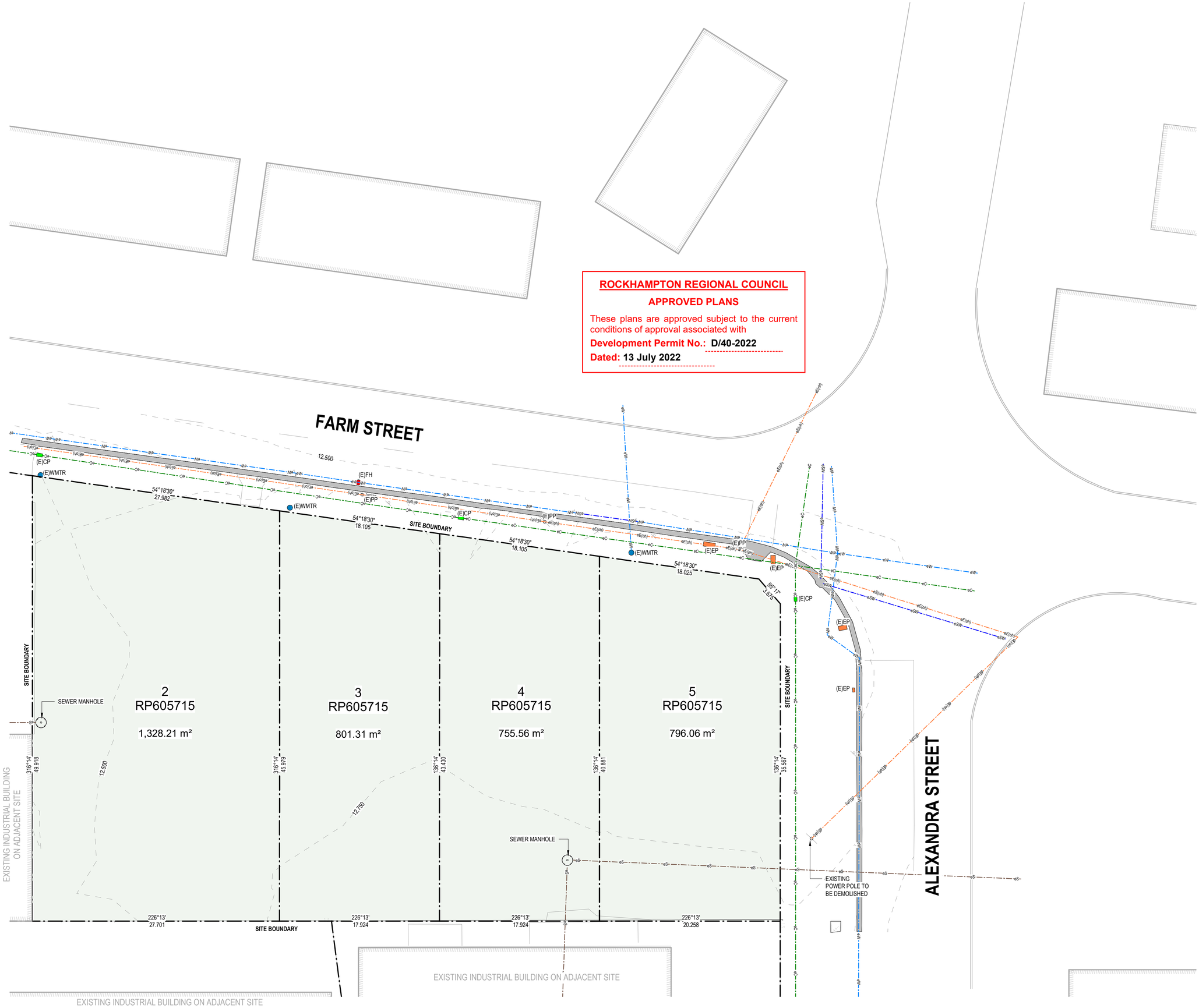

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/40-2022

Dated: 13 July 2022

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SITE ADDRESS:
146 - 152 FARM STREET, KAWANA, QLD 4701

LOT NUMBERS:
2 RP605715
3 RP605715
4 RP605715
5 RP605715

PROPOSED USE:
AUTOMATED SELF-STORAGE WAREHOUSE FACILITY

SITE AREA (AMALGAMATED):
3681 m2

SERVICES LEGEND

- SEWERAGE PIPE. EXISTING
- STORMWATER PIPE. EXISTING
- WATER PIPE. EXISTING
- OVERHEAD ELECTRICAL CABLE. EXISTING
- COMMUNICATIONS CABLE. EXISTING
- (E) or EX — DENOTES EXISTING
- COMMS PIT
- ELECTRICAL PIT
- WATER METER
- FIRE HYDRANT. FLOOR

KEYNOTE LEGEND

CP	COMMS PIT
EP	ELECTRICAL PIT
FH	FIRE HYDRANT
PP	POWER POLE
WMTR	WATER METER

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0 10m 1:200

PRELIMINARY

REV.	DESCRIPTION	ISSUED BY	DATE
P1	REVISED CONCEPT	LM	18/03/2022
P2	DA ISSUE	LM	24/03/2022

TONY MADDEN ARCHITECTS
(07) 4927 9700
www.tmarchitects.com.au

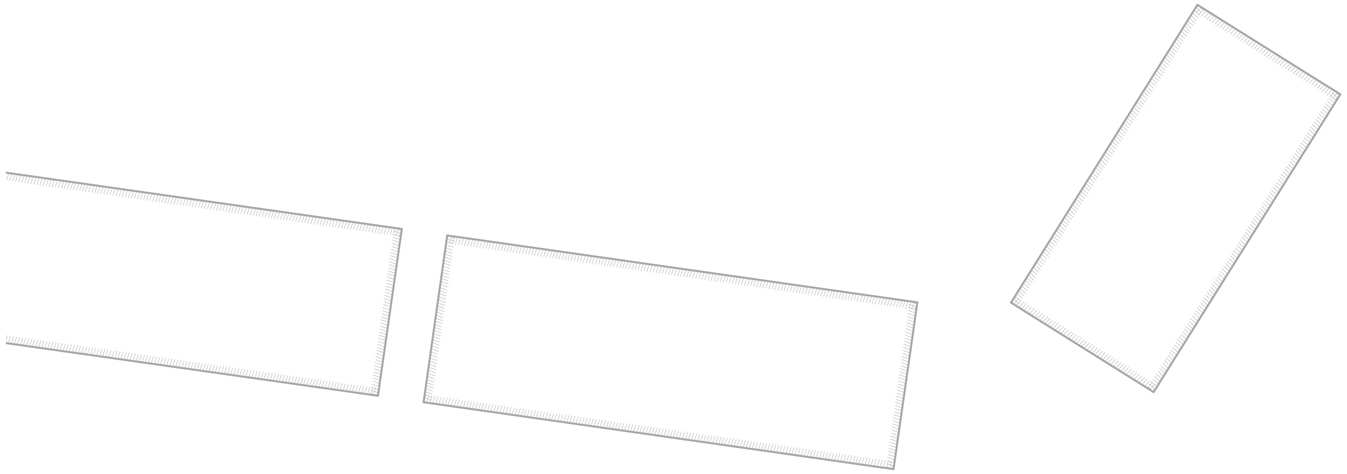
client:
SS PROPERTY TRUST

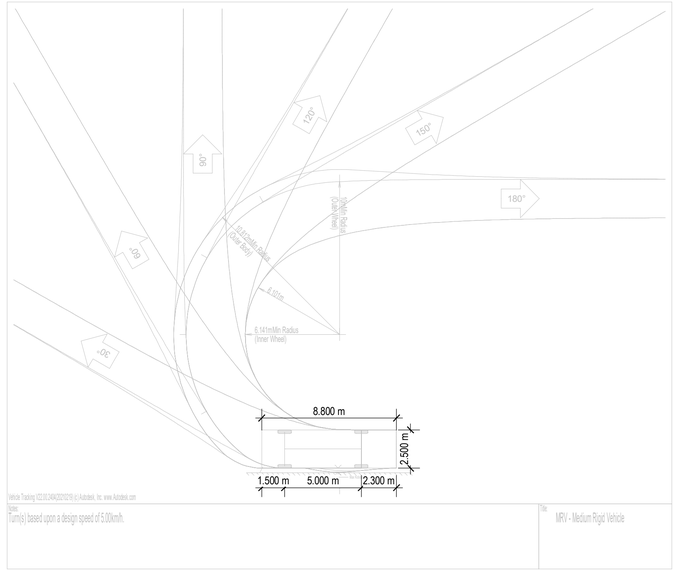
location:
146 - 152 FARM STREET, KAWANA Q 4701

project:
SWIFT STORAGE - FARM ST

drawing title:
EXISTING SITE PLAN

job no:	drawing no:	rev:
2256	A-SD-001	P2





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SITE ADDRESS:
146 - 152 FARM STREET, KAWANA, QLD 4701

LOT NUMBERS:
2 RP605715
3 RP605715
4 RP605715
5 RP605715

PROPOSED USE:
AUTOMATED SELF-STORAGE WAREHOUSE FACILITY

SITE AREA (AMALGAMATED):
3681 m2

BUILDING AREA:

BUILDING A	124.88 m²
BUILDING B	419.25 m²
BUILDING C	709.50 m²
BUILDING D	571.13 m²
BUILDING TOTAL	1824.77 m² **(50.40%)**
LANDSCAPE (PERVIOUS) AREAS:	358.6 m² **(9.7 %)**
CARPARKING:	5 + 1 ACCESSIBLE

UNIT SCHEDULE:

