PROPOSED FUEL FILLING STATION DEVELOPMENT
AT

20- 26 ALBERT STREET, ROCKHAMPTON, QLD

ARCHITECTURAL DRAWING LIST:	
TP01	TITLE PAGE AND SITE LOCALITY PLAN
TP02	EXISTING CONDITIONS & DEMOLITION PLAN
TP03	PROPOSED SITE PLAN
TP04	PROPOSED FLOOR PLAN
TP05	PROPOSED ELEVATIONS
TP06	SIGNAGE PLAN
TP07	SHADOW DIAGRAMS
TP08	EXISTING & PROPOSED PERSPECTIVES

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/28-2020

Dated: 29 March 2021

REV	AMENDMENT DETAILS	BY	DATE
B	CANOPY LINK ADDED	JS	03-09-20
A	TP07-08 SHEET ADDED. LOCALITY PLAN UPDATED TO SUIT SITE PLAN	JS	07-05-20
Ø	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

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RBP No. DP-AD1689

Town Planning
Not for construction

PROJECT
PROPOSED FUEL FILLING STATION DEVELOPMENT

PROJECT ADDRESS
20- 26 ALBERT STREET

ROCKHAMPTON
QLD 4700

DRAWING TITLE
TITLE PAGE AND SITE LOCALITY PLAN

CLIENT
RCI GROUP

DATE	SCALE @ A1	NORTH
FEB.'20	1:500	
DRAWN	CHECKED	
JS	AB	
ISSUE		
PLANNING		

PROJECT No.	DRAWING No.	REVISION No.	SHEET
20004	TP01	B	01 of 08

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1:500 @ A1 SIZE & 1:1000@A3

ROCKHAMPTON REGIONAL COUNCIL

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Ø	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

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EXISTING CONDITIONS & DEMOLITION PLAN

CLIENT
RCI GROUP

DATE	SCALE @ A1	NORTH
FEB.'20	1:200	
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JS	AB	
ISSUE		
PLANNING		

PROJECT No.	DRAWING No.	REVISION No.	SHEET
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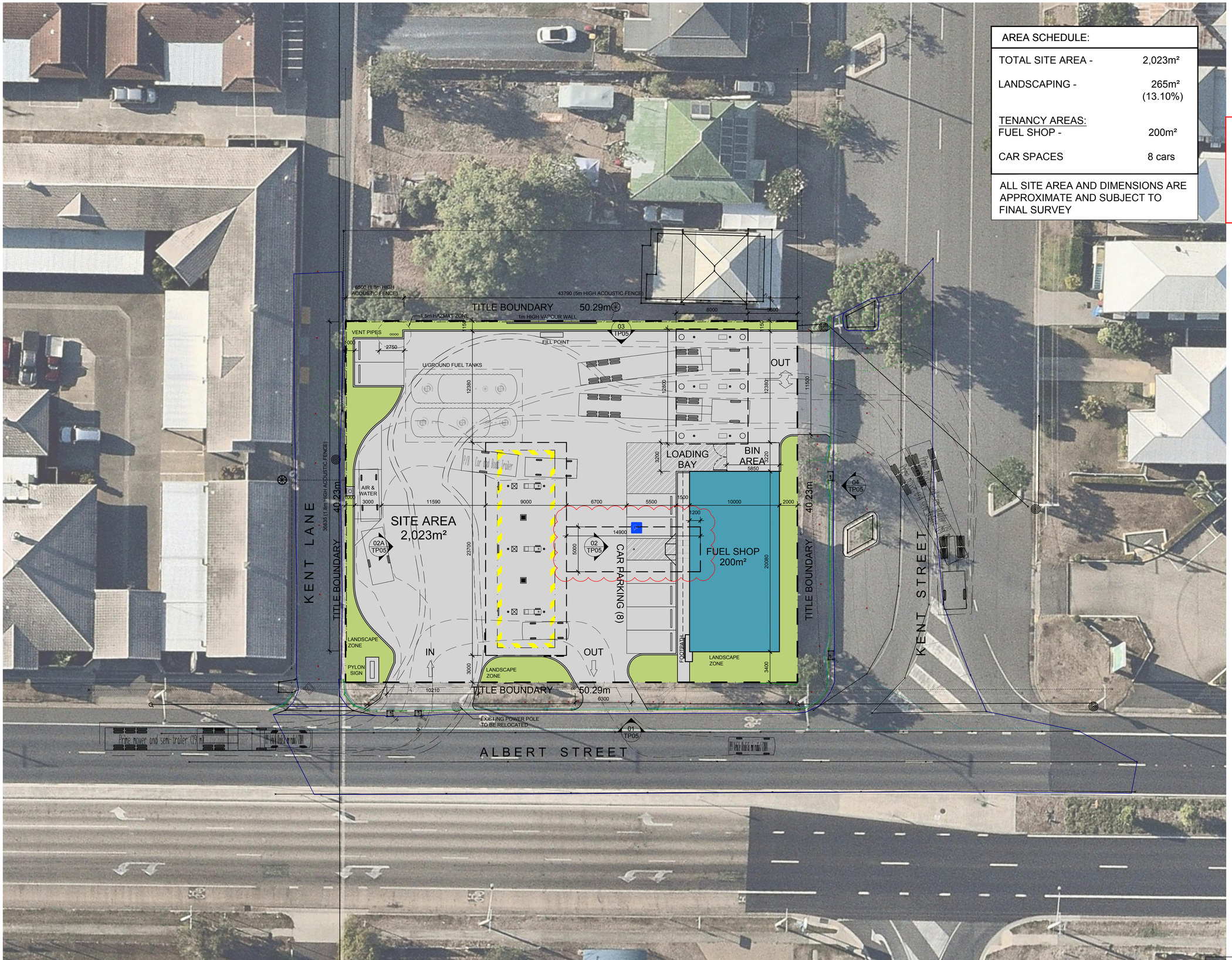

AREA SCHEDULE:	
TOTAL SITE AREA -	2,023m²
LANDSCAPING -	265m² (13.10%)
TENANCY AREAS:	
FUEL SHOP -	200m²
CAR SPACES	8 cars

ALL SITE AREA AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO FINAL SURVEY

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REV.	AMENDMENT DETAILS	BY	DATE
E	CANOPY LINK ADDED	JS	03-09-20
D	CAR PATH MODIFIED	JS	08-05-20
C	PYLON SIGN, AIR & WATER RELOCATED. EGRESS CROSSOVER TO ALBERT ST. & LANDSCAPING AREA REVISED	JS	07-05-20
B	PYLON SIGN RELOCATED. FENCE EXTENT REVISED	JS	05-05-20
A	LANDSCAPE BUFFER INCREASED AT NORTH SIDE. FENCE ADDED ALONG NORTH & WEST BOUNDARY. LANDSCAPE AREA ADDED.	JS	05-03-20
Ø	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

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DRAWING TITLE
PROPOSED SITE PLAN

CLIENT
RCI GROUP

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DATE	SCALE @ A1	NORTH
FEB.'20	1:200	
DRAWN: JS	CHECKED: AB	
ISSUE: PLANNING		

PROJECT No.	DRAWING No.	REVISION No.	SHEET
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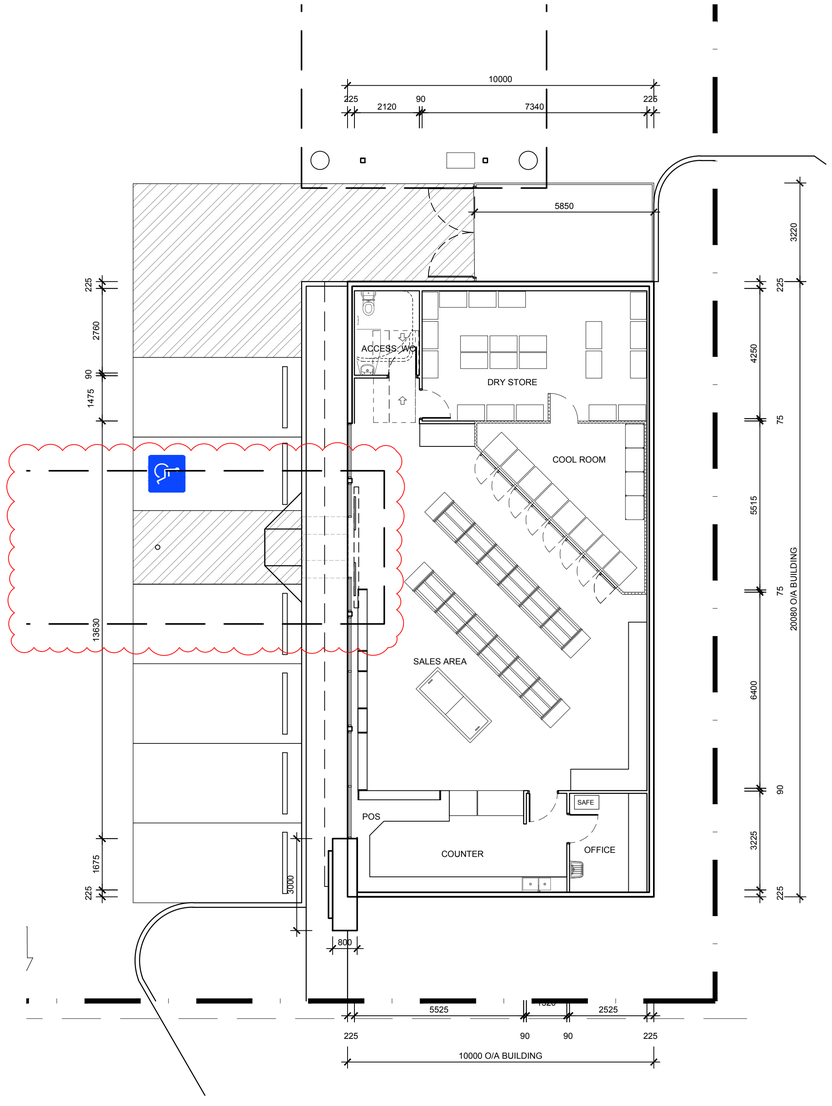

01 - FLOOR PLAN
SCALE 1:100

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C	CANOPY LINK ADDED	JS	03-09-20
B	DIMENSIONS ADJUSTED TO SUIT SITE PLAN LAYOUT	JS	07-05-20
A	BIN AREA LENGTH REVISED	JS	05-03-20
Ø	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

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DRAWING TITLE
PROPOSED FLOOR PLAN

CLIENT
RCI GROUP

DATE	SCALE @ A1	NORTH
FEB.'20	1:100	
DRAWN: JS	CHECKED: AB	
ISSUE: PLANNING		

PROJECT No.	DRAWING No.	REVISION No.	SHEET
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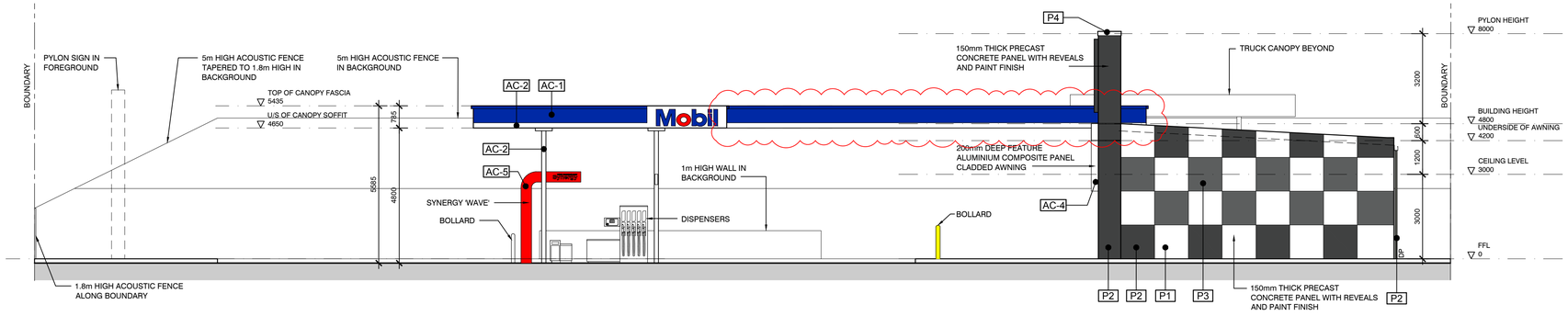
Town Planning
Not for construction



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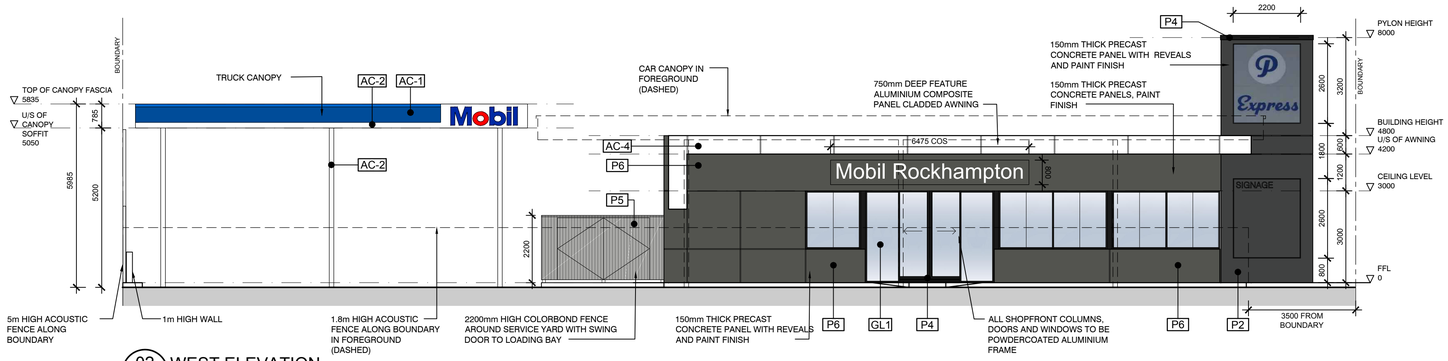

02 TP03 WEST ELEVATION
SCALE 1:100

EXTERNAL COLOUR SCHEDULE

- AC-1 CANOPY FASCIA ALUMINIUM COMPOSITE PANEL COLOUR 'BLUE'
- AC-2 CANOPY FASCIA AND STEEL COLUMNS ALUMINIUM COMPOSITE PANEL COLOUR 'WHITE'
- P6 STORE FASCIA PRECAST PANEL COLOUR 'WOODLAND GREY'
- AC-4 STORE FEATURE AWNING ALUMINIUM COMPOSITE PANEL COLOUR 'WHITE'
- AC-5 SIGNAGE ALUMINIUM COMPOSITE PANEL COLOUR 'RED'
- P1 PRECAST EXTERNAL WALLS PAINT DULUX - WHITE
- P2 PRECAST PANEL PAINT DULUX - MONUMENT
- P3 PRECAST PANEL PAINT DULUX - BASALT
- P4 DOOR & WINDOW POWDERCOATED NIGHT SKY
- P5 VERTICAL COLORBOND FENCE 'WOODLAND GREY'
- GL1 CLEAR GLAZING TO CODE, NCC & RELEVANT STANDARDS

ROCKHAMPTON REGIONAL COUNCIL

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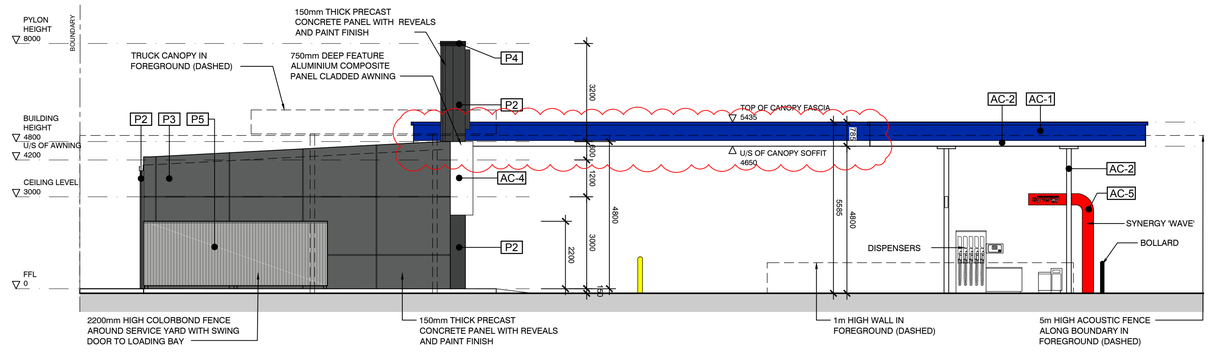
Dated: 29 March 2021

REV	AMENDMENT DETAILS	BY	DATE
C	CANOPY LINK ADDED	JS	03-09-20
B	SOUTH & EAST BUILDING ELEVATION REVISED. SOUTH FENCE, SIGNAGE & FINISHES REVISED. PYLON RELOCATED. FENCE DETAIL ADDED	JS	07-05-20
A	SIGN S05 & S06 REVISED. SIGN S04 REMOVED. ACOUSTIC FENCE ADDED	JS	05-03-20
Ø	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	07-02-20



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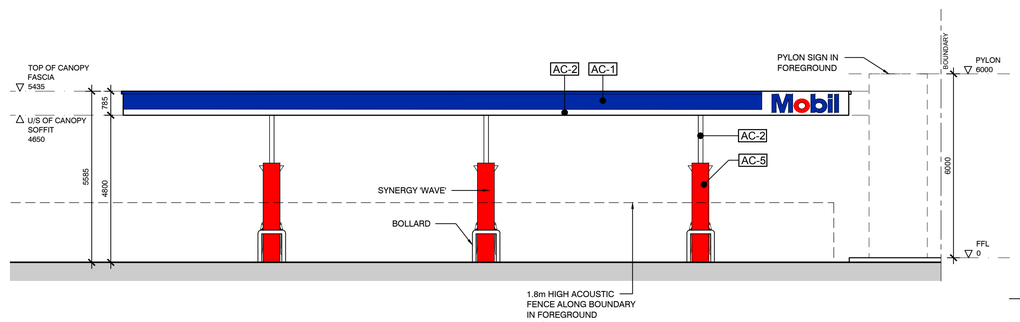

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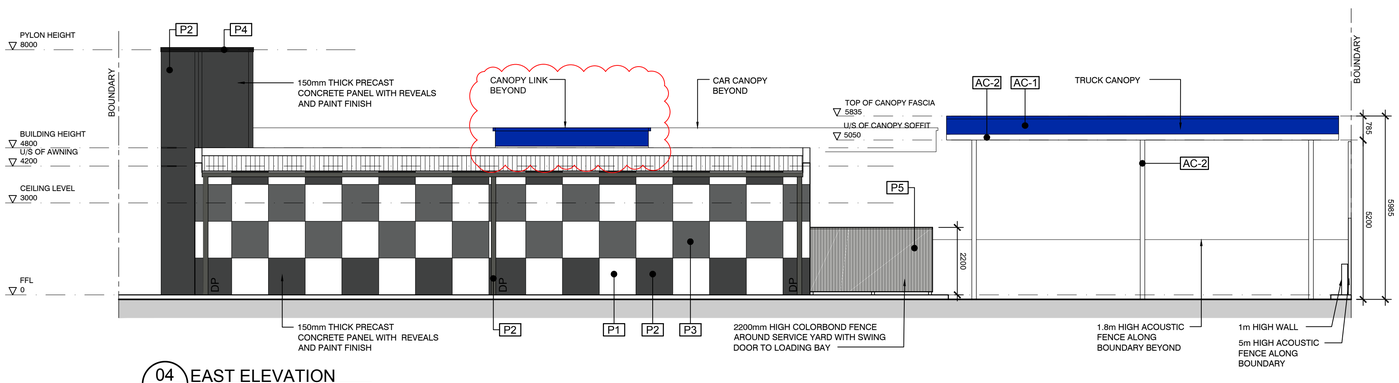

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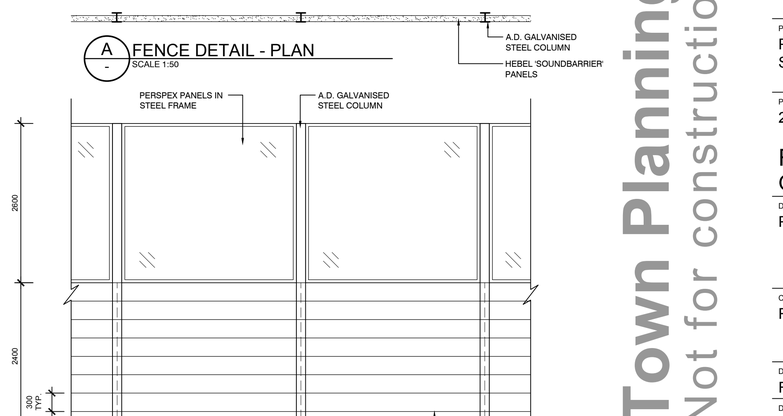

A - FENCE DETAIL - PLAN
SCALE 1:50

B - FENCE DETAIL - SOUTH ELEV.
SCALE 1:50

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0m 1m 2m 3m 4m
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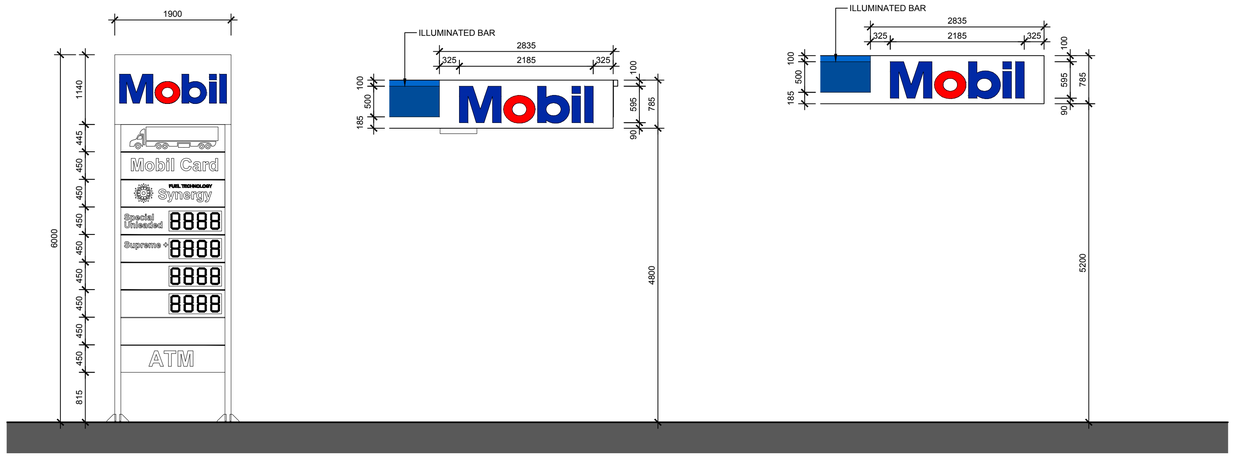
ROCKHAMPTON
QLD 4700

DRAWING TITLE
PROPOSED ELEVATIONS

CLIENT
RCI GROUP

DATE	SCALE @ A1	NORTH
FEB. '20	1:100	
DRAWN	CHECKED	
JS	AB	
ISSUE		
PLANNING		

PROJECT No.	DRAWING No.	REVISION No.	SHEET
20004	TP05	C	05of 08



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SCALE 1:50

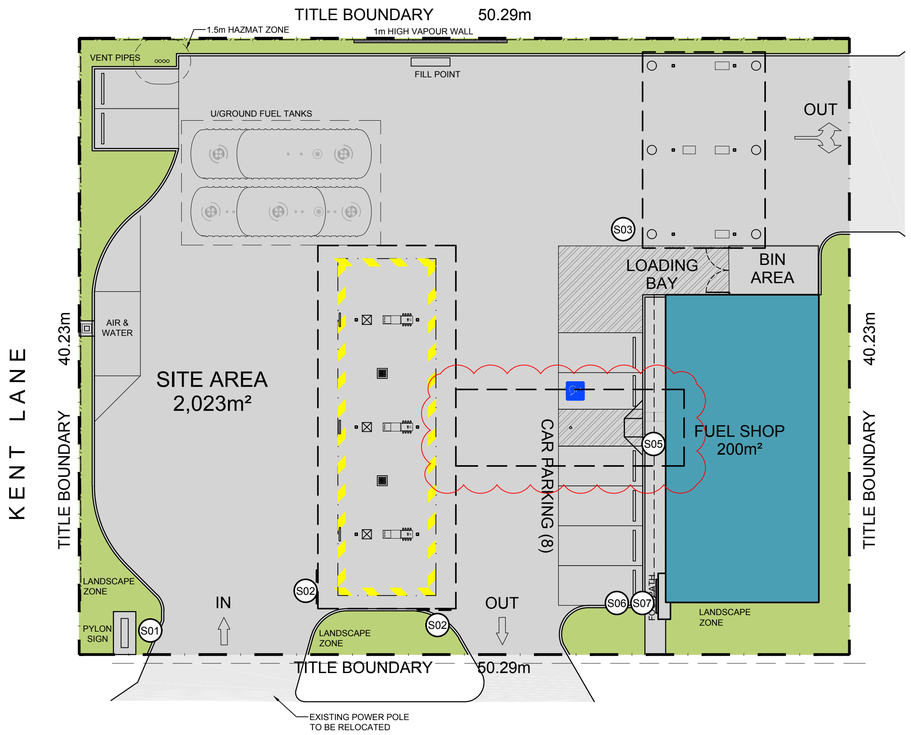
INTERNALLY ILLUMINATED
6m PYLON SIGN

02 SIGN 02
SCALE 1:50

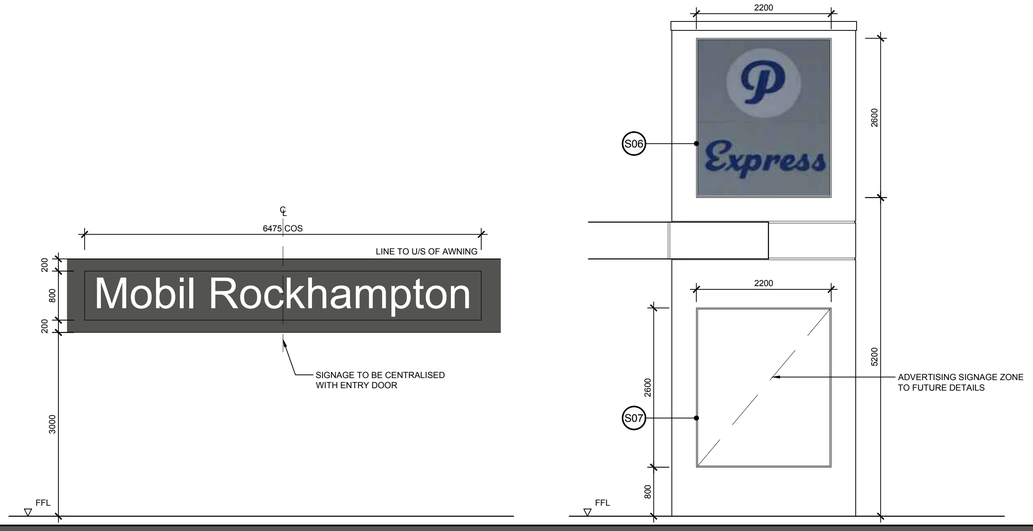
INTERNALLY ILLUMINATED
CANOPY SIGN

03 SIGN 03
SCALE 1:50

INTERNALLY ILLUMINATED
CANOPY SIGN



A KEY PLAN
SCALE NTS



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SCALE 1:50

NON-ILLUMINATED FASCIA
SIGN

06 SIGN 06
SCALE 1:50

INTERNALLY ILLUMINATED
SIGN

07 SIGN 07
SCALE 1:50

NON-ILLUMINATED SIGN

ROCKHAMPTON REGIONAL COUNCIL

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C	CANOPY LINK ADDED	JS	03-09-20
B	SIGN S05 DETAILS & S01 LOCATION REVISED	JS	07-05-20
A	SIGN S05 & S06 REVISED. SIGN S04 REMOVED	JS	05-03-20
Ø	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

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PROJECT ADDRESS
20- 26 ALBERT STREET

ROCKHAMPTON
QLD 4700

DRAWING TITLE
SIGNAGE DETAILS

CLIENT
RCI GROUP

DATE	SCALE @ A1	NORTH	
FEB.'20	1:50		
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ISSUE			
PLANNING			
PROJECT No.	DRAWING No.	REVISION No.	SHEET
20004	TP06	C	06of 08

Town Planning
Not for construction

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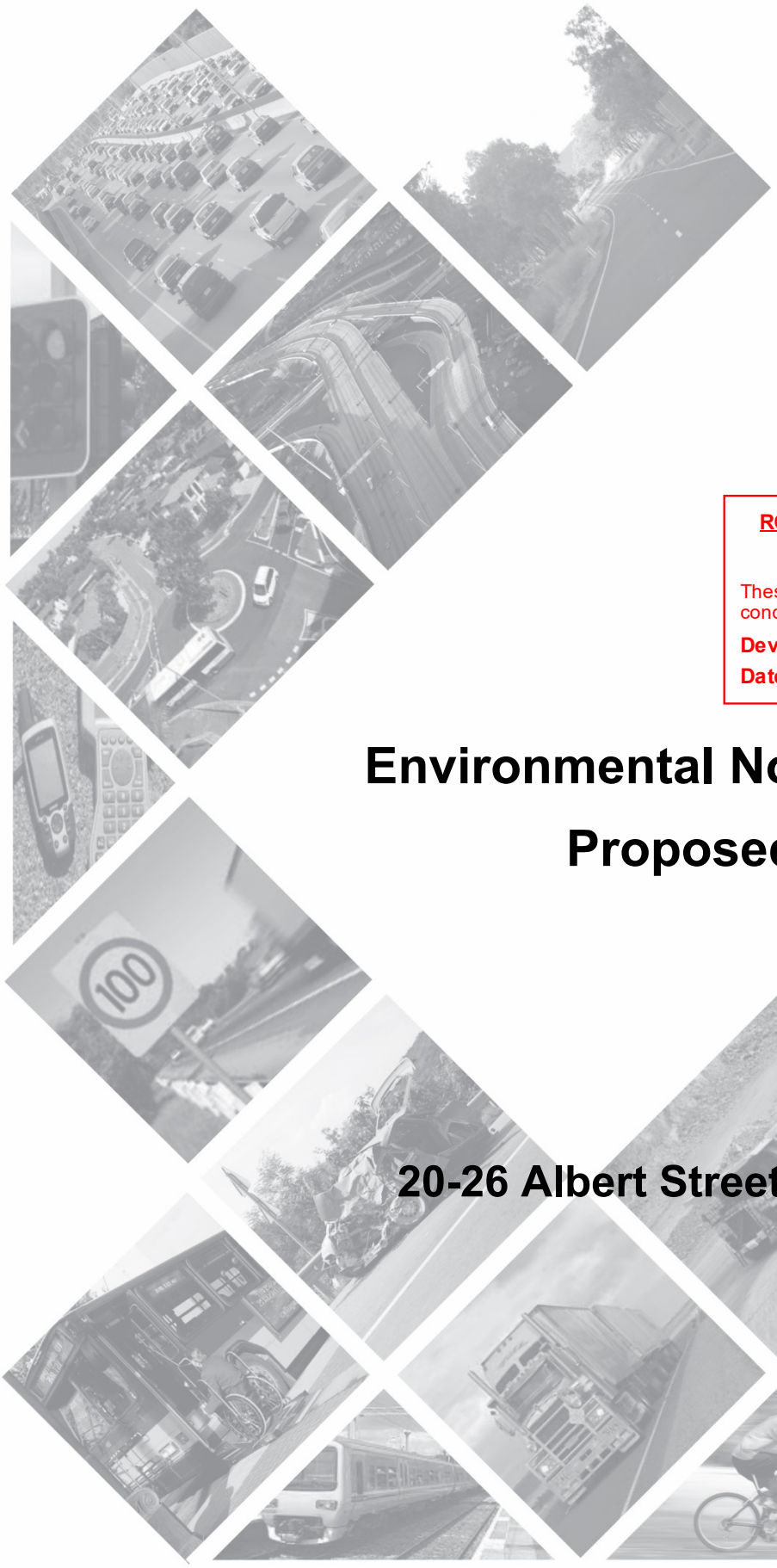

RoadPro ACOUSTICS

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/28-2020

Dated: 29 March 2021

Environmental Noise Assessment

Proposed Service Station

20-26 Albert Street and 34 Kent Street

Rockhampton

Report 1237R1-R1

13 May 2020

Document Control

Report 1237R1-R1

Version History:

Version	Date	Prepared by	Reviewed by	Description / nature of amendments
Draft 1	21-Feb-20	JC	JC	Initial draft
Revision 0	5-Mar-20	JC	JC	Final report
Revision 1	13-May-20	JC	JC	Inclusion of additional information request from RRC

Contact for enquiries

Please direct any queries regarding the preparation of this document to:

Authorising Officer: **Joseph Carroll RPEQ 7798**
Director / Principal Engineer
RoadPro Acoustics

Job number: **1237**

Email: **joseph@roadpro.net.au**

Web: **www.roadpro.net.au**

Table of Contents

1 Introduction

RoadPro Acoustics was engaged by RCI Group to assess potential noise impacts from a proposed service station at a site at 20-26 Albert Street and 34 Kent Street, Rockhampton (the Site). The Site location is shown in **Figure 1**, and proposed site layout is shown in **Figure 2**. Plans are provided in **Appendix A**.

