STOCKLAND ROCKHAMPTON PROPOSED CHILDCARE CENTRE DEVELOPMENT APPLICATION

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oc. No.	Document Title
A001	Cover Sheet
A002	Existing Ground Floor Plan
A010	Childcare Site Plan
A011	Childcare Ground Floor Plan
A020	Childcare Elevations
A021	Childcare Elevations
A022	Childcare Sections
A030	Childcare Materials / Signage
A031	Childcare Signage
A040	Childcare Shadow Diagrams
A050	Childcare Perspectives
A051	Childcare Perspectives
A060	Childcare Landscape - Site Plan
A061	Childcare Landscape - 0-2 Years
A062	Childcare Landscape - 2-3 Years
A063	Childcare Landscape - 3+ Years
A064	Childcare landscape - Ground Plan



































ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval as sociated with **Development Permit No.: D/117-2020**

Dated: 10 February 2021







01 SUMMER 9am



03 SUMMER 3pm

ROCKHAMPTON REGIONAL COUNCIL APPROVED PLANS These plans are approved subject to the current conditions of approval associated with Development Permit No.: D/117-2020 Dated: 10 February 2021







ARTIST IMPRESSION ONLY







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SION: AT 08.09.20 Submission 29.09.20 STATUS: AUTHOR: DA Submission MB SCALE: NTS DATE: 09.09.20 Childcare/Pad Site Options 120331 tembra Road, North Rockhampton QLD 4701 TTLE: CHILDCARE PERSPECTIVES





ARTIST IMPRESSION ONLY



scale: NTS





up Design Delivery

SION:

STATUS: DA Submission AUTHOR MB date: 09.09.20 PROJECT: Stockland ROCKHAMPTON Childcare/Pad Site Options 120-331 Yaamba Road, North Rodshampton QLD 4701 CHILDCARE PERSPECTIVES





scale: NTS

Stockland

DRAWING NUMBER

CHILDCARE LANDSCAPE - Site Plan

OUTDOOR PLAY AREA | 0 - 2 YEAR OLDS



Stocklan

VISION:

29.09.20

STATUS: DA Submission AUTHO MB

PROJECT: Stockland ROCKHAMPTON Childcare/Pad Site Options 120-331 Yeamba Road, North Roddhampton QLD 4701 CHILDCARE LANDSCAPING - 0-2 Years

17-07-04-RO

DA061-A

OUTDOOR PLAY AREA | 2-3 YEAR OLDS



ARTIFICIAL TURF MOUNDS & CRAWL TUNNELS **OPEN TURF & PLAY MULCH AREAS** WATER PLAY AND DRY CREEK BED BIKE TRACK

ELEVATED CUBBY HOUSE WITH SLIDE

PASSIVE PLAY AREAS

VEGGIE GARDEN WITH FRUIT TREES

SENSORY GARDENS WITH ARBORS

STORY TELLING / GATHERING AREAS

INFORMAL SEATING AREAS

CHALK AND MIRROR BOARDS

DECKS WITH PERGOLA AND SHADE OVER



ROCKHAMPTON REGIONAL COUNCIL APPROVED PLANS These plans are approved subject to the current conditions of approval associated with Development Permit No.: D/117-2020

DATE: 15.09.20









Stocklan

VISION:

29.09.20

STATUS: DA Submission AUTHO MB BCALE:

Stockland ROCKHAMPTON Childcare/Pad Site Options 120-331 Yasmba Road, North Rockhampton GLD 4701 CHILDCARE LANDSCAPE - 2-3 Years

2



OUTDOOR PLAY AREA| 3+ YEAR OLDS



SAND PITS WITH MOUNDED EDGES BRIGHT COLOURS / CONTRASTING MATERIALS ARTIFICIAL TURF MOUNDS & CRAWL TUNNELS OPEN TURF & PLAY MULCH AREAS WATER PLAY AND DRY CREEK BED BIKE TRACK

ELEVATED CUBBY HOUSE AND SLIDE

PASSIVE PLAY AREAS

SENSORY GARDENS WITH ARBORS OUTDOOR LEARNING SPACES INFORMAL SEATING/ RELAXATION AREAS CHALK AND MIRROR BOARDS

DECKS WITH PERGOLA AND SHADE OVER

ROCKHAMPTON REGIONAL COUNCIL APPROVED PLANS

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Dated: 10 February 2021

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STATUS: AUTHOR: DA Submission MB scale: NTS

DATE: 15.09.20 PROJECT: Stockland ROCKHAMPTON Childcare/Pad Site Options 120-331 Yeamba Road, North Rosthampton GLD 4701 TTLE: CHILDCARE LANDSCAPE - 3+ Years PROJECT NUMBER: 17-07-04-RO DRAWING NUMBER: DA063-A













APPROVED PLANS These plans are approved subject to the current conditions of approval associated with Development Permit No.: D/117-2020 Dated: 10 February 2021

ROCKHAMPTON REGIONAL COUNCIL

FLOOD HAZARD OVERLAY CODE ASSESSMENT REPORT

245 VICTORIA PLACE, BERSERKER

14 October 2020



ACN 105 078 377 5/541 Old Cleveland Rd, CAMP HILL QLD 4152 Ph (07) 3398 4992 Fax (07) 3398 4993 www.stormw.com.au **Job No:** J7757 v1.0

Job Name: 245 Victoria Place, Berserker

Report Name	Date	Report No.
Flood Hazard Overlay Code Assessment Report	14 October 2020	J7757 v1.0

- Project Engineer:Jack Hu
BE Civil (Hons), MIEAust
E Jack@stormw.com.auReviewed By:Darren Rogers
BE Civil (Hons), MIEAust, RPEQ
Director
 - E <u>darren@stormw.com.au</u>



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1.0 INTRODUCTION

Storm Water Consulting Pty Ltd was commissioned by Stockland to complete a Flood Hazard Overlay Code Assessment Report for the proposed childcare centre development on 245 Victoria Place, Berserker. The subject site is located within the Rockhampton Regional Council Local Government Area.

