

1 LOCATION PLAN

ROCKHAMPTON REGIONAL COUNCIL

AMENDED PLANS APPROVED

31 May 2024

DATE

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

Development Permit No.: D/106-2023

Dated: 7 November 2023

DEVELOPMENT INFORMATION				
BERSERKER TAVERN 368 DEAN STREET NORTH ROCKHAMPTON 4702 QLD				
SITE AREA	6,524 m ²			
DEVELOPMENT AREA				
EXISTING GFA	1,418 m ²			
PROPOSED GFA	1,429 m ²			
CAR PARKING	4			
EXISTING (INC PWD)	103 (5 PWD)			
PROPOSED (INC PWD) 89 (4 PWD)				
DRAWING LIS	ST			
A-DA-0000 COVER PAGE	6 19.02.2	24		
A-DA-0001 SITE PLAN	5 19.02.2	24		
A-DA-0002 AREA PLAN	5 19.02.2	24		
A-DA-1100 GROUND LEVEL FLOOR PLAN	6 19.02.2	24		
A-DA-1101 ROOF PLAN	5 19.02.2	24		
A-DA-2001 SECTION	4 19.02.2	:4		
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BERSERKER TAVERN 368 Dean St, North Rockhampton QLD 4702



Project Number 220613



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Revision 6







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1 AREA PLAN - EXISTING GROUND FLOOR 1:200



AREA SCHEDULE (EXISTING CONDITION) GFA OUTDOOR EXISTING GROUND FLOOR 1,280m² 73m² LEVEL ONE 138m² TOTAL: 1,418m²

3 AREA PLAN - EXISTING LEVEL 1 PLAN 1:200

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EXISTING OUTDOOR AREA



PROPOSED ADDITIONAL GFA



Iss. Appr. JR PW JR PW JR PW JR PW LE PW

 Date
 Description

 26.07.2023
 DA DRAFT

 01.08.2023
 DA ISSUE

 02.08.2023
 DA ISSUE

 03.08.2023
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 19.02.24
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2 AREA PLAN - PROPOSED 1:200

AREA SCHEDULE (PROPOSED SCHEME)				
	GFA	OUTDOOR		
EXISTING GFA TO REMAIN	1,418m ²			
PROPOSED ADDITIONAL GFA	11m ²			
TOTAL GFA 1,429m ²				
EXISTING CONVERTING TO OUTDOOR AREA		73m ²		
PROPOSED OUTDOOR EXTENSION				
GROUND FLOOR		379m ²		
TOTAL OUTDOOR AREA: 452m ²				

GRAND TOTAL: 1,881m²





Project Number 220613

ROCKHAMPTON REGIONAL COUNCIL AMENDED PLANS APPROVED 31 May 2024 DATE These plans are approved subject to the current conditions of approval associated with **Development Permit No.:** D/106-2023 **Dated:** 7 November 2023





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	26.07.2023	DA DRAFT	JR	PW
	19.02.24	DA AMENDMENT DRAFT	LE	PW

Project Number 220613









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BERSERKER TAVERN, 368 DEAN STREET

Traffic Impact Assessment

ROCKHAMPTON REGIONAL COUNCIL

MENDED PLANS APPROVED

31 May 2024

DATE

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

Development Permit No.: D/106-2023

Dated: 7 November 2023

DATE 8 March 2024 REF R040-22-23 CLIENT The Berserker Tavern COMMERCIAL IN CONFIDENCE

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Document Information		
Prepared for	The Berserker Tavern	
Document Name	Traffic Impact Assessment	
Job Reference	R040-22-23	
Revision	3	

Document History						
Revision	Date Description of Revision	Prepared	Approved by			
			by	Name	Signature	RPEQ No
1	21/02/2023	DRAFT	Chris Hewitt	Chris Hewitt		
2	04/08/2023	FINAL	Chris Hewitt	Chris Hewitt		
3	08/03/2024	CHANGE	Chris Hewitt	Chris Hewitt		

NOTE - It is acknowledged that there may be some minor discrepancies between the architectural layouts provided in this report and the associated architectural documentation. Whilst not ideal, the minor layout discrepancies should form no material impact to the proposed development from an engineering assessment perspective. Conservative engineering principals have been applied to the afforded earthworks areas, stormwater intent and servicing. As such, any concern should be suitable for conditioning as part of the detailed design process (i.e. finalised in Operational Works stage).

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1 Introduction

1.1 Background

McMurtrie Consulting Engineers (MCE) have been engaged by the Berserker Tavern in Frenchville to prepare a Traffic Impact Assessment for its proposed refurbishment and extension.

This report forms part of a change application to be lodged with the Rockhampton Regional Council (RRC). An approval for an extension of the existing tavern over the subject site has been issued in November 2023.

The following issues have been addressed as part of the study:

- Adequacy of the proposed car parking supply;
- The proposed car parking layout and design;
- Site access arrangements;
- Provision for service vehicle access;
- Provision for safe access by cyclists and pedestrians;
- Potential impact upon the local road network.

1.2 References

In preparing this report, reference has been made to the following:

- Rockhampton Region Planning Scheme;
- Queensland Globe Database (Online);
- Australian / New Zealand Standard, Parking Facilities, Part 1: Off-Street Car parking AS/ NZS 2890.1:2004;
- Australian / New Zealand Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS/ NZS 2890.2:2018;
- Australian / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with a Disability AS/ NZS 2890.6:2009;
- Austroads Guide to Road Design;
- Austroads Guide to Road Safety;
- Nearmap;
- Other documents and data as referenced in the report.

2 Site Environs

2.1 Subject Site

As shown in Figure 2.1, the subject site is located on the eastern side of the Dean Street / Gair Street intersection, and provides frontage to both Dean Street along the western frontage and Diplock Street along the eastern. The site gains access via three separate crossovers, two off Dean Street and one off Diplock Street.

The site is formally identified as Lot 1 on RP890077 and has an area of approximately 6,524 m². As shown in Figure 2.2, the site is located within the Local Centre Zone. The site is currently occupied by a tavern and liquor shop.



Figure 2.1: Location of subject site [Source: Nearmap]



Figure 2.2: Development planning overlay [Source: Rockhampton Planning Scheme]

2.2 Road Network

As shown in Figure 2.3, the subject site is bound by Dean Street and Diplock Street. As shown, Dean Street has an urban arterial road function and is subject to a posted speed limit of 60 km/hr. Adjacent to the site Dean Street provides dual through traffic lanes in both directions, with a dedicated right turn lane to Gair Street. Access to the site is restricted to left in / left out movements, with a raised median along the frontage of the northern crossover and painted chevron along the southern crossover (Figure 2.4).

Diplock Street has an urban access street function along the frontage of the site and is subject to a speed limit of 50km/hr. Diplock Street comprises of a single unmarked carriageway, facilitating two-way movement, with on-street car parking generally available along both sides. A single point of access is provided off Diplock Street at the northern end of the frontage (Figure 2.5).

Street view images of Dean Street and Diplock Street along the frontage of the site are shown in Figures 2.6 and 2.7.



Figure 2.3: Local road network [Source: Rockhampton Planning Scheme]



Figure 2.4: Aerial image of the Dean Street / Gair Street intersection and access points off Dean Street [Source: Nearmap]



Figure 2.5: Aerial image of Diplock Street / Limpus Street intersection and access points off Diplock Street [Source: Nearmap]



Figure 2.6: Dean Street along the frontage of the site [Source: Google Street View]



Figure 2.7: Diplock Street along the frontage of the site [Source: Google Street View]

2.3 Integrated Transport Infrastructure

2.3.1 Public Transport

As shown in Figure 2.8, there are 7 bus stops within comfortable walking distance (400 metres) of the subject site. The bus stops located in the immediate vicinity of the site are serviced on a regular basis, generally every 30 minutes to an hour throughout the day.



Figure 2.8: Bus stops in the vicinity of subject site [Source: Google Maps]

2.3.2 Pedestrian and Cyclist Infrastructure

Pedestrian and cyclist infrastructure is well established adjacent to the site. As shown in Figure 2.9, there are both bicycle and pedestrian paths provided on Dean Street frontage which connect to the wider active transport network.



Figure 2.9: Pedestrian and cyclist infrastructure in the vicinity of subject site [Source: Nearmap]

2.4 Background Traffic Volumes

2.4.1 Annual Average Traffic Data

Annual Average Traffic Data (AADT) for Dean Street was provided by the Rockhampton Regional Council for year 2020. The AADT survey has been carried out 280m south of the subject site, with the approximate location of the traffic count shown in Figure 2.10 below with daily volumes and peak hour traffic estimates presented in Table 2.1.



Figure 2.10 - Location of surveyed daily traffic

Table 2.1: Surveyed traffic volumes

Dean Street (Opposite Nr. 336)	Vehicles Per Day (VPD) (year 2020)	Peak Hour (vehicles per hour - vph) (morning & afternoon)*
AADT	8838 vpd	900 vph
Northbound	4342 vpd	450 vph
Southbound	4495 vpd	450 vph

*Peak hour volumes are estimated as approximately 10% of daily traffic.

2.4.2 Future Background Estimates

Future traffic conditions along the frontage of the site have been estimated through application of a 1.5% compounded growth factor from the survey traffic conditions in year 2020. This is based on the data provided in the Table 26 of the Rockhampton Traffic Study 2008 prepared by Arup in 2008 (shown in Figure 2.11).

As shown below, the future traffic forecast indicates a relatively low growth rate from the 2005 traffic conditions, generally less than 1.5%. On this basis it is considered that the assessment based on a growth factory of 1.5% will result in a conservative (high) estimate of background demand along the frontage of the site.

Rockhan	npton Regional Council			Rockhampt	on Traffic Study 2008 Final Report
	Table 26 – Fo	orecast Future Year Tr	avel Demand		
	Year	City Plan	Scenario	Parkhurst Acce Scen	lerated Growth ario
		Demand	Per Annum Growth from 2005	Demand	Per Annum Growth from 2005
	2005	285,967	-	285,967	
	2011	312,708	1.5%	312,375	1.5%
	2016	327,046	1.2%	338,002	1.5%
	2021	343,885	1.2%	377,120	1.7%

Figure 2.11 - Forecast future year travel demand

(Source: Rockhampton Traffic Study 2008)

Based on the above, the background traffic estimate along the Dean Street frontage is in the order of 9,380 and 10,886 daily trips at the anticipated completion year (year 2024) and 10 year design horizon (year 2034) as show below.

Table 2.2: Future traffic estimates

Dean Street @ 1.5% p.a. (Future Estimate)	Year 2024	Year 2034
AADT (vpd)	9,380 vpd	10,886 vpd
Peak Hour (vph)	950 vph	1,000 vph

3 Development Proposal

3.1 Land Uses

The proposed plan of development is for the refurbishment and extension of the existing tavern, with the drive-thru liquor shop proposed to be retained along the Dean Street frontage. The proposal results in a net increase in gross floor area of $11m^2$, with the change in the internal use area resulting in an increase in outdoor use to $452m^2$ as follows:

Table 3.1 - Development Summary

	GFA	OUTDOOF
EXISTING GFA TO REMAIN	1,418m ²	
PROPOSED ADDITIONAL GFA	11m ²	1
TOTAL GFA	1,4	429m ²
EXISTING CONVERTING TO OUTDOOR AREA	_	73m ²
PROPOSED OUTDOOR EXTENSI	ON	
GROUND FLOOR		379m ²
TOTAL OUTDOOR AREA:	45	2m ²

It is noted that the proposal includes light refurbishment of internal bistro, sports bar and gaming areas, with a summary of specific use areas in comparison to existing provided as follows:

	Existing	Proposed
Liquorland (drive-thru)	186.83m ²	No Change
Sports Bar:	200m ²	No Change
Gaming:	85m ²	No Change
Bistro:	44m ²	No Change
Beer Garden:	n/a	452m ²
TOTAL:	515.83m ²	967.83m ²

It is noted that the current approval over the site includes a beer garden extension equating to an area of 450m². The resultant change in use area against the current approval over the site is therefore relatively small (2m²) and is not expected to result in significant change in the approved outcomes in relation to transport, access, parking and servicing matters.

A plan of the proposed development is shown in Figures 3.1 and 3.2, with a comparison of proposed uses against the existing building configuration shown in Figure 3.3.

3.2 Vehicle Access

It is proposed that access from both frontages will be retained, with the arrangements off Dean Street reconfigured so that the northern crossover only facilitates entry movements to the drive-thru liquor shop. The southern access will be retained and will function as the primary access to the site, with secondary access gained from Diplock Street. Vehicular movements along Dean Street are proposed to be restricted to left in / left out, with all movements permitted at Diplock Street. Street.

3.3 Car Parking

The proposed development will provide a total of 89 parking spaces, as follows:

Existing parking supply:	103 spaces (inc. 5x PWD spaces)
Proposed parking supply:	89 spaces (inc. 4x PWD spaces)

3.4 Pedestrian and Cyclist Facilities

Pedestrian and cyclist facilities on both site frontages will be retained. Access crossovers will be designed with appropriate sight splays to ensure pedestrians are visible to cars entering and exiting the site. A separate pedestrian path is proposed to be provided adjacent to the southern crossover off Dean Street to facilitate safe pedestrian passage from the frontage road.



Figure 3.1: Proposed plan of development (overall plan)



Figure 3.2 Proposed plan of development (internal layout)



Figure 3.3: Land use comparison summary

4 Car Parking Layout and Design

4.1 Statutory Requirement

The car parking rates for various development types are set out in Table 9.3.1.3.2 - Parking requirements of the Rockhampton Regional Council Planning Scheme. The following car parking rate is applicable for the proposed use:

Shop:	Four (4) spaces per 100m ² of non-residential Gross Floor Area (GFA)
Hotel (Tavern):	Five (5) spaces per 100m ² of Gross Floor Area (GFA)
	Provision for ten (10) vehicles in drive-thru

Application of the above rates to the proposed plan of development results in an Acceptable Outcome of 48 car parking spaces as shown below in Table 4.1.

Description	Use / scale	Statutory Parking Rate	Acceptable Outcome for Car Parking
Shop	GFA (186.83m²)	4 spaces per 100m ²	8 (7.47) spaces
Tavern	GFA (781m²)	5 spaces per 100m ²	40 (39.05) spaces
TOTAL			48 spaces

Table 4.1: Statutory Requirement for car parking (Rockhampton Planning Scheme)

The proposal provides a total of 89 car parking spaces including 4 x space for people with a disability. The proposal therefore satisfies Council's Acceptable Outcome for car parking.

4.2 Car Parking Design

The geometric layout of the proposed car parking has been designed to comply with the relevant requirements specified in AS2890.1:2004, in respect to parking bay dimensions and aisle widths. The proposed car parking provides the following dimensions and characteristics:

Table 4.2: Parking Layout and Geometry

Design Element	Required	Supplied	Compliance
General parking (User Class 3)	2.6m wide x 5.4m long	2.6m wide x 5.4m long (generally)	Compliant
Disabled Parking	2.4m wide x 5.4m long, plus shared zone	2.6m wide x 5.4m long, plus Shared zone	Non-compliant
Aisle Width Circulation width (2 way) Circulation width (1 way)	5.8 metres 5.5 metres 3.6 metres	> 5.8 metres> 5.5 metres> 3.6 metres	Compliant Compliant Compliant
Internal Driveway Grades	1:20 maximum for the first 6 metres into the site	1:20 for the first 6 metres	Compliant
Internal Car Parking Grades (car parking module)	1:20 measured parallel to the angle of the parking space or 1:16 in all other directions	1:20 measured parallel to the angle of the parking space or 1:16 in all other directions	Compliant

As demonstrated in Table 4.2, the geometric layout of the proposed parking facilities is compliant with the requirements of the Australian Standards. As shown in Figure 4.1, it is proposed that the internal parking arrangements at the rear will be modified to suit the modified building layout.

It is proposed that signage and linemarking will be implemented at the drive-thru liquor shop to formalise the internal arrangements, achieving a formal drop off facility adjacent to the beer garden and a standing position for four (4) cars within the drive-thru bottle shop. Given the excess of parking provided on site, additional spaces for overflow drive-thru demand can be nominated at the southern driveway. Concept plan of the proposed arrangement is shown in Figure 4.2.

A swept path analysis has been prepared for the proposed parking arrangements using AutoTurn software. As shown in Figures 4.3 and 4.4, the proposed parking arrangements allow satisfactory manoeuvring for the 85th percentile design vehicle, with the drive-thru designed appropriately to facilitate a large car (B99).

4.3 Provision for Queuing

In accordance with Table 3.3 of AS2890.1:2004, the proposal should allow queuing for up to two vehicles or 3% of the total car parking supply for up to 100 spaces (whichever is greater). Based on this, the proposal should allow for queuing for up to two vehicles between the boundary and first conflict point. The proposed design comfortably allows a minimum of one vehicle to queue within the boundary at each access point satisfying the minimum requirements for a car park of this scale.



Figure 4.1: Proposed modified parking arrangements (overall plan)

Engineering reimagined.



Figure 4.2: Proposed drive-thru / drop off arrangements



Figure 4.3: Swept path of 85th percentile vehicle (car parking)

Engineering reimagined.



Figure 4.4: Swept path of a car (B99) manoeuvring drive-thru liquor and drop off bay

5 Traffic Impact

5.1 Traffic Generation

Given that the site is currently occupied, it is already generating traffic and any additional demand added to the network by the proposal will only be a difference in trips between the current and proposed uses. For the purposes of the analysis traffic generation rates for the proposed and existing uses have been based on the rates prescribed in the RMS Guide to Traffic Generating Development and Appendix 3A of the TMR Road Planning and Design Manual (RPDM).

It is noted that a specific traffic generation rate is not prescribed for a liquor store, therefore a 'shop rate' has been applied for the purposes of the assessment. The following trip generation rates are considered to be applicable to the proposed uses:

Restaurant / Bar Peak Hour: 5 trips per 100m²

Shop / Drive-Thru F & B Peak Hour: 12.5 trips per 100m²

Application of the above rates to the respective uses results in a peak hour traffic generation estimate of 64 trips, as shown below in Table 5.1

Table 5.1 - Estimated development traffic generation

Component	Peak Hour E	Estimates		
	In	Out	Total	
Drive Thru F&B (186.83m²)	12	12	24	
Bar (781m²)	28	12	40	
TOTAL	40	24	64	

Peak Hour distribution: Bar: PM: 70/30, F&B (Drive-Thru): 50/50

5.2 Traffic Distribution

Based on the location of the site and the configuration of the access arrangements in the context of the surrounding road network, it is expected that traffic to and from the site will distribute throughout the network as shown in Figure 5.1, with peak hour development traffic estimates at each access point shown in Figure 5.2.



Figure 5.1: Development traffic distribution



Figure 5.2: Development traffic estimates

5.3 Intersection Capacity

Whilst the resultant impact of the proposal will be negligible, given the change in traffic movements at the Dean Street crossovers, a capacity analysis has been carried out at the southern access. This is due to the intensification of traffic movements on the basis that the southern access is intended to facilitate primary access to the tavern, with the northern access reduced to only facilitate access to the drive-thru liquor shop. A secondary access to the tavern will be retained via Diplock Street.

The analysis has been carried out using SIDRA software in accordance with the Guide to Traffic Impact Assessment (GTIA 2018). As shown below in Figure 5.3, the analysis has been carried out for the estimated traffic conditions at the anticipated completion year of the project (year 2024) and future background (year 2034) design traffic estimates.





The primary access off Dean Street has been assessed based on the design traffic conditions shown in Figure 5.2, under the 2024 and 2034 traffic conditions. A summary of the results based on the below criteria is provided in Table 5.2 with detailed results of the assessment shown as Appendix A:

- 2024 Peak design traffic estimates (with development);
- 2034 Peak design traffic estimates (with development);

Table 5.2: SIDRA results summary (Dean Street / Southern Access intersection)

Scenario	Degree of Saturation	Level of Service	Total Average Delay - SB Approach (seconds)	Queue Length - SB Approach (metres)
DESIGN TRAFFIC ESTIMATES				
2024 Peak [W dev]	0.142	А	9.8	0.0
2034 Peak [W dev]	0.149	А	9.8	0.0

As shown above, the result of the analysis indicates that the proposal will have negligible impact on the operation of the frontage road, with minimal delays and queuing on the southbound approach on Dean Street under both 2024 and 2034 conditions.

6 Access and mobility management

6.1 Access Location

The proposal provides access via both frontages, with the Dean Street access reconfigured to facilitate access to the drive-thru via the northern crossover and primary access to the tavern at the southern. It is proposed that the primary access off Dean Street will be restricted to left in / left out movements, with all movements maintained at the Diplock Street access.

6.2 Access Design

A turn warrants analysis has been carried out at the modified entry configuration from Dean Street in accordance with Austroads Guide to Traffic Management Part 6. The assessment has been based on resultant future peak hour design traffic estimates at the expected commencement year of the proposal (year 2024) and 10 year design horizon (year 2034).

As shown in Figure 6.1, in accordance with Austroads Guide to Traffic Management Part 6, the left turn demand from Dean Street warrants Basic Left Turn (BAL) treatments at both access crossovers. This is consistent with that currently provided, therefore, no additional changes are considered to be warranted to facilitate the proposed reconfiguration.



Figure 6.1: Turn warrants analysis at Dean Street site accesses (year 2034)

Given the relatively low traffic turnover estimated at the secondary access and lower order function of Diplock Street, it is considered that the existing arrangements are suitable for the anticipated traffic demand generated by the proposed plan of development.
6.3 Provision for Pedestrians

It is intended that a dedicated pedestrian connection to the site will be provided clear of the vehicular crossovers. Detail of the proposed pedestrian connection will be provided during detailed design, with concept arrangements proposed shown in Figure 3.1.

6.4 Provision for Bicycles and End of Trip Facilities

The bicycle parking rates for various development types are set out in Table SC6.4.7.1 - Bicycle parking facilities provision rates of the Rockhampton Regional Council Development Code. The following bicycle parking rates are applicable for the proposed use:

Bar:	one (1) space per 25m ² of bar floor area, plus
	one (1) space per $100m^2$ of lounge and beer garden floor area
Food and Beverage:	one (1) space per 100m ² GFA

Detailed breakdown of parking requirements for the proposed use is provided in Table 6.1 below.

