Patcol Group Pty Ltd
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www.patcol.com.au

# PLANNING REPORT
# CARPARK

**Project Name:** Proposed Carpark at 29 Denning St, Park Avenue

**Project Number:** 21-552

**Project Address:** 29 Denning St, Park Avenue

**Client:** L. Kenealy

**ROCKHAMPTON REGIONAL COUNCIL**

**APPROVED PLANS**

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

**Development Permit No.:** D/10-2022

**Dated:** 20 April 2022

| Revision | Revision | Issue Date |
|---|---|---|
| Original Issue | A | 25.11.21 |

# 1.0 Introduction

## 1.1 Project Overview

Patcol Group Pty Ltd have been engaged by Mr L. Kenealy to carry out an engineering assessment on various aspects of a proposed development. The intention of this report is to form part of a proposal to be submitted to the Local Government Authority in support of the development approval.

It is proposed that an existing residential lot at 29 Denning St, Park Avenue, be developed for use as a carpark to service an adjacent shopping centre. To achieve this, the below construction scope has been proposed:

- Bulk earthworks;
- Construction of pavement base;
- Concreting including kerbing works and minor drainage works;
- Asphalting & linemarking;
- Landscaping.

The scope of this report is to address the required provisions of the Rockhampton Regional Council Planning Scheme.

## 1.2 Methodology

The project methodology is as follows:

1. Identify catchments for the pre-development case and quantify peak discharge from the site with respect to catchment parameters, local rainfall intensities and other hydrologic properties. XP-STORM utilising the Laurenson runoff routing method was used to achieve this.
2. Identify the critical storm durations for the required AEP event.
3. Identify catchments for the post-development case and quantify peak discharge from the site similar to item 1.
4. Identify measures required to achieve no net change to stormwater quantity and quality discharged from the site as a result of the proposed development.

Data sources for the project include:

1. Australian Rainfall & Runoff data hub for Intensity-Frequency-Duration data and temporal patters.
2. Rockhampton Regional Council GIS data.
3. Survey completed by Capricorn Survey Group.
4. Preliminary site layout provided by Rufus Design Group.

# 2.0 Hydrology

## 2.1 External Catchments

The site does not have any external catchments due to the eastern and southern boundaries being roofed buildings that extend the length of the lot. The northern and western boundaries are kerbed road reserve, which are lower than the site.

## 2.2 Pre-Development Case

The pre-development case is a residential lot with an existing structure of approx. 182m$^2$ site coverage. The site slopes from east to west generally on approx. 1% grade, and is a low-cut turf surface.

Table 1 presents the relevant pre-development sub-catchment parameters.

*Table 1 - Pre-development sub-catchment parameters*

| | | Pre-Development Case | |
|---|---|---|---|
| | | Pervious | Impervious |
| Area (ha) | | 0.061 | .018 |
| Percent Impervious (%) | | 0 | 100 |
| Slope (%) | | 1 | 10 |
| Manning's 'n' | | 0.03 | 0.015 |
| Infiltration | Initial Loss (mm/hr) | 0 | 0 |
| | Continuing Loss (mm/hr) | 2 | 0 |
| Pre-Development Fraction Impervious | | 0.23 | |

Values for the initial and continuing loss model applied are taken from Australian Rainfall Runoff guidelines around urban catchment hydrology. The overall peak discharges for the site are shown in Figure 1 and

Figure 2 in the form of box-and-whisker plots of the mean peak flow for a range of storm durations for the design storm events.

