Civil Engineering & Servicing Report for Reconfiguring a Lot (RAL)

Southern Thornlands PDA Precinct One

Stage 1 and 2

Job No: B00702

Submission to: Urbex Pty Ltd.

Date: 12 December 2025

EMPOWER

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Document Control Sheet

Project	**Southern Thornlands PDA Precinct One**
Report Title	Civil Engineering & Servicing Report for Reconfiguring a Lot (RAL) Stage 1 and 2
Job Number	B00702

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E			

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Destination	**Revision**						
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1. Introduction

Empower Engineers & Project Managers have been engaged by Urbex to prepare an Engineering Infrastructure Report as supporting information to the Reconfiguring a Lot (RAL) development application for Precinct 1, Stage 1 & 2, of the Southern Thornlands Priority Development Area (PDA). The infrastructure nominated within this report has been prepared to be consistent with the approved MCU application for this site.

This report has been compiled based on the approved MCU plans (Precinct 1 Land Use & Context Plans), which can be found in Appendix A.

This report should be read in conjunction with the other documents issued by the consultant team.

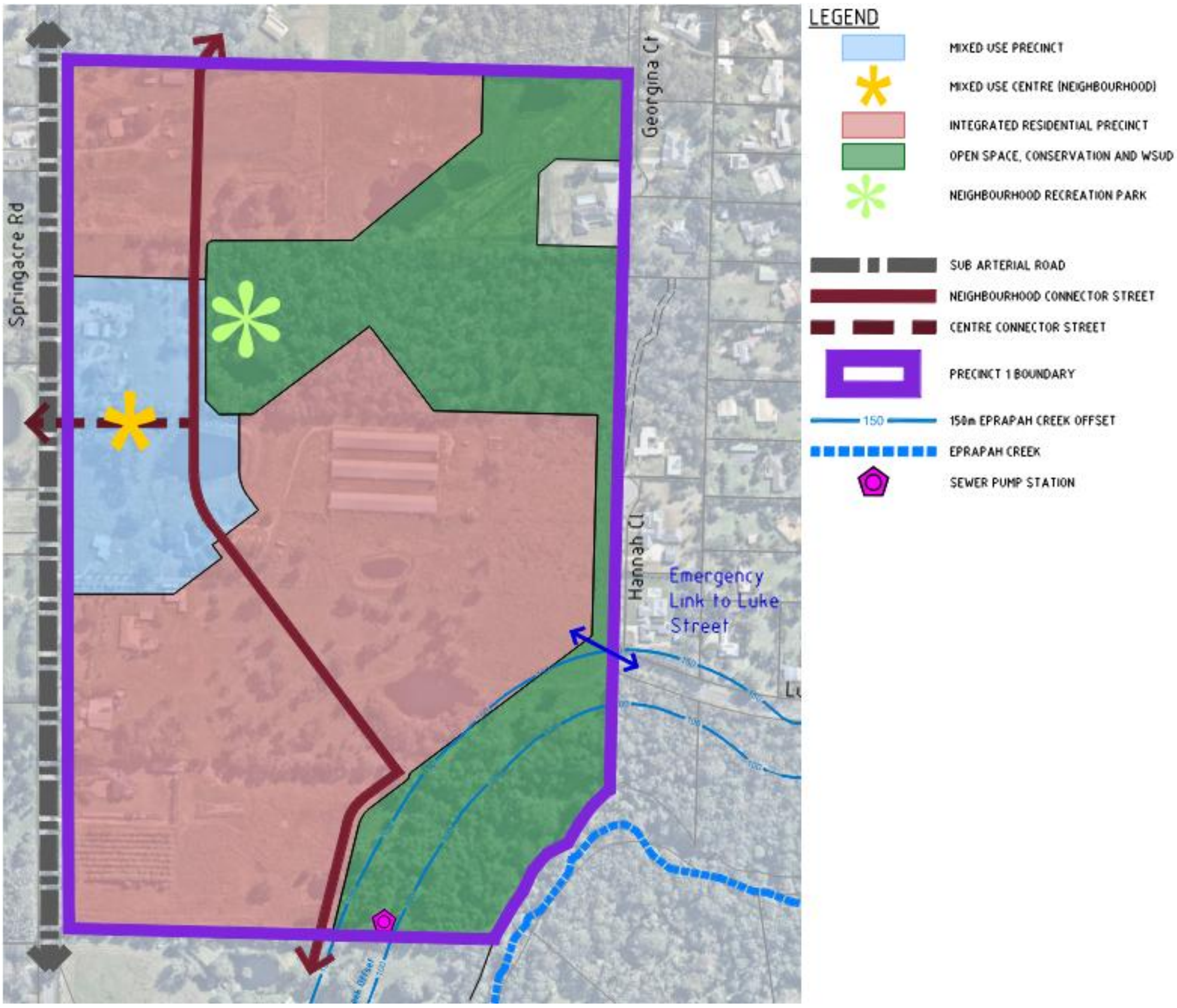

Springacre Rd
Georgina Ct
Hannah Ct
Emergency Link to Luke Street
LEGEND
MIXED USE PRECINCT
MIXED USE CENTRE (NEIGHBOURHOOD)
INTEGRATED RESIDENTIAL PRECINCT
OPEN SPACE, CONSERVATION AND WSUD
NEIGHBOURHOOD RECREATION PARK
SUB ARTERIAL ROAD
NEIGHBOURHOOD CONNECTOR STREET
CENTRE CONNECTOR STREET
PRECINCT 1 BOUNDARY
150
150m EPRAPAH CREEK OFFSET
EPRAPAH CREEK
SEWER PUMP STATION

Figure 1-1 | Precinct 1 Land Use Plan

2. Site Characteristics

2.1 Location

The proposed development site is located to the east of Springacre Road, Thornlands. The site is comprised of six allotments, with street address and SP descriptions listed in Table 2-1 below.

This site is bounded externally by a public road to the west (Springacre Road), by Eprapah Creek to south-east, and existing rural-res to the east. Other parts of the Priority Development Area (PDA) bound the site to the north and south, these representing future urban residential opportunity.

The existing properties and allotments on the western side of Springacre Road are not part of this Precinct 1 development application.

Table 2-1 | Property Data

Item	**Street Address**	**RP Description**
1	62-74 Springacre Road, Thornlands	Lot 12 on RP 53653
2	76-94 Springacre Road, Thornlands	Lot 13 on RP 53653
3	96-108 Springacre Road, Thornlands	Lot 14 on RP 53653
4	110-118 Springacre Road, Thornlands	Lot 2 on RP 128089
5	120-122 Springacre Road, Thornlands	Lot 1 on RP 128089
6	124-138 Springacre Road, Thornlands	Lot 16 on RP 53653

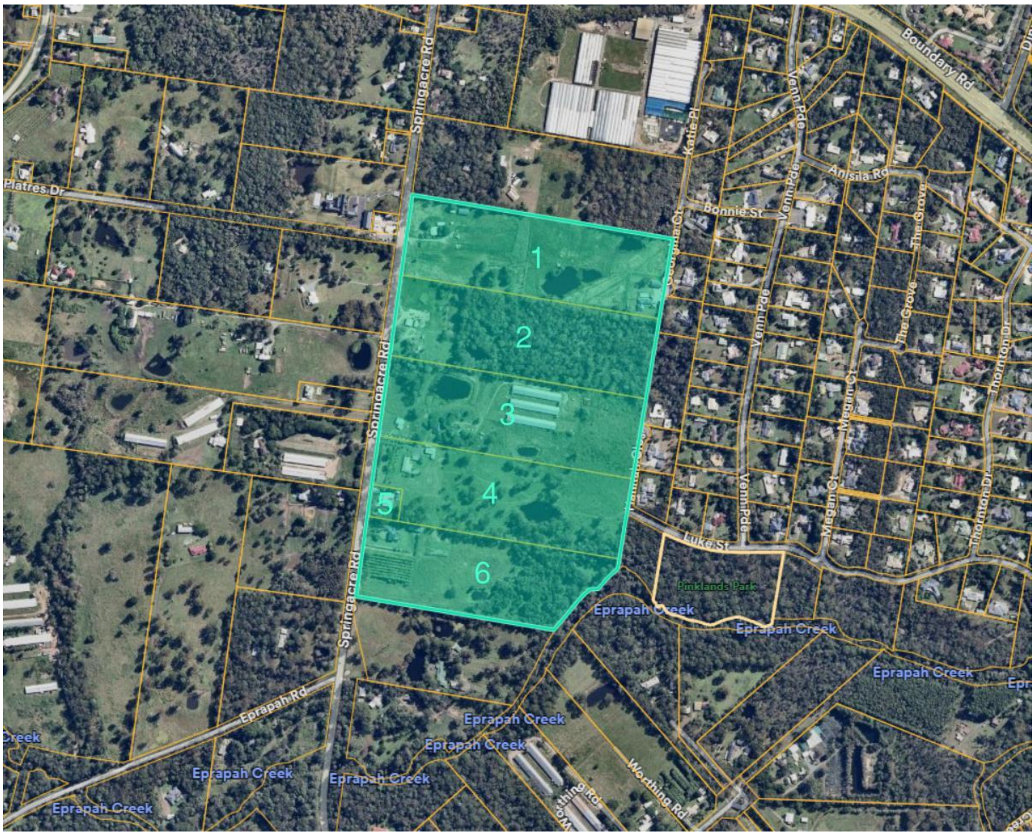

Springacre Rd
Boundary Rd
Katie Pl
Platres Dr
Anisila Rd
Bonnie St
Venn Pde
The Grove
Thornton Dr
Megan Ct
1
2
3
4
5
6
Luke St
Pinklands Park
Eprapah Creek
Eprapah Rd
Worthing Rd

Figure 2-1 | Aerial Photo of the Proposed Development Site and Surrounds – NearMap ©

2.2 Land Use

2.2.1 Existing

The existing sites have a combined area of approximately 40.41 ha and are currently occupied by a combination of pasture and cultivated fields, native and exotic vegetation, small and large farming sheds, farm dams and single dwelling houses. The sites also have several unsealed internal access tracks.

There are several dams onsite, however and as expected, based on the provided survey information, none of the dams have low flows pipes or formed overflow weirs. As such the onsite dams are not considered to attenuate flows in the predevelopment scenario. As per typical rural farm dams, they are intended to capture and hold water and not release it.

Figure 2-2 below details the existing structures and vegetation of the proposed development sites.

