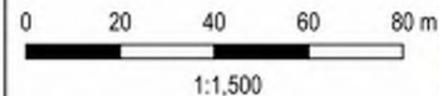




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Traffic | Flood Modelling

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GLADSTONE | NEW ZEALAND
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W: www.nconsg.com.au

In Association With:
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Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**
**100yr ARI DEVELOPED FLOOD
VELOCITY**

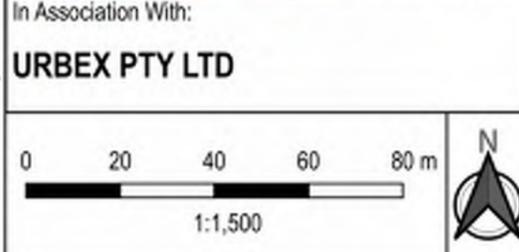
Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	D02
NCE Ref: URB0001-P4			



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**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

2yr ARI BASELINE FLOOD VELOCITY

Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	D03
NCE Ref: URB0001-P4			



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Traffic | Flood Modelling

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Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**
**2yr ARI DEVELOPED FLOOD
VELOCITY**

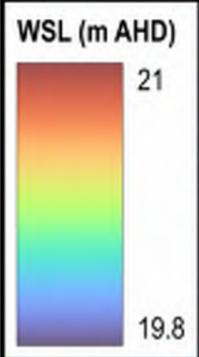
Prepared By: BB
Reviewed by: AW

Date: 19/12/2025
Revision: A
NCE Ref: URB0001-P4

Size: **A3**
Map: **D04**

APPENDIX E

WSL Mapping – 100- and 2-year ARI

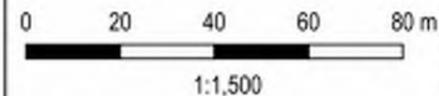


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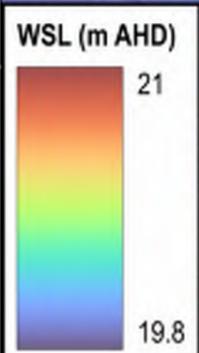


Legend

- TCC Land Parcels
- ➔ Existing Culverts
- Existing Pits

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**
**100yr ARI BASELINE FLOOD WATER
SURFACE LEVELS**

Prepared By: BB	Date: 19/12/2025	Size: A3	Map: E01
Reviewed by: AW	Revision: A		
	NCE Ref: URB0001-P4		

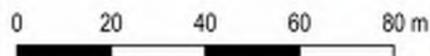


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1:1,500



Legend

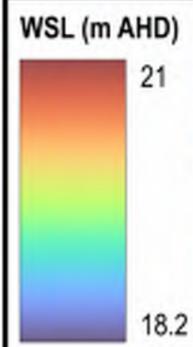
- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**
**100yr ARI DEVELOPED FLOOD
WATER SURFACE LEVELS**

Prepared By: BB
Reviewed by: AW

Date: 19/12/2025
Revision: A
NCE Ref: URB0001-P4

Size: **A3**
Map: **E02**



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0 20 40 60 80 m

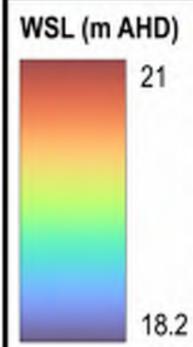
1:1,500

- Legend**
- TCC Land Parcels
 - ➔ Existing Culverts
 - Existing Pits

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

**2yr ARI BASELINE FLOOD WATER
SURFACE LEVELS**

Prepared By: BB	Date: 19/12/2025	Size: A3	Map: E03
Reviewed by: AW	Revision: A		
	NCE Ref: URB0001-P4		



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0 20 40 60 80 m

1:1,500

- Legend**
- TCC Land Parcels
 - Stage 12 Lots
 - Existing Pits
 - Existing Culverts
 - Previous Development Pits
 - Previous Development Culverts
 - Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

**2yr ARI DEVELOPED FLOOD WATER
SURFACE LEVELS**

Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	E04
NCE Ref: URB0001-P4			

APPENDIX F

Hazard Mapping – 100-year ARI only



- Flood Hazard**
- H1
 - H2
 - H3
 - H4
 - H5
 - H6



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0 20 40 60 80 m

1:1,500

- Legend**
- TCC Land Parcels
 - Existing Pits
 - Existing Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

100yr ARI BASELINE FLOOD HAZARD

Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	F01
NCE Ref: URB0001-P4			



- Flood Hazard**
- H1
 - H2
 - H3
 - H4
 - H5
 - H6



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0 20 40 60 80 m

1:1,500

- Legend**
- TCC Land Parcels
 - Stage 12 Lots
 - Existing Pits
 - Existing Culverts
 - Previous Development Pits
 - Previous Development Culverts
 - Proposed Development Culverts

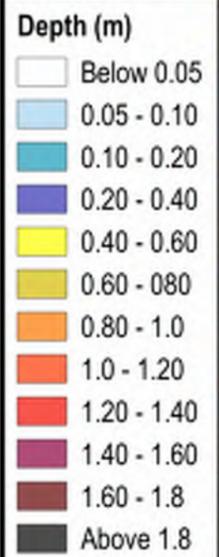
**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

**100yr ARI DEVELOPED FLOOD
HAZARD**

Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	F02
NCE Ref: URB0001-P4			

APPENDIX G

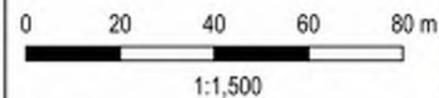
Development Staging Assessment – Stage 1 Mapping



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Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

100yr ARI STAGE 1 FLOOD DEPTHS

Prepared By: BB
Reviewed by: AW

Date: 19/12/2025
Revision: A
NCE Ref: URB0001-P4

Size: **A3**
Map: **G01**



Depth (m)

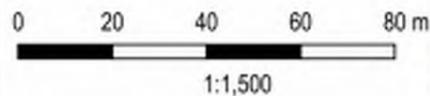
Below 0.05
0.05 - 0.10
0.10 - 0.20
0.20 - 0.40
0.40 - 0.60
0.60 - 0.80
0.80 - 1.0
1.0 - 1.20
1.20 - 1.40
1.40 - 1.60
1.60 - 1.8
Above 1.8



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Traffic | Flood Modelling

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Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

2yr ARI STAGE 1 FLOOD DEPTHS

Prepared By: BB
Reviewed by: AW

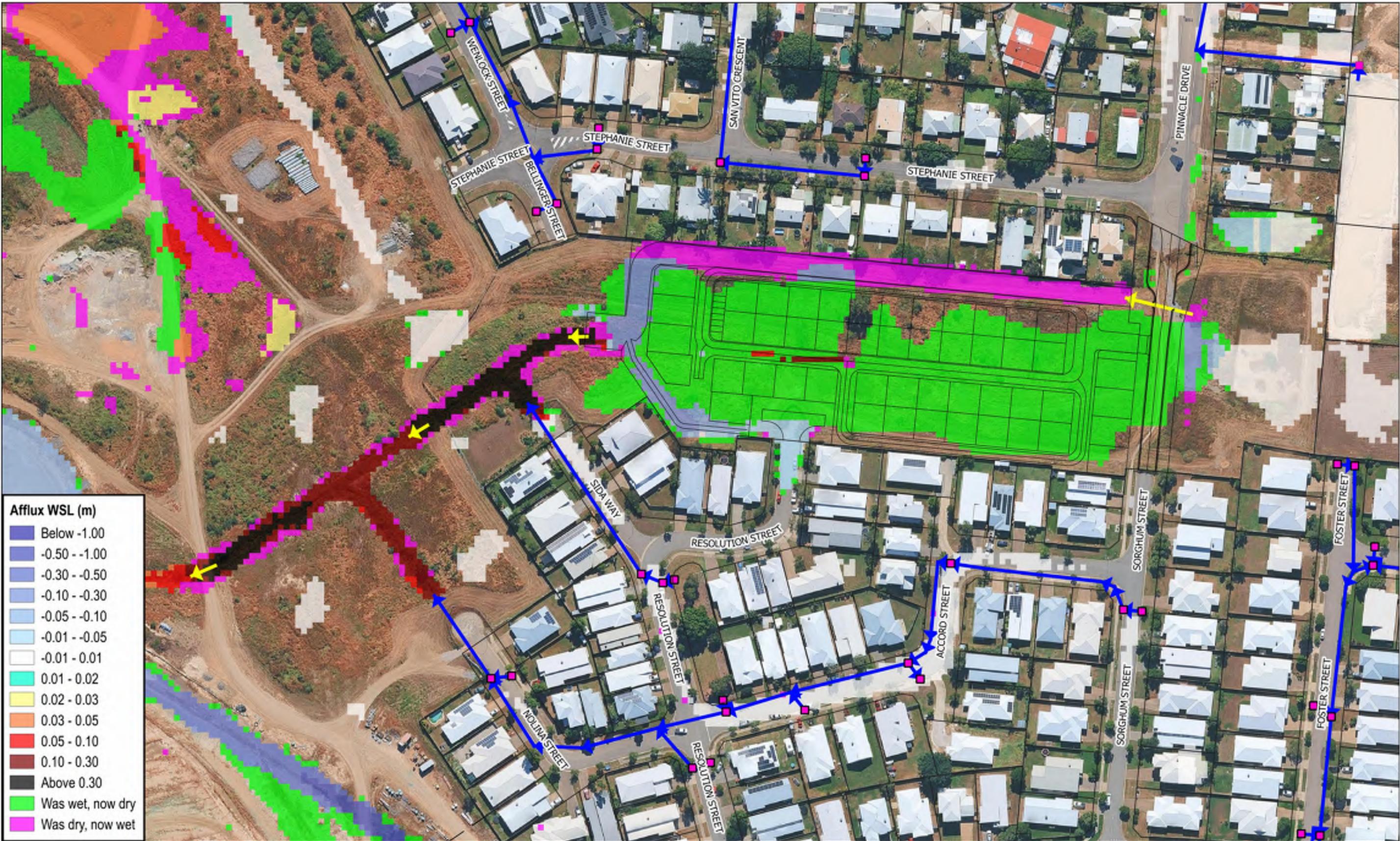
Date: 19/12/2025
Revision: A
NCE Ref: URB0001-P4

Size: **A3**
Map: **G02**



Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts



Afflux WSL (m)

Below -1.00
-0.50 - -1.00
-0.30 - -0.50
-0.10 - -0.30
-0.05 - -0.10
-0.01 - -0.05
-0.01 - 0.01
0.01 - 0.02
0.02 - 0.03
0.03 - 0.05
0.05 - 0.10
0.10 - 0.30
Above 0.30
Was wet, now dry
Was dry, now wet

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0 20 40 60 80 m

1:1,500

Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

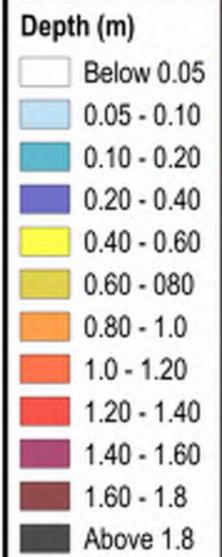
**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

2yr ARI STAGE 1 WSL AFFLUX

Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	G04
NCE Ref: URB0001-P4			

APPENDIX H

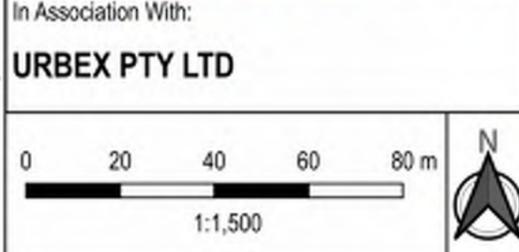
Sensitivity and Climate Change Mapping – WSL Afflux and Depth for select cases



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- Legend**
- TCC Land Parcels
 - Stage 12 Lots
 - Existing Pits
 - Existing Culverts
 - Previous Development Pits
 - Previous Development Culverts
 - Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

**100yr ARI DEVELOPED FLOOD
DEPTHS - 100% BLOCKAGE**

Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	H01
NCE Ref: URB0001-P4			



Depth (m)

Below 0.05
0.05 - 0.10
0.10 - 0.20
0.20 - 0.40
0.40 - 0.60
0.60 - 0.80
0.80 - 1.0
1.0 - 1.20
1.20 - 1.40
1.40 - 1.60
1.60 - 1.8
Above 1.8

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0 20 40 60 80 m

1:1,500

Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

**2yr ARI DEVELOPED FLOOD DEPTHS
- CLIMATE CHANGE**

Prepared By: BB	Date: 19/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	H02
NCE Ref: URB0001-P4			



Afflux WSL (m)

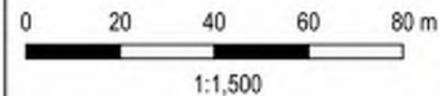
Below -1.00
-0.50 - -1.00
-0.30 - -0.50
-0.10 - -0.30
-0.05 - -0.10
-0.01 - -0.05
-0.01 - 0.01
0.01 - 0.02
0.02 - 0.03
0.03 - 0.05
0.05 - 0.10
0.10 - 0.30
Above 0.30
Was wet, now dry
Was dry, now wet



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Traffic | Flood Modelling

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Legend

- TCC Land Parcels
- Stage 12 Lots
- Existing Pits
- Existing Culverts
- Previous Development Pits
- Previous Development Culverts
- Proposed Development Culverts

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**
**100yr ARI WSL AFFLUX - CLIMATE
CHANGE**

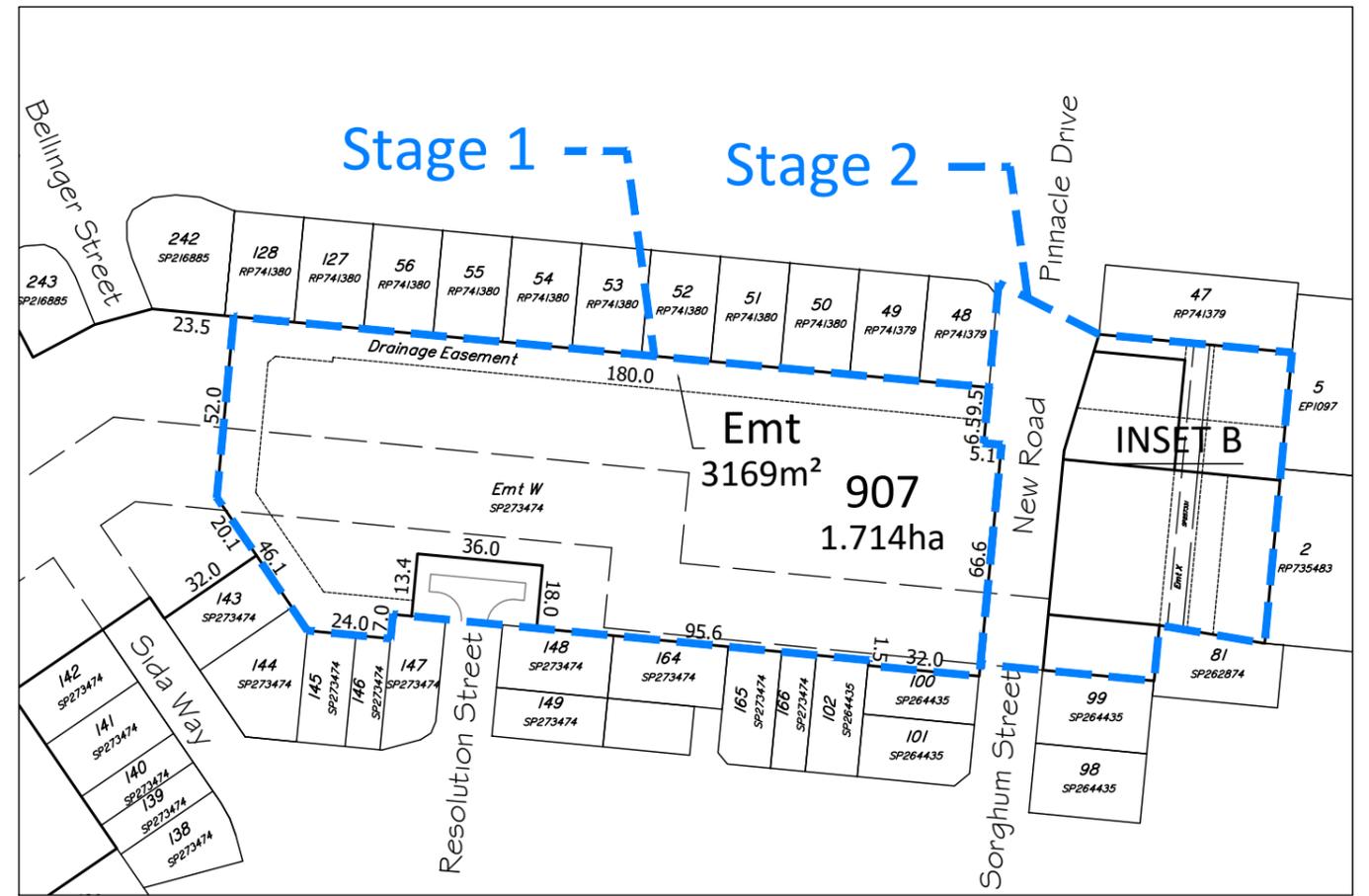
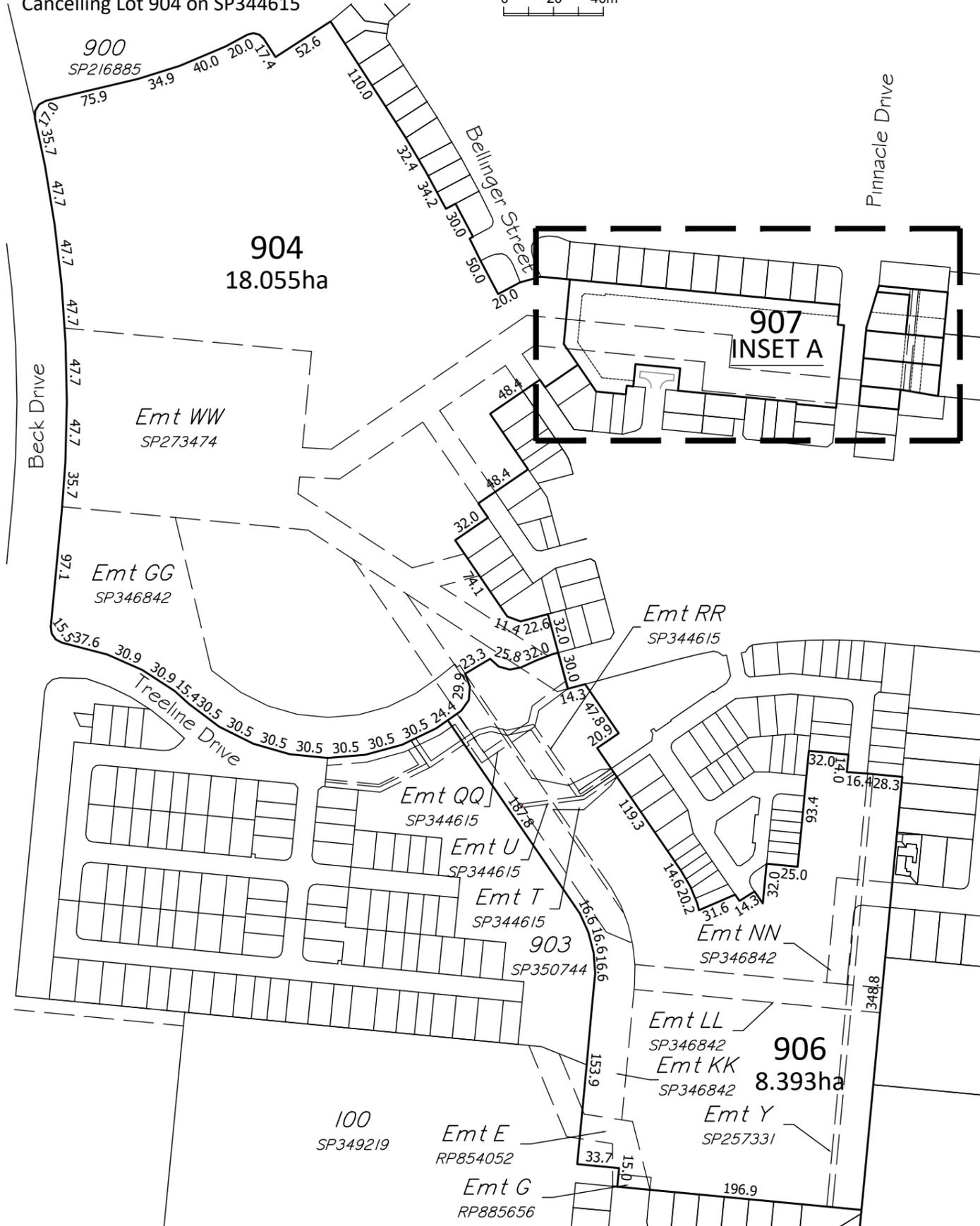
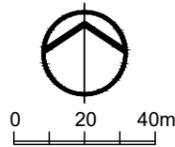
Prepared By: BB	Date: 19/12/2025	Size: A3	Map: H03
Reviewed by: AW	Revision: A		
	NCE Ref: URB0001-P4		

APPENDIX I

Stage 12a Development Plan

PROPOSED RECONFIGURATION

Lots 203-207, 904, 906-907 and Easements
Cancelling Lot 904 on SP344615



INSET A - 1:2000



INSET B - 1:1000

Date: 4th December, 2025	
Scale: 1:2000	A3
Drawn: MJM	
Job No: 43126-40-01	
Plan No:	43126/023 I

brazier motti

This plan is conceptual and for discussion purposes only. All areas, dimensions and land uses are preliminary, subject to investigation, survey, engineering, and Local Authority and Agency approvals.

braziermotti.com.au

SURVEYING
TOWNPLANNING
PROJECT MANAGEMENT
MAPPING & GIS



APPENDIX J

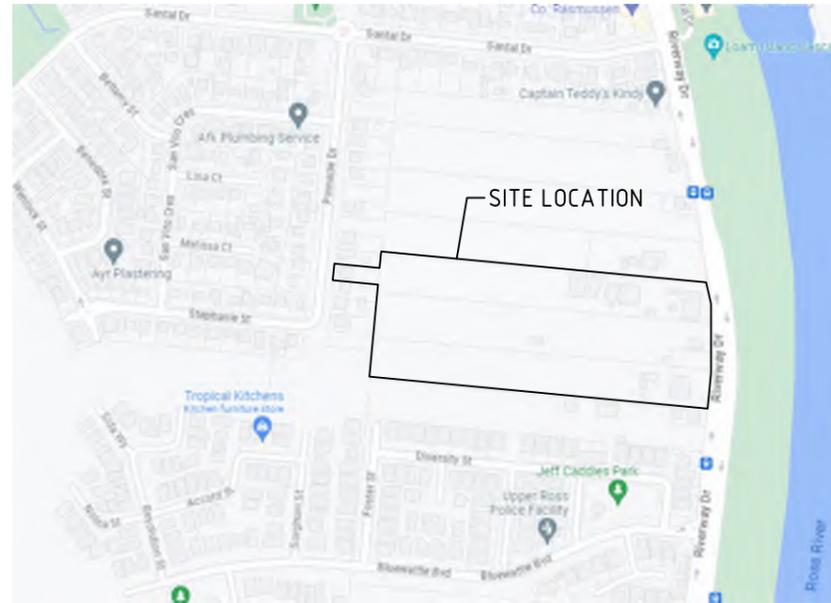
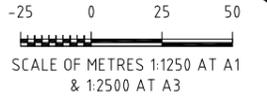
Yumba Meta Development Approved Plans

YUMBA-META DEVELOPMENT

AT

1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

SAFETY IN DESIGN INFORMATION
THERE MAY BE ADDITIONAL HAZARDS/RISKS NOT NORMALLY ASSOCIATED WITH THE TYPES OF WORK SHOWN ON THIS DRAWING. REFER TO THE SAFETY IN DESIGN REPORT.



LOCALITY PLAN
NOT TO SCALE

TOWNSVILLE CITY COUNCIL STANDARD DRAWINGS

ROADWORKS

- SD-020 CONCRETE KERBING
- SD-060 TRAFFIC SIGN INSTALLATION

STORMWATER

- SD-200 PRECAST GRATED KERB INLET SYSTEM AND CAST INSITU STORMWATER MANHOLE
- SD-205 STORMWATER MANHOLE DETAILS
- SD-210 PRECAST STORMWATER MANHOLE- SLAB TOP DETAILS
- SD-215 RAISED GRATE FIELD INLET MANHOLE

CTM STANDARD DRAWINGS

WATER RETICULATION

- SEQ-WAT-1102-1 TYPICAL MAINS CONSTRUCTION RETICULATION MAIN ARRANGEMENT
- SEQ-WAT-1103-1 TYPICAL MAINS CONSTRUCTION DISTRIBUTION AND TRANSFER MAIN ARRANGEMENTS
- SEQ-WAT-1105-2 TYPICAL CONNECTION TO EXISTING MAINS
- SEQ-WAT-1200-2 EMBEDMENT & TRENCH FILL TYPICAL ARRANGEMENT
- SEQ-WAT-1201-1 STANDARD EMBEDMENT TYPICAL FLEXIBLE & RIGID PIPES
- SEQ-WAT-1204-1 TYPICAL TRENCH AND BEDDING DETAILS WITH IN EXISTING ROADS TYPE K TO N
- SEQ-WAT-1205-1 TYPICAL THRUST BLOCK DETAILS MASS CONCRETE
- SEQ-WAT-1206-1 TYPICAL THRUST AND ANCHOR BLOCKS FOR VALVES
- SEQ-WAT-1207-1 TYPICAL THRUST AND ANCHOR BLOCKS FOR VERTICAL BENDS
- SEQ-WAT-1300-1 TYPICAL VALVE, HYDRANT AND WATER MAIN ROAD CROSSING ROAD AND PAVEMENT MARKERS
- SEQ-WAT-1300-2 TYPICAL VALVE AND HYDRANT IDENTIFICATION MARKER POSTS
- SEQ-WAT-1301-1 TYPICAL VALVE AND HYDRANT INSTALLATION VALVE ARRANGEMENT
- SEQ-WAT-1302-1 TYPICAL VALVE AND HYDRANT INSTALLATION HYDRANT ARRANGEMENT

CTM STANDARD DRAWINGS

SEWERAGE RETICULATION

- SEW-1102-1 DESIGN LAYOUTS CONNECTION TO EXISTING SEWER TYPICAL SCHEDULE OF WORKS
- SEW-1103-1 RIGSS PIPELAYING TYPICAL ARRANGEMENTS
- SEW-1103-2 NUSEWER PIPELAYING TYPICAL ARRANGEMENTS
- SEW-1104-1 SEWERAGE HOUSE CONNECTION TYPICAL CONSTRUCTION DETAILS RIGSS-SHEET1
- SEW-1105-1 SEWERAGE HOUSE CONNECTION TYPICAL CONSTRUCTION DETAILS RIGSS-SHEET2
- SEW-1106-3 PE NUSEWERS TYPICAL PROPERTY CONNECTION TYPE A3, A4 STANDARD & EXTENDED
- SEW-1106-5 PE NUSEWERS TYPICAL PROPERTY CONNECTION TYPE C1 TO C4 VERTICAL RISER EMBEDMENT & TRENCH FILL TYPICAL ARRANGEMENT
- SEW-1200-2 TYPICAL STANDARD EMBEDMENT FLEXIBLE & RIGID PIPES
- SEW-1300-1 MAINTENANCE HOLES < DN300 SEWER TYPES P1, P2 & P3 TYPICAL PRE-CAST CAST IN-SITU MAINTENANCE HOLE TYPICAL COPING & ANCHOR BRACKET DETAILS
- SEW-1301-1 "G" TYPE- PE NUSEWERS TYPICAL MAINTENANCE HOLE DETAILS
- SEW-1301-2 "G" TYPE- PE NUSEWERS TYPICAL MAINTENANCE HOLE AND SLAB DETAILS
- SEW-1301-3 "F" TYPE- PE NUSEWERS TYPICAL MAINTENANCE HOLE DETAILS
- SEW-1301-4 "F" TYPE PE NUSEWER TYPICAL MAINTENANCE HOLE AND SLAB DETAILS
- SEW-1302-1 MAINTENANCE HOLES CAST IN-SITU & PRECAST TYPICAL PIPE CONNECTION DETAILS
- SEW-1303-1 MAINTENANCE HOLES SEWERS < DN300 TYPICAL CHANGES IN LEVEL DETAILS
- SEW-1304-1 MAINTENANCE HOLES SEWERS <DN300 TYPICAL CHANNEL ARRANGEMENTS
- SEW-1305-1 MAINTENANCE HOLES TYPICAL CHANNEL DETAILS
- SEW-1306-1 MAINTENANCE HOLES TYPICAL ALTERNATIVE DROP CONNECTIONS
- SEW-1308-1 TYPICAL MAINTENANCE HOLE COVER & SURROUND DETAIL
- SEW-1313-1 MAINTENANCE HOLE SEWER CONNECTION DETAILS ALL PIPE MATERIALS
- SEW-1314-1 MAINTENANCE STRUCTURES FOR DN225 AND SMALLER RIGSS TYPICAL ARRANGEMENT DETAILS

