



ELEVATION KEY

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

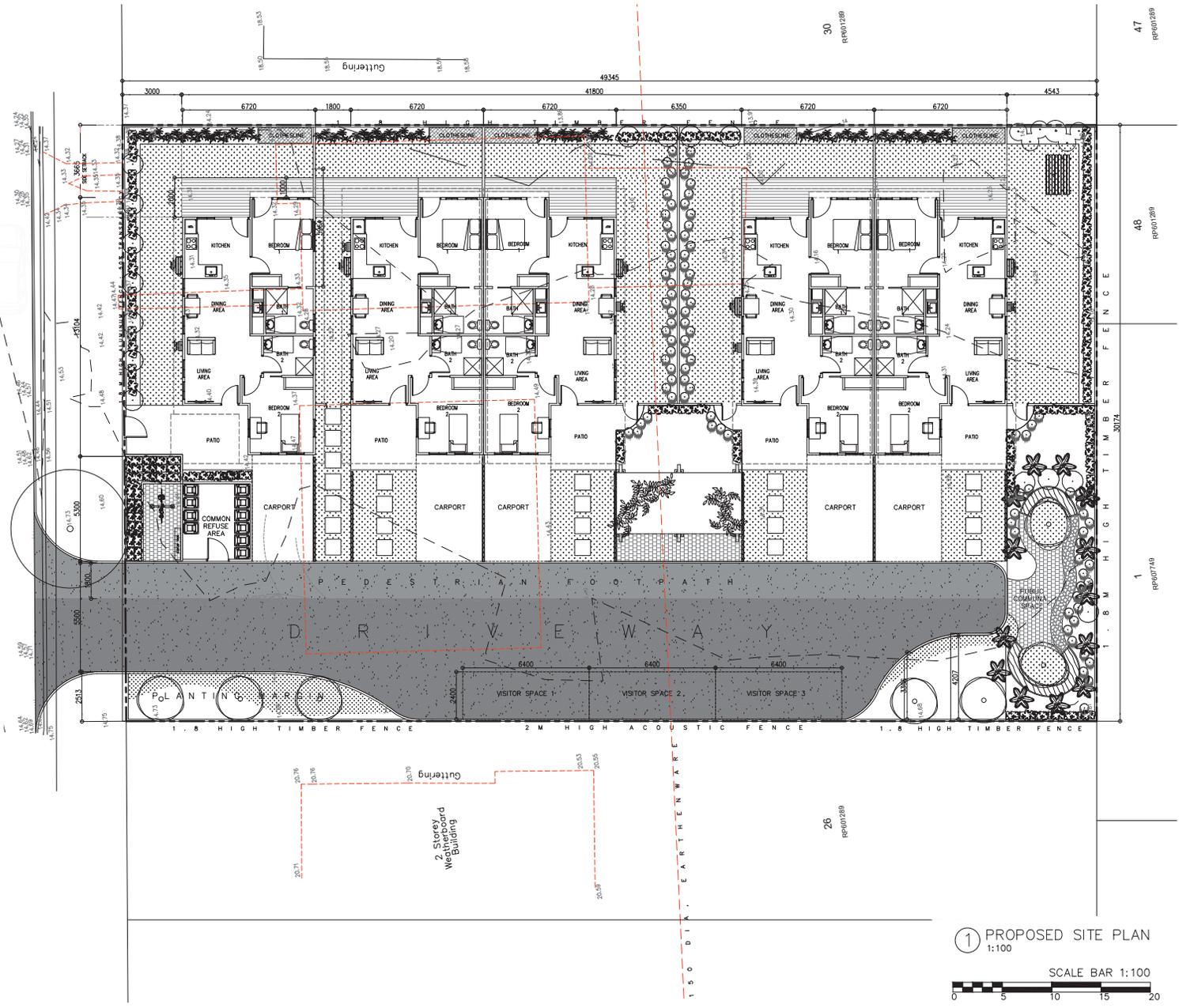
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Development Permit No.: D/84-2022

Dated: 20 October 2022

COMPLIANCE TABLE – LOW-MEDIUM DENSITY ZONE

ITEM	REQUIREMENT	PROVISION	
HEIGHT	4.6 meters	SINGLE STORY	<input checked="" type="checkbox"/>
SITE COVER	65% and below	24%	<input checked="" type="checkbox"/>
PLOT RATIO	1:1 maximum	0.24:1	<input checked="" type="checkbox"/>
SETBACK			
Front	3 meters min.	3 meters	<input checked="" type="checkbox"/>
Rear	4 meters min.	4.5 meters	<input checked="" type="checkbox"/>
Side	1.5 meters min.	3.6 meters	<input checked="" type="checkbox"/>
PRIVATE OPEN SPACE	A minimum area (inclusive of verandahs, patios and terraces) of at least 16 sqm in total, and having dimensions of 4 x 4 meters.	24 m ²	<input checked="" type="checkbox"/>
COMMON OPEN SPACE	A minimum of ten (10%) of the total site area is provided for open space with a minimum dimension of 3m x 3m.	156.5 m ²	<input checked="" type="checkbox"/>
CAR PARKING	1 car space per dwelling	5 bays provided	<input checked="" type="checkbox"/>
	1 car space per two (2) dwellings for visitors	3 visitor carparking spaces	<input checked="" type="checkbox"/>



① PROPOSED SITE PLAN
1:100
SCALE BAR 1:100
0 5 10 15 20



OWNER
Aspella Vista Pty Ltd

LOCATION
74-76 Elphinstone St., Berserker, Queensland

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DATE: 09-09-2022
DRAWING NO.: 00001
DRAWN BY: K.AGUILAR/S.SISON
REVISION NO.: 0005
PRIMARY UNIT: mm-Millimeters

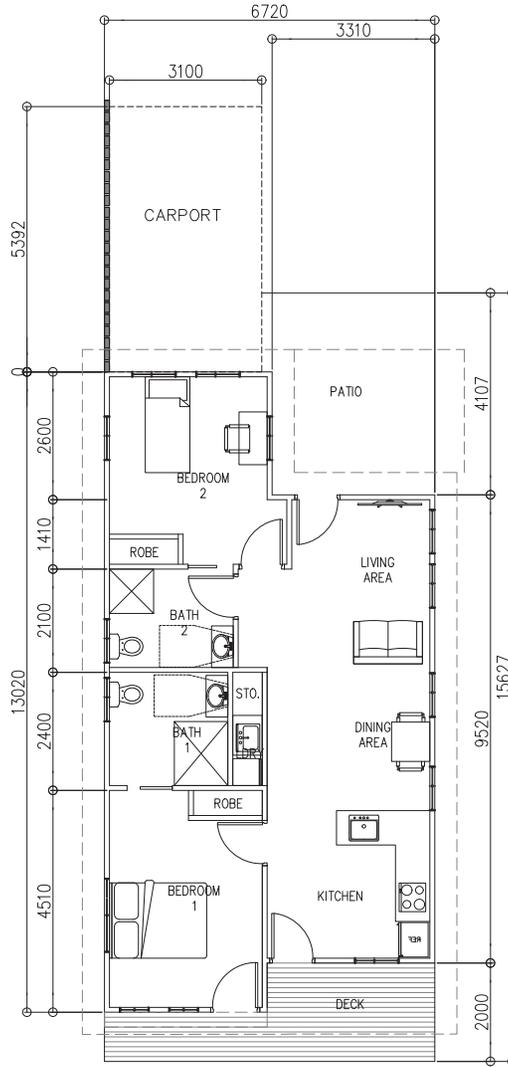
SHEET CONTENT
PROPOSED SITE PLAN



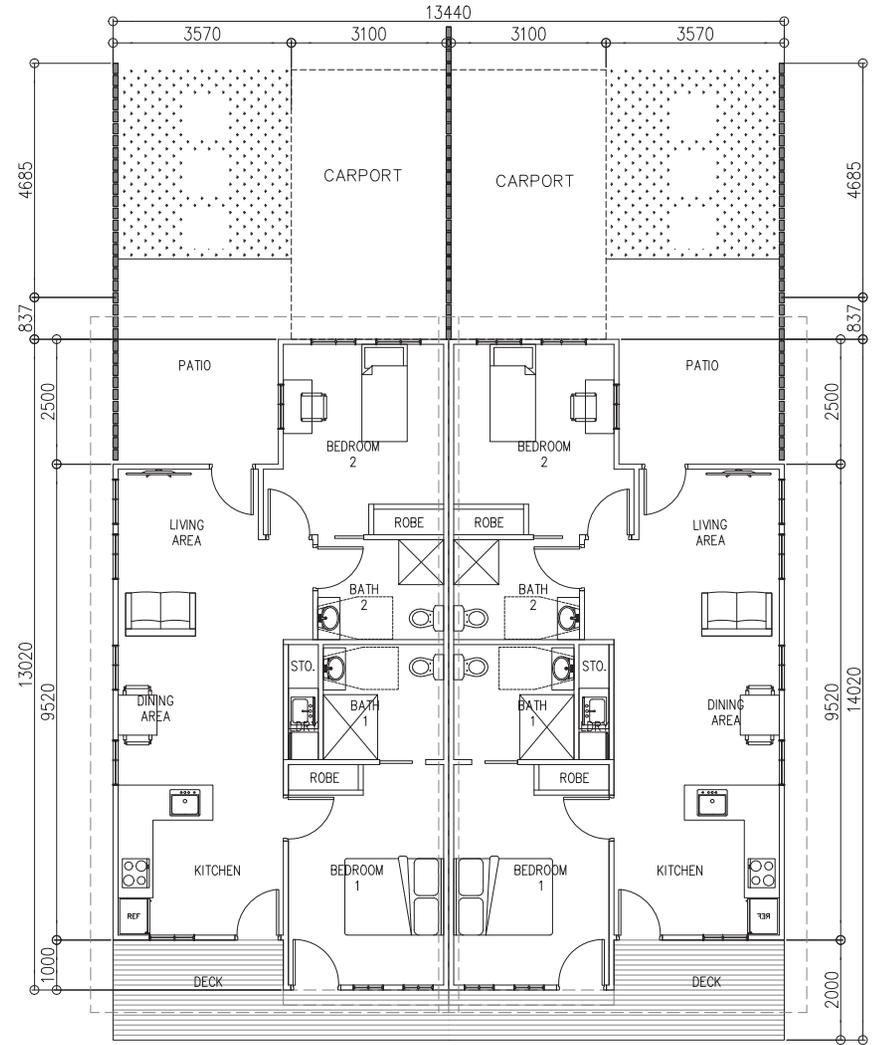
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SHEET NO.
1
A1 PAPER

UNIT NO.	BEDROOMS	INTERNAL AREA	PRIVATE YARD
UNIT 1	2	71.90 m ²	70.68 m ²
UNIT 2	2	71.90 m ²	53.13 m ²
UNIT 3	2	71.90 m ²	71.42 m ²
UNIT 4	2	71.90 m ²	71.42 m ²
UNIT 5	2	71.90 m ²	89.42 m ²



A-1 UNIT 1 FLOOR PLAN
1:50



A-2 TYPICAL UNIT FLOOR PLAN (UNIT 2-5)
1:50

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

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

Development Permit No.: D/84-2022

Dated: 20 October 2022



COMPANY

Aspella Vista Pty Ltd

LOCATION

74-76 Elphinstone St., Berserker, Queensland

DATE:

09-09-2022

DRAWING NO.:

00001

DRAWN BY:

K.AGUILAR/S.SISON

REVISION NO.:

0005

PRIMARY UNIT:

mm-Millimeters

SHEET CONTENT

GROUND FLOOR PLAN



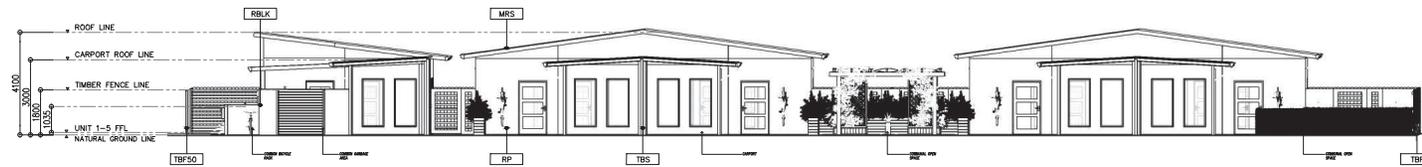
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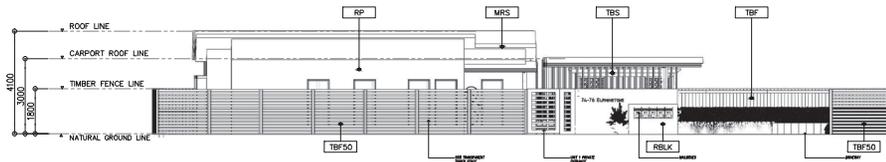
2

A1 PAPER

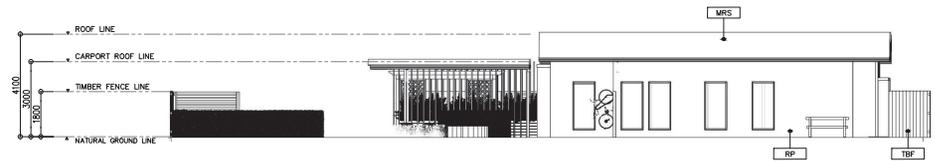
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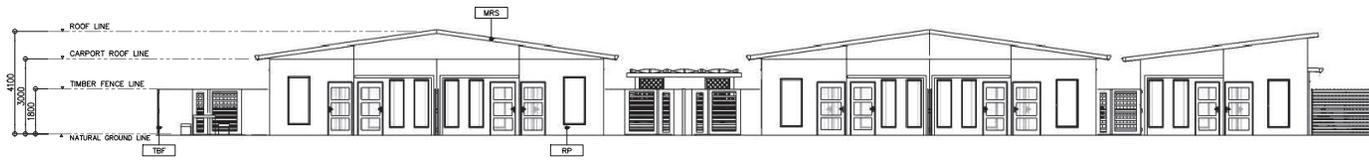
2 ELEVATION 2
1:100