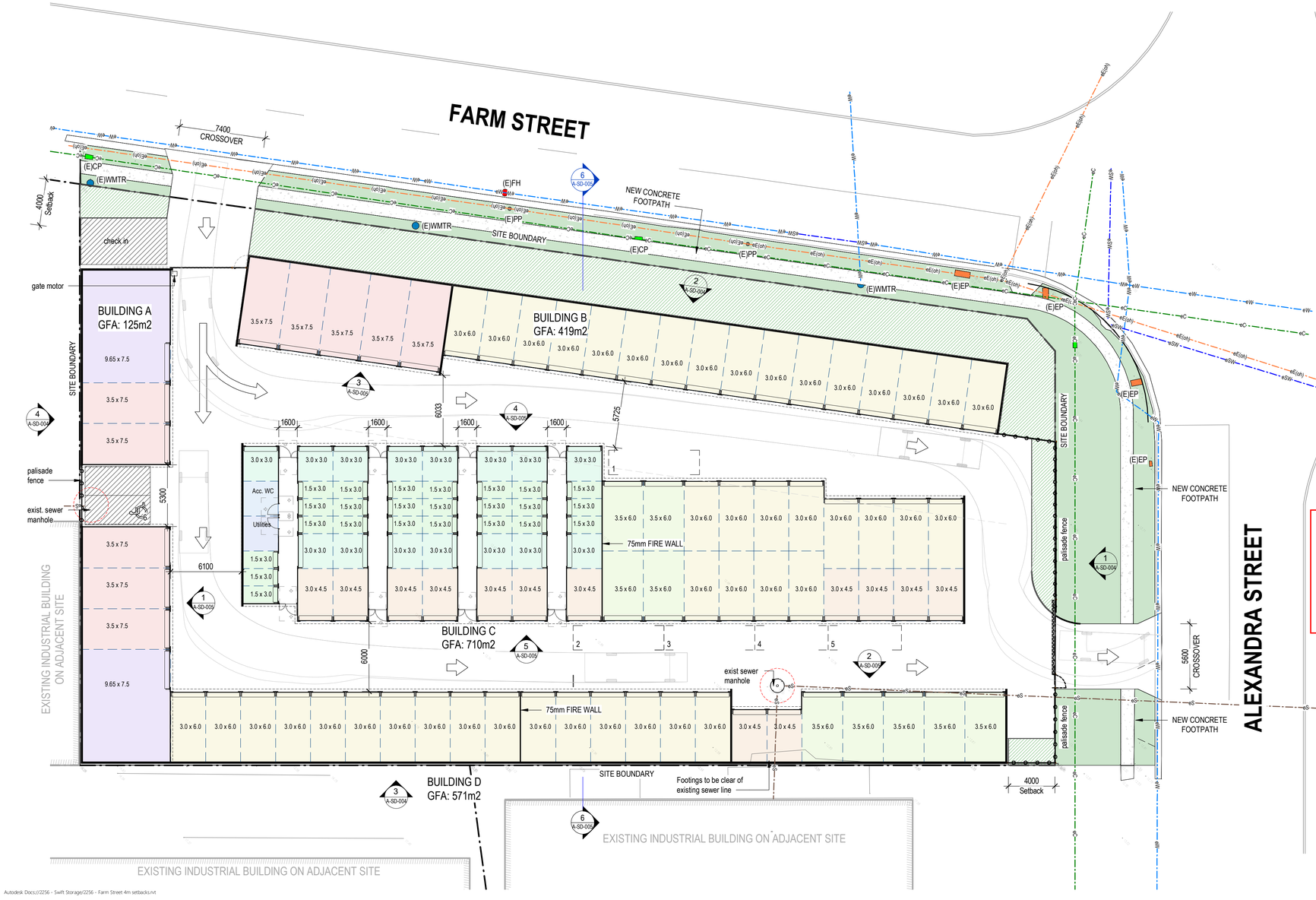
UNIT SIZE	NUMBER
1.5 x 3.0	24
3.0 x 3.0	15
3.0 x 4.5	13
3.0 x 6.0	44
3.5 x 6.0	9
3.5 x 7.5	10
9.65 x 7.5	2
Grand total	117

KEYNOTE LEGEND

CP	COMMS PIT
EP	ELECTRICAL PIT
FH	FIRE HYDRANT
PP	POWER POLE
WMTR	WATER METER
(e)	DENOTES EXISTING

SERVICES LEGEND

- eS — SEWERAGE PIPE. EXISTING
- eSW — STORMWATER PIPE. EXISTING
- eW — WATER PIPE. EXISTING
- eE(oh) — OVERHEAD ELECTRICAL CABLE. EXISTING
- eC — COMMUNICATIONS CABLE. EXISTING
- (E) or EX — DENOTES EXISTING
- COMMS PIT
- ELECTRICAL PIT
- WATER METER
- FIRE HYDRANT, FLOOR



ROCKHAMPTON REGIONAL COUNCIL

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www.tmarchitects.com.au

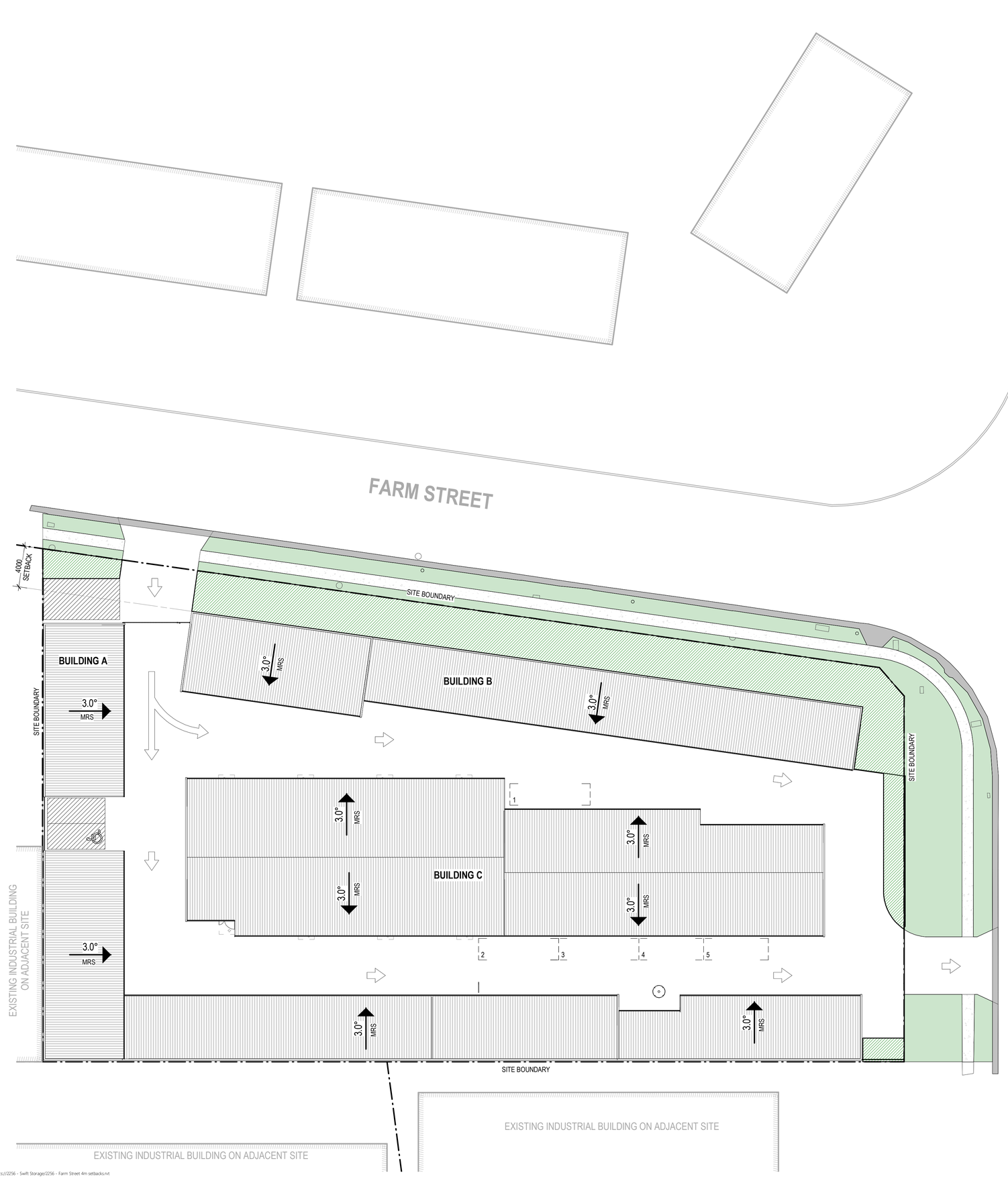
client:
SS PROPERTY TRUST

location:
146 - 152 FARM STREET, KAWANA Q 4701

project:
SWIFT STORAGE - FARM ST

drawing title:
PROPOSED SITE PLAN

job no:	drawing no:	rev:
2256	A-SD-002	P2



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KEYNOTE LEGEND

MRS METAL ROOF SHEETING

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www.tmarchitects.com.au

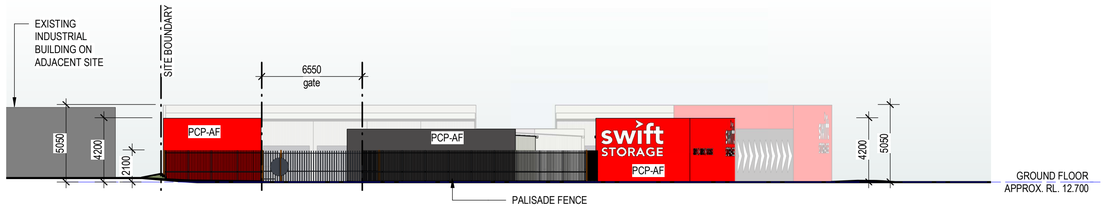
client:
SS PROPERTY TRUST

location:
146 - 152 FARM STREET, KAWANA Q 4701

project:
SWIFT STORAGE - FARM ST

drawing title:
PROPOSED ROOF PLAN

job no:	drawing no:	rev:
2256	A-SD-003	P2



1 EXT. ELEVATIONS - EAST (ALEXANDRA ST)

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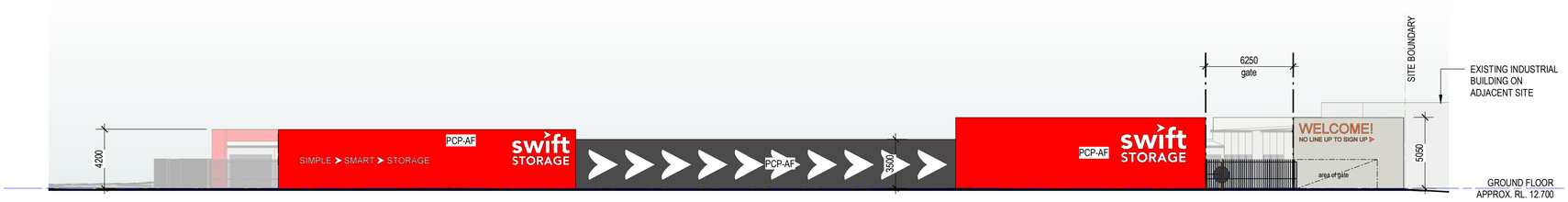

