

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2021/1239

Date: 13 April 2022



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Engineering Assessment Report

99-101 & 13-105 Hamilton Street, Redlands

Prepared for: Glenn Bliesner Design

Document no: BR210376

Revision no: 1



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Revisions

Revision	Description	Date	Prepared by	Approved by	Signature
1	For DA Application	28/10/21	Peter Kirby	Roshan Khadka	
				 RPEQ:15945 2021.10.28 16:47:27+10'00'	

Review Panel

Division/ office	Revision	Name
Civil / Brisbane, QLD	1	Roshan Khadka
		 RPEQ:15945 2021.10.28 16:47:36+10'00'

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1 Introduction

1.1 Background

ACOR Consultants (QLD) Pty. Ltd. were engaged by Glenn Bliesner Design (Client) to prepare an Engineering Assessment Report for the proposed service station development to be located at 99-101 + 130-105 Hamilton Street, Redlands QLD.

1.2 Scope

The following items will be addressed in this report:

- Lawful point of discharge for the development.
- Concept stormwater quantity management plan for the site.
- Concept stormwater quality management plan for the site.
- Sewer and water capacity assessment for the site.

1.3 Criteria

This report has been compiled based on:

- Existing site survey prepared by Bennett & Francis (Surveyor)
- Proposed site layout plan prepared by Glenn Bliesner Design (Architect)
- Discussions with the Client
- Information obtained from Council's online mapping system.

2 Site Characteristics

2.1 Location and Description

The proposed development is located at 99-101 Hamilton Street, Redlands QLD 4165 over lots described as Lots 135,136,137 and 138 on RP116753 (Site).

The existing area of the Site is 0.2026 hectares.

The Site is fronted by Hamilton Street along its eastern boundary. The adjoining lots surrounding the development are residential lots.



Figure 1 - Existing Site Layout

Source: ©Nearmap 2021

2.2 Watercourses and Topography

Weinam Creek is located approximately 130m Southeast of the development site.

The Site levels range between around 10.5m AHD and 7.4m AHD.

The Site has general falls west towards Hamilton Street.

Refer to Appendix A for the site survey.

2.3 Existing Land Use and Proposed Development

The Site is currently four separate lots with 2 residential dwellings.

The proposed development is a residential unit development.

Refer to **Appendix B** for the proposed development plans.

3 Stormwater Management

3.1.1 Existing Stormwater Infrastructure

There is existing underground stormwater infrastructure within the existing road reserves along the Site frontages.

Refer to **Appendix A** for the site Survey.

3.1.2 Lawful Point of Discharge

The existing stormwater infrastructure within road reserves along the Site frontages is considered as the lawful point of discharge for the development.

3.2 Quantity Management

3.2.1 Hydrology

Hydrological analysis has been undertaken using DRAINS to calculate the peak flow rates from the Site. The hydrological model used in DRAINS is the Extended Rational Method using ARR87 methods.

Rainfall Intensity-Frequency-Distribution (IFD) data for the Site has been obtained from the Bureau of Meteorology (BOM) based on the Site locality coordinates of approximately 27°37'09" (S) latitude and 153°18'27" (E) longitude respectively.

3.2.2 Catchment Summary

Pre- and post-development catchment parameters to be used in DRAINS have been calculated based on information obtained from site survey, aerial image of the Site, information provided to us about the proposed development and methods outlined in QUDM.

Times of concentrations have been calculated based on survey contours and methods outlined in QUDM.

Fraction impervious for pre-development conditions was calculated based on detailed site survey. Post-development fraction impervious was calculated based on the proposed development layout plans.

The Table 1 below provides a summary of the catchment characteristics used in the hydrological modelling.

Table 1 - Pre and Post Development Catchment Parameters

Catchments	Area (ha)	F _i	T _c (min)	Comments
Discharge Location 1				
Pre-development	0.2026	37%	10	
Post-development	0.2026	85%	5	

3.2.3 Peak Discharge Flow Rates

The table below provides a summary of the calculated pre-and post-development peak flow rates off the Site only:

Table 2 - Comparison of Pre and Post Development Peak Discharge Flow Rates

Catchment Name	Peak Discharge m ³ /s: ARI						
	1 years	2 years	5 years	10 years	20 years	50 years	100 years
Discharge Location 1							
(Pre-Development)	0.036	0.049	0.067	0.078	0.093	0.108	0.121
(Post-Development)	0.048	0.065	0.089	0.103	0.122	0.148	0.164
Increase	0.012	0.016	0.022	0.025	0.029	0.040	0.043

Results show that, without mitigation, there is an increase in total post-development peak flow rates off the Site.

3.2.4 Proposed Design

A new stormwater pit and pipe drainage system with an on-site underground detention tank is proposed for the Site. The proposed system will discharge to the existing stormwater infrastructure within Hamilton Street.

Refer to **Appendix C** for the concept stormwater layout sketch for the development.

3.2.4.1 Detention System

An underground detention system under the proposed carpark area is proposed. The following table summarises the proposed detention system characteristics:

Table 3 - Preliminary Underground Detention Tank Details

Underground Detention Tank	
Tank Surface Area (m ²)	50
Tank Depth (m)	1.0
1% AEP Storage Depth (m)	0.93
Detention Volume at 1% AEP Storage Level (m ³)	46.5
Low Level Orifice Control	200mm dia orifice @ base of tank
High Level Weir Control	600 mm wide weir @ 800mm above tank invert
Outlet Pipe Size	Minimum 375mm @ 0.5% minimum

3.2.4.2 Pre- and post-development (with mitigation) peak flow rates comparison

The table below summarises the pre- and post-developed (mitigated) peak flow rates off the Site and into Hamilton Street after mitigation.

Table 4 - Comparison of Pre- and Post-Development (Mitigated) Peak Flow Rates off the Site and into Hamilton Street

Catchment Name	Peak Discharge m ³ /s: ARI						
	1 years	2 years	5 years	10 years	20 years	50 years	100 years
Site (pre-Development)	0.036	0.049	0.067	0.078	0.093	0.108	0.121
Site (post-Development)	0.033	0.041	0.053	0.059	0.067	0.096	0.120
Increase	-0.003	-0.008	-0.014	-0.019	-0.026	-0.012	-0.001

Results show that, with mitigation, there is no increase in post-development flow rates off the Site and into Hamilton Street.

3.3 Quality Management

3.3.1 Operational Phase

3.3.1.1 Water Quality Objectives

The following two documents specify the assessment benchmarks and the target objectives for the development:

- The Queensland State Planning Policy; and
- Brisbane City Council City Plan.

The identified relevant thresholds that trigger the required target objectives, specified in the above-mentioned documents, are as follow:

- Material Change of Use or Operational works for an urban purpose that involves disturbing a land area 2500 m² or greater in size (SPP);

The proposed development area is 2026m². Therefore, the performance outcomes that achieve the required water quality objectives, as specified in the above-mentioned documents, are not required.

3.3.2 Construction Phase

3.3.2.1 Water Quality Objectives

The following list summarises the required construction phase water quality objectives for the development:

- Control measures to be put in place to protect downstream properties from nuisance flows.
- Maximum of 50mg/L of total suspended solids present in run-off discharged from the Site during the construction stage, and a pH between 6.5 and 8.5.
- Provide adequate erosion and sediment control measures.

3.3.2.2 Reference and Guidelines

Erosion and sediment control management for the development should be in accordance with the International Erosion Control Association (IECA) Best Management Practices (2008), the Institute of Engineers (QLD) 'Sediment and Erosion Control Guidelines' and Council requirements.

All erosion and sediment control devices used during and after construction is to be in line with current best management practices and all practical measures applicable to the site. Erosion and Sediment Control Measures should include, but not be limited to, details within the Erosion and Sediment Control Plan Drawings to be provided at detailed design stage.

As per the Environmental Protection Act (EPA) 1994 all personnel must comply with the general environmental controls under Sections 319 and 320, provided as follows:

- Section 319 of the EPA states that all persons involved in the project, from design to construction, are to act in accordance with the 'general environmental duty'. This requires all reasonable and practicable measures to be adopted to prevent or minimise environmental harm. Consequently, any erosion and sediment control devices proposed or implemented on site must represent current best management practices and all practical measures applicable to the site.
- In addition, Section 320 of the EPA, all personnel have a legally binding duty to notify their employer, their Local Regulatory Authority and the Environmental Protection Agency (QLD) should they become aware of a potential or actual incident of environmental harm. The principal contractor should therefore be aware of their responsibility to ensure all persons on site are aware of their environmental duties.