3 ELEVATION 3
1:100



1 ELEVATION 1
1:100

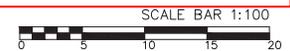


4 ELEVATION 4
1:100

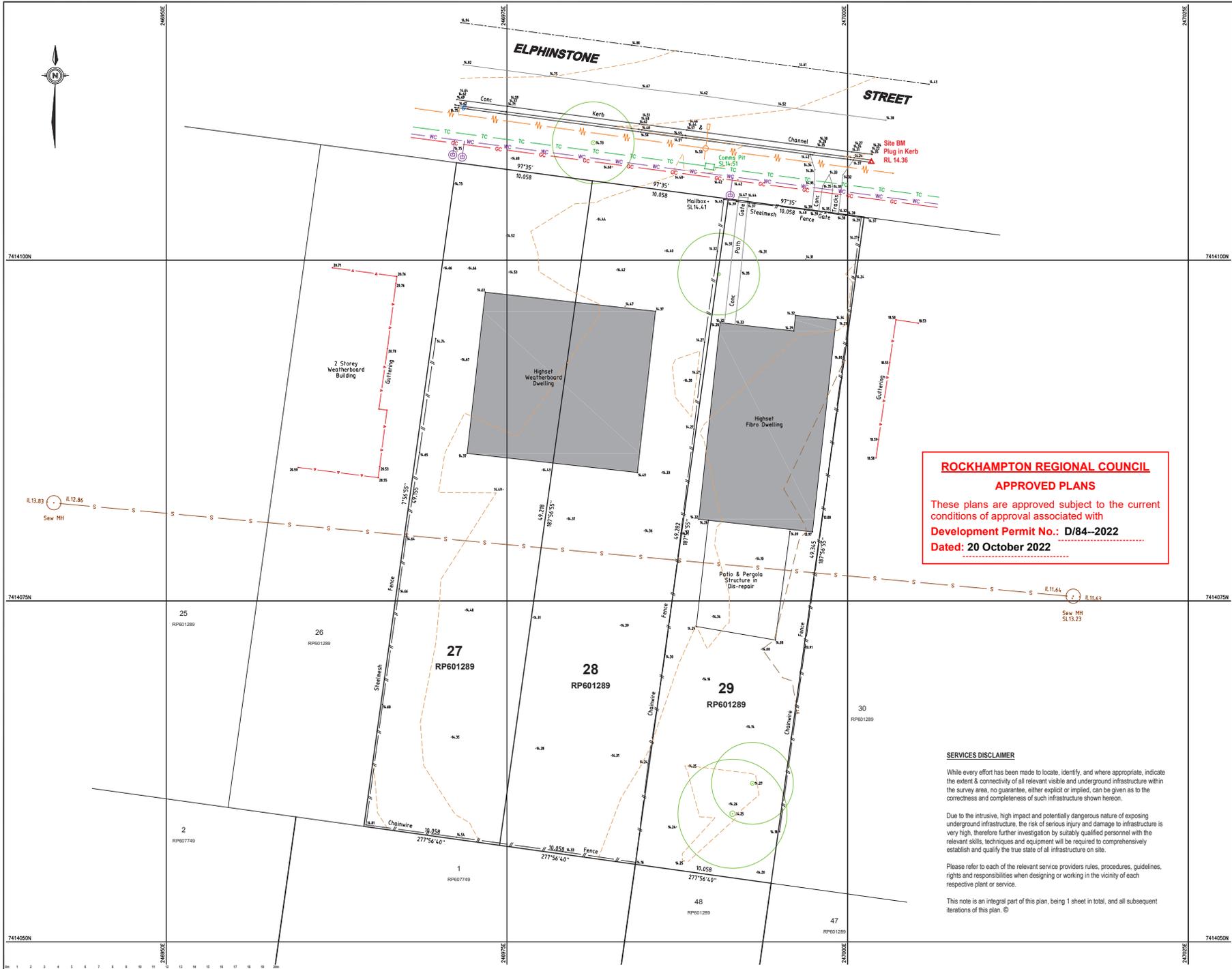
BUILDING MATERIALS	
KEY	MATERIAL
RP	RENDERED PANEL
TBS	TIMBER SCREEN
TBF50	TIMBER FENCE 1800MM HIGH 50% VISIBILITY
MRS	METAL ROOF SHEETING
RBLK	RENDERED BLOCKWORK
TBFAC	ACOUSTIC TIMBER FENCE 2000MM HIGH
TBF	TIMBER FENCE 1800MM HIGH

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/84--2022
Dated: 20 October 2022



CLIENT	LOCATION	DATE:	09-09-2022	SHEET CONTENT	SHEET NO.
Aspella Vista Pty Ltd	74-76 Elphinstone St., Berserker, Queensland	DRAWING NO.:	00001	SITE ELEVATIONS	3
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		REVISION NO.:	0005		
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				SCALE 1:100	A1 PAPER



ASPELLA VISTA PTY LTD
A.B.N. 29 654 135 225

DETAIL SURVEY OF
LOTS 27-29 ON RP601289

74-76 ELPHINSTONE STREET,
BERSERKER

REAL PROPERTY DESCRIPTION
Lot/Plan: Lots 27, 28 & 29 on RP601289
Area: 4819.2 sqm (Dwell)
Locality: Berserker
Local Authority: Rockhampton Regional Council

NOTES
This plan was prepared for ASPELLA VISTA PTY LTD from field survey for the purpose of designing new constructions on the subject land and should not be used by any other persons for any other purpose.
Property boundaries have not been established or marked at the time of survey and are approximate only, based on appropriate boundary connections.
Where possible underground services have been located by field survey. Some services shown herein are compiled from local authority and service provider plans and/or plans provided by the client and are noted accordingly on the plan.
Prior to any design, excavation or construction on site, the relevant authorities, and a qualified service provider should be engaged to ensure all services that may be affected by any future works have been located.
These plans have been prepared as verification plans only. Some text RL's have been omitted for clarity. Please refer to the relevant 3D data files for any spatial interrogation requirements.
Any discrepancies should be verified in writing with Capricorn Survey Group (CSG) Pty Ltd.
This note is an integral part of this plan.

LEGEND

LINETYPE LEGEND

- S UG Sewerage Line
- SC UG Sewerage Line (Completed)
- SW UG Stormwater Line
- SWC UG Stormwater Line (Completed)
- Overlaid Flow Direction
- E UG Electrical Line
- EC UG Electrical Line (Completed)
- UG Electrical Line
- UG Communication Line
- TC UG Communication Line (Completed)
- W UG Water Line
- WC UG Water Line (Completed)
- AG Gas Line
- G UG Gas Line (Completed)
- Gas Line
- Tip of Bank
- Toe of Bank
- CG of Blotman
- Edge of Blotman
- Retaining Wall
- Line Marking
- Fence Line
- Roof Outlining
- Contour

CONTOUR LEGEND

- 0.25m Interval
- 1.00m Interval

GENERAL SYMBOL LEGEND

- Comes Conduit Marker
- Comes PI
- Elec Conduit Marker
- Elec Terve
- Elec PI
- Elec Light Bolthead
- Elec Light Pole
- Elec Power Pole
- Elec Power Pole + Light
- Elec Power Pole + Transformer
- Elec Stay Point
- Traffic Lights
- Gas Marker
- Gas Meter
- Gas Hot Water System
- Sewerage MH
- Sewerage Vent
- Sewerage ID
- Stormwater MH
- Stormwater PI
- Stormwater OP / Outlet
- Stormwater ID
- Water Fire Hydrant
- Water Meter
- Water Valve
- Water Tap
- Water Control Tap
- Water Tee
- Water Conduit Marker
- Water Tapping Band
- Post
- Bolthead
- Guide Sign
- Flag Pole
- Australia Post Box
- Shrub

GENERAL
Vertical Datum: AHD Wide Smartstreet Aus
Horizontal Datum: MGA84 Wide Smartstreet Aus
Contour Interval: 0.25m, 1.0m Index
Co-ord System: MGA84 Wide Smartstreet Aus

WARNING
LOCATION AND CONNECTIVITY OF UG SERVICES SHOWN HEREON HAVE BEEN DETERMINED BY DIRECT ACCESS OR COMPILED FROM LOCAL AUTHORITY AND SERVICE PROVIDER PLANS AND FURTHER INVESTIGATION MAY BE REQUIRED TO DETERMINE LOCATIONS OF ALL ACCESSIBLE SERVICES.

REVISION

Issue	Date	Details	Authorised
A	14-06-2022	Initial Issue	RLJKF

CREATED
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SCALE
1:125 @ A1

DRAWING NUMBER
8626-01-DTL (1/1)

ISSUE
A

CONCEPTUAL STORMWATER MANAGEMENT PLAN

Proposed Residential Development

74-76 Elphinstone Street, Berserker

Lots 27-29 on RP601289

For Botanica IM

7 October 2022

File No: OSK6054-0002-A

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/84--2022

Dated: 20 October 2022

DOCUMENT CONTROL SHEET

Title:	Conceptual Stormwater Management Plan
Document No:	OSK6054-0002-A
Original Date of Issue:	1 August 2022
Project Manager:	Aaron Pianta
Author:	Ben Grant
Client:	Botanica IM
Client Contact:	Ian Adams – The Planning Place
Client Reference:	74-76 Elphinstone Street, Berserker
Synopsis:	This <i>Conceptual Stormwater Management Plan</i> describes the existing site characteristics, and corresponding stormwater quantity and quality management controls to be implemented during the operation phase of the development.

Reviewed by RPEQ	Reg. No.	Signed	Date
Aaron Pianta	10423		7 October 2022

Revision/Checking History			
Revision No	Date	Checked By	Issued By
Draft	1 August 2022	Tom Watt	Ben Grant
A	7 October 2022	Aaron Pianta	Ben Grant

Distribution		
Recipient	No of Copies	Method
Ian Adams – The Planning Place	1	PDF

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Appendix B	Botanica IM, Proposed Site Plan (Ref: 00001-0005)
Appendix C	OSKA Consulting Group, Pre Development Catchment Plan (Ref: OSK6054/P001/B)
Appendix D	OSKA Consulting Group, Post Development Catchment Plan (Ref: OSK6054/P002/B)
Appendix E	OSKA Consulting Group, Stormwater Management Plan & Details (Ref: OSK6054/P003/B)
Appendix F	OSKA Consulting Group, Sediment and Erosion Control Plan (Ref: OSK6054/P004/B); OSKA Consulting Group, Sediment and Erosion Control Details (Ref: OSK6054/P005/B)

1.0 INTRODUCTION

1.1 Background

OSKA Civil Consultants has been commissioned by Botanica IM to prepare a Conceptual Stormwater Management Plan (CSWMP) to support a Development Application (DA) to the Rockhampton Regional Council (RRC) for the proposed Residential Development situated at 74-76 Elphinstone Street, Berserker.

The subject site is described as Lots 27-29 on RP601289 and has a total site area of 0.149ha.

1.2 Scope

This CSWMP details the conceptual planning, layout and design of the stormwater management infrastructure for both the construction and operational phases of this development.

This CSWMP aims to:

- Establish the required performance criteria for both the existing and proposed stormwater quantity and quality improvement systems;
- Provide a conceptual design of stormwater infrastructure including stormwater quality improvement devices and stormwater quantity management controls;
- Demonstrate the modelled post-development stormwater quality discharging from the site does not adversely impact on the water quality and ecological values of downstream watercourses;
- Demonstrate stormwater runoff is conveyed through the site to a Lawful Point of Discharge (LPOD) in accordance with the Queensland Urban Drainage Manual (QUDM); and
- Provide reporting and monitoring mechanisms whereby the performance of this system can be measured enabling identification of corrective actions/alterations required to ensure the above mentioned objectives are maintained.

This CSWMP has been prepared in accordance with the IEAust *Australian Runoff Quality: Guide to Water Sensitive Urban Design*, Queensland State Planning Policy 2017, IPWEA *Queensland Urban Drainage Manual (QUDM) Fourth Edition (2017)* Queensland Water Quality Objectives (2009), Rockhampton Regional Council (RRC) *Planning Scheme (2015)* and Capricorn Municipal Development Guidelines (2020).

2.0 SITE DESCRIPTION

2.1 Location

The subject site is located on 74-76 Elphinstone Street, Berserker. The site fronts Elphinstone Street to the north and has existing residential properties to the south, east and west. The site covers a total combined area of 0.149ha, with details as summarised in Table 1 and as located in Figure 1.