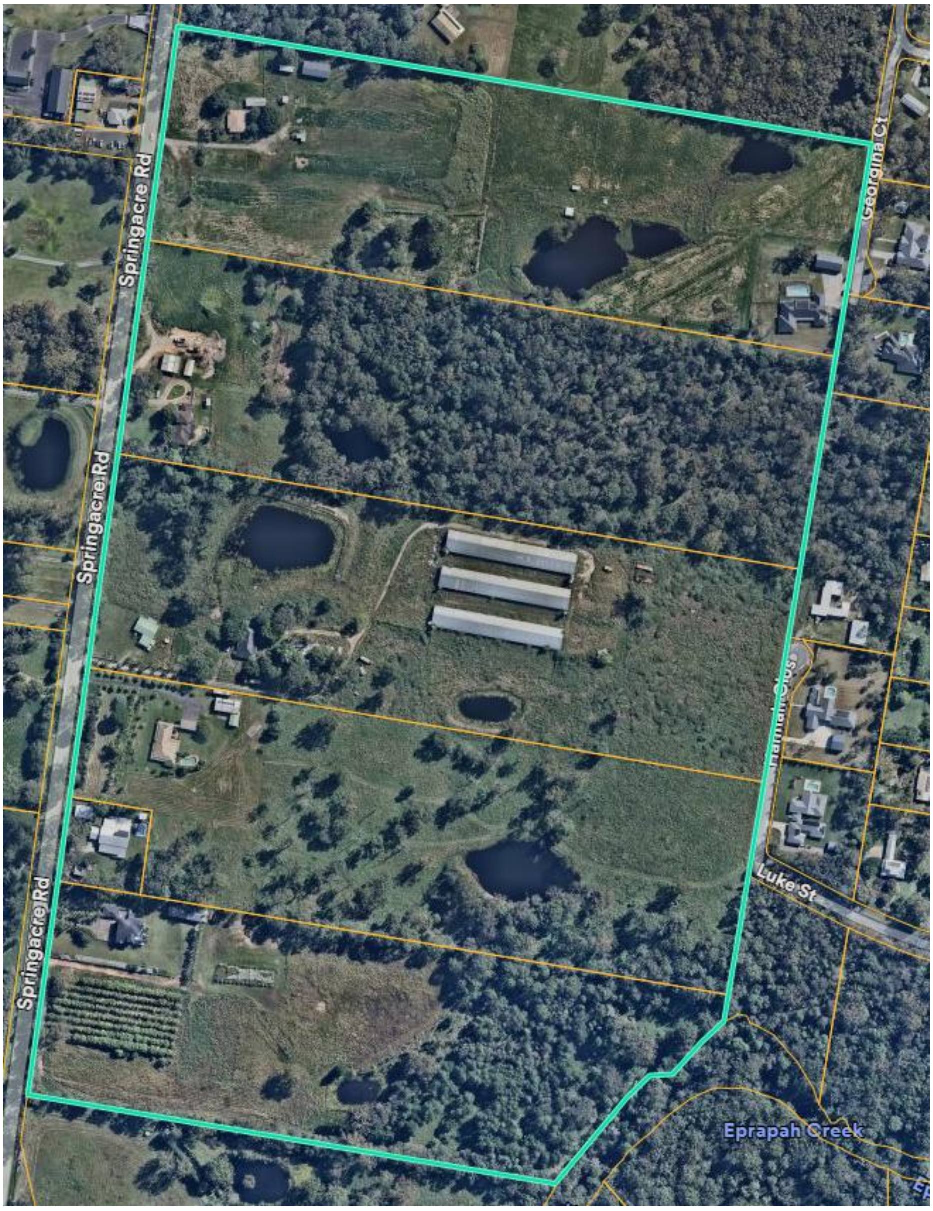


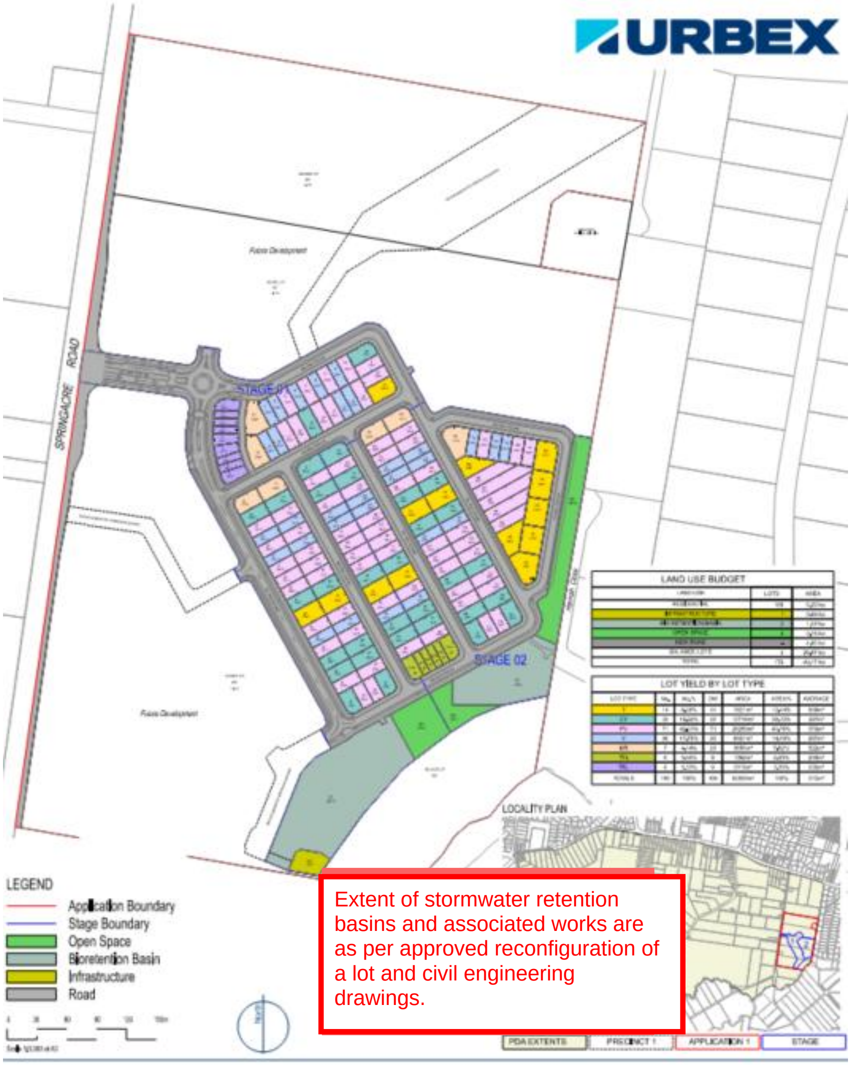
Figure 2-2 | Proposed Development Sites Existing Condition

2.2.2 Proposed Development

The proposed development is to consist of an internal road network, residential lots of mixed sizes and an open space conservation zone which will also be included as part of the stormwater system. The proposed development layout can be seen in Appendix C. All engineering services are to be provided to each allotment as part of the proposed development. This includes the following:

- Road Access via Springacre Road
- Stormwater Drainage
- Sewer Connection
- Reticulated Potable Water Connection, and
- Electrical and Communication Services

Figure 2-3 below (and Appendix B) shows the proposed RAL for Stages 1 and 2


URBEX
SPRINGACRE ROAD
Future Development
STAGE 01
STAGE 02
Future Development
LAND USE BUDGET
LOT YIELD BY LOT TYPE
LOCALITY PLAN
LEGEND
Application Boundary
Stage Boundary
Open Space
Bioretention Basin
Infrastructure
Road
PDA EXTENTS
PRECINCT 1
APPLICATION 1
STAGE

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

Figure 2-3 | Proposed RAL Plan Stage 1 and 2

AMENDED IN RED

By: Tiana Hill

Date: 5 August 2026

Queensland Government

2.2.3 Development Staging

The initial engineering assessment for the proposed development has been based on the staging details as per Table 2-2 below.

Table 2-2 | Assumed Development Staging Table

	Stage	Lots
Current	1	88 (+5 MD)
	2	77 (+6 MD)
	Subtotal	**165 (+11 MD)**
Future Stages	*3*	*77 (+6 MD)*
	4	*73 (+7 MD)*
	5	*56 (+5 MD)*
	6	*47 (+10 MD)*
	Grand Total	***418 (+39 MD)***

2.3 Topography and Site Drainage

The site is divided by a central ridge running east-to-west, splitting the site into two distinct catchments, north and south.

The levels across the northern half of the site vary from RL 44.0 at the western boundary to RL 39.5 at the site’s centre and RL 25.0 at the north-eastern boundary. The levels across the southern half of the site vary from RL 39.5 at the site’s centre to RL 15.0 at the south-eastern boundary.

The site falls with an approximate grade of 6.0% on average with surface water currently flowing to four discharge locations across the site:

1. The north-eastern boundary of the development discharging to an existing private property (40-60 Springacre Road) and channel near Georgina Court
2. The eastern boundary of the development discharging to the existing drainage infrastructure adjacent to Hannah Close and ultimately Eprapah Creek.
3. The southern boundary of the development drains towards Eprapah Creek.
4. The north-western boundary of the development discharging to an existing property (40-60 Springacre Road) and road reserve adjacent to Springacre Road.

It is noted that there is an external catchment (to the west of the site) which flows naturally to the proposed development via cross drainage under Springacre Road and overland flow. There is also a catchment to the north of the Precinct One Sites which flows naturally into the Precinct One Area.

For the purposes of stormwater modelling, it shall be assumed that external flows entering the site are doing so at undeveloped flow rates in the pre-development scenario. However, because the upstream catchment is flagged for development as part of a greater PDA, the post development flow from this catchment shall be assumed to be developed in a similar nature to the internal catchments. This will allow for conveyance through the site and stormwater detention of the regional flows. This information is summarised in Figure 2-4 below.

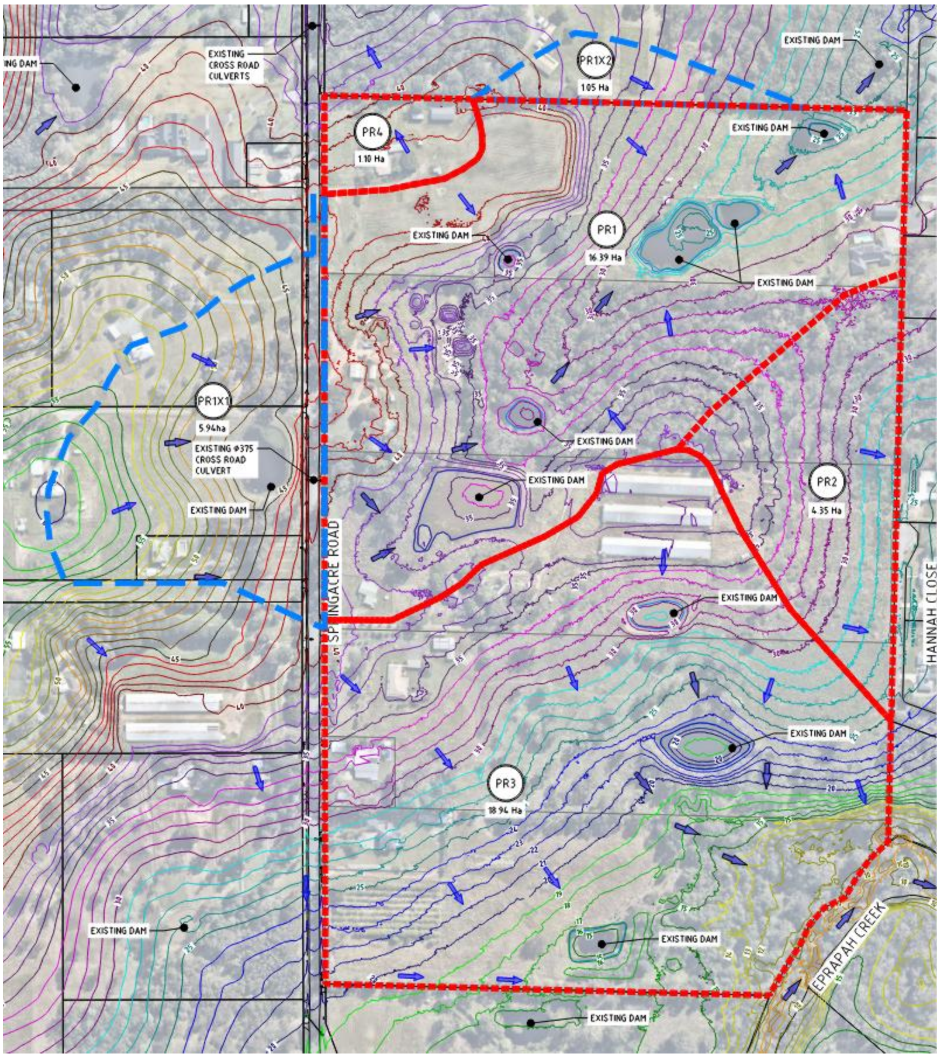

ING DAM
EXISTING CROSS ROAD CULVERTS
PR1X2
105 Ha
EXISTING DAM
PR4
1.10 Ha
EXISTING DAM
PR1
16.39 Ha
EXISTING DAM
EXISTING DAM
PR1X1
5.94ha
EXISTING ø375 CROSS ROAD CULVERT
EXISTING DAM
EXISTING DAM
EXISTING DAM
PR2
4.35 Ha
SPRINGACRE ROAD
EXISTING DAM
HANNAH CLOSE
EXISTING DAM
PR3
18.94 Ha
EXISTING DAM
EXISTING DAM
EPRAPAH CREEK
EXISTING DAM

Figure 2-4 | Existing Catchment Diagram

3. Existing and Proposed Civil Engineering Infrastructure

The engineering plans included in Appendix C show the proposed infrastructure intended to service the reconfiguration of the lot for stages 1 and 2 of Precinct 1. The final infrastructure servicing strategy for the rest of Precinct 1 and the wider PDA is subject to further planning with Economic Development Queensland (EDQ) which will consider the wider Southern Thornlands PDA requirements.

3.1 Stormwater

The proposed stormwater strategy to manage stormwater quality, quantity and overland flow has been developed in accordance with the RCC City Plan - Planning Policy 2. A Conceptual Stormwater Management Plan has been prepared by Engeny Australia and is included in Appendix D. This report details the stormwater strategy for the proposed development and details the requirements for Stages 1 and 2.

Significant coordination between Engeny, AS Design and Empower has been undertaken in relation the Eprapah Creek Conservation/drainage reserve area. As detailed on the Civil and Landscape plans significant investment into civil and landscape elements ensure a seamless integration with the ecological elements of the corridor.

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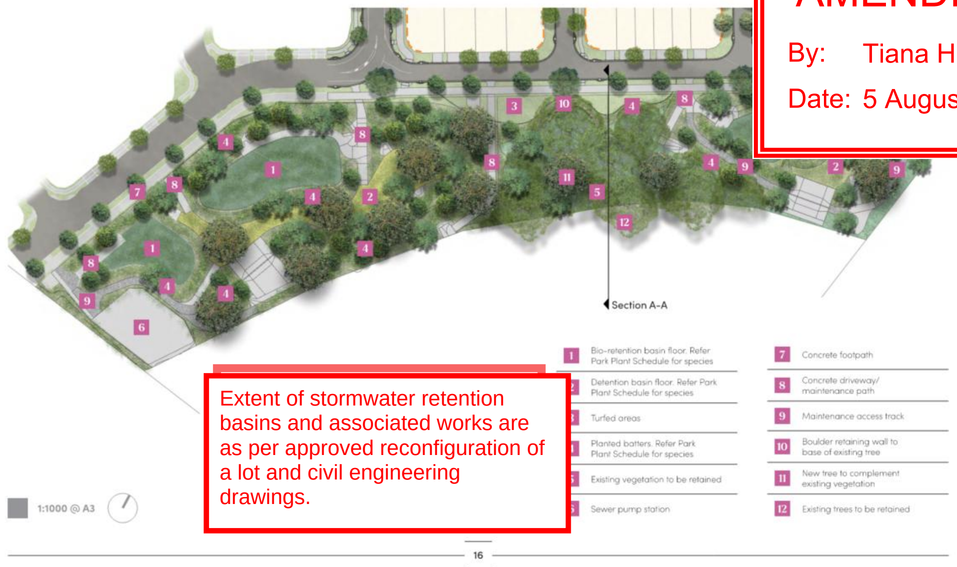

1
2
3
4
5
6
7
8
9
10
11
12
Section A-A
1:1000 @ A3
16
1 Bio-retention basin floor. Refer Park Plant Schedule for species
2 Detention basin floor. Refer Park Plant Schedule for species
3 Turfed areas
4 Planted batters. Refer Park Plant Schedule for species
5 Existing vegetation to be retained
6 Sewer pump station
7 Concrete footpath
8 Concrete driveway/ maintenance path
9 Maintenance access track
10 Boulder retaining wall to base of existing tree
11 New tree to complement existing vegetation
12 Existing trees to be retained

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

Figure 3-1 | Extract of Landscape plan for Eprapah Corridor

3.1.1 Existing Infrastructure

The existing site consists of primarily agricultural land, farming sheds and single dwellings. There are several farmers dams on-site, however in the absence of any identifiable low flow pipes or formed overflow weirs, they aren't considered attenuating in the pre-development scenario.

3.1.2 Proposed Infrastructure

The stormwater management plan in Appendix D further details the strategy for the management of stormwater quality and quantity. The information contained below is intended to provide a high-level overview of the stormwater management strategy and as such should be read in conjunction with the above mentioned Engeny Report.

3.1.2.1 Stormwater Quality Approach

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC) has been used to predict the likely pollutants generated in the post development scenario. A series of bioretention basins have been modelled and appropriately sized within the MUSIC model so as to ensure that pollutants are reduced in accordance with the requirements outlined in the state planning policy. The overall reduction in pollutants discharged from the site and the requirements for pollutant reduction can be seen in Table 3-1 below.