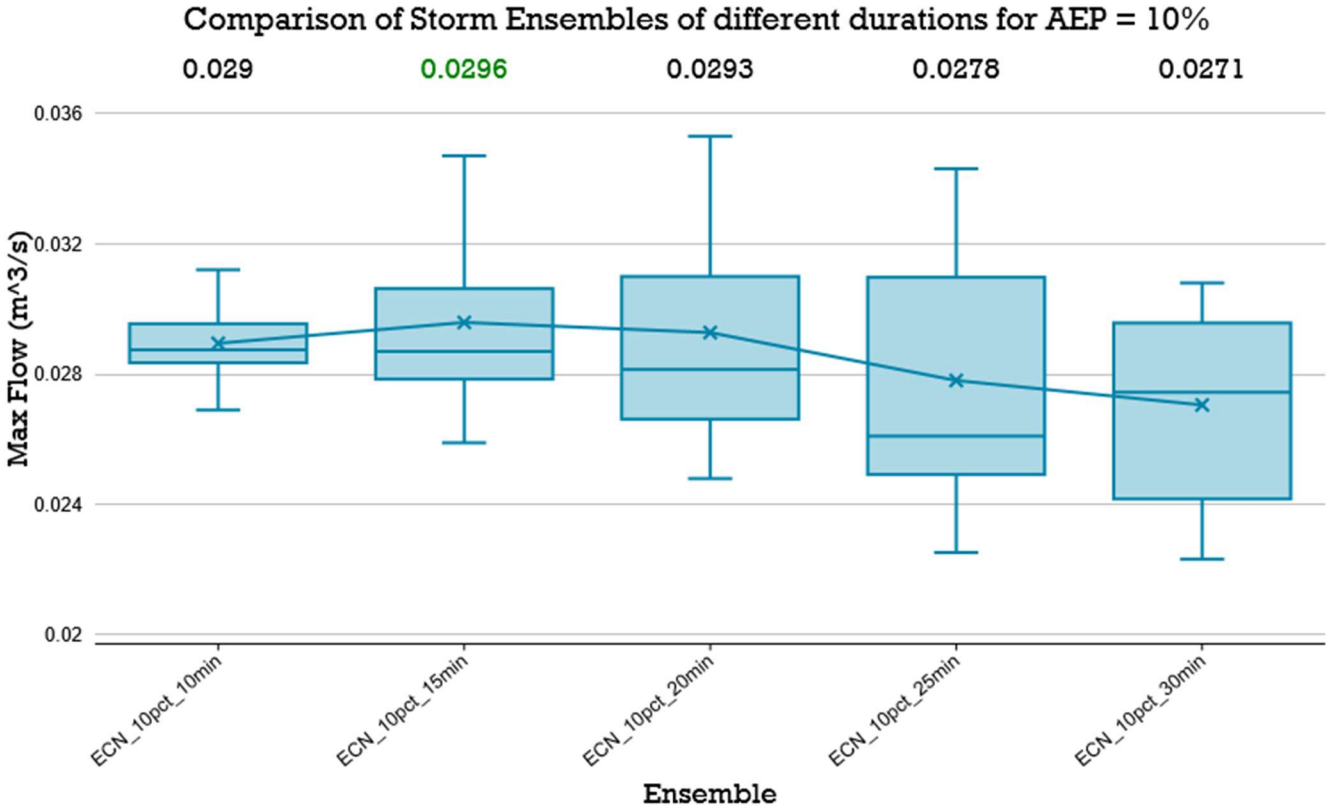


*Figure 1 - Pre-development 10% AEP box-and-whisker plot*

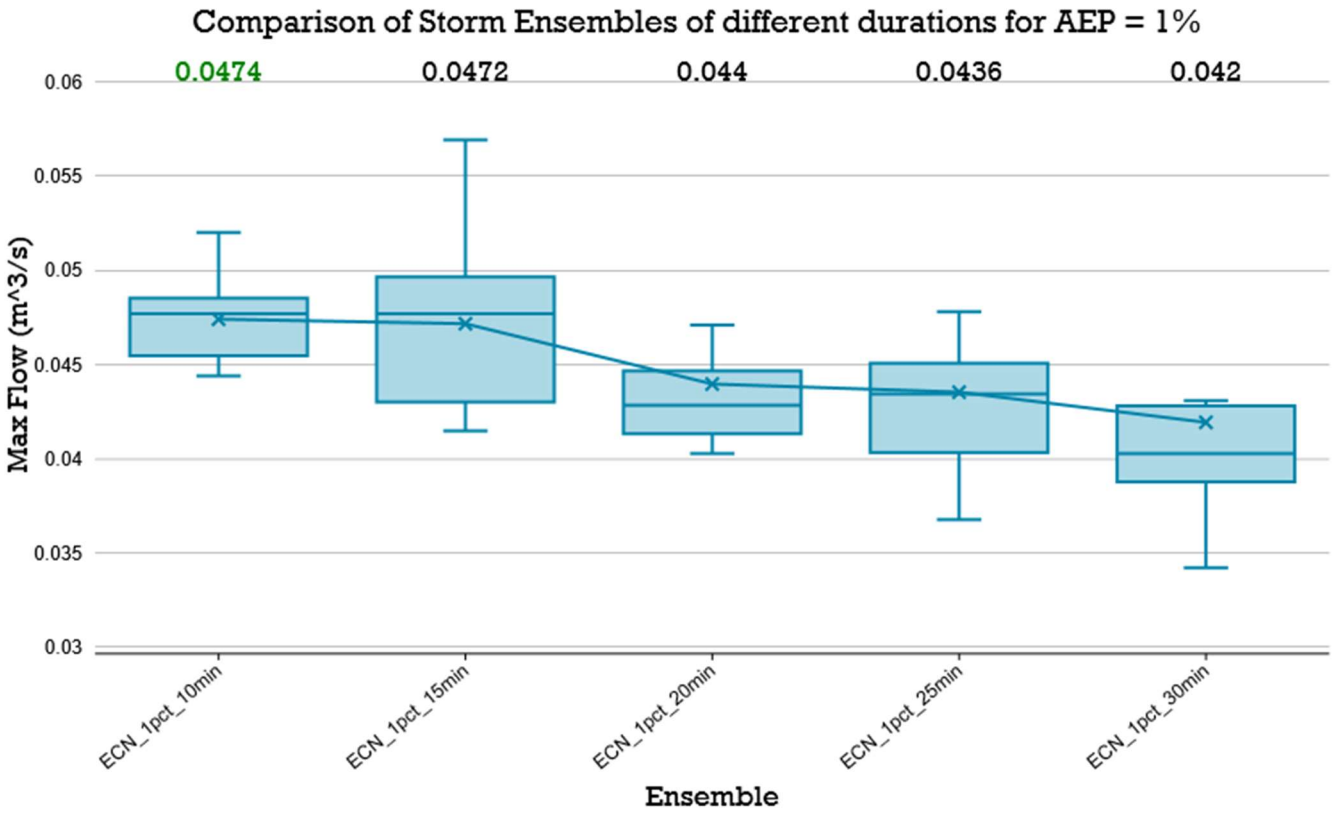


*Figure 2 - Pre-development 1% AEP box-and-whisker plot*

Summarising, the below Table 2 shows the peak discharges for each design storm, as well as the corresponding storm duration and design rainfall ID.