Table 1: Site Description

Client	Lot and Property Description	Street Address
<i>Botanica IM</i>	<i>Lots 27-29 on RP601289</i>	<i>74-76 Elphinstone Street, Berserker</i>

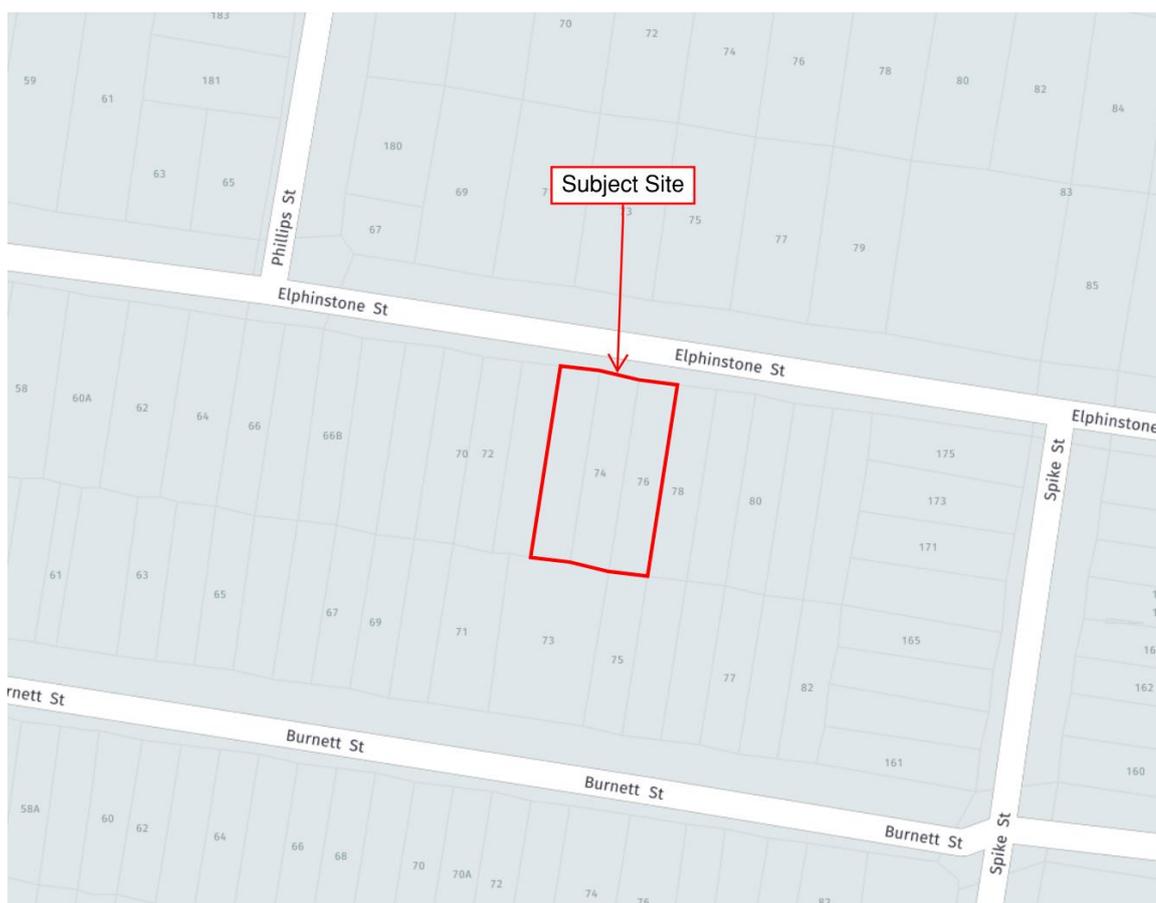


Figure 1: Locality Plan (Modified from Nearmap – accessed on 12 July 2022)

2.2 Site Topography

The existing site generally grades to the east at approximately 2.5% with spot heights ranging from 13.88m AHD to 14.81m AHD. Based on the provided survey and aerial information, any stormwater runoff from ground surfaces drains as sheet flow towards the existing stormwater system to the east of the site within Elphinstone Street and Burnett Street.

Further information of the site survey has been provided by Capricorn Survey Group CQ, Detail Survey (Ref: 8626-01-DTL (1/1) Issue A) included as Appendix A.

2.3 Vegetation and Land Use

The subject site currently consists of two high set single storey residential dwellings. The site contains grassed areas to the front and rear of the lot with several scattered trees. Access to the site is gained from the north via Elphinstone Street.

An aerial photograph taken on the 1 June 2022 of the subject site is included in Figure 2.



Figure 2: Aerial Image of the Site (Source: Nearmap – Image taken 1 June 2022)

2.4 Proposed Development

The proposed development consists of five single storey residential dwellings with a rear landscaped courtyard. Access to the site will be gained via Elphinstone Street to the north which will provide access to the 5.8m wide internal road.

Refer to Appendix B for proposed architectural details prepared by Botanica IM, Proposed Site Plan (Ref: 00001-0005).

2.5 Proposed Conceptual Drainage

It is proposed that the site's captured roof water be diverted to individual above ground stormwater detention tanks to each dwelling, with the remaining ground and road flows to bypass the detention tanks and drain as sheet flow across the site to the kerb and channel of Elphinstone Street.

The stormwater connection to the Lawful Point of Discharge (LPOD) is conceptual at this stage. The captured flows within the tanks are proposed to be discharged via kerb adaptors to the kerb and channel of Elphinstone Street.

2.6 Rainfall Data

Rainfall intensity data has been obtained from the Australian Bureau of Meteorology's 2016 Design IFD Rainfall System. The data has been extracted for the nearest grid cell at Latitude 23.3625 (S) and Longitude 150.5375 (E). The IFD data and average rainfall intensities used in this report are in accordance with the procedures outlined in Geosciences Australia, Australian Rainfall and Runoff 2019.

3.0 DATA

Data which has been sourced or provided, in order to prepare this report for the site, was gathered from the following sources:

- Detailed site survey provided by Capricorn Survey Group CQ, Detail Survey (Ref: 8626-01-DTL (1/1) Issue A) included as Appendix A;
- Proposed site layout provided by Botanica IM, Proposed Site Plan (Ref: 00001-0005) included as Appendix B;
- LIDAR data for the subject site sourced from Australian Government Elevation and Depth Foundation Spatial Data (ELVIS), Date Source: 2014, DEM Data;
- Rainfall and Meteorological 2016 IFD Data by the Australian Bureau of Meteorology;
- Information Extracted from Rockhampton Regional Council online mapping system; and
- Aerial Imagery by Nearmap (Accessed on 12 July 2022);

4.0 SITE HYDROLOGY

4.1 Background

The following sections define the method and parameters utilised within the hydrologics of the site, in order to establish a simulation of the anticipated flow regime and peak discharge at the Lawful Point of Discharge (LPOD). A Rational Method calculation has been provided for comparison of the pre and post development peak flow rates.

The Rational Method (Section 4.3 of the Queensland Urban Drainage Manual - QUDM 2017) is a suitable estimation technique, given its flexibility in its data requirements and is able to produce satisfactory estimates of peak site discharges based on the following data input:

- specific intensity frequency duration (IFD) data;
- length/type of flow path;
- contributing catchment areas; and
- coefficient of discharge.

4.2 Pre Development

4.2.1 Catchment Definition and Lawful Point of Discharge

The pre-development site has been analysed as a singular internal catchment and has a contributing area of 1,486m². Any stormwater on ground surfaces is conveyed as sheet flow through the subject site towards the existing stormwater infrastructure within Elphinstone Street and Burnett Street to the east.

The existing point of discharge (EPOD) for the subject site (for analysis in accordance with QUDM), is the neighbouring property to the east of the site.

The catchment area and LPOD for the subject site are shown on OSKA Consulting Group, Pre Development Catchment Plan (Ref: OSK6054/P001/B) included as Appendix C.

4.2.2 Coefficient of Runoff

The pre-development coefficient of runoff (C year) was determined based on the fraction impervious method specified in QUDM. The pre-development catchment, based on the provided survey information, has 374m² of impervious surfaces, which equates to a fraction impervious (fi) of 0.25. Using a one hour, ten-year rainfall intensity (¹I₁₀) of 65.6 mm/hr a C10 value of 0.72 has been adopted for the pre-development catchment.

The following pre-development coefficients of runoff (as shown in Table 2) have been adopted in accordance with QUDM Table 4.5.2, which apply the frequency factors for the standard Annual Exceedance Probability (AEP) design storms of 39%, 10%, 5% and 1% (corresponding to the 2, 10, 20 and 100 year Average Recurrence Interval (ARI) storms).

Table 2: Pre Development Coefficient of Runoff

Catchment	C ₂	C ₁₀	C ₂₀	C ₁₀₀
PRE	0.61	0.72	0.76	0.87

4.2.3 Time of Concentration

The Time of Concentration for the pre developed catchment has been calculated in accordance with QUDM Table 4.6.3 – Recommended roof drainage system travel times.

In accordance with Table 4.6.3 of QUDM, the pre-development catchment will have a time of concentration that will incorporate 5 minutes of the roof to downpipes time. This equates to a total travel time of five (5) minutes for the pre-development catchment.

4.2.4 Design Flow Rates

Pre-development peak flow rates have been estimated for the adopted storms using design rainfall intensities from the Bureau of Meteorology IFD Data. The Rational Method ($Q = 2.78 \times 10^{-3} \text{ CIA}$) has been used to estimate the subject site's design peak flow rates. The pre-development peak flows for the subject site are presented in Table 3.

Table 3: Pre Development Peak Flow Estimation – Rational Method

PRE					
Annual Exceedance Probability	AEP	39%	10%	5%	1%
Coefficient of Runoff	C	0.61	0.72	0.76	0.87
Area of Catchment (ha)	A	0.149	0.149	0.149	0.149
Average Rainfall Intensity (mm/h)	I	129	201	230	302
Peak Flow Rate (m³/s)	Q	0.033	0.060	0.072	0.108

4.3 Post Development

4.3.1 Catchment Definition and Lawful Point of Discharge

The post-development scenario has been analysed as the same internal catchment as described in the pre-development scenario and has a total contributing area of 1,486m².

Stormwater collected from the roof areas shall be conveyed via downpipes to individual stormwater detention tanks before discharging to the kerb and channel of Elphinstone Street via kerb adaptors. Stormwater runoff from the remaining driveway and ground areas shall be conveyed as sheet flow to the kerb and channel of Elphinstone Street (the site's LPOD). The site is proposed to be re-graded to allow surface runoff to be conveyed towards the kerb and channel of Elphinstone Street.

The post development catchment area and LPOD are detailed on OSKA Consulting Group, Post Development Catchment Plan (Ref: OSK6054/P002/B) included as Appendix D.

4.3.2 Coefficient of Runoff

The post-development coefficients of runoff (C year) were determined using the fraction impervious method as specified in QUDM.

Based on the supplied architectural plans, the post-development catchment has approximately 1,168m² of impervious surfaces which equates to a fraction impervious (fi) of 0.70. Using a one-hour, ten-year rainfall intensity (¹I₁₀) of 65.6 mm/hr, a C10 value of 0.82 has been adopted for the post-development catchment.

The following post-development Coefficients of Runoff (as shown in *Table 4*) have been adopted in accordance with QUDM Table 4.5.2, which apply the frequency factors for the standard Annual Exceedance Probability (AEP) design storms of 39%, 10%, 5% and 1% (corresponding to the 2, 10, 20 and 100-year ARI storms).

Table 4: Post Development Coefficient of Runoff

Catchment	C ₂	C ₁₀	C ₂₀	C ₁₀₀
POST	0.70	0.82	0.87	0.99

4.3.3 Time of Concentration

The Time of Concentration for the post developed catchment has been calculated in accordance with QUDM Table 4.6.3 – Recommended roof drainage system travel times.

In accordance with Table 4.6.3 of QUDM, the post-development catchment will have a time of concentration that will incorporate 5 minutes of the roof to downpipes time. This equates to a total travel time of five (5) minutes for the post development catchment.

4.3.4 Design Flow Rates

Post-development peak flow rates have been calculated for the adopted storms using design rainfall intensities from the Bureau of Meteorology 2016 IFD Data. The Rational Method ($Q = 2.78 \times 10^{-3} CIA$) has been used to estimate the required design peak flow rates for the subject site. The post-development peak flows for the subject site are presented in Table 5.

Table 5: Post Development Peak Flow Estimation – Rational Method

POST					
Annual Exceedance Probability	AEP	39%	10%	5%	1%
Coefficient of Runoff	C	0.70	0.82	0.87	0.99
Area of Catchment (ha)	A	0.149	0.149	0.149	0.149
Average Rainfall Intensity (mm/h)	I	129	201	230	302
Peak Flow Rate (m³/s)	Q	0.037	0.068	0.082	0.124

4.4 Change in Flow Rates

The difference in peak flow rates calculated from the total pre and post developed site has been estimated via The Rational Method, with the results detailed in Table 6.

Table 6: Change in Peak Flow Rates Estimation – Rational Method

Annual Exceedance Probability	AEP	39%	10%	5%	1%
Pre Developed Peak Flow Rate (m ³ /s)	Q	0.033	0.060	0.072	0.108
Post Developed Peak Flow Rate (m ³ /s)	Q	0.037	0.068	0.082	0.124
Change in Peak Flow Rate (m³/s)	Q	+0.004	+0.008	+0.010	+0.016

The proposed development has demonstrated via a Rational Method assessment, that an increase in peak flow rates discharging to the existing stormwater infrastructure is anticipated due to the proposed development, therefore On-Site Detention (OSD) will be required to mitigate flows to the pre-development conditions.

4.5 External Catchments

The subject site and the surrounding area were examined to determine if any localised external catchments will contribute to the subject site. The site was deemed not to contain any external catchments with the stormwater from neighbouring properties captured and conveyed to their respective LPODs. The southern neighbouring properties (Lots 1 and 2 on RP607749) appear to grade to the east/south-east based on LIDAR information and any stormwater runoff will be conveyed towards Burnett Street. The western neighbouring property (Lots 25 and 26 on RP601289) appears to discharge stormwater across the sites western boundary based on LIDAR information, however the internal roadway appears to have been constructed to allow stormwater runoff to be conveyed towards the kerb and channel of Elphinstone Street. The captured stormwater from the roof of the dwelling appears to discharge to the kerb and channel of Elphinstone Street via kerb adaptor outlet which can be seen in Figure 3. The latest imagery of the western neighbouring property displayed in Figure 3, appears to show the internal roadway grading towards Elphinstone Street with the edge of the roadway noticeably higher than the subject site and therefore is not envisaged to convey flows into the subject site.



Figure 3: Street View of the Subject Site (Source: Google Street View – Image taken August 2022)

5.0 STORMWATER QUANTITY ASSESSMENT

5.1 Background

The development of land will increase peak flow rates from the subject site due to increased impervious areas and a reduction in the surface roughness of the site. Accordingly, the following section provides preliminary details of a proposed On-Site Detention (OSD) system to demonstrate no increase in nuisance flows and adverse impacts, as a result of potential increased post-development runoff, on neighbouring properties and/or authorities stormwater infrastructure.

5.2 Objective

In accordance with RRC's requirements and typical industry-standard practices, the following objective has been set for post-development stormwater discharge from the site:

- No net increase in peak flows from the subject site, for all events up to the 1% AEP design storm event, during the post developed condition.

This objective shall be demonstrated via a suitable hydrologic and hydraulic modelling package, by detaining site runoff from the subject site within proposed below ground detention tanks.

5.3 Hydraulic Model

An estimation of the required detention volume to mitigate any increase in total site discharge rates has been undertaken using the DRAINS software programme.

A DRAINS model has been adopted at the preliminary planning stage to ensure that the individual above ground detention tanks volumes are estimated with a higher degree of confidence. As finished site levels and internal pipe levels are still preliminary, this initial calculation is an estimate, however, it has the required level of accuracy to progress the design with confidence.

The model was developed by simulating the pre, post and mitigated catchment layouts and comparing the peak flow rates generated from each scenario.