This report has been prepared to assess the extent of flooding on the subject site and to address the relevant sections of the Flood Hazard Overlay Code. This code forms part of the Rockhampton Region Planning Scheme 2015.



2.0 SITE CONDITIONS

2.1 Existing Site

The subject site is located toward the southern portion of the Stockland Rockhampton Shopping Centre precinct. A commercial building and an open-air bitumen car park are located on the subject site. The subject site is bound by Victoria Place to the east, High Street to the south and internal accessways of the shopping centre to the north and west. A locality plan is presented in Figure 2.1 below.

The subject site is susceptible to flooding from Moores Creek. Moores Creek is located approximately 150 metres west and 230 metres north of the subject site.



Figure 2.1 – Locality Plan

2.2 Developed Site

A childcare centre development is proposed to be constructed on the subject site, replacing the existing commercial precinct. Development plans are presented in Appendix A.



3.0 MOORES CREEK FLOOD STUDY

Rockhampton Regional Council (RRC) recently completed a flood study of Moores Creek in 2017 and published the draft findings in the *Moores Creek Local Catchment Study*. The defined flood event for a childcare development is the 0.5% AEP (1 in 200 year ARI) flood event. The 0.5% AEP flood results were sourced from RRC and are presented below.



Figure 3.1 – 0.5% AEP Flood Levels (metres AHD)



Figure 3.2 – 0.5% AEP Flood Depths (metres)





Figure 3.3 – 0.5% AEP Flood Velocities (m/s)

During a site visit, it was observed that a raised kerb is located along the northern boundary of the site, which would be sufficient in conveying the minor flows coming from the shopping centre basement carpark (refer photographs in Appendix B). Flows would continue westward and away from the site. It is therefore considered that the flooding on the site is from overland flow that traverses the site from a local catchment to the east.

A TUFLOW hydraulic model was set up to assess the potential impacts of the development on the overland flow. This is documented in the following sections.



4.0 HYDROLOGIC MODELLING

The catchment contributing to the local overland flow across the site is presented below.



Figure 4.1 – Catchment Plan

Rational Method calculations were undertaken of the total catchment (in accordance with QUDM 2016). A summary of the total catchment flow is presented in Table 4.1 on the following page. Detailed Rational Method calculations are presented in Appendix C.

AEP	Flow		
%	m³/s		
63%	1.36		
39%	1.61		
18%	2.38		
10%	2.94		
5%	3.55		
2%	4.58		
1%	5.19		
0.5%	5.79		

Table	4.1 -	Total	Catchment	Flow
10010		1000	Garcenteric	



URBS hydrologic modelling was undertaken to produce an inflow hydrograph for input into the TUFLOW hydraulic model. A schematic representation of the URBS model is presented below. URBS data files are presented in Appendix D. A summary of the adopted URBS parameters is presented in Table 4.2 below.



Figure 4.2 – URBS Schematic Layout

AEP	Storage Coefficient	Non-Linearity Index	Initial Rainfall Loss	Continuing Rainfall Loss	
%	α	β	mm	mm/hr	
0.5	1.2	0.8	0	2.5	

Table 4.2 – Catchment URBS Model Parameters

The URBS model peak 0.5% AEP catchment runoff, adopting the above model parameters, was modelled to give 5.73 m³/s. This flow compares favourably with the Rational Method calculated flow of 5.79 m³/s.

A 750 mm diameter pipe is located under High Street. This pipe is capable of conveying a portion of the catchment runoff underground. The capacity of this pipe is presented on the following page. A stormwater pipe plan is presented in Appendix E.



Location	Pipe Diameter	Slope	Maximum Velocity	Adopted Capacity
	mm	1 in	m/s	m³/s
High Street	1 / 750	150	2.1	0.9

Table 4.3 – Existing Pipe Capacity Calculation

The critical storm duration for the 0.5% AEP event is the 15-minute storm. The peak 0.5% AEP hydrograph is shown below. The peak discharge is $4.83 \text{ m}^3/\text{s}$.



Figure 4.3 – Inflow Hydrograph



5.0 HYDRODYNAMIC MODELLING

TUFLOW hydrodynamic modelling was undertaken to assess the potential impacts of the development on the local overland flow.



5.1 TUFLOW Model Setup – Existing

Figure 5.1 – Existing Model Extents

The Digital Elevation Model (DEM) was based on ALS survey data obtained from the Department of Natural Resources and Mines (Rockhampton 2015 LiDAR). The DEM consists of 1 metre cell sizes. A global Manning's roughness coefficient of n = 0.02 was adopted to represent the bitumen and concrete surface across the majority of the model extents. The existing site survey TIN was also incorporated into the model.

The downstream boundary condition was set as a height-discharge (HQ) boundary based on the Moores Creek Local Catchment Study 0.5% AEP flood slope. The inflow into the model was based on a discharge-time (QT) inflow as shown in Figure 4.3. The existing buildings were modelled as obstructions. The existing model was run with a timestep of 0.5 seconds for a period of 1 hour. The results of the existing TUFLOW model are presented in the following section.