*Table 2 - Pre-development peak discharges & storms for design purposes*

| | Pre-Development Case | | |
|---|---|---|---|
| | Max Flow ($m^3/s$) | Storm Duration (mins) | Design Rainfall ID |
| 10% AEP ($m^3/s$) | 0.0296 | 15 | ECN_10pct_15min_5 |
| 1% AEP ($m^3/s$) | 0.0474 | 10 | ECN_1pct_10min_2 |

## 2.3 Post-Development Case

Table 3 presents the relevant post-development sub-catchment parameters.

*Table 3 - Post-development sub-catchment parameters*

| | | Post-Development Case | |
|---|---|---|---|
| | | Pervious | Impervious |
| Area (ha) | | 0.006 | 0.073 |
| Percent Impervious (%) | | 0 | 100 |
| Slope (%) | | 1 | 1 |
| Manning's 'n' | | 0.03 | 0.015 |
| Infiltration | Initial Loss (mm/hr) | 0 | 0 |
| | Continuing Loss (mm/hr) | 2 | 0 |
| Post-Development Fraction Impervious | | 0.93 | |

Figure 1 and Figure 2 present the box-and-whisker plots of the mean peak flow for a range of storm durations for the design storm events.

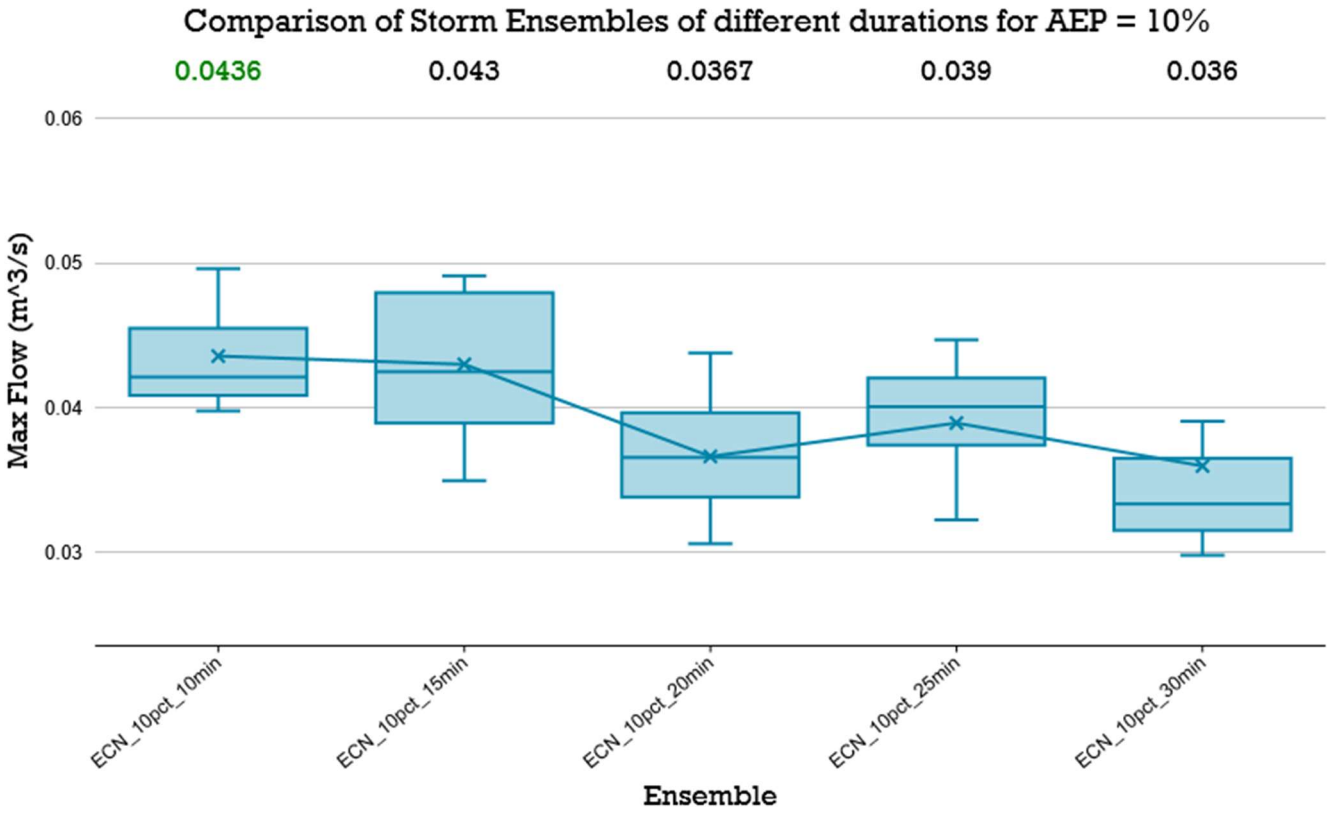


*Figure 3 - Post-development 10% AEP box-and-whisker plot*

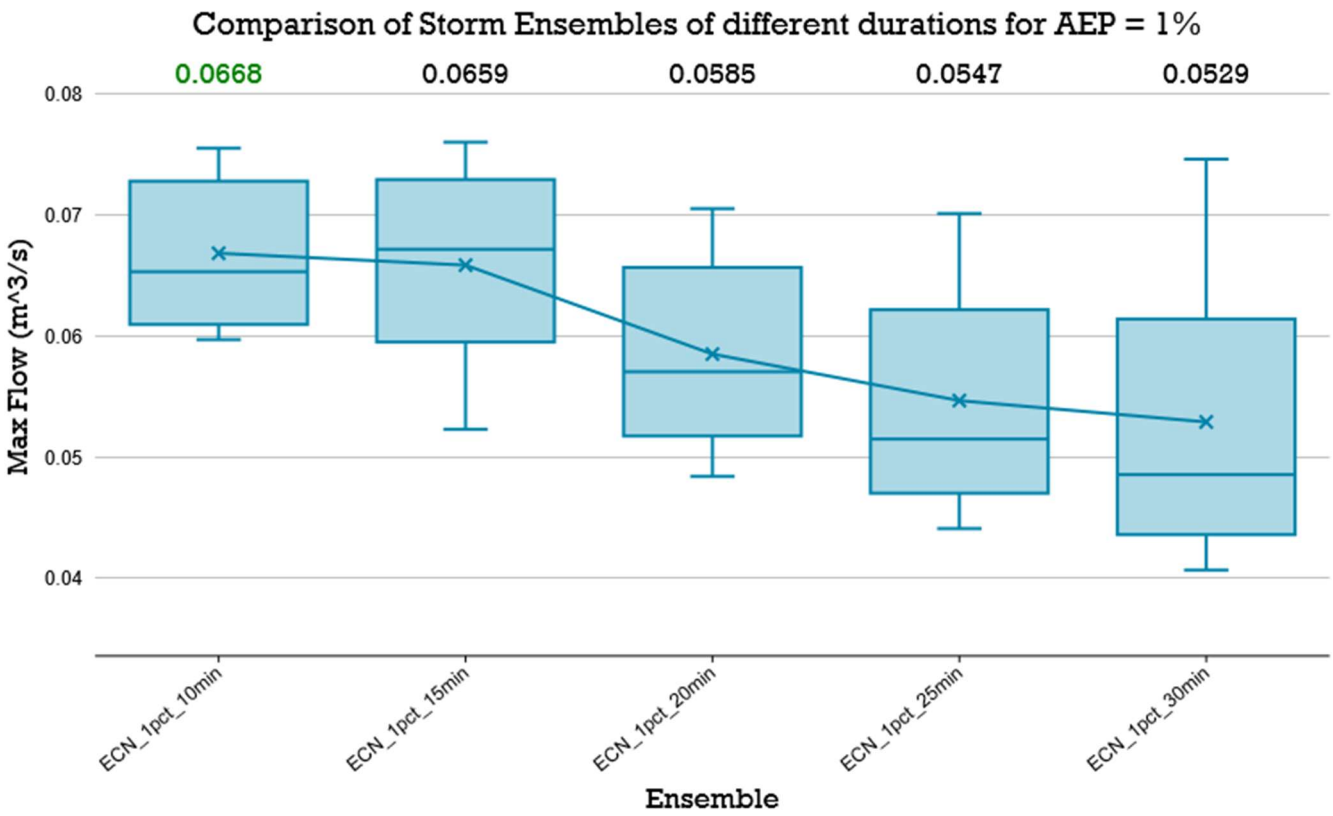


*Figure 4 - Post-development 1% AEP box-and-whisker plot*

*Table 4 - Post-development peak discharges & storms for design purposes*

| | Post-Development Case | | |
|---|---|---|---|
| | Max Flow ($m^3/s$) | Storm Duration (mins) | Design Rainfall ID |
| 10% AEP ($m^3/s$) | 0.0436 | 10 | ECN_10pct_10min_7 |
| 1% AEP ($m^3/s$) | 0.0668 | 10 | ECN_1pct_10min_8 |

The post-development case was assessed using realistic estimates of the impervious fraction taken from Autocad and survey data. The as shown in Table 3, it was predicted that the site slope would be averaged to 1% as part of the operational works design to facilitate surface water drainage. This has resulted in increases in the design flows, as presented below.