3.3.2.3 Responsibility

In addition to the above, it is the responsibility of the contractor to put in place all the erosion and sediment control measures on site until all disturbed areas are reinstated including maintenance of such measures.

The contractor is, at all times, responsible for the erosion and sediment control measures to ensure minimal environmental harm and compliance with Council's standards.

3.3.2.4 Proposed Erosion & Sediment Control Measures

During the construction phase of the development, an Erosion and Sediment Control Program will be implemented to minimise water quality impacts.

This Program will be developed by the Contractor that is engaged to design and construct plan and, will hence, not be available until closer to the start of construction.

Details of the required construction phase sediment and erosions control measures will be provided on the engineering drawings (detailed design phase) and shall be in accordance with the SPP 2017. However, the contractor shall be responsible for the preparation and implementation of an Erosion and Sediment Control Program and meeting the required minimum construction phase water quality objectives.

The information below is provided to identify possible controls and procedures, that could be adopted to mitigate erosion and sediment impacts, including who is responsible for them, and is recommended to be incorporated into the Erosion and Sediment Control Program.

3.3.2.5 Pre Construction

- Establish a single stabilised entry/exit point for each stage of construction. This point should also include a vehicle shakedown device to mitigate the transportation of dust and dirt.
- Sediment fences are to be placed along the low side of the site to slow flows, reduce scour and capture some sediment runoff.
- Sediment fences are to be constructed at the base of fill embankments.
- Divert up-slope water around the work site and appropriately stabilise any drainage channels.
- Areas for plant and construction material storage are to be designated along with associated diversion drains and spillage holding ponds.
- Diversion banks are to be created at the upstream boundary of construction activities to ensure upstream runoff is diverted around any areas to be exposed. Catch drains are to be created at the downstream boundary of construction activities.
- Construction of temporary sediment basins where required.
- Site personnel are to be educated to the sediment and erosion control measures implemented on site.

3.3.2.6 During Construction

- Progressive stabilization of filled areas and fill batters.
- Construction activities are to be confined to the necessary construction areas.
- The provision of a construction entry/exit to prevent the tracking of debris from tyres of vehicles onto public roads and to limit the movement of construction equipment.
- The topsoil stockpile location will be nominated to coincide with areas previously disturbed. A sediment fence is to be constructed around the bottom of the stockpile to trap sediment. A diversion drain is to be installed upstream of the stockpile if required.
- Roof downpipes should be installed as soon as practicable after the roof is constructed.

- Transport loads that are subject to loss through wind or spillage shall be covered or sealed to prevent entry of pollutants to the stormwater system.
- Regular inspection and maintenance of slit fences, sediment basins and other erosion control measures. Following rainfall events greater than 50mm inspection of erosion control measures and removal of collected material should be undertaken. Replacement of any damaged equipment should be performed immediately.

3.3.2.7 Post Construction

- The Contractor/ Developer will be responsible for the maintenance of erosion and sediment control devices from the possession of the site until stabilisation has occurred to the satisfaction of the superintendent and Principal.
- The Erosion and Sediment Control Management Plans should be provided to all people involved with the site, including sub-contractors, private certifiers, body corporates and regulators.

4 Sewer and Water

There is existing sewer and water infrastructure located near the proposed development site. As per information available from Council's online mapping, the nearest infrastructure is:

- A 100mm AC water main within the verge of Hamilton Street
- A 150mm uPVC sewer gravity main within the adjoining neighbouring properties along the western boundary

There are two existing sewer property connections currently servicing the Site. During detailed design, additional coordination with adjoining properties and Council will need to be undertaken to confirm the location of a proposed new connection or alternatively, continue to use either one or both of the existing connections.

Coordination with Redland City Council has been undertaken to confirm that the existing sewer and water infrastructure has sufficient capacity for the proposed development. Refer to **Appendix D** for the sewer and water assessment letter received by council.

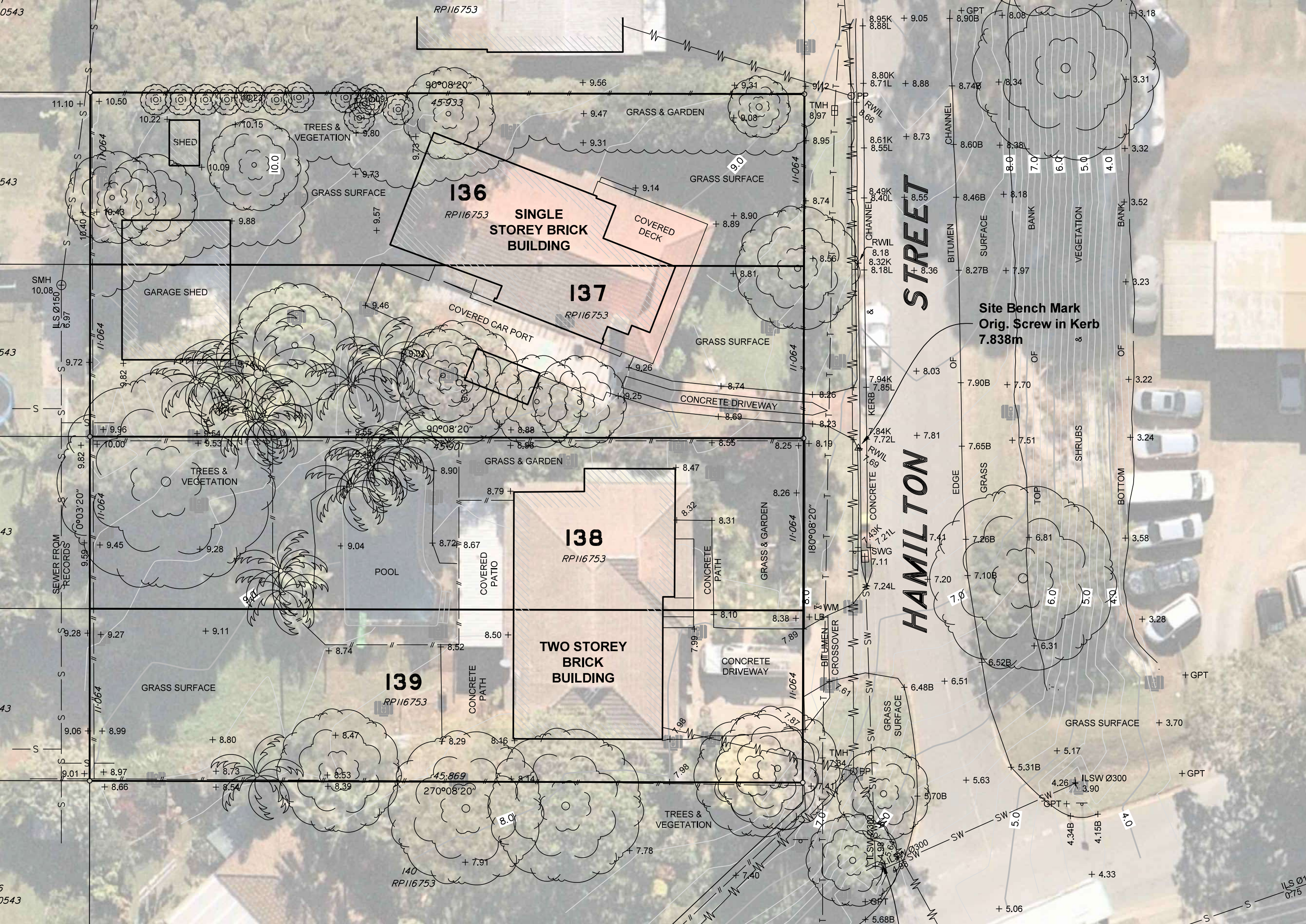
5 Conclusion

A stormwater management plan has been prepared to manage stormwater quantity and quality for the development.

An on-site underground detention tank is proposed for the Site. No stormwater quality devices are proposed for the development.

