



136 South Street, South Toowoomba Stormwater Management Plan 260025

June 2026

Document Control Sheet

Project No.: 260025

Site Address: 136 South Street, South Toowoomba

Contact: Ben Harvey

Document History:

Version	Date	Author	Reviewer	Details
1	10/06/2026	JWG	BRH	Development Application
2	12/06/2026	JWG	BRH	Development Application, Annotation Amendments



Approved for Issue by: Ben Harvey (RPEQ: 26710)

Disclaimer:

This report is a professional opinion based on the information available at the time of writing. It is not intended as a quote, guarantee or warranty and does not cover any latent defects.

The conclusion in this report should not be read in isolation. We recommend that its contents be reviewed in person with the author should there be discrepancies, so the assumptions and available information can be discussed in detail. This will enable the reader to make their own risk assessment in conjunction with information from other sources.

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1. INTRODUCTION

A Concept Stormwater Management Plan (CSWMP) has been prepared to support the Development Application for a proposed commercial development, for Struxi Design on a site located at 136 South Street in South Toowoomba. The subject site lies within the local government area of Toowoomba Regional Council (TRC). Figure 2.1 overleaf shows the location of the site, as well as the ultimate reporting point for stormwater discharge, "Outfall A".

As per Toowoomba Regional Council (TRC) Planning Scheme Policy (PSP) SC6.2, new developments require non-worsening and are not to create any new actionable nuisance to existing neighbouring properties. As such, the subject development shall not result in any actionable nuisance or worsening of stormwater flows to any downstream neighbouring properties.

The subject site's total area is 1,010m² (less than 2,500m²), and therefore not large enough to trigger stormwater **quality** assessment. This report will only assess stormwater **quantity** requirements set out by TRC.

1.1 STORMWATER DRAINAGE ASSESSMENT

The hydrological and hydraulic assessment address the overland flow paths and quantity of flow from the proposed development for the 10% AEP (Q10), 5% (Q20), 2% (Q50) and 1% (Q100) annual exceedance probability (AEP's) events. This report details the analyses undertaken to derive the peak flows, for the pre-development and post-developed scenarios.

Due to the development category of the works proposed, the recommended minor and major system designs are 10% and 1% AEP in accordance with QUDM 2016 Table 7.3.1 and 7.3.2. As such, the minor and major storms adopted for this development are 10% AEP (Q10) and 1% AEP (Q100) respectively.

2. SITE DESCRIPTION

Site Address: 136 South Street

Title: Lot 1 on RP44881

Locality: South Toowoomba

The subject site, located at 136 South Street in South Toowoomba, in a low-medium density Residential precinct. The lot currently contains one 206m² dwelling with an attached roofwater tank and driveway, and vegetation to the surrounding yards leaving the site approximately 25% impervious. The site incorporates topography of average slopes ranging from 0.5% to 5.0%, uniformly from the south to the north of the site. It is believed that roofwater discharge not captured for reuse in the existing tank is allowed to either flow to surface, or to bubblers in the front garden. It is also evident that all remaining surface runoff is dealt with via surface infiltration or eventually flows to the South Street kerb and channel. This ultimate discharge point in the current condition is the lawful point of discharge, located in the northeast corner and shown on BRCE Layout plan 260025 / DA-302 as "Outfall 1".

Analysis of the upstream topography to the south demonstrates that the subject site is at the bottom of the catchment, with Hunter Street being a cutoff point for surface runoff. However, the drainage easement from the multi-unit development on Lot SP303027/5 suggests that runoff is diverted away from the subject site straight to South Street. The remaining contributing upstream catchment from Lot RP44881/10 used in this assessment is shown on BRCE layout plan 260025 / DA-302.



**Figure 2.1: Locality Plan showing the existing site at 136 South Street, South Toowoomba
(Image source: TRC Mapping 2026)**

2.1 STORMWATER LAWFUL POINT OF DISCHARGE (LPOD)

As mentioned above, the current ultimate discharge point is the north-east corner of the site, to the South Street kerb and channel and is the Lawful Point of Discharge (LPOD), referred to herein as "Outfall 1". As a result of the proposed works, all runoff generated on proposed sealed surfaces are to be captured and discharged via kerb adaptor to the same kerb and channel on South Street. This new location is to be the north-west corner of the site and is referred to herein as "Outfall A", shown on Figure 2.1 above. The comparison forming the basis of the "Non-Worsening" stormwater Quantity analysis of this report will be between these two discharge points.

3. STORMWATER QUANTITY ASSESSMENT

The design philosophy and methodology of the strategy for the management of stormwater for the proposed development is outlined below.

3.1 HYDROLOGICAL AND HYDRAULIC MODELLING

Rainfall intensities and temporal patterns for the area were calculated from the methodology described in Book 2 of Australian Rainfall and Runoff (ARR 2016). The Log Normal Intensities, Temporal Patterns and resultant Intensity-Frequency-Duration (IFD) table determined for Harristown are attached in Appendix A.

The change in the hydrological response of the catchment between the existing and developed case was investigated using the "Initial Loss / Continuing loss (IL-CL)" model in "DRAINS" program. "DRAINS" is a rainfall-runoff modelling program that is used to simulate runoff hydrographs at defined points throughout a watershed / catchment for a set of catchment conditions and specified rainfall events. In line with the ARR 2019 and stormwater industry standards, the IL-CL model with rainfall preburst data have been utilized as an alternative approach to Horton (ILSAX). The IL-CL and preburst values can be obtained from ARR data hub based on a specific site. Thus, this provides better accuracy for modelling of a specific site. The following parameters have been adopted for this site:

- Stormwater Initial Losses = 40.0mm
- Stormwater Continuing Losses = 1.0mm

Individual "IL-CL" hydrologic models were developed for the existing and proposed developed catchment conditions for 10% (Q10), 5% (Q20), 2% (Q50) and 1% (Q100) Annual Exceedance Probability (AEP's). A series of 10 storms, ranging from 5 minutes to 2.0 hours, were used to test for the maximum discharge during the 10% to 1% AEP events.

Methods outlined in the Queensland Urban Drainage Manual (QUDM, 2016) were adopted to calculate the peak discharge for the developed conditions. The stormwater pre- and post-development catchment plans are included in Appendix C of this report. Stormwater catchment details such as catchment areas, fraction impervious, minor and major runoff coefficients can be found on the tables on these plans.

The drawings referenced in this report should be read in conjunction with the Proposed Site Plan, Drawing No. 25071-SD-1005 prepared by VHD Studio and the Contour and Detail Survey Drawing No. 15971-DTM-01 A prepared by DSQ Land Surveyors included in Appendix B of this report.

3.2 MODELLING DATA SOURCES

All rainfall data, including storm losses, temporal patterns, Intensity-Frequency-Duration (IFD) values, and median pre-burst data, was obtained from ARR Data Hub in May 2026, using the subject site coordinates (-27.581, 151.966). Table 3.2.1 shows the adopted initial and continuing loss parameters adopted for impervious and pervious areas (ARR ID 3932.0). The IFD table for rainfall data in the location of the subject site is located in Appendix B.

	Impervious Area	Pervious Area
Initial Loss	1.0	40.0
Continuing Loss	0.0	1.0

Table 3.2.1 – Stormwater Runoff Losses – South Toowoomba, QLD (Source: ARR Data Hub, 2026).