*Table 5 - Comparison of pre and post development flows*

| | Pre-Development Max Flow ($m^3/s$) | Post-Development Max Flow ($m^3/s$) | Change ($m^3/s$) | Change (%) |
|---|---|---|---|---|
| 10% AEP ($m^3/s$) | 0.0296 | 0.0436 | 0.014 | 47.3% |
| 1% AEP ($m^3/s$) | 0.0474 | 0.0668 | 0.019 | 40.9% |

# 3.0 Hydraulics

## 3.1 Scope

The hydraulic assessment of this report has been carried out using XPSTORM (Version 2021.1) and the hydrologic inputs developed in Section 2 with the aim to demonstrate a suitable method of attenuating the peak flows produced as a result of the proposed development.

### 3.2 Stormwater Management Strategy

The proposed stormwater management strategy is to provide a low-flow rectangular hollow section (RHS) pipe to a kerb adapter, with a high-flow kerb break at the low point of the carpark with the intention that the carpark will act as it's own storage. This is the only option available, due to the fact that there is no stormwater pipe network adjacent the lot, hence below ground tanks aren't possible. Refer to Appendix A for the site general arrangement which shows the proposed site stormwater management strategy.

A 100x150 RHS was modelled as the main outlet of the carpark, with a 600mm square shallow pit at the low point to allow a 1.5% grade to the invert of kerb. A 1.5m wide kerb weir was modelled to allow high-flow discharge.

The parameters of the carpark design is presented below:

*Table 6 - Basin Parameters*

| | |
|---|---|
| Base Level | 21.8m |
| Top of Kerb at Lowest Point | 21.95m |
| Outlet Structure | 1500(w) x 50(h) kerb weir, invert at 21.9m<br>150(w) x 100(h) RHS pipe, invert at 21.65m |

Figure 5 shows the mitigated flow rates from the site to the lawful point of discharge, which is at the kerb on Denning St. Table 1 presents a comparison between pre-development and mitigated max flows.