Council has confirmed sufficient capacity within the existing sewer and water infrastructure near the Site to service the proposed development. During detailed design, additional coordination with adjoining properties and Council will need to be undertaken to confirm the location of a proposed new connection or alternatively, continue to use either one or both of the existing connections.

Appendix A Site Survey



Appendix B Proposed Development Plan

SITE INFORMATION

99-101
LOT 136RP116753
LOT 137RP116753

1014.25m²

103-105
LOT 138RP116753
LOT 139RP116753

1011.72m²

TOTAL COMBINED SITE AREA
2,025.97m²

LANDSCAPED AREA (ON GROUND)
500m²

DEEP PLANTING
225m2 / 11% SITE AREA

24 TOTAL DWELLINGS OVER 5 LEVELS

10x 4 BED DWELLINGS
9x 3 BED DWELLINGS
5x 2 BED DWELLINGS

INCLUSIVE OF
2x4 BED DWELLINGS ASSESSED AS SDA
FULLY ACCESSIBLE ACCOMODATION
LOCATED ON GROUND FLOOR

22 DWELLINGS SDA ENHANCED
LIVABILITY UNITS

ALL DWELLINGS TO BE DESIGNED IN
ALIGNMENT WITH SDA ENHANCED
LIVABILITY DESIGN GUIDELINES & LHA
GOLD STANDARD.

PARKING
SITE LOCATED WITHIN 300m OF
HAMILTON ST / PITT ST BUS STOP WITH
GREATER THAN 10 SERVICES PER DAY

SITE VISITORS PARKING
GROUND FLOOR 3 DEDICATED
VISITORS PARKS INCLUDE 1 DDA
VISITOR PARK

BASEMENT SECURE PARKING
46 PARKS TOTAL

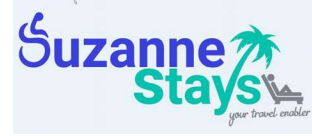
24 RESIDENTS BICYCLES IN BASEMENT

6 FLOOR MOUNTED VISITORS BICYCLES
ON GROUND LEVEL



GLENN BLIESNER DESIGN

OPEN BUILDING DESIGN QLD
LIC 1269277
20 RAINBOW ST, SANDGATE QLD 4017
E. GLENNBLIESNER@GMAIL.COM
M: 0401619444



No.	DES	DTE
A	CONSULTANT PRELIM REVIEW	13/08/21
B	CONSULTANT COORDINATION	15/10/21

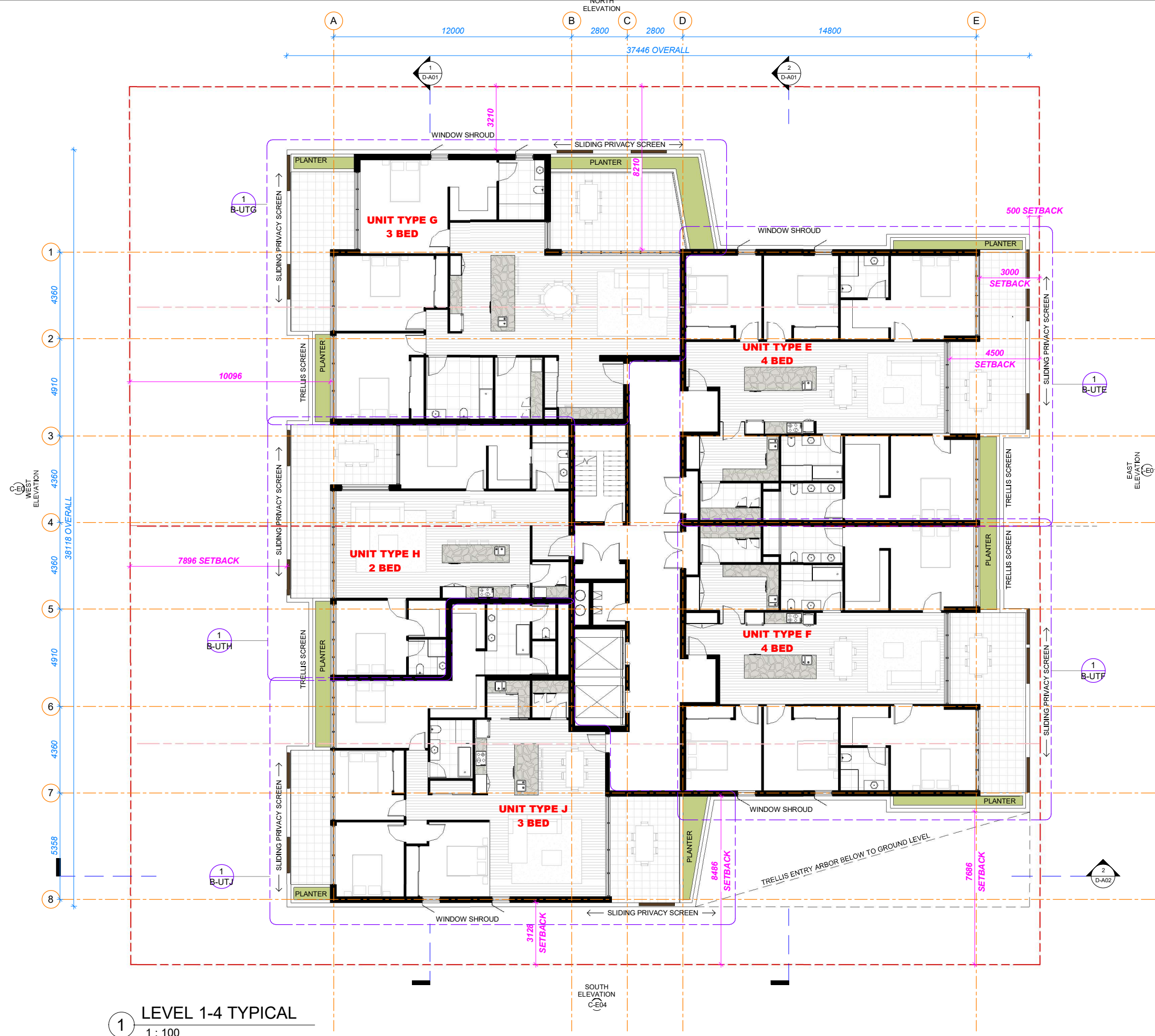
200901
99-101 + 103-105
HAMILTON ST REDLAND
BAY