3.3 STORMWATER MANAGEMENT STRATEGY

To enable a stormwater drainage system to be developed, it was necessary to assign design levels for the site, including levels to the proposed building, driveway and carpark areas. These details and the proposed stormwater drainage system, are nominated on BRCE Development Application Drawings included in Appendix A.

3.3.1 METHDOLOGY

Based on the design, the following stormwater attenuation measures are proposed:

- Strategic grading of all proposed pavement surfaces to direct surface runoff into a series of grated inlet pits, ranging from 600x600mm up to 1200x1200mm all with heel proof, trafficable grates and pipework ranging from 150 to 375mm in diameter;
- One inlet pit to the north-western corner, with two 150x100mm RHS to kerb adaptors for discharge of the entire network to "Outfall A" on South Street;
- 2/oversized chambers equipped with inlet filter traps in the southern carpark (outlined further in section 3.3.2) with a reduced outlet, to attenuate upstream flows before discharging to the network.

3.3.2 DETENTION SYSTEM

The proposed detention system is designed to attenuate the rate of stormwater run-off from a developed area to a level that is no greater than those generated by the existing catchment. For this project, the following detention devices are proposed:

- One 5,000L slimline detention / retention tank wherein 1,500L will be retained for reuse as per QDC guidelines, and 3,500L will offer attenuation for 2/3 of the proposed roof area;
- Two oversized, 2100mm diameter precast stormwater chambers, connected via a 2.0m long, 375mm diameter pipe wherein the downstream chamber shall include a 1.0m high internal weir with a 40mm low-flow orifice, offering 9,000L of detention capacity.

Stormwater "non-worsening" comparisons between the pre and post discharge between "Outfall 1" and "Outfall A" for the storm events are noted below. *Table 3.1* below outlines the peak flow estimates for the existing scenario, as well as the post development scenario.

Catchment Conditions	Overall Catchment Area (ha)	Runoff Coefficient (C10)	Discharge (m ³ /s)			
			10%	5%	2%	1%
Pre-Development, "Outfall 1"	0.014	0.57	0.025	0.030	0.043	0.053
Post-Development, "Outfall A"	0.014	0.75	0.022	0.029	0.043	0.053
"Non-Worsening" of Stormwater Quantity for the Subject Development						
Increase (+) Decrease (-) Neutral			-0.003	-0.001	0.000	0.000

Table 3.3.1: Catchment Discharge- Hydrologic Details

3.4 "DRAINS" SCREEN CAPTURES

"DRAINS" results in the form of screen captures for the 10%, 5%, 2% and 1% AEP events associated with the Pre- and Post-development conditions have been included in Appendix D. It can be noted from these screen captures that the post-development discharge at "Outfall A" are less than 50 L/s for a minor storm event (10% AEP) at the outlet.

4. STORMWATER QUALITY

The subject site's total area is 1,010m² (less than 2,500m²), and therefore not large enough to trigger stormwater **quality** assessment. As such, this report has not provided any considerations toward stormwater quality treatment for the proposed development.

5. CONCLUSION

This CSWMP has been developed to address specific stormwater drainage outcomes and solutions for Stormwater Quantity Discharge, in support of the Development Application for the commercial development at 136 South Street, in South Toowoomba.

5.1 STORMWATER QUANTITY ANALYSIS

The hydrological and hydraulic analyses have been undertaken using rainfall-runoff modelling program, "DRAINS" to determine peak runoff for the nominated 10%, 5%, 2% and 1% AEP rainfall events. The stormwater strategy outlined in this report, achieve the desired results as per TRC guidelines and PSP on the surrounding properties.

5.2 LEGAL POINT OF DISCHARGE

As indicated on the attached catchment plans and as detailed in *Section 2.1* of this report, stormwater runoff from the development is proposed to outlet to South Street kerb and channel ("Outfall A") which represents the LPOD for the site.

5.3 SUMMARY

Acceptable solutions to Council's desired outcomes for Stormwater Quantity Discharge have in our professional opinion been achieved in this report in conjunction with the accompanying calculations and concept engineering drawings. This development is not expected to cause any actionable nuisance to downstream properties, caused by peak discharges, flood levels, frequency / duration of flooding, flow velocities, sedimentation and scour effects.

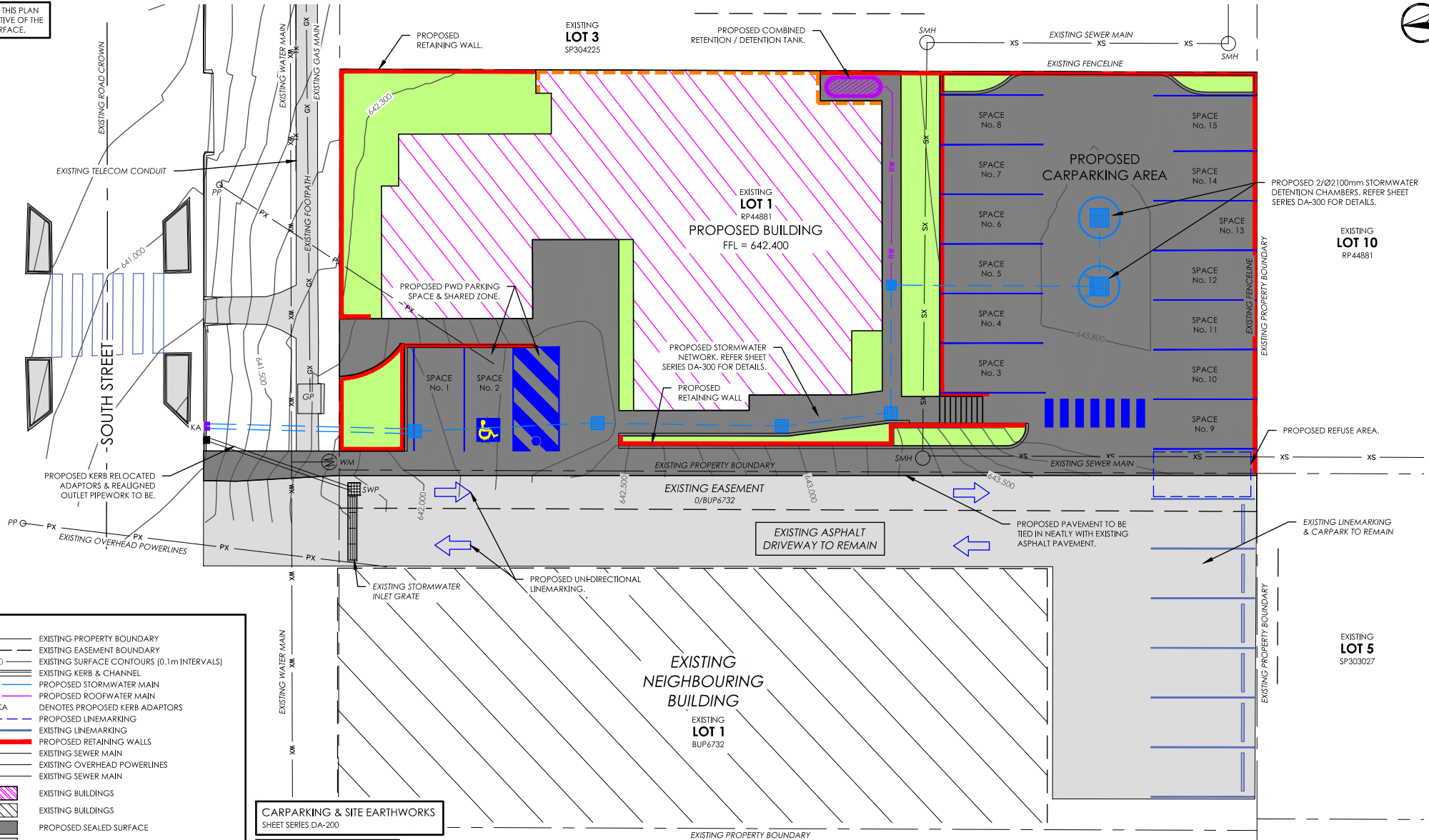
It should be noted that the calculations and drawings referred to and contained herein, are preliminary only and are subject to confirmation and/or amendment, in the Detailed Design Phase of this project, when Development Conditions are determined by Council.