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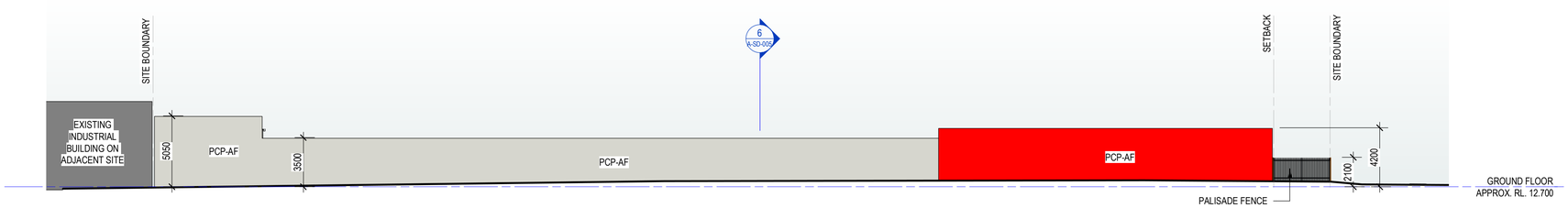

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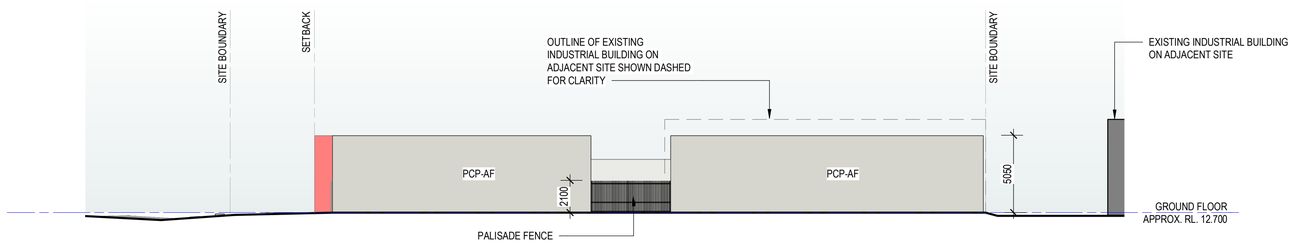

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A-SD-002 — 1 : 200 @ A1

24/03/2022 11:32:34 AM Autodesk Docs://2256 - Swift Storage/2256 - Farm Street 4m setbacks.rvt

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KEYNOTE LEGEND

PCP-AF PRECAST CONCRETE PANELS WITH SELECTED PAINT FINISH

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TONY MADDEN ARCHITECTS
(07) 4927 9700
www.tmarchitects.com.au

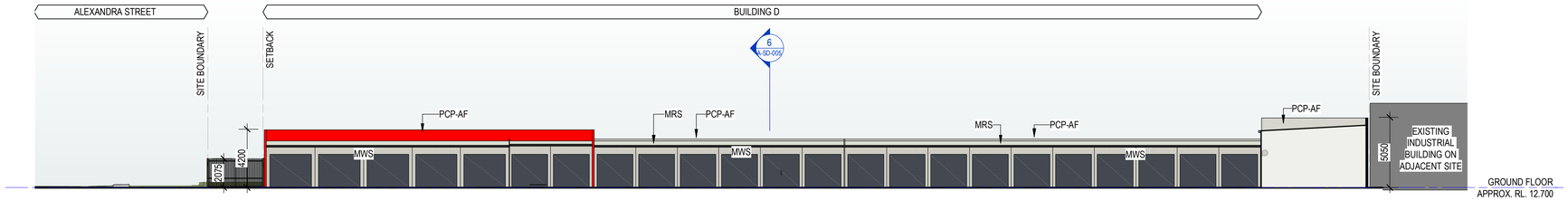
client: SS PROPERTY TRUST

location: 146 - 152 FARM STREET, KAWANA Q 4701

project: SWIFT STORAGE - FARM ST

drawing title: EXT. ELEVATIONS

job no:	drawing no:	rev:
2256	A-SD-004	P2



2 WALL ELEVATIONS - BUILDING D
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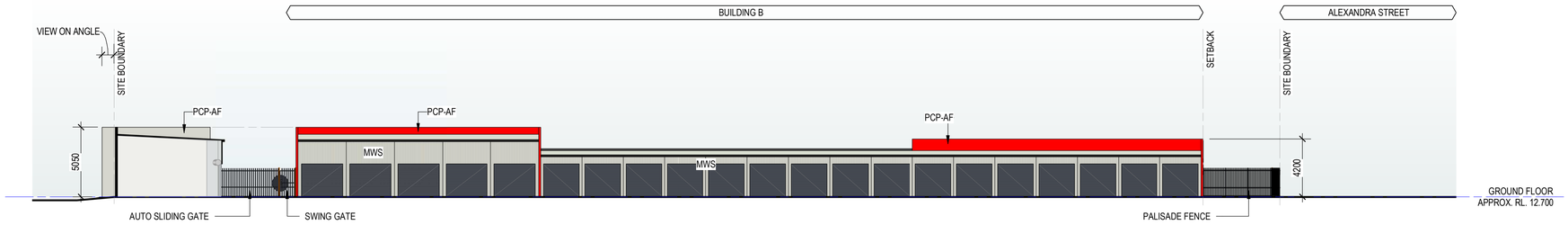

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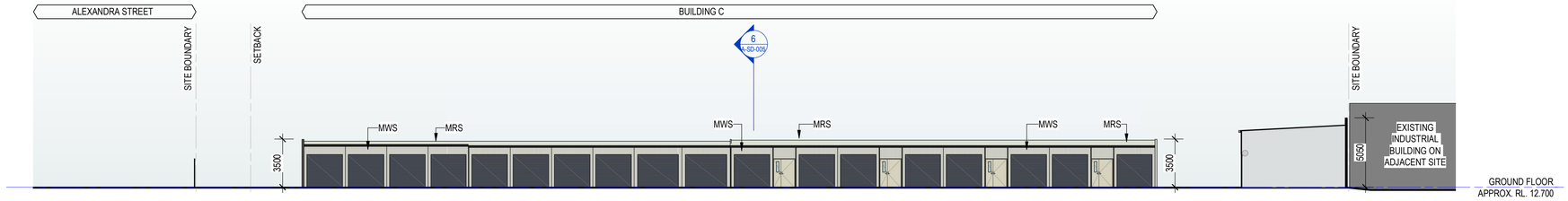
A-SD-002 — 1 : 200 @ A1



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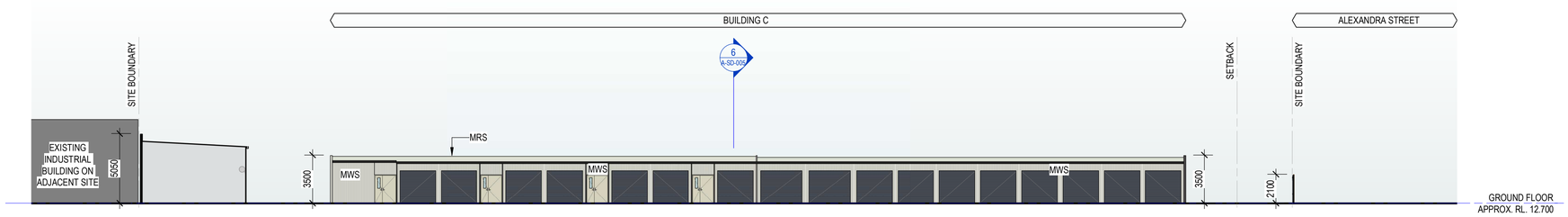
A-SD-002 — 1 : 200 @ A1



5 WALL ELEVATIONS - BUILDING C (SOUTH)
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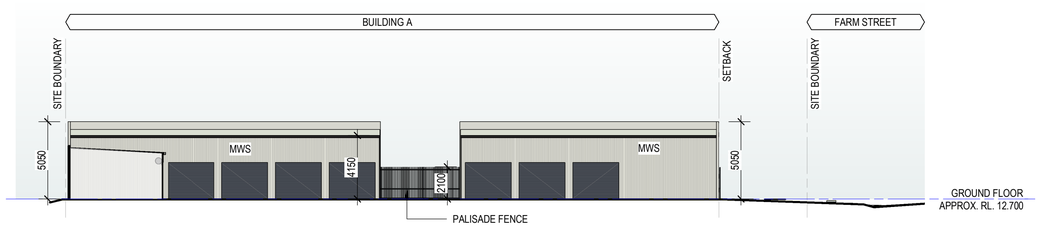

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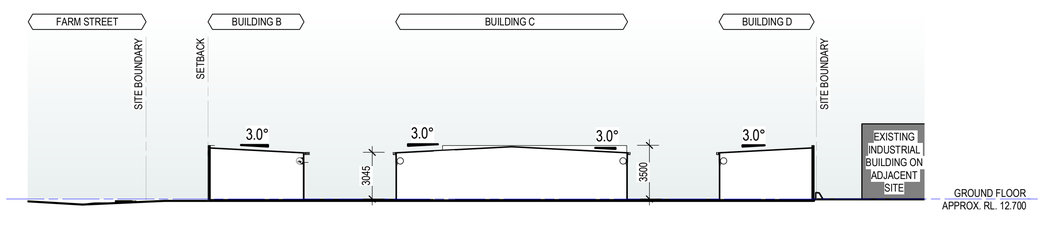

6 SITE SECTION A-A
A-SD-002 — 1 : 200 @ A1

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KEYNOTE LEGEND

MRS	METAL ROOF SHEETING
MWS	METAL WALL SHEETING
PCP-AF	PRECAST CONCRETE PANELS WITH SELECTED PAINT FINISH

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TONY MADDEN ARCHITECTS
(07) 4927 9700
www.tmarchitects.com.au

client:
SS PROPERTY TRUST

location:
146 - 152 FARM STREET, KAWANA Q 4701

project:
SWIFT STORAGE - FARM ST

drawing title:
WALL ELEVATIONS

job no:	drawing no:	rev:
2256	A-SD-005	P2

ARTIST IMPRESSION - VIEW FROM INTERSECTION BETWEEN FARM STREET & ALEXANDRA STREET

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scale @A1 scale @A3

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SS PROPERTY TRUST

location:
146 - 152 FARM STREET, KAWANA Q 4701

project:
SWIFT STORAGE - FARM ST

drawing title:
3D VIEWS

job no:	drawing no:	rev:
2256	A-SD-006	P1

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Dated: 13 July 2022

N

FARM STREET

93m SIGHT DISTANCE

47m SIGHT DISTANCE

ENTRY CROSSOVER

EXIT CROSSOVER

DEVELOPMENT SITE
REFER ARCHITECTURAL DOCUMENTS
FOR INTERNAL LAYOUT

73m SIGHT DISTANCE

ALEXANDRA STREET

HOLLINGSWORTH STREET

1
RP606368

2
RP606368

3
RP6063

5
RP605715

4
RP605715

3
RP605715

2
RP605715

1
RP605715

9
RP899822

2
RP605914

3
RP605914

10
SP158494

ROCKHAMPTON REGIONAL COUNCIL

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0 2.5 10.0m

1:500

Janes and Stewart Structures Pty Ltd
120 William Street | Po Box 1072
Rockhampton 4700
07 4922 1948
janes.and.stewart@jsstructures.com.au
ABN 30 620 233 025

