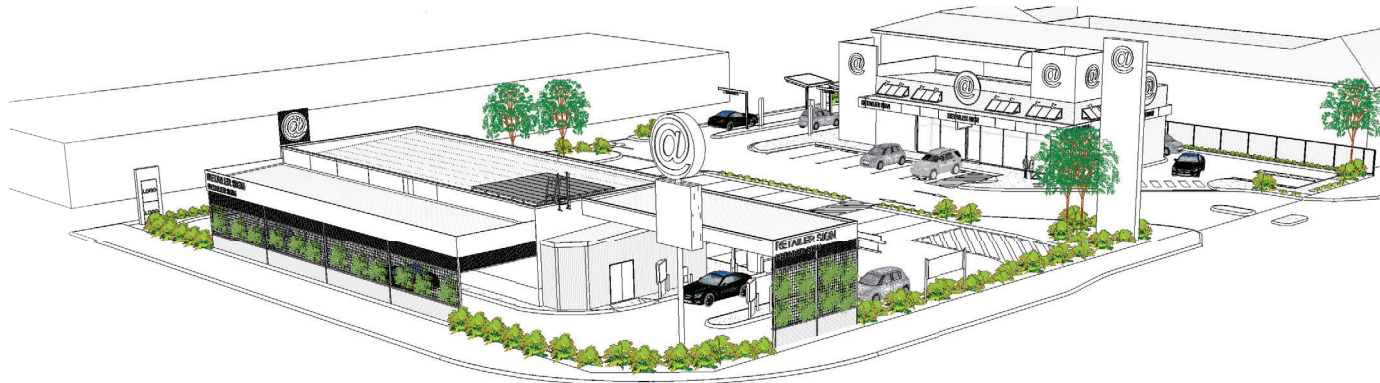


ARCHITECTURAL DRAWINGS

PROPOSED MIXED USE DEVELOPMENT

87 FITZROY ST, ROCKHAMPTON



3D PERSPECTIVES FOR ILLUSTRATION ONLY

ARCHITECTURAL DA DRAWINGS	
DRG No.	DRAWING TITLE
DA00	COVER PAGE
DA01	EXISTING SITE PLAN
DA02	PROP. SITE PLAN
DA03	BUILDING ELEVATIONS & PERSPECTIVES
DA04	BUILDING ELEVATIONS & PERSPECTIVES
DA05	BUILDING ELEVATIONS & PERSPECTIVES
DA06	BUILDING PERSPECTIVES
DA07	TENANCY 1 - SEATING AREA PLAN
DA08	TENANCY 2 - SEATING AREA PLAN

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current
conditions of approval associated with
Development Permit No.: D/21-2022
Dated: 14 December 2022

THIS DRAWING PACKAGE IS FOR **D.A. PURPOSES ONLY** AND IS **NOT** TO BE USED FOR TENDER PURPOSES.
ALL DESIGN COMPONENTS ARE SHOWN INDICATIVE ONLY AND ARE SUBJECT TO FINAL DESIGN DURING DETAILED DESIGN BY THE RESPECTIVE CONSULTANT.
ANY PRICING BASED UPON THE DETAILS SHOWN IN THESE DRAWINGS ARE COMPLETELY AT THE **RESPONSIBILITY OF THE TENDERER**.
VERVE BUILDING DESIGN CO. SHALL NOT BE HELD RESPONSIBLE FOR ANY REQUIRED CHANGES OR UPDATES TO THE DESIGN, POST D.A. THAT ARE PRICE IMPACTED.

VERVE SCHEDULES DISCLAIMER:

- ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
- SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
- ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
- ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



- ☐ commercial / industrial / retail
- ☐ fast food restaurant design
- ☐ travel centre / service stations
- ☐ project concept to completion

©2011 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and is not to be reproduced without written permission.
Do not scale this drawing.
Check all dimensions on site prior to construction of works.

Revision and approvals				
Rev	Date	By	Description	Appr.
P1	25.02.2022	NR	PRELIMINARY ISSUE	
P2	18.02.2022	NR	PRELIMINARY ISSUE	
P3	25.02.2022	NR	PRELIMINARY ISSUE	
A	09.03.2022	NR	DA ISSUE	
B	17.05.2022	NR	RESPONSE TO LR	
C	05.10.2022	NR	RESPONSE TO LR	

Project Description	
PROP. MIXED USE DEVELOPMENT	
87 FITZROY ST, ROCKHAMPTON	
Scale: 0A1	Date: JAN 2022
Drawn: NR	Approved By: GR

Drawing Title	
COVER PAGE	
Job Number - Drawing Number	Revision
21185 DA00	C



Consulting Engineer



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

© 2021 copyright, all rights reserved.
 This drawing is the property of VERVE BUILDING DESIGN and must not be used or duplicated without authorisation.
 Do not make this drawing.
 Check all dimensions on site prior to commencement of works

Revision and approval				Project Description		Drawing Title	
Rev	Date	By	Description	Rev	PROPOSED MIXED USE DEVELOPMENT 87 FITZROY ST. ROCKHAMPTON	EXISTING SITE PLAN	
B	15/12/2021	MR	RESPONSE TO LP			Scale	Drawing Number
A	01/12/2021	MR	DA ISSUE			1:200 @ A1 / 1:400 @ A3	21185-DA01
PL	04/12/2021	MR	PRELIMINARY ISSUE			Author	Designer
						Checker	B

DA ISSUE

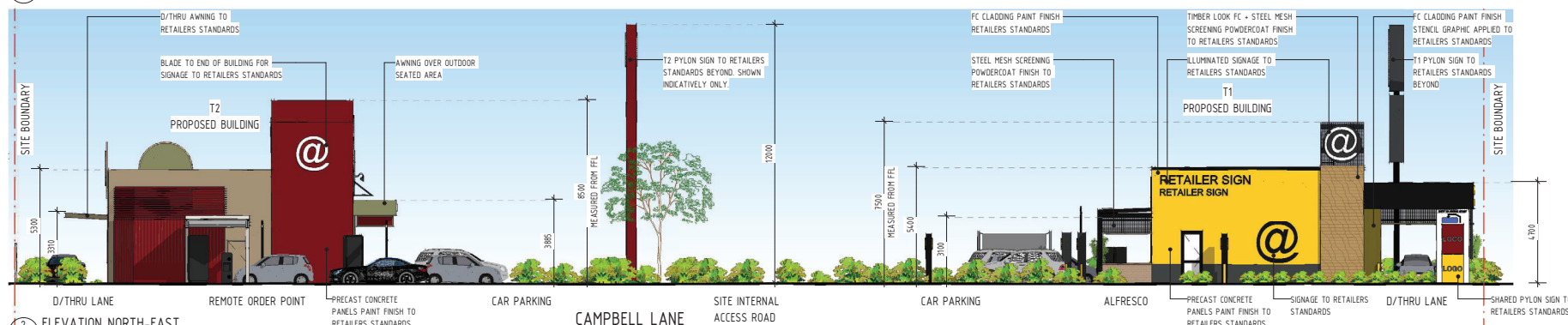
THIS DRAWING IS NOT FOR CONSTRUCTION

NOTE

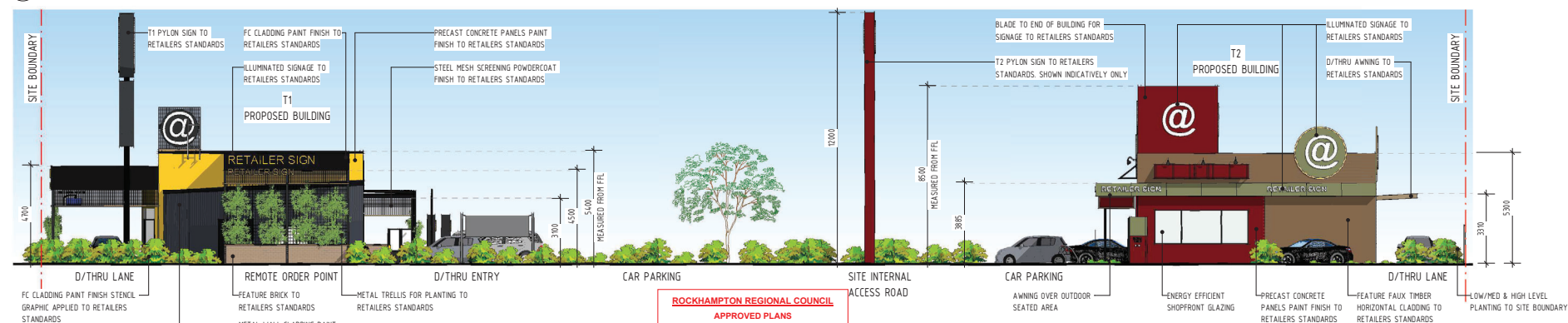
1. ALL EXTERNAL MATERIALS & FINISHES SHOWN INDICATIVE ONLY AND SUBJECT TO FINAL TENANT STANDARDS
2. ALL DIMENSIONS MEASURED FROM FINISHED GROUND FLOOR LEVEL UNLESS NOTED OTHERWISE
3. ALL SIGNAGE INCLUDING LOCATIONS AND HEIGHTS ARE SUBJECT TO A SEPARATE SIGNAGE APPLICATION AND APPROVAL BY LOCAL AUTHORITY
4. LANDSCAPING IS SHOWN FOR "ARTIST IMPRESSION" PURPOSES ONLY. REFERENCE SHOULD BE MADE TO THE LANDSCAPE DRAWINGS PREPARED BY THE RELEVANT CONSULTANT.



1 SITE PERSPECTIVE



2 ELEVATION NORTH-EAST



3 ELEVATION SOUTH-WEST

VERVE SCHEDULES DISCLAIMER:

1. ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET
2. SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
3. ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED
4. ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE

CONSULTING ENGINEER



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

©2011 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and is not to be reproduced without written permission.

Do not make this drawing.

Check all dimensions on site prior to construction of work.

Revision and approvals

Rev	Date	By	Description
P1	25.02.2022	NB	PRELIMINARY ISSUE
P2	18.02.2022	NB	PRELIMINARY ISSUE
P3	25.02.2022	NB	PRELIMINARY ISSUE
A	19.03.2022	NB	DA ISSUE
B	17.05.2022	NB	RESPONSE TO LR
C	05.10.2022	NB	RESPONSE TO LR

THIS DRAWING PACKAGE IS FOR D.A. PURPOSES ONLY AND IS NOT TO BE USED FOR TENDER PURPOSES.

ALL DESIGN COMPONENTS ARE SHOWN INDICATIVE ONLY AND ARE SUBJECT TO FINAL DESIGN DURING DETAILED DESIGN BY THE RESPECTIVE CONSULTANT. ANY PRICING BASED UPON THE DETAILS SHOWN IN THESE DRAWINGS ARE COMPLETELY AT THE RESPONSIBILITY OF THE TENDERER. VERVE BUILDING DESIGN CO. SHALL NOT BE HELD RESPONSIBLE FOR ANY REQUIRED CHANGES OR UPDATES TO THE DESIGN, POST D.A. THAT ARE PRICE IMPACTED.

Project Description

PROP. MIXED USE DEVELOPMENT

87 FITZROY ST, ROCKHAMPTON

Scale: 0/1

Drawn: NB

Date: JAN 2022

Approved By: GN

Job Number - Drawing Number

21185 DA03

Revision

C

Drawing Title

BUILDING ELEVATIONS & PERSPECTIVES

21185 DA03

Revision

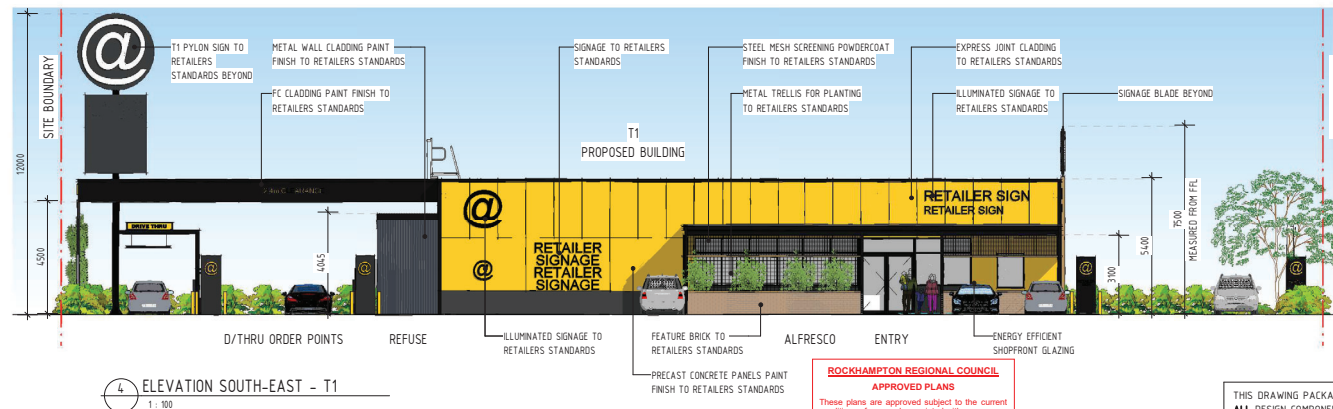
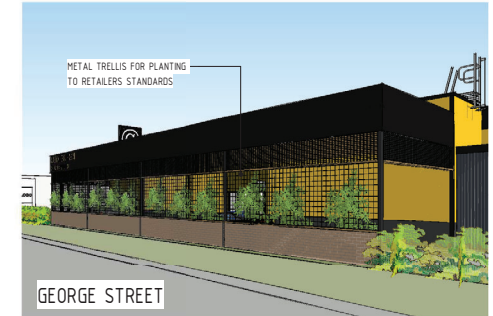
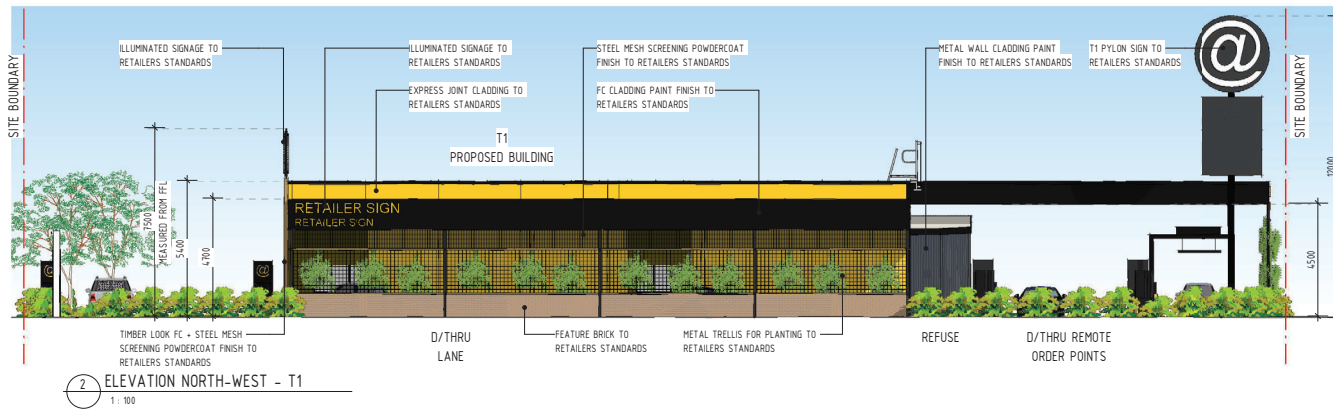
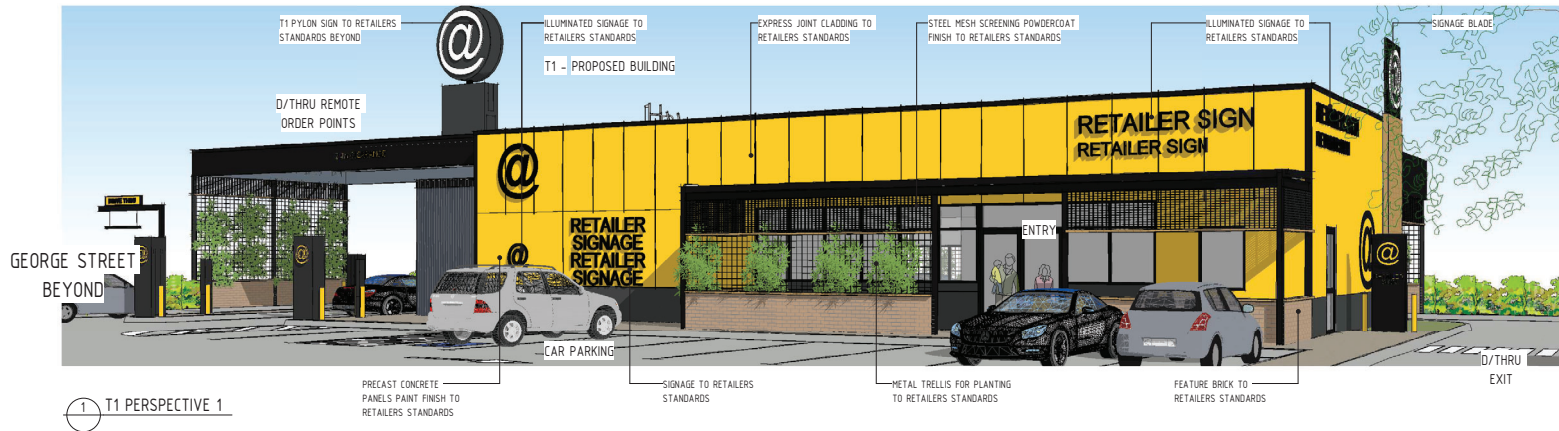
C

DA ISSUE

THIS DRAWING IS NOT FOR CONSTRUCTION

NOTE

1. ALL EXTERNAL MATERIALS & FINISHES SHOWN INDICATIVE ONLY AND SUBJECT TO FINAL TENANT STANDARDS
2. ALL DIMENSIONS MEASURED FROM FINISHED GROUND FLOOR LEVEL UNLESS NOTED OTHERWISE
3. ALL SIGNAGE INCLUDING LOCATIONS AND HEIGHTS ARE SUBJECT TO A SEPARATE SIGNAGE APPLICATION AND APPROVAL BY LOCAL AUTHORITY
4. LANDSCAPING IS SHOWN FOR "ARTIST IMPRESSION" PURPOSES ONLY. REFERENCE SHOULD BE MADE TO THE LANDSCAPE DRAWINGS PREPARED BY THE RELEVANT CONSULTANT.



3 T1 D/THRU TRELLIS PERSPECTIVE



5 T1 ALFRESCO/ENTRY PERSPECTIVE

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with Development Permit No.: D121-2022
Dated: 14 December 2022

THIS DRAWING PACKAGE IS FOR D.A. PURPOSES ONLY AND IS NOT TO BE USED FOR TENDER PURPOSES.
ALL DESIGN COMPONENTS ARE SHOWN INDICATIVE ONLY AND ARE SUBJECT TO FINAL DESIGN DURING DETAILED DESIGN BY THE RESPECTIVE CONSULTANT.
ANY PRICING BASED UPON THE DETAILS SHOWN IN THESE DRAWINGS ARE COMPLETELY AT THE RESPONSIBILITY OF THE TENDERER.
VERVE BUILDING DESIGN CO. SHALL NOT BE HELD RESPONSIBLE FOR ANY REQUIRED CHANGES OR UPDATES TO THE DESIGN, POST D.A. THAT ARE PRICE IMPACTED.

VERVE SCHEDULES DISCLAIMER:

1. ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
2. SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
3. ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
4. ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

©2011 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and is not to be reproduced without written permission.

Do not make this drawing.

Check all dimensions on site prior to construction of works.