APPENDIX A

BRCE Development Application Plans

260025 – DA-102
260025 – DA-201
260025 – DA-202
260025 – DA-301
260025 – DA-302
260025 – DA-303

CONTOURS ON THIS PLAN ARE REPRESENTATIVE OF THE FINISHED SURFACE.



LEGEND	
	EXISTING PROPERTY BOUNDARY
	EXISTING EASEMENT BOUNDARY
	EXISTING SURFACE CONTOURS (0.1m INTERVALS)
	EXISTING KERB & CHANNEL
	PROPOSED STORMWATER MAIN
	PROPOSED ROOFWATER MAIN
	DENOTES PROPOSED KERB ADAPTORS
	PROPOSED LINEMARKING
	EXISTING LINEMARKING
	PROPOSED RETAINING WALLS
	EXISTING SEWER MAIN
	EXISTING OVERHEAD POWERLINES
	EXISTING SEWER MAIN
	EXISTING BUILDINGS
	EXISTING BUILDINGS
	PROPOSED SEALED SURFACE
	EXISTING PAVEMENT/CONCRETE
	PROPOSED LANDSCAPING AREAS
	EXISTING SEWER MANHOLE
	EXISTING STORMWATER PIT
	EXISTING WATER METER
	EXISTING POWER POLE
	EXISTING GAS PIT

CARPARKING & SITE EARTHWORKS
SHEET SERIES DA-200

STORMWATER DRAINAGE
SHEET SERIES DA-300

CAUTION!
CONTRACTOR TO EXERCISE EXTREME CARE DURING EXCAVATION IN VICINITY OF EXISTING UNDERGROUND ELECTRICAL CABLES AND SEWER INFRASTRUCTURE.

DA SUBMISSION
NOT FOR CONSTRUCTION

THESE DRAWINGS ARE FOR THE PURPOSE OF DEVELOPMENT APPLICATION, IN ORDER TO DEMONSTRATE CONCEPTS FOR ROADWORKS, SEWER, STORMWATER DRAINAGE, WATER SUPPLY AND ALLOTMENT EARTHWORKS. SUBJECT TO DETAILED DESIGN

REVISIONS	DRAWN	DESIGN	DATE
B	ANNOATION AMMENDMENTS	JWG	JWG 12/06/26
A	ORIGINAL ISSUE	JWG	JWG 10/06/26



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CLIENT: **STRUXI DESIGN**

PROJECT: **PROPOSED COMMERCIAL DEVELOPMENT
136 SOUTH STREET, SOUTH TOOWOOMBA**

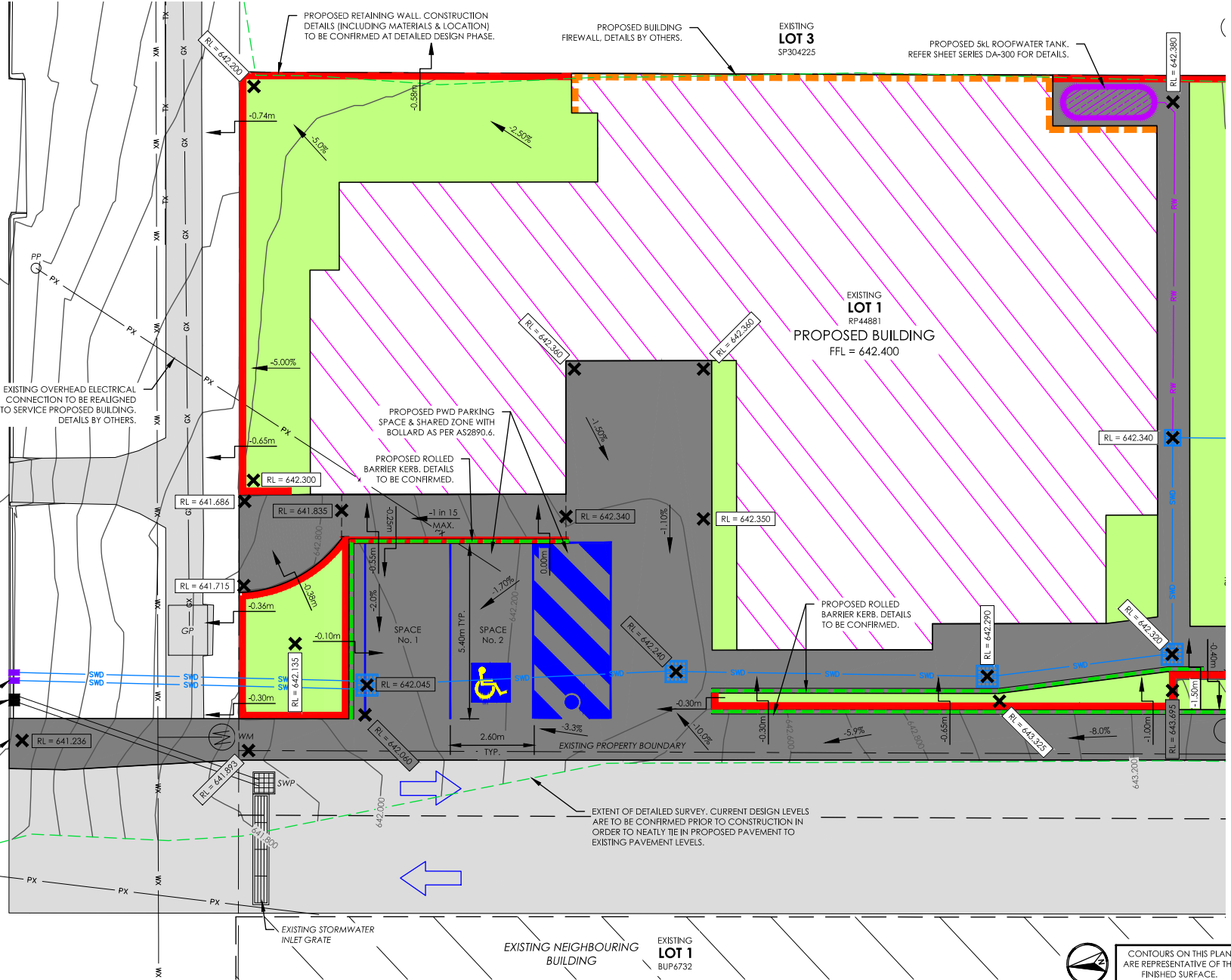
TITLE: **OVERALL LAYOUT PLAN**

SCALE			
1:200			
EXAMINED:	PROJECT NUMBER:	ORIG. SHE:	
B.HARVEY	260025	A3	
CHECKED:	REQ#: 26710	PLAN NUMBER:	REVISION:
		DA-102	B