*Table 7 - Comparison of pre and mitigated flows*

| | Pre-Development Max Flow ($m^3/s$) | Mitigated Max Flow ($m^3/s$) | Change ($m^3/s$) | Change (%) |
|---|---|---|---|---|
| 10% AEP ($m^3/s$) | 0.0296 | 0.025 | -0.0046 | -15.54 |
| 1% AEP ($m^3/s$) | 0.0474 | 0.026 | -0.0214 | -45.15 |

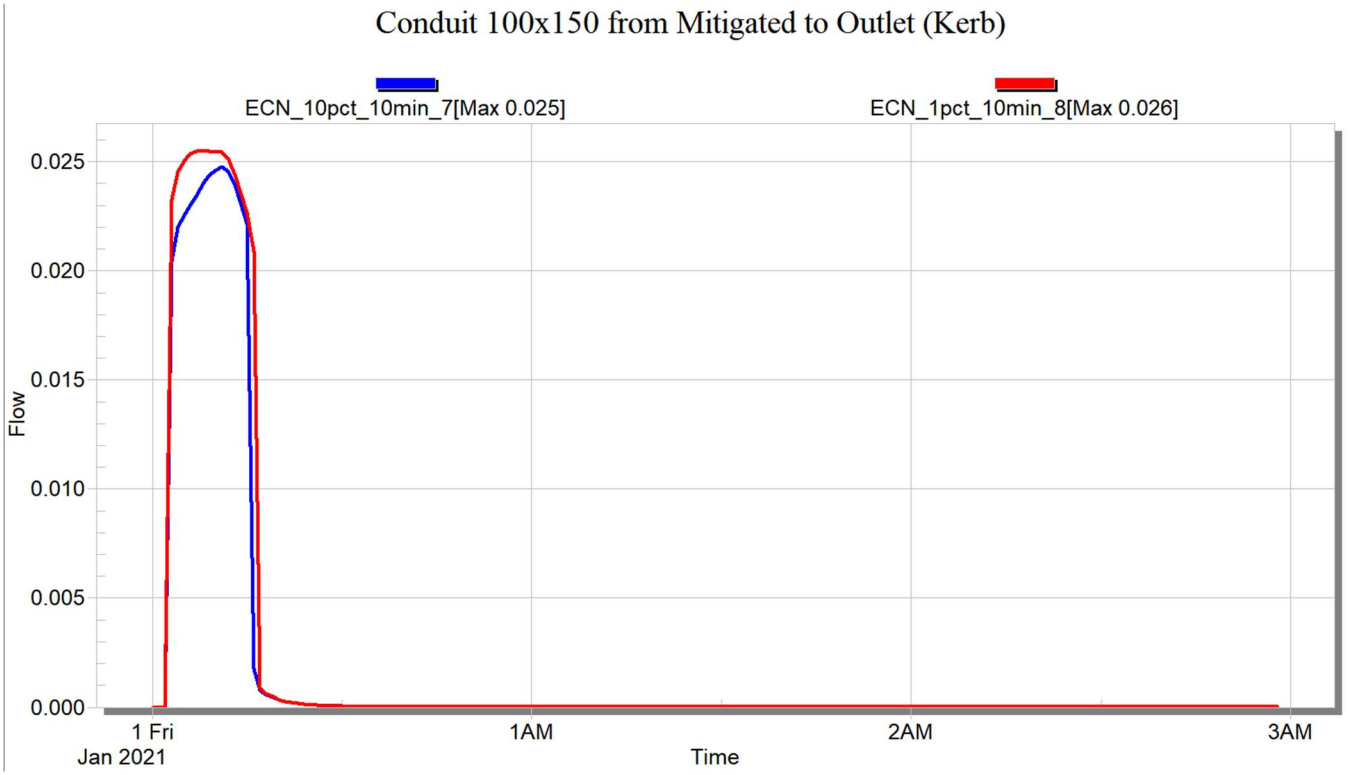


*Figure 5 - Site to RRC kerb discharge*

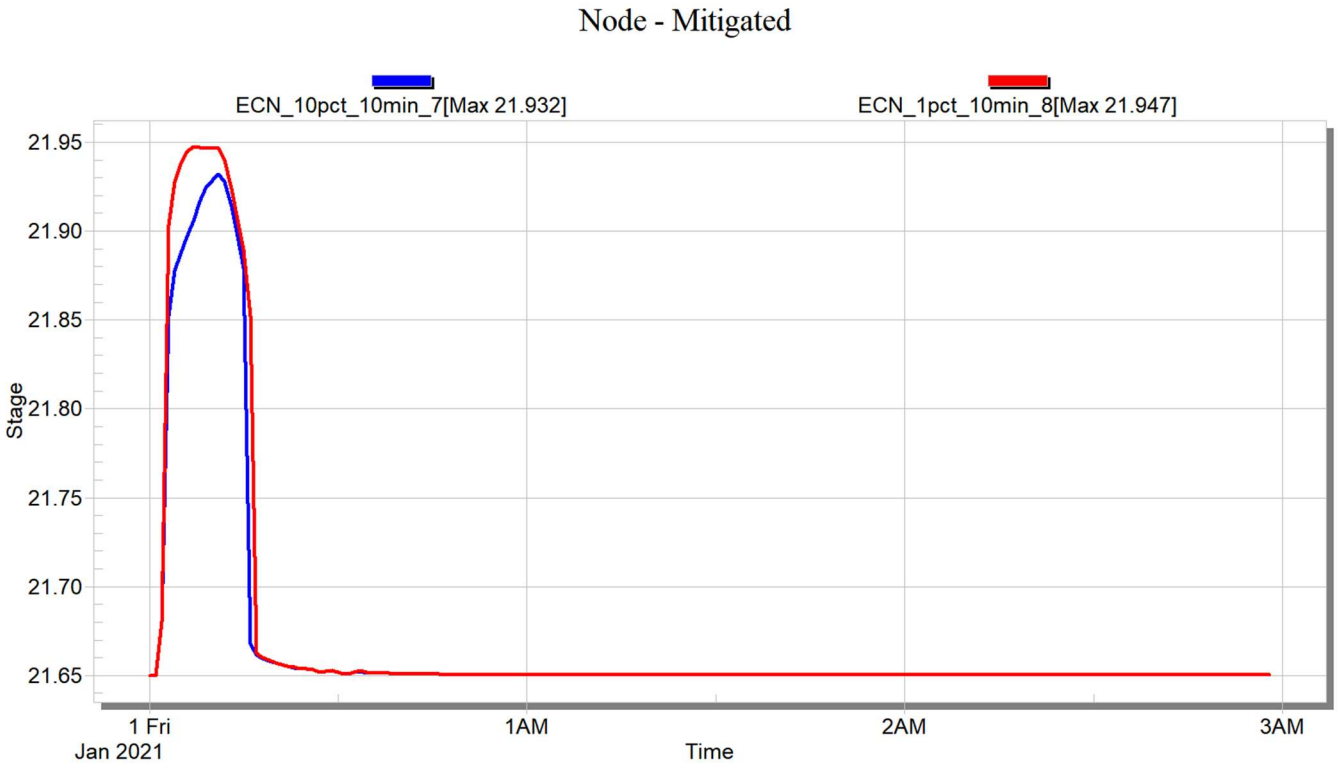


*Figure 6 - Stage curves for storage nodes*

Figure 6 shows the stage curves for the storage node.

Overall the proposed design results in no net increase in discharged flows from the site.

# 4.0 Stormwater Quality

## 4.1 Scope

The development being smaller than 2500m$^2$ does not trigger the need to address the stormwater quality provisions of the State Planning Policy 2017 (SPP 2017). This section aims to provide a high-level guide on measures to address the potential for an increase in pollutant loads during operational works.

## 4.2 During Operational Works

The main risk of increased pollutant loads during construction is likely to be from erosion and sediment loss from disturbing the site. The following are the key pollutants that must be addressed during construction:

*Table 8 - Key Pollutants During Construction*

| Pollutant | Sources |
|---|---|
| Litter | Paper, construction packaging, food packaging, cement bags, material offcuts etc. |
| Sediment | Exposed soil and stockpiled soil/gravel. |
| Hydrocarbons | Fuel and oils. |
| Toxic Materials | Cement, asphaltic materials, solvents, cleaning agents etc. |
| Acids or Alkaline Materials | Acid sulphate soils, cement. |