Revision and approvals

Rev	Date	By	Description
P1	25.02.2022	NR	PRELIMINARY ISSUE
P2	18.02.2022	NR	PRELIMINARY ISSUE
P3	25.02.2022	NR	PRELIMINARY ISSUE
A	19.03.2022	NR	DA ISSUE
B	17.05.2022	NR	RESPONSE TO LR
C	05.10.2022	NR	RESPONSE TO LR

Project Description

Prop.	Description
PROP. MIXED USE DEVELOPMENT	
87 FITZROY ST, ROCKHAMPTON	
Scale: 1:100	
Drawn: NR	

Approval

Date	By
JAN 2022	GN
Approved By:	GN

Job Number - Drawing Number

21185	DA04
-------	------

Building Elevations & Perspectives

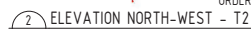
Job Number - Drawing Number	Revision
21185	DA04

Revision

Revision	Description
C	

NOTE

1. ALL EXTERNAL MATERIALS & FINISHES SHOWN INDICATIVE ONLY AND SUBJECT TO FINAL TENANT STANDARDS
2. ALL DIMENSIONS MEASURED FROM FINISHED GROUND FLOOR LEVEL UNLESS NOTED OTHERWISE
3. ALL SIGNAGE INCLUDING LOCATIONS AND HEIGHTS ARE SUBJECT TO A SEPARATE SIGNAGE APPLICATION AND APPROVAL BY LOCAL AUTHORITY
4. LANDSCAPING IS SHOWN FOR "ARTIST IMPRESSION" PURPOSES ONLY. REFERENCE SHOULD BE MADE TO THE LANDSCAPE DRAWINGS PREPARED BY THE RELEVANT CONSULTANT



21185	DA05
-------	------

DA ISSUE

THIS DRAWING IS NOT FOR CONSTRUCTION

NOTE

1. ALL EXTERNAL MATERIALS & FINISHES SHOWN INDICATIVE ONLY AND SUBJECT TO FINAL TENANT STANDARDS
2. ALL DIMENSIONS MEASURED FROM FINISHED GROUND FLOOR LEVEL UNLESS NOTED OTHERWISE
3. ALL SIGNAGE INCLUDING LOCATIONS AND HEIGHTS ARE SUBJECT TO A SEPARATE SIGNAGE APPLICATION AND APPROVAL BY LOCAL AUTHORITY
4. LANDSCAPING IS SHOWN FOR "ARTIST IMPRESSION" PURPOSES ONLY. REFERENCE SHOULD BE MADE TO THE LANDSCAPE DRAWINGS PREPARED BY THE RELEVANT CONSULTANT.



1 SITE PERSPECTIVE 1



2 SITE PERSPECTIVE 2



3 SITE PERSPECTIVE 3

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

Dated: 14 December 2022

THIS DRAWING PACKAGE IS FOR **D.A. PURPOSES ONLY** AND IS **NOT** TO BE USED FOR TENDER PURPOSES.
ALL DESIGN COMPONENTS ARE SHOWN INDICATIVE ONLY AND ARE SUBJECT TO FINAL DESIGN DURING DETAILED DESIGN BY THE RESPECTIVE CONSULTANT.
 ANY PRICING BASED UPON THE DETAILS SHOWN IN THESE DRAWINGS ARE COMPLETELY AT THE **RESPONSIBILITY OF THE TENDERER**.
 VERVE BUILDING DESIGN CO. SHALL NOT BE HELD RESPONSIBLE FOR ANY REQUIRED CHANGES OR UPDATES TO THE DESIGN, POST D.A. THAT ARE PRICE IMPACTED.

VERVE SCHEDULES DISCLAIMER:

1. ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
2. SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
3. ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
4. ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



PROPERTY DESCRIPTION

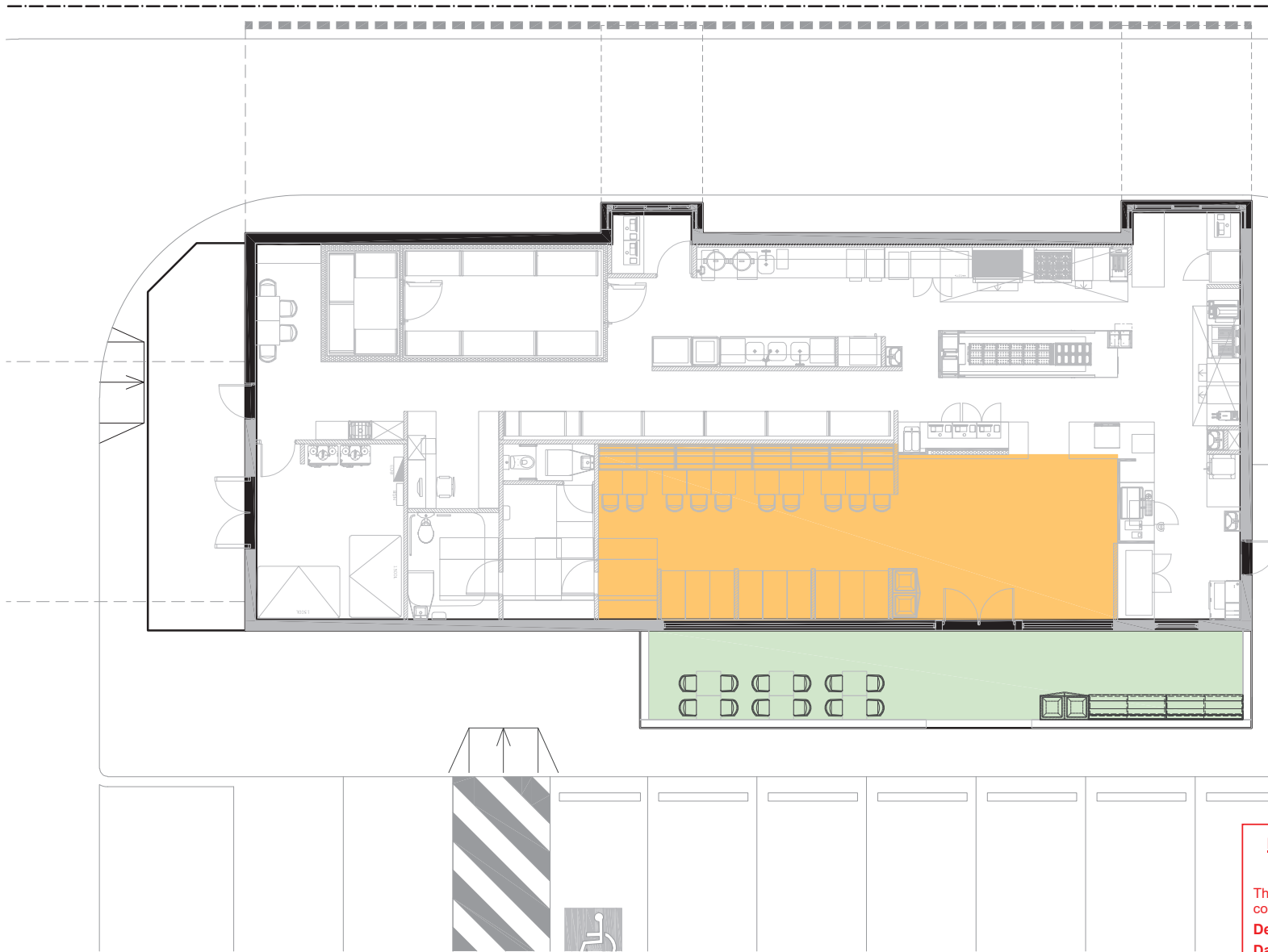
LOT 1 & 2 on RP604178
LOT 2 on RP848798
LOT 2 on RP603146
LOT 34 on SP107136



COUNCIL: ROCKHAMPTON

BUILDING AREAS

INTERNAL DINING	- 53.9m ²
EXTERNAL DINING	- 32.25m ²
TOTAL	- 86.15m ²



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

Dated: 14 December 2022

Consulting Engineer



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

© 2011 copyright, all rights reserved.
This drawing is the property of VERVE BUILDING DESIGN and must not be used or duplicated without authorisation.
Do not make this drawing.
Check all dimensions on site prior to commencement of works.

Rev	Date	Description	By
A	21/12/2022	DA ISSUE	
PE	21/02/2023	PRELIMINARY ISSUE	
PE	04/12/2023	PRELIMINARY ISSUE	

Project Description	PROPOSED MIXED USE DEVELOPMENT 87 FITZROY ST. ROCKHAMPTON
Scale	1:200 @ A1 / 1:400 @ A3
Drawn	BN
Checked	

Drawing Title	TENANCY 1 - SEATING AREA PLAN
Drawing Number	21185-DA07
Revision	A

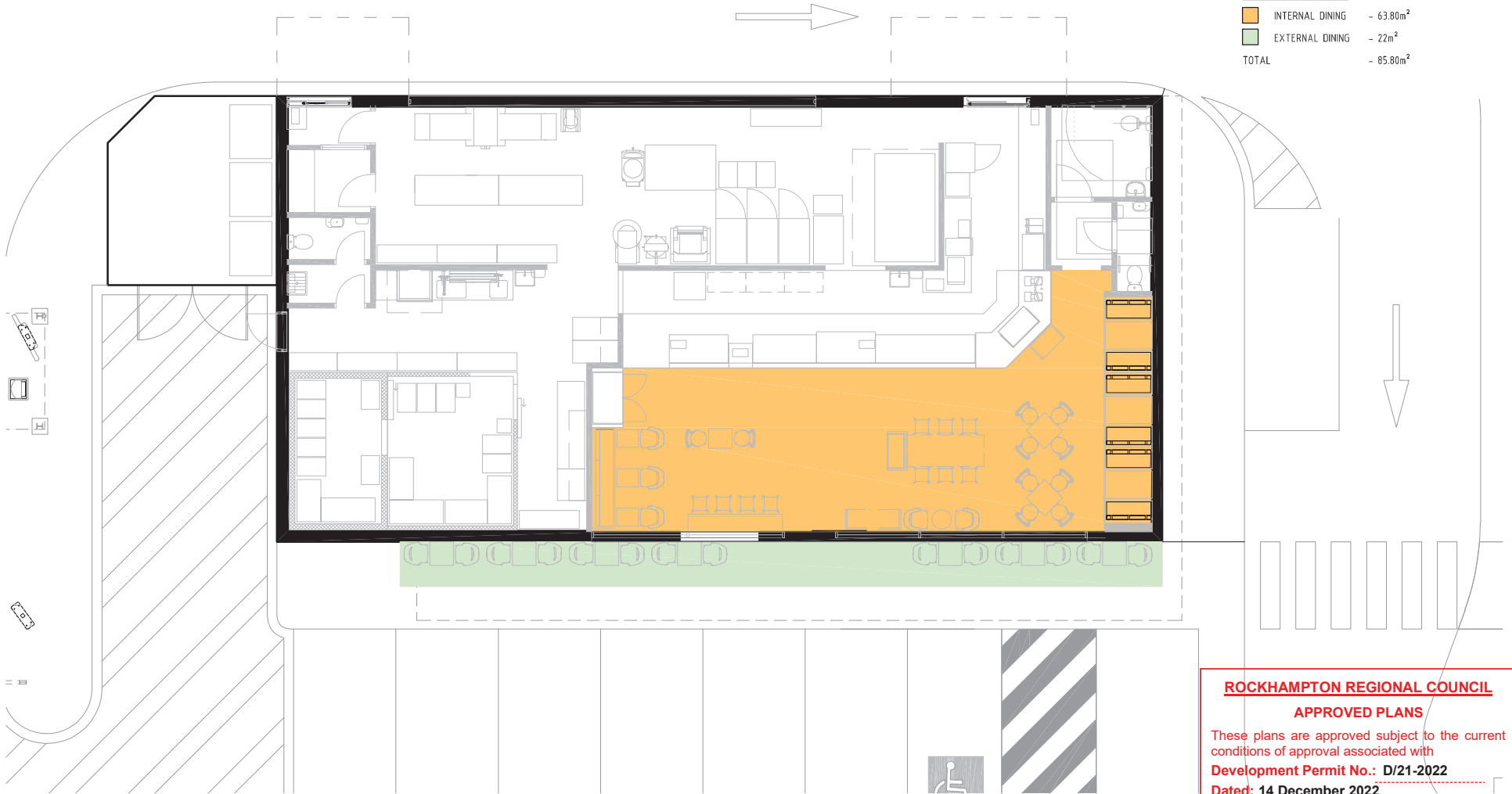
PROPERTY DESCRIPTION

LOT 1 & 2 on RP604178
LOT 2 on RP848798
LOT 2 on RP603146
LOT 34 on SP107136

COUNCIL: ROCKHAMPTON

BUILDING AREAS

INTERNAL DINING	- 63.80m ²
EXTERNAL DINING	- 22m ²
TOTAL	- 85.80m ²



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

Dated: 14 December 2022

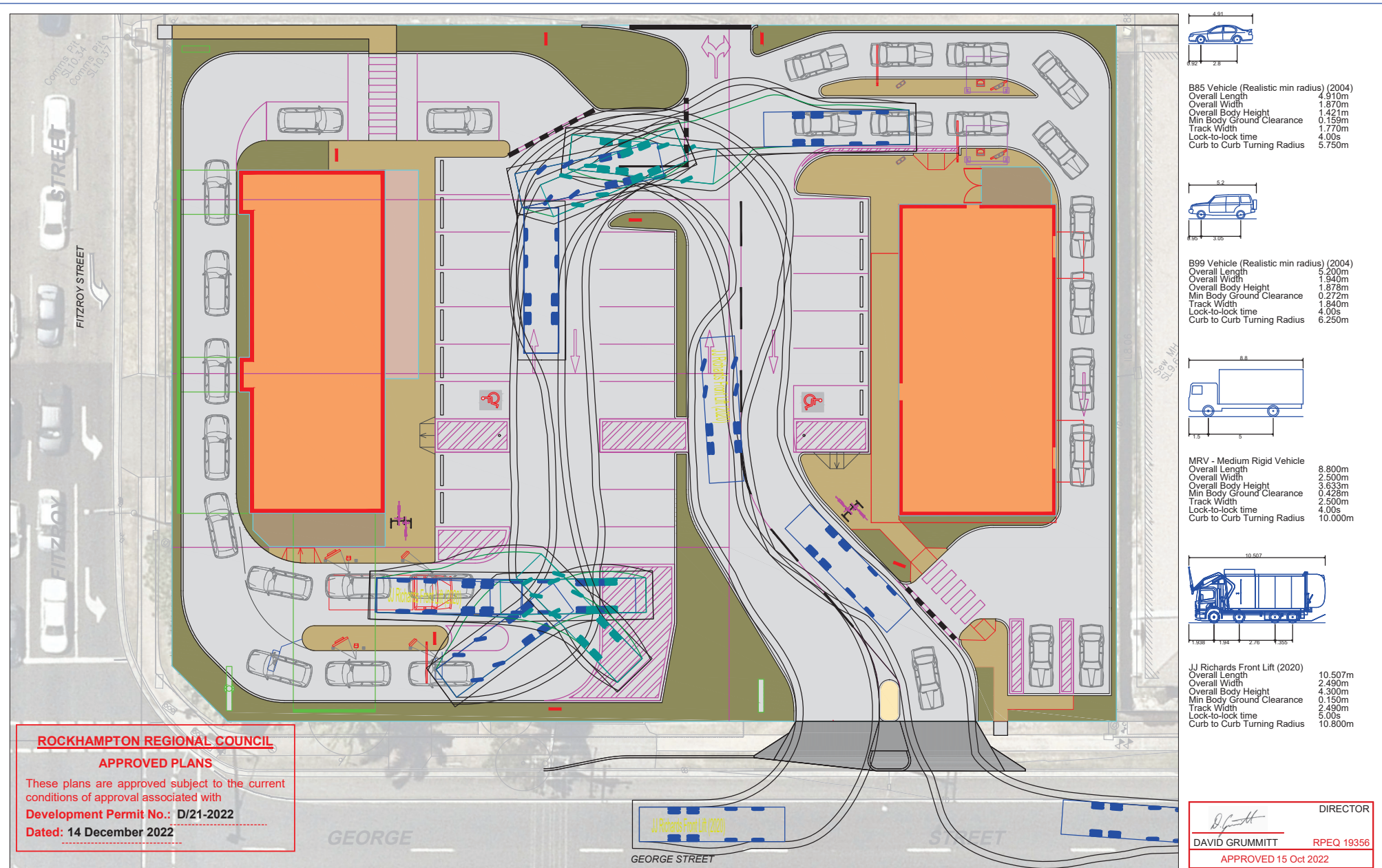
Consulting Engineer



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

© 2011 copyright, all rights reserved.
This drawing is the property of VERVE BUILDING DESIGN
and must not be used or duplicated without authorisation.
Do not make this drawing.
Check all dimensions on site prior to commencement of works

Revision and approval				Project Description		Drawing Title	
Rev	Date	By	Description	Rev	PROPOSED MIXED USE DEVELOPMENT 87 FITZROY ST. ROCKHAMPTON	TENANCY 2 - SEATING AREA PLAN	
A	01/12/2022	MR	SA ISSUE		Scale 1:200 @ A1 / 1:400 @ A3	Approved	Project
BY	04/12/2022	BN	PROJ/ISSUE ISSUE		Issue	Drawing Number 21185-DA08	Project A



B85 Vehicle (Realistic min radius) (2004)
 Overall Length 4.910m
 Overall Width 1.870m
 Overall Body Height 1.421m
 Min Body Ground Clearance 0.159m
 Track Width 1.770m
 Lock-to-lock time 4.00s
 Curb to Curb Turning Radius 5.750m

B99 Vehicle (Realistic min radius) (2004)
 Overall Length 5.200m
 Overall Width 1.940m
 Overall Body Height 1.878m
 Min Body Ground Clearance 0.272m
 Track Width 1.840m
 Lock-to-lock time 4.00s
 Curb to Curb Turning Radius 6.250m

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

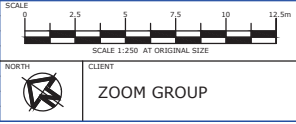
JJ Richards Front Lift (2020)
 Overall Length 10.507m
 Overall Width 2.490m
 Overall Body Height 4.300m
 Min Body Ground Clearance 0.150m
 Track Width 2.490m
 Lock-to-lock time 5.00s
 Curb to Curb Turning Radius 10.800m

DIRECTOR
 DAVID GRUMMITT RPEQ 19356
 APPROVED 15 Oct 2022

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/21-2022
Dated: 14 December 2022