 Table 6.1: Acceptable outcome for bicycle parking (Rockhampton Planning Scheme)

Description	Use / scale	Statutory Parking Rate	Acceptable Outcome for Car Parking
Drive-Thru Liquor Shop	GFA - 186.83m ²	1 space / 100m ²	2 (1.87) space
Bar	Bar - 200m ²	1 space per 25m ²	8 spaces
	Other - 581m ²	1 space per 100m ²	6 (5.81) spaces
TOTAL			16 (15.68) spaces

It is proposed that adequate bicycle provision will be made to meet the above Council's Acceptable Outcome.

7 Provision for Heavy Vehicles

It is proposed that existing servicing and delivery activities will be retained via the existing loading arrangements. The arrangements allow for trucks up to the size of a Medium Rigid Vehicle. Swept paths of an MRV negotiating the proposed arrangements and entering and exiting the site from Dean Street are shown in Figures 7.1 and 7.2.



Figure 7.1: Medium Rigid Vehicle (MRV) manoeuvring (access paths)

Engineering reimagined.



Figure 7.2: Medium Rigid Vehicle (MRV) internal manoeuvring

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8 Safety

8.1 Crash Data Evaluation

A review of the road crash history within 200 metres of the access points, the Dean Street / Gair Street intersection and the Diplock Street / Limpus Street intersection was undertaken using the road crash data available from the Queensland Globe and DTMR databases, with the assessment completed for the last five years (2018-2023).

The incidents are summarised in Table 8.1 and shown in Figure 8.1. As shown, based on the nature and location of the recorded incidents, it is considered that the proposal and its associated access points will not compromise the safety and efficiency of the frontage roads.

Table 8.1: Crash history summary

Total Incident Count
0
3
0
0
0



Figure 8.1: Crash locations [Source: Google Earth]

8.2 Sight Distance Assessment

A Safe Intersection Sight Distance (SISD) sight distance assessment has been prepared for the southern access off Dean Street and the access off Diplock Street. The assessment has been prepared in accordance with Austroads Part 4A, for design speed limits of 60 km/h and 50 km/h respectively.

As shown in Figure 8.3, the sight distance analysis indicates that there is adequate view lines achieved between the driver exiting the subject development and vehicles approaching from either direction Dean Street or Diplock Street.



Figure 8.2: Sight distance assessment

9 Conclusions and Recommendations

- The subject site is located on the eastern side of the Dean Street / Gair Street intersection, and provides frontage to both Dean Street along the western frontage and Diplock Street along the eastern. The site gains access via three separate crossovers, two off Dean Street and one off Diplock Street.
- The proposed plan of development is for refurbishment and extension of the existing tavern, with the drivethru liquor shop proposed to be retained along the Dean Street frontage.
- As discussed in Section 4, the Acceptable Outcome for car parking is in the order of 48 spaces. The proposal
 provides a total of 89 parking spaces, including four for people with a disability and therefore satisfies
 Council's Acceptable Outcome.
- The proposed new car parking arrangements have been designed to satisfy the minimum requirements specified in Councils Planning Scheme and AS2890.1:2004.
- A capacity analysis has been carried out at the southern access off Dean Street due to the proposed reconfiguration of existing arrangements. The results of the analysis indicate that the proposal will have negligible impact on the operation of the frontage road, with minimal delays and queuing on the southbound approach under both 2024 and 2034 conditions.
- The proposal provides access via both frontages, with the northern Dean Street access reconfigured to
 facilitate access to the drive-thru only, with primary access to the tavern gained at the southern crossover. It
 is proposed that movement to and from the site from Dean Street will be restricted to left in / left out
 movements, with all movements maintained at the Diplock Street access.
- A turn warrants analysis has been carried out for the modified entry configuration from Dean Street in accordance with Austroads Guide to Traffic Management Part 6. The assessment has been based on resultant future peak hour design traffic estimates at years 2024 and 2034. As discussed in Section 6, left turn demand from Dean Street warrants Basic Left Turn (BAL) treatments at both crossovers. This is consistent with that currently provided, therefore, no changes are considered to be warranted to facilitate the proposed reconfiguration.
- It is intended that a dedicated pedestrian connection to the site will be provided clear of the vehicular crossovers. Detail of the proposed pedestrian connection will be provided during detailed design, with concept arrangements proposed shown in Section 3.
- It is proposed that existing servicing and delivery activities will be retained via the existing loading arrangements. The arrangements allow for trucks up to the size of a Medium Rigid Vehicle.
- A review of the road crash history within 200 metres of the access points, the Dean Street / Gair Street intersection and the Diplock Street / Limpus Street intersection indicates that the proposal and its associated access points will not compromise the safety and efficiency of the frontage roads.
- A Safe Intersection Sight Distance (SISD) sight distance assessment has been prepared for the southern access off Dean Street and the access off Diplock Street. The assessment has been prepared in accordance with Austroads Part 4A, for a design speed limits of 60 km/h and 50 km/h respectively. The analysis indicates that there is adequate view lines achieved between the driver exiting the development and vehicles approaching from either direction on Dean Street or Diplock Street.

Appendix A: SIDRA

SITE LAYOUT

▽ Site: 101 [2024 Peak Hour - With Development (Site Folder: General)]

23-011 - Dean Street / Site Access (Primary) Site Category: (None) Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



MOVEMENT SUMMARY

V Site: 101 [2024 Peak Hour - With Development (v3 IR Response) (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221 23-011 - Dean Street / Site Access (Primary) Site Category: (None) Give-Way (Two-Way)

Vehi	cle M	ovemen	t Perfo	rma	nce		-								
Mov ID	Tum	Mov Class	Den F [Total veh/h	nand lows HV] %	A F [Total veh/h	rrival lows HV] %	Deg. Satn Vic	Aver. Delay	Level of Service	95% (Qu [Veh. veh	Back Of ieue Dist]	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
South	East:	Site Acce	ess (Prir	nary)											
1	L2	All MCs	14	5.0	14	5.0	0.013	6.6	LOS A	0.1	0.4	0.32	0.56	0.32	51.7
Appro	ach		14	5.0	14	5.0	0.013	6.6	LOSA	0.1	0.4	0.32	0.56	0.32	51.7
North	East: I	Dean Stre	eet												
4	L2	All MCs	19	5.0	19	5.0	0.142	5.6	LOSA	0.0	0.0	0.00	0.04	0.00	56.8
5	T1	All MCs	500	10.0	500	10.0	0.142	0.0	LOSA	0.0	0.0	0.00	0.02	0.00	59.7
Appro	ach		519	9.8	519	9.8	0.142	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
South	West:	Dean St	reet												
11	T1	All MCs	500	10.0	500	10.0	0.137	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
Appro	bach		500	10.0	500	10.0	0.137	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Ve	hicles		1033	9.8	1033	9.8	0.142	0.2	NA	0.1	0.4	0.00	0.02	0.00	59.6

MOVEMENT SUMMARY

V Site: 101 [2034 Peak Hour - With Development (v3 IR Response) (Site Folder: General)] Output produced by SIDRA INTERSECTION Version: 9.1.4.221

23-011 - Dean Street / Site Access (Primary) Site Category: (None) Give-Way (Two-Way)

Vehi	cle Ma	ovemen	t Perfo	orma	nce										
Mov ID	Tum	Mov Class	Den F [Total veh/h	nand lows HV] %	Ai F [Total veh/h	rrival lows HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% E Qi. [Veh. veh	Back Of leue Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South	East:	Site Acce	ess (Prir	mary)											
1	L2	All MCs	14	5.0	14	5.0	0.013	6.7	LOS A	0.1	0.4	0.33	0.56	0.33	51.7
Appro	bach		14	5.0	14	5.0	0.013	6.7	LOSA	0.1	0.4	0.33	0.56	0.33	51.7
North	East: [Dean Stre	eet												
4	12	All MCs	19	5.0	19	5.0	0.149	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	56.8
5	T1	All MCs	526	10.0	526	10.0	0.149	0.0	LOSA	0.0	0.0	0.00	0.02	0.00	59.7
Appro	bach		545	9.8	545	9.8	0.149	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
South	West:	Dean St	reet												
11	T1	All MCs	526	10.0	526	10.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Appro	bach		526	10.0	526	10.0	0.144	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Ve	hicles		1085	9.8	1085	9.8	0.149	0.2	NA	0.1	0.4	0.00	0.02	0.00	59.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Appendix B: Response to RCC - Access, Parking & Transport Code

9.3.1 Access, parking and transport code

9.3.1.1 Specific benchmarks for assessment

Table 9.3.1.3.1 Development outcomes for assessable development Access driveways

Table 9.3.1.3.1 Develop	ment outcomes for ass	sessable development	(part)
-------------------------	-----------------------	----------------------	--------

Perforn	nance outcomes	Accept	able outcomes	Response					
Access	Access driveways								
PO1 Access driveways are located to avoid conflicts and designed to operate efficiently and safely, taking into account:			driveways are not located within: twenty–five (25) metres of a signalised road	Not Applicable – Existing Access to be retained.					
(a)	the size of the parking area;	()	intersection;						
(b)	the volume, frequency and type of vehicle traffic;	(b)	twenty (20) metres of an un-signalised road						
(c)	the need for some land uses (for example hospitals) to accommodate emergency vehicle access;		intersection in an industrial or centres zone or ten (10) metres otherwise; and						
(d)	the type of use and the implications on parking and circulation, for example long-term or short-term car parking;	(c)	one (1) metre of any street signage, power poles, street lights, manholes, stormwater gully pits or other Council asset.						
(e)	frontage road function and conditions; and								
(f)	the capacity and function of the adjoining street system.								

Performance outcomes	Acceptable outcomes	Response	
Access driveways			
PO2 Access driveways do not disrupt existing road or footpath	AO2.1 Access driveways:	Complies, the proposal does not include a change to the	
infrastructure.	 (a) do not require the modification, relocation or removal of any infrastructure including street trees, fire hydrants, water meters and street signs; 	arrangements.	
	 (b) do not front a traffic island, speed control device, car parking bay, bus stop or other infrastructure within the road carriageway; 		
	(c) must be sealed and to a formed road;		
	 (d) are not constructed over an access point to equipment under the control of a regulatory authority, including storm water pits, water meters, hydrants and telephone pits; and 		
	(e) are raised or lowered to match the surface level of the driveway, where an access chamber is to be incorporated within the driveway.		
PO3	AO3.1	Not applicable, existing	
Access driveways are designed and constructed so as to:	Access driveways are constructed in compliance with the	access arrangements are proposed to be retained	
 enable safe and functional vehicular access from the street to the property; and 	Capricorn Municipal Development Guidelines.		
(b) not cause a change in the level of a footpath.			
PO4 A driveway does not allow water to pond adjacent to any buildings or cause water to enter a building.	AO4.1 A driveway has a minimum cross fall of one (1) metre (vertical) to 100 metres (horizontal) away from all adjoining buildings.	Not applicable, existing access arrangements are proposed to be retained.	

Parking

Perform	nance outcomes	Acceptable outcomes	Response
Parking	l		
PO5		AO5.1	Complies, adequate parking is provided to satisfactorily accommodate the anticipated demand of the site (refer to Traffic Report).
Provisio	n is made for on-site vehicle parking:	AO5.1.1	
(a)	to meet the demand likely to be generated by the development; and	On-site car parking is provided at the rates set out in Table 9.3.1.3.2 of the access, parking and transport code.	
(b)	to avoid on-street parking where that would adversely impact on the safety or capacity of the	OR	
	road network or unduly impact on local amenity.	AO5.1.2	
		Where a change of use of existing premises is proposed and	
Editor's n prescribe	ote—SC6.6 — Car parking contributions planning scheme policy as circumstances under which an applicant can satisfy PO5.	there is no increase in the gross floor area, the existing number of on-site car parks is retained or increased.	
		AND	
		AQ5.2	
		All parking, loading and manoeuvring facilities for visitors and	
		employees to be located on-site.	
		AND	
		AO5.3	
		Manoeuvring facilities to be of adequate dimensions to	
		prevent any queuing in a roadway.	

Perform	nance outcomes	Acceptable outcomes	Response
Parking	l		
PO6 Parking requiren	and servicing facilities are designed to meet user nents.	AO6.1 Parking spaces, access and manoeuvring facilities, loading facilities and connections to the transport network are sealed and designed in accordance with Australian Standard AS 2890.	Not Applicable, the proposal does not include a change to the existing servicing arrangements.
PO7 Sites wi laneway if it will i into a st	th more than one (1) road frontage (excluding /s) gain access only from the lower order road, except ntroduce traffic generated by a non–residential use reet that is in a residential zone.	No acceptable outcome is nominated.	Not Applicable, existing access arrangements are proposed to be retained.
PO8 Parking user saf resident	areas are illuminated in a manner that maximises fety but minimises the impacts on adjoining s.	AO8.1 Parking areas for uses that operate at night are illuminated in accordance with the requirements of Australian Standard AS 1158.	Complies, the car park will be satisfactorily illuminated to the standard currently provided on site.
		AO8.2 Lighting used in parking areas does not cause an environmental nuisance and complies with Australian Standard AS 4282.	
PO9			Complies.
Car parl transpor discoura	king areas, pathways and other elements of the rt network are designed to enhance public safety by aging crime and antisocial behaviour, having regard to:	No acceptable outcome is nominated. Editor's note—Refer to Crime Prevention Through Environmental Design (CPTED) guidelines for Queensland for guidance.	
(a) (b)	provision of opportunities for casual surveillance; the use of fencing to define public and private spaces, whilst allowing for appropriate sightlines;		
(c)	minimising potential concealment points and assault locations;		
(d)	minimising opportunities for graffiti and other vandalism; and		
restrictir	ng unlawful access to buildings and between buildings.		

Performance outcomes	Acceptable outcomes	Response
Parking		
PO10		Complies.
Parking and servicing areas are kept accessible and available	No acceptable outcome is nominated.	
for their intended use at all times during the normal business		
hours of the activity.		

Transport impact

Performance outcomes	Acceptable outcomes	
Transport impact Editor's note—Applicants should note that the Department of Transport and N	Main Roads may have additional requirements.	
 PO11 Development contributes to the creation of a transport network which is designed to: (a) achieve a high level of permeability and connectivity for all modes of transport, including pedestrians and cyclists, within the development and to the surrounding area; and (b) encourage people to walk, cycle or use public transport to and from the site instead of using a car. 	No acceptable outcome is nominated. Editor's note—Refer to SC6.19 – Structure plan planning scheme policy for guidance.	Not applicable, the proposal is for a refurbishment and extension of the existing use.
PO12 Development is located on roads that are appropriate for the nature of traffic (including vehicles, pedestrians and cyclists) generated, having regard to the safety and efficiency of the transport network.	 AO12.1 Traffic generated by the development is safely accommodated within the design capacity of roads as provided in SC6.15 — Road infrastructure and hierarchy planning scheme policy. AND AO12.2 A road or street does not connect with another road or street that is more than two (2) levels higher or lower in the road hierarchy. AND AO12.3 The existing infrastructure fronting the proposed development is upgraded in accordance with SC6.15 — Road infrastructure and hierarchy planning scheme policy and Capricorn Municipal Development Guidelines. 	Complies, refer to traffic report.

Performance outcomes	Acceptable outcomes	Response
Transport impact Editor's note—Applicants should note that the Department of Transport and I	Main Roads may have additional requirements.	
PO13 Where the nature of the development creates a demand, provision is made for set down and pick-up facilities by bus, taxis or private vehicle, which:	No acceptable outcome is nominated.	Not applicable, the operation of the site is proposed to be retained generally in accordance with the existing use.
 (a) are safe for pedestrians and vehicles; (b) are conveniently connected to the main component of the development by pedestrian pathway; and 		
(c) provide for pedestrian priority and clear sightlines.		

Site access

Performance outcomes	Acceptable outcomes	
Site access		
Performance outcomes Site access PO14 Development does not impact on the safety, operation or function of the road network or system.	Acceptable outcomes AO14.1 Vehicle manoeuvring into and from the site for all vehicles is designed in accordance with the Australian Standard AS 2890, as updated from time to time. AND AO14.2 No direct property access is gained to a highway, main road, urban arterial or sub arterial road as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy other than via a service road or a joint access arrangement with other sites. AND AO14.3 Development that generates greater than 100 vehicle movements per day does not gain access to or from an urban access place or urban access streets as defined in SC6.15 — Road infrastructure and hierarchy planning scheme policy.	Complies, refer to traffic report.

Performance outcomes	Acceptable outcomes	
Site access		
PO15		Not applicable.
Development facilitates the orderly provision and upgrading of	No acceptable outcome is nominated.	
the transport network or contributes to the construction of		
transport network improvements.		
PO16	AO16.1	Not applicable
On-site transport network infrastructure integrates safely and	Intersections, connections and access arrangements are	
effectively with surrounding networks.	designed in accordance with the Capricorn Municipal	
	Development Guidelines and Australian Standard AS 2890.	

Pedestrian and cyclist facilities

Performance outcomes	Acceptable outcomes	Response	
Pedestrian and cyclist facilities			
PO17 Development provides safe and convenient pedestrian and cycle movement to the site and within the site having regard to desire lines, users' needs, safety and legibility.	AO17.1 Pedestrian and cyclist movement are designed in compliance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890 — Parking facilities.	Complies.	
PO18		Complies.	
Provision is made for adequate bicycle parking and end of trip facilities, to meet the leikely needs of users and encourage cycle travel.	No acceptable outcome is nominated. Editor's note—Provisions are made for parking and end of trip facilities in accordance with the SC6.4 — Bicycle network planning scheme policy.		

Servicing

Performance outcomes	Acceptable outcomes	Response
Servicing		
PO19	AO19.1	Complies, no change is proposed in comparison to the existing use.
Refuse collection vehicles are able to safely access on-site refuse collection facilities.	Refuse collection areas are provided and designed in accordance with the waste management code and Australian	-
	Standard AS 2890.	

DESIGN Existing palm trees to remain. site boundary **CONCEPT SITE PLAN** 1:400 @ A3 EXISTING CARPARK TO REMAIN EAS FALL 1:14 10 15 20 **TERN ELEVATION** WESTERN ELEVATION 1.16 FALL 1:21 FOR DETAIL SEE CONCEPT PLAN: BEER GARDEN Existing landscaping to Dean Street to remain Shade trees included across carpark with a coverage of 1 tree per 6 carpark spaces. Existing street tree to be retained **ROCKHAMPTON REGIONAL COUNCIL** DIPLOCK STREET **APPROVED PLANS** These plans are approved subject to the current conditions of approval associated with Cross-block pedestrain link Development Permit No.: D/106-2023 connecting Dean to Diplock DEAN STREET Streets. CBL to be buffered from Dated: 7 November 2023 the carpark by landscaping. EXISTING CARPARK TO REMAIN Existing landscaping to Diplock Street to remain The President 0890 221 27. 11 1023



WESTERN ELEVATION

Technical Memorandum

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/106-2023

Dated: 7 November 2023

То:	From
Rockhampton Regional Council	Chris Hewitt Principal Civil Engineer McMurtrie Consulting Engineers

RE: Response to Information Request (D/106-2023) 368 Dean Street, Frenchville (Berserker Tavern)

Reference is made to the project at the above address, and Rockhampton Regional Council's Information Request dated 31 August 2023. McMurtrie Consulting Engineers (MCE) have been engaged to prepare a response to Item 2 of the request in relation to Engineering, as follows:

2. Engineering

2.1

Reconfigure the proposed set-down area located in the north-western corner of the site adjacent to the drive-through entry such that vehicles are not stopping on a painted (chevroned) area in accordance with the Transport Operations Act. Suitable line-marking and/or signage should be included that clearly identifies the area as a drop-off / set-down area. Further to this, a pedestrian link from the footpath along the Dean Street frontage to the entry door adjacent to the drop-off point should be incorporated.

RESPONSE:

The proposed drop off facility has been modified to include a marked set down space with associated signage. As shown as Attachment A, the proposed facility allows a large car (B99 design vehicle) to park in the facility clear of the drive-thru entry aisle. A dedicated pedestrian path is proposed to be provided to the north of the crossover to provide direct link between the frontage footpath and building entry.

2.2

The submitted SIDRA analysis for the entry to the site from Dean Street shows the outer lane as a through / turn-lane. As this lane will remain as a through-lane only, please revise the analysis to suit this configuration. Additionally, there does not appear to be any vehicles entering or exiting the site from the eastern end of Diplock Street. Please provide justification for this approach, or alternatively, revise the analysis to consider these movements.

RESPONSE:

As shown as Attachment B, development traffic estimates have been redistributed identifying some movements originating from the north via Diplock Street. Based the configuration of the proposed access arrangements and function of the local road network in the context of surrounding land uses it is not expected that a significant number of trips will distribute to and from the north via Diplock Street.

The SIDRA analysis of the Dean Street / Site Access intersection has been updated to reflect the redistributed traffic estimates of the subject site. As shown as Attachment C, the access will function satisfactorily with acceptable delays and queues on all approaches. It is noted that that function of the access off Dean Street has been retained, with movements to the site occurring from the kerbside traffic lane. Such is reflected in the SIDRA model, where the distribution allows traffic turning to the site to turn directly from the southbound traffic lane.

Please contact the undersigned in relation to the above information.