Figure 1: Site Location "A" – 20-26 Albert Street and 34 Kent Street, Rockhampton

Figure 2: Site layout - 20-26 Albert Street and 34 Kent Street, Rockhampton

The proposal involves the establishment of a service station catering for light and heavy vehicles.

6 bowsers will be available for light vehicles, while 4 will be available for heavy vehicles.

An air and water station will be provided, and the fuel shop will retail typical convenience items.

It is proposed that the Site will be accessed from Albert Street in the east-bound direction of traffic, with egress provided to Albert Street and Kent Street.

This noise assessment has been carried out generally in accordance with the following:

- Environmental Protection (Noise) Policy 2019;
- Environmental Protection Act 1997;
- *Noise Measurement Manual*, Queensland Government – Environmental Protection Agency, Version 4, August 2013; and
- Australian Standard *AS1055.1–1997 Acoustics – Description and measurement of environmental noise*.

Information used for this assessment included:

- Development plans prepared by trg;
- Google Earth imagery;
- Ausmap LIDAR spot heights; and
- Photographs and general information from a site visit and inspection.

2 Acoustic Terminology

The following is a brief explanation of the acoustic terminology used in this report.

2.1 Sound (Noise) Level

Sound or noise consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols "L" or "L_A" are commonly used to represent Sound Pressure Level.

2.2 "A" Weighted Sound Pressure Level - dB(A)

The overall level of a sound is usually expressed in terms of dB(A), which is measured using a sound level meter with an "A-weighting" filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dB(A) is a good measure of the loudness of that sound. Different sources having the same dB(A) level generally sound about equally as loud.

A change of 1 dB(A) or 2 dB(A) in the level of a sound is difficult for most people to detect, whilst a 3 dB(A) to 5 dB(A) change corresponds to small but noticeable change in loudness. A 10 dB(A) change corresponds to an approximate doubling or halving in loudness.

Table 1 below shows examples of typical noise levels.

Table 1: Typical Noise Levels

Sound Pressure Level (dB(A))	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely
110	Grinding on steel	noisy
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Curbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to
50	General Office	quiet
40	Inside private office	Quiet to very
30	Inside bedroom	quiet
20	Unoccupied recording studio	Almost silent

2.3 Statistical Sound (Noise) Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels L_{AN}, where L_{AN} is the A-weighted sound pressure level exceeded by N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} the noise exceeded for 10% of the time, and so on.

Of particular relevance are:

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} The noise level exceed for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

L_{A90} The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level

L_{Aeq} is the A-weighted equivalent continuous sound pressure level (basically the average sound level). It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

When dealing with numerous days of statistical noise data a method is required to determine the noise descriptors that are representative of a monitoring location for a particular time of day. The method of statistical accumulation provides an appropriate method of determining these noise descriptors.

This method accumulates each value for the days of monitoring and produces an estimate of the “repeatable minimum” L_{A90} noise level over the daytime and night-time measurement periods, as required by the Department of Environment and Heritage Protection. In addition, the method produces mean or “average” levels that are representative of the other descriptors that can be expected on a typical day at each particular site.

3 Background Noise

Noise measurements were carried out at the site from 29th January 2020 to 3rd February 2020 at the location shown in **Figure 3** and **Figure 4**. The location was selected as being representative of background noise levels for the nearest sensitive receivers.

The measurements were carried out using a Rion NL-21 sound level meter (Serial number 888250) recording "fast" response "A" frequency weighted sound levels at 15-minute intervals, with the microphone at a height of approximately 1.3 m. The instrument was checked for calibration prior to and post-measurement using a 94 dB acoustic signal at 1000 Hz, and drift in calibration remained within ±0.5 dB.

Weather conditions for the duration of the survey were generally suitable for noise monitoring.

Figure 3: Noise Logger Location ML1 - 20-26 Albert Street and 34 Kent Street, Rockhampton

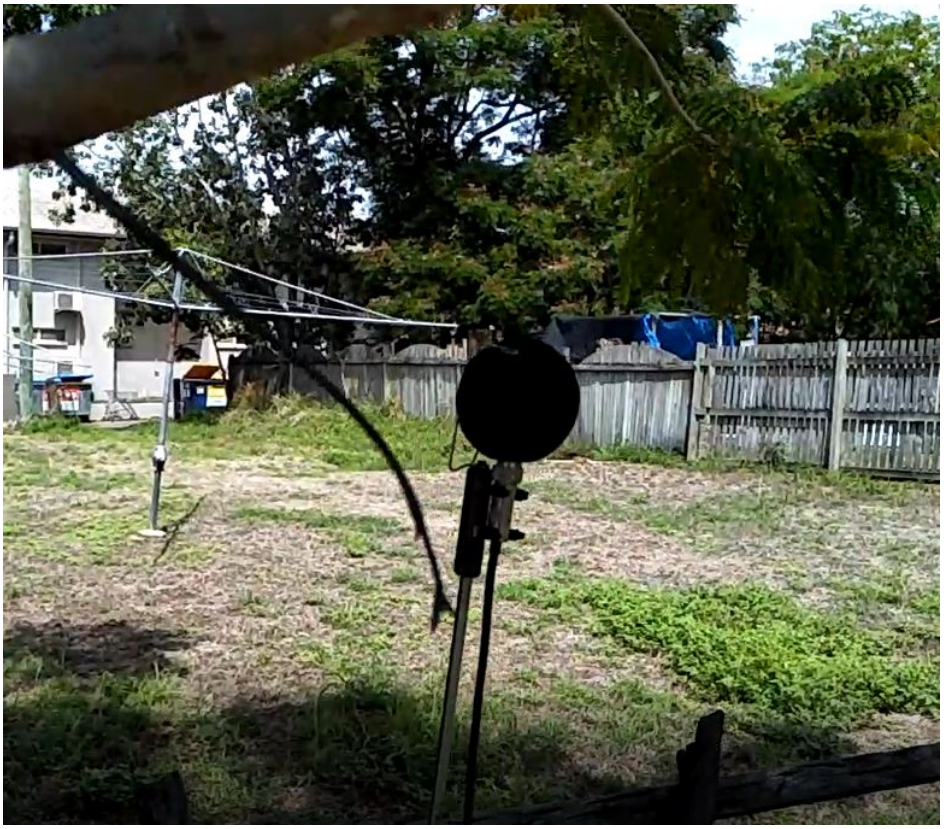

Figure 4: Noise Logger

Ambient noise at the Site was dominated by road traffic on Albert Street.

A summary of the logged data is provided in **Table 2**. The full dataset of the measurements and weather is provided as charts in **Appendix B**.

Table 2: Logger noise measurement results, dB(A)

Day	Period,T	$L_{A90,T}$	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A1,T}$
Wednesday-29-Jan-20	Day	43.3	58.9	62.3	68.8
	Evening	38.1	56.8	59.2	68.3
	Night	31.2	55.0	54.7	67.4
Thursday-30-Jan-20	Day	44.2	59.2	62.1	68.5
	Evening	40.8	57.2	60.0	68.8
	Night	31.9	55.1	55.5	67.4
Friday-31-Jan-20	Day	45.0	59.3	62.3	68.9
	Evening	40.2	56.4	59.5	67.2
	Night	32.5	53.5	54.5	65.5
Saturday-1-Feb-20	Day	44.4	58.2	61.4	68.0
	Evening	38.8	55.7	57.9	67.5
	Night	32.5	52.0	52.8	62.0
Sunday-2-Feb-20	Day	42.3	57.1	60.2	67.0
	Evening	35.1	55.3	57.9	67.1
	Night	30.0	53.2	51.7	64.5
Monday-3-Feb-20	Day	41.7	58.5	61.6	67.9
Overall RBL and averages	Day	44	59	62	68
	Evening	39	56	59	68
	Night	32	54	55	66

4 Noise Criteria

4.1 Acoustic Quality Objectives - Residences

The *Environmental Protection (Noise) Policy 2019* (EPP(Noise)) is designed to achieve the object of the *Environmental Protection Act 1994*. Relevant extracts are as follows:

The environmental values to be enhanced or protected under this policy are—

(a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and

(b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following—

(i) sleep;

(ii) study or learn;

(iii) be involved in recreation, including relaxation and conversation; and

(c) the qualities of the acoustic environment that are conducive to protecting the amenity of the community.

Acoustic Qualify Objectives are specified for residences as shown in **Table 3**.

Table 3: *Environmental Protection (Noise) Policy 2019* Acoustic Quality Objectives

Sensitive receptor	**Time of day**	**Acoustic quality objectives (measured at the receptor) dB(A)**			**Environmental value**
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
Dwelling (for outdoors)	Daytime and evening	50	55	65	health and wellbeing
Dwelling (for indoors)	Daytime and evening	35	40	45	health and wellbeing
	Nighttime	30	35	40	health and wellbeing, in relation to the ability to sleep
commercial and retail activity (for indoors)	when the activity is open for business	45			health and wellbeing, in relation to the ability to converse

In order to assess internal sound levels, a 7 dB(A) noise reduction (free-field) through partially opened windows as per the Queensland Ecoaccess Guideline *Planning for Noise Control* (2004) is assumed. Where a building façade is expected to be closed, the outside to inside noise reduction is expected to be 20 dB(A)+.

4.2 Background Creep

The EPP(Noise) provides the following regarding *background* creep in **Section 9**. Note that the technical provisions for *background creep* for time-varying (L_{Aeq}) and constant noise (L_{A90}) have been removed from the EPP(Noise) as of 1 September 2019.

(2) To the extent it is reasonable to do so, noise must be dealt with in a way that ensures—

(a)the noise does not have any adverse effect, or potential adverse effect, on an environmental value under this policy; and

(b)background creep in an area or place is prevented or minimised.

The potential for an increase in background noise levels from this proposal is limited to noise from mechanical plant. The criteria specified in the *Environmental Protection Act 1994* is deemed to be appropriate for appropriate control of mechanical plant noise by the Queensland Government.

4.3 Sleep Disturbance

The Queensland Ecoaccess Guideline *Planning for Noise Control* (2004), which refers to the WHO guidelines, indicates that unreasonable sleep disturbance impacts due to impulsive noise sources such as engine starts and door slams can occur at levels of 45 to 50 dB(A) within a bedroom depending upon the number of noise events per night. Maximum external noise levels to limit the likelihood of sleep disturbance for a range of noise levels and number of events are shown in **Table 4**.

Table 4: Number of permissible noise events for various external maximum noise levels for partially closed windows (10% probability of awakening) from DEHP *Planning for noise control*

MaxLpA (dBA)[1]	47	52	57	62
Number of events (n)	32	10	3	1

When the expected number of maximum noise events during the night-time period exceeds 32, the L_{Amax} criterion should default to the $L_{A1(1\ hour)}$ Acoustic Quality Objective i.e. 40 dB(A) inside, or 47 dB(A) outside (free-field).

4.4 Mechanical Plant Noise

The *Environmental Protection Act 1994* specifies criteria for specific mechanical plant, summarised in **Table 5**.

Table 5: Summary of mechanical plant noise criteria from the Queensland *Environmental Protection Act 1994*

Plant	Time Period Start	Time Period Finish	Criterion
Pumps[1]	7am	7pm	Background + 5 dB(A)
	7pm	10pm	Background + 3 dB(A)
	10pm	7am	Inaudible
Air conditioning equipment	7am	10pm	Background + 5 dB(A)
	10pm	7am	Background + 3 dB(A)
Refrigeration plant[2]	7am	10pm	Background + 5 dB(A)
	10pm	7am	Background + 3 dB(A)

Notes:
[1]A pump means an electrical, mechanical or pneumatic pump; and includes a swimming pool pump and a spa blower. Examples — liquid pump, air pump, heat pump.
[2]Criteria for refrigeration plant applies to an occupier of premises at or for which there is plant or equipment for refrigeration (refrigeration equipment); or an owner of refrigeration equipment that is on or in a vehicle, other than a vehicle used or to be used on a railway. "Vehicle" includes a trailer.

The site-specific criteria for mechanical plant noise considering the measured background noise levels are provided in **Table 6**.

[1] Free-field

Table 6: Site-specific mechanical plant noise criteria from the Queensland *Environmental Protection Act 1994*

Plant	Time Period Start	Time Period Finish	Criterion
Pumps	7am	6pm	44 + 5 = 49 dB(A)
	6pm	7pm	39 + 5 = 44 dB(A)
	7pm	10pm	39 + 3 = 42 dB(A)
	10pm	7am	32 - 10 = 22 dB(A)
Air conditioning equipment	7am	6pm	44 + 5 = 49 dB(A)
	6pm	10pm	39 + 5 = 44 dB(A)
	10pm	7am	32 + 3 = 35 dB(A)
Refrigeration plant	7am	6pm	44 + 5 = 49 dB(A)
	6pm	10pm	39 + 5 = 44 dB(A)
	10pm	7am	32 + 3 = 35 dB(A)

Notes:
[1]A noise level 10 dB(A) or more below the ambient background noise level is generally adopted for design purposes to represent "inaudibility". Even though a noise level 10 dB(A) below the background noise level may not be imperceptible, the likelihood of disturbance being causes by the source is considered to be negligible.

5 Predicted Noise Emission Levels

5.1 General Methodology

The nearest potentially affected receivers to the Site are:

- The Stirling motel to the eastern side of Kent Lane. The building nearest Albert Street is a single-storey building, while the other building exposed to the Site is a double-storey building. The windows of these buildings are to the bathrooms inside (determined by examining internal photos and floor plans published by the motel on Google).
- A 2-storey residence at 32 Kent Street to the north of the Site.
- A 2-storey residence opposite the Site at 33 Kent Street.
- A 2-storey residence opposite the Site at 33 Albert Street.
- A single-storey commercial use opposite the Site at 38 Albert Street.

The surrounding receivers are shown in **Figure 5**.

Figure 5: Site and surrounding receivers

Calculations of environmental noise emissions from the site were carried out using the PEN3D environmental noise software package. Terrain data was derived from LIDAR spot heights at 5 m grid intervals and converted to 0.25 m ground contours. The model layout is shown in **Figure 6**.

Figure 6: Model scenario

5.2 Vehicles

Vehicle noise for carparking (and refuelling) was modelled using the BayFIU method adapted for Australian conditions[2]. The $L_{Aeq(1\ hour)}$ sound power level for a single vehicle movement is 64 dB, and it was assumed a peak hour would have one vehicle stop and leave per car park. The method incorporates all noise such as door closures and engine starts. The $L_{A10(1\ hour)}$ and $L_{A1(1\ hour)}$ noise levels are approximately 2 dB(A) and 8 dB(A) greater than the $L_{Aeq(1\ hour)}$ respectively.

Vehicles travelling through the Site were modelled as moving point sources, with a peak hour of approximately 5 heavy and 20 light vehicles assumed. Sound power spectra for vehicle types[3] is shown in **Table 7**.

Table 7: Vehicle sound power levels at low speeds, dB

	1/1 Octave Band Centre Frequency (Hz)							
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**
Light	63	72	73	77	78	78	75	69
Heavy	103	101	99	98	99	96	89	78

Predicted $L_{Aeq(1\ hour)}$ noise levels for vehicles in the Site are shown in **Table 8**.

[2] Laurence Nicol and Paul Johnson, Paper Number 39, Proceedings of ACOUSTICS 2011 (November 2011) "Prediction of parking area noise in Australian conditions"
[3] Emanuel Hammer, Sebastian Egger, Tina Saurer and Erik Bühlmann, 23rd International Congress on Sound and Vibration (July 2016) "Traffic Noise Modelling at Lower Speeds"

Table 8 Predicted $L_{Aeq(1\ hour)}$ noise levels from vehicles

Receptor	X Posn (m)	Y Posn (m)	Height (m)	Ground (m)	Noise Level (dB(A))
The Stirling (ground near Albert St)	244781.2	7412841.2	1.8	11.5	39
The Stirling (upper floor facing Kent Lane)	244768.9	7412858.9	4.5	11.7	39
32 Kent Street	244801.8	7412893	4.5	11.5	53
33 Kent Street	244848.2	7412907.4	4.5	11.3	38
38 Albert Street	244844.8	7412830	4.5	11.4	31
33 Albert Street	244818.9	7412814.8	4.5	11.5	33

Predicted L_{AMax} noise levels from vehicles and carparking are shown in **Table 9**.

Table 9 Predicted L_{AMax} noise levels from vehicles

Receptor	X Posn (m)	Y Posn (m)	Height (m)	Ground (m)	Noise Level (dB(A))
The Stirling (ground near Albert St)	244781.2	7412841.2	1.8	11.5	58
The Stirling (upper floor facing Kent Lane)	244768.9	7412858.9	4.5	11.7	66
32 Kent Street	244801.8	7412893	4.5	11.5	78
33 Kent Street	244848.2	7412907.4	4.5	11.3	61
38 Albert Street	244844.8	7412830	4.5	11.4	54
33 Albert Street	244818.9	7412814.8	4.5	11.5	55

5.3 Pumps

Bowser pumps can have significantly varying noise emissions. Given the criterion for night-time use is “inaudibility”, taken to be 10 dB(A) below the background level, consideration of noise from pumps should be a high priority when procuring this equipment.

5.4 Air Conditioners

Air conditioning plant noise levels have been calculated based on a generic commercial AC condenser unit sound power level of 75 dB(A), with the plant located on the roof of the fuel shop. The resultant predicted noise level is no greater than 32 dB(A) at any of the identified sensitive receivers.

There is some flexibility in locating the plant, as the noise attenuation measures designed for other sources on the Site will also be effective for mechanical plant.

5.5 Refrigeration Plant

Fixed refrigeration plant has also been assumed to be located on the roof of the fuel shop for assessment purposes.

A generic sound power level of 80 dB(A) was assumed, with resultant noise levels potentially exceeding the criterion at night time by 3 dB(A).

Mobile refrigeration plant will possibly be fixed to some trucks that use the service station. However, as the Site does not include any truck parking areas, noise caused by mobile refrigeration plant will be highly transient and isn’t considered to require assessment and attenuation in addition to general truck engine and exhaust noise.

5.6 Loading Bay Noise

Provided loading activities are constrained to daytime and early evening hours, it is considered unlikely that this has potential to cause a nuisance.

5.7 Waste Collection Noise

As with the loading bay, provided this activity is constrained to daytime and early evening, it is considered unlikely that waste collection will cause a nuisance.

5.8 Other Ancillary Noise

Compressed air dispensers are typically fitted with tonal audible alarms. It is recommended that a unit is procured on which the alarm volume can be adjusted, or the alarm can be disabled during the evening and night.

6 Discussion of Results and Attenuation

6.1 Vehicle Movements

The most significant noise impacts from the Site are expected to be a result of vehicle movements, particularly heavy vehicles.

The noise levels inside the Stirling Motel and commercial use on the opposite side of Albert Street are expected to achieve the criteria. Note that the rooms of the Stirling Motel facing the Site are bathrooms.

The maximum noise levels at the surrounding residences are predicted to exceed the nominated criterion for sleep disturbance (52 dB(A)), as well as the internal Acoustic Quality Objectives for the $L_{A1(1\ hour)}$ parameter.

These results should, however, be reviewed in the context of the existing noise environment, in which Albert Street is a leg of the Bruce Highway and a major internal traffic route for Rockhampton which carries significant volumes of heavy vehicles (11% of approximately 20,000 vehicles per day).

The ambient noise level results in **Table 2** show relatively consistent existing L_{A1} noise levels throughout the day, evening and night-time periods that already significantly exceed the Acoustic Quality Objectives.

Acoustic barriers are proposed to mitigate noise from the Site to a minimum “non-worsening” impact compared to the existing ambient noise environment, shown in **Figure 7**.

6.2 Mechanical Plant

Air conditioning plant is expected to achieve the noise criteria at all sensitive receivers.

Refrigeration plant will require some further assessment during the detailed design stage of the project to ensure the night-time noise criterion is achieved. Likely solutions are:

1. Selection of refrigeration plant with a total sound power level not exceeding 77 dB(A).
2. Screening of the plant with a small acoustic barrier.
3. Locating the plant in a screened area such as the refuse area.

Figure 7 Proposed acoustic barriers

The resultant L_{AMax} noise levels with the proposed barriers in place are shown in **Table 10**.

Table 10 Predicted L_{AMax} noise levels from vehicles with acoustic barrier attenuation

Receptor	X Posn (m)	Y Posn (m)	Height (m)	Ground (m)	Noise Level (dB(A))
The Stirling (ground near Albert St)	244781.2	7412841.2	1.8	11.5	58
The Stirling (upper floor facing Kent Lane)	244768.9	7412858.9	4.5	11.7	64
32 Kent Street	244801.8	7412893	4.5	11.5	61
33 Kent Street	244848.2	7412907.4	4.5	11.3	60
38 Albert Street	244844.8	7412830	4.5	11.4	52
33 Albert Street	244818.9	7412814.8	4.5	11.5	55

Any acoustic barrier fencing must have the following properties:

- Have a minimum surface density of 12 kg/m^2 e.g. 14 mm lapped softwood palings, and
- Be free of gaps, including underneath.

Due to potentially conflicting requirements of maintaining acoustic and visual amenity, it is proposed to construct the higher half of the noise barrier on the northern boundary of the property with clear Perspex, thereby maintaining light through the area but controlling the potentially intrusive noise.

7 Conclusion and Summary of Recommendations

RoadPro Acoustics was engaged by RCI Group to assess potential noise emissions from a proposed service station at 20-26 Albert Street and 34 Kent Street, Rockhampton.

It was found that the Acoustic Quality Objectives would be difficult to achieve for the Site at night, with heavy vehicles being the primary concern. However, noise barriers have been recommended to attenuate noise to at least achieve a "non-worsening" of the existing noise environment, which is predominately due to road traffic.

Refrigeration plant should be further assessed during the detailed design stage of the project to ensure the noise criteria are achieved. However, based on predictions assuming generic plant noise levels, it is expected the solution(s) will be minor in nature due to the small exceedances expected.

Considerations for equipment procurement should include:

- Noise levels of bowser pumps, and
- Options for adjusting or disabling alarms on compressed air dispensers.

It is the view of RoadPro Acoustics that the Site is suitable for the proposed use, subject to the recommendations made in this report.

Appendix A – Proposal Plans

PROPOSED FUEL FILLING STATION DEVELOPMENT
AT
20- 26 ALBERT STREET, ROCKHAMPTON, QLD

ARCHITECTURAL DRAWING LIST:	
TP01	TITLE PAGE AND SITE LOCALITY PLAN
TP02	EXISTING CONDITIONS & DEMOLITION PLAN
TP03	PROPOSED SITE PLAN
TP04	PROPOSED FLOOR PLAN
TP05	PROPOSED ELEVATIONS
TP06	SIGNAGE PLAN
TP07	SHADOW DIAGRAMS
TP08	EXISTING & PROPOSED PERSPECTIVES

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PROJECT
PROPOSED FUEL FILLING STATION DEVELOPMENT

PROJECT ADDRESS
20- 26 ALBERT STREET
ROCKHAMPTON
QLD 4700

DRAWING TITLE
TITLE PAGE AND SITE LOCALITY PLAN

CLIENT
RCI GROUP

DATE	SCALE @ A1	NORTH
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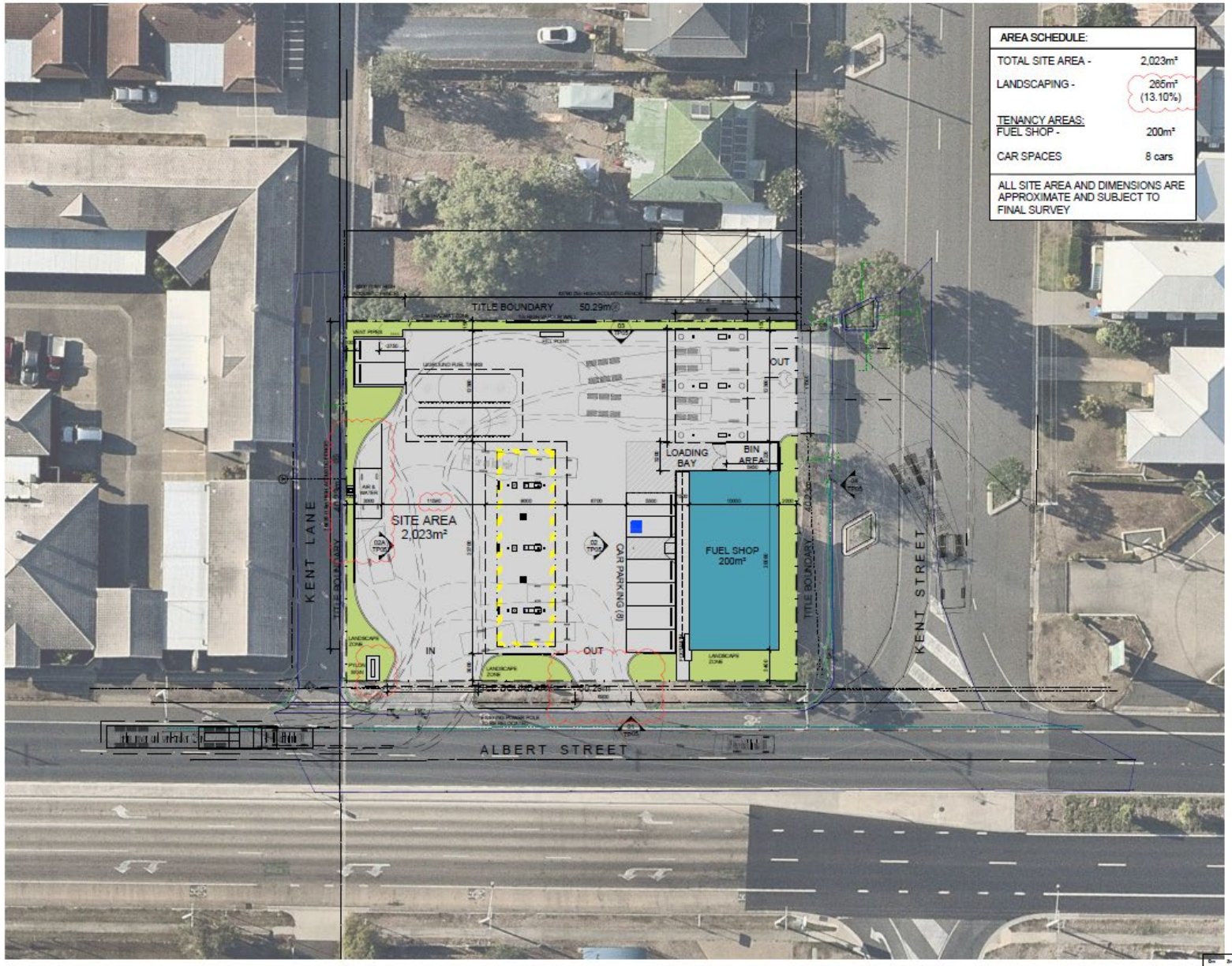
ISSUE: PLANNING		
PROJECT No.: 20004	DRAWING No.: TP01	REVISION No.: A



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PROJECT
PROPOSED FUEL FILLING STATION DEVELOPMENT

PROJECT ADDRESS
20- 26 ALBERT STREET
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QLD 4700

DRAWING TITLE
PROPOSED SITE PLAN

CLIENT
RCI GROUP

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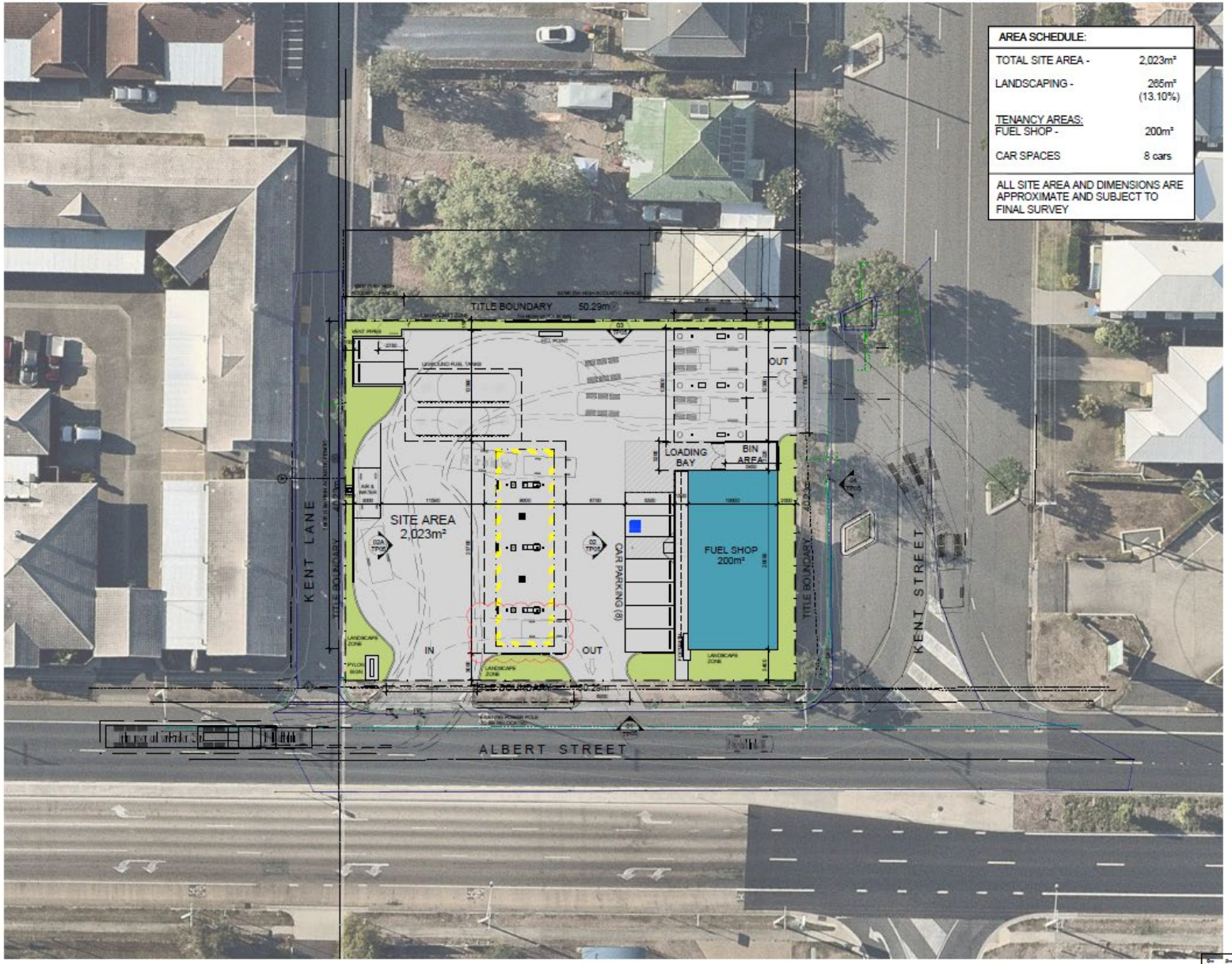