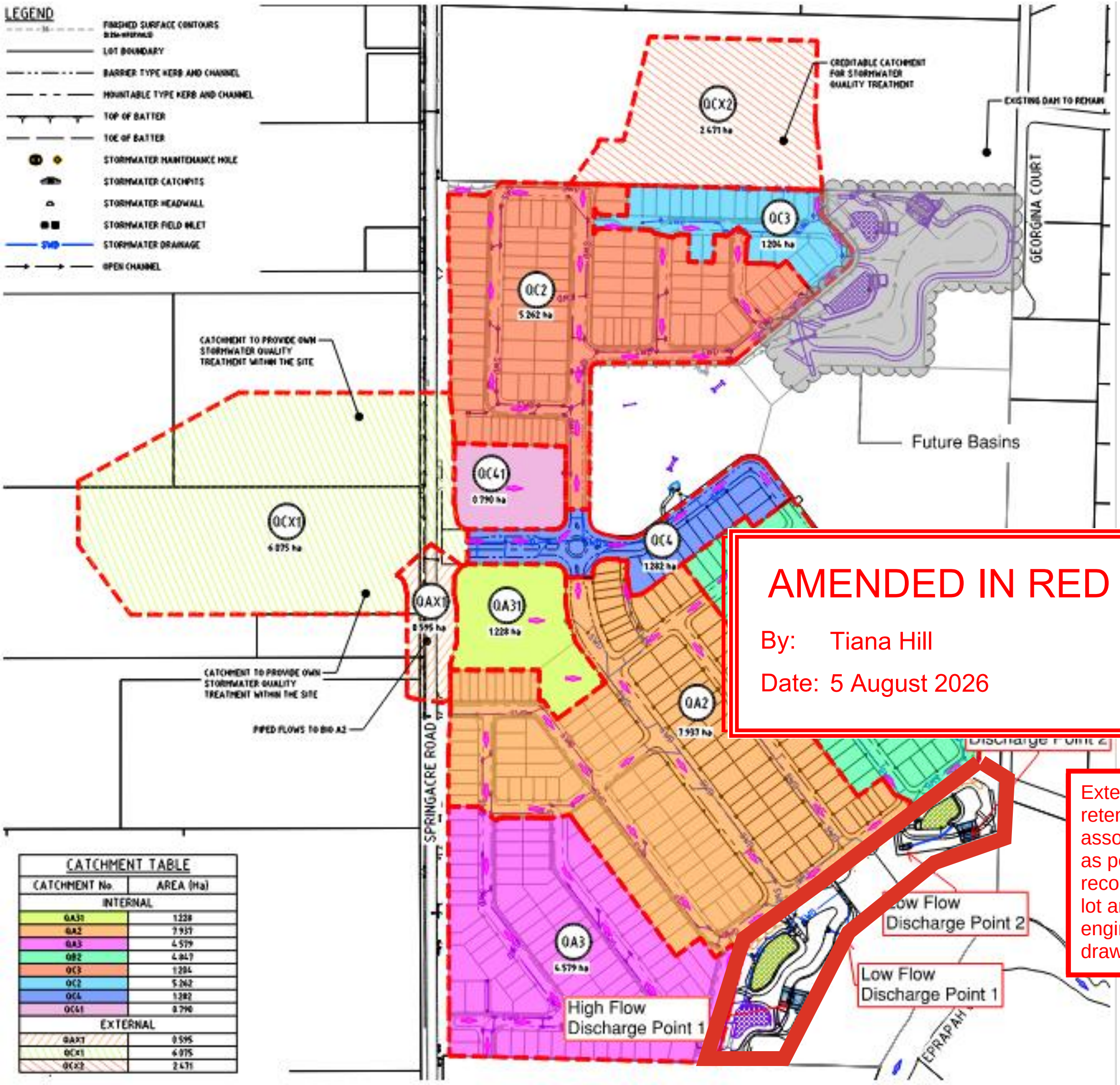
Table 3-1 | Overall Treatment Train Effectiveness

Pollutants	Sources	Residual	Required Reduction	Development Reduction
Total Suspended Solids (kg/yr.)	48200	9650	80%	80%
Total Phosphorus (kg/yr.)	94.4	24.8	60%	73.7%
Total Nitrogen (kg/yr.)	453	224	45%	50.5%
Gross Pollutants (kg/yr.)	5920	249	90%	95.8%

Further detail on the composition and performance of the bioretention basins can be found in Appendix D, while their locations and footprints are included in the engineering plans Appendix C.

3.1.2.2 Stormwater Quantity Approach

The software package XP-Rafts has been used to confirm that the pre-development peak discharge is not exceeded by the post development peak discharge for a range of storm events over a range of recurrence intervals. To ensure non-worsening of pre-development peak flows, a series of detention basins have been proposed at strategic locations within the site. The installation of these detention basins combined with the proposed bulk earthworks has ensured that the pre-development peak discharge across all storm events is not exceeded in the post development scenario at all of the discharge points. This has been shown diagrammatically in Figure 3-2.


LEGEND
FINISHED SURFACE CONTOURS
LOT BOUNDARY
BARRIER TYPE KERB AND CHANNEL
MOUNTABLE TYPE KERB AND CHANNEL
TOP OF BATTER
TOE OF BATTER
STORMWATER MAINTENANCE HOLE
STORMWATER CATCHPITS
STORMWATER HEADWALL
STORMWATER FIELD INLET
SWD
STORMWATER DRAINAGE
OPEN CHANNEL
CREDITABLE CATCHMENT FOR STORMWATER QUALITY TREATMENT
EXISTING DAM TO REMAIN
QCX2
2.471 ha
QC3
1.204 ha
QC2
5.262 ha
GEORGINA COURT
CATCHMENT TO PROVIDE OWN STORMWATER QUALITY TREATMENT WITHIN THE SITE
Future Basins
QC41
0.790 ha
QCX1
6.075 ha
QC4
1.282 ha
QAX1
0.595 ha
QA31
1.228 ha
QA2
7.937 ha
CATCHMENT TO PROVIDE OWN STORMWATER QUALITY TREATMENT WITHIN THE SITE
PIPED FLOWS TO BIO A2
SPRINGACRE ROAD
Discharge Point 2
Low Flow Discharge Point 2
Low Flow Discharge Point 1
QA3
4.579 ha
High Flow Discharge Point 1
EPRAPAH

CATCHMENT TABLE	
CATCHMENT No.	AREA (Ha)
INTERNAL	
QA31	1.228
QA2	7.937
QA3	4.579
QB2	4.847
QC3	1.204
QC2	5.262
QC4	1.282
QC41	0.790
EXTERNAL	
QAX1	0.595
QCX1	6.075
QCX2	2.471

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Date: 5 August 2026

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Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

Figure 3-2 | Summary of Post Development Catchments and Discharge Points for Precinct 1 Stages 1 & 2

3.1.2.3 Stormwater Staging

The basins to the north are not required for stages 1 and 2 and as such will be developed further in future stages. During development, dedicated temporary sediment basins will also be installed on the bottom of each catchment and will have sufficient capacity to contain the treatment within the sites. These temporary sediment basins, for construction phase erosion and sediment control, will be designed in accordance with Appendix B of Best Practise Erosion and Sediment Control (IECA Australasia, Nov 2008). Where practical, it is planned that the sediment basins will be decommissioned and replaced with bio-retention/detention basins when construction of a majority (>80%) of residential dwellings and commercial buildings has been completed.

3.1.2.4 External Catchments

Catchment QCX1 to the west of Springacre Road is expected to be developed in a similar manner to the proposed development site. In it's current condition, the undeveloped external catchment discharges to the proposed development site which is assumed to continue once the site is developed. No allowance has been made for treatment of external catchments for stormwater quality with the expectance that this site is to provide it's own quality treatment.

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Queensland Government

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

3.2 Sewerage Reticulation

3.2.1 Existing Infrastructure

No existing sewer infrastructure is directly adjacent to the proposed site. Connection to existing external sewer infrastructure is intending to be carried out as detailed in Appendix E - Sewer Network Capacity Assessment, prepared by H2One.

3.2.2 Proposed Infrastructure

To service Precinct 1 for sewer, a new sewage pump station is proposed to be established within the site. This pump station with an associated proposed rising main shall conveying flows to the existing RCC sewer network. The rising main is then proposed to connect into an existing DN300 gravity main in the vicinity of Ondine Court, Victoria Point. For further information refer the H2One report in Appendix E.

Opportunities exist for the sewage pump station to service other developed areas within the PDA. This approach provides a practical and scalable solution that is consistent with the broader infrastructure vision for the Southern Thornlands PDA. As part of this application an appropriately sized land parcel is proposed to be dedicated for a future pump station.

Empower understands that EDQ is actively engaging with Redland City Council to facilitate an integrated sewer solution as part of their formulation of the PDA-wide Development Scheme and Development Charges and Offset Plan (DCOP). These ongoing discussions will inform the alignment, capacity and delivery responsibilities for sewer infrastructure across the PDA.

The proposed strategy ensures that sewer servicing for Precinct 1 is both feasible, scalable and adaptable and does not prejudice the delivery or staging of EDQ's ultimate infrastructure plans for the PDA.

Additionally, subject to confirmation by EDQ on preferred service strategies, interim solutions such as tankering would be suggested during development for Precinct 1 stages 1 & 2. This would then service this development until the sewer strategy is finalised and implemented.

3.2.3 Design Loading

3.2.3.1 Design Loading Assumptions

The sewer design loading has been based on the proposed lot layout for the development and design parameters in the SEQ WS&S D&C Code. The total number of equivalent persons (EP's) the sewerage network must service as part of the proposed development has been based on an EP/ET ratio of 2.7; as per Appendix A of the SEQ WS&S D&C Code. Similarly, Average Dry Weather Flows (ADWF), Peak Dry Weather Flows (PDWF) and Peak Wet Weather Flows (PWWF) have been calculated based on the information provided within Table 10 of the SEQ WS&S D&C Code. The table below outlines the design calculations used to determine flows within the sewerage network.

Table 3-2 | Sewer Loading Calculations

Parameter	**Calculation/Assumption**
ADWF	Assumed to be 210 L/EP/Day for existing sewerage infrastructure Assumed to be 200 L/EP/Day for proposed sewerage infrastructure
PDWF	$PDWF = C2 \times ADWF$
C2	$C2 = 4.7 \times (EP)^{-0.105}$
PWWF	$PWWF = 5 \times ADWF$

Table 3-3 | Estimated Sewage Generation for Precinct 1 (Ultimate)

Site Land-Use and Density	Demand Rate	EP	ADWF (L/s)	PWWF (L/s)
418 x res. freehold lots	2.7	1128.6	2.6	13.1
47 x duplex units	2.51 EP/Apt.	197.7	0.5	2.3
140 x 1 bedroom apt.	1.31 EP/Apt.	183.4	0.4	2.1
40 x 2-bedroom apt.	1.76 EP/Apt.	70.4	0.2	0.8
70 x 3-bedroom apt.	2.51 EP/Apt.	175.7	0.4	2
3,400 m^2 GFA com.	1.68 EP/100 m^2 GFA	57.1	0.1	0.7
	TOTAL	1812.9	4.2	21

3.2.3.2 Sewer Design Flows

The design flows adopted for the ultimate catchment are as follows in Table 3-4 and further detailed in Appendix E.

Table 3-4 | Sewer Design Flows

Catchment	Site Total
ET	671.4
EP/ET	2.7
EP	1812.9
Flow per EP (L/EP/Day)	200
ADWF (L/Day)	99.78
ADWF (L/S)	4.2
C1	3.5
PDWF (L/s)	349.22
PWWF (L/s)	21.0

3.3 Potable Water Reticulation

3.3.1 Existing Infrastructure

Existing potable water infrastructure is present along the frontage of the site to Springacre Road; in the form of a DN 150 AC main. Figure 3-3 shows existing potable water infrastructure adjacent to and nearby the site.

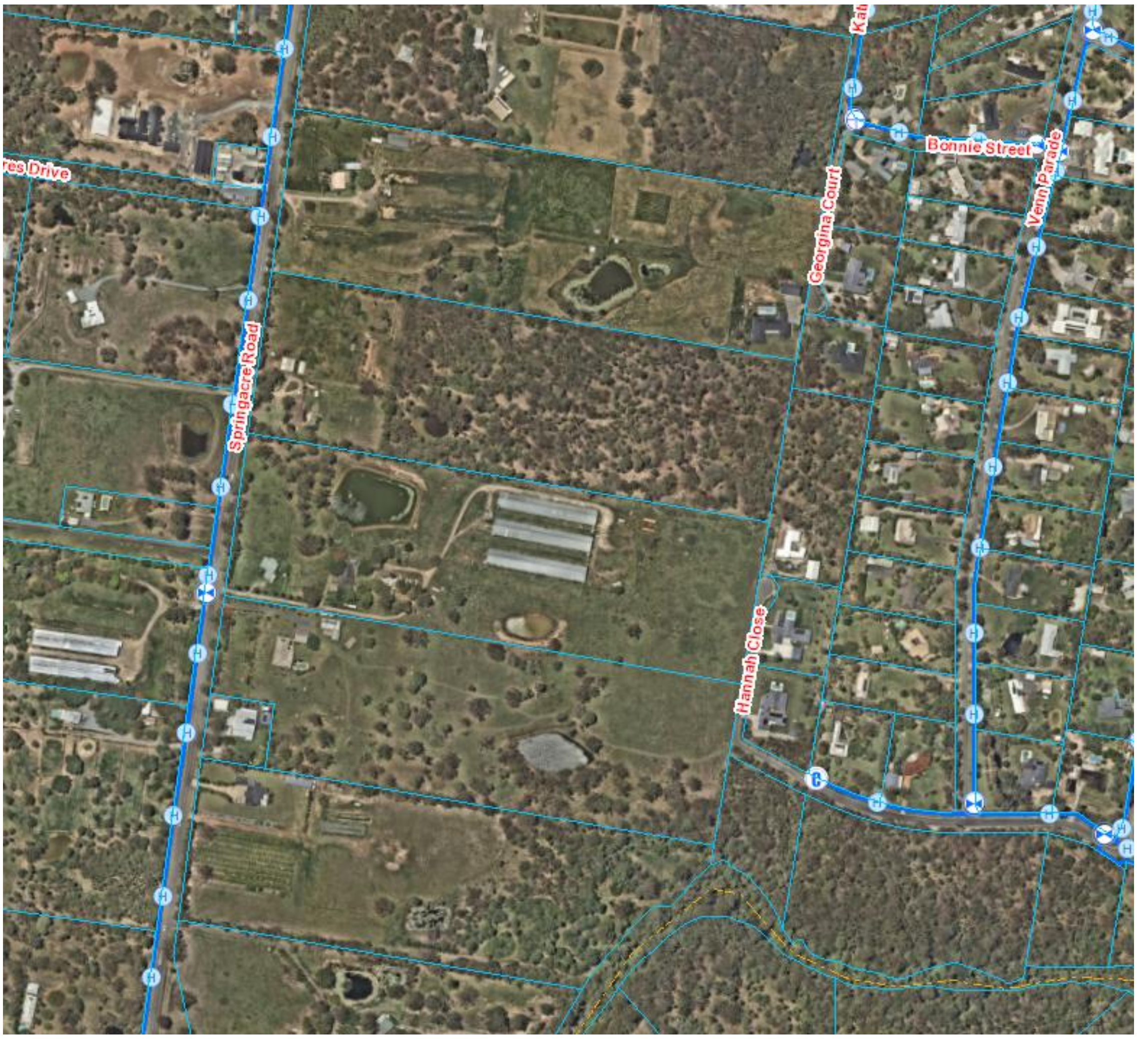


Figure 3-3 | Existing Potable Water Network as per Red-E-Map

3.3.2 Proposed Infrastructure

An interim potable water servicing solution for the initial two stages of the development is available via connection to the existing DN 150 watermain located adjacent to the site in Springacre Road. This option may be appropriate for early stages of development, subject to further capacity analysis.

