															
10.1	Introduction of vehcile movements during dark/night times.	Operations	Vehicle collisions	Engienering	Nil	Property Only	Very Unlikely (Rare)	L	Engineering	All movements Intersection (CHR(s) and AUL(s) With V Category lighting.	Design team	Prior to OPW Approval	Medical Treatment	Unlikely	M	New hazard introduces into road syste. Limit risk as far as possible by including CHR(s) and AUL(s) to avoid rear end collision. Improve visibility at night through inclusion of V Category lighting.

CHECKLIST 2: PRELIMINARY DESIGN STAGE AUDIT

Issue	Yes	No	Comment
2.1 General topics			
2.1.1 Changes since previous audit			
Do the conditions for which the scheme was originally designed still apply? (for example, no changes to the surrounding network, area activities or traffic mix)	☐	☑	New Development Proposal
Has the general form of the project design remained unchanged since previous audit (if any)?	☐	☑	New development Proposal
2.1.2 Drainage			
Will the scheme drain adequately?	☑	☐	Development to drain northward toward the existing drainage reserve.
Has the possibility of surface flooding been adequately addressed, including overflow from surrounding or intersecting drains and water courses?	☑	☐	Table drain design within Lionel Turner Drive will need to be adjusted to accomdate the proposed access. Table Drain along frontage to be removed changed to urban profile.
2.1.3 Climatic conditions			
Has consideration been given to weather records or local experience that may indicate a particular problem? (for example, snow, ice, wind, fog)	☑	☐	N/A
2.1.4 Landscaping			
If any landscaping proposals are available, are they compatible with safety requirements? (for example, sight lines and hazards in clear zones)	☑	☐	Landscaping to be contained within development footprint.
2.1.5 Services			
Does the design adequately deal with buried and overhead services? (especially in regard to overhead clearances, etc)	☑	☐	
Has the location of fixed objects or furniture associated with services been checked, including the position of poles?	☑	☐	Alterations to existing Ergon Energy Infrastructure will be required as part of the development.
2.1.6 Access to property and developments			
Can all accesses be used safely? (entry and exit/merging)	☑	☐	Establishment of a suitabe intersection configuration.
Is the design free of any downstream or upstream effects from points of access, particularly near intersections?	☐	☑	Nearby roundabout access to Peggy Banfield Park / Coles Supermarket is nearby. Installation of an AUL(s) is acheivable.
Have rest areas and truck parking accesses been checked for adequate sight distance, etc.?	☐	☑	N/A
2.1.7 Adjacent developments			
Does the design handle accesses to major adjacent generators of traffic and developments safely?	☑	☐	Assessment of impacts to adjacent roundabout has been considered. (Beggy Banfield Park / Coles/supermarket)

Issue	Yes	No	Comment
Is the driver's perception of the road ahead free of misleading effects of any lighting or traffic signals on an adjacent road?	☑	☐	
2.1.8 Emergency vehicles and access			
Has provision been made for safe access and movements by emergency vehicles?	☑	☐	
Does the design and positioning of medians and vehicle barriers allow emergency vehicles to stop and turn without unnecessarily disrupting traffic?	☑	☐	
2.1.9 Future widening and/or realignments			

If the scheme is only a stage towards a wider or dual carriageway is the design adequate to impart this message to drivers? (is the reliance on signs minimal/appropriate, rather than excessive?)	☐	☐	N/A
Is the transition between single and dual carriageway (either way) handled safely?	☑	☐	
2.1.10 Staging of the scheme			
If the scheme is to be staged or constructed at different times: are the construction plans and program arranged to ensure maximum safety? do the construction plans and program include specific safety measures, signing; adequate transitional geometry, etc. for any temporary arrangements?	☐ ☐	☐ ☐	N/A
2.1.11 Staging of the works			
If the construction is to be split into several contracts, are they arranged safely?	☐	☐	N/A
2.1.12 Maintenance			
Can maintenance vehicles be safely located?	☑	☐	
2.2 Design issues (general)			
2.2.1 Design standards			
Is the design speed and speed limit appropriate? (for example, consider the terrain, function of the road)	☑	☐	
Has the appropriate design vehicle and check vehicle been used?	☑	☐	MHRV