AREA SCHEDULE:	
TOTAL SITE AREA -	2,023m²
LANDSCAPING -	265m² (13.10%)
TENANCY AREAS:	
FUEL SHOP -	200m²
CAR SPACES	8 cars

ALL SITE AREA AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO FINAL SURVEY

REV	AMENDMENT DETAILS	BY	DATE
D	CAR PATH MODIFIED	JS	09-03-20
C	PYLON SIGN, AIR & WATER RELOCATED, BARRIER CROSSOVER TO ALBERT ST. & LANDSCAPING AREA REVISED	JS	07-03-20
B	PYLON SIGN RELOCATED, FENCE EXTENT REVISED	JS	06-03-20
A	LANDSCAPE BUFFER INCREASED AT NORTH SIDE, FENCE ADDED ALONG NORTH & WEST BOUNDARY, LANDSCAPE AREA ADDED.	JS	05-03-20
E	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

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DRAWING TITLE
PROPOSED SITE PLAN

CLIENT
RCI GROUP

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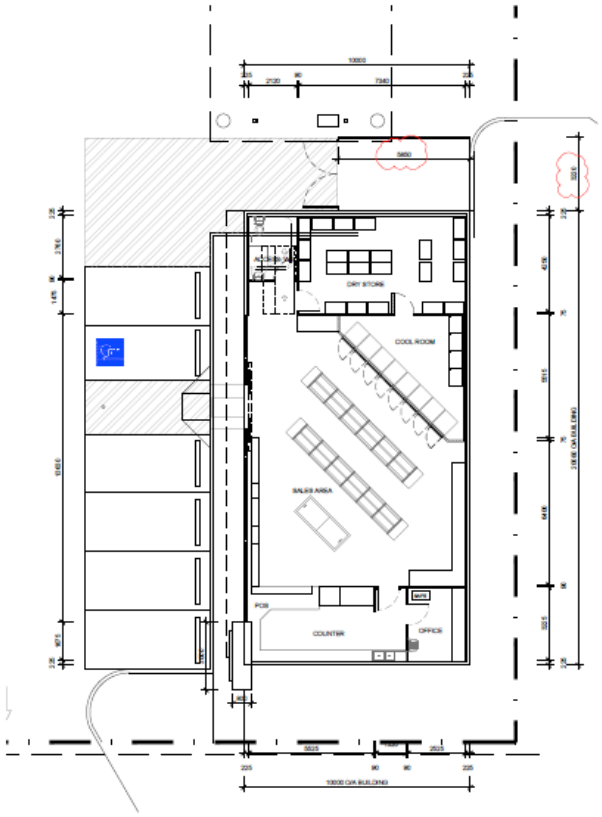

01 FLOOR PLAN
SCALE 1:100

REV	AMENDMENT DETAILS	BY	DATE
N	DIMENSIONS ADJUSTED TO SUIT SITE PLAN LAYOUT	JS	07-04-20
A	BIN AREA LENGTH REVISED	JS	09-04-20
B	PLANNING ISSUE	JS	13-04-20
P1	PRELIMINARY ISSUE	JS	06-04-20

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T: +61 3 9542 9500 F: +61 3 9542 9512
www.trgarch.com
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NSW No. DP-AD1989

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PROJECT
PROPOSED FUEL FILLING STATION DEVELOPMENT

PROJECT ADDRESS
20- 26 ALBERT STREET
ROCKHAMPTON
QLD 4700

DRAWING TITLE
PROPOSED FLOOR PLAN

CLIENT
RCI GROUP

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ISSUE: PLANNING		
PROJECT No. 20004	DRAWING No. TP04	REVISION No. B

SHEET 04 of 08

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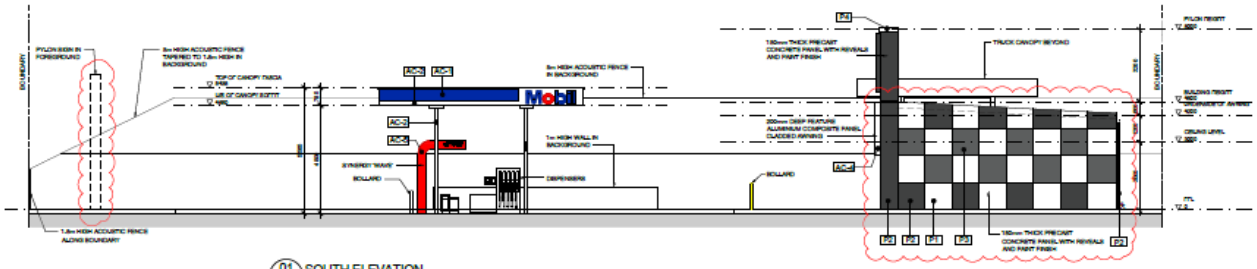
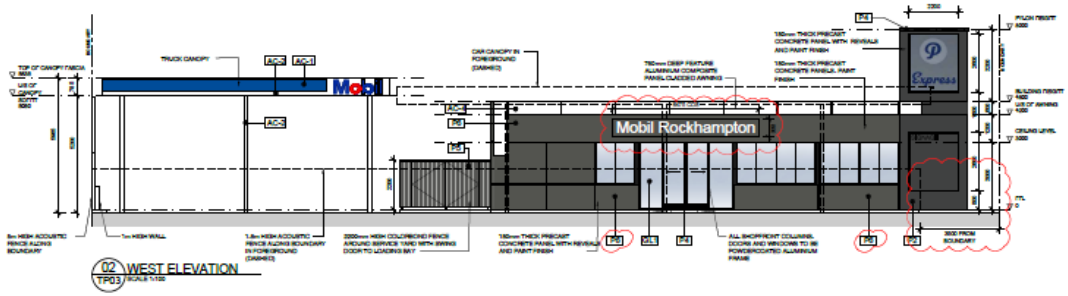
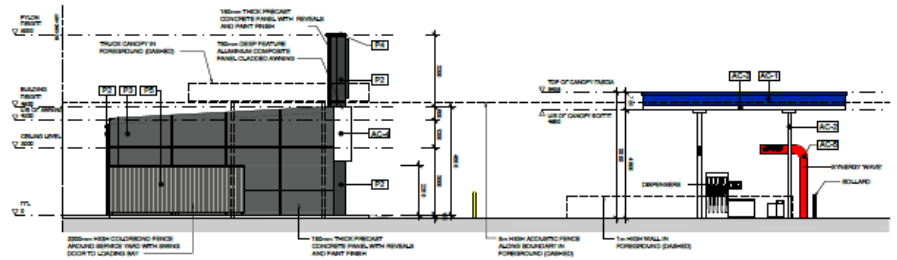
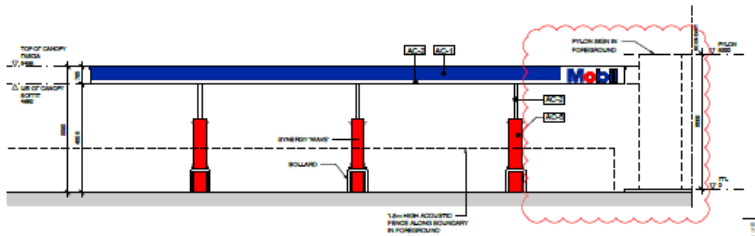


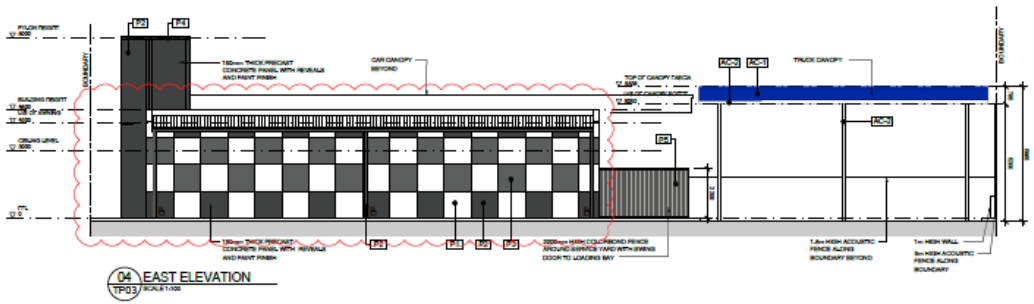


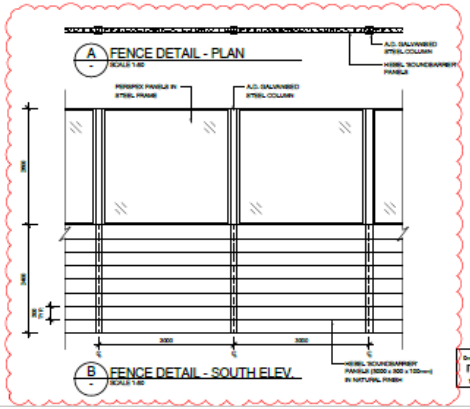
EXTERNAL COLOUR SCHEDULE

AC-1	CANOPY FASCIA ALUMINIUM COMPOSITE PANEL COLOUR: BLUE	P1	PRECAST EXTERNAL WALLS PAINT DULUX - WHITE
AC-2	CANOPY FASCIA AND STEEL COLUMNS ALUMINIUM COMPOSITE PANEL COLOUR: WHITE	P2	PRECAST PANEL PAINT DULUX - MONUMENT
P6	STORE FASCIA PRECAST PANEL COLOUR: WOODLAND GREY	P3	PRECAST PANEL PAINT DULUX - BASALT
AC-3	STORE FEATURE AWNING ALUMINIUM COMPOSITE PANEL COLOUR: WHITE	P4	DOOR & WINDOW POWDERCOATED NIGHT SKY
AC-4	SIGNAGE ALUMINIUM COMPOSITE PANEL COLOUR: RED	P5	VERTICAL COLORBOND FENCE 'WOODLAND GREY'
		GL1	CLEAR GLAZING TO CODE, NCC & RELEVANT STANDARDS









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PROPOSED ELEVATIONS

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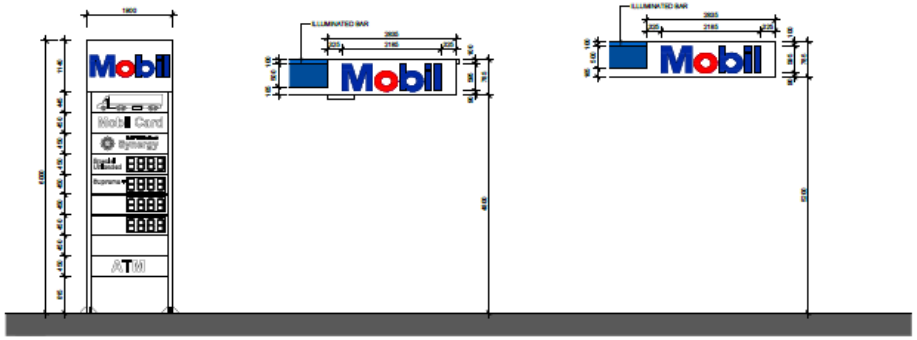

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02 SIGN 02
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03 SIGN 03
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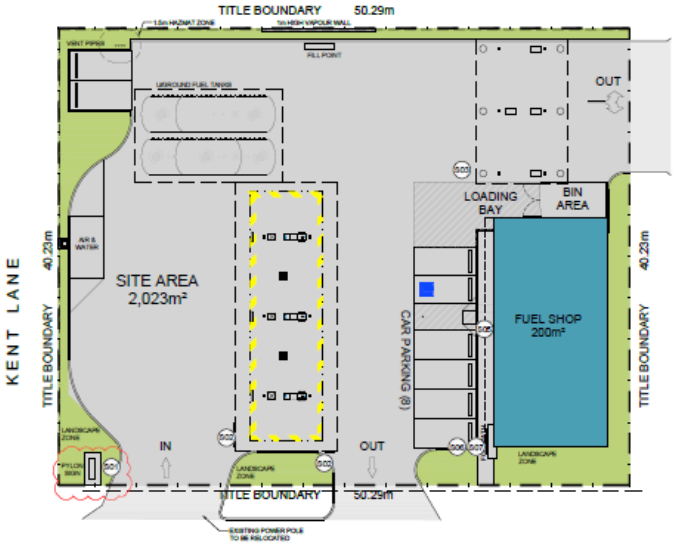
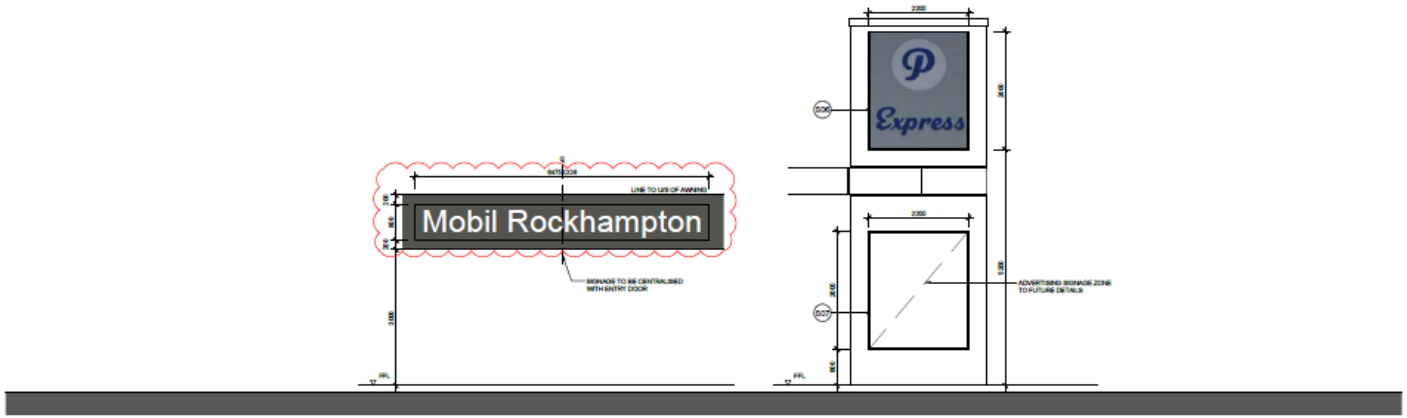


A KEY PLAN



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06 SIGN 06
INTERNALLY ILLUMINATED
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07 SIGN 07
NON-ILLUMINATED SIGN

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D	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

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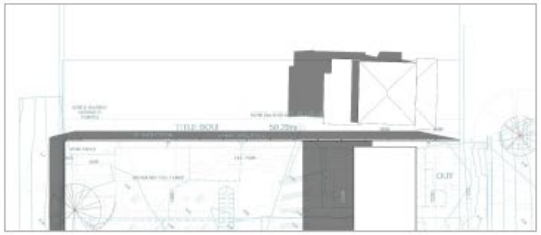

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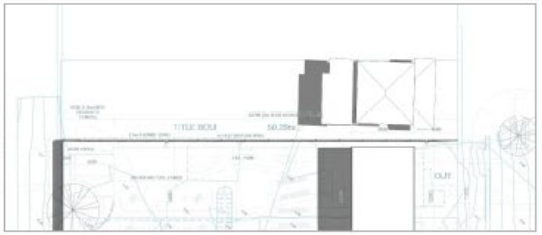

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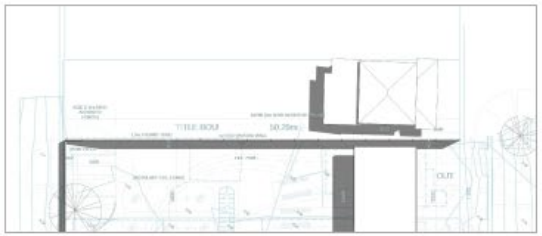

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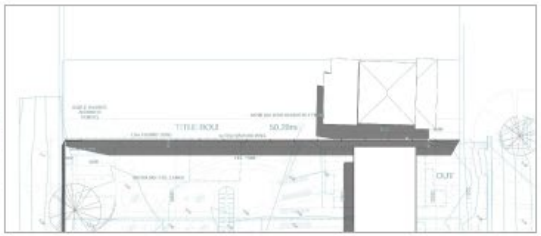

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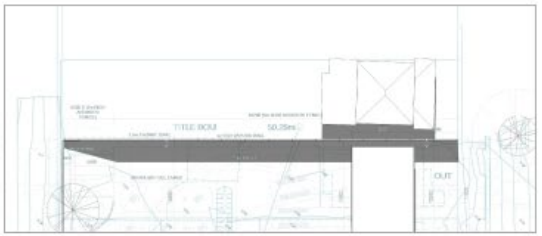

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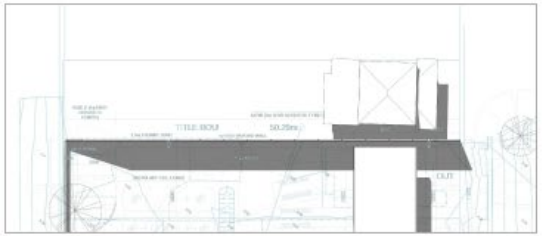


SPRING EQUINOX 3pm

Town Planning
Not for construction

BRISBANE + MELBOURNE

concept + design + interiors + project management

PROPOSED FUEL FILLING STATION DEVELOPMENT

20- 26 ALBERT STREET

ROCKHAMPTON
QLD 4700

SHADOW DIAGRAM

RCI GROUP

DATE: APR.'20	SCALE @ A1: -	NORTH
DRAWN: KS	CHECKED: AB	
ISSUE: PLANNING		
PROJECT No: 20004	DRAWING No: TP07	REVISION No: Ø

VIEW FROM INTERSECTION OF ALBERT STREET & CAMPBELL STREET (BEFORE)

VIEW FROM INTERSECTION OF ALBERT STREET & KENT LANE (BEFORE)

VIEW FROM INTERSECTION OF ALBERT STREET & CAMPBELL STREET (AFTER)

VIEW FROM INTERSECTION OF ALBERT STREET & KENT LANE (AFTER)