Future stages of the development will require additional network connections to offer enhanced capacity and longer-term network resilience, including;

- Northern Connection: a trunk main exists in Springacre Rd near Boundary Road,
- Southern Connection: a trunk watermain solution is available to the south via Bunker Road. This aligns with the likely ultimate trunk infrastructure strategy currently under consideration by EDQ and RCC for the PDA.
    - Alternatively, other connections through to Woodlands Drive are available should the southern connection be delayed.

The proposed solution shall be designed to ensure flexibility in servicing and shall not prejudice the delivery of EDQ's ultimate water infrastructure plans for the PDA.

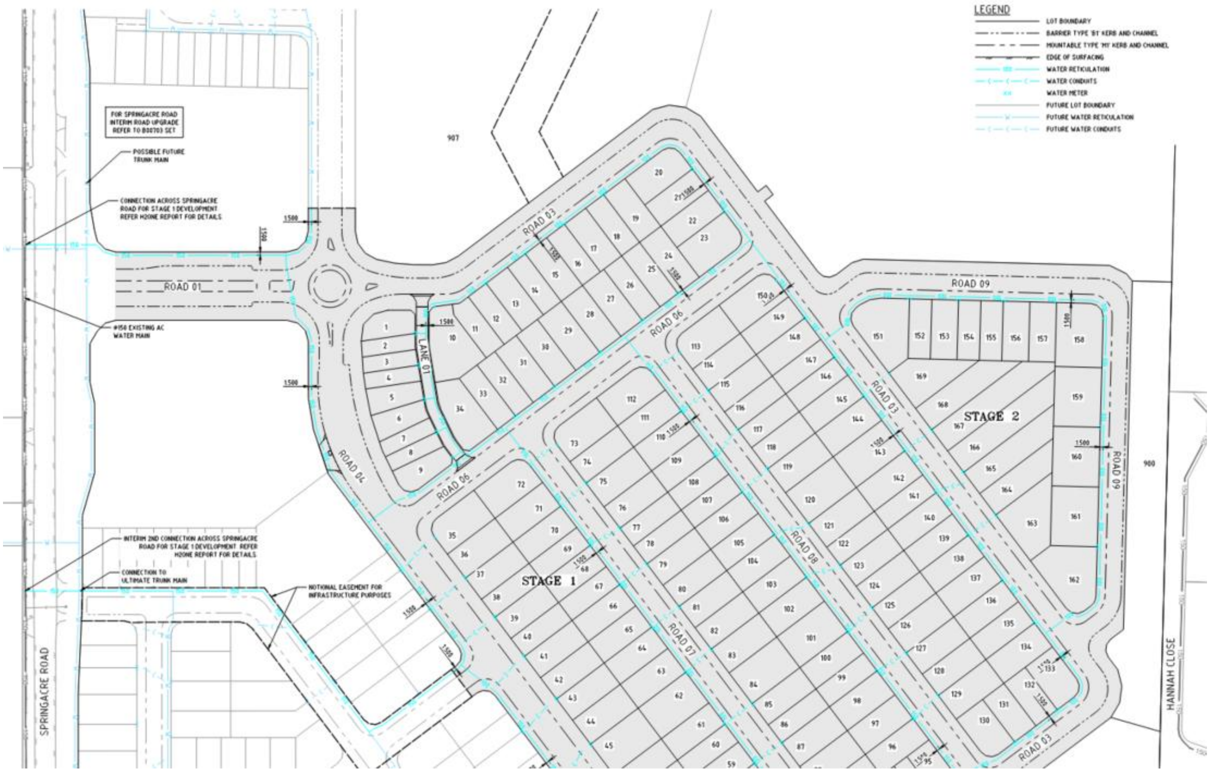

LEGEND
LOT BOUNDARY
BARRIER TYPE 'B1' KERB AND CHANNEL
MOUNTABLE TYPE 'M1' KERB AND CHANNEL
EDGE OF SURFACING
WATER RETICULATION
WATER CONDUITS
WATER METER
FUTURE LOT BOUNDARY
FUTURE WATER RETICULATION
FUTURE WATER CONDUITS
FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET
POSSIBLE FUTURE TRUNK MAIN
CONNECTION ACROSS SPRINGACRE ROAD FOR STAGE 1 DEVELOPMENT REFER H2ONE REPORT FOR DETAILS
#150 EXISTING AC WATER MAIN
INTERIM 2ND CONNECTION ACROSS SPRINGACRE ROAD FOR STAGE 1 DEVELOPMENT. REFER H2ONE REPORT FOR DETAILS
CONNECTION TO ULTIMATE TRUNK MAIN
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
ROAD 01
ROAD 03
ROAD 04
ROAD 06
ROAD 07
ROAD 08
ROAD 09
LANE 01
STAGE 1
STAGE 2
SPRINGACRE ROAD
HANNAH CLOSE
907
900
1500

Figure 3-4 | Dual Connections for Stage 1 & 2 - Existing Springacre Watermains

3.4 Development Access

3.4.1 External Roads & Intersection

The rural zoned site in its existing condition is currently serviced by Springacre Road. The existing Springacre Road is a sub-arterial road within the Redland City Council Network. The existing road has a rural profile with a spray sealed wearing course and roadside swale drains.

It is proposed that a new intersection on Springacre Road will provide access to all proposed lots.

A traffic study has been prepared by SLR Consulting to support the development; this providing additional technical guidance related to the suitability of the Springacre Road formation.

In accordance with advice from EDQ the proposed ultimate cross section of Springacre is shown below in Figure 3-5.

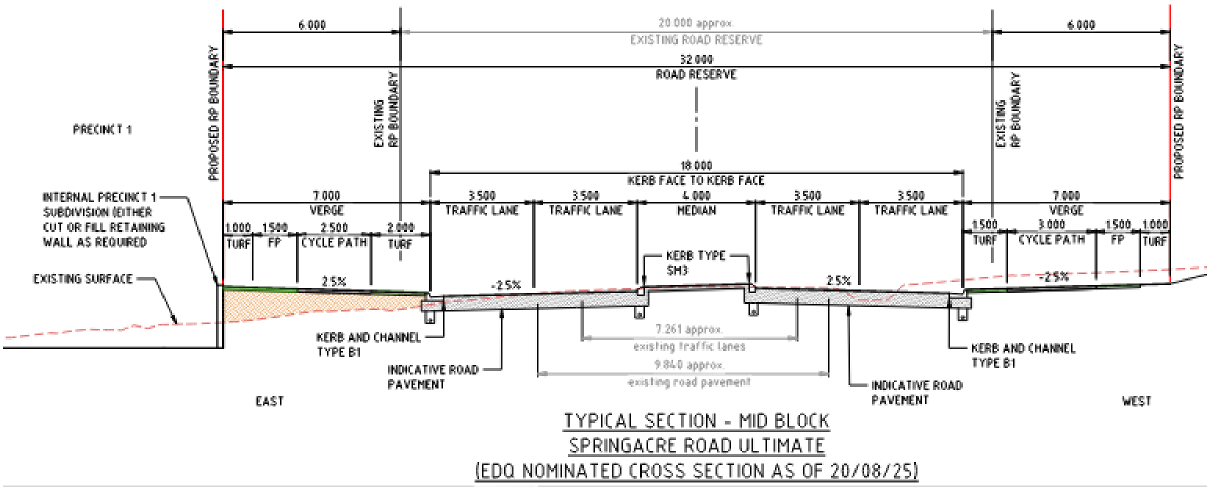

6.000
20.000 approx
EXISTING ROAD RESERVE
6.000
32.000
ROAD RESERVE
PROPOSED RP BOUNDARY
EXISTING RP BOUNDARY
EXISTING RP BOUNDARY
PROPOSED RP BOUNDARY
PRECINCT 1
18.000
KERB FACE TO KERB FACE
INTERNAL PRECINCT 1 SUBDIVISION (EITHER CUT OR FILL RETAINING WALL AS REQUIRED
7.000
VERGE
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
4.000
MEDIAN
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
7.000
VERGE
1.000
TURF
1.500
FP
2.500
CYCLE PATH
2.000
TURF
1.500
TURF
3.000
CYCLE PATH
1.500
FP
1.000
TURF
KERB TYPE SM3
EXISTING SURFACE
2.5%
-2.5%
2.5%
-2.5%
KERB AND CHANNEL TYPE B1
7.261 approx.
existing traffic lanes
9.840 approx.
existing road pavement
INDICATIVE ROAD PAVEMENT
INDICATIVE ROAD PAVEMENT
KERB AND CHANNEL TYPE B1
EAST
WEST
TYPICAL SECTION - MID BLOCK
SPRINGACRE ROAD ULTIMATE
(EDQ NOMINATED CROSS SECTION AS OF 20/08/25)

Figure 3-5 | EDQ Nominated Cross Section for Ultimate Springacre Road

It is also a requirement for the Springacre Road Speed Limit to be reduced to posted 60km/hr. There are many reasons and justification for the proposed change which is detailed in SLR's Speed Review

Preliminary design of the proposed intersection on Springacre Road has been undertaken to confirm that a future road connection to Woodlands Drive as part of the overall PDA is possible. This design and associated conformance checks (SISD, hydroplane etc.) can be found in Appendix G.

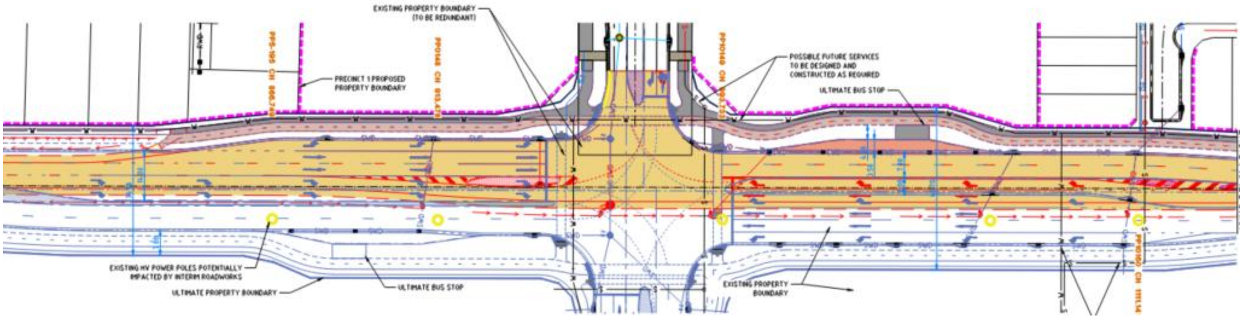

EXISTING PROPERTY BOUNDARY (TO BE REDUNDANT)
PRECINCT 1 PROPOSED PROPERTY BOUNDARY
POSSIBLE FUTURE SERVICES TO BE DESIGNED AND CONSTRUCTED AS REQUIRED
ULTIMATE BUS STOP
EXISTING HV POWER POLES POTENTIALLY IMPACTED BY INTERIM ROADWORKS
ULTIMATE PROPERTY BOUNDARY
ULTIMATE BUS STOP
EXISTING PROPERTY BOUNDARY

Figure 3-6 | Extract showing interim design coordinated with ultimate design

The detailed design of the interim and ultimate intersections shall be in accordance with Austroads Guide to Road Design and the SLR Traffic Report. The design of interim and ultimate intersections throughout the project shall consider input from all key stakeholders including EDQ, Council, Traffic Consultants and other relevant parties.

3.4.2 Internal Roads

In co-operation with SLR consulting, the internal road network has been designed to account for a dynamic range of road users. A holistic design approach has been undertaken, considering a multitude of parameters including spatial constraints, estimate road user volumes and transport mode preferences, drainage requirements, road safety, vertical and horizontal geometry.

3.4.2.1 Road Hierarchy

The road hierarchy as shown in Figure 3-7 has been determined to best convey users through the development under this design philosophy.