Yours sincerely

agt #

Chris Hewitt Principal Civil Engineer RPEQ NO. 5141

ATTACHMENT A – MODIFIED SET DOWN FACILITY ATTACHMENT B – DEVELOPMENT TRAFFIC ESTIMASTES ATTACHMENT C – SIDRA ANALYSIS (DEAN STREET / SITE ACCESS INTERSECTION)

ATTACHMENT A - MODIFIED DROP OFF FACILITY

FUNCTIONAL LAYOUT



Document Set ID: 40604034 OUR REF: KU40-22-23 Version: 1, Version Date: 26/09/2023

B99 MANOEUVRING



PROJECT: Berserker Tavern, 368 Dean Street Dearte: 20/09/23 OUR REF: R040-22-23 Version: 1, Version Date: 26/09/2023

ATTACHMENT B - DEVELOPMENT TRAFFIC DISTRIBUTION

DISTRIBUTION DIAGRAM



DEVELOPMENT TRAFFIC ESTIAMTES

DESIGN TRAFFIC ESTIMATES (years 2024 & 2034) [v3 IR Response] Background as per Table 2.2 500 475 Dean Street LEGEND 0 0 19 19 2024 PEAK HOUR TRAFFIC 19 19 11 11 2034 PEAK HOUR TRAFFIC 17 Drive-thru / Drop off Primary Crossover Crosssover SUBJECT SITE 13 2 13 2 7 7 5

PROJECT: Berserker Tavern, 368 Dean Street Document Set ID: 4060703/23 OUR REF: R040-22-23 Version: 1, Version Date: 26/09/2023

ATTACHMENT C - SIDRA ANALYSIS (DEAN STREET / SITE ACCESS INTERSECTION)

MOVEMENT SUMMARY

∇ Site: 101 [2024 Peak Hour - With Development (v3 IR Response) (Site Folder: General)]

23-011 - Dean Street / Site Access (Primary) Site Category: (None) Give-Way (Two-Way)

Vehi	cle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLL [Total veh/h	PUT JMES HV] %	DEM/ FLO [Total veh/h	AND WS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BA QUE [Veh. veh	CK OF UE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
Sout	hEast:	Site Acce	ess (Prim	ary)										
1	L2	17	5.0	18	5.0	0.017	6.6	LOS A	0.1	0.5	0.32	0.56	0.32	52.4
Appr	oach	17	5.0	18	5.0	0.017	6.6	LOS A	0.1	0.5	0.32	0.56	0.32	52.4
North	nEast:	Dean Str	eet											
4	L2	19	5.0	20	5.0	0.142	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	57.6
5	T1	475	10.0	500	10.0	0.142	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Appr	oach	494	9.8	520	9.8	0.142	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.6
Sout	hWest:	Dean St	reet											
11	T1	475	10.0	500	10.0	0.137	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Appr	oach	475	10.0	500	10.0	0.137	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehic	cles	986	9.8	1038	9.8	0.142	0.3	NA	0.1	0.5	0.01	0.02	0.01	59.6

MOVEMENT SUMMARY

∇ Site: 101 [2034 Peak Hour - With Development (v3 IR Response) (Site Folder: General)]

23-011 - Dean Street / Site Access (Primary) Site Category: (None) Give-Way (Two-Way)

Vehi	cle M	ovemen	t Perfor	mance										
Mov ID	Turn	INP VOLU [Total veh/h	UT MES HV] %	DEM, FLO [Total veh/h	AND WS HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BA QUE [Veh. veh	ACK OF EUE Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South	nEast:	Site Acce	ess (Prim	ary)										
1	L2	17	5.0	18	5.0	0.018	6.7	LOS A	0.1	0.5	0.33	0.57	0.33	52.4
Appro	bach	17	5.0	18	5.0	0.018	6.7	LOS A	0.1	0.5	0.33	0.57	0.33	52.4
North	East:	Dean Stre	eet											
4	L2	19	5.0	20	5.0	0.149	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.7
5	T1	500	10.0	526	10.0	0.149	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Appro	bach	519	9.8	546	9.8	0.149	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
South	nWest:	Dean St	reet											
11	T1	500	10.0	526	10.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Appro	bach	500	10.0	526	10.0	0.144	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehic	les	1036	9.8	1091	9.8	0.149	0.2	NA	0.1	0.5	0.01	0.02	0.01	59.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

PROJECT: Berserker Tavern, 368 Dean Street





August 2023 Project No.: 23231 Revision No.: A

These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/106-2023**Dated: 7 November 2023

PROVED PLANS

TIL



CIVIL & STRUCTURAL ENGINEERING | DESIGN | MANAGEMENT Document Set ID: 40550325 Version: 1, Version Date: 07/08/2023

ROCKHAMPTON

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	Introduction

Engineering Report & Stormwater Management Plan

Document No.:	23231-ENG-A	
Revision No.:	А	

Document Status:

REVISION	PREPARED BY	REVIEWED BY	DATE
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1. Introduction

vT Consulting Engineers has been commissioned by Queensland Venue Co. to prepare this engineering services report and stormwater management plan. The development is located at 368 Dean Street, Frenchville, QLD 4701. The site locality is illustrated in Figure 1.1. This report is being submitted to support the Development Approval for the proposed extension to the Berserker Tavern for Rockhampton Regional Council's consideration.

The proposed development includes an extension to the existing Berserker Tavern. This extension features a Beer Garden and a play area for children.

Refer attached Appendix A for proposed layout plans and details.

The following report will detail civil engineering requirements for the development.

Street Address Real Property Description Total Site Area Proposed Use Local Authority 368 Dean Street, Frenchville, QLD 4701
Lot 1 RP 890077
6524 m²
Proposed extension – Beer Garden and Play area
Rockhampton Regional Council



Figure 1.1

Site Layout Plan (Nearmaps)

a. Existing Land Use

The site is situated in a mixed use area fronting Dean Street, occupied by a large commercial tavern located at the centre of the block. It is bounded by Diplock Street on the eastern boundary and residential properties on the southern boundary of the development.

2. Erosion and Sediment Control

Using the International Erosion Control Association's (IECA) Erosion Hazard Assessment Procedure AustIECA, 2016a), we believe the proposed development site represents a low erosion risk as trigger values were not equalled or exceeded and resulted in a total score of 15 (Refer Appendix B for Erosion Hazard Assessment Form). IECA requires that a preliminary Erosion and Sediment Control Plan (ESCP) be submitted to the local government for approval during the planning phase if the development obtains a total point score of 17 or greater or when any trigger value is scored or exceeded.

The construction contractor is responsible for ensuring that soil and debris does not leave the site as well as the confines of the construction zone and is not deposited on external roads or existing in-use areas due to the proposed earthworks and construction activity.

Acid Sulphate Soils

The local council is listed in the Glossary (Acid Sulphate soil affected area) in State Planning Policy July 2017, indicating that this development application may require compliance with the State Planning Policy July 2017 acid sulphate soils development objectives.

Acid sulphate soil testing is typically conducted in areas with reduced levels of less than 5.0m Australian Height Datum (AHD) as stated in State Planning Policy July 2017. This policy also states that developments below 20.0m AHD that involve a Material Change of Use or operational works are required to be assessed against the State Planning Policy July 2017 acid sulphate soils development objectives. As the lowest point on this site is an approximate level of RL 30.80, we believe that possibility of acid sulphate soil being present is unlikely.



Figure 2.1 provides a visual aid to determining assessable development.

Figure 2.1 Acid Sulphate Soils assessment diagram (Adapted from SPP Water Quality State Interest Guideline 2016)

As the proposed excavations are not expected to be below RL5.0m AHD, the State Planning Policy does not apply.

The requirements for Acid Sulphate Testing will be confirmed by a geotechnical engineer prior to the detailed design stage of this proposed development.

Land Disturbing Activities

Important causes/issues of erosion for this site would consist of the following:

- Precipitation and consequent run-off
- Stripping and removal of topsoil
- Removal of fill
- Other earthwork operations
- Heavy vehicle use on site
- Wind erosion

The proposed development is a short construction period which will be programmed so that the shortest period of time elapses between ground cover removal and restoration.

Erosion and Sediment Control Measures

Sediment control filter fabric will be securely placed around the downstream boundaries of the construction site. This will ensure sediment is trapped before being released into the catchment. Refer Appendix C.

An ESC measure will be provided at any vehicular access points to the site. Construction and maintenance details are given in Appendix C. A temporary construction entrance will be provided from the adjacent roads for access during construction.

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A filter sock sediment trap will be utilized on all downstream stormwater inlets. Refer Appendix C for construction and maintenance details.

No clearing will be undertaken unless preceded or accompanied by installation of adequate runoff and sediment control measures, as described above.

Following practical completion of the project a minimum of 70% coverage of all soil with ground cover (i.e. topsoiling and seeding) will be provided within 30 calendar days.

During the demolition and construction phases, spraying of water will be used with care to act as a dust suppression method.

Monitoring and Maintenance Programs

Water discharge from the site will adhere to a total suspended solid content of less than 50 milligrams per litre and a pH range of between 6.5 and 8.5 at all times. If the pH of the flocculated water is not achieved, then pH adjustments will be required. This could possibly be done by a dosing of lime.

Site personnel will inspect all erosion and control measures at least at the following frequencies:

- Daily during construction works,
- Weekly when construction works are not happening,
- Within 24 hours of expected rain, and
- Within 18 hours of an impacting rainfall event.

All erosion and sediment control measures that have an order of efficiency below 75% will be corrected by the end of that working day.

3. Earthworks

For the purpose of this proposed development earthworks will be conducted for constructing the new proposed building platform. The existing stairwell on the Northen entry way will be demolished to facilitate for proposed extension. Any excess cut will need to be removed from the site by the contractor.

4. Roadworks

The proposed development fronts onto Dean Street and allows vehicular access via Diplock Street. No external roadworks are proposed for this development.
EN C

5. Stormwater Drainage

a. Existing Stormwater Drainage

Existing site stormwater is generally directed into grated pits located within the existing carpark. The stormwater pit located in the southeast of the site discharges stormwater east into the existing stormwater infrastructure that traverses through Diplock Street and the western residential lots. The existing grated pit located in the northwest discharges the remaining flows to the kerb and channel in Dean Street. Figure 5.1 below shows the existing stormwater drainage in the area of the site.



Figure 5.1 Rockhampton Regional Council- Stormwater infrastructure

b. Proposed Stormwater Drainage

The proposed development is not expected to increase runoff as there is no change in impervious areas. The existing stormwater drainage system is proposed to be retained and reused to service the developed site.

Refer to attached Appendix A for proposed layout plans and details.

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c. Stormwater Quality Management

State Planning Policy

The State Planning Policy (SPP) applies for stormwater quality management and management of new or expanded non-tidal artificial waterways applies to development that is outlined below in Table 5.1.

SPP PART E: INTERIM DEVELOPMENT ASSESSMENT REQUIREMENTS. STATE INTEREST – WATER QUALITY	YES / NO
Material change of use for urban purposes that involves a land area greater than 2500m ² that:	
will result in an impervious area greater than 25% of the net developable area	NO
Will result in 6 or more dwellings	NO
<i>Reconfiguring a lot for urban purposes that involves a land area greater than 2500m² and will result in six or more lots:</i>	NO
<i>Operational works for urban purposes that involve disturbing more than 2500m² of land</i>	NO
Table 5.1 Water Quality Objectives	

Table 5.1 Water Quality Objectives

The proposed development does not trigger any applicable items in the above Table 5.1, therefore the SPP is not applicable, and compliance is not expected by the local government authority.

d. MUSIC Model

While the entirety of the site area is over 2500m², the extent of works proposed does not exceed 2500 m². Therefore, the SPP does not apply and a MUSIC model has not been prepared.

e. Stormwater Quantity Management

Detailed calculations of the flow from the site are summarised in the table below:

PARAMETERS					
Catchment Area - Developed:	6524		m²		
Catchment Area - Undeveloped:	6524		m²		
Runoff Coefficient (C ₁₀) - Developed:	0.90	t _c =	5	min.	
Runoff Coefficient (C ₁₀) - Undeveloped:	0.90	t _c =	5	min.	

ARI		2yr	5yr	10yr	20yr	50yr	100yr
Rainfall Intensity	mm/hr	133	171	201	231	271	303
Frequency Factor	f _{y=}	0.85	0.95	1.00	1.05	1.15	1.20
Developed C	C _u =	0.76	0.85	0.89	0.93	1.00	1.00
Undeveloped C	C _d =	0.76	0.85	0.89	0.93	1.00	1.00

				FLOW	S				
Developed Flow	Q _u =	C*I*A	l/s	182	262	324	391	491	549
Undeveloped Flow	Q _d =Q _i =	C*I*A	l/s	182	262	324	391	491	549
Difference	Q _o =		l/s	0	0	0	0	0	0

Table 5.6 Quantity Summary using Rational Method

The proposed development site will have no change in terms of impervious areas in comparison to the existing site. Based on the location and retained fraction imperviousness of the site, it is anticipated that stormwater detention is not required for this development. Justification for not providing stormwater detention is based on the following:

- The development will not cause adverse impacts or actionable nuisance to surrounding properties;
- for infill development only, the development site has an existing actual impervious fraction greater than 60%; pre and post developed impervious areas remain the same.

In accordance with Rockhampton Regional Council's planning scheme stormwater detention for this site is not required.

f. Maintenance

Construction Phase Management Plan

Potential construction phase impacts include the following:

- Sedimentation and erosion
- Management of contaminated soils and materials on the site Construction Material (such as cement)

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General

The objective of the Construction Phase Management Plan is to comply with the requirements of the Queensland Environmental Protection Act 1994 and Environmental Protection (Water) Policy 2009 so that the environmental values of effected receiving waters are maintained or enhanced. In essence the purpose of the Plan is to prevent polluted stormwater being discharged to the local waterways.

Performance Indicators

The management is not being effective when any of the following occur during the construction phase of the project.

- The required water quality objectives are not achieved,
- Contaminated water is released off site.

Construction Phase Management of Sedimentation and Erosion

Existing vegetation from site will be removed in stages as required to reduce the likelihood of surface erosion. A sediment and siltation fence will be erected around the property boundary to ensure that sediment is not washed off site and onto adjacent properties or roads. Entry and exit from the site will be restricted to a single stabilised location to minimise the rise of onsite transport of silt sediment or mud. It is anticipated that a layer of crushed rock will provide the necessary stabilisation of the access route. If required a specific bunded wash down area will be provided for the cleaning of plant before leaving the site and all wash down wastewater will be collected. In the event that debris or sediment leaves the site it will be cleaned.

Management of Imported Materials

Any material imported to the site including construction materials will be stockpiled in a location where it cannot contaminate the stormwater system or stormwater runoff.

Complaint Response

The contractor will erect signage at the entrance to the works with contact information, including afterhours contact numbers. The contractor will properly deal with all complaints.

Monitoring and Reporting

All sediment and erosion control devices will be checked daily and after rainfall events by the construction site supervisor. Defective or full devices will be cleaned and repaired as required. Regular inspections and maintenance of the storm water system will be carried out by the property owner. The civil components (structural and erosion) are to be assessed by a suitably qualified engineer as required.

It remains the service provider and user's responsibility to maintain the treatment and site in accordance with the current State Planning Policy and legislation requirements.

Lifecycle cost assessment

There will be no abnormal capital or recurrent costs for the proposed stormwater strategy.

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6. Flood Planning and Overland Flow

Figure 6.1 below shows the extent of flooding in relation to the site. As shown, the site is not impacted by river, creek or waterway and overland flow sources. In addition to this, there are currently no Coastal Hazard Overlays that apply this property. It is anticipated that development complies with Rockhampton Regional Council's flooding requirements.

vT Consulting Engineers have not been commissioned to complete a flood assessment report for this development.







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7. Sewer Reticulation

An sewer connection exists from the sewer infrastructure that traverses through the site as shown by the Rockhampton Regional Council Planning Scheme Sewer and Water infrastructure mapping below in Figure 7.1. This connection will be reused for the proposed development if it is in accordance with Fitzroy River Water and SEQ Code design standards.

For more details refer to the engineering plans in Appendix A.







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8. Water Reticulation

It is proposed to reuse the existing water connection that currently services the site from the water main located within Dean Street as the extension does not pose a significant increase in water demand. A hydrant exists in Diplock Street to service the proposed development. Please refer to Figure 7.1.

For more details refer to the engineering plans in Appendix A.

The Internal water supply design for this proposed development will be by others.

9. Electrical and Telecommunication

The electrical supply and communications supply for this proposed development will be by others.

10.Development Codes

The following applicable Local Codes have been completed to address the proposed development and are included in Appendix E:

- Rockhampton Regional Council Stormwater Management Code
- Rockhampton Regional Council Works Code
- Rockhampton Regional Council Filling and Excavation Code

11.Safety in Design

At the time of preparing this report, it is considered that there is no atypical safety in design issues for a project of this type and use. Typical issues to be reviewed include but are not limited to construction activities, falls, confined spaces, excavations, and hazardous materials.

A full review of and preparation of a Safety In Design report will be conducted during the detailed design of the project by the project design engineer. The ongoing implementation, review and amendments to the Safety in Design register is to be by the property owner or users.

12. Conclusions

vT Consulting Engineers has undertaken a preliminary review of civil engineering services required for the proposed development located at 368 Dean Street, Frenchville, QLD 4701.

Based on all the findings outlined in this report, vT Consulting Engineers believes that, should the recommendation contained within the report be implemented, there are no significant engineering issues in relation to this development.

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Appendix A - Proposed Preliminary Design Drawings

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VOLUMES PROVIDED ARE INDICATIVE ONLY AND THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE VOLUMES PRIOR TO TENDERING AND CONSTRUCTION. REFER TO STRUCTURAL ENGINEERS DETAILS FOR SAFE BEARING CAPACITY REQUIREMENTS. NO ALLOWANCE HAS BEEN MADE FOR EXCAVATION OF

STRUCTURAL FOOTING, SERVICE TRENCHES OR PITS.

 PROJECT: COMMERCIAL DEVELOPEMENT 368 DEAN STREET, NORTH ROCKHAMPTON	JOB No.: 2323	1
DRAWING TITLE: PRELIMINARY EARTHWORKS LAYOUT PLAN	DRAWING No.: P200 PRELIMINARY	REV.: A



LEGEND	
LEGEND 100 100 RW SW RW RW RW RW RW RW RW RW SS RW SS RW SS RW SS SSS SS	EXISTING PROPERTY BOUNDARY EXISTING EASEMENT BOUNDARY EXISTING CONTOUR - MAJOR EXISTING CONTOUR - MINOR EXISTING KERB AND CHANNEL EXISTING KERB AND CHANNEL EXISTING KERB AND CHANNEL EXISTING RETAINING WALL EXISTING STORMWATER DRAINAGE EXISTING GOOFWATER DRAINAGE EXISTING COMMUNICATIONS ABANDON EXISTING SERVICE PROPERTY BOUNDARY EXISTING COMMUNICATIONS ABANDON EXISTING SERVICE PROPERTY BOUNDARY CONTOUR - MAJOR CONTOUR - MAJOR CONTOUR - MINOR BUILDING EARTHWORKS TOP OF BATTER RETAINING WALL SEDIMENT FENCE FENCE - TYPE 1 KERB AND CHANNEL KERB STORMWATER DRAINAGE
	ROOFWATER DRAINAGE SUBSOIL DRAIN SEWER
+ \\) ^{2%} + RL0.00 × 0.00	WATER EXISTING SURFACE LEVEL (ESL) FINISHED SURFACE LEVEL (FSL) BULK EARTHWORKS LEVEL (BEL)

COMMERCIAL DEVELOPEMENT 368 DEAN STREET, NORTH ROCKHAMPTON	JOB №.: 2323	1
DRAWING TITLE: PRELIMINARY SERVICES LAYOUT PLAN	DRAWING No.: P300 PRELIMINARY	A

Document No.: 23231-ENG-A Revision No.: A

Appendix B - Erosion and Sediment Control Hazard Assessment Form

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Erosion Hazard Assessment Form

Condition	Points	Score	Trigger value
AVERAGE SLOPE OF DISTURBANCE AREA [1]			
• not more than 3% [3% 33H:1V]			
• more than 3% but not more than 5% $[5\% = 20H:1V]$	$\mathbf{\nabla}$		
• more than 5% but not more than 10% $[10\% = 10H:1V]$	2	0	4
• more than 10% but not more than 15% [15% 6 7H:1V]	4		
• more than 15%	6		
SOIL CLASSIFICATION GROUP (AS1726) [2]	-		
	0		
• SW SP OL OH	1	3	
	2		
MI CL or if imported fill is used or if soils are untested			
EMERSON (DISPERSION) CLASS NUMBER [3]			
Class 4 6 7 or 8	0		
	0	4	6
 Class 5 Class 2 (default value if apile are unterted) 	\bigtriangleup		-
Class 3, (default value il solis are untested)	4		
	0		
DURATION OF SOIL DISTURBANCE [4]	_		
not more than 1 month	0	4	6
more than 1 month but not more than 4 months	2	-	U
more than 4 months but not more than 6 months	4		
more than 6 months	6		
AREA OF DISTURBANCE [5]			
not more than 1000 m ²	0		
more than 1000 m ² but not more than 5000 m ²	(1)	1	4
 more than 5000 m² but not more than 1 ha 	2	•	-
more than 1 ha but not more than 4 ha	4		
more than 4 ha	6		
WATERWAY DISTURBANCE [6]			
No disturbance to a watercourse, open drain or channel		•	2
 Involves disturbance to a constructed open drain or channel 	1	U	-
Involves disturbance to a natural watercourse	2		
REHABILITATION METHOD [7]			
Percentage of area (relative to total disturbance) revegetated by seeding			
without light mulching (i.e. worst-case revegetation method).			
not more than 1%		0	
 more than 1% but not more than 5% 	1	U	
 more than 5% but not more than 10% 	2		
more than 10%	4		
RECEIVING WATERS [8]			
Saline waters only		0	
Freshwater body (e.g. creek or freshwater lake or river)	2		
SUBSOIL EXPOSURE [9]	(
No subsoil exposure except of service trenches	\bigcirc	2	
Subsoils are likely to be exposed	2		
EXTERNAL CATCHMENTS [10]			
No external catchment			
External catchment diverted around the soil disturbance	1	0	
External catchment not diverted around the soil disturbance	2		
ROAD CONSTRUCTION [11]			
No road construction		0	
Involves road construction works	2		
pH OF SOILS TO BE REVEGETATED [12]			
• more than pH 5.5 but less than pH 8	0	1	
• other pH values, or if soils are untested	(1)		
	1	15	
Total	Score		

Explanatory notes

- **Requirements:** Specific issues or actions required by the proponent.
- Warnings: Issues that should be considered by the proponent.