5.2 TUFLOW Model Results – Existing



Figure 5.2 – Existing 0.5% AEP Inundation Levels (metres AHD)



Figure 5.3 – Existing 0.5% AEP Inundation Depths (metres)





Figure 5.4 – Existing 0.5% AEP Velocities (m/s)



Figure 5.5 – Existing 0.5% AEP Velocity-Depth Products (m²/s)



5.3 TUFLOW Model Setup – Developed

The existing model was modified to include the design surface TIN. The building and play areas were modelled as obstructions (raised elevation polygons). Figure 5.6 below presents the modifications to the existing model.



Figure 5.6 – Developed Model Setup

All other model parameters remain the same as the existing model. The developed model was run with a timestep of 0.5 seconds for a period of 1 hour. The results of the developed TUFLOW model are presented in the following section.





5.4 TUFLOW Model Results – Developed

Figure 5.7 – Developed 0.5% AEP Inundation Levels (metres AHD)



Figure 5.8 – Developed 0.5% AEP Inundation Depths (metres)





Figure 5.9 – Developed 0.5% AEP Velocities (m/s)



Figure 5.10 – Developed 0.5% AEP Velocity-Depth Products (m²/s)


5.5 Flood Impacts

The afflux impacts of the proposed development were assessed and is presented in Figure 5.11 below.



Figure 5.11 – Afflux Impacts Plot (metres)

The above results show that the majority of the hydraulic impacts are contained within the subject site or within the Stockland Shopping Centre land. Post-development, additional overland flow is conveyed along the northern section of High Street toward the west. This is considered to be acceptable as the resulting flow depths and velocity-depth products along High Street are not unsafe for pedestrians (depths less than 150 mm and velocity-depth products less than 0.2 m²/s). The minor impacts on the southern side of High Street is due to minor hydrodynamic model instabilities. The minor impacts on the downstream end of the site would not create any material worsening.

The flow depths reach 0.45 metres and velocity-depth products reach 0.2 m²/s at the eastern vehicular entrance and exit for the site. These flow characteristics are located outside of the site boundaries and are not able to be improved without significant works to Victoria Place. Notwithstanding this, there exists a secondary vehicular entrance and exit for the site at the north-western corner. This access is flood-free during the 0.5% AEP storm event and would provide a safe point of egress for vehicles and pedestrians. All flow depths within the site are less than 300 mm with velocity-depth products less than 0.2 m²/s, hence there would trafficable paths from the building or the carpark providing access towards the entrance/exit located at the north-western site corner.



5.6 Minimum Design Levels

The governing 0.5% AEP overland flow level for setting minimum design levels is 13.8 m AHD. The Flood Hazard Overlay Code recommends a minimum freeboard of 500 mm to be incorporated above the defined flood level. As such, the minimum design level for the childcare centre building is 14.3 m AHD. This requirement is summarised in Table 5.1 below.

Flore d'an Flore	Minimum Design Level			
Flooding Type	metres AHD			
Overland Flow	14.3 m AHD			

Table 5.1 – Minimum Design Level



6.0 CONCLUSIONS

This Flood Hazard Overlay Code Assessment Report was prepared for the proposed childcare centre development on 245 Victoria Place, Berserker.

This report has been prepared to assess the extent of flooding on the subject site and to address the relevant sections of the Flood Hazard Overlay Code. This code forms part of the Rockhampton Region Planning Scheme 2015.

TUFLOW hydraulic modelling was completed for the existing and developed site conditions. The model results show that the majority of the hydraulic impacts are contained within the subject site or within the Stockland Shopping Centre land. Post-development, additional overland flow is conveyed along the northern section of High Street toward the west. This is considered to be acceptable as the resulting flow depths and velocity-depth products along High Street are not unsafe for pedestrians (depths less than 150 mm and velocity-depth products less than 0.2 m²/s). The minor impacts on the downstream end of the site would not create any material worsening.

The flow depths reach 0.45 metres and velocity-depth products reach 0.2 m²/s at the eastern vehicular entrance and exit for the site. These flow characteristics are located outside of the site boundaries and are not able to be improved without significant works to Victoria Place. Notwithstanding this, there exists a secondary vehicular entrance and exit for the site at the northwestern corner. This access is flood-free during the 0.5% AEP storm event and would provide a safe point of egress for vehicles and pedestrians. All flow depths within the site are less than 300 mm with velocity-depth products less than 0.2 m²/s, hence there would trafficable paths from the building or the carpark providing access towards the entrance/exit located at the north-western site corner.

A response to the relevant sections of the Flood Hazard Overlay Code is presented in Appendix F.

Darren Rogers BE Civil (Hons), MIE Aust, RPEQ 5016 Director



LIST OF APPENDICIES

APPENDIX A – Development Plans

APPENDIX B – Photographs

APPENDIX C – Rational Method Calculations

APPENDIX D – URBS Model Files

APPENDIX F – Stormwater Pipe Plan

APPENDIX E – Flood Hazard Overlay Code Response

APPENDIX A

Development Plans







APPENDIX B

Photographs



Photograph 1 – Victoria Place



Photograph 2 – Site Condition



Photograph 3 – Northern site boundary (existing raised kerb)



Photograph 4 - Moores Creek at High Street bridge crossing

APPENDIX C

Rational Method Calculations

STORM Water Consulting

RATIONAL METHOD CALCULATIONS

а

Project: 245 Victoria Place, Berserker

Location: Point 1 - Total Flow - DS

Comments:

Developed Catchment

Time of Concentration		
Standard Inlet Time	5	min
Travel Length	400	metres
Fall	6	metres
Travel Time (Argue)	5	min
Delta for	1.0	
Time of Concentration	10.0	min

Rainfall Data: Rainfall Intensity Frequency Duration data for ROCKHAMPTON

7757

Sub-Areas and Runoff Coefficients													
	Area	C	10	Areas incl	uded in Cal	culations			Separat	e c100 >	1.0 and c1	L00 < 1.0	
	ha	Exist	Dev	Condition	Area	C10	C10 x A	C10	C10	C10 x A	C10 x A	Area	Area
Cmt	7.41	0.00	0.86	Developed	7.41	0.86	6.37		0.86		6.37		7.41
					7.41		Sum			0.00	6.37	0.00	7.41
						-	Total		0.860		6.371		7.408
							Individual	0.000	0.860	0.000	6.371	0.000	7.408

	Discha	rge Cal	culation	S				
	tc			10.0				
C100>1		Average	c10	0.860		Total C	atchment	
			Area (ha)	7.41		7.4	41 ha	
C100<1	c10 - 2	Average		0.000				•
			Area (ha)	0.00				
Donth	ADT	Ev	Bunoff C	officiants	Dainfall		Discharge	
Depth	AKI	гу	Kulloli C	Jenncients	Kaiiliaii		m³/s	
mm	years		C100>1	C100<1	(mm/hr)	1	2	Total
16	1	0.80	0.69	0.00	96.00	1.36	0.00	1.36
18	2	0.85	0.73	0.00	106.80	1.61	0.00	1.61
24	5	0.95	0.82	0.00	141.60	2.38	0.00	2.38
28	10	1.00	0.86	0.00	166.20	2.94	0.00	2.94
32	20	1.05	0.90	0.00	190.80	3.55	0.00	3.55
38	50	1.15	0.99	0.00	225.00	4.58	0.00	4.58
42	100	1.20	1.00	0.00	252.00	5.19	0.00	5.19
47	200	1.20	1.00	0.00	281.40	5.79	0.00	5.79
56	500	1.20	1.00	0.00	334.20	6.88	0.00	6.88

Frequent ARI's	Discharge m ³ /s	% of Q_1
1mth	0.340	25%
2mth	0.544	40%
3mth	0.680	50%
4mth	0.815	60%
6mth	1.019	75%
9mth	1.223	90%
12mth	1.359	100%

APPENDIX D

URBS Model Files

7757_Ex.DAT & 7757_Dev.DAT – Catchment Parameters

"Index", "Area", "UL", "UM", "I" #1,0.00601,0.20,0.80,0.80 #2,0.00857,0.20,0.80,0.80 #3,0.01133,0.20,0.80,0.80 #4,0.01172,0.20,0.80,0.80 #5,0.01158,0.20,0.80,0.80 #6,0.01085,0.20,0.80,0.80 #7,0.00792,0.20,0.80,0.80 #8,0.00271,0.20,0.80,0.80 #9,0.00343,0.20,0.80,0.80

7757_Ex.U – Routing

Berserker - Existing MODEL: Basic USES: L, U Default Parameters: alpha=1.20 m=0.8 Catchment File=7757 Ex.dat #1 L=0.063 Rain Store. Rain #2 L=0.067 Get. Route thru #3 L=0.063 Add Rain #3 L=0.071 Store. Rain #4 L=0.043 Route thru #5 L=0.048 Add Rain #5 L=0.080 Add Rain Get. #7 L=0.118 Route thru Store. Rain #7 L=0.077 Get. Route thru #8 L=0.030 #8 L=0.041 Add Rain Store. Rain #6 L=0.068 #9 L=0.029 #9 L=0.037 Route thru Add Rain Get. Print. FC01 end of catchment details.

7757_Dev.U - Routing

```
Berserker - Development
MODEL: Basic
USES: L, U
Default Parameters: alpha=1.20 m=0.8
Catchment File=7757 Dev.dat
              L=0.063
Rain
      #1
Store.
Rain #2 L=0.067
Get.
Route thru #3 L=0.063
Add Rain #3 L=0.071
Store.
Rain #4
               L=0.043
Route thru #5 L=0.048
Add Rain #5 L=0.080
Get.
Route thru #7 L=0.118
Store.
Rain #7 L=0.077
Get.
Route thru #8
                     L=0.030
Add Rain
              #8 L=0.041
Store.
Rain #6
              L=0.068

        Route thru
        #9
        L=0.029

        Add Rain
        #9
        L=0.037

Get.
Loss C=0.9 F= Q= BYPASS=750RCP
Print. FC01
end of catchment details.
```

APPENDIX E

Stormwater Pipe Plan



APPENDIX F

Flood Hazard Overlay Code Response

Table 8.2.8.3.1 Development outcomes for assessable development and requirements for accepted development

Fitzroy River – H1 or H2 or North Rockhampton flood management area or Creek catchment planning area 2