DEPARTMENT OF TRANSPORT AND MAIN ROADS STANDARD DRAWINGS

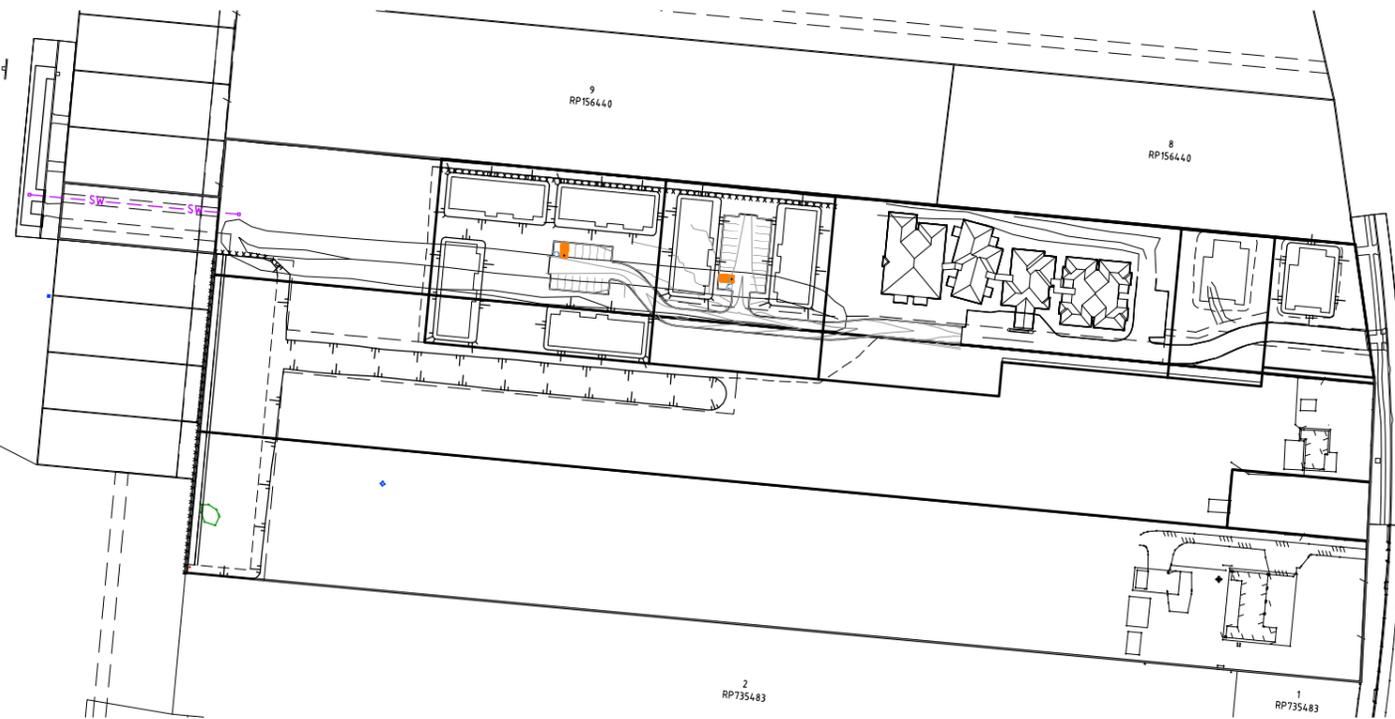
DRAINAGE, RETAINING STRUCTURES AND PROTECTIVE TREATMENTS

- SD1260 R C BOX CULVERTS AND SLAB LINK BOX CULVERTS - CULVERTS HEIGHT = 375 TO 600

TOWNSVILLE CITY COUNCIL DEVELOPMENT MANUAL PLANNING SCHEME

- SC6.4.5 ROAD TRANSPORT NETWORK
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OPW23/0071
24/10/2023



LAYOUT PLAN
SCALE 1:1250 AT A1

DRAWING SCHEDULE	
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C23	SOIL EROSION & SEDIMENT CONTROL DETAILS

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APPROVED	DATE
SLT	SLT
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RPEQ:	

CLIENT
YUMBA-META HOUSING ASSOCIATION LTD

PROJECT
YUMBA-META DEVELOPMENT STAGE 1
1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

DRAWING		
COVER SHEET		
NUMBER	SHEET NO.	REVISION
ROSE001	C01	B

GENERAL NOTES

- THIS SET OF DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER WRITTEN INSTRUCTIONS OR SKETCHES THAT MAY BE ISSUED.
- ALL DISCREPANCIES SHALL BE REFERRED TO THE SUPERINTENDENT FOR A DECISION BEFORE PROCEEDING WITH THE WORK.
- ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED. THE ENGINEERS DRAWINGS SHALL NOT BE SCALED.
- THE CONTRACTOR SHALL DETERMINE THE CORRECT LOCATIONS OF ALL EXISTING SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORKS.
- NO SUBSTITUTIONS SHALL BE MADE WITHOUT OBTAINING THE APPROVAL OF THE ENGINEER. THE APPROVAL OF A SUBSTITUTION FROM THE ENGINEER SHALL NOT BE AN AUTHORISATION FOR AN EXTRA. ANY EXTRA INVOLVED SHALL BE RESOLVED WITH THE SUPERINTENDENT BEFORE THE WORK COMMENCES.
- ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT CURRENT AUSTRALIAN STANDARDS CODES AND THE BY-LAWS, ORDINANCES AND REQUIREMENTS OF THE RELEVANT AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION AND CONTRACT DOCUMENTS.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE. ALL CHAINAGES AND LEVELS ARE EXPRESSED IN METRES UNLESS NOTED OTHERWISE.
- DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE WORKS IN A STABLE CONDITION AND ENSURING NO PART SHALL BE OVERSTRESSED UNDER CONSTRUCTION ACTIVITIES.
- NO HOLES, RECESSES OR CHASES OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE MADE WITHOUT PRIOR APPROVAL OF THE ENGINEER.
- ALL MATERIALS AND ELEMENTS SHALL BE FIXED IN STRICT ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS FOR THE NOMINATED LOADING CONDITIONS AND THE SUPPORTING STRUCTURE SHOWN ON THESE DRAWINGS.
- THE CONTRACTOR SHALL ALLOW IN HIS TENDER FOR APPROVED SUBSTITUTIONS DUE TO NON AVAILABILITY OF NOMINATED ITEMS.
- ALL EXISTING LEVELS AT CONNECTIONS TO EXISTING PIPES & PITS TO BE VERIFIED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- ANY DAMAGE CAUSED TO EXISTING SERVICES WILL BE MADE GOOD AT THE CONTRACTORS EXPENSE.
- EXPLOSIVES SHALL NOT BE USED FOR WORK UNDER THIS CONTRACT.
- THE SITE MAY CONTAIN HAZARDOUS MATERIAL (INCLUDING BUT NOT LIMITED TO ASBESTOS). THE CONTRACTOR SHALL IDENTIFY ALL HAZARDOUS MATERIALS AND TREAT/REMOVE IN ACCORDANCE WITH THE RELEVANT REGULATIONS, ACTS AND STANDARDS.
- THE CONTRACTOR IS TO PROVIDE A GUARANTEE, GUARANTEEING THE WORKMANSHIP AND ENSURING THAT THE WORKS ARE CONSTRUCTED IN ACCORDANCE WITH OUR DESIGNS AND DOCUMENTATION AS APPROVED BY COUNCIL FOR CONSTRUCTION.
- SURVEY CONDUCTED BY:
 - RPS SURVEY AND MAPPING ON 4th AUGUST 2020 DRAWING NO. 147582-001.
 - VISION SURVEYS ON 12th AUGUST 2019 DRAWING NO. 19452-CD-01.
 - VISION SURVEYS ON 13th APRIL 2021 DRAWING NO. 20323-ASC-01.
- THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING ANY TEMPORARY BENCHMARKS REQUIRED AND REINSTATING ANY PERMANENT BENCHMARKS DISTURBED.

EARTHWORKS NOTES

- EARTHWORKS SHALL GENERALLY BE CARRIED OUT IN ACCORDANCE WITH TOWNSVILLE CITY COUNCIL CITY PLAN UNLESS NOTED OTHERWISE.
- EXISTING SURFACES UNDER NEW WORKS ARE TO BE STRIPPED OF ALL VEGETATION, TOPSOIL AND UNCONTROLLED FILL TO A MINIMUM DEPTH OF 75mm. ALL TREE STUMPS AND ROOTS SHALL BE CHASED OUT AND REMOVED. IF DECLARED WEEDS ARE ENCOUNTERED THE CONTRACTOR IS TO ADVISE THE SUPERINTENDENT AND DISPOSE OF THEM IN AN APPROVED MANNER.
- GRUBBING OPERATIONS SHALL BE CARRIED OUT TO A DEPTH OF 0.5m BELOW THE NATURAL SURFACE OR 1.5m BELOW THE FINISHED SURFACE LEVEL, WHICHEVER IS THE LOWER.
- CHIPPING OF CLEARED VEGETATION THE CONTRACTOR SHALL:
 - PRODUCE A WOODCHIP MULCH DERIVED FROM CROWNS OF TREES AND BRANCHES OF SHRUBS CLEARED.
 - THE WOOD CHIP MULCH PRODUCED SHALL BE STOCKPILED FOR SUBSEQUENT USE OR FOR USE AT OTHER LOCATIONS AS APPROPRIATE, WHERE A BIOSECURITY RISK HAS NOT BEEN IDENTIFIED.
 - THE WOODCHIP MULCH SHALL BE PRODUCED FROM BRANCHES HAVING A MAXIMUM DIAMETER OF 100mm AND THE CHIPPED MATERIAL PRODUCED SHALL NOT HAVE TWO ORTHOGONAL DIMENSIONS EXCEEDING 75mm AND 50mm.
- FILL MATERIAL IS TO BE PLACED IN LAYERS NOT EXCEEDING 200mm LOOSE THICKNESS AND COMPACTED TO 98% OF THE STANDARD COMPACTION TEST. UNO EXCEPT AREAS BENEATH LANDSCAPING THAT ARE GREATER THAN 600mm AWAY FROM EITHER:
 - PAVEMENT EDGE;
 - SHOULDER EDGE; OR
 - BUILDING PLATFORM
 AND ARE NOT ON A BATTER, WHICH SHALL BE COMPACTED TO 85% OF THE STANDARD COMPACTION TEST
- GRADE EVENLY BETWEEN LEVELS SHOWN

PAVEMENT NOTES

- ASSUMED SUBGRADE CBR HAVE BEEN SHOWN ON PAVEMENT SECTIONS. PAVEMENT MAKEUP MAY BE ALTERED, SUBJECT TO THE DESIGN ENGINEERS APPROVAL IF THE EXPOSED SUBGRADE CONDITIONS VARY FROM THE VALUES ASSUMED FOR DESIGN.
- PAVEMENT TESTING SHALL BE IN ACCORDANCE WITH THE REQUIREMENT SECTION SC6.4.6 OF THE CITY PLAN. MINIMUM 25% OF TESTS TO BE LOCATED 0.3m FROM KERB LIP.

LINE MARKING NOTES

- LINE MARKING IN ACCORDANCE WITH THE DEPARTMENT OF TRANSPORT AND MAIN ROADS QUEENSLAND MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- LINE MARKING PAINT SHALL COMPLY WITH MAIN ROADS TECHNICAL STANDARD MRTS 45-ROAD SURFACE DELINEATION (REFLECTIVE TYPE).
- LINE MARKING DIMENSIONS ARE TO THE CENTRE OF THE LINE INDICATED
- ALL PARKING LINES UNLESS NOTED OTHERWISE TO BE UNBROKEN 100mm WIDE WHITE LINES

FORMWORK

- ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH AS 3610 AND AS 3600.
- THE DESIGN, CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF THE FORMWORK AND FALSEWORK IS THE RESPONSIBILITY OF THE CONTRACTOR.
- EXPOSED FORMED SURFACES SHALL HAVE A CLASS 3 SURFACE FINISH AND A 20mm CHAMFER UNLESS NOTED OTHERWISE. OBTAIN SIZES AND LOCATIONS OF PENETRATIONS FROM WORKSHOP DRAWINGS APPROVED BY THE ENGINEER. SIZES MUST NOT EXCEED DIMENSIONS WHERE SHOWN ON THE DRAWINGS.
- FORMWORK STRIPPING AND BACK PROPPING OF SOFFITS SHALL BE IN ACCORDANCE WITH AS 3610 AND SHALL OCCUR NO SOONER THAN:
 - FORMWORK STRIPPING: 4 DAYS
 - REMOVAL OF SHORES OR BACKPROPS: 12 DAYS
 OR WHEN 25MPa CONCRETE STRENGTH HAS BEEN REACHED. CONCRETE STRENGTH IS TO BE CONFIRMED BY A COMPRESSIVE STRENGTH TEST.

REINFORCEMENT

- REINFORCEMENT SYMBOLS
 R - GRADE 230R PLAIN ROUND BARS TO AS/NZS4671
 N - GRADE 500 DEFORMED BARS TO AS/NZS4671
 L - GRADE 500 HARD DRAWN WELDED WIRE FABRIC TO AS/NZS4671
 W - HARD DRAWN PLAIN WIRE TO AS/NZS4671
- REINFORCEMENT IS SHOWN DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.
- REINFORCEMENT SHALL BE SUPPLIED AND BENT IN ACCORDANCE WITH AS3600. REBENDING OF REINFORCEMENT WITH OR WITHOUT HEATING IS NOT PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER.
- SPLICES TO REINFORCEMENT SHALL ONLY BE MADE IN POSITIONS SHOWN OR AS APPROVED OTHERWISE BY THE ENGINEER.
- REINFORCEMENT SPLICES SHALL BE FULL STRENGTH TENSION SPLICES WITH LAPS AS FOLLOWS UNLESS NOTED OTHERWISE.

	fc'	MIN. COVER	N12	N16	N20
ALL HORIZONTAL AND VERTICAL BARS UNO	25MPa	30mm	480	750	1030
	32MPa	40mm	390	590	840
	40MPa	45mm	350	530	750
	50MPa	50mm	350	460	610
HORIZONTAL BARS WITH +300 CONCRETE BELOW BAR	25MPa	30mm	630	970	1340
	32MPa	40mm	500	770	1090
	40MPa	45mm	450	650	930
	50MPa	50mm	450	600	800

- THE MINIMUM FABRIC LAP SHALL BE TWO CROSS WIRES PLUS 25mm. STAGGER SHEETS TO AVOID EXCESSIVE THICKNESS AT LAPS.



- USE MECHANICAL SPLICES ONLY WHERE SPECIFIED OR APPROVED BY THE ENGINEER.
- DO NOT WELD REINFORCEMENT WITHOUT THE APPROVAL OF THE ENGINEER.
- PROVIDE 3-N12 DIAGONAL BARS x 2000 LONG IN THE TOP LAYER AT ALL RE-ENTRANT CORNERS. 100 MIN. SPACING.
- REINFORCING BARS SHALL NOT BE CUT TO CLEAR PENETRATIONS NOT DETAILED ON THE DRAWINGS BUT BE DISPLACED TO CLEAR THEM. ADDITIONAL REINFORCING CONSISTENT WITH THE REINFORCEMENT MAT SPACING IS TO BE PROVIDED IN LINE WITH THE BLOCKOUTS.
- SUPPORT ALL REINFORCEMENT SECURELY IN ITS CORRECT POSITION DURING CONCRETING BY SECURELY TYING WITH 1.25mm WIRE TO APPROVED PLASTIC TIPPED BAR CHAIRS, SPACERS OR SUPPORT BARS. SUPPORT SPACINGS SHALL BE SUCH AS TO POSITION AND MAINTAIN THE REINFORCEMENT TO THE TOLERANCES OF AS3600 AND SHALL BE AT 800mm MAXIMUM CENTRES IN SLABS. BAR CHAIRS SHALL COMPLY WITH AS/NZS 2425. PLASTIC TIPPED STEEL BAR CHAIRS SHALL NOT BE USED FOR EXTERNAL WORK.

ESCP & TMP

- THE CONTRACTOR IS RESPONSIBLE FOR THE IMPLEMENTATION & MAINTENANCE OF THE SOIL EROSION & SEDIMENT CONTROL MEASURES DURING CONSTRUCTION AS PER TOWNSVILLE CITY COUNCIL GUIDELINES AND APPLICABLE CATCHMENTS AND CREEKS FIELD GUIDES
- THE OWNER IS RESPONSIBLE FOR THE IMPLEMENTATION & MAINTENANCE OF THE SOIL EROSION & SEDIMENT CONTROL POST CONSTRUCTION.
- DURING CONSTRUCTION ALL CONTRACTOR VEHICLES THAT ARE NOT ABLE TO BE CONTAINED ON SITE MUST ONLY UTILISE SPACES WITHIN THE ROAD RESERVE THAT DIRECTLY FRONTS THE SUBJECT ALLOTMENT, UNLESS OTHERWISE APPROVED BY COUNCIL. VEHICLES MUST NOT AT ANY TIME OBSTRUCT FOOTPATH AREAS OR SIGHT LINES WITHIN THE VICINITY OF THE DEVELOPMENT.
- ALL MATERIAL AND MACHINERY TO BE USED DURING THE CONSTRUCTION PERIOD ARE TO BE WHOLLY STORED ON THE SITE UNLESS OTHERWISE AGREED IN WRITING BY COUNCIL.

CONCRETE

- ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH AS 3600 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
- THE CONTRACTOR SHALL ALLOW FOR AND GIVE TWO FULL WORKING DAYS NOTICE FOR ALL INSPECTIONS.
- CONCRETE GRADES AND COVER TO REINFORCEMENT SHALL BE AS FOLLOWS UNLESS SPECIFIED OTHERWISE:

ELEMENT	EXPOSURE	COVER	GRADE	
CULVERT BASE SLABS,	- AGAINST GROUND	A2	75	N40
HEAD & WING WALLS	- FINISHED	B1	40	N40
PITS	- EXTERNAL	B1	40	N32
	- INTERNAL	A1	40	N32

KERBS SHALL COMPLY WITH AS2876. MANUALLY PLACED CONCRETE SHALL BE GRADE N32. MACHINE-PLACED CONCRETE SHALL HAVE A MINIMUM OF, OR EQUIVALENT OF 320kg OF CEMENT PER CUBIC METRE OF CONCRETE

- MINIMUM CONCRETE GRADES OF MINOR ELEMENTS ARE INDICATED ON THE DESIGN DRAWINGS, WHERE NO GRADE IS SPECIFIED CONCRETE SHALL BE GRADE N32
- ALL CONCRETE SUPPLIED SHALL HAVE A SLUMP OF 80+/-15mm AND A MAXIMUM NOMINAL AGGREGATE SIZE OF 20mm UNLESS SPECIFIED OTHERWISE.
 - CONCRETE SAMPLING AND TESTING SHALL BE BY PROJECT ASSESSMENT TO AS3600 AND AS1379 UNLESS SPECIFIED OTHERWISE.
 - SHOULD CONDITIONS OTHER THAN THOSE DESCRIBED ABOVE BE ENCOUNTERED THEN REFER TO THE ENGINEER FOR POSSIBLE FOOTING REDESIGN.
 - ALL STRUCTURES CAST AGAINST GROUND SHALL BE LAID ON AN APPROVED VAPOUR BARRIER, OR A 50mm THICK N15 BLINDING LAYER EXCEPT FOR FOOTINGS.
 - PROPERLY FORM ALL CONSTRUCTION JOINTS AND LOCATE THEM ONLY WHERE SHOWN OR SPECIFICALLY APPROVED BY THE ENGINEER.
 - PIPES OR CONDUITS SHALL NOT BE PLACED WITHIN THE CONCRETE COVER TO REINFORCEMENT WITHOUT THE APPROVAL OF THE ENGINEER.
 - ALL CHEMICAL & EXPANSIVE ANCHORS IN CONCRETE OR REINFORCED BLOCKWORK SHALL BE NOT DIPPED GALVANISED AND HILTI OR RAMSET PRODUCTS OR AN APPROVED EQUIVALENT. UNLESS NOTED OTHERWISE, EPOXY FOR CHEMICAL ANCHORS SHALL BE RAMSET REO 502. MINIMUM INSTALLATION REQUIREMENTS SHALL BE AS FOLLOWS.

SIZE	MINIMUM EDGE DISTANCE	MINIMUM SPACING	MINIMUM EMBEDMENT DEPTH
M12	100	100	110
M16	125	125	125
M20	150	150	140

- NO ADMIXTURES SHALL BE USED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER EXCEPT IN STANDARD CONTROLLED GRADE CONCRETE. CALCIUM CHLORIDE ADMIXTURES WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES.
- COMPACT ALL CONCRETE DURING PLACEMENT USING HIGH FREQUENCY MECHANICAL VIBRATORS.
- CURE ALL CONCRETE SURFACES EXPOSED WITHIN 7 DAYS OF INITIAL SET USING A METHOD APPROVED BY AS3799 OR THE STRUCTURAL ENGINEER. COMMENCE CURING WITHIN 1 HOUR OF INITIAL SET OR FIRST EXPOSURE AND CONTINUE FOR AT LEAST 7 DAYS AFTER POURING CONCRETE.
- THE PROCEDURES OUTLINED IN THE FOLLOWING DATA SHEETS, "CURING OF CONCRETE", "AVOID EARLY CRACKING" AND "HOT-WEATHER CONCRETING", SHALL BE FOLLOWED TO REDUCE THE RISK OF PLASTIC SHRINKAGE CRACKING.
- MAINTAIN SPECIFIED COVER AT CHAMFERS, DRIP GROOVES, REGLETS AND OTHER MINOR CONCRETE SURFACE TREATMENTS.
- CONCRETE TO BE BROOM FINISHED
- UNLESS NOTED OTHERWISE TOLERANCES SHALL COMPLY WITH REQUIREMENTS SET OUT IN THE TABLE BELOW:

ELEMENT	POSITION/ SIZE	SURFACE QUALITY
SLABS AND DISH DRAINS	MAX. DEVIATION FROM ANY SPECIFIED HEIGHT, PLAN OR CROSS-SECTIONAL DIMENSION TO BE THE GREATER OF 1/200 TIMES SPECIFIED DIMENSIONS OR 5mm. SURFACE LEVEL TO BE WITHIN ±10mm OF SPECIFIED LEVEL	EXPOSED EDGES TO BE CLASS 3. FLATNESS- MAX. DEVIATION FROM A 3m STRAIGHTEDGE PLACED ANYWHERE ON THE SURFACE: 5mm.

Townsville City Council

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24/10/2023

SAFETY IN DESIGN INFORMATION
THERE MAY BE ADDITIONAL HAZARDS/RISKS NOT NORMALLY ASSOCIATED WITH THE TYPES OF WORK SHOWN ON THIS DRAWING. REFER TO THE SAFETY IN DESIGN REPORT.

REVISION	APP'D	DATE
B	ISSUE FOR APPROVAL	DEJ 21/07/23
A	ORIGINAL ISSUE	SLT 14/07/23

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DRAWN	DESIGNED
SLT	SLT
APPROVED	DATE
D.E.JOHNSTONE	21/07/23
RPEQ:	

CLIENT
 YUMBA-META HOUSING ASSOCIATION LTD
PROJECT
 YUMBA-META DEVELOPMENT STAGE 1
 1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN
DRAWING

NOTES - SHEET 1

NUMBER	SHEET NO.	REVISION
ROSE001	C02	B

STORMWATER DRAINAGE

1. STORMWATER DRAINAGE PIPES TO BE
 - 1.1. PVC WITH SOLVENT CEMENT JOINTS
 - 1.2. BLACKMAX WITH SPIGOT AND SOCKET JOINTS.
 - 1.3. ALL REINFORCED CONCRETE STORMWATER DRAINAGE PIPES ARE TO BE MINIMUM CLASS 3, HAVE BELLED - SOCKET RUBBER RING JOINTS AND LAID ON H2 BEDDING IN ACCORDANCE WITH AS3725 UNO.
2. SITE STORMWATER DRAINAGE SHALL BE FREE OF LEAKS WHEN SUBJECTED TO THE WATER TEST REQUIREMENTS OF AS/NZS 3500.3.
3. ALL STORMWATER PIPEWORK IS TO BE LAID WITH THE SOCKET FACING UPSTREAM. ALL WORKS ARE TO COMMENCE AT THE OUTLET END OF EACH LINE.
4. THE CONTRACTOR IS TO ORGANISE AND STAGE CONSTRUCTION WORK AND UNDERTAKE ANY DIVERSION WORKS, TO PROTECT WORKS IN PROGRESS UNTIL SUCH A TIME AS THE WORKS ARE IN A FINISHED AND STABLE CONDITION AND TO ENSURE EXISTING DRAINS ARE ABLE TO CONVEY ALL STORMWATER FLOWS THAT MAY OCCUR DURING THE PERIOD OF THE CONSTRUCTION WORKS.
5. ANY DAMAGE TO THE WORKS DUE TO STORMWATER FLOWS OR FLOODING DURING THE CONSTRUCTION PERIOD IS AT THE CONTRACTORS RISK.
6. SETOUT POINT FOR STORMWATER STRUCTURES IS AS INDICATED IN THE DRAWINGS UNLESS NOTED OTHERWISE.
7. STORMWATER STRUCTURES ARE TO BE CONSTRUCTED PERPENDICULAR TO THE INCOMING PIPEWORK UNLESS NOTED OTHERWISE.
8. PITS TO BE:
 - 8.1. PVC/PRECAST/CAST IN SITU UP TO 600mm DEEP TO HAVE 450x450 INTERNAL OPENING
 - 8.2. PVC/PRECAST/CAST IN SITU UP TO 900mm DEEP TO HAVE 600x600 INTERNAL OPENING
 - 8.3. PRECAST/ CAST IN SITU WHERE GREATER THAN 900mm DEEP TO HAVE 900x900 INTERNAL OPENING UNLESS NOTED OTHERWISE.
9. PROVIDE MASS CONCRETE BENCHING IN STORMWATER ACCESS CHAMBERS TO ALLOW MINIMUM 30mm FALL ACROSS PITS. ADJUST BENCHING IN EXISTING MANHOLES AND PITS THAT ARE BEING MODIFIED OR ADJUSTED TO SUIT NEW STORMWATER DRAINAGE.
10. GRATES AND FRAMES SHALL COMPLY WITH THE DRAWINGS AND BE INSTALLED IN ACCORDANCE WITH AS 3996 AND THE MANUFACTURERS RECOMMENDATIONS. GRATES TO BE GALV. STEEL GRATES (CLASS B UNO) WITH LOCKING MECHANISM. GRATES SHALL BE SLIP RESISTANT, BICYCLE AND HEEL SAFE UNLESS APPROVED OTHERWISE BY THE SUPERINTENDENT.
11. CONCRETE DESIGN FOR STORMWATER STRUCTURES HAS BEEN BASED ON THE USAGE OF THE DRAINAGE SYSTEM FOR FRESH WATER ONLY.
12. ALL EXPOSED EDGES ON STORMWATER PITS TO BE ROUNDED TO 5mm RADIUS.
13. THE CONTRACTOR MAY ELECT TO SUBSTITUTE PRECAST PITS FOR CAST INSITU PITS SHOWN ON THE DRAWINGS. DETAILS OF ANY PROPOSED PRECAST ELEMENTS MUST BE SUBMITTED TO THE SUPERINTENDENT PRIOR TO USE.
14. PRECAST COMPONENTS SHALL BE CONNECTED BY MEANS OF 12mm DOWEL PINS EPOXIED IN DRILLED ϕ 14-16mm HOLES. THESE PINS TO BE MANUFACTURED FROM GRADE 250 STEEL BAR TO AS3679.1 HOT-DIPPED GALVANISED TO COMPLY WITH THE REQUIREMENTS OF AS/NZS4680.
15. DOWEL EPOXY TO BE APPROVED BY THE SUPERINTENDENT PRIOR TO USE.
16. HORIZONTAL JOINT SPACE (-10mm) SHALL BE FILLED WITH A 3:1 SAND:CEMENT MORTAR.
17. VERTICAL JOINTS BETWEEN PRECAST COMPONENTS SHALL BE SEALED WITH AN APPROVED PRODUCT FIXED TO THE EXTERNAL FACE OF THE JOINT. APPLICATION OF EPOXY TO BE AS PER MANUFACTURER'S INSTRUCTIONS OR TECHNICAL DATA SHEETS. INSTALLATION TO BE COMPLETED WITHIN THE POT LIFE OF THE EPOXY PRODUCT.
18. WATER RUN OFF DURING CONSTRUCTION SHALL BE COLLECTED AND CHANNED AWAY FROM THE BUILDING SITE. WATER SHALL NOT BE ALLOWED TO POND IN TRENCHES.
19. SUBSURFACE DRAINS SHALL NOT BE USED WITHIN 1.5m OF THE BUILDING UNLESS APPROVED BY THE ENGINEER. DRAINS SHALL BE PROTECTED BY FILTERS AND/OR GEOTEXTILES AND SHALL BE ABLE TO BE INSPECTED AND MAINTAINED.
20. THE MAXIMUM AND MINIMUM PIPE GRADES SHALL CONFIRM WITH THE FOLLOWING:

PIPE DIAMETER (mm)	MAXIMUM GRADE (%)	MINIMUM GRADE (%)
300	20.0	0.50
375	15.0	0.40
450	11.0	0.30
525	9.0	0.25
600	7.5	0.20
675	6.5	0.18
750	5.5	0.15
900	4.5	0.12
1050	3.5	0.10
1200	3.0	0.10

SEWER NOTES

1. THESE DRAWINGS ARE READ IN CONJUNCTION WITH THE RELEVANT STD DRAWINGS, CONSTRUCTION SPECIFICATIONS AND ADDENDUM TO WSA.
2. SEWER MAINS ARE CONSTRUCTED ON A 1.5m ALIGNMENT FROM PROPERTY BOUNDARIES UNO.
3. SEWER GRAVITY MAINS TO BE U-PVC, CLASS SN8 (UNLESS NOTED OTHERWISE).
4. ALL SEWER PIPES TO BE RUBBER RING JOINTED UNLESS NOTED OTHERWISE.
5. MANHOLES (MH) TO BE STANDARD SEWER MANHOLES ϕ 1050. MAINTENANCE SHAFTS TO COMPLY WITH COUNCIL STANDARDS AND MANUFACTURERS SPECIFICATIONS. COVERS TO BE CLASS D UNLESS NOTED OTHERWISE.
6. ALL CONNECTIONS TO MAINTENANCE HOLES SHALL BE AT A SHORT CONNECTOR 450 MIN. TO 600 MAX. LONG.
7. UNDERLAY, SIDE SUPPORT AND OVERLAY MATERIAL SHALL BE IN ACCORDANCE WITH TECHNICAL SPECIFICATION.
8. TRENCH WIDTHS SPECIFIED ARE MINIMUM WIDTHS THAT ARE REQUIRED TO A LEVEL OF 300mm ABOVE THE OBVERT OF THE PIPE. TRENCH WIDTHS ABOVE THIS LEVEL MAY BE WIDENED TO SUIT SAFETY REQUIREMENTS.
9. MINIMUM COVER TO SEWER PIPES AT MAINTENANCE HOLES TO BE 1200mm. AT INTERMEDIATE LOCATIONS MINIMUM COVER TO BE 750mm WITHOUT CONCRETE SURROUND. MAXIMUM COVER TO BE 5000mm
10. CONCRETE TO BE GRADE S32 SULPHIDE RESISTANT.
11. UNLESS OTHERWISE APPROVED FOR PARTICULAR SITE CONDITIONS, SHORT PIPES (500mm MAX.) TO BE FLEXIBLY JOINTED TO ALL SECTIONS BEDDED ON OR SURROUNDED WITH CONCRETE. MAXIMUM FALL ACROSS MAINTENANCE HOLE SHALL BE 150mm, UNLESS A DROP INLET IS USED.
12. SUBCONTRACTOR TO CONFIRM LOCATION OF BUILDING DRAIN CONNECTIONS PRIOR TO CONSTRUCTION.
13. BUILDING DRAIN BRANCH TERMINATION LOCATION TO BE IDENTIFIED WITH APPROVED MARKER TAPE. TAPE SHALL BE SECURED TO END AND BROUGHT TO THE SURFACE ATTACHED TO A MARKER STAKE.
14. CONNECTION TO EXISTING SEWERAGE TO BE CARRIED OUT BY CONTRACTOR UNDER COUNCIL SUPERVISION.