Erosion and sediment control devices will be the main hard-control to lower pollutant loads during construction. At operational works design stage an Erosion & Sediment Control Plan (ESCP) will be provided detailing the controls required, however the below provides high-level measures that will be implemented.

Pre-Construction:

- Site personnel are to be informed and made aware of the ESCP and it's requirements around implementation, maintenance and decommissioning;
- Sediment fences to all areas requiring bulk earthworks will be installed;
- Major flowpaths (kerb and channel, formalised drains etc.) will have erosion & sediment control devices installed upstream;
- The site access/s will have rumble pads installed to limit soil material tracked off-site by vehicles;
- Topsoil (if any) will be stripped and stockpiled to be reinstated after construction. Stockpiled topsoil will be bunded off.

During Construction:

- All bulk earthworks to be kept tidy with batters and stockpiles ironed to minimise erosion by wind and rain;
- Areas of bulk filling to be bunded off during construction;
- Erosion and sediment control devices are to be monitored and maintained for the duration of construction;
- Appropriate waste disposal facilities are to be provided onsite – e.g. skip bins.

Post-Construction:

- Areas to be revegetated to have topsoil reinstated prior to placement of turf or hydromulching;
- Sediment fencing to remain in place until revegetation has occurred.

# 5.0 Conclusion

The effects of the proposed development at 29 Denning St, Park Avenue on the existing infrastructure network and surrounding lots have been demonstrated to be successfully managed through use of relevant controls.

Further enquiries should be directed to the below signed if required.