Performance outcomes	Acceptable outcomes	Response
Development in Fitzroy River flood areas – H1 (I Creek catchment flood - planning area 2 Editor's note—Refer to overlay maps <u>OM-8A</u> and <u>OM-8C</u>	ow hazard area) or H2 (medium hazard area) or N	Vorth Rockhampton flood management area or
PO1 Development (including extensions) for non- residential purposes is able to provide a safe refuge for people and for the storage of goods during times of flood inundation.	AO1.1 For non-residential development, at least thirty (30) per cent of the <u>gross floor area</u> of all new buildings and structures is located a minimum of 500 millimetres above the defined flood level.	Minimum floor level recommended is 14.3 m AHD. This level provides 500 mm of freeboard above the 0.5% AEP flood level.
	Editor's note—Areas less than those nominated above may be supported where accompanied by a flood impact report in accordance with <u>SC6.10— Flood hazard planning</u> scheme policy.	
	A01.2 A report from a registered professional engineer of Queensland certifies that the development in the flood area will not result in a material increase in flood level or flood hazard on upstream, downstream or adjacent properties.	The proposed development would not result in any material worsening on adjoining properties.
PO2 Development is located to minimise susceptibility to and potential impacts of flooding.	AO2.1 For residential uses the finished floor levels of all habitable rooms shall be constructed a minimum of 500 millimetres above the defined flood level.	Not applicable.
	AO2.2 A report from a registered professional engineer of Queensland certifies that the development in the flood area will not result in a material increase in flood level or flood hazard on upstream,	Refer AO1.2 response.

	downstream or adjacent properties.	
	Editor's note—Report to be prepared in accordance with SC6.10—Flood hazard planning scheme policy.	
PO3 Development avoids the release of hazardous	A03.1 All hazardous materials and hazardous	Not applicable.
	containers are located and stored a minimum of 500 millimetres above the defined flood level.	
	Editor's note—Refer to the <u>Work Health and Safety Act</u> <u>2011</u> and associated regulation, the <i>Environmental</i> <i>Protection Act 1994</i> and the relevant building assessment provisions under the <i>Building Act 1975</i> for requirements related to the manufacture and storage of hazardous substances.	

Table 8.2.8.3.2 Development outcomes for assessable development

Fitzroy River – all hazard areas, North Rockhampton flood management area or Creek catchment – all planning areas

Performance outcomes	Acceptable outcomes	Response
Development in Fitzroy River flood area – al. all planning areas Editor's note—Refer to overlay maps <u>OM-8A</u> and <u>OM-8C</u>	l hazard areas, North Rockhampton flood m	ıanagement area or Creek catchment flood –
PO8 Development is located to minimise susceptibility to and potential impacts of flooding.	No acceptable outcome is nominated.	The development is located to minimise susceptibility to and potential impacts of flooding by maintaining the overland flow path through the development and designing the development around the overland flow path.
PO9 Underground car parks are designed to prevent the intrusion of floodwaters.	A09.1 Development with underground car parking is designed to prevent the intrusion of floodwaters by the incorporation of a bund or similar barrier a minimum of 500 millimetres above the defined flood level	Not applicable.
 PO10 Development: 1. does not result in any reduction of onsite flood storage capacity; or 2. does not result in any change to depth, duration or velocity of floodwaters within the premises; and 3. does not change flood characteristics outside the premises, including but not limited to causing: 1. loss of flood storage; or 2. loss of or changes to flow paths; or 	No acceptable outcome is nominated.	The site is not affected by flooding from Moores Creek, but from overland flow from the local catchment. As such, it is considered that the development would not result in any reduction of onsite flood storage capacity, nor does it increase the depth, duration or velocity of floodwaters within the premises. The development does not result in any material worsening due to loss of flood storage, changes to flow paths, flow acceleration or retardation or reduction in flood warning times elsewhere on the floodplain.
3. acceleration or retardation of flows; or		

		The proposed childcare centre is not located within the flood hazard area and only within the creek catchment area as denoted in the Flood Hazard overlay. There is at least 1 flood free access road, being the access at the north-western corner of the site.	A vehicular entrance and exit for the site is available at the north-western site corner. This access is flood-free during the 0.5% AEP storm event and would provide a safe point of egress for vehicles and pedestrians.	A vehicular entrance and exit for the site is available at the north-western site corner. This access is flood-free during the 0.5% AEP storm event and would provide a safe point of egress for vehicles and pedestrians.	
		 A011.1 A use for a purpose listed in <u>Table 8.2.8.3.3</u>: 1. is not located within the flood hazard area; and 2. has at least one (1) flood free access road. 	A012.1 Trafficable access to and from the development complies with the Capricorn Municipal Guidelines.	A012.2 Trafficable access to and from the development within the creek catchment planning areas are in accordance with the Queensland Urban Drainage Manual.	community related uses is obtained from at least one (1) route (minor collector or higher) for <u>emergency</u>
 any reduction in flood warning times elsewhere on the <u>floodplain</u>. 	Editor's note— <u>Council</u> may require the applicant to submit a <u>site</u> -based flood study that investigates the impact of the development on the <u>floodplain</u> and demonstrates compliance with the relevant performance outcome.	P011 Essential community infrastructure and community facilities are protected from, and able to function effectively during and immediately after, a defined flood event.	P012 Development provides safe and trafficable access to the local evacuation centres and evacuation services and have regard to: 1. evacuation time;	 number of persons affected; types of vehicles necessary for evacuation purposes; the distance to flood free land; and the evacuation route. 	