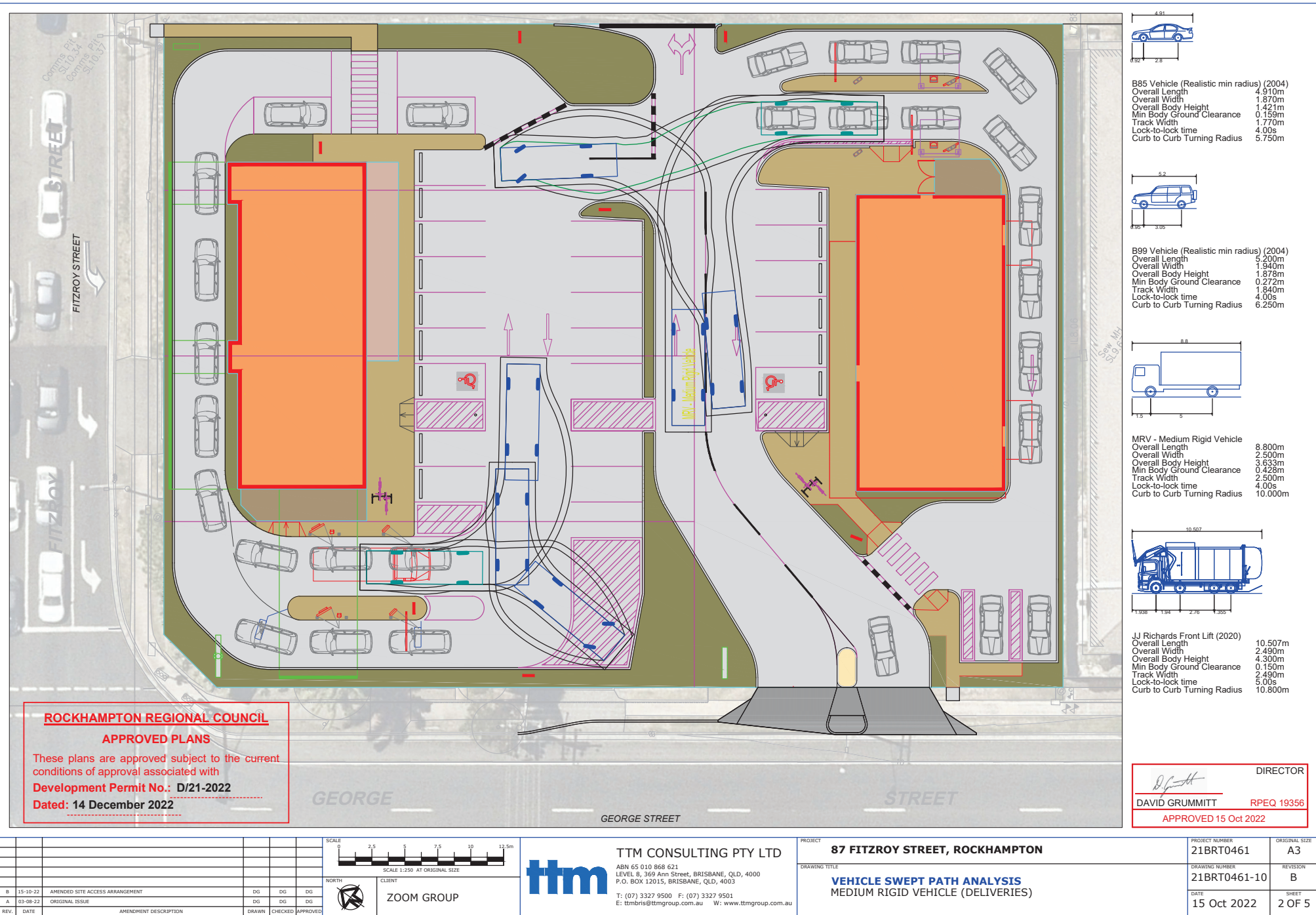
REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	15-10-22	AMENDED SITE ACCESS ARRANGEMENT	DG	DG	DG
A	03-08-22	ORIGINAL ISSUE	DG	DG	DG



TTM CONSULTING PTY LTD
 ABN 65 010 868 621
 LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
 P.O. BOX 12015, BRISBANE, QLD, 4003
 T: (07) 3327 9500 F: (07) 3327 9501
 E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT 87 FITZROY STREET, ROCKHAMPTON
DRAWING TITLE VEHICLE SWEEP PATH ANALYSIS
REFUSE COLLECTION VEHICLE (FRONT-LOADING)

PROJECT NUMBER	21BRT0461	ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0461-10	REVISION	B
DATE	15 Oct 2022	SHEET	1 OF 5



B85 Vehicle (Realistic min radius) (2004)
Overall Length 4.910m
Overall Width 1.870m
Overall Body Height 1.421m
Min Body Ground Clearance 0.159m
Track Width 1.770m
Lock-to-lock time 4.00s
Curb to Curb Turning Radius 5.750m

B99 Vehicle (Realistic min radius) (2004)
Overall Length 5.200m
Overall Width 1.940m
Overall Body Height 1.878m
Min Body Ground Clearance 0.272m
Track Width 1.840m
Lock-to-lock time 4.00s
Curb to Curb Turning Radius 6.250m

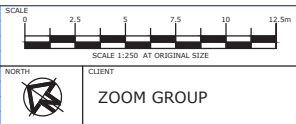
MRV - Medium Rigid Vehicle
Overall Length 8.800m
Overall Width 2.500m
Overall Body Height 3.633m
Min Body Ground Clearance 0.428m
Track Width 2.500m
Lock-to-lock time 4.00s
Curb to Curb Turning Radius 10.000m

JJ Richards Front Lift (2020)
Overall Length 10.507m
Overall Width 2.490m
Overall Body Height 4.300m
Min Body Ground Clearance 0.150m
Track Width 2.490m
Lock-to-lock time 5.00s
Curb to Curb Turning Radius 10.800m

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/21-2022
Dated: 14 December 2022

DIRECTOR
DAVID GRUMMITT **RPEQ 19356**
APPROVED 15 Oct 2022

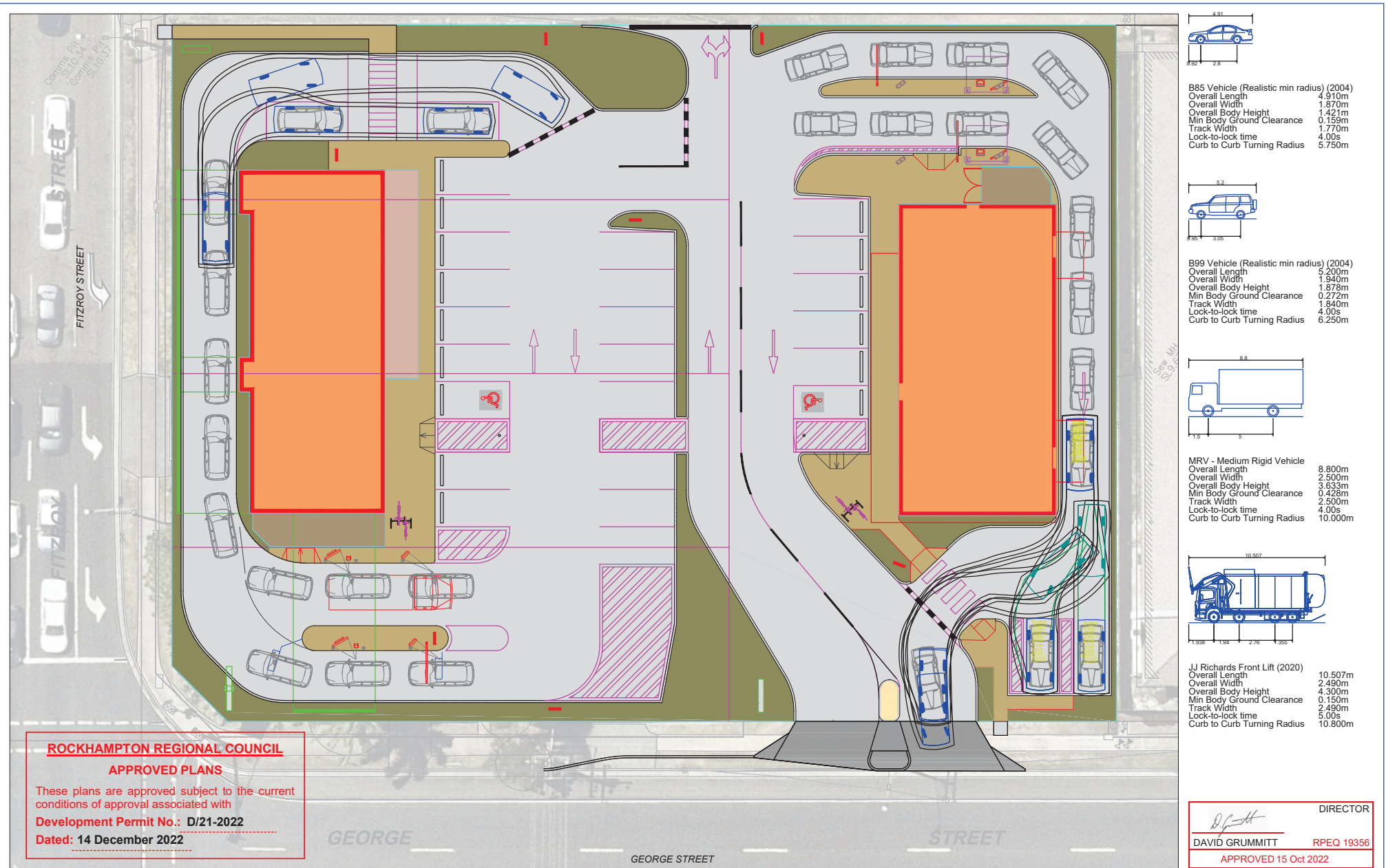
REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	15-10-22	AMENDED SITE ACCESS ARRANGEMENT	DG	DG	DG
A	03-08-22	ORIGINAL ISSUE	DG	DG	DG



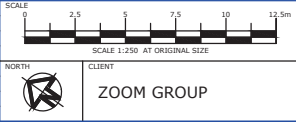
ttm
TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
P.O. BOX 12015, BRISBANE, QLD, 4003
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbis@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT 87 FITZROY STREET, ROCKHAMPTON
DRAWING TITLE VEHICLE SWEEP PATH ANALYSIS MEDIUM RIGID VEHICLE (DELIVERIES)

PROJECT NUMBER	ORIGINAL SIZE
21BRT0461	A3
DRAWING NUMBER	REVISION
21BRT0461-10	B
DATE	SHEET
15 Oct 2022	2 OF 5



REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	15-10-22	AMENDED SITE ACCESS ARRANGEMENT	DG	DG	DG
A	03-08-22	ORIGINAL ISSUE	DG	DG	DG

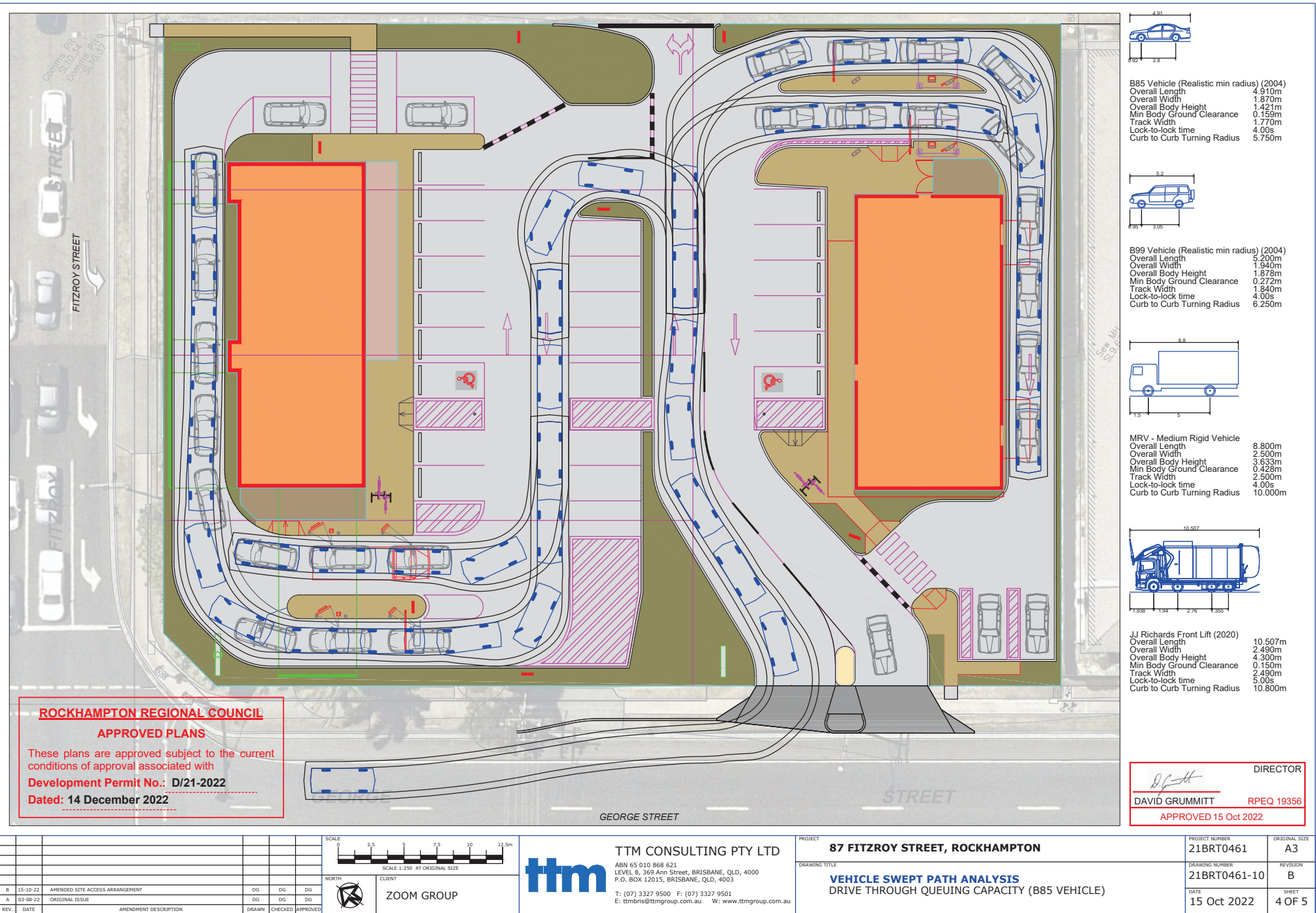


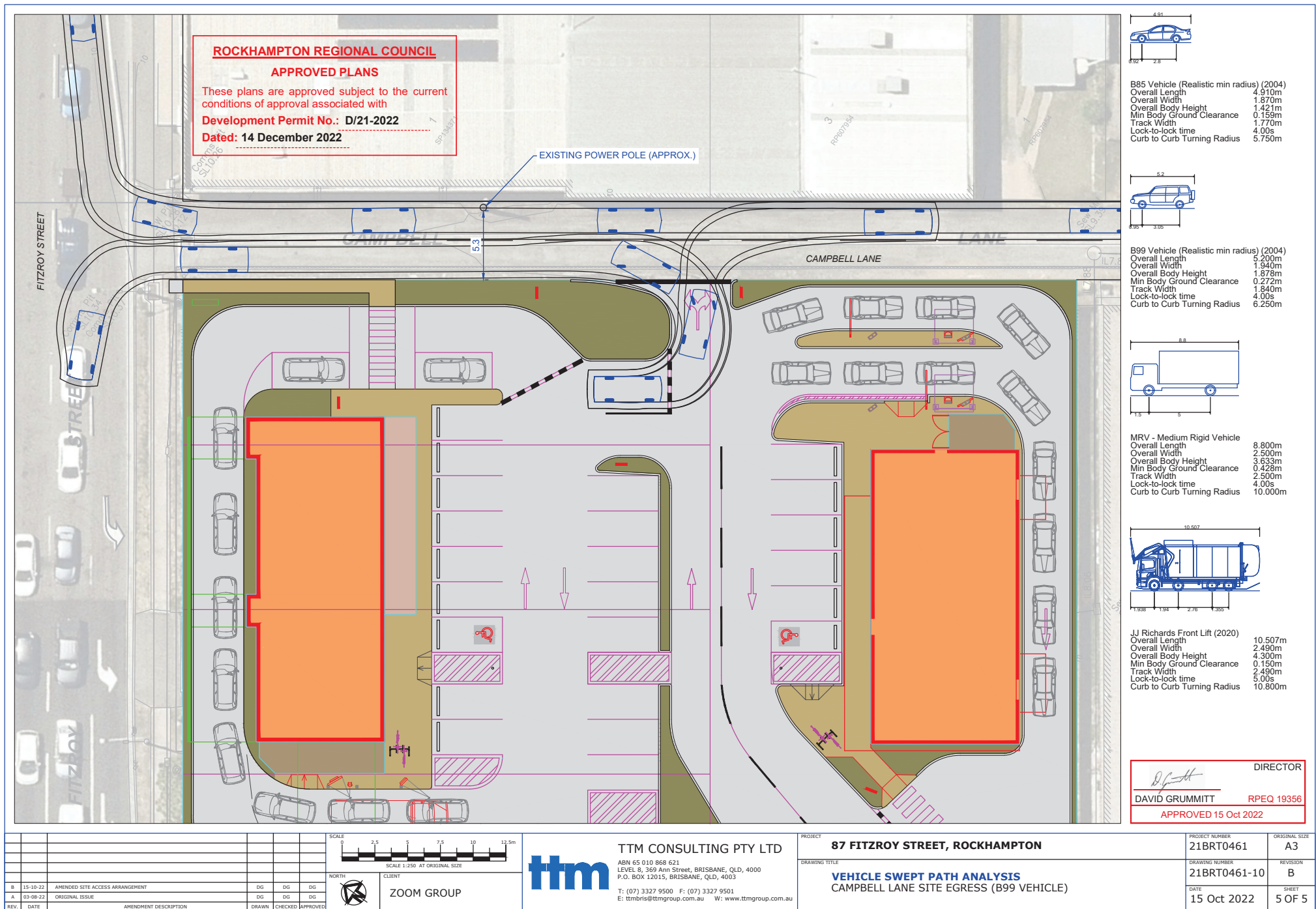
TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
P.O. BOX 12015, BRISBANE, QLD, 4003
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

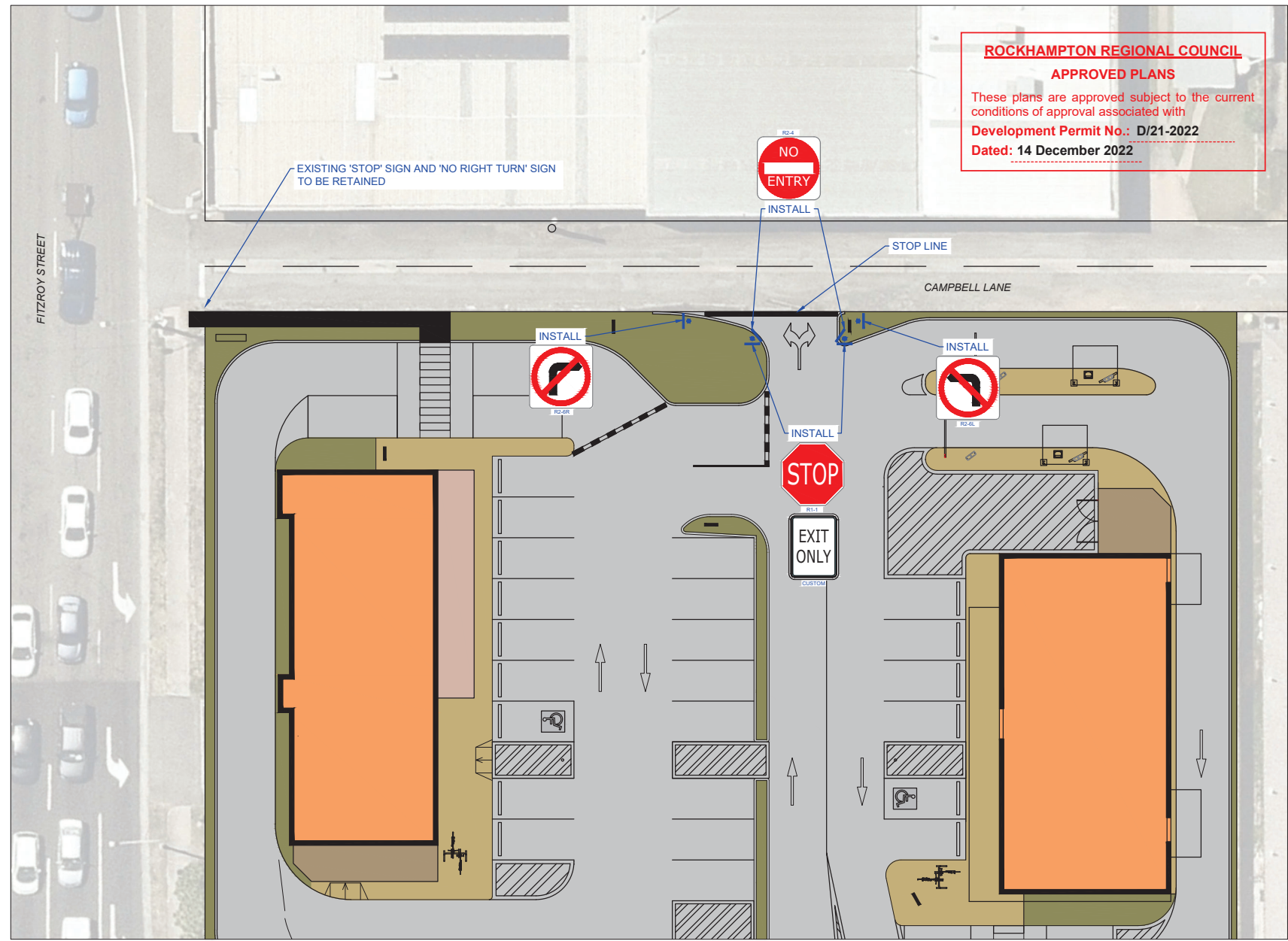
PROJECT
87 FITZROY STREET, ROCKHAMPTON

DRAWING TITLE
VEHICLE SWEEP PATH ANALYSIS
B99 PASSING B85 VEHICLE (DRIVE THROUGH WAITING)