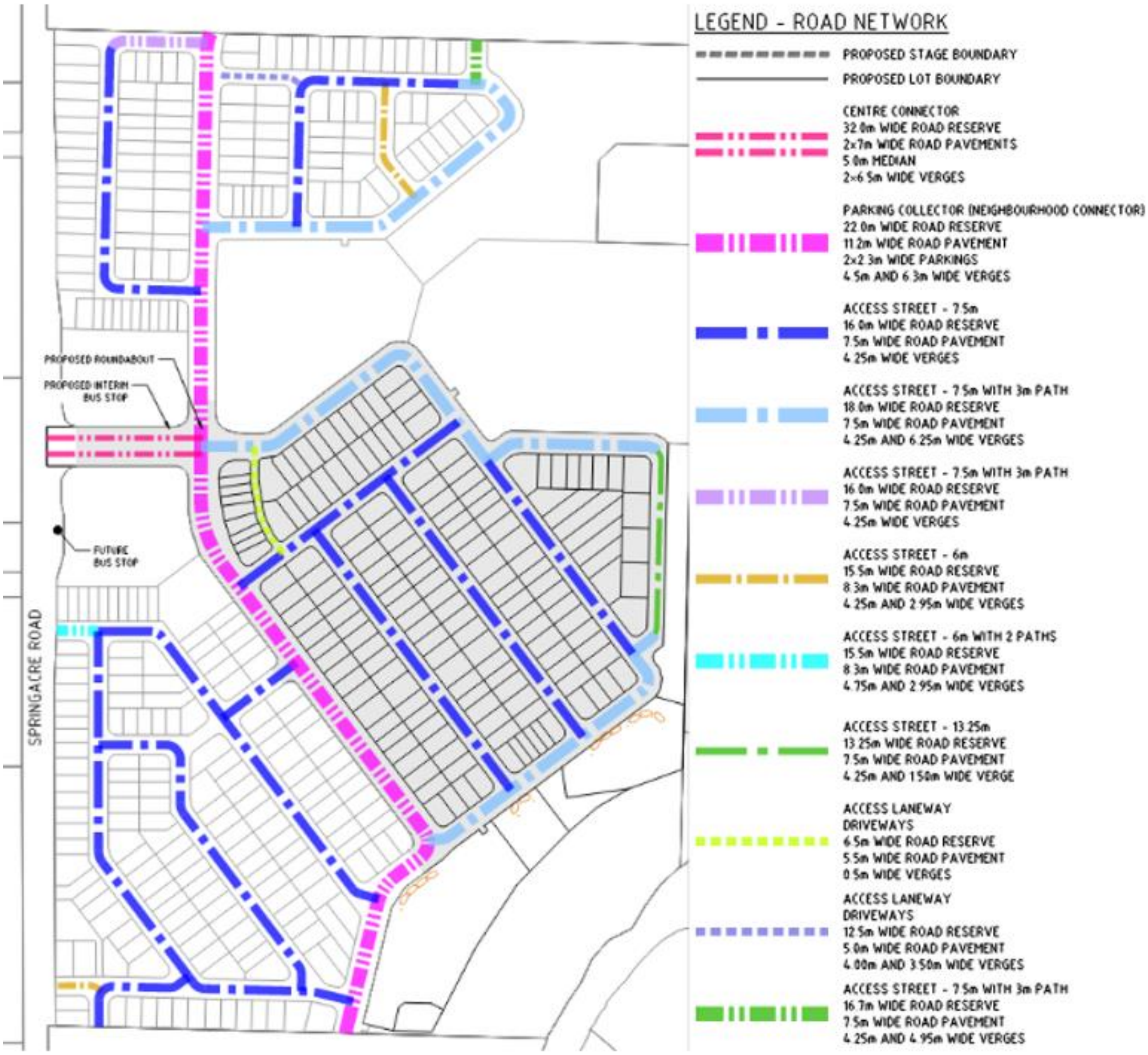

PROPOSED ROUNDABOUT
PROPOSED INTERIM BUS STOP
FUTURE BUS STOP
SPRINGACRE ROAD
LEGEND - ROAD NETWORK
PROPOSED STAGE BOUNDARY
PROPOSED LOT BOUNDARY
CENTRE CONNECTOR
32.0m WIDE ROAD RESERVE
2x7m WIDE ROAD PAVEMENTS
5.0m MEDIAN
2x6.5m WIDE VERGES
PARKING COLLECTOR (NEIGHBOURHOOD CONNECTOR)
22.0m WIDE ROAD RESERVE
11.2m WIDE ROAD PAVEMENT
2x2.3m WIDE PARKINGS
4.5m AND 6.3m WIDE VERGES
ACCESS STREET - 7.5m
16.0m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m WIDE VERGES
ACCESS STREET - 7.5m WITH 3m PATH
18.0m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m AND 6.25m WIDE VERGES
ACCESS STREET - 7.5m WITH 3m PATH
16.0m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m WIDE VERGES
ACCESS STREET - 6m
15.5m WIDE ROAD RESERVE
8.3m WIDE ROAD PAVEMENT
4.25m AND 2.95m WIDE VERGES
ACCESS STREET - 6m WITH 2 PATHS
15.5m WIDE ROAD RESERVE
8.3m WIDE ROAD PAVEMENT
4.75m AND 2.95m WIDE VERGES
ACCESS STREET - 13.25m
13.25m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m AND 1.50m WIDE VERGE
ACCESS LANEWAY
DRIVEWAYS
6.5m WIDE ROAD RESERVE
5.5m WIDE ROAD PAVEMENT
0.5m WIDE VERGES
ACCESS LANEWAY
DRIVEWAYS
12.5m WIDE ROAD RESERVE
5.0m WIDE ROAD PAVEMENT
4.00m AND 3.50m WIDE VERGES
ACCESS STREET - 7.5m WITH 3m PATH
16.7m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m AND 4.95m WIDE VERGES

Figure 3-7 | Road Network Hierarchy

3.4.2.1.1 Centre Connector

Access to Precinct 1 Stages 1 & 2 will be through the centre connector off of Springacre Road. During the development of Precinct 1, an interim T-intersection as seen in Figure 3-8 will service the site.

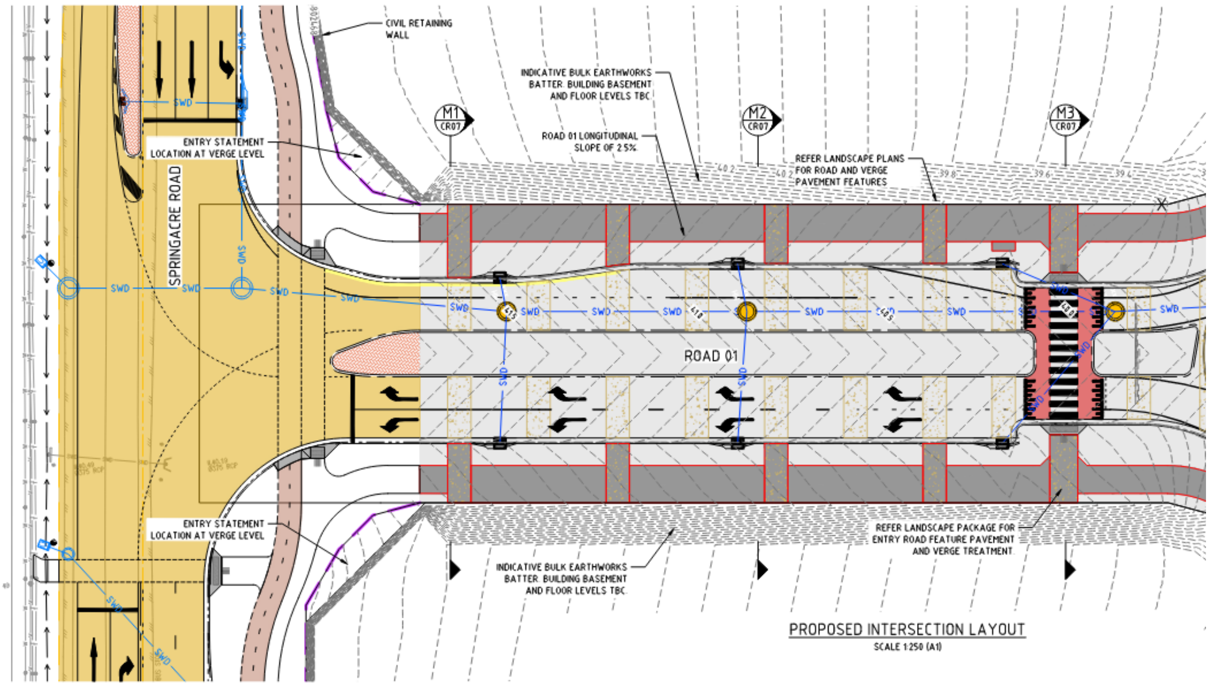

CIVIL RETAINING WALL
INDICATIVE BULK EARTHWORKS BATTER. BUILDING BASEMENT AND FLOOR LEVELS TBC
M1 CR07
M2 CR07
M3 CR07
ROAD 01 LONGITUDINAL SLOPE OF 2.5%
REFER LANDSCAPE PLANS FOR ROAD AND VERGE PAVEMENT FEATURES
ENTRY STATEMENT LOCATION AT VERGE LEVEL
SPRINGACRE ROAD
ROAD 01
SWD
ENTRY STATEMENT LOCATION AT VERGE LEVEL
REFER LANDSCAPE PACKAGE FOR ENTRY ROAD FEATURE PAVEMENT AND VERGE TREATMENT
INDICATIVE BULK EARTHWORKS BATTER. BUILDING BASEMENT AND FLOOR LEVELS TBC
PROPOSED INTERSECTION LAYOUT
SCALE 1:250 (A1)

Figure 3-8 | Entry Road and Intersection Interim Layout

As demand increases with the construction of further stages and the planned development to the west of Springacre Road commences, this interim layout will be replaced by the ultimate intersection layout as shown in Figure 3-9.

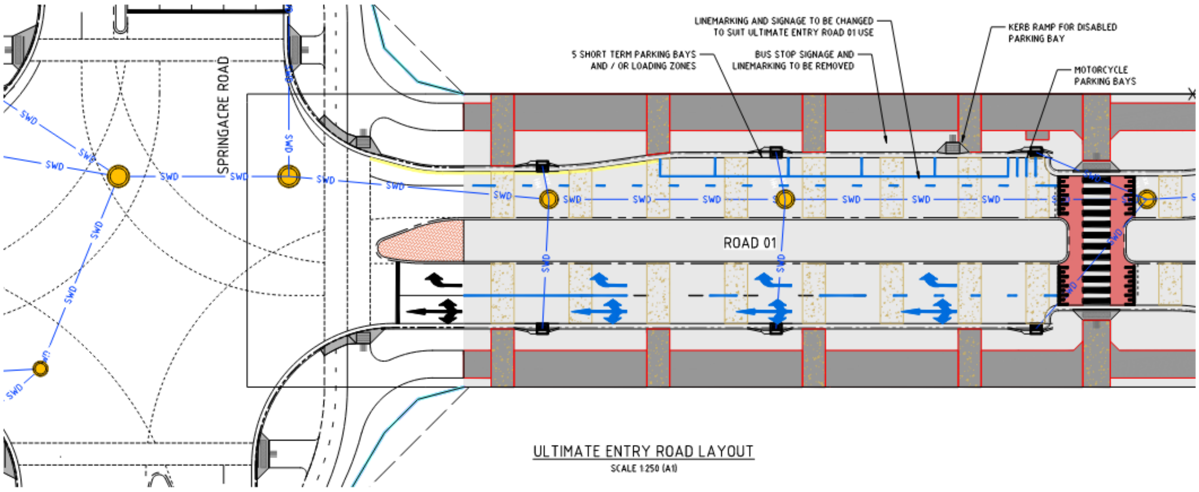

LINEMARKING AND SIGNAGE TO BE CHANGED TO SUIT ULTIMATE ENTRY ROAD 01 USE
KERB RAMP FOR DISABLED PARKING BAY
5 SHORT TERM PARKING BAYS AND / OR LOADING ZONES
BUS STOP SIGNAGE AND LINEMARKING TO BE REMOVED
MOTORCYCLE PARKING BAYS
SPRINGACRE ROAD
ROAD 01
SWD
ULTIMATE ENTRY ROAD LAYOUT
SCALE 1:250 (A1)

Figure 3-9 | Entry Road and Intersection Ultimate Layout

The proposed cross-section of this centre corridor is as shown in Figure 3-10. This and all cross-sections (as can be seen in Appendix C) have been designed in accordance with EDQ’s PDA Guideline no. 06. The centre connector profile was selected for this road due to the requirement to service a combination of high-density residential and commercial lots while satisfying volume requirements.

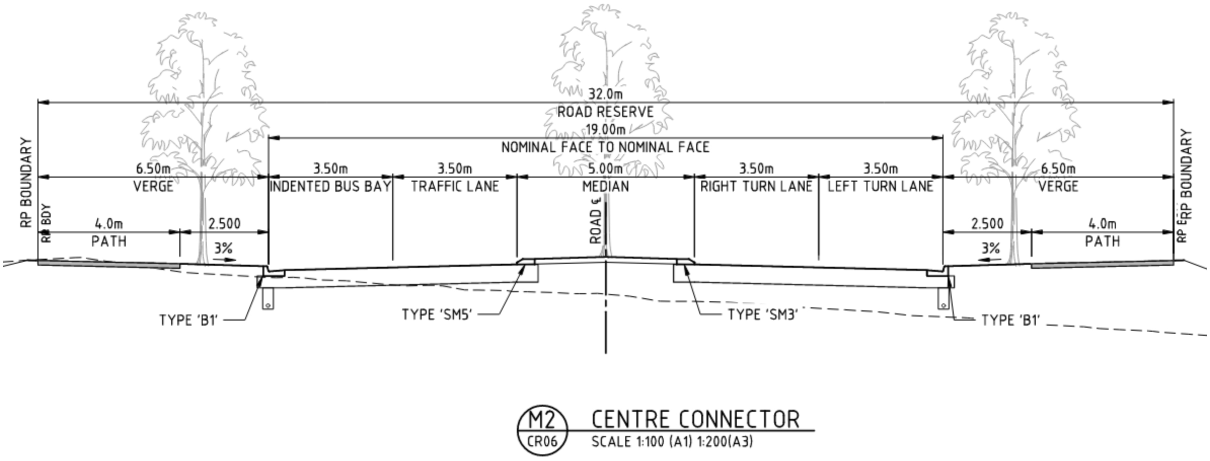

32.0m
ROAD RESERVE
19.00m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
6.50m
VERGE
3.50m
INDENTED BUS BAY
3.50m
TRAFFIC LANE
5.00m
MEDIAN
3.50m
RIGHT TURN LANE
3.50m
LEFT TURN LANE
6.50m
VERGE
RP BOUNDARY
RP BDY
4.0m
PATH
2.500
3%
ROAD ℄
2.500
3%
4.0m
PATH
RP BDY
TYPE 'B1'
TYPE 'SM5'
TYPE 'SM3'
TYPE 'B1'
M2
CR06
CENTRE CONNECTOR
SCALE 1:100 (A1) 1:200(A3)

Figure 3-10 | Centre Connector Profile

3.4.2.2 Active Transport

Special consideration has been given to 'Active Transport' to ensure that there are safe, accessible and efficient routes for multimodal travel as an alternative to private transport. Raised "Wombat Crossings" have been emplaced in areas expecting a high volume of pedestrian movement. Where footpath grades must be steeper than 5.0% due to the topography of the site, steps have been taken to ensure an alternative route is available at shallower grades. These examples can be seen in Figure 3-11.