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Table 8.2.8.3.3 Essential community infrastructure and community facilities and public assets

Use	Flood event level per cent annual exceedance probability
Emergency services	0.2
Emergency/evacuation shelters	0.5
Fire and police stations	0.5
Hospitals and associated facilities	0.2
Stores of valuable record or items of historic/cultural significance	0.2
Air services	0.5
Telecommunications facilities	0.5
Power stations	0.2
Major electricity infrastructure	0.2
Substations	0.5
Sewage treatment plants	1.0
Water treatment plants	0.2
Retirement facility, residential care facility and community residence	0.5
Community related uses (including child care centres and educational establishments)	0.5
Regional fuel storage	0.5
Food storage warehouse	0.5

ROCKHAMPTON REGIONAL COUNCIL APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with Development Permit No.: D/117-2020 Dated: 10 February 2021



Technical Memorandum

Title	245 Victoria Place, Berserker - Pro Traffic Statement	posed Childc	are Centre
Client	Stockland on behalf of The Trust Company Limited	Project No	CEB06360A
Date	28 Sept 2020	Status	Final
Author	Alice Shi	Discipline	Traffic and Transport
Reviewer	Andy Johnston (RPEQ: 24764)	Office	Brisbane

Introduction

Cardno has been engaged by Stockland on behalf of The Trust Company Limited to provide traffic engineering advice for the proposed childcare centre located at 245 Victoria Place, Berserker, 3km northeast of Rockhampton City. The plans of the proposed childcare centre can be found in Appendix A.

The proposed development would redevelop the existing 708 sg.m gross leasable area (GLA) site of the Colonial Mart complex. The childcare centre is proposed to be 793 sg.m catering for up to 100 enrolments and 18 staff. The aim of this traffic statement is to determine the impact of the change in land use based on the following aspects:

- > Traffic generation
- > Parking and servicing provision
- > Sight distance review

Background

Cardno has previously completed a Traffic Impact Assessment assessing the impact of the existing centre to accommodate a cinema expansion with additional retail space, a discount department store (DDS) (minimajor retail) expansion and redevelopment of a food and drink outlet. These were approved in November 2017 under DA application D/69-2017-MCU, May 2018 under DA application D/29-2018-MCU and May 2020 under 'Other Change' application D/69-2017, respectively. As these approved expansions have not yet commenced construction, this assessment reviews the two listed baseline scenarios, as follows:

- 1. The existing shopping centre
- 2. The existing shopping centre + approved cinema / retail development (application D/69-2017-MCU) + Mini-Major (DDS) retail expansion (application D/29-2018-MCU) + approved food and drink development (application D/69-2017).

A summary of the existing shopping centre and the approved expansion is provided in **Table 1**.

Table 1	Baseline Scenarios – Proposed Yields

Land Use	Existing Centre	Approved Expansion (Cinema and Retail), Mini-Major (DDS) and Food and Drink
Retail	55,005 sq.m	59,984 sq.m
Cinema	954 seats / 3,392 sq.m	1,169 seats / 3,993 sq.m
Mini Major Retail	-	1,449 sq.m
Food and Drink	-	0 sq.m*
Total	58,397 sq.m	65,426 sq.m

Note * net change in floor area for food and drink application was nil

Proposed Redevelopment

The proposed development comprises of the following land use:

- > Removal of 708 sq.m GLA of existing retail
- > Addition of 793 sq.m of new childcare centre, up to 100 enrolments

Refer to Drawing DA010-B at **Appendix A** for site specific information and boundary lines. It is noted that the 793 sq.m floor area prescribed for the childcare centre is noted on the plans as GBA, gross building area, while the gross floor area (GFA) has been prescribed as 822 sq.m. For the purposes of this assessment, GLA has been assumed to be similar to the GBA and as such, has been adopted as 793 sq.m.

The proposed redevelopment is to be located at the existing Shopping Centre precinct, Colonial Mart, at the southern portion of the Stockland Rockhampton Shopping Centre, fronting High Street. **Figure 1** illustrates the proposed development location in relation to the shopping centre.



Figure 1 Proposed Development Context

Source: Nearmap

The site currently provides for 75 spaces. It is noted that the adjacent parking area outside of the childcare centre study area provides 19 spaces currently which are not proposed to be changed.

The redevelopment of the site involves provision of 36 spaces.

Development Impact

Yields

The two baseline scenarios outlined above in **Table 1** have been adjusted for the proposed for redevelopment. These scenarios are shown below in **Table 2**.

Table 2 Centre Yields (GLA)

Land Use	Existing Centre	Proposed Development	Total		
Scenario 1 - Existing Centre					
Shopping Centre	55,005 sq.m	-	55,005 sq.m		
Cinema	3,392 sq.m	-	3,392 sq.m		
Childcare Centre	708 sq.m	793 sq.m*	793 sq.m		
Total	59,105 sq.m	793 sq.m	59,190 sq.m		
Scenario 2 - Existing Centre + Approved Development (Cinema & Retail) + Mini-Major Expansion (DDS) + Food and Drink					
Shopping Centre (including DDS and Food and Drink)	61,433 sq.m	-	61,433 sq.m		
Cinema	3,993 sq.m	-	3,993 sq.m		
Childcare Centre	708 sq.m	793 sq.m*	793 sq.m		
Total	66,134 sq.m	793 sq.m	66,219 sq.m		

Note * 793 sq.m assumed as GLA for this assessment, although this relates to GBA.

As shown, with the inclusion of the proposed redevelopment, the total precinct GLA would be 66,219 sq.m, after the approved cinema, retail, DDS and food and drink expansion are completed.

Trip Generation

As the proposal relates to a change in land use, the difference in trip generation needs to be estimated. For the purposes of this assessment, the existing retail site has been assumed to generate trips at the same rate as the rest of the shopping centre. The traffic related to Scenario 2 has been estimated based on the previous assessments undertaken for those applications.

Scenario 1 - Existing Centre

Drawing on previous assessments prepared by Cardno for the development, the trip generation for the existing centre is shown in **Table 3**.

