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A	ISSUE FOR DA	13.09.17	SJE

PROPOSED SERVICE STATION - ROCKHAMPTON CITY
PLANNING DOCUMENTS

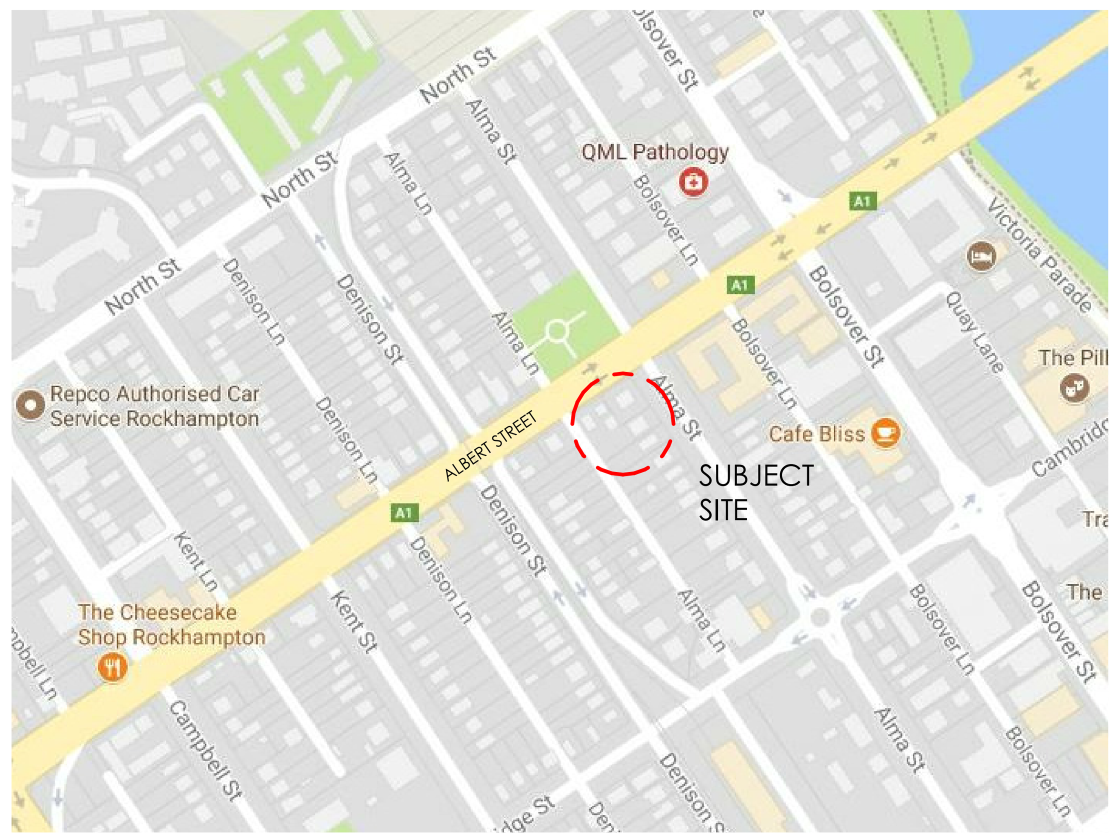
23 ALBERT STREET, ROCKHAMPTON CITY, QLD

1 **ARTIST IMPRESSION**

ARTISTS IMPRESSION - FOR INDICATIVE PURPOSES ONLY - (FINAL BUILDING MAY DIFFER SLIGHTLY)

DA - DRAWING LIST

Sheet Number	Sheet Name	Scale
DA-000	COVER SHEET & ARTIST IMPRESSION	NTS
DA-101	EXISTING CONDITIONS	1:200 @ A1
DA-102	SITE PLAN	1:200 @ A1
DA-201	GROUND FLOOR PLAN	1:100 @ A1
DA-301	ELEVATIONS	1:100 @ A1
DA-302	SECTION	1:100 @ A1
DA-801	SIGNAGE DETAILS	1:100 @ A1



2 **LOCALITY PLAN**

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

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COVER SHEET & ARTIST IMPRESSION

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SCALE NTS

PROPOSED SERVICE STATION
23 ALBERT STEET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
DATE: AUG '17
DRAWN: LC

DWG NO. DA-000 REV. A

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1 EXISTING CONDITIONS & DEMOLITION PLAN

Scale: 1 : 200

EXISTING CONDITIONS

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0 4 8 12 16 20 SCALE 1:200

PROPOSED SERVICE STATION
23 ALBERT STEET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
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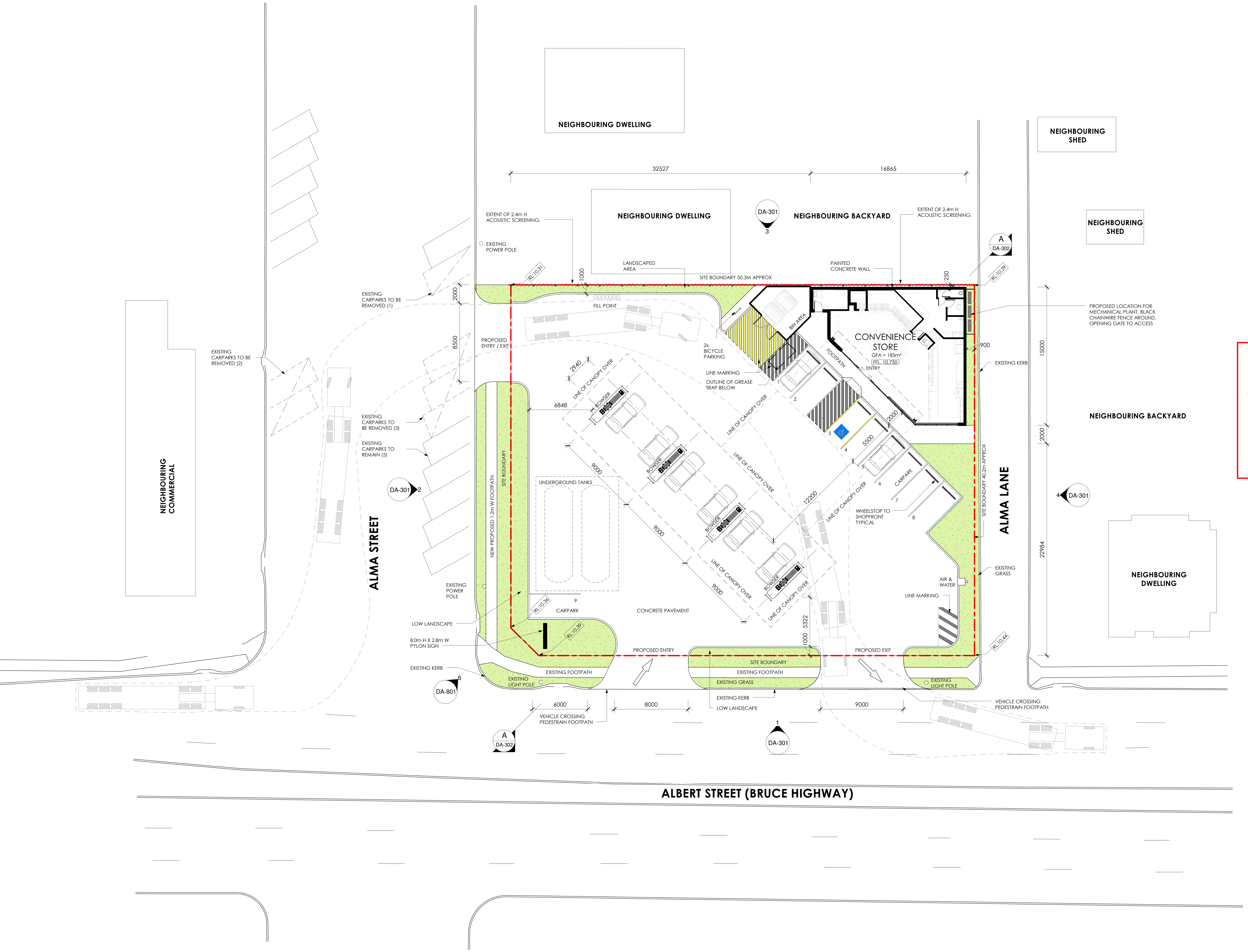

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NOTE:

ALL ROADS, CARPARKING, PAVEMENTS & LINEMARKING TO COMPLY WITH TRAFFIC ENGINEERS SPECIFICATIONS AND AUSTRALIAN STANDARDS.

ENTRIES, EXITS & CARPARKING LAYOUTS ARE SUBJECT TO TRAFFIC ENGINEER'S DESIGN.

SITE BOUNDARIES & SITE AREAS ARE INDICATIVE ONLY & SUBJECT TO CONFIRMATION BY LICENSED SURVEYOR.

ALL SETBACKS, PLOT RATIOS, LANDSCAPE AREAS, CARPARKING NUMBERS & THE LIKE ARE SUBJECT TO LOCAL AUTHORITY APPROVAL.

ALL SERVICES, LIGHTING, ETC ARE PRELIMINARY ONLY & SUBJECT TO ENGINEER'S DESIGN.

ALL DOOR LOCATIONS ARE PRELIMINARY AND SUBJECT TO SURVEYOR'S ASSESSMENT.

ALL TRAFFIC CONSIDERATIONS INCLUDING TRUCK TURNING AND ACCESS/EGRESS ARE TO BE AS PER TRAFFIC ENGINEER'S REPORT.

SURROUNDING ROAD DESIGN AND SITE ACCESS/EGREES IS TO BE AS PER TRAFFIC ENGINEER'S DRAWINGS.

ALL REDUNDANT VEHICLE CROSSINGS SHALL BE REMOVED AND REPLACED WITH KERB & CHANNEL.

SITE AREA & CARPARK	
SUBJECT SITE AREA:	2018 m²
TOTAL BUILDING AREA:	183 m²
TOTAL PAVEMENT:	1517 m²
CAR SPACES:	9 CS
CAR PARK RATIO:	1 CS / 20.3m²
BICYCLE SPACES:	2

NOTE:
TOTAL OF 6 CAR SPACES REMOVED OUTSIDE OF SUBJECT SITES BOUNDARY.