PROJECT NUMBER	ORIGINAL SIZE
21BRT0461	A3
DRAWING NUMBER	REVISION
21BRT0461-10	B
DATE	SHEET
15 Oct 2022	3 OF 5





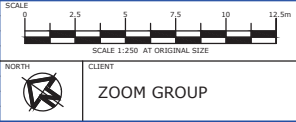


ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/21-2022
Dated: 14 December 2022

Note: Only the directional signage shown in this plan is approved. The plan should be updated at Operational Works stage to align with the other approved plans (e.g. site plan)

David Grummitt DIRECTOR
DAVID GRUMMITT RPEQ 19356
APPROVED 3 Aug 2022

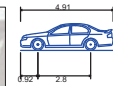
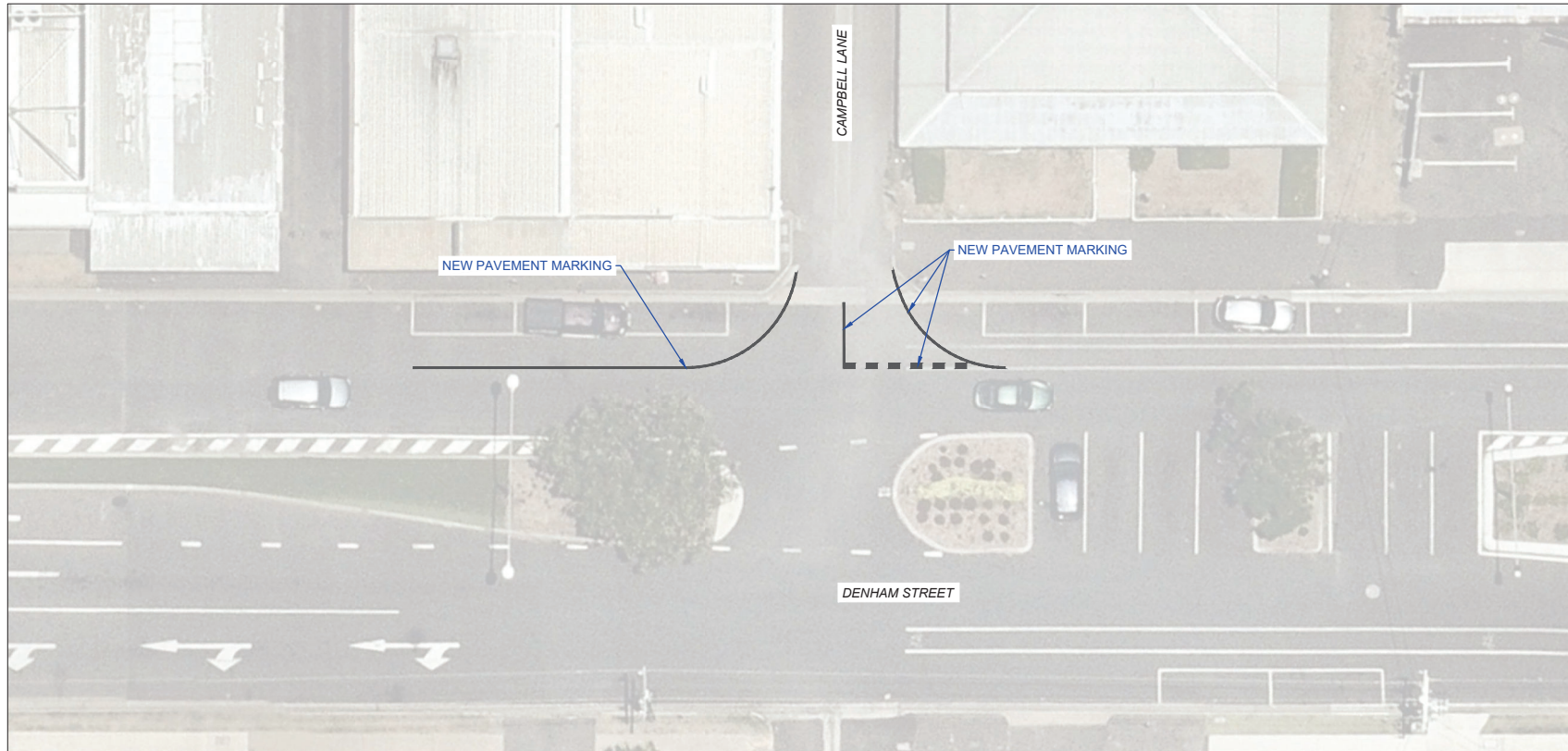
REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	03-08-22	ORIGINAL ISSUE	DD	DD	DD



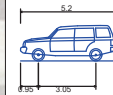
TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
P.O. BOX 12015, BRISBANE, QLD, 4003
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT	87 FITZROY STREET, ROCKHAMPTON
DRAWING TITLE	CAMPBELL LANE SITE EGRESS ARRANGEMENT PRELIMINARY SIGNAGE & PAVEMENT MARKING PLAN

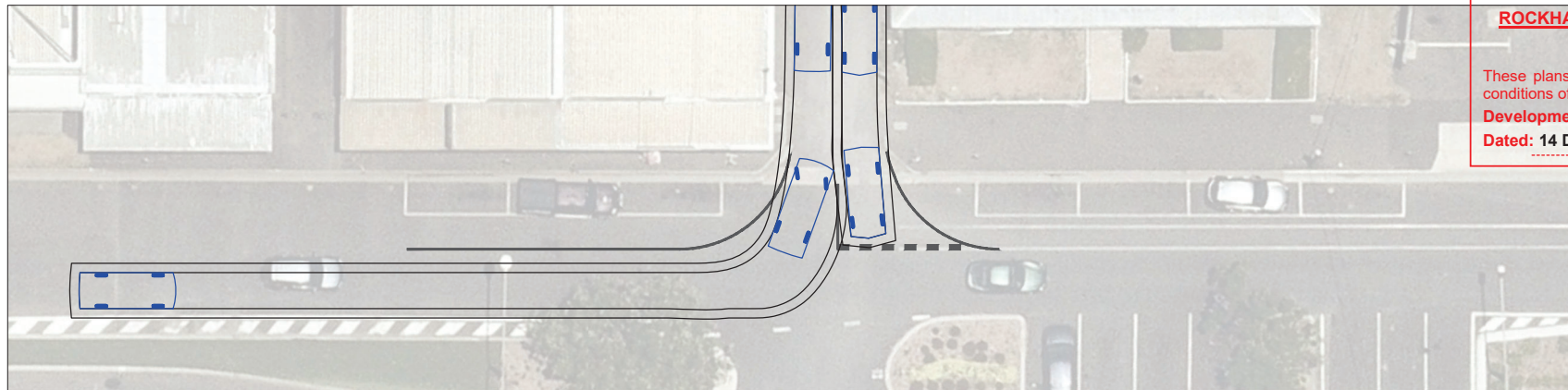
PROJECT NUMBER	21BRT0461	ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0461-11	REVISION	A
DATE	3 Aug 2022	SHEET	1 OF 1



B85 Vehicle (Realistic min radius) (2004)
 Overall Length 4.910m
 Overall Width 1.870m
 Overall Body Height 1.421m
 Min Body Ground Clearance 0.159m
 Track Width 1.770m
 Lock-to-lock time 4.00s
 Curb to Curb Turning Radius 5.750m



B99 Vehicle (Realistic min radius) (2004)
 Overall Length 5.200m
 Overall Width 1.940m
 Overall Body Height 1.878m
 Min Body Ground Clearance 0.272m
 Track Width 1.840m
 Lock-to-lock time 4.00s
 Curb to Curb Turning Radius 6.250m



ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

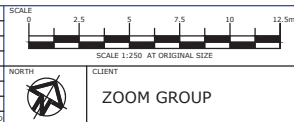
Development Permit No.: D/21-2022

Dated: 14 December 2022

Only signage is approved. Layout shown in the plan should be updated to align with other approvals at Operational Works Stage.

David Grummitt DIRECTOR
 DAVID GRUMMITT RPEQ 19356
 APPROVED 8 Aug 2022

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	08-08-22	GENERAL AMENDMENTS	DG	DG	DG
A	03-08-22	ORIGINAL ISSUE	DG	DG	DG



TTM CONSULTING PTY LTD
 ABN 65 010 868 621
 LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
 P.O. BOX 12015, BRISBANE, QLD, 4003
 T: (07) 3327 9500 F: (07) 3327 9501
 E: ttmbri@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT	87 FITZROY STREET, ROCKHAMPTON
DRAWING TITLE	DENHAM STREET / CAMPBELL LANE INTERSECTION PROPOSED UPGRADE CONCEPT PLAN

PROJECT NUMBER	21BRT0461	ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0461-12	REVISION	B
DATE	8 Aug 2022	SHEET	1 OF 1

PROPOSED FAST FOOD DEVELOPMENT
125 GEORGE ST & 87-93 FITZROY
ST, ROCKHAMPTON CITY
LANDSCAPE CONCEPT PLAN

- 1 PROPOSED STREET TREE
Street tree in accordance with Council's Street Tree Planting Guidelines;
Refer Proposed Planting Schedule
(ie. *Xanthostemon chrysanthus*)
- 2 MEDIUM SHADE/ SCREEN TREE
Medium sized trees that assist in the landscape presentation to the streetscape; provides shade, visual and climatic amenity, as well as primary screening to neighbouring property;
Refer Proposed Planting Schedule
(ie. *Elaeocarpus eumundi*, *Harpullia pendula*)
- 3 COLUMNAR PALMS
Vertical columnar palms to provide visual and climatic amenity; and softens building presentation to the adjacent streetscape;
Refer Proposed Planting Schedule
(ie. *Phycosperma elegans*)
- 4 SCREEN PLANTING
Dense planting to boundaries so as to provide visual amenity and privacy screening to neighbouring properties;
Refer Proposed Planting Schedule
- 5 SHRUBS AND GROUNDCOVERS
Mass planting to assist in building presentation to the streetscape and to provide visual amenity;
Refer Proposed Planting Schedule

LEGEND

- PROPOSED SCREEN FENCE
1800mm high timber screen fence
- PROPOSED GARDEN EDGE
To future detail

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

Dated: 14 December 2022

B	18/10/22	UPDATED ARCHITECTURAL DWGS FOR SUBMISSION TO RRC
A	17/05/22	
ISSUE	DATE	REASON
1	22/10/22	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		
81		
82		
83		
84		
85		
86		
87		
88		
89		
90		
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		

THESE DRAWINGS ARE AT A PRELIMINARY STAGE AND NOT A FULLY DETAILED AND CHECKED DESIGN READY FOR CONSTRUCTION. THIS DRAWING HAS BEEN PREPARED WITH ALL CARE PROVIDED INFORMATION AVAILABLE AT THE TIME OF PREPARATION. AGLA CAN NOT BE LIABLE OR RESPONSIBLE FOR ANY LIABILITIES, CLAIM OR LOSSES ARISING FROM RELIANCE FOR CONSTRUCTION.

PLEASE NOTE THESE DRAWINGS (E.G. VISUAL REPRESENTATIONS, ILLUSTRATIONS, PHOTOGRAPHS, ART RENDERINGS, AND OTHER GRAPHIC REPRESENTATIONS AND REFERENCES) ARE AN ARTIST'S IMPRESSION FOR ILLUSTRATION PURPOSES ONLY. THEY CANNOT BE REGARDED AS REPRESENTATION OF FACT OR THE INTENDED FINAL PRODUCT. CHANGES MAY BE MADE DURING THE FURTHER PLANNING OR DEVELOPMENT STAGES OF THE PROJECT AND DIMENSIONS, FITTINGS, FINISHES, DRAINAGE, COSTS AND SPECIFICATIONS AND REPRESENTATIONS ETC. ARE SUBJECT TO CHANGE WITHOUT NOTICE.

PLANT AND TREE SIZES ARE INDICATIVE TO SUPPORT THE GRAPHIC NATURE OF THE REPRESENTATION AND ARE TYPICALLY SHOWN AT FULL MATURITY RATHER THAN INSTALLATION SIZE. PLANT AND TREE DENSITY, SIZE AND SPECIES ARE SUBJECT TO A RANGE OF FACTORS CONFIRMED DURING THE DETAILED DESIGN AND CONSTRUCTION PHASE.



NEARMAP DATED: 22/09/21 (PHOTOMANIPULATED)

Document Set ID: 40447698

Version: 1, Version Date: 14/12/2022

Document Set ID: 40442151

Version: 1, Version Date: 05/04/2023



ANDREW GOLD LANDSCAPE ARCHITECTURE
PO BOX 5220, MT GRAVATT EAST QLD 4122
T 07 3420 0006 M 0405 389 243 E andrew@agla.com.au

PROPOSED FAST FOOD DEVELOPMENT
125 GEORGE ST & 87-93 FITZROY
ST, ROCKHAMPTON CITY
PROPOSED PLANTING
SCHEDULE



1.1



2.1



2.2



3.1

CODE	SPECIES	COMMON NAME	SIZE**	SPACING(m)	HEIGHT(m)	WIDTH(m)
1 PROPOSED STREET TREE						
1.1	<i>Xanthostemon chrysanthus</i>	Golden Penda	45L	as shown	10	6
2 PROPOSED MEDIUM SHADE/ SCREEN TREES						
2.1	<i>Elaeocarpus eumundii</i>	Smooth Leaved Quandong	100L	as shown	8	4
2.2	<i>Harpullia pendula</i>	Tulipwood	100L	as shown	10	6
3 PROPOSED COLUMNAR PALM						
3.1	<i>Ptychosperma elegans</i>	Solitaire Palm	100L	as shown	12	6

****PLANT CONTAINER SIZE:**

100L	100 Litre container stock min	Min. height at time of planting: 2.4m
45L	45 Litre container stock min	Min. height at time of planting: 1.9-2.3m

The spacing of plants shown on plan have been derived as a compromise between growth rate, anticipated size, and the ability to provide a good vegetative cover within a reasonable space of time.

B	18/10/22	UPDATED ARCHITECTURAL DWGS
A	17/05/22	FOR SUBMISSION TO RRC
ISSUE	DATE	REASON

JOB NUMBER	SHEET NO.	ISSUE	DRAWN BY
22.107	2	B	AG/ PD

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current
conditions of approval associated with
Development Permit No.: D/21-2022
Dated: 14 December 2022

THESE DRAWINGS ARE AT A PRELIMINARY STAGE AND NOT A FULLY DETAILED AND CHECKED DESIGN. READY FOR CONSTRUCTION. THIS DRAWING HAS BEEN PREPARED WITH ALL CARE. PROMISEE INFORMATION AVAILABLE AT THE TIME OF PREPARATION. AGLA CAN NOT BE LIABLE OR RESPONSIBLE FOR ANY LIABILITIES, CLAIM OR LOSSES ARISING FROM RELIANCE FOR CONSTRUCTION.

PLEASE NOTE THESE DRAWINGS (E.G. VISUAL REPRESENTATIONS, ILLUSTRATIONS, PHOTOGRAPHS, ART RENDERINGS, AND OTHER GRAPHIC REPRESENTATIONS AND REFERENCES) ARE AN ARTIST'S IMPRESSION FOR ILLUSTRATION PURPOSES ONLY. THEY CANNOT BE REGARDED AS REPRESENTATION OF FACT OR THE INTENDED FINAL PRODUCT. CHANGES MAY BE MADE DURING THE FURTHER PLANNING OR DEVELOPMENT STAGES OF THE PROJECT AND DIMENSIONAL FITTINGS, FINISHES, ONGOING COSTS AND SPECIFICATIONS AND REPRESENTATIONS ETC. ARE SUBJECT TO CHANGE WITHOUT NOTICE.

PLANT AND TREE SIZES ARE INDICATIVE TO SUPPORT THE GRAPHIC NATURE OF THE REPRESENTATION AND ARE TYPICALLY SHOWN AT FULL MATURITY RATHER THAN INSTALLATION SIZE. PLANT AND TREE DENSITY, SPECIES, SUPPLYMENT ON A RANGE OF FACTORS CONFIRMED DURING THE DETAILED DESIGN AND CONSTRUCTION PHASE.



ANDREW GOLD LANDSCAPE ARCHITECTURE
PO BOX 5220, MT GRAVATT EAST QLD 4122
T 07 3420 0006 M 0405 389 243 E andrew@agla.com.au

PROPOSED FAST FOOD DEVELOPMENT
125 GEORGE ST & 87-93 FITZROY
ST, ROCKHAMPTON CITY
PROPOSED PLANTING
SCHEDULE



CODE	SPECIES	COMMON NAME	SIZE**	SPACING(m)	HEIGHT(m)	WIDTH(m)
4. PROPOSED SCREEN PLANTING						
4.1	<i>Syzygium australe</i> Aussie Boomer	Lillypilly	300mm	1.2	1.5	1.5
4.2	<i>Syzygium australe</i> Aussie Southern	Lillypilly	300mm	1.5	5	2
5. PROPOSED SHRUBS AND GROUNDCOVERS						
5.1	<i>Allamanda cathartica</i> Sunee	Dwarf Yellow Allamanda	200mm	0.8	1	1.2
5.2	<i>Callistemon</i> Little John	Dwarf Bottlebrush	200mm	0.8	1	0.9
5.3	<i>Carissa grandiflora</i> Desert Star	Desert Star	200mm	0.7	1	1
5.4	<i>Ixora chinensis</i> Coral Fire	Ixora	200mm	0.8	1	1
5.5	<i>Ixora chinensis</i> Orange Dwarf Maui	Ixora Dwarf	200mm	0.8	1	1
5.6	<i>Russelia equisetiformis</i> Tangerine Falls	Tangerine Falls	200mm	0.7	1	1
5.7	<i>Westringia</i> Flat n Fruity	Prostrate Native Rosemary	200mm	1	0.3	2
5.8	<i>Westringia</i> Zena	Dwarf Rosemary	200mm	0.9	1	1
5.9	<i>Xanthostemon chrysanthus</i> Little Goldie	Dwarf Golden Penda	200mm	0.7	1	0.8

**PLANT CONTAINER SIZE:

300mm 300mm dia minimum pot size
200mm 200mm dia minimum pot size

The spacing of plants shown on plan have been derived as a compromise between growth rate, anticipated size, and the ability to provide a good vegetative cover within a reasonable space of time.

B	18/10/22	UPDATED ARCHITECTURAL DWGS
A	17/05/22	FOR SUBMISSION TO RRC
ISSUE	DATE	REASON

JOB NUMBER	SHEET NO.	ISSUE	DRAWN BY
22.107	3	B	AG/ PD

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

Dated: 14 December 2022

THESE DRAWINGS ARE AT A PRELIMINARY STAGE AND NOT A FULLY DETAILED AND CHECKED DESIGN. READY FOR CONSTRUCTION. THIS DRAWING HAS BEEN PREPARED WITH ALL CARE. PROMISE INFORMATION AVAILABLE AT THE TIME OF PREPARATION. AGLA CAN NOT BE LIABLE OR RESPONSIBLE FOR ANY LIABILITIES, CLAIM OR LOSSES ARISING FROM RELIANCE FOR CONSTRUCTION.