NUMBER
A-A10
NAME
SITE PLAN

SCALE(A1)
1 : 150

APPROVED	CHECKED
GB	GB
DATE	ISSUE
15/10/21	B



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A	CONSULTANT PRELIM REVIEW	13/08/21
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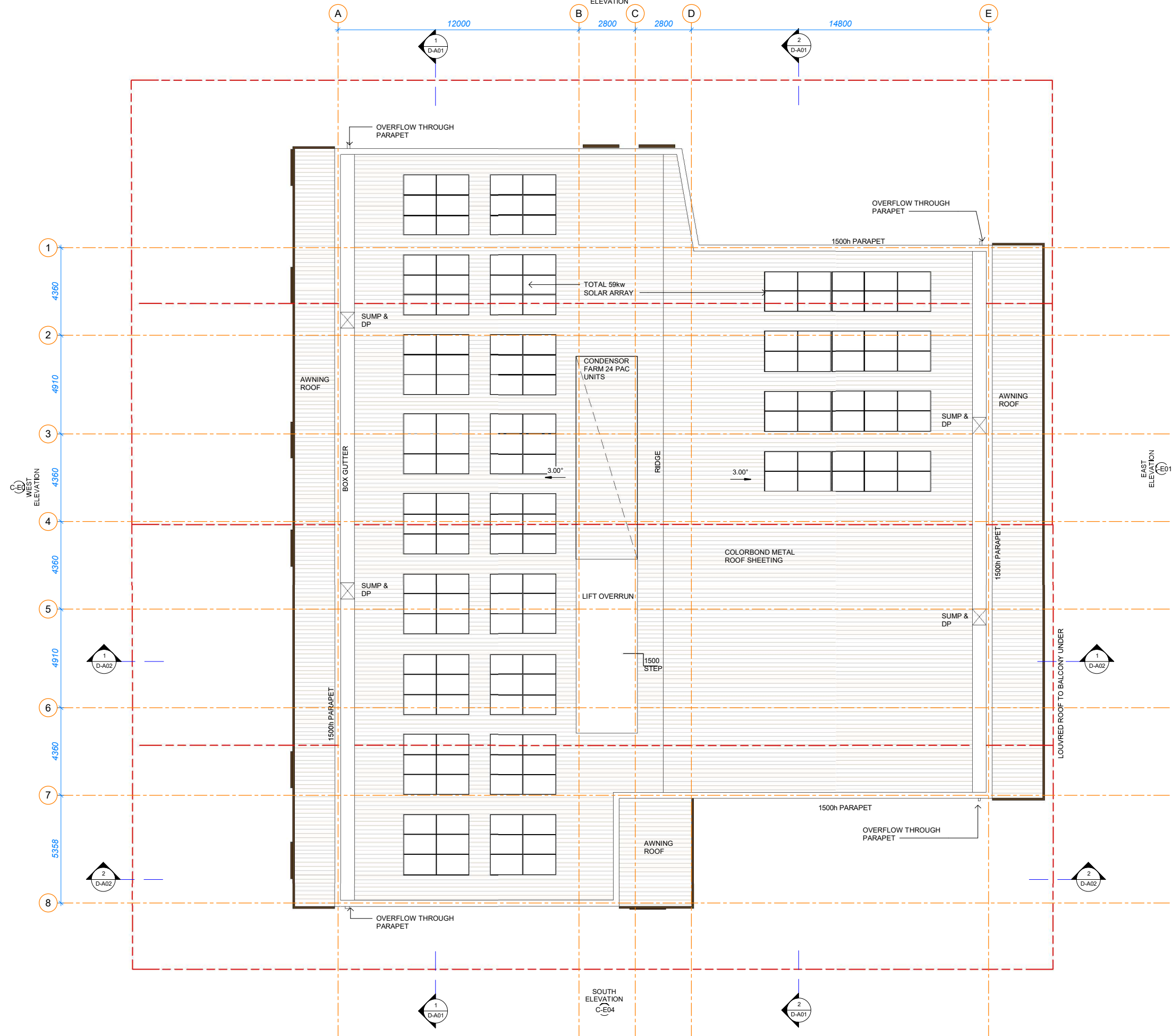
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99-101 + 103-105
HAMILTON ST REDLAND
BAY



NUMBER
B-L01
NAME
LEVEL 01-04 TYPICAL PLAN

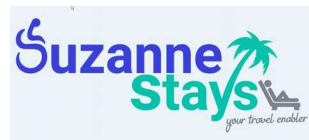
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GB	GB
DATE	ISSUE
15/10/21	B



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No.	DES	DTE
A	CONSULTANT PRELIM REVIEW	13/08/21
B	CONSULTANT COORDINATION	15/10/21

200901
99-101 + 103-105
HAMILTON ST REDLAND
BAY



NUMBER
B-L05
NAME
ROOF PLAN

SCALE(A1)
1 : 100

APPROVED	CHECKED
GB	GB
DATE	ISSUE
15/10/21	B

Appendix C Concept Stormwater Layout Sketch

SITE INFORMATION

99-101
LOT 136RP116753
LOT 137RP116753

1014.25m²

103-105
LOT 138RP116753
LOT 139RP116753

1011.72m²

TOTAL COMBINED SITE AREA
2,025.97m²

LANDSCAPED AREA (ON GROUND)
500m²

DEEP PLANTING
225m2 / 11% SITE AREA

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10x 4 BED DWELLINGS
9x 3 BED DWELLINGS
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2x4 BED DWELLINGS ASSESSED AS SDA
FULLY ACCESSIBLE ACCOMODATION
LOCATED ON GROUND FLOOR

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LIVABILITY UNITS

ALL DWELLINGS TO BE DESIGNED IN
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SITE LOCATED WITHIN 300m OF
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GROUND FLOOR 3 DEDICATED
VISITORS PARKS INCLUDE 1 DDA
VISITOR PARK

BASEMENT SECURE PARKING
46 PARKS TOTAL

24 RESIDENTS BICYCLES IN BASEMENT

6 FLOOR MOUNTED VISITORS BICYCLES
ON GROUND LEVEL



NOTE:
Design information shown as indicative only
to support DA application. Proposed Concept
design will need to be confirmed during full
detailed design following DA approval.



PROJECT NUMBER: BR210376

DATE: 28.10.2021

MARKUP: CONCEPT STORMWATER LAYOUT SKETCH

No.	DES	DTE
A	CONSULTANT PRELIM REVIEW	13/08/21
B	CONSULTANT COORDINATION	15/10/21

200901

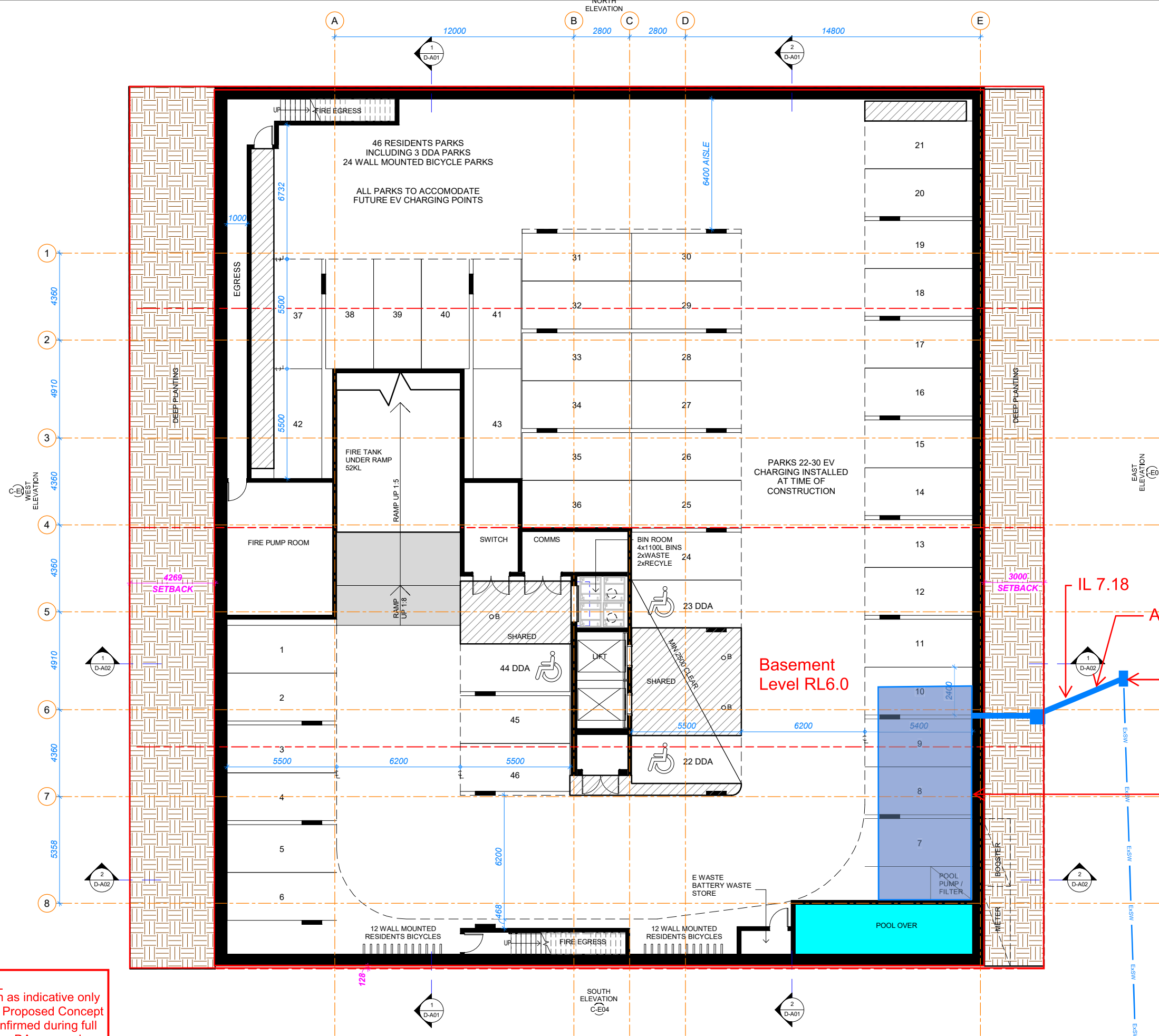
99-101 + 103-105
HAMILTON ST REDLAND
BAY



NUMBER
A-A10
NAME
SITE PLAN

SCALE(A1)
1 : 150

APPROVED	CHECKED
GB	GB
DATE	ISSUE
15/10/21	B



NOTE:
Design information shown as indicative only to support DA application. Proposed Concept design will need to be confirmed during full detailed design following DA approval.