1 -

PROPOSED SITE PLAN

Scale: 1 : 200

SITE PLAN

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0 4 8 12 16 20 SCALE 1:200

PROPOSED SERVICE STATION
23 ALBERT STREET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
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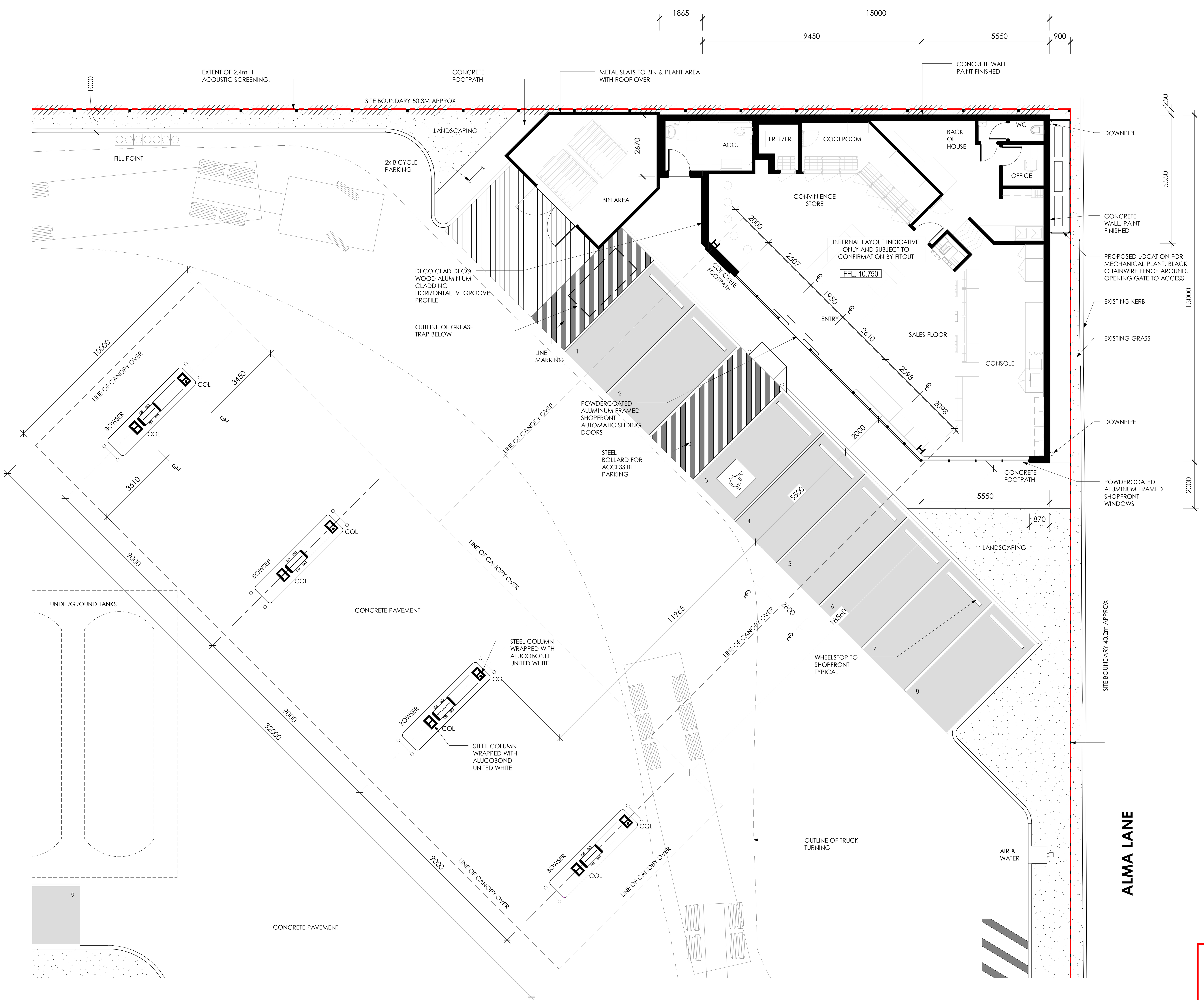

1 PROPOSED FLOOR PLAN

Scale: 1 : 100

GROUND FLOOR PLAN

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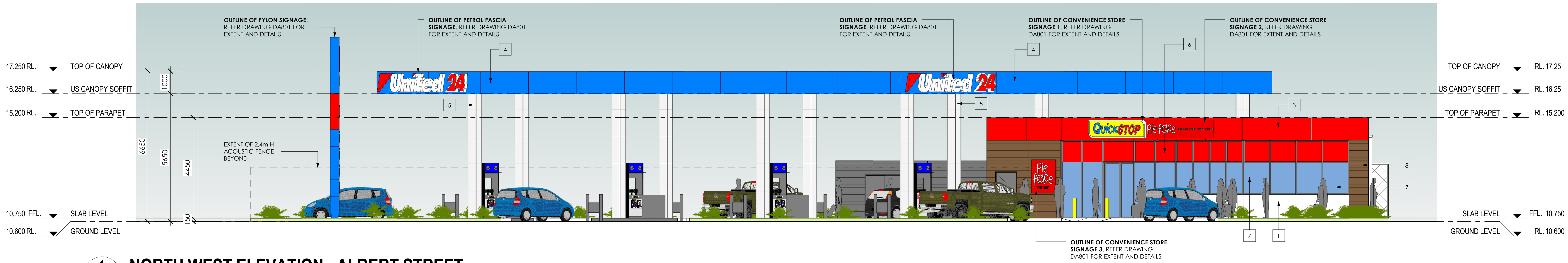
SCALE 1:100 — 0 2 4 6 8 10

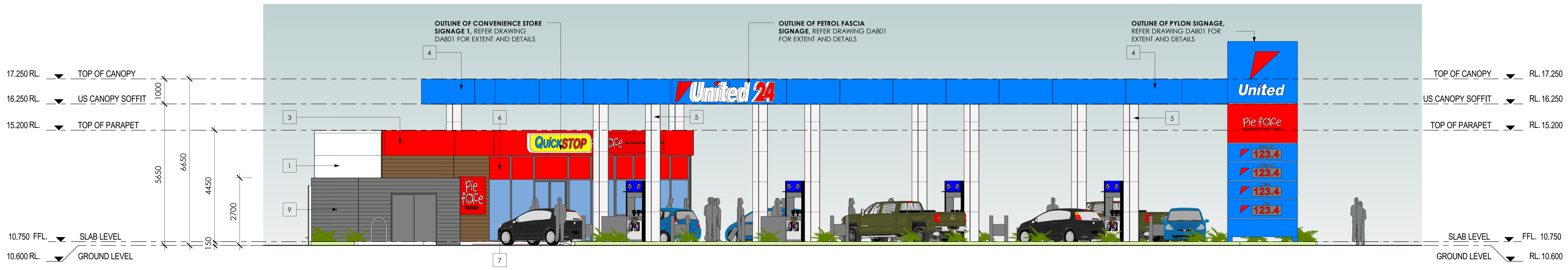
PROPOSED SERVICE STATION
23 ALBERT STEET, ROCKHAMPTON CITY, QLD

JOB NO:	4340	DWG NO.	REV.
DATE:	AUG '17	DA-201	A
DRAWN:	LC		

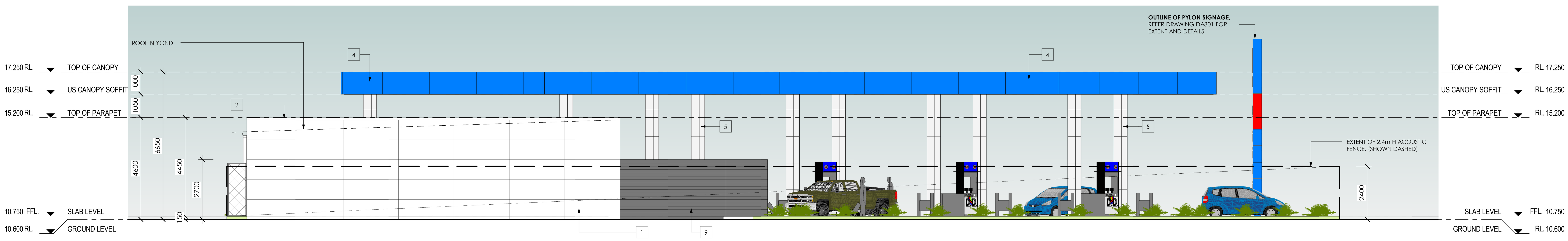
LEFFLER SIMES ARCHITECTS



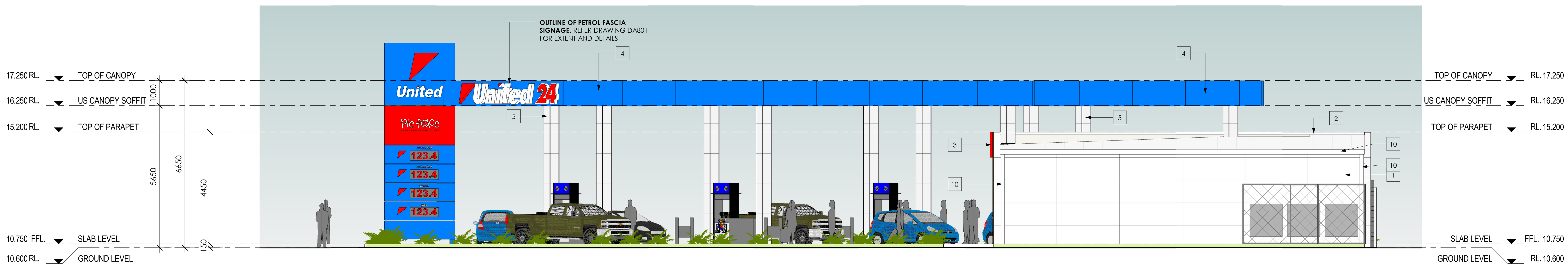
1 DA-102 **NORTH WEST ELEVATION - ALBERT STREET**
Scale: 1 : 100



2 DA-102 **NORTH EAST ELEVATION - ALMA STREET**
Scale: 1 : 100



3 DA-102 **SOUTH EAST ELEVATION**
Scale: 1 : 100



4 DA-102 **SOUTH WEST ELEVATION- ALMA LANE**
Scale: 1 : 100

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EXTERNAL FINISHES

CODE	DESCRIPTION
1	CONCRETE PANEL WITH GROOVES. PAINTED COLOUR (DULUX - VIVID WHITE)
2	POWDERCOATED METAL CAPPING COLOUR (WHITE TO MATCH WALL)
3	COMPOSITE METAL PANEL COLOUR (ALUCOBOND UNITED RED)
4	COMPOSITE METAL PANEL COLOUR (ALUCOBOND UNITED BLUE)
5	COMPOSITE METAL PANEL COLOUR (ALUCOBOND UNITED WHITE CLADDING)
6	COLOUR-BACK GLAZING FINISH (RED TO MATCH METAL PANEL)
7	POWERCOATED ALUMINIUM WITH CLEAR GLAZING (BLACK POWDERCOAT)
8	HORIZONTAL ALUMINIUM CLADDING (NATURAL TEAK)
9	METAL SLATS
10	POWDERCOATED METAL GUTTER & DOWNPIPE COLOUR (WHITE TO MATCH WALL)

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

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Dated: 22 February 2018

ELEVATIONS

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0 2 4 6 8 10 SCALE 1:100

PROPOSED SERVICE STATION
23 ALBERT STREET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
DATE: AUG '17
DRAWN: LC
DWG NO. DA-301 REV. A

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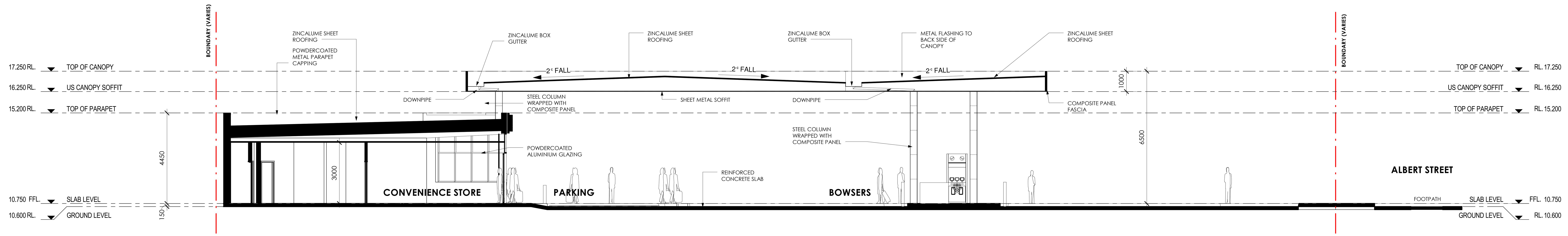
P 2	ISSUE FOR INFORMATION	01.09.17	SJE
P 3	ISSUE FOR INFORMATION	12.09.17	SJE



A
DA-102

OVERALL SECTION

Scale: 1 : 100

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

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SECTION

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0 2 4 6 8 10 SCALE 1:100

PROPOSED SERVICE STATION
23 ALBERT STEET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
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DWG NO. DA-3023 REV.