WATER RETICULATION NOTES

1. THESE DRAWINGS ARE READ IN CONJUNCTION WITH THE RELEVANT STD DWGS, CONSTRUCTION SPECIFICATIONS AND ADDENDUM TO WSA.
2. COVER TO WATER MAINS TO BE 600mm UNO.
3. PROVIDE COVER BOXES AT ALL VALVES AND HYDRANTS.
4. DUCTILE IRON FITTINGS ARE TO BE USED WITH PVC PIPE. FITTINGS MAY BE FBE COATED AND LINED OR CEMENT LINED WITH A BITUMINOUS EXTERNAL COATING.
5. ALL POTABLE AND FIRE WATER TO BE M-PVC PN16 UNLESS NOTED OTHERWISE. BUILDING WATER SERVICE BRANCH CONNECTIONS TO BE PE PN12.5 UNLESS NOTED OTHERWISE.
6. VALVES TO BE LOCATED BY PAINTING A WHITE ENAMEL "V" ON A 300mm LONG BLACK ENAMEL BACKGROUND ON FACE AND TOP OF KERB OPPOSITE FITTING.
7. IF COVER TO VALVE SPINDLE IS GREATER THAN 350mm THEN AN EXTENSION SPINDLE SHALL BE INSTALLED TO ACHIEVE COVER REQUIREMENTS.
8. USE PRE-TAPPED CONNECTORS ON DN100 & DN150 NEW MAIN INSTALLATIONS.
9. ALL BENDS, TEES AND FITTINGS TO BE D.I.C.L. SOCKET END UNLESS NOTED OTHERWISE.
10. ALL FITTINGS TO BE PROVIDED WITH THRUST ANCHOR OF MIN. AREA AGAINST SOLID GROUND TO TRANSFER UNBALANCED FORCES FROM FITTINGS TO SOLID GROUND.
11. SINGLE PIPELINE THRUST BLOCKS TO BE IN ACCORDANCE WITH WSA-REQUIREMENTS AND MINIMUM THRUST AREA. FOR MULTIPLE PIPES SHALL BE CONFIRMED DURING THE SCHEMATIC DESIGN.
12. PERMANENT ANCHORS TO BE 25MPa CONCRETE. TEMPORARY ANCHORS MAY BE APPROVED TIMBER TOMS.
13. VALVES TO BE SUPPORTED ON CONCRETE PADS TO CARRY WEIGHT OF VALVE.
14. CROSSES TO BE ANCHORED AS FOR TEES WHERE ONE OR MORE BRANCHES CLOSED OFF.
15. MINIMUM AREA OF ANCHORS FOR REDUCERS/TAPERS TO BE EQUAL TO DIFFERENCE IN AREA FOR DEAD END ANCHORS OF DIAMETERS OF EACH END OF REDUCER.
16. MAXIMUM SIZE OF DRILLED HOLES FOR SERVICE CONNECTIONS IN PVC PIPE TO BE 30% DN OR 50 (LOWER VALUE TO BE USED) LARGER HOLES CAN BE USED FOR UNDER PRESSURE TAPPING.
17. FINISH THRUST BLOCKS APPROXIMATELY 100mm ABOVE THE TOP OF THE FITTING OR BEARING PAD AND EXTEND TO THE FLOOR OF THE TRENCH OR DEEPER IF NECESSARY TO ACHIEVE THE REQUIRED THRUST AREA. MAXIMUM ENCASEMENT TO BE 180°
18. THE MANUFACTURERS RECOMMENDED PRACTICE FOR THE ANCHORING OF BENDS, TEES, CROSSES, VALVES AND REDUCERS ETC. SHALL BE FOLLOWED.
19. WHEN SETTING PIPES IN CONCRETE A MEMBRANE OF POLYTHENE, P.V.C. OR FELT SHALL SURROUND THE PIPE AND THE FITTINGS TO PERMIT MOVEMENT.
20. CONNECTION TO EXISTING WATER MAINS EXTERNAL TO THE SITE SHALL BE CARRIED OUT BY THE CONTRACTOR UNDER COUNCIL SUPERVISION. ANY COUNCIL FEES ASSOCIATED WITH THE CONNECTION SHALL BE PAID FOR BY THE CONTRACTOR.

UTILITIES

1. EXISTING SERVICES INDICATED ON THE DRAWINGS ARE INDICATIVE ONLY AND MAY NOT INCLUDE ALL SERVICES PRESENT. IT IS THE CONTRACTORS RESPONSIBILITY TO CHECK THE POSITION OF ALL SERVICES WITH ALL SERVICES AUTHORITIES, AND ESTABLISH THE POSITION LEVEL AND SIZE OF THE UTILITY SERVICES IN THE FIELD PRIOR TO PROCEEDING WITH ANY CONSTRUCTION OR EXCAVATION WORK.
2. WHERE THE CONTRACT REQUIRES THE CONTRACTORS TO ADJUST, REMOVE, DIVERT, CUT INTO OR CUT OFF ANY SERVICE, THE CONTRACTORS SHALL ARRANGE FOR THE NECESSARY WORK TO BE EXECUTED AT THEIR COST. WHERE THE CONTRACT WORK DOES NOT NOMINATE THE CONTRACTOR TO CARRY OUT SUCH WORK, THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT.
3. ANY SERVICE MODIFIED OR CONNECTED TO IS TO HAVE ITS CONDITION EVALUATED TO ENSURE IT WILL MAINTAIN ITS SERVICEABILITY FOR THE DESIGN LIFE
4. ALL CONCRETE ENCASEMENT OF SEWER PIPES AND WATER MAINS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE WATER SERVICES ASSOCIATION'S SEWERAGE CODE OF AUSTRALIA: WSA-02 & WSA-03.
5. MINIMUM VERTICAL CLEARANCES AT CROSSINGS ARE TO BE ACHIEVED BY JOINT DEFLECTIONS WHERE POSSIBLE. OTHERWISE, WHERE THIS CANNOT BE ACHIEVED CONTACT THE SUPERINTENDENT FOR ADVICE.

ROCK PROTECTION

1. ROCK PROTECTION TO BE CARRIED OUT IN ACCORDANCE WITH QUEENSLAND DEPARTMENT OF TRANSPORT AND MAIN ROADS TECHNICAL SPECIFICATIONS "MRTS03 - DRAINAGE, RETAINING STRUCTURES AND PROTECTIVE TREATMENTS, EXCEPT WHERE VARIED BY THESE DOCUMENTS.
2. ROCK MATERIAL SHALL BE PRODUCED OR DERIVED FROM DENSE, HARD DURABLE AND CLEAN ROCK. IT SHALL BE RESISTANT TO WEATHERING AND SHALL BE FREE FROM OVERBURDEN, SPOIL, SHALE AND ORGANIC MATTER. ROCK PORTIONS THAT IS CRACKED, FRACTURED, LAMINATED, POROUS OR CONTAINS OTHER STRUCTURAL DEFECTS WHICH MAY REDUCE ITS MECHANICAL STRENGTH OR RESISTANCE TO WEATHERING SHALL NOT BE USED.
3. THE BREADTH OR THICKNESS OF A SINGLE STONE SHALL NOT BE LESS THAN ONE-THIRD OF ITS LENGTH.
4. UNLESS NOTED OTHERWISE, ROCK WITHIN THE GROUND SURFACE TREATMENT AND ROCK PROTECTION TO THE CULVERTS SHALL BE A UNIFORM SIZE. THE NOMINAL SIZE OF ROCK USED IN PROTECTION SHALL BE 200mm. MINUS 19mm GRAVEL SHALL COMPLY WITH THE FOLLOWING GRADING.

SIEVE SIZE (mm)	MASS OF SAMPLE PASSING (%)
26.5	100
19.0	85-100
13.2	-
9.50	0-20
6.70	-
4.75	0-5
2.36	-
0.075	0-2

5. PADS BENEATH CULVERTS AND PAVEMENTS SHALL BE COMPACTED BY THE COMPACTED LAYER METHOD UNTIL THERE IS NO PERCEPTIBLE SURFACE DEFORMATION OR SPRINGING DURING ROLLING.
6. ALL MATERIAL SHALL BE PLACED AND COMPACTED IN UNIFORM LAYERS.
7. THE PLACING OPERATIONS SHALL MINIMISE THE CHANCES OF MATERIAL RUNNING LOOSE AND DAMAGING ADJACENT AREAS.
8. THE FINISHED SURFACE SHALL HAVE A UNIFORM APPEARANCE OVERALL AND SHALL NOT HAVE NOTICEABLE IRREGULARITIES IN HORIZONTAL OR VERTICAL ALIGNMENTS.

GEOTEXTILES

1. THE GEOTEXTILE SHALL BE BIDIM A39 OR AN EQUIVALENT APPROVED BY THE ENGINEER. IT SHALL BE PLACED FOR THE EXTENTS SHOWN ON THE PLAN AND BENEATH ALL ROCK PROTECTION WORKS.
2. ALTERNATIVE GEOTEXTILES SHALL ONLY BE CONSIDERED IF:
 - a) THEY ARE NON-WOVEN, NEEDLE PUNCHED STAPLE FIBRE.
 - b) THEY HAVE AN EQUIVALENT OPENING SIZE SUFFICIENT TO RETAIN THE SOIL BELOW WHILE PASSING WATER WITHOUT A SIGNIFICANT RISE IN HEAD.
 - c) IT CAN BE DEMONSTRATED THAT CLOGGING OF THE OPENINGS BY FINE PARTICLES AND CONSEQUENTLY A REDUCTION IN PERMEABILITY HAS BEEN AGREED AS NOT BEING AND ISSUE.
 - d) THEY HAVE THE FOLLOWING PROPERTIES AS DEFINED BY THE QUEENSLAND DEPARTMENT OF MAIN ROADS AND TRANSPORT SPECIFICATIONS MRTS27.
 - STRENGTH CLASS = D
 - FILTRATION CLASS = IV
3. THE GEOTEXTILES SHALL BE INSTALLED ONTO THE PREPARED SURFACE ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.
4. PLACEMENT OF THE GEOTEXTILE SHALL INCORPORATE THE FOLLOWING:
 - a) GEOTEXTILES SHALL BE LAID LOOSELY, FREE OF WRINKLES, CREASES AND FOLDS. IT SHALL BE PLACED IN A MANNER THAT ALLOWS THE FABRIC TO CONFORM TO IRREGULARITIES IN THE SOIL WHEN HEAVIER MATERIALS ARE PLACED ON THE FABRIC. PLACING THE GEOTEXTILE IN A STRETCHED CONDITION UNDER TENSILE STRESS SHALL BE AVOIDED.
 - b) FABRIC PLACEMENT ON SLOPES SHALL BEGIN AT THE SLOPE TOE AND PROCEED UPSLOPE WITH THE UPSLOPE PANEL OVERLAPPING THE DOWNSLOPE PANEL.
 - c) STEEL SECURING PINS (WHERE REQUIRED) SHALL BE 5mm IN DIAMETER AND HAVE A HEAD CAPABLE OF RETAINING A STEEL WASHER HAVING A 38mm OUTSIDE DIAMETER. PIN LENGTH SHALL BE A MINIMUM OF 450mm FOR MEDIUM TO HIGH DENSITY SOIL AND LONGER FOR LOOSER SOILS. PIN SPACING ALONG THE OVERLAP SHALL BE A MAXIMUM OF 0.6m FOR SLOPES STEEPER THAN 1 ON 3, 1.0m FOR SLOPES BETWEEN 1 ON 3 AND 1 ON 4, AND 1.5m FOR SLOPES FLATTER THAN 1 ON 4. ADDITIONAL PINS SHALL BE USED AS NECESSARY TO PREVENT GEOTEXTILE SLIPPAGE.
 - d) OVERLAPS SHALL BE AT LEAST 450mm.
 - e) CARE SHALL BE EXERCISED IN PLACING OVERLYING STONE TO AVOID PUNCTURING THE GEOTEXTILE.
5. MINOR CONSTRUCTION DAMAGE TO GEOTEXTILE FILTERS SHALL BE REPAIRED BY TRIMMING OUT THE DAMAGED SECTION AND REPLACING WITH A SECTION OF FABRIC THAT PROVIDES A MINIMUM OF 600mm OVERLAP IN ALL DIRECTIONS. THE EDGES OF THE REPLACEMENT FABRIC SHALL BE PLACED UNDER THE UNDAMAGED GEOTEXTILE. IF REQUIRED, OVERLAYING STONE LAYERS MUST FIRST BE REMOVED TO EXPOSE THE DAMAGED FILTER CLOTH.

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B	ISSUE FOR APPROVAL	DEJ 21/07/23
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SLT	SLT
APPROVED	DATE
D.E.JOHNSTONE	21/07/23
RPEQ:	

CLIENT
YUMBA-META HOUSING ASSOCIATION LTD

PROJECT
YUMBA-META DEVELOPMENT STAGE 1

1145, 1151 & 1155 RIVERWAY DRIVE
RASMUSSEN

DRAWING

NOTES - SHEET 2

NUMBER	SHEET NO.	REVISION
ROSE001	C03	B

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LIFECYCLE STAGE: MAINTENANCE

HAZARDS	CONTROL MEASURE	CONTROL			PERSON RESPONSIBLE FOR CONTROL	ADDITIONAL NOTES
		ELIMINATION	ENGINEERING	ADMINISTRATION		
TRAFFIC INCIDENTS	MAINTENANCE CONTRACTOR SAFETY	PROVIDE A TRAFFIC CONTROL PLAN WHERE APPLICABLE WHEN PERFORMING MAINTENANCE		✓	✓	MAINTENANCE CONTRACTOR
FALLS, SLIPS AND TRIPS	WORK AT HEIGHT	WHERE POSSIBLE, PLACE ITEMS OF REGULAR MAINTENANCE AT LOW HEIGHT	✓			ENGINEER
		WHERE APPROPRIATE, PROVIDE SAFE ACCESS TO ITEMS AT HEIGHT, INCLUDING ANCHOR POINTS OR FIXED LADDERS		✓		ENGINEER
CONFINED SPACE	ENCLOSED SPACES	MINIMISE THE REQUIREMENT TO ENTER CONFINED SPACES FOR MAINTENANCE	✓			ENGINEER
		FOLLOW THE PROVISIONS OF CODE OF PRACTICE: CONFINED SPACES			✓	CONTRACTOR
		PROVIDE WARNING SIGNS			✓	ARCHITECT
	STORMWATER DEVICES	PROVIDE INFRASTRUCTURE THAT CAN BE MAINTAINED WITHOUT CONFINED SPACE ENTRY		✓		ENGINEER/ARCHITECT
ACCESS	ACCESS TO PITS AND MANHOLES	WHERE POSSIBLE ACCESS MANHOLES AND PITS HAVE BEEN PLACED IN PUBLIC PROPERTY AND NOT WITHIN PRIVATE LOTS OR TRAFFIC LANES	✓	✓		ENGINEER
MATERIAL SELECTION AND DESIGN	MATERIAL DURABILITY	SELECT MATERIALS WHICH REQUIRE MINIMAL MAINTENANCE DURING DESIGN LIFE		✓		ENGINEER
	LOADS ON STRUCTURE	DESIGN SURFACE FOR APPROPRIATE MAINTENANCE LOADS - ELEVATED WORK PLATFORMS ETC.		✓		ENGINEER
		WHERE POSSIBLE PROVIDE LEVEL WORKING SURFACE FOR MAINTENANCE		✓		ENGINEER
RETAINING STRUCTURES	TRENCHING/PAVEMENT MAINTENANCE	DESIGN ALLOWS FOR REMOVAL OF PAVEMENT UP TO 500mm DEEP FOR MAINTENANCE		✓		ENGINEER
MANUAL TASKS	LIFTING OF MATERIALS	PROVIDE MECHANICAL LIFTING DEVICES OR LIFTING POINTS WHERE APPROPRIATE		✓		ENGINEER
		PROVIDE TRAINING FOR WORKERS			✓	CLIENT
HAZARDOUS SUBSTANCES	SKIN/EYE IRRITATION	PROVIDE EYE WASH STATION AND SAFETY SHOWER WHERE APPROPRIATE			✓	ENGINEER/ARCHITECT

LIFECYCLE STAGE: USE FOR INTENDED PURPOSE

HAZARDS	CONTROL MEASURE	CONTROL			PERSON RESPONSIBLE FOR CONTROL	ADDITIONAL NOTES
		ELIMINATION	ENGINEERING	ADMINISTRATION		
GENERAL ARRANGEMENT	TYING INTO EXISTING INFRASTRUCTURE	ENSURE NEW WORKS TIE INTO EXISTING AS PER CURRENT DESIGN STANDARDS WHERE ABLE. IF UNABLE, ENSURE CONSISTENCY WITH SURROUNDING ENVIRONMENT AND ENSURE RESIDUAL RISK IS CONVEYED TO THE STAKEHOLDER.		✓		ENGINEER
	PROJECT RESTRAINTS (eg BUDGET, REGULATORY, PROPERTY, EXISTING CONDITIONS) MAY PREVENT AN IDEAL DESIGN FROM BEING COMPLETED	THE ASSET OWNER MAY BE REQUIRED TO PROVIDE MORE MAINTENANCE THAN PROJECTS WITHOUT RESTRAINTS			✓	ASSET OWNER / CLIENT / MAINTENANCE CONTRACTOR
PAVEMENT DETERIORATION	ROUTINE AND PREVENTATIVE MAINTENANCE	ENSURE SCHEDULED MAINTENANCE WORKS ARE IN ACCORDANCE WITH STANDARD ROAD MAINTENANCE PRACTICES BUT ARE AT LEAST SUFFICIENT TO MAINTAIN THE SKID RESISTANCE, SHAPE, PROFILE AND AMENITY OF THE PAVEMENT AND PREVENT AQUAPLANING			✓	MAINTENANCE CONTRACTOR / ASSET OWNER
DRAINAGE STRUCTURES	ROUTINE AND PREVENTATIVE MAINTENANCE	ENSURE SCHEDULED MAINTENANCE WORK ARE IN ACCORDANCE WITH STANDARD MAINTENANCE PRACTICES FOR DRAINAGE BUT ARE AT LEAST SUFFICIENT TO MAINTAIN THE HYDRAULIC PERFORMANCE OF DRAINAGE STRUCTURES AND PREVENT PIPING AND/OR EROSION OF TRENCH BACKFILL			✓	MAINTENANCE CONTRACTOR / ASSET OWNER
LINEMARKING / SIGNAGE	FADING	REPLACE WHEN REFLECTIVITY AND / OR LUMINOSITY DOES NOT COMPLY WITH MINIMUM REQUIREMENTS			✓	MAINTENANCE CONTRACTOR / ASSET OWNER
FALLS, SLIPS AND TRIPS	ELEVATED PATHS AND WALKWAYS	PROVIDE ADEQUATE BALUSTRADES		✓		ENGINEER / CONTRACTOR
	UNEVEN SURFACES	WHERE APPLICABLE, LEVELS DESIGNED TO ELIMINATE UNEXPECTED STEPS AND FALLS		✓		ENGINEER / CONTRACTOR
	SLIPPERY SURFACES	PROVIDE ADEQUATE DRAINAGE TO ALL SURFACES		✓		ENGINEER / CONTRACTOR
FALLING OBJECTS	LOOSE OBJECTS	BALUSTRADES AND BARRIERS TO COMPLY WITH ASSET OWNERS REQUIREMENTS		✓		ENGINEER
		RESTRICT ACCESS TO LOW LEVEL AREAS			✓	ASSET OWNER
TRAFFIC MANAGEMENT	VEHICLES	DESIGN VEHICLE AND ROAD SAFETY MEASURES COMPLY WITH ASSET OWNERS REQUIREMENTS		✓		ENGINEER
	PEDESTRIANS	PEDESTRIANS SEPARATED FROM TRAFFIC		✓		ENGINEER
	CYCLISTS	SEPARATED FROM VEHICLE TRAFFIC, NO PINCH POINTS IN DESIGN AND NON-SLIP PAVEMENT MARKINGS ADOPTED WHERE WITHIN DESIGNATED CYCLE WAYS		✓		ENGINEER
	WORKER AND TRAFFIC INTERACTION	SEPARATE TRAFFIC AND PEDESTRIANS WHERE POSSIBLE	✓			ENGINEER
	EMERGENCY AND WASTE MANAGEMENT VEHICLE	ENSURE ADEQUATE ACCESS AND CLEARANCE FOR EMERGENCY AND WASTE MANAGEMENT VEHICLES		✓		ENGINEER / MAINTENANCE CONTRACTOR
	UNEXPECTED OVERSIZED VEHICLES	CONSIDERED IN GEOMETRIC DESIGN OF ROAD	✓			ENGINEER
EROSION	LANDSCAPING AREAS	ENSURE WORKS ARE ESTABLISHED AT HANDOVER AND VEGETATION TYPE, SOIL TYPE AND PREPARATION IS SUITABLE TO ENSURE LANDSCAPING IS SUSTAINABLE			✓	MAINTENANCE CONTRACTOR
	HARD LANDSCAPING AREAS	ENSURE WORKS ARE MAINTAINED DURING DESIGN LIFE TO ENSURE THAT EROSION DOES NOT COMPROMISE THE SAFETY OF USERS			✓	MAINTENANCE CONTRACTOR
DISABLED ACCESS	ACCESS AND EGRESS	ENSURE DESIGN CATERS FOR PERSONS WITH DISABILITIES		✓		ENGINEER / ARCHITECT

LIFECYCLE STAGE: DEMOLITION

HAZARDS	CONTROL MEASURE	CONTROL			PERSON RESPONSIBLE FOR CONTROL	ADDITIONAL NOTES
		ELIMINATION	ENGINEERING	ADMINISTRATION		
SEQUENCING	EARTH COLLAPSE	ENSURE EARTH IS STABLE BEFORE REMOVING STRUCTURE			✓	CONTRACTOR
	STRUCTURE COLLAPSE	CLEARLY NOTE ANY CONSTRUCTION SEQUENCING REQUIREMENTS ON PLANS			✓	ENGINEER
		FULL SUPPORT STRUCTURE DURING DEMOLITION AND REMOVE IN METHODOICAL FASHION			✓	CONTRACTOR

B	ISSUE FOR APPROVAL	DEJ	21/07/23
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APPROVED	D.E. JOHNSTONE	DATE	21/07/23
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CLIENT
YUMBA-META HOUSING ASSOCIATION LTD

PROJECT
YUMBA-META DEVELOPMENT STAGE 1
1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

DRAWING
SAFETY IN DESIGN - SHEET
2

NUMBER	SHEET NO.	REVISION
ROSE001	C05	B

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SCALE OF METRES 1:250 AT A1 & 1:500 AT A3



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C. TCC RFI COMMENTS	DEJ	13/09/23
B. ISSUE FOR APPROVAL	DEJ	21/07/23
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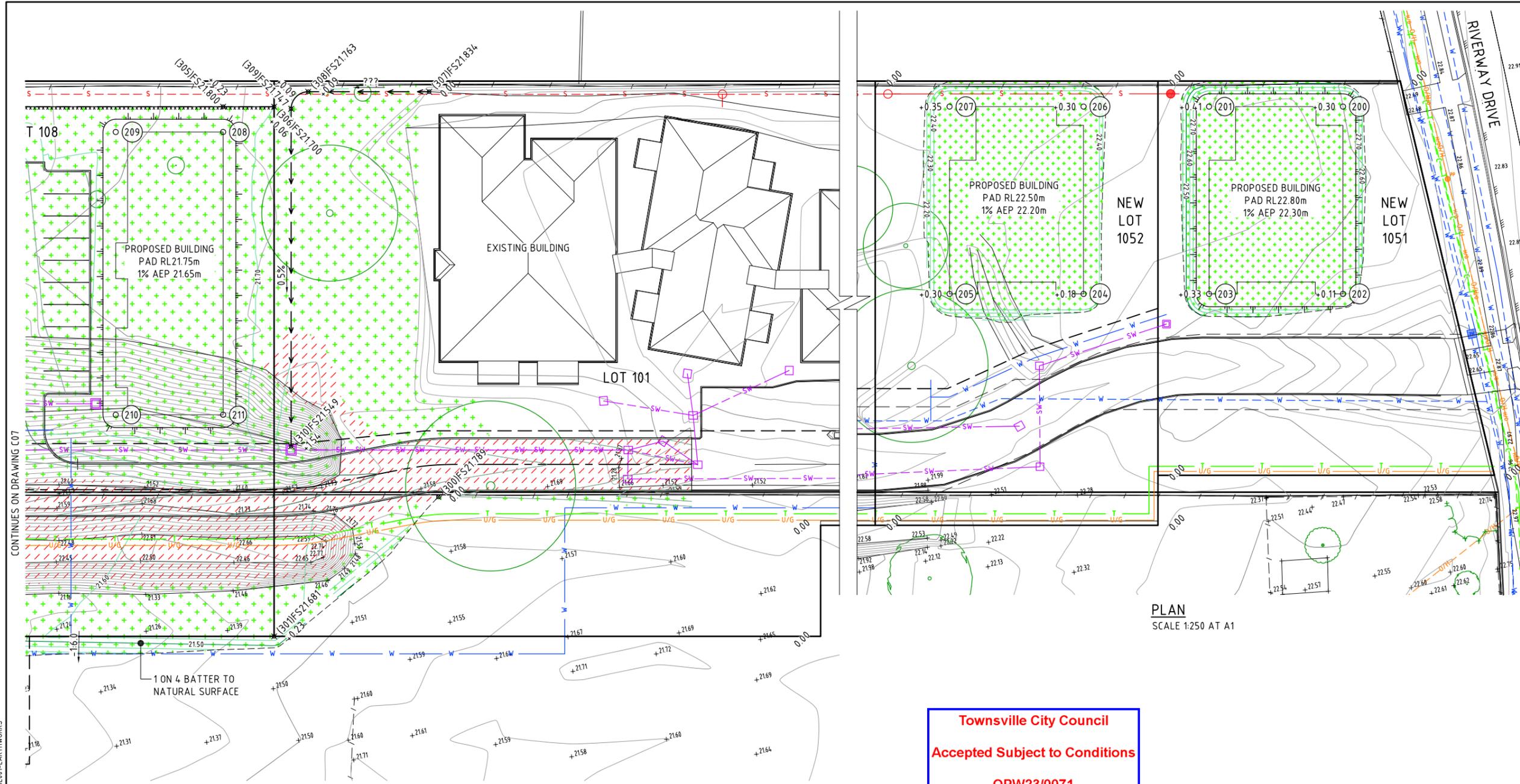
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PROJECT
 YUMBA-META DEVELOPMENT STAGE 1
 1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