Issue	Yes	No	Comment
2.2.2 Typical cross-sections			
Are lane widths, shoulders, medians and other crosssection features adequate for the function of the road?	☑	☐	
Is the width of traffic lanes and carriageway suitable in relation to: alignment? traffic volume? vehicle dimensions? the speed environment? combinations of speed and traffic volume?	 ☑ ☑ ☑ ☑ ☑	 ☐ ☐ ☐ ☐ ☐	
Are overtaking/climbing lanes provided if needed?	☐	☐	N/A
Have adequate clear zones been achieved?	☑	☐	
2.2.3 The effect of cross-sectional variation			
Is the design free of undesirable variations in cross-section design?	☐	☐	
Are crossfalls safe? (particularly where sections of existing highway have been used or there have been compromises to accommodate accesses, etc.)	☐	☐	
Does the cross-section avoid unsafe compromises such as narrowings at bridge approaches or past physical features?	☐	☐	
2.2.4 Roadway layout			
Are all traffic management features designed to avoid creating unsafe conditions?	☑	☐	
Is the layout of road markings and reflective materials able to deal satisfactorily with changes in alignment? (particularly where the alignment may be substandard)	☑	☐	
2.2.5 Shoulders and edge treatment			

Are the following safety aspects of shoulder provision satisfactory:	☑	☐	Potential for Urban profile
provision of sealed or unsealed shoulders			
width and treatment on embankments	☑	☐	
crossfalls all of shoulders	☑	☐	
Are the shoulders likely to be safe if used by slow moving vehicles or cyclists?	☐	☑	
Are any rest areas and truck parking areas safely designed?	☐	☐	N/A

Issue	Yes	No	Comment
2.2.6 Effect of departures from standards or guidelines			
Any approved departures from standards or guidelines: is safety maintained?	☐	☐	N/A
Any hitherto undetected departures from standards: is safety maintained?	☐	☐	N/A
2.3 Alignment details			
2.3.1 Geometry of horizontal and vertical alignment			
Do the horizontal and vertical design fit together correctly?	☑	☐	
Is the design free of visual cues that would cause a driver to misread the road characteristics? (for example, visual illusions, subliminal delineation such as lines of trees, poles, etc.)	☑	☐	
Does the alignment provide for speed consistency?	☑	☐	
2.3.2 Visibility; sight distance			
Are horizontal and vertical alignments consistent with the visibility requirements?	☑	☐	
Will the design be free of sight line obstructions due to safety fences or barriers?			
boundary fences?	☑	☐	
street furniture?	☑	☐	
parking facilities?	☑	☐	
signs?	☑	☐	
landscaping?	☑	☐	
bridge abutments?	☑		
parked vehicles in laybys or at the kerb?	☑	☐	
queued traffic?	☑	☐	
Are railway crossings, bridges and other hazards all conspicuous?	☐	☐	N/A
Is the design free of any other local features which may affect visibility?	☑	☐	
2.3.3 New/existing road interface			
Does the interface occur well away from any hazard? (for example, a crest, a bend, a roadside hazard or where poor visibility/distractions may occur)	☐	☑	Nearby roundabout has been assessed and considered safe
If carriageway standards differ, is the change effected safely?	☑	☐	Urban profile adopted to eliminate excessive batter slopes.

Issue	Yes	No	Comment
Is the transition where the road environment changes (for example, urban to rural; restricted to unrestricted; lit to unlit) done safely?	☑	☐	
Has the need for advance warning been considered?	☐	☑	Extenstion of an Urban profile.

2.3.4 Readability of the alignment by drivers			
Will the general layout, function and broad features be recognised by drivers in sufficient time?	☑	☐	
Will approach speeds be suitable and can drivers correctly track through the scheme?	☑	☐	
2.4 Intersections			
2.4.1 Visibility to and at intersections			
Are horizontal and vertical alignments at the intersection or on the approaches to the intersection consistent with the visibility requirements?	☑	☐	
Will drivers be aware of the presence of the intersection? (especially on the minor road approach)	☑	☐	
Will the design be free of sight line obstructions due to:			
safety fences or barriers?	☑	☐	
boundary fences?	☑	☐	
street furniture?	☑		
parking facilities?	☑	☐	
signs?	☑	☐	
landscaping?	☑	☐	
bridge abutments?	☑	☐	
Are railway crossings, bridges and other hazards near intersections conspicuous?	☐	☐	N/A
Will the design be free of any local features which adversely affect visibility?	☑	☐	
Will intersection sight lines be obstructed by permanent or temporary features such as parked vehicles in laybys, or by parked or queued traffic generally?	☐	☑	
2.4.2 Layout, includes its appropriateness			
Is the type of intersection selected (cross roads, T, roundabout, signalised, etc.) appropriate for the function of the two roads?	☑	☐	
Are the proposed controls (Give Way, Stop signals, etc.) appropriate for the particular intersection?	☑	☐	
Are junction sizes appropriate for all vehicle movements?	☑	☐	