JS² Janes and Stewart Structures

Project Number
SK01[1]

22032

Date
25/03/2022

VEHICLE CROSSOVER SIGHT DISTANCE PLAN

Stormwater Management Report

Swift Storage Facility
146 - 152 Farm Street, Kawana

SS Property Trust

22032REP02.DOCX

Janes and Stewart Structures Pty Ltd

ABN: 30 620 233 025
120 William Street
PO Box 1072
Rockhampton QLD 4700

07 4922 1948
janes.and.stewart@jsstructures.com.au

Janes and Stewart Structures

22032REP02.docx

Revision	Date	Revision Description	Author	Checked	Approval for issue for and on behalf of Janes and Stewart Structures Pty Ltd
A	28 April 2022	For Approval	MD	CJ	Matthew Dennis RPEQ 24862

Contents

Appendices

1 Introduction

Janes and Stewart Structures Pty Ltd has prepared this Stormwater Management Report in support of the Material Change of Use Application on behalf of our client, SS Property Trust. This report relates to the development of a new self-storage warehouse facility located at 146-152 Farm Street over four (4) existing allotments, on the corner of Farm Street and Alexandra Street, Kawana. The real property description of these freehold land parcels is Lot 2 - 5 on RP605715.

The existing site is located within a low impact industry zone as stipulated in the Rockhampton Regional Council planning scheme with several light industrial and commercial businesses located in close proximity. The site is currently vacant land, however was previously used as residential with the dwellings being demolished several years ago. The new self-storage facility will incorporate 117 storage units with a variety of different unit sizes incorporated into the development layout.

This report intends to address stormwater drainage relating to the redevelopment works including an assessment of stormwater quantity and quality measures.

The locality of the subject site can be seen in the following illustration and Appendix A details the existing site plan and Appendix B details the proposed development plan both prepared by Tony Madden Architects.

Figure 1 Locality Image

2 Stormwater Quantity

A review has been undertaken for the stormwater management of the development to ensure that no significant adverse impacts occur to adjacent and downstream properties and infrastructure from the proposed self-storage warehouse facility.

2.1 Existing System

The site is located within the lower portion of the Splitters Creek catchment area as defined in the Splitters Creek Local Catchment Study prepared by AECOM for Rockhampton Regional Council. The following image includes an extract of the modelled catchment from the AECOM study with the site location overlaid:

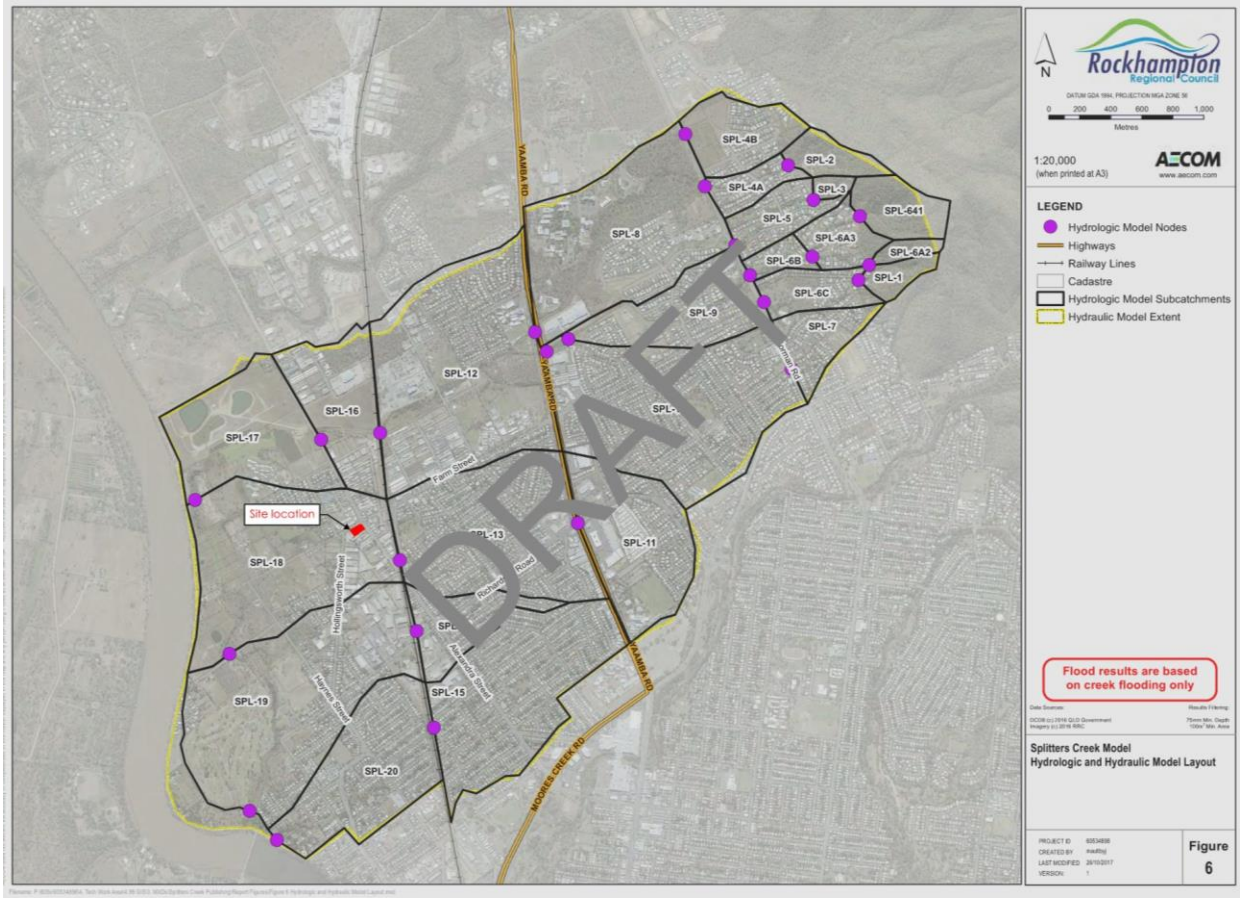

Figure 2 Site Location within Splitters Creek Catchment

(Extracted from AECOM Splitters Creek Local Catchment Study 2017 available on Rockhampton Regional Councils website with site location overlaid onto map)

The existing site is currently vacant poorly grassed land and falls to the adjoining road reserves of Farm Street and Alexandra Street, where these streets are considered to be the lawful points of discharge for the site. The site is situated over four existing allotments which were previously used for residential purposes, with dwellings along with associated driveways and infrastructure in place on the respective allotments until they were demolished.

The following points highlight the key stormwater characteristics of the site:

- The site topography determined from detailed survey data identifies a small ridge line which splits runoff to the respective adjoining road reserves. The topography of the site is flat with surface falls in the order of ~1%.
- A small portion on the north-eastern side of the site discharges to Alexandra Street, with the majority of the site discharging to the Farm Street road reserve.
- An existing pit and pipe drainage system exists at the Alexandra Street and Farm Street intersection as defined in Rockhampton Regional Council's Geographical Information System (GIS). This pit and pipe drainage system currently caters for the north-eastern portion of the site along with an external catchment.
- The outlet of this pit and pipe drainage ultimately converges further downstream with a broader catchment which includes the subject site.
- The external catchment extends approximately 240m upstream of the Alexandra Street and Farm Street intersection.

The following image shows the existing drainage network currently in place:

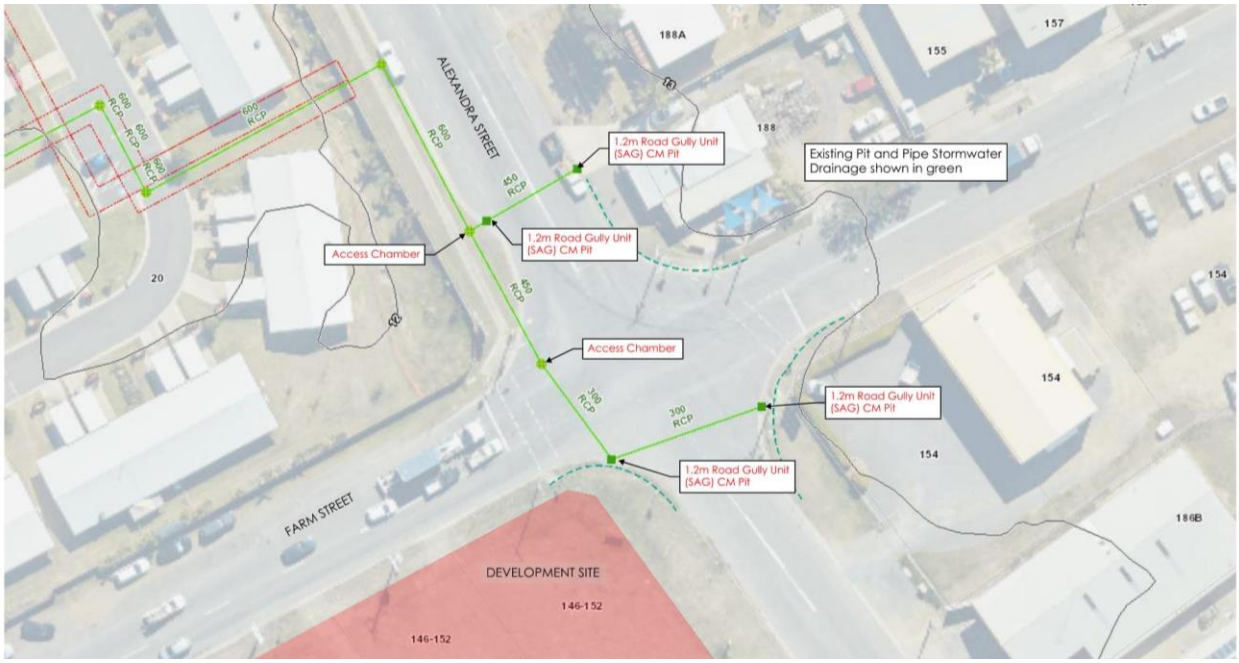

Figure 3 Existing Council Controlled Pit and Pipe Stormwater Drainage Infrastructure (Source: RRC Mapping with Markups)

The existing catchments for the site and for the existing pit and pipe drainage system at the Alexandra Street and Farm Street intersection can be seen in Appendix C of this report.