DA-100 - OVERALL LAYOUT PLAN - 12/06/2026 8:40:58 AM

LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING EASEMENT BOUNDARY
- EXISTING SURFACE CONTOURS (0.1m INTERVALS)
- EXISTING KERB & CHANNEL
- PROPOSED STORMWATER MAIN
- PROPOSED ROOFWATER MAIN
- DENOTES PROPOSED KERB ADAPTORS
- PROPOSED ROLLED KERB
- PROPOSED LINEMARKING
- EXISTING LINEMARKING
- PROPOSED RETAINING WALLS
- PROPOSED FIRE WALL (BY OTHERS)
- EXTENT OF DETAILED SURVEY
- PROPOSED FINISHED SURFACE FALL GRADE
- PROPOSED FINISHED SURFACE SPOT HEIGHT
- DENOTES PROPOSED RETAINING WALL STEP-DOWN
- EXISTING SEWER MAIN
- EXISTING OVERHEAD POWERLINES
- EXISTING SEWER MAIN
- EXISTING BUILDINGS
- EXISTING BUILDINGS
- PROPOSED DRIVEWAY PAVEMENT SURFACE
- EXISTING PAVEMENT/CONCRETE
- PROPOSED LANDSCAPING AREAS
- EXISTING SEWER MANHOLE
- EXISTING STORMWATER PIT
- EXISTING WATER METER
- EXISTING POWER POLE
- EXISTING GAS PIT



CAUTION!
CONTRACTOR IS TO CONFIRM LEVELS OF ALL INFRASTRUCTURE ON SITE PRIOR TO CONSTRUCTION TO AVOID CLASHES WITH PROPOSED STORMWATER.

CAUTION!
CONTRACTOR TO EXERCISE EXTREME CARE DURING EXCAVATION IN VICINITY OF EXISTING UNDERGROUND ELECTRICAL CABLES AND SEWER INFRASTRUCTURE.

REVISIONS	DRAWN	DESIGN	DATE
A	JWG	JWG	10/06/24



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STRXUI DESIGN

PROJECT
PROPOSED COMMERCIAL DEVELOPMENT
136 SOUTH STREET, SOUTH TOOWOOMBA

TITLE
DETAILED LAYOUT PLAN - SHEET 1 OF 2

SCALE	1:200
EXAMINED	B. HARVEY
PROJECT NUMBER	260025
ORIG. SHEET	A3
CERTIFIED	REQ: 26710
PLAN NUMBER	DA-201
REVISION	A

SCALE: 1:200

0 1 2 3 4 5m

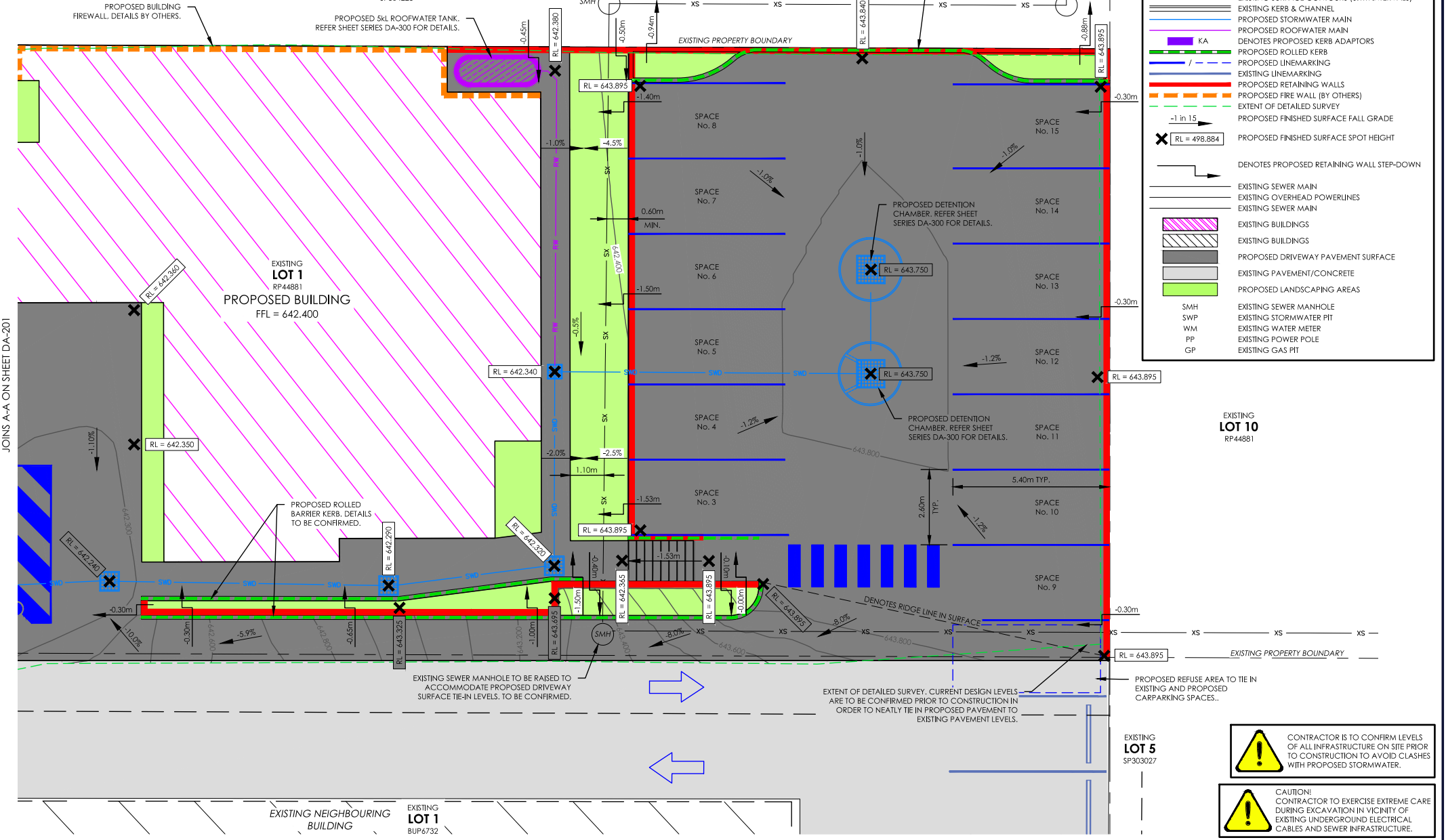
SCALE - 1:100 AT A1
SCALE - 1:100 AT A1

CONTOURS ON THIS PLAN ARE REPRESENTATIVE OF THE FINISHED SURFACE.