PLEASE NOTE THESE DRAWINGS (E.G. VISUAL REPRESENTATIONS, ILLUSTRATIONS, PHOTOGRAPHS, ART, RENDERINGS, AND OTHER GRAPHIC REPRESENTATIONS AND REFERENCES) ARE AN ARTIST'S IMPRESSION FOR ILLUSTRATION PURPOSES ONLY. THEY CANNOT BE REGARDED AS REPRESENTATION OF FACT OR THE INTENDED FINAL PRODUCT. CHANGES MAY BE MADE DURING THE FURTHER PLANNING OR DEVELOPMENT STAGES OF THE PROJECT AND DIMENSIONAL FITTINGS, FINISHES, ONGOING COSTS AND SPECIFICATIONS AND REPRESENTATIONS ETC. ARE SUBJECT TO CHANGE WITHOUT NOTICE.

PLANT AND TREE SIZES ARE INDICATIVE TO SUPPORT THE GRAPHIC NATURE OF THE REPRESENTATION AND ARE TYPICALLY SHOWN AT FULL MATURITY RATHER THAN INSTALLATION SIZE. PLANT AND TREE DENSITY, SIZE, PLACEMENT, AND RANGE OF FACTORS CONFIRMED DURING THE DETAILED DESIGN AND CONSTRUCTION PHASE.

February 2023

MNCE Ref: C5656

SITE BASED STORMWATER MANAGEMENT PLAN

ROCKHAMPTON REGIONAL COUNCIL

AMENDED PLANS APPROVED

4 April 2023

DATE

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

Development Permit No.: D/21-2022

Dated: 14 December 2022

87-93 Fitzroy Street, Rockhampton

Commissioned By
Puget Sound Pty Ltd ART Synchronicity
Investment Trust

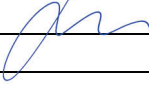
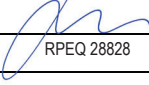
BRISBANE OFFICE
5/63 Annerley Road, Woolloongabba QLD 4102
PO Box 8380, Woolloongabba QLD 4102
T 07 3255 1877 F 07 3255 1878
W mnce.com.au ABN 68 678 825 458

IPSWICH OFFICE
18 Canning Street, North Ipswich QLD 4305
PO Box 2118, North Ipswich QLD 4305
T 07 3281 6603 F 07 3281 6602


MILANOVIC NEALE
CONSULTING ENGINEERS

REPORT CONTROL SHEET

MNCE Ref. No.:	C5656
Site:	87-93 Fitzroy Street, Rockhampton
Report Title:	Site Based Stormwater Management Plan
Report Author:	Timothy Emms

Revision / Checking					
Rev No.	Date	Issued By	Signed	Authorised By	Signed
A	23/02/23	JHu		JHu	 RPEQ 28828

Distribution <small>*(CR-Courier; P-Post; H-Hand Delivered; CL-Collected; F-Fax; E-Email)</small>										
Destination	Date Sent	By*	Revision Number / Number of Copies Sent							
			Draft	A	B	C	D	E	F	G
MNCE File	-	-		1	1					
Puget Sound Pty Ltd ART Synchronicity Investment Trust	23/02/23	E		1						

Model File Reference			
Rev No.	MUSIC File Name	ICM File Name	Rational Method File Name
A	C5656-230223-CALCS-MUSIC-REVC	N/A	C5656-230210-RM CALC-REVA

TABLE OF CONTENTS

1 INTRODUCTION	4
1.1 Overview and Background	4
1.2 Objectives and Scope	6
2 DATA	7
2.1 State and Local Government Policies	7
2.2 Level and Modelling Data	7
3 OPPORTUNITIES AND CONSTRAINTS	8
3.1 Site Opportunities	8
3.2 Site Constraints	8
4 WATER QUALITY MANAGEMENT	9
4.1 Risk Category	9
4.2 Water Quality Objectives	10
4.2.1 Construction Phase	10
4.2.2 Operational Phase	10
4.3 Water Quality Treatment	11
4.3.1 Construction Phase	11
4.3.2 Operational Phase	11
4.4 Water Quality Treatment	11
4.4.1 Model Selection	11
4.4.2 MUSIC Model Configuration	11
4.4.2.1 Meteorological and Time Step	12
4.4.2.2 Catchment Properties	12
4.4.2.3 Rainfall Runoff Parameters	13
4.4.2.4 Pollutant Export Parameters	13
4.4.3 Developed Unmitigated Conditions	14
4.4.4 Developed Mitigated Conditions	15
5 WATER QUANTITY MANAGEMENT	17
5.1 Existing Condition	17
5.2 Existing Hydrologic Model	17
5.2.1 Catchment Parameters	17
5.2.2 Existing Hydrological Results	18
5.3 Developed Conditions	18
5.4 Developed Hydrological Model	18
5.4.1 Catchment Parameters	18
5.4.2 Developed Hydrological Results	19
5.5 Potential Impacts of Development	19
5.6 Road Capacity Analysis	21
5.6.1 Road Properties	21
5.6.2 Existing Conditions	21
5.6.3 Developed Conditions	22
5.6.4 Carriageway Flow Conditions Comparison	22
5.7 Stormwater Management Strategy	23
6 INTERPRETATION AND CONCLUSIONS	24
APPENDIX A: PROPOSED DEVELOPEMNT LAYOUT	25
APPENDIX B: MUSIC MODEL SUMMARY	26
APPENDIX C: RATIONAL METHOD CALCULATION SUMMARY	27
APPENDIX D: ROAD CAPACITY CALCULATION SUMMARY	28

1 INTRODUCTION

1.1 Overview and Background

This report has been prepared to support a proposed commercial development over Lots 1 & 2 on RP604178, Lot 2 on RP878798, Lot 2 on RP603146, and Lot 34 on SP107136 at 87-93 Fitzroy Street, Rockhampton. The site is located within the Rockhampton Regional Council local government area and has a total area of approximately 0.342ha. Figure 1.1 below provides an aerial locality of the site and adjacent areas.

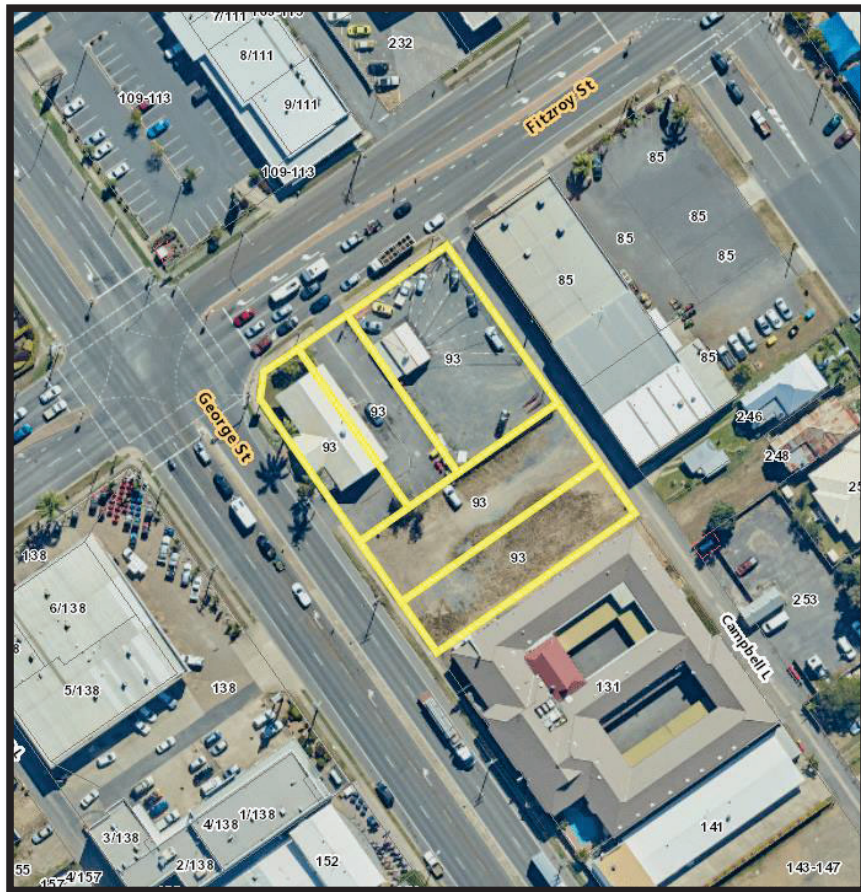


Figure 1.1: Subject site bound by Fitzroy Street to the north, George Street to the west and Campbell Lane to the east (RRPS Maps)

The proposed development involves the construction of two takeaway food outlets. Refer Appendix A for proposed development layout.

The site is currently occupied by two commercial buildings and site flows predominantly drain to the rear towards Campbell Lane in a south easterly direction at a grade of approximately 1. Rockhampton Regional Council's infrastructure mapping indicates that no municipal stormwater infrastructure is located within the vicinity of the subject site

and site runoff is therefore considered to discharge as overland sheet flow before being captured by Council drainage infrastructure within Denham and Campbell Street approximately 160m south of the subject site. Refer to Figure 1.2 on the below for Council stormwater infrastructure mapping.



Figure 1.2: Municipal Stormwater Infrastructure (RRC Maps)

Rockhampton Regional Council Flooding overlay maps indicate that the site is not considered to be flood affected.

1.2 Objectives and Scope

Milanovic Neale Consulting Engineers have been commissioned by Puget Sound Pty Ltd ART Synchronicity Investment Trust to undertake an assessment of stormwater quality and quantity impacts associated with the proposed development. Stormwater management strategies are also to be identified for the proposed development as required.

The scope of works undertaken for this project shall be for the assessment of the pre and post development stormwater discharge and undertake preliminary design and commentary of any mitigation devices required to control site discharge if required.

This report has been prepared to supersede the previously prepared Site Based Stormwater Management Plan (MIS-1019/R02) prepared by Premise dated 01/03/2022. Updates to the stormwater quality and quantity components of the site have been made due to adjustments to the internal layout, and subsequent ability to provide swales as shown on the Concept Stormwater Layout Plan within the above mentioned report.

2 DATA

2.1 State and Local Government Policies

The *Rockhampton Region Planning Scheme (2015) – Version 2.2*, the *Queensland Urban Drainage Manual (QUDM 2017)*, *Australian Rainfall and Runoff: A Guide to Flood Estimation (2019)* and *Healthy Land and Water (2018) MUSIC Modelling Guidelines* has been used as a guide to establish the required stormwater objectives and requirements for the development.

2.2 Level and Modelling Data

A detailed survey undertaken by Capricorn Survey Group CQ on the 1st February 2022 which comprises of surface level contours at 0.25m intervals.

Rainfall data relative to the subject site was extracted from AR&R 2016 through the IFD tool on the Bureau of Meteorology website.

3 OPPORTUNITIES AND CONSTRAINTS

3.1 Site Opportunities

Site flows currently free drain from site as overland sheet flow and the proposed development offers the opportunity to improve flow capture and reduce nuisance flows affecting adjacent neighbouring properties.

3.2 Site Constraints

Due to limited fall across the existing site and development space restrictions, it will be difficult to implement large-scale or underground water quality treatment measures.

4 WATER QUALITY MANAGEMENT

This section of the report will provide an assessment of the development against State and Local Government legislation to identify water quality management measures to be adopted for the proposed development.

4.1 Risk Category

The *State Planning Policy – July 2017* identifies developments as high risk with respect to stormwater quality if any of the following criteria are triggered:

1. Material change of use urban purposes that involves a land area greater than 2,500m² that:
 - a. Will result in an impervious area greater than 25 percent of the net developable area; or
 - b. Will result in six or more dwellings, or
2. Reconfiguring a Lot for urban purposes that involves a land area greater than 2,500m² and will result in 6 or more Lots: or
3. Operational work for urban purposes that involves disturbing more than 2,500m² of land;

With respect to the above, the proposed development is considered high risk with regards to stormwater quality as operational works are proposed over an area greater than 2500m² and will result in an impervious area greater than 25% of the net developable area.

4.2 Water Quality Objectives

4.2.1 Construction Phase

The *Urban Stormwater Quality Guidelines 2010* identify that eroded soils and litter are major pollutant sources during construction activity. There is also potential for hydro-modification of streams due to increased run-off coefficients when subsoils are exposed, for longer term major developments. Water sensitive urban design principles and reducing erosion during construction are fundamental to achieving water quality objectives in relevant waterways.

It is therefore proposed to prepare an erosion and sediment management plan during the operational works phase of the development which will incorporate a range of control measures to be implemented during the construction phase of the project.

4.2.2 Operational Phase

The key pollutants generated by various developments during the operational (post-construction) phase of residential developments are outlined below. Those presented in bold text are identified as the key pollutants to be targeted for treatment, and have been selected with consideration of the proposed operational activities and processes to be undertaken on the site.

- **Litter**
- **Sediment**
- Oxygen demanding substances (possibly present)
- **Nutrients (nitrogen & phosphorus)**
- Pathogens / Faecal coliforms (possibly present)
- **Hydrocarbons**
- **Heavy Metals (often associated with fine sediment)**
- **Surfactants**
- Organochlorines & organophosphates (unlikely to be present)
- Thermal pollution
- pH altering substances (possibly present)

If during the operational phase, no major sources of oxygen demanding substances, pathogens/faecal coliforms, organochlorines & organophosphates have been identified within the site; therefore it is believed that no further consideration of these pollutants is required.

4.3 Water Quality Treatment

4.3.1 Construction Phase

Refer Section 4.2.1 for water quality treatment during construction phase.

4.3.2 Operational Phase

Stormwater quality management design objectives for the operational phase of the development are identified in the following table in accordance with the Urban Stormwater Quality Guidelines 2010. These objectives provide an emphasis on the reduction of mean annual loadings associated with suspended sediments and nutrients in the Central Queensland (South) Region.

Table 4.1: Stormwater Quality Objectives

Region	Minimum Reductions in Mean Annual Loads from Unmitigated Development (%)			
	Total Suspended Solids (TSS)	Total Phosphorus (TP)	Total Nitrogen (TN)	Gross Pollutants > 5mm (GP)
Central Queensland	85	60	45	90

4.4 Water Quality Treatment

4.4.1 Model Selection

To determine on site pollutant generation, discharge concentrations of target pollutants and the effectiveness of Stormwater Quality Improvement Devices the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) has been used to model the development proposal.

4.4.2 MUSIC Model Configuration

The following sections identify the modelling parameters used in the configuration of the MUSIC Model adopted for the development. The following figure provides a screenshot of the MUSIC model schematic for reference. Refer Appendix B for associated MUSIC model summary report and Appendix A for catchment plan.

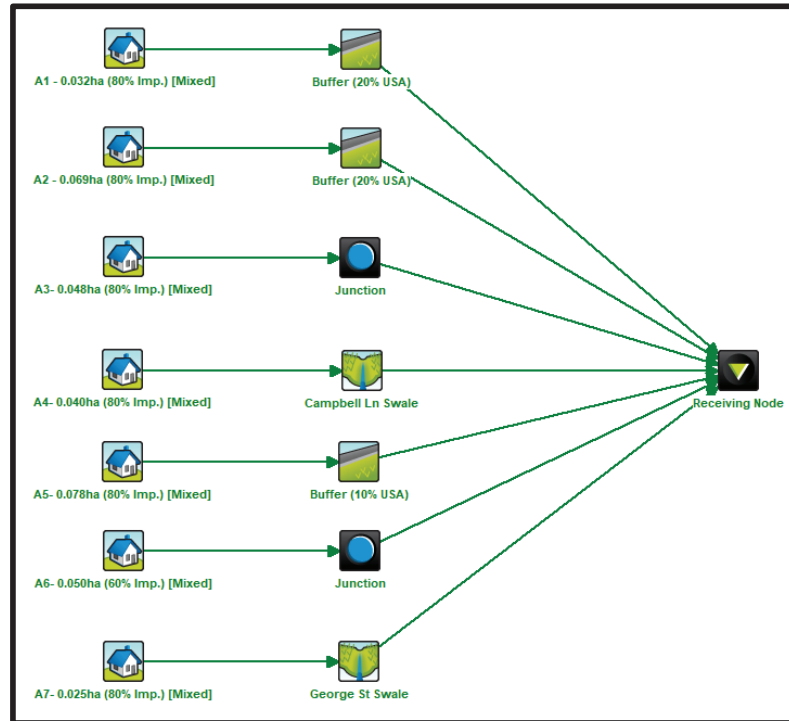


Figure 4.1: MUSIC Model Layout

4.4.2.1 Meteorological and Time Step

Meteorological Data used in the MUSIC model has been identified in accordance with *Healthy Land and Water (2018) MUSIC Modelling Guidelines*, incorporating the following parameters:

Rainfall Period: 01/01/2000 12:00 AM to 31/12/2010 11:54 PM

Rainfall Station: 39083 ROCKHAMPTON

A model time step of 6 minutes has also been adopted as recommended in Section 3.2 of *Healthy Land and Water (2018) MUSIC Modelling Guidelines*.

4.4.2.2 Catchment Properties

The MUSIC model for the development adopts a lumped catchment approach, in accordance with Table 3.7 in the *Healthy Land and Water (2018) MUSIC Modelling Guidelines*. Table 4.2 provides a summary of the catchment data used in the MUSIC analysis.

Table 4.2: MUSIC Catchment Parameters

Catchment Name	Area (ha)	Fraction Impervious (%)	MUSIC Source Node
A	0.032	80	Commercial
B	0.069	80	
C	0.048	80	
D	0.040	80	
E	0.078	80	
F	0.050	60	
G	0.025	80	

4.4.2.3 Rainfall Runoff Parameters

The following table provides a summary of the rainfall runoff parameters adopted for the source nodes used in the MUSIC analysis which has been extracted from Table 3.8 of the *Healthy Land and Water (2018) MUSIC Modelling Guidelines*.

Table 4.3: MUSIC Source Node Base and Storm Flow Concentration Parameters (Commercial Use)

Land Use	Parameter	Total Suspended Solids (Log ₁₀ mg/L)		Total Phosphorus (Log ₁₀ mg/L)		Total Nitrogen (Log ₁₀ mg/L)	
Commercial	Mean	0.78	2.16	-0.60	-0.39	0.32	0.37
	Std Deviation	0.39	0.38	0.50	0.34	0.30	0.34

4.4.2.4 Pollutant Export Parameters

The following table provides a summary of the pollutant export parameters for lumped catchment surface types which have been adopted for the source nodes used in the MUSIC analysis. This information has been extracted from Table A1.2 of the *Healthy Land and Water (2018) MUSIC Modelling Guidelines*

Table 4.4: MUSIC Catchment Parameters (Commercial Use)

Parameter	Quantity
Rainfall Threshold (mm)	1
Soil Storage Capacity (mm)	18
Initial Storage (%)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient A	243
Infiltration Capacity Coefficient B	0.6
Daily Recharge Rate (%)	0.0
Daily Base-Flow Rate (%)	31
Daily Seepage Rate (%)	0

4.4.3 Developed Unmitigated Conditions

MUSIC Modelling has been performed to determine the pollutant export and corresponding concentrations from the development site under the proposed conditions. The mean annual loads that have been estimated for proposed unmitigated conditions are given in Table 4.5 below, also shown are the mean annual load percentage reductions required to meet current State Planning Policy objectives.