The mitigated catchments consist of the 1% AEP runoff generated from the roof areas (101m² each & 506m² in total) being conveyed to individual proposed above ground detention tanks, while the remaining ground and road areas (980m² total) have been modelled as bypassing the proposed above ground detention tanks. It is proposed to re-grade the site to allow surface runoff from the ground and road areas to drain as sheet flow towards the kerb and channel of Elphinstone Street. This catchment arrangement provides enough mitigation to demonstrate no increase in the peak flow rates exiting the site when compared to the pre-development scenario.

Note that roof gutters are to be designed to convey the major 1% AEP event into the detention tanks.

The TOC values calculated in the Rational Method calculations were adopted. The 39%, 10% and 1% AEP design storm events were analysed for all standard durations ranging from 5 minutes to 120 minutes. The critical duration for the combined peak site discharge was determined to be the 5 minute storm for both the pre-development and post-development scenarios. The peak discharge rates for the site calculated by the DRAINS model are shown in *Table 7*.

The pre and post-development catchment area and LPOD are detailed on OSKA Consulting Group, Pre Development Catchment Plan (Ref: OSK6054/P001/B) and on OSKA Consulting Group, Post Development Catchment Plan (Ref: OSK6054/P002/B) included respectively as *Appendix C and D*.

Table 7: Anticipated Peak Site Discharge Rate – Extracted from DRAINS Model (m³/s)

Design AEP Events	Peak Flow Rate Discharge (m ³ /s)		
	39%	10%	1%
Pre Development	0.038	0.062	0.113
Post Development (unmitigated)	0.042	0.069	0.120

The DRAINS assessment results shown in *Table 7* supports the Rational Method in *Section 4* in confirming that an increase in peak flow rates discharging from the site is anticipated, therefore On-Site Detention is deemed required to mitigate flows to predevelopment conditions.

5.4 Detention Volume

The following detention storage parameters were adopted to achieve the target predevelopment flow rates, via mitigation of the post-development flow rates. Note that the following parameters provide details for each above ground tank to be installed at the rear of each dwelling.

Table 8: Adopted Detention Tank Parameters

Minimum Detention Area:	1.00m ²
Detention Tank Internal Height:	1.00m
Low Flow (at invert of tank)	60mm Orifice
High Flow (at 0.90m above tank invert)	100mm Orifice (Emergency Overflow)
Consolidated Outlet Pipe	100mm
1% AEP Water Level:	0.75m
Available Detention Volume:	1.00m ³

Note: The 100mm high flow outlet has been provided as an emergency overflow orifice only.

The 5-minute design storm was determined as the critical storm duration for determining the required volume within the individual detention tanks. A comparison of the pre-development and mitigated flow rates based on the above arrangements is shown in *Table 9*.

Table 9: Comparison of Pre-Development and Mitigated Flow Rates – Extracted from DRAINS

Annual Exceedance Probability	39%	10%	1%
Pre-Development Peak Flow Rate (m ³ /sec)	0.038	0.062	0.113
Mitigated Peak Flow Rate (m ³ /sec)	0.037	0.059	0.097

The hydrograph for the critical duration of the Mitigated 1% AEP storm event compared against the pre and post development is shown in *Figure 4*.

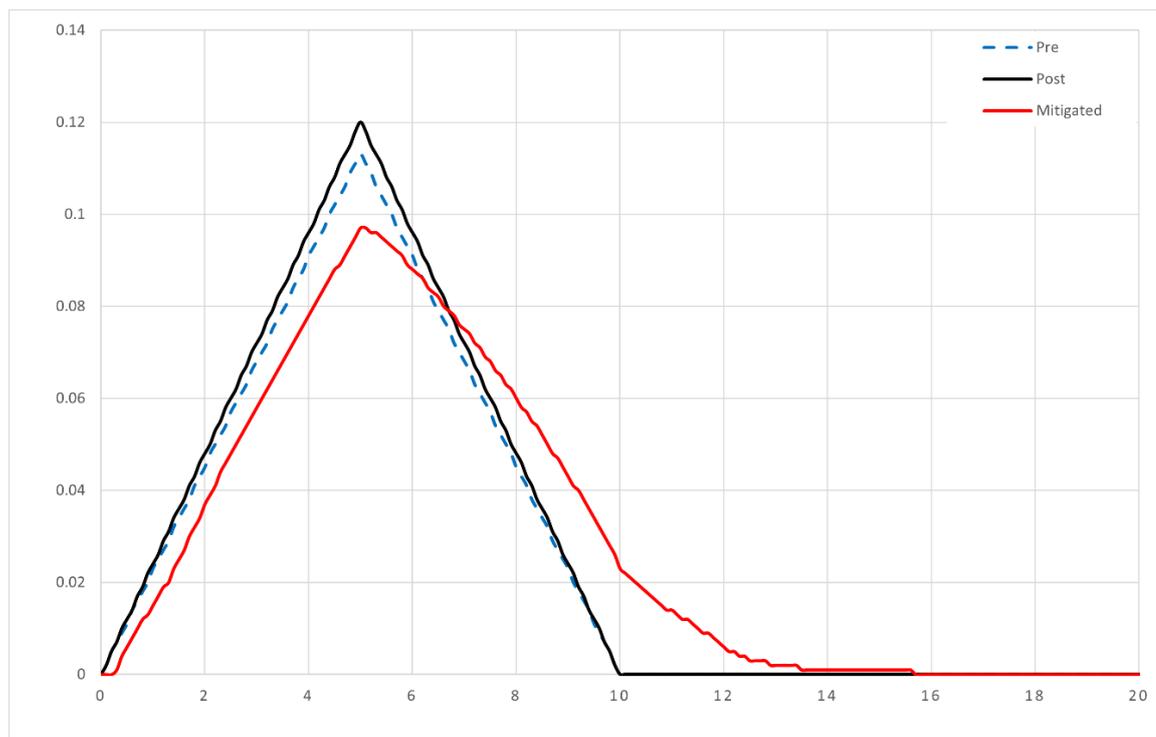


Figure 4: Pre, Post and Mitigated Flow Rates for the 1% AEP Design Storm Event

As demonstrated in the results displayed in *Table 9*, the detention arrangement can be seen to effectively mitigate the post-development flows in the adopted critical design storm AEP events.

The hydraulic analysis using the DRAINS model has determined that a minimum total of 1.00m³ of storage is required for runoff attenuation and is to be provided in the form of individual above ground detention tanks. The individual above ground detention tanks are to be fitted with an outlet pipe configuration (low flow outlet with emergency overflow) as detailed in *Table 8* to satisfy the mitigation requirements. Refer to the OSKA Consulting Group, Stormwater Management Plan & Details (Ref: OSK6054/P003/B) in *Appendix E* for details of the tank's arrangement and indicative location. The final location onsite and construction levels will be determined at the detailed design stage.

A copy of DRAINS model used in this report can be made available to council upon request.

6.0 STORMWATER QUALITY ASSESSMENT

6.1 Background

The development of the land has the potential to increase the pollutant loads within stormwater runoff and downstream watercourses. During the construction phase of the development, disturbances to the existing ground have the potential to significantly increase sediment loads entering downstream drainage systems and watercourses. The operational phase of the development will potentially increase the amount of sediments and nutrients washing from the site.

The following sections describe the construction and operational phase controls and water quality modelling of the proposed treatment train in compliance with Council guidelines.

6.2 Construction Phase

A high risk of stormwater pollution will occur from the site during the construction phase due to erosion and sediment transportation off-site to the receiving environment. The majority of this risk results from construction activities disturbing the site and exposing areas of soil to the direct erosive influence of the environment.

The following section outlines the procedures necessary to minimise erosion and control sediment during construction in accordance with the International Erosion Control Association (IECA) Best Practice ESC Document.

6.2.1 Key Pollutants

The key pollutants have been identified for the Construction Phase of this development.

Table 10: Key Pollutants, Construction Phase

Pollutant	Sources
Litter	Paper, construction packaging, food packaging, cement bags, material offcuts.
Sediment	Exposed soils and stockpiles during earthworks and building works.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment and temporary car park areas.
Toxic Materials	Cement slurry, asphalt primer, solvents, cleaning agents, and wash waters (e.g., from tile works).
Acids or Alkaline substances	Acid sulphate soils, cement slurry and wash waters.

6.2.2 Sediment and Erosion Controls

Sediment and Erosion Control devices (S&EC) employed on the site shall be designed and constructed in accordance with the International Erosion Control Association (IECA) Best Practice ESC Document as shown on OSKA Consulting Group, Sediment and Erosion Control Plan (Ref: OSK6054/P004/B); OSKA Consulting Group, Sediment and Erosion Control Details (Ref: OSK6054/P005/B) included as Appendix F.

Pre-Construction

- Stabilised site access/exit onto Elphinstone Street to the north;
- Sediment fences to be located around the perimeter of the site;
- Sediment trap to be installed in the north-east of the site;
- Dust fencing to be installed if required; and
- Educate site personnel to the requirements of Erosion and Sediment Control Plan.

Initial Construction

- Maintain construction access/exit, sediment fencing, dust fences and all other existing controls as required;
- Construct diversion drains to convey disturbed site run-off to the temporary sediment traps; and
- Confine construction activities to stages to minimise areas of disturbance at any given time.

Second Stage Construction

- Maintain construction access/exit, sediment fencing, dust fences, diversion drain and all other existing controls as required;
- Progressively revegetate finished areas where applicable;
- Divert runoff from undisturbed areas around disturbed areas; and
- Drainage structure protection around field inlets and gully pits.

During construction, all areas of exposed soils allowing dust generation are to be suitably treated. Treatments will include covering the soil and watering. Road accesses are to be regularly cleaned to prevent the transmission of soil on vehicle wheels and eliminate any build-up of typical road dirt and tyre dust from delivery vehicles.

Adequate waste disposal facilities are to be provided and maintained on the site to cater for all waste materials such as litter, hydrocarbons, toxic materials, acids or alkaline substances.

6.3 Operational Phase

The following sections provide details of the Stormwater Quality Improvement Devices (SQID's) proposed for the operational phase of the development. OSKA Consulting Group, Stormwater Management Plan & Details (Ref: OSK6054/P003/B) in Appendix E illustrates the size and location of the proposed SQID's.

6.3.1 Stormwater Quality Objectives

The proposed development is required to be assessed against Department of State Development, Infrastructure and Planning, State Planning Policy, July 2017 to determine whether the application of the documents water quality objectives apply. The triggers for the state planning policy are as follows:

1. A material change of use for urban purposes that involves a land area greater than 2,500 square metres that:
 - a) Will result in an impervious land area greater than 25 percent of the net developable area, or
 - b) Will result in six or more dwellings, or
2. Reconfiguring a lot for urban purposes that involves a land area greater than 2,500 square metres and will result in six or more lots, or

3. Operational works for urban purposes that involve disturbing more than 2,500 square metres of land.

As the development is less than 2,500 square metres no formal stormwater quality devices are required.

7.0 CONCLUSIONS

OSKA Civil Consultants has been commissioned by Botanica IM to prepare a Conceptual Stormwater Management Plan (CSWMP) to support a Development Application (DA) to the Rockhampton Regional Council (RRC) for the proposed residential development situated at 74-76 Elphinstone Street, Berserker. This CSWMP intends to provide an optimised stormwater management system that would be compatible and readily integrated into the proposed site use.

This CSWMP details the conceptual planning, layout and design of the stormwater management infrastructure for both the construction and operational phases of this development and satisfies the requirements of the Rockhampton Regional Council (RRC) Planning Scheme (2015) and Capricorn Municipal Development Guidelines.

A hydrological analysis demonstrated that the anticipated post-development peak flow rates discharging from the site are the higher than the pre-development flow rates. A hydraulic model was built using the DRAINS software program, to estimate the required detention volume and arrangement. The report and stormwater management plan define the preliminary size and layout of the proposed individual above ground stormwater detention tanks. The flows from the detention tanks are to be piped to the kerb and channel of Elphinstone Street via kerb adaptors. A minimum total tank volume of 1.00m³ for each dwelling was modelled, which demonstrates no additional or actionable nuisance associated with the increased runoff rate on downstream properties and infrastructure.

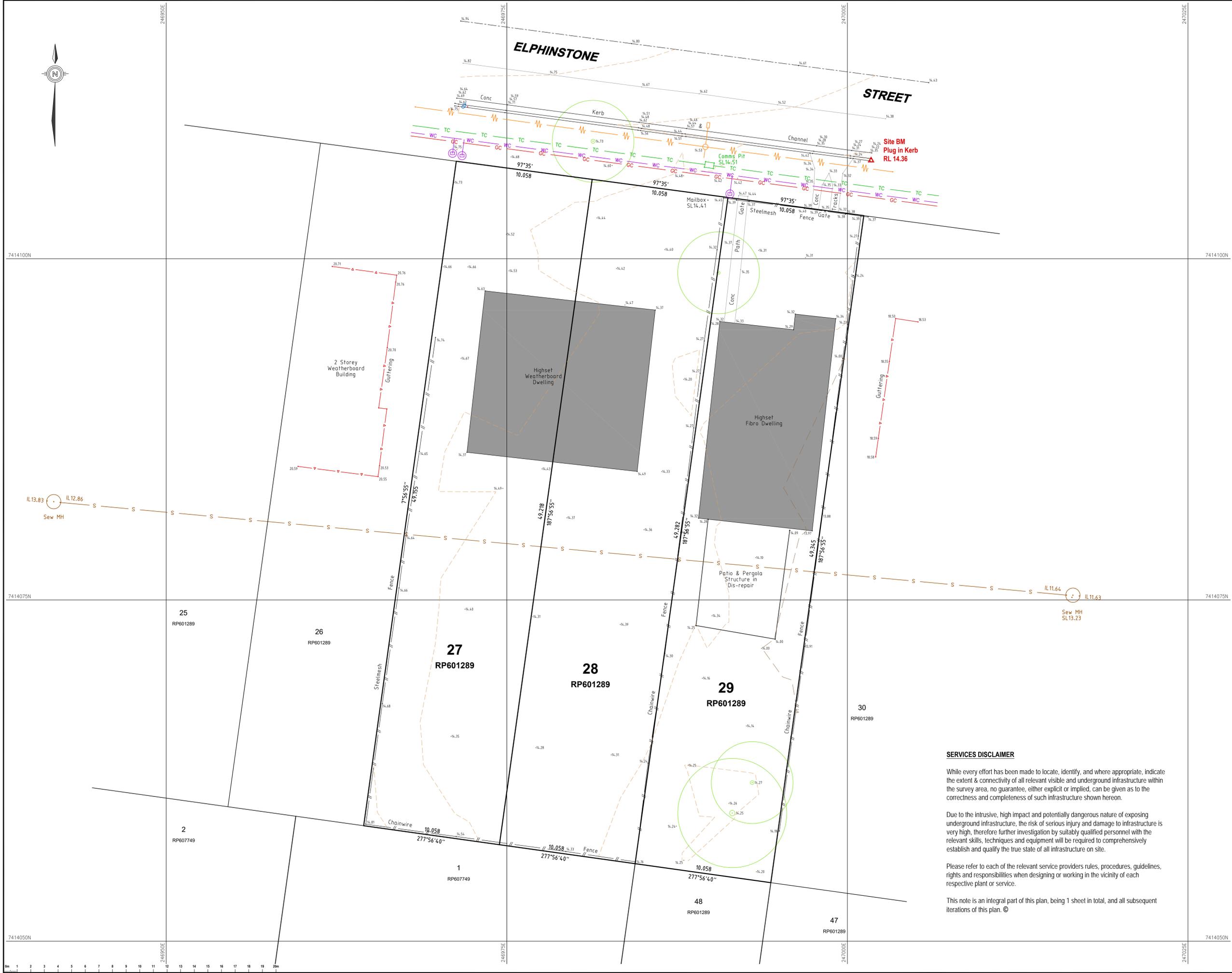
OSKA Civil Consultants has adopted a Water Sensitive Urban Design (WSUD) approach, in accordance with the State Planning Policy, to managing the stormwater runoff from the proposed development. It has been determined that there is no requirement for the implementation of permanent onsite stormwater quality treatment measures as the subject site is less than 2,500 square metres.