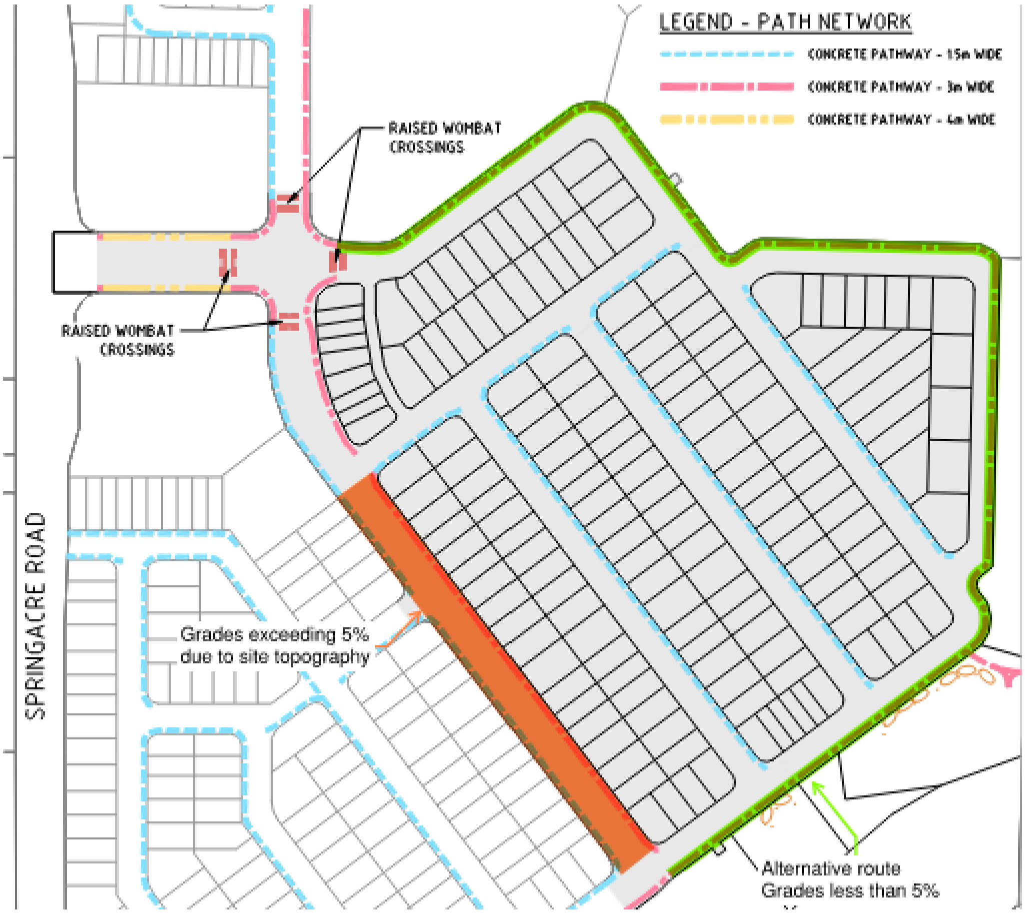

LEGEND - PATH NETWORK
CONCRETE PATHWAY - 15m WIDE
CONCRETE PATHWAY - 3m WIDE
CONCRETE PATHWAY - 4m WIDE
RAISED WOMBAT CROSSINGS
RAISED WOMBAT CROSSINGS
SPRINGACRE ROAD
Grades exceeding 5% due to site topography
Alternative route Grades less than 5%

Figure 3-11 | Pedestrian Considerations

3.4.2.3 Design Vehicles

Design vehicles were adopted as shown at critical locations in Appendix C and in Table 3-5.

Table 3-5 | Design Vehicles

Road/Intersection	Design Vehicle	Design Vehicle Turn Radii	Check Vehicle	Check Vehicle Turn Radii
Roundabout: Roads 01, 02, 03, 04	14.5m Long Rigid Bus	15.00m	19.0m Semi-Truck	15.0m
Road 04	14.5m Long Rigid Bus	15.00m	19.0m Semi-Truck	15.0m
Lane 01	10.3m Service Vehicle	9.757m		
Road 06	10.3m Service Vehicle	9.757m		
Road 04 to Commercial Driveway	10.3m Service Vehicle	9.757m		
Road 03	5.2m Passenger Vehicle	6.30m		

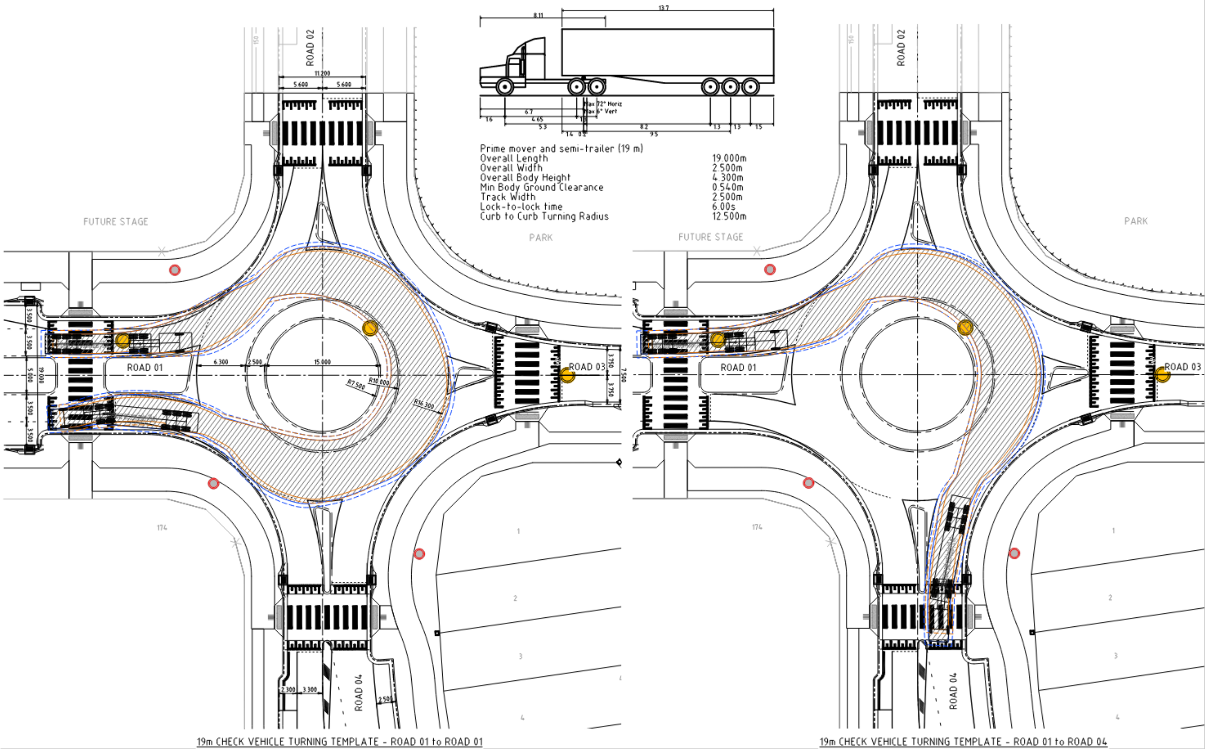
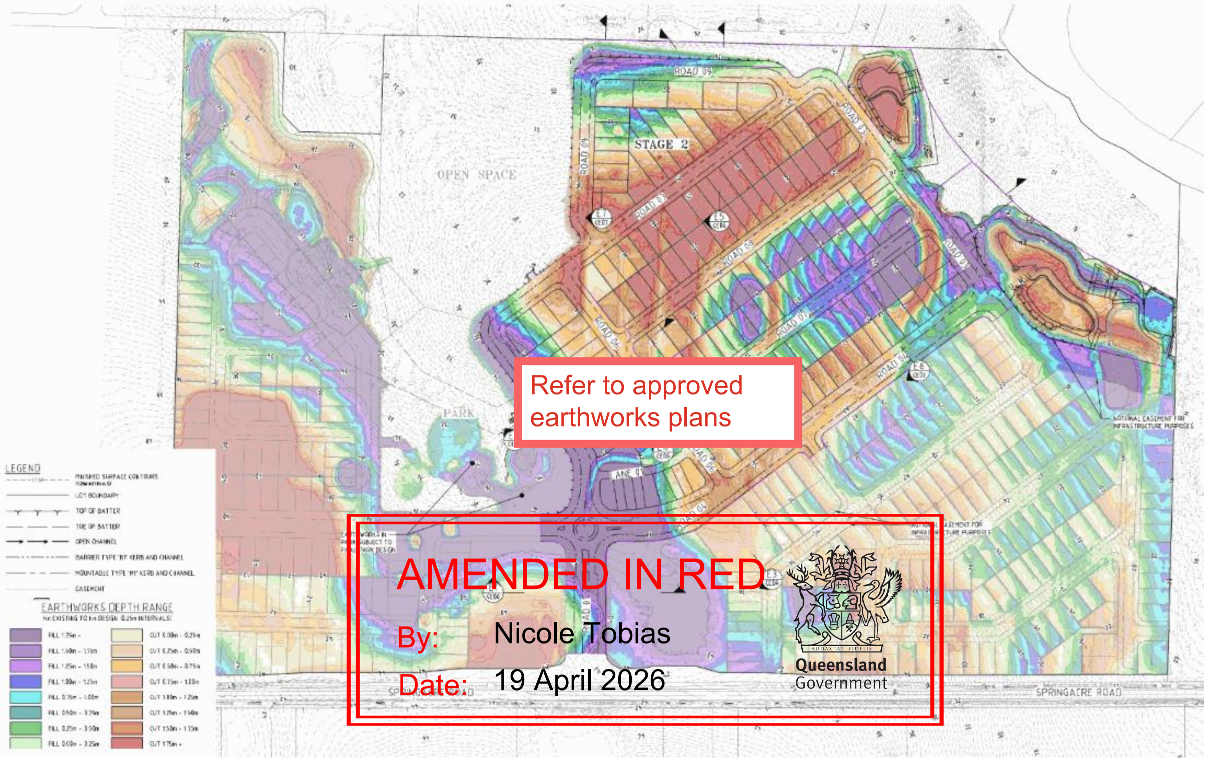

ROAD 02
ROAD 01
ROAD 03
ROAD 04
FUTURE STAGE
PARK
Prime mover and semi-trailer (19 m)
Overall Length 19.000m
Overall Width 2.500m
Overall Body Height 4.300m
Min Body Ground Clearance 0.540m
Track Width 2.500m
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12.500m
Max 72° Horiz
Max 6° Vert
19m CHECK VEHICLE TURNING TEMPLATE - ROAD 01 to ROAD 01
19m CHECK VEHICLE TURNING TEMPLATE - ROAD 01 to ROAD 04

Figure 3-12 | Example Turning Path Check with 19.0m Semi-Truck

3.5 Earthworks

As can be seen in Figure 3-13 and attached in Appendix C, the earthworks design, where possible, minimises steep grades on lots and reduces the requirements for retaining walls. The natural slope of the development area will be incorporated into the earthworks design, and it is intended that the earthworks cut to fill is to be balanced. The preliminary design of earthworks will be undertaken with the intention that where possible all lots will fall to the street. This will reduce the need for rear of lot services for stormwater and sewer. Steep grades on lots will also be avoided.



Refer to approved earthworks plans

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

Figure 3-13 | Earthworks Plan

Where retaining walls are required within allotments, they are to have a desirable maximum height of 2.5 m. Noting the steep grade within the existing site, this may not be possible in all areas and the design shall seek to adopt an absolute maximum retaining wall height of 3.0 m. If walls are to be greater than 2.5m the walls will be terraced and landscape in accordance with RCC requirements. The 3m max walls will only be used at the rear of lot. It is proposed that all retaining structures are to be installed in accordance with AS 4678-2002. It is noted that structural design of retaining walls is to be undertaken by others.

Earthworks for the proposed development sites are to be constructed in accordance with AS3798-2007 – Guidelines on Earthworks for Commercial, and Residential Developments and Redland City Council requirements. Testing of fill will also be undertaken as part of the construction stage of the development. All fill shall be placed, compacted, and tested to a Level 1 standard as specified within the Australian standards.

3.6 Electrical, Streetlighting & Communications

An 11 kV High Voltage feeder lines exists along the Springacre Road frontage to the subject site, with several distribution transformers and Customer Energy Resources (CER). These can be seen in Figure 3-14.

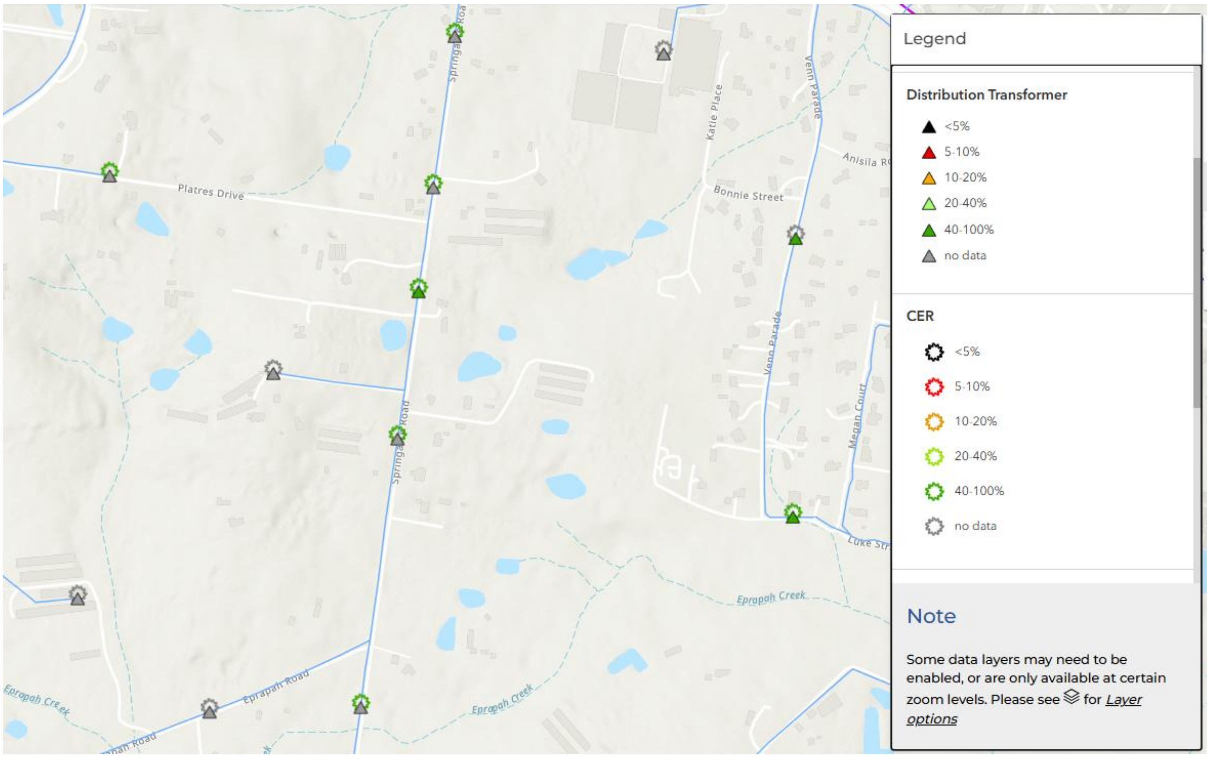

Springacre Road
Platres Drive
Katie Place
Venn Parade
Anisila R
Bonnie Street
Megan Court
Luke Str
Eprapah Creek
Eprapah Road
Legend
Distribution Transformer
<5%
5-10%
10-20%
20-40%
40-100%
no data
CER
<5%
5-10%
10-20%
20-40%
40-100%
no data
Note
Some data layers may need to be enabled, or are only available at certain zoom levels. Please see for Layer options

Figure 3-14 | Existing External HV Infrastructure

It is proposed that each allotment within the development shall be provided with an LV Service.