DRAWING
 EARTHWORKS PLAN - SHEET 1

NUMBER	SHEET NO.	REVISION
ROSE001	C06	C



CONTINUES ON DRAWING C07

PLAN
 SCALE 1:250 AT A1

PLAN
 SCALE 1:250 AT A1

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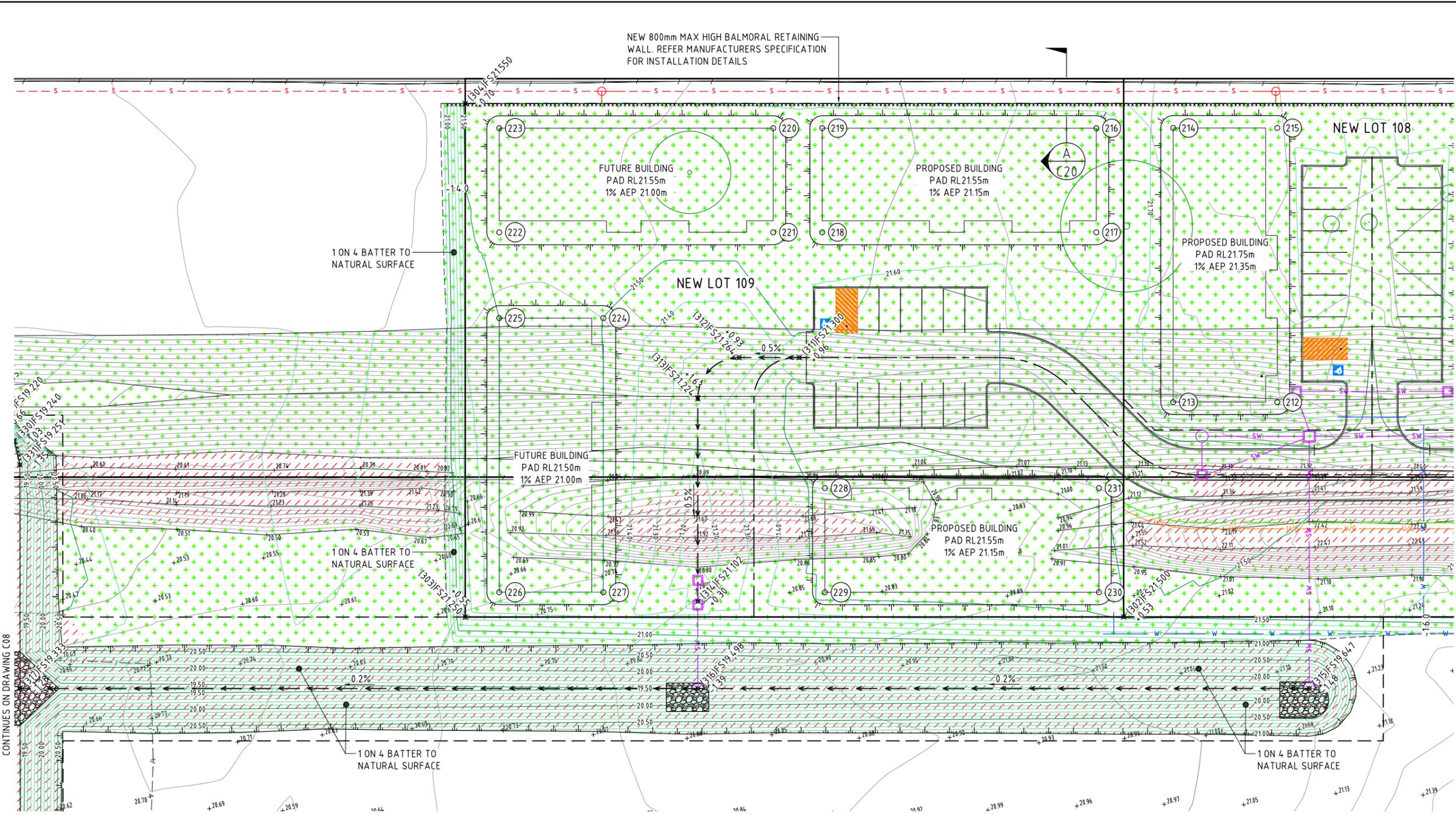
LEGEND

- NATURAL SURFACE LEVEL
- NATURAL SURFACE CONTOURS (0.1m INTERVALS)
- (POINT NUMBER) FINISHED SURFACE LEVEL CUT (-) / FILL (+) DEPTH
- FINISHED SURFACE CONTOURS (0.1m INTERVALS)
- CUT AREA
- FILL AREA
- TOP OF BATTER
- BOTTOM OF BATTER
- RETAINING WALL
- BUILDING PAD SETOUT REFER DRG C08 FOR TABLES

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0 5 10
 SCALE OF METRES 1:250 AT A1 & 1:500 AT A3



PLAN
 SCALE 1:250 AT A1

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REVISION	APP'D	DATE
C. TCC RFI COMMENTS	DEJ	13/09/23
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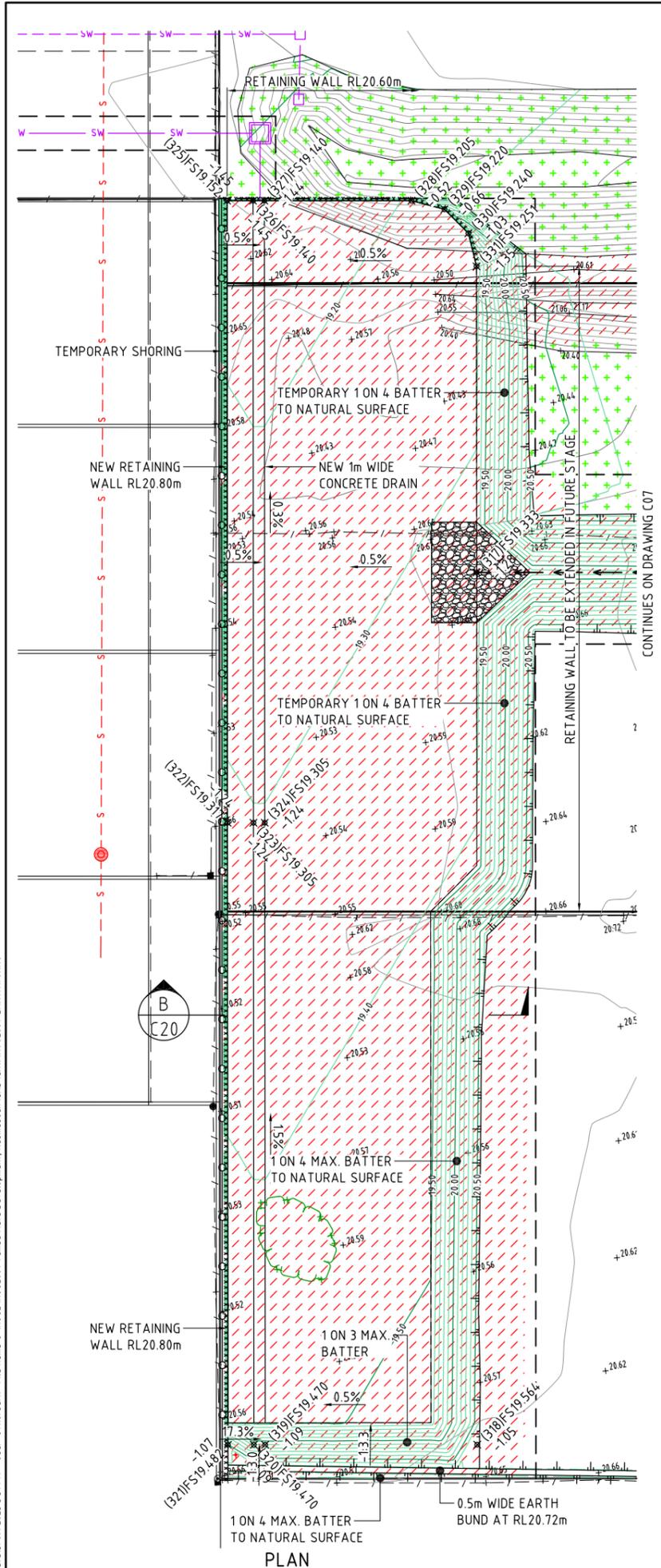
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PROJECT
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 1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

DRAWING
 EARTHWORKS PLAN - SHEET 2

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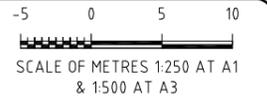
EARTHWORKS SETOUTS

POINT TABLE			
POINT #	EASTING	NORTHING	LEVEL
300	471723.419	7859775.425	21.79
301	471702.690	7859760.918	21.68
302	471642.752	7859766.528	21.50
303	471563.301	7859773.958	21.25
304	471569.096	7859835.887	21.55
305	471702.513	7859823.411	21.80
306	471708.486	7859822.853	21.70
307	471726.785	7859822.903	21.83
308	471712.632	7859824.227	21.76
309	471710.455	7859822.422	21.75
310	471706.762	7859782.966	21.55
311	471606.534	7859801.474	21.30
312	471599.273	7859802.154	21.26
313	471593.829	7859797.642	21.22
314	471591.542	7859773.224	21.10
315	471664.347	7859755.809	19.65
316	471590.558	7859762.710	19.50
317	471508.779	7859770.357	19.33
318	471501.634	7859693.465	19.56
319	471482.915	7859695.204	19.47
320	471481.919	7859695.297	19.47
321	471479.629	7859695.508	19.48
322	471484.725	7859750.350	19.32
323	471487.015	7859750.137	19.31
324	471488.010	7859750.044	19.31
325	471489.821	7859805.192	19.15
326	471492.111	7859804.978	19.14
327	471493.106	7859804.885	19.14
328	471506.092	7859803.672	19.21
329	471508.930	7859802.632	19.22
330	471510.844	7859800.324	19.24
331	471511.287	7859797.347	19.25

BUILDING PAD SETOUTS

POINT TABLE			
POINT #	EASTING	NORTHING	LEVEL
200	471885.671	7859806.284	22.80
201	471869.999	7859807.751	22.80
202	471883.621	7859784.380	22.80
203	471867.950	7859785.846	22.80
204	471853.276	7859787.219	22.50
205	471837.604	7859788.685	22.50
206	471855.325	7859809.123	22.50
207	471839.654	7859810.589	22.50
208	471702.237	7859820.451	21.75
209	471689.680	7859821.626	21.75
210	471686.587	7859788.560	21.75
211	471699.143	7859787.385	21.75
212	471663.706	7859790.701	21.75
213	471651.150	7859791.875	21.75
214	471654.243	7859824.941	21.75
215	471666.800	7859823.767	21.75
216	471644.965	7859825.789	21.55
217	471643.790	7859813.233	21.55
218	471610.724	7859816.326	21.55
219	471611.899	7859828.882	21.55
220	471605.985	7859829.436	21.55
221	471604.810	7859816.879	21.55
222	471571.744	7859819.973	21.55
223	471572.919	7859832.529	21.55
224	471583.333	7859808.453	21.50
225	471570.777	7859809.628	21.50
226	471567.683	7859776.562	21.50
227	471580.240	7859775.387	21.50
228	471608.153	7859785.442	21.55
229	471606.979	7859772.885	21.55
230	471640.044	7859769.792	21.55
231	471641.219	7859782.348	21.55

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REVISION	APP'D	DATE
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B ISSUE FOR APPROVAL	DEJ	21/07/23
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APPROVED		DATE	
D.E.JOHNSTONE		21/07/23	
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PROJECT
 YUMBA-META DEVELOPMENT STAGE 1
 1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

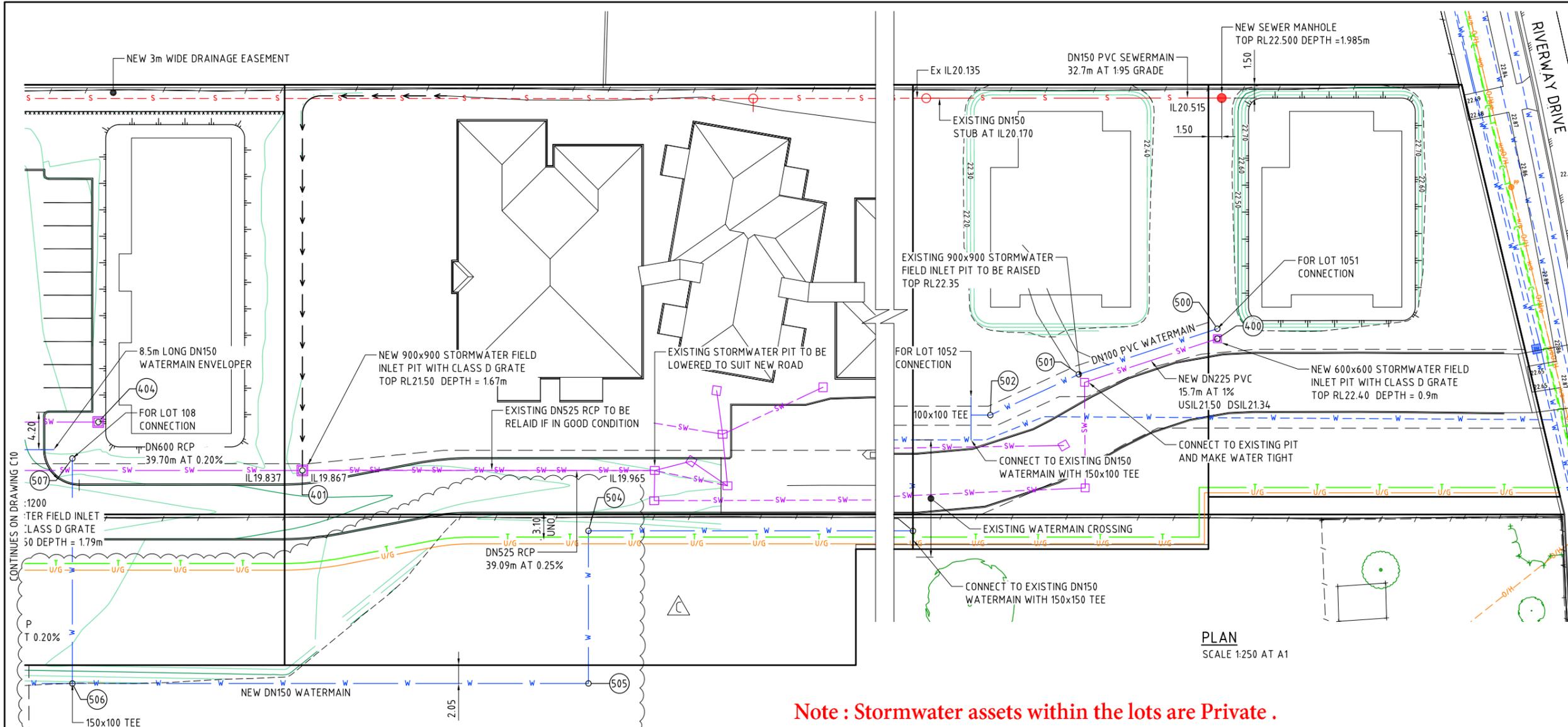
DRAWING
 EARTHWORKS PLAN - SHEET 3

NUMBER	SHEET NO.	REVISION
ROSE001	C08	C

LEGEND

- +21.43 NATURAL SURFACE LEVEL
- NATURAL SURFACE CONTOURS (0.1m INTERVALS)
- (POINT NUMBER) FINISHED SURFACE LEVEL CUT (-) / FILL (+) DEPTH
- FINISHED SURFACE CONTOURS (0.1m INTERVALS)
- CUT AREA
- FILL AREA
- TOP OF BATTER
- BOTTOM OF BATTER
- RETAINING WALL
- (218) BUILDING PAD SETOUT REFER DRG C08 FOR TABLES

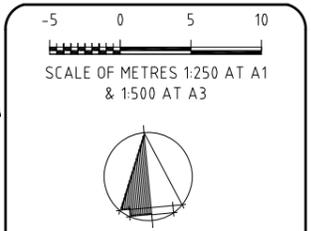
PLAN
 SCALE 1:250 AT A1



PLAN
SCALE 1:250 AT A1

Note : Stormwater assets within the lots are Private .

SAFETY IN DESIGN INFORMATION
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POINT NUMBER	PIT NUMBER	EASTING	NORTHING	TOP OF PIT LEVEL	PIT SIZE
400	Setout Point	471862.642	7859782.786	22.40	900x900
401	Setout Point	471706.720	7859782.518	21.50	900x900
402	Setout Point	471667.193	7859786.218	21.50	1200x1200
403	Setout Point	471666.156	7859791.778	21.78	900x900
404	Setout Point	471684.376	7859790.072	21.78	900x900
405	Setout Point	471664.412	7859756.515	19.65	OUTLET
406	Setout Point	471654.244	7859787.430	21.54	HYDROSYSTEM
407	Setout Point	471653.809	7859782.788	21.19	900x900
408	Setout Point	471591.780	7859775.763	21.11	900x900
409	Setout Point	471593.731	7859774.074	21.30	HYDROSYSTEM
410	Setout Point	471591.500	7859772.776	21.30	900x900
411	Setout Point	471590.610	7859763.272	19.50	OUTLET
412	Setout Point	471492.732	7859804.922	19.12	INLET
413	Setout Point	471493.287	7859810.864	20.40	1500x1500
414	Setout Point	471422.640	7859817.463	20.33	1500x1500
415	Setout Point	471427.609	7859869.512	20.16	1500x1500
416	Setout Point	471432.525	7859869.039	19.98	1500x900

POINT #	EASTING	NORTHING
500	471862.746	7859783.905
501	471846.773	7859780.257
502	471836.440	7859776.621
503	471826.562	7859764.482
504	471738.095	7859772.763
505	471736.496	7859755.692
506	471678.748	7859761.097
507	471681.105	7859786.276
508	471641.366	7859764.596

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24/10/2023

LEGEND

- FINISHED SURFACE CONTOURS (0.1m INTERVALS)
- SW - EXISTING STORMWATER
- SW - NEW STORMWATER
- W - NEW WATER MAIN
- E - NEW ELECTRICAL
- C - NEW COMMUNICATIONS
- TOP OF BATTER
- BOTTOM OF BATTER
- RETAINING WALL
- ROCK SCOUR PROTECTION REFER DRG C20 FOR DETAILS
- (218) STORMWATER SETOUT POINT

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DRAWN	SLT	DESIGNED	SLT
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D.E.JOHNSTONE		21/07/23	

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YUMBA-META HOUSING ASSOCIATION LTD

PROJECT
YUMBA-META DEVELOPMENT STAGE 1
1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

DRAWING
SERVICES PLAN - SHEET 1

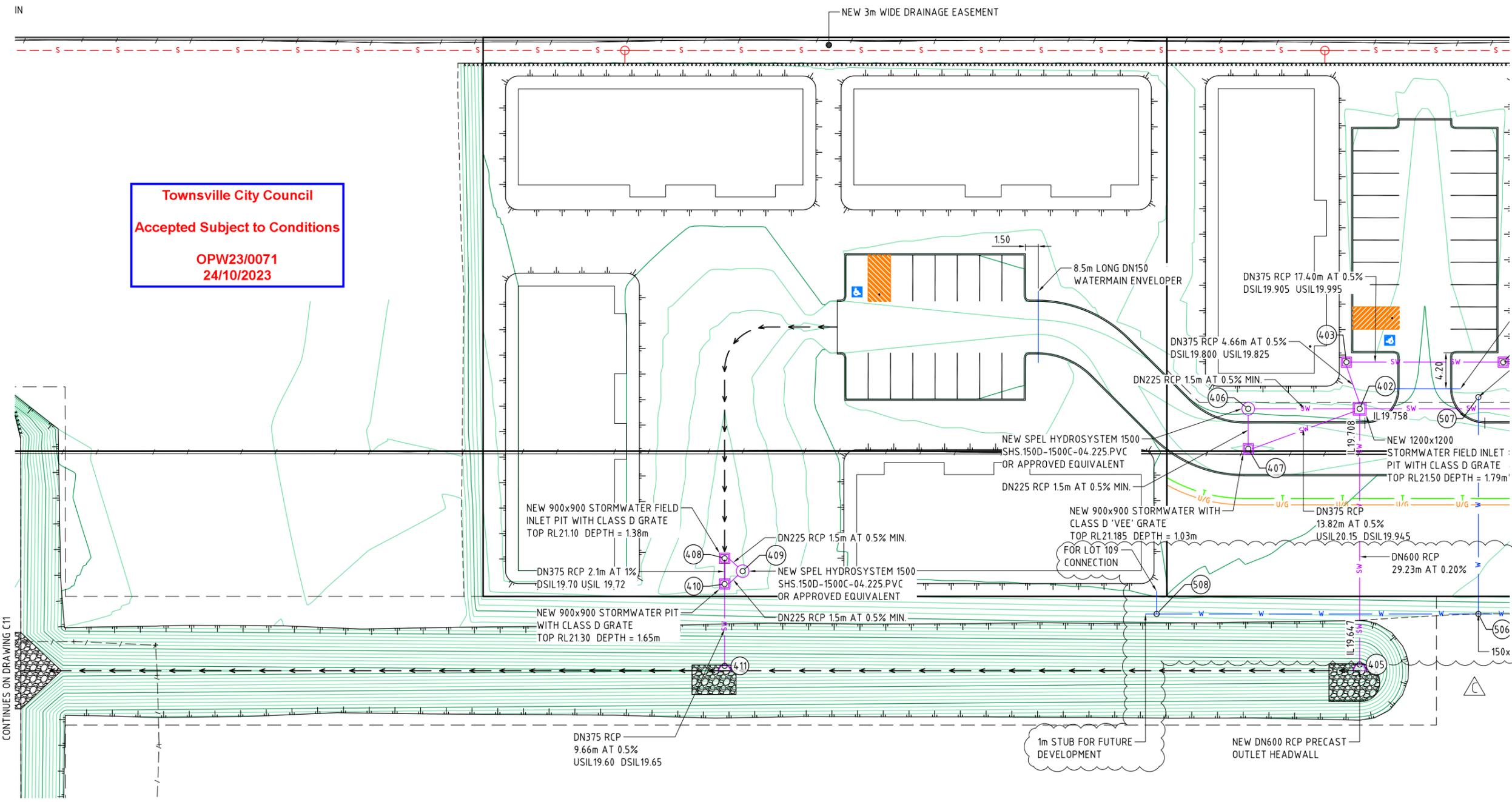
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ROSE001	C09	C

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SCALE OF METRES 1:250 AT A1 & 1:500 AT A3



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CONTINUES ON DRAWING C09

CONTINUES ON DRAWING C11

REVISION	APP'D	DATE
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PLAN
 SCALE 1:250 AT A1

Note : Stormwater assets within the lots are Private .

- LEGEND**
- FINISHED SURFACE CONTOURS (0.1m INTERVALS)
 - SW - EXISTING STORMWATER
 - SW - NEW STORMWATER
 - W - NEW WATER MAIN
 - E - NEW ELECTRICAL
 - C - NEW COMMUNICATIONS
 - TOP OF BATTER
 - BOTTOM OF BATTER
 - RETAINING WALL
 - ROCK SCOUR PROTECTION REFER DRG C20 FOR DETAILS
 - (218) STORMWATER SETOUT POINT

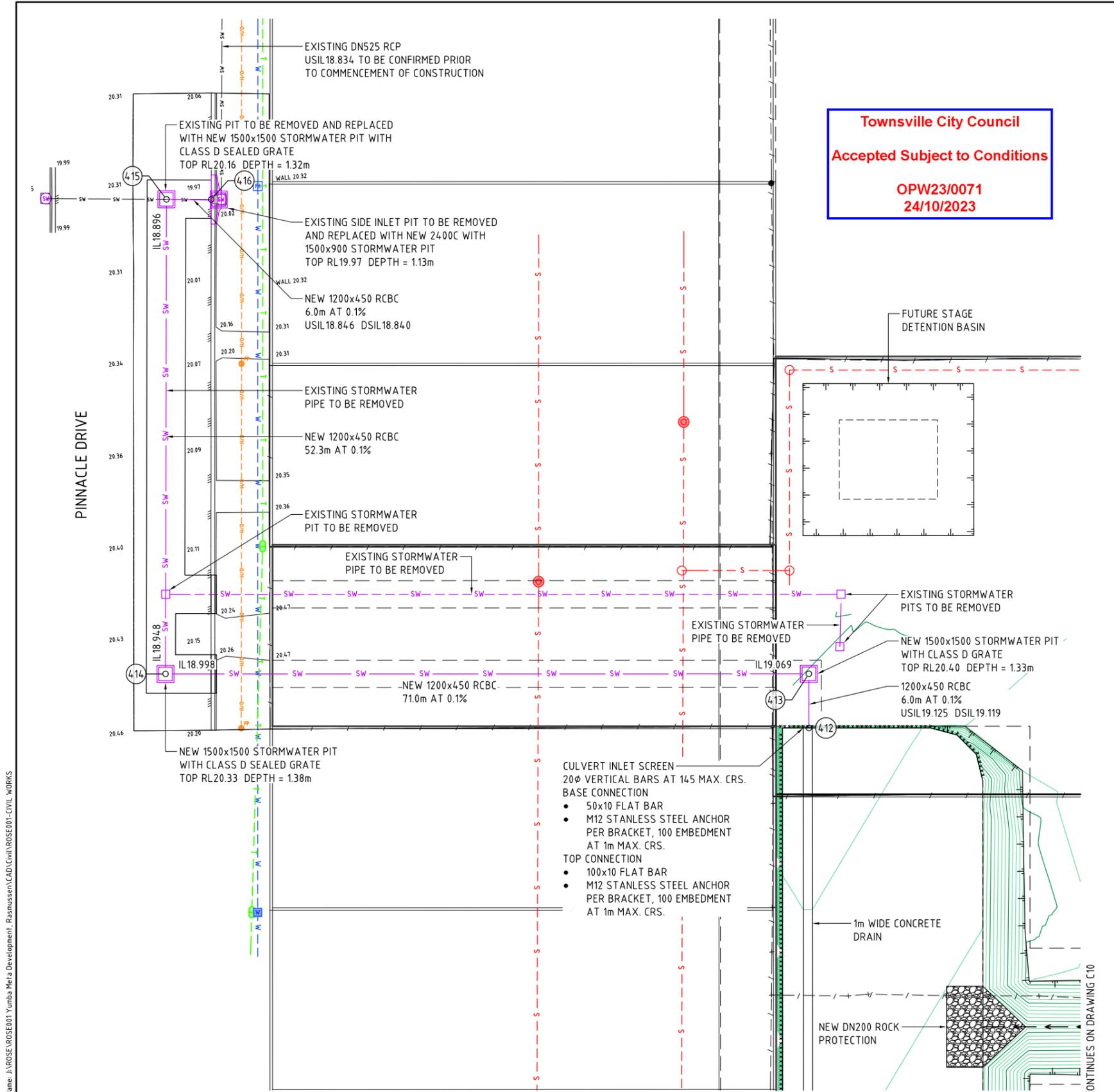
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 1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

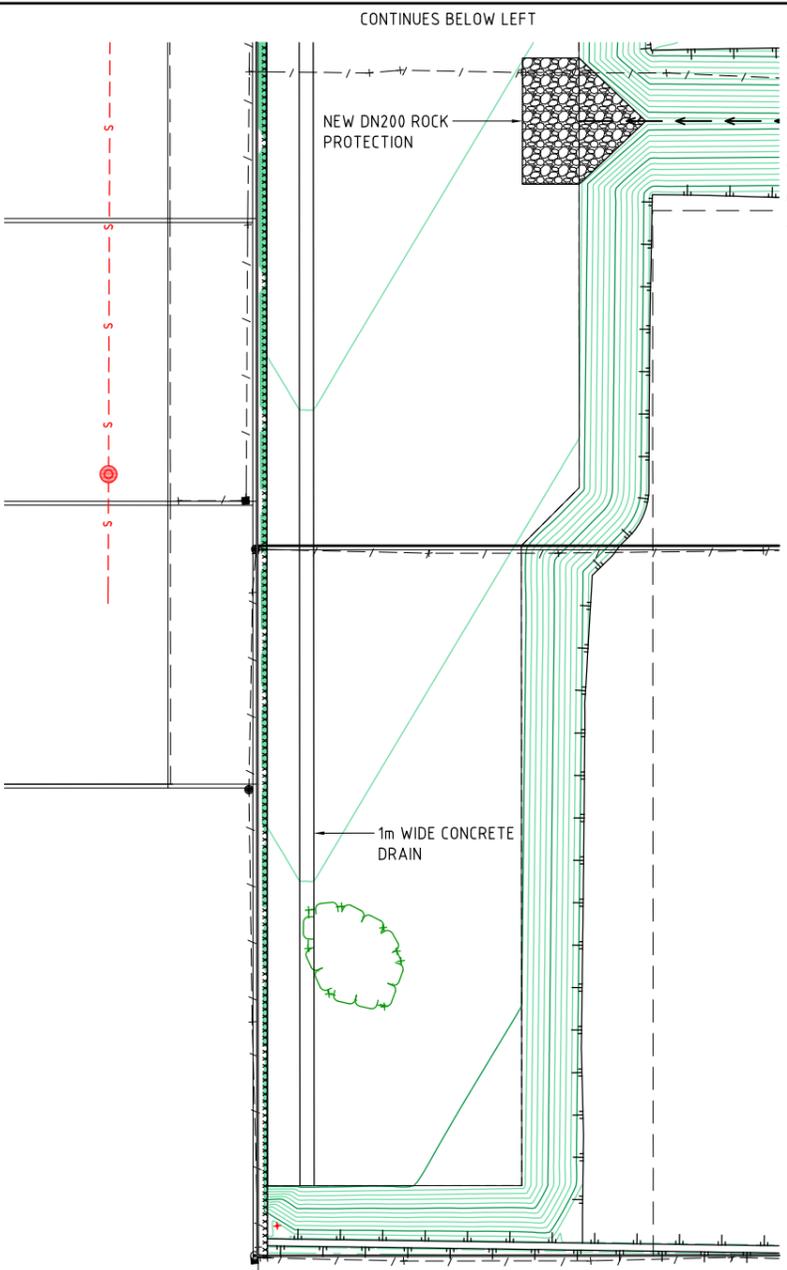
DRAWING
 SERVICES PLAN - SHEET 2

NUMBER	SHEET NO.	REVISION
ROSE001	C10	C



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PLAN
 SCALE 1:250 AT A1

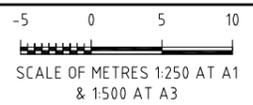


PLAN
 SCALE 1:250 AT A1

LEGEND

- FINISHED SURFACE CONTOURS (0.1m INTERVALS)
- SW EXISTING STORMWATER
- SW NEW STORMWATER
- W NEW WATER MAIN
- E NEW ELECTRICAL
- C NEW COMMUNICATIONS
- TOP OF BATTER
- BOTTOM OF BATTER
- RETAINING WALL
- ROCK SCOUR PROTECTION REFER DRG C20 FOR DETAILS
- (218) STORMWATER SETOUT POINT

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PROJECT
 YUMBA-META DEVELOPMENT STAGE 1

1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

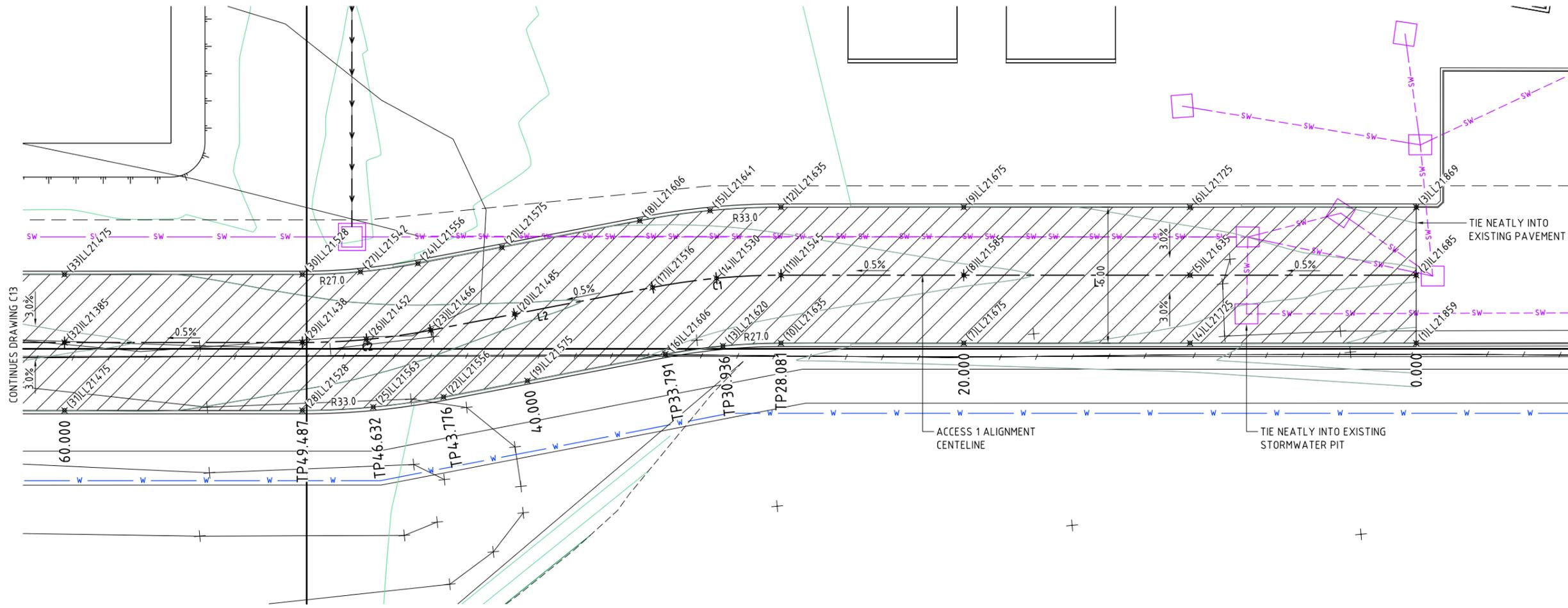
NUMBER	SHEET NO.	REVISION
ROSE001	C11	C

Note: Stormwater assets downstream of the detention basin are Public.