LEFFLER SIMES ARCHITECTS

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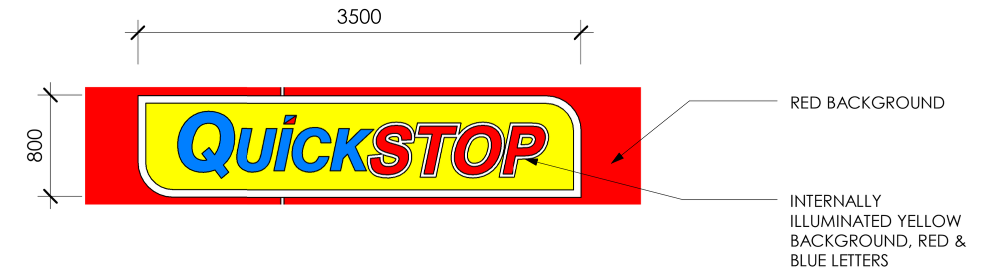
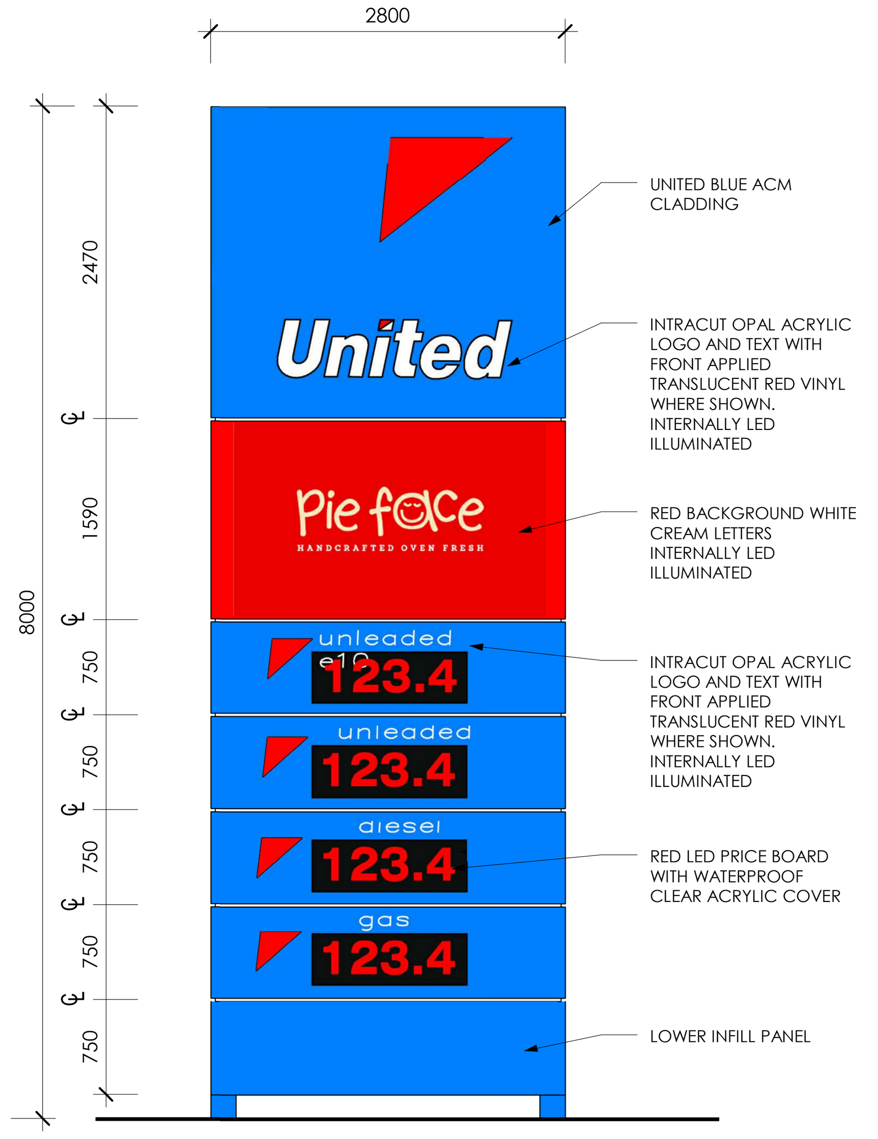
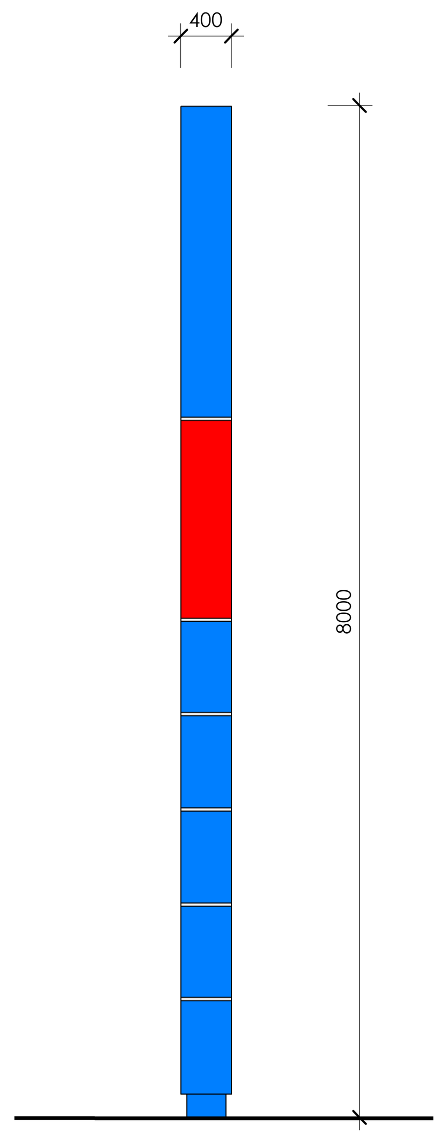
3 - **SIGNAGE ELEVATION - PETROL FASCIA SIGNAGE**
Scale: 1 : 50



4 - **SIGNAGE ELEVATION - CONVENIENCE STORE SIGNAGE 1**
Scale: 1 : 50

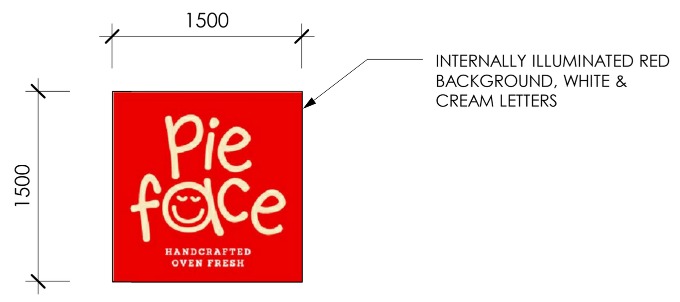




5 - **SIGNAGE ELEVATION - CONVENIENCE STORE SIGNAGE 2**
Scale: 1 : 50

1 - **SIGNAGE ELEVATION 1 - PYLON**
Scale: 1 : 50

2 - **SIGNAGE ELEVATION 2 - PYLON**
Scale: 1 : 50



6 - **SIGNAGE ELEVATION - CONVENIENCE STORE SIGNAGE 3**
Scale: 1 : 50

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SIGNAGE DETAILS

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0 2 4 6 8 10 SCALE 1:100

PROPOSED SERVICE STATION
23 ALBERT STEET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
DATE: AUG '17
DRAWN: LC
DWG NO. REV.
DA-801 A

LEFFLER SIMES ARCHITECTS

Engineering Services Report

23 Alma Street, Rockhampton

Proposed Service Station

For Gondor Investments Pty Ltd

Artists Impression prepared by Leffler Simes Architects

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

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

Development Permit No: D/114-2017

Dated: 22 February 2018

Davey Engineering Solutions Pty Ltd

23 Dune Circle, Lammermoor, QLD 4703

(07) 49 33 69 61 - Jeff@daveyes.com.au

Contents

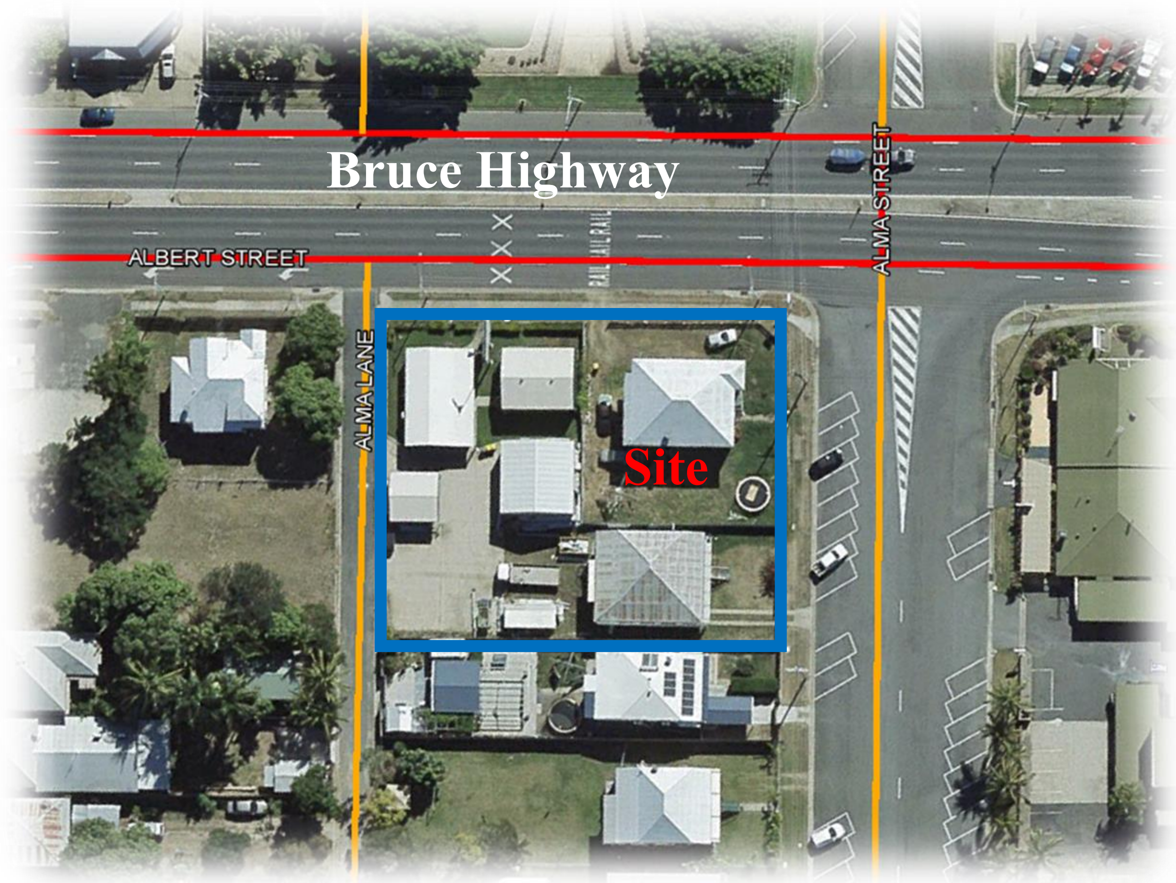
Revision History
A – 15 September 2017
B – 16 September 2017

Jeff Davey
B.Eng (Hons), RPEQ 8386, JP (Qual)

1.0 INTRODUCTION

Davey Engineering Solutions Pty Ltd has prepared the following report to address the engineering services and issues associated with the Material Change of Use & Reconfiguration of Lot.

The development is located on the corner of Albert Street and Alma Street on Lot 1on RP606047 & Lot 2 on SP195031. The locality of the subject development site can be seen in the below Site Locality Image.



Site Locality

2.0 SITE WORKS / EROSION CONTROL / GROUND CONDITIONS

Siteworks for the proposed development will be relatively minor as the site naturally falls from its south-western boundary towards its north-eastern boundary. The site has a number of slab on ground buildings and two two-story dwellings which are all slightly elevated from the surrounding ground. The existing fall across the majority of the site is less than 0.5% and ranges from ~10.53m AHD down to ~10.26m AHD.