Catchment Details

To determine the capacity of the existing pit and pipe drainage system and the overland surface flow immediately downstream of the site, the contributing catchments were determined using a combination of detailed survey information, available aerial contour information and aerial imagery to define total and impervious areas. Catchments that have bypass properties to another catchment have also been considered.

The following table shows key characteristics of each catchment considered in the analysis:

Table 1 Existing Catchment Details

Catchment ID	Area (ha)	% Impervious	Discharge Location	Bypass
1	1.305	70%	Existing Road Gully Unit ID EX1/1: 1.2m Sag CM Pit	Over crown Bypass to Catchment 2 exceeding inlet capacity
2	0.378	70%	Existing Road Gully Unit ID EX2/1: 1.2m Sag CM Pit	Bypass to Catchment 5
3	0.366	70%	Existing Road Gully Unit ID EX3/1: 1.2m Sag CM Pit	N/A
4	3.058	70%	Existing Road Gully Unit ID EX1/2: 1.2m Sag CM Pit	Over crown Bypass to Catchment 3
5	0.380	40%	Farm Street (Immediately downstream of site)	N/A
Total	**5.487**	**68%**	Farm Street (Immediately downstream of site)	

Design Rainfall Data

The adopted design rainfall intensities were sourced from the Bureau of Meteorology Design Rainfall Data System (2016) for the site location in North Rockhampton, Queensland. From this data, the 1 hour duration, 10 year design storm for North Rockhampton was determined.

PC Drains software was used to model both minor and major design storms. The minor storm was assigned to be the 39% Average Exceedance Probability (AEP) for industrial land use and a 1% AEP for the major storm as stated in Table D05.04.1 of the Capricorn Municipal Development Guidelines (CMDG) for Stormwater Drainage Design.

Existing Drainage System Capacity

The capacity of the existing pit and pipe drainage system at the Farm Street and Alexandra Street intersection was determined using the PC Drains software. The modelling has indicated that the system will surcharge in a minor 39% AEP storm event and larger design storms from upstream contributing catchments at the existing inlet EX2/1 (at the outlet of catchment 2). Runoff is then conveyed via kerb and channel and the half road profile of Farm Street. The surcharging runoff has been factored into the calculations of the total peak flow immediately downstream of the site (at the outlet of Catchment 5) along Farm Street.

The outlet pipe from the road gully inlet (RGU) EX2/1 based on survey information and Council records is a 300mm diameter reinforced concrete pipe (RCP) and is approximately 1m deep from surface level to invert level of pipe at the pit. Based on discharge for a circular sharp created weir for a 300mm diameter pipe with 1m of head, the existing outlet pipe can convey the following flow:

Outlet Pipe Capacity EX2/1 (300mm diameter): 0.190m³/s

Peak Flow Calculations

Based on the capacity of the existing pit and pipe drainage system determined above leaving the system and the nature of the contributing catchments, the existing system was modelled using PC Drain software to determine the following approximate peak flows in a minor and major design storm immediately downstream of the site on Farm Street at the outlet of Catchment 5:

Table 2 Existing Peak Flows – Farm Street Immediately downstream of site

Contributing Catchments	39% AEP Minor Peak Flow (m³/s)	1% AEP Major Peak Flow (m³/s)
1, 2 & 5	0.142	0.946

Existing Road Flow Capacity

The capacity of the existing Farm Street half road profile was checked at the outlet of Catchment 5 in order to determine if the half road profile has capacity to cater for the contributing catchments in minor and major storm events before bypassing over the road crown.

A summary of the calculations is provided in the following table:

Table 3 Overland Flow Capacity - Farm Street (Catchment 5 Outlet)

Section ID	Road Name	Details	Overland Flow Capacity (m³/s)	39% AEP Approach Flow (m³/s)	1% AEP Approach Flow (m³/s)
Catchment 5 Outlet	Farm Street (Half Road)	Half Road Carriageway Width: ~4.53m Longitudinal Grade: 0.37% Surface: Sealed (Manning's n=0.013) Max Water Depth at Kerb: 0.235m (based on road crown to invert of kerb)	1.04	0.142	0.946

Therefore, as shown in the above table, the existing road profile of Farm Street and the Catchment 5 outlet has capacity to cater for the existing minor and major approach flows.

2.2 Proposed System

The drainage strategy for the proposed development will not alter significantly from the existing scenario.

The development includes four (4) new buildings accommodating various size storage sheds along with associated driveway hardstand areas. The stormwater strategy for the development is intended to comprise of a new on-site stormwater pit and pipe drainage system within the driveway areas to cater for surface overland flow from the driveways and roofwater from the buildings.

It is intended that the new on-site pit and pipe drainage system will cater for the minor 39% AEP design storm and connect to the existing Council infrastructure on the corner of Farm Street and Alexandra Street. The gap flow between the minor 39% AEP flow and the major 1% AEP flows from the development site will discharge to Farm Street and Alexandra Street, similar to the existing system.

Therefore, the proposed stormwater strategy outlined above has been modelled into the existing system to determine any changes to the hydraulics and hydrology of the system.

Catchment Details

With the increase of impervious area on the development site, the fraction impervious was updated for the applicable existing catchments, in this case being Catchments 2 and 5. All other catchments maintained the same parameters. Therefore, Catchments 2 and 5 are now labelled Catchment A and C respectively. A new Catchment has been introduced for the development site being labelled as Catchment B.
The following table includes the catchment characteristics analysed in the proposed system scenario with fraction impervious values assigned based on the development layout. A proposed stormwater catchment plan is provided in Appendix D:

Table 4 Proposed Catchment Details

Catchment ID	Area (ha)	% Impervious	Discharge Location	Bypass
1	1.305	70%	Existing Pit ID 1/1: 1.2m Sag CM Pit	Over crown Bypass to Catchment A exceeding inlet capacity
A	0.317	70%	Existing Pit ID 2/1: 1.2m Sag CM Pit	Bypass to Catchment C
3	0.366	70%	Existing Pit ID 3/1: 1.2m Sag CM Pit	N/A
4	3.058	70%	Existing Pit ID 1/2: 1.2m Sag CM Pit	Over crown Bypass to Catchment 3
B	0.325	100%	Minor Outlet: Pipe System at EX2/1. Major Oultet: Farm Street (Immediately downstream of site)	Bypass to Catchment C
C	0.117	60%	Farm Street (Immediately downstream of site)	N/A
Total	**5.488**	**72%**	Farm Street (Immediately downstream of site)	

Peak Flow Calculations

Adopting the same design rainfall data as the existing system and considering the same minor and major design storms, the peak flows for the proposed system were calculated using the PC Drain software. The capacity of the existing pit and pipe drainage system was taken into account similar to the existing case.

The peak flows in the proposed system were assessed immediately downstream of the site at the outlet of Catchment 5 with results for the approximate peak flows provided in the following table:

Table 5 Proposed Peak Flows – Farm Street Immediately downstream of site

Contributing Catchments	39% AEP Minor Peak Flow (m^3/s)	1% AEP Major Peak Flow (m^3/s)
1, 2 & 5	0.149	1.018

2.3 Summary of Existing and Proposed Systems

A comparison of the existing and proposed system peak flow rates immediately downstream of the site has been undertaken. The following table provides a summary of the minor and major design storm peak flow rates in the existing case compared to the proposed case.

Table 6 Existing and Proposed Peak Flow Rates Summary

Average Exceedance Probability (AEP)	Peak Flow (m^3/s)	
	Existing	Proposed
39% (Minor)	0.142	0.149
1% (Major)	0.946	1.018

As can be seen in the table above, there is minimal change in peak flow rates in the minor and major design storms assessed.

The available half road capacity of Farm Street was determined to be 1.04m^3/s as outlined in the existing system section of this report. Therefore, the expected major peak flow in the proposed system is less than this capacity and can be catered for by the combination of the existing pit and pipe drainage network and the half road capacity of Farm Street, indicating no actionable nuisance to downstream infrastructure or properties. The peak water surface level on Farm Street in the major design storm is anticipated to increase by 8.5mm at the kerb and channel, which is considered insignificant particularly given the flow can be contained in the half road width of Farm Street. Therefore, no stormwater mitigation measures such as detention is proposed as part of the development.

This is further supported by the site location in relation to the broader regional catchment. Given the significant upstream catchment within the Splitters creek regional catchment, there will be a lag time between the peak flows leaving the site in comparison to the time for peaking flows from the greater upstream catchment. It is therefore important to keep the separation between the peak flows between the site catchment and the upstream catchment.

This approach is in line with the recommendations of the background notes of the Queensland Urban Drainage Manual (QUDM) Table BN 5.2.1 which suggests it is not desirable to install stormwater detention devices within the lower third of a catchment.

3 Stormwater Management Strategy

The site based stormwater management strategy is intended to comprise of a pit and pipe drainage system to cater for surface overland flow runoff from the internal driveway areas with provision for the building roofwater drainage. The surface grading of the internal driveway will be designed to fall to a series of inlet pits with freeboard to the building structures on-site. The use of multiple inlets in the driveways will allow surface grades to be controlled from the fixed building floor levels.

The driveway crossovers will be used as overland flow paths to the legal point of discharge being Farm Street where runoff exceeds the capacity of the internal pit and pipe drainage and surface drainage system. This strategy will be confirmed in further detailed design phases of the project.

A stormwater quality improvement device (SQID) is proposed as part of the stormwater strategy and located at the downstream end of the internal pit and pipe drainage system just prior to discharge to the stormwater infrastructure in Farm Street. Details of the stormwater quality improvement device is included in the following section of this report.

A site based stormwater management plan showing a preliminary pit and pipe drainage layout is included in Appendix E of this report. This layout is subject to further detailed analysis and could be subject to change as the project advances in design.

4 Stormwater Quality

The stormwater quality assessment for the development has been based on the requirements listed in the State Planning Policy – July 2017 under the Water Quality section.

It is expected that the proposed self-storage warehouse facility will increase the stormwater pollutants that are exported from the subject site. A treatment train of suitable Stormwater Quality Improvement Devices (SQID's) has been proposed to intercept and capture the pollutants associated with the proposed development, so that the potential impacts external to the subject site will be adequately mitigated to achieve the target Water Quality Objectives (WQO's).

This section discusses:

- The identification of key stormwater pollutants associated with the proposed development;
- The Water Quality Objectives (WQO's) identified for the catchment;
- Proposed measures to mitigate the increase in pollutant export; and
- Modelling of the proposed measures and comparison to the identified WQO's.