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SCALE OF METRES 1:100 AT A1
 & 1:200 AT A3



ROADWORKS PLAN
 SCALE 1:100 AT A1

ACCESS-1 ALIGNMENT SETOUT TABLE

Number	CHAINAGE	EASTING	NORTHING	Line/Chord Direction	Radius
L1	0+00.000 0+28.081	471753.403 471725.444	7859776.452 7859779.069	N84° 39' 09.23"W	
C1	0+28.081 0+33.791	471725.444 471719.742	7859779.069 7859779.058	S89° 53' 39.42"W	30.000
L2	0+33.791 0+43.776	471719.742 471709.804	7859779.058 7859778.091	S84° 26' 28.07"W	
C2	0+43.776 0+49.487	471709.804 471704.103	7859778.091 7859778.081	S89° 53' 39.42"W	30.000
L3	0+49.487 1+00.501	471704.103 471653.310	7859778.081 7859782.835	N84° 39' 09.22"W	
C3	1+00.501 1+09.926	471653.310 471645.190	7859782.835 7859787.125	N62° 09' 07.61"W	12.000
L4	1+09.926 1+20.064	471645.190 471638.720	7859787.125 7859794.931	N39° 39' 05.99"W	
C4	1+20.064 1+29.489	471638.720 471630.599	7859794.931 7859799.221	N62° 09' 07.61"W	12.000
L5	1+29.489 1+54.155	471630.599 471606.040	7859799.221 7859801.520	N84° 39' 09.22"W	
C5	1+54.155 1+62.009	471606.040 471600.596	7859801.520 7859797.008	S50° 20' 50.78"W	5.000
L6	1+62.009 1+88.432	471600.596 471598.134	7859797.008 7859770.700	S5° 20' 50.78"W	

ACCESS-2 ALIGNMENT SETOUT TABLE

Number	CHAINAGE	EASTING	NORTHING	Line/Chord Direction	Radius
L7	0+00.000 0+38.500	471674.325 471677.912	7859780.868 7859819.201	N5° 20' 42.11"E	

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LEGEND

- NATURAL SURFACE CONTOURS (0.1m INTERVALS)
- FINISHED SURFACE CONTOURS (0.1m INTERVALS)
- (POINT NUMBER) FINISHED SURFACE LEVEL
- LL - LIP LEVEL
- IL - INVERT LEVEL
- CG - CHANGE OF GRADE
- NEW CONCRETE PAVEMENT REFER DRG C19 FOR DETAILS
- NEW ROAD REINSTATEMENT REFER DRG C19 FOR DETAILS
- SW --- EXISTING STORMWATER
- SW --- NEW STORMWATER
- W --- NEW WATER MAIN
- E --- NEW ELECTRICAL
- C --- NEW COMMUNICATIONS
- TOP OF BATTER
- BOTTOM OF BATTER
- RETAINING WALL

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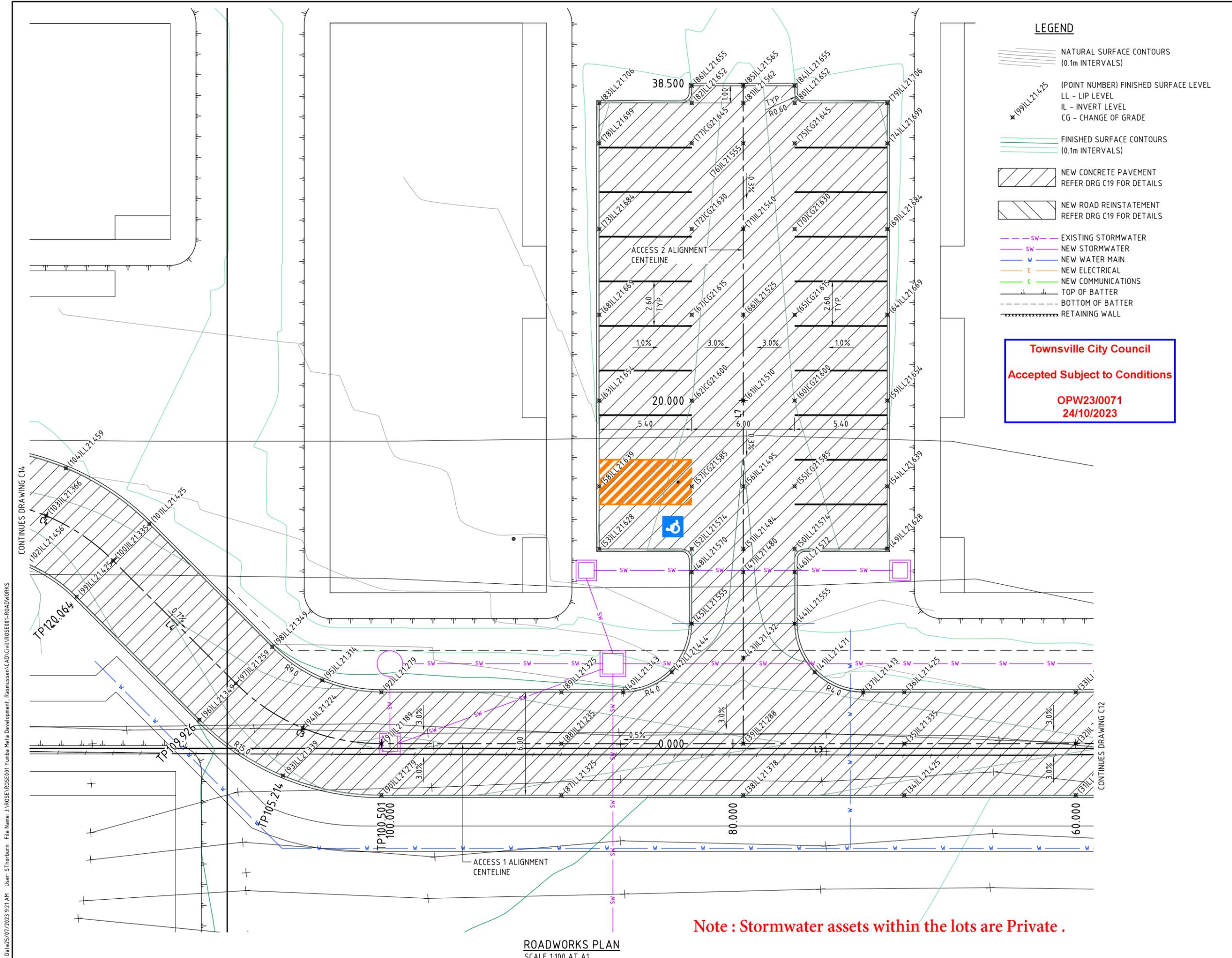
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D.E. JOHNSTONE		21/07/23	
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PROJECT
 YUMBA-META DEVELOPMENT STAGE 1
 1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

DRAWING
 ROADWORKS PLANS - SHEET 1

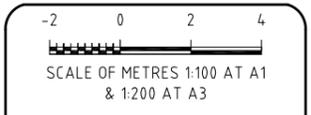
NUMBER	SHEET NO.	REVISION
ROSE001	C12	B



- LEGEND**
- NATURAL SURFACE CONTOURS (0.1m INTERVALS)
 - (POINT NUMBER) FINISHED SURFACE LEVEL
 - LL - LIP LEVEL
 - IL - INVERT LEVEL
 - CG - CHANGE OF GRADE
 - FINISHED SURFACE CONTOURS (0.1m INTERVALS)
 - NEW CONCRETE PAVEMENT REFER DRG C19 FOR DETAILS
 - NEW ROAD REINSTATEMENT REFER DRG C19 FOR DETAILS
 - SW - EXISTING STORMWATER
 - SW - NEW STORMWATER
 - W - NEW WATER MAIN
 - E - NEW ELECTRICAL
 - C - NEW COMMUNICATIONS
 - TOP OF BATTER
 - BOTTOM OF BATTER
 - RETAINING WALL

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B	ISSUE FOR APPROVAL	DEJ	21/07/23
A	ORIGINAL ISSUE	SLT	14/07/23
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PROJECT
 YUMBA-META DEVELOPMENT STAGE 1
 1145, 1151 & 1155 RIVERWAY DRIVE RASMUSSEN

DRAWING
 ROADWORKS PLANS - SHEET 2

NUMBER	SHEET NO.	REVISION
ROSE001	C13	B

Note : Stormwater assets within the lots are Private .

ROADWORKS PLAN
 SCALE 1:100 AT A1

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SCALE OF METRES 1:100 AT A1 & 1:200 AT A3



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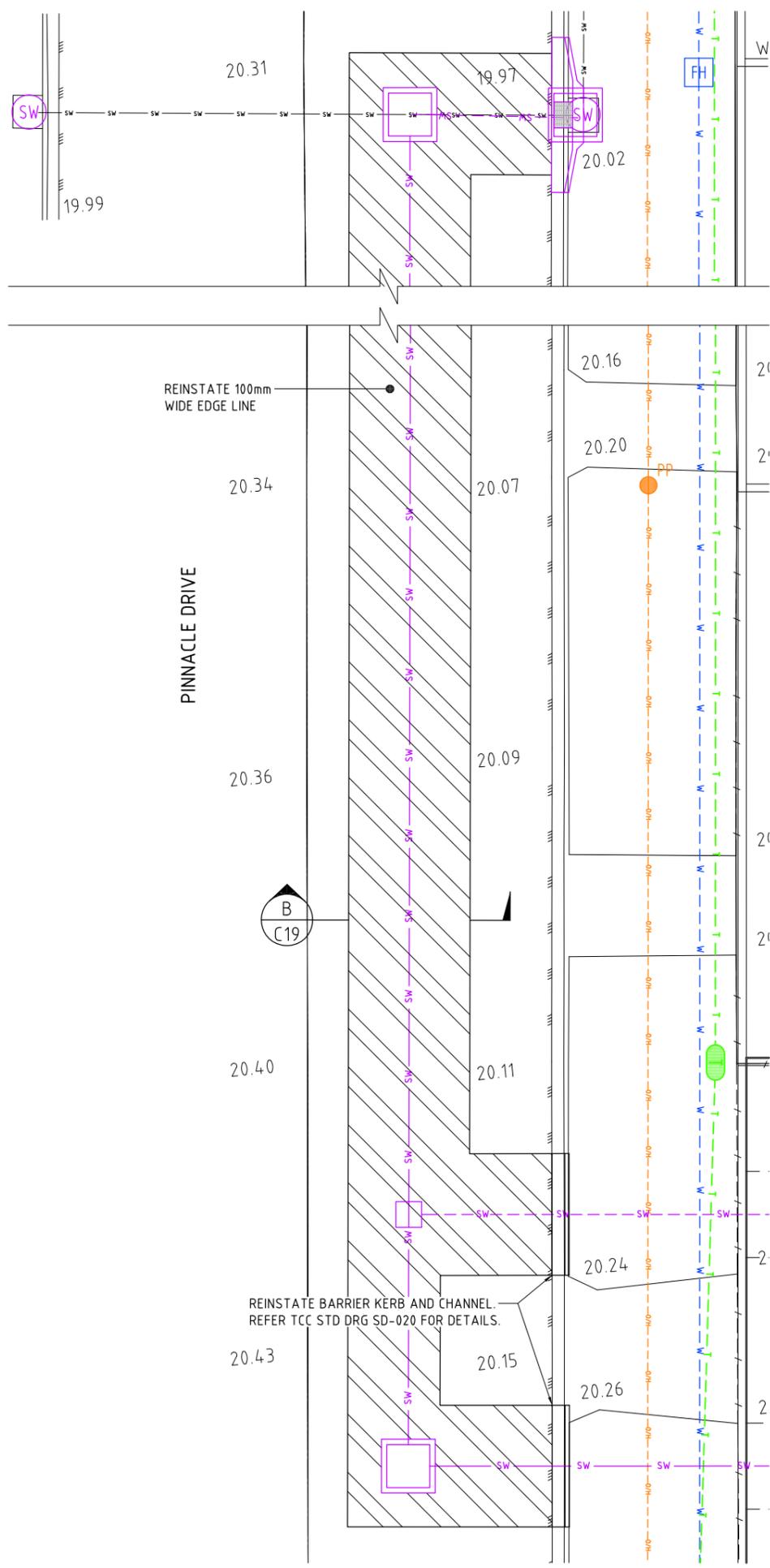
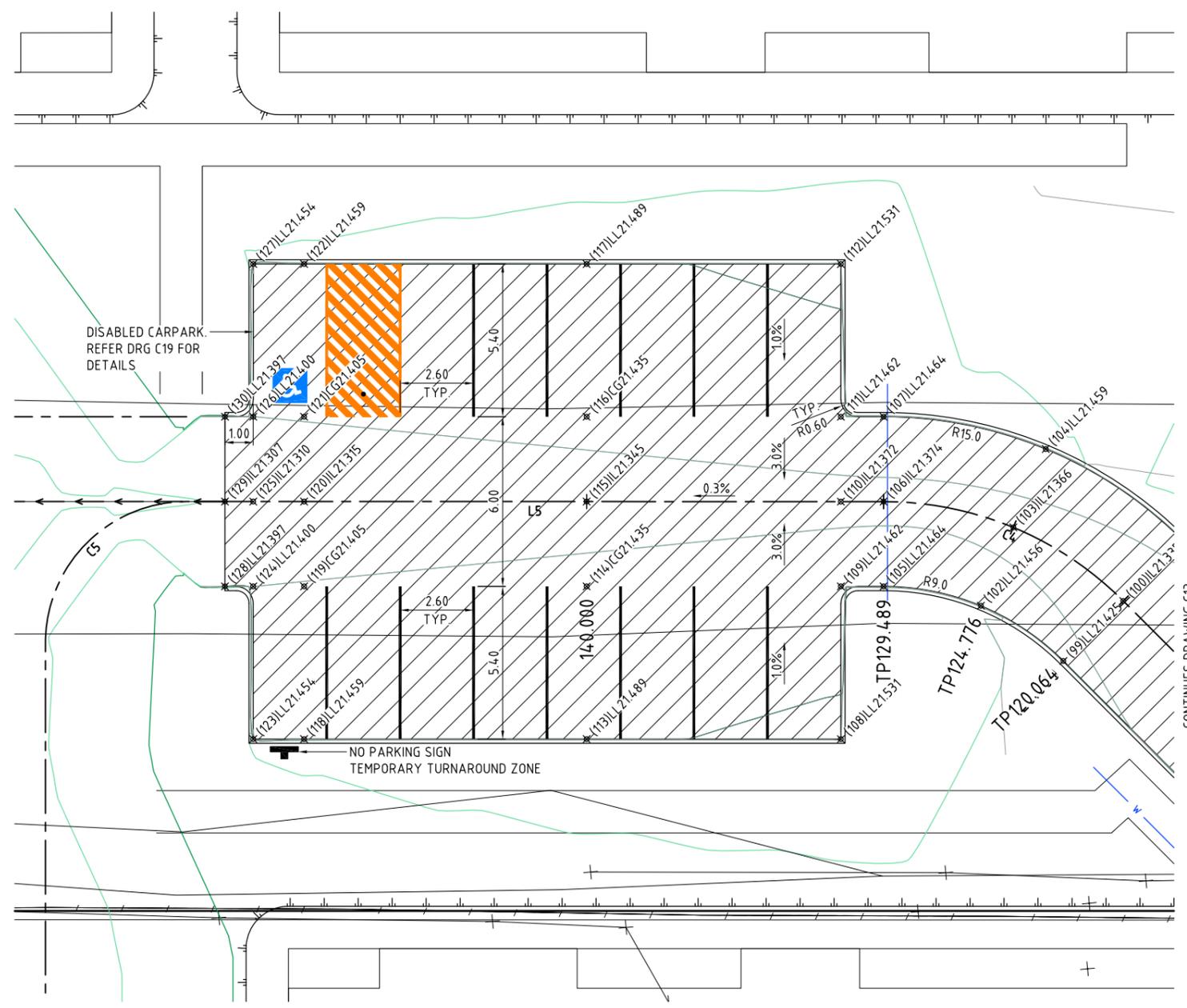
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 YUMBA-META DEVELOPMENT STAGE 1
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DRAWING
 ROADWORKS PLANS - SHEET 3

NUMBER	SHEET NO.	REVISION
ROSE001	C14	B



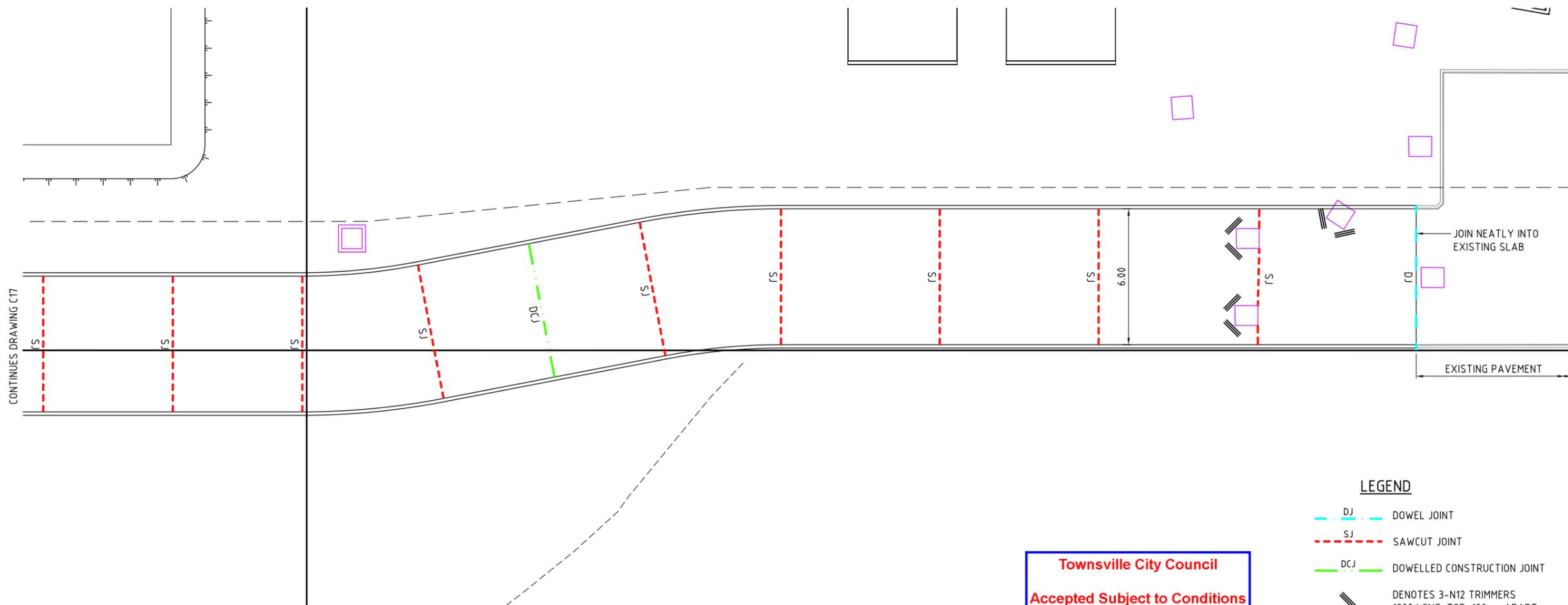
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- LEGEND**
- NATURAL SURFACE CONTOURS (0.1m INTERVALS)
 - FINISHED SURFACE CONTOURS (0.1m INTERVALS)
 - (POINT NUMBER) FINISHED SURFACE LEVEL
 - LL - LIP LEVEL
 - IL - INVERT LEVEL
 - CG - CHANGE OF GRADE
 - NEW CONCRETE PAVEMENT REFER DRG C19 FOR DETAILS
 - NEW ROAD REINSTATEMENT REFER DRG C19 FOR DETAILS
 - SW - EXISTING STORMWATER
 - SW - NEW STORMWATER
 - W - NEW WATER MAIN
 - E - NEW ELECTRICAL
 - C - NEW COMMUNICATIONS
 - TOP OF BATTER
 - BOTTOM OF BATTER
 - RETAINING WALL

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SCALE OF METRES 1:100 AT A1 & 1:200 AT A3



JOINTS PLAN
SCALE 1:100 AT A1

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LEGEND

- DJ DOWEL JOINT
- SJ SAWCUT JOINT
- DCJ DOWELLED CONSTRUCTION JOINT
- DENOTES 3-N12 TRIMMERS 1200 LONG, TOP, 100mm APART

B	ISSUE FOR APPROVAL	DEJ	21/07/23
A	ORIGINAL ISSUE	SLT	14/07/23
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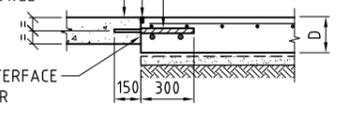
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CONCRETE JOINTS PLAN - SHEET 1

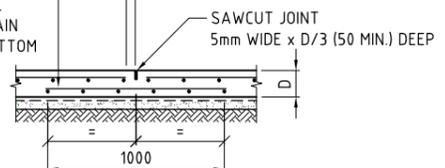
NUMBER	SHEET NO.	REVISION
ROSE001	C16	B

CONTACT ENGINEER FOR POSSIBLE REDESIGN IF COVER TO DOWEL IN EXISTING SLAB IS LESS THAN THREE TIMES THE DOWEL DIAMETER.



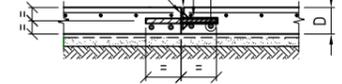
NEW - EXIST. DOWEL JOINT (D.J.)
SCALE 1:20 AT A1

BOTTOM REINFORCEMENT SIZE TO MATCH TYPICAL REINFORCEMENT. MAINTAIN SPECIFIED COVER ON BOTTOM REINFORCEMENT.



SAWCUT JOINT (S.J.)
SCALE 1:20 AT A1

REFER NOTE 4
PAINT CONCRETE INTERFACE WITH BOND-BREAKER
400mm LONG R20 AT 300 MAX. CRS. REFER NOTE 3.
2-N16 SUPPORT BARS. LAP 400 AT SPLICES. STOP AT INTERSECTING JOINT LOCATIONS. (NOT REFQ'D IF DOWEL SLEEVES USED).

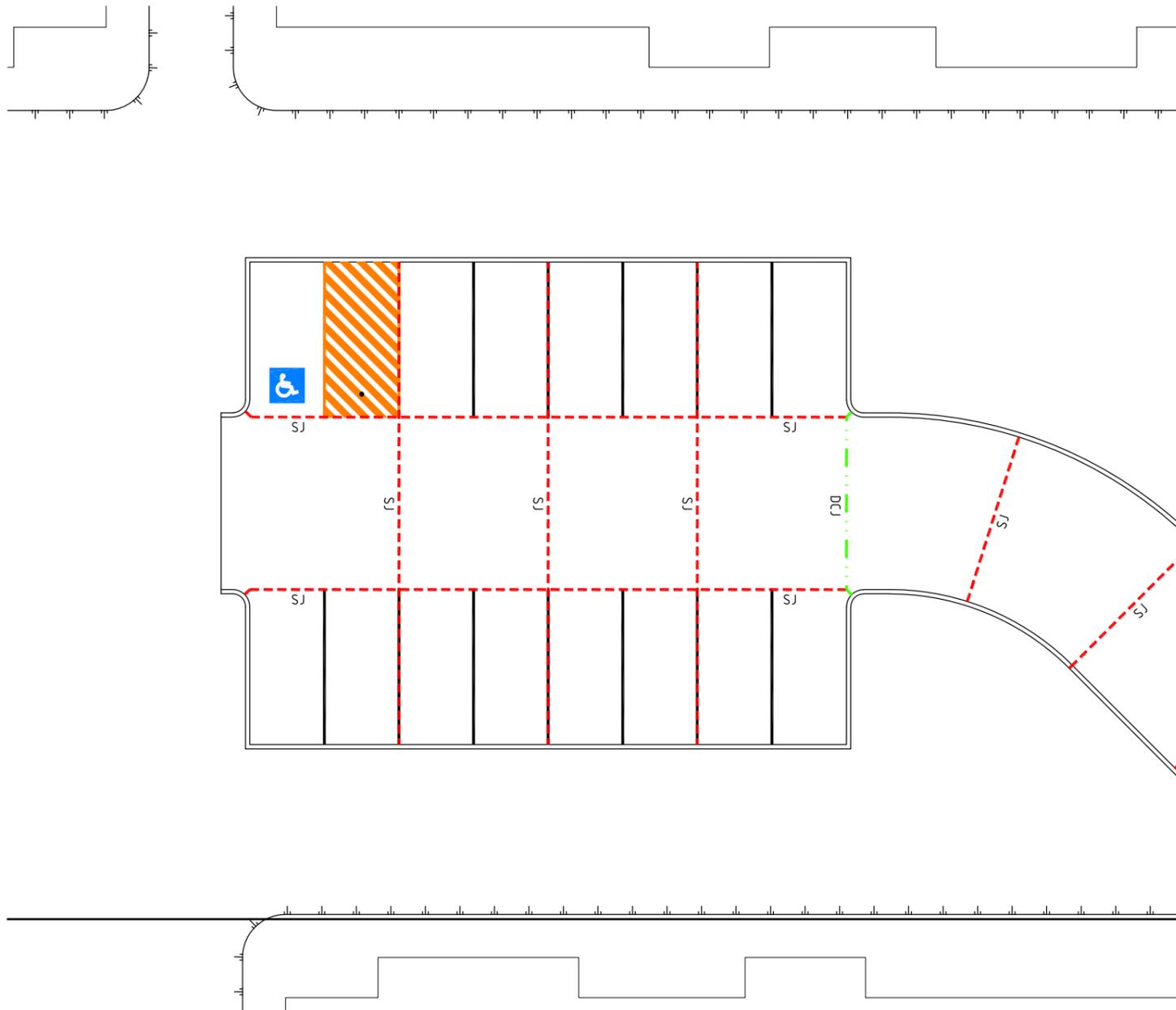


DOWELLED CONSTRUCTION JOINT (D.C.J.)
SCALE 1:20 AT A1

- DOWEL NOTES:**
- GALVANISE DOWELS IN EXTERNAL APPLICATIONS.
 - DOWELS SHALL BE SQUARE CUT (NOT SHEARED) PLACED HORIZONTALLY AND SQUARE TO THE JOINT U.N.O. DOWELS IN SKEWED JOINT MUST BE ALIGNED PARALLEL TO THE DIRECTION OF THE LONGITUDINAL JOINT.
 - PROVIDE 'DENSO' TAPE OR ALTERNATIVELY PROVIDE GREASE AND PVC SLEEVE TO EACH DOWEL ON ONE SIDE OF CONSTRUCTION JOINT. TAPE AND/OR GREASE TO EXTEND 25mm PAST CONCRETE INTERFACE ON NON-SLEEVED SIDE OF JOINT.
 - MAKE 10 WIDE x 20 DEEP GROOVE WHEN CONCRETE IS PLACED. FIT BACKING ROD AND 10x10 SILICONE SEALANT COMPLYING WITH TCC CITY PLAN SPECIFICATION TO SUIT PERMANENT SEALING.