The site works will consist of the following stages:

- Removal of current buildings within the proposed development area, this includes a business and associated 3 sheds, a carport, and two residential houses.
- Minor earthworks involving shaping of the proposed carpark and accesses and building pads. The proposed buildings pad will be slightly elevated (250mm) from the site to create positive fall for stormwater drainage and to improve the ground foundation for the buildings.
- Underground services installation.
- Roadworks and stormwater drainage works
- Building construction works
- Final detailed works

All stockpiles are to be segregated into topsoil, pavements, sand/gravels and protected with appropriate silt traps and fences. All stockpiles are to be accessed from the upstream side to reduce erosion and need to be maintained consistently throughout the project construction phase. Erosion control measures are to be implemented during construction in accordance with Rockhampton Regional Council requirements. The principal contractor is to reinstate all erosion control measures after all rain events and any vandalism during the construction period.

From site inspection and having previous knowledge of the surrounding area, the natural material below the existing buildings would be representative of the clayey soils typically found in the lower lying areas of the Rockhampton. The material on the site are expected to have a high clay content and subject of movement as the ground varies with moisture content. To overcome these issues it is proposed the car parking and circulation areas will constructed out of a ridged pavement material (concrete) to minimise the potential moisture ingress into the subgrade. The objective of the building and car park design will be to maintain as close as possible a constant moisture content in the surrounding ground to reduce potential infrastructure damage sustained as clays expand and contract due to moisture variances.

3.0 SEWER

A 150mm sewer and manhole terminates three metres inside the southern boundary. It is possible to service the development via the existing main which has an invert of 8.73m AHD. The furthest section of the building is 35 metres and at 1 in 40 requires less than 900mm fall. With a proposed floor level of 10.750m AHD, there is sufficient level difference to service the site via the existing manhole onsite. A jump-up into this manhole will be used to service the development.

Demand Calculations

The CMDG Sewer Network Design & Construction Guideline states that 1 ET (Equivalent Tenements) within the Rockhampton Regional Council is 540L/day, and the Typical Loadings Per Development Type, as per Table D12.C.01, are:

- 2 Bedroom Dwelling - Sewer Flow is 0.8ET per unit
- Commercial Business – Sewer Flow is 0.8ET per 100sqm of GFA
- Service Station – Sewer Flow is 0.8ET per 100sqm of GFA

Based on the above guidelines the table below outlines the net difference in loading the proposed development will have on the sewer network.

Existing loadings to be demolished	
2 Bedroom Dwelling	-432 L/day
2 Bedroom Dwelling	-432 L/day
229m^2 of Commercial Business (GFA)	-989 L/day
Sub Total	**-1,853 L/day**
Proposed Development	
185m^2 of Service Station (GFA)	799 L/day
Total	**-1,054 L/day**

Therefore it can be seen that the net sewer flow for the development site will be less than the predeveloped case, overall reducing the demand on the existing sewer network.

4.0 WATER

A 150mm watermain is located along the road frontage of Albert Street and a 100mm main is located off the sites' Alma Street frontage. The service to the development will be via a short connection into the 150mm on Albert Street. As the Council watermain is located directly adjacent to this development there will be no problems obtaining a connection as required for the proposed development. Council records indicate that hydrants exist on both road frontages. A hydrant will be installed (if required) in accordance with the National Construction Code of Australia at a located nominated during the detailed design phase.

Demand Calculations

The Water and Sewerage Planning Guidelines* states that indicative averages are:

- Home Unit - Water demand is between 550 - 750 liters per day (2 bedroom)
- Commercial Premises - Water demand is between 500 - 800 liters per day per 100m^2 GFA
- Service Station – Water demand is between 500 - 700 liters per day per 100m^2 GFA

**Reference QLD Gov - Planning Guidelines for Water Supply and Sewerage April 2010 Chapter 6 amended March 2014*

Existing loadings to be demolished	
2 Bedroom Dwelling	-650 L/day
2 Bedroom Dwelling	-650 L/day
229m^2 of Commercial Business (GFA)	-1,488 L/day
Sub Total	**-2,788 L/day**
Proposed Development	
185m^2 of Service Station (GFA)	1,110 L/day
Total	**-1,678 L/day**

Based on the planning guidelines it is estimated the proposed development demand will reduced by approximately 1,678 liters per day.

Davey Engineering Solutions does not have access to a calibrated hydraulic model of the existing water infrastructure for the area.

5.0 ELECTRICAL / COMMUNICATIONS

Existing overhead electrical and underground communications / Telstra are available to the property. There will be further discussions with Ergon Energy regarding the existing connection arrangements.

6.0 STORMWATER MANAGEMENT (QUANTITY)

The intent of this Stormwater Management section is to provide guidelines and recommendations to be incorporated into the future Operational Works design to minimise the impact this development has on the surrounding environment, infrastructure and nearby properties.

The subject site allotments for part of an existing larger external catchment that extents from Talford Lane and that discharges towards the Fitzroy River. The distance from the upper catchment is to it discharge location in the River is 1.5km. The site is located only 300 meters from the Fitzroy River or within the bottom 20% of the catchment.

The digital survey contours completed by Capricorn Survey Group, show the sites' catchment having two discreate catchments, one of which flows to the Bruce Highway and the other flows towards Alma Lane. The existing site catchments and site flow directions are shown on the image in Section 6.1.

Two (2) scenarios have been investigated to establish if peak flow mitigation measures are required as a result of this development. The first scenario (1) is comparing pre development situation and the second (2) scenario is the post situations of the development site.

6.1 – SCENARIO 1 EXISTING STORMWATER QUANTITY ASSESSMENT

The existing development site is split over two catchments that both discharge Council stormwater network that ultimately discharge to the Fitzroy River as shown below.

The total area of the existing overall catchment is as follows:

CATCHMENT	AREA
A	518m^2
B1	1,250m^2
B2	250m^2

Existing catchment flows have been prepared in accordance with the Rational Method outlined in the Queensland Urban Drainage Manual (QUDM) and the Capricorn Municipal Development Guidelines (CMDG).

The time of concentration of 5 minutes has been adopted due to small site area and is also based on QUMD Table 4.06.2.

In accordance with Australian Rainfall and Runoff (AR&R), Rockhampton Regional Council's stormwater intensity charts, the rainfall intensity for Q_1 to Q_{100} storm events are as follows:

Stormwater Event	Rainfall Intensity
Q_1	117mm/hr
Q_2	151mm/hr
Q_5	194mm/hr
Q_{10}	220mm/hr
Q_{20}	256mm/hr
Q_{50}	304mm/hr
Q_{100}	342mm/hr

In accordance with the Digital Terrain Model completed by Capricorn Survey Group and onsite inspection the fraction impervious for the onsite catchments are: A ~91% and B is ~30%.

Pre-Development Catchment Plan

The calculated Q_1 to Q_{100} flow rates discharging from existing Catchment A are as follows:

Stormwater Event	Flow Rate
Q_1	0.012m³/s
Q_2	0.016m³/s
Q_5	0.023m³/s
Q_{10}	0.028m³/s
Q_{20}	0.034m³/s
Q_{50}	0.044m³/s
Q_{100}	0.049m³/s

For this development, catchment B1 and B2 have been treated as the one catchment. While each catchment discharges to different sections of Albert St, the two road gully pits that are capturing the water are connected in to the same trunk stormwater main running down Albert Street, and ultimately discharging to the Fitzroy River. The calculated Q_1 to Q_{100} flow rates discharging from existing Catchment B1 & B2 combined are as follows:

Stormwater Event	Flow Rate
Q_1	0.030m³/s
Q_2	0.041m³/s
Q_5	0.058m³/s
Q_{10}	0.070m³/s
Q_{20}	0.085m³/s
Q_{50}	0.111m³/s
Q_{100}	0.130m³/s

Refer to Appendix 2 for Stormwater Calculations.

6.2 – SCENARIO 2 PROPOSED STORMWATER QUANTITY ASSESSMENT

The proposed developed site is designed with two catchments, similar to the existing scenario, as shown in the image below. Catchment A is designed to discharge to back of kerb in Alma lane, and Catchment B to discharge directly to the stormwater infrastructure in Albert street.

Post Development Catchment Plan

The pre and post situations fraction impervious and the area of the catchments were altered to match the post development layout. For Catchment A, the impervious area decreased from 91% to 86%, and the area also decreased by 118m^2. Catchment B increased by 62% impervious and catchment increased by 118m^2.

Post Development catchments are:

CATCHMENT	AREA
A	400m^2
B	1,618m^2

Incorporating these changes, the calculated Q_1 to Q_{100} flow rates discharging from proposed Catchment A are as follows:

Stormwater Event	Flow Rate
Q_1	$0.009m^3/s$
Q_2	$0.012m^3/s$
Q_5	$0.018m^3/s$
Q_{10}	$0.021m^3/s$
Q_{20}	$0.026m^3/s$
Q_{50}	$0.033m^3/s$
Q_{100}	$0.038m^3/s$

The calculated Q_1 to Q_{100} flow rates discharging from proposed Catchment B are as follows:

Stormwater Event	Flow Rate
Q_1	$0.037m^3/s$
Q_2	$0.051m^3/s$
Q_5	$0.073m^3/s$
Q_{10}	$0.087m^3/s$
Q_{20}	$0.106m^3/s$
Q_{50}	$0.137m^3/s$
Q_{100}	$0.154m^3/s$

Refer to Appendix 2 for Stormwater Calculations.
Developed stormwater drainage calculations have been completed comparing the post developed scenario against the pre developed for the both site catchments.

6.3 – PROPOSED STORMWATER CONTROL SYSTEMS

To ensure that existing and proposed infrastructure is protected throughout the development, the stormwater concept is usually to maintain the site discharge towards the existing discharge points of both Albert Street and Alma Lane kerb and channel. Developed stormwater control system calculations have been completed comparing the post developed scenario against the pre developed scenario for the both site catchments.

The concept for catchment A entitles directing the down pipes from the proposed building, half of the covered walkway and the bin enclosure to kerb adaptors to Alma Lane. The landscaped section with in this catchment will have gentle fall to top of kerb. The comparison between the pre development flow and the post development flow for this catchment has resulted in a reduction of approximately 24% of the peak flow, this means that the proposed development will improve the existing stormwater drainage situation in Alma Lane, and no further mitigation will be implemented.
For catchment B, a network of pit and pipes collects shallow sumps across the site will drain to the existing Council stormwater infrastructure in Albert Street. The comparison between the pre

development flow from catchment B1 and B2, against the post development flow of catchment B, has resulted in a net increase of approximately 26 litres per second during a 1 in 50 year event and 24 litres per second during a 1 in 100 year event.

Detailed external catchment modelling has not been undertaken as part of this assessment, however due to the site being located within the lower 1/3 of the catchment it is believed any detention may have a detrimental impact on the peak flow through the system. Refer Table 5.2.2 in the Queensland Urban Drainage Manual. Should Council advise otherwise based on an assessment of their stormwater modelling of the external catchment, onsite detention could be provided. Should detention be required by Council, the peak runoff could be detained in an underground tank with throttled outlet to ensure that the existing infrastructure is not adversely impacted. Using a preliminary estimation method for sizing the detention basins a volume of 9,500L was calculated, this volume will ensure that there is no increase to the flow entering the existing infrastructure at the time of the peak discharge for the subject site. Note the site peak and catchment peak are likely no to coincide.

Refer to Appendix 1 illustrating the proposed conceptual stormwater layout and Appendix 2 for Stormwater Calculations.

As shown on the plans the stormwater from the below Retail & Diesel Canopy's is bunded and any runoff or fuel spills will be directed to an oily water separating device. The fuel delivery and take-off point area is bunded with an automatic diversion valves to an underground tank which will be engaged when delivery is underway.