Town Planning
Not for construction

trg
BRISBANE + MELBOURNE

concept +
design + interiors +
project management

PROPOSED FUEL FILLING STATION DEVELOPMENT

20- 26 ALBERT STREET

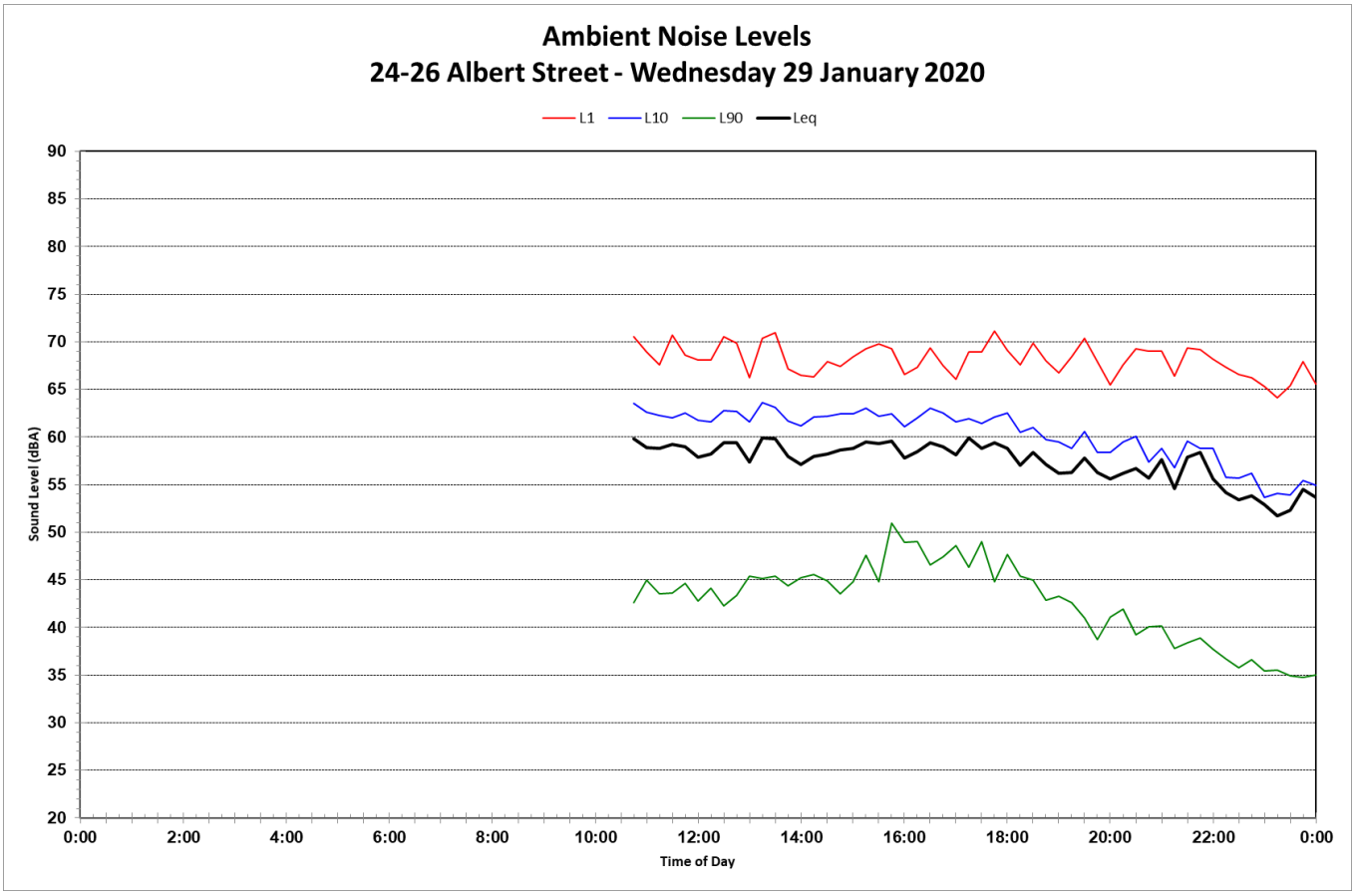
ROCKHAMPTON
QLD 4700

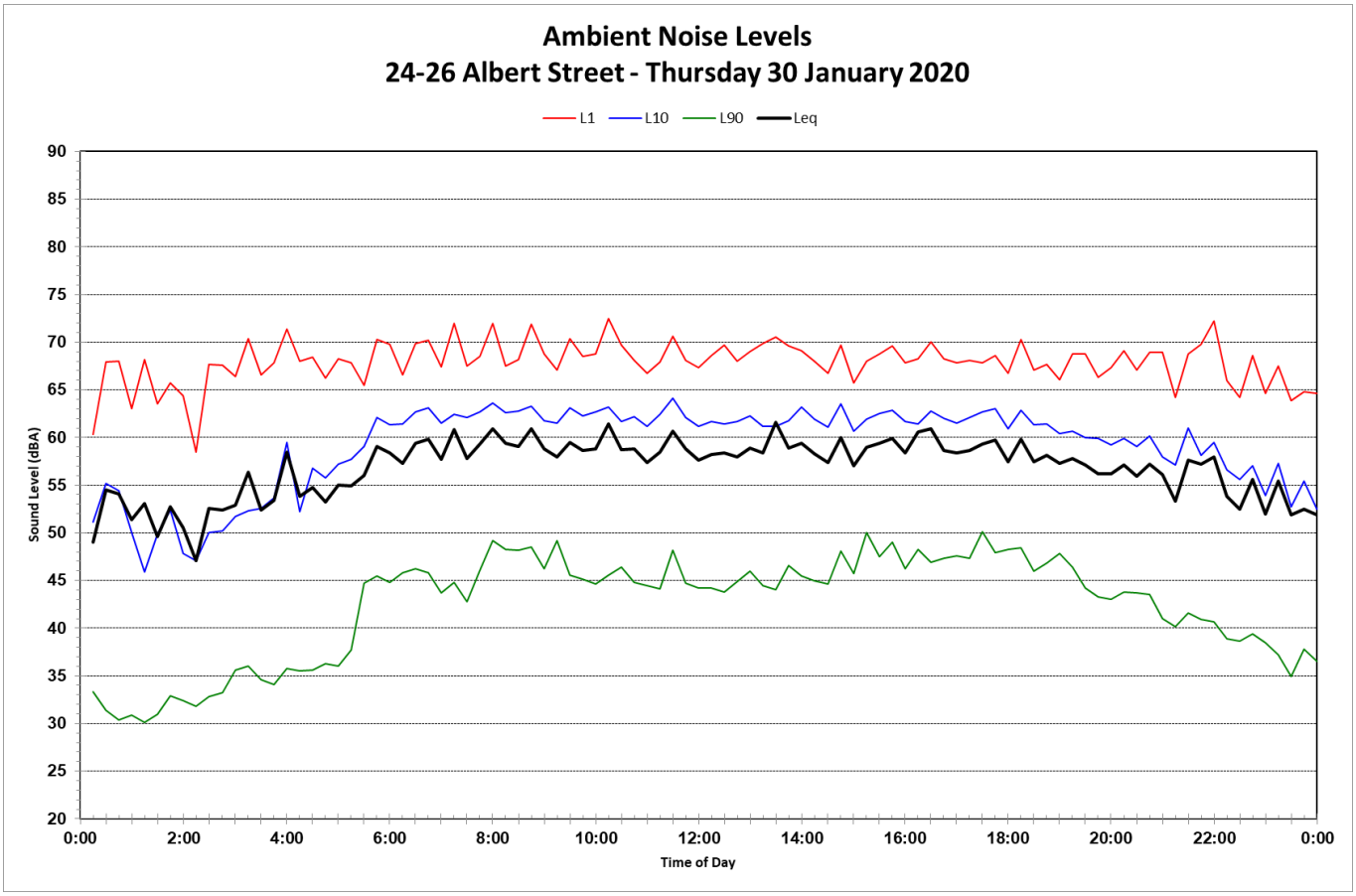
EXISTING & PROPOSED PERSPECTIVES

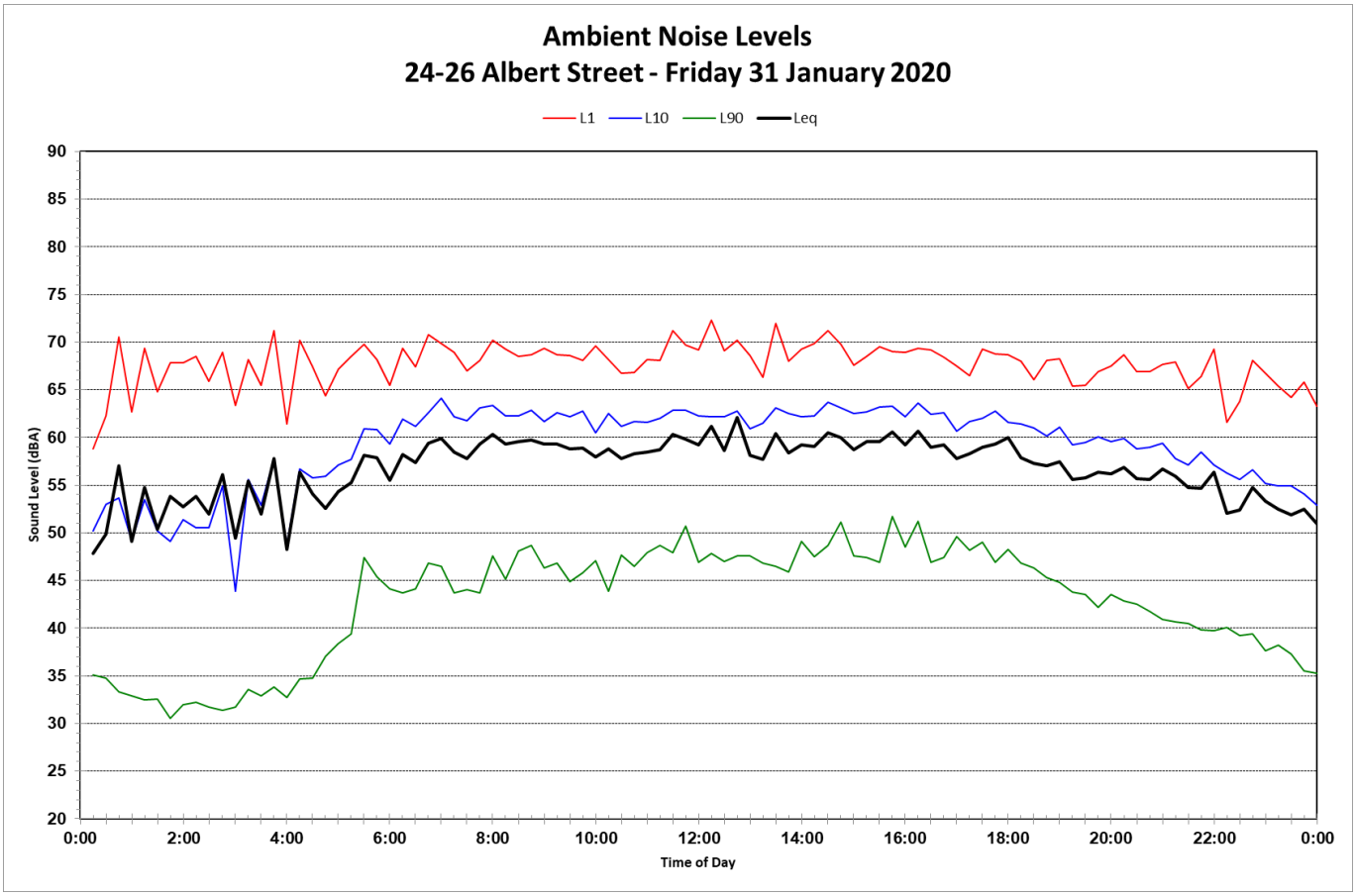
RCI GROUP

APR.'20	-	
KS	AB	
PLANNING		
20004	TP08	A

Appendix B – Noise Charts



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24-26 Albert Street - Friday 31 January 2020
L1
L10
L90
Leq
Sound Level (dBA)
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
0:00
2:00
4:00
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8:00
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14:00
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22:00
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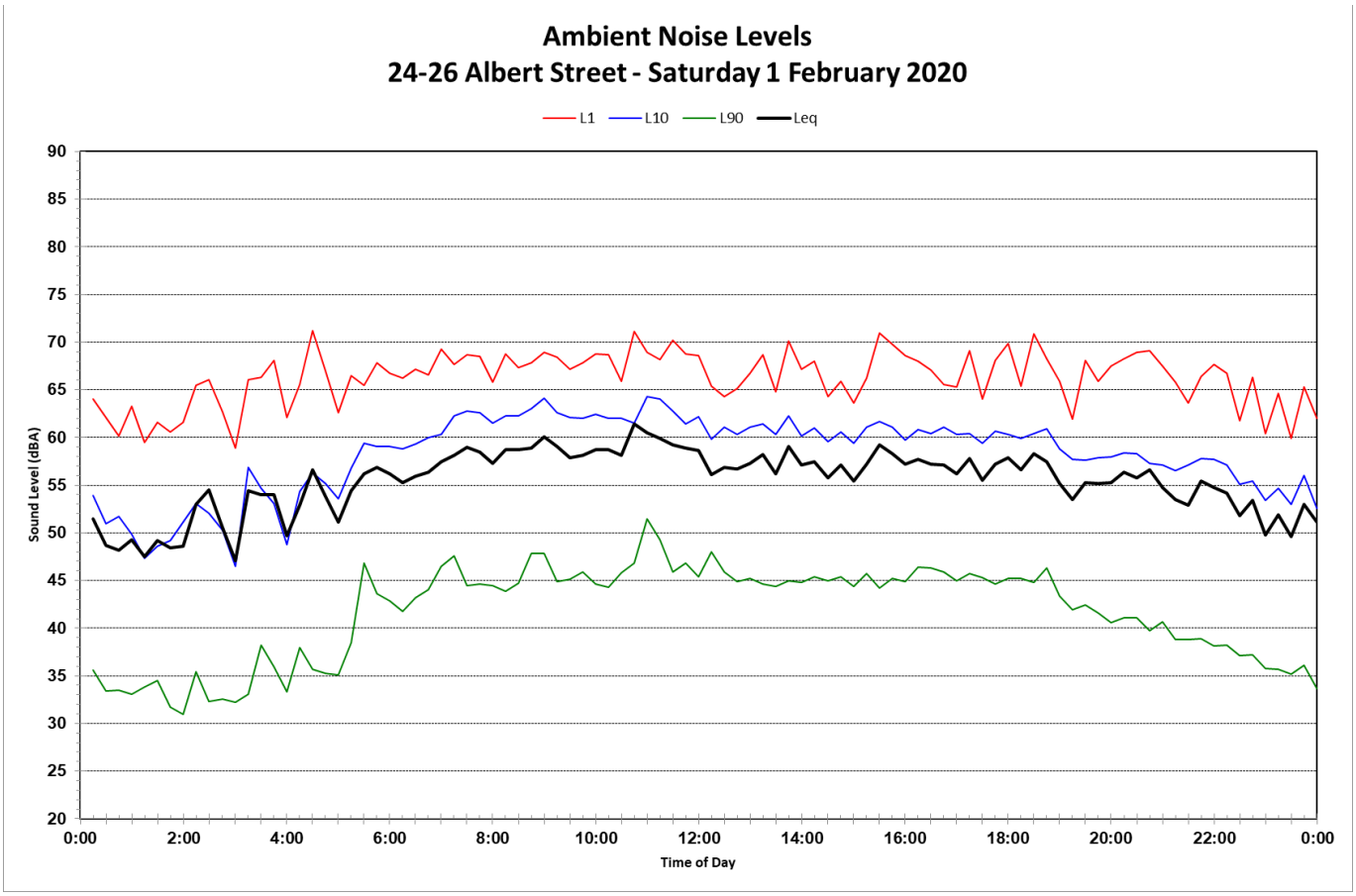
Time of Day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24-26 Albert Street - Saturday 1 February 2020
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L10
L90
Leq
Sound Level (dBA)
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85
80
75
70
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50
45
40
35
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0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
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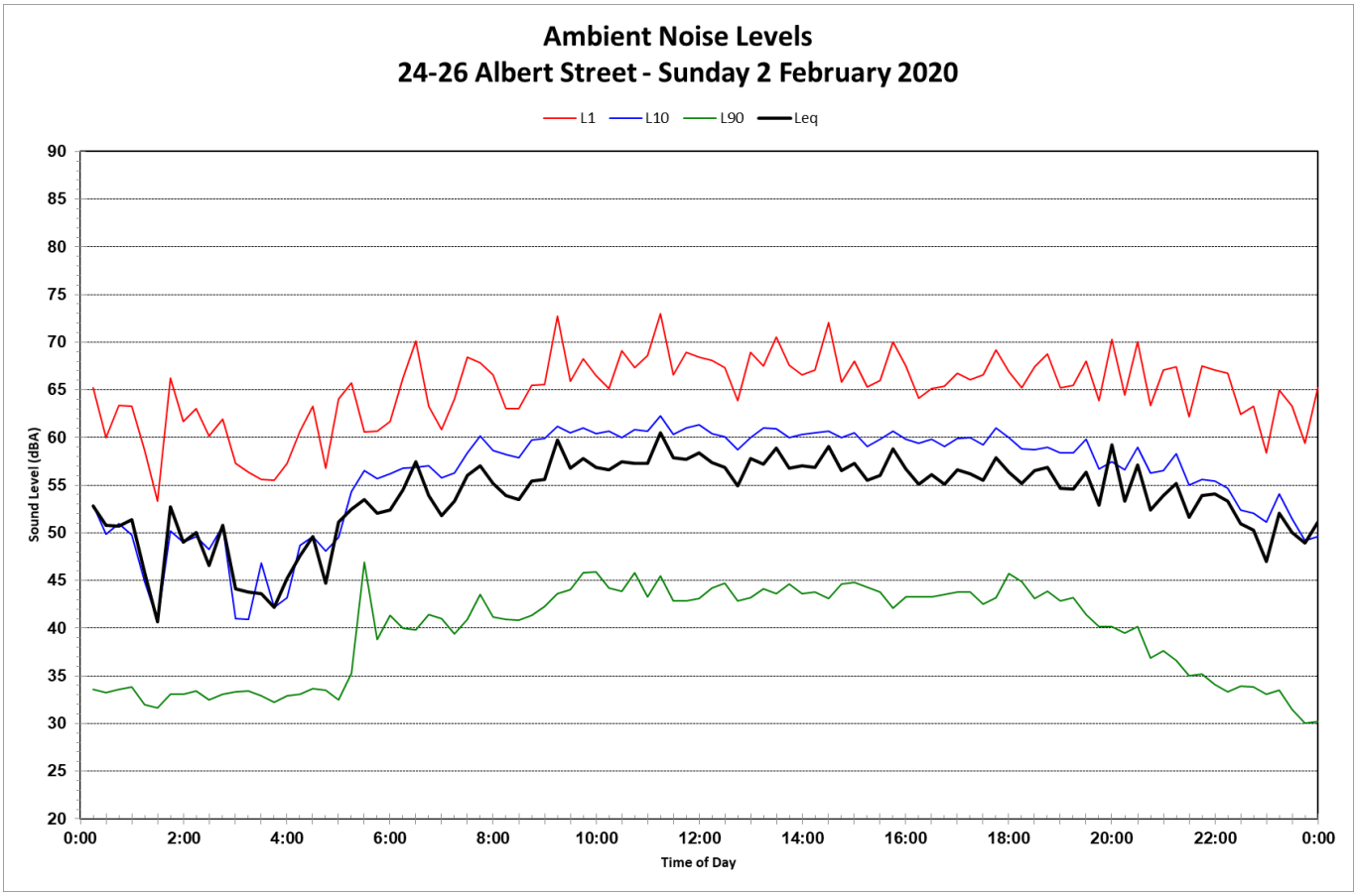
18:00
20:00
22:00
0:00
Time of Day


Ambient Noise Levels
24-26 Albert Street - Sunday 2 February 2020
L1
L10
L90
Leq
Sound Level (dBA)
90
85
80
75
70
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0:00
2:00
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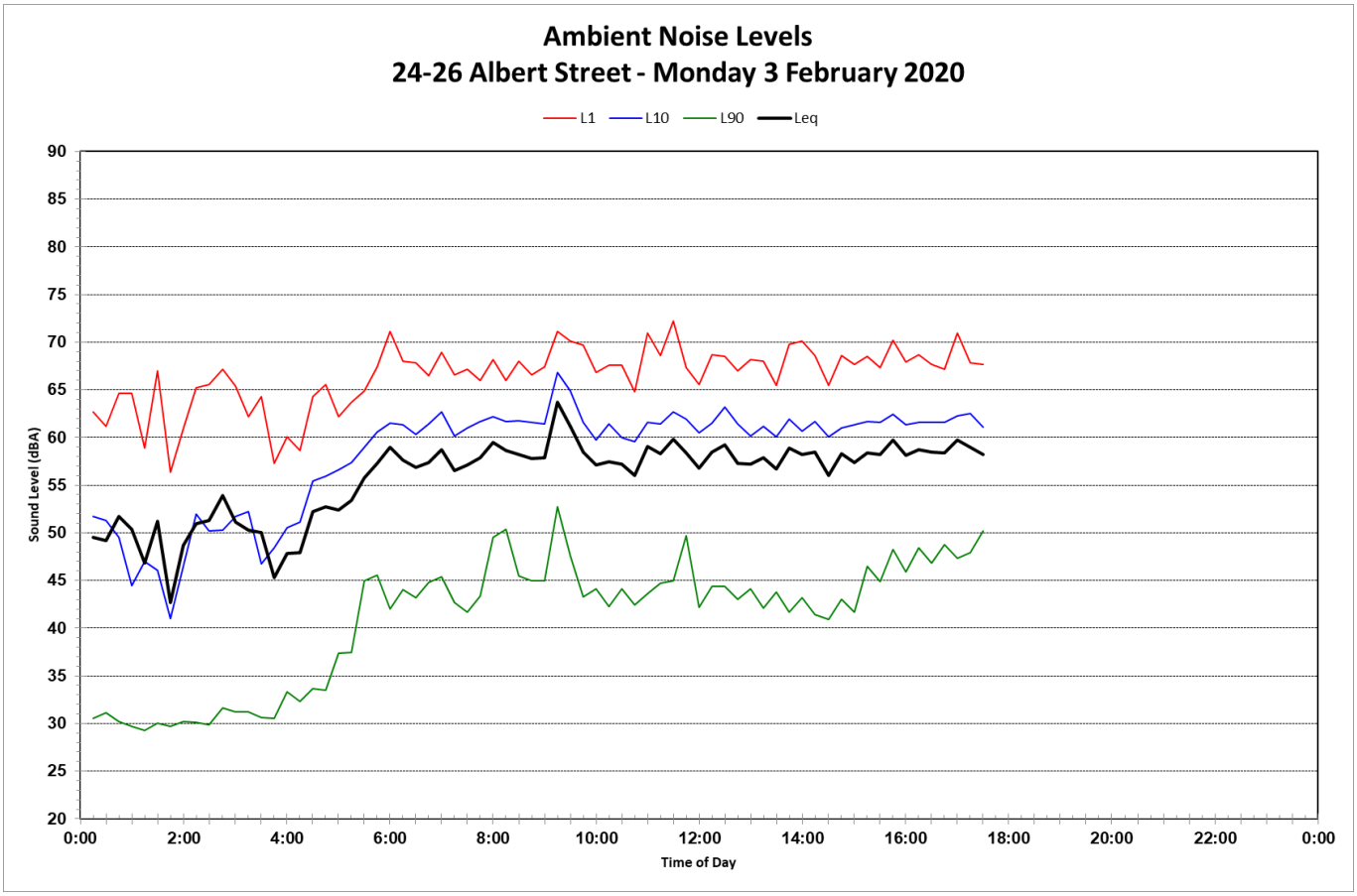
Time of Day


Ambient Noise Levels
24-26 Albert Street - Monday 3 February 2020
L1
L10
L90
Leq
Sound Level (dBA)
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85
80
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0:00
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16:00
18:00
20:00
22:00
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Time of Day

mcmurtrie
CONSULTING ENGINEERS

Traffic Impact Assessment Report

Proposed Albert Street Service Station

20-26 Albert St & 34 Kent St (Lot 1-5 RP600729), Rockhampton, QLD

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/28-2020

Dated: 29 March 2021

Prepared For: RCI Group

Job No. 053-19-20

February 2020

Revision A

ABN 69 958 286 371
P (07) 4921 1780
F (07) 4921 1790
E mail@mcmengineers.com

PO Box 2149
Wandal Q 4700
63 Charles Street
North Rockhampton Q 4701

Traffic Impact Assessment Report

Rev.	Description	Signature	Date
A	Final	-	21.02.2020

CONTENTS

Traffic Impact Assessment Report

Albert Street Service Station, 20-26 Albert St and 34 Kent St (Lot 1-5 RP600729), Rockhampton QLD

1.0 INTRODUCTION

1.1. PROJECT BACKGROUND

RCI Group are proposing to establish a service station on the properties at 20-26 Albert St and 34 Kent St (Lot 1-5 RP600729) in Rockhampton, Queensland. The service station is expected to cater for passing traffic on the adjacent section of the Bruce Highway, and provides refuelling and parking facilities for predominantly light vehicles.

1.2. SCOPE AND STUDY AREA

McMurtrie Consulting Engineers (MCE) have been commissioned by RCI Group to undertake a Traffic Impact Assessment (TIA) for the proposed Service Station, located at 20-26 Albert St and 34 Kent St (Lot 1-5 RP600729) in Rockhampton, Queensland.

This Traffic Impact Assessment (TIA) was carried out to determine the level of potential impacts of the operational phases of the Project on the operation of the surrounding road network. The outcomes of the TIA will be used in support of the Development Application which will be assessed by Department of Transport and Main Roads (TMR) and Rockhampton Regional Council (RRC).

The assessment methodology adopted for this TIA is summarised in the key tasks listed below.

- Broadly identify the existing transport infrastructure which is of relevance to the Project.
- Estimate traffic generation associated with the Project and the distribution of this development traffic on the identified road network.
- Assess the potential impact of the Project on the surrounding transport infrastructure.
- Identify potential mitigation and management strategies to be implemented to offset the impact of the proposed Project (if required).

As outlined above, the adopted methodology centres on establishing a background, “without development” traffic scenario for the identified transport routes and comparing this with a scenario including the Project-generated traffic, i.e. the “with development” scenario.

The process allows for the assessment of the traffic impacts of the Project in terms of road safety, access requirements, intersection operations, road link capacity, pavement and other transport infrastructure. Following this, if required, potential mitigation and/or management measures would be formulated to address the potential traffic impacts caused by the proposed Project.

1.2.1 STUDY AREA

As previously identified, the proposed service station is proposed to be 20-26 Albert St and 34 Kent St, Rockhampton, on the land parcel formally described as Lot 1-5 RP600729, as shown in **Figure 1** below.

Figure 1 Study Area – 20-26 Albert St & 34 Kent St, Rockhampton Qld [Source: Qld Globe]

2.0 EXISTING CONDITIONS

2.1. SURROUNDING ROAD NETWORK DETAILS

2.1.1 ROAD LINKS

Bruce Highway (Rockhampton-St Lawrence) – 10F

The Bruce Highway links the east coast of Queensland running from Brisbane to Cairns. In the Rockhampton area, specifically along Albert Street the link is the primary north-south road transport route for both passenger and road freight vehicles within Central Queensland. The section of the Bruce Highway along Albert Street currently is typically a two-way, four lane separated urban standard road with a posted speed limit of 60km/h, permitting left in/left out site access for vehicle up to 19 m Prime mover. Site access to the highway for the proposed development will be from the northbound or gazettal direction as indicated in **Figure 2** below.

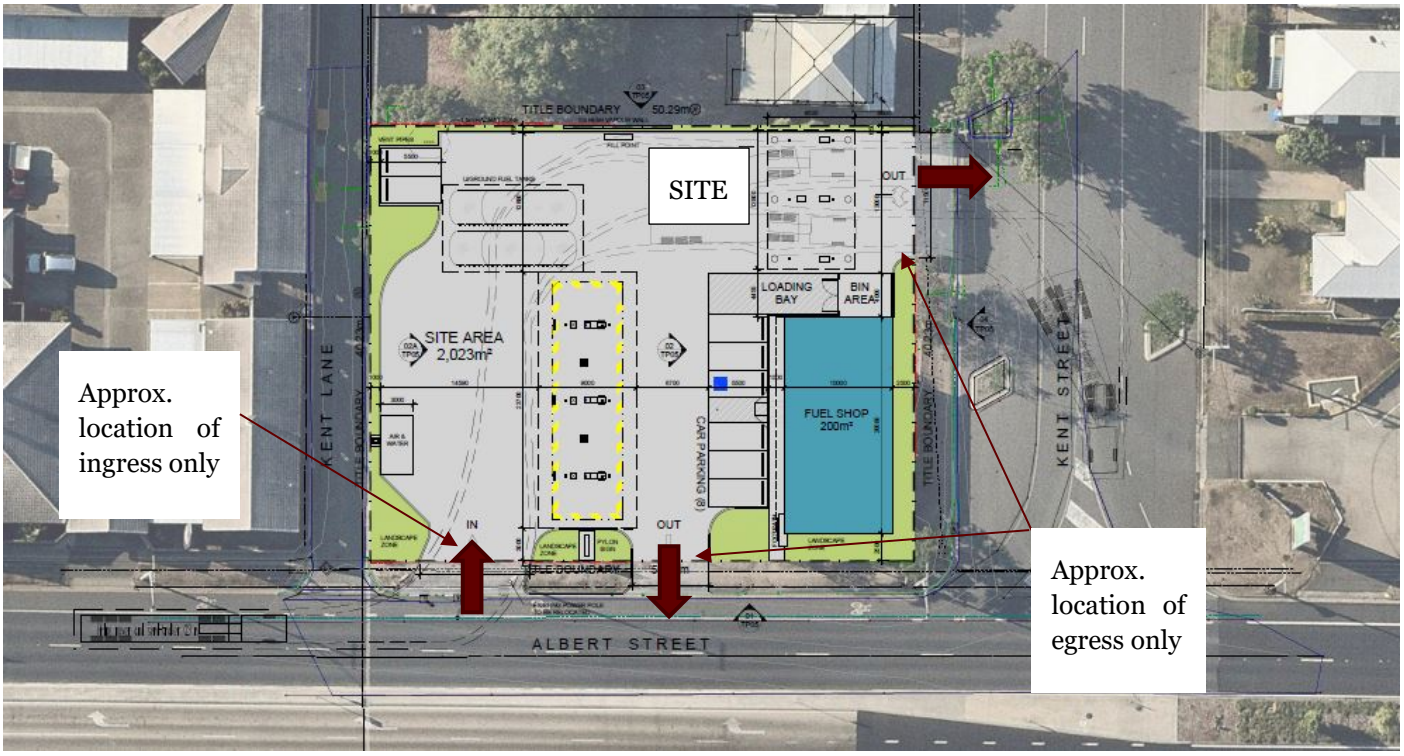


Figure 2 Bruce Highway frontage along Albert St, Rockhampton

2.2. TRAFFIC VOLUMES

2.2.1 ROAD LINK VOLUMES

The background traffic volumes for the relevant section of the state-controlled road network were established using the available 2018 AADT segment traffic count data provided by TMR (refer **Appendix A**). Using these established traffic volumes for each section of the road links, the development year (2020) daily traffic volumes on the network were established assuming a slightly conservative 4.5% background traffic growth rate on the link (actual average 10-year growth rate was identified to be 4.33%).

A summary of the forecast background traffic volumes for each of the relevant road segments for the current year (2019) is provided in **Table 1** and refer to **Appendix A** for peak hourly counts.

Table 1 Forecast Future Background AADT Traffic Volumes

Site ID	AADT Segment		Base Data Year	Base Year (2018) AADT				10 Yr. GR %	Background AADT (2020)			
	Start (km)	End (km)		Gaz	% HV	A-Gaz	% HV		Gaz		A-Gaz	
									Total	HV	Total	HV
Bruce Highway – 10F												
60017	0.00	1.41	2018	7,468	17.02	6,966	18.40	4.5	8,155	1,387	7,607	1,399

2.3. NETWORK PERFORMANCE

2.3.1 ROAD LINKS

Based on the daily traffic volumes identified in **Table 1** above, it is anticipated that all relevant sections of the Bruce Highway can be considered to be currently operating satisfactorily and within capacity, as the existing mid-block traffic volumes identified are considered well within the capacity of a two-way, four lane sealed separated urban road / highway.

2.4. ROAD SAFETY ISSUES

2.4.1 EXISTING SITE CONDITIONS

A site inspection of the existing traffic conditions on the relevant road network was undertaken by Raitt McLeod on Wednesday 12 February 2020. No safety issues were able to be identified and any new access will be left in/left out under the 4-lane separated layout there is not likely to be any significant safety issues as the traffic along Albert St is controlled by the traffic lights at the intersection of Albert and Campbell Street.

2.4.2 ROAD CRASH HISTORY REVIEW

A review of the road crash history of the section of the Bruce Highway considering the intersections either side of the proposed access point was undertaken using the road crash data available from the Queensland Globe database, with the assessment completed for the available data range (2002-2018).

The results of this assessment identified 54 crashes in the nominated extents within this timeframe, with the approximate location of the recorded crashes shown in **Figure 4** below, while a summary of the details of the road crash data is provided in **Table 2**.

Figure 3 Road Crash Locations – Bruce Highway / Proposed Site Access Intersection [Source: QLD Globe]

Table 2 Summary of Road Crash History (2002-2018)

Crash Ref. No.	Crash Year	Crash Severity	Crash Type	DCA Description	Crash Description
Bruce Highway					
136367	2007	Property damage only	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
180514	2008	Property damage only	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
123881	2006	Property damage only	Single Vehicle	Off Path-Straight: Left Off Cway Hit Obj	Off carriageway on straight hit object

208750	2010	Property damage only	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
224532	2010	Property damage only	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Right	Intersection from adjacent approaches
214929	2010	Property damage only	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
102344	2005	Property damage only	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
189786	2009	Property damage only	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
98391	2005	Property damage only	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
132837	2006	Property damage only	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
171147	2008	Property damage only	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
26904	2002	Property damage only	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
108069	2005	Property damage only	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
30065	2002	Property damage only	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
131181	2006	Property damage only	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
171804	2008	Property damage only	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
131352	2006	Property damage only	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
127691	2006	Property damage only	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
161748	2008	Property damage only	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
142596	2007	Minor injury	Single Vehicle	Veh'S On Path: Temporary Object On C'Way	Other
251178	2012	Minor injury	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
29515	2002	Minor injury	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Left	Intersection from adjacent approaches
207396	2010	Minor injury	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
66561	2003	Minor injury	Multi-Vehicle	Veh'S Adjacent Approach: Right-Thru	Intersection from adjacent approaches
128393	2006	Minor injury	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
36550	2002	Minor injury	Hit pedestrian	Ped'N: Hit Walking With Traffic	Pedestrian
62297	2003	Minor injury	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
241350	2012	Medical treatment	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
120218	2006	Medical treatment	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches

186853	2009	Medical treatment	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
27360	2002	Medical treatment	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
33965	2002	Medical treatment	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
48949	2003	Medical treatment	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
86948	2004	Medical treatment	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
209778	2010	Medical treatment	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
120666	2006	Medical treatment	Single Vehicle	Off Path-Straight: Left Turn	Off carriageway on straight
29012	2002	Medical treatment	Hit pedestrian	Ped'N: Near Side Vehicle Hit From Right	Pedestrian
8568	2001	Medical treatment	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
7754	2001	Hospitalisation	Single Vehicle	Off Path-Straight: Mounts Traffic Island	Off carriageway on straight hit object
202833	2009	Hospitalisation	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
26441	2002	Hospitalisation	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
249963	2012	Hospitalisation	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
216073	2010	Hospitalisation	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
80854	2004	Hospitalisation	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
292912	2016	Hospitalisation	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
194920	2009	Hospitalisation	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
228484	2011	Hospitalisation	Multi-Vehicle	Veh'S Same Direction: Rear End	Rear-end
239820	2011	Hospitalisation	Hit pedestrian	Ped'N: Near Side Vehicle Hit From Right	Pedestrian
115917	2006	Hospitalisation	Multi-Vehicle	Veh'S Adjacent Approach: Thru-Thru	Intersection from adjacent approaches
130922	2006	Hospitalisation	Hit pedestrian	Ped'N: Far Side Vehicle Hit From Left	Pedestrian
228430	2011	Hospitalisation	Multi-Vehicle	Veh'S Opposite Approach: Thru-Right	Opposing vehicles turning
230216	2011	Hospitalisation	Multi-Vehicle	Veh'S Adjacent Approach: Other	Intersection from adjacent approaches
288092	2015	Hospitalisation	Hit pedestrian	Ped'N: Play; Work; Stand; Lie On C'Way	Pedestrian
190545	2009	Hospitalisation	Other	Pass & Misc: Hit Railway Xing Furniture	Off carriageway on straight hit object

The results above indicate that the majority of the crashes/incidents occur at the intersection of Albert and Campbell St. Disregarding the incidents which occurred at the signalized intersections, there have been only 6 crashes recorded in the northbound lane of the Bruce Highway in the vicinity of the proposed site over the last 16 years (2002-2018) with no incidents recorded in the previous 4 years.

2.5. SITE ACCESS

As previously identified, access to the site will be via left in/left out intersection to the northbound lanes

of the Bruce Highway. The access intersection will need to cater for vehicles up to a 19 m Prime mover.

3.0 PROPOSED DEVELOPMENT DETAILS

3.1. OPERATIONAL DETAILS

The proposed development is a service station, which will occupy majority of the subject site as shown in the site plan included as **Appendix B** and the extract provided as **Figure 4** below.

The development will provide three (3) bowsers for cars (i.e. six (6) refuelling positions), and four (4) bowsers for heavy vehicles/trucks (i.e. two (2) refuelling positions). Vehicular access is proposed via a left in/left out access intersection with the Bruce Highway, while the largest design vehicle anticipated to require access to the site is a 19m Prime mover.

The proposed service station building has an area of 200m² GFA, with parking bays provided for cars parking in close proximity to the building and truck parking areas provided to the north of the main service station area.

The traffic elements of the proposed development are discussed further in the following sections.

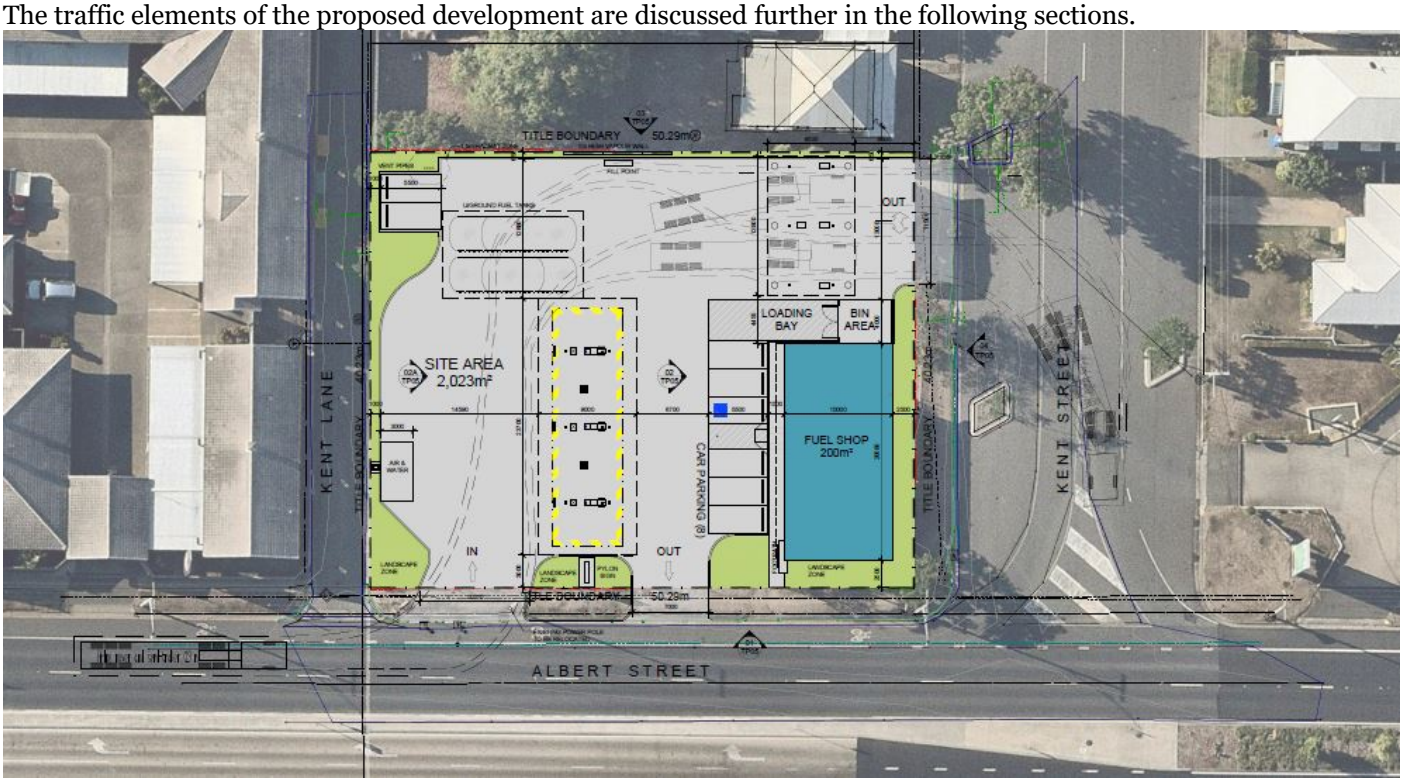


Figure 4 Extract from Site Layout Plan (Dwg. 20004 – TP03 Rev ø) [Source: RCI Group]

3.2. PROPOSED ACCESS AND PARKING

3.2.1. SITE ACCESS

As previously identified, vehicular access to the service station development is proposed to be provided via a left in/left out access intersection with the Bruce Highway catering for vehicles in the Northbound lanes.

3.2.2 INTERNAL SITE FACILITIES

In order to assess the adequacy of the internal traffic facilities, reference has been made to the Access, Parking and Transport Code within the Rockhampton Regional Council Planning Scheme, as well as the relevant Australian Standards.

Compliance with the requirements of these documents is discussed in the following sections.

3.2.2.1 CAR PARKING

Table 9.3.1.3.2 of RRC's Access, Parking and Transport Parking Code stipulates a car parking requirement of 1 space per 25m² GFA for the relevant shop area of a service station. Given the proposed service station includes approximately 200m² GFA of shop area, the recommended parking provision for the development is therefore 8 parking spaces (minimum).

As shown in the site plan Dwg. 20004 – TP03 Rev ø (included within **Appendix B**), a total of 8 parking spaces are proposed on site, including 1 PWD Bay for Persons with Disabilities.

All parking spaces proposed for light vehicles (cars) are generally 5.5m long and 2.6m wide and are accessed by a parking aisle exceeding 6.6m width, which meets the requirements stipulated in AS2890.1 for short term, high turnover parking, while the provision of 1 PWD bay for the proposal aligns with the general PWD bay provision rate of between 1-2% of the overall parking bays on site.