JOINS A-A ON SHEET DA-202

DA-201 - DETAILS & EARTHWORKS.DWG - 11/06/2024, 8:24:52 AM

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LEGEND

- EXISTING PROPERTY BOUNDARY
- - - EXISTING EASEMENT BOUNDARY
- EXISTING SURFACE CONTOURS (0.1m INTERVALS)
- EXISTING KERB & CHANNEL
- PROPOSED STORMWATER MAIN
- PROPOSED ROOFWATER MAIN
- DENOTES PROPOSED KERB ADAPTORS
- PROPOSED ROLLED KERB
- PROPOSED LINEMARKING
- EXISTING LINEMARKING
- PROPOSED RETAINING WALLS
- PROPOSED FIRE WALL (BY OTHERS)
- EXTENT OF DETAILED SURVEY
- PROPOSED FINISHED SURFACE FALL GRADE
- ✕ RL = 498.884 PROPOSED FINISHED SURFACE SPOT HEIGHT
- DENOTES PROPOSED RETAINING WALL STEP-DOWN
- EXISTING SEWER MAIN
- EXISTING OVERHEAD POWERLINES
- EXISTING SEWER MAIN
- EXISTING BUILDINGS
- EXISTING BUILDINGS
- PROPOSED DRIVEWAY PAVEMENT SURFACE
- EXISTING PAVEMENT/CONCRETE
- PROPOSED LANDSCAPING AREAS
- SMH EXISTING SEWER MANHOLE
- SWP EXISTING STORMWATER PIT
- WM EXISTING WATER METER
- PP EXISTING POWER POLE
- GP EXISTING GAS PIT

JOINS A-A ON SHEET DA-201

EXISTING LOT 10
RP44881

EXISTING LOT 5
SP303027

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CAUTION!
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REVISIONS	DRAWN	DESIGN	DATE
A	JWG	JWG	10/06/26



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PROJECT: PROPOSED COMMERCIAL DEVELOPMENT
136 SOUTH STREET, SOUTH TOOWOOMBA

TITLE: DETAILED LAYOUT PLAN - SHEET 2 OF 2

SCALE: 1:200

EXAMINED: B.HARVEY	PROJECT NUMBER: 260025	ORIG. SHE: A3
CERTIFIED: RPEQ: 26710	PLAN NUMBER: DA-202	REVISION: A

DA-202 - DETAILS & EARTHWORKS.DWG - 11/06/2026, 8:25:06 AM

CONTOURS ON THIS PLAN ARE REPRESENTATIVE OF THE EXISTING SURFACE.

OUTFALL 1
 $Q_{100} = 0.053\text{m}^3/\text{s}$
 $Q_{10} = 0.029\text{m}^3/\text{s}$

SOUTH STREET

EXISTING LOT 3
 SP304225

EXISTING LOT 10
 RP44881

R1
 0.028ha

EXISTING LOT 1
 RP44881

EX1
 0.078ha

EX2
 0.034ha

EXISTING NEIGHBOURING BUILDING
 EXISTING LOT 1
 BUP6732

EXISTING LOT 5
 SP303027



LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING EASEMENT BOUNDARY
- 460.000
- EXISTING SURFACE CONTOURS (0.1m INTERVALS)
- EXISTING KERB & CHANNEL
- EXISTING CATCHMENT R1
- EXISTING CATCHMENT C1
- EXISTING CATCHMENT C2

CATCHMENT NAME	CATCHMENT AREA (ha)	RUNOFF COEFF. MINOR	RUNOFF COEFF. MAJOR	IMPERVIOUS CATCHMENT AREA (%)
R1	0.028	0.90	1.00	100.00
EX1	0.078	0.58	0.70	10.00
EX3	0.034	0.46	0.55	0.00

POST-DEVELOPMENT STORMWATER CATCHMENT TABLE

REVISIONS	DRAWN	DESIGN	DATE
A	JWG	JWG	10/06/26



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 136 SOUTH STREET, SOUTH TOOWOOMBA

TITLE
 PRE-DEVELOPMENT STORMWATER CATCHMENT PLAN

SCALE 1:200		 <small>SCALE - 1:100 AT A3 SCALE - 1:100 AT A1</small>	
EXAMINED B.HARVEY	PROJECT NUMBER 260025	ORIG. SIZE A3	
CHECKED	RPEQ: 26710	PLAN NUMBER DA-302	REVISION A

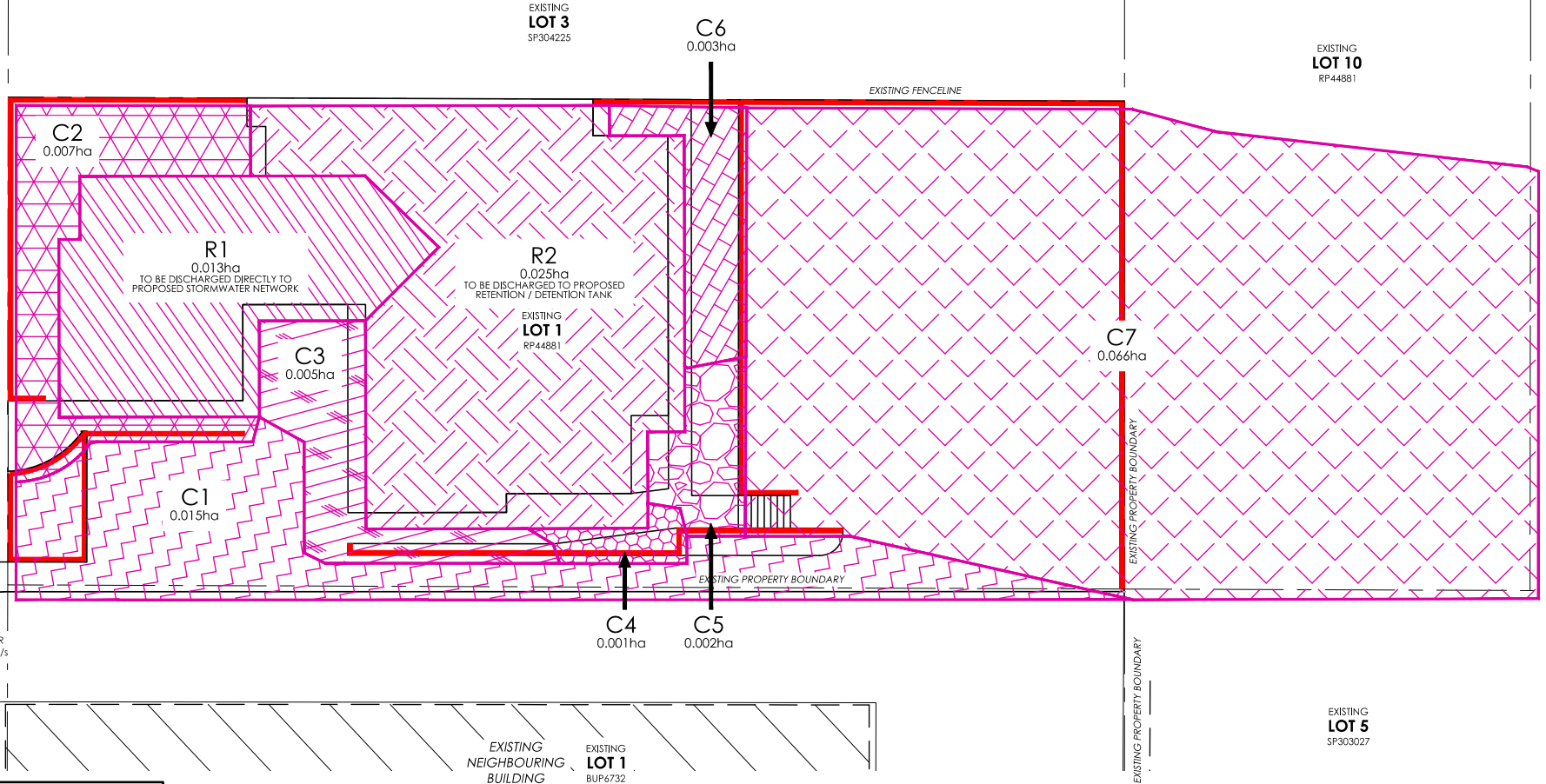


SOUTH STREET

OUTFALL A

$Q_{100} = 0.053\text{m}^3/\text{s}$
 $Q_{10} = 0.022\text{m}^3/\text{s}$

UPSTREAM KERB ADAPTOR
 Q_{10} DISCHARGE = $0.018\text{m}^3/\text{s}$



LEGEND

- EXISTING PROPERTY BOUNDARY
- EXISTING EASEMENT BOUNDARY
- 460.000 EXISTING SURFACE CONTOURS (0.1m INTERVALS)
- EXISTING KERB & CHANNEL
- PROPOSED CATCHMENT R1
- PROPOSED CATCHMENT R2
- PROPOSED CATCHMENT C1
- PROPOSED CATCHMENT C2
- PROPOSED CATCHMENT C3
- PROPOSED CATCHMENT C4
- PROPOSED CATCHMENT C5
- PROPOSED CATCHMENT C6
- PROPOSED CATCHMENT C7