7.0 CONCLUSION

There appears to be no engineering infrastructure difficulties with the proposed service station located on the corner of Albert Street & Alma Street, Rockhampton. A review of the services proposed for this development and their impact on existing services indicated that there is no impediment to development.

Detailed external stormwater catchment modelling has not been undertaken as part of this assessment, however due to the site being located within the lower 1/3 of the catchment it is believed any detention may have a detrimental impact on the peak flow through the system. Council's regional stormwater model should be reviewed to confirm onsite detention is not warranted.

There is a workable design strategy for access and sewer, stormwater management, water supply, electricity and telecommunication. Minor alterations in design may eventuate from future operational works applications, however the fundamentals of the design strategy ensures that service provisions will not pose a serious constraint to development.

APPENDIX 1

Development Plans- Perspectives & Engineering Plan

WATER RETICULATION LEGEND

Existing Roadway

New Concrete Roadway

Existing 100mm dia. Water Reticulation Main

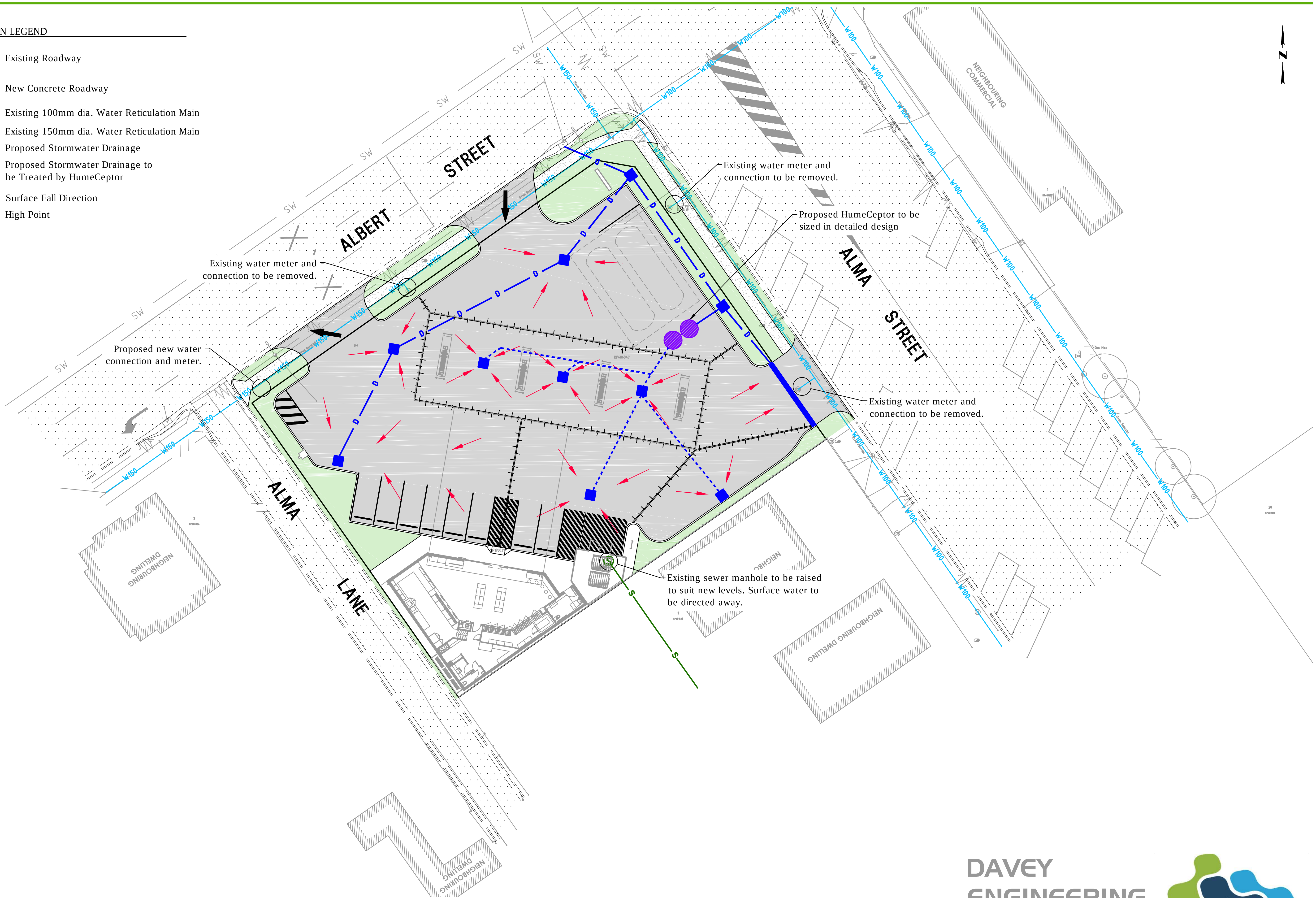
Existing 150mm dia. Water Reticulation Main

Proposed Stormwater Drainage

Proposed Stormwater Drainage to be Treated by HumeCeptor

Surface Fall Direction

High Point



PROPOSED SERVICE STATION
23 ALBERT STREET, ROCKHAMPTON

SCALE 1:400 (A3) (REV 1 14/09/17)

DAVEY ENGINEERING SOLUTIONS

Telephone: +61 419 872 040
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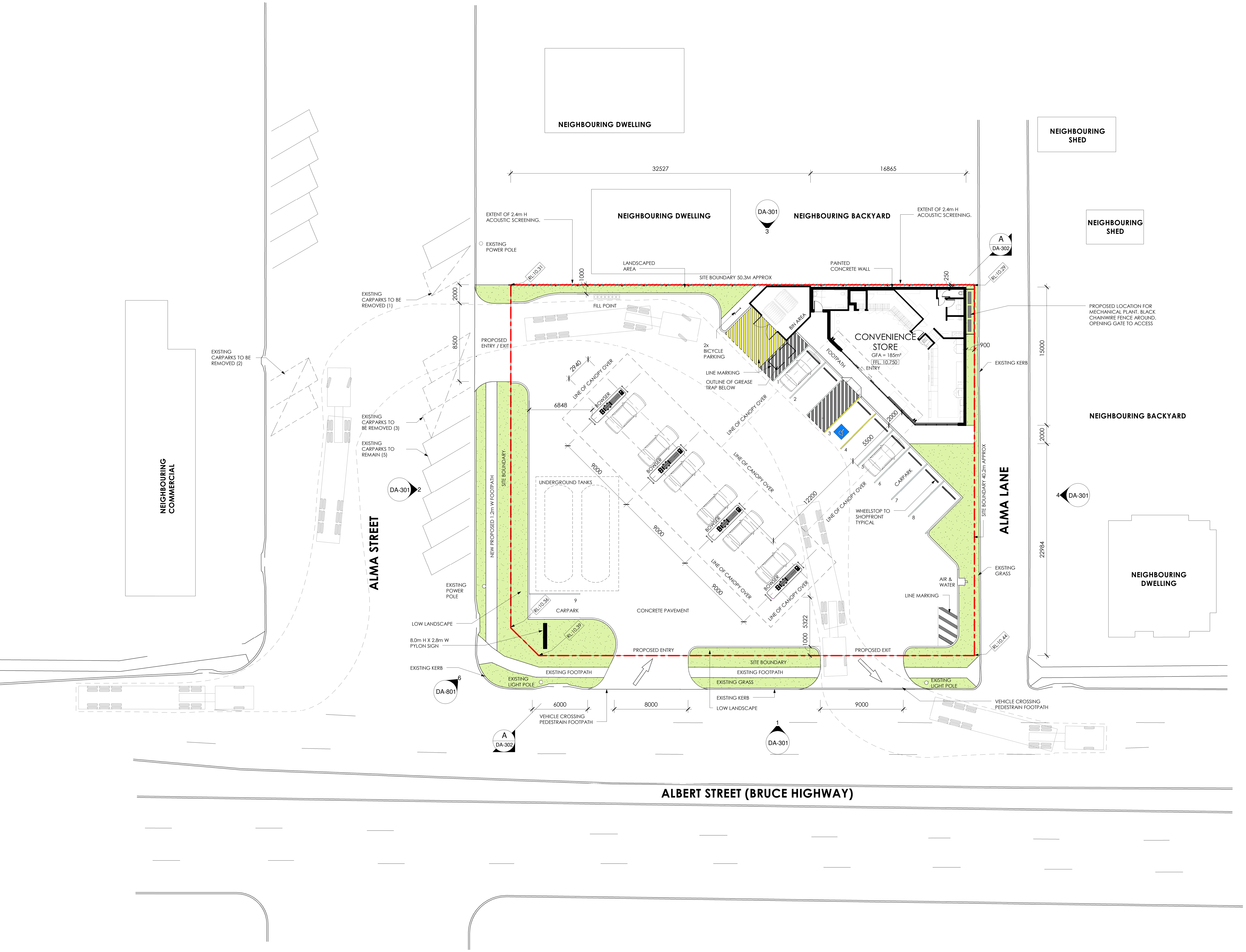

NOTE:

ALL ROADS, CARPARKING, PAVEMENTS & LINEMARKING TO COMPLY WITH TRAFFIC ENGINEERS SPECIFICATIONS AND AUSTRALIAN STANDARDS.

ENTRIES, EXITS & CARPARKING LAYOUTS ARE SUBJECT TO TRAFFIC ENGINEER'S DESIGN.

SITE BOUNDARIES & SITE AREAS ARE INDICATIVE ONLY & SUBJECT TO CONFIRMATION BY LICENSED SURVEYOR.

ALL SETBACKS, PLOT RATIOS, LANDSCAPE AREAS, CARPARKING NUMBERS & THE LIKE ARE SUBJECT TO LOCAL AUTHORITY APPROVAL.

ALL SERVICES, LIGHTING, ETC ARE PRELIMINARY ONLY & SUBJECT TO ENGINEER'S DESIGN.

ALL DOOR LOCATIONS ARE PRELIMINARY AND SUBJECT TO SURVEYOR'S ASSESSMENT.

ALL TRAFFIC CONSIDERATIONS INCLUDING TRUCK TURNING AND ACCESS/EGRESS ARE TO BE AS PER TRAFFIC ENGINEER'S REPORT.

SURROUNDING ROAD DESIGN AND SITE ACCESS/EGREES IS TO BE AS PER TRAFFIC ENGINEER'S DRAWINGS.

ALL REDUNDANT VEHICLE CROSSINGS SHALL BE REMOVED AND REPLACED WITH KERB & CHANNEL.

SITE AREA & CARPARK	
SUBJECT SITE AREA:	2018 m²
TOTAL BUILDING AREA:	183 m²
TOTAL PAVEMENT:	1517 m²
CAR SPACES:	9 CS
CAR PARK RATIO:	1 CS / 20.3m²
BICYCLE SPACES:	2

NOTE:
TOTAL OF 6 CAR SPACES REMOVED OUTSIDE OF SUBJECT SITES BOUNDARY.