A sediment and erosion control plan is provided for the construction phase of the development and shall be implemented by the contractor and developer.

APPENDIX

A

Capricorn Survey Group
CQ, Detail Survey (Ref: 8626-01-DTL (1/1)
Issue A)



ASPELLA VISTA PTY LTD
A.B.N. 29 654 135 225

DETAIL SURVEY OF
LOTS 27-29 ON RP601289

74-76 ELPHINSTONE STREET,
BERSERKER

Lot/Plan : Lots 27, 28 & 29 on RP601289
Area : 493m2 each (Deed)
Locality : Berserker
Local Authority : Rockhampton Regional Council

NOTES
This plan was prepared for ASPELLA VISTA PTY LTD from field survey for the purpose of designing new constructions on the subject land and should not be used by any other persons for any other purpose.

Property boundaries have not been reinstated or marked at the time of survey and are approximate only, based on appropriate boundary connections.

Where possible underground services have been located by field survey. Some services shown hereon are compiled from local authority and service provider plans and/or plans provided by the client and are noted accordingly on the plan.

Prior to any design, excavation or construction on site, the relevant authorities, and a qualified service locator should be engaged to ensure all services that may be affected by any future works have been located.

These plans have been prepared as verification plots only. Some text RL's have been omitted for clarity. Please refer to the relevant 3D data files for any spatial interrogation requirements.

Any discrepancies should be verified in writing with Capricorn Survey Group (CQ) Pty Ltd.

This note is an integral part of this plan.

LEGEND

LINETYPE LEGEND	
— S —	UG Sewerage Line
— SC —	UG Sewerage Line (Compiled)
— SW —	UG Stormwater Line
— SWC —	UG Stormwater Line (Compiled)
—>—	Overland Flow/Direction
— E —	UG Electrical Line
— EC —	UG Electrical Line (Compiled)
— W —	OH Electrical Line
— T —	UG Communication Line
— TC —	UG Communication Line (Compiled)
— W —	UG Water Line
— WC —	UG Water Line (Compiled)
— W —	AG Water Line
— G —	UG Gas Line
— GC —	UG Gas Line (Compiled)
—	Top of Bank
—	Toe of Bank
—	CL of Bitumen
—	Edge of Bitumen
—	Retaining Wall
—	Line Marking
—	Fence Line
—	Roof / Guttering
—	Eaves
—	0.25m Interval
—	1.00m Interval

GENERAL SYMBOL LEGEND

□	Comms Conduit Marker	□	Stormwater MH
□	Comms Pit	□	Stormwater Pit
□	Elec Conduit Marker	□	Stormwater DP / Outlet
□	Elec Turret	□	Stormwater IO
□	Elec Pit	□	Water Fire Hydrant
□	Elec Light Bollard	□	Water Meter
□	Elec Light Pole	□	Water Valve
□	Elec Power Pole	□	Water Tap
□	Elec Power Pole + Light	□	Water Control Tap
□	Elec Power Pole + Transformer	□	Water Tee
□	Elec Stay Point	□	Water Conduit Marker
□	Traffic Lights	□	Water Tapping Band
□	Gas Marker	□	Post
□	Gas Valve	□	Bollard
□	Gas Hot Water System	□	Guide Sign
□	Sewerage MH	□	Flag Pole
□	Sewerage Vent	□	Australia Post Box
□	Sewerage IO	□	Shrub

DATUM
Vertical Datum : AHD Vide Smartnet Aus
Horizontal Datum : MGA94 Vide Smartnet Aus
Contour Interval : 0.25m, 1.0m Index
Co-ord System : MGA94 Vide Smartnet Aus

WARNING
LOCATION AND CONNECTIVITY OF U/G SERVICES SHOWN HEREON HAVE BEEN DETERMINED BY DIRECT ACCESS OR COMPILED FROM LOCAL AUTHORITY AND SERVICE PROVIDER PLANS ONLY. FURTHER INVESTIGATION MAY BE REQUIRED TO DETERMINE LOCATIONS OF ALL INACCESSIBLE SERVICES.

REVISION

Issue	Date	Details	Authorised
A	14-06-2022	Initial Issue	RJKF



SCALE
1:125 @ A1

DRAWING NUMBER
8626-01-DTL (1/1)

ISSUE
A

SERVICES DISCLAIMER

While every effort has been made to locate, identify, and where appropriate, indicate the extent & connectivity of all relevant visible and underground infrastructure within the survey area, no guarantee, either explicit or implied, can be given as to the correctness and completeness of such infrastructure shown hereon.

Due to the intrusive, high impact and potentially dangerous nature of exposing underground infrastructure, the risk of serious injury and damage to infrastructure is very high, therefore further investigation by suitably qualified personnel with the relevant skills, techniques and equipment will be required to comprehensively establish and qualify the true state of all infrastructure on site.

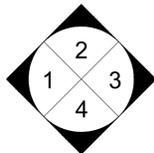
Please refer to each of the relevant service providers rules, procedures, guidelines, rights and responsibilities when designing or working in the vicinity of each respective plant or service.

This note is an integral part of this plan, being 1 sheet in total, and all subsequent iterations of this plan. ©

APPENDIX

B

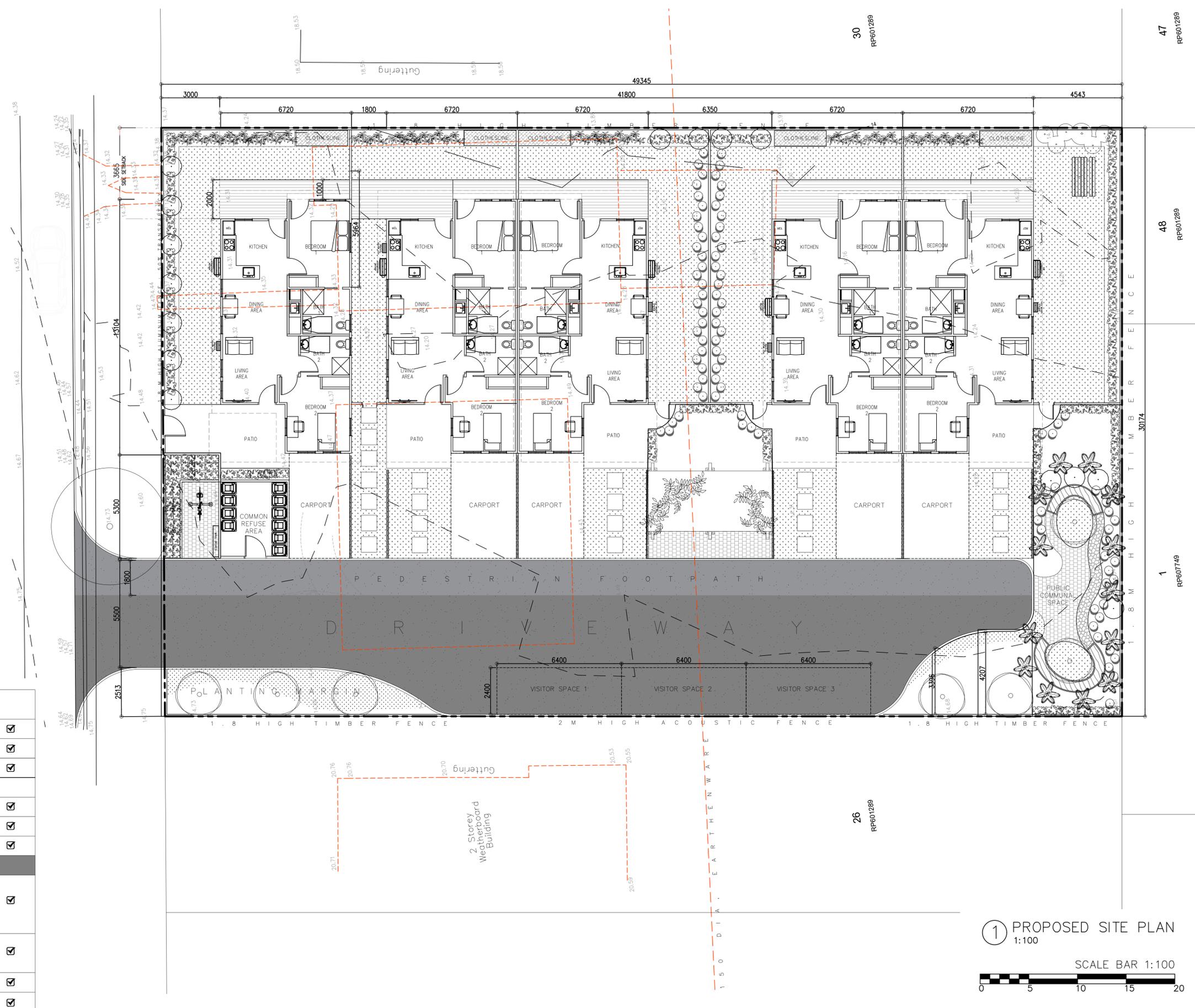
Botanica IM, Proposed
Site Plan (Ref: 00001-0005)



ELEVATION KEY

COMPLIANCE TABLE – LOW-MEDIUM DENSITY ZONE

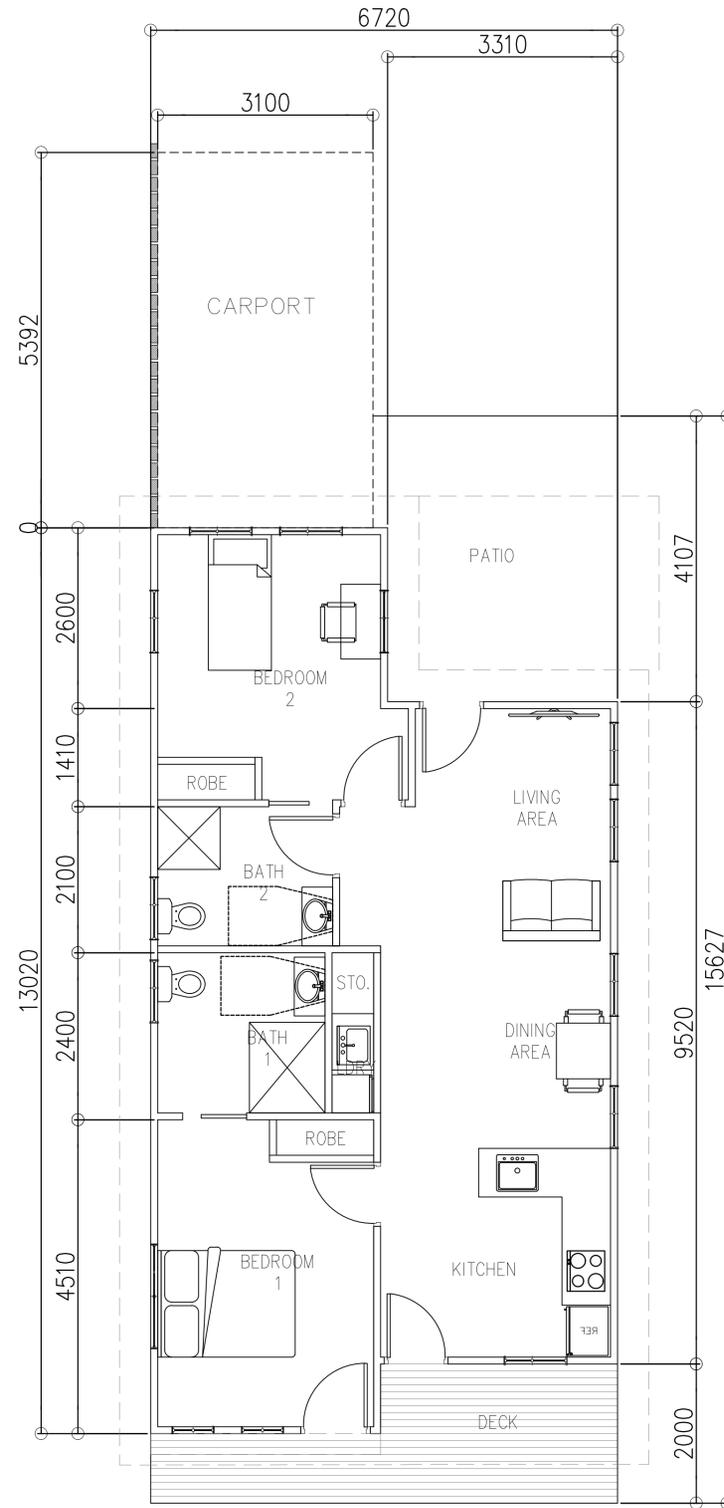
ITEM	REQUIREMENT	PROVISION	
HEIGHT	4.6 meters	SINGLE STORY	<input checked="" type="checkbox"/>
SITE COVER	65% and below	24%	<input checked="" type="checkbox"/>
PLOT RATIO	1:1 maximum	0.24:1	<input checked="" type="checkbox"/>
SETBACK			
Front	3 meters min.	3 meters	<input checked="" type="checkbox"/>
Rear	4 meters min.	4.5 meters	<input checked="" type="checkbox"/>
Side	1.5 meters min.	3.6 meters	<input checked="" type="checkbox"/>
PRIVATE OPEN SPACE	A minimum area (inclusive of verandahs, patios and terraces) of at least 16 sqm in total, and having dimensions of 4 x 4 meters.	24 m ²	<input checked="" type="checkbox"/>
COMMON OPEN SPACE	A minimum of ten (10%) of the total site area is provided for open space with a minimum dimension of 3m x 3m.	156.5 m ²	<input checked="" type="checkbox"/>
CAR PARKING	1 car space per dwelling	5 bays provided	<input checked="" type="checkbox"/>
	1 car space per two (2) dwellings for visitors	3 visitor carparking spaces	<input checked="" type="checkbox"/>