PROJECT NUMBER: BR210376
DATE: 28.10.2021
MARKUP: CONCEPT STORMWATER LAYOUT SKETCH

No.	DES	DTE
A	CONSULTANT PRELIM REVIEW	13/08/21
B	CONSULTANT COORDINATION	15/10/21

200901
99-101 + 103-105
HAMILTON ST REDLAND BAY



NUMBER
B-B01
NAME
BASEMENT FLOOR PLAN

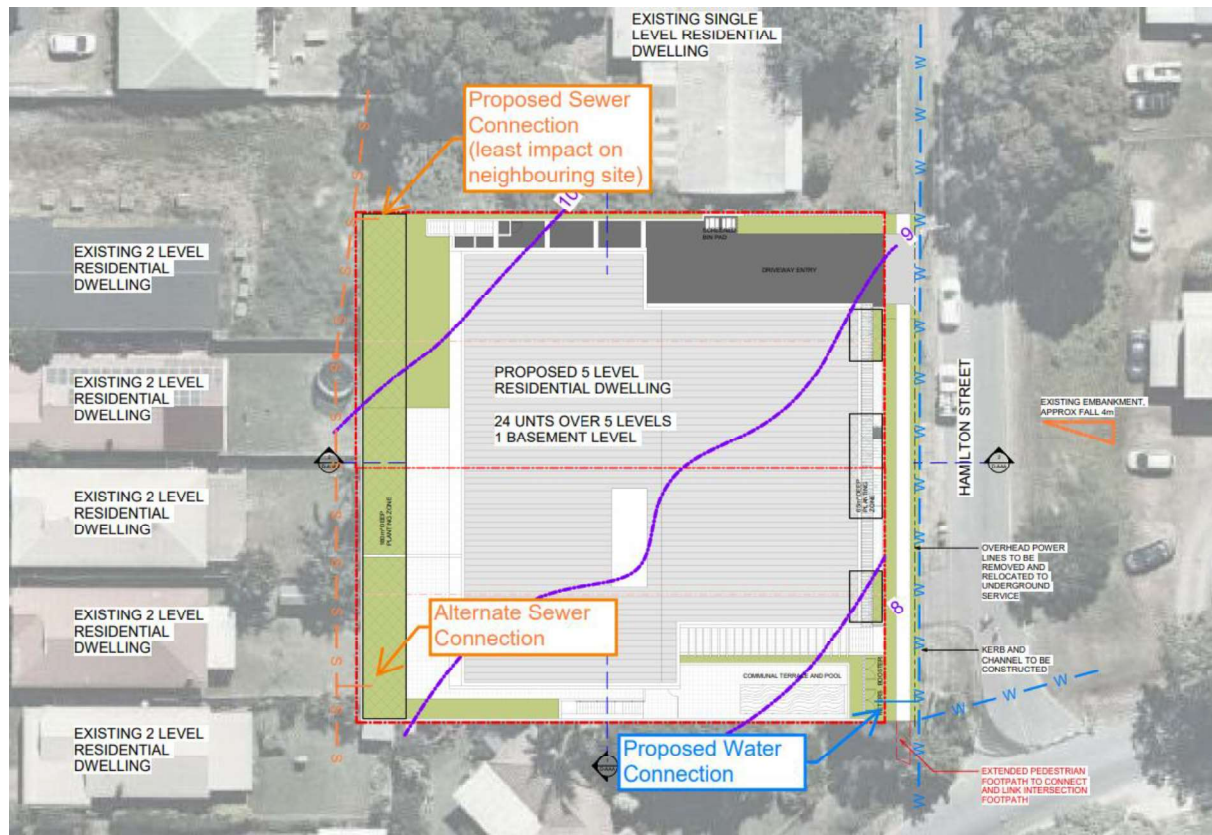
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APPROVED	CHECKED
GB	GB
DATE	ISSUE
15/10/21	B

Appendix D Redland council Sewer and Water Capacity Assessment

Development Application: 99-105 Hamilton St Redlands

Water Capacity Assessment



For service standards, the designer is directed to RCC's Customer Service Standard:

https://www.redland.qld.gov.au/info/20156/water_and_sewerage/756/about_redland_water

RCC cannot guarantee water pressures and flows in excess of its published service standards. The information provided is based on the best available information at the time of publication and is subject to variation over time.

Network models are verified with limited data and conditions in the field may vary from modelling assumptions.

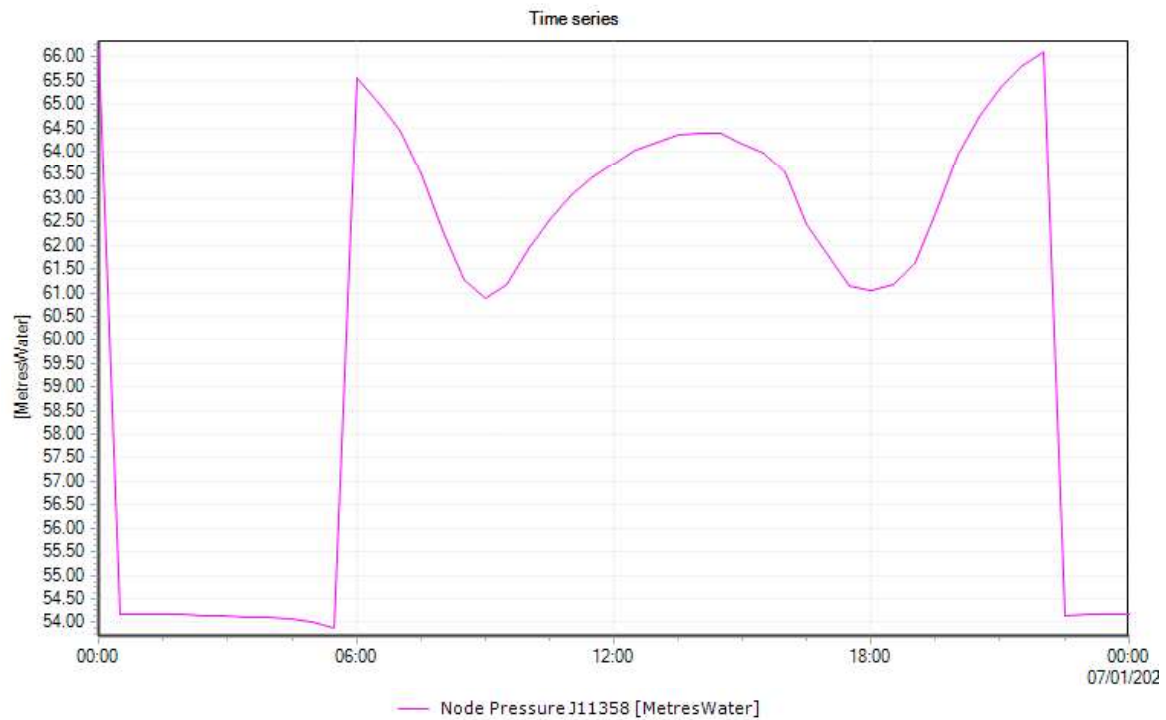
Hydraulic values shown in Q-H curves below are provided by Q-H function in the MikeUrban 2020 + model.

No site specific field testing has been conducted in preparation of this information.