3.2.2.2 QUEUING AND VEHICLE CIRCULATION

As shown in Dwg. 20004 – TP03 Rev ø (refer **Appendix B**) the proposed site layout nominates one-way traffic flow (clockwise) for vehicles through the petrol pump lanes in the vicinity of the service station, with the vehicle access to the pump area located off the main access road. Vehicle swept paths have also been undertaken which confirm the ability of a 19m Prime mover to travel through the site as required, with a copy of the relevant swept paths for the proposal included for reference in **Appendix B and C**.

3.2.2.3 SERVICE VEHICLE ACCESS, CIRCULATION AND LOADING

RRC's Access, Parking and Transport Parking Code does not stipulate any specific requirement for servicing at service station developments. Notwithstanding this, a service vehicle bay is proposed to the east of the building.

Finally, it is also understood that the fuel tanker which expected to be used for regular refuelling of the service station tanks will be a 19m Prime mover configuration vehicle. The swept path for the proposed refuelling activities on site are shown on Dwg. 20004 – TP03 (refer **Appendix B**), which clearly indicates that the 19m Prime mover can comfortably access the proposed fuel fill points within the truck stop area.

4.0 DEVELOPMENT TRAFFIC

4.1. TRAFFIC GENERATION

As mentioned previously it is envisioned that the site will cater for north bound traffic only as there is no direct access to or from the site from the south bound lanes due to the concrete median. In any case for heavy vehicles there is no close practical facility for a heavy vehicle to exit the site and continue south bound.

In order to determine the traffic generation of the proposed service development, reference has been made to the Traffic Generation Data—2006–2017 recently published on the Queensland Government website (https://data.qld.gov.au/dataset/traffic-generation-data-2006-2018) which includes the recorded weekday trip generation rates for 10 separate service stations locations in Queensland.

A summary of the relevant service station data is provided in **Table 4** below, which reveals an average trip generation rate of 29.32 trips / 100m² GFA for service stations which are less than 1,000m² GFA. Applying this rate to the identified service station tenancy area (200m² GFA) would equate to a peak hour trip generation for the proposed development site of 59 trips (entry and exit).

Table 4: Summary of Trip Generation Data (Service Stations)

Year	Land use	Suburb	Variable Units	Variable Value	Start Date	End Date	Weekday Peak Hour Start	Weekday Peak Hour End	Weekday Peak Volume	Average Weekday Peak Hour Trip Generation Rate
2009	Service Station	MORAYFIELD	GLFA	3521	9/05/2009	15/05/2009	13:30:00	14:30:00	584	16.59
2009	Service Station	BURPENGARY EAST	GLFA	3246	9/05/2009	15/05/2009	9:00:00	10:00:00	535	16.48
2009	Service Station	CARSELDINE	GLFA	1772	9/05/2009	15/05/2009	15:00:00	16:00:00	423	23.87
2009	Service Station	STAPYLTON	GLFA	2273	9/05/2009	15/05/2009	12:30:00	13:30:00	577	25.38
2009	Service Station	UPPER COOMERA	GLFA	2396	9/05/2009	15/05/2009	5:30:00	6:30:00	759	31.68
2009	Service Station	COLLEGE VIEW	GLFA	796	9/05/2009	15/05/2009	13:30:00	14:30:00	355	44.60
2011	Service Station	WOODRIDGE	GLFA	332	14/03/2011	20/03/2011	5:30:00	6:30:00	156	46.99
2011	Service Station	SUNNYBANK HILLS	GLFA	542	14/03/2011	20/03/2011	15:00:00	16:00:00	93	17.16
2011	Service Station	MACGREGOR	GLFA	529	23/03/2011	29/03/2011	14:45:00	15:45:00	117	22.12
2011	Service Station	ELANORA	GLFA	793	8/04/2011	14/04/2011	7:45:00	8:45:00	125	15.76
									AVERAGE	29.32

Source: https://data.qld.gov.au/dataset/traffic-generation-data-2006-2018/resource/73079dc1-c34e-44cf-9e9a-8acb13591c1b

It is considered that this calculated rate is more appropriate for the site than the standard trip generation rates recommended in the DTMR's *Road Planning and Design Manual (Chapter 3)* and the RTA *Guide to Traffic Engineering Developments* of 66 trips / 100m² GFA in the peak hour. This is because the adoption of this rate for the development would equate to a peak hour generation of 132 trips for the site, which is considered to be excessive given the saturation of service stations for northbound traffic through Rockhampton. With 3 service stations accessible to northbound traffic after the intersection of the Capricorn and Bruce Highway at the Yeppen Roundabout and 1 service station adjacent to the proposed site, it is not considered reasonable that an additional service station at the proposed site will generate 132 trips during the peak periods. Also, given the relatively limited facilities at the proposed site (6 car and 1 truck/heavy vehicle refuelling positions) it is not anticipated that the site can cater for such high volumes of attendance.

As such the adoption of the calculated rate from the Queensland Government's Traffic Generation Data—2006–2017 of 29.32 trips / 100m² for service stations under 1,000m² GFA is considered acceptable, which equates to a peak hour traffic generation of 59 trips during the AM and PM periods.

4.2. TRAFFIC DISTRIBUTION

Given the proposed development is a service station with no fast food or ancillary retail services, it is anticipated that the vast majority of trips generated by the proposed development will be undiverted "drop-in" trips undertaken by vehicles travelling past on the Bruce Highway.

However with a view to maintaining a conservative approach, it has been assumed that 20% of trips generated by the service station during the peak hours will be destination (i.e. new) trips, with a summary of the expected distribution of traffic from the development provided in **Table 5** below.

Table 5 Proposed Development Traffic Distribution

AM PEAK	PM PEAK
ARRIVAL / DEPARTURE SPLIT	
• 50% traffic inbound to development; and • 50% traffic outbound from development.	• 50% traffic inbound to development; and • 50% traffic outbound from development.
"NEW" TRIP DISTRIBUTION (20% Overall Trips)	
INBOUND • 100% from Bruce Highway (North). **OUTBOUND** • 100% to Bruce Highway (South).	**INBOUND** • 100% from Bruce Highway (North). **OUTBOUND** • 100% to Bruce Highway (South).
"DROP-IN" TRIP DISTRIBUTION (80% Overall Trips)	

INBOUND • 100% from Bruce Highway (North). **OUTBOUND** • 100% to Bruce Highway (South).	**INBOUND** • 100% from Bruce Highway (North). **OUTBOUND** • 100% to Bruce Highway (South).

4.3. DEVELOPMENT TRAFFIC VOLUMES ON THE NETWORK

Based on the information outlined above and the conservative assumptions applied, an estimate of the additional development traffic volumes at the key site access intersection of the Bruce Highway were established, with a summary of the resultant peak hour development traffic volumes provided in **Figure 6** to **Figure 8** below, noting that 5% of the development traffic is assumed to be heavy vehicles.

The development year has been assumed as 2020 thus resulting in a 10-year design period of 2030.

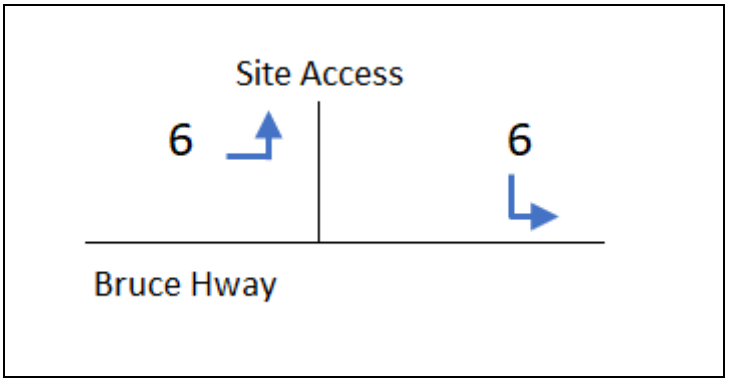


Figure 6 "New Trip" Development Volumes Peak

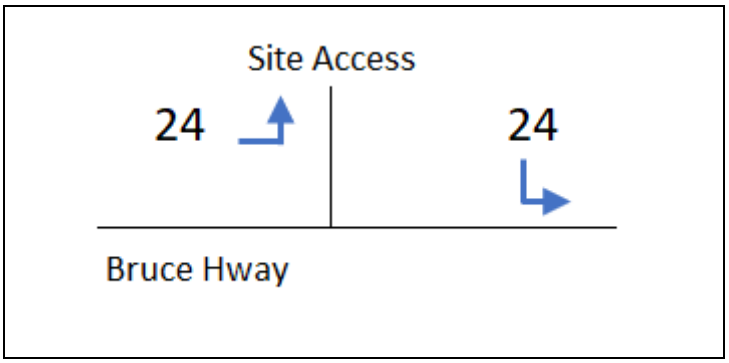


Figure 7 "Drop In" Development Volumes Peak

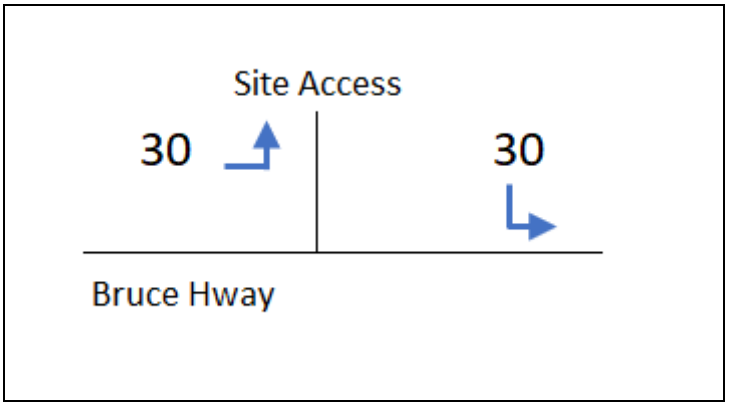


Figure 8 Total Development Traffic Volumes Peak

5.0 IMPACT ASSESSMENT AND MITIGATION

Based on the information provided above, it was determined that the critical elements of the surrounding road network in terms of the potential impact of the proposed service station development was the Bruce Highway access intersection.

Further details of the assessment of the impact of the development on road network is provided in the following sections.

5.1. WITH AND WITHOUT DEVELOPMENT TRAFFIC VOLUMES

5.1.1 ROAD LINK VOLUMES

As previously discussed, given the proposed development is a service station (with no fast food or ancillary retail services it is anticipated that the vast majority of trips generated by the proposed development will be undiverted drop-in trips.

Whilst the development is predicted to generate in the order of 59 vehicle trips (entry and exit) in the AM and PM peak hours, at least 80% of these trips are expected to be undiverted drop-in trips by vehicles travelling past the site on the Bruce Highway, which would have been on the road network even in the absence of the proposed development. Accordingly, the impact of the proposed development upon existing road link volumes is anticipated to be negligible.

5.2. ACCESS AND FRONTAGE IMPACT ASSESSMENT AND MITIGATION

The proposed site access ingress and egress will be provided as per **Figures 2 and 4** with an ingress only access point located approximately 70m downstream of the traffic lights at Albert and Campbell St and an egress only access point located approximately 90m downstream from the traffic lights at Albert and Campbell St. Due to the configuration of the refuelling facilities for the heavy vehicles, all heavy vehicles will leave the site and exit onto Kent St before continuing to the Bruce Highway, it is also anticipated that most light vehicles will manoeuvre the site in this manner out of convenience. The intersection of the Kent St and the Bruce Highway is located 130 downstream of the traffic lights at Albert and Campbell St.

Access visibility from egress point on the site will be able to sight a vehicle entering Albert St from George St comfortable achieving SISD of 141m for a 70 km/h design speed. The section of the Albert St adjacent to the proposed site is controlled by the traffic lights at intersection of Albert and Campbell St and subsequently provides sufficient gaps in the traffic to allow vehicle to safely exit the site. **Figure 9** shows the degree of access visibility afforded at the proposed egress point.

Figure 9 Sight Distance from proposed egress point

Forecast through road and access volumes based on **Table 1** and **Figures 8,** the detailed hourly volumes from **Appendix A** and a compound growth rate of 4.5% are shown in **Figures 10 and 11** below for the opening year of 2020 and the 10-year design horizon of 2030. We have also assumed 50% of traffic will utilize the outside lane of the 2 southbound lanes.

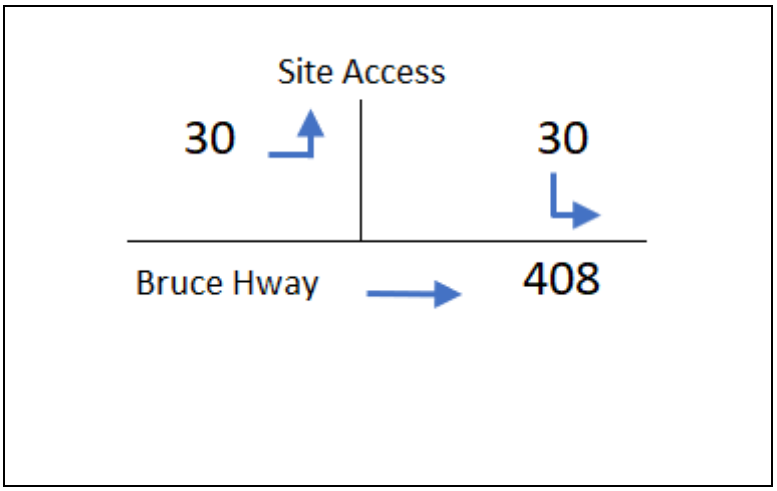


Figure 10 Development Volumes Peak 2020

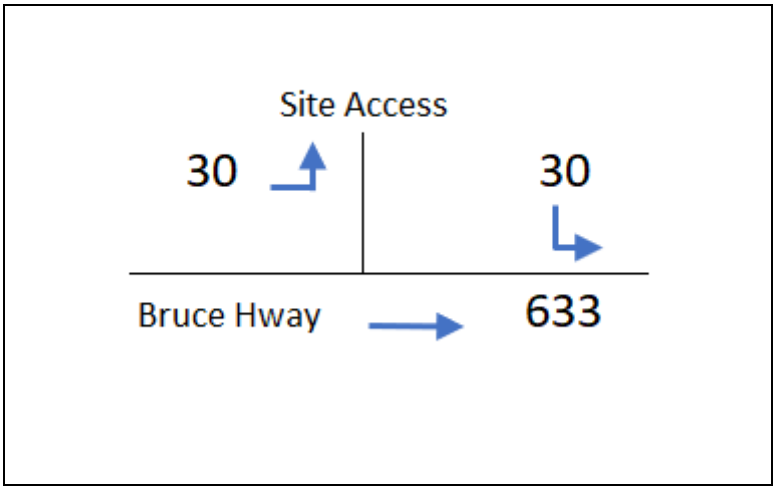


Figure 11 Development Volumes Peak 2030

A turn warrants assessment was undertaken for the current site access intersection with the Bruce Highway based on the forecast 2030 post development traffic volumes from the proposed Albert Street service station as identified in **Figure 11** above. The assessment was completed using Figure 2.25C of Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings, which depicts the turn warrants graph for design speeds less than 70km/h.

The resultant graph from the assessment for the post development (2030) traffic conditions (worst case am peak) is provided in **Figure 12** below.

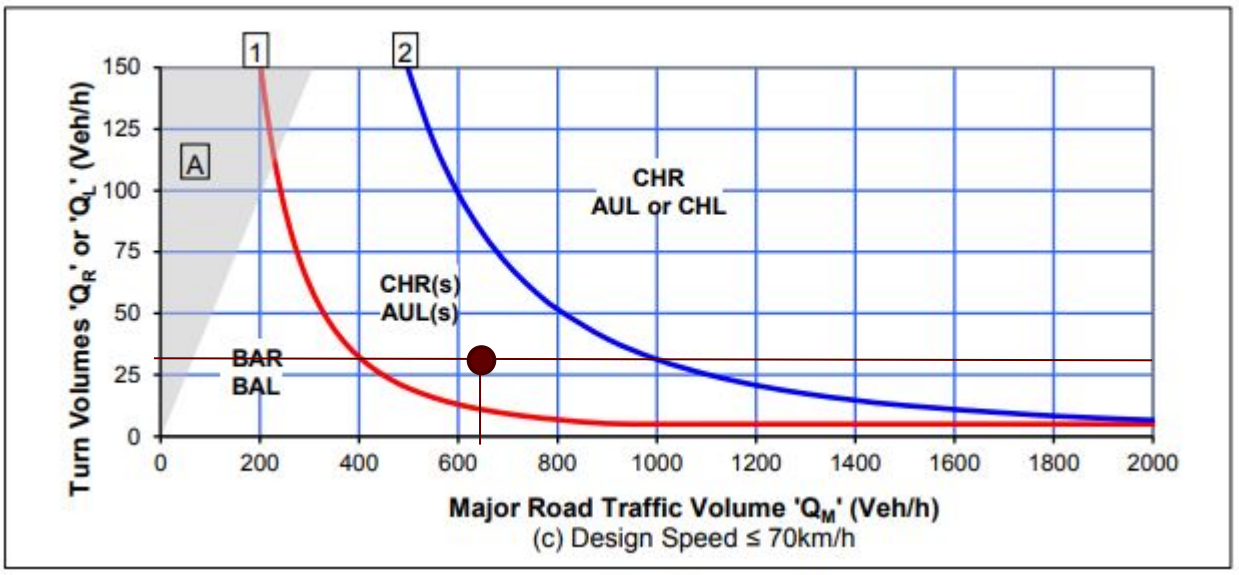


Figure 12 Turn Warrants Graph (70-100km/hr) – Post Development Traffic Volume Scenario (2030)

The results of the turn warrants assessment indicate that the recommended turn treatments at the site access intersection of the Bruce Highway/site access intersection for the post development traffic volume scenario was an AUL(s) treatment.

As such a functional layout plan for the upgrade works to the Bruce Highway / site access intersection proposed as part of the service station development has been developed. This layout (refer **Appendix C**) identifies the expected works required at the intersection including the provision of the required AUL(s) turn treatment. The design and construction of any site access (driveway) will be in accordance with CMDG-R-042. Swept paths for a 19m prime mover have also been detailed as part of this plan.

5.3. PAVEMENT IMPACT ASSESSMENT AND MITIGATION

Given the proposed development is a service station on a major arterial road and is not expected to generate a significant number of new heavy vehicle movements under typical operation, no pavement mitigation works are deemed warranted or required as a result of the proposal.

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1. SUMMARY OF IMPACTS AND MITIGATION MEASURES PROPOSED

6.1.1 INTERNAL FACILITIES

The traffic elements of the proposed plan of development have been designed generally in accordance with the requirements of AS2890 and the Access, Parking and Transport Code within the Rockhampton Regional Council Planning Scheme.

The proposed on-site parking provision of **8 spaces** (including 1 PWD bay meets Council's requirements (**8 spaces**) and as such is considered adequate to cater for the parking demand expected to be generated by the development.

In addition, the proposed shop and petrol tank servicing and refuse collection arrangements for the service station development can be considered adequate, with the swept paths of all nominated service vehicles shown to comfortably be able to enter the site, access the required loading and servicing locations for the development and egress the site in a forwards gear.

6.1.2 TRAFFIC IMPACTS

The turn warrants assessment undertaken based on the estimated post development traffic volumes (2030) indicated that the recommended turn treatments for the site access intersection of the Bruce Highway / site access was an AUL(s) treatment.

These works are proposed to be completed generally in accordance with the functional layout plan for the intersection provided in **Appendix C,** which identifies the required AUL(s) turn treatment and the minor widening works to the Bruce Highway (site access) approach to the intersection required to accommodate the vehicle swept path of a 19 m prime mover.

6.1.3 RECOMMENDATIONS

In light of the information provided above, it is concluded that conditional to the provision of the identified upgrade works to the Bruce Highway/site access intersection the proposed development will have a negligible impact on the adjacent road network and can therefore be recommended to be approved from a traffic engineering perspective.

6.2. CERTIFICATION STATEMENT AND AUTHORISATION

A copy of the RPEQ certification and authorisation statement covering this assessment of the proposed Parkhurst Service Station development located at 1018 Bruce Highway (Lot 81 SP300144) is included for reference as **Appendix D**.

APPENDIX A

TMR Traffic Data

Site 60027. Point 260000051. Bruce Hwy @ Archer St Lights.

0.10 km

0.00 km

Start Point 260000036. George St to Albert St @ Fitzroy St.

1.41 km

End Point 260000727. Albert St to Base Hospital @ Bolsover St.

The width of each Road Segment is proportional to its AADT.

This report shows Annual Average Daily Traffic values (AADTs). Because the AADT values are converted to whole numbers, there will be occasional inaccuracies due to rounding. These inaccuracies are statistically insignificant.

	Annual Segment Growth		
	Based on 1 year's data	Based on 5 years' data	Based on 10 years' data
G	-7.34%	-5.82%	-3.42%
A	-9.54%	-2.82%	-5.08%
B	-8.42%	-4.46%	-4.33%

All Vehicles (00)

G	7,468	100%
A	6,966	100%
B	14,434	100%

Light Vehicles (0A)

G	6,195	82.95%
A	5,686	81.63%
B	11,881	82.31%

Heavy Vehicles (0B)

G	1,271	17.02%
A	1,282	18.40%
B	2,553	17.69%

Short Vehicles (1A)

G	6,195	82.95%
A	5,686	81.63%
B	11,881	82.31%

Trucks and Buses (1B)

G	877	11.74%
A	947	13.59%
B	1,824	12.64%

Articulated Vehicles (1C)

G	210	2.81%
A	195	2.80%
B	405	2.81%

Road Trains (1D)

G	184	2.46%
A	140	2.01%
B	324	2.24%

Short 2-Axle Vehicles (2A)

G	6,045	80.95%
A	5,561	79.83%
B	11,606	80.41%

Short Vehicles Towing (2B)

G	150	2.01%
A	125	1.79%
B	275	1.91%

2-Axle Trucks and Buses (2C)

G	778	10.42%
A	803	11.53%
B	1,581	10.95%

3-Axle Trucks and Buses (2D)

G	82	1.10%
A	116	1.67%
B	198	1.37%

4-Axle Trucks (2E)

G	17	0.23%
A	28	0.40%
B	45	0.31%

3-Axle Articulated (2F)

G	21	0.28%
A	19	0.27%
B	40	0.28%

4-Axle Articulated (2G)

G	35	0.47%
A	31	0.45%
B	66	0.46%

5-Axle Articulated (2H)

G	26	0.35%
A	24	0.34%
B	50	0.35%

6-Axle Articulated (2I)

G	128	1.71%
A	121	1.74%
B	249	1.73%

B Double (2J)

G	178	2.38%
A	134	1.92%
B	312	2.16%

Double Road Trains (2K)

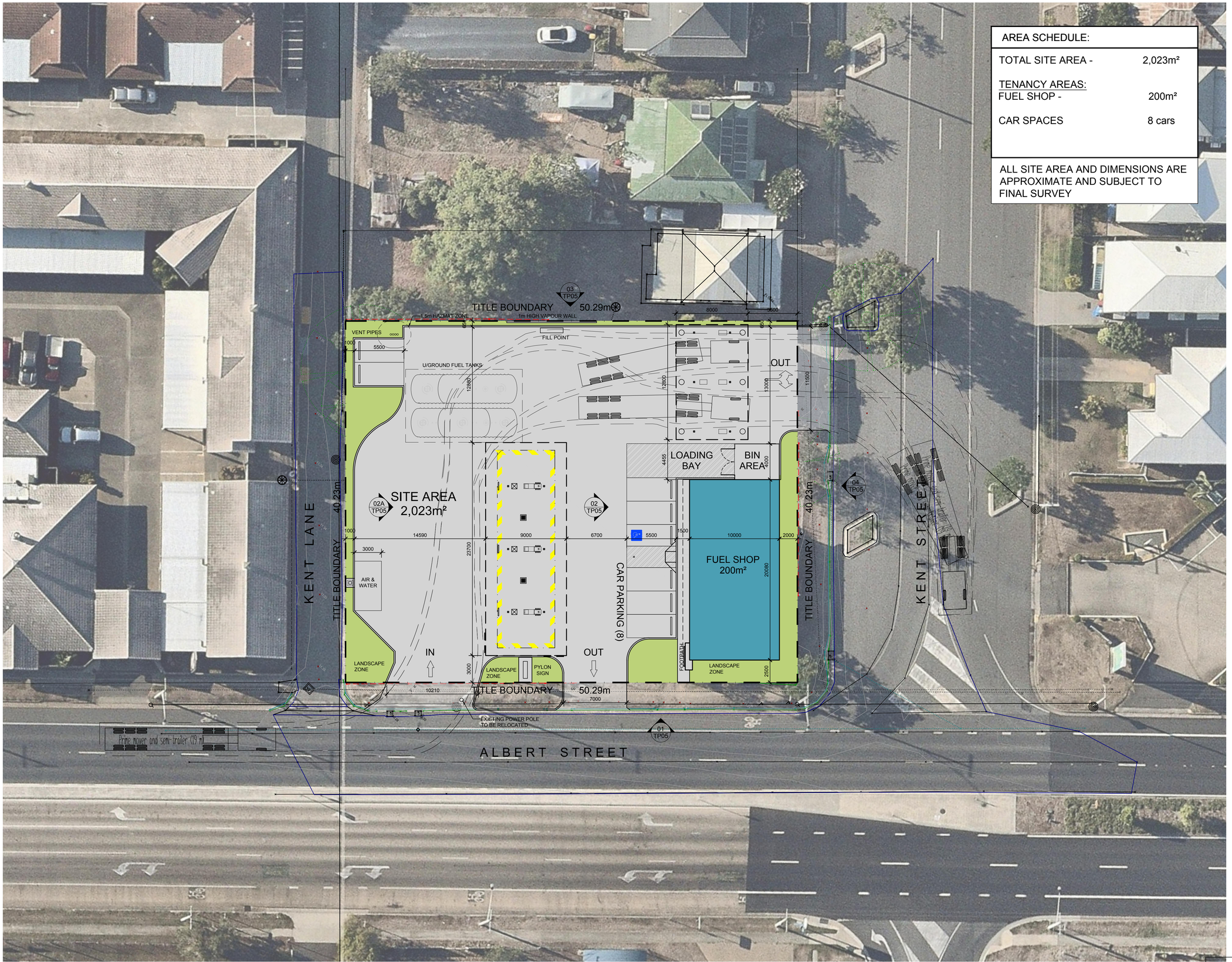
G	6	0.08%
A	6	0.09%
B	12	0.08%

Triple Road Trains (2L)

G	0	0%
A	0	0%
B	0	0%

APPENDIX B

Site Layout Plan and Swept Paths



AREA SCHEDULE:	
TOTAL SITE AREA -	2,023m²
TENANCY AREAS:	
FUEL SHOP -	200m²
CAR SPACES	8 cars

ALL SITE AREA AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO FINAL SURVEY

REV.	AMENDMENT DETAILS	BY	DATE
Ø	PLANNING ISSUE	JS	13-02-20
P1	PRELIMINARY ISSUE	JS	06-02-20

trg
BRISBANE + MELBOURNE

concept + design + interiors + project management

Level 3, Suite 37, 799 Springvale Road, Mulgrave, Victoria 3170 Australia

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www.trg-aus.com
The Retail Group Pty Ltd ABN 85 050 134 686

RBP No. DP-AD1689

Town Planning
Not for construction

PROJECT
PROPOSED FUEL FILLING STATION DEVELOPMENT

PROJECT ADDRESS
20- 26 ALBERT STREET

ROCKHAMPTON
QLD 4700

DRAWING TITLE
PROPOSED SITE PLAN

CLIENT
RCI GROUP

DATE	SCALE @ A1	NORTH
FEB.'20	1:200	
DRAWN	CHECKED	
JS	AB	
ISSUE		
PLANNING		

PROJECT No.	DRAWING No.	REVISION No.	SHEET
20004	TP03	Ø	03 of 06

0m 2m 4m 6m 8m
1:200 @ A1 SIZE & 1:400@A3

APPENDIX C

Bruce Highway / Site Access Intersection Upgrade Plan

LEGEND

CONCRETE SURFACE

LANDSCAPE

PROPOSED AREA OF WORKS

2.5 0 2.5 5 7.5 10 12.5m

SCALE 1:125 @ A1 SCALE 1:250 @ A3

INFORMATION ONLY

SURVEYOR										
ADDRESS:										
CO-ORDINATE DATUM										
HEIGHT DATUM										
	DRAWING No.	REFERENCE DRAWING TITLE	A		SUBMITTED FOR INFORMATION	MT		RM	
			REV	DATE	REVISION DESCRIPTION	DFT	DFT CHK	DES	DES CHK

	BY	DATE
REVIEWED		
RPEQ ENG		

RPEQ No:

CLIENT

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SCALE: AS SHOWN

PREPARED BY 053-19-20

mcmurtrie CONSULTING ENGINEERS
Address: 63 Charles Street NORTH ROCKHAMPTON QLD 4701
Postal: PO BOX 2149, WANDAL QLD 4700
E-mail: mail@mcmengineers.com
Phone: (07) 4921 1780
Mobile: 0407 631 066
Fax: (07) 4921 1790

CLIENT

PROJECT ALBERT ST & KENT ST SERVICE STATION

TITLE ALBERT ST INTERSECTION TREATMENT

A1

DRAWING NUMBER 0531920-SK01

REVISION A

PLOT DATE: 20/02/2020 3:01:02 PM DRAWING LOCATION: S:\PROJECT RECORDS\19-20\053-19-20\00 CIVIL DESIGN\DWG\053-19-20.DWG

APPENDIX D

RPEQ Certification

Certification of Traffic Impact Assessment Report

Registered Professional Engineer Queensland

for

Project Title:	Albert Street Service Station

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,

v) embrace contemporary practice initiatives and will deliver the desired outcomes.

Name:	Chris Hewitt	**RPEQ No:**	5141
RPEQ Competencies:	Civil		
Signature:		**Date:**	30 October 2019
Postal Address:	PO Box 2149 Wandal QLD 4700		
Email:	chris@mcmengineers.com		

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	N/A
Road safety issues	✓
Site access	✓
Public transport (if applicable)	N/A
Active transport (if applicable)	N/A
Parking (if applicable)	N/A
Pavement (if applicable)	N/A
Transport infrastructure (if applicable)	N/A
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)	N/A
Road safety impact assessment and mitigation	✓
Access and frontage impact assessment and mitigation	✓
Intersection delay impact assessment and mitigation	N/A
Road link capacity assessment and mitigation	✓
Pavement impact assessment and mitigation	✓
Transport infrastructure impact assessment and mitigation	N/A
Other impacts assessment relevant to the specific development type / location (if applicable)	N/A
6. Conclusions and Recommendations	
Summary of impacts and mitigation measures proposed	✓
Certification statement and authorisation	✓

PROPOSED SERVICE STATION

20-26 Albert & 34 Kent St, Rockhampton

STORMWATER / CIVIL WORKS

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/28-2020

Dated: 29 March 2021

GENERAL NOTES

G1. THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL DRAWINGS AND SPECIFICATIONS AND OTHER WRITTEN INSTRUCTIONS THAT MAY BE ISSUED.
G2. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING FROM THE DRAWINGS. REFER ARCHITECTS DRAWINGS FOR ALL DIMENSIONS.
G3. REFER ANY DISCREPANCY TO THE ENGINEER/ARCHITECT.
G4. MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE APPROPRIATE SAA SPECIFICATIONS OR CODE AND WITH THE REQUIREMENTS OF THE RELEVANT LOCAL AUTHORITY.
G5. THE ALIGNMENT AND LEVEL OF ALL SERVICES SHOWN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL CONFIRM THE POSITION AND LEVEL OF ALL SERVICES PRIOR TO COMMENCEMENT OF CONSTRUCTION. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED AT THE CONTRACTORS EXPENSE.
G6. NO WORKS ARE TO COMMENCE UNTIL THE REQUIRED TREE REMOVAL PERMITS HAVE BEEN GRANTED BY RELEVANT LOCAL AUTHORITY, AND THE APPROPRIATE NOTICE OF INTENTION TO COMMENCE GIVEN.
G7. ALL SERVICES, OR CONDUITS FOR SERVICING SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF PAVEMENT CONSTRUCTION.
G8. SUBSOIL DRAINAGE, COMPRISING 100 AGRICULTURE PIPE IN GEO-STOCKING TO BE PLACED AS SHOWN AND AS MAY BE DIRECTED BY THE SUPERINTENDENT. SUBSOIL DRAINAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT LOCAL AUTHORITY CONSTRUCTION SPECIFICATION.
G9. NO WORK IS PERMITTED WITHIN ADJOINING PROPERTIES WITHOUT WRITTEN PERMISSION FROM THE OWNERS OR RESPONSIBLE AUTHORITY.