- SAWCUT NOTES:**
- SAWCUT TIMING TO SUIT CONCRETE MIX, CONCRETE PLACEMENT TECHNIQUE, ENVIRONMENTAL CONDITIONS AT POURING, CURING AND ABILITY OF SLABS TO SUPPORT SAW CUTTING EQUIPMENT. NOTWITHSTANDING THE ABOVE, ALL SAW CUTTING SHALL BE COMPLETED WITHIN 12 HOURS OF PLACING CONCRETE IF CONVENTIONAL CUTTING IS USED. IF SOFF CUT EQUIPMENT IS USED CUT IN ACCORDANCE WITH OPERATING MANUAL GUIDELINES BUT NO LATER THAN 2 HOURS AFTER PLACEMENT.
 - WHERE SAWCUT CANNOT EXTEND TO FACE OF EXISTING STRUCTURES TROWEL THROUGH WET CONCRETE TO ENSURE NO AGGREGATE CROSSES THE JOINT.

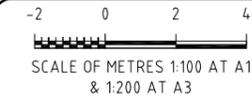
- DOWEL NOTES:**
- GALVANISE DOWELS IN EXTERNAL APPLICATIONS.
 - DOWELS SHALL BE SQUARE CUT (NOT SHEARED) PLACED HORIZONTALLY AND SQUARE TO THE JOINT U.N.O. DOWELS IN SKEWED JOINT MUST BE ALIGNED PARALLEL TO THE DIRECTION OF THE LONGITUDINAL JOINT.
 - PROVIDE 'DENSO' TAPE OR ALTERNATIVELY PROVIDE GREASE AND PVC SLEEVE TO EACH DOWEL ON ONE SIDE OF CONSTRUCTION JOINT. TAPE AND/OR GREASE TO EXTEND 25mm PAST CONCRETE INTERFACE ON NON-SLEEVED SIDE OF JOINT.
 - MAKE 10 WIDE x 20 DEEP GROOVE WHEN CONCRETE IS PLACED. FIT BACKING ROD AND 10x10 SILICONE SEALANT COMPLYING WITH TCC CITY PLAN SPECIFICATION TO SUIT PERMANENT SEALING.



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JOINTS PLAN
 SCALE 1:100 AT A1

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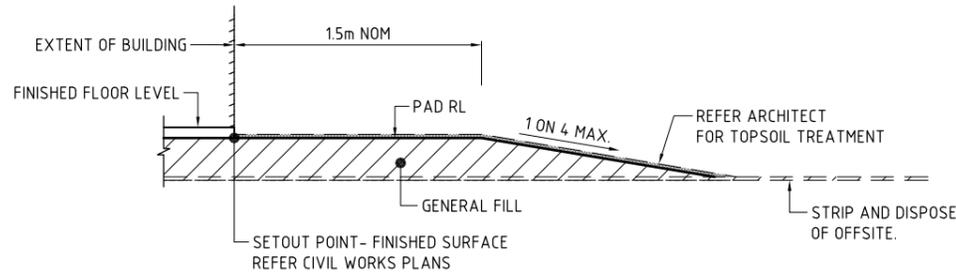
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 CONCRETE JOINTS PLAN - SHEET 3

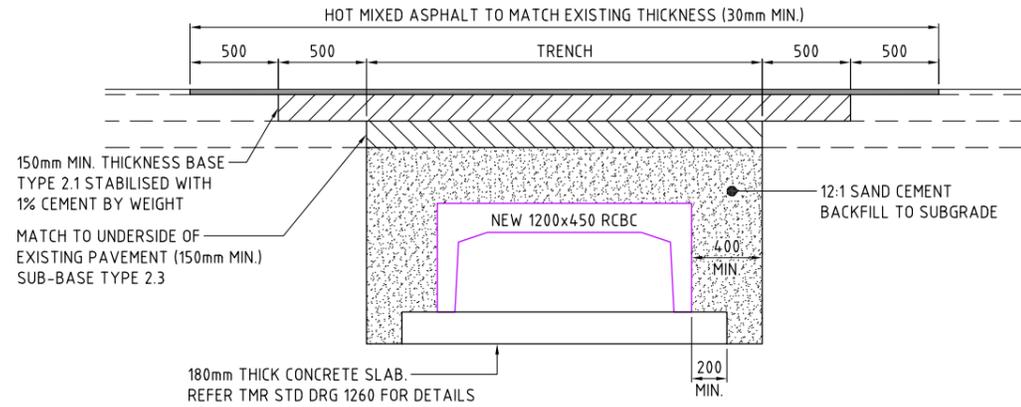
NUMBER	SHEET NO.	REVISION
ROSE001	C18	B

- LEGEND**
- DJ DOWEL JOINT
 - SJ SAWCUT JOINT
 - DCJ DOWELLED CONSTRUCTION JOINT
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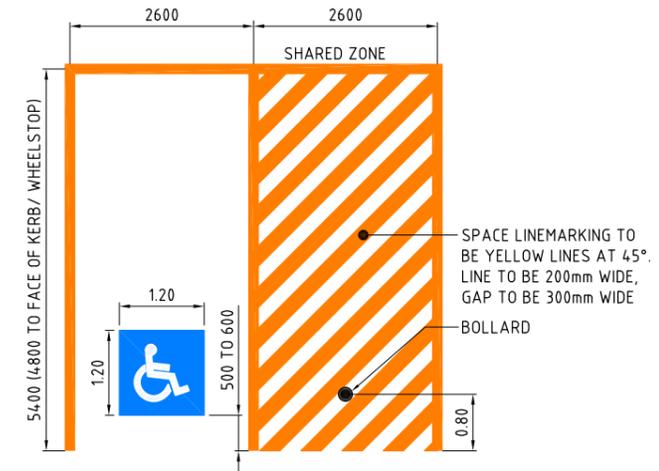
TYPICAL BUILDING PAD
SCALE: 1:50



ROAD REINSTATEMENT DETAIL

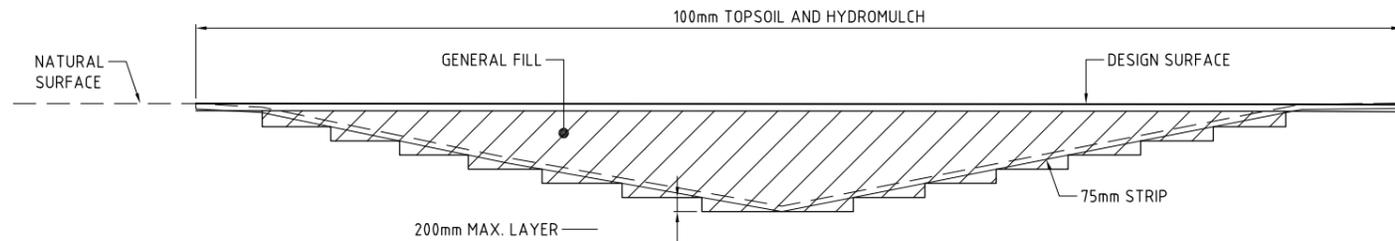
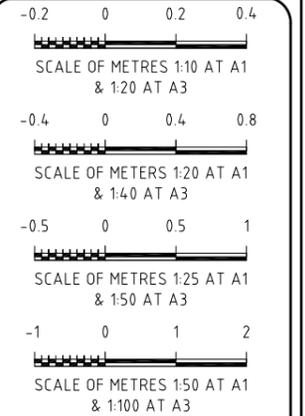
SECTION **B**
SCALE 1:20
C14

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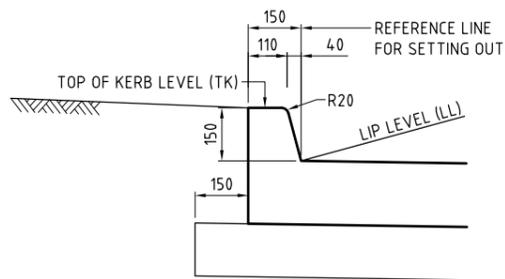


TYPICAL DISABLED PARKING DETAIL
SCALE 1:50 AT A1

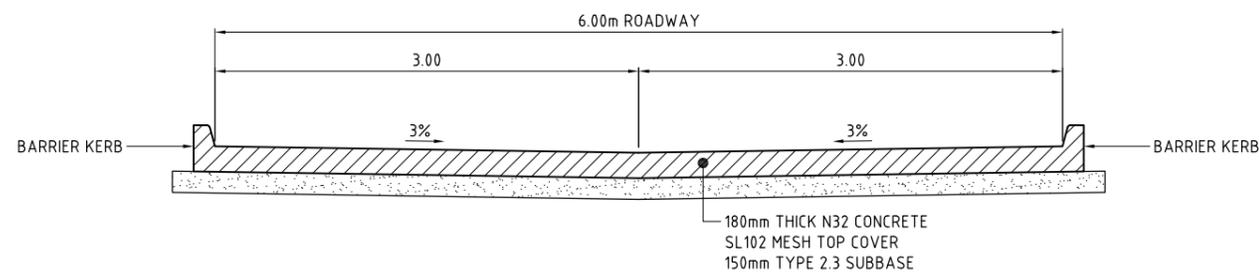
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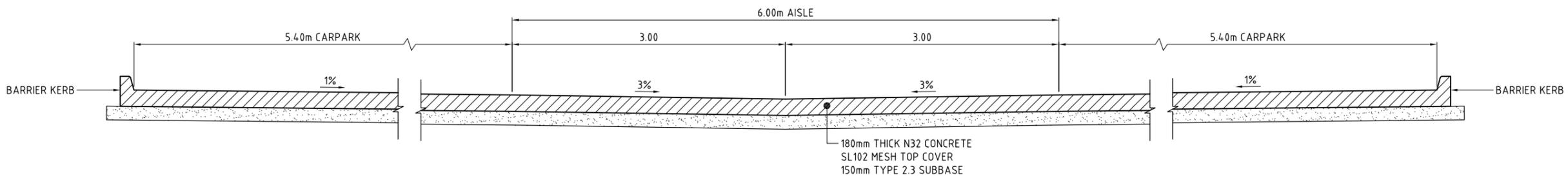
TYPICAL SWALE DRAIN BACKFILL DETAIL
SCALE 1:50 AT A1



BARRIER KERB
SCALE 1:10 AT A1



ROADWAY TYPE CROSS SECTION
SCALE 1:25 AT A1



CARPARK TYPE CROSS SECTION
SCALE 1:25 AT A1

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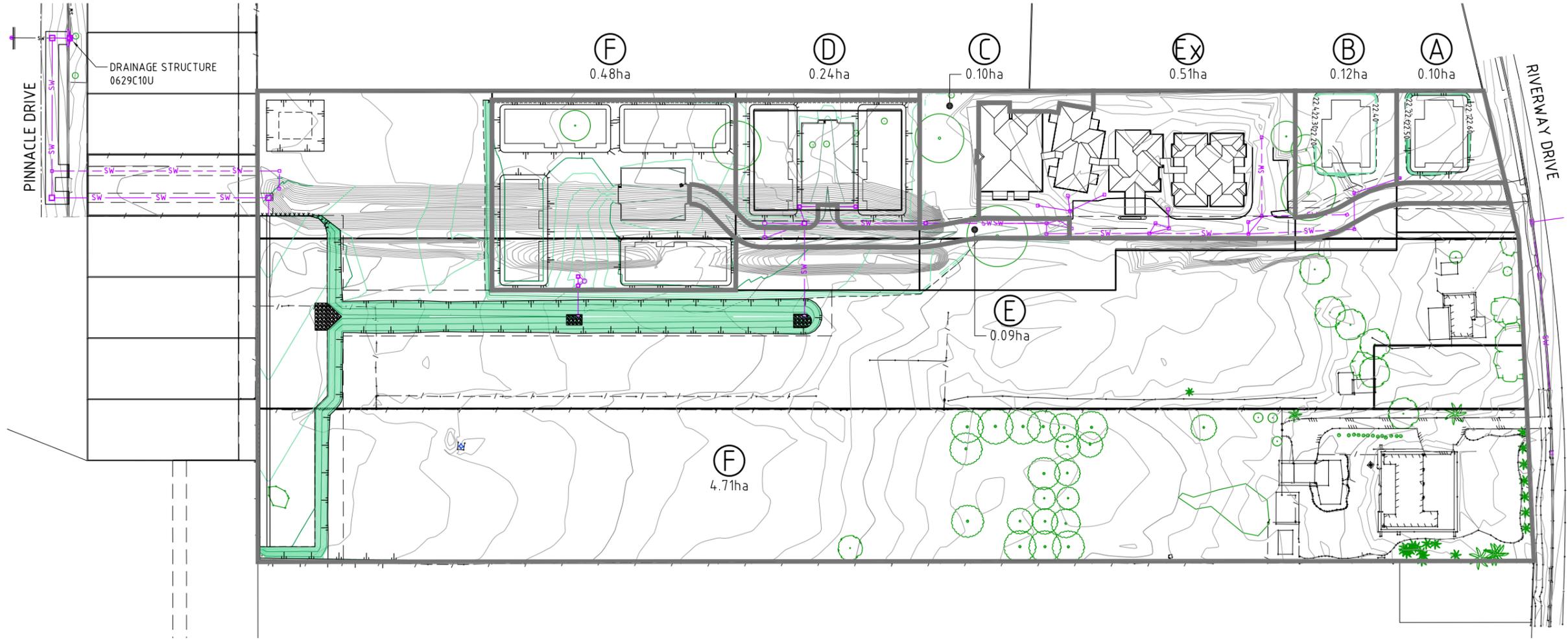
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DETAILS - SHEET 1

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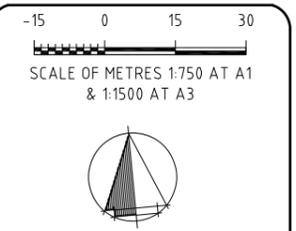
PLAN
SCALE 1:750 AT A1

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 OPW23/0071
 24/10/2023

LEGEND

- NATURAL SURFACE CONTOUR (0.1m INTERVAL)
- FINISHED SURFACE CONTOUR (0.1m INTERVAL)
- CATCHMENT BOUNDARY
- CATCHMENT NUMBER CATCHMENT AREA

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D TCC RFI COMMENTS	DEJ	17/10/23
C TCC RFI COMMENTS	DEJ	13/09/23
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DRAWING
CATCHMENT PLAN & CALCULATIONS

NUMBER	SHEET NO.	REVISION
ROSE001	C21	E

DRAINAGE CALCULATIONS - Return Period: 39% AEP

STRUCTURE No.	INLET DESIGN	INLET TYPE	INLET CURVE	FLOW TO INLET		DRAIN DESIGN			PIPE CLASS	FLOW VELOCITY	CAPACITY FLOW (MANNINGS)		DESIGN LEVELS		DRAIN SECTION HGL	UPSTREAM H.G.L.	DOWNSTREAM H.G.L.	W.S.E.	SURFACE OR K&C INVERT LEVEL
				Qg L/s	m	Qp L/s	L m	S %			mm	L/s	L/s	m					
0629C10U	63	LLG-BK-24.00-3.3%XF	SAG	63	0.038	207	128	0.137	S25	Class 3 RRJ	0.98	153	201	19.361	19.371	19.479	19.186	20.002	20.002

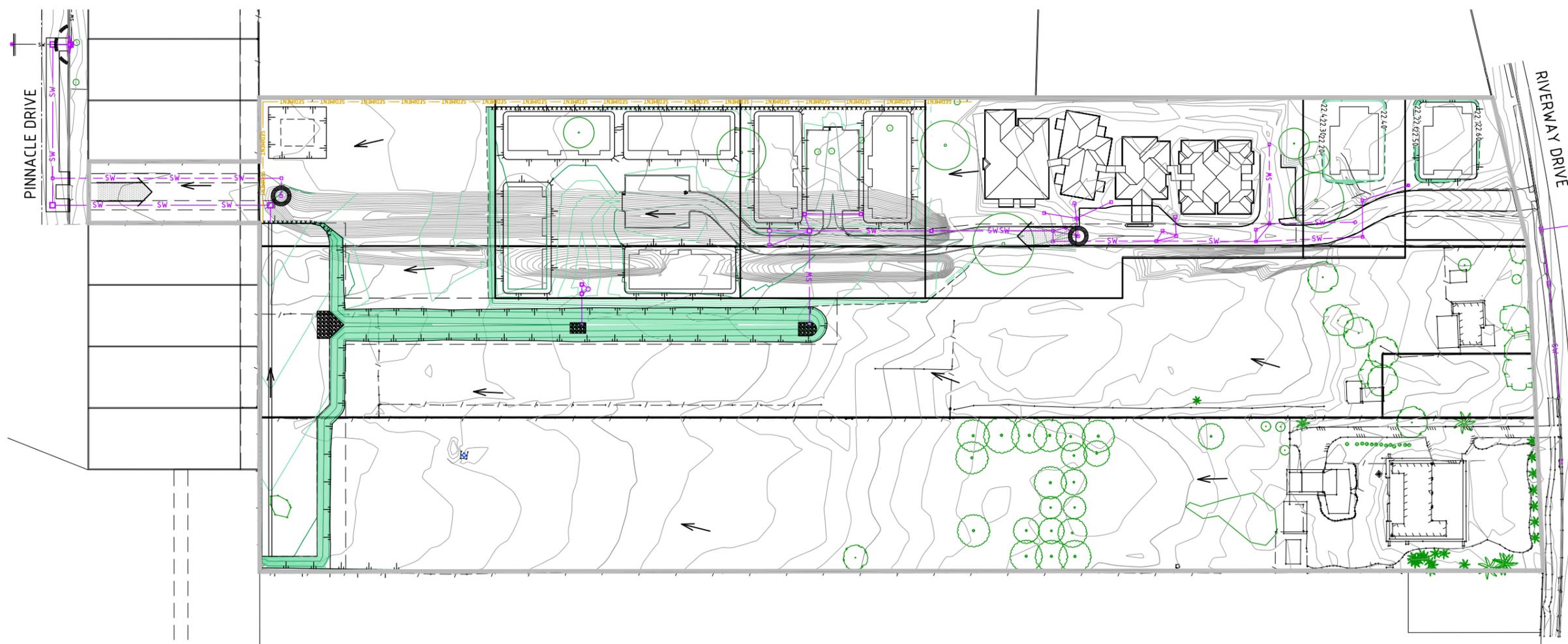
DRAINAGE CALCULATIONS - Return Period: 1% AEP

STRUCTURE No.	INLET DESIGN	INLET TYPE	INLET CURVE	FLOW TO INLET		DRAIN DESIGN			PIPE CLASS	FLOW VELOCITY	CAPACITY FLOW (MANNINGS)		DESIGN LEVELS		DRAIN SECTION HGL	UPSTREAM H.G.L.	W.S.E.	SURFACE OR K&C INVERT LEVEL
				Qg L/s	m	Qp L/s	L m	S %			mm	L/s	L/s	m				
0629C10U	253	LLG-BK-24.00-3.3%XF	SAG	253	0.131	855	128	0.137	S25	Class 3 RRJ	4.06	153	201	19.361	22.032	23.885	REFER TCC FLOOD MAPPING	20.002

HYDROLOGY TABLE

CATCHMENT ID	AREA ha	TIME min	C10	C2	I2 mm/hr	Q2 m³/s	C100	I100 mm/hr	Q100 m³/s
Ex	0.51	5.0	0.77	0.73	122	0.13	1.00	287	0.41
A	0.096	5.0	0.82	0.70	122	0.02	0.98	287	0.08
B	0.121	5.0	0.82	0.70	122	0.03	0.98	287	0.09
C	0.104	5.0	0.70	0.60	122	0.02	0.84	287	0.07
D	0.245	7.0	0.83	0.71	112	0.05	1.00	260	0.18
E	0.087	5.0	0.90	0.76	122	0.02	1.00	287	0.07
F	0.485	10.0	0.84	0.71	100	0.10	1.00	231	0.31
G	4.71	40.0	0.62	0.45	55	0.32	0.64	129	1.07

Date: 19/10/2023 11:56 AM User: EHooper File Name: J:\ROSE\ROSE001_Yumba Meta Development - Rasmussen\CAD\Civil\ROSE001-CATCHMENT
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PLAN
SCALE 1:750 AT A1

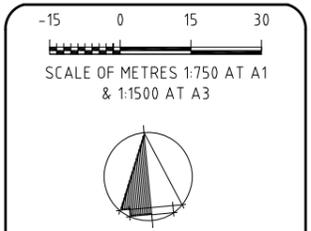
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24/10/2023

- LEGEND**
- NATURAL SURFACE CONTOUR (0.1m INTERVAL)
 - FINISHED SURFACE CONTOUR (0.1m INTERVAL)
 - SEDIMENT FENCE
 - EXISTING STORMWATER
 - NEW STORMWATER
 - DRAIN FLOW DIRECTION
 - ROCK PROTECTION REFER DRG C20
 - SITE EXTENT
 - TEMPORARY CONSTRUCTION ENTRY/EXIT
 - SIDE INLET PIT PROTECTION
 - FIELD INLET PIT PROTECTION
 - SURFACE FLOW DIRECTION

- NOTES**
- ALL EXPOSED EARTH TO BE HYDROMULCHED.
 - THE CONTRACTOR IS RESPONSIBLE FOR REVEGETATION AND ESTABLISHMENT OF DISTURBED AREAS DUE TO CONSTRUCTION ACTIVITIES BEYOND WHAT IS SHOWN IN THE DESIGN.

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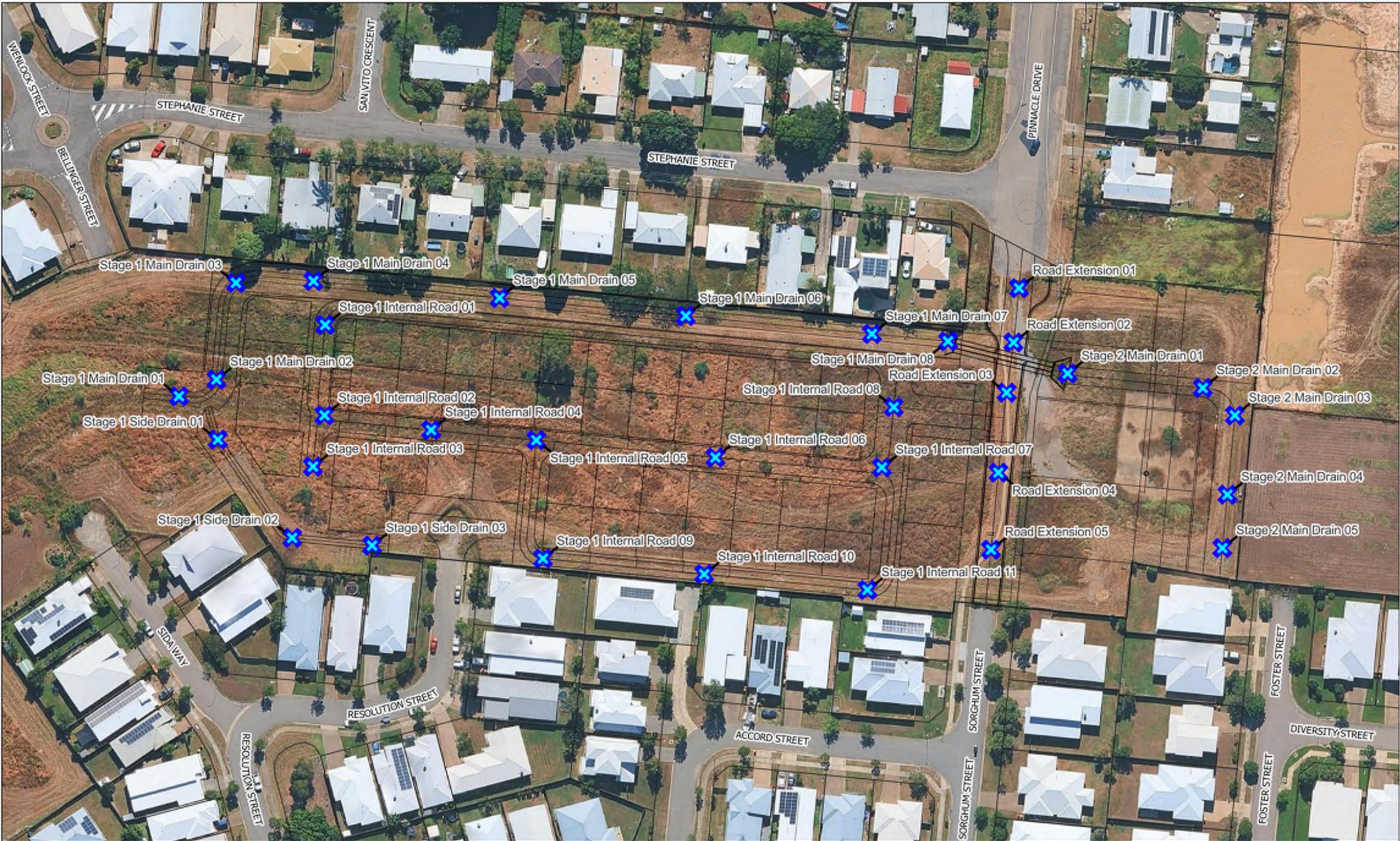
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DRAWING
 SOIL EROSION & SEDIMENT CONTROL PLAN

NUMBER	SHEET NO.	REVISION
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APPENDIX K

Stage 12a DFE Flood Levels




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 engineers

Civil | Structural | Forensic
 Traffic | Flood Modelling

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 GLADSTONE | NEW ZEALAND
 T: +617 4725 5550 E: mail@nceg.com.au
 W: www.nceg.com.au

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0 10 20 30 40 50 m

1:1,000



Legend

 TCC Land Parcels

**SOMERS & HERVEY ESTATE
PRECINCT 4 - STAGE 12A**

DEVELOPED WSL RESULTS POINTS

Prepared By: BB	Date: 18/12/2025	Size	Map
Reviewed by: AW	Revision: A	A3	A06
NCE Ref: URB0001-P4			

Appendix F

DesignFlow Somers & Hervey, Precinct 4 - Stage 12A
Stormwater Quality Management Technical
Memorandum



www.bmdgroup.global

TECHICAL MEMORANDUM

To: David Argent - Urbex
From: Ralph Williams - DesignFlow
Reviewed: Shaun Leinster (RPEQ 15637) - DesignFlow
Date: 5th December 2025
Subject: Somers & Hervey Estate – Precinct 4 - Stage 12A development

1 INTRODUCTION

This technical memorandum describes stormwater quality management relevant to Somers and Hervey Estate to support Precinct 4 Stage 12A development.

2 BACKGROUND

In support of the Somers and Hervey Estate development, stormwater quality management requirements under ultimate development conditions have been assessed. A stormwater treatment strategy was derived to treat stormwater runoff from the site to meet State Planning Policy objectives. The latest assessments are reported in the following documents:

- *Bluewattle Development, Rasmussen – Updated Stormwater Quality Management Plan* (DesignFlow, August 2022)
- *Bluewattle Development – Precinct 1 Stormwater Treatment (DesignFlow Tech Memo, 7 March 2023)*

3 PRECINCT 4 STAGE12A DEVELOPMENT

Precinct 4 Stage 12A development covers an area of ~2.6ha. The stormwater treatment strategy previously reported has been completed for ultimate development conditions. The catchment and drainage assumptions made relating to future development are still valid for Stage 12A development and the stormwater treatment strategy previously reported is unaltered with the inclusion of Stage 12A development.

Prepared by:

Ralph Williams

Reviewed/Certified by:



Shaun Leinster

RPEQ 15637

DesignFlow

Appendix G

Townsville City Council 'Works Code' Response



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Townsville City Council

9.3.6 Works code

9.3.6.1 Application

This code applies to development where the code is identified as applicable in the categories of development and assessment.

When using this code, reference should be made to section 5.3.2 and where applicable, section 5.3.3 located in Part 5.

9.3.6.2 Purpose

- (1) The purpose of the Works code is to ensure development is provided with a level of infrastructure which maintains or enhances community health, safety and amenity and which avoids or minimises impacts on the natural environment.
- (2) The purpose of the code will be achieved through the following overall outcomes:
 - (a) premises are provided with a level of service which is appropriate to the intended character and function of the zone;
 - (b) risk to life and property is avoided;
 - (c) development does not detract from environmental values, including the quality of receiving waters;
 - (d) development does not detract from the desired character and amenity of the locality;
 - (e) the integrity and quality of existing infrastructure is maintained;
 - (f) access, parking, streets and pedestrian and cycle paths are provided to standards that ensure safe, convenient and efficient operation of movement networks;
 - (g) development facilitates an efficient provision of infrastructure and use of resources; and
 - (h) whole of life cycle costs for infrastructure are minimised.