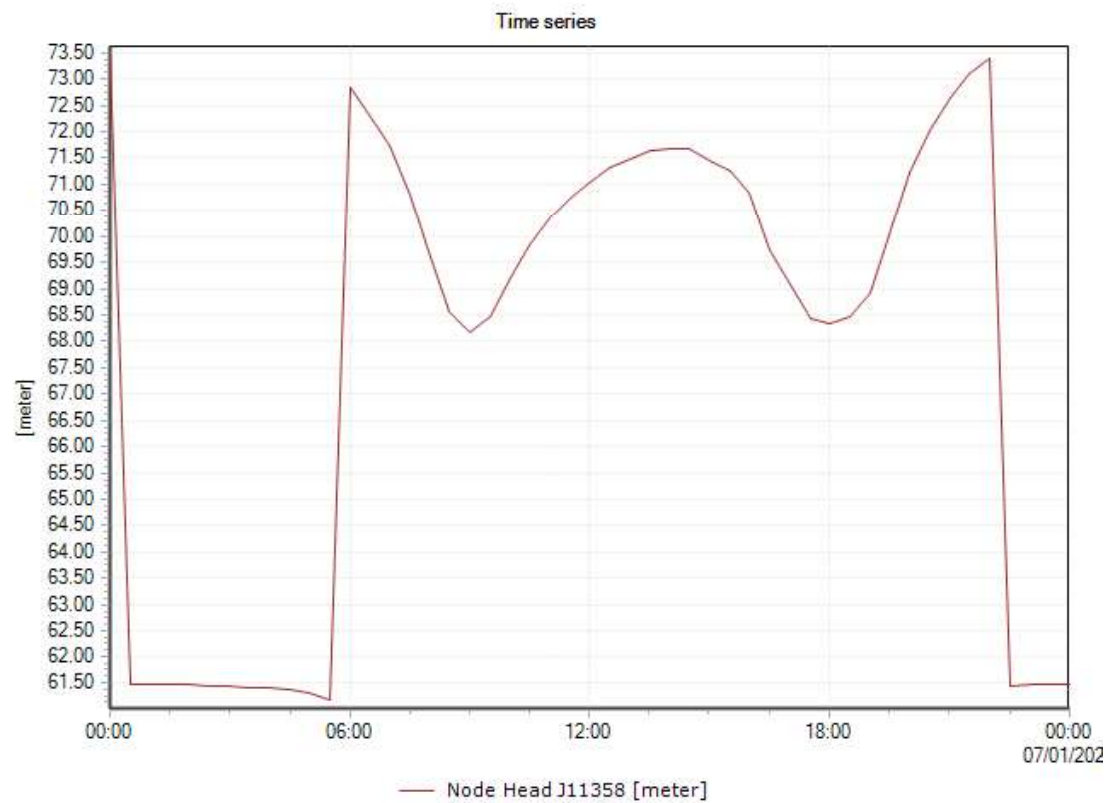
Field investigations and inspections should be undertaken to satisfy the user that the data is suitable for its intended purpose. Users relying on hydraulic modelling information do so at their own risk.