DRAINAGE NOTES

D1. ALL DRAINAGE OUTLET LEVELS SHALL BE CONFIRMED ON SITE, PRIOR TO CONSTRUCTION COMMENCING.
D2. ALL PIPES WITHIN THE PROPERTY TO BE MIN. 100 DIA UPVC @ 1% MIN. GRADE, UNO.
D3. ALL PITS WITHIN THE PROPERTY ARE TO BE FITTED WITH "WELDLOK" OR APPROVED EQUIVALENT GRATES:
- LIGHT DUTY FOR LANDSCAPED AREAS
- HEAVY DUTY WHERE SUBJECTED TO VEHICULAR TRAFFIC
D4. PITS WITHIN THE PROPERTY MAY BE CONSTRUCTED AS:
1) PRECAST STORMWATER PITS
2) CAST INSITU MASS CONCRETE
3) CEMENT RENDERED 230mm BRICKWORK
SUBJECT TO THE RELEVANT LOCAL AUTHORITY CONSTRUCTION SPECIFICATION.
D5. ENSURE ALL GRATES TO PITS ARE SET BELOW FINISHED SURFACE LEVEL WITHIN THE PROPERTY. TOP OF PIT RL'S ARE APPROXIMATE ONLY AND MAY BE VARIED SUBJECT TO APPROVAL OF THE ENGINEER. ALL INVERT LEVELS ARE TO BE ACHIEVED.
D6. ANY PIPES BENEATH RELEVANT LOCAL AUTHORITY ROAD TO BE RUBBER RING JOINTED RCP, UNO.
D7. ALL PITS IN ROADWAYS ARE TO BE FITTED WITH HEAVY DUTY GRATES WITH LOCKING BOLTS AND CONTINUOUS HINGE.
D8. PROVIDE STEP IRONS TO STORMWATER PITS GREATER THAN 1200 IN DEPTH.
D9. TRENCH BACK FILL IN ROADWAYS SHALL COMPRISE SHARP, CLEAN GRANULAR BACK FILL IN ACCORDANCE WITH THE RELEVANT LOCAL AUTHORITY SPECIFICATION TO NON-TRAFFICABLE AREAS TO BE COMPACTED BY RODDING AND TAMPING USING A FLAT PLATE VIBRATOR.
D10. WHERE A HIGH EARLY DISCHARGE (HED) PIT IS PROVIDED ALL PIPES ARE TO BE CONNECTED TO THE HED PIT, UNO.
D11. DOWN PIPES SHALL BE A MINIMUM OF DN100 SW GRADE UPVC OR 100X100 COLORBOND/ZINCALUME STEEL, UNO.
D12. COLORBOND OR ZINCALUME STEEL BOX GUTTERS SHALL BE A MINIMUM OF 450 WIDE X 150 DEEP.
D13. EAVES GUTTERS SHALL BE A MINIMUM OF 125 WIDE X 100 DEEP (OR OF EQUIVALENT AREA) COLORBOND OR ZINCALUME STEEL, UNO.
D14. SUBSOIL DRAINAGE SHALL BE PROVIDED TO ALL RETAINING WALLS & EMBANKMENTS, WITH THE LINES FEEDING INTO THE STORMWATER DRAINAGE SYSTEM, UNO.

EARTHWORKS NOTES

E1. THE EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT.
E2. THE SITE OF THE WORKS SHALL BE PREPARED BY STRIPPING ALL EXISTING TOPSOIL, FILL AND VEGETATION.
E3. SUBGRADE SHALL BE COMPACTED UNTIL A DRY DENSITY HAS BEEN ACHIEVED OF NOT LESS THAN 100% OF THE STANDARD MAXIMUM DRY DENSITY WHEN TESTED IN ACCORDANCE WITH AS 1289 TESTS E.1.1. OR E.1.2.
E4. THE EXPOSED SUBGRADE SHOULD BE PROOF ROLLED TO DETECT ANY SOFT OR WET AREAS WHICH SHOULD BE LOCALLY EXCAVATED AND BACK FILLED WITH SELECTED MATERIAL.
E5. THE BACK FILLING MATERIAL SHALL BE IMPORTED GRANULAR FILL OF LOW PLASTICITY, PREFERABLY CRUSHED SANDSTONE, AND TO BE PLACED IN LAYERS NOT EXCEEDING 150 LOOSE THICKNESS AND COMPACTED TO 98% OF STANDARD DRY DENSITY AT A MOISTURE CONTENT WITHIN 2% OF OPTIMUM.
E6. SITE WORKS ARE TO BE BATTERED TO ADJACENT PROPERTY LEVELS.
E7. STORMWATER MUST NOT BE CONCENTRATED ON TO AN ADJACENT PROPERTY.
E8. AT NO TIME DURING OR AFTER CONSTRUCTION IS STORMWATER TO BE PONDED ON ADJOINING PROPERTIES.
E9. THE SITE SHALL BE GRADED AND DRAINED SO THAT STORMWATER WILL BE DIRECTED AWAY FROM THE BUILDING PLATFORM.
E10. STORMWATER DRAINAGE SHALL BE PROVIDED AND MAINTAINED THROUGHOUT THE COURSE OF CONSTRUCTION. ALL STORMWATER RUNOFF SHALL BE GRADED AWAY FROM THE SITE WORKS AND DISPOSED OF VIA SURFACE CATCHDRAINS AND STORMWATER COLLECTION PITS.
E11. ALL SURFACE CATCH DRAINS SHALL BE GRADED AT 1% (1 IN 100) MINIMUM. THE GROUND SHALL GRADE AWAY FROM ANY DWELLING AT 5% (1 IN 20) FOR THE FIRST METRE THEN AT 2.5% (1 IN 40).
E12. WHERE A CUT FILL PLATFORM IS USED THERE SHALL BE A MINIMUM BERM 1000 WIDE TO THE PERIMETER OF THE SITE WORKS WHICH SHALL BE SUPPORTED BY BATTERS OF 3:1 IN FILL.
E13. ANY VERTICAL OR NEAR VERTICAL PERMANENT EXCAVATION (CUT) DEEPER THAN 600 IN MATERIAL OTHER THAN ROCK SHALL BE ADEQUATELY RETAINED OR BATTERED AT A MINIMUM OF 3:1.
E14. WHERE BATTERS CANNOT BE PROVIDED TO SUPPORT THE CUT OR FILL, THEY SHALL BE ADEQUATELY RETAINED.
E15. RETAINING WALLS ARE TO BE CONSTRUCTED WITH ADEQUATE SUBSOIL DRAINAGE.

CONCRETE PAVEMENT

C1. SUBGRADE SHALL BE PREPARED AS OUTLINED IN EARTHWORKS.
C2. PROVIDE JOINTING AT MINIMUM 6000 MAX. INTERVALS OR AS OTHERWISE SPECIFIED IN THE DRAWINGS.
C3. CONCRETE SHALL COMPRISE A MIN. COMPRESSIVE STRENGTH OF 32MPa AT 28 DAYS IN ACCORDANCE WITH THE RELEVANT LOCAL AUTHORITY SPECIFICATION, UNO.
C4. ANY SUB-BASE MATERIAL SHALL BE COMPACTED AS OUTLINED IN EARTHWORKS.
C5. CONCRETE KERB AND GUTTER SHALL COMPRISE A MINIMUM COMPRESSIVE STRENGTH OF 25MPa, UNO.
C6. CONCRETE WORKS ARE TO BE CURED BY ONE OF THE FOLLOWING MEANS:
i) WETTING TWICE DAILY FOR THE FIRST THREE DAYS;
ii) USING AN APPROVED CURING COMPOUNDED FOR A MINIMUM OF 7 DAYS COMMENCING IMMEDIATELY AFTER POURING.

FLEXIBLE PAVEMENT NOTES

F1. SUBGRADE SHALL BE PREPARED AS OUTLINED IN EARTHWORKS.
F2. PAVEMENT MATERIAL SHALL CONSIST OF APPROVED OR RIPPED SANDSTONE, NATURAL GRAVEL OR FINE CRUSH ROCK AS PER THE RELEVANT COUNCIL AUTHORITY SPECIFICATION.
F3. PAVEMENT MATERIALS SHALL BE SPREAD IN LAYERS NOT EXCEEDING 150 AND NOT LESS 75 COMPACTED THICKNESS.
F4. PAVEMENT MATERIALS SHALL BE SIZED AND OF A STANDARD OUTLINED IN AS1141.
F5. CRUSHED OR RIPPED SANDSTONE SHALL BE MINUS 75 NOMINAL SIZE DERIVED FROM SOUND, CLEAN SANDSTONE FREE FROM OVERBURDEN, CLAY SEAMS, SHALE AND OTHER DELETERIOUS MATERIAL.
F6. PAVEMENT MATERIALS SHALL BE COMPACTED BY SUITABLE MEANS TO SATISFY THE FOLLOWING MINIMUM SPECIFICATIONS (AS PER AS1289.2)

DESCRIPTION	MEDIUM DENSITY RATIO
SUB-BASE	98% MOD
BASE COURSE	98% MOD
ASPHALTIC CONCRETE	97% MOD

AND SUBJECT TO THE RELEVANT LOCAL AUTHORITY CONSTRUCTION SPECIFICATION.

F7. TESTING FOR EACH LAYER SHALL BE UNDERTAKEN BY A N.A.T.A. REGISTERED LABORATORY IN ACCORDANCE WITH AS1289, AT NOT MORE THAN 50m INTERVALS AND A MINIMUM OF TWO PER LAYER. FURTHER FREQUENCY OF TESTING SHALL BE NO LESS THAN THAT REQUIRED BY AS3978.

PAVED AREAS NOTES

A1. SUBGRADE SHALL BE PREPARED AS OUTLINED IN EARTHWORKS.
A2. ALL PAVERS ARE TO BE PLACED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATION.
A3. TRAFFICABLE AREAS:
SUB-BASE TO BE 150 COMPACTED THICKNESS DGS75.
SUB-BASE TO BE SUITABLY COMPACTED TO MEDIUM DENSITY 98% MOD.
SUB-BASE TO EXTEND AT LEAST 200 BEYOND PAVED SURFACE.
PAVERS TO BE 80 THICK INTERLOCKING PAVERS ON 50 SAND BEDDING.
A4. NON TRAFFICABLE AREAS:
SUB BASE AS PER TRAFFICABLE AREAS
PAVERS TO BE 60 INTERLOCKING PAVERS ON 50 SAND BEDDING (UNO).

EROSION AND SEDIMENT NOTES

B1. THIS PLAN TO BE READ IN CONJUNCTION WITH EROSION AND SEDIMENT CONTROL DETAILS AS ATTACHED.
B2. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES AS NECESSARY AND TO THE SATISFACTION OF THE RELEVANT LOCAL AUTHORITY PRIOR TO THE COMMENCEMENT OF AND DURING CONSTRUCTION. NO DISTURBANCE TO THE SITE SHALL BE PERMITTED OTHER THAN IN THE IMMEDIATE AREA OF THE WORKS AND NO MATERIAL SHALL BE REMOVED FROM THE SITE WITHOUT THE RELEVANT LOCAL AUTHORITY APPROVAL. ALL EROSION AND SEDIMENT CONTROL DEVICES TO BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH STANDARDS OUTLINED IN NSW DEPARTMENT OF HOUSING'S "MANAGING URBAN STORMWATER - SOILS AND CONSTRUCTIONS".
B3. TOPSOIL SHALL BE STRIPPED AND STOCKPILED OUTSIDE HAZARD AREAS SUCH AS DRAINAGE LINES. THIS TOPSOIL SHALL BE RESPREAD LATER ON AREAS TO BE REVEGETATED AND STABILISED ONLY, (I.E. ALL FOOTPATHS, BATTERS, SITE REGARDING AREAS, BASINS AND CATCHDRAINS). TOPSOIL SHALL NOT BE RESPREAD ON ANY OTHER AREAS UNLESS SPECIFICALLY INSTRUCTED BY THE SUPERINTENDENT. IF THEY ARE TO REMAIN FOR LONGER THAN ONE MONTH STOCKPILES SHALL BE PROTECTED FROM EROSION BY COVERING THEM WITH A MULCH AND HYDROSEEDING AND, IF NECESSARY, BY LOCATING BANKS OR DRAINS DOWNSTREAM OF A STOCKPILE TO RETARD SILT LADEN RUNOFF.
B4. THE CONTRACTOR SHALL REGULARLY MAINTAIN ALL EROSION AND SEDIMENT CONTROL DEVICES AND REMOVE ACCUMULATED SILT FROM SUCH DEVICES SUCH THAT MORE THAN 60% OF THEIR CAPACITY IS LOST. ALL THE SILT IS TO BE PLACED OUTSIDE THE LIMIT OF WORKS. THE PERIOD FOR MAINTAINING THESE DEVICES SHALL BE AT LEAST UNTIL ALL DISTURBED AREAS ARE REVEGETATED AND FURTHER AS MAY BE DIRECTED BY THE SUPERINTENDENT OR COUNCIL.
B5. LAY TURF STRIP (MIN 300 WIDE) ON 100 TOPSOIL BEHIND ALL KERB WITH 1000 LONG RETURNS EVERY 6000 AND AROUND STRUCTURES IMMEDIATELY AFTER BACKFILLING AS PER THE RELEVANT LOCAL AUTHORITY SPECIFICATION.
B6. THE CONTRACTOR SHALL GRASS SEED ALL DISTURBED AREAS WITH AN APPROVED MIX AS SOON AS PRACTICABLE AFTER COMPLETION OF EARTHWORKS AND REGRADING.
B7. VEHICULAR TRAFFIC SHALL BE CONTROLLED DURING CONSTRUCTION CONFINING ACCESS WHERE POSSIBLE TO NOMINATED STABILISED ACCESS POINTS.
B8. WHEN ANY DEVICES ARE TO BE HANDED OVER TO COUNCIL THEY SHALL BE IN CLEAN AND STABLE CONDITION.
B9. THE CONTRACTOR SHALL IMPLEMENT DUST CONTROL BY REGULAR WETTING DOWN (BUT NOT SATURATING) DISTURBED AREA.
B10. PROVIDE AND MAINTAIN SILT TRAPS AROUND ALL SURFACE INLET PITS UNTIL CATCHMENT IS REVEGETATED OR PAVED.
B11. REVEGETATE ALL TRENCHES IMMEDIATELY UPON COMPLETION OF BACKFILLING.
B12. ALL DRAINAGE PIPE INLETS TO BE CAPPED UNTIL:
- DOWNPIPES CONNECTED
- PITS CONSTRUCTED AND PROTECTED WITH SILT BARRIER

CONCRETE STRUCTURES NOTES

S1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
S2. CONCRETE COMPONENTS AND QUALITY SHALL BE AS FOLLOWS, UNO:

ELEMENT	SLUMP mm	MAX. SIZE AGG. mm	CEMENT TYPE	f'c AT 28 DAYS - MPa	ADMIXTURE
FOOTINGS	80	20	A	25	-
PIERS & CAPS	80	20	A	25	-
SLABS ON GROUND	80	20	A	32	-
SUSPENDED SLABS	80	20	A	32	-
PITS	80	20	A	25	-

S3. MINIMUM CLEAR CONCRETE COVER TO REINFORCEMENT INCLUDING TIES AND STIRRUPS SHALL BE AS FOLLOWS UNO.

EXPOSURE CLASSIFICATION	MINIMUM COVER (mm) CONCRETE STRENGTH (f'c)				
	20 MPa	25 MPa	32 MPa	40 MPa	>50 MPa
A1	20	20	20	20	20
A2	(50)	30	25	20	20
B1	-	(60)	40	30	25
B2	-	-	(65)	45	35
C	-	-	-	(70)	50

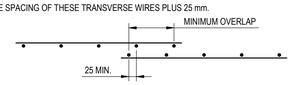
FOR BRACKETED FIGURES REFER TO AS 3600 CURRENT EDITION TABLE 4.10.3.2

S4. MINIMUM COVER FOR FIRE RESISTANCE LEVEL (FRL) SHALL BE AS FOLLOWS;

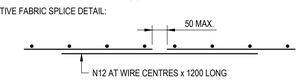
MINIMUM ELEMENT WIDTH OR THICKNESS / MIN COVER (mm)				
FRL	BEAM	SLAB	COLUMN	WALL
60	125 / 30	80 / 20	200 / 20	80 / 20
90	150 / 45	100 / 25	250 / 35	100 / 35
120	200 / 55	120 / 30	300 / 45	120 / 40
180	240 / 70	150 / 45	400 / 60	150 / 45
240	270 / 80	170 / 55	450 / 70	170 / 50

NOTE : 1. REFER TO AS 3600 CURRENT EDITION FOR REDUCED COVERS IF GREATER ELEMENT THICKNESSES ARE ADOPTED FOR BEAMS & COLUMNS.
2. COVER IS MEASURED TO THE MAIN REINFORCEMENT

S5. COVER TO REINFORCEMENT SHALL BE OBTAINED BY THE USE OF APPROVED BAR CHAIRS. ALL CHAIRS SHALL BE SPACED AT 1000 CTS MAXIMUM.
S6. ALL CONCRETE SHALL BE MECHANICALLY VIBRATED. VIBRATORS SHALL NOT BE USED TO SPREAD CONCRETE.
S7. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
S8. NO HOLES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.
S9. CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO APPROVAL OF THE ENGINEER. ALL CONSTRUCTION JOINTS SHALL BE SCABBLED OVER THE WHOLE FACE AND ANY UNSOUND MATERIAL REMOVED.
S10. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY; IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
S11. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN OR AS APPROVED BY THE ENGINEER. WHERE THE LAP LENGTH IS NOT SHOWN IT SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT AS SPECIFIED IN AS3600. COGS AND HOOKS SHALL BE STANDARD UNLESS SHOWN OTHERWISE.
S12. WELDING OF REINFORCEMENT WILL NOT BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWINGS OR APPROVED BY THE ENGINEER.
S13. PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT WITHOUT THE APPROVAL OF THE ENGINEER.
S14. REINFORCEMENT SYMBOLS:
N - DENOTES DEFORMED GRADE 500 NORMAL DUCTILITY REINFORCING BARS TO AS/NZS 4671.
R - DENOTES PLAIN ROUND GRADE 250 NORMAL DUCTILITY REINFORCING BARS TO AS/NZS 4671.
SL - DENOTES DEFORMED GRADE 500 LOW DUCTILITY REINFORCING MESH TO AS/NZS 4671.
RL - DENOTES DEFORMED GRADE 500 LOW DUCTILITY REINFORCING MESH TO AS/NZS 4671.
L--TM - DENOTES DEFORMED GRADE 500 LOW DUCTILITY TRENCH MESH TO AS/NZS 4671.
S15. ALL REINFORCING FABRIC SHALL COMPLY WITH AS1303 AND AS1304 AND SHALL BE SUPPLIED IN FLAT SHEETS.
S16. SPLICES IN FABRIC: THE OUTERMOST TRANSVERSE WIRES SHALL BE OVERLAPPED BY AT LEAST THE SPACING OF THESE TRANSVERSE WIRES PLUS 25 mm.



ALTERNATIVE FABRIC SPLICE DETAIL:



S17. EXPOSED CORNERS SHALL BE 20 mm CHAMFERED UNO.
S18. ALL REINFORCEMENT SHALL BE INSPECTED BY THE SUPERINTENDENT OR ENGINEER PRIOR TO PLACING CONCRETE.
S19. ALL SLAB CONCRETE TO BE CURED IN AN APPROVED MANNER FOR A MINIMUM OF 7 DAYS.
S20. ALL FORMWORK AND PROPS FOR SLABS AND BEAMS SHALL BE REMOVED BEFORE CONSTRUCTION OF ANY MASONRY WALLS OR PARTITIONS ON THE FLOOR.
S21. ALL ABBREVIATIONS ARE IN ACCORDANCE WITH AS1100.
S22. FORMWORK SHALL NOT BE STRIPPED UNTIL CONCRETE HAS ACHIEVED A MINIMUM STRENGTH OF 20 MPa. THE CONCRETE SLAB AND BEAMS SHALL BE TEMPORARILY BACK PROPPED UNTIL THE CONCRETE HAS ACHIEVED 28 DAY STRENGTH AND ANY PROPPING TO HIGHER LEVEL FORMS HAVE BEEN REMOVED.
S23. WHERE A SUSPENDED SLAB IS TO BE SUPPORTED OFF A SUSPENDED SLAB BELOW, WRITTEN APPROVAL SHALL BE OBTAINED FROM THE ENGINEER PRIOR TO ANY SITE WORKS.

MASONRY

M1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3700.
M2. THE DESIGN STRENGTH OF MASONRY SHALL BE AS FOLLOWS U.N.O. :

EXPOSURE CLASSIFICATION TO AS 3600	MASONRY COMPRESSIVE STRENGTH MPa (fm)	MASONRY SALT RESISTANCE GRADE	DURABILITY CLASSIFICATION OF BUILT IN COMPONENTS	MORTAR MIX GP PORTLAND CEMENT : LIME : SAND	f'c MPa
A1 / A2	> 6.3	General Purpose	R3 (Galvanised)	1.0 : 1.0 : 6.0	2.8
B1	> 6.3	General Purpose	R3 (Galvanised)	1.0 : 1.0 : 6.0	2.8
B2	> 6.7	Exposure	R4 (Stainless)	1.0 : 0.5 : 4.5	2.8

M3. ALL MASONRY WALLS SUPPORTING SLABS AND BEAMS SHALL HAVE A PRE-GREASED TWO LAYER GALVANISED STEEL SLIP JOINT BETWEEN CONCRETE AND MASONRY.
M4. ALL MASONRY WALLS SUPPORTING OR SUPPORTED BY CONCRETE FLOORS SHALL BE PROVIDED WITH VERTICAL JOINTS TO MATCH ANY CONTROL JOINTS IN THE CONCRETE.
M5. NON LOAD BEARING WALLS SHALL BE SEPARATED FROM CONCRETE ABOVE BY 20 mm THICK CLOSED CELL POLYETHYLENE STRIP.
M6. MASONRY SHALL BE ARTICULATED IN ACCORDANCE WITH TECHNICAL NOTE 61 FROM THE CEMENT AND CONCRETE ASSOCIATION OF AUSTRALIA. VERTICAL CONTROL JOINTS SHALL NOT EXCEED 5 METRES MAXIMUM CENTRES, AND 4 METRES MAXIMUM FROM CORNERS IN MASONRY WALLS, AND BETWEEN NEW & EXISTING BRICKWORK.
M7. MASONARY RETAINING WALLS ARE TO BE BACKFILLED WITH EITHER OF THE FOLLOWING MATERIAL:
- COARSE GRAINED SOIL WITH LOW SILT CONTENT
- RESIDUAL SOIL CONTAINING STONES
- FINE SILTY SAND
- GRANULAR MATERIALS WITH LOW CLAY CONTENT

BLOCKWORK

B1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3700.
B2. REINFORCED CONCRETE BLOCKWORK SHALL COMPLY WITH THE FOLLOWING, UNO:
- BLOCKS : GRADE 15 CONFORMING TO AS1500.
- MORTAR : 1 CEMENT / 0.25 LIME / 3 SAND.
- PROVIDE CLEANOUT HOLES AT BASE OF WALL & ROD CORE HOLES TO REMOVE PROTRUDING MORTAR FINS.
- CORE FILLING : f'c = 20 MPa, 10 AGG, 230 SLUMP +/- 30 mm.
- COVER : 55 mm MIN. FROM OUTSIDE OF BLOCKWORK.

B3. BACKFILL TO RETAINING WALLS TO BE FREE DRAINING GRANULAR MATERIAL, UNO. PROVIDE SUBSOIL DRAIN BEHIND WALL AND AT WEEP HOLES.
B4. VERTICAL CONTROL JOINTS SHALL BE PROVIDED AT 10 m MAX. CENTRES.
B5. NO ADMIXTURES SHALL BE USED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.

STANDARD LINE TYPES AND SYMBOLS:

PROPOSED KERB & GUTTER
EXISTING KERB & GUTTER
PROPOSED BELOW GROUND PIPELINE
PROPOSED SUSPENDED PIPELINE
EXISTING PIPELINE
SUBSOIL DRAINAGE LINE
PROPOSED KERB INLET PIT
EXISTING KERB INLET PIT
PROPOSED JUNCTION OR INLET PIT
EXISTING JUNCTION OR INLET PIT
DESIGN CENTRELINE
EXISTING EDGE OF BITUMEN
TELECOMMUNICATION CONDUIT
GAS MAIN
WATER MAIN
SEWER MAIN
UNDERGROUND ELECTRICITY CABLES
PERMANENT MARK & S.S.M.
BENCH MARK, SURVEY STATION

LOCATION PLAN

SCHEDULE OF DRAWINGS

FOR APPROVAL ONLY

NOT TO BE USED FOR CONSTRUCTION PURPOSES

A1 ORIGINAL SIZE

REVISION	DATE	AMENDMENT DESCRIPTION
B	23.02.20	REVISIONS AS CLOUDED
A	27.02.20	ISSUED FOR APPROVAL

ECLIPSE | CONSULTING ENGINEERS

ECLIPSE Consulting Engineers Pty Ltd
304/12 Century Circuit
Norwest Central
BAULKHAM HILLS NSW 2153

Phone : (02) 9894 8500
Fax : (02) 8850 0212
info@eclipseconsulting.com.au
www.eclipseconsulting.com.au

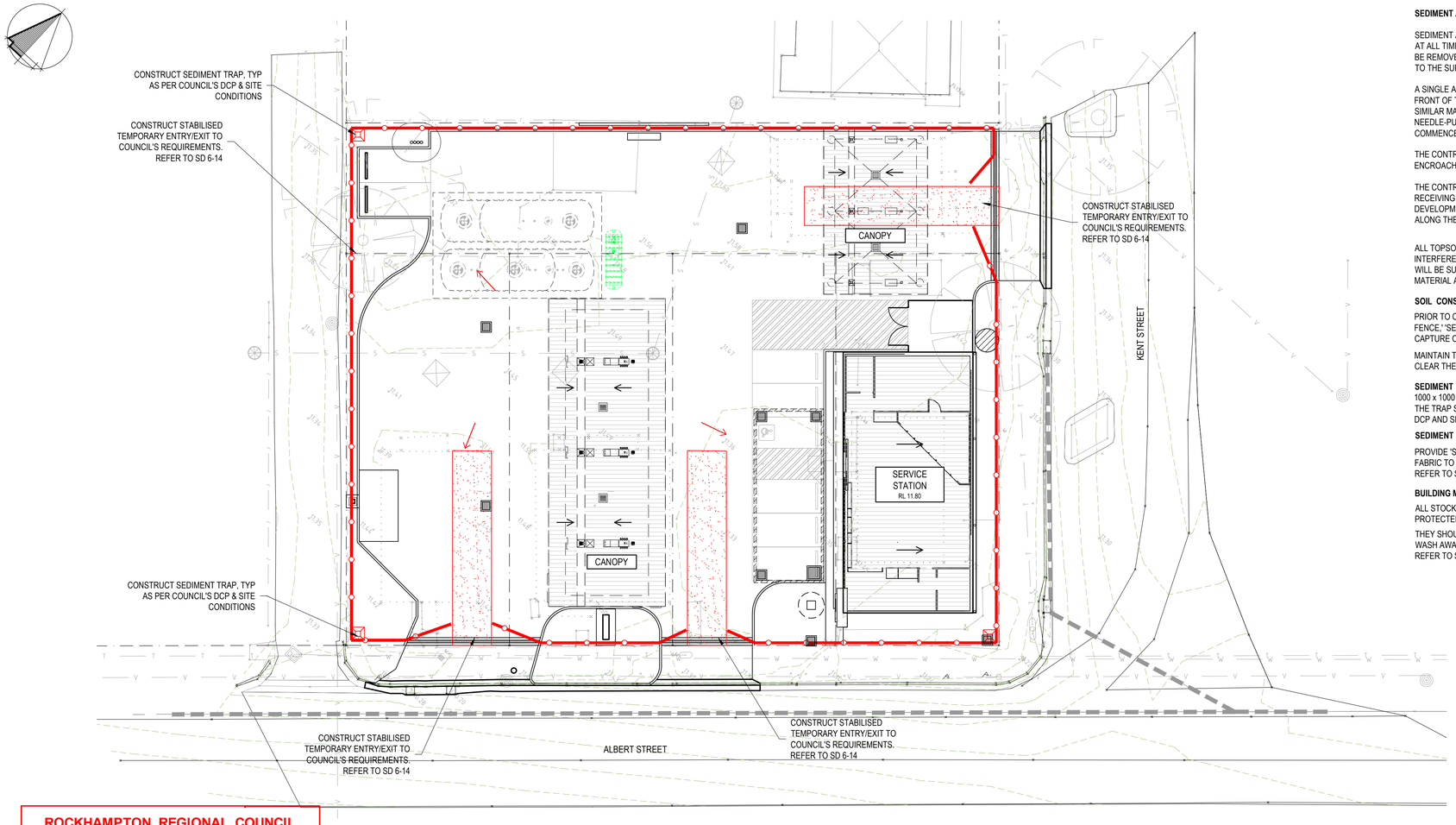
PROPOSED SERVICE STATION

20-26 Albert & Kent St, Rockhampton

For RCI Group

GENERAL NOTES

DESIGN	DRAWN	DATE	PROJECT No.
SWH	RCL	FEB 2020	9916
CHECKED	APPROVED	SCALE	DRG No. C01 - B



SEDIMENT & EROSION CONTROL PLAN

1:200

- DENOTES SEDIMENT FENCE

← - DENOTES SURFACE WATER FLOW

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/28-2020

Dated: 29 March 2021

SEDIMENT AND EROSION CONTROL NOTES

SEDIMENT AND EROSION CONTROL SHALL BE EFFECTIVELY MAINTAINED AT ALL TIMES DURING THE COURSE OF CONSTRUCTION AND SHALL NOT BE REMOVED UNTIL THE SITE HAS BEEN STABILISED OR LANDSCAPED TO THE SUPERINTENDENT'S SATISFACTION.