9.3.6.3 Assessment benchmarks

Accepted development subject to requirements-Access and parking

Table 9.3.6.3—Accepted development subject to requirements (Part)

Performance outcomes	Acceptable outcomes	
Access and parking		
PO1 Access arrangements are appropriate for: <ol style="list-style-type: none">(a) the capacity of the parking area;(b) the volume, frequency and type of vehicle usage; and(c) the function and characteristics of the access road and adjoining road network.	AO1 Access is provided in accordance with Australian Standard AS2890.1 .	N/A

<p>PO2</p> <p>Provision is made for on-site vehicle parking to meet the demand likely to be generated by the development and to avoid on street parking where that would adversely impact on the safety or capacity of the road network or unduly impact on local amenity.</p>	<p>AO2.1</p> <p>Parking is provided at the rates set out in Parking rates planning scheme policy no. SC6.10.</p> <p>OR</p> <p>AO2.2</p> <p>Where an existing lawful premises and involves not more than 5% or 50m²(whichever is the greater) of additional gross floor area, the existing number of on-site parking is retained or increased.</p>	<p>N/A</p>
<p>PO3</p> <p>Parking areas are designed to:</p> <p>(a) be clearly defined, marked and signed;</p> <p>(b) be convenient and accessible;</p> <p>(c) be safe for vehicles, pedestrians and cyclists; and</p> <p>(d) provide spaces which meet the needs of people with disabilities.</p>	<p>AO3.1</p> <p>Parking areas are designed in accordance with Australian Standard AS2890.1.</p> <p>OR</p> <p>AO3.2</p> <p>where an existing lawful premises and involves not more than 5% or 50m² (whichever is the greater) of additional gross floor area, the existing standard of on-site parking is maintained or improved.</p>	<p>N/A</p>
<p>PO4</p> <p>Landscaping is provided to soften the visual impact of parking areas and to provide shading.</p>	<p>AO4.1</p> <p>Shade trees within parking areas are provided at the following rate:</p> <p>(a) in single sided, angle or parallel bays - 1 tree per 3 parking spaces; and</p> <p>(b) in double sided, angle or parallel bays - 1 tree per 6 parking spaces.</p> <p>Editor's note—The Development manual planning scheme policy no. SC6.4 - SC6.4.12 Landscaping and Open Space sets out guidance on tree species and planting standards.</p> <p>OR</p> <p>AO4.2</p> <p>Where an existing lawful premises and involves not more than 5% or 50 m² (whichever is the greater) of additional gross floor area, the existing standard of landscaping is maintained or improved.</p>	<p></p>

<p>PO5 Provision is made for the onsite loading, unloading, maneuvering and access by service vehicles that:</p> <p>(a) is adequate to meet the demands generated by the development;</p> <p>(b) is able to accommodate the design service vehicle requirements;</p> <p>(c) is wholly contained within the site; and</p> <p>(d) does not unduly impede vehicular, cyclist and pedestrian safety and convenience within the site.</p>	<p>AO5.1 Servicing areas are provided and designed in accordance with Australian Standard AS2890.2.</p> <p>OR</p> <p>AO5.2 Where an existing lawful premises and involves not more than 5% or 50m² (whichever is the greater) of additional gross floor area, the existing provision for service vehicles is maintained or improved.</p>	<p>N/A</p>
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Table 9.3.6.3—Accepted development subject to requirements (Part)

Performance outcomes	Acceptable outcomes	
Services and utilities		
<p>PO6 A potable water supply is provided that is adequate for the needs of the intended use.</p>	<p>AO6.1 The development is connected to council's reticulated water supply system in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.11.2 Water Supply Planning and Design Guidelines and SC6.4.3 Standard Drawings.</p> <p>Editor's note—If a main exists, then an application for a water meter will be required.</p>	
	<p>AO6.2 Water supply systems and connections are designed and constructed in accordance with Development manual planning scheme policy no. SC6.4 - SC6.4.11.2 Water Supply Planning and Design Guidelines and SC6.4.3 Standard Drawings.</p>	

<p>PO7</p> <p>Wastewater treatment and disposal is provided that is appropriate for the level of demand generated, protects public health and avoids environmental harm.</p>	<p>AO7.1</p> <p>The development is connected to council's reticulated sewerage system via an existing sewer connection to the site.</p>	
	<p>AO7.2</p> <p>Waste water systems and connections are designed and constructed in accordance with Development manual planning scheme policy no. SC6.4 - SC6.4.11.2 Water Supply Planning and Design Guidelines, SC6.4.11.4 Sewerage Planning and Design Guidelines and SC6.4.3 Standard Drawings.</p>	
<p>PO8</p> <p>Provision is made for waste management that is appropriate to the use, protects the health and safety of people and the environment.</p> <p>Editor's note—Applicants should also be aware that any provision for disposal of any trade waste is to be made in accordance council's Trade Waste Policy supporting the Water Act 2000, Plumbing and Drainage Act 2002 and the Standard Plumbing Regulation 2003</p>	<p>AO8.1</p> <p>The development provides a bin container storage area that has an imperviously sealed pad and is screened to the height of the bins.</p>	
	<p>AO8.2</p> <p>On sites in an industrial zone that are greater than 2,000m² in area, provision is made for refuse collection vehicles to access the collection area, undertake the collection activity and to enter and leave the site in a forward direction without having to make more than a 3J point turn.</p>	<p>N/A</p>
<p>PO9</p> <p>The proposed stormwater management system or site works does not adversely affect flooding or drainage characteristics of properties that are upstream, downstream or adjacent to the development site.</p>	<p>AO9.1</p> <p>The development does not result in an increase in flood level or flood duration on upstream, downstream or adjacent properties.</p>	
	<p>AO9.2</p> <p>Roof and surface water is conveyed to the kerb and channel or an inter-allotment drainage system in accordance with Australian Standard AS/NZS3500.3:2003.</p>	
<p>PO10</p> <p>The drainage network has sufficient capacity to safely convey stormwater run-off from the site and development does not cause a drainage nuisance to a downstream or adjoining property.</p>	<p>AO10</p> <p>Post development discharge of stormwater from the subject land does not exceed predevelopment peak flows and no change to flows across a downstream or adjoining property is created.</p>	

Assessable development-Services and utilities

Table 9.3.6.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Services and utilities		
<p>PO11 A potable water supply is provided that is adequate for the needs of the intended use.</p>	<p>AO11.1 Where within an area designated for urban or rural residential development, the development is connected to council's reticulated water supply system in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.11.2 Water Supply Planning and Design Guidelines. OR AO11.2 Otherwise, the development is provided with an on-site water supply in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.11.7 On-Site Water Supply.</p>	
	<p>AO11.3 Water supply systems and connections are designed and constructed in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.11.2 Water Supply Planning and Design Guidelines, SC6.4.11.3 Water Supply Construction and SC6.4.3 Standard Drawings.</p>	
<p>PO12 Wastewater treatment and disposal is provided that is appropriate for the level of demand generated, protects public health and avoids adverse impacts on environmental values.</p>	<p>AO12.1 Where within an area designated for urban development, the development is connected to the council's reticulated sewerage system in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.11.2 Water Supply Planning and Design Guidelines. OR AO12.2 Otherwise, on-site waste water treatment and disposal is provided which complies with the Development manual</p>	

	<p>planning scheme policy no. SC6.4 - SC6.4.11.8 On-Site Sewerage Facilities.</p>	
	<p>AO12.3 Waste water systems and connections are designed and constructed in accordance with the Development manual planning scheme policy no. SC6.4-SC6.4.11.2 Water Supply Planning and Design Guidelines, SC6.4.11.3 Water and Sewerage Infrastructure, SC6.4.11.5 Sewerage System Constructions and SC6.4.3 Standard Drawings.</p>	
<p>PO13 The design and management of the development integrates water cycle elements having regard to:</p> <ul style="list-style-type: none"> (a) reducing potable water demand; (b) minimising wastewater production; (c) minimising stormwater peak discharges and run-off volumes; (d) maintaining natural drainage lines and hydrological regimes as far as possible; (e) reusing stormwater and greywater is encouraged where public safety and amenity will not be compromised; and (f) efficient use of water. 	<p>AO13 Integrated water management practices and infrastructure are implemented in accordance with Development manual planning scheme policy no. SC6.4 - SC6.4.10 Stormwater Quality and SC6.4.10.2 Water Sensitive Urban Design.</p>	
<p>PO14 The development is provided with an adequate energy supply which maintains acceptable standards of public health, safety, environmental quality and amenity.</p>	<p>AO14 For other than the Rural zone, premises are serviced by:</p> <ul style="list-style-type: none"> (a) an underground electricity supply approved by the relevant energy authority; or (b) an overhead supply approved by the relevant energy authority where in the Rural residential zone, Special purpose zone or High impact industry zone or where on a lot of less than 2,500m² within an area where the existing 	

	<p>supply is overhead.</p> <p>Editor's note—Applicants should also have regard to the Development manual planning scheme policy no. SC6.4 - SC6.4.14.2 Public Lighting (Urban, Urban Residential and Rural) and SC6.4.12.3 Utility Services.</p>	
<p>PO15</p> <p>Premises are connected to a telecommunications service approved by the relevant authority.</p>	<p>AO15</p> <p>The development is connected to telecommunications infrastructure in accordance with the standards of the relevant regulatory authority.</p> <p>Editor's note—The Development manual planning scheme policy no. SC6.4 - SC6.4.14.2 Public Lighting (Urban, Urban Residential and Rural) and SC6.4.14.3 Utility Services provides additional information regarding the supply of telecommunications.</p>	
<p>PO16</p> <p>Provision is made for future telecommunications services (for example fibre optic cable).</p>	<p>No acceptable outcome is nominated.</p>	
<p>PO17</p> <p>Where available, provision is made for reticulated gas.</p>	<p>AO17</p> <p>Design and provision of reticulated gas is undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.14.2 Public Lighting (Urban, Urban Residential and Rural).</p> <p>Editor's note—Applicants should also have regard to the metering requirements of other relevant authorities.</p>	<p>N/A</p>
<p>PO18</p> <p>Adequate access is provided to public services and utilities for future maintenance.</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—The Development manual planning scheme policy no. SC6.4 provides additional information and requirements for applicants, including when council will require easements over public services and utilities.</p>	

Table 9.3.6.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
<p>Acceptable outcomes</p>		
<p>Earthworks</p>		
<p>Editor's note—Applicants should be aware that some retaining walls constitute building works that are assessable under the <i>Building Regulation 2006</i>. No approval is required under <i>the Building Regulation 2006</i> for retaining walls if:</p>		
<p>(a) there is no surcharge loading; and</p> <p>(b) the height of wall or height of fill or excavation is not more than 1m; and</p> <p>(c) the wall is no closer than 1.5m to a building, structure (e.g. a swimming pool) or other retaining wall. In these cases, the “applicable code” for the purposes of the Act is the Building Code of Australia (refer to BCA Volume 2, Part 3.1.1). Retaining walls not more than 1m in height may be constructed in accordance with an accepted industry standard publication (e.g. timber, concrete masonry or similar).</p>		
<p>Editor's note—Applicants should note that council may request the submission of an engineering report undertaken by suitably qualified engineer to demonstrate compliance with the performance outcomes, particularly where alternative solutions are proposed.</p>		
<p>sPO19 Filling and excavation does not result in contamination of land or pose a health and safety risk.</p>	<p>AO19 Filling and excavation does not:</p> <p>(a) use contaminated materials as fill;</p> <p>(b) excavate contaminated material; and</p> <p>(c) use waste material as fill.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4 - SC64.7.4 Earthworks Construction and SC6.4.23.1 Construction</p>	
<p>PO20 Earthworks result in stable landforms and structures.</p>	<p>AO20 Earthworks and the construction of retaining walls and batters are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.7.3 Earthworks Design and SC6.4.7.4 Earthworks Construction.</p>	
<p>PO21 Earthworks are undertaken in a manner that:</p> <p>(a) maintains natural landforms as far as possible; and</p>	<p>AO21.1 Earthworks are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.7.3 Earthworks Design and SC6.4.7.4 Earthworks Construction.</p>	
<p>(b) minimises height of retaining walls and batter faces.</p>	<p>AO21.2 Retaining walls are designed and constructed:</p> <p>(a) certified as stable by a Registered Professional Engineer of Queensland; and</p> <p>(b) have a combined height of retaining wall and fence of not more than 2 metres.</p>	

<p>PO22 Earthworks do not unduly impact on amenity or privacy for occupants of the site or on adjoining land.</p>	<p>No acceptable outcome is nominated.</p>	
<p>PO23 No acceptable outcome is nominated. Earthworks do not cause environmental harm.</p>	<p>No acceptable outcome is nominated.</p>	
<p>PO24 Filling or excavation does not worsen any flooding or drainage problems on the site or on neighbouring properties.</p>	<p>AO24 Earthworks are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.7.3 Earthworks Design and SC6.4.7.4 Earthworks Construction.</p>	
<p>PO25 Any structure used to restrain fill or excavation does not worsen drainage problems or cause surface water to be a nuisance to neighbouring properties.</p>	<p>AO25 Earthworks are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.7.3 Earthworks Design and SC6.4.7.4 Earthworks Construction.</p>	
<p>PO26 Filling or excavation does not adversely affect sewer, stormwater or water utility infrastructure or access to them for maintenance purposes.</p>	<p>AO26 Earthworks are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.7.3 Earthworks Design and SC6.4.7.4 Earthworks Construction.</p>	
<p>PO27 Filling or excavation does not present or create difficult access to any property.</p>	<p>AO27 Earthworks are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.7.3 Earthworks Design and SC6.4.7.4 Earthworks Construction.</p>	
<p>PO28 Earthworks do not cause significant impacts through truck movements, dust or noise on the amenity of the locality in which the works are undertaken or along routes taken to transport the material and the transportation of materials minimises adverse impacts on the road network.</p>	<p>AO28 Earthworks are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.7.4 Earthworks Construction and SC6.4.23.1 Construction Management.</p>	

Table 9.3.6.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Movement networks		
<p>PO29 The following are provided along the full extent of the road frontage and to a standard that is appropriate to the function of the road or street and the character of the locality:</p> <ul style="list-style-type: none"> (a) paved roadway; (b) appropriate pavement edging (including kerb and channel); (c) pedestrian paths and cycleways; (d) streetscaping and street tree planting; (e) stormwater drainage; (f) street lighting systems; and conduits to facilitate the provision of and other utility 	<p>AO29 Design and construction of external road works are undertaken in accordance with the Development manual planning scheme policy no. SC6.4.</p> <p>Editor's note—Applicants should have regard to the following sub- sections of the Development manual planning scheme policy no. SC6.4 - SC6.4.14.2 Public Lighting (Urban, Urban Residential and Rural); SC6.4.14.3 Utility Services; SC6.4.9 Stormwater Quantity; SC6.4.10 Stormwater Quality; SC6.4.4 Active Transport Infrastructure; SC6.4.12 Landscaping and Open Space; SC6.4.6.1 Geometric Road Design; SC6.4.20.1 Footpath Treatment Policy; and SC6.4.23 Construction Management, Quality Management, Inspection and Testing.</p>	
<p>PO30 Provision is made in the road reserve for streetscaping, pedestrians and cyclists in a manner consistent with:</p> <ul style="list-style-type: none"> (a) the current and projected level of usage; (b) the desired streetscape character; and (c) activities which are anticipated to occur within the verge. 	<p>AO30 Streetscaping works, footpaths and cycle paths are provided in accordance with Development manual planning scheme policy no. SC6.4.</p> <p>Editor's note—Applicants should have regard to the following sub- sections of the Development manual planning scheme policy no. SC6.4 - SC6.4.14.3 Utility Services in demonstrating compliance. C6.4.20.1 Footpath Treatment Policy; SC6.4.6.1 Geometric Road Design; SC6.4.5.1 Townsville Road Hierarchy; SC6.4.4 Active Transport Infrastructure; SC6.4.12 Landscaping and Open Space; SC6.4.14.2 Public Lighting (Urban, Urban Residential and Rural); and SC6.4.14.3 Utility Services in demonstrating compliance.</p>	

<p>PO31</p> <p>Parking areas are designed and constructed in a manner that is sufficiently durable for the intended function, maintains all weather access and ensures the safe passage of vehicles, pedestrians and cyclists.</p>	<p>AO31</p> <p>Parking area design and construction is undertaken in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.5.3 Public Transport Facilities and SC6.4.5.4 Car Parking.</p>	
<p>PO32</p> <p>Movement networks can be easily and efficiently maintained.</p>	<p>AO32</p> <p>Infrastructure is provided in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.6.1 Geometric Road Design, SC6.4.5.1 Townsville Road Hierarchy and SC6.4.5.2 Traffic Impact Assessment (TIA).</p>	

Table 9.3.6.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Waste management		
<p>PO33</p> <p>Development provides adequate waste management facilities on site for the storage of waste and recyclable material in a manner which:</p> <ul style="list-style-type: none"> (a) is of adequate size to accommodate the expected (b) amount of refuse to be generated by the use; (c) is in a position that is conveniently accessible for collection at all times; (d) is able to be kept in a clean, safe and hygienic state at all times; and (e) minimises the potential for environmental harm, environmental nuisance and adverse amenity impacts. 	<p>AO33</p> <p>Waste management facilities are provided in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.22 Waste Management.</p> <p>Editor's note—Applicants may be requested to prepare a Waste management plan in accordance with the Development manual planning scheme policy no. SC6.4 SC6.4.22 Waste Management.</p>	

Table 9.3.6.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Construction management		
<p>PO34</p> <p>Work is undertaken in a manner which does not cause unacceptable impacts on surrounding areas as a result of dust, odour, noise or lighting.</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4 for assistance in complying with this outcome.</p>	
<p>PO35</p> <p>While undertaking development works, the site and adjoining road are maintained in a tidy, safe and</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4 for assistance in complying with this outcome.</p>	

<p>PO36 Traffic and parking generated during construction are managed to minimise impact on the amenity of the surrounding area.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no.SC6.4 for assistance in complying with this outcome.</p>	
<p>PO37 Council's infrastructure is not damaged by construction activities.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no.SC6.4 for assistance in complying with this outcome</p>	
<p>PO38 The integrity of new infrastructure is maintained.</p>	<p>No acceptable outcome in nominated. Editor's note—Applicants should have regard to the following sections of the Development manual planning scheme policy no. SC6.4 - SC6.4.23.1 Construction Management; and SC6.4.24 Acceptance of Completed Works in demonstrating compliance.</p>	
<p>PO39 Construction activities and works are carried out in a manner which avoids damage to the environment, retained vegetation and impacts on fauna.</p>	<p>AO39 Construction activities and works are undertaken in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.23.1 Construction Management.</p>	
<p>PO40 Vegetation cleared from a site is disposed of in a manner that maximises reuse and recycling and minimises impacts on public health and safety.</p>	<p>AO40 Construction activities and works are carried out in accordance with Development manual planning scheme policy no. SC6.4 - SC6.4.7.1 Clearing and Grubbing. Editor's note—Applicants shall also refer to Development manual planning scheme policy no. SC6.4 for assistance in complying with this outcome.</p>	

Appendix H

Townsville City Council 'Healthy Water Code' Response



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Townsville City Council

9.3.2 Healthy waters code

9.3.2.1 Application

This code applies to development where the code is identified as applicable in the categories of development and assessment.

When using this code, reference should be made to [section 5.3.2](#) and where applicable, [section 5.3.3](#) located in Part 5.

9.3.2.2 Purpose

- (1) The purpose of the code is to ensure development manages stormwater and wastewater as part of the integrated total water cycle and in ways that help protect the environmental values specified in the [Environmental Protection \(Water\) Policy 2009](#).
- (2) The purpose of the code will be achieved through the following overall outcomes:
 - (a) environmental values of receiving water are protected from adverse development impacts arising from altered stormwater quality and altered stormwater flow;
 - (b) environmental values of receiving water are protected from waste water impacts;
 - (c) environmental values of receiving water are protected from development impacts arising from the creation or expansion of non-tidal artificial waterways such as urban lakes;
 - (d) potential adverse impacts on the natural and built environment, including infrastructure and human health as a result of acid sulfate soils are avoided;
 - (e) public health and safety are protected and damage or nuisance caused by stormwater is avoided;
 - (f) stormwater is designed to maintain or recreate natural hydrological processes and minimise run-off;
 - (g) whole of lifecycle costs of infrastructure are minimised; and
 - (h) well-designed developments are responsive to receiving water quality.

Table 9.3.2.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Stormwater management - protecting water quality		
<p>PO1 Development contributes to the protection of environmental values and water quality objectives of receiving waters to the extent practicable.</p> <p>Editor's note - The environmental values and water quality objectives are established under the Environmental Protection (Water and Wetland Biodiversity) Policy (2019). Catchment-specific Environmental Values (EVs) and Water Quality Objectives (WQOs) have been prepared for some catchments (including the Ross River and Black River catchments). The Queensland Water Quality Guidelines 2009 provides EVs and WQOs for waters where no catchment-specific values have been established.</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 - SC6.4.8.10 Stormwater Management Plans; and SC6.4.10.2 Water Sensitive Urban Design.</p>	
<p>PO2 High environmental value waters and slightly disturbed waters (shown on Figure 9.1 — High environmental value waters and slightly disturbed</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Refer to the <i>Queensland Water Quality Guidelines (QWQG)</i> for details on how to establish a minimum water quality data set for these areas.</p>	

waters) are protected from the impacts of development within their catchments. Existing water quality, habitat and biota values, flow regimes and riparian areas are maintained or enhanced.

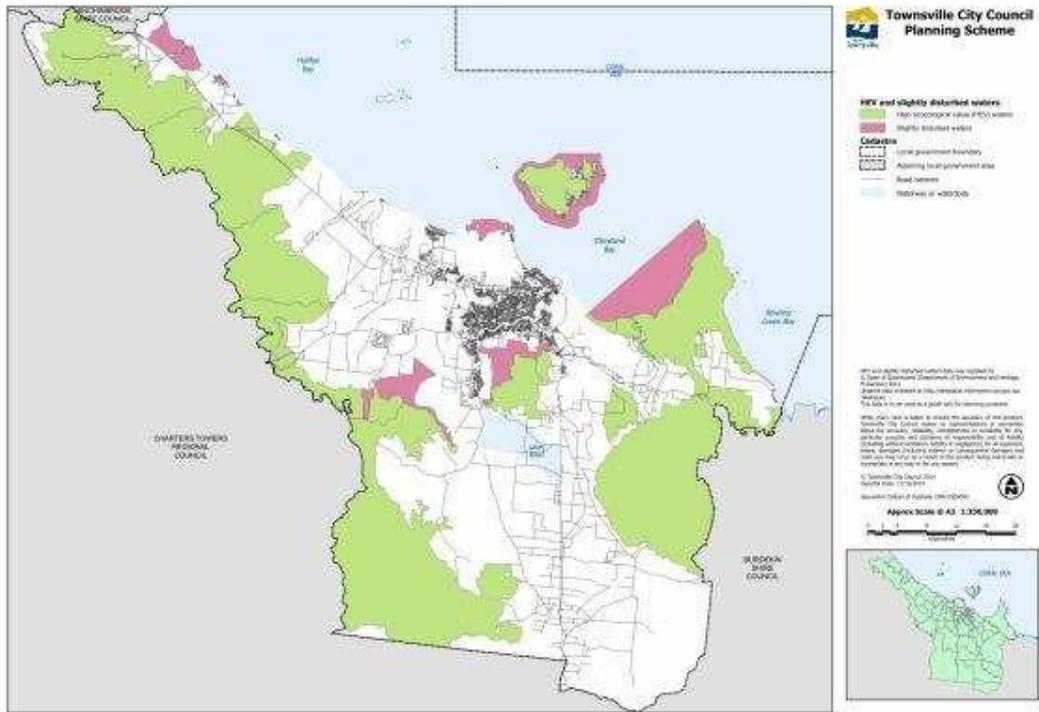


Figure 9.1 - High environmental value waters and slightly disturbed waters

Table 9.3.2.3—Assessable development (Part)

<p>PO3 The entry of contaminants into, and transport of contaminants in, stormwater is avoided or minimised.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 - SC6.4.8.10 Stormwater Management Plans; and SC6.4.10.2 Water Sensitive Urban Design.</p>	
<p>PO4 Within the areas identified as potential acid sulfate soils on Figure 9.2 — Acid sulfate soils, the generation or release of acid and metal contaminants into the environment from acid sulfate soils is avoided by:</p> <p>(a) not disturbing acid sulfate soils when excavating or otherwise removing soil or sediment, draining or extracting groundwater, excluding tidal water or filling land; or</p> <p>(b) where disturbance of acid sulfate soils cannot be avoided, development:</p> <p>(i) neutralises existing acidity and prevents the generation of acid and metal contaminants; and</p> <p>(ii) prevents the release of surface or groundwater flows containing acid and metal contaminants into the environment.</p>	<p>AO4.1 Development does not:</p> <p>(a) involve excavating or removing 100m³ or more of soil and sediment at or below 5m AHD; or</p> <p>(b) permanently or temporarily drain or extract groundwater or exclude tidal water resulting in the aeration of previously saturated acid sulfate soils; or</p> <p>(c) involve filling with 500m³ or more with an average depth of 0.5m or greater that results in:</p> <p>(i) actual acid sulfate soils being moved below the water table; or</p> <p>(ii) previously saturated acid sulfate soils being aerated.</p> <p>OR</p> <p>AO4.2 Development manages waters so that:</p> <p>(a) all disturbed acid sulfate soils are adequately treated and/or managed so that they can no longer release acid or heavy metals;</p> <p>(b) the pH of all site any water including discharges and seepage to groundwater, is maintained between 6.5 and 8.5 (or an agreed pH in line with natural background);</p> <p>(c) waters on the site, including discharges and seepage to groundwater, do</p>	

	<p>not contain elevated levels of soluble metals;</p> <p>(d) there are no visible iron stains, flocs or sums in discharge water;</p> <p>(e) all reasonable preparations and actions are undertaken to ensure that aquatic health is safeguarded; and</p> <p>(f) infrastructure such as buried services, pipes, culverts and bridges are protected from acid attack.</p> <p>Editor's note—Where works are proposed within the areas identified as potential acid sulfate soils on Figure 9.2 - Acid sulfate soils, the applicant is required to undertake an on-site acid sulfate investigation. The reason for undertaking an acid sulfate soils investigation is to determine the presence of acid sulfate soil in order to avoid disturbance. Where acid sulfate soils cannot reasonably be avoided, investigation results assist in the planning of treatment and remedial activities and must be undertaken in accordance with the <i>Queensland Acid Sulfate Soil Technical Manual</i> and relevant State Planning Policy. Applicants should also refer to the <i>Guidelines for Sampling Analysis of Lowland Acid Sulfate Soils in Queensland</i>, <i>Acid Sulfate Soils Laboratory Methods Guidelines</i> or Australian Standard 4969. It is highly recommended that the applicant develop a practical Acid Sulfate Soil Management Plan for use in monitoring and treating acid sulfate soils.</p>	
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[Click here](#) to view PDF high resolution map.