Issue	Yes	No	Comment
Are the intersections free of any unusual features which could affect road safety?	☑	☐	
Are the lane widths and swept paths adequate for all vehicles?	☑		
Is the design free of any upstream or downstream geometric features that could affect safety? (for example, merging of lanes)	☑	☐	
Are the approach speeds consistent with the intersection design?			
Where a roundabout is proposed:	☐	☐	N/A
have pedal cycle movements been considered?	☐	☐	
have pedestrian movements been considered?	☐	☐	
are details regarding the circulating carriageway sufficient?			
2.4.3 Readability by drivers			
Will the general type, function and broad features be perceived correctly by drivers?	☑	☐	

Are the approach speeds and likely positions of vehicles as they track through the scheme safe?	☑	☐	
Is the design free of sunrise or sunset problems that may create a hazard for motorists?	☑	☐	
2.5 Special road users			
2.5.1 Adjacent land			
Will the scheme be free of adverse effects from adjacent activity and intensity of land use? (if not, what special measures are needed?)	☐	☐	Peggy Banfield Park (Attractor) limit access through nominated corridors.
2.5.2 Pedestrians	☐	☐	
Have pedestrian needs been satisfactorily considered?	☑	☐	
If footpaths are not specifically provided, is the road layout safe for use by pedestrians? (particularly at blind corners or on bridges)	☐	☑	
Are pedestrian subways or footbridges sited to provide maximum use? (i.e. Is the possibility of pedestrians crossing at grade in their vicinity minimised?)	☐	☐	N/A
Has specific provision been made for pedestrian crossings, school crossings or pedestrian signals?	☑	☐	Linkages to existing cvrossing have been included.
Where present, are these facilities sited to provide maximum use with safety?	☑	☐	

Issue	Yes	No	Comment
Are pedestrian refuges/kerb extensions provided where needed?	☐	☑	
Has specific consideration been given to provision required for special groups? (for example, young, elderly, disabled, deaf or blind)	☐	☑	
2.5.3 Cyclists			
Have the needs of cyclists been satisfactorily considered, especially at intersections?	☑	☐	2.5m wide shared Off Road facilities provided each side of the roasdway.
Are all cycleways of standard or adequate design? Where a need for shared pedestrian/cycle facilities exists, have they been safely treated?	☑	☐	
Where cycleways terminate at intersections or adjacent to the carriageway, has the transition treatment been handled safely?	☑	☐	
Have any needs for special cycle facilities been satisfactorily considered? (for example, cycle signals)	☑	☐	
2.5.4 Motorcyclists			
Has the location of devices or objects that might destabilise a motorcycle been avoided on the road surface?	☑	☐	
Will warning or delineation be adequate for motorcyclists?	☑	☐	
Has barrier kerb been avoided in high-speed areas?	☑	☐	
In areas more likely to have motorcycles run off the road is the roadside forgiving or safely shielded?	☐	☑	
2.5.5 Equestrians and stock			
Have the needs of equestrians been considered, including the use of verges or shoulders and rules regarding the use of the carriageway?	☐	☐	N/A
Can underpass facilities be used by equestrians/stock?			N/A
2.5.6 Freight			
Have the needs of truck drivers been considered, including turning radii and lane widths?	☑	☐	
2.5.7 Public transport			
Has public transport been catered for?	☑	☐	