Comments: General information relating to the topic.

[1] **REQUIREMENTS**:

For sites with an average slope of proposed land disturbance greater than 10%, a preliminary ESCP must be submitted to the regulatory authority for approval during planning negotiations.

Proponents must demonstrate that adequate erosion and sediment control measures can be implemented on-site to effectively protect downstream environmental values.

If site or financial constraints suggest that it is not reasonable or practicable for the prescribed water quality objectives to be achieved for the proposal, then the proponent must demonstrate that alternative designs or construction techniques (e.g. pole homes, suspended slab) cannot reasonably be implemented on the site.

WARNINGS:

Steep sites usually require more stringent drainage and erosion controls than flatter grade sites.

COMMENTS:

The steeper the land, the greater the need for adequate drainage controls to prevent soil and mulch from being washed from the site.

[2] **REQUIREMENTS**:

If the actual soil K-factor is known from soil testing, then the Score shall be determined from Table 1.

If a preliminary ESCP is required during planning negotiations, then it must be demonstrated that adequate space is available for the construction and operation of any major sediment traps, including the provision for any sediment basins and their associated embankments and spillways. It must also be demonstrated that all reasonable and practicable measures can be taken to divert the maximum quantity of sediment-laden runoff (up to the specified design storm) to these sediment traps throughout the construction phase and until the contributing catchment is adequately stabilised against erosion.

WARNINGS:

The higher the point score, the greater the need to protect the soil from raindrop impact and thus the greater the need for effective erosion control measures. A point score of 2 or greater will require a greater emphasis to be placed on revegetation techniques that do not expose the soil to direct rainfall contact during vegetation establishment, e.g. turfing and *Hydromulching*.

COMMENTS:

Table 2 provides an *indication* of soil conditions likely to be associated with a particular Soil group based on a statistical analysis of soil testing across NSW. This table provides only an initial estimate of the likely soil conditions.

The left-hand-side of the table provides an indication of the type of sediment basin that will be required (Type C, F or D). The right-hand-side of the table provides an indication of the likely erodibility of the soil based on the Revised Universal Soil Loss Equation (RUSLE) K-factor.

Table 3 provides some general comments on the erosion potential of the various soil groups.

	RUSLE soil erodibility K-factor						
	K < 0.02	0.02 <k<0.04< th=""><th>0.04<k<0.06< th=""><th>K > 0.06</th></k<0.06<></th></k<0.04<>	0.04 <k<0.06< th=""><th>K > 0.06</th></k<0.06<>	K > 0.06			
Score	0	1	2	3			

 Table 1 – Score if soil K-factor is known

Unified Soil	Likely sediment basin classification (%)		Probable soil erodibility K-factor (%) ^[2]				
Class	Dry	W	et	Low	Moderate	High	Very High
System	Туре С	Type F	Type D	K < 0.02	0.02 <k<0.04< th=""><th>0.04<k<0.06< th=""><th>K > 0.06</th></k<0.06<></th></k<0.04<>	0.04 <k<0.06< th=""><th>K > 0.06</th></k<0.06<>	K > 0.06
GM	30	58	12	12	51	26	12
GC	42	33	25	13	71	17	0
SW	40	48	12	49	39	12	0
SP	53	32	15	76	18	5	1
SM	21	67	12	26	48	25	1
SC	26	50	24	16	64	18	2
ML	5	63	32	4	35	45	16
CL	9	51	39	12	56	19	13
OL	2	80	18	34	61	5	1
МН	12	41	48	15	19	41	25
СН	5	44	51	39	43	11	7

Table 2 – Statistical analysis of NSW soil data^[1]

Notes: [1] Analysis of soil data presented in Landcom (2004).

[2] Soil erodibility based on Revised Universal Soil Loss Equation (RUSLE) K-factor.

Unified Soil Classification System (USCS)

- GW Well graded gravels, gravel-sand mixtures, little or no fines
- GP Poorly graded gravels, gravel-sand mixture, little or no fines
- GM Silty gravels, poorly graded gravel-sand-silt mixtures
- GC Clayey gravels, poorly graded gravel-sand-clay mixtures
- SW Well graded sands, gravelly sands, little or no fines
- SP Poorly graded sands, gravelly sands, little or no fines
- SM Silty sands, poorly graded sand-silt mixtures
- SC Clayey sands, poorly graded sand-clay mixtures
- ML Inorganic silts & very fine sands, rock flour, silty or clayey fine sands with slight plasticity
- CL Inorganic clays, low-medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
- OL Organic silts and organic silt-clays of low plasticity
- MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
- CH Inorganic clays of high plasticity, fat clays
- OH Organic clays of medium to high plasticity

Soil Groups	Typical properties ^[2]
GW, GP	Low erodibility potential.
GM, GC	Low to medium erodibility potential.
	 May create turbid runoff if disturbed as a result of the release of silt and clay particles.
SW, SP	Low to medium erodibility potential.
SM, SC	Medium erodibility potential.
	• May create turbid runoff if disturbed as a result of the release of silt and clay particles.
MH, CH	Highly variable (low to high) erodibility potential.
	Will generally create turbid runoff if disturbed.
ML, CL	High erodibility potential.
	Tendency to be dispersive.
	May create some turbidity in runoff if disturbed.

Table 3 – Typical properties of va	arious soil groups ^[1]
------------------------------------	-----------------------------------

Note: [1] After Soil Services & NSW DLWC (1998).

[2] Any soil can represent a high erosion risk if the binding clays or silts are unstable.

Table 4 provides **general** guidelines on the suitability of various soil groups to various engineering applications.

		Embankments			•	
Unified Soil Class	USC Group	Water retaining	Non water retaining	FIII	Slope stability	Untreated roads
Well graded gravels	GW	Unsuitable	Excellent	Excellent	Excellent	Average
Poorly graded gravel	GP	Unsuitable	Average	Excellent	Average	Unsuitable
Silty gravels	GM	Unsuitable	Average	Good	Average	Average
Clayey gravels	GC	Suitable	Average	Good	Average	Excellent
Well graded sands	SW	Unsuitable	Excellent	Excellent	Excellent	Average
Poorly graded sands	SP	Unsuitable	Average	Good	Average	Unsuitable
Silty sands	SM	Suitable ^[2]	Average	Average	Average	Poor
Clayey sands	SC	Suitable	Average	Average	Average	Good
Inorganic silts	ML	Unsuitable	Poor	Average	Poor	Unsuitable
Inorganic clays	CL	Suitable ^[2]	Good	Average	Good	Poor
Organic silts	OL	Unsuitable	Unsuitable	Poor	Unsuitable	Unsuitable
Inorganic silts	MH	Unsuitable	Poor	Poor	Poor	Unsuitable
Inorganic clays	СН	Suitable ^[2]	Average	Unsuitable	Average	Unsuitable
Organic clays	ОН	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Highly organic soils	Pt	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable

Table 4 – Engineering suitability based on Unified Soil Classification^[1]

Notes: [1] Modified from Hazelton & Murphy (1992)

[2] Suitable only after modifications to soil such as compaction and/or erosion protection

[3] If the soils have not been tested for Emerson Class, then adopt a score of 4.

REQUIREMENTS:

Works proposed on sites containing Emerson Class 1 or 2 soils have a very high pollution potential and must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the authority) during planning negotiations.

WARNINGS:

Class 3 and 5 soils disturbed by cut and fill operations or construction traffic are highly likely to discolour stormwater (i.e. cause turbid runoff). Chemical stabilisation will likely be required if these soils are placed immediately adjacent to a retaining wall. Any disturbed Class 1, 2, 3 and 5 soils that are to be revegetated must be covered with a non-dispersive topsoil as soon as possible (unless otherwise agreed by the regulatory authority).

Class 1 and 2 soils are highly likely to discolour (pollute) stormwater if exposed to rainfall or flowing water. Treatment of these soils with gypsum (or other suitable substance) will most likely be required. These soils should not be placed directly behind a retaining wall unless it has been adequately treated (stabilised) or covered with a non-dispersible soil.

[4] The duration of disturbance refers to the total duration of soil exposure to rainfall up until a time when there is at least 70% coverage of all areas of soil.

REQUIREMENTS:

All land developments with an expected soil disturbance period greater than 6 months must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the authority) during planning negotiations.

COMMENTS:

Construction periods greater than 3 months will generally experience at least some significant storm events, independent of the time of year that the construction (soil disturbance) occurs.

[5] **REQUIREMENTS**:

Development proposals with an expected soil disturbance in excess of 1ha must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the regulatory authority) during planning negotiations.

The area of disturbance refers to the total area of soil exposed to rainfall or dustproducing winds either as a result of:

- (a) the removal of ground cover vegetation, mulch or sealed surfaces;
- (b) past land management practices;
- (c) natural conditions.

WARNINGS:

A Sediment Basin will usually be required if the disturbed area exceeds 0.25ha (2500m²) within any sub-catchment (i.e. land flowing to one outlet point).

COMMENTS:

For soil disturbances greater than 0.25ha, the revegetation phase should be staged to minimise the duration for which soils are exposed to wind, rain and concentrated runoff.

[6] **REQUIREMENTS**:

All developments that involve earthworks or construction within a natural watercourse (whether that watercourse is in a natural or modified condition) must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the regulatory authority) during planning negotiations.

Permits and/or licences may be required from the State Government, including possible submission of the ESCP to the relevant Government department.

[7] **REQUIREMENTS**:

No areas of soil disturbance shall be left exposed to rainfall or dust-producing winds at the end of a development without an adequate degree of protection and/or an appropriate action plan for the establishment of at least 70% cover.

COMMENTS:

Grass seeding without the application of a light mulch cover is considered the least favourable revegetation technique. A light mulch cover is required to protect the soil from raindrop impact, excessive temperature fluctuations, and the loss of essential soil moisture.

[8] **COMMENTS**:

All receiving waters can be adversely affected by unnatural quantities of sediment-laden runoff. Freshwater ecosystems are generally more susceptible to ecological harm resulting from the inflow of fine or dispersible clays than saline water bodies. The further inland a land disturbance is, the greater the potential for the released sediment to cause environmental harm as this sediment travels towards the coast.

For the purpose of this clause it is assumed that all sediment-laden runoff will eventually flow into saline waters. Thus, sediment-laden discharges that flow first into freshwater are likely to adversely affect both fresh and saline water bodies and are therefore considered potentially more damaging to the environment.

This clause does **not** imply that sediment-laden runoff will not cause harm to saline waters.

[9] **COMMENTS**:

This clause refers to subsoils exposed during the construction phase either as a result of past land practices or proposed construction activities. The exposure of subsoils resulting from the excavation of minor service trenches should not be considered.

[10] WARNINGS:

The greater the extent of external catchment, the greater the need to divert upslope stormwater runoff around any soil disturbance.

COMMENTS:

The ability to separate "clean" (i.e. external catchment) stormwater runoff from "dirty" site runoff can have a significant effect on the size, efficiency and cost of the temporary drainage, erosion, and sediment control measures.

[11] **REQUIREMENTS**:

Permission must be obtained from the owner of a road reserve before placing any erosion and sediment control measures within the road reserve.

WARNINGS:

Few sediment control techniques work efficiently when placed on a road and/or around roadside stormwater inlets. Great care must be taken if sediment control measures are located on a public roadway, specifically:

- safety issues relating to road users;
- the risk of causing flooding on the road or within private property.

The construction of roads (whether temporary or permanent) will usually modify the flow path of stormwater runoff. This can affect how "dirty" site runoff is directed to the sediment control measures.

COMMENTS:

"On-road" sediment control devices are at best viewed as secondary or supplementary sediment control measures. Only in special cases and/or on very small projects (e.g. kerb and channel replacement) might these controls be considered as the "primary" sediment control measure.

[12] WARNINGS:

Soils with a pH less than 5.5 or greater than 8 will usually require treatment in order to achieve satisfactory revegetation. Soils with a pH of less than 5 (whether naturally acidic or in acid sulfate soil areas) may also limit the choice of chemical flocculants (e.g. Alum) for use in the flocculation of *Sediment Basins*.

[13] **REQUIREMENTS**:

A preliminary ESCP must be submitted to the local government for approval during the planning phase for any development that obtains a total point score of 17 or greater or when any trigger value is scored or exceeded.

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Appendix C - IECA (Australasia) Standard Drawings

Available from: http://www.austieca.com.au/publications/book-6-standard-drawings

A PO Box 26, Carina Q 4152 E admin@vtce.com.au W www.vtce.com.au



ESC-01

MATERIALS

FABRIC (LIGHT TRAFFIC AREAS): HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH ('BIDIM' A34 OR EQUIVALENT).

FABRIC (HEAVY TRAFFIC AREAS): POLY-PROPYLENE, POLYAMIDE, NYLON POLYESTER OR

NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN REINFORCED FABRIC. THE FABRIC WIDTH SHOULD BE AT LEAST 700mm, WITH A MINIMUM UNIT WEIGHT OF 140g/m². FABRICS SHOULD CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

4. WRAP THE FABRIC AROUND OR OVER THE STORMWATER INLET GRATE IN SUCH A MANNER THAT PREVENTS ANY WATER ENTERING THE STORMWATER INLET WITHOUT PASSING THROUGH THE FABRIC.

5. ENSURE ALL OTHER FLOW ENTRY POINTS ARE COVERED WITH FABRIC SUCH THAT WATER CANNOT ENTER THE STORMWATER INLET WITHOUT PASSING THROUGH A SUITABLE FILTER.

6. TAKE ALL NECESSARY MEASURE TO MINIMISE SAFETY OR FLOODING RISK CAUSED BY OPERATION OF THE SEDIMENT TRAP.

MAINTENANCE

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.

3. SELECT THE APPROPRIATE FABRIC FOR THE SITE CONDITIONS.

1. INSPECT THE BARRIER AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT AND MAKE REPAIRS AS NEEDED TO THE SEDIMENT TRAP.

2. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REPLACE THE FABRIC IF IT IS TORN OR DAMAGED.

4. SEDIMENT DEPOSITS SHOULD BE REMOVED IMMEDIATELY IF THEY REPRESENT A SAFETY RISK.

REMOVAL

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.



(a) Fabric wrap drop inlet protection with trench



(b) Typical details of excavated sediment collection trench

Drawn: GMW	May-10	Grated Stormwater (Field) Inlet Sediment Trap	ESC-02
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MATERIALS

SOCKS: MINIMUM 200mm DIAMETER SYNTHETIC OR BIODEGRADABLE TUBES MANUFACTURED FROM NON-WOVEN OR COMPOSITE FABRIC SUITABLE FOR THE 'FILTRATION' OF COARSE SEDIMENTS.

FILL MATERIAL: STRAW, CANE MULCH, COMPOSTED MATERIAL (AS4454), COARSE SAND, OR CLEAN AGGREGATE.

STAKES: MINIMUM 25 x 25mm TIMBER.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. ENSURE THE SOCKS ARE PLACED INDIVIDUALLY OR COLLECTIVELY (AS A SINGLE SEDIMENT TRAP) SUCH THAT: (i) LEAKAGE AROUND OR UNDER THE SOCKS IS MINIMISED;

(ii) ADJOINING SOCKS ARE TIGHTLY BUTTED OR OVERLAPPED AT LEAST 450mm;

(iii) THE SURFACE AREA OF POTENTIAL
WATER PONDING UP-SLOPE OF EACH
SEDIMENT TRAP IS MAXIMISED;
(iv) TO THE MAXIMUM DEGREE
PRACTICAL, ALL SEDIMENT-LADEN
WATER WILL PASS THROUGH THE
FORMED POND BEFORE FLOWING OVER
THE DOWN-SLOPE END OF THE
SEDIMENT TRAP.

3. WHEN PLACED ACROSS THE INVERT OF MINOR DRAINS, ENSURE THE SOCKS ARE PLACED SUCH THAT: (i) THE CREST OF THE DOWNSTREAM SOCK IS LEVEL WITH THE CHANNEL INVERT AT THE IMMEDIATE UPSTREAM SOCK (IF ANY); (ii) EACH SOCK EXTENDS UP THE CHANNEL BANKS SUCH THAT THE CREST OF THE SOCK AT ITS LOWEST POINT IS LOWER THAN GROUND LEVEL AT EITHER END OF THE SOCK.

4. IF STAKES ARE REQUIRED TO ANCHOR THE SOCKS, THEIR SPACING DOES NOT EXCEEDING 1.2m OR SIX TIMES THE SOCK DIAMETER (WHICHEVER IS THE LESSER). A MAXIMUM STAKE SPACING OF 0.3m APPLIES WHEN USED TO FORM CHECK DAMS.

MAINTENANCE

1. INSPECT ALL FILTER SOCKS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORMS OR OTHERWISE AT WEEKLY INTERVALS.

2. REPAIR OR REPLACE DAMAGED SOCKS.

3. THE BULK OF THE SEDIMENT COLLECTED BEHIND THE FILTER SOCKS SHOULD BE REMOVED BY SHOVEL AFTER EACH STORM EVENT.

4. REMOVE COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. ALL SAND, SOIL, SEDIMENT OR MUD MUST BE PHYSICALLY REMOVED FROM SEALED SURFACES, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.

2. IF NECESSARY FOR SAFETY REASONS, THE SEALED SURFACE SHALL ONLY BE

WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIAL FROM THE SURFACE.

3. DISPOSE OF COLLECTED SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD. 4. ALL SYNTHETIC (PLASTIC) MESH OR OTHER NON READILY BIODEGRADABLE MATERIAL MUST BE REMOVED FROM THE SITE ONCE THE SLOPE OR DRAIN IS STABILISED, OR THE SOCKS HAVE DETERIORATED TO A POINT WHERE THEY ARE NO LONGER PROVIDING THEIR INTENDED DRAINAGE OR SEDIMENT CONTROL FUNCTION.



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MATERIALS

FABRIC: POLYPROPYLENE, POLYAMIDE. NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN FABRIC, AT LEAST 700mm IN WIDTH AND A MINIMUM UNIT WEIGHT OF 140a/m². ALL FABRICS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).

FABRIC REINFORCEMENT: WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.

SUPPORT POSTS/STAKES: 1500mm² (MIN) HARDWOOD, 2500mm² (MIN) SOFTWOOD, OR 1.5kg/m (MIN) STEEL STAR PICKETS SUITABLE FOR ATTACHING FABRIC.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT. AND REQUIRED TYPE OF FABRIC (IF SPECIFIED). IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION. EXTENT. FABRIC TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. TO THE MAXIMUM DEGREE PRACTICAL, AND WHERE THE PLANS ALLOW, ENSURE THE FENCE IS LOCATED: (i) TOTALLY WITHIN THE PROPERTY BOUNDARIES: (ii) ALONG A LINE OF CONSTANT ELEVATION WHEREVER PRACTICAL; (iii) AT LEAST 2m FROM THE TOE OF ANY FILLING OPERATIONS THAT MAY RESULT IN SHIFTING SOIL/FILL DAMAGING THE FENCE. 3. INSTALL RETURNS WITHIN THE FENCE AT MAXIMUM 20m INTERVALS IF THE FENCE IS INSTALLED ALONG THE CONTOUR, OR 5 TO

10m MAXIMUM SPACING (DEPENDING ON SLOPE) IF THE FENCE IS INSTALLED AT AN ANGLE TO THE CONTOUR. THE 'RETURNS' SHALL CONSIST OF EITHER: (i) V-SHAPED SECTION EXTENDING AT LEAST 1.5m UP THE SLOPE; OR (ii) SANDBAG OR ROCK/AGGREGATE CHECK

DAM A MINIMUM 1/3 AND MAXIMUM 1/2 FENCE HEIGHT, AND EXTENDING AT LEAST 1.5m UP THE SLOPE.

4. ENSURE THE EXTREME ENDS OF THE FENCE ARE TURNED UP THE SLOPE AT LEAST 1.5m. OR AS NECESSARY. TO MINIMISE WATER BYPASSING AROUND THE FENCE.

5. ENSURE THE SEDIMENT FENCE IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE FENCE, AND THE UNDESIRABLE DISCHARGE OF WATER AROUND THE ENDS OF THE FENCE.

6. IF THE SEDIMENT FENCE IS TO BE INSTALLED ALONG THE EDGE OF EXISTING TREES, ENSURE CARE IS TAKEN TO PROTECT THE TREES AND THEIR ROOT SYSTEMS DURING INSTALLATION OF THE FENCE. DO NOT ATTACH THE FABRIC TO THE TREES.

7. UNLESS DIRECTED BY THE SITE SUPERVISOR OR THE APPROVED PLANS, EXCAVATE A 200mm WIDE BY 200mm DEEP TRENCH ALONG THE PROPOSED FENCE LINE. PLACING THE EXCAVATED MATERIAL ON THE UP-SLOPE SIDE OF THE TRENCH.

8. ALONG THE LOWER SIDE OF THE TRENCH. APPROPRIATELY SECURE THE STAKES INTO THE GROUND SPACED NO GREATER THAN 3m IF SUPPORTED BY A TOP SUPPORT WIRE OR WEIR MESH BACKING, OTHERWISE NO GREATER THAN 2m.

9. IF SPECIFIED. SECURELY ATTACH THE SUPPORT WIRE OR MESH TO THE UP-SLOPE SIDE OF THE STAKES WITH THE MESH EXTENDING AT LEAST 200mm INTO THE EXCAVATED TRENCH. ENSURE THE MESH AND FABRIC IS ATTACHED TO THE UP-SLOPE SIDE OF THE STAKES EVEN WHEN DIRECTING A FENCE AROUND A CORNER OR SHARP CHANGE OF DIRECTION.

10. WHEREVER POSSIBLE, CONSTRUCT THE SEDIMENT FENCE FROM A CONTINUOUS ROLL OF FABRIC. TO JOIN FABRIC EITHER: (i) ATTACH EACH END TO TWO OVERLAPPING STAKES WITH THE FABRIC FOLDING AROUND THE ASSOCIATED STAKE ONE TURN, AND WITH THE TWO STAKES TIED TOGETHER WITH WIRE: OR

(ii) OVERLAP THE FABRIC TO THE NEXT ADJACENT SUPPORT POST.