1 / -
PROPOSED SITE PLAN
Scale: 1 : 200

SITE PLAN

LEFFLER SIMES PTY LTD
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SYDNEY 7 YOUNG ST NEUTRAL BAY NSW 2089 T:+61 2 99093344
MELBOURNE LEVEL 2 - 18 OLIVER LANE VIC 3000 T:+61 3 96546344
BRISBANE 2 - 290 BOUNDARY ST SPRING HILL QLD 4004 T:+61 7 31235544

0 4 8 12 16 20 SCALE 1:200

PROPOSED SERVICE STATION
23 ALBERT STEET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
DATE: AUG '17
DRAWN: LC
DWG NO. DA-102 REV. A

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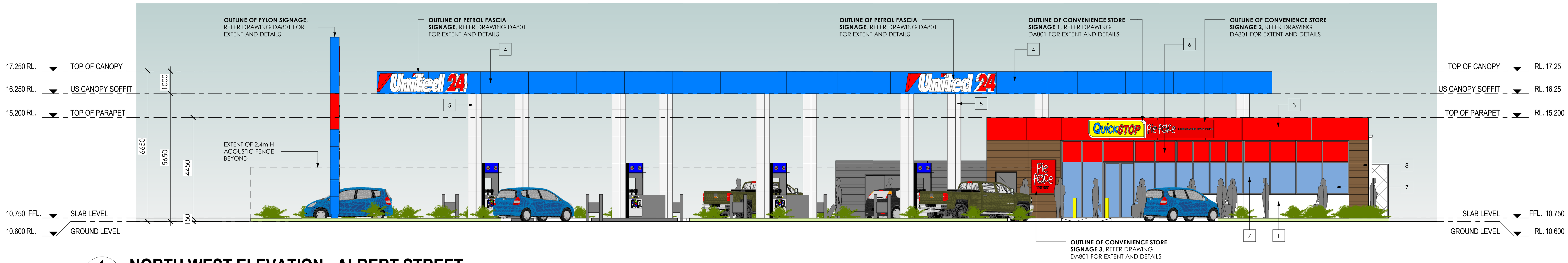
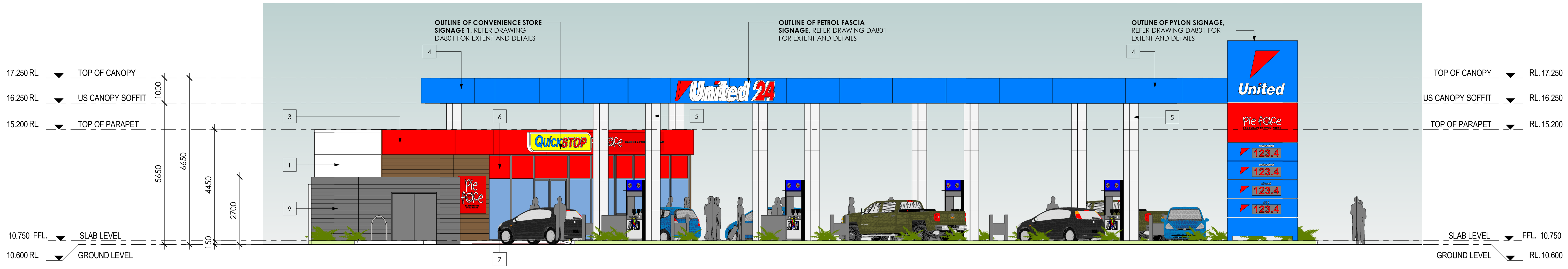


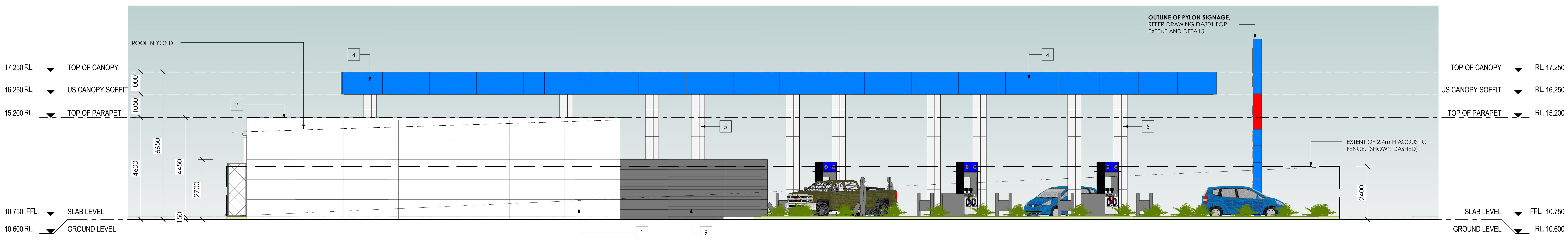
1 DA-102 **NORTH WEST ELEVATION - ALBERT STREET**
Scale: 1 : 100

EXTERNAL FINISHES

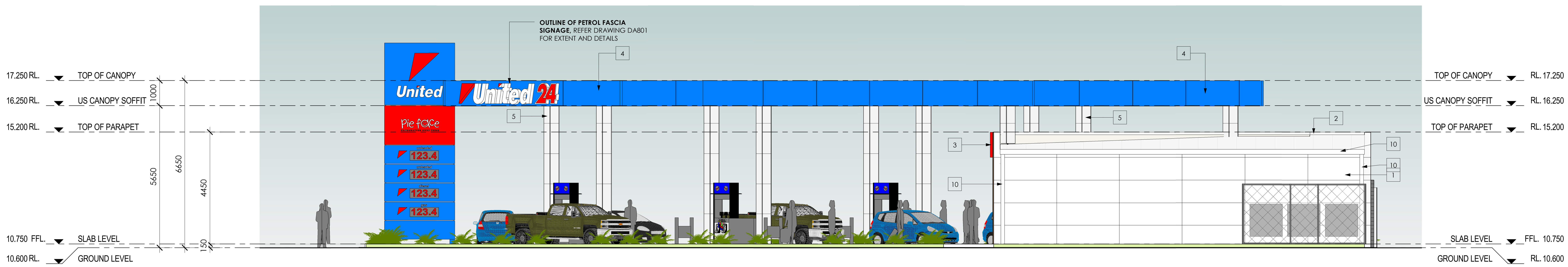
CODE	DESCRIPTION
1	CONCRETE PANEL WITH GROOVES. PAINTED COLOUR (DULUX - VIVID WHITE)
2	POWDERCOATED METAL CAPPING COLOUR (WHITE TO MATCH WALL)
3	COMPOSITE METAL PANEL COLOUR (ALUCOBOND UNITED RED)
4	COMPOSITE METAL PANEL COLOUR (ALUCOBOND UNITED BLUE)
5	COMPOSITE METAL PANEL COLOUR (ALUCOBOND UNITED WHITE CLADDING)
6	COLOUR-BACK GLAZING FINISH (RED TO MATCH METAL PANEL)
7	POWERCOATED ALUMINIUM WITH CLEAR GLAZING (BLACK POWDERCOAT)
8	HORIZONTAL ALUMINIUM CLADDING (NATURAL TEAK)
9	METAL SLATS
10	POWDERCOATED METAL GUTTER & DOWNPIPE COLOUR (WHITE TO MATCH WALL)



2 DA-102 **NORTH EAST ELEVATION - ALMA STREET**
Scale: 1 : 100



3 DA-102 **SOUTH EAST ELEVATION**
Scale: 1 : 100



4 DA-102 **SOUTH WEST ELEVATION- ALMA LANE**
Scale: 1 : 100

ELEVATIONS

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MELBOURNE	LEVEL 2 - 18 OLIVER LANE VIC 3000	T:+61 3 96546344
BRISBANE	2 - 290 BOUNDARY ST SPRING HILL QLD 4004	T:+61 7 31235544

0 2 4 6 8 10 SCALE 1:100

PROPOSED SERVICE STATION
23 ALBERT STREET, ROCKHAMPTON CITY, QLD

JOB NO: 4340
DATE: AUG '17
DRAWN: LC
DWG NO. DA-301 REV. A

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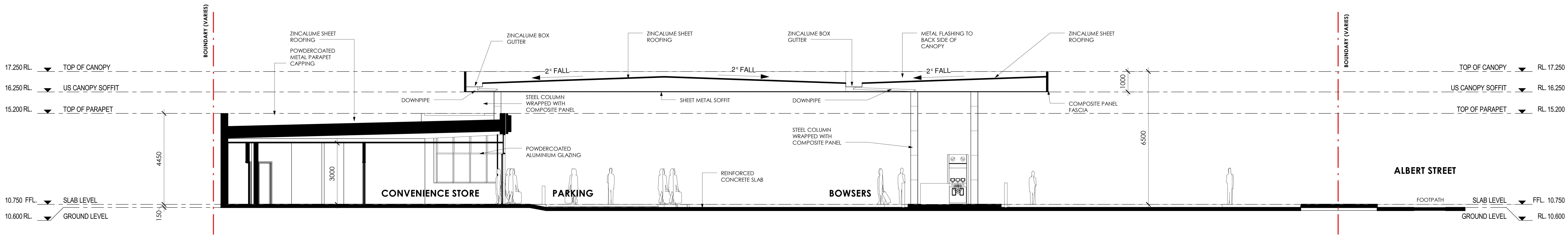
P 1	ISSUE FOR INFORMATION	29.08.17	SJE
P 2	ISSUE FOR INFORMATION	01.09.17	SJE
P 3	ISSUE FOR INFORMATION	12.09.17	SJE



A
DA-102

OVERALL SECTION

Scale: 1 : 100

SECTION

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0 2 4 6 8 10 SCALE 1:100

PROPOSED SERVICE STATION
23 ALBERT STREET, ROCKHAMPTON CITY, QLD

JOB NO: 4340 DWG NO. REV.
DATE: AUG '17
DRAWN: LC
DA-3023

LEFFLER SIMES ARCHITECTS

APPENDIX 2

Stormwater Calculations

DAVEY ENGINEERING SOLUTIONS PTY LTD

CATCHMENT REFERENCE EX A Q100

23 ALBERT STREET
ROCKHAMPTON CITY, QLD, 4701
Rational Method

Job No: 1711
Date: 15-Sep-17

Time of Concentration - Friends Equation for Overland Sheet Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Horton's Roughness (n): (From Table 4.6.5)	0.035
tc = 0.0 mins	

Time of Concentration - Channel Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Assumed Stream Velocity (m/s): (From Table 4.6.6)	0.3
tc = 0.0 mins	

Catchment Time of Concentration (QUDM) = 5 mins

Fraction Impervious (fi) *From Table 4.5.1*	0.91
1hr Intensity Q10 (mm/hr)	71.9
C 10 Values *From Tables 4.5.3 & Table 4.5.4*	0.88
Area of Catchment (ha)	0.0518

EAST ROCKHAMPTON (CMDG)

Common Rain Fall Events							
ARI (years)	Q1	Q2	Q5	Q10	Q20	Q50	Q100
Frequency Factor (fy) *From Table 4.5.2*	0.8	0.85	0.95	1	1.05	1.15	1.2
Intensity (mm/hr) *From IFD tables* @ 5 min	117	151	194	220	256	304	342
Cy Values	0.70	0.75	0.84	0.88	0.92	1.00	1.00
Q (m^3/sec)	**0.012**	**0.016**	**0.023**	**0.028**	**0.034**	**0.044**	**0.049**

DAVEY ENGINEERING SOLUTIONS PTY LTD

CATCHMENT REFERENCE PR A Q100

23 ALBERT STREET
ROCKHAMPTON CITY, QLD, 4701
Rational Method

Job No: 1711
Date: 15-Sep-17

Time of Concentration - Sheet Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Horton's Roughness (n): (From Table 4.6.5)	0.02
tc = 0.0 mins	

Time of Concentration - Channel Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Assumed Stream Velocity (m/s): (From Table 4.6.6)	0.3
tc = 0.0 mins	

Catchment Time of Concentration (QUDM) = 5 mins

Fraction Impervious (fi) *From Table 4.5.1*	0.86
1hr Intensity Q10 (mm/hr)	71.9
C 10 Values *From Tables 4.5.3 & Table 4.5.4*	0.86
Area of Catchment (ha)	0.040

EAST ROCKHAMPTON (CMDG)

Common Rain Fall Events							
ARI (years)	Q1	Q2	Q5	Q10	Q20	Q50	Q100
Frequency Factor (fy) *From Table 4.5.2*	0.8	0.85	0.95	1	1.05	1.15	1.2
Intensity (mm/hr) *From IFD tables* @ 5 min	117	151	194	220	256	304	342
Cy Values	0.69	0.73	0.82	0.86	0.90	0.99	1.00
Q (m^3/sec)	**0.009**	**0.012**	**0.018**	**0.021**	**0.026**	**0.033**	**0.038**