Table 4.5: MUSIC Unmitigated Mean Annual Loads (kg/yr)

Pollutant	Unmitigated Mean Annual Load (kg/yr)	Reduction required to meet Council Requirements (%)
Total Suspended Solids (TSS)	519	85
Total Phosphorous (TP)	1.38	60
Total Nitrogen (TN)	7.88	45
Gross Pollutants (GP)	63.8	90

Refer Appendix B for MUSIC summary report.

4.4.4 Developed Mitigated Conditions

In the absence of underground municipal infrastructure and the level constraints associated with the development site, the proposed treatment system is limited to the formation of two drainage swales located to the south west and south east corners of the site. Grassed landscape areas are also proposed along the perimeter of the site which will receive site flows and act as a buffer prior to sheet flow release to the adjoining verge. It is noted that proposed development design allows for the majority of site flows to interact with landscaped areas prior to release from site.

The proposed treatment train may be summarised as follows:

- Catchments A and B are to sheet flow into landscaping areas proposed along the northern end of the site's eastern boundary.
- Catchments C and F are to free drain to Campbell Lane and George Street respectively via. site access crossovers.
- Catchment E is to sheet flow into landscaped area proposed along northern end of site's western boundary.
- Catchment D flows are to sheet flow into drainage swales (average top width of 1m) along the site's eastern and southern boundary and combined flows are conveyed to the existing Campbell Lane carriageway at natural surface.
- Catchment G flows are to sheet flow into drainage swales (average top width of 1m) along the site's western and southern boundary and combined flows are conveyed to the George St carriageway via. intake pit and kerb outlet.

Refer below table for primary MUSIC model swale parameters.

Table 4.6: MUSIC Model Swale Parameters

Swale Catchment	Length (m)	Mean Bed Slope (%)	Mean Top Width (m)	Mean Depth (m)	Mean Vegetation Height (m)
D	43	2	1.0	0.20	0.1
G	32	1	1.0	0.20	0.1

The table below outlines pollutant load reductions which have been achieved through the implementation of the proposed stormwater treatment train.

Table 4.7: MUSIC Model Removal Efficiencies

Pollutant	Unmitigated Mean Annual Load (kg/yr)	Mitigated Mean Annual Load (kg/yr)	Reduction required to meet Council Requirements (%)	Removal Efficiency Achieved (%)
Total Suspended Solids (TSS)	519	230	85	56
Total Phosphorous (TP)	1.38	0.85	60	38
Total Nitrogen (TN)	7.88	6.34	45	20
Gross Pollutants (GP)	63.8	51.5	90	20

While it is noted that the development does not meet pollutant load reduction targets for assessable pollutants, a notable reduction is achieved in TSS and TP. The lesser reduction in TN and GP is due to the treatment limitations associated with the vegetated swales, the reliance on landscaped buffers rather than drainage swales due to topographical constraints and the presence of sizeable free drain areas which cannot be drained to proposed drainage swales or landscaped areas. Despite this, the proposed treatment system is considered to offer the most practical outcome for the development due to site level constraints and the absence of underground municipal stormwater drainage within the vicinity of the site.

5 WATER QUANTITY MANAGEMENT

This section of the report will provide an assessment of the pre and post development stormwater discharge and undertake preliminary design and commentary of any mitigation devices required to control site discharge.

5.1 Existing Condition

This section of the report will analyse and comment on the existing site stormwater discharge conditions. The Rational Method will be used to generate the peak flows from the site for all storm events up to and including the 1% AEP storm event.

5.2 Existing Hydrologic Model

5.2.1 Catchment Parameters

An examination of the existing site land topography and land use was undertaken to quantify the number of sub catchments and sub catchment areas applicable for the site. It was established that the existing site comprises of three fundamental sub catchments being roof, hardstand and vegetated areas.

Based on the methods outlined in QUDM, the following parameters were used to estimate the peak runoff generated from the site. Refer Appendix C for detailed rational method calculation summary.

Table 5.1: Rational Method Parameters

Catchment Description	Sub-Catchment Description	Area (ha)	Runoff Coefficient (C10)	Time of Concentration (mins)
George Street	Roof	0.024	0.90	15
	Hardstand	0.064	0.88	15
	Vegetation	0.012	0.70	15
Campbell Lane	Roof	0.008	0.90	15
	Hardstand	0.092	0.88	15
	Vegetation	0.142	0.70	15

5.2.2 Existing Hydrological Results

The following table provides the results of the Rational Method for existing peak discharges up to and including the 1% AEP storm event.

Table 5.2: Existing Site Peak Discharges

Storm Event	George Street Rational Method Peak Runoff (m ³ /s)	Campbell Lane Rational Method Peak Runoff (m ³ /s)
39% AEP	0.019	0.040
18% AEP	0.028	0.060
10% AEP	0.034	0.074
5% AEP	0.041	0.089
2% AEP	0.052	0.115
1% AEP	0.059	0.132

5.3 Developed Conditions

This section of the report will analyse and comment on the developed site stormwater discharge conditions. The Rational Method will be used to generate the peak flows from the site for all storm events up to and including the 1% AEP storm event.

5.4 Developed Hydrological Model

5.4.1 Catchment Parameters

An examination of the developed site land topography and land use was undertaken to establish the quantity of sub catchments applicable to the proposed development. Three fundamental sub catchments were considered for the site; being the roof, hardstand, and vegetation areas.

Based on the methods outlined in QUDM, the following parameters were used to estimate the peak runoff generated from the site. Refer Appendix C for detailed rational method calculation summary.

Table 5.3: Rational Method Parameters

Catchment Description	Sub-Catchment Description	Area (ha)	Runoff Coefficient (C10)	Time of Concentration (mins)
George Street	Roof	0.031	0.90	5
	Hardstand	0.103	0.88	5
	Vegetation	0.023	0.70	5
Campbell Lane	Roof	0.030	0.90	5
	Hardstand	0.133	0.88	5
	Vegetation	0.022	0.70	5

5.4.2 Developed Hydrological Results

The following table provides the results of the Rational Method for developed peak discharges up to and including the 1% AEP storm event.

Table 5.4: Developed Site Peak Discharges

Storm Event	George Street Rational Method Peak Runoff (m ³ /s)	Campbell Lane Rational Method Peak Runoff (m ³ /s)
39% AEP	0.041	0.048
18% AEP	0.060	0.072
10% AEP	0.075	0.089
5% AEP	0.090	0.106
2% AEP	0.114	0.135
1% AEP	0.128	0.151

5.5 Potential Impacts of Development

The following tables provides a summary of the peak runoff from the site under both existing and developed scenarios.

Table 5.5: Runoff Comparison (George Street)

Storm Event	Existing Peak Runoff (m ³ /s)	Developed Peak Runoff (m ³ /s)	Difference	
			+/-	%
39% AEP	0.019	0.041	0.017	89
18% SEP	0.028	0.060	0.026	93
10% AEP	0.034	0.075	0.032	94
5% AEP	0.041	0.090	0.039	95
2% AEP	0.052	0.114	0.049	94
1% AEP	0.059	0.128	0.054	92

Table 5.6: Runoff Comparison (Campbell Lane)

Storm Event	Existing Peak Runoff (m ³ /s)	Developed Peak Runoff (m ³ /s)	Difference	
			+/-	%
39% AEP	0.040	0.048	0.014	26
18% SEP	0.060	0.072	0.020	25
10% AEP	0.074	0.089	0.025	25
5% AEP	0.089	0.106	0.030	25
2% AEP	0.115	0.135	0.035	23
1% AEP	0.132	0.151	0.036	21

The proposed development has increased the proportion of the site that is impervious, consequently the runoff characteristics from the site will be altered as a result of the development. As demonstrated above, the development has increased runoff volumes and peak flow rates to both George St and Campbell Lane in comparison to existing conditions. A road flow capacity check of existing and developed conditions in the minor storm event (10% AEP) will therefore be undertaken for the section of Campbell Lane and George Street carriageways adjacent to the site to quantify depth, velocity, and flow hazard impacts.

5.6 Road Capacity Analysis

This section of the report aims to quantify flow depth, velocity and hazard impacts associated with the unmitigated release of minor (10% AEP) development flows to Campbell Lane and George Street. It is noted that this impact analysis is limited to site flow contributions only and does not consider external catchment areas. Road cross sections are relative to site survey data adjacent to the site's southern boundary.

5.6.1 Road Properties

Flow conveyance properties attributed to the George Street and Campbell Lane road carriageways are presented in Table 5.7 below:

Table 5.7: Existing Carriageway Properties

Parameter	George Street	Campbell Lane
Long Slope (%)	0.4	0.5
Mean Cross Slope (%)	6	8
Profile	One-Way	Trapezoidal
Base Width (m)	n/a	2.9
n	0.015	0.020
Kerb Height (m)	0.15	n/a
Qcap (m ³ /s)	0.15	0.50

5.6.2 Existing Conditions

Table 5.8 below outlines road flow conditions within the adjoining road carriageways due to existing site contributions alone in the 10% AEP storm event. Refer Appendix D for calculation summary.

Table 5.8: Existing Road Flow Conditions

Parameter	George Street	Campbell Lane
Q10 (m ³ /s)	0.034	0.074
Depth (m)	0.087	0.049
Velocity (m/s)	0.087	0.425
Hazard (m ² /s)	0.008	0.021

5.6.3 Developed Conditions

Table 5.9 below outlines road flow conditions within the adjoining road carriageways due to existing site contributions alone in the 10% AEP storm event. Refer Appendix D for calculation summary.

Table 5.9: Developed Conditions

Parameter	George Street	Campbell Lane
Q10 (m ³ /s)	0.075	0.089
Depth (m)	0.117	0.054
Velocity (m/s)	0.143	0.450
Hazard (m ² /s)	0.017	0.024

5.6.4 Carriageway Flow Conditions Comparison

The following tables provide a comparison between existing and developed road flow conditions within George Street and Campbell Lane due to site contributions alone, up to and including the 10% AEP storm event.

Table 5.10: Road Conveyance Comparison (George Street)

Road Conditions	George Street Existing	George Street Developed	Difference (%)
Q (m ³ /s)	0.034	0.075	55
Depth (m)	0.087	0.117	26
Velocity (m/s)	0.087	0.143	39
Hazard (m ² /s)	0.008	0.017	53

Table 5.11: Road Conveyance Comparison (Campbell Lane)

Road Conditions	Campbell Lane Existing	Campbell Lane Developed	Difference (%)
Q (m ³ /s)	0.074	0.089	17
Depth (m)	0.049	0.054	9
Velocity (m/s)	0.425	0.450	6
Hazard (m ² /s)	0.021	0.024	13

The following conclusions may be drawn from the above local investigation:

- The proposed development is to increase flows within the adjoining road carriageways.
- Both road carriageways are considered to have sufficient capacity to convey additional development flows.
- Carriageway flow velocities and hazard are shown to increase however these values are nominal not considered to materially impact vehicle safety.

5.7 Stormwater Management Strategy

The proposed development is to achieve a lawful point of discharge via. kerb and channel discharge within George Street. Flows associated with the eastern end of the site are to sheet flow into Campbell Lane as per existing conditions.

It is noted that although peak site discharges were found to increase, site level constraints and the absence of municipal stormwater infrastructure within the vicinity of the site mean that on-site detention and underground treatment is not a practical solution for the site.

The road carriageways adjacent to the site are considered to have sufficient capacity to cater for the increase in peak site discharge in the minor storm event (10% AEP).

6 INTERPRETATION AND CONCLUSIONS

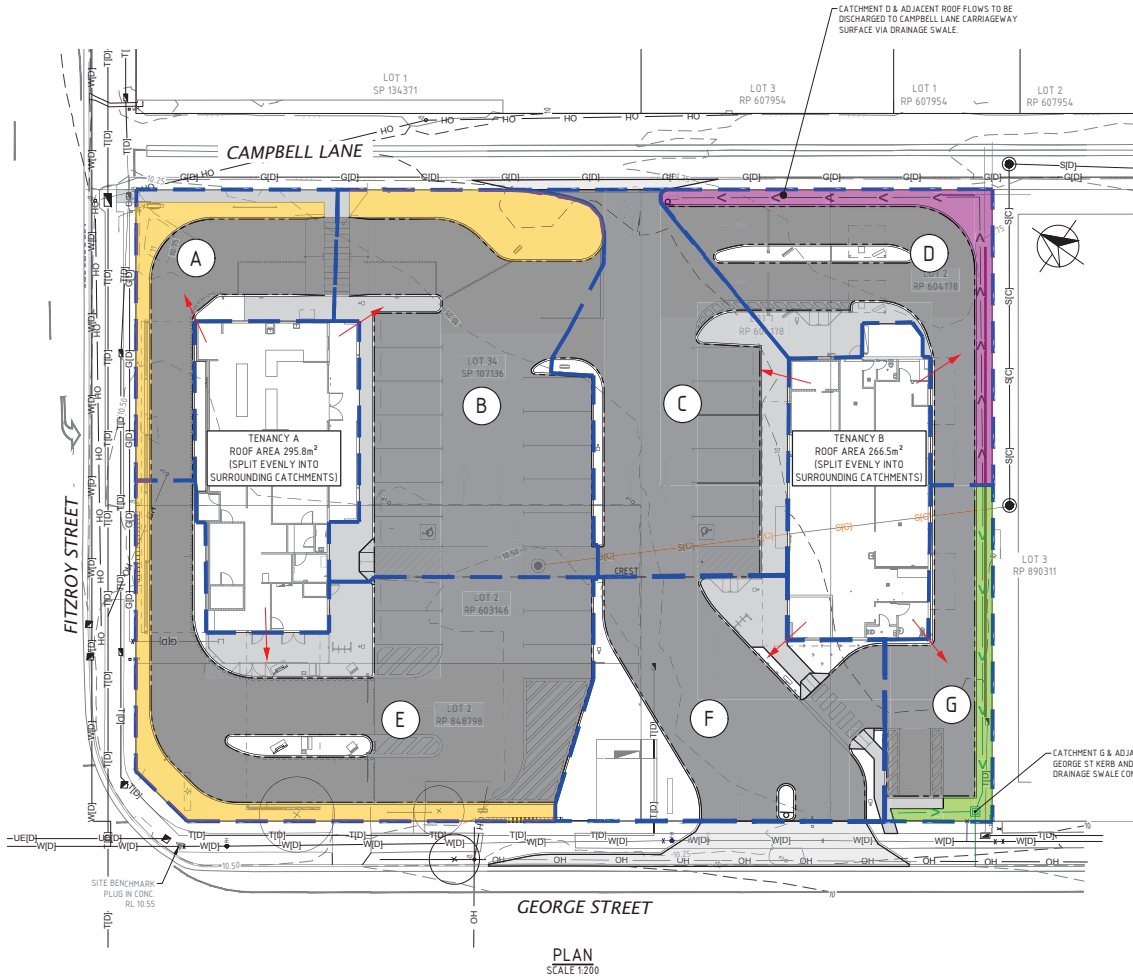
The proposed development is to achieve a lawful point of discharge via. kerb and channel discharge within George Street. Flows associated with the eastern end of the site are to sheet flow into Campbell Lane as per existing conditions. The adjoining road carriageways were found to have sufficient capacity to cater for development flows in the minor storm event (10% AEP).

The development is considered high risk with regards to stormwater quality but does not meet pollutant load reduction targets for assessable pollutants. A notable reduction is achieved in TSS and TP, with a lesser reduction in TN and GP considered to be due to the treatment limitations associated with vegetated swales, the reliance on landscaped buffers rather than drainage swales due to topographical constraints and the presence of sizeable free drain areas which cannot be drained to proposed drainage swales or landscaped areas.

Despite this, the proposed treatment system is considered to offer the most practical outcome for the development due to site level constraints and the absence of underground municipal stormwater drainage within the vicinity of the site.

Refer Appendix A for the proposed stormwater management layout.

APPENDIX A: PROPOSED DEVELOPEMNT LAYOUT



NOTE:
ALL SITE CATCHMENTS (WITH THE EXCEPTION OF D, G & ADJACENT ROOF AREAS) TO SHEET FLOW ACROSS VERGE INTO ADJACENT ROAD CARRIAGEWAYS.

MUSIC CATCHMENT PROPERTIES		
CATCHMENT NAME	AREA (HA)	FRACTION IMPERVIOUS (%)
A	0.932	80
B	0.069	80
C	0.048	80
D	0.040	80
E	0.078	80
F	0.050	60
G	0.025	80

- LEGEND
- 9.999 - - - - - EXISTING CONTOURS
 - PROPOSED STORMWATER DRAINAGE
 - PROPOSED SWALE
 - PROPOSED FOOTPATH
 - PROPOSED TRAFFICABLE PAVEMENT
 - PROPOSED CATCHMENT BOUNDARY
 - (A) DRAINAGE CATCHMENT NUMBER
 - CAMPBELL LANE SWALE
 - GEORGE STREET SWALE
 - LANDSCAPE BUFFER AREA

WORKPLACE HEALTH AND SAFETY NOTE:
ALL WORKS UNDERTAKEN BY THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORK HEALTH AND SAFETY ACT 2011. CONTACT THE NEAREST OFFICE OF THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE NO. 1300 362 128.

DIAL BEFORE YOU DIG:
THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY THE DESIGN.

EXISTING SERVICES NOTE:
THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION OR FIELD SURVEY, IF MADE AVAILABLE TO MNCE AT THE TIME OF DESIGN. THE LOCATION OF UNDERGROUND SERVICES ARE NOTED WITH THEIR RESPECTIVE CLASS IN ACCORDANCE WITH ASSAQB 2019, THE AUSTRALIAN STANDARDS FOR CLASSIFICATION OF SUBSURFACE UTILITY INFORMATION (SUI). NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE FURTHER SURVEY AND POT HOLING AS REQUIRED, TO CONFIRM THE NATURE AND LOCATION OF THESE SERVICES AND VERIFY THE DESIGN.