11. SECURELY ATTACH THE FABRIC TO THE SUPPORT POSTS USING 25 X 12.5mm STAPLES. OR TIE WIRE AT MAXIMUM 150mm SPACING.

12. SECURELY ATTACH THE FABRIC TO THE SUPPORT WIRE/MESH (IF ANY) AT A MAXIMUM SPACING OF 1m.

13. ENSURE THE COMPLETED SEDIMENT FENCE IS AT LEAST 450mm, BUT NOT MORE THAN 700mm HIGH. IF A SPILL-THOUGH WEIR IS INSTALLED. ENSURE THE CREST OF THE WEIR IS AT LEAST 300mm ABOVE GROUND LEVEL.

14. BACKFILL THE TRENCH AND TAMP THE FILL TO FIRMLY ANCHOR THE BOTTOM OF THE FABRIC AND MESH TO PREVENT WATER FROM FLOWING UNDER THE FENCE.

ADDITIONAL REQUIREMENTS FOR THE INSTALLATION OF A SPILL-THROUGH WEIR

1. LOCATE THE SPILL-THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.

2. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm THE GROUND ELEVATION.

3. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/ STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.

4. INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL-THROUGH WEIR TO CONTROL SOIL EROSION AND APPROPRIATELY DISCHARGE THE CONCENTRATED FLOW PASSING OVER THE WEIR.

MAINTENANCE

1. INSPECT THE SEDIMENT FENCE AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR ANY TORN SECTIONS WITH A CONTINUOUS PIECE OF FABRIC FROM POST TO POST.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. IF THE FENCE IS SAGGING BETWEEN STAKES. INSTALL ADDITIONAL SUPPORT POSTS.

5. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 1/3 THE HEIGHT OF THE FENCE.

6. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

7. REPLACE THE FABRIC IF THE SERVICE LIFE OF THE EXISTING FABRIC EXCEEDS 6-MONTHS.

REMOVAL

1. WHEN DISTURBED AREAS UP-SLOPE OF THE SEDIMENT FENCE ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION. THE FENCE MUST BE REMOVED.

2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

Drawn:	Date:		
GMW	May-10	Sediment Fence	ESC-05

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Appendix D - Rockhampton Regional Council Development Codes

A PO Box 26, Carina Q 4152 E admin@vtce.com.au W www.vtce.com.au

Document Set ID: 40550325 Version: 1, Version Date: 07/08/2023

Stormwater Management Code

Stormwater Management - General

9.3.6.3 Specific benchmarks for assessment

Table 9.3.6.3.1—Development outcomes for assessable development

Table 9.3.6.3.1 — Development outcomes for assessable development			
Performance outcomes	Acceptable outcomes	Response	
Stormwater management - General			
 PO1 Development provides a stormwater management system which achieves the integrated management of stormwater to: (a) ensure that flooding impacts do not increase, including upstream or downstream of the development site; (b) avoid net worsening of stormwater peak discharges and runoff volumes; (c) utilises the use of water sensitive urban design principles; and (d) ensure the site maximizes opportunities for capture and reuse. (e) Editor's note—A stormwater management plan may be required to demonstrate compliance with the performance outcome 	AO1.1 Development provides a stormwater management system which is designed in compliance with SC6.18— Stormwater management planning scheme policy, SC6.10 — Flood hazard planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff.	Proposed development will reuse the existing stormwater management system.	
	AO1.2 Stormwater is conveyed to a lawful point of discharge in accordance with the Queensland Urban Drainage Manual.	Proposed development nominates a lawful point of discharge generally in accordance with the Queensland Urban Drainage Manual.	
 PO2 Development provides a stormwater management system which (a) has sufficient capacity to safely convey runoff taking into account increased runoff from impervious surfaces and flooding in local catchments; (b) maximises the use of natural waterway corridors and natural channel design principles; and 	AO2.1 Development provides a stormwater management system which is designed in compliance with SC6.18 — Stormwater management planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff.	Proposed development will reuse the existing stormwater management system.	



Table 9.3.6.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
(c) efficiently integrates with existing stormwater treatments upstream and downstream.		
 PO3 Development ensures that the location and design of stormwater detention and water quality treatment facilities: (a) minimise risk to people and property; (b) provide for safe access and maintenance; and (c) provide for the safe recreational use of stormwater 	AO3.1 Development provides for stormwater detention and water quality treatment facilities which are located outside of a waterway.	Not appliable to this development.
(c) provide for the safe recreational use of stormwater management features.	AO3.2 Development provides for stormwater detention in accordance with SC6.18 — Stormwater management planning scheme policy, Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff.	Not appliable to this development.
	AO3.3 Development provides a stormwater quality treatment system which is designed in accordance with State Planning Policy Water Quality.	Not appliable to this development. Proposed development will not feature stormwater detention and water quality treatment devices.
Environmental Values		
PO4 Development and drainage works including stormwater channels, creek modification works, bridges, culverts and	AO4.1 Development ensures natural waterway corridors and drainage paths are retained.	Not applicable for this development.



Table 9.3.6.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
 major drains, protect and enhance the environmental values of the waterway corridors and drainage paths and permit terrestrial and aquatic fauna movement. Editor's note—Compliance with the performance outcomes and acceptable outcomes should be demonstrated by the submission of a sitebased stormwater management plan for development. 	AO4.2 Development incorporates the use of natural channel design principles in constructed components to maximise environmental benefits and waterway stability in accordance with the Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff	Not applicable for this development.
	AO4.3 Development provides stormwater outlets into waterways, creeks, wetlands and overland flow paths with energy dissipation to minimise scour in accordance with the Queensland Urban Drainage Manual, Capricorn Municipal Development Guidelines and Australian Rainfall and Runoff	Not applicable for this development.
PO5 Development protects and enhances the environmental and water quality values of waterways, creeks and estuaries within or external to the site. Editor's note—The State Planning Policy Guideline Water Quality and Section 9 of the Environmental Protection Act 1994 define environmental values as 'a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety.'	No acceptable outcome is nominated.	Development protects and enhances the environmental and water quality values of the surrounding receiving waterways, creeks and estuaries.
Overland flow path tenure		
PO6 All overland flow paths are maintained under tenure arrangements that facilitate efficient infrastructure and enhance environmental sustainability. Editor's note—As a guide, Council prefers that the location of Council owned assets are contained within a road reserve, drainage system is contained within a road reserve, drainage easement, drainage reserve, public reserve, public pathway, park or waterway corridor.	No acceptable outcome is nominated.	Not applicable for this development.



Table 9.3.6.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
Detention Systems		
PO7 Detention basins are designed, located and constructed on land solely dedicated for stormwater management.	AO7.1 Detention basins are designed in accordance with SC6.18 Stormwater management planning scheme policy.	Not appliable to this development. Proposed development will not feature detention basins.
PO8 Development ensures that location and design of stormwater detention and water quality treatment: (a) minimises risk to people and property; (b) provides for safe access and maintenance; and (c) minimises ecological impacts to creeks and waterways.	AO8.1 Development provides a stormwater management system designed in accordance with SC6.10 Flood hazard planning scheme policy and SC6.18 Stormwater management planning scheme policy.	Not appliable to this development. Proposed development will not feature stormwater detention and water quality treatment devices.
 PO9 Flood plain storage and function, and detention system functions are maintained. This shall include ensuring that: (a) detention system design does not remove floodplain storage; and (b) detention systems continue to operate effectively during a major storm event. 	No acceptable outcome is nominated.	Not applicable for this development.
PO10 Detention basins shall not be provided in locations that prevent easy access to or maintenance of the detention basin.	AO10.1 The location of detention basins are in accordance with SC6.18 Stormwater management planning scheme policy.	Not appliable to this development. Proposed development will not feature stormwater detention and water quality treatment devices.
Efficiency and whole of life cycle cost		



Table 9.3.6.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
PO11 Development ensures that there is sufficient site area to accommodate an effective stormwater management system. Editors note - compliance with the performance outcome should be demonstrated by the submission of a site based stormwater management plan for development.	No acceptable outcome is nominated.	Proposed development will reuse the existing stormwater management system.
 PO12 Development provides for the orderly development of stormwater infrastructure within a catchment, having regard to the: (a) existing capacity of stormwater infrastructure within and external to the site, and any planned stormwater infrastructure upgrades; (b) safe management of stormwater discharge from existing and future upslope development; and (c) implications for adjacent and downslope development. 	No acceptable outcome is nominated.	Proposed development will reuse the existing stormwater management system.
 PO13 Development provides proposed stormwater infrastructure which: (a) remains fit for purpose for the life of the development and maintains full functionality in the design storm event; and (b) can be safely accessed and maintained in a cost effective way. 	No acceptable outcome is nominated.	Proposed development will reuse the existing stormwater management system.
Erosion and sediment control		



Table 9.3.6.3.1 — Development outcomes for assessable development			
Performance outcomes	Acceptable outcomes	Response	
 PO14 Development ensures that all reasonable and practicable measures are taken to manage the impacts of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, civil construction, installation of services, rehabilitation, revegetation and landscaping to protect: (a) the environmental values and water quality objectives of waters; (b) waterway hydrology; and (c) the maintenance and serviceability of stormwater infrastructure. 	A014.1 Erosion and sediment control plan is to be designed and implemented in accordance with the Capricorn Municipal Development Guidelines.	A preliminary erosion and sediment control plan has been prepared for this development site. All planned erosion and sediment control measures will be designed and constructed in accordance with the stormwater drainage section of the Capricorn Municipal Development Guidelines.	
Water quality within catchment areas			
PO15 For development proposals within the Fitzroy River subbasin, relevant environmental values are recognized and enhanced, and relevant water quality objectives are addressed.	A015.1 Development complies with the provisions of the State Planning Policy Guideline Water Quality.	Not applicable for this development.	
Editor's note—Section 3.2 of Queensland Water Quality Guidelines 2009 identifies values for water quality for waters in the Central Coast Queensland region.	 AO15.2 Development adjoining the full supply height above the Fitzroy River Barrage includes the provision of an effective buffer that assists in filtering runoff, including: (a) a buffer distance of 100 metres to the water supply height of the barrage which excludes cropping or grazing of a low intensity nature; and (b) fencing and water troughs installed on the land to prevent encroachment of animals within 100 metres of the full supply height above the barrage. 	Not applicable for this development.	



Table 9.3.6.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
Protecting water quality		
 PO16 The development is compatible with the land use constraints of the site for: (a) achieving stormwater design objectives; and (b) avoiding or minimising the entry of contaminants into, and transport of contaminants in stormwater. 	 AO16.1 Development is undertaken in accordance with a stormwater management plan that: (a) incorporates stormwater quality control measures to achieve the design objectives set out in the State Planning Policy – Guideline – Water Quality; (b) provides for achievable stormwater quality treatment measures reflecting land use constraints, such as soil type, landscape features (including landform), nutrient hazardous areas, acid sulfate soil and rainfall erosion potential; and (c) accounts for development type, construction phase, local landscape, climatic conditions and design objectives. Editor's note—A stormwater management plan includes the design, construction, operation, maintenance of the stormwater system. Editor's note—SC6.18 — Stormwater management planning scheme policy provides guidance on preparing a stormwater quality management plan. 	Not applicable for this development.
Protecting water quality in existing natural waterways		
 PO17 The waterway is designed for stormwater flow management, stormwater quality management and the following end use purposes: (a) amenity including aesthetics, (b) landscaping and recreation; (c) flood management; (d) stormwater harvesting as part of an integrated water cycle management plan; (e) as a sustainable aquatic habitat; and (f) the protection of water environmental values. 	No acceptable outcome is nominated	Not appliable to this development. Proposed development will not feature stormwater detention and water quality treatment devices.



Table 9.3.6.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
PO18 The waterway is located in a way that is compatible with existing tidal waterways.	 AO18.1 Where the waterway is located adjacent to, or connected to, a tidal waterway by means of a weir, lock, pumping system or similar: (a) there is sufficient flushing or a tidal range of more than 0.3 metres; or (b) any tidal flow alteration does not adversely impact on the tidal waterway; or (c) there is no introduction of salt water into freshwater environments. 	Not applicable for this development.
PO19 The construction phase for the waterway is compatible with protecting water environmental values in existing natural waterways.	A019.1 Erosion and sediment control measures are incorporated during construction to achieve design objectives set out in State Planning Policy Guideline Water Quality. Editor's note—Erosion and sediment control is to be designed and implemented in accordance with the International Erosion Control Association Best Practice Erosion and Sediment Control Guidelines.	A preliminary erosion and sediment control plan has been prepared for this development site. All planned erosion and sediment control measures will be designed and constructed in accordance with the applicable standards and will achieve the design objectives set out in the State Planning Policy Guideline Water Quality.
PO20 Stormwater overflows from the waterway do not result in lower water quality objectives in existing natural waterways.	AO20.1 Stormwater runoff entering nontidal waterways is pretreated prior to release in accordance with the guideline design objectives, water quality objectives of local waterways, and any relevant local area stormwater management plan.	Not applicable for this development.



Works Code

Works code

9.3.9.3 Specific benchmarks for assessment

Table 9.3.9.3.1—Development outcomes for assessable development

Table 9.3.9.3.1 — Development outcomes for assessable development			
Performance outcomes	Acceptable outcomes	Response	
Access driveways			
 PO1 Access driveways are located to avoid conflicts and designed to operate efficiently and safely, taking into account: (a) the size of the parking area; (b) the voluzme, frequency and type of vehicle traffic; (c) the need for some land uses (for example hospitals) to accommodate emergency vehicle access; (d) the type of use and the implications on parking and circulation for example longterm or shortterm car parking; (e) frontage road function and conditions; and (f) the capacity and function of the adjoining street system. 	 AO1.1 New access driveways are not located within: (a) twenty-five (25) metres of a signalised road intersection; (b) twenty (20) metres of an unsignalised road intersection in an industrial or centres zone or ten (10) metres otherwise; and (c) one (1) metre of any street signage, power poles, street lights, manholes, stormwater gully pits or other Council asset. 	Not applicable to this development.	
PO2 Access driveways do not disrupt existing road or footpath infrastructure.	 AO2.1 New access driveways: (a) do not require the modification, relocation or removal of any infrastructure including street trees, fire hydrants, water meters and street signs; (b) do not front a traffic island, speed control device, car parking bay, bus stop or other infrastructure within the road carriageway; must be sealed and to a formed road; (c) are not constructed over an access point to equipment under the control of a regulatory authority, including stormwater pits, water meters, hydrants and telephone pits; and 	Not applicable to this development.	



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Performance outcomes	Acceptable outcomes	Response
	(d) where an access chamber is to be incorporated within the driveway, are raised or lowered to match the surface level of the driveway are provided with a trafficable lid	
 PO3 Access driveways and crossfalls within the verge are designed and constructed so as to: (a) enable safe and functional vehicular access from the street to the property; and (b) not cause a change in the level of a footpath 	AO3.1 New access driveways and crossfalls within the verge are constructed in compliance with the Capricorn Municipal Development Guidelines.	Not applicable to this development.
PO4 An access driveway does not allow water to pond adjacent to any buildings or cause water to enter a building.	AO4.1 New access driveways have a minimum cross fall of one (1) metre (vertical) to 100 metres (horizontal) away from all adjoining buildings.	Not applicable to this development.
Parking, access and transport	·	
 PO5 Provision is made for onsite vehicle parking: (a) to meet the demand likely to be generated by the development; and (b) to avoid onstreet parking where that would adversely impact on the safety or capacity of the road network or unduly impact on local amenity. Editor's note—C6.6 — Car parking contributions planning scheme policy prescribes circumstances under which an applicant can satisfy PO5. 	AO5.1 AO5.1.1 Onsite car parking is provided at the rates set out in Table 9.3.1.3.2 of the access, parking and transport code. AO5.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing number of onsite car parks is retained or increased.	Carparking will be provided in accordance with the rates set out in Table 9.3.1.3.2 of the access, parking and transport code. Not applicable for this development.
 PO6 Car parking areas are designed to: (a) be clearly defined, marked and signed; (b) be convenient and accessible; (c) be safe for vehicles, pedestrians and cyclists; and 	AO6.1 AO6.1.1 The car parking areas are sealed and designed in accordance with Australian Standard AS 2890, as updated from time to time. OR	Carparking will be designed and constructed in accordance with the version of Australian Standard AS 2890.


Table 9.3.9.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
(d) provide spaces which meet the needs of people with disabilities.	AO6.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing standard of on- site car parks is maintained or improved.	Carparking of the proposed extension will be designed and constructed in accordance with the applicable standards, be clearly marked and signed, convenient and accessible and provide sufficient spaces which meets the needs of people with disabilities. Carparking will be designed and constructed to be safe for vehicle, pedestrian and cyclist movement.
 PO7 Parking access arrangements are appropriate for: (a) the capacity of the parking area; (b) the volume, frequency and type of vehicle usage; and 	AO7.1 Parking access is provided in accordance with Australian Standard AS 2890, as updated from time to time. OR	Access will be designed and constructed in accordance with the latest version of Australian Standard AS 2890.
(c) the function and characteristics of the access road and adjoining road network.	A07.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing parking access is maintained or improved.	Parking access arrangements will be designed and constructed to be appropriate for the capacity and volume, frequency and type of vehicle usage, whilst retaining and protecting the functionality of the surrounding road network.
PO8	A08.1	Not applicable to this development.
Landscaping is provided to soften the visual impact of car parking areas and to provide shading.	 AO8.1.1 Shade trees with a minimum height of two (2) metres are provided within car parking areas at the following rate: (a) in single sided, angle or parallel bays — one (1) tree per three (3) car parks; and (b) in double sided, angle or parallel bays — one (1) tree per six (6) car parks. Editor's note—SC6.12 — Landscaping design and street trees planning scheme policy provides sources for determining appropriate species and planting standards. OR 	



Table 9.3.9.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
	AO8.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing standard of landscaping is maintained or improved.	Not applicable to this development.
 PO9 Provision is made for the onsite loading, unloading, manoeuvring and access by service vehicles that: (a) is adequate to meet the demands generated by the development; (b) is designed to accommodate service vehicle 	AO9.1.1 New development is designed to ensure service vehicles do not perform reversing movements onto public roads. AND	The proposed carparking layout has been designed to provide sufficient areas and space for service vehicle movements and prevents service vehicles do not use public roads to maneuver.
 (d) is designed to decommodate service vehicle requirements; (c) is wholly contained within the site; and (d) does not unduly impede vehicular, cyclist and pedestrian safety and convenience within the site. 	AO9.1.2 Access and maneuvering facilities, loading facilities and connections to the transport network are sealed and designed in accordance with Australian Standard AS 2890. OR	Access and maneuvering facilities, loading facilities and connections to the transport network will be sealed and designed and constructed generally in accordance with Australian Standard AS 2890.
	AO9.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing provision for service vehicles is maintained or improved.	Access and maneuvering facilities, loading facilities and connections to the transport network will be sealed and designed and constructed generally in accordance with Australian Standard AS 2890.
PO10 Development is located on roads that are appropriate for the nature of traffic (including vehicles, pedestrians and cyclists) generated, having regard to the safety and efficiency of the transport network.	AO10.1 AO10.1.1 The existing infrastructure fronting the proposed development is upgraded in accordance with SC6.15 — Road infrastructure and hierarchy planning scheme policy and Capricorn Municipal Development Guidelines. OR	Existing infrastructure in the road frontage will be retained and protected during construction. Existing infrastructure and services disturbed by the proposed development works will be reinstated with the applicable standards and to match existing profiles. Upgrades will be undertaken in accordance with SC6.15 – Road infrastructure and hierarchy planning



Table 9.3.9.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
		scheme policy and the Capricorn Municipal Development Guidelines.
	AO10.1.2 Where a change of use of existing premises is proposed and involves not more than minor building work, the existing infrastructure fronting the proposed development is maintained or improved.	Existing infrastructure in the road frontage will be retained and protected during construction. Exiting infrastructure and services disturbed by the proposed development works will be reinstated with the applicable standards and to match existing profiles. Upgrades will be undertaken in accordance with SC6.15 – Road infrastructure and hierarchy planning scheme policy and the Capricorn Municipal Development Guidelines.
Infrustructure		
PO11 A water supply is provided that is adequate for the current and future needs of the development.	AO11.1 Where within a water supply planning area, the development is connected to Council's reticulated water supply system in accordance with SC6.21 — Water supply infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines. Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome. Editor's note—Where development is located outside of the water supply	The proposed development will reuse the existing water supply infrastructure in the road corridor, adjacent to the site generally in accordance with SC6.21 – Water supply infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines.
	planning area to refer to the requirements under the Plumbing Code of Australia.	-
Reticulated water supply networks ensure that the installation is sustainable and minimises whole of life cycle costs.	AU12.1 Where within a water supply planning area, water supply systems and connections are designed and constructed in accordance with SC6.21 — Water supply infrastructure	suitably connected to the existing water supply infrastructure in the road corridor, adjacent to the site generally in accordance with SC6.21 – Water



Table 9.3.9.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
	planning scheme policy and the Capricorn Municipal Development Guidelines.	supply infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines.
	Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome.	
	AND	
	A012.2	Not applicable for this development.
	Where within a water supply planning area, staged developments are connected to the water supply network and operational, prior to the commencement of the use or endorsement of the survey plan.	
PO13	A013.1	The development proposes to reuse
Sewerage treatment and disposal is provided that is appropriate for the level of demand generated, protects public health and avoids environmental harm.	Where within a sewer planning area, the development is connected to Council's reticulated waste water system in accordance with SC6.17 — Sewerage infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines.	the existing sewer infrastructure available within the site generally in accordance with SC6.17 – Sewerage infrastructure planning scheme policy and the Capricorn Municipal
	Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome.	Development Guidelines.
	Editor's note—Where development is located outside of the sewer planning area to refer to the requirements under the Plumbing Code of Australia	
PO14	A014.1	The development proposes to reuse
Reticulated sewer networks ensure that the installation of infrastructure assets is sustainable and minimises whole of life cycle costs.	Where within a sewer planning area, waste water systems and connections are designed and constructed in accordance with SC6.17 — Sewerage infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines.	the existing sewer infrastructure available within the site generally in accordance with SC6.17 – Sewerage infrastructure planning scheme policy and the Capricorn Municipal Development Guidelines.
	Editor's note—A network analysis may be required to demonstrate compliance with this acceptable outcome.	
	AND	



Table 9.3.9.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
	AO14.2 Where within a sewer planning area, staged developments are connected to the waste water network and operational prior to the commencement of the use or endorsement of the survey plan.	Not applicable for this development.
PO15 Development is located and designed in a manner that does not result in adverse flood affects to the site and on adjoining properties.	AO15.1 The development does not result in an increase in flood level, flood water velocity or flood duration on upstream, downstream or adjacent properties. AND	The proposed development will not result in increases to flood levels or velocity or duration on upstream and/or downstream adjacent sites.
	AO15.2 Roof and surface water is conveyed to the kerb and channel or an inter- allotment drainage system in accordance with Australian Standard AS/NZ 3500.3.2, and the Queensland Urban Drainage Manual as updated from time to time.	Roof and surface water will be designed and constructed to be captured and conveyed to discharge to the road corridor to the south (location of existing lawful point of discharge) generally in accordance with Australian Standard AS/NZ 3500.2 and the Queensland Urban Drainage Manual.
Waste Management		
PO16 Provision is made for waste management that is appropriate to the use, protects the health and safety of people and the environment.	AO16.1The development provides a bin container storage area that has a sealed pad and is screened to the height of the bins.AND	Development will provide suitable storage areas for waste collection and screened appropriately. Refer to architectural site plan provided.
Editor's note—Applicants should also be aware that any provision for disposal of any trade waste is to be made in accordance Council's Trade Waste Policy supporting the Water Act 2000, Water Supply (Safety and Reliability) Act 2008 and the Plumbing and Drainage Act 2018.	AO16.2 On sites in an industrial zone that are greater than 2,000 square metres in area, provision is made for refuse collection vehicles to access the collection area and to enter and leave the site in a forward direction without having to make more than a threepoint turn.	Development will provide suitable area for refuse collection vehicles to access bin storage area.