Internal streetlighting design shall be provided to all internal roads in accordance with Australian Standards and the requirements of the Redland City Council Planning Scheme.

Communications infrastructure shall also be provided to each allotment as part of the detailed design. This shall be subject to the approval of the relevant communications providers.

As part of the proposed development, once the site layout has been finalised, it is proposed to undertake a HV and LV assessment of the site to determine the minimum upgrade requirements externally.

- The internal HV Electrical Design shall nominate the location and staging requirements for all HV Infrastructure.
- The internal subdivision detailed LV and HV Design shall be prepared in accordance with Energex standards and guidelines.
- This information shall be documented and submitted to Energex for approval as part of the separate approval.

3.7 Erosion and Sediment Control

A comprehensive erosion and sediment control plan is to be prepared and submitted as part of the operational works application for this development. The erosion and sediment control plan is to be prepared in accordance with standards outlined by Redland City Council and the standards specified within the International Erosion Control of Australasia (IECA) Best Practices Erosion and Sediment Control (BPESC), November 2008. The erosion and sediment control plan will aim to mitigate potential erosion in the first instance and utilise end of line sedimentation devices. Recommendations for the ongoing monitoring and maintenance of sedimentation devices will also be included as part of the erosion and sediment control plan.

3.8 Asset Handover

It is the intention of the applicant that all engineering infrastructure which forms part of these developments is to be handed over to Redland City Council upon the completion of construction and acceptance "on maintenance". This includes infrastructure such as:

- Stormwater
- Reticulated Water
- Sewerage
- Roads and Drainage
- Parks
- Conservation areas
- Bioretention/detention Basins
- Streetlights.

Electrical and communications assets shall be owned, operated and maintained by their respective approval authorities.

4. Conclusion

This engineering infrastructure report and associated documents appended demonstrate that the proposed development can be adequately serviced. The servicing strategy for all engineering features assessed within this report shall be further refined as part of future submissions.

The engineering infrastructure nominated within this report is consistent with the Southern Thornlands Interim Land Use Plan and does not inhibit the future development of the PDA.

The proposed development will require access to the following existing services and infrastructure from their associated providers:

- Sewerage Reticulation (Redland Water)
- Water Reticulation (Redland Water)
- Stormwater Quality and Quantity Treatment (Redland City Council)
- Internal and External Road Networks (Redland City Council)

The design methodology implemented as part of the detailed design phase shall be consistent with the EDQ Requirements, as well as other best practices engineering standards and guidelines.

It is proposed that the ownership of all infrastructure will be transferred to the appropriate service providers, as detailed above, upon completion of construction works.

Appendix A. MCU Approved Plans

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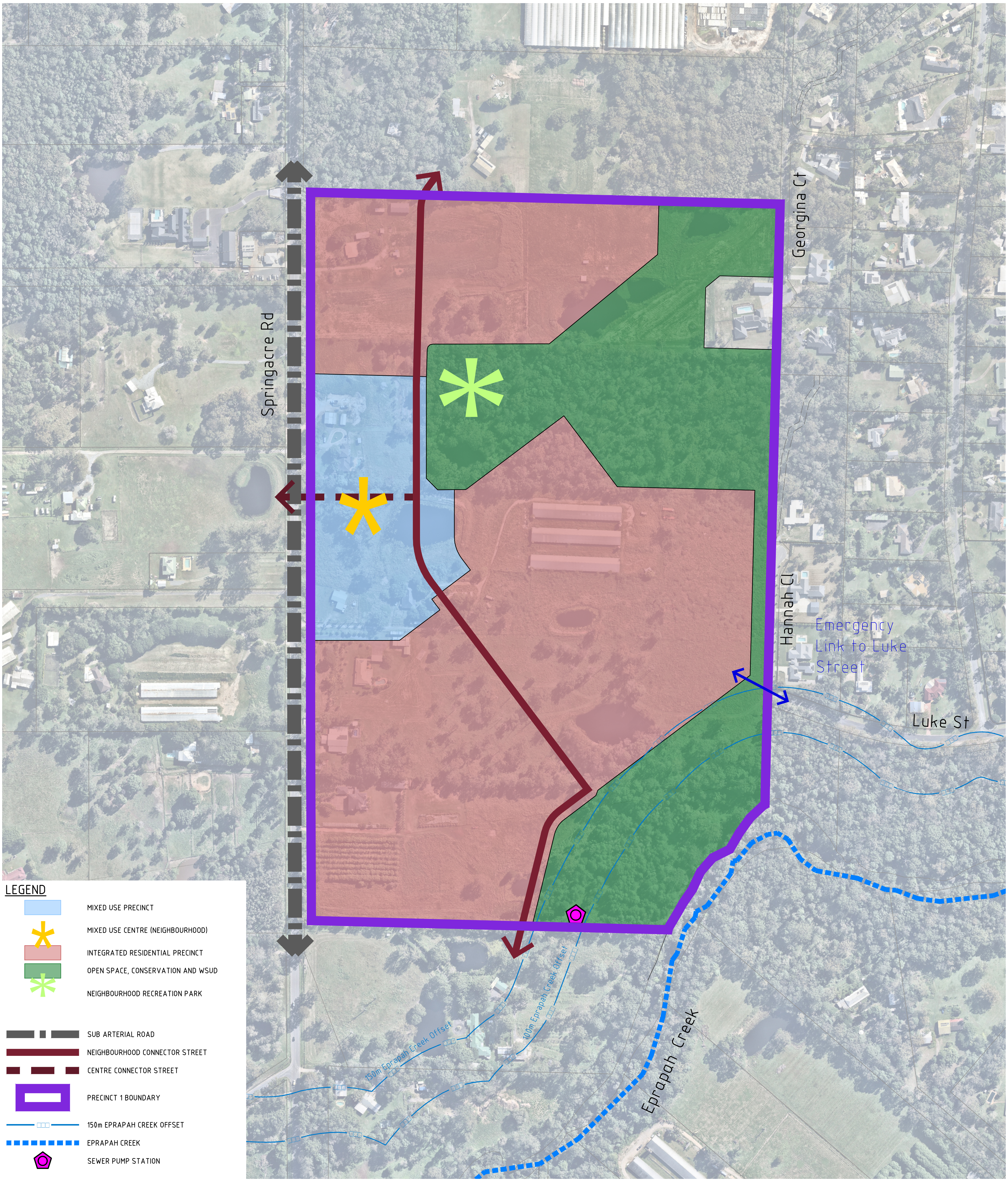
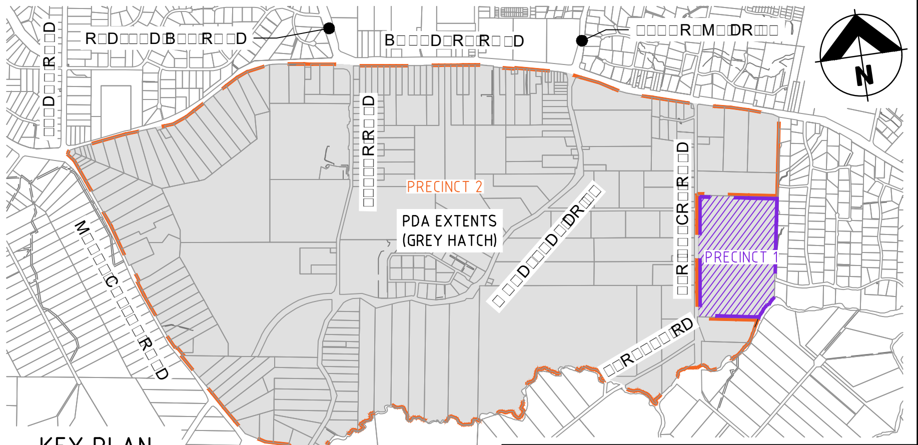
Plot Date: 20/06/2025 1:18:10 PM
File Name: S:\12ds\data\MAN12DSYN01\B00702__2451\4 CIVIL-DRGS\4.2 CURRENT\MCU\B00702-MC-LUP


Springacre Rd
Georgina Ct
Hannah Cl
Emergency Link to Luke Street
Luke St
Eprapah Creek
150m Eprapah Creek Offset
100m Eprapah Creek Offset
LEGEND
MIXED USE PRECINCT
MIXED USE CENTRE (NEIGHBOURHOOD)
INTEGRATED RESIDENTIAL PRECINCT
OPEN SPACE, CONSERVATION AND WSUD
NEIGHBOURHOOD RECREATION PARK
SUB ARTERIAL ROAD
NEIGHBOURHOOD CONNECTOR STREET
CENTRE CONNECTOR STREET
PRECINCT 1 BOUNDARY
150m EPRAPAH CREEK OFFSET
EPRAPAH CREEK
SEWER PUMP STATION

URBEX

PlacePlan


PRECINCT 2
PDA EXTENTS (GREY HATCH)
PRECINCT 1
RD
N

KEY PLAN
1:25,000 @ A1

Aerial images shown on this drawing sourced from Nearmaps

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EMPOWER

Client
URBEX PTY LTD

Project
SOUTHERN THORNLANDS PRECINCT 1

Title
LAND USE PLAN

Drawn	*Design*	*Design Chk*	*Appd*	*Date*	*Project No.* *Drawing No.*	*Rev*
PDW	PDW	PI	PI	20/06/25	**B00702-MC-LU01**	**A**

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DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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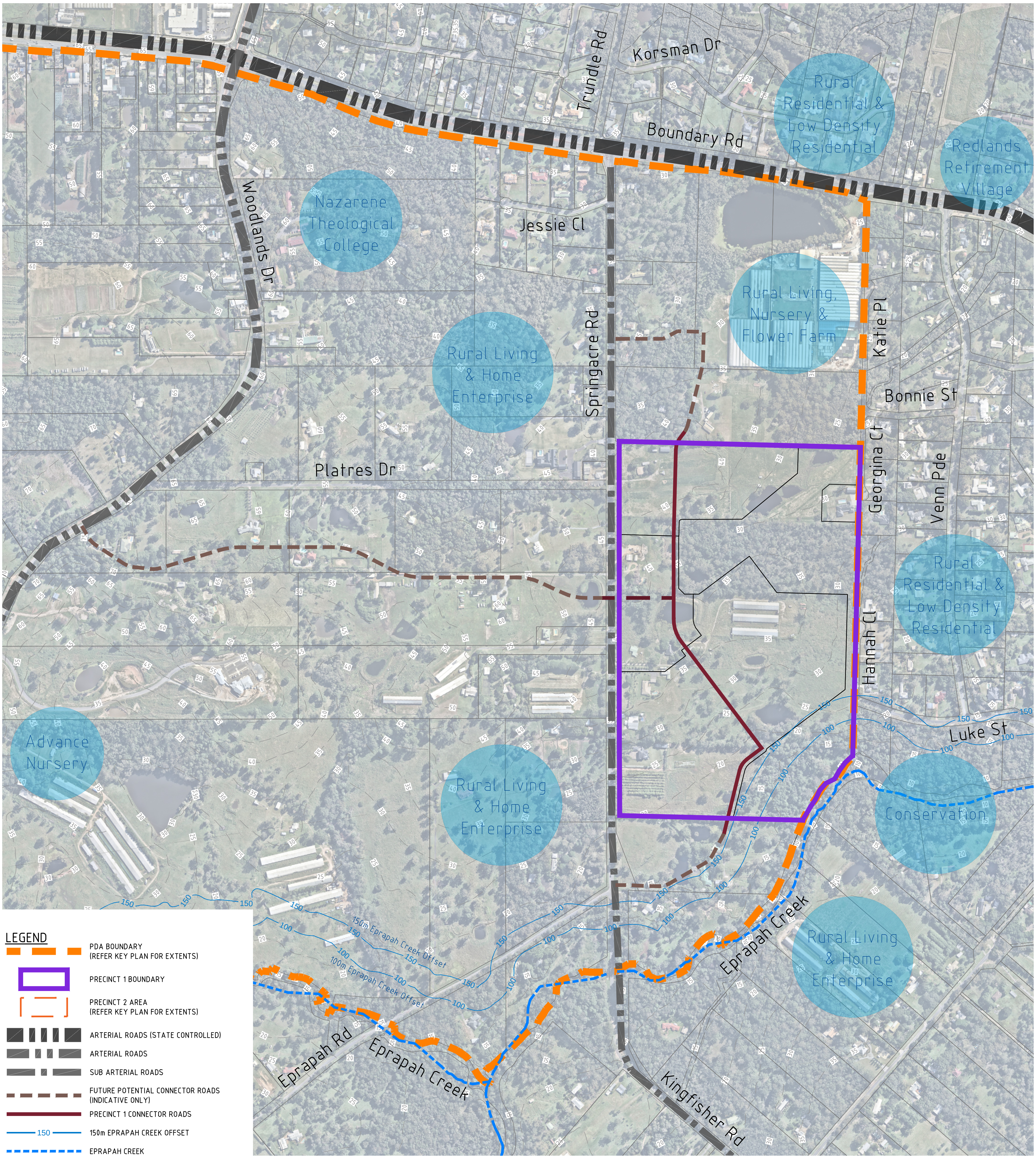
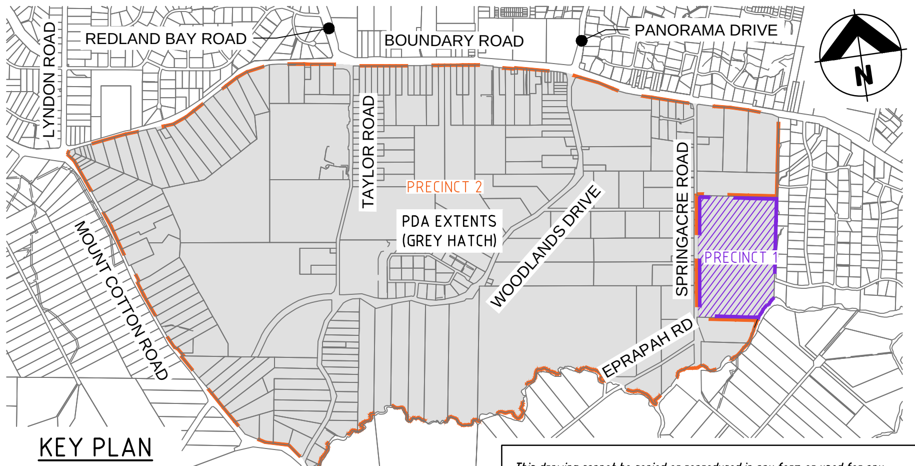