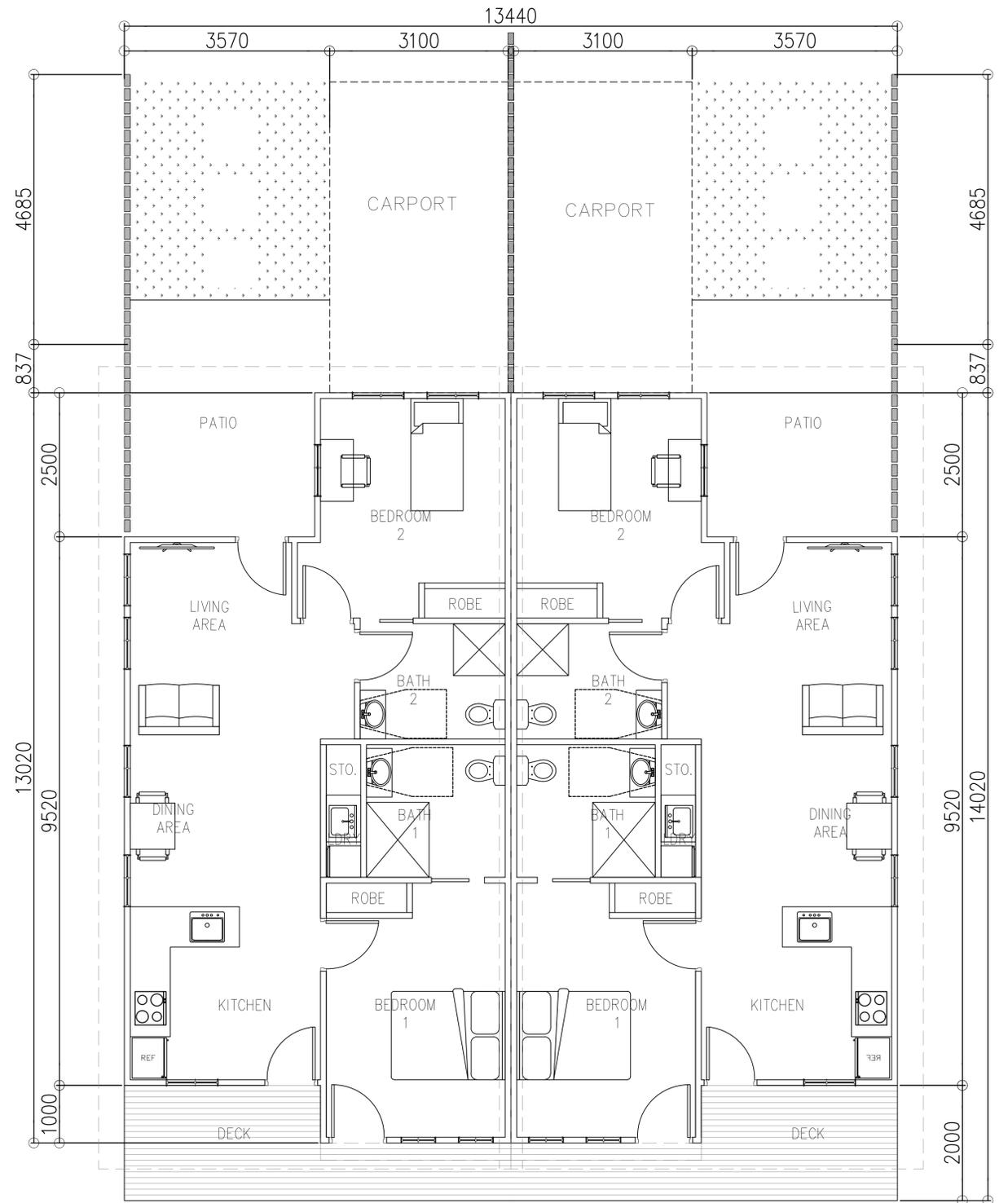
1 PROPOSED SITE PLAN
1:100
SCALE BAR 1:100

<p>Botanica IM PTY LTD</p>	OWNER	LOCATION	DATE:	09-09-2022	SHEET CONTENT	<p>SCALE 1:100</p>	SHEET NO.
	Aspella Vista Pty Ltd	74-76 Elphinstone St., Berserker, Queensland	DRAWING NO.:	00001			1
<p>THIS DRAWING CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF BotanicaIM AND IS LOANED FOR REVIEW ONLY. THE DRAWINGS MAY NOT BE COPIED OR USED FOR ANY OTHER PURPOSE WITHOUT THE WRITTEN CONSENT OF BotanicaIM AND SHALL BE RETURNED ALONG WITH ALL COPIES UPON DEMAND. © BotanicaIM, ALL RIGHTS RESERVED</p>			DRAWN BY:	K.AGUILAR/S.SISON	PROPOSED SITE PLAN	A1 PAPER	
			REVISION NO.:	0005			
			PRIMARY UNIT:	mm-Millimeters			

UNIT NO.	BEDROOMS	INTERNAL AREA	PRIVATE YARD
UNIT 1	2	71.90 m ²	70.68 m ²
UNIT 2	2	71.90 m ²	53.13 m ²
UNIT 3	2	71.90 m ²	71.42 m ²
UNIT 4	2	71.90 m ²	71.42 m ²
UNIT 5	2	71.90 m ²	89.42 m ²



(A-1) UNIT 1 FLOOR PLAN
1:50



(A-2) TYPICAL UNIT FLOOR PLAN (UNIT 2-5)
1:50



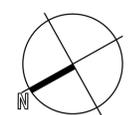
COMPANY
Aspella Vista Pty Ltd

LOCATION
74-76 Elphinstone St., Berserker, Queensland

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DATE: 09-09-2022
DRAWING NO.: 00001
DRAWN BY: K.AGUILAR/S.SISON
REVISION NO.: 0005
PRIMARY UNIT: mm-Millimeters

SHEET CONTENT
GROUND FLOOR PLAN

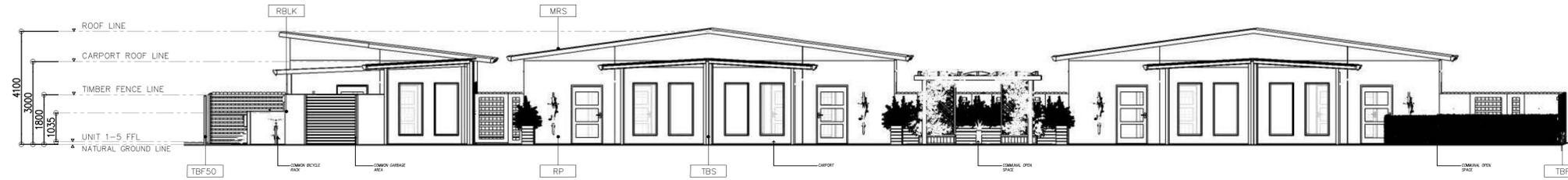


SCALE AS SHOWN

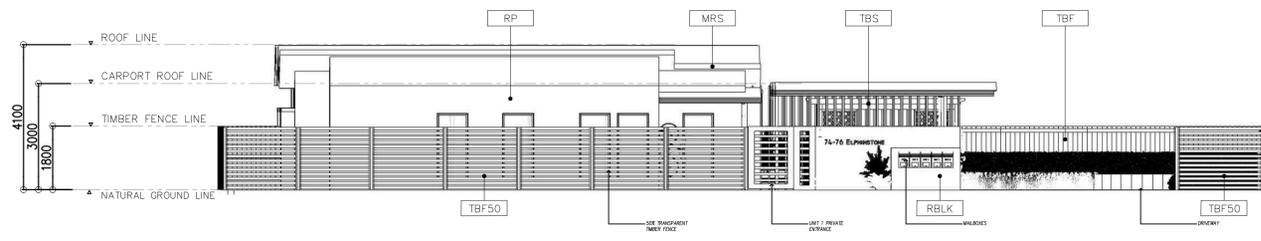
SHEET NO.

2

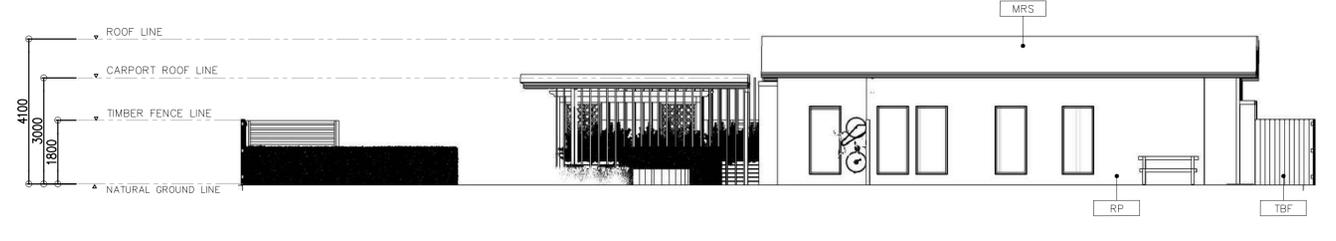
A1 PAPER



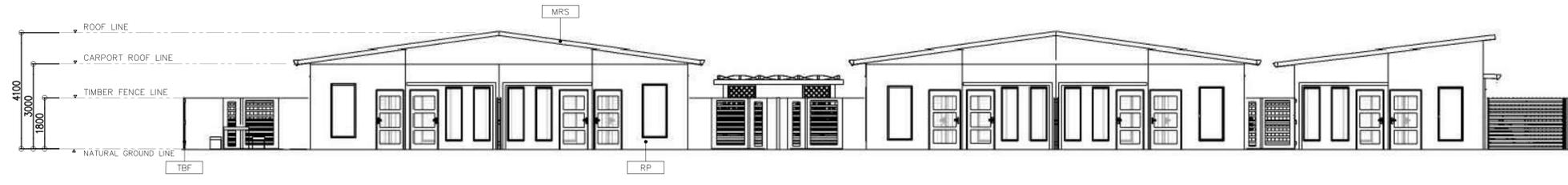
2 ELEVATION 2
1:100



3 ELEVATION 3
1:100

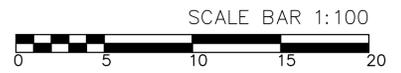


1 ELEVATION 1
1:100



4 ELEVATION 4
1:100

BUILDING MATERIALS	
KEY	MATERIAL
RP	RENDERED PANEL
TBS	TIMBER SCREEN
TBF50	TIMBER FENCE 1800MM HIGH 50% VISIBILITY
MRS	METAL ROOF SHEETING
RBLK	RENDERED BLOCKWORK
TBFAC	ACOUSTIC TIMBER FENCE 2000MM HIGH
TBF	TIMBER FENCE 1800MM HIGH



CLIENT	LOCATION
Aspella Vista Pty Ltd	74-76 Elphinstone St., Berserker, Queensland

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DATE:	09-09-2022
DRAWING NO.:	00001
DRAWN BY:	K.AGUILAR/S.SISON
REVISION NO.:	0005
PRIMARY UNIT:	mm-Millimeters

SHEET CONTENT
SITE ELEVATIONS

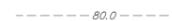
	SHEET NO.
SCALE 1:100	3
	A1 PAPER

APPENDIX

C

OSKA Consulting Group,
Pre Development Catchment Plan
(Ref: OSK6054/P001/B)