DAVEY ENGINEERING SOLUTIONS PTY LTD

CATCHMENT REFERENCE EX-PR A Q100

23 ALBERT STREET
ROCKHAMPTON CITY, QLD, 4701
Preliminary Detention

Job No: 1711
Date: 15-Sep-17

	Pre Development	Post Development	% Increase
Q1 *(m³/sec)*	0.01	0.01	-25%
Q2 *(m³/sec)*	0.02	0.01	-25%
Q5 *(m³/sec)*	0.02	0.02	-25%
Q10 *(m³/sec)*	0.03	0.02	-25%
Q20 *(m³/sec)*	0.03	0.03	-25%
Q50 *(m³/sec)*	0.04	0.03	-24%
Q100 *(m³/sec)*	0.05	0.04	-23%

	r	V in
Q1 *(m³/sec)*	-0.325	3.58
Q2 *(m³/sec)*	-0.325	4.91
Q5 *(m³/sec)*	-0.325	7.05
Q10 *(m³/sec)*	-0.325	8.42
Q20 *(m³/sec)*	-0.325	10.28
Q50 *(m³/sec)*	-0.309	13.37
Q100 *(m³/sec)*	-0.295	15.21

	Culp Method	Boyd Method	Carroll Method	Basha Method
Q1 *(m³)*	-0.14	-1.16	-0.20	-0.65
Q2 *(m³)*	-0.19	-1.60	-0.27	-0.89
Q5 *(m³)*	-0.27	-2.29	-0.39	-1.28
Q10 *(m³)*	-0.32	-2.74	-0.47	-1.53
Q20 *(m³)*	-0.39	-3.34	-0.57	-1.87
Q50 *(m³)*	-0.53	-4.14	-0.75	-2.33
Q100 *(m³)*	-0.61	-4.49	-0.86	-2.55

As per 'Preliminary Estimation Methods for Sizing Detention Basins in Queensland (Griffith University)'

Condition	Method
0.00 < r < 0.25	Boyd Method
0.25 < r < 0.45	Basha Method
0.45 < r < 0.60	Carroll Method
0.60 < r < 1.00	Culp Method

Q100

V Storage	0.000	m³
V Storage	0	L

DAVEY ENGINEERING SOLUTIONS PTY LTD

CATCHMENT REFERENCE EX B1 & B2 Q100

23 ALBERT STREET
ROCKHAMPTON CITY, QLD, 4701

Job No: 1711
Date: 15-Sep-17

Rational Method

Time of Concentration - Friends Equation for Overland Sheet Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Horton's Roughness (n): (From Table 4.6.5)	0.035
tc = 0.0 mins	

Time of Concentration - Channel Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Assumed Stream Velocity (m/s): (From Table 4.6.6)	0.3
tc = 0.0 mins	

Catchment Time of Concentration (QUDM) = 5 mins

Fraction Impervious (fi) *From Table 4.5.1*	30
1hr Intensity Q10 (mm/hr)	71.9
C 10 Values *From Tables 4.5.3 & Table 4.5.4*	0.76
Area of Catchment (ha)	0.15

EAST ROCKHAMPTON (CMDG)

Common Rain Fall Events							
ARI (years)	Q1	Q2	Q5	Q10	Q20	Q50	Q100
Frequency Factor (fy) *From Table 4.5.2*	0.8	0.85	0.95	1	1.05	1.15	1.2
Intensity (mm/hr) *From IFD tables* @ 5 min	117	151	194	220	256	304	342
Cy Values	0.61	0.65	0.72	0.76	0.80	0.87	0.91
Q (m³/sec)	**0.030**	**0.041**	**0.058**	**0.070**	**0.085**	**0.111**	**0.130**

DAVEY ENGINEERING SOLUTIONS PTY LTD

CATCHMENT REFERENCE PR B Q100

23 ALBERT STREET
ROCKHAMPTON CITY, QLD, 4701
Rational Method

Job No: 1711
Date: 15-Sep-17

Time of Concentration - Sheet Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Horton's Roughness (n): (From Table 4.6.5)	0.02
tc = 0.0 mins	

Time of Concentration - Channel Flow	
Overland Length (m):	0
Average Grade %:	1.0%
Assumed Stream Velocity (m/s): (From Table 4.6.6)	0.3
tc = 0.0 mins	

Catchment Time of Concentration (QUDM) = 5 mins

Fraction Impervious (fi) *From Table 4.5.1*	0.92
1hr Intensity Q10 (mm/hr)	71.9
C 10 Values *From Tables 4.5.3 & Table 4.5.4*	0.88
Area of Catchment (ha)	0.1618

EAST ROCKHAMPTON (CMDG)

Common Rain Fall Events							
ARI (years)	Q1	Q2	Q5	Q10	Q20	Q50	Q100
Frequency Factor (fy) *From Table 4.5.2*	0.8	0.85	0.95	1	1.05	1.15	1.2
Intensity (mm/hr) @ 5 min *From IFD tables*	117	151	194	220	256	304	342
Cy Values	0.70	0.75	0.84	0.88	0.92	1.00	1.00
Q (m^3/sec)	**0.037**	**0.051**	**0.073**	**0.087**	**0.106**	**0.137**	**0.154**

DAVEY ENGINEERING SOLUTIONS PTY LTD

CATCHMENT REFERENCE EX-PR B Q100

23 ALBERT STREET
ROCKHAMPTON CITY, QLD, 4701
Preliminary Detention

Job No: 1711
Date: 15-Sep-17

	Pre Development	Post Development	% Increase
Q1 *(m^3/sec)*	0.03	0.04	25%
Q2 *(m^3/sec)*	0.04	0.05	25%
Q5 *(m^3/sec)*	0.06	0.07	25%
Q10 *(m^3/sec)*	0.07	0.09	25%
Q20 *(m^3/sec)*	0.09	0.11	25%
Q50 *(m^3/sec)*	0.11	0.14	23%
Q100 *(m^3/sec)*	0.13	0.15	18%

	r	V in
Q1 *(m^3/sec)*	0.199	14.82
Q2 *(m^3/sec)*	0.199	20.32
Q5 *(m^3/sec)*	0.199	29.18
Q10 *(m^3/sec)*	0.199	34.83
Q20 *(m^3/sec)*	0.199	42.56
Q50 *(m^3/sec)*	0.190	54.70
Q100 *(m^3/sec)*	0.155	61.53

	Culp Method	Boyd Method	Carroll Method	Basha Method
Q1 *(m^3)*	1.38	2.95	1.48	2.17
Q2 *(m^3)*	1.89	4.05	2.02	2.97
Q5 *(m^3)*	2.71	5.82	2.91	4.26
Q10 *(m^3)*	3.24	6.94	3.47	5.09
Q20 *(m^3)*	3.96	8.48	4.24	6.22
Q50 *(m^3)*	4.77	10.38	5.12	7.58
Q100 *(m^3)*	4.15	9.51	4.48	6.83

As per 'Preliminary Estimation Methods for Sizing Detention Basins in Queensland (Griffith University)'

Condition	Method
0.00 < r < 0.25	Boyd Method
0.25 < r < 0.45	Basha Method
0.45 < r < 0.60	Carroll Method
0.60 < r < 1.00	Culp Method

Q100

V Storage	9.508	m^3
V Storage	9508	L

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

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

Development Permit No: D/114-2017

Dated: 22 February 2018

TECHNICAL DESIGN NOTE

Date	**20th September 2017**
Title	**Proposed Service Station, Albert Street Rockhampton**
Project	**17750**
Client	**Gibb Group**

Development Proposal and Site Location

This design note provides preliminary advice on traffic, parking and access arrangements to a proposed service station development site at 23 Albert Street, Rockhampton. The location is immediately adjacent to the Bruce Highway along the north boundary, with residential to the south and road frontages to the east and west as depicted in Figure 1.

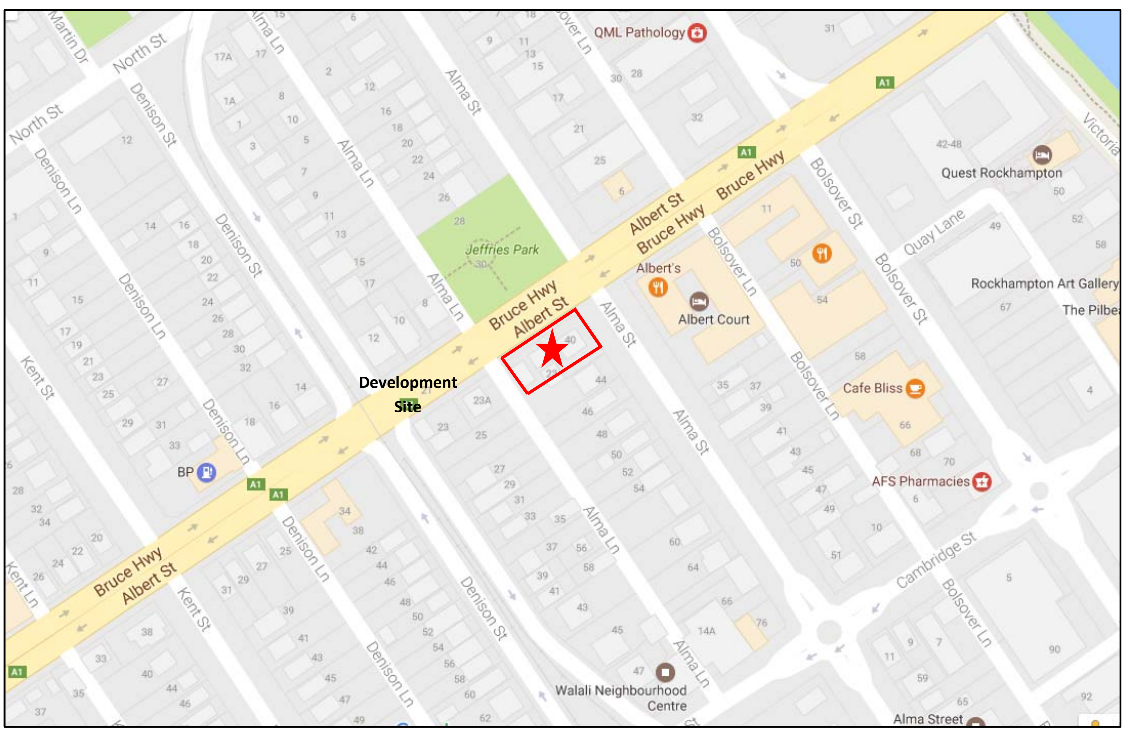


Figure 1: Location of Proposed Development Site

The site is currently occupied by a residential dwelling and a commercial business (Garage World) with accesses provided from Alma Street and also Alma Lane.

Figure 2 – Aerial View of Site Access

Traffic Flow Data

The most recent traffic volumes obtained from the TMR Traffic Census for the Bruce Highway indicates a daily traffic volume of 33,380 vehicles per day (vpd) with 8.66% heavy vehicles across the bridge to the east and a traffic volume of 16,384 vpd with 11.24% heavy vehicles to the west of the subject site. The posted speed limit on the Bruce Highway adjacent to the subject site is 60km/h.

Traffic surveys were undertaken on Wednesday afternoon 26th April 2017 between 3:00pm and 6:00pm to establish existing traffic flows around the site, in particular the number of movements to and from Alma Lane.

Results are shown in Table 1 below and indicate only 4 movements into Alma Lane and 4 movements out of Alma Lane during the 3 hour period.