Table 9.3.9.3.1 — Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
Erosion and sediment control		
PO17 Development ensures that all reasonable and practical measures are taken to manage the impact of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, to protect water quality and environmental values.	AO17.1 AO17.1.1 Erosion and sediment control plan is to be designed and implemented in accordance with the Capricorn Municipal Development Guidelines. OR	A preliminary erosion and sediment control plan has been prepared for this development site. All planned erosion and sediment control measures will be designed and constructed in accordance with the Capricorn Municipal Development Guidelines.
	AO17.1.2 No filling or excavation is occurring on the site.	Suitable protection devices and methods will be implemented during proposed earthworks to protect surrounding sites, the environmental values of the area and receiving waterways.



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Filling and Excavation Code

Filling and Excavation Code

9.3.3.3 Specific benchmarks for assessment

Table 9.3.3.3.1—Development outcomes for assessable development

Table 9.3.3.1—Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
Retaining walls		
PO1 The construction of retaining walls does not adversely impact	AO1.1 Retaining walls are set back at least half the height of the wall	Not applicable for this development.
upon the stability of land or existing structures.	from any boundary of the site.	
	AO1.2 Retaining walls over 1.5 metres are stepped 1.5 metres for every 1.5 metres in height, terraced and landscaped.	Not applicable for this development.
Amenity		
PO2 Excavation or filling or the construction of retaining walls does not adversely affect the visual character of the surrounding area and areas of high scenic amenity and visibility.	No acceptable outcome is nominated.	The proposed earthworks will not adversely affect the visual character of the surrounding area and areas of high scenic amenity and visibility. Retaining walls will be constructed using select materials and will utilize landscaping to enhance the overall visual amenity.
PO3 Excavation or filling or the construction of retaining walls does not adversely affect the amenity of adjoining or nearby properties.	AO3.1 No dust or other air emissions extend beyond the boundaries of the site.	Dust suppression on the site during construction is addressed in the preliminary erosion and sediment control plan. Planned measures will ensure no dust emissions from the site or from construction vehicles entering and leaving the site.
	AO3.2 The total duration of filling or excavation operations does not exceed four (4) weeks.	Filling and excavation works on site will be limited to 4 weeks and/or the shortest time practicable.



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Filling and Excavation Code

Table 9.3.3.3.1—Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
	AO3.3 Filling or excavation operations occur only between 07:00 to 18:00 Monday to Saturday.	Filling and excavation activities on site will be limited to specified hours. Any variation for particular activities will be subject to approval.
	AO3.4 Excavation and filling operations are undertaken in accordance with the Capricorn Municipal Development Guidelines.	Excavation and filling operations will be undertaken generally in accordance with the Capricorn Municipal Development Guidelines.
Environment		
PO4 Excavation or filling or the construction of retaining walls does not adversely affect the environmental values of the locality.	No acceptable outcome is nominated.	Excavation, filling and construction of retaining walls will not impact the local environmental values and/or the surrounding sites.
PO5 Excavation or filling of land is carried out in such a way that it does not materially impede the flow of water through the site or worsen the flow of water external to the site.	AO5.1 Excavation or filling does not increase, concentrate or divert stormwater into an adjoining site.	Proposed earthworks will not result in an increase, concentration or diversion of stormwater on adjacent sites. The development proposes to construct a suitable stormwater management system on site to cater for developed flows.
Editor's note—Excavation or filling is carried out in accordance with an approved hydrology and hydraulics report, prepared by a suitably qualified person. The report demonstrates that any proposed excavation or filling or structures will not adversely affect flows on the site, upstream of the site and downstream of the site.	AO5.2 Excavation or filling does not cause or enable the ponding of water on the site or on any other adjoining land.	Proposed earthworks will not result in an ponding of stormwater on adjacent sites. The development proposes to construct a suitable stormwater management system on site to cater for developed flows.
	AO5.3 Excavation and filling is not located: (a) In any waterway corridor; and (b) In any wetland. Editor's note—Waterway corridors and wetlands are shown on the biodiversity areas overlay maps OM3A to OM3D.	Not applicable for this development.



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Filling and Excavation Code

Table 9.3.3.3.1—Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
	AO5.4 Filling or excavation does not adversely affect the level or flow of water in any overland flow path.	Not applicable for this development.
Traffic and access		
PO6 Traffic generated by excavation and filling does not adversely impact on the amenity of the surrounding area.	AO6.1 Haulage routes used for the transportation of fill to or from the site use major streets and only those minor streets that are necessary to provide direct access to the site.	Haul trucks will only use major roads for the minimum possible length of time.
	AO6.2 Truck movements generated by excavation or filling, do not exceed twenty (20) truck movements per day.	Truck movement generated by excavation and filling activities will be limited to the smallest number of movements per day as possible.
	AO6.3 Truck movements generated by excavation or filling, do not occur for longer than four (4) weeks within any three (3) month period.	Truck movement generated by proposed excavation and filling activities will be limited to the shortest duration achievable.
PO7 Filling or excavation does not prevent or create difficult access to the property.	No acceptable outcome is nominated.	Proposed earthworks will not impede access to the property.
Infrastructure		
 PO8 Excavation or filling or the construction of retaining walls is carried out in a manner that will not: (a) Damage, or result in damage to existing infrastructure; or (b) Compromise the safety of existing infrastructure. 	AO8.1 In respect to electricity works, unless an approval from the owner of the electricity works is granted stating otherwise, excavation and filling does not occur within: (a) twenty (20) metres of any tower, pole, foundation, ground anchorage or stay supporting electric lines or associated equipment; or	All existing electrical infrastructure will be suitably protected during construction and will not be impacted upon by proposed earthworks.



368 Dean Street, Frenchville QLD 4701 Filling and Excavation Code

Table 9.3.3.3.1—Development outcomes for assessable development		
Performance outcomes	Acceptable outcomes	Response
Editor's note—Development involving excavation or filling on land adjacent to electricity infrastructure should be referred to the relevant electricity entity to ensure there will be no electrical hazard created by the proposed development, before any application is lodged with Council.	 (b) five (5) metres of a substation site boundary; or (c) two (2) metres of a pad mount substation; or (d) one (1) metre of a pad mount transformer or an underground cable. 	
Erosion and sediment control		
PO9 Development ensures that all reasonable and practical measures are taken to manage the impact of erosion, turbidity and sedimentation, both within and external to the development site from construction activities, including vegetation clearing, earthworks, to protect water quality and environmental	AO9.1 Erosion and sediment control plan is to be designed and implemented in accordance with the Capricorn Municipal Development Guidelines.	A preliminary erosion and sediment control plan has been prepared for this development site. All planned erosion and sediment control measures will be designed and constructed in accordance with the Capricorn Municipal Development Guidelines.





YOUR TRUSTED ENVIRONMENTAL PARTNER

WASTE MANAGEMENT PLAN BERSERKER TAVERN FRENCHVILLE QLD 4701

ROCKHAMPTON REGIONAL COUNCIL APPROVED PLANS

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

Development Permit No.: D/106-2023 Dated: 7 November 2023



CLIENT Queensland Venue Co. Pty Ltd August 2023



DOCUMENT INFORMATION

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Document Details:

Title:	Waste Management Plan
	Berserker Tavern
	368 Dean Street
	Frenchville, Qld 4701

Project Number: MRA23-097

Revision	Date	Author	Reviewed By	Issued By
V.1	28 July 2023	C Caruso	A Reiser	C Caruso
V.2	2 August 2023	C Caruso	A Reiser	C Caruso
V.3	4 August 2023	C Caruso	A Reiser	C Caruso

Destination	Draft	Final	Rev.
Queensland Venue Co. Pty Ltd	V.1	V.2	V.3
MRA Environmental	V.1	V.2	V.3



LIMITATIONS

Mark Rigby & Associates Pty Ltd (MRA Environmental) has prepared this Waste Management Plan for the sole use of Queensland Venue Co. Pty Ltd, to support the proposed Development Application for the Berserker Tavern Extension located at the 368 Dean Street, Frenchville.

Specifically, this report supports the Development Application and relates to the waste storage and collection activities for the operational phase of the planned development in accordance with the *Rockhampton Region Planning Scheme 2015 - SC6.20 PSP - Waste Management*. This WMP will be submitted to Council as a component of the Development Application.

This report is for the sole use of Queensland Venue Co. Pty Ltd and in relation to the Development Application to be submitted to Rockhampton Regional Council. It may not contain sufficient information for the purposes of other parties, for other uses or at other locations.

We have performed our services for this project in accordance with our current professional standards. No other warranty expressed or implied is made as to the professional advice included in this submission.

Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions. The report also contains comments and information provided by others. MRA Environmental cannot take responsibility for advice provided by any third party.

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ATTACHMENTS

Attachment A: Waste Management Code



1.0 INTRODUCTION

1.1 BACKGROUND

MRA Environmental (MRA) has been commissioned by Queensland Venue Co. Pty Ltd c/ Urbis to prepare a Waste Management Plan (WMP) for the proposed extension to the Berserker Tavern located at 368 Dean Street, Frenchville QLD.

The Berserker Tavern has been in operation for many years subject to historic planning approvals and we understand that Queensland Venue Co. Pty Ltd propose an extension to the existing tavern. The existing development consists of a single storey hotel/tavern with dining lounge, public bar, sports bar, gaming area, office and BOH facilities on the ground floor. A drive-through Liquorland retail store is attached to the western side of the Berseker Taven and is to be retained with no changes proposed. Please note the existing drive-through Liquorland does not form part of this WMP.

We understand, Australian Venue Co. propose an overall refurbishment to all existing areas, extension to the beer garden, provision of outdoor seating. There is an approximate additional 450m² of GFA proposed to the existing development. Some changes to the carpark will also be a part of the refurbishment. A review of existing waste management provisions has been undertaken by MRA Environmental for the project. It was considered that existing waste arrangements will be sufficient for the proposed refurbishment and extension and should continue to remain in place.

Therefore, this WMP will be submitted to the Rockhampton Regional Council (Council) as part of the Development Application and ensures that the waste storage and collection activities for the operational phase of the proposed expansion of the development are in accordance with *Rockhampton Region Planning Scheme 2015 - SC6.20 PSP - Waste Management*.

1.2 SITE DETAILS

The subject site is located at 368 Dean Street, Frenchville QLD on a parcel of land described as Lot 1 on RP890077 (Refer to **Figure 1**). The subject site is bounded by Dean Street to the east, Diplock Street to the west, existing commercial developments to the north and residential dwellings to the south.

1.3 PURPOSE SCOPE OF REPORT

This report represents a Waste Management Plan for the operational phase of the refurbished Berserker Tavern, which includes:

- Details on the existing and anticipated quantity of waste (Section 3.0);
- Details of the existing waste storage arrangements (Section 4.0); and
- Details of the proposed waste collection arrangements (Section 5.0).



1.4 WMP OBJECTIVES & STRUCTURE

The main objectives of this report are to provide details for optimal waste management in the operational phase of the development.

The structure of this report will be as follows:

- An introduction including the site details, summary, purpose and scope of the report along with the objectives and structure;
- Development figures including the site location and outlining the waste storage and servicing infrastructure and locations;
- Waste quantities including the type of waste, quantities of waste and the proposed development tenancies;
- Proposed waste storage and servicing areas including waste storage infrastructure and locations within the development; and
- Details of the waste collection including servicing frequencies, the waste servicing area and collection vehicle access.



Version: 1, Version Date: 07/08/2023



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Version: 1, Version Date: 07/08/2023



2.0 WASTE QUANTITIES

2.1 TYPE OF WASTE

Table 1 outlines the predicted types of waste that are expected to be generated from the proposed refurbishment and extension to the Berserker Tavern.

Tenancy Type	Predicted Waste Types		
Kitchen & Bistro Areas	General waste and recycling		
Outdoor Dining Area Extension (Beer Garden)	General waste and recycling		
Bars	General waste and recycling		
BOH Areas/Offices	General waste and recycling		

2.2 WASTE QUANTITIES

Calculations of the anticipated waste quantities for the proposed refurbishment and extension to the Berserker Tavern have been separated into the general waste and recycling components. Please note no waste generation rates for Bars/Pubs/Hotels are outlined in *Rockhampton Region Planning Scheme 2015 - SC6.20 PSP - Waste Management*. Therefore, we will apply indicative waste generation rates from other local government policies such as the City of Gold Coast *City Plan - SC6.16 City Plan Policy v.10 - Solid Waste Management*.

The current arrangements for the site include a $3.0m^3$ general waste bulk bin serviced three times per week, $3 \times 240L$ general waste wheelie bins serviced once per week, and $7 \times 240L$ co-mingled recycling wheelie bins serviced once per week. It is not expected that the increased GFA will result in the requirement of additional bins during future operations. Therefore, it is proposed that the existing strategy be retained, with the strategy to be reviewed once operations commence with the opportunity to increase the number of servicing days per week if needed.



Table 2 and **Table 3** display the calculated general waste and recycling waste quantitiesfor the proposed tenancies of the Berserker Tavern.

Tenancy	Approximate floor area (m²)	Estimated Waste Generation Rate (L/100m ² /day)	Total Required Waste Capacity (L/week)	Estimated Waste Generation (m³/week)	Estimated Waste Generation (m ³ /day)
Beer Garden	353.31	50	1,237	1.24	0.18
Bistro	173.65	660	8,023	8.02	1.15
Bars - Sports, Main & Bistro	262.66	50	919	0.92	0.13
Gaming Room/Bar	209.31	50	733	0.73	0.10
BOH Areas	316.2	10	221	0.22	0.03
TOTAL	1,325.05	N/A	11,167	11.17	1.59

Table 2: Anticipated general waste quantities for the tavern refurbishment

 Table 3: Anticipate recycling quantities for the tavern refubishment

Tenancy	Approximate floor area (m²)	Estimated Waste Generation Rate (L/100m ² /day)	Total Required Waste Capacity (L/week)	Estimated Recycling Generation (m ³ /week)	Estimated Recycling Generation (m ³ /day)
Beer Garden	353.31	50	1,237	1.24	0.18
Bistro	173.65	200	2,431	2.43	0.35
Bars - Sports, Main & Bistro	262.66	50	919	0.92	0.13
Gaming Room/Bar	209.31	50	733	0.73	0.10
BOH Areas	316.2	20	443	0.44	0.06
TOTAL	1,325.05	N/A	5,797	5.80	0.82

In summary, the proposed extension to the tavern is estimated to generate a total of approximately **1.59m³/day** of general waste and **0.82m³/day** of recycling waste.

3.0 WASTE & RECYCLING STORAGE

This section outlines the general design criteria for the waste & recycling storage point as required by *Rockhampton Region Planning Scheme 2015 - SC6.20 PSP - Waste Management*, along with a description of the proposed bins to be used.

3.1 COMBINED WASTE STORAGE AND SERVICING POINT

The existing waste storage and servicing point for the Berserker Tavern is located within the loading/unloading yard at the rear of the development adjacent to the carpark (refer to **Figure 2**). There are no changes proposed to this area and therefore the existing waste storage and servicing point will be retained.



The current arrangements for the site include a $3.0m^3$ general waste bulk bin serviced three times per week, $3 \times 240L$ general waste wheelie bins serviced once per week, and $7 \times 240L$ co-mingled recycling wheelie bins serviced once per week. These bins will be provided to cater for the existing tavern and proposed extension. General waste & recycling waste generated by the tavern will be collected by staff or contracted cleaners and placed in the appropriate bulk or wheelie bins.

The existing waste storage point will meet the requirements listed below:

- 1. Aesthetically screened from any road frontage or adjoining property, and setback two (2) metres from any road frontage or property boundary;
- 2. Integrated into the building design wherever possible;
- 3. Permitting the collection vehicle drive in and drive out access in a forward gear;
- 4. Surrounded by at least a 1.8m high fence that obstructs from view the contents of the bin from a public place;
- 5. To be kept in a clean and tidy condition which is odour free;
- 6. Not to be located directly adjacent to any dwelling units or adjoining properties;
- 7. Adequate clearance provided around each bin to allow for manoeuvring and washing of the bins and storage area;
- 8. To be constructed of impermeable and durable material to allow for easy cleaning;
- 9. Ensures the location, design and operation does not have adverse acoustic, odour or visual impacts on surrounding properties;
- 10. Suitable drainage, with water discharging into a sewer drain, must be installed to allow the washing of bins and a tap with hose connection available;

3.2 PROPOSED WASTE BINS

To ensure that the waste storage area is sufficiently sized, details of the type and quantity of waste and number of bins to be stored are detailed in **Table 4**.

Waste Type	Proposed Waste Quantity (m³/week)	Bins Proposed in Area	Collection Frequency
General Waste	11.13	1 x 3.0m ³ general waste bulk bin	Three times per week
		3 x 240L general waste wheelie bins	Once per week
Recycling Waste	5.76	7 x 240L recycling wheelie bin	Once per week

Table 4: Details of bins stored within the waste storage point



3.3 DIMENSIONS OF WASTE CONTAINERS

Table 5 below provides dimensions of the wheelie bins to be used on-site. The 3m³ bulk bin will be composed of a heavy-duty metal with a lightweight plastic lid, and the 240L wheelie bins will be composed of heavy-duty plastic with lightweight plastic lids.

Bin Type	Volume	Length (mm)	Width (mm)	Height (mm)	Collection Vehicle Type
Bulk bin	3m ³	2,030	1,450	1,684	Front Lift Truck
Wheelie bin	240L	730	585	1,060	Side Lift Truck

 Table 5: Wheelie bin dimensions

3.4 DRAINAGE AND BIN WASH

As part of the arrangement with the engaged waste contractor providing bins to the site, the provision of regular bin washing and/or replacement of the bins on a regular basis to maintain amenity will be incorporated into the agreement. Should the engaged waste contractor not provide a bin washing service, suitable arrangements will be made with a separate commercial provider of such services.

4.0 DETAILS OF COLLECTION

4.1 FREQUENCY

Waste servicing frequencies for general waste bulk and wheelie bins, and recycling wheelie bins for the development have been outlined in **Table 4.** As per the existing arrangements, the general waste bulk bin is anticipated to be serviced three (3) times per week, the general waste wheelie bins and recycling wheelie bins are both anticipated to be serviced once per week.

4.2 COMBINED WASTE STORAGE AND SERVICING POINT

On-site servicing is proposed for this development. The combined waste storage and servicing point is located adjacent to the existing loading dock (Refer to **Figure 2**). The engaged waste contractor will be responsible for moving the bins to/from the existing waste storage point for servicing within the loading dock.

In addition to the requirements noted in **Section 4.1**, this area will also be designed to meet the following requirements:

- 1. They are easily accessed and convenient to use;
- 2. Sufficient space is provided for safe entry and exit and servicing by service vehicles without the need for manual handling;



- 3. Sufficient heigh clearance is provided for the safe operation of both front and side bin lifting operations;
- 4. Clear of car parking bays, loading bays and similar areas;
- 5. Clear of footpaths and pedestrian access;

4.3 COLLECTION VEHICLE ACCESS

Table 6 details the dimensions of the waste collection vehicles that service the development. Importantly, there is adequate access, egress and manoeuvring for the vehicles to service the bins at the nominated location. The side and front lift truck/s can gain enter and exit the site in a forward motion. It is expected the RCV will access via Dean Street or Diplock Street. Refer to traffic report for further details.