Current Scenario

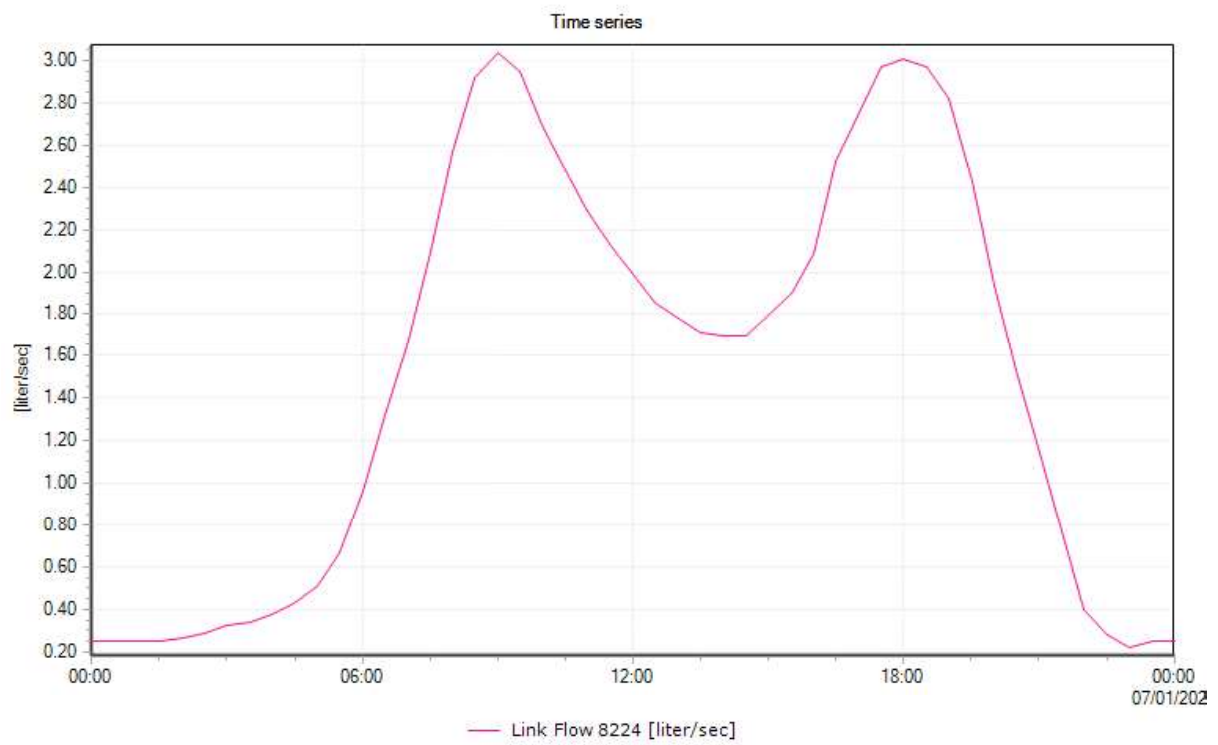
Pressure



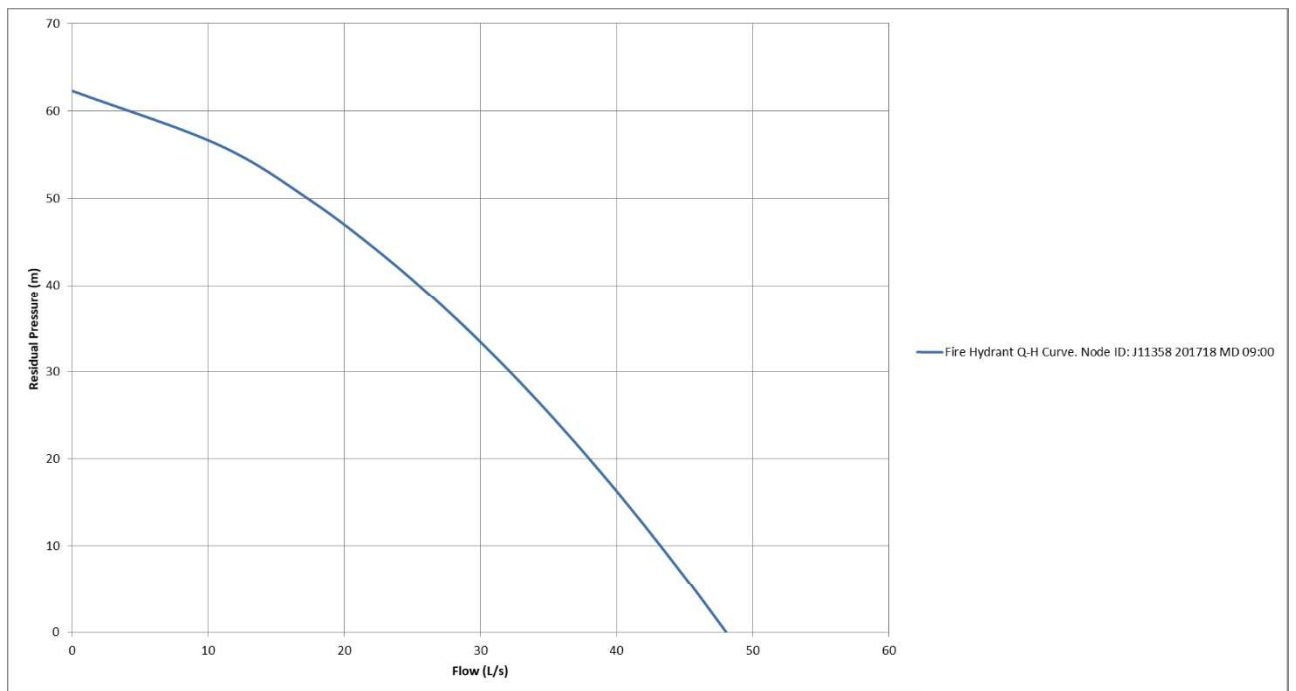
Head



Pipe flow

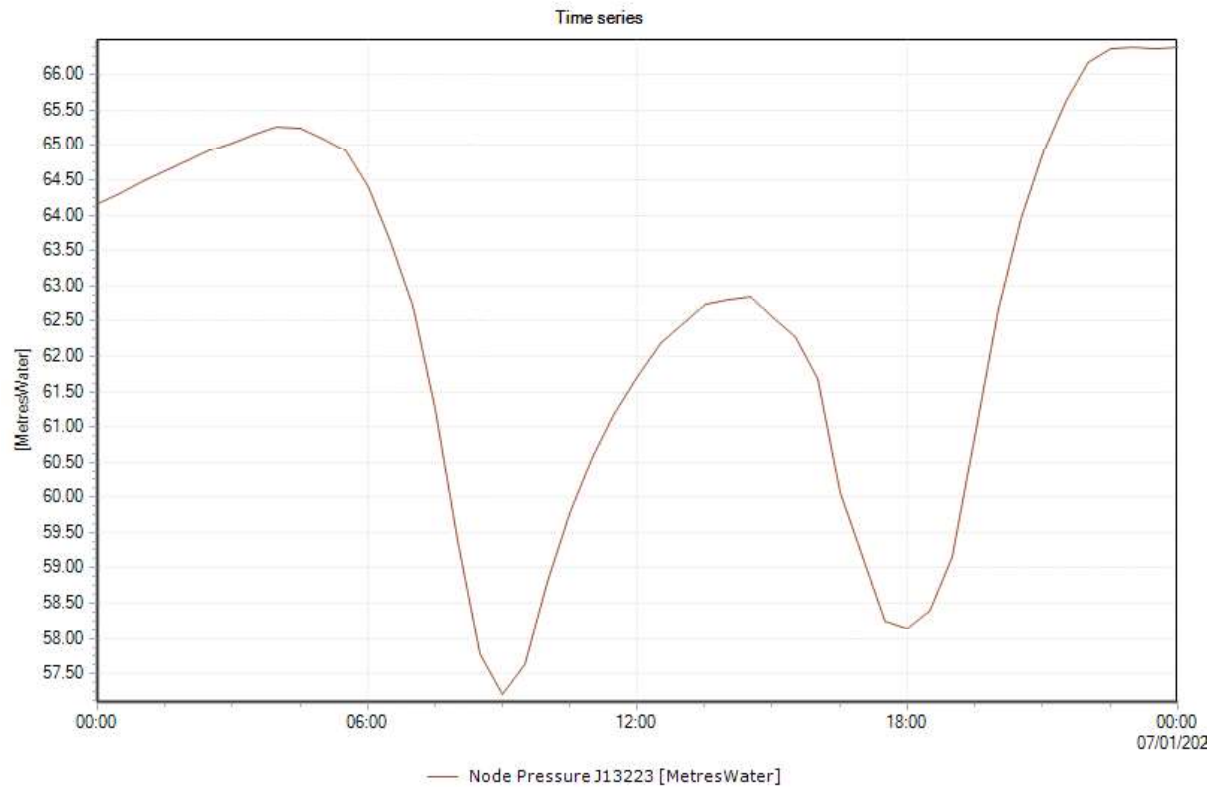


Fireflow

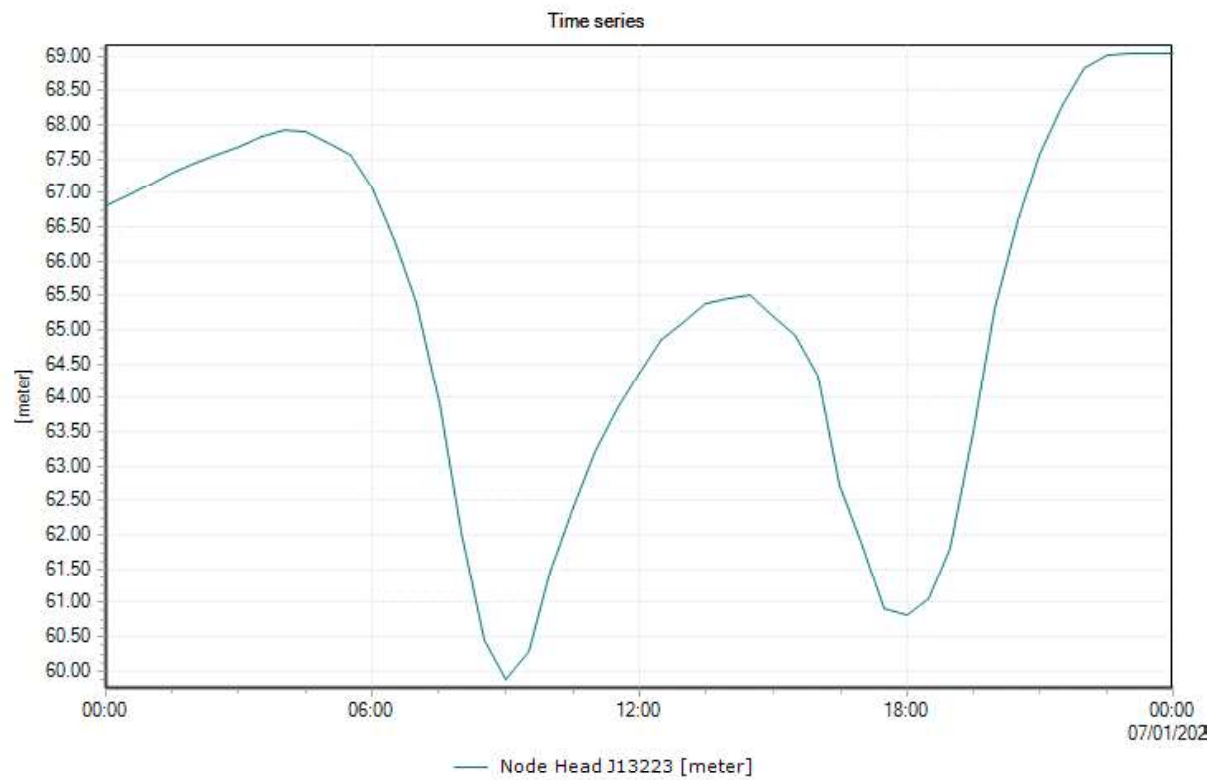


Ultimate Scenario

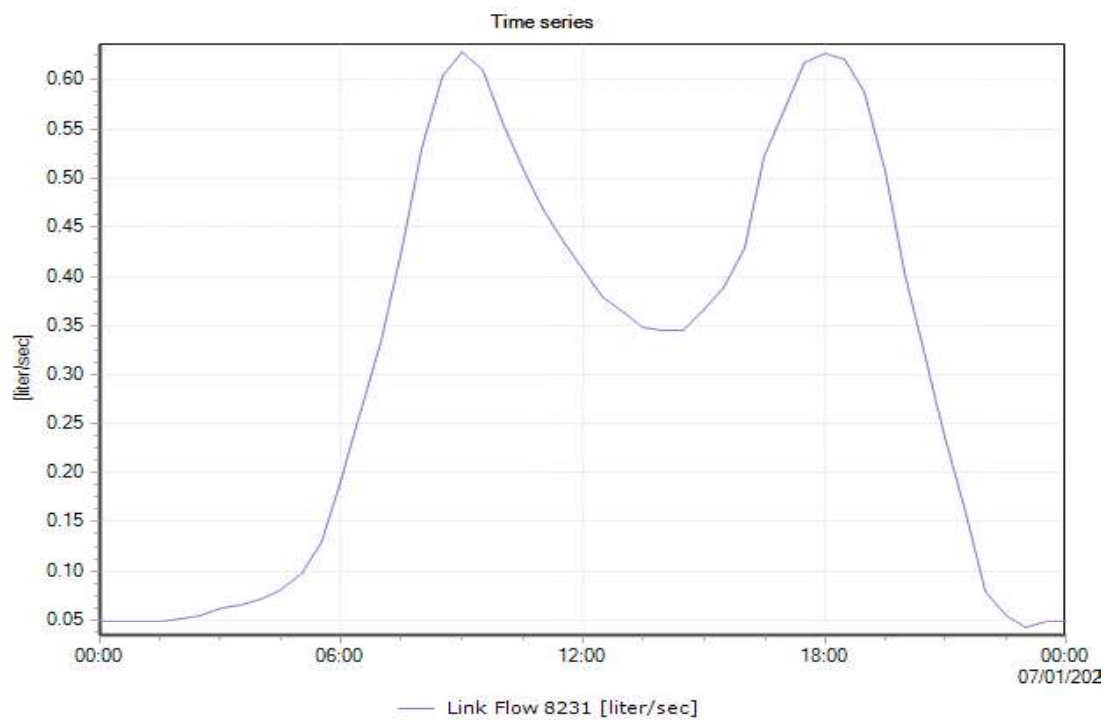
Pressure



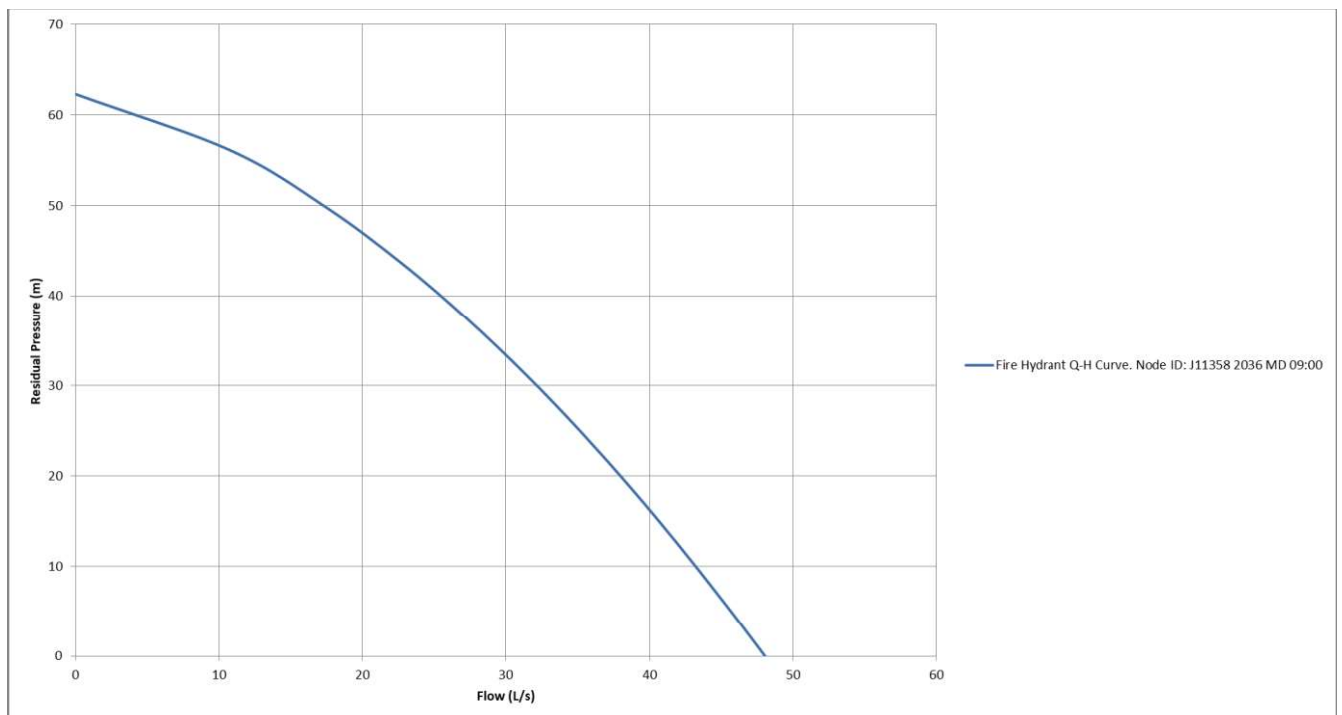
Head



Pipe flow



Fireflow



We can allow the proposed development to proceed without imposing any condition for water augmentations.

Sewer Capacity Assessment

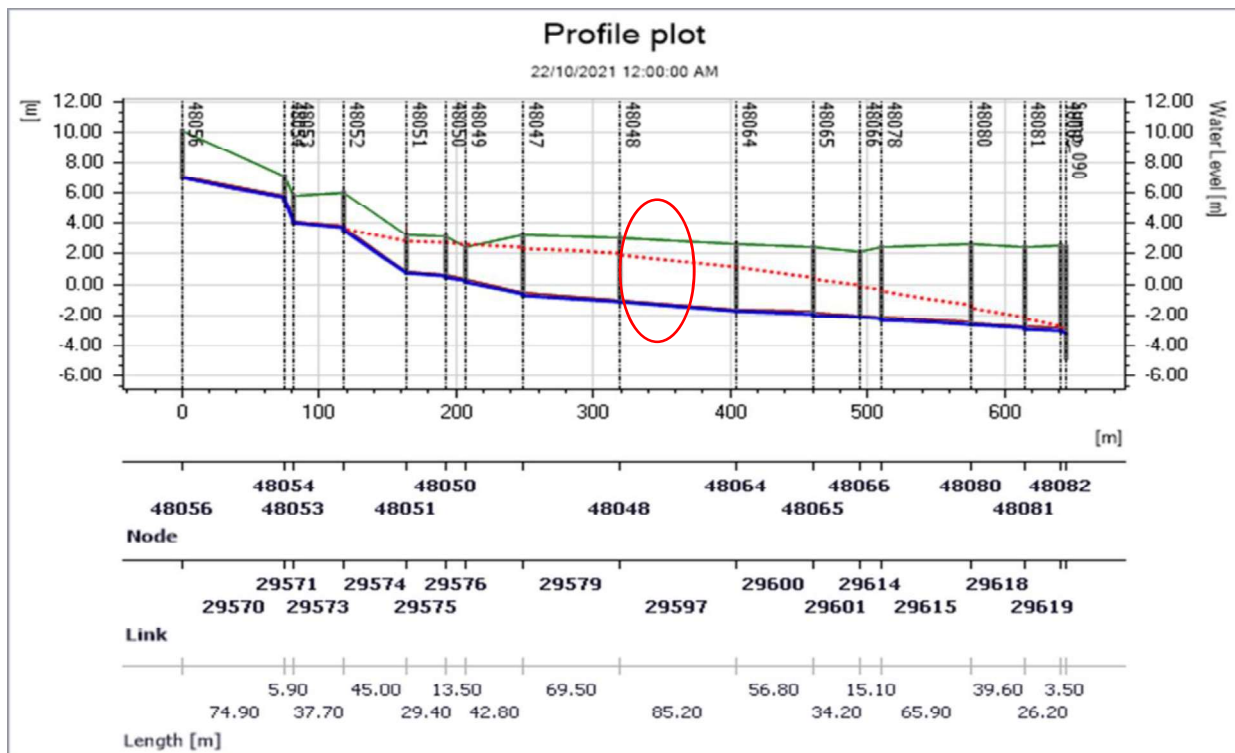
The development site is in the SPS 90 catchment in the Victoria Point WTP Catchment.

The modelling was done with the model VP206P_211022.sqlite

Scenario: PF36WeiDJR-5 (includes future flows from the proposed Weinam Development Area)

Profile plot shows the path from the development site (MH 48056) to SPS90.

Water surface profile is shown with the red dotted line.



Surcharged conditions exist starting at chainage 80m approximately right up to the SPS 90.

Over-capacity sewers are evident downstream of MH 48064 (in OUTRIDGE STREET).

These sewers will be carrying a lot of flow from the proposed Weinam Creek Development Area.

The sewers are earmarked for future augmentation under the Weinam Development.

Once these sewers are augmented, backing up upstream of the MH 48064 will get drawn down.

We can allow the proposed development to proceed without imposing any condition for sewer augmentations.