Yours sincerely,

Scott Thomas

Manager – B. Eng (Civil/Structural) RPEQ 16203

## Appendix A – Drawings

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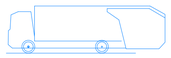
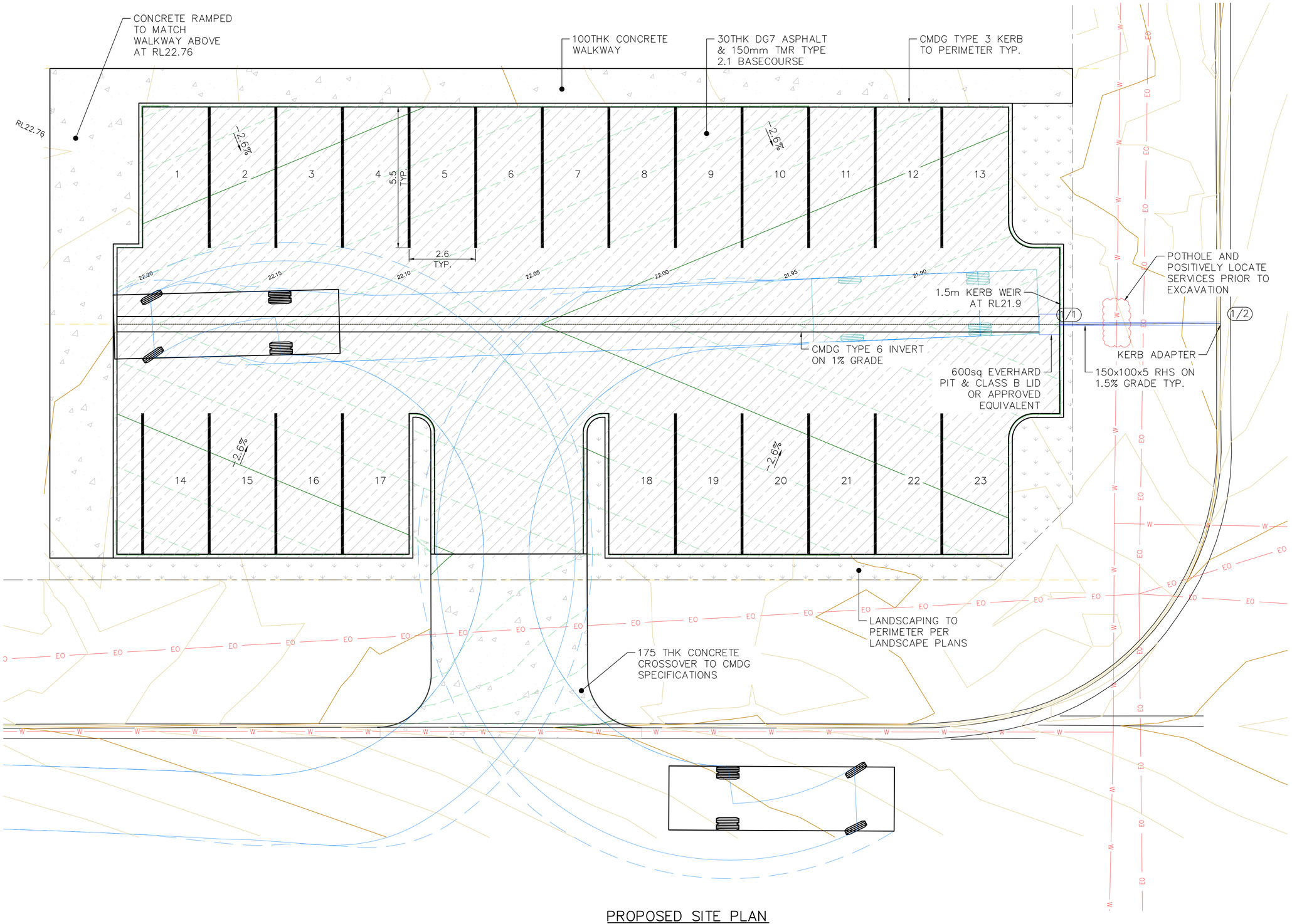
LEGEND

- PROPOSED CONTOUR (0.05m)
- PROPOSED CONTOUR (0.25m)
- EXISTING CONTOUR (0.05m)
- EXISTING CONTOUR (0.25m)
- EXISTING ROAD CENTRELINE
- EXISTING ROAD EDGE
- LOT BOUNDARY
- EDGE OF CONCRETE
- PROPOSED CONCRETE



| | |
|---|---|
| OVERALL LENGTH | 8.800m |
| OVERALL WIDTH | 2.500m |
| OVERALL BODY HEIGHT | 3.205m |
| MIN BODY GROUND CLEARANCE | 0.296m |
| TRACK WIDTH | 2.500m |
| LOCK-TO-LOCK TIME | 6.00s |
| WALL TO WALL TURNING RADIUS | 12.000m |

WASTE VEHICLE DETAIL
NOT TO SCALE




PROPOSED SITE PLAN
SCALE 1:100

| REV | DESCRIPTION | BY | CHKD. | APP'VD | DATE |
|---|---|---|---|---|---|
| A | ISSUED FOR CLIENT REVIEW | T.A.L | S.M.T. | S.M.T. | 08.12.21 |

REVISION SCHEDULE

IF IN DOUBT ASK
THIS DOCUMENT BECOMES UNCONTROLLED WHEN PRINTED – CHECK THE REVISION IS CURRENT

SURVEY DATUM
HORIZ: GDA84 ZONE: 55 VERT: AHD

0 0.5 1.0 1.5 2.0 1:100
PLAN

SCALES m. FULL SIZE A1

REGISTERED PROFESSIONAL ENGINEER QUEENSLAND
RPEQ NO: 16203
SIGNATURE: .....
DATE: 23.11.21

| | | |
|---|---|---|
| DRAWN | T.A.L | 08.12.21 |
| DESIGNED | S.M.T. | 08.12.21 |
| CHECKED | S.M.T. | 08.12.21 |
| APPROVED | S.M.T. | 08.12.21 |

ISSUED FOR APPROVAL

PATCOL GROUP
info@patcol.com.au : www.patcol.com.au

L. KENEALY
PROPOSED CARPARK AT 29 DENNING ST, PARK AVENUE
PROPOSED SITE PLAN FOR MCU APPLICATION

DRAWING No. 21-552-C-SK01
REV A


GIDEON
TOWN PLANNING

**ROCKHAMPTON REGIONAL COUNCIL**
**APPROVED PLANS**
These plans are approved subject to the current conditions of approval associated with
**Development Permit No.:** D/10-2022
**Dated:** 20 April 2022