 Table 6: Side & Front Lift truck dimensions (based on Gold Coast Council specifications)

Parameter	Side Lift truck	Front Lift truck
Height (m)	4.10	4.30
Length (m)	9.80	10.20
Working Height (m)	4.50*	6.50*

*Please note that Council specifies a minimum vertical clearance for side lift and front lift trucks



5.0 SUMMARY

Details of this Waste Management Plan are summarised below:

- Queensland Venue Co. Pty Ltd propose an extension and additional outdoor seating to the existing Berserker Tavern. We understand, Australian Venue Co. propose an overall refurbishment to all existing areas, and extension to the beer garden, provision of outdoor seating. There is an approximate additional 450m2 of GFA proposed to the existing development;
- A review of existing waste management provisions has been undertaken and it was considered that existing waste arrangements will be sufficient for the proposed refurbishment and extension and should continue to remain in place.
- The proposed refurbishment to the Berserker Tavern is estimated to generate a total of approximately 1.59m³/day of general waste and 0.82m³/day of recycling waste;
- The current arrangements for the site include a 3.0m³ general waste bulk bin serviced three times per week, 3 x 240L general waste wheelie bins serviced once per week, and 7 x 240L co-mingled recycling wheelie bins serviced once per week. It is not expected that the increased GFA will result in the requirement of additional bins during future operations. Therefore, it is proposed that the existing strategy be retained, with the strategy to be reviewed once operations commence with the opportunity to increase the number of servicing days per week if needed;
- The existing waste storage and servicing point for the Berserker Tavern is located within the loading/unloading yard at the rear of the development adjacent to the carpark. No changes are proposed;
- On-site servicing is proposed for this development. The combined waste storage and servicing point is located adjacent to the existing loading dock. The engaged waste contractor will be responsible for moving the bins to/from the existing waste storage point for servicing within the loading dock; and
- As part of the arrangement with the engaged waste contractor providing bins to the site, the provision of regular bin washing and/or replacement of the bins on a regular basis to maintain amenity will be incorporated into the agreement. Should the engaged waste contractor not provide a bin washing service, suitable arrangements will be made with a separate commercial provider of such services.



ATTACHMENT A

Waste Management Code (9.3.7 Rockhampton Regional Council)



ASSESSABLE DEVELOPMENT CRITERIA

9.3.7 WASTE MANAGEMENT CODE (*Rockhampton Region Planning Scheme 2015*)

Performance outcomes	Acceptable Outcomes	Compliance Achieved	Comments
Assessable development			
Design and location			
PO1 For on-site waste collection, waste storage areas are located and designed so that: (a) They are easily accessed and convenient to use; (b) Sufficient space is provided for safe entry and exit and servicing by service vehicles without the need for manual	AO1.1 Waste storage areas are designed and maintained in accordance with <i>SC6.20 – Waste management planning scheme policy</i> .		The Waste Management Plan confirms the development includes a Waste storage area designed and maintained in accordance with SC6.20 – Waste management planning scheme policy.
 handling; (c) Sufficient height clearance is provided for the safe operation of both front and side bin lifting operations; (d) They are clear of car parking bays, loading bays and similar areas; and (e) They are clear of footpaths and pedestrian access. 			
PO2 Kerbside collection of waste containers ensures the safety and amenity of road and footpath users.	 AO2.1 Waste bins are located on the footpath so that: (a) Bins are located one (1) metre apart from other bins and obstructions; (b) All bins are accommodated within the street frontage of the site; 	N/A	The development does not propose kerbside servicing.



PO3 Waste storage minimises adverse impacts on adjoining properties.	 (c) A clear pedestrian access way two (2) metres wide is retained; and (d) Bins are capable of being serviced by the collection vehicle travelling forward, without having to reverse the vehicle. AO3.1 Waste storage areas are: (a) Integrated with the building design; or (b) Set back a minimum of two (2) metres from any boundary; (c) Screened from neighbouring properties and the street by a fence of 1.8 metres minimum height; and (d) Not located directly adjoining dwelling units on the site and neighbouring properties. 	✓	The Waste Management Plan confirms the waste storage area will minimise adverse impacts and be designed in accordance with SC6.20 – Waste management planning scheme policy .
PO4 Waste storage areas: (a) Have a level area on impermeable, durable materials so that they are easily cleaned; and (b) Have adequate clearance between and around waste storage bins to allow for manoeuvring and washing of bins.	No acceptable outcome is nominated.	\checkmark	The Waste Management Plan confirms the waste storage area be designed in accordance with SC6.20 – Waste management planning scheme policy.
P05 Waste storage areas are designed to separate stormwater and wash- down water.	AO5.1Wash-down water drains to either the reticulated sewerage system or an on-site sewerage facility if not in a sewer area.AND	\checkmark	The Waste Management Plan confirms the waste storage area will be designed in accordance with SC6.20 – Waste management planning scheme policy.
	AO5.2 Wash-down areas are: (a) Provided with a tap and water supply; or (b) Provided with a stormwater diversion valve and arrestor trap.	\checkmark	The Waste Management Plan confirms the waste storage area will be designed in accordance with SC6.20 – Waste management planning scheme policy.

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with **Development Permit No.: D/106-2023 Dated: 7 November 2023**

Environmental Noise Level Impact Assessment for Proposed Extensions and Refurbishments to Berserker Tavern, 368 Dean Street, Frenchville

conducted for

Queensland Venue Company Pty Ltd

Report No: R22114.docx/D3724/Rev.1/03.08.23

Description	Name	Date
Ambient Noise Assessment	Josh Finlayson	09 to 16.11.2022
Calculations	Josh Finlayson/David Moore	18.11.2022
Draft Report	David Moore	21.11.2022
Draft1 Report	David Moore	23.11.2022
Final Report	David Moore	28.02.2023
Revision 1 – report amended to suite current proposed layout	David Moore	03.08.2023

Report prepared for:

Authorised by:

Queensland Venue Company Pty Ltd Level 3, 616 St Kilda Road MELBOURNE VIC 3004

Ms Yvette Neilson General Manager - Development Queensland Venue Company Pty Ltd

 Telephone:

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Dates of assessment:

Consultants:

Wednesday 09 to Wednesday 16 November 2022

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David Moore, B App Sc, MAAS R22114.docx/D3724/Rev.1/03.08.23

Our reference:

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INTRODUCTION

It is proposed to refurbish and extend the existing Berserker Tavern, 368 Dean Street, Frenchville (Lot 1 on RP890077) as follows:

- from the existing outdoor seating, create a beer garden to the north, including a children's play area, with shade sail over the children's play area and partial roof over the new beer garden;
- add a DOSA to the north-western side of the new beer garden;
- create a new entry to the Gaming Room and make the Gaming Room larger;
- other minor changes to internal walls.

The closest residential to the Berserker Tavern are:

- house to the north at 371 Diplock Street (R1);
- houses to the east at 368 (R2) and 362 (R3) Diplock Street;
- houses to the south at 361 (R4) Diplock Street and 360 (R5) Dean Street;
- houses to the west at 167 (R6) and 168 (R7) Gair Street.

To ensure that this project does not create a noise nuisance relative to the nearby residential, this environmental noise level impact assessment has been prepared. Noise limits have been based on the Rockhampton Region Planning Scheme, Section SC6.3 '*Air, noise and hazard assessments planning scheme policy*' and in particular section SC6.3.2 *Noise Impact Assessment Requirements.* Whilst this section of the planning scheme is for consideration of assessing the noise impacts from industry upon sensitive receptors, it is considered to be equally relevant in considering potential noise impact from the Berserker Tavern to the nearby residential premises. This part of the Planning Scheme references the Environmental Protection (Noise) Policy 2019 and achieving the requirements of the Acoustic Quality Objectives. It also requires assessment of the existing background sound levels.

To determine the background sound levels an unattended noise logger was located at monitoring location A, which was on the subject site adjacent to the southern boundary with the microphone elevated 1.6 metres, for a 7-day period.

This report details the results of the ambient noise level study, all potential noise sources and source noise levels for the proposed refurbishment and extensions, noise limits, state of compliance with these noise limits and any required noise control measures.

Refer Figure 1 for locality plan, Figure 2 for monitoring location A and closest residential receptors, Figure 3 for existing floor plan and proposed demolition, Figure 4 for proposed site plan, Figure 5 for the proposed floor plan and Figure 6 for proposed roof plan.



Figure 1 Locality Plan



Figure 2 Monitoring Location A and Closest Residential (R1 to R7) (Top of the Page is approx. East)



Figure 3 Existing Floor Plan



Figure 4 Proposed Site Plan

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Figure 5 Proposed Floor Plan


Figure 6 Proposed Roof Plan

CRITERIA

Measurements and Calculations

All noise level measurements were conducted generally in accordance with the following:

- general requirements of the Queensland environmental protection legislation;
- Environmental Protection (Noise) Policy 2019 (EPP Noise);
- *Noise Measurement Manual*, Queensland Department of Environment and Heritage Protection, Version 4.01, 10 March 2020;
- Australian Standard AS 1055 2018, Acoustics, Description and measurement of environmental noise.

Noise Limits

The Rockhampton Regional Planning Scheme 2015 Version 2.2 requires protection of amenity of residential areas and makes mention of the Environmental Protection (Noise) Policy 2019 (EPP Noise). Noise limits, therefore, have been defined in accordance with the EPP Noise 2019, which only contains the Acoustic Quality Objectives. Reference is also made to the Default Noise Standards of the Environmental Protection Act 1994 for refrigeration and air-conditioning unit noise limits and the Office of Liquor and Gaming Regulation for amplified music noise limits.

The adopted noise limits are as follows:

- air-conditioning and refrigeration:
 - daytime (0700 to 1800 hours): background + 5 dB(A);
 - evening (1800 to 2200 hours): background + 5 dB(A);
 - night-time (2200 to 0700 hours): background + 3 dB(A);
- patron noise sources Acoustic Quality Objectives:
 - Acoustic quality objectives, daytime and evening, external to dwelling:
 - 50 dB(A) L_{Aeq,adj,1H};
 - 55 dB(A) LA10,adj,1H; and
 - 65 dB(A) LA1,adj,1H;
 - Acoustic quality objectives, daytime and evening, inside dwelling:
 - 35 dB(A) L_{Aeq,adj,1H};
 - 40 dB(A) LA10,adj,1H; and
 - 45 dB(A) L_{A1,adj,1H};
 - Acoustic quality objectives, night-time, inside dwelling:
 - 30 dB(A) L_{Aeq,adj,1H};
 - 35 dB(A) L_{A10,adj,1H}; and
 - 40 dB(A) L_{A1,adj,1H};

For the night-time period the internal noise criteria needs to be converted to be equivalent to outside the closest residences. Allowing a 7 dB(A) noise level reduction from outside to inside (based on windows partially closed and in accordance with the Queensland Environmental Protection Agency Ecoaccess Guideline *Planning for Noise Control*) the internal criteria would be equivalent to the following levels external to the dwelling:

- 37 dB(A) L_{Aeq,adj,1H};
- 42 dB(A) LA10,adj,1H; and
- o 47 dB(A) L_{A1,adj,1H}.

For amplified music the Berserker Tavern is a liquor licensed premises and the relevant noise limits are:

"... Regulation 40 Liquor Regulation 2002

Between 6.00am and 10.00pm – the adjusted maximum sound pressure level L_{A10} , plus adjustments for tonal and impulsive components, must not exceed the background level L_{A90} by more than 10 dB(A) when measured at any affected premises.

Between 10.00pm and 6.00am - the sound pressure level L_{OCT10} , in a full octave band with centre frequencies from 63 Hz to 2000 Hz must not exceed the background level, L_{OCT90} , by more than 8 dB in any octave bands when measured at any affected premises.

... This standard therefore applies to all areas of affected premises including indoor and outdoor areas. ..."

For the new beer garden it is only proposed to have background music.

CURRENT AMBIENT NOISE LEVELS

For monitoring location A Table 1 details the results of the ambient noise level measurements obtained from the un-attended noise logger. For details of the ambient noise level measurement equipment, equipment settings, calibration, monitoring location and atmospheric conditions, refer Appendix A. Appendix B contains, for the key parameters, all of the results of the ambient noise level measurements. Refer Appendix C for atmospheric data for Rockhampton, which predominantly complied with the requirements of the Australian Standard for conducting environmental noise levels.

With respect to noise the following should be noted:

- daytime: 0700 to 1800 hours;
- evening: 1800 to 2200 hours;
- night-time: 2200 to 0700 hours;
- 'A' weighted: adjustment made by the sound level meter to the measured noise to correspond to the response of the human ear. This adjustment is standardised by international noise standards;
- L_{Aeq,T}: the equivalent continuous (or approximately the 'average') 'A' weighted sound pressure level for the measurement period 'T';
- L_{A1,T}: the 'A' weighted sound pressure level exceeded for 1% of the measurement period 'T';
- L_{A10,T}: the 'A' weighted sound pressure level exceeded for 10% of the measurement period 'T', which is an approximation of the 'average of the maximum noise levels';
- L_{A90,T}: the 'A' weighted sound pressure level exceeded for 90% of the measurement period 'T', which is an approximation of the 'average of the minimum noise levels', which is also known as the 'background' noise level.

	Table 1 Results of Ambient Noise Assessment, Monitoring Location A													
				$L_{\text{Aeq},\text{T}}$			$L_{A1,T}$			L _{A10,T}		L _{A90,T}		
Day	Date	Time	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
Wedneedey.	00 11 00	Evening	46.4	55.7	51.2	54.2	68.2	62.2	48.6	56.3	52.9	41.8	48.3	45.6
Weunesuay	09.11.22	Night	41.2	62.2	51.6	45.5	72.0	62.0	43.2	66.6	54.6	35.9	47.9	42.7
		Day	48.9	60.3	53.3	55.8	72.7	63.5	51.6	58.2	55.0	45.0	50.0	46.9
Thursday	10.11.22	Evening	45.9	53.8	49.6	53.5	67.7	60.0	47.8	55.5	51.8	41.3	47.6	44.5
		Night	40.9	62.7	51.9	47.3	71.4	62.1	42.8	67.1	55.1	35.5	46.8	41.8
	11.11.22	Day	49.1	64.2	56.5	56.3	73.7	65.9	51.4	67.5	59.2	44.2	62.4	49.7
Friday		Evening	47.2	61.5	54.9	54.1	71.9	65.7	49.4	61.7	55.3	42.3	47.9	45.8
		Night	41.7	60.6	51.5	46.4	72.5	62.8	42.9	65.3	54.2	35.4	45.1	41.1
	12.11.22	Day	49.7	63.9	54.2	55.7	73.7	63.0	51.6	64.1	56.3	43.4	54.2	48.1
Saturday		Evening	47.6	54.2	50.2	53.9	66.5	59.3	49.8	55.1	52.1	42.8	47.3	45.6
		Night	41.5	61.5	50.8	45.9	71.4	61.6	42.8	66.0	54.3	34.9	44.8	41.1
		Day	49.4	63.5	54.1	56.2	76.4	63.9	52.5	66.5	57.3	43.6	50.2	47.8
Sunday	13.11.22	Evening	46.3	55.4	49.9	53.6	59.7	58.3	47.6	54.9	51.4	41.1	47.5	45.1
		Night	41.9	63.0	51.6	45.6	73.5	61.9	42.8	66.9	54.9	36.0	46.2	42.4
		Day	50.2	67.3	55.5	55.8	80.4	66.3	51.3	61.3	54.9	45.8	53.5	48.2
Monday	14.11.22	Evening	46.7	55.5	51.0	53.1	61.5	58.1	48.7	59.1	53.9	43.5	48.9	46.9
		Night	42.2	58.7	50.6	45.7	69.5	60.6	43.6	62.8	53.8	37.6	46.2	42.5
		Day	48.6	59.0	53.9	55.6	66.7	61.6	51.2	63.4	56.6	44.6	53.6	48.3
Tuesday	15.11.22	Evening	47.5	56.9	51.6	52.0	67.7	60.1	49.0	59.0	53.6	44.8	51.3	47.3
		Night	42.4	65.8	55.3	44.9	73.6	65.1	43.7	69.9	59.2	37.8	50.2	44.0
Wednesday	16.11.22	Day	50.9	63.9	55.0	57.3	74.5	65.0	52.8	64.4	57.0	43.6	50.9	47.4

Average Noise Level, dB(A)

	Daytime	54.6		Daytime	56.6
L _{Aeq,T}	Evening	51.2	La10,T	Evening	53.0
	Night-time	51.9		Night-time	55.2
	Daytime	64.2		Daytime	48.1
L _{A1,T}	Evening	60.5	L _{A90,T}	Evening	45.8
	Night-time	62.3		Night-time	42.2

Based on the above background sound levels the plant and equipment noise limits at all of the closest residences to the Berserker Tavern are:

- daytime (0700 to 1800 hours): ٠
- 48.1 + 5 = 53 dB(A) L_{Aeq, adj,T}; 45.8 + 5 = 51 dB(A) L_{Aeq,adj,T}; $42.2 + 3 = 45 \text{ dB}(A) \text{ L}_{\text{Aeq,adj,T}}$.
- evening (1800 to 2200 hours):
 night-time (2200 to 0700 hours):

Based on the acoustic quality objectives the patron noise limits are:

•	daytime (0700 to 1800 hours):	50 dB(A) L	LAeq,adj,1H;	65	dB(A)	L _{A1,adj,1H}	and	55	dB(A)
•	evening (1800 to 2200 hours):	50 dB(A) L	L _{Aeq,adi,1H} ;	65	dB(A)	L _{A1,adi,1H}	and	55	dB(A)
•	night-time (2200 to 0700 hours):	LA10,adj,1H;	LANDER	17	dB(A)	LALIN	and	12	
•		LA10,adj,1H.	∟Aeq,adj,1H,	47	UD(A)	LA1,adj,1H	anu	42	uD(A)

For amplified music up to 2200 hours the noise limits are:

- daytime: 48.1 + 10 = 58 dB(A) L_{A10,adj,T};
- evening: 45.8 + 10 = 56 dB(A) L_{A10,adj,T}.

These are the noise limits which have been adopted in this report for noise from the Berserker Tavern.

SOURCE NOISE LEVELS

The potential noise sources associated with proposed development are as follows:

- carpark activity, including vehicles driving in the carpark, people talking, car doors closing and car engines starting;
- waste collection;
- delivery truck;
- plant and equipment, including air-conditioning units, refrigeration units and kitchen exhaust fan;
- patron noise from the beer garden and DOSA areas.
- background amplified music from the beer garden.

Of the above potential noise sources there are no proposed changes to the carpark nor the delivery area. Therefore, as these noise sources are existing (and will not change) they have not been considered further in this report. Also, there are no proposed changes to the Sports Bar DOSA and, therefore, this DOSA has not been considered further either.

For the noise of people laughing and talking the source noise levels have been based on a paper presented at Acoustics 2011 by Hayne, M.J. titled *'Prediction of Noise from Small to Medium Sized Crowds'* the applicable formula for determining patron noise are:

• $L_{WAeq} = 15log_{10}N + 64 dB(A).$

where 'N' is the number of patrons.

For the different external areas (and including the new DOSA for the extended Gaming Room and the DOSA for the Beer Garden) the assumed people noise levels have been based on the architectural plans and are:

0	DOSA:	79 dB(A) L _{WAeq} ;
0	Beer Garden:	95 dB(A) L _{WAeq} ;

At the time of preparing this report no detail was available with respect to the location or noise level of any plant and equipment. Once detail of the actual location, extent and source noise level (manufacturer's data) for all plant and equipment is available the acoustic consultant will calculate noise impact to the closest residential, compare to the noise limits detailed in this report and if any of the noise limits are exceeded, nominate suitable noise control measures. It should be noted that this is only likely to affect the extended Gaming Room. Based on the above the adopted source noise levels are:

•	people noise:	
	o DOSA:	79 dB(A) L_{WAeq} = 50 dB(A) $L_{Aeq,adj,1H}$, 57 dB(A) $L_{A1,adj,1H}$ and 53
		dB(A) L _{A10,adj,1H} @ 8m;
	 Beer Garden: 	95 dB(A) $L_{WAeq} = 64 dB(A) L_{Aeq,adj,1H}$, 71 dB(A) $L_{A1,adj,1H}$ and 67
		dB(A) L _{A10,adj,1H} @ 8m;
•	amplified music:	70 dB(A) L _{A10,adj,T} @ 3m.

For the beer garden the above patron noise level is for full capacity. Based on data contained in Google for popular times for the Berserker Tavern post 2200 hours the number of patrons in the beer garden will be reduced, with an associated noise level of 58 dB(A) $L_{Aeq,adj,1H}$, 65 dB(A) $L_{A1,adj,1H}$ and 61 dB(A) $L_{A10,adj,1H}$ @ 8m. The number of people will also be reduced in the DOSAs, with an associated noise level of 45 dB(A) $L_{Aeq,adj,1H}$, 52 dB(A) $L_{A1,adj,1H}$ and 48 dB(A) $L_{A10,adj,1H}$ @ 8m.

NOISE LEVEL IMPACT

At the closest residences to the Berserker Tavern (refer Figure 2 for identification of closest residences) the noise level impact of the various noise sources will be as per Table 2. For the beer garden, the noise levels in parenthesis () is patron noise post 2200 hours.