A SINGLE ALL WEATHER ACCESS WAY WILL BE PROVIDED AT THE FRONT OF THE PROPERTY CONSISTING OF 50-75 AGGREGATE OR SIMILAR MATERIAL AT A MINIMUM THICKNESS OF 150 LAID OVER NEEDLE-PUNCHED GEOTEXTILE FABRIC AND CONSTRUCTED PRIOR TO COMMENCEMENT OF WORKS.

THE CONTRACTOR SHALL ENSURE THAT NO SPOIL OR FILL ENCROACHES UPON ADJACENT AREAS FOR THE DURATION OF WORKS.

THE CONTRACTOR SHALL ENSURE THAT KERB INLETS AND DRAINS RECEIVING STORMWATER SHALL BE PROTECTED AT ALL TIMES DURING DEVELOPMENT. KERB INLET SEDIMENT TRAPS SHALL BE INSTALLED ALONG THE IMMEDIATE VICINITY ALONG THE STREET FRONTAGE.

ALL TOPSOIL STRIPPED FROM THE SITE AND STOCKPILED DOES NOT INTERFERE WITH DRAINAGE LINES AND STORMWATER INLETS AND WILL BE SUITABLY COVERED WITH AN IMPERVIOUS MEMBRANE MATERIAL AND SCREENED BY SEDIMENT FENCING.

SOIL CONSERVATION NOTE:

PRIOR TO COMMENCEMENT OF CONSTRUCTION PROVIDE 'SEDIMENT FENCE,' 'SEDIMENT TRAP' AND WASHOUT AREA TO ENSURE THE CAPTURE OF WATER BORNE MATERIAL GENERATED FROM THE SITE.

MAINTAIN THE ABOVE DURING THE COURSE OF CONSTRUCTION, AND CLEAR THE 'SEDIMENT TRAP AFTER EACH STORM.

SEDIMENT TRAP

1000 x 1000 WIDE 500 DEEP PIT, LOCATED AT THE LOWEST POINT TO THE TRAP SEDIMENT AND IN ACCORDANCE WITH LOCAL COUNCIL'S DCP AND SITE CONDITIONS.

SEDIMENT FENCE

PROVIDE 'SEDIMENT FENCE ON DOWN SLOPE BOUNDARY AS SHOWN ON PLAN. FABRIC TO BE BURIED BELOW GROUND AT LOWER EDGE.
REFER TO SD 6-8

BUILDING MATERIAL STOCKPILES

ALL STOCKPILES OF BUILDING MATERIAL SUCH AS SAND AND SOIL MUST BE PROTECTED TO PREVENT SCOUR AND EROSION.

THEY SHOULD NEVER BE PLACED IN THE STREET GUTTER WHERE THEY WILL WASH AWAY WITH THE FIRST RAINSTORM.
REFER TO SD 4-1

GENERAL NOTES

THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER SUCH WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

ALL DIMENSIONS ARE IN MILLIMETRES & ALL LEVELS ARE IN METRES, UNO (UNLESS NOTED OTHERWISE).

NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.

ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO THE COMMENCEMENT OF THE WORK.

DURING EXCAVATION WORK THE STRUCTURE SHALL BE MAINTAINED IN A STABLE AND NO PART SHALL BE OVERSTRESSED.

ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS & THE SPECIFICATION.

EXISTING SERVICES WHERE SHOWN HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.

ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACK FILLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL COUNCIL.

ALL TRENCH BACK FILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.

ON COMPLETION OF STORMWATER INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS, UNLESS DIRECTED OTHERWISE.

CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS UNLESS DIRECTED OTHERWISE.

STORMWATER DRAINAGE

THE STORMWATER DRAINAGE DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH AS/NZS 3500.3 - 1990 "STORMWATER DRAINAGE" & AS/NZS 3500.3.2-1998 "STORMWATER DRAINAGE - ACCEPTABLE SOLUTIONS".

ANY VARIATIONS TO THE NOMINATED LEVELS SHALL BE REFERRED TO ENGINEER IMMEDIATELY.

ANY VARIATIONS TO SPECIFIED PRODUCTS OR DETAILS SHALL BE REFERRED TO THE ENGINEER FOR APPROVAL.

DOWN PIPES SHALL BE A MINIMUM OF DN100 SW GRADE UPVC OR 100X100 COLORBOND/ZINCALUME STEEL, UNO.

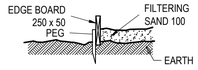
BOX COLORBOND OR ZINCALUME STEEL. GUTTERS SHALL BE A MINIMUM OF 450 WIDE X 150 DEEP.

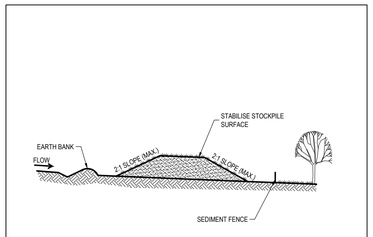
EAVES GUTTERS SHALL BE A MINIMUM OF 125 WIDE X 100 DEEP (OR OF EQUIVALENT AREA) COLORBOND OR ZINCALUME STEEL.

SUBSOIL DRAINAGE SHALL BE PROVIDED TO ALL RETAINING WALLS & EMBANKMENTS, WITH THE LINES FEEDING INTO THE STORMWATER DRAINAGE SYSTEM.

WASHOUT AREA

TO BE 1800 x 1800 ALLOCATED FOR THE WASHING OF TOOL & EQUIPMENT.

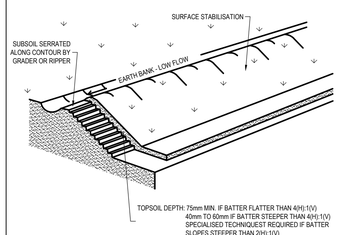




CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2 METRES DOWNSLOPE.

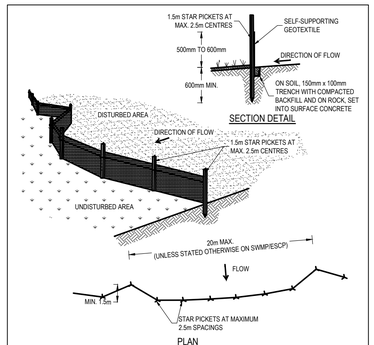
STOCKPILES — SD 4-1



CONSTRUCTION NOTES

1. SCARIFY THE GROUND SURFACE ALONG THE LINE OF THE CONTOUR TO A DEPTH OF 50mm TO 100mm TO BREAK UP ANY HARDSETTING SURFACES AND TO PROVIDE A GOOD BOND BETWEEN THE RESPREAD MATERIAL AND SUBSOIL.
2. ADD SOIL AMELIORANTS AS REQUIRED BY THE ESCP OR SWMP.
3. RIP TO A DEPTH OF 300mm IF COMPACTED LAYERS OCCUR.
4. WHERE POSSIBLE, REPLACE TOPSOIL TO A DEPTH OF 40 TO 60mm ON LANDS WHERE THE SLOPE EXCEEDS 4(H):1(V) AND TO AT LEAST 75mm ON LOWER GRADIENTS.

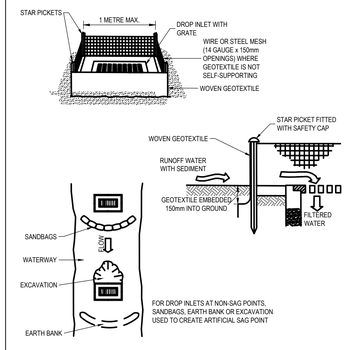
REPLACING TOPSOIL — SD 4-2



CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

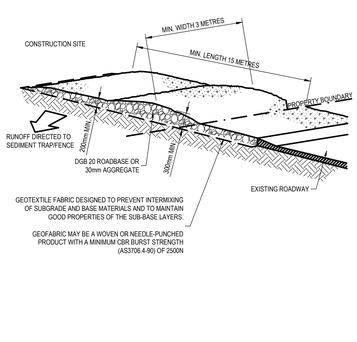
SEDIMENT FENCE — SD 6-8



CONSTRUCTION NOTES

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE OR STRAW BALES.
2. FOLLOW STANDARD DRAWING 6-7 AND STANDARD DRAWING 6-8 FOR INSTALLATION PROCEDURES FOR THE STRAW BALES OR GEOFABRIC. REDUCE THE PICKET SPACING TO 1 METRE CENTRES.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILE UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER — SD 6-12



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

STABILISED SITE ACCESS — SD 6-14

FOR APPROVAL ONLY

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A1 ORIGINAL SIZE

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304/12 Century Circuit
Norwest Central
BAULKHAM HILLS NSW 2153

Phone : (02) 9894 8500
Fax : (02) 8850 0212
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PROPOSED SERVICE STATION

20-26 Albert & Kent St, Rockhampton

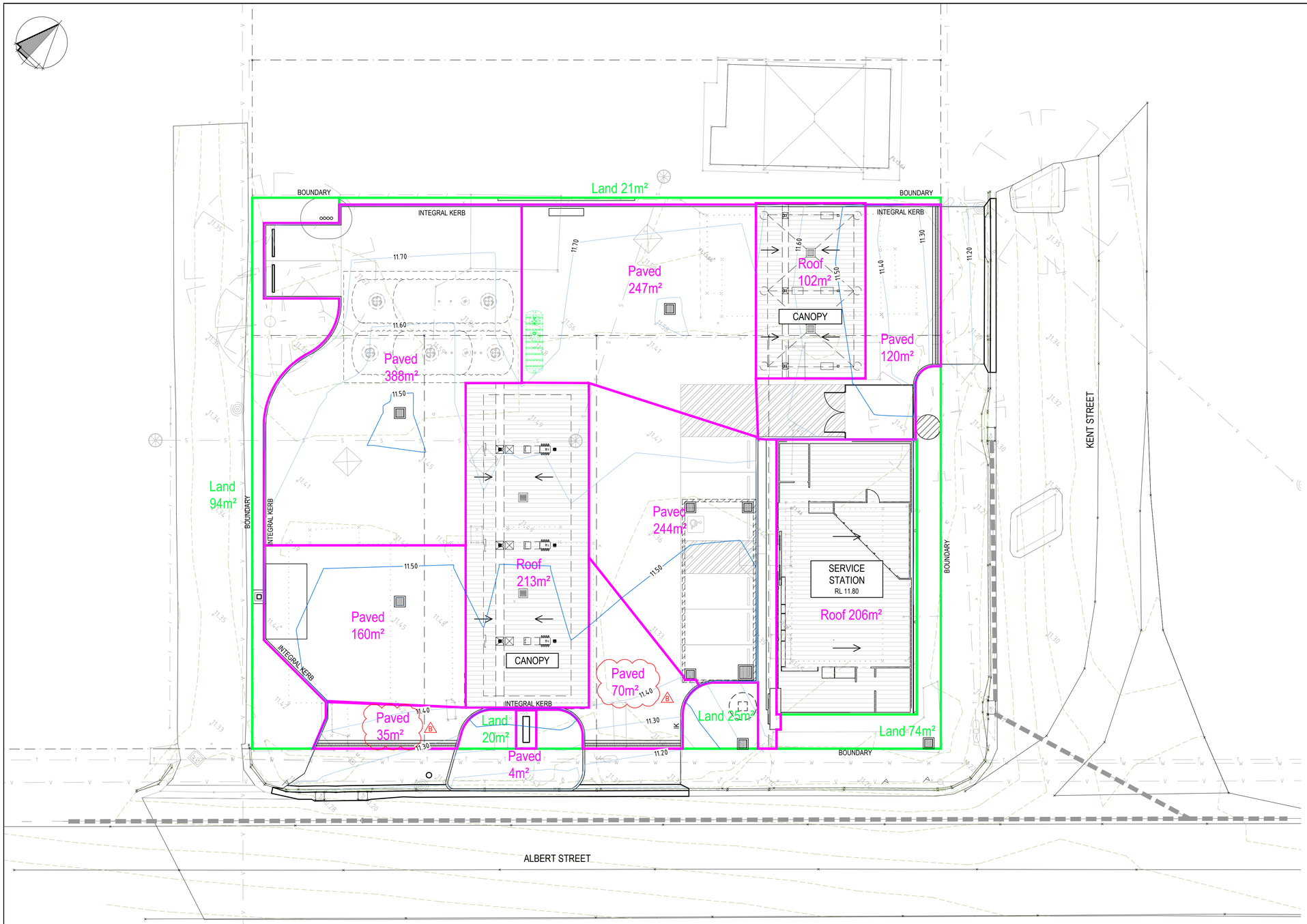
For RCI Group

SEDIMENT & EROSION CONTROL PLAN

DESIGN	DRAWN	DATE	PROJECT No.
SWH	RCL	FEB 2020	9916
CHECKED	APPROVED	SCALE	DRG No.
		1:200	C02 - A

STORMWATER DRAINAGE STRATEGY

- ALL GUTTERS & DOWNPIPES ARE DESIGNED TO ACCEPT A 1:20 YEAR ARI STORM EVENT.
- BOX GUTTERS & DOWNPIPES ARE DESIGNED TO ACCEPT A 1:100 YEAR ARI STORM EVENT.
- ALL PITS & PIPES ARE DESIGNED TO ACCEPT A 1:20 YEAR ARI STORM EVENT.
- DESIGN RAINFALL INTENSITIES:
  1:20 YEAR, 5 MIN = 230 mm/hr
  1:100 YEAR, 5 MIN = 301 mm/hr
- ALL PIPES MUST HAVE A MIN. 1.0% FALL, UNO.
- ALL STORMWATER RUNOFF IS DIRECTED TO A SQID PRIOR TO EXITING THE SITE.
- ON-SITE DETENTION HAS BEEN PROVIDED FOR THE DEVELOPMENT AS PER COUNCIL'S REQUIREMENTS.
- SQID'S USED ON THIS SITE INCLUDE:
  - SPEL STORMSACKS IN THE SURFACE INLET PITS AS NOTED ON PLAN
  - ON SITE DETENTION TANK
  - SPEL ECOCEPTOR



STORMWATER CATCHMENT AREA PLAN

1:150

- DENOTES STORMWATER CATCHMENT AREA BOUNDARY (IMPERVIOUS)
- DENOTES STORMWATER CATCHMENT AREA BOUNDARY (PERVIOUS)

TOTAL SITE AREA	= 2023 m²
ROOF AREA	= 521 m²
PAVEMENT AREA	= 1268 m²
LANDSCAPE AREA	= 234 m²

- DENOTES EXISTING SURVEY CONTOUR
- DENOTES NEW SURFACE LEVEL CONTOUR

ROCKHAMPTON REGIONAL COUNCIL

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304/12 Century Circuit
Norwest Central
BAULKHAM HILLS NSW 2153

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Fax : (02) 8850 0212
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STORMWATER CATCHMENT AREA PLAN

DESIGN	DRAWN	DATE	PROJECT No.
SWH	RCL	FEB 2020	9916
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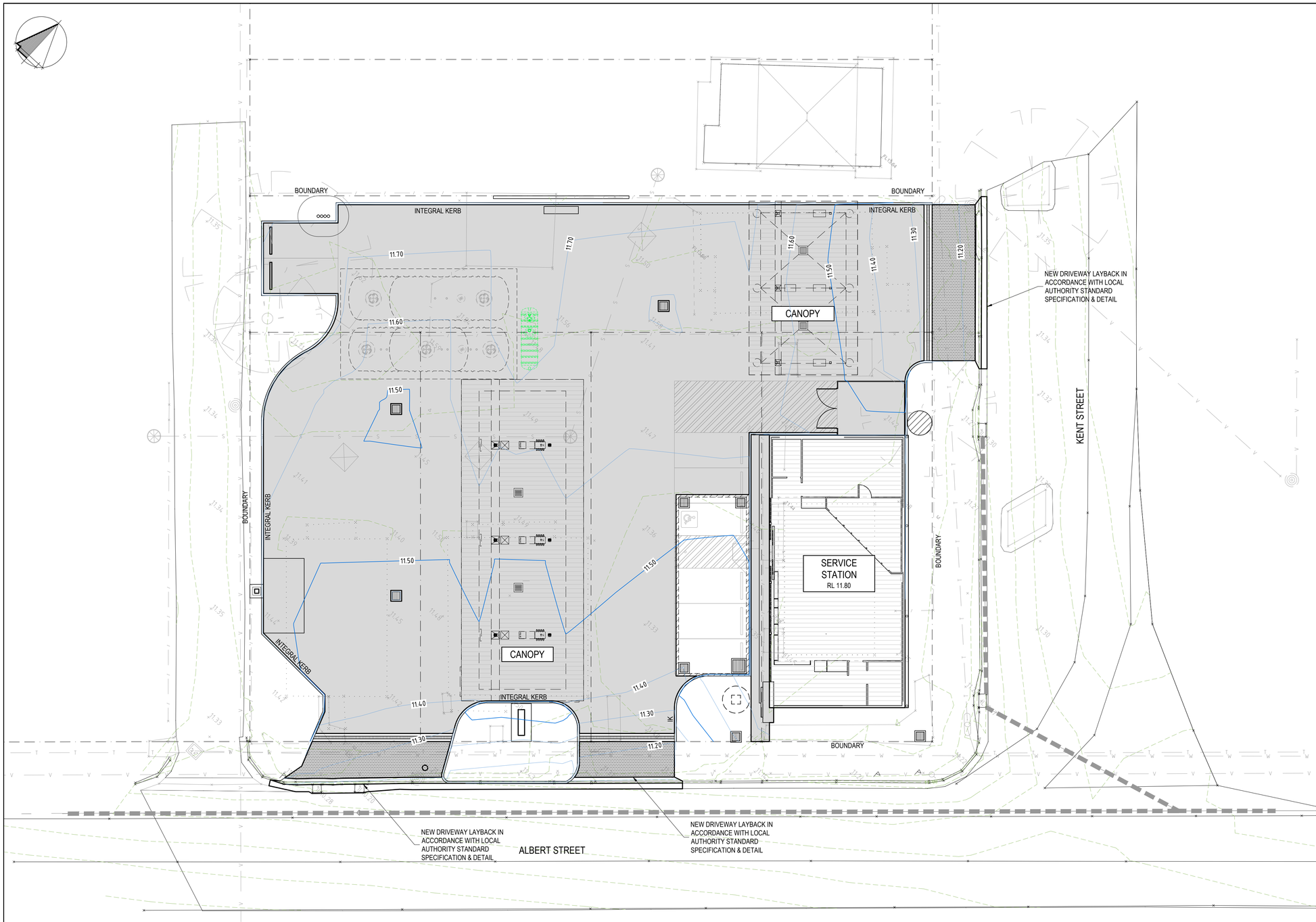
		1:150	C03 - B



EXTERNAL PAVEMENT PLAN

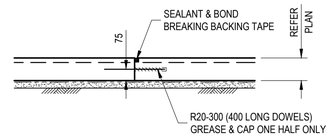
1:150

DENOTES **150 THICK SLAB** WITH **SL82 MESH TOP** THROUGHOUT
CONCRETE STRENGTH = **32 MPa**

DENOTES **200 THICK SLAB** WITH **SL82 MESH TOP & BOTTOM** THROUGHOUT
CONCRETE STRENGTH = **32 MPa**

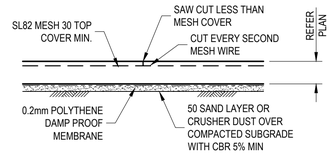
2-N12 (75 SPACING 1200 LONG) TRIMMERS TOP SHALL BE LOCATED 50 FROM ALL RE-ENTRANT CORNERS, TYPICAL U.N.O.

REINFORCEMENT COVER TO GROUND FLOOR SLAB SHALL BE AS FOLLOWS:
- 40mm - TO UNPROTECTED GROUND
- 40mm - EXTERNAL EXPOSURE
- 30mm - TO A MEMBRANE IN CONTACT WITH GROUND
- 30mm - INTERNAL EXPOSURE



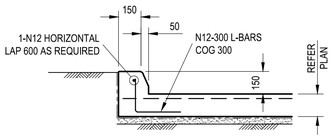
CONSTRUCTION JOINT (C.J.) DETAIL

1:20



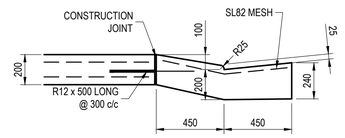
SAWN JOINT (S.J.) DETAIL

1:20



INTEGRAL KERB DETAIL

1:20



TYPICAL HEAVY DUTY LAYBACK DETAIL

1:20

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ROCKHAMPTON REGIONAL COUNCIL
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EXTERNAL PAVEMENT SLAB PLAN & DETAILS

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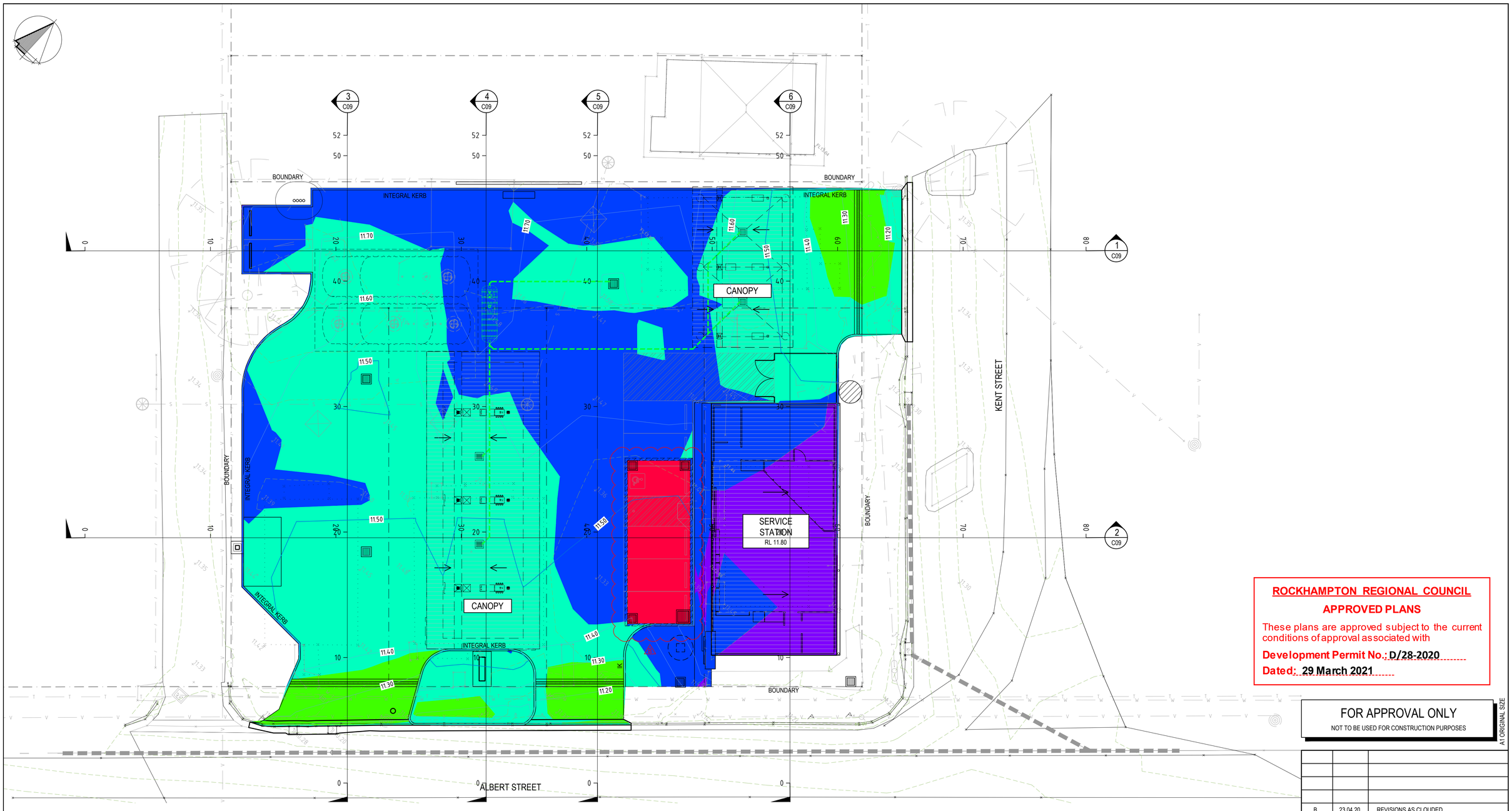
CHECKED	APPROVED	SCALE	DRG No.
		1:150, 1:20	C05 - A



BULK EARTHWORKS CUT AND FILL PLAN

1:150

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Cut and Fill Volume - proposed less 150mm	1.000	1.000	1953.360sq.m	200.636 Cu. M.	86.806 Cu. M.	113.830 Cu. M.<Cut>
Totals			1953.360sq.m	200.636 Cu. M.	86.806 Cu. M.	113.830 Cu. M.<Cut>

Range Details

Scale scheme to fit

ID	Minimum Elevation	Maximum Elevation	Color Scheme
1	-1.000m	-0.750m	
2	-0.750m	-0.500m	
3	-0.500m	-0.250m	
4	-0.250m	0.000m	
5	0.000m	0.250m	
6	0.250m	0.500m	

CUT

FILL

ROCKHAMPTON REGIONAL COUNCIL

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BULK EARTHWORKS CUT AND FILL PLAN

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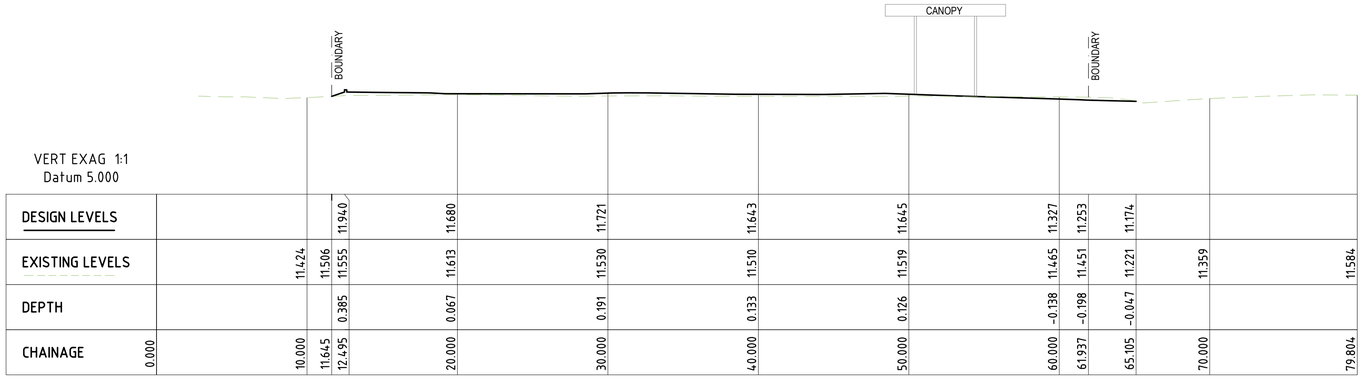
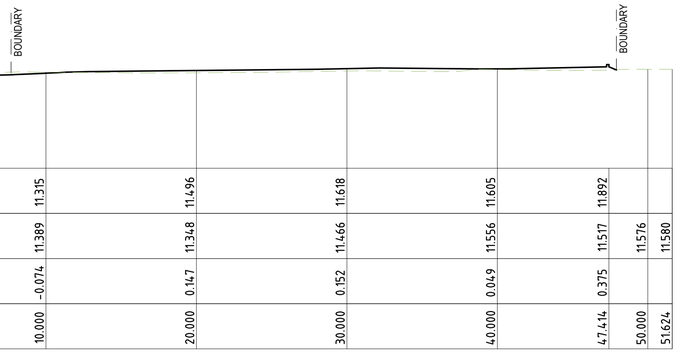
CHECKED	APPROVED	SCALE	DRG No.
		1:150	C08 - B



VERT EXAG 1:1
Datum 5.000

DESIGN LEVELS			11.940	11.680	11.721	11.643	11.645	11.327	11.253	11.174				
EXISTING LEVELS		11.424	11.506	11.555	11.613	11.530	11.510	11.519	11.465	11.451	11.221	11.359		11.584
DEPTH			0.385	0.067	0.191	0.133	0.126	-0.138	-0.198	-0.047				
CHAINAGE	0.000	10.000	11.645	12.495	20.000	30.000	40.000	50.000	60.000	61.937	65.105	70.000		79.804

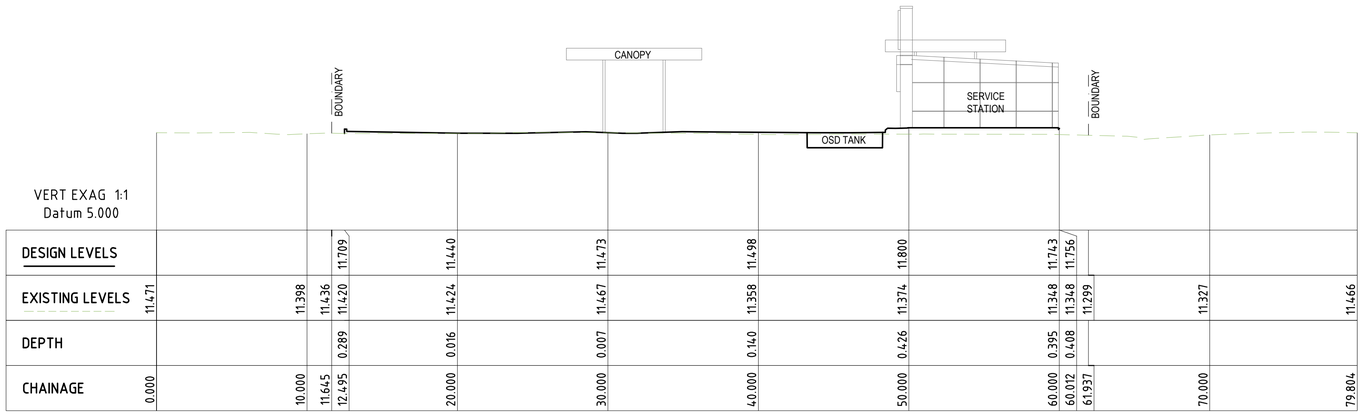
SITE SECTION 1 / C08
1:200



VERT EXAG 1:1
Datum 5.000

DESIGN LEVELS			11.045	11.315	11.496	11.618	11.605	11.892						
EXISTING LEVELS	11.348		11.043	11.389	11.348	11.466	11.556	11.517	11.576	11.580				
DEPTH			0.002	-0.074	0.147	0.152	0.049	0.375						
CHAINAGE	0.000	4.615	10.000		20.000	30.000	40.000	47.414	50.000	51.624				

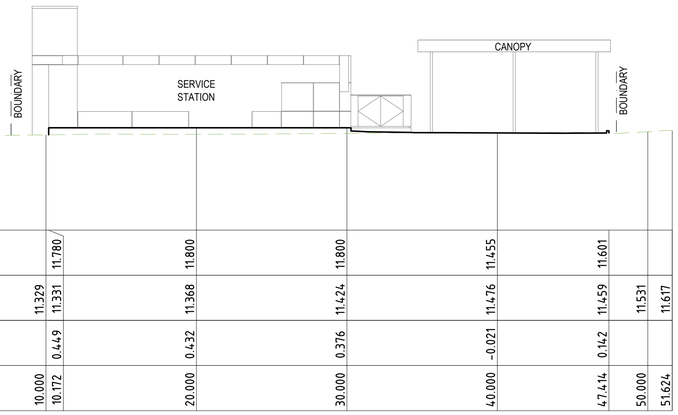
SITE SECTION 5 / C08
1:200



VERT EXAG 1:1
Datum 5.000

DESIGN LEVELS			11.709	11.440	11.473	11.498	11.800	11.743	11.756					
EXISTING LEVELS	11.471	11.398	11.436	11.420	11.424	11.467	11.358	11.374	11.348	11.299	11.327			11.466
DEPTH			0.289	0.016	0.007	0.140	0.426	0.395	0.408					
CHAINAGE	0.000	10.000	11.645	12.495	20.000	30.000	40.000	50.000	60.000	61.937	70.000			79.804