REV.	DESCRIPTION	DATE	INT.
A	PRELIMINARY ISSUE	23.02.23	SH

MILANOVIĆ NEALE CONSULTING ENGINEERS
BRISBANE PH No. (07) 3255 1877
IPSWICH PH No. (07) 3281 6603

CIVIL STRUCTURAL TRAFFIC PROJECT MANAGEMENT
SYDNEY PH No. 1300 827 901
GOLD COAST PH No. 1300 827 901

CONTACT DETAILS
E mail@mnce.com.au
W www.mnce.com.au
JAS-ANZ
SGS

CLIENT
PUGET SOUND PTY LTD

PROJECT
**87-93 FITZROY STREET,
ROCKHAMPTON**

TITLE
**STORMWATER QUALITY
CATCHMENT PLAN**

DRAWN	DESIGNED	DATE
SH	CFR	FEB 2023
CHECKED	APPROVED	
JHU		
DRAWING No.	REV	
C5656 - CD04	A	

APPENDIX B: MUSIC MODEL SUMMARY

	Treatment Train Effectiveness				
	Flow (ML/yr)	TSS (kg/yr)	TP (kg/yr)	TN (kg/yr)	Gross Pollutants (kg/yr)
Sources	2.48	519	1.38	7.88	63.8
Residual Load	2.48	230	0.851	6.34	51.5
% Reduction	0.0	55.6	38.1	19.6	19.4

APPENDIX C: RATIONAL METHOD CALCULATION SUMMARY



LEGEND:

TOTAL SITE AREA = 0.342ha

ROOF TO GEORGE STREET

A = 0.024

HARDSTAND TO GEORGE STREET

A = 0.064

VEGETATION TO GEORGE STREET

A = 0.012

ROOF TO CAMPBELL LANE

A = 0.008

HARDSTAND TO CAMPBELL LANE

A = 0.092

VEGETATION TO CAMPBELL LANE

A = 0.142



MILANOVIC NEALE
CONSULTING ENGINEERS

BRISBANE OFFICE
5/63 Annerley Road, Woolloongabba QLD 4102
PO Box 8380, Woolloongabba QLD 4102
T 07 3255 1877 F 07 3255 1878

IPSWICH OFFICE
18 Canning Street, North Ipswich QLD 4305
PO Box 2118, North Ipswich QLD 4305
T 07 3281 6603 F 07 3281 6602
W mncce.com.au ABN 68 678 825 458

EXISTING CATCHMENT AREAS PLAN

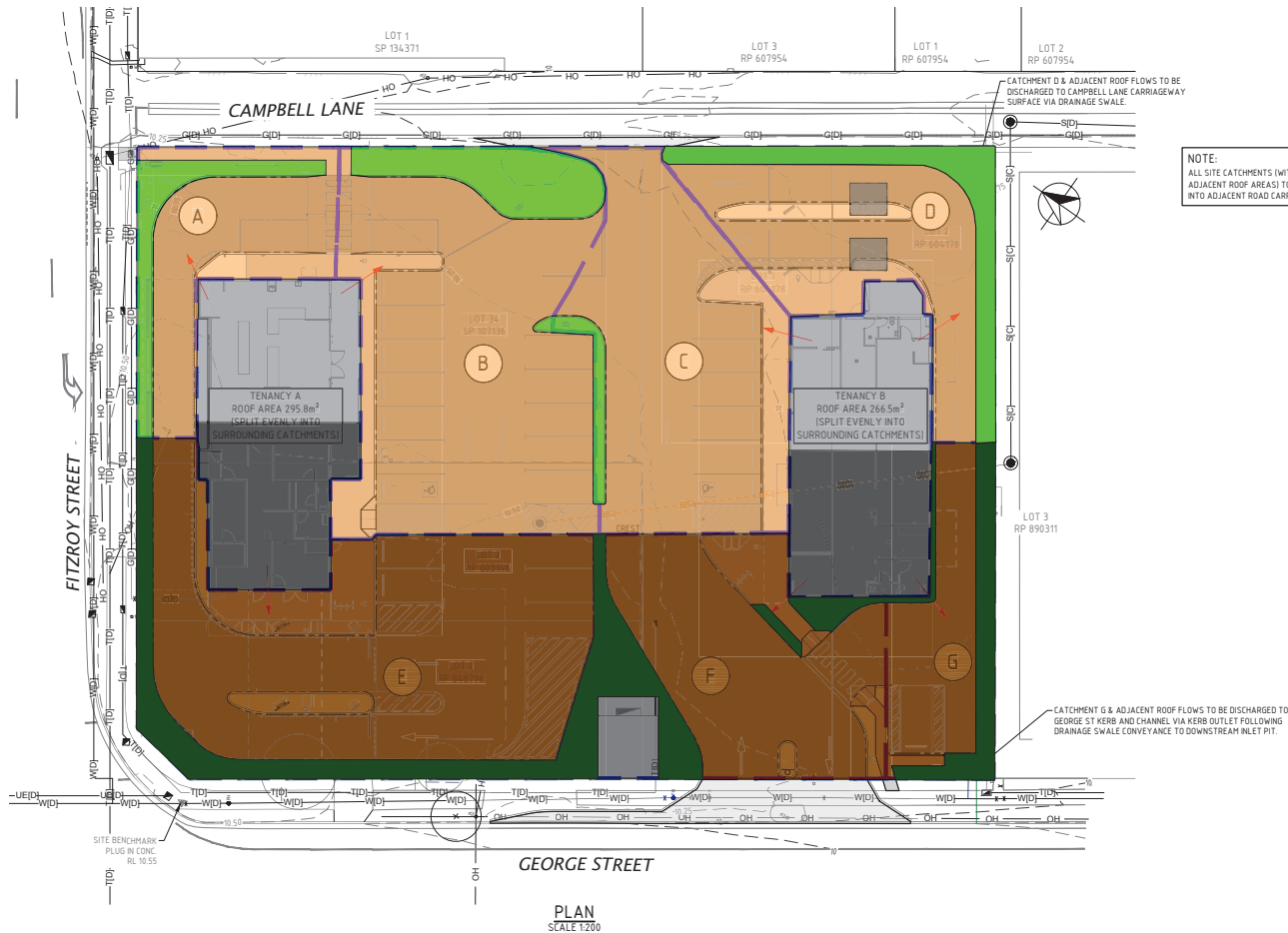
C5656-230222-SK01-REVA

DRAWN BY TE

DATE 22/02/2023

SCALE 1:200 @ A1

**NOT FOR
CONSTRUCTION**



NOTE:
ALL SITE CATCHMENTS (WITH THE EXCEPTION OF D, G & ADJACENT ROOF AREAS) TO SHEET FLOW ACROSS VERGE INTO ADJACENT ROAD CARRIAGEWAYS.

LEGEND:

ROOF TO GEORGE STREET
A = 0.031

HARDSTAND TO GEORGE STREET
A = 0.103

VEGETATION TO GEORGE STREET
A = 0.023

ROOF TO CAMPBELL LANE
A = 0.030

HARDSTAND TO CAMPBELL LANE
A = 0.133

VEGETATION TO CAMPBELL LANE
A = 0.022

WORKPLACE HEALTH AND SAFETY NOTE:
ALL WORKS UNDERTAKEN BY THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE QUEENSLAND WORK HEALTH AND SAFETY ACT 2011. CONTACT THE NEAREST OFFICE OF THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. PHONE NO. 1300 362 128.

DIAL BEFORE YOU DIG:
THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION. NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE POT HOLING TO VERIFY THE DESIGN.

EXISTING SERVICES NOTE:
THIS DESIGN HAS BEEN PREPARED BASED ON SERVICE AUTHORITY AS CONSTRUCTED INFORMATION OR FIELD SURVEY, IF MADE AVAILABLE TO MNCE AT THE TIME OF DESIGN. THE LOCATION OF UNDERGROUND SERVICES ARE NOTED WITH THEIR RESPECTIVE CLASS IN ACCORDANCE WITH ASSAQB 2019, THE AUSTRALIAN STANDARDS FOR CLASSIFICATION OF SUBSURFACE UTILITY INFORMATION (SUI). NO POT HOLING HAS BEEN UNDERTAKEN TO VERIFY EXISTING SERVICE LOCATIONS AND DEPTHS. IT IS THE CONTRACTORS RESPONSIBILITY TO UNDERTAKE FURTHER SURVEY AND POT HOLING AS REQUIRED, TO CONFIRM THE NATURE AND LOCATION OF THESE SERVICES AND VERIFY THE DESIGN.



REV.	DESCRIPTION	DATE	INIT.
A	PRELIMINARY ISSUE	23.02.23	SH

MILANOVIĆ NEALE CONSULTING ENGINEERS
BRISBANE PH No. (07) 3255 1877
IPSWICH PH No. (07) 3281 6603

CIVIL STRUCTURAL TRAFFIC PROJECT MANAGEMENT
SYDNEY PH No. 1300 827 901
GOLD COAST PH No. 1300 827 901

CONTACT DETAILS
E mail@mnce.com.au
W www.mnce.com.au

JAS-ANZ
SGS

CLIENT
PUGET SOUND PTY LTD

PROJECT
87-93 FITZROY STREET, ROCKHAMPTON

TITLE
PROPOSED CATCHMENT AREAS PLAN

DRAWN	DESIGNED	DATE
SH	CFR	FEB 2023
CHECKED	APPROVED	
JHU		
DRAWING No.	REV.	
C5656 - SK02	A	

RATIONAL METHOD CALCULATIONS - EXISTING SITE TO GEORGE STREET

Job Reference	C5656
Site Address	87-93 Fitzroy Street, Rockhampton
Council	Rockhampton Regional Council

Number of Sub-Catchments	3
Minor Storm Event	10% AEP (As per QUDM Table 7.02.1)
Major Storm Event	1% AEP (As per QUDM Table 7.02.1)

Subcatchment Summary Table				
Number	Catchment Name	Catchment Description	C₁₀	tc
1	Roof	Impervious Roof	0.90	15
2	Hardstand	Significant paved areas	0.88	15
3	Vegetation	Open Space (eg parks)	0.70	15

Site C₁₀ 0.86

Catchment Calculations (Major and Minor Storm ARI's)							
Number	Area	C10	I10	10% AEP	C100	I100	1% AEP
	<i>ha</i>		<i>mm/hr</i>	<i>m³/s</i>		<i>mm/hr</i>	<i>m³/s</i>
1	0.024	0.90	142	0.009	1.00	216	0.014
2	0.064	0.88	142	0.022	1.00	216	0.038
3	0.012	0.70	142	0.003	0.84	216	0.006

Total Runoff	Minor	0.034 m ³ /s
	Major	0.059 m ³ /s
Total Area		0.100 ha

Overland Flow Calculations	
Trunk SW Infrastructure	
Pipe Diameter	N/A m
Number of Pipes	
Grade	m/m
mannings	
Pipe Capacity	m ³ /s
Pipe Velocity	m/s
Capacity @ 3m/s	m ³ /s
Overland Flow	m ³ /s

Runoff Summary		
Freq.	Peak Discharge	
4 EY	0.008	m ³ /s
63% AEP	0.016	m ³ /s
39% AEP	0.019	m ³ /s
15% AEP	0.028	m ³ /s
10% AEP	0.034	m ³ /s
5% AEP	0.041	m ³ /s
2% AEP	0.052	m ³ /s
1% AEP	0.059	m ³ /s

RATIONAL METHOD CALCULATIONS - DEVELOPED SITE TO GEORGE STREET

Job Reference	C5656
Site Address	87-93 Fitzroy Street, Rockhampton
Council	Rockhampton Regional Council

Number of Sub-Catchments	3
Minor Storm Event	10% AEP (As per QUDM Table 7.02.1)
Major Storm Event	1% AEP (As per QUDM Table 7.02.1)

Subcatchment Summary Table				
Number	Catchment Name	Catchment Description	C ₁₀	tc
1	Roof	Impervious Roof	0.90	5
2	Hardstand	Significant paved areas	0.88	5
3	Vegetation	Open Space (eg parks)	0.70	5

Site C₁₀ 0.86

Catchment Calculations (Major and Minor Storm ARI's)							
Number	Area	C10	I10	10% AEP	C100	I100	1% AEP
	ha		mm/hr	m ³ /s		mm/hr	m ³ /s
1	0.031	0.90	200	0.016	1.00	300	0.026
2	0.103	0.88	200	0.050	1.00	300	0.086
3	0.023	0.70	200	0.009	0.84	300	0.016

Total Runoff	Minor	0.075 m ³ /s
	Major	0.128 m ³ /s
Total Area		0.157 ha

Overland Flow Calculations	
Trunk SW Infrastructure	
Pipe Diameter	N/A m
Number of Pipes	
Grade	m/m
mannings	
Pipe Capacity	m ³ /s
Pipe Velocity	m/s
Capacity @ 3m/s	m ³ /s
Overland Flow	m ³ /s

Runoff Summary		
Freq.	Peak Discharge	
4 EY	0.017	m ³ /s
63% AEP	0.034	m ³ /s
39% AEP	0.041	m ³ /s
15% AEP	0.060	m ³ /s
10% AEP	0.075	m ³ /s
5% AEP	0.090	m ³ /s
2% AEP	0.114	m ³ /s
1% AEP	0.128	m ³ /s

RATIONAL METHOD CALCULATIONS - EXISTING SITE TO CAMPBELL LANE

Job Reference	C5656
Site Address	87-93 Fitzroy Street, Rockhampton
Council	Rockhampton Regional Council

Number of Sub-Catchments	3
Minor Storm Event	10% AEP (As per QUDM Table 7.02.1)
Major Storm Event	1% AEP (As per QUDM Table 7.02.1)

Subcatchment Summary Table				
Number	Catchment Name	Catchment Description	C₁₀	tc
1	Roof	Impervious Roof	0.90	15
2	Hardstand	Significant paved areas	0.88	15
3	Vegetation	Open Space (eg parks)	0.70	15

Site C₁₀ 0.78

Catchment Calculations (Major and Minor Storm ARI's)							
Number	Area	C10	I10	10% AEP	C100	I100	1% AEP
	<i>ha</i>		<i>mm/hr</i>	<i>m³/s</i>		<i>mm/hr</i>	<i>m³/s</i>
1	0.008	0.90	142	0.003	1.00	216	0.005
2	0.092	0.88	142	0.032	1.00	216	0.055
3	0.142	0.70	142	0.039	0.84	216	0.072

Total Runoff	Minor	0.074 m ³ /s
	Major	0.132 m ³ /s
Total Area		0.242 ha

Overland Flow Calculations	
Trunk SW Infrastructure	
Pipe Diameter	N/A m
Number of Pipes	
Grade	m/m
mannings	
Pipe Capacity	m ³ /s
Pipe Velocity	m/s
Capacity @ 3m/s	m ³ /s
Overland Flow	m ³ /s

Runoff Summary		
Freq.	Peak Discharge	
4 EY	0.017	m ³ /s
63% AEP	0.034	m ³ /s
39% AEP	0.040	m ³ /s
15% AEP	0.060	m ³ /s
10% AEP	0.074	m ³ /s
5% AEP	0.089	m ³ /s
2% AEP	0.115	m ³ /s
1% AEP	0.132	m ³ /s

RATIONAL METHOD CALCULATIONS - DEVELOPED SITE TO CAMPBELL LANE

Job Reference	C5656
Site Address	87-93 Fitzroy Street, Rockhampton
Council	Rockhampton Regional Council

Number of Sub-Catchments	3
Minor Storm Event	10% AEP (As per QUDM Table 7.02.1)
Major Storm Event	1% AEP (As per QUDM Table 7.02.1)

Subcatchment Summary Table				
Number	Catchment Name	Catchment Description	C ₁₀	tc
1	Roof	Impervious Roof	0.90	5
2	Hardstand	Significant paved areas	0.88	5
3	Vegetation	Open Space (eg parks)	0.70	5

Site C₁₀ 0.86

Catchment Calculations (Major and Minor Storm ARI's)							
Number	Area	C10	I10	10% AEP	C100	I100	1% AEP
	ha		mm/hr	m ³ /s		mm/hr	m ³ /s
1	0.030	0.90	200	0.015	1.00	300	0.025
2	0.133	0.88	200	0.065	1.00	300	0.111
3	0.022	0.70	200	0.009	0.84	300	0.015

Total Runoff	Minor	0.089 m ³ /s
	Major	0.151 m ³ /s
Total Area		0.185 ha

Overland Flow Calculations	
Trunk SW Infrastructure	
Pipe Diameter	N/A m
Number of Pipes	
Grade	m/m
mannings	
Pipe Capacity	m ³ /s
Pipe Velocity	m/s
Capacity @ 3m/s	m ³ /s
Overland Flow	m ³ /s

Runoff Summary		
Freq.	Peak Discharge	
4 EY	0.020	m ³ /s
63% AEP	0.041	m ³ /s
39% AEP	0.048	m ³ /s
15% AEP	0.072	m ³ /s
10% AEP	0.089	m ³ /s
5% AEP	0.106	m ³ /s
2% AEP	0.135	m ³ /s
1% AEP	0.151	m ³ /s

APPENDIX D: ROAD CAPACITY CALCULATION SUMMARY

GEORGE STREET ROAD CAPACITY COMPARISON

83-91 FIT ROY STREET ROCKHAMPTON


OVERALL CONDITIONS

[illegible]

EXISTING CONDITIONS

[illegible]

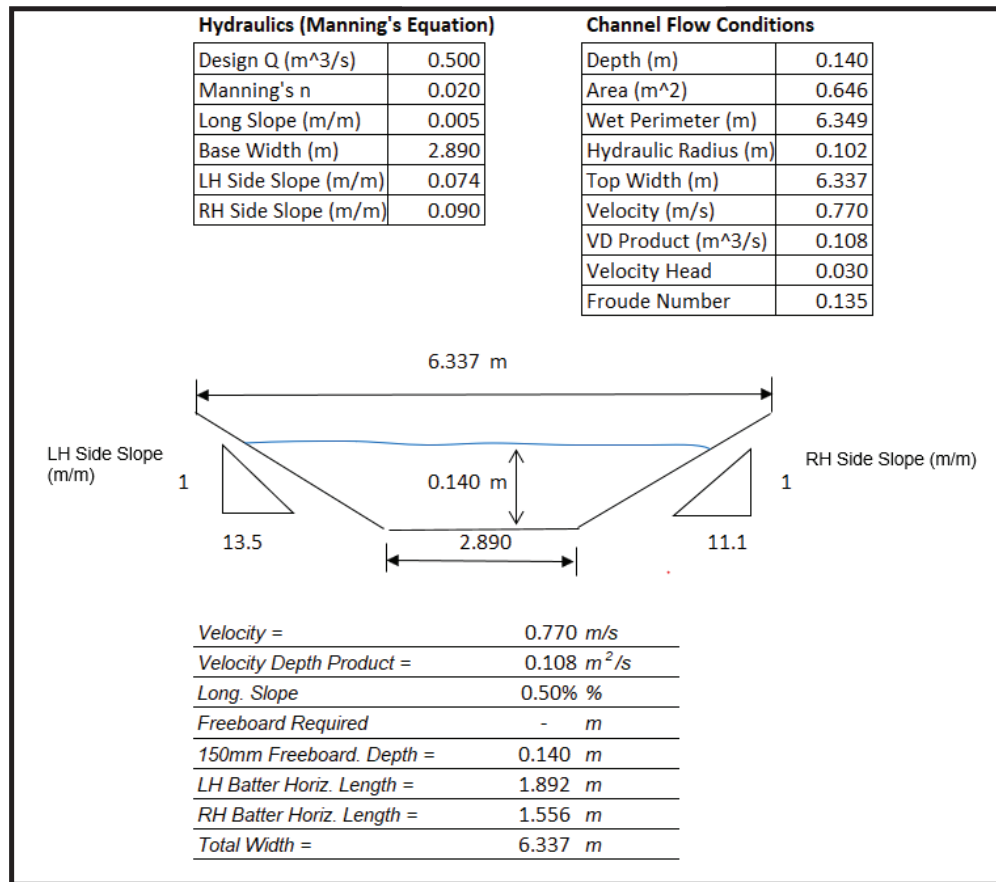
DEVELOPED CONDITIONS

Road Capacity of Roads with kerb and channel			
Izzards Equation			
QUDM EQUATION 7.03			
			
Flow Correction Factor (F)		0.9	
Cross slope gradient (Z)		16.2	1 in x
mannings roughness (n)		0.015	
long slope of road (S)		0.004	m/m
maximum depth of flow (d)		0.117	m
Road Width		9.039	m
Flow Area		0.529	m ²
Velocity		0.143	m/s
VDP		0.017	m ² /s
Capacity (Q)		0.075	m ³ /s