Figure 9.2 - Acid sulfate soils

Table 9.3.2.3—Assessable development (Part)

<p>PO5 Construction activities for the development avoid or minimise adverse impacts on stormwater quality or hydrological processes.</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 - SC6.4.8.10 Stormwater Management Plans, SC6.4.23.1 Construction Management; and SC6.4.6.1 - Water Sensitive Urban Design.</p>	
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Table 9.3.2.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Hydrological processes		
<p>PO6 The stormwater management system:</p> <p>(a) retains natural waterway corridors and drainage paths; and</p> <p>(b) maximises the use of natural channel design in constructed components.</p>	<p>AO6.1 All existing waterways and overland flow paths are retained.</p>	
	<p>AO6.2 The stormwater management system is designed in accordance with the Development manual planning scheme policy no. SC6.4 — SC6.4.10.2 Water Sensitive Urban Design.</p>	

<p>PO7 The development is designed to minimise run-off and peak flows by:</p> <p>(a) minimising large areas of impervious material; and</p> <p>(b) maximising opportunities for capture and reuse.</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 - SC6.4.8.10 Stormwater Management Plans; and SC6.4.10.2 Water Sensitive Urban Design.</p>	
<p>PO8 Stormwater management is designed to:</p> <p>(a) protect in-stream ecosystems from the significant effects of increased run-off frequency by capturing the initial portion of run-off from impervious areas; and</p> <p>(b) create conditions such that the frequency of hydraulic disturbance to in-stream ecosystems in developed catchments is similar to pre-development conditions.</p> <p>Editor's note—Frequent flow management is distinct from flood management purposes, which is concerned with the management of less frequent, more extreme stormwater flows. The latter is an important part of integrated stormwater management and should in no way be compromised in pursuit of the management of more frequent flows for waterway health</p>	<p>A08 The stormwater management system is designed in accordance with the Development manual planning scheme policy no. SC6.4 - SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity and SC6.4.10 Stormwater Quality.</p>	
<p>PO9 Stormwater management is designed to prevent exacerbated in-stream erosion downstream of a development site by controlling the magnitude and duration of sediment-transporting, erosion-causing flows.</p>	<p>A09 The stormwater management system is designed in accordance with the Development manual planning scheme policy no. SC6.4—SC6.4.10.2 Water Sensitive Urban Design and SC6.4.8.10 Stormwater Management Plans.</p>	

Table 9.3.2.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Stormwater drainage generally		
<p>PO10 The proposed stormwater management system or site works does not adversely affect flooding or drainage characteristics of properties that are upstream, downstream or adjacent to the development site.</p>	<p>AO10.1 The development does not result in an increase in flood level or flood duration on upstream, downstream or adjacent properties.</p>	✓
	<p>AO10.2 The stormwater management system is designed and constructed in accordance with the Development manual planning scheme policy SC6.4 —SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	✓
<p>PO11 Development does not cause ponding, or changes in flows and velocities such that the safety, use and enjoyment of nearby properties are adversely affected.</p>	<p>AO11 The stormwater management system is designed and constructed in accordance with the Development manual planning scheme policy SC6.4 — SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	✓
<p>PO12 The drainage network has sufficient capacity to safely convey stormwater run-off from the site.</p>	<p>AO12 Development is undertaken in accordance with the Development manual planning scheme policy SC6.4 — SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	✓
<p>PO13 The stormwater management system:</p> <ul style="list-style-type: none"> (a) provides for safe access and maintenance; and (b) where relevant, provides for safe recreational use of stormwater management features. 	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4- SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	✓

Table 9.3.2.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Point source waste water management (other than contaminated stormwater and sewage)		
<p>PO14 Waste water is managed in accordance with a waste management hierarchy that:</p> <ul style="list-style-type: none"> (a) avoids waste water discharge to waterways; or (b) if waste water discharge to waterways cannot practicably be avoided, minimises waste water discharge to waterways by re-use, recycling, recovery and treatment for disposal to sewer, surface water and groundwater. <p>Editor's note—To meet this outcome, a waste water management plan (WWMP) should be prepared by a suitably qualified person. The WWMP is to account for the waste water type, climatic conditions, Water Quality Objective (WQOs) and best practice environmental management.</p>	No acceptable outcome is nominated.	
<p>PO15 Any treatment and disposal of waste water to a waterway:</p> <ul style="list-style-type: none"> (a) protects the applicable water quality objectives for the receiving waters; and (b) avoids adverse impact on ecosystem health of receiving waters. 	No acceptable outcome is nominated.	
<p>PO16 Development avoids or minimises and appropriately manages soil disturbance or altering natural hydrology in nutrient hazardous areas.</p>	No acceptable outcome is nominated.	
<p>PO17 Waste water discharge to waterways is managed to avoid or minimise the release of nutrients of concern so as to minimise the occurrence, frequency and intensity of coastal algal blooms.</p> <p>Editor's note—Compliance with this outcome can be demonstrated by following the management advice in the Implementing Policies and Plans for Managing Nutrients of Concern for Coastal Algal Blooms in Queensland and associated technical guideline.</p>	No acceptable outcome is nominated.	

Table 9.3.2.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Constructed Lakes and artificial waterways		
<p>PO18 Where established, a constructed lake or artificial waterway is designed to maintain a reasonable standard of water quality, having regard to factors affecting lake health, including:</p> <ul style="list-style-type: none"> (a) nutrients and eutrophication; (b) gross pollutants, including organic material; (c) light and turbidity; (d) organic carbon loads; (e) lake stormwater detention time; (f) salinity; (g) temperature; (h) water depth and seasonal variations; (i) water column mixing temperature; and (j) pesticides and other chemicals. 	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	N/A
<p>PO19 Stormwater run-off entering and leaving a constructed lake or artificial waterway maintains receiving water quality.</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC 6.4 - SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	N/A

<p>PO20</p> <p>The location, design and operation of a constructed lake or artificial waterway:</p> <ul style="list-style-type: none"> (a) protects environmental values in downstream and upstream waterways; (b) protects any groundwater recharge areas; (c) incorporates low lying areas of a catchment connected to an existing waterway; (d) does not disrupt natural wetlands and any associated buffer areas; (e) avoids disturbing soils or sediments; and (l) avoids altering the natural hydrologic regime in acid sulfate soil and nutrient hazardous areas. <p>Editor's Note—Monitoring and maintenance programs will be required to adaptively manage water quality and to achieve relevant water quality objectives.</p>	<p>No acceptable outcome is nominated.</p> <p>Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality..</p>	<p>N/A</p>
<p>PO21</p> <p>The constructed lake or artificial waterway is located in a way that is compatible with existing tidal waterways.</p>	<p>For constructed lakes — No acceptable solution is nominated.</p> <p>AO21</p> <p>For an artificial waterway:</p> <p>Where an artificial waterway is located adjacent to, or connected to, a tidal waterway by means of a weir, lock, pumping system or similar:</p> <ul style="list-style-type: none"> (a) there is sufficient flushing or tidal flushing with water level variation >0.3m; (b) any tidal flow alteration does not adversely impact on the tidal waterway; and (c) there is no introduction of salt water into freshwater environments. <p>Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>

<p>PO22 The construction phase for the constructed lake or artificial waterway is compatible with protecting aquatic environmental values in existing natural waterways and wetlands.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>
<p>PO23 A constructed lake or artificial waterway is designed to avoid terrestrial and aquatic weeds, vectors and concentrations of populations.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>
<p>PO24 The lake design provides for suitable machinery access to enable maintenance of the lake, including the removal of terrestrial and aquatic weeds.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>
<p>PO25 A constructed lake or artificial waterway has no adverse impact on flood capacity, including the capacity of upstream catchments and floodplain areas.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>
<p>PO26 A constructed lake or artificial waterway is designed to minimise hazards to ensure public safety is maintained.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>
<p>PO27 A constructed lake or artificial waterway is designed to provide a high level of amenity for surrounding residents.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>
<p>PO28 Opportunities for incorporation of accessible passive and active recreation facilities into the design of the constructed lake or artificial waterway are facilitated.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy no. SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	<p>N/A</p>

Table 9.3.2.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Efficiency and whole of life cycle cost		
<p>PO29 Life cycle costs are minimised, taking into account acquisition, construction, establishment, operation, monitoring, maintenance, replacement and disposal costs.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 for assistance in demonstrating this outcome.</p>	
<p>PO30 The design of the development allows for sufficient site area to accommodate an effective stormwater management system.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 for assistance demonstrating this outcome.</p>	
<p>PO31 The proposal provides for the orderly development of stormwater infrastructure within a catchment, having regard to:</p> <ul style="list-style-type: none"> (a) existing capacity of stormwater infrastructure and ultimate catchment conditions; (b) discharge for existing and future upstream development; and (c) protecting the integrity of adjacent and downstream development. 	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 for assistance in demonstrating this outcome.</p>	
<p>PO32 Proposed stormwater infrastructure remains fit for purpose for the life of the development.</p>	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 for assistance in demonstrating this outcome.</p>	
<p>PO33 Proposed stormwater infrastructure can be easily accessed and can be maintained in a safe and cost effective way.</p>	<p>AO33 The stormwater management system is designed in accordance with the Development manual planning SC6.4.8 Stormwater Management, SC6.4.9 Stormwater Quantity; and SC6.4.10 Stormwater Quality.</p>	

Table 9.3.2.3—Assessable development (Part)

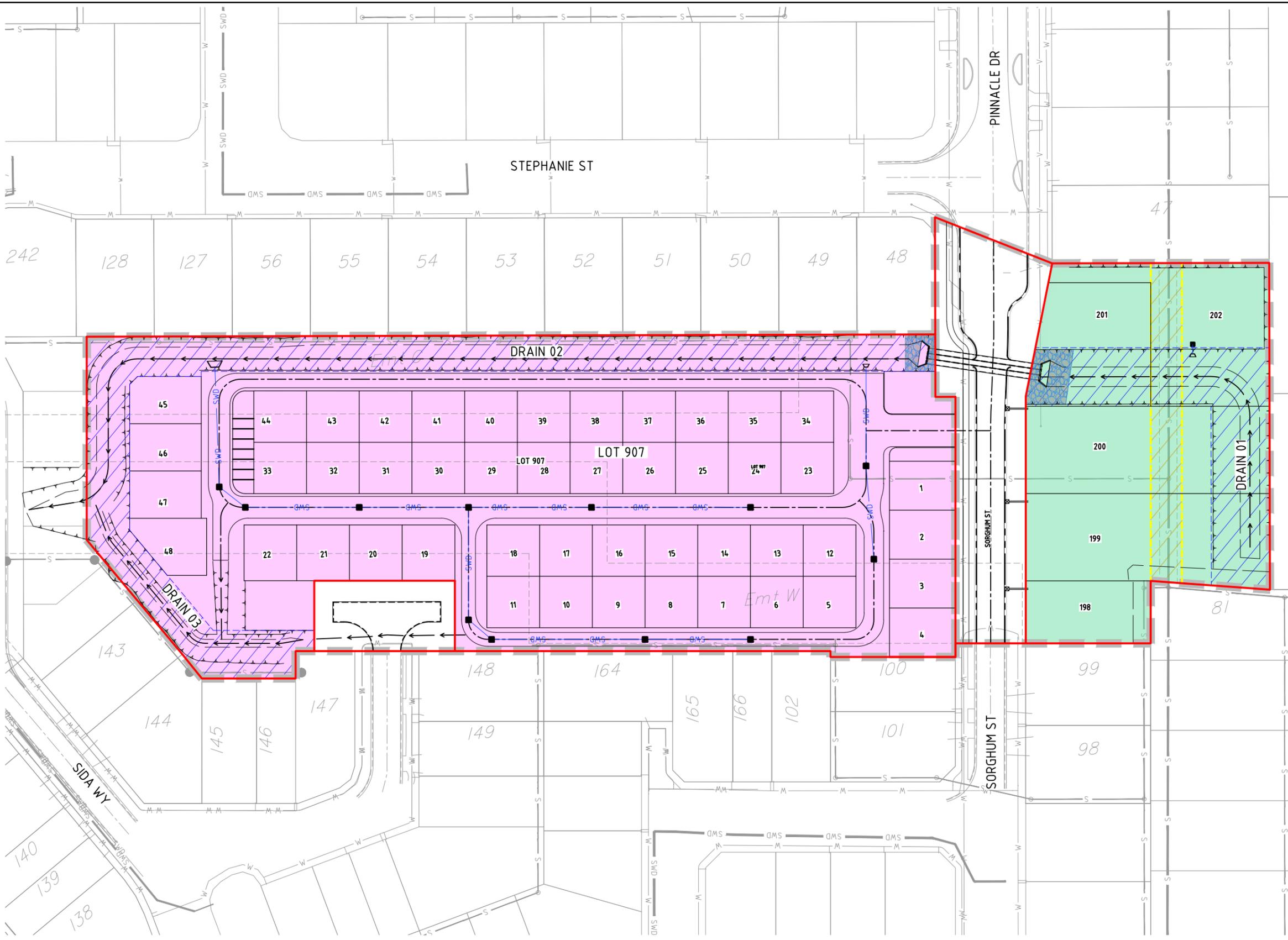
Performance outcomes	Acceptable outcomes	
Water management in reconfiguring a lot		
<p>PO34 Reconfiguration of lots includes water management measures in the design of any road reserve, streetscape or drainage networks to:</p> <ul style="list-style-type: none"> (a) minimise impacts on the water cycle; (b) protect waterway health by improving stormwater quality and reducing site run-off; and (c) avoid large areas of impervious surfaces. 	<p>No acceptable outcome is nominated. Editor's note—Applicants should refer to the Development manual planning scheme policy SC6.4 for assistance in demonstrating this outcome.</p>	

Table 9.3.2.3—Assessable development (Part)

Performance outcomes	Acceptable outcomes	
Ship-sourced pollutants		
<p>PO35 Common user facilities for the handling and disposal of ship-sourced pollutants including oil, garbage and sewage are provided at a suitable location in any development involving a marina or berthing facilities.</p> <p>Editor's note—Refer to: <i>Australian and New Zealand Environment and Conservation Council (ANZECC), 1997, Best Practice Guidelines for Waste Reception Facilities at Ports, Marinas and Boat Harbours in Australia and New Zealand.</i></p>	No acceptable outcome is nominated.	N/A
<p>PO36 Marinas or berthing facilities are designed and operated to ensure the risk of spillage from operations is minimised.</p>	No acceptable outcome is nominated.	N/A
<p>PO37 Equipment to contain and remove spillages is stored in a convenient position near marina or berthing facilities and is available for immediate use.</p>	No acceptable outcome is nominated.	N/A
<p>PO38 Where practical, the marina pollutant reception facility is connected to a sewerage or other waste reception infrastructure.</p> <p>Editor's note—Reception facilities require compliance assessment under the <i>Plumbing and Drainage Act 2002</i>. The plumbing compliance assessment process will ensure that the proposed facilities address 'peak load'.</p>	No acceptable outcome is nominated.	N/A

Appendix I

General Internal Services Layout Plans - Stormwater,
Sewerage and Water



- LEGEND**
- STAGE BOUNDARY
 - LOT BOUNDARY
 - SEWER EASEMENT
 - DRAINAGE EASEMENT
 - ROAD CENTERLINE
 - MOUNTABLE TYPE KERB AND
 - TOP OF BATTER
 - TOE OF BATTER
 - GROUDED ROCK PITCHING
 - STORMWATER FIELD INLET
 - SWD STORMWATER DRAINAGE
 - STORMWATER HEADWALL
 - STORMWATER FIELD INLET

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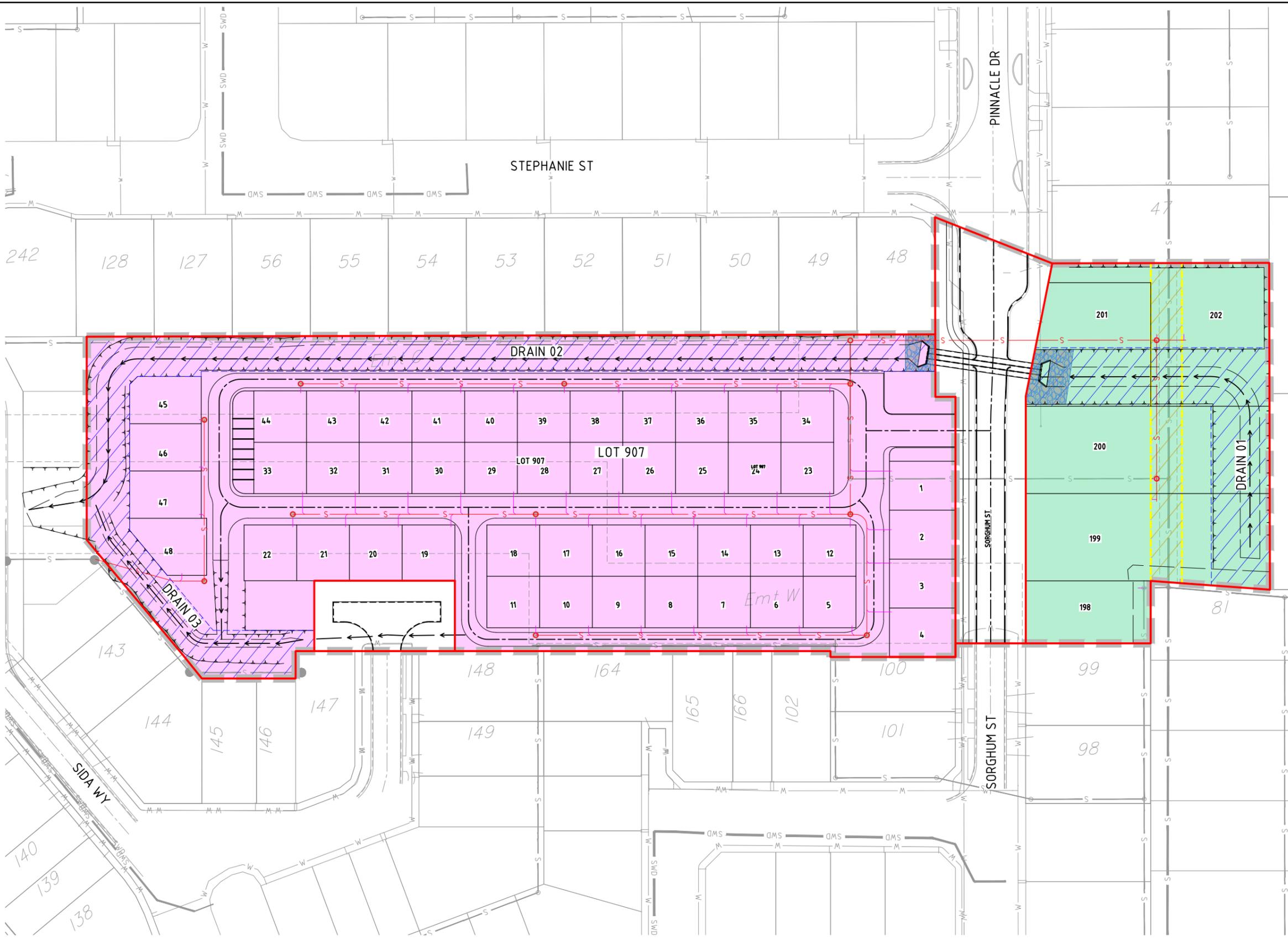
ENGINEERING CERTIFICATION

Registered Engineer
Date
Registered Accreditation

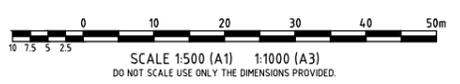
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A	ORIGINAL ISSUE	EK	YL	CH	CH	03/12/25

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Client	URBEX 118 PTY LTD	Datum	AHD
Project	SOMERS & HERVEY PRECINCT 4 LOT 907	PSM	RL
Title	MATERIAL CHANGE OF USE GENERAL SERVICES LAYOUT PLAN STORMWATER	(MGA) COORD	 NOT FOR CONSTRUCTION
		Project No.	Drawing No.
		B00541-MCU-SK10	A



- LEGEND**
- STAGE BOUNDARY
 - LOT BOUNDARY
 - SEWER EASEMENT
 - DRAINAGE EASEMENT
 - ROAD CENTERLINE
 - MOUNTABLE TYPE KERB AND CHANNEL
 - TOP OF BATTER
 - MOUNTABLE TYPE KERB AND CHANNEL
 - S PROPOSED SEWER RETICULATION
 - MAINTENANCE HOLE/SHAFT
 - |— PROPOSED SEWER HOUSE CONNECTION
 - S EXISTING SEWER RETICULATION
 - STORMWATER FIELD INLET
 - SWD STORMWATER DRAINAGE



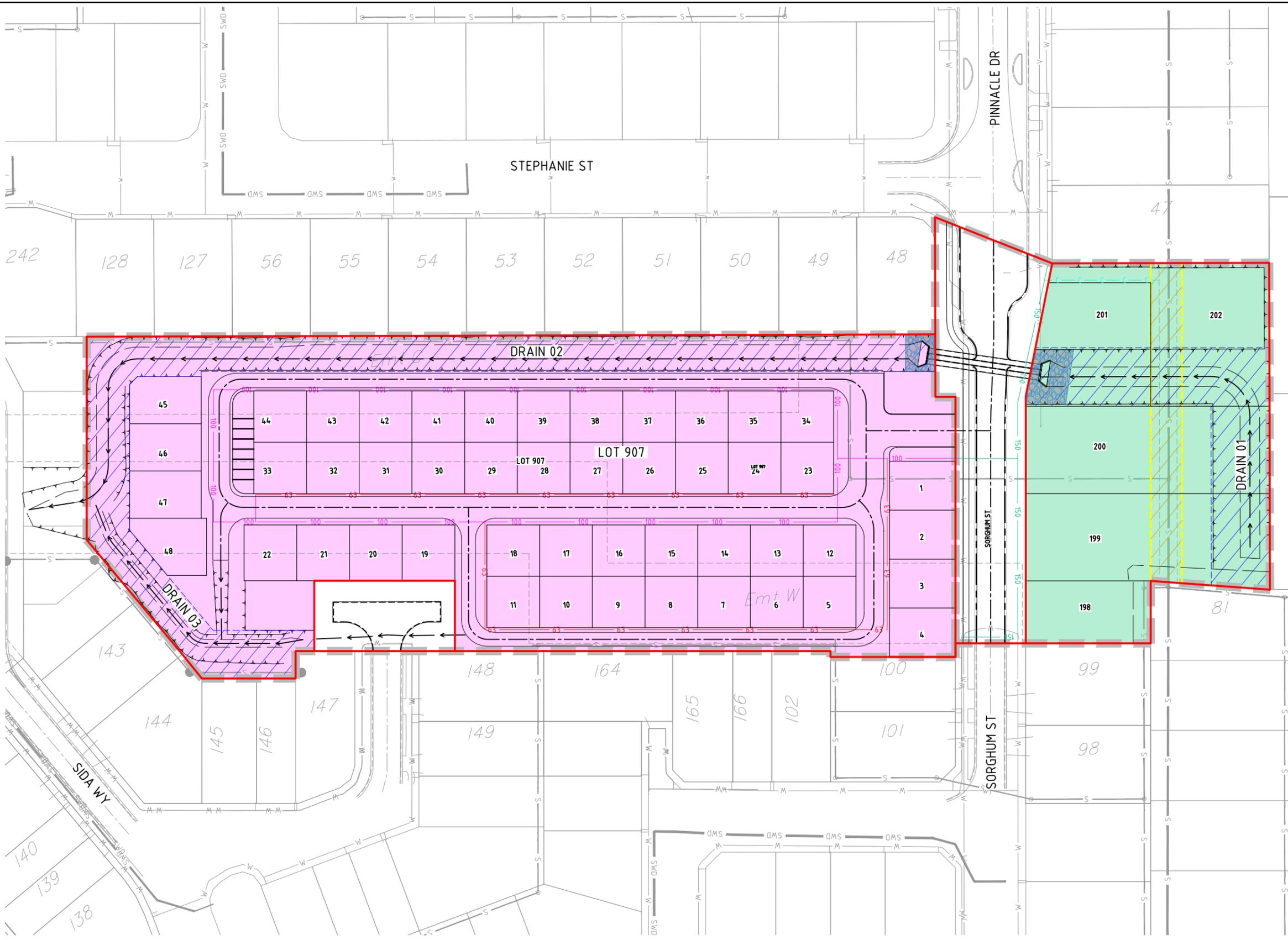
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No.	Amendments	Drawn	Design	Design	Chk	Appd	Date	Registered Accreditation			

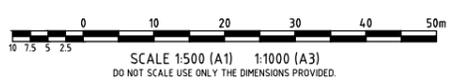
ENGINEERING CERTIFICATION	
Registered Engineer	
Date	
Registered Accreditation	

Client	URBEX 118 PTY LTD
Project	SOMERS & HERVEY PRECINCT 4 LOT 907
Title	MATERIAL CHANGE OF USE GENERAL SERVICES LAYOUT PLAN SEWER

Datum	AHD	
PSM	RL	
(MGA) COORD		NOT FOR CONSTRUCTION
Project No.	Drawing No.	Rev
B00541-MCU-SK11	A	A



- LEGEND**
- STAGE BOUNDARY
 - LOT BOUNDARY
 - SEWER EASEMENT
 - DRAINAGE EASEMENT
 - ROAD CENTERLINE
 - MOUNTABLE TYPE KERB ANC
 - TOP OF BATTER
 - TOE OF BATTER
 - CONCRETE DRIVEWAY
 - STORMWATER FIELD INLET
 - SWD STORMWATER DRAINAGE
 - MOUNTABLE TYPE KERB AND CHANNEL
 - OPEN CHANNEL
 - EXISTING WATER RETICULATION
 - DN63 PE WATER MAIN
 - DN100 uPVC WATER MAIN



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ORIGINAL ISSUE		Amendments		ENGINEERING CERTIFICATION	
No.	Drawn	Design Chk	Appd	Date	Registered Accreditation
A	EK	YL	CH	03/12/25	Registered Engineer
					Date

ENGINEERING CERTIFICATION Registered Engineer Date Registered Accreditation	
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Client URBEX 118 PTY LTD	Datum AHD	
Project SOMERS & HERVEY PRECINCT 4 LOT 907	PSM RL (MGA) COORD	
Title MATERIAL CHANGE OF USE GENERAL SERVICES LAYOUT PLAN WATER	NOT FOR CONSTRUCTION	
Project No. N00541-MCU-SK12	Drawing No. A	Rev A

Appendix J

Think Tank Stage 12A Multiple Dwellings Development -
Concept Landscape Plans

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Client: BMD

LOT 907 _ PINNACLE DRIVE, TOWNSVILLE

DA-1

Document Set ID: 27988765
Version: 1, Version Date: 28/01/2026

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GENERAL NOTES:
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KEY PLAN:

PLANNING SUMMARY

LOT 907

SITE AREA part 1	17145 sqm
Usable Area	13964 sqm
Drainage Area	3181 sqm (*TO BE CONFIRMED)
SITE AREA part 2	1569 sqm
Usable Area	1326 sqm
Drainage Area	243 sqm
SITE COVER	
over PART 1	4748 sqm (34% of Usable Area)

PROPOSED MIX

PART 1	
1 BED TYPE	41 HOUSES
2 BED TYPE	7 HOUSES
TOTAL	48 HOUSES
PART 2	
4 ALLOTMENTS	

PROPOSED CARS

1 CAR / HOUSE (COVERED)	48 CARS
+ 1 CAR / HOUSE (UNCOVERED) (to be used for visitors)	48 CARS
EXTRA / VISITOR CARS	6 CARS
TOTAL	98 CARS

PROPOSED LANDSCAPE

PRIVATE LANDSCAPE part 1	TOTAL 3318 sqm
PUBLIC LANDSCAPE part 1	TOTAL 1182 sqm
TOTAL private + public	4500 sqm

COMMUNAL OPEN SPACE

C.O.S. 1	95 sqm
C.O.S. 2	450 sqm
TOTAL	545 sqm



DA LIST

SHEET	SHEET NAME
SD000	COVER SHEET
SD010	PLANNING SUMMARY
SD050	ARTIST'S IMPRESSION
SD051	ARTIST'S IMPRESSION
SD100	OVERALL GROUND LEVEL
SD101	OVERALL ROOF PLAN
SD102	GROUND PART A
SD103	GROUND PART B
SD200	SECTIONS
SD201	SECTIONS
SD300	ELEVATIONS
SD301	ELEVATIONS
SD302	ELEVATIONS
SD303	ELEVATIONS
SD400	1 BED HOUSE - TYPE 1_PLANS
SD401	1 BED HOUSE - TYPE 1_ELEVATIONS
SD402	1 BED HOUSE - TYPE 2_PLANS
SD403	1 BED HOUSE - TYPE 2_ELEVATIONS
SD404	2 BED HOUSE - TYPE 1_PLANS
SD405	2 BED HOUSE - TYPE 1_ELEVATIONS
SD406	2 BED HOUSE - TYPE 2_PLANS
SD407	2 BED HOUSE - TYPE 2_ELEVATIONS
SD500	BIN ENCLOSURE DETAIL
SD501	MAILBOXES & BBQ PAVILION DETAIL
SD600	GFA
SD601	SITE COVER
SD602	LANDSCAPE AREAS
SD603	LOTS AREAS
SD700	1 BED_TYPE 1 & 2 - SHADOWS DETAIL
SD701	2 BED_TYPE 1 & 2 - SHADOWS
SD800	SHADOW DIAGRAMS, SUMMER
SD801	SHADOW DIAGRAMS, WINTER
SD900	PERSPECTIVES
SD901	PERSPECTIVES

REVISION	AMENDMENT	DATE
1	PRELIMINARY SITE COMPOSITION	27.05.2025
2	INTERSECTION DETAIL	12.06.2025
3	SECOND PASS OVERALL CONCEPTS	11.08.2025
4	SECOND PASS B	15.08.2025
5	OPTION C	26.09.2025
6	OPTION D	29.10.2025
7	TEST ADJOINING SITE 908/B	03.11.2025
8	LOT 45-48	20.11.2025
9	DA-1	26.11.2025
10	DA-1_BINS ENCLOSURE UPDATE	01.12.2025



DRAWN:	APPROVED:	NORTH:
MP	MICHAEL JULLYAN	
CLIENT:		
BMD		

PROJECT:
LOT 907 TOWNVILLE
PINNACLE DRIVE

TITLE:
PLANNING SUMMARY

PROJECT NUMBER:	SHEET NUMBER:	REV.
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PRELIMINARY ISSUE
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1 SITE PLAN PROPOSED
1:500





ARTIST'S IMPRESSION 01



ARTIST'S IMPRESSION 02

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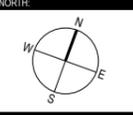
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REVISION	AMENDMENT	DATE
1	PRELIMINARY SITE COMPOSITION	27.05.2025
2	INTERSECTION DETAIL	12.06.2025
3	SECOND PASS OVERALL CONCEPTS	11.08.2025
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7	TEST ADJOINING SITE 908/B	03.11.2025
8	LOT 45-48	20.11.2025
9	DA-1	26.11.2025
10	DA-1_BINS ENCLOSURE UPDATE	01.12.2025

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SCALE
@ A1
10 0 10 20 30 40 50 60 70
mm

DRAWN: Author
APPROVED: MICHAEL JULLYAN
CLIENT: BMD
PROJECT: LOT 907 TOWNVILLE
PINNACLE DRIVE



TITLE:
ARTIST'S IMPRESSION

PROJECT NUMBER:	SHEET NUMBER:	REV.
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KEY PLAN



ARTIST'S IMPRESSION 04



ARTIST'S IMPRESSION 05



ARTIST'S IMPRESSION 06



ARTIST'S IMPRESSION 07

300mm
200mm
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10mm

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8	LOT 45-48	20.11.2025
9	DA-1	26.11.2025
10	DA-1_BINS ENCLOSURE UPDATE	01.12.2025

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DRAWN	APPROVED	NORTH
Author	MICHAEL JULLYAN	
CLIENT:	BMD	

PROJECT:
 LOT 907 TOWNVILLE
 PINNACLE DRIVE

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