CATCHMENT NAME	CATCHMENT AREA (ha)	RUNOFF COEFF MINOR	RUNOFF COEFF MAJOR	IMPERVIOUS CATCHMENT AREA (%)
R1	0.013	0.90	1.00	100.00
R2	0.025	0.90	1.00	100.00
C1	0.015	0.82	0.99	83.00
C2	0.007	0.57	0.68	24.00
C3	0.005	0.82	0.99	83.00
C4	0.001	0.64	0.77	40.00
C5	0.002	0.64	0.77	40.00
C6	0.003	0.61	0.73	33.00
C7	0.066	0.68	0.81	49.00

POST-DEVELOPMENT STORMWATER CATCHMENT TABLE

REVISIONS	DRAWN	DESIGN	DATE
A	JWG	JWG	10/06/26



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PROJECT
PROPOSED COMMERCIAL DEVELOPMENT
136 SOUTH STREET, SOUTH TOOWOOMBA

TITLE
POST-DEVELOPMENT STORMWATER CATCHMENT PLAN

SCALE			
1:200			
EXAMINED	PROJECT NUMBER	ORIG. SHEET	
B.HARVEY	260025	A3	
CHECKED	PLAN NUMBER	REVISION	
RPEQ: 26710	DA-303	A	

APPENDIX B

BOM IFD Depths & ARR 2019 IL-CL Losses
South Street, South Toowoomba, QLD

Location

Label: Not provided

Latitude: -27.581 [Nearest grid cell: 27.5875 (S)]

Longitude: 151.966 [Nearest grid cell: 151.9625 (E)]

IFD Design Rainfall Depth (mm)

Issued: 09 June 2026

Rainfall depth for Durations, Exceedance per Year (EY), and Annual Exceedance Probabilities (AEP).
[FAQ for New ARR probability terminology](#)

Duration	Annual Exceedance Probability (AEP)						
	63.2%	50%#	20%*	10%	5%	2%	1%
1 min	2.20	2.50	3.44	4.09	4.73	5.58	6.23
2 min	3.75	4.26	5.94	7.14	8.35	9.97	11.2
3 min	5.24	5.95	8.26	9.89	11.5	13.7	15.4
4 min	6.60	7.50	10.4	12.4	14.4	17.0	19.1
5 min	7.85	8.91	12.3	14.6	16.9	20.0	22.4
10 min	12.6	14.4	19.7	23.4	26.9	31.7	35.4
15 min	15.9	18.1	24.9	29.5	34.1	40.1	44.7
20 min	18.4	20.9	28.8	34.2	39.5	46.5	52.0
25 min	20.4	23.1	31.9	37.9	43.8	51.7	57.8
30 min	22.0	24.9	34.4	41.0	47.4	56.0	62.7
45 min	25.5	29.0	40.0	47.7	55.3	65.6	73.6
1 hour	28.0	31.8	43.8	52.3	60.8	72.2	81.2
1.5 hour	31.6	35.7	49.1	58.6	68.1	81.1	91.4
2 hour	34.2	38.6	52.8	62.9	73.2	87.2	98.3
3 hour	38.1	42.8	58.1	69.1	80.2	95.6	108
4.5 hour	42.4	47.4	64.0	75.7	87.7	104	118
6 hour	45.8	51.2	68.6	81.0	93.6	111	125
9 hour	51.4	57.2	76.3	89.9	104	123	138
12 hour	55.9	62.2	82.9	97.5	112	133	149
18 hour	63.1	70.4	94.0	111	127	151	169
24 hour	68.9	77.0	103	122	141	167	187
30 hour	73.7	82.6	112	132	153	182	204
36 hour	77.8	87.5	119	142	165	195	219
48 hour	84.6	95.6	132	158	184	219	246
72 hour	94.4	107	150	182	215	256	290
96 hour	101	115	162	198	235	282	320
120 hour	106	121	170	208	248	299	339
144 hour	110	124	175	214	256	308	350
168 hour	112	127	177	216	258	310	353

Storm Losses

Note: Burst Loss = Storm Loss - Preburst

Note: These losses are only for rural use and are **NOT FOR DIRECT USE** in urban areas

ID	3932.0
Storm Initial Losses (mm)	40.0
Storm Continuing Losses (mm/h)	1.1

APPENDIX C

Byrnes Surveyors Detailed Survey Plan

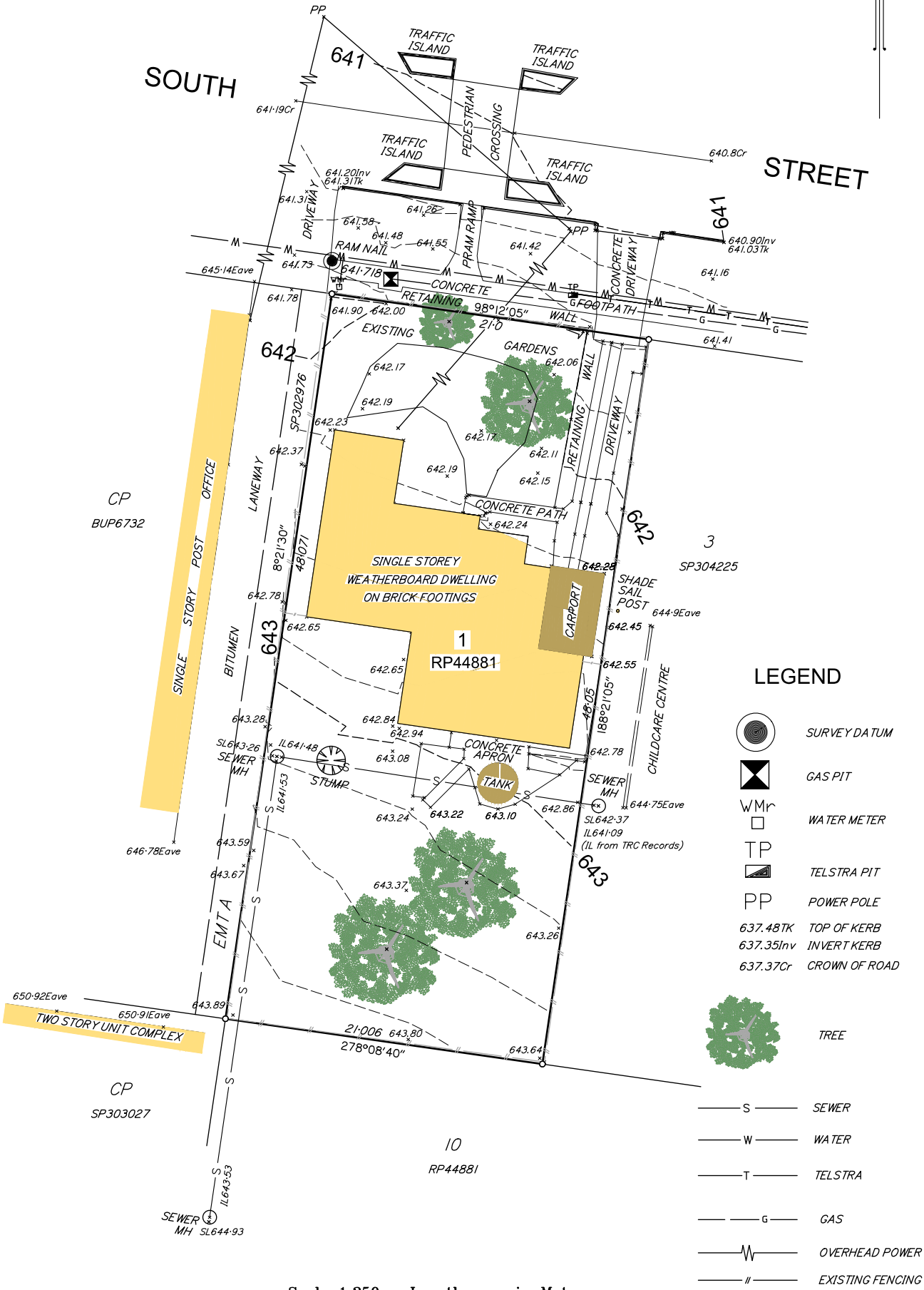
CONTOUR INTERVAL
 0.25 metres
 LEVEL DATUM
 PSM12759 AHD (der)
 HORIZONTAL DATUM
 MGA (via GPS Methodology)