Table 3 E	Existing	Peak	Hour	Traffic	Generation
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	Thursday Peak	Saturday Peak
85 th %ile Retail Traffic Generation	3,105 vph	3,678 vph
Existing Site GLA – Retail	55,005 sq.m	55,005 sq.m
85 th %ile Retail Traffic Generation Rate	5.64 vph / 100 sq.m	6.69 vph / 100 sq.m

The trips which would be removed from the network as a result of the replacement of the existing Colonial Mart use are outlined in **Table 4**.

Table 4 Traffic Generation – Colonial Mart (to be removed)

Land Use	Viold	Trip Rate (vph / 100 sq.m)		Traffic Generation	
	neiu	Thursday Peak	Saturday Peak	Thursday Peak	Saturday Peak
Existing Retail	708 sq.m	5.64	6.69	40 vph	47 vph

The trips associated with the proposed childcare centre are based on trip rates sourced from TMR Trip Generation Database (2018). The trip rate is calculated from the average of the weekday and weekend peak hour trips for the sites surveyed within Queensland, outlined in **Table 5**.

Table 5 Traffic Generation – Proposed Childcare Cen

Land Use	Vield	Trip Rate (vph / 100 sq.m)		Traffic Generation	
	i leiu	Thursday Peak	Saturday Peak	Thursday Peak	Saturday Peak
Childcare centre	100 children	0.63	0.03	63 vph	3 vph

The incremental increase in trips resulting from the proposed development is outlined in Table 6.

Table 6 Increase in Traffic Generation

Land Use	Viold	Traffic Generation		
	Tielu	Thursday Peak	Saturday Peak	
Existing Retail	708 sq.m	- 40 vph	- 47 vph	
Childcare centre	100 children	+ 63 vph	+ 3 vph	
Difference		+ 23 vph	- 44 vph	

While the proposed development will yield an increase of 23 vph in the weekday peak, a reduction of 44 trips during the weekend peak will be realised. With regards to the increase in trips, the proportionate impact of this change has been calculated in **Table 7** based on the overall centre trips, as the access points to the external road network are shared.

Table 7 Proportionate Impact in Trip Generation

Land Lloo	Traffic	Generation
Lanu USe	Thursday Peak	Saturday Peak
Existing Centre	3,105 vph	3,678 vph
Childcare centre	+ 23 vph	- 44 vph
Impact	+ 0.7%	- 1.2%

As indicated, the proposed change will result in a 0.7% increase in trips during the weekday peak and a 1.2% reduction in trips during the weekend peak. As the impact is less than a 5% increase, the traffic impact is considered to be not significant and detailed analysis is not required.

Scenario 2 - Existing Centre + Approved Development (Cinema & Retail) + Mini-Major Expansion (DDS) + Food and Drink

Drawing on previous assessments prepared by Cardno for the development, the trip generation for the expanded centre is shown in **Table 8**.

Table 8 Peak Hour Traffic Generation – Approved Expansions

	Thursday Peak	Saturday Peak
Existing Retail	3,105 vph	3,678 vph
Existing Cinema	96 vph	92 vph
Cinema and Retail Expansion	+212 vph	+241 vph
Mini-Major Expansion	+49 vph	+58 vph
Food and Drink Redevelopment*	-	-
Total 85 th %ile Retail Traffic Generation	3,462 vph	4,069 vph

Note * net change in floor area for food and drink application was nil, hence no change in trips associated with this redevelopment

As outlined in Table 6, while the proposed development will yield an increase of 23 vph in the weekday peak, a reduction of 44 trips during the weekend peak will be realised. With regards to the increase in trips, the proportionate impact of this change has been calculated in **Table 9** based on the overall centre trips for the approved expansion, as the access points to the external road network are shared.

Table 9	Proportionate	Impact in Trig	Generation	- Approved	Expansions
1 0.010 0					

	Traffic Generation	
Land Use	Thursday Peak	Saturday Peak
Approved Centre	3,462 vph	4,069 vph
Childcare Centre	+ 23 vph	- 44 vph
Impact	+ 0.7%	- 1.1%

As indicated, the proposed change will result in a 0.7% increase in trips during the weekday peak and a 1.1% reduction in trips during the weekend peak. As the impact is less than a 5% increase, the traffic impact is considered to be not significant and detailed analysis is not required.

Car Parking Assessment

Parking Requirement

The parking requirements for childcare centres are outlined in the Rockhampton planning scheme. Based on the proposed yield, **Table 10** outlines the minimum parking requirement in accordance with these rates.

Table 10 Minimum Parking Requirement

Land Use		Yield	Parking Rate	Parking Requirement
Childeoro Contro	Staff	18 staff	1 space per FTE staff	18 spaces
Childcare Centre	Visitors	100 children	1 space per 6 children	17 spaces
Total				35 spaces

As shown, 35 spaces are required to service the proposed development.

Parking Provision

The proposed development provides for 36 spaces, which satisfies the requirement for the childcare centre parking requirements, as outlined in **Table 10**.

Parking Design

The reconfigured parking area has been reviewed to ensure that the design is compliant with the relevant standards. The changes included relocating the main parking aisle to accommodate the new childcare building and redesigning the parking bays to suit.

A design review was undertaken for the proposed site layout, in accordance with the Rockhampton Regional Council Planning Scheme (RRCPS) and AS2890:2004, where not specified in the RRCPS.

The proposed site design compliance has been summarised in Table 11.