N
0 10 metres
Scale 1:756

Legend

Subject Site

**Client:**

Kenealy Superannuation Pty Ltd

**Contains:**

SITE PLAN – AERIAL VIEW

MATERIAL CHANGE OF USE FOR A SHOPPING CENTRE (CAR PARK)

29 DENNING STREET & 379 YAAMBA ROAD, PARK AVENUE

**Project Ref No:**

GTP_ 2131

**Date:**

January 2022

**R.P.D.**

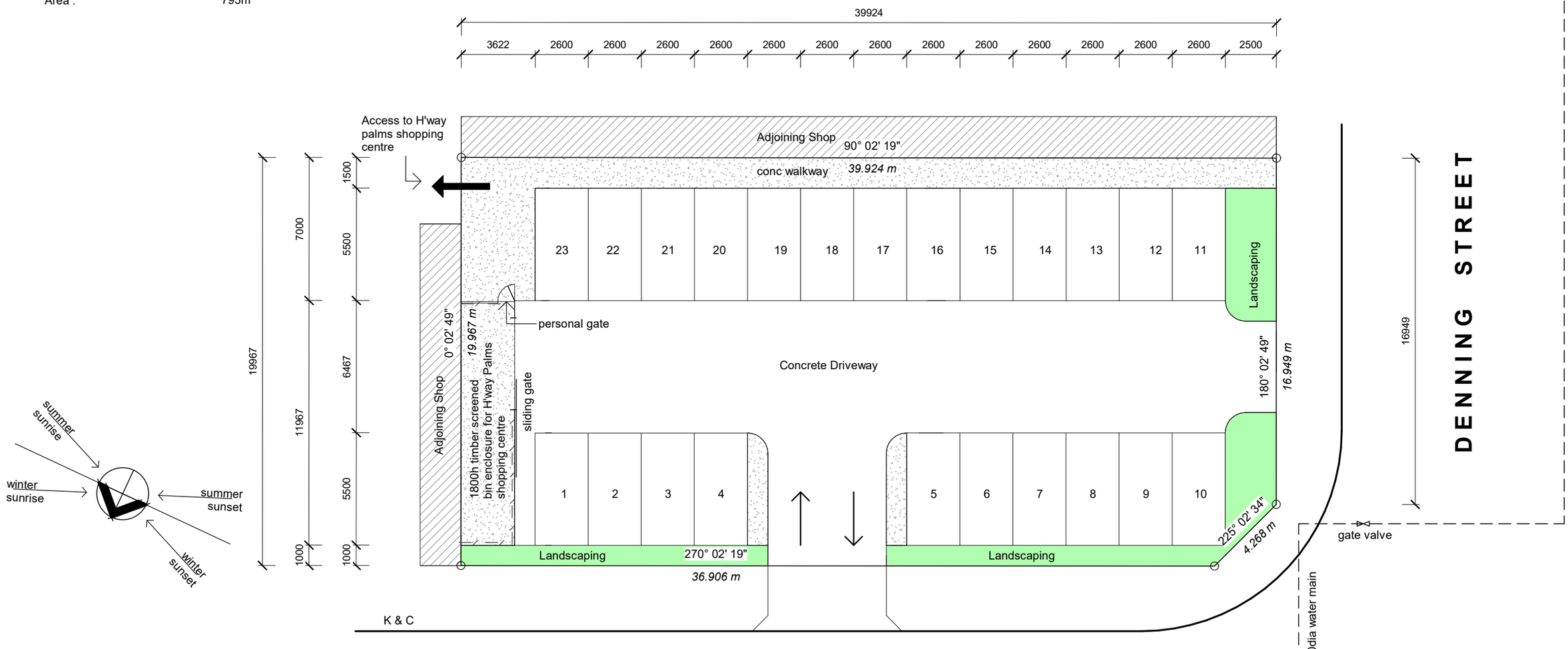
| | |
|---|---|
| Lot Number : | 5 |
| Reg./Survey Plan Number : | 869470 |
| Locality : | North Rockhampton |
| Local Government : | Rockhampton RC |
| Area : | 793m² |

# PRELIM

DATE: **12/07/21**

# 01

## NOT FOR CONSTRUCTION




1 Site Plan

1 : 200

## SHEEHY STREET

2623 1000 2600 2600 2600 2600 1000 5800 1000 2600 2600 2600 2600 2600 2600

36906

**ROCKHAMPTON REGIONAL COUNCIL**

**APPROVED PLANS**

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**Development Permit No.:** **D/10-2022**

**Dated:** **20 April 2022**

| REVISIONS | | | |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| No. | DESCRIPTION | DATE | |

PROPOSED CARPARK
FOR L KENEARLY
AT 29 DENNING STREET
PARK AVENUE


Rufus Design Group
STYLE • QUALITY • INNOVATION

MEMBER BUILDING DESIGNERS ASSOC. OF QLD INC.

Licenced under the QBSA Act Lic No. 1180286

Telephone 61 7 49288011
Facsimile 61 7 49266579
E-mail mailbox@rufusdesigngroup.com


| | |
|---|---|
| PROJECT MANAGER : | DJWebb |
| DRAWN : | MJR |
| CHKD : | |
| WIND SPEED | C1 |
| PLAN SIZE: | A3 |

PROJECT NUMBER
210610 - 01

SHEET 01 OF 01 SHEETS

REVISION

PRINT DATE : 12/07/2021 1:11:51 PM