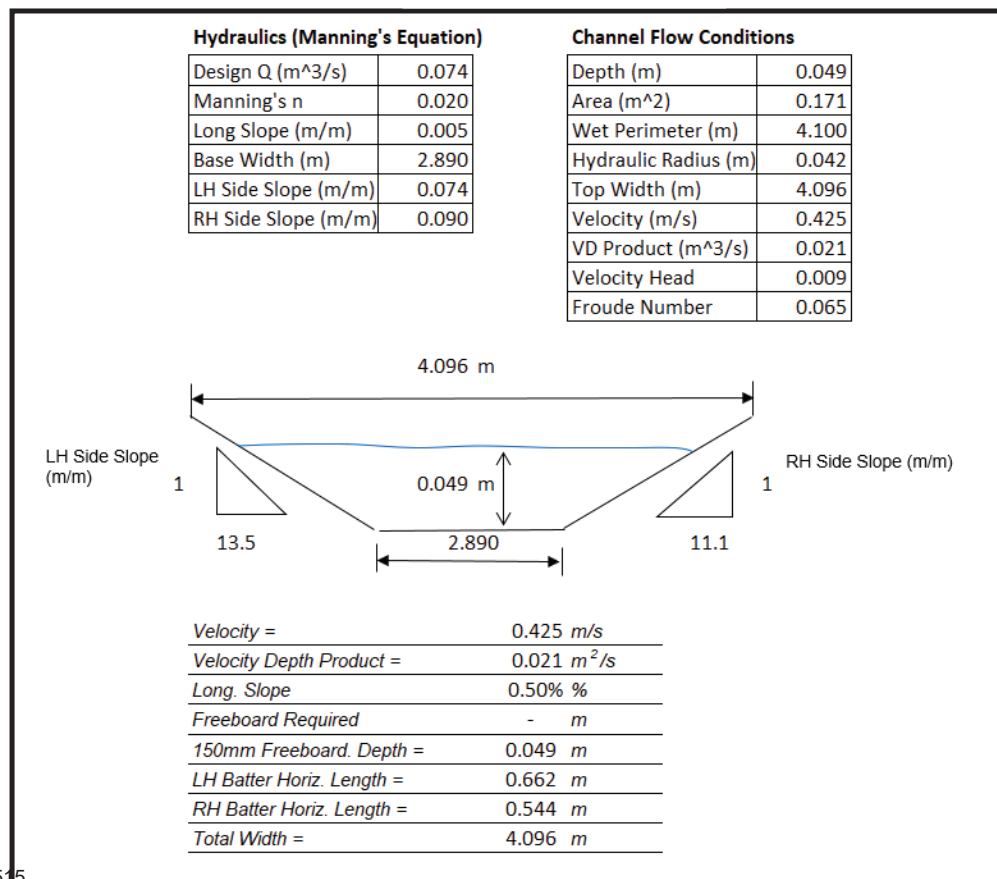
CAMPBELL LANE ROAD CAPACITY COMPARISON

83-91 FIT ROY STREET ROCKHAMPTON

OVERALL CONDITIONS



EXISTING CONDITIONS



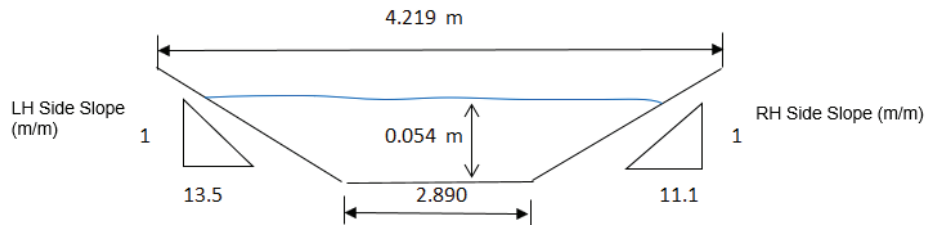
DEVELOPED CONDITIONS

Hydraulics (Manning's Equation)

Design Q (m ³ /s)	0.089
Manning's n	0.020
Long Slope (m/m)	0.005
Base Width (m)	2.890
LH Side Slope (m/m)	0.074
RH Side Slope (m/m)	0.090

Channel Flow Conditions

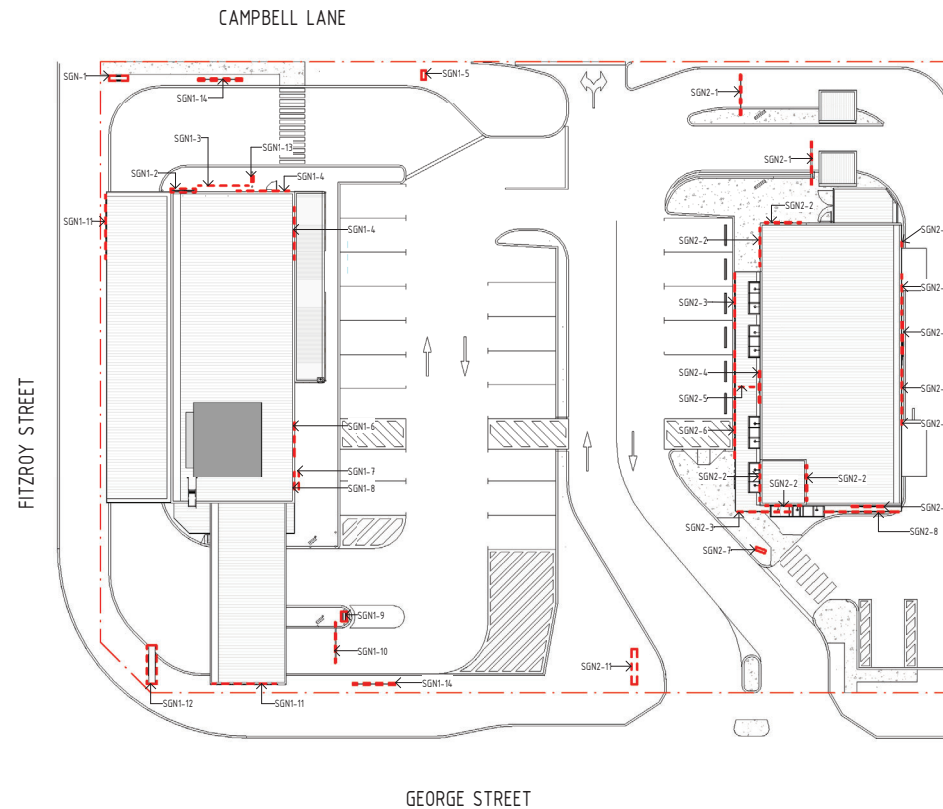
Depth (m)	0.054
Area (m ²)	0.192
Wet Perimeter (m)	4.224
Hydraulic Radius (m)	0.045
Top Width (m)	4.219
Velocity (m/s)	0.450
VD Product (m ³ /s)	0.024
Velocity Head	0.010
Froude Number	0.071



Velocity =	0.450 m/s
Velocity Depth Product =	0.024 m ² /s
Long. Slope	0.50% %
Freeboard Required	- m
150mm Freeboard. Depth =	0.054 m
LH Batter Horiz. Length =	0.730 m
RH Batter Horiz. Length =	0.600 m
Total Width =	4.219 m



DA ISSUE
THIS DRAWING IS NOT
FOR CONSTRUCTION



ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current
conditions of approval associated with
Development Permit No.: D/21-2022
Dated: 14 December 2022

VERVE SCHEDULES DISCLAIMER:

1. ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
2. SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
3. ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
4. ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

©2011 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and is not to be reproduced without written permission.

Do not scale this drawing.

Check all dimensions on site prior to construction of works.

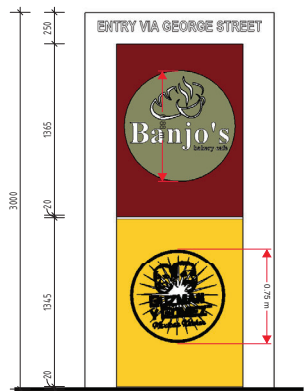
Revision and approvals				
Rev	Date	By	Description	Appr.
P1	10/01/2022	NR	PRELIMINARY ISSUE	
A	10/01/2022	NR	DA ISSUE	
B	01/01/2022	NR	REVISED DA ISSUE	
C	10/01/2022	NR	REVISED DA ISSUE	

Project Description	
PROP. MIXED USE DEVELOPMENT	
87 FITZROY ST, ROCKHAMPTON	
Scale: 0/1	Date: MAR 2022
Drawn: NR	Approved By: GR

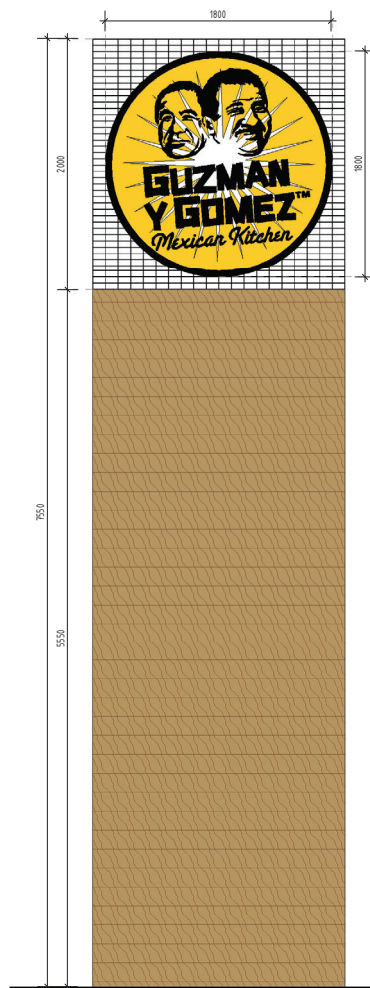
Drawing Title:
SIGNAGE PLAN

Job Number - Drawing Number	Revision
21185 Z010	C

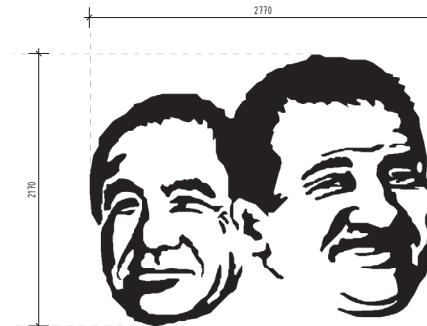
DA ISSUE
THIS DRAWING IS NOT
FOR CONSTRUCTION



1 SGN-1 - ILLUMINATED SHARED PYLON
1: 20



2 SGN1-2 - T1 ILLUMINATED SIGNAGE
1: 20



3 SGN1-3 - T1 NON-ILLUMINATED SIGNAGE
1: 20



4 SGN1-4 - T1 ILLUMINATED SIGNAGE
1: 20
2 OFF

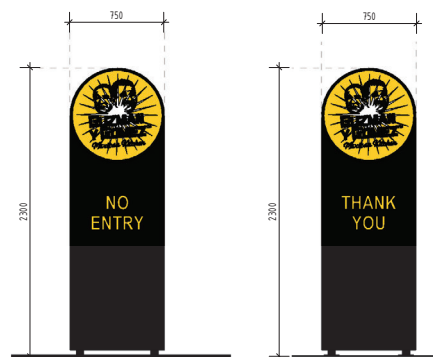
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

Dated: 14 December 2022



7 SGN1-5 - T1 ILLUMINATED DIRECTIONAL SIGNAGE
1: 20



6 SGN1-6 - T1 NON-ILLUMINATED SIGNAGE
1: 20

VERVE SCHEDULES DISCLAIMER:

- ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
- SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
- ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
- ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

©2011 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and is not to be reproduced or used in any form without the written consent of Verve Building Design Co.

Do not scale this drawing.

Check all dimensions on site prior to construction of works.

Revision and approvals

Rev	Date	By	Description	Appr.
1	10.05.2022	NR	PRELIMINARY ISSUE	
A	10.05.2022	NR	DA ISSUE	
B	10.05.2022	NR	REVISED DA ISSUE	

Project Description

PROP. MIXED USE DEVELOPMENT

87 FITZROY ST, ROCKHAMPTON

Scale: 0/1

1: 20

Drawn: NR

Date:

MAR 2022

Approved By:

GN

Drawing Title

EXTERNAL SIGNAGE DETAILS - T1

Job Number - Drawing Number

21185

Z011

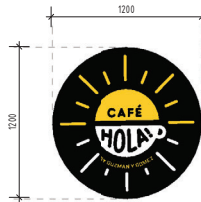
Revision

B

DA ISSUE
THIS DRAWING IS NOT
FOR CONSTRUCTION



1 SGN1-7 - T1 ILLUMINATED SIGNAGE
1 : 20



2 SGN1-8 - T1 ILLUMINATED SIGNAGE
1 : 20



3 SGN1-9 - T1 ILLUMINATED DIRECTIONAL SIGNAGE
1 : 20

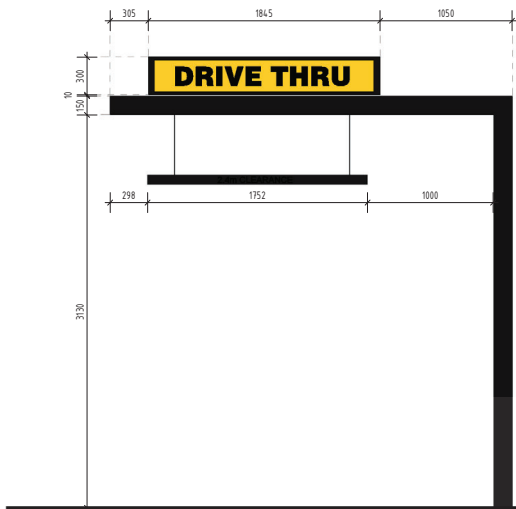
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

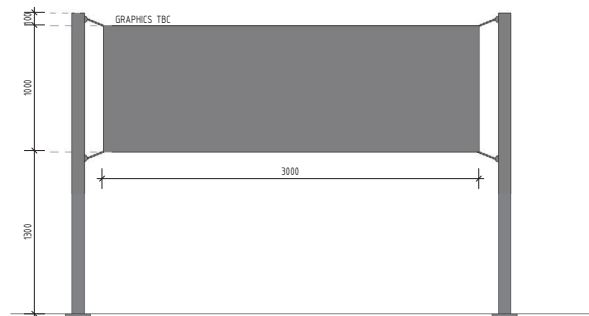
Dated: 14 December 2022



4 SGN1-10 - T1 ILLUMINATED D/THRU HT. BAR
1 : 20



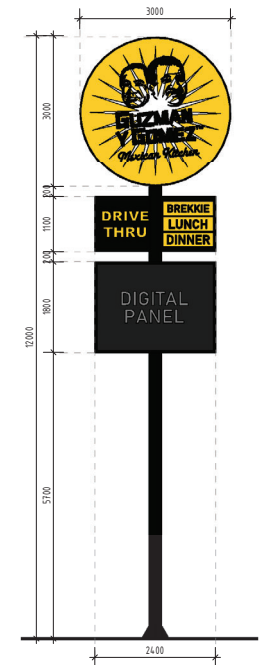
5 SGN1-11 - T1 ILLUMINATED SIGNAGE
1 : 20
2 OFF



9 SGN1-14 - T1 GRAPHIC SIGNAGE
1 : 20
2 OFF



8 SGN1-13 - T1 ILLUMINATED DIRECTIONAL SIGNAGE
1 : 20



6 SGN1-12 - T1 ILLUMINATED PYLON SIGN
1 : 50

VERVE SCHEDULES DISCLAIMER:

- ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
- SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
- ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
- ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

©2011 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and is not to be reproduced without the written permission of Verve Building Design Co.

Do not scale this drawing.

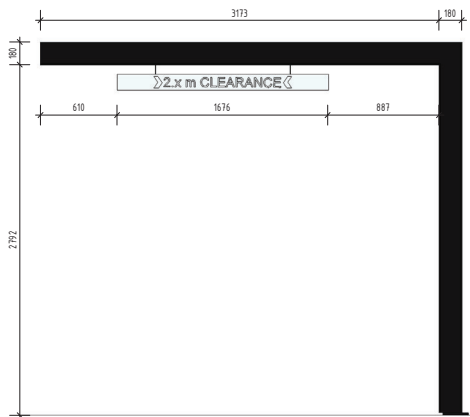
Check all dimensions on site prior to construction of works.

Revision and approvals				
Rev	Date	By	Description	Appr.
1	10.05.2022	NR	PRELIMINARY ISSUE	
A	10.05.2022	NR	DA ISSUE	
B	18.05.2022	NR	REVISED DA ISSUE	

Project Description	
PROP. MIXED USE DEVELOPMENT	
87 FITZROY ST, ROCKHAMPTON	
Scale: 0/1	Date: MAR 2022
Drawn: NR	Approved By: GR

Drawing Title	
EXTERNAL SIGNAGE DETAILS - T1	
Job Number - Drawing Number	Revision
21185	2012 B

DA ISSUE
THIS DRAWING IS NOT
FOR CONSTRUCTION



1 SGN2-1 - T2 NON-ILLUMINATED SIGNAGE
1: 20



2 SGN2-2 - T2 ILLUMINATED SIGNAGE
1: 20
5 OFF



3 SGN2-3 - T2 ILLUMINATED SIGNAGE
1: 20
2 OFF



4 SGN2-4 - T2 ILLUMINATED SIGNAGE
1: 20
3 OFF



5 SGN2-5 - T2 NON-ILLUMINATED SIGNAGE
1: 20



7 SGN2-7 - T2 ILLUMINATED DIRECTIONAL SIGNAGE
1: 20



6 SGN2-6 - T2 ILLUMINATED SIGNAGE
1: 20

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/21-2022

Dated: 14 December 2022

VERVE SCHEDULES DISCLAIMER:

- ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
- SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
- ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
- ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

© 2022 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and must not be copied or reproduced without authorisation.

Do not scale this drawing.

Check all dimensions on site prior to construction of works.

Revision and approvals

Rev	Date	By	Description	Appr.
1	10.05.2022	NR	PRELIMINARY ISSUE	
2	10.05.2022	NR	DA ISSUE	
3				
4				
5				
6				

Project Description

PROP. MIXED USE DEVELOPMENT
87 FITZROY ST, ROCKHAMPTON
Scale: 0/1
1: 20
Drawn: NR
Date: MAR 2022
Approved By: GR

Drawing Title

EXTERANL SIGNAGE DETAILS
- T2
Job Number - Drawing Number
21185 2013
Revision
A

DA ISSUE
THIS DRAWING IS NOT
FOR CONSTRUCTION



1 SGN2-8 - T2 ILLUMINATED SIGNAGE
1: 20



2 SGN2-9 - T2 ILLUMINATED SIGNAGE
1: 20



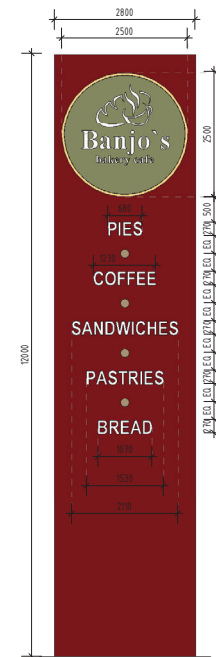
3 SGN2-10 - T2 ILLUMINATED SIGNAGE
1: 20



5 SGN2-11 - T2 ILLUMINATED SIGNAGE
1: 20



6 SGN2-12 - T2 ILLUMINATED SIGNAGE
1: 20



4 SGN2-13 - T2 ILLUMINATED PYLON SIGN
1: 50

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current
conditions of approval associated with
Development Permit No.: D/21-2022
Dated: 14 December 2022

VERVE SCHEDULES DISCLAIMER:

- ALL SCHEDULES SHOULD BE CHECKED WITH THE REMAINDER OF THE DRAWING SET.
- SCHEDULED RATES AND AREAS ARE INTENDED FOR ASSISTANCE ONLY. NO RESPONSIBILITY IS TAKEN FOR THE ACCURACY OF QUANTITIES.
- ANY DISCREPANCIES IN SCHEDULES SHOULD BE IDENTIFIED TO THE AUTHOR NOTED.
- ALL AREAS ARE GROSS AREAS, UNLESS NOTED OTHERWISE.

CONSULTING ENGINEER



- commercial / industrial / retail
- fast food restaurant design
- travel centre / service stations
- project concept to completion

© 2022 copyright, all rights reserved.

This drawing is the property of Verve Building Design Co. and must not be copied or reproduced without authorisation.

Do not scale this drawing.

Check all dimensions on site prior to construction of works.

Revision and approvals

Rev	Date	By	Description	Appr.
1	10.01.2022	NR	PRELIMINARY ISSUE	
2	10.01.2022	NR	DA ISSUE	
3				
4				
5				
6				

Project Description

PROP. MIXED USE DEVELOPMENT
87 FITZROY ST, ROCKHAMPTON
Scale: 0/1 As indicated
Drawn: NR
Date: MAR 2022
Approved By: GR

Drawing Title

EXTERNAL SIGNAGE DETAILS - T2
Job Number - Drawing Number
21185 2014
Revision
A