Table 11Site Compliance Check

	Design Criteria	Design Requirement	Proposed Design	AS2890 / RRCPS Compliant
	Bay length	Min 5.4m	5.4m	\checkmark
	Bay width	Min 2.6m	2.6m – 2.7m	\checkmark
Parking Bays	PWD space	-	1 space with shared zone provided	\checkmark
	PWD bay dimensions	2.4m wide with 2.4m wide shared zone	2.4m wide with 2.4m wide shared zone	\checkmark
Aiclos	Aisle-width	Min 6.2m	Min 6.2m	\checkmark
Alsies	Maximum continuous aisle length	Max 100m	50m	\checkmark
	Pedestrian Sight Lines	2.5m x 2.0m sight splay	2.5m x 2.0m sight splay	\checkmark
Access	Queueing Area	2 vehicles	3 vehicles	\checkmark

The dimensions of all car bays were determined to comply with AS2890.1 and RRCPS standards. The majority of spaces are 2.6m wide with the five spaces along the western boundary measuring at 2.7m wide. One parking space for people with disabilities (PWD) has been provided, designed in accordance with standards.

Given the parking provision, queueing for up to 2 vehicles should be provided for. The design allows for 2 vehicle storage at the Victoria Place access and 1 vehicle storage at the northern access connecting to the internal centre road.

Figure 2 illustrates the location of the proposed staff and visitor parking spaces as well as the PWD space in relation to the site.





Source: Stockland and Raunik Design Group, drawing DA010-B

Servicing Arrangement

The development proposes to use wheelie bins for refuse. These bins will be serviced as kerbside collection from Victoria Place. The bin store is located adjacent to Victoria Place, allowing for easy access for bins to be wheeled between the store area and the road frontage. **Figure 3** illustrates the proposed refuse arrangement. As kerbside collection is proposed, swept paths are not considered to be necessary as Victoria Place has been designed as a public road.



Figure 3 Refuse Arrangement

Source: Stockland and Raunik Design Group, drawing DA010-B

Sight Distance Review

Vehicle Sight Distance

Sight distance at the Victoria Place / High Street intersection has been reviewed for inclusion of the development plans. In accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersection, the safe intersection sight distance (SISD) has been reviewed. As High Street is median divided, the sight distance has only been reviewed in the western direction.

Figure 4 illustrates the SISD review at the Victoria Place / High Street intersection. As per the Austroads standards, the sightline has been taken at a point 5m from the conflict point, in this case, from the kerbside lane on High Street. The minimum SISD of 151m associated with a design speed of 70km/h has been adopted. The figure illustrates that the propose design will not impede on sightlines to meet the SISD requirement. Therefore, the vehicle sight distance at the Victoria Place / High Street intersection is considered to be suitable.

 None
 High Street

Figure 4 Vehicle Sight Distance Review - Victoria Place / High Street

Source: Nearmap, Stockland and Raunik Design Group, drawing DA010-B

Pedestrian Sight Distance

In addition to the vehicle sight distance, pedestrian sight distance at the Victoria Place access has been reviewed. In accordance with AS2890.1 Figure 3.3, the pedestrian sight splay at the access should provide a sight triangle of $2.5m \times 2.0m$. As shown in **Figure 5**, the site access has been designed to meet this requirement. Therefore, the pedestrian sight distance at the Victoria Place access is considered to be suitable.



Figure 5 Pedestrian Sight Distance Review – Victoria Place Access

Source: Stockland and Raunik Design Group, drawing DA010-B

Summary

Cardno was engaged by Stockland on behalf of The Trust Company Limited to provide traffic engineering advice in relation to the proposed childcare centre development located at the Colonia Mart building at the south of the Rockhampton Stockland Shopping Centre precinct.

Upon review of the development plans, the following traffic and design aspects were determined:

- > The additional trips generated by the childcare centre would not produce a significant increase in trips, as only up to 0.7% increase in trips above the existing shopping centre are expected at most. Therefore, further traffic analysis is not considered to be required.
- > The childcare centre is required to provide 35 parking spaces. With provision of 36 spaces, the requirement is considered to be satisfied.
- > The design of the parking area is in compliance with Australian Standards, with parking bays and aisles confirmed to meet minimum design requirements
- Servicing is proposed to be facilitated with kerbside refuse collection via Victoria Place. The bin store has been designed adjacent to the Victoria Place frontage, minimising the distance required to wheel the bins.
- > Sight distance has been reviewed at Victoria Place / High Street intersection for SISD and at the Victoria Place access for pedestrian sight splays. Both locations are confirmed to provide adequate sight distance to meet the minimum requirements.

On the basis of the above, the proposed childcare centre is considered to be suitable from a traffic perspective.

245 Victoria Place, Berserker - Proposed Childcare Centre

APPENDIX A PROPOSED DEVELOPMENT PLANS



OCKLAND	OCKHAMPTON	OSED CHILDCARE CENTRE	
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Doc. No.	Document Title
DA001	Cover Sheet
DA002	Existing Ground Floor Plan
DA010	Childcare Site Plan
DA011	Childcare Ground Floor Plan
DA020	Childcare Elevations
DA021	Childcare Elevations
DA022	Childcare Sections
DA030	Childcare Materials / Signage
DA031	Childcare Signage
DA040	Childcare Shadow Diagrams
DA050	Childcare Perspectives
DA051	Childcare Perspectives
DA060	Childcare Landscape - Site Plan
DA061	Childcare Landscape - 0-2 Years
DA062	Childcare Landscape - 2-3 Years
DA063	Childcare Landscape - 3+ Years
DA064	Childcare landscape - Ground Plan