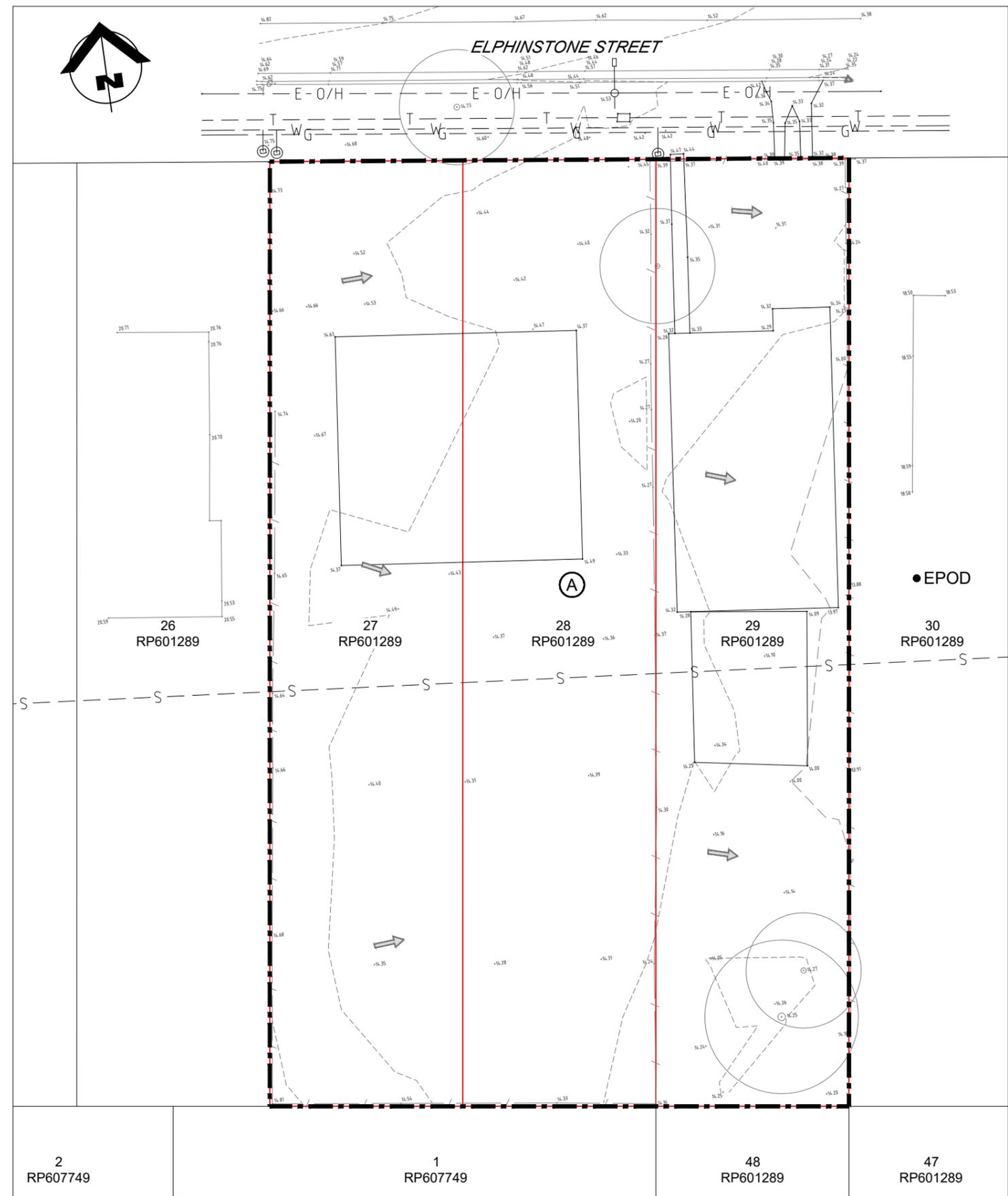
LEGEND

-  STORMWATER CATCHMENT BOUNDARY
-  STORMWATER CATCHMENT I.D.
-  EXISTING SURFACE CONTOURS
-  EPOD
-  FLOW DIRECTION
-  SITE BOUNDARY

STORMWATER CATCHMENT TABLE	
STORMWATER CATCHMENT I.D.	AREA (ha)
A	0.1486
TOTAL	0.1486

EXISTING SERVICES LEGEND

-  EXISTING SEWER MAIN
-  EXISTING WATER MAIN
-  EXISTING STORMWATER PIPE
-  EXISTING TELECOMMUNICATIONS CABLE
-  EXISTING OVERHEAD ELECTRICAL CABLE
-  EXISTING GAS MAIN



CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REPORT ISSUE
NOT FOR CONSTRUCTION

ISSUE No.	DATE	AMENDMENT
B	07-10-22	ISSUED FOR REPORT
A	01-08-22	ISSUED FOR REPORT



CLIENT
BOTANICA IM

PROJECT
PROPOSED RESIDENTIAL DEVELOPMENT
74-76 ELPHINSTONE STREET
BERSERKER, QLD, 4701

DESIGN
BG

DRAWN
BG

APPROVED

TITLE
PRE DEVELOPMENT CATCHMENT PLAN

SCALE
1:125 AT A1
1:250 AT A3



PROJECT NO.
OSK6054

DWG NO. | ISSUE
P001 | B

APPENDIX

D

OSKA Consulting Group,
Post Development Catchment Plan
(Ref: OSK6054/P002/B)

APPENDIX

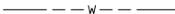
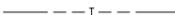
E

OSKA Consulting Group,
Stormwater Management Plan & Details
(Ref: OSK6054/P003/B)

LEGEND

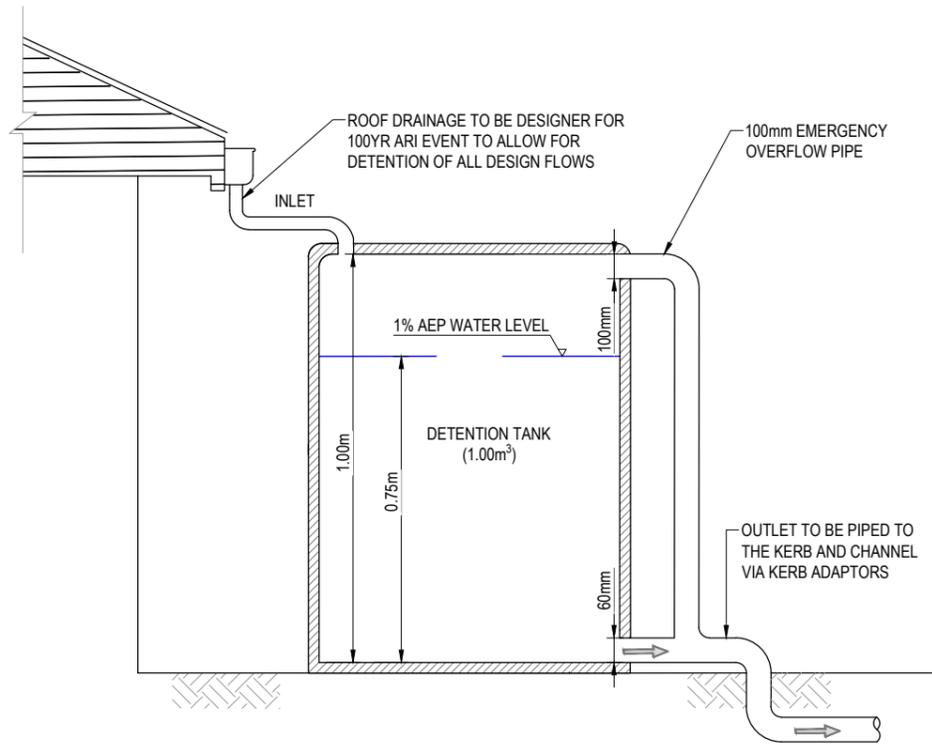
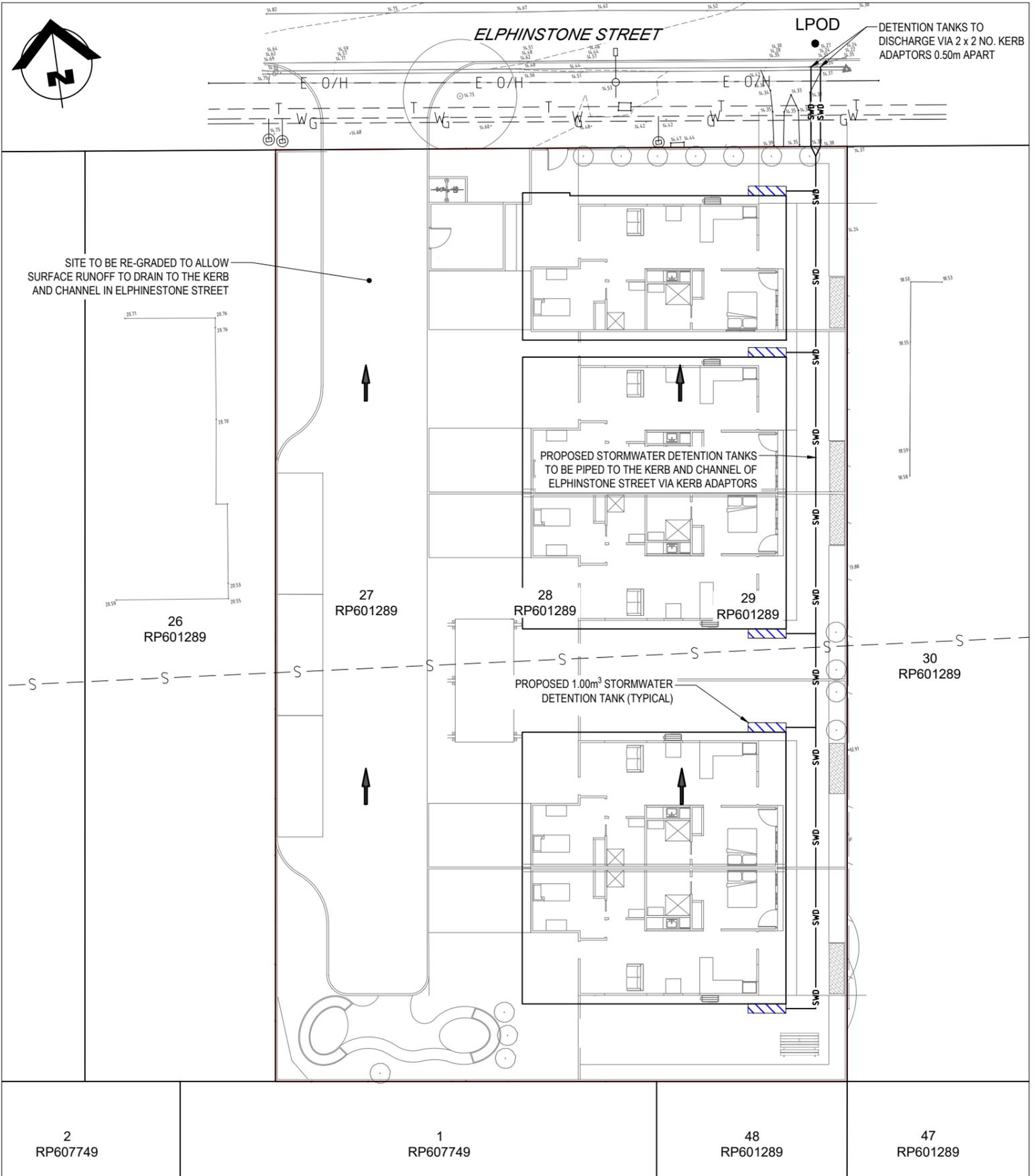
-  EXISTING SURFACE CONTOURS
-  LPOD LAWFUL POINT OF DISCHARGE
-  PROPOSED STORMWATER PIPE
-  PROPOSED FLOW DIRECTION
-  SITE BOUNDARY
-  PROPOSED STORMWATER DETENTION TANK (INDICATIVE LOCATION)

EXISTING SERVICES LEGEND

-  EXISTING SEWER MAIN
-  EXISTING WATER MAIN
-  EXISTING STORMWATER PIPE
-  EXISTING TELECOMMUNICATIONS CABLE
-  EXISTING OVERHEAD ELECTRICAL CABLE
-  EXISTING GAS MAIN

CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

REPORT ISSUE
NOT FOR CONSTRUCTION



PROPOSED STORMWATER DETENTION TANK
TYPICAL SECTION
SCALE: N.T.S

B	07-10-22	ISSUED FOR REPORT			
A	01-08-22	ISSUED FOR REPORT			
		AMENDMENT			



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BOTANICA IM

PROJECT
PROPOSED RESIDENTIAL DEVELOPMENT
74-76 ELPHINSTONE STREET
BERSERKER, QLD, 4701

DESIGN	DRAWN	APPROVED	TITLE
BG	BG		STORMWATER MANAGEMENT PLAN & DETAILS

SCALE
1:125 AT A1
1:250 AT A3

PROJECT NO.	
OSK6054	
DWG NO.	ISSUE
P003	B

APPENDIX

F

OSKA Consulting Group,
Sediment and Erosion Control Plan
(Ref: OSK6054/P004/B);
OSKA Consulting Group,
Sediment and Erosion Control Details
(Ref: OSK6054/P005/B)

SEDIMENT & EROSION CONTROL LEGEND

-  SEDIMENT FENCE
-  LOCATION OF STABILISED ENTRY/EXIT POINT
-  DRAINAGE STRUCTURE PROTECTION
-  PROPOSED STORMWATER PIPE
-  PROPOSED STORMWATER DETENTION TANK (INDICATIVE LOCATION)
-  FLOW ARROW
-  LAWFUL POINT OF DISCHARGE
-  EXISTING SURFACE CONTOURS

EXISTING SERVICES LEGEND

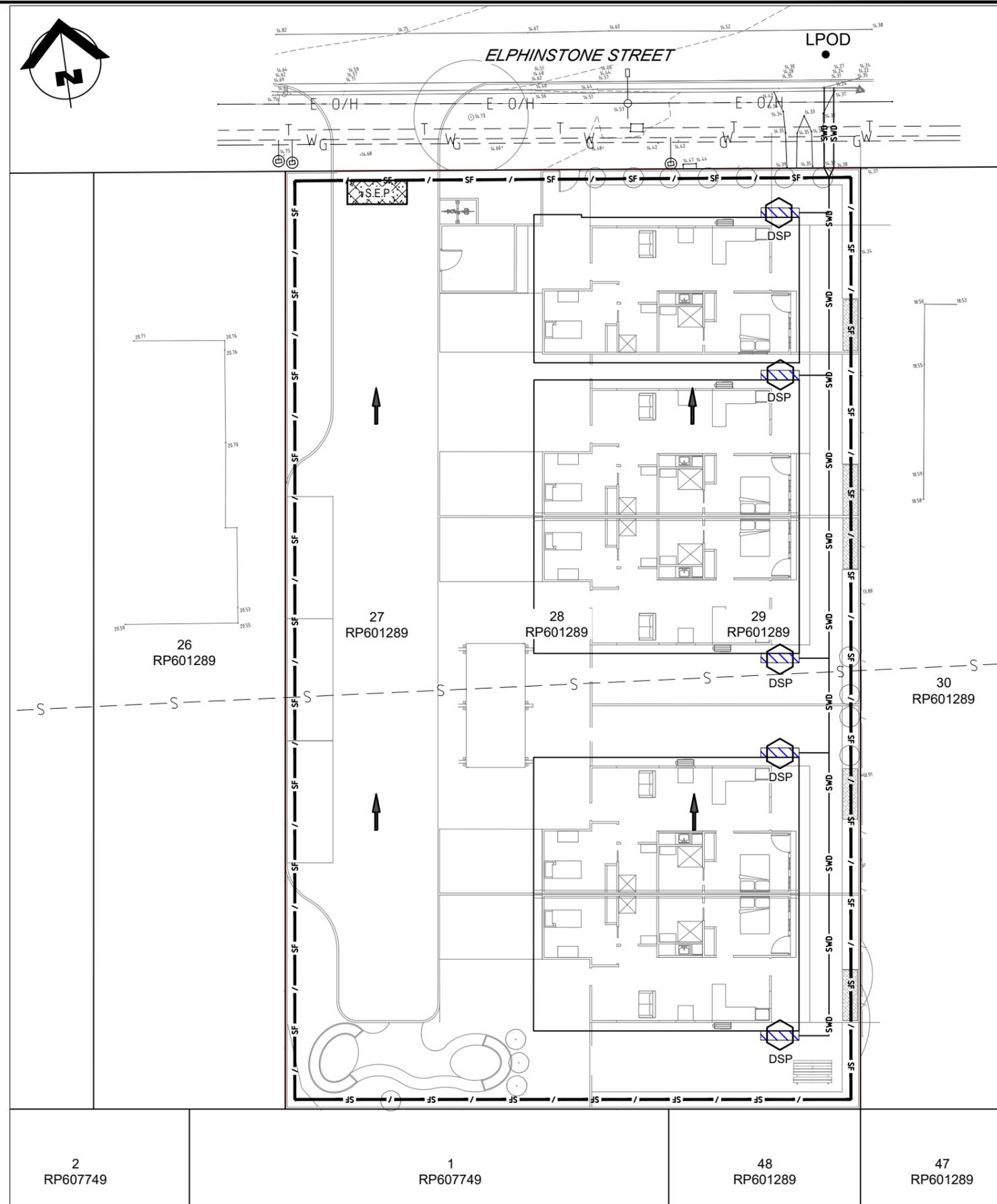
-  EXISTING SEWER MAIN
-  EXISTING WATER MAIN
-  EXISTING STORMWATER PIPE
-  EXISTING TELECOMMUNICATIONS CABLE
-  EXISTING OVERHEAD ELECTRICAL CABLE
-  EXISTING GAS MAIN