REV	A	Contour and Feature Survey	LWI	GTC	20-08-25	Date	20 AUGUST 2025	Scale	1:250 @ A3 SIZE	Client	STRUXI DESIGN
			DWIN	CHK			Drawn	LWI		Site Address	136 SOUTH STREET
							Check	GTC		LOT 1 on RP44881	
							Locality	CENTENARY HEIGHTS		CONTOUR SURVEY	
							Local Authority	TOOWOOMBA REGION			
							Title				
											Rev
											A

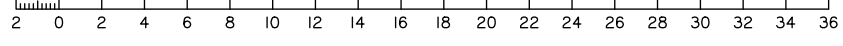
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- LEGEND**
- SURVEY DATUM
 - GAS PIT
 - WATER METER
 - TELSTRA PIT
 - POWER POLE
 - TOP OF KERB
 - INVERT KERB
 - CROWN OF ROAD
 - TREE
 - SEWER
 - WATER
 - TELSTRA
 - GAS
 - OVERHEAD POWER
 - EXISTING FENCING

Scale 1:250 - Lengths are in Metres.



APPENDIX D

Overall Site Discharge – “DRAINS” Modelling Results

Results for median storm in critical 5% AEP ensembles using Full Unsteady hydraulic model.

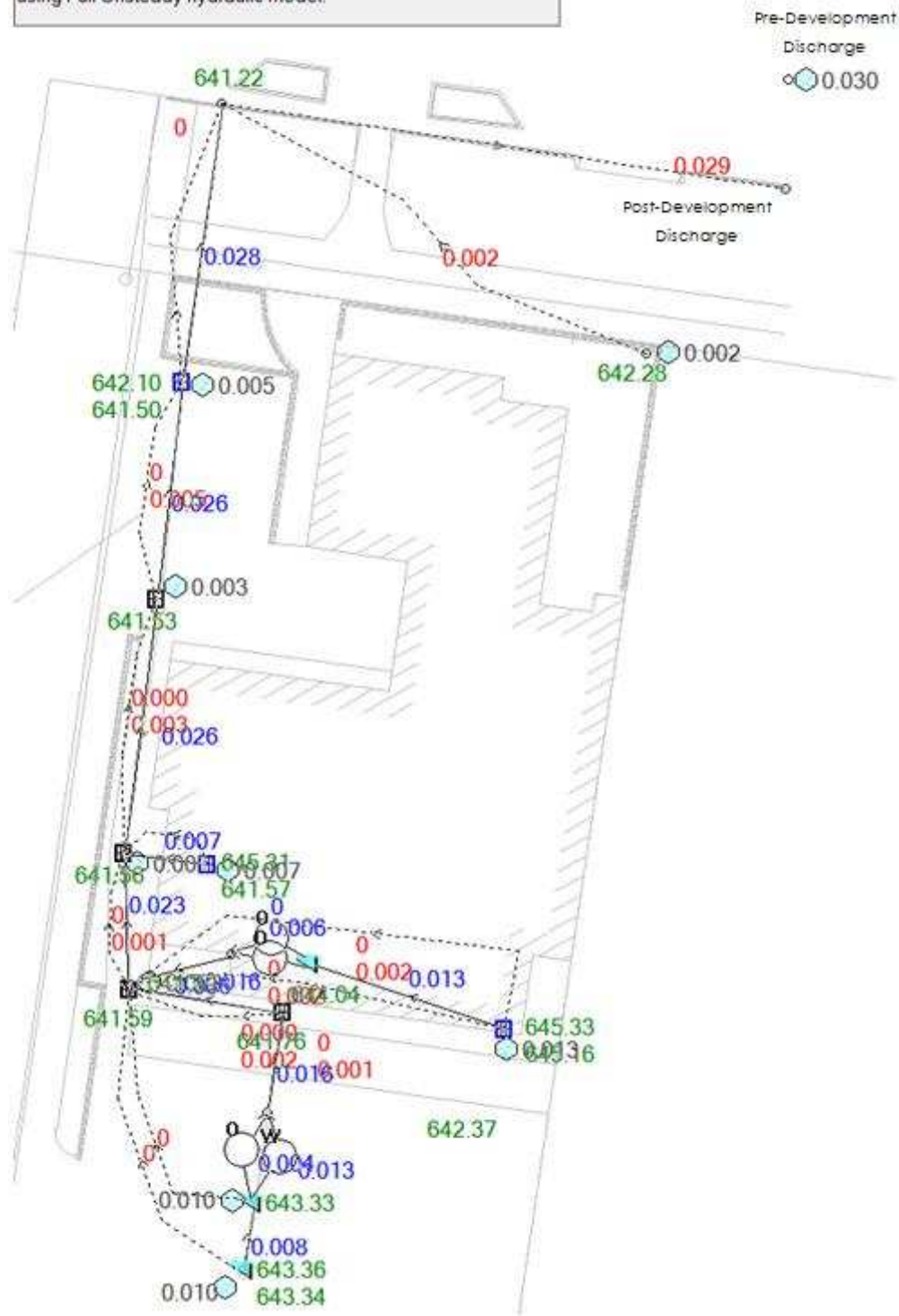


Figure D.2 – 5% AEP (Q20) Event – Pre- and Post-Development

Results for median storm in critical 2% AEP ensembles using Full Unsteady hydraulic model.