Water quality modelling was undertaken with Model for Urban Stormwater Improvement Conceptualisation (MUSIC), generally in accordance with the Water By Design Music Modelling Guidelines (2018).

4.1 Pollutants of Concern

Pollutants typically generated during the operational phase of a development are as follows:

- Litter
- Sediment
- Oxygen demanding substances (possibly present)
- Nutrients (N & P)
- Pathogens/Faecal Coliforms
- Hydrocarbons
- Heavy Metals (often associated with the fine sediment)
- Surfactants
- Organochlorines & organophosphates
- Thermal Pollution
- pH altering substances

4.2 Water Quality Objectives

The load reduction WQO's presented in below in Table 7 have been extracted from Table B of the Queensland State Planning Policy (SPP) (July 2017) for the Central Queensland (south) climatic region.

Table 7 Load Reduction Water Quality Objective Targets

Pollutant	Total Suspended Solids (kg/yr)	Total Phosphorus (kg/yr)	Total Nitrogen (kg/yr)	Gross Pollutants (kg/yr)
1	85%	60%	45%	90%

Source: Table 2.1 – Queensland State Planning Policy (July 2017)

4.3 Water Quality Management Strategy

The proposed layout for the self-storage warehouse facility includes internal vehicular access driveways to access the storage sheds which are incorporated into four main building areas on the site. Stormwater runoff from these hardstand areas is intended to be controlled through the use of an underground pit and drainage system which will capture surface runoff from the driveway and also interconnect the roofwater drainage from the buildings. The use of a proprietary underground treatment system as part of the pit and pipe drainage system has been incorporated to assist in stormwater quality improvement. This pipe drainage system is proposed to discharge to the existing Council stormwater network on the corner of Farm Street and Alexandra Street.

The stormwater quality catchments have been based on the proposed finished levels and are shown on the stormwater quality catchment plan included in Appendix F of this report.

4.4 Meteorological and Rainfall Data

Six-minute pluviographic (rainfall) data was sourced from the Bureau of Meteorology (BOM) for Rockhampton and a ten (10) year data set from 01/01/1990 to 31/03/2000 was adopted due to the consistency in data over this period. Monthly evapotranspiration data for the period was sourced from the Bureau of Meteorology and entered into the MUSIC Model. The following image shows the rainfall and evapotranspiration pattern used and the table summarises key data for the modelling:

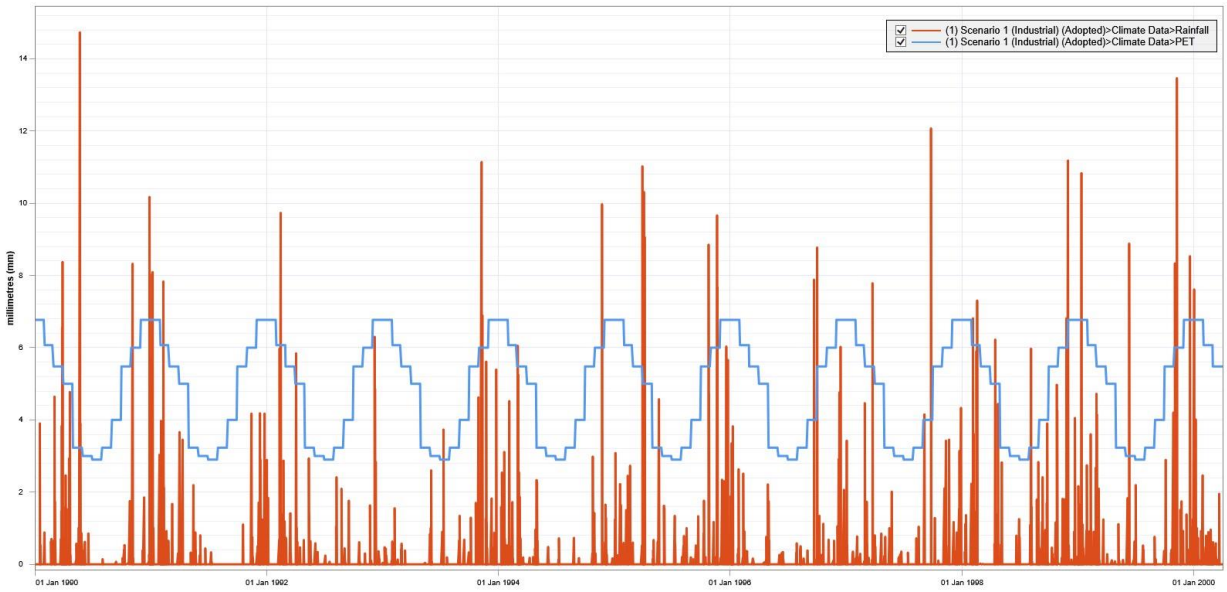

Figure 4 Rainfall and Evapotranspiration Pattern

Table 8 Meteorological and Rainfall Runoff Data Table

Input	Data Used in Modelling
Rainfall Station	Rockhampton: BOM Station ID 039083
Time Step	6 Minute
Modelling Period	01/01/1990 to 31/03/2000
Rainfall runoff parameters	Industrial
Pollutant export parameters	Industrial

4.5 Source Nodes

Source nodes utilised for the proposed development were assigned as Industrial in nature with all Rainfall-Runoff parameters and concentration parameters being in accordance with the Water by Design MUSIC Modelling Guidelines – November 2018. A total of three (3) water quality catchments were used for modelling as shown on the catchment plan in Appendix D of this report. Catchments WQ1 and WQ2 will be treated to improve stormwater quality. WQ3 has been designed to bypass the quality treatment. The following table provides a summary of the details for each source node:

Table 9 Catchment Definition Reporting Table

Catchment ID	Area (ha)	Percentage Impervious (%)	Land Use
WQ1	0.2042	100	Industrial
WQ2	0.1200	100	Industrial
WQ3	0.0423	17.0	Industrial

4.6 Treatment Nodes

A number of different scenarios were investigated during the design process through trialing various methods of stormwater quality treatment including bio-retention basins and in-ground proprietary treatment systems. With the limitations of available depth to successfully outlet stormwater to the various legal points of discharge, the adopted treatment incorporates an in ground proprietary treatment system as part of the internal pit and pipe network, just prior to discharge from the site.

Each water quality catchment discharges to a treatment node with the exception of catchment WQ3 which has been designed to bypass any water quality treatment given the small catchment area of WQ3.

The following table provides a summary of the parameters for each of the treatment nodes in the water quality system:

Table 10 In-Ground Proprietary Treatment System

Description	Details
In-Ground Proprietary Treatment System	Modelled using Ocean Protect Stormfilter with 12 x 310 PSORB filters[1]
Litter Baskets	Modelled using 2 x Ocean Protect Oceanguard Litter Baskets[1]

[1]The modelling has been completed using Ocean Protect stormwater quality treatment products. Other equivalent stormwater quality treatment products by other manufacturers may be considered to achieve treatment targets during the further detailed design phase of the project.

4.7 MUSIC Model

The following extract has been provided from the MUSIC model displaying the treatment train adopted for the site:

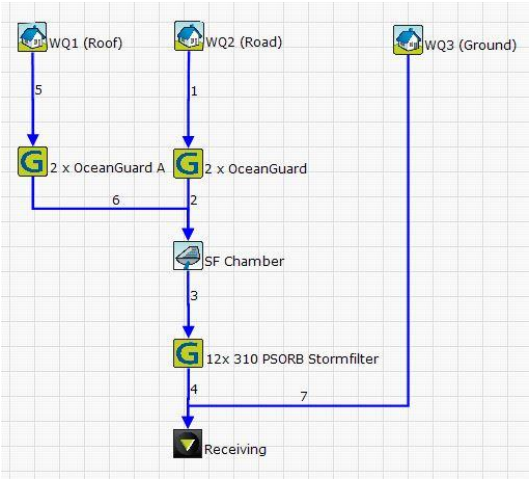

Figure 5 Adopted MUSIC Model

4.8 MUSIC Modelling Results

The development has been considered holistically for water quality analysis. The results from the MUSIC model at the receiving node, including the proposed treatment measures are shown below. The achieved percentage reductions in pollutants are compared with the water quality objective targets outlined in the State Planning Policy – July 2017.

Table 11 MUSIC Modelling Results - Receiving Node

Description	Sources	Residual Load	% Reduction	Water Quality Objectives (%)
Flow (ML/yr)	2.25	2.26	0.001	
Total Suspended Solids (kg/yr)	411.38	54.68	86.7	85
Total Phosphorus (kg/yr)	0.84	0.30	63.8	60
Total Nitrogen (kg/yr)	5.23	2.84	45.7	45
Gross Pollutants (kg/yr)	51.80	2.29	95.6	90

As shown in the above table, the proposed treatment strategy successfully meets the water quality objectives for pollutant removal of Total Suspended Solids, Total Phosphorus, Total Nitrogen and Gross Pollutants. Details of the intended water quality treatment systems are provided in Appendix E of this report.

5 Conclusion

There appears to be no insurmountable difficulties in relation to the stormwater management proposal for the new self-storage warehouse facility located at 146-152 Farm Street over four (4) existing allotments, on the corner of Farm Street and Alexandra Street, Kawana.

Stormwater Quantity and Quality for the development has been assessed with the following conclusions determined:

- The existing pit and pipe drainage system at the Farm Street and Alexandra Street intersection currently caters for a portion of the minor design storm modelled, with the remainder surcharging downstream along Farm Street.
- The existing major design storm peak flow from the contributing catchments can be contained within the half road width of Farm Street.
- The proposed development increases the peak water surface on Farm Street by less than 10mm with the flow contained in the half road width of Farm Street.
- Therefore, no stormwater mitigation measures such as detention are proposed.
- Stormwater quality has been reviewed in accordance with the State Planning Policy – July 2017 (SPP). The use of a propriety in ground treatment system incorporated into the site internal pit and pipe network ensures that the development complies with the pollutant load reduction provisions within the SPP.

If you should have any questions regarding this report, please do not hesitate to contact the office of Janes and Stewart Structures Pty Ltd (07) 4922 1948.