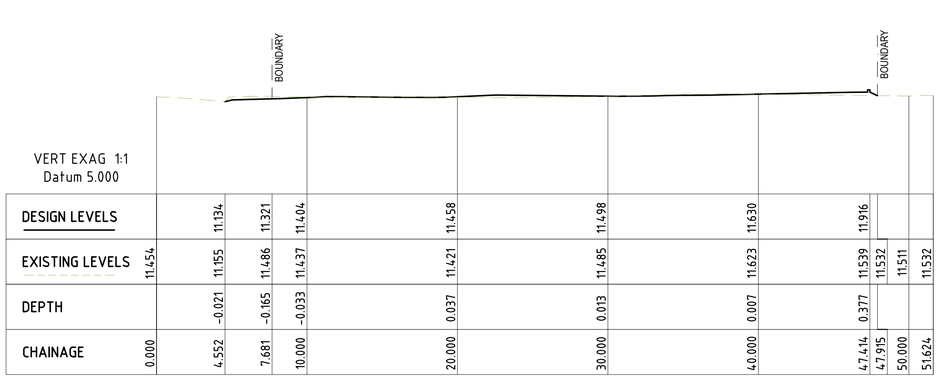
SITE SECTION 2 / C08
1:200



VERT EXAG 1:1
Datum 5.000

DESIGN LEVELS			11.780	11.800	11.800	11.455	11.601							
EXISTING LEVELS	11.285	11.329	11.331	11.368	11.424	11.476	11.459	11.531	11.617					
DEPTH			0.449	0.432	0.376	-0.021	0.142							
CHAINAGE	0.000	10.000	10.172	20.000	30.000	40.000	47.414	50.000	51.624					

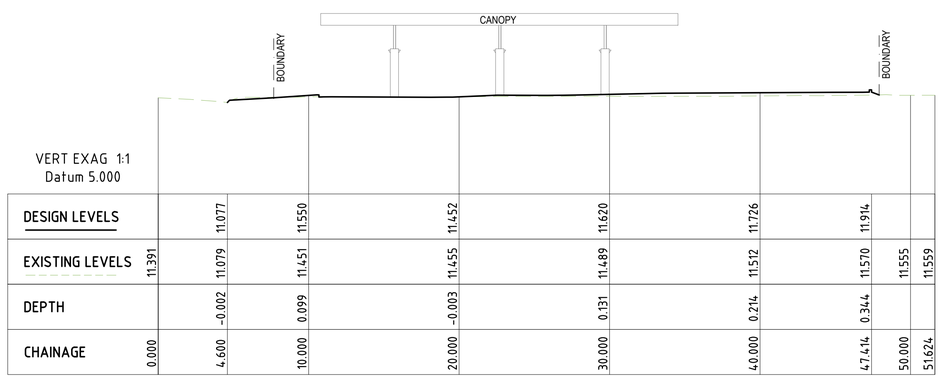
SITE SECTION 6 / C08
1:200



VERT EXAG 1:1
Datum 5.000

DESIGN LEVELS		11.134	11.321	11.404	11.458	11.498	11.630	11.916						
EXISTING LEVELS	11.454	11.155	11.486	11.437	11.421	11.485	11.623	11.539	11.532	11.511	11.532			
DEPTH		-0.021	-0.165	-0.033	0.037	0.013	0.007	0.377						
CHAINAGE	0.000	4.552	7.681	10.000	20.000	30.000	40.000	47.414	47.915	50.000	51.624			

SITE SECTION 3 / C08
1:200



VERT EXAG 1:1
Datum 5.000

DESIGN LEVELS		11.077	11.550	11.452	11.620	11.726	11.914							
EXISTING LEVELS	11.391	11.079	11.451	11.455	11.489	11.512	11.570	11.555	11.559					
DEPTH		-0.002	0.099	-0.003	0.131	0.214	0.344							
CHAINAGE	0.000	4.600	10.000	20.000	30.000	40.000	47.414	50.000	51.624					

SITE SECTION 4 / C08
1:200

ROCKHAMPTON REGIONAL COUNCIL

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SITE CROSS SECTIONS

DESIGN	DRAWN	DATE	PROJECT No.
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		1:200	C09 - A

SHEET 1 OF 3 SITE ANALYSIS PLAN
SHEET 2 OF 3 LANDSCAPE PLAN
SHEET 3 OF 3 SPECIFICATION PLAN

DIAL 1100 BEFORE YOU DIG

ROCKHAMPTON REGIONAL COUNCIL

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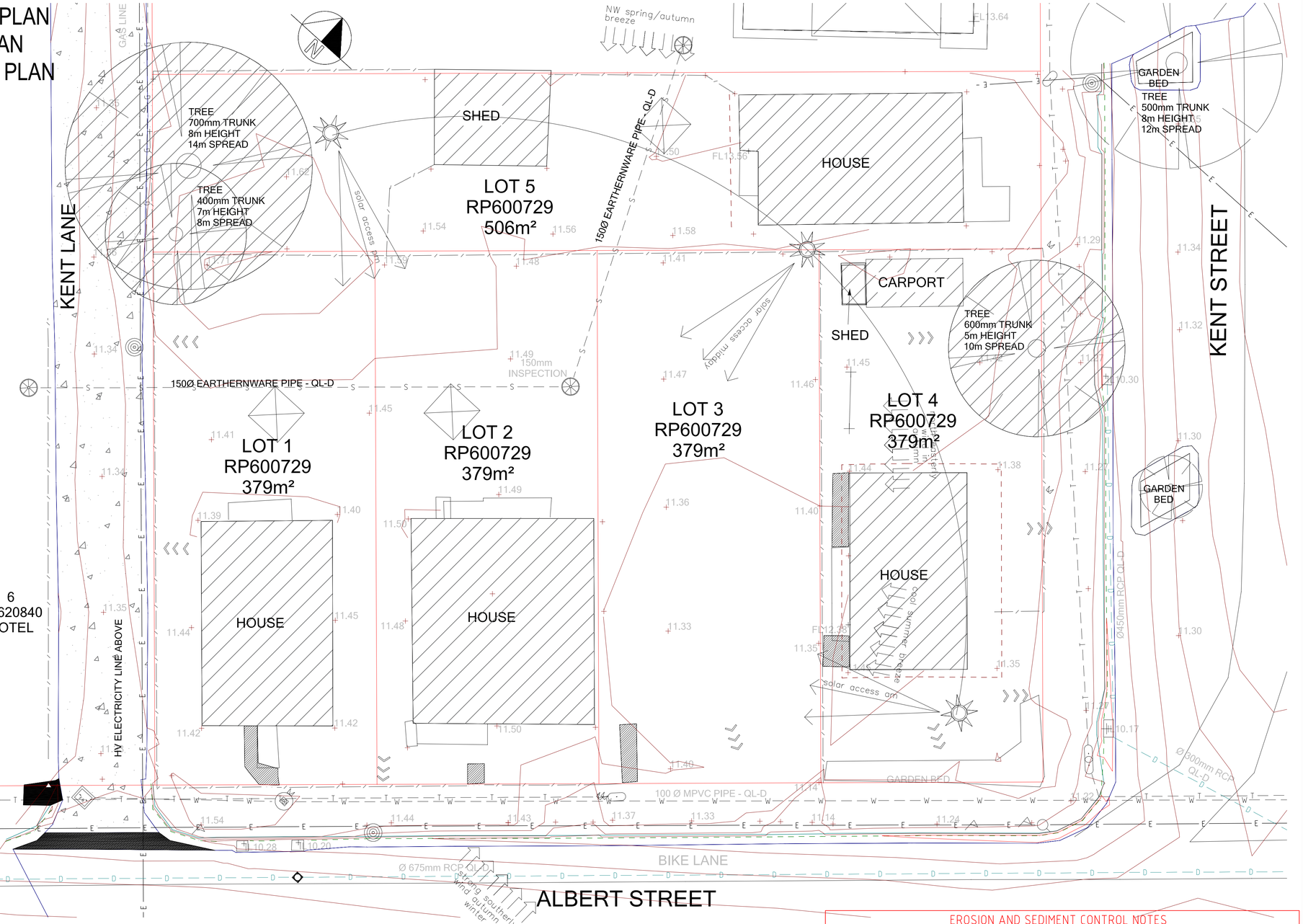
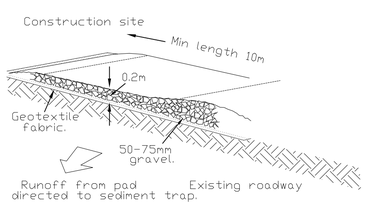
6
RP620840
MOTEL



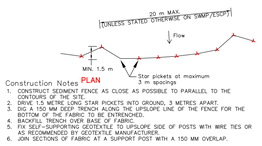
NOTES

The lots have four (4) existing houses, two (2) shed and one (1) carport to be removed.
The site has three (3) existing trees to be removed along with the existing shrubs and small vegetation to be removed also.
Drainage lines slope towards the street verge.
The soil is a gravel-base with a sandy loam topsoil.



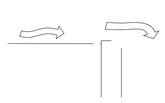
TEMPORARY CONSTRUCTION EXIT

MAINTENANCE:
THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND / OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED

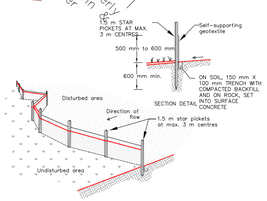


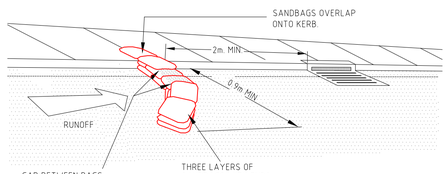
Construction Notes PLAN
1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5 m LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150 MM DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150 MM OVERLAP.

SEDIMENT CONTROL FENCE



Geotextile Filter Fabric Drop Inlet Sediment Trap.





SANDBAG KERB INLET SEDIMENT TRAP
NTS

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

E1. THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, AND ANY OTHER PLANS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED AND RELATING TO DEVELOPMENT AT THE SUBJECT SITE.

E2. THE SITE SUPERINTENDENT WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS INSTRUCTED IN THIS SPECIFICATION.

E3. ALL BUILDERS AND SUB-CONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS.

CONSTRUCTION SEQUENCE

E4. THE SOIL EROSION POTENTIAL ON THIS SITE SHALL BE MINIMISED. HENCE WORKS SHALL BE UNDERTAKEN IN THE FOLLOWING SEQUENCE :

(a) INSTALL SEDIMENT FENCES

(b) UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

EROSION CONTROL

E5. DURING WINDY CONDITIONS, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.

E6. FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

FENCING

E7. STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS. SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.

ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.

WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.

TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

OTHER MATTERS

ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.

RECEPTORS FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER ARE TO BE EMPTIED AS NECESSARY. DISPOSAL OF WASTE SHALL BE IN A MANNER APPROVED BY THE SITE SUPERINTENDENT.

SITE INSPECTION & MAINTENANCE

EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED AFTER RAINFALL EVENTS TO ENSURE THAT THEY OPERATE EFFECTIVELY. REPAIR AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED.

DRAWING TO BE READ IN CONJUNCTION WITH THE ARCHITECTS-- STORMWATER-- ENGINEERS PLANS PLUS ASSOCIATED SHEETS ATTACHED

Legend

- E — ELECTRICITY CABLE
- G — GAS MAIN
- S — SEWER MAIN
- T — TELSTRA CABLE
- W — WATER MAIN
- D — D — DRAINAGE LINE
- LIGHT POLE
- POWER POLE
- POWER POLE WITH LIGHT
- SIGN
- SEWER MANHOLE
- TELSTRA PIT
- FIRE HYDRANT
- WATER METER
- STOP VALVE
- CLOTHES HOIST
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- STRUCTURES TO BE REMOVED
- OVERLAND FLOW PATH
- PREVAILING WIND

DATE	BY	AMENDMENT
21.4.20	JK	BUILDING SITE LINE PLANT BUFFER

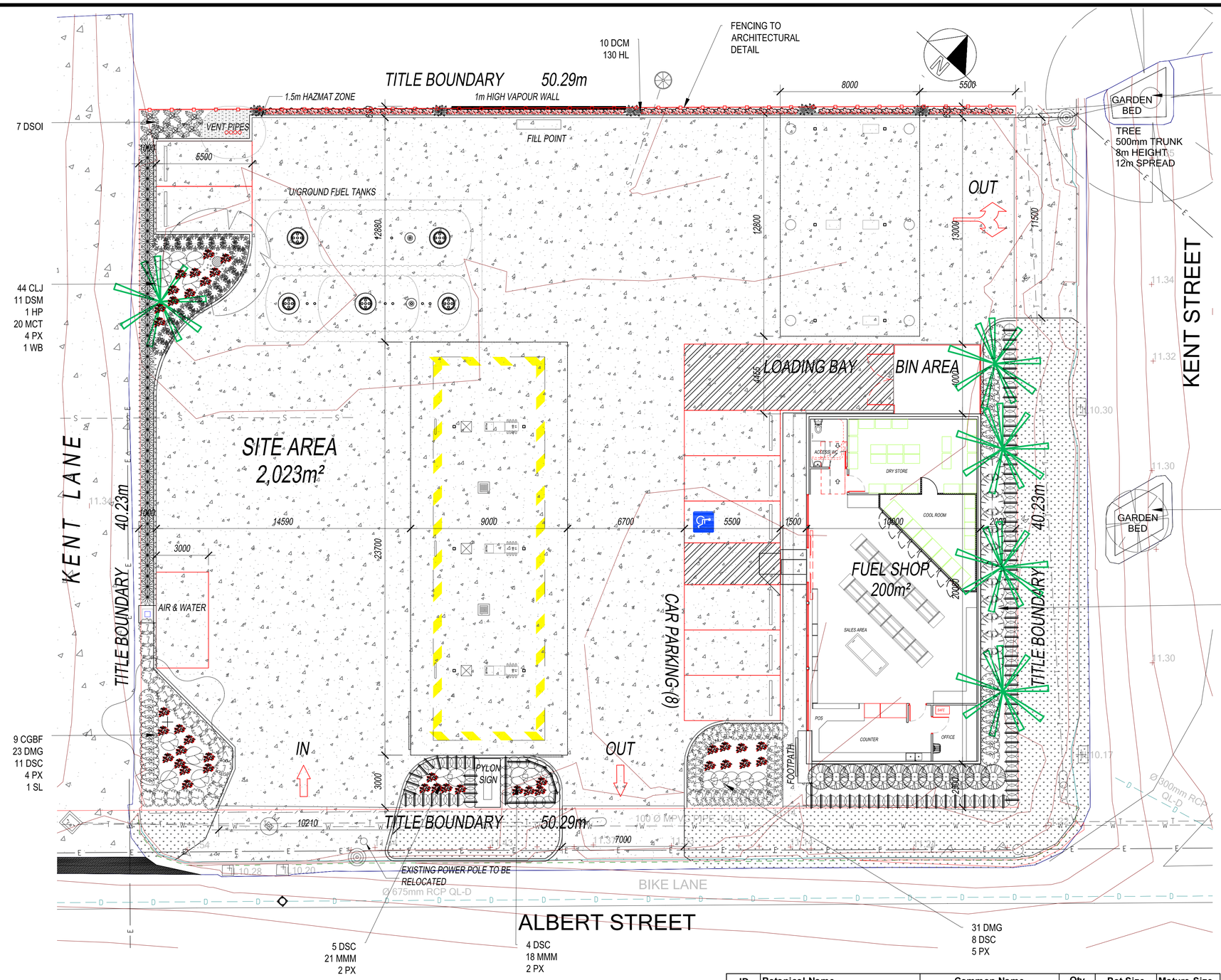
LANDSCAPE DESIGNER
JK's GARDEN CREATIONS
PO. BOX 168 GAN GAN RD
ANNA BAY. NSW. 2316
John A. Kime
Mob. 0412582966
email.gardenflora704@gmail.com
Member AILDM

SITE ADDRESS
SERVICE STATION
LOTS1-5 RP600729
20-26 ALBERT & KENT ST
ROCKHAMPTON

CLIENT
RCI GROUP

ARCHITECT
trg
BRISBANE + MELBOURNE
concept + design + interiors + project management
Level 2, Suite 37, 799 Springvale Road, Mulgrave, Victoria 3170 Australia
T: +61 3 9542 9300 F: +61 3 9542 9310
www.trg.com.au
The Retail Group Pty Ltd ABN 85 050 134 686
RBP No. DP-AD1689

DRAWN	DATE
MISHKA	20/02/2020
SCALES	CHECKED
	JK
SHEET	JOB No.
1 OF 3 Site Analysis Plan	



DRAWING TO BE READ IN CONJUNCTION WITH THE ARCHITECTS-- STORMWATER-- ENGINEERS PLANS PLUS ASSOCIATED SHEETS ATTACHED

LEGEND

- CONCRETE PATHS & DRIVEWAY
- TURF
- PERMEABLE GRAVEL TO SHADED AREAS
- BOUNDARY FENCE TO ARCHITECTURAL DETAIL
- E — ELECTRICITY CABLE
- G — GAS MAIN
- S — SEWER MAIN
- T — TELSTRA CABLE
- W — WATER MAIN
- D — D — DRAINAGE LINE
- LIGHT POLE
- POWER POLE
- POWER POLE WITH LIGHT
- SIGN
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- TELSTRA PIT
- FIRE HYDRANT
- WATER METER
- STOP VALVE
- CLOTHES HOIST
- EXISTING TREE

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
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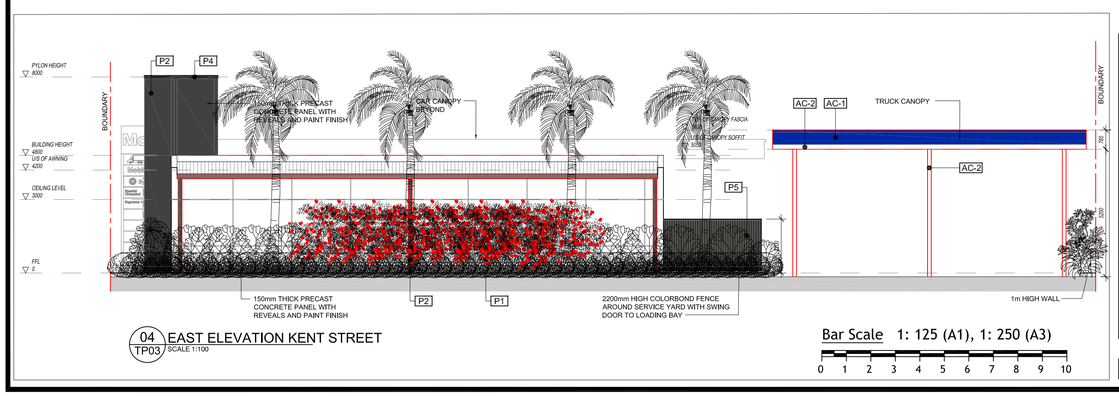
Development Permit No.: D/28-2020
Dated: 29 March 2021

DIAL 1100 BEFORE YOU DIG

Bar Scale 1: 125 (A1), 1: 250 (A3)
0 1 2 3 4 5 6 7 8 9 10

PLANT LIST

- EXISTING SITE TREE
- ACS ACMENA CHERRY SURPRISE
- CGBF CALLISTEMON GREAT BALLS OF FIRE
- CLJ CALLISTEMON LITTLE JOHN
- DMC DRACENA MARG COLOURAMA
- DMG DURANTA MINI GOLD
- DSC DIPLADENIA SAND. CTVR
- DSOI DRACENA SONG OF INDIA
- HL HYMENOCALLIS LITTEROLLIS
- HP HARPULA PENDULA
- MCT MELALEUCA CLARET TOPS
- MMM MURRAYA MIN A MIN
- PX PHILODENDRON XANADU
- SL SYZYGIUM LEUHMANNII
- SMDS SCHEFFLERA MADAM DE SMET
- WB WODYETIA BIFURCATA



04 TP03 EAST ELEVATION KENT STREET
SCALE 1:100

Bar Scale 1: 125 (A1), 1: 250 (A3)
0 1 2 3 4 5 6 7 8 9 10

ID	Botanical Name	Common Name	Qty	Pot Size	Mature Size
	PLANT SCHEDULE			mm/ltr	w x h mtrs
	TREES, SHRUBS, GRASSES, GROUNDCOVERS				
ACS	Acmena cherry surprise	Red tipped lilly pilly	12	200mm	2 x 3m
CGBF	Callistemon great balls of fire	Dwarf white bottlebrush	25	200mm	1.5x1.5m
CLJ	Callistemon little john		44	200mm	1.5x1.5m
DMC	Dracena marg colourama		10	200mm	1 x 2m
DMG	Duranta mini gold		55	200mm	1x1m
DSC	Dipladenia sand Ctvr		28	200mm	Clbr/Shrub
DSOI	Dracena song of india		7	200mm	2 x 3m
HL	Hymenoca litterollis	Spider plant	130	150mm	.5x .5m
HP	Harpula pendula	Tulipwood	1	25ltr	6 x 10m
MCT	Melaleuca claret tops	red tipped snow in summer	20	200mm	1.5x1.5m
MMM	Murraya min a min	Dwarf mock orange	111	200mm	1 x 1m
PX	Philodendron xanadu		17	200mm	1.2x1.2m
SL	Syzygium leuhmannii	Riberry	1	25 Ltr	6 x 9m
SMDS	Schefflera madam de smet	Dwarf umbrella	12	200mm	2 x 2m
WB	Wodyetia bifurcata	Foxtail plam	4	25ltr	4 x 12m

ALL HEIGHTS ARE AVERAGE DEPENDENT ON SOIL, CLIMATE, MAINTENANCE, ETC.

DATE	BY	AMENDMENT
21.4.20	JK	BUILDING SITE LINE PLANT BUFFER

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RBP No. DP-AD1669

DRAWN	DATE
MISHKA	20/02/2020
SCALES 1:125 @ A1 1:250 @ A3	CHECKED JK
SHEET 2 OF 3 Landscape Plan	JOB No.

INITIAL PREPARATION

Verify all dimensions on site prior to commencement, locate all underground services and ensure no damage occurs to them throughout the contract. Comply with the requirements of the Council site guidelines in reference to erosion and sediment control regulations and other environmental controls to contain all within confines of the site. Spray with approved herbicide weed killer to all proposed lawn and garden areas to manufactures directions. Spray all weeds before commencement of any site works are carried and throughout the contract so as to suppress any weeds that may arise. Source all plants before start of job so the time factor to purchase from species list, will be true to plant schedule. The trees and shrubs recommended may sometimes be difficult to source due to times of year, weather, disease etc, this being the case, please inform early so arrangements to substitute can be made. Excess soils and contaminated soil are to removed within the guidelines of the council requirements to approved sites.

SOIL PREPARATION

Cultivate to the minimum depth of 200mm in all garden areas and 100mm depth in all lawn areas; add a clay breaker to all garden areas, before the addition of garden soil is added. In all areas where fill is required, gain required levels using a premium soil mix. Where excavation is required as with clay excavate as required to allow for addition of 200-400mm depth of premium garden soil to garden areas and 100-300mm depth of topsoil to lawn areas. Undertake all required action to ensure that no root balls of proposed plants sit in clay wells and that all garden and lawn areas drain satisfactorily. It is the contractor's responsibility to ensure the end result of the project is that all lawn and garden areas drain sufficiently (both surface and subsurface), are at required finished levels and have sufficient soil depths to enable lawn and plants to thrive and grow. Soil levels are to allow for the addition of turf and mulches to specified requirements.

GARDEN EDGING

EDGING: Timber edging shall be located to all planter bed edges where meeting new or existing turfed areas. Use 38x150mm treated pine edging with 50x50 pegs at 1200 centres finished 30mm below top of edging.

PLANTING

Purchase plants from an approved nursery that supplies plants that are true to type and species, healthy and able to store at nursery to maintain vigor before planting. Plant within 24hrs of plants being delivered. Set out plants as indicated on plan. Plant holes shall be dug approximately twice the width and 100mm deeper than the plant root balls that they are to receive. Add fertilizer, followed by 100mm of garden soil shall be placed into the base of hole and lightly consolidated. Remove plant from container install and backfill with garden soil and firmed into place. Base of stem shall finish flush with finished soil level. Thoroughly water all plants on first planting to soak soil of plant and surrounding soil so as to allow roots to adjust, do not allow drying out. Water regular over the first 3-4 weeks.

FERTILISING

Use slow release fertilizers such as osmocote and or agriform tablets on all plants.

MULCHING

Install 100mm minimum of Forest mulch as a mulch over all gardens. Shaded areas mulch with 10-25mm pebble mulch with weedmat under.

RETAINING WALLS

Erection of masonry block retaining walls treated timber retaining walls to be as per retaining wall specification guidelines . All retaining walls and footings to remain within the confines of boundary.

TURF

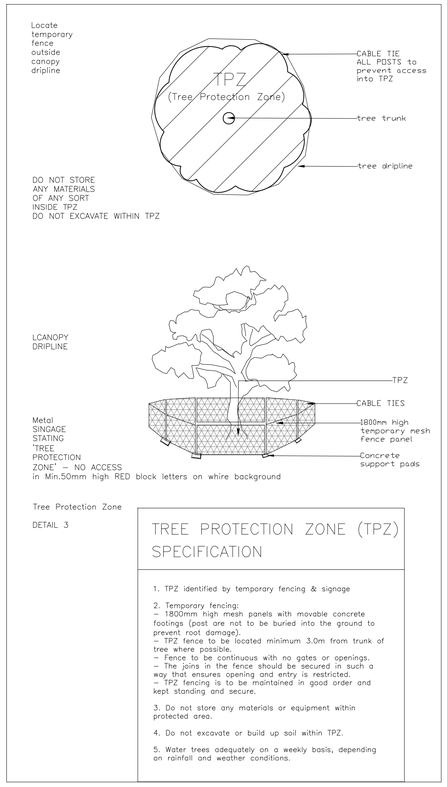
Prepare for, level and lay cultivated Buffalo turf to all areas nominated on the plan as being lawn. To be layed within 24 hrs of delivery on site, making sure all areas are level for drainage, garden edging and paths.

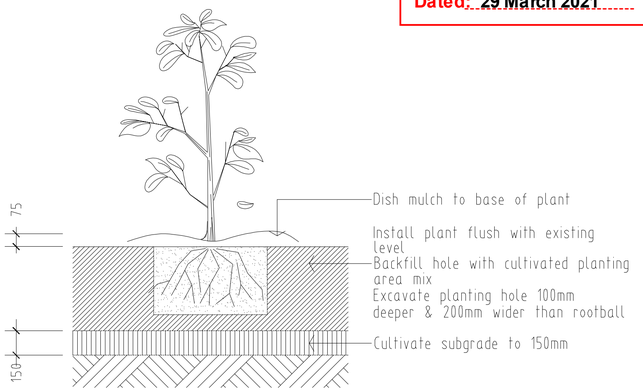
COMPLETION

Prior to practical completion removal from site all unwanted debris occurring from work. Satisfy council that all landscaping work has been undertaken in strict accordance with council's landscape codes and guide lines. At the completion of landscape works and prior to the issue of the Certificate of Practical Completion.
Carry out the following during the maintenance period(determined by Builder). These works shall include but not limited to watering, weeding, fertilizing, pest and disease control, returfing, staking and tying, replanting, cultivation, pruning, aerating, renovation, top dressing and the like.

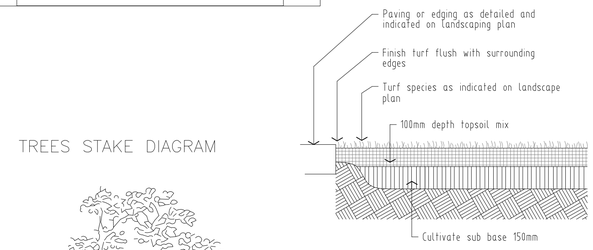
EXISTING TREES

The existing trees to be retained on site are to be protected by surrounding with a 1.8m high chainmesh fence 3.00m from the base of the tree. This fence is to be erected prior to works commencing on site and is to be retained until all building works are completed. The enclosed area is to remain free of materials, machinery, vehicles or site sheds. With this preparation is to protect the existing tree and its critical roots from mechanical damage, compaction or any other adverse impacts resulting from construction activity and allowing the trees to grow the optimum growth once all works have been finalized.

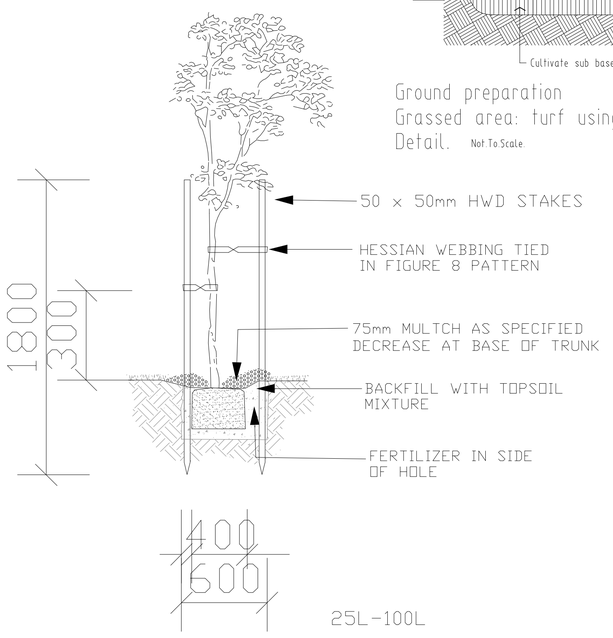


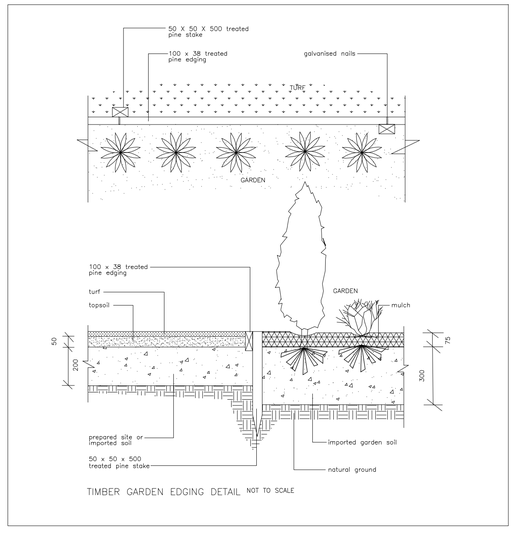


Planting in garden beds
Detail. Not To Scale.



Ground preparation
Grassed area: turf using imported topsoil
Detail. Not To Scale.





TIMBER GARDEN EDGING DETAIL NOT TO SCALE

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The Royal Group Pty Ltd ABN 85 090 134 686
RBP No. DP-AD 11699

DRAWN	DATE
MISHKA	20/02/2020
SCALES	CHECKED
	JK
SHEET	JOB No.
3 OF 3 Specification Plan	