Table 1 – Traffic flows around the subject site

Wednesday 26th April 2017

Time	Movements to and from Bruce Highway	
1/4 hour end	**Left into Alma Lane**	**Left out of Alma Lane**
3:00 PM	1	1
3:15 PM	0	0
3:30 PM	0	1
3:45 PM	0	0
4:00 PM	1	0
4:15 PM	0	0
4:30 PM	0	0
4:45 PM	0	0
5:00 PM	1	0
5:15 PM	0	0
5:30 PM	1	0
5:45 PM	0	1
3 hr Total	4	3

Crash Records

Crash history data was obtained from TMR for crashes occurring in the vicinity of the site over the past 5 years, between January 2011 and December 2016. Data indicates 3 crashes have occurred. All crashes occurred on the northern side (eastbound) of the Bruce Highway, with one single vehicle crash east of Dennison Street and two crashes at the northern intersection of the Bruce Highway and Alma Street. No crashes were recorded along the road frontages to the subject site in the past 5 years.

Proposed Development

The proposed development consists of a service station with 4 bowsers and 185m^2 of shop. Access to the site is proposed from two locations: all movement access from Alma Street and separate entry and exit direct from the Bruce Highway. A conceptual layout of the proposal is provided in Figure 2.

Figure 3 – Proposed Concept Layout

Access

Access to the proposed development site will be from two new access driveways into the site. All access driveways must comply with standard drawings SEQ R-051 for heavy duty vehicle crossovers. The location of the driveway according to the requirements of AS2890.1 Figure 3.1 must be at least 6m from the tangent of the curve with Alma Street (see Figure 4) and the proposal complies with this requirement.

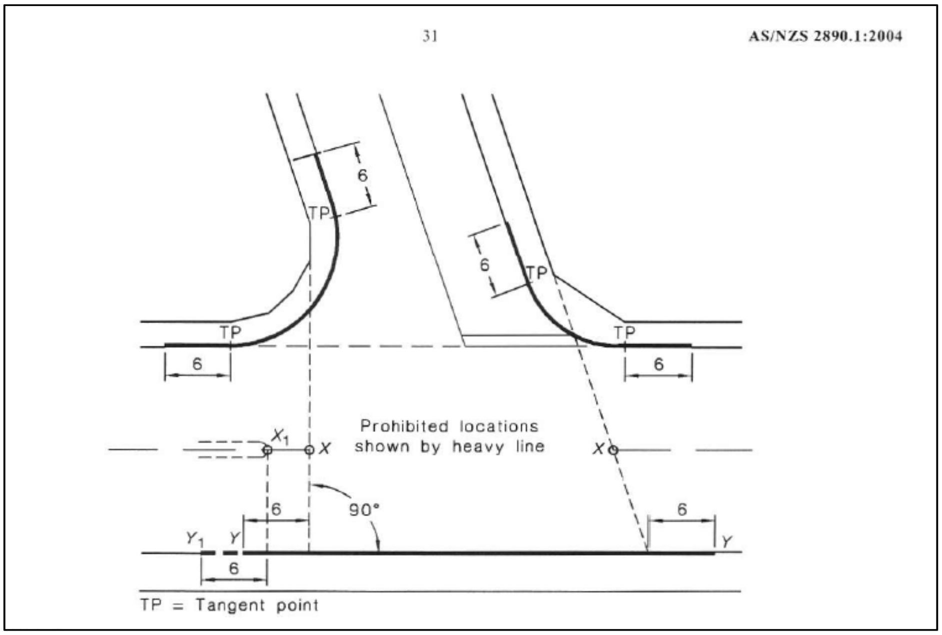


Figure 4–Driveway Locations

The minimum driveway width must be 6.0m and the maximum driveway width must be 9.0m. The two access driveways must comply with standard drawing R-051.

Parking

The requirements for parking are outlined in AS2890.1:2004 *Off-street car parking*. The proposed development requires facilities for short-term parking identified as User Class 3. Dimensions for car parking spaces are outlined in Figure 2.2 of AS2890.1. Minimum requirements for 90 degree angle parking bays include a minimum width of 2.6m, length of 5.4m and aisle width of 5.8m for User Class 3.

Parking for disabled must comply with AS2890.6. Dimensions for service vehicle bays are outlined in Table 4.1 of AS2890.2 with requirements for an articulated vehicle (AV) 3.5m wide and 19.0m long with a minimum vertical height clearance of 4.5m.

The requirements for parking for shop are 1/25m^2 and 4 spaces per bowser. The shop includes 185m^2 and provides 9 spaces plus space for air and water complying with current planning requirements.

The requirements for bicycle parking includes 1 space per 10 fuel bowsers and 1 space for 400m^2 for Shop, resulting in at least 2 bicycle spaces required for the site which has been provided.

Queuing & Circulation

Clause 3.4 of AS2789.1 includes requirements for queuing. For car parks with less than 100 spaces, provision for the queueing of two vehicles between the property boundary and the first car park is required. The proposal complies with this requirement.

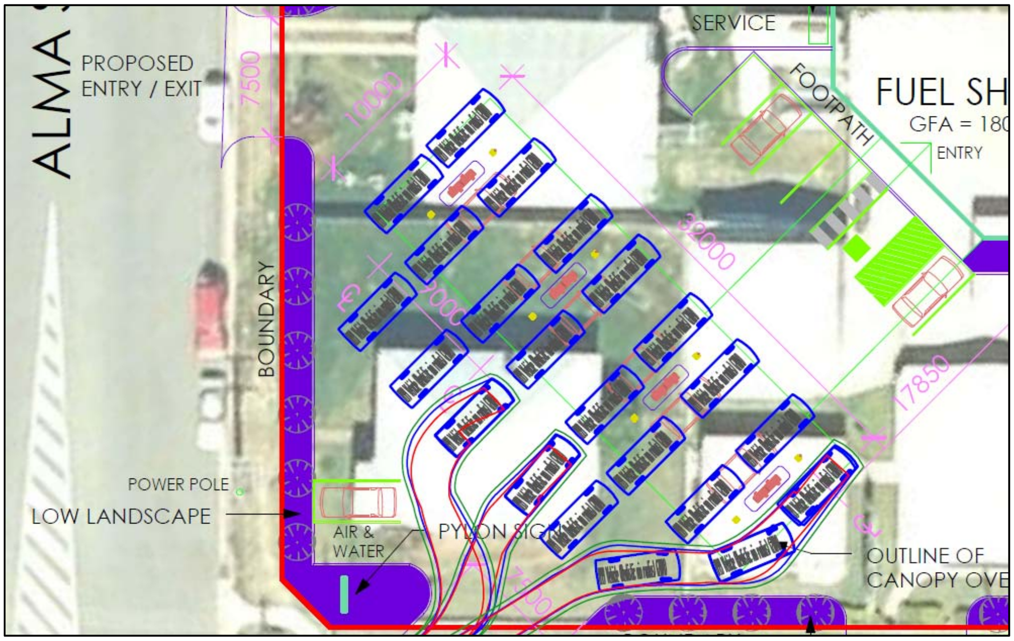


Figure 5 – Adequate queue provision on site

The design of the bowser allows adequate queuing and circulation within the site. A copy of the proposed AV swept path has attached. Please note the exit has been widened to 9m to allow the tankers to exit onto the Bruce Highway without impacting on the adjacent through lane.

Summary

A review of the proposed service station has been undertaken. A summary of existing conditions are provided below:

- No recorded crashes in the vicinity of the site
- Very low traffic volumes to and from Alma Lane
- Good sight visibility

The proposal complies with the currents requirements of AS2890, and Council's planning scheme

- There is a 6m minimum clearance between Alma Street and the access driveway from the Bruce Highway.
- Provide compliant car parking and bicycle parking facilities
- Adequate queueing and circulation within the site with 4 vehicles parked at the bowsers.
- The fuel tanker is able to refuel and adequate service the site.

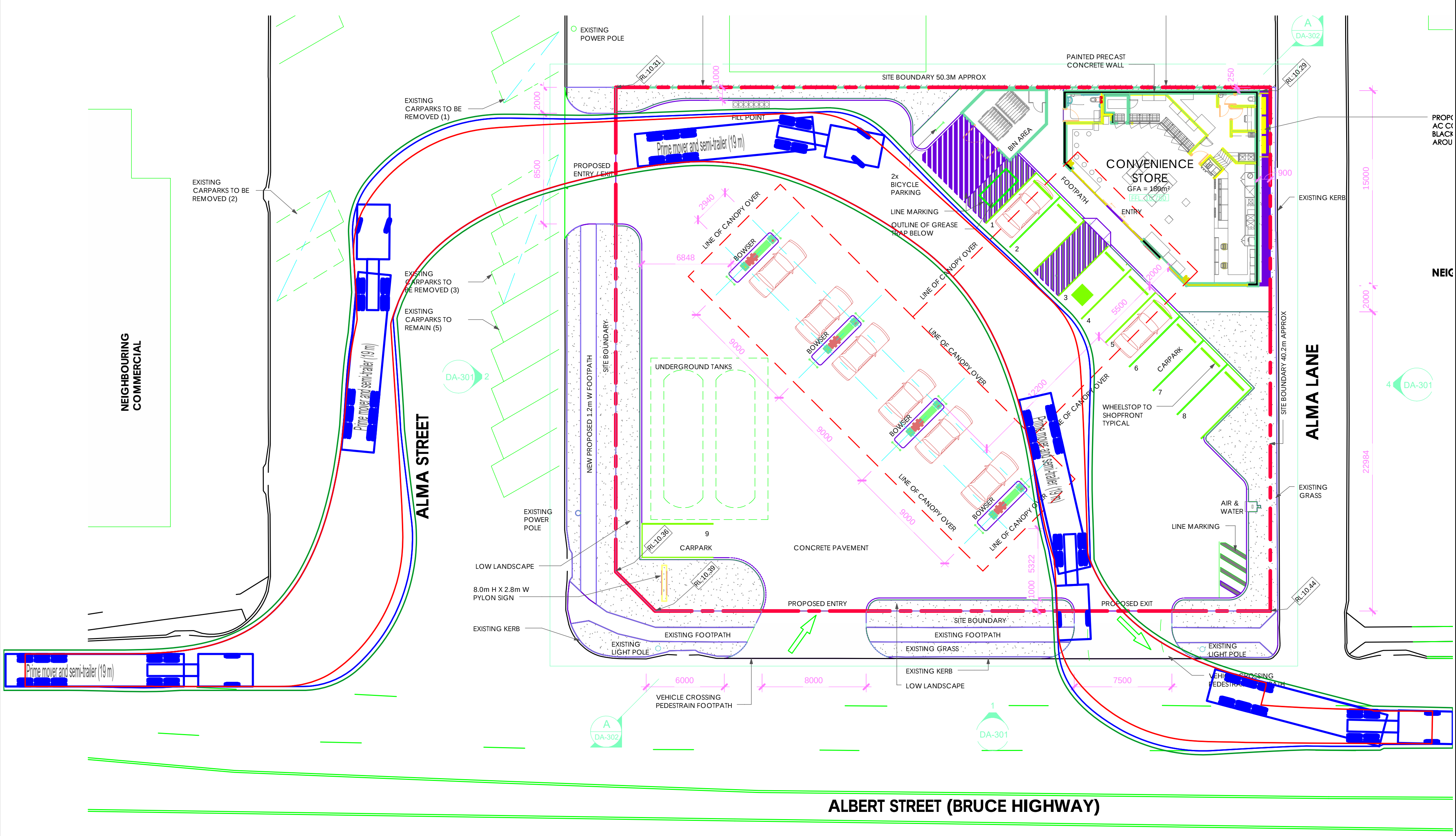
If you require further information or wish to discuss in greater detail, please don't hesitate to contact me.

Yours faithfully

D. Hayes

Dianne Hayes
B. Eng (Civil) RPEQ 7086

Attached – Swept path of 19m AV



Prime Mover and Trailer (19m Total Length)

Austroads 2013 Vehicle

Note: Exit Requires Change of Driveway

Scale 1:400 at A4

23 Albert Street, Rockhampton

Drawing No: ATR02 Version: 1

Prepared By: Dianne Hayes RPEQ #7086 Date: 07/09/2017

Hayes Traffic Engineering

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