Appendix A

Existing Site Plan

Swift Storage Facility
146 - 152 Farm Street, Kawana
SS Property Trust

22032REP02.DOCX

Janes and Stewart Structures Pty Ltd

ABN: 30 620 233 025
120 William Street
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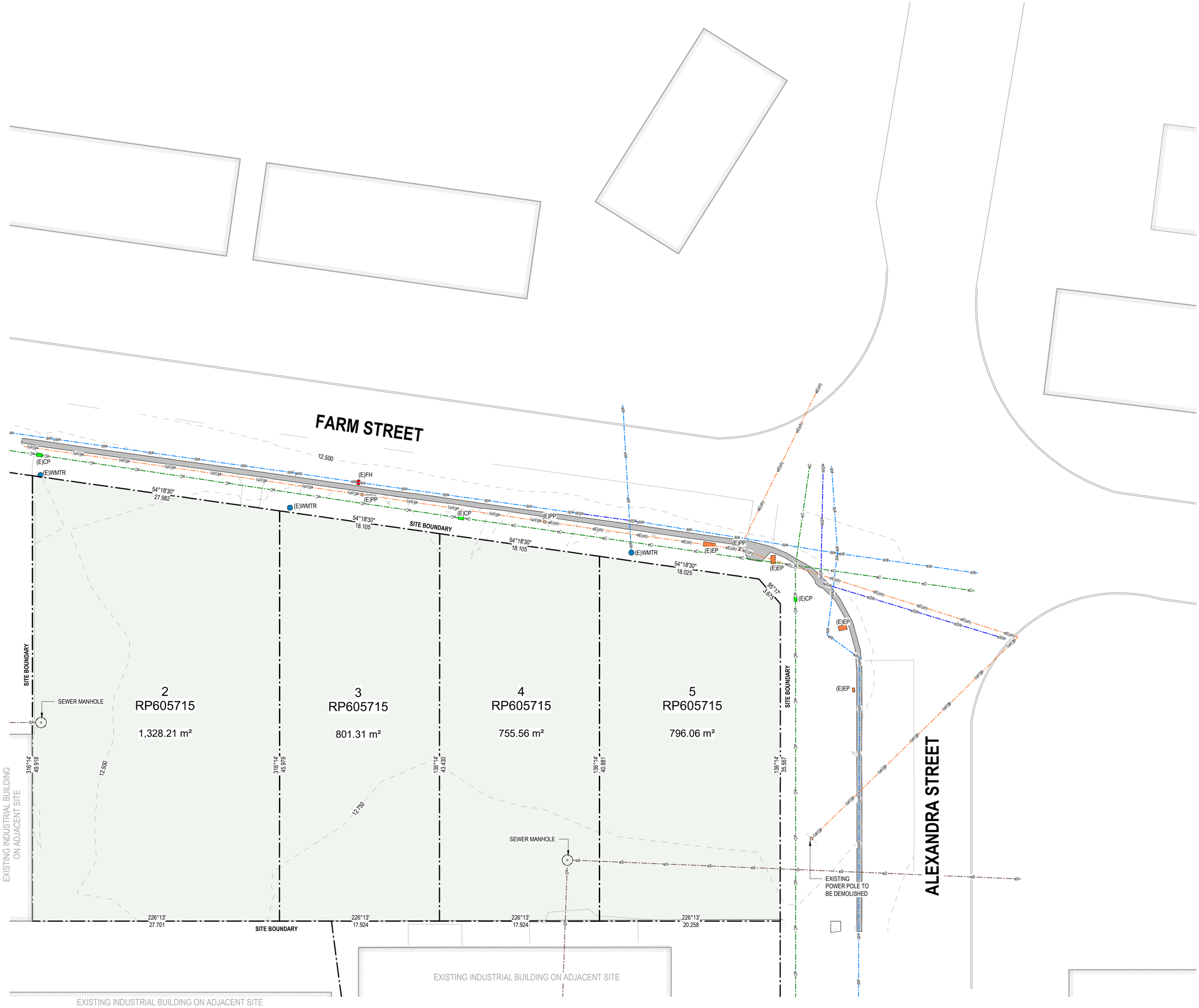

GENERAL NOTES

- CONTRACTOR TO CONFIRM ALL DIMENSIONS ON SITE BEFORE COMMENCING WORK.
- ALL WORKS TO BE CARRIED OUT TO LOCAL AUTHORITY REQUIREMENTS.
- THESE DRAWINGS ARE TO BE READ IN CONJUNCTION WITH SPECIFICATION AND ASSOCIATED NOTES.
- DO NOT SCALE THIS DRAWING. IF IN DOUBT, ASK.

SITE ADDRESS:
146 - 152 FARM STREET, KAWANA, QLD 4701

LOT NUMBERS:
2 RP605715
3 RP605715
4 RP605715
5 RP605715

PROPOSED USE:
AUTOMATED SELF-STORAGE WAREHOUSE FACILITY

SITE AREA (AMALGAMATED):
3681 m2

SERVICES LEGEND

- SEWERAGE PIPE. EXISTING
- STORMWATER PIPE. EXISTING
- WATER PIPE. EXISTING
- OVERHEAD ELECTRICAL CABLE. EXISTING
- COMMUNICATIONS CABLE. EXISTING
- (E) or EX — DENOTES EXISTING
- COMMS PIT
- ELECTRICAL PIT
- WATER METER
- FIRE HYDRANT. FLOOR

KEYNOTE LEGEND

CP	COMMS PIT
EP	ELECTRICAL PIT
FH	FIRE HYDRANT
PP	POWER POLE
WMTR	WATER METER

scale @A1 1 : 200
scale @A3 1:400
0 10m 1:200

PRELIMINARY

REV.	DESCRIPTION	ISSUED BY	DATE
P1	REVISED CONCEPT	LM	18/03/2022
P2	DA ISSUE	LM	24/03/2022

TONY MADDEN ARCHITECTS
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client:
SS PROPERTY TRUST

location:
146 - 152 FARM STREET, KAWANA Q 4701

project:
SWIFT STORAGE - FARM ST

drawing title:
EXISTING SITE PLAN

job no:	drawing no:	rev:
2256	A-SD-001	P2

Appendix B

Proposed Site Plan

Swift Storage Facility
146 - 152 Farm Street, Kawana
SS Property Trust

22032REP02.DOCX

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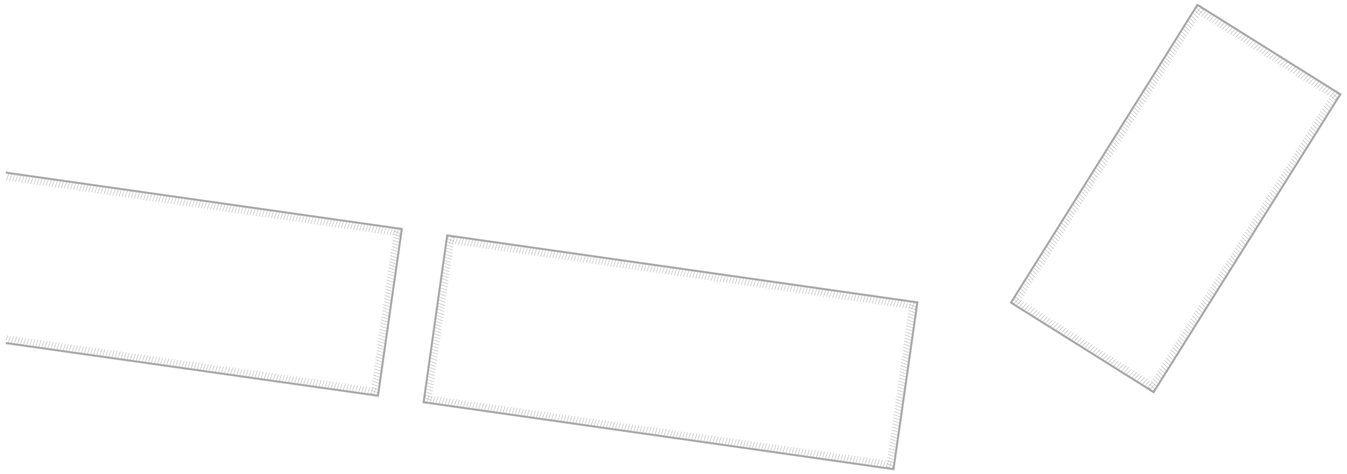

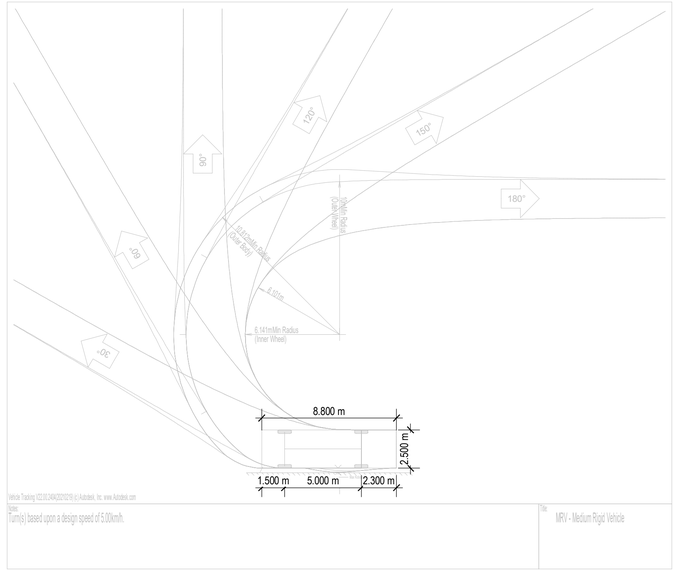

GENERAL NOTES

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- DO NOT SCALE THIS DRAWING. IF IN DOUBT, ASK.