TABLE 2 On Site Source Noise Level Impact to Closest Residential											
		e (m)	N Rec d	oise luction, B(A)	eiver	Noise Limits, dB(A)			Complies With Noise Limit (Y/N)		
Noise source	Noise Level, dB(A)	Separation Distanc	Distance	Barrier	Noise Level at Rec	Daytime	Evening	Night-time	Daytime	Evening	Night-time
CLOSEST RESIDENTIAL TO NORTH (R1)											
Patrons:											
	50 (45) L _{Aeq,adj,1H} @ 8m	35	13	8	29 (24)	50	50	37	Y	Y	Y
Gaming DOSA	57 (52) L _{A1,adj,1H} @ 8m	35	13	8	36 (31)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	35	13	8	32 (27)	55	55	42	Y	Y	Y
	50 (45) L _{Aeq,adj,1H} @ 8m	35	17	8	25 (20)	50	50	37	Y	Y	Y
Beer Garden DOSA	57 (52) L _{A1,adj,1H} @ 8m	35	17	8	32 (27)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	35	17	8	28 (23)	55	55	42	Y	Y	Y
	64 (58) L _{Aeq,adj,1H} @ 8m	45	15	8	41 (35)	50	50	37	Y	Y	Y
Beer Garden	71 (65) L _{A1,adj,1H} @ 8m	45	15	8	48 (42)	65	65	47	Y	Y	Y
	67 (61) L _{A10,adj,1H} @ 8m	45	15	8	44 (38)	55	55	42	Y	Y	Y
COMBINED (LAeq,T only, a											
daytime	-	-	-	-	41	50			Y		
evening	-	-	-	-	41		50			Y	
night-time	-	-	-	-	36			37			Y

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TABLE 2 On Site Source Noise Level Impact to Closest Residential											
		(m) e	N Rec d	loise luction, B(A)	aiver	Noise	Limits,	dB(A)	Complies With Noise Limit (Y/N)		Vith (Y/N)
Noise source	Noise Level, dB(A)	Separation Distanc	Distance	Barrier	Noise Level at Reo	Daytime	Evening	Night-time	Daytime	Evening	Night-time
CLOSEST RESIDENCES TO EAST (R2 & R3)											
Patrons:											
	50 (45) L _{Aeq,adj,1H} @ 8m	56	17	5	28 (23)	50	50	37	Y	Y	Y
Gaming DOSA	57 (52) L _{A1,adj,1H} @ 8m	56	17	5	35 (30)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	56	17	5	31 (26)	55	55	42	Y	Y	Y
	50 (45) L _{Aeq,adj,1H} @ 8m	90	21	5	24 (19)	50	50	37	Y	Y	Y
Beer Garden DOSA	57 (52) L _{A1,adj,1H} @ 8m	90	21	5	31 (26)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	90	21	5	27 (22)	55	55	42	Y	Y	Y
	64 (58) L _{Aeq,adj,1H} @ 8m	78	20	2	42 (36)	50	50	37	Y	Y	Y
Beer Garden	71 (65) L _{A1,adj,1H} @ 8m	78	20	2	45 (43)	65	65	47	Y	Y	Y
	67 (61) L _{A10,adj,1H} @ 8m	78	20	2	43 (39)	55	55	42	Y	Y	Y
COMBINED (L _{Aeq,T} only, as this is the most sensitive parameter)											
daytime	-	-	-	-	42	50			Y		
evening	-	-	-	-	42		50			Y	
night-time	-	-	-	-	36			37			Y
CLOSEST RESIDE	ENCE TO SOUTH	(R4)									
Patrons:											
	50 (45) L _{Aeq,adj,1H} @ 8m	56	17	5	28 (23)	50	50	37	Y	Y	Y
Gaming DOSA	57 (52) L _{A1,adj,1H} @ 8m	56	17	5	35 (30)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	56	17	5	31 (26)	55	55	42	Y	Y	Y
	50 (45) L _{Aeq,adj,1H} @ 8m	90	21	15	24 (19)	50	50	37	Y	Y	Y
Beer Garden DOSA	57 (52) L _{A1,adj,1H} @ 8m	90	21	15	21 (16)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	90	21	15	17 (12)	55	55	42	Y	Y	Y
	64 (58) L _{Aeq,adj,1H} @ 8m	78	20	15	29 (23)	50	50	37	Y	Y	Y
Beer Garden	71 (65) L _{A1,adj,1H} @ 8m	78	20	15	36 (30)	65	65	47	Y	Y	Y
	67 (61) LA10,adj,1H @ 8m	78	20	15	32 (26)	55	55	42	Y	Y	Y
COMBINED (LAeg, T only, as thi	s is the most sensitive param	eter)									
daytime	-	-	-	-	32	50			Y		
evening	-	-	-	-	32		50			Y	
night-time	-	-	-	-	27			37			Y
CLOSEST RESIDE	ENCE TO SOUTH ((R5)									
Patrons:											
	50 (45) L _{Aeq,adj,1H} @ 8m	63	18	16	16 (11)	50	50	37	Y	Y	Y
Gaming DOSA	57 (52) L _{A1,adj,1H} @ 8m	63	18	16	23 (18)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	63	18	16	19 (14)	55	55	42	Y	Y	Y
	50 (45) L _{Aeq,adj,1H} @ 8m	77	20	5	25 (20)	50	50	37	Y	Y	Y
Beer Garden DOSA	57 (52) L _{A1,adj,1H} @ 8m	77	20	5	32 (27)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	77	20	5	28 (23)	55	55	42	Y	Y	Y

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TABLE 2 On Site Source Noise Level Impact to Closest Residential											
		e (m)	N Rec d	loise luction, B(A)	eiver	Noise	Limits,	dB(A)	Co Nois	mplies V e Limit (Vith Y/N)
Noise source	Noise Level, dB(A)	Separation Distanc	Distance	Barrier	Noise Level at Reo	Daytime	Evening	Night-time	Daytime	Evening	Night-time
	64 (58) L _{Aeq,adj,1H} @ 8m	70	19	16	29 (23)	50	50	37	Y	Y	Y
Beer Garden	71 (65) L _{A1,adj,1H} @ 8m	70	19	16	36 (30)	65	65	47	Y	Y	Y
	67 (61) L _{A10,adj,1H} @ 8m	70	19	16	32 (26)	55	55	42	Y	Y	Y
COMBINED (LAeq,T only, as this	s is the most sensitive param	eter)									
daytime	-	-	-	-	31	50			Y		
evening	-	-	-	-	31		50			Y	
night-time	-	-	-	-	25			37	-	-	Y
CLOSEST RESIDE	NCE TO WEST (R	<u>(6)</u>	-								
Patrons:											
	50 (45) L _{Aeq,adj,1H} @ 8m	85	21	16	13 (8)	50	50	37	Y	Y	Y
Gaming DOSA	57 (52) L _{A1,adj,1H} @ 8m	85	21	16	20 (15)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	85	21	16	16 (11)	55	55	42	Y	Y	Y
	50 (45) L _{Aeq,adj,1H} @ 8m	75	19	0	31 (26)	50	50	37	Y	Y	Y
Beer Garden DOSA	57 (52) L _{A1,adj,1H} @ 8m	75	19	0	38 (33)	65	65	47	Y	Y	Y
	53 (48) L _{A10,adj,1H} @ 8m	75	19	0	34 (29)	55	55	42	Y	Y	Y
	64 (58) L _{Aeq,adj,1H} @ 8m	77	20	8	36 (30)	50	50	37	Y	Y	Y
Beer Garden	71 (65) L _{A1,adj,1H} @ 8m	77	20	8	43 (35)	65	65	47	Y	Ŷ	Y
COMPINED (I only on this	67 (61) LA10,adj,1H @ 8ffi	(/	20	0	39 (33)	55	55	42	T	T	T
doutimo			_	-	37	50			v		
evening					37	50	50		•	v	
night-time	-				31		50	37			Y
					0.			0.			
CLOSEST RESIDE	NCE TO WEST (R	<u> </u>	1			1					
Patrons:											
	50 L _{Aeq,adj,1H} @ 8m	95	22	16	12 (7)	50	50	37	Y	Y	Y
Gaming DOSA	57 L _{A1,adj,1H} @ 8m	95	22	16	19 (14)	65	65	47	Y	Y	Y
	53 LA10,adj,1H @ 8m	95	22	16	15 (10)	55	55	42	Y	Ŷ	Y
Deer Oradan DOOA	50 LAeq,adj,1H @ 8m	65	22	8	20 (15)	50	50	37	Y	Ŷ	Y
Beer Garden DOSA	57 LA1,adj,1H @ 8M	65	22	8	27 (22)	65 55	65 55	47	ř	ř	ř V
	64 (58)	00 75	10	5	23 (18) 40 (34)	50	50	42 37	r v	r v	r v
Beer Garden	71 (65) LAL 2014 @ 8m	75	19	5	47 (41)	65	65	47	v	v	v v
2001 Oarden	67 (61) LA10 and 14 @ 8m	75	19	5	43 (37)	55	55	42	Y	Y	Y
COMBINED (I Arr t only as the	COMBINED (1 +										
COMBINED (LAeq.1 Only, as this	e le une most sensitive pardill				40	50			v		
					40	00	50			Y	
					34			37			Y

For background amplified music in the beer garden the relevant noise limits are:

- daytime: background + 10 = 45 + 10 = 55 dB(A) L_{A10,adj,T};
- evening: background + $10 = 43 + 10 = 53 \text{ dB}(A) L_{A10,adj,T}$.

There will be no external amplified music post 2200 hours.

At the closest residences these amplified music noise levels from the beer garden will be:

Image: R2: LA10,adj,T; 70 dB(A) @ 3m - 28 (78m distance) - 0 (barrier) = 42 dB(A) LA10,adj,T; R3: 70 dB(A) @ 3m - 28 (78m distance) - 0 (barrier) = 42 dB(A) LA10,adj,T; R4: 70 dB(A) @ 3m - 28 (78m distance) - 15 (barrier) = 27 dB(A) LA10,adj,T; R5: 70 dB(A) @ 3m - 28 (77m distance) - 16 (intervening building acting as barrier) = 26 dB(A) LA10,adj,T; R6: 70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) LA R7: 70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) LA	•	R1:	70 dB(A) @ 3m - 24 (45m distance) - 8 (barrier) = 38 dB(A)
• R3: $L_{A10,adj,T}$; • R4: 70 dB(A) @ 3m - 28 (78m distance) - 0 (barrier) = 42 dB(A) $L_{A10,adj,T}$; • R4: 70 dB(A) @ 3m - 28 (78m distance) - 15 (barrier) = 27 dB(A) $L_{A10,adj,T}$; • R5: 70 dB(A) @ 3m - 28 (77m distance) - 16 (intervening building acting as barrier) = 26 dB(A) $L_{A10,adj,T}$; • R6: 70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) $L_{A10,adj,T}$; • R7: 70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) $L_{A10,adj,T}$;	•	R2:	L _{A10,adj,T} ; 70 dB(A) @ 3m – 28 (78m distance) – 0 (barrier) = 42 dB(A)
 R3: 70 dB(A) @ 3m - 28 (78m distance) - 0 (barrier) = 42 dB(A) LA10,adj,T; R4: 70 dB(A) @ 3m - 28 (78m distance) - 15 (barrier) = 27 dB(A) LA10,adj,T; R5: 70 dB(A) @ 3m - 28 (77m distance) - 16 (intervening building acting as barrier) = 26 dB(A) LA10,adj,T; R6: 70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) LA 70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) LA 			LA10,adj,T;
• R4: $70 \text{ dB}(A) @ 3m - 28 (78m \text{ distance}) - 15 (\text{barrier}) = 27 \text{ dB}(A)$ $L_{A10,adj,T};$ • R5: $70 \text{ dB}(A) @ 3m - 28 (77m \text{ distance}) - 16 (\text{intervening building acting as barrier}) = 26 \text{ dB}(A) L_{A10,adj,T};$ • R6: $70 \text{ dB}(A) @ 3m - 28 (77m \text{ distance}) - 8 (\text{barrier}) = 34 \text{ dB}(A) L_A$ • R7: $70 \text{ dB}(A) @ 3m - 28 (75m \text{ distance}) - 8 (\text{barrier}) = 37 \text{ dB}(A) L_A$	•	R3:	70 dB(A) @ $3m - 28$ (78m distance) - 0 (barrier) = 42 dB(A)
 R4. 70 dB(A) @ 3m - 28 (76m distance) - 15 (barrier) = 27 dB(A) L_{A10,adj,T}; R5: 70 dB(A) @ 3m - 28 (77m distance) - 16 (intervening building acting as barrier) = 26 dB(A) L_{A10,adj,T}; R6: 70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) L_A R7: 70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) L_A 	_	D 4.	LA10, adj,T; $70 dP(\Lambda) \otimes 2m = 29 (79m distance) = 15 (horrigr) = 27 dP(\Lambda)$
 R5: 70 dB(A) @ 3m - 28 (77m distance) - 16 (intervening building acting as barrier) = 26 dB(A) L_{A10,adj,T}; R6: 70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) L_A R7: 70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) L_A 	•	K4:	$L_{A10,adj,T}$; $U = 28 (78m distance) - 15 (barner) = 27 dB(A)$
acting as barrier) = 26 dB(A) $L_{A10,adj,T}$;• R6:70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) L_A • R7:70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) L_A	•	R5:	70 dB(A) @ 3m – 28 (77m distance) – 16 (intervening building
 R6: 70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) L/ R7: 70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) L/ 			acting as barrier) = $26 \text{ dB}(A) \text{ L}_{A10,adj,T};$
 R7: 70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) L₄ 	•	R6:	70 dB(A) @ 3m - 28 (77m distance) - 8 (barrier) = 34 dB(A) LA10,adj,T;
	•	R7:	70 dB(A) @ 3m - 28 (75m distance) - 5 (barrier) = 37 dB(A) LA10,adj,T.

At all of the closest residences to the proposed beer garden an amplified music noise level of 80 dB(A) $L_{A10,adj,T}$ @ 3 metres from the speakers complies with the Office of Liquor and Gaming Regulation noise limits up to 2200 hours. The only amplified music in the beer garden post 2200 hours will be background music with a noise level of approximately 70 to 75 dB(A) $L_{A10,T}$ @ 3 metres from the speakers.

In accordance with the requirements of the Office of Liquor and Gaming Regulation Guideline 51, once these refurbishment and extension works are completed an actual amplified music noise assessment must be conducted to establish the actual amplified music noise levels and, therefore, the amplified music noise levels which must not be exceeded. These amplified music noise levels will be added to the Liquor Licence for the Berserker Tavern.

NOISE CONTROL

Patron noise from the beer garden complies with the daytime, evening and night-time noise limits at all of the closest residences, with no additional noise control measures in place.

Patron noise from the new Gaming Dosa and the new Beer Garden DOSA also comply with the noise limits with no additional noise control measures required.

For amplified music in the beer garden a volume of up to 80 dB(A) L_{A10,adj,T} is permitted up to 2200 hours. Post 2200 hours and up to midnight there will be just background music in the beer garden.

The actual permissible levels for amplified music in the new beer garden will need to be determined once the refurbishment and extension work is completed, by way of an actual on-site amplified music noise assessment, as required by the Office of Liquor and Gaming Regulation (OLGR). This amplified music noise assessment will be conducted in accordance with the OLGR Guideline 51.

CONCLUSIONS

For the Berserker Tavern, 368 Dean Street, Frenchville it is proposed to extend the beer garden to the north, remove the northern wall of the Bistro and install a multi-fold door in this opening and relocate the Gaming DOSA from the northern to the eastern wall.

The closest residential to the Berserker Tavern are to the north, east, south and west, with the residences to the north, east and south separated from the Tavern building by carparking. The closest residences to the east and west are also separated from the Tavern by roads.

Potential noise sources for the Berserker Tavern are:

- carpark activity, including vehicles driving in the carpark, people talking, car doors closing and car engines starting;
- waste collection;
- delivery truck;
- plant and equipment, including air-conditioning units, refrigeration units and kitchen exhaust fan;
- patron noise from the beer garden and DOSA areas.
- Background amplified music from the beer garden.

However, of the above potential noise sources there are no proposed changes to the carpark, the delivery area, or the Sports Bar DOSA. Therefore, as these noise sources are existing (and will not change) they have not been considered further.

For plant and equipment, at the time of preparing this report it had not been determined whether or not any upgrades would be required. Once this information is available an acoustic consultant should calculate plant and equipment noise to the closest residences, compare these source noise levels to the noise limits and, if any of the noise limits are exceeded, nominate suitable noise control measures. For the new beer garden potential noise sources include patrons and amplified music, whilst for the relocated Gaming DOSA the only potential noise source is patrons.

Amplified music noise control is the responsibility of the Office of Liquor and Gaming Regulation and, therefore, for this potential noise source their criteria has been applied.

Noise limits for patrons have been based on the requirements of the Rockhampton Regional Council Planning Scheme and are based on the Acoustic Quality Objectives detailed in the Environmental Protection (Noise) Policy 2019. Plant and equipment noise limits have been based on the Default Noise Standards of the Environmental Protection Act 1994.

In accordance with the Rockhampton Regional Council Planning Scheme an ambient noise assessment was conducted and the background sound levels determined. These background sound levels were used to determine the plant and equipment noise limits, as well as the amplified music noise limits.

Source noise data for patrons was based on the architectural drawings and calculated in accordance with a paper presented at Acoustics 2011 by Hayne, M.J. titled *'Prediction of Noise from Small to Medium Sized Crowds'*. Based on data contained in Google the number of patrons at the Berserker Tavern reduces post 2200 hours, and this has been applied to the beer garden patron source noise levels for post 2200 hours.

Patron noise from the relocated Gaming DOSA complies with the noise limits for the complete 24-hour day with no additional noise control measures in place. Patron noise from the beer garden DOSA and the beer garden complies with the noise limits at all of the closest residences with no additional noise control measures in place.

It has been calculated that the beer garden can have amplified music at a volume of 80 dB(A) @ 3 metres from the speakers for up to 2200 hours, then background music from 2200 hours to midnight. However, the actual permissible levels for amplified music in the new beer garden will need to be determined once the refurbishment and extension work is completed, by way of an actual on-site amplified music noise assessment, as required by the Office of Liquor and Gaming Regulation (OLGR). This amplified music noise assessment will be conducted in accordance with the OLGR Guideline 51.

RECOMMENDATION

It is recommended that provided the noise control measures detailed in this report are incorporated into this project, the proposed extensions and refurbishment of the Berserker Tavern should be approved.

APPENDIX A: LOGGED NOISE LEVEL MEASUREMENT EQUIPMENT

Measurement Equipment

The following equipment was used to conduct the 7-day ambient noise assessment from monitoring location A:

- Bruel and Kjaer Type 2250 Hand Held Analyzer, Serial No. 3004242, with Type BZ 7133 Software Version 4.7.6 and Prepolarised free-field 1/2" microphone, Type 4189, Serial No. 2880058;
- Bruel and Kjaer Type 4231 Sound Level Calibrator, Serial No. 3024824.

All of the above equipment is Type 1 in accordance with the requirements of Australian Standard AS 1259-1990, Acoustics – Sound Level Meters.

Measurement Equipment Settings

The above equipment was used with the following settings:

- Detector: RMS FAST
- Time Weighting:
 - Frequency Weighting: Sound Incidence: linear in 1/3rd octave bands from 12.5 to 16000 Hz
- FRONTAL;
- 37.934 mV/Pa. Sensitivity:

Calibration

The sound level meter was calibrated to the required value of 93.8 dB at 1000 Hz immediately before and after the noise level measurements were conducted. At no time was an adjustment of more than ± 0.5 dB required. This complies with the requirements of the Australian Standard.

Monitoring Location

Monitoring Location A was located on the subject site adjacent to the southern boundary of the subject site and approximately 14 metres from the Diplock Street boundary with the microphone elevated 1.6 metres above ground level. Refer Figure 2 for further detail.

Atmospheric Conditions

Throughout the 7-day period, atmospheric conditions generally complied with the requirements of the Australian Standard – refer Appendix C for detail.

APPENDIX B: DETAILED RESULTS OF AMBIENT LOGGED NOISE LEVELS

Instrument:		2250-L
Application:		BZ7133 Version 4.7.6
Start Time:		11/09/2022 06:52:45
End Time:		11/16/2022 08:24:38
Elapsed Time:		7.01:31:53
Bandwidth:		1/3-octave
Max Input Level:		143.33
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		С
Spectrum:	FS	Z
Instrument Serial Number:		3004242
Microphone Serial Number:		2880058
Input:		
Windscreen Correction:		None
Sound Field Correction:		Free-field
Calibration Time:		11/09/2022 06:52:22
Calibration Type:		External reference
Sensitivity:		37.9336811602116 mV/Pa







Day 2, Thursday 10 November 2022

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Day 3, Friday 11 November 2022



Day 4, Saturday 12 November 2022



Day 5, Sunday 13 November 2022



Day 6, Monday 14 November 2022







Day 8, Wednesday 16 November 2022 until 0745 hours

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ચ અનુ જે		a		9.7	3.7	3.6	5.5	5.5	6.1	5.4	3.6	5.9	5.4	7.6	9.8	9.8	2.2	4.5	5.1	0.9	7.7	9.6	3.3			8.8	5.4	5.1	
		Tem	°	26	9	9	36	26	26	5	26	26	26	21	30	50	32	37	36	30	21	50	33	~		28	35	36	
		MSLP	hPa	1006.6	1012.9	1017.9	1021.6	1022.7	1021.0	1018.5	1016.5	1017.5	1018.0	1016.6	1015.3	1015.2	1012.8	1009.5	1009.2	1011.7	1013.7	1012.7	1010.5	1009.3		1014.7	1006.6	1022.7	
		pd	m/h	7	24	20	13	26	20	19	17	19	17	1	2	0	19	7	13	13	15	1	13	20		15	7	26	
		s u	×	z	SW	SE	SE	SE	ESE	ESE	SE	SE	SE	SE	ШN	INE	ΜN	МN	3	SE	ш	INE	NΝ	z			#	ESE	
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		Cld	eighths																										
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	╞	e T	le le	:21	:27	:56	:42	:48	:49	:20	:46		:35	:27	:13	11	:59	:57	:25	:13	:17	:07	:58			$\left - \right $			
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er Observation	Ma	Dirn		WNW	SSW	SSE	ш	SE	ESE	ESE	SSE		ш	ESE	SE	NNE	MNN	NNE	MNW	SW	ШN	NNE	MNN					SE	
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ensla y We		Rai	um	0	9	2	4	0	5	80	4	0	0	6	N	0	<u></u>	9	9	4	0	0	e.		of Nov	-	4	6	-
Quee Dail	sdu	Max	ပ္	31.	27.	27.	26.	27.	27.	27.	27.	28.	28.	28.	31.	31.	33.	35.	35.	31.	29.	32.	35.		1 days	30.	26.	35.	
ockhampton, (ovember 2022	Ter	Min	°	23.2	17.7	12.7	14.1	17.3	17.1	16.4	16.5	17.0	16.7	17.3	17.4	17.7	19.8	21.8	23.6	19.3	18.0	20.0	24.3	23.3	first 2	18.6	12.7	24.3	
	F	Day		Τu	We	Ч	F	Sa	Su	Mo	Tu	We	Ч	F	Sa	Su	Mo	Tu	We	Ļ	ц	Sa	Su	Mo	for the	Mean	owest	ighest	Total
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APPENDIX C: ATMOSPHERIC CONDITIONS FOR NOVEMBER 2022, ROCKHAMPTON