Have the needs of public transport users been considered?	☑	☐	

Issue	Yes	No	Comment
Have the manoeuvring needs of public transport vehicles been considered?	☑	☐	
Are bus stops well positioned for safety?	☑	☐	
2.5.8 Road maintenance vehicles			
Has provision been made for road maintenance vehicles to be used safely at the site?	☑	☐	
2.6 Signs and lighting			
2.6.1 Lighting			
Is this project to be lit? Will safety be maintained if the project is not lit?	☑	☐	
Is the design free of features that make illuminating sections of the road difficult? (for example, shadow from trees or over bridges)	☑	☐	
Has the question of sighting of lighting poles been considered as part of the general concept of the scheme?	☑	☐	
Are frangible or slip-base poles to be provided?	☑	☐	
Are any special needs created by ambient lighting? Will safety be maintained if special treatments are not provided?	☑	☐	
Have the safety consequences of vehicles striking lighting poles (of any type) been considered?	☑	☐	
2.6.2 Signs			
Are signs appropriate for their location?	☑	☐	
Are signs located where they can be seen and read in adequate time?	☑	☐	
Will signs be readily understood?	☑	☐	
Are signs located so that visibility to and from accesses and intersecting roads is maintained?	☑	☐	
Are signs appropriate to the driver's needs? (for example, destination signs, advisory speed signs, etc.)	☑	☐	
Have the safety consequences of vehicles striking sign posts been considered?	☑	☐	
Are signs located so that drivers' sight distance is maintained?	☑	☐	
Where signs are to be located in the clear zone, are they frangible or adequately shielded by a crash barrier?	☑	☐	

Issue	Yes	No	Comment
2.6.3 Marking and delineation			
Has the appropriate standard of delineation and marking been adopted?	☑	☐	
Are the proposed markings consistent with the works in the adjoining section of the route?	☑	☐	
Are the previous/adjacent markings to be upgraded? If not, will safety be maintained?	☑	☐	
2.7 Traffic management			
2.7.1 Traffic flow and access restrictions			
Can traffic volumes from the proposed scheme be safely accommodated on existing sections of road?	☑	☐	
Have parking provision and parking control been adequately considered?	☑	☐	

Can any turn bans be implemented without causing problems at adjacent intersections?	☑	☐	
Has the effect of access to future developments been considered?	☑	☐	
Is safety maintained for any traffic diverting to other roads? (for example, to avoid a traffic control device)	☑	☐	
2.7.2 Overtaking and merges			N/A
Are overtaking sight distance and stopping distance adequate?	☐	☐	
Have suitable shoulder widths been provided at lane drop merges?	☐	☐	
Have standard signs and markings been provided for any lane drop?	☐	☐	
Has adequate sight distance been provided to any lane drop?	☐	☐	
Are shoulders wide enough opposite access points and intersections?	☐	☐	
2.7.3 Rest areas and stopping zones			N/A
Are there sufficient roadside stopping areas, rest areas and truck parking areas?	☐	☐	
Are any entries and exits to rest areas or truck parking areas safe?	☐	☐	

Issue	Yes	No	Comment
2.7.4 Construction and operation			
If the scheme is to be constructed 'under traffic', can this be done so safely?	☑	☐	
Can the scheme be safely constructed?	☑	☐	
Have the maintenance requirements been adequately considered?	☑	☐	
Is safe access to and from the works available?	☑	☐	
2.8 Additional questions to be considered for development proposals **2.8.1 Horizontal alignment**			
Is visibility adequate for drivers and pedestrians at proposed accesses?	☑	☐	
Is adequate turning space provided for the volume and speed of traffic?	☑	☐	
Are curve radii and forward visibility satisfactory?	☑	☐	
Are sight and stopping distances adequate?	☑	☐	
2.8.2 Vertical alignment			
Are gradients satisfactory?	☑	☐	
Are sight and stopping distances adequate?	☑	☐	
2.8.3 Parking provision			
Is on-site parking adequate to avoid on-street parking and associated risks?	☐	☐	N/A
Are parking areas conveniently located?	☐	☐	N/A
Is adequate space provided in parking areas for circulation and intersection sight distance?	☐	☐	N/A
2.8.4 Servicing facilities			
Are off-street loading/unloading areas adequate?	☑	☐	
Are turning facilities for large vehicles provided in safe locations?	☑	☐	
Is emergency vehicle access adequate?	☑	☐	
2.8.5 Signs and markings			

Have necessary traffic signs and road markings been provided as part of a development?	☑	☐	