SITE ADDRESS:
146 - 152 FARM STREET, KAWANA, QLD 4701

LOT NUMBERS:
2 RP605715
3 RP605715
4 RP605715
5 RP605715

PROPOSED USE:
AUTOMATED SELF-STORAGE WAREHOUSE FACILITY

SITE AREA (AMALGAMATED):
3681 m2

BUILDING AREA:

BUILDING A	124.88 m²
BUILDING B	419.25 m²
BUILDING C	709.50 m²
BUILDING D	571.13 m²
BUILDING TOTAL	1824.77 m² **(50.40%)**
LANDSCAPE (PERVIOUS) AREAS:	358.6 m² **(9.7 %)**
CARPARKING:	5 + 1 ACCESSIBLE

UNIT SCHEDULE:

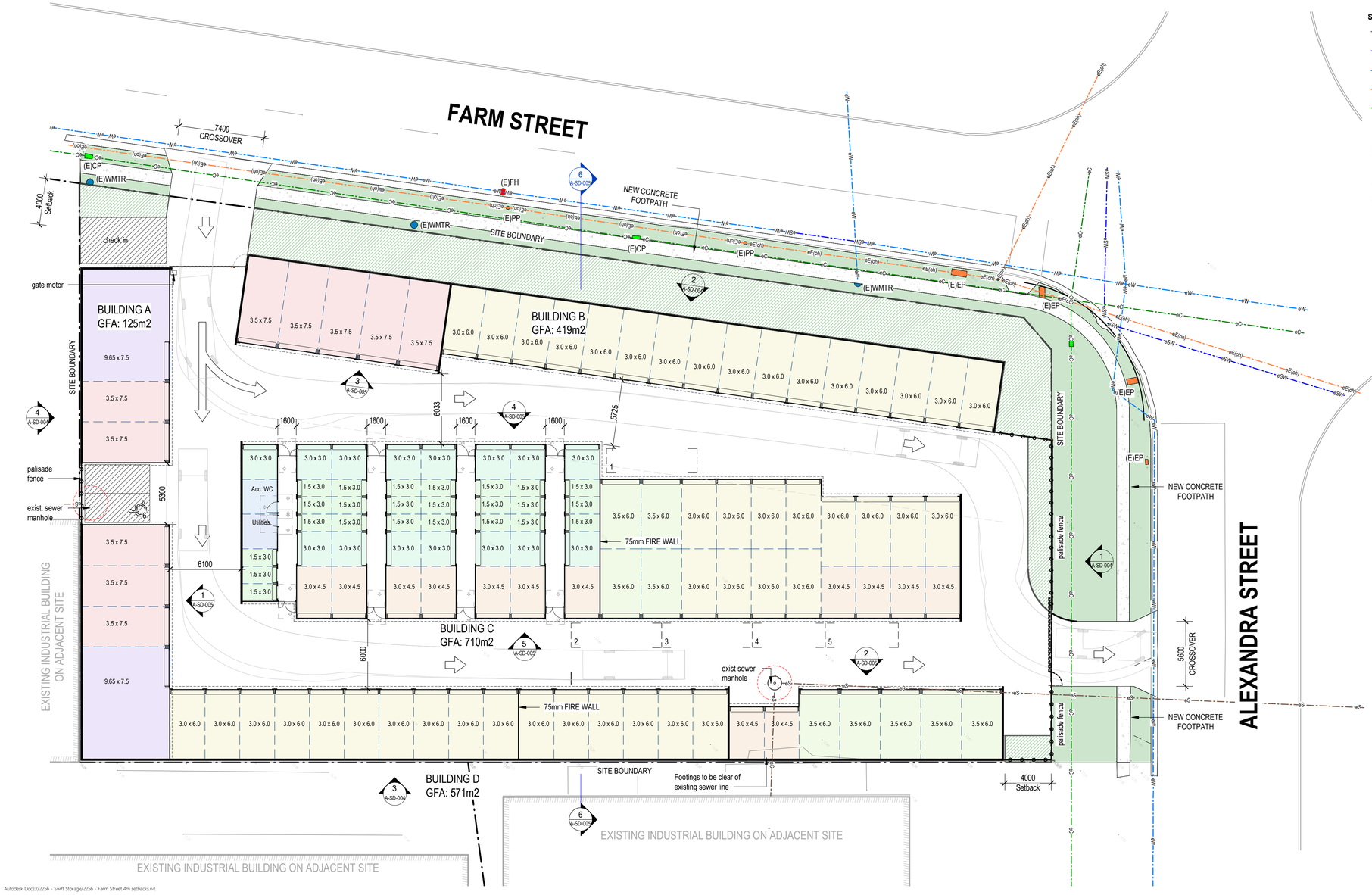
UNIT SIZE	NUMBER
1.5 x 3.0	24
3.0 x 3.0	15
3.0 x 4.5	13
3.0 x 6.0	44
3.5 x 6.0	9
3.5 x 7.5	10
9.65 x 7.5	2
Grand total	117

KEYNOTE LEGEND

CP	COMMS PIT
EP	ELECTRICAL PIT
FH	FIRE HYDRANT
PP	POWER POLE
WMTR	WATER METER
(e)	DENOTES EXISTING

SERVICES LEGEND

- SEWERAGE PIPE. EXISTING
- STORMWATER PIPE. EXISTING
- WATER PIPE. EXISTING
- OVERHEAD ELECTRICAL CABLE. EXISTING
- COMMUNICATIONS CABLE. EXISTING
- (E) or EX — DENOTES EXISTING
- COMMS PIT
- ELECTRICAL PIT
- WATER METER
- FIRE HYDRANT. FLOOR



scale @A1 1 : 200
scale @A3 1:400
0 10m 1:200

PRELIMINARY

REV.	DESCRIPTION	ISSUED BY	DATE
P1	REVISED CONCEPT	LM	18/03/2022
P2	DA ISSUE	LM	24/03/2022

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client:
SS PROPERTY TRUST

location:
146 - 152 FARM STREET, KAWANA Q 4701

project:
SWIFT STORAGE - FARM ST

drawing title:
PROPOSED SITE PLAN

job no:	drawing no:	rev:
2256	A-SD-002	P2

Appendix C

Existing Stormwater Catchment Plan

Swift Storage Facility
146 - 152 Farm Street, Kawana
SS Property Trust

22032REP02.DOCX

Janes and Stewart Structures Pty Ltd

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N

QUINN STREET

HINCHLIFF STREET

NORTH COAST RAIL LINE

ALEXANDRA STREET

FARM STREET

FARM STREET

ALEXANDRA STREET

4

3

1

2

5

EX1/2

EX3/1

EX2/1

EX1/1

HALF ROAD CAPACITY OF FARM STREET ANALYSED AT THIS POINT IMMEDIATELY DOWNSTREAM OF SITE.

0 5.0 20.0m

1:1,000

LEGEND

	EXISTING LOT BOUNDARY
	EXISTING KERB
	EXISTING STORMWATER DRAINAGE
	EXISTING BUILDING OUTLINE
	EXISTING STORMWATER DRAINAGE CATCHMENT
10.00	EXISTING CONTOUR
	EXISTING DRAINAGE FLOWPATH

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Janes and Stewart Structures

SK10[1]

Project Number
22023

Date
27/04/2022

EXISTING CATCHMENT PLAN

Appendix D

Proposed Stormwater Catchment Plan

Swift Storage Facility
146 - 152 Farm Street, Kawana
SS Property Trust

22032REP02.DOCX

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N

QUINN STREET

HINCHLIFF STREET

NORTH COAST RAIL LINE

ALEXANDRA STREET

FARM STREET

EX1/2

EX3/1

EX2/1

EX1/1

1

2

3

4

A

B

C

HALF ROAD CAPACITY OF FARM STREET ANALYSED AT THIS POINT IMMEDIATELY DOWNSTREAM OF SITE.

0 5.0 20.0m

1:1,000

LEGEND

	PROPOSED CONCRETE AREA
	PROPOSED LANDSCAPE AREA
	EXISTING LOT BOUNDARY
	EXISTING KERB
	EXISTING STORMWATER DRAINAGE
	EXISTING BUILDING OUTLINE
	PROPOSED STORMWATER DRAINAGE CATCHMENT
10.00	EXISTING CONTOUR
	EXISTING DRAINAGE FLOWPATH

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Janes and Stewart Structures

Project Number
22023

Date
27/04/2022

SK11[1]

PROPOSED CATCHMENT PLAN

Appendix E

Stormwater Management Plan

Swift Storage Facility
146 - 152 Farm Street, Kawana
SS Property Trust

22032REP02.DOCX

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LEGEND

	EXISTING SEAL AREA
	PROPOSED CONCRETE AREA
	PROPOSED LANDSCAPE AREA
	EXISTING LOT BOUNDARY
	EXISTING KERB
D300	EXISTING 300Ø STORMWATER DRAINAGE
	EXISTING BUILDING OUTLINE
	PROPOSED INVERT LINE

LEGEND

	PROPOSED CROWN LINE
10.00	EXISTING CONTOUR
D	PROPOSED STORMWATER DRAINAGE
EXSL9.000	EXISTING SURFACE LEVEL
EXIL9.000	EXISTING INVERT LEVEL
SL9.000	PROPOSED SURFACE LEVEL
IL9.000	PROPOSED INVERT LEVEL (US = UPSTREAM, DS = DOWNSTREAM)
	EXISTING DRAINAGE FLOWPATH

FARM STREET

N

IN-GROUND PROPRIETARY STORMWATER QUALITY IMPROVEMENT DEVICE. OPTION SHOWN IS BASED ON OCEAN PROTECT 2250Ø STORMFILTER CHAMBER WITH 12 X 310 PSORB FILTERS. OTHER EQUIVALENT PRODUCTS CAN BE INVESTIGATED DURING FURTHER DETAILED DESIGN.

TWO GROSS POLLUTANT TRAPS (LITTER BASKETS) TO BE INSTALLED BELOW INCOMING PIPES. OPTION SHOWN IS BASED ON OCEAN PROTECT 2 X OCEANGUARD BASKETS. OTHER EQUIVALENT PRODUCTS CAN BE INVESTIGATED DURING FURTHER DETAILED DESIGN.

ALEXANDRA STREET

INDICATIVE FFL 12.900

INDICATIVE FFL 12.950

SL12.820
IL12.570

SL12.820
IL12.570

EXSL12.470
EXIL11.471

IL11.535

IL11.527

DSIL11.925

SL12.800

USIL12.225

SL12.800
IL12.300

PIPE GRADE 0.5%

PIPE GRADE 0.5%

PIPE GRADE 0.5%

PIPE GRADE 0.5%

EX2/1

Acc. WC

Utilities

0 1.25 5.0m

1:250

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Janes and Stewart Structures

SK12[1]	Project Number
	22023
	Date
	27/04/2022
	STORMWATER MANAGEMENT PLAN

Appendix F

Stormwater Quality Catchment Plan

Swift Storage Facility
146 - 152 Farm Street, Kawana
SS Property Trust

22032REP02.DOCX

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LEGEND

	EXISTING SEAL AREA
	PROPOSED CONCRETE AREA
	PROPOSED LANDSCAPE AREA
	EXISTING LOT BOUNDARY
	EXISTING KERB
D300	EXISTING 300Ø STORMWATER DRAINAGE
	EXISTING BUILDING OUTLINE
	PROPOSED INVERT LINE
	PROPOSED CROWN LINE
	PROPOSED STORMWATER DRAINAGE CATCHMENT
10.00	EXISTING CONTOUR
D	PROPOSED STORMWATER DRAINAGE

N

FARM STREET

ALEXANDRA STREET

WQ1

WQ2

WQ3

EX2/1

D300

Acc. WC

Utilities

0 1.25 5.0m

1:250

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ABN 30 620 233 025

Janes and Stewart Structures

Project Number
SK13[1]
22023
Date
27/04/2022

WATER QUALITY CATCHMENT PLAN