SEDIMENT AND EROSION CONTROL NOTES

1. THE PROJECT SEDIMENT AND EROSION CONTROL DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE SITE'S APPROVED STORMWATER MANAGEMENT PLAN.
2. CONSTRUCTION IS TO BE PROGRAMMED TO PROVIDE INSTALLATION OF PERIMETER LANDSCAPING / SURFACE TREATMENTS AS EARLY AS PRACTICAL.
3. THE CONTRACTOR'S WORKS PROGRAM IS TO BE REVIEWED AT THE PRESTART MEETING. ALTERATIONS TO THE PROGRAM MAY BE REQUIRED TO ENSURE SATISFACTORY EROSION AND SEDIMENT CONTROL.
4. SAFETY ISSUES MUST BE CONSIDERED AND MONITORED FOR EACH DEVICE TO THE SATISFACTION OF THE SUPERINTENDENT.
5. SEDIMENT FENCE FILTER FABRIC IS TO BE APPROVED BY THE ENGINEER. FILTER CLOTH AND SHADE CLOTH IS NOT TO BE USED.
6. SEDIMENTATION MANAGEMENT DEVICES SHALL BE INSTALLED PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES AND MAINTAINED AT A SUITABLE LEVEL/ CONDITION THROUGHOUT CONSTRUCTION.
7. SEDIMENT FENCES ARE TO BE CLEANED OUT WHEN CAPACITY IS REDUCED BY 30%.
8. DRAINAGE STRUCTURE PROTECTION IS TO BE CLEANED FOLLOWING EACH SIGNIFICANT RUNOFF PRODUCING STORM.
9. ACCESS TO THE SITE IS TO BE PROVIDED BY THE CONTRACTOR. APPROVAL IS TO BE OBTAINED FROM COUNCIL FOR THE LOCATION OF THE SITE ACCESS POINT AND WASH DOWN AREA WHICH IS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD. ACCESS TO AND FROM THE SITE IS TO BE VIA THE SHAKEDOWN FACILITY ONLY. ALL VEHICLES ARE TO BE WASHED DOWN PRIOR TO LEAVING THE SITE.
10. THE CONTRACTOR SHALL PROVIDE TEMPORARY DRAINAGE CONTROLS TO DIVERT FLOW FROM UNDISTURBED AREAS AROUND DISTURBED AREAS AND DIRECT FLOW FROM DISTURBED AREAS TOWARD CONTROL DEVICES.
11. SEDIMENT TRAP WILL COLLECT SEDIMENT DURING RUN-OFF EVENTS. DEWATERING OF THIS SEDIMENT TRAP CAN ONLY OCCUR WHEN TSS IS <50MG/L AND PH IS BETWEEN 6.5 - 8.5 IN ACCORDANCE WITH IECA GUIDELINES.

CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS

CONCEPT ONLY
IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ADEQUATE SEDIMENT & EROSION CONTROL DURING ALL PHASES OF CONSTRUCTION TO THE SATISFACTION OF BOTH THE SUPERINTENDENT AND COUNCIL.



ISSUE No.	DATE	AMENDMENT
B	07-10-22	ISSUED FOR REPORT
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TITLE
SEDIMENT AND EROSION CONTROL PLAN

SCALE
1:125 AT A1
1:250 AT A3



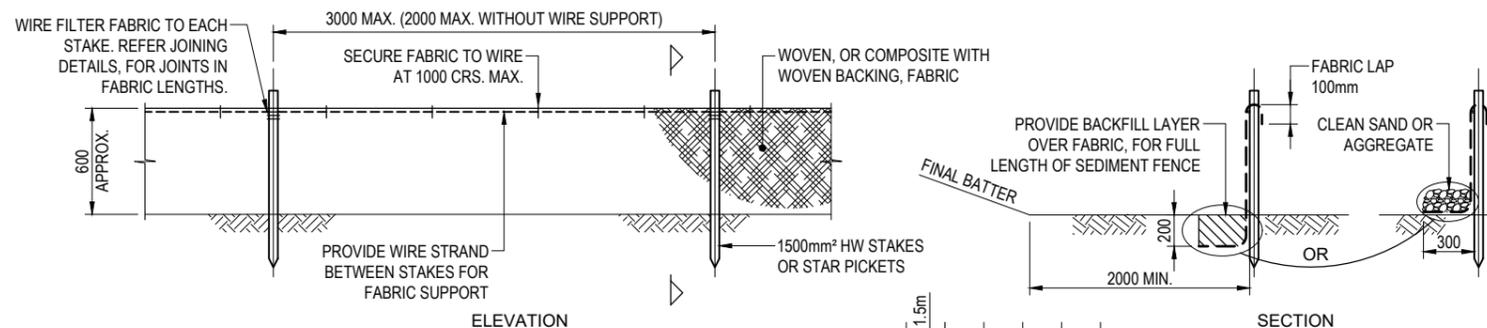
PROJECT NO.
OSK6054

DWG NO.
P004

ISSUE
B

CONCEPT ONLY
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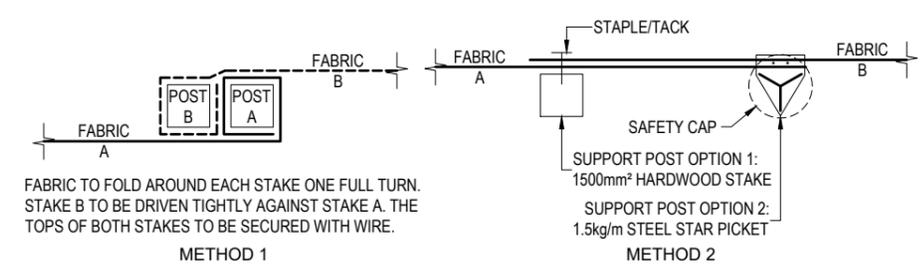
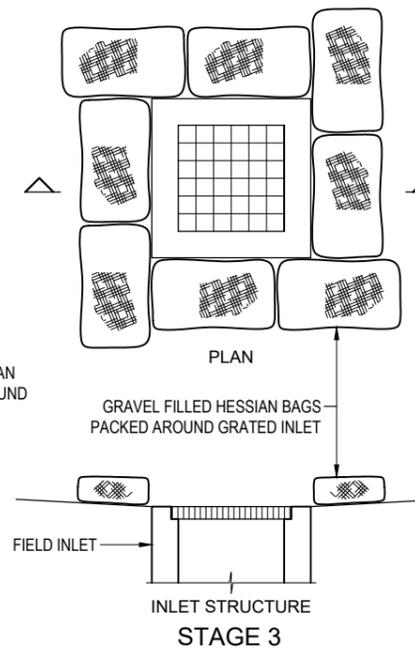
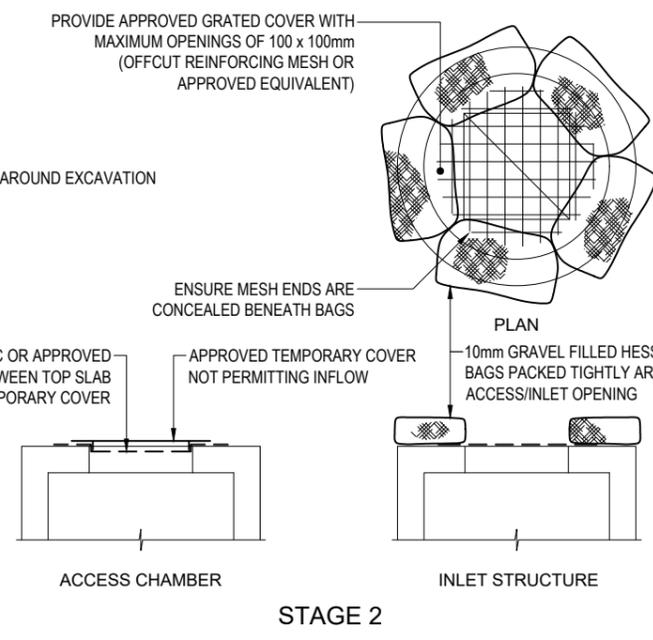
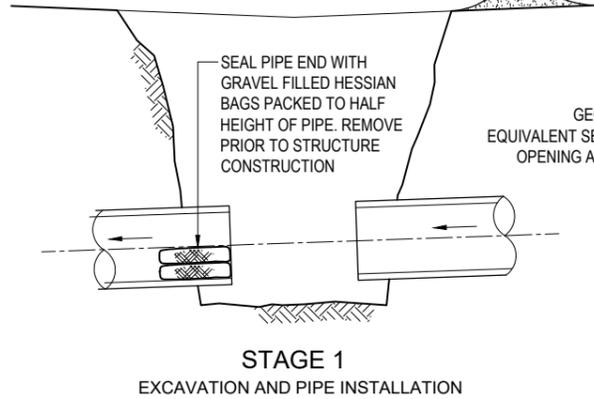
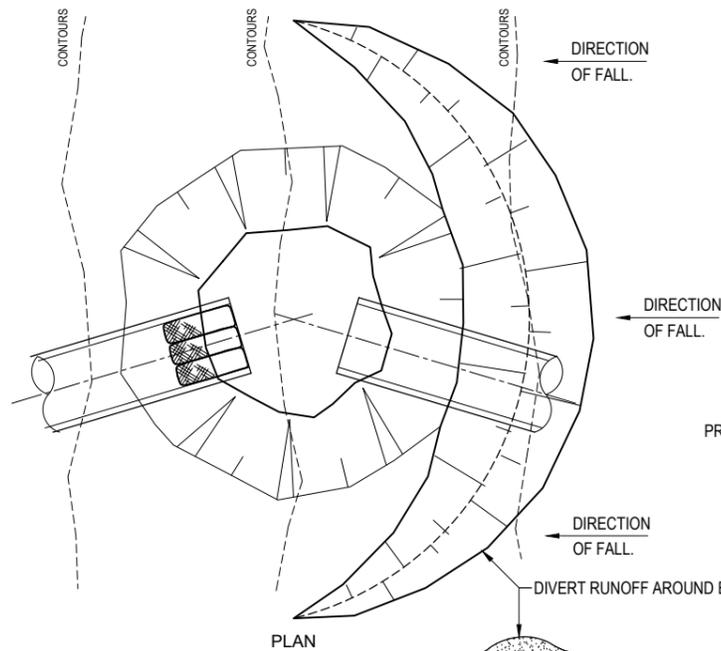
CONTRACTOR TO DETERMINE AND LOCATE ALL EXISTING SERVICES PRIOR TO COMMENCEMENT OF WORKS



NOTE: INSTALL 1.5m (MIN.) DEEP 'RETURNS' AT 20m SPACING (MAX.) ON UPSLOPE SIDE OF FENCELINE (5-10m MAX SPACING IF FENCE ALIGNED AT ANGLE TO CONTOUR). EG:

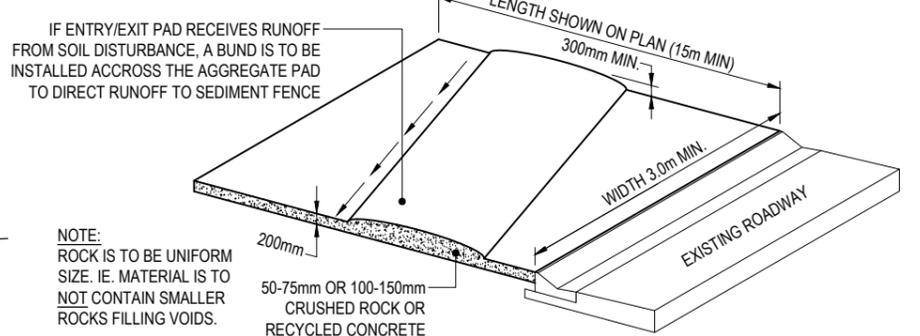
SEDIMENT FENCE DETAILS

N.T.S. — / — SF DENOTES SEDIMENT FENCE. REFER PLAN FOR LOCATION AND EXTENTS.



SEDIMENT FENCE FABRIC JOINING DETAILS

N.T.S.



STABILISED ENTRY/EXIT POINT

N.T.S. OR APPROVED EQUIVALENT

SEP DENOTES STABILISED ENTRY/EXIT POINT, REFER PLAN FOR LOCATIONS.



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TITLE
SEDIMENT AND EROSION CONTROL DETAILS
 SCALE

PROJECT NO.
OSK6054
 DWG NO. ISSUE
 P005 B