Issue	Yes	No	Comment
Is priority clearly defined at all the intersection points within the car park and access routes?	☑	☐	
Will the signs and markings be clear in all conditions, including day/night, rain, fog, etc.?	☑	☐	
2.8.6 Landscaping			
Does landscaping maintain visibility at intersections, bends, accesses and pedestrian locations?	☑	☐	
Has tree planting been avoided where vehicles are likely to run off the road?	☑	☐	
2.8.7 Traffic management			
Have any adverse area-wide effects been addressed?	☑	☐	
Will the design keep travel speeds at the safe level?	☑	☐	
Are the number and location of accesses appropriate?	☑	☐	
Are the facilities for public transport services safely located?	☑	☐	
Are any bicycle facilities safely located in respect to vehicular movements?	☑	☐	
Are pedestrian facilities adequate and safely located?	☑	☐	
2.8.8 Other			
Has appropriate street lighting been provided?	☑	☐	
Are any roadside hazards appropriately dealt with?	☑	☐	
Has safe pedestrian access to the development been provided?	☑	☐	
2.9 Any other matter **2.9.1 Safety aspects not already covered**			
Have all unusual or hazardous conditions associated with special events been considered?	☑	☐	
Is the road able to safely handle oversize vehicles, or large vehicles like trucks, buses, emergency vehicles, road maintenance vehicles?	☑	☐	
If required, can the road be closed for special events in a safe manner?	☑	☐	
If applicable, are special requirements of scenic or tourist routes satisfied?	☐	☐	N/A
Have all other matters which may have a bearing on safety been addressed?	☑	☐	

APPENDIX E

Certification Statement and Authorisation

Appendix B: Traffic impact assessment certification

Certification of Traffic Impact Assessment Report

Registered Professional Engineer Queensland

for

Project title:	10-32 Lionel Turner Drive. Mt Low, 4818 Lot 2 on SP218628 Traffic Impact Assessment (IPA0002C)

As a professional engineer registered by the Board of Professional Engineers of Queensland pursuant to the *Professional Engineers Act 2002* as competent in my areas of nominated expertise, I understand and recognise:

- the significant role of engineering as a profession, and that
- the community has a legitimate expectation that my certification affixed to this engineering work can be trusted, and that
- I am responsible for ensuring its preparation has satisfied all necessary standards, conduct and contemporary practice.

As the responsible RPEQ, I certify:

(i) I am satisfied that all submitted components comprising this traffic impact assessment, listed in the following table, have been completed in accordance with the *Guide to Traffic Impact Assessment* published by the Queensland Department of Transport and Main Roads and using sound engineering principles, and

(ii) where specialised areas of work have not been under my direct supervision, I have reviewed the outcomes of the work and consider the work and its outcomes as suitable for the purposes of this traffic impact assessment, and that

(iii) the outcomes of this traffic impact assessment are a true reflection of results of assessment, and that

(iv) I believe the strategies recommended for mitigating impacts by this traffic impact assessment, embrace contemporary practice initiatives and will deliver the desired outcomes.

Name:	Derek Saw	RPEQ No:	7363
RPEQ competencies:	Civil		
Signature:		Date:	8th October 2025
Postal address:	50 Punari Street, Currajong. 4812		
Email:	derek.saw@nceng.com.au		

Traffic impact assessment components to which this certification applies	✓
1. Introduction	
Background	✓
Scope and study area	✓
Pre-lodgement meeting notes	
2. Existing Conditions	
Land use and zoning	✓
Adjacent land uses / approvals	✓
Surrounding road network details	✓
Traffic volumes	✓
Intersection and network performance	✓
Road safety issues	✓
Site access	✓
Public transport (if applicable)	✓
Active transport (if applicable)	✓
Parking (if applicable)	✓
Pavement (if applicable)	
Transport infrastructure (if applicable)	✓
3. Proposed Development Details	
Development site plan	✓
Operational details (including year of opening of each stage and any relevant catchment / market analysis)	✓
Proposed access and parking	✓
4. Development Traffic	
Traffic generation (by development stage if relevant and considering light and heavy vehicle trips)	✓
Trip distribution	✓
Development traffic volumes on the network	✓
5. Impact Assessment and Mitigation	
With and without development traffic volumes	✓
Construction traffic impact assessment and mitigation (if applicable)	✓
Road safety impact assessment and mitigation	✓
Access and frontage impact assessment and mitigation	✓
Intersection delay impact assessment and mitigation	
Road link capacity assessment and mitigation	✓
Pavement impact assessment and mitigation	
Transport infrastructure impact assessment and mitigation	✓
Other impacts assessment relevant to the specific development type / location (if applicable)	✓

Traffic impact assessment components to which this certification applies	✓
6. Conclusions and Recommendations	
Summary of impacts and mitigation measures proposed	✓
Certification statement and authorisation	✓
[change above and / or insert other component as needed]	