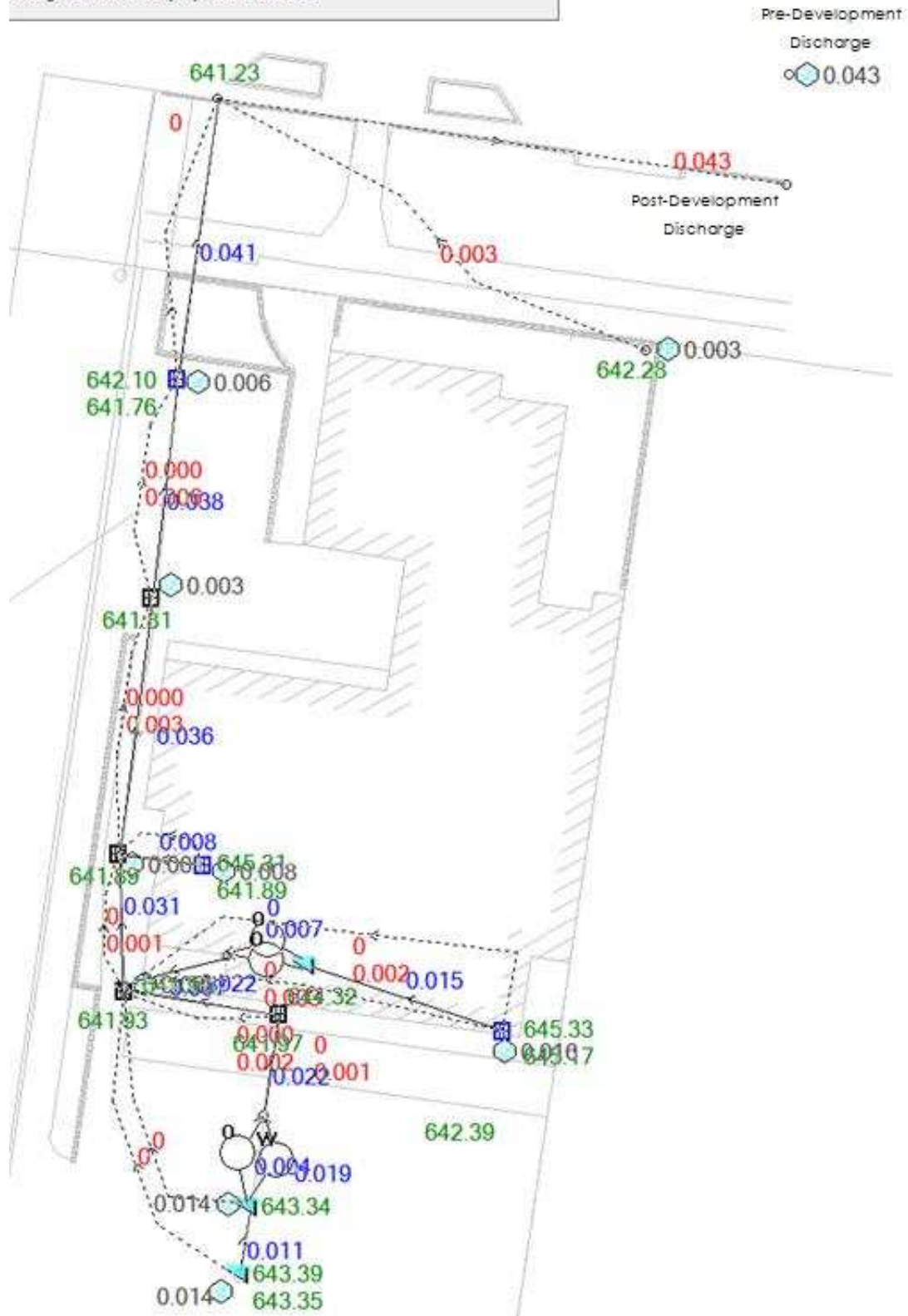


Figure D.3 – 2% AEP (Q50) Event – Pre- and Post-Development

Results for median storm in critical 1% AEP ensembles using Full Unsteady hydraulic model.

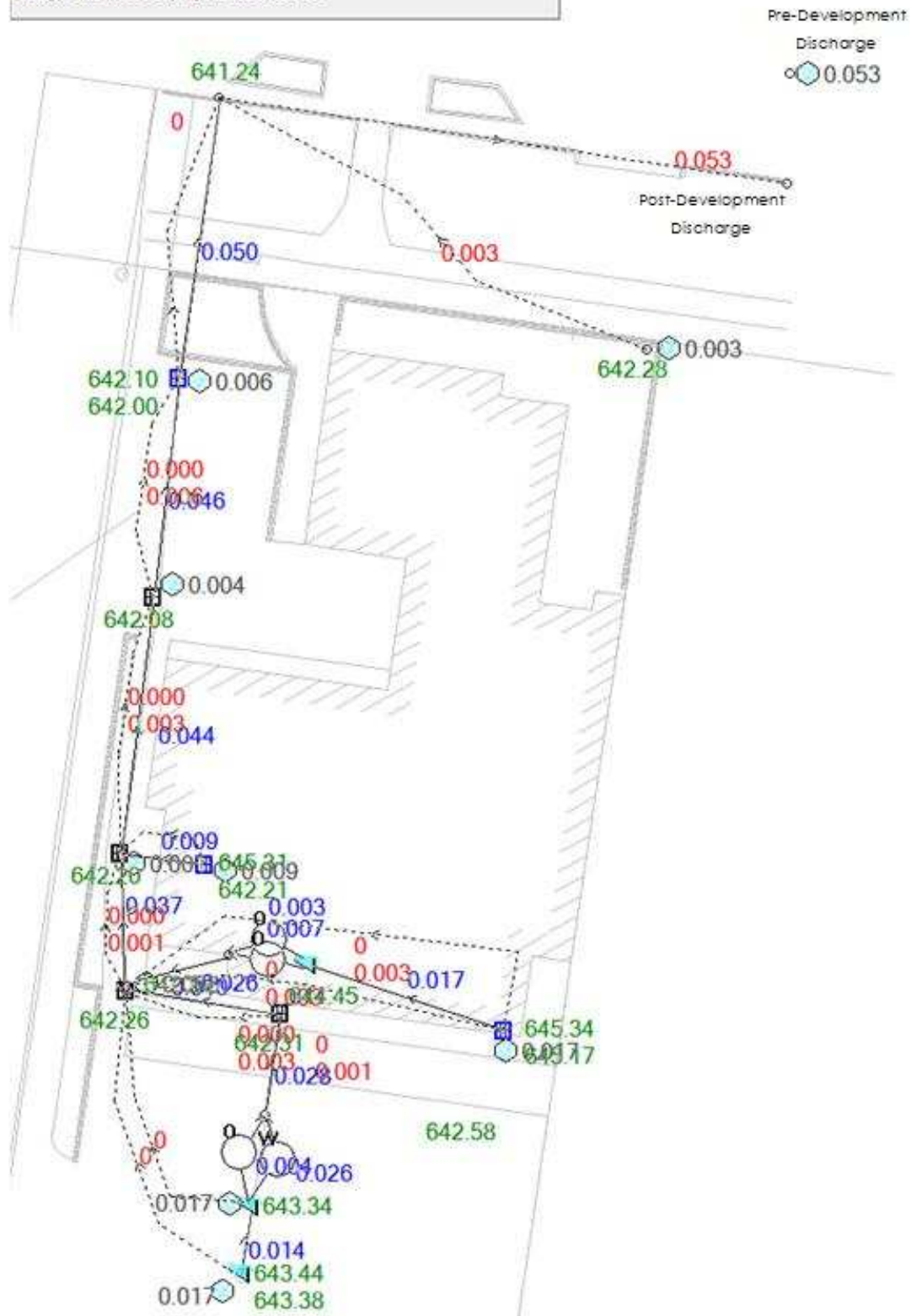


Figure D.4 – 1% AEP (Q100) Event – Pre- and Post-Development