Korsman Dr
Trundle Rd
Boundary Rd
Rural Residential & Low Density Residential
Redlands Retirement Village
Nazarene Theological College
Woodlands Dr
Jessie Cl
Rural Living, Nursery & Flower Farm
Katie Pl
Rural Living & Home Enterprise
Springacre Rd
Bonnie St
Georgina Ct
Venn Pde
Platres Dr
Rural Residential & Low Density Residential
Hannah Cl
Luke St
Advance Nursery
Rural Living & Home Enterprise
Conservation
150m Eprapah Creek Offset
100m Eprapah Creek Offset
Eprapah Creek
Rural Living & Home Enterprise
Eprapah Rd
Eprapah Creek
Kingfisher Rd
LEGEND
PDA BOUNDARY (REFER KEY PLAN FOR EXTENTS)
PRECINCT 1 BOUNDARY
PRECINCT 2 AREA (REFER KEY PLAN FOR EXTENTS)
ARTERIAL ROADS (STATE CONTROLLED)
ARTERIAL ROADS
SUB ARTERIAL ROADS
FUTURE POTENTIAL CONNECTOR ROADS (INDICATIVE ONLY)
PRECINCT 1 CONNECTOR ROADS
150
150m EPRAPAH CREEK OFFSET
EPRAPAH CREEK

URBEX

PlacePlan


REDLAND BAY ROAD
BOUNDARY ROAD
PANORAMA DRIVE
N
LYNDON ROAD
TAYLOR ROAD
PRECINCT 2
PDA EXTENTS (GREY HATCH)
WOODLANDS DRIVE
SPRINGACRE ROAD
PRECINCT 1
MOUNT COTTON ROAD
EPRAPAH RD

KEY PLAN
1:25,000 @ A1

Aerial images shown on this drawing sourced from Nearmaps

EMPOWER

Client
URBEX PTY LTD

Project
SOUTHERN THORNLANDS PRECINCT 1

Title
CONTEXT PLAN

Drawn	Design	Design Chk	Appd	Date	Project No. Drawing No.	Rev
PDW	PDW	PI	PI	20/06/25	**B00702-MC-CP01**	**A**

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80 60 40 20
SCALE 1:4000 (A1) 1:8000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Appendix B. POD and RAL Drawings

Refer to Approved Plans

AMENDED IN RED

By: Nicole Tobias

Date: 19 April 2026

Queensland Government

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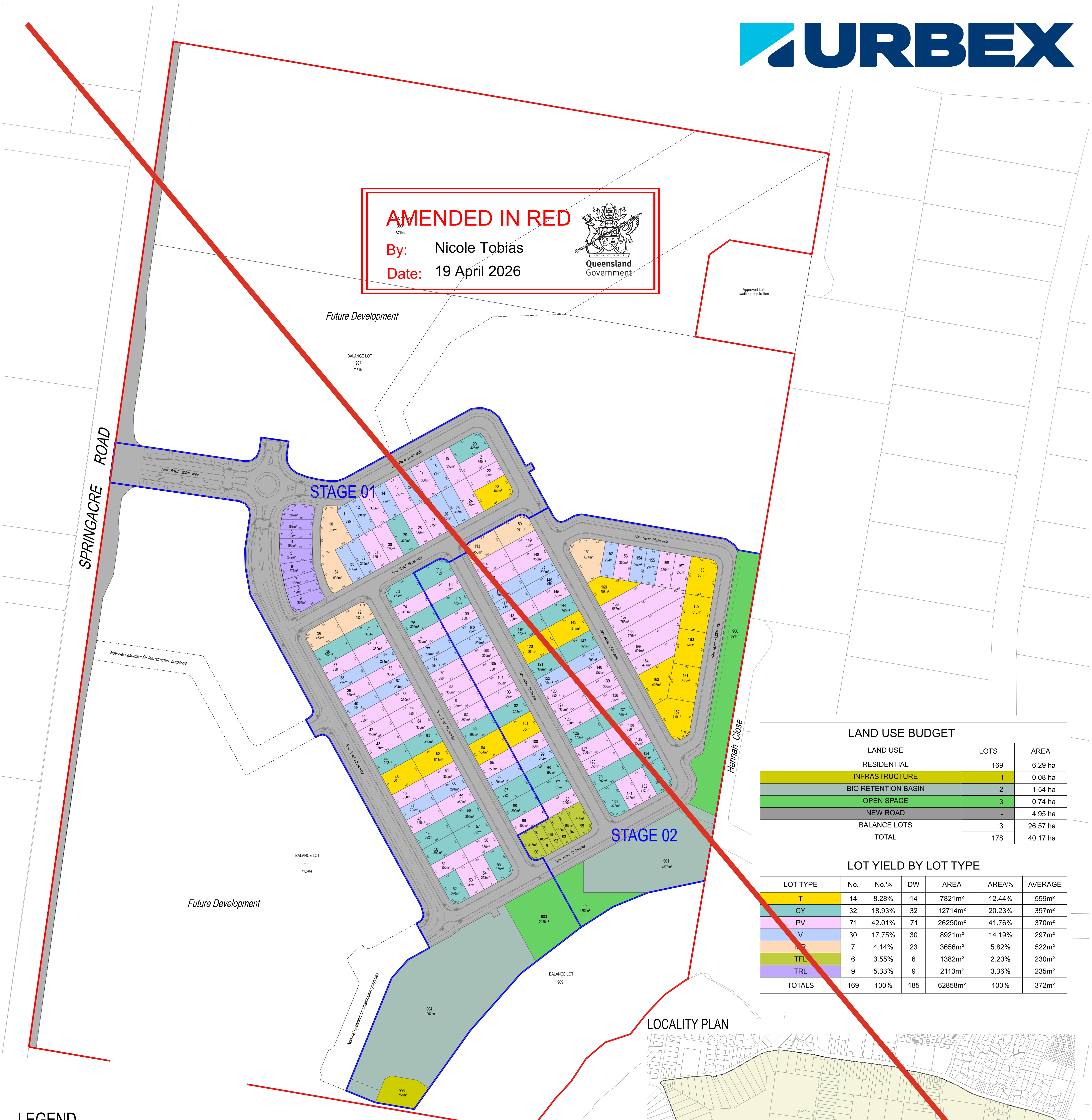
URBEX

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government


SPRINGACRE ROAD
New Road 32.0m wide
STAGE 01
STAGE 02
Future Development
BALANCE LOT 907 7.71ha
Approved Lot awaiting registration
Notional easement for infrastructure purposes
BALANCE LOT 909 11.64ha
BALANCE LOT 909
New Road 18.0m wide
New Road 13.25m wide
Hannah Close
900
901
902
903
904
905

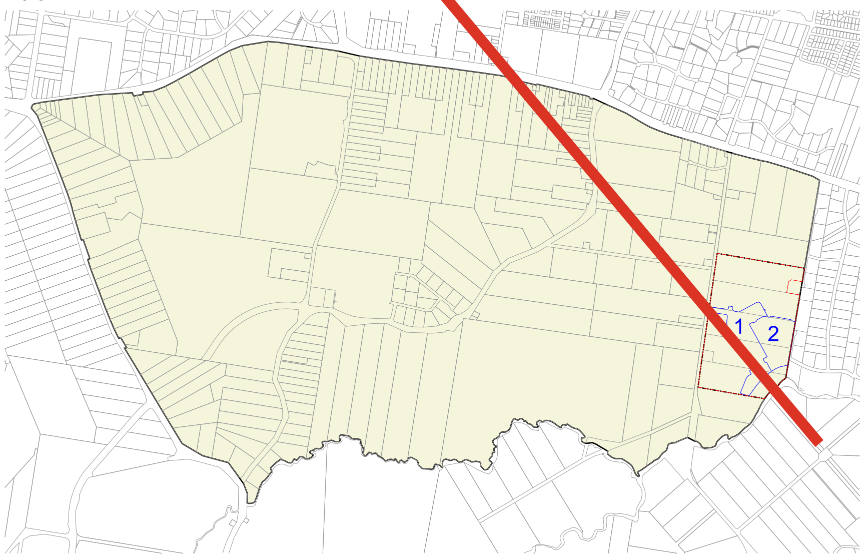
LAND USE BUDGET

LAND USE	LOTS	AREA
RESIDENTIAL	169	6.29 ha
INFRASTRUCTURE	1	0.08 ha
BIO RETENTION BASIN	2	1.54 ha
OPEN SPACE	3	0.74 ha
NEW ROAD	-	4.95 ha
BALANCE LOTS	3	26.57 ha
TOTAL	178	40.17 ha

LOT YIELD BY LOT TYPE

LOT TYPE	No.	No.%	DW	AREA	AREA%	AVERAGE
T	14	8.28%	14	7821m²	12.44%	559m²
CY	32	18.93%	32	12714m²	20.23%	397m²
PV	71	42.01%	71	26250m²	41.76%	370m²
V	30	17.75%	30	8921m²	14.19%	297m²
MR	7	4.14%	23	3656m²	5.82%	522m²
TFL	6	3.55%	6	1382m²	2.20%	230m²
TRL	9	5.33%	9	2113m²	3.36%	235m²
TOTALS	169	100%	185	62858m²	100%	372m²

LOCALITY PLAN



PDA EXTENTS | PRECINCT 1 | APPLICATION 1 | STAGE

LEGEND

- Application Boundary
- Stage Boundary
- 🟩 Open Space
- ▨ Bioretention Basin
- ▨ Infrastructure
- ▨ Road

0 30 60 90 120 150m

Scale 1:3,000 at A3

North

Southern Thornlands Precinct 1
Reconfiguration of a Lot - Application 1

DRAWING NO STP01-RaL1 (Sht 1 of 3)
DATE 10.12.2025
FILE REF STP01

Prepared by Place Plan for Urbex Pty Ltd

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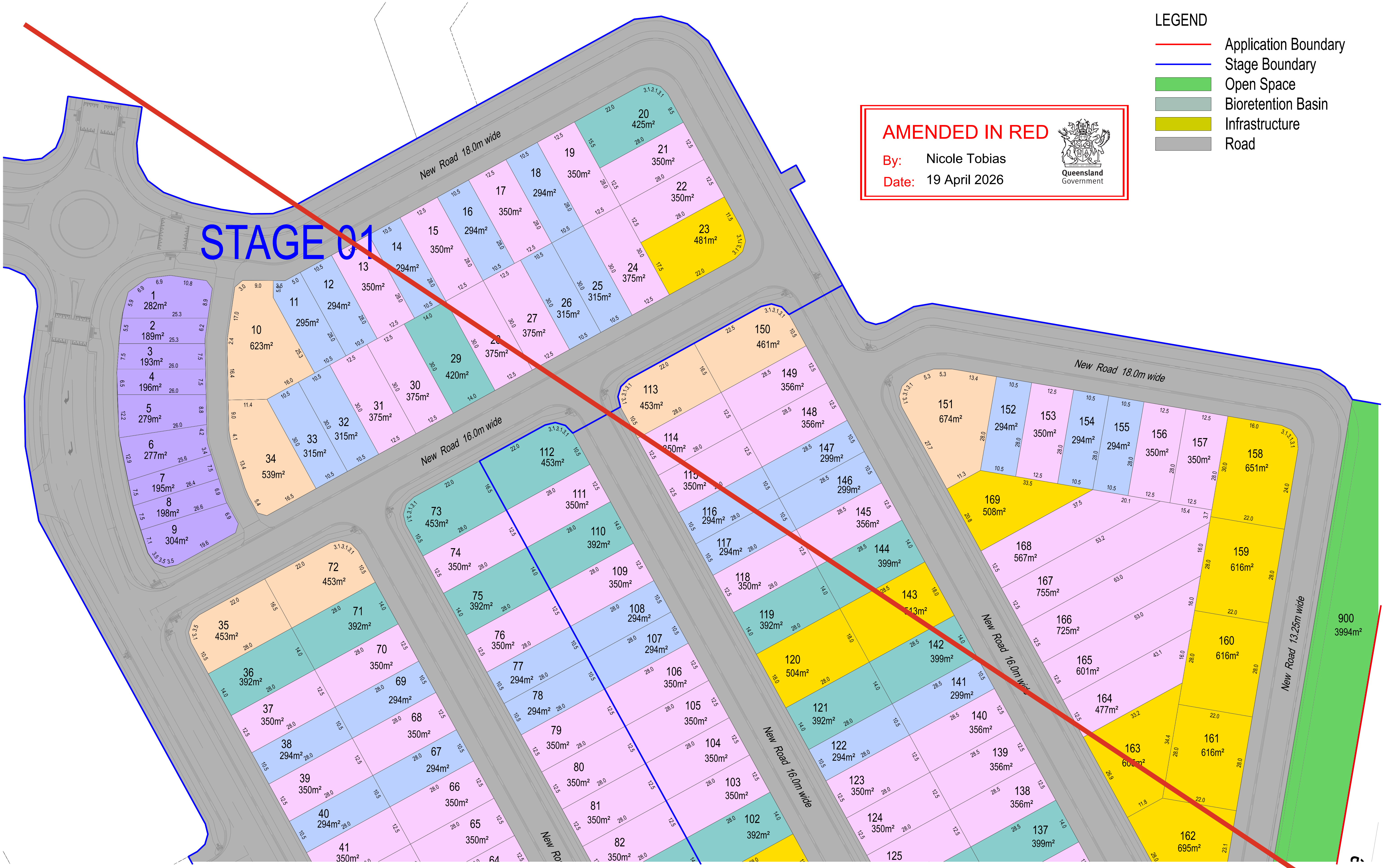
STAGE 01
New Road 18.0m wide
New Road 16.0m wide
New Road 16.0m wide
New Road 16.0m wide
New Road 18.0m wide
New Road 13.25m wide
New Ro
1 282m²
2 189m²
3 193m²
4 196m²
5 279m²
6 277m²
7 195m²
8 198m²
9 304m²
10 623m²
11 295m²
12 294m²
13 350m²
14 294m²
15 350m²
16 294m²
17 350m²
18 294m²
19 350m²
20 425m²
21 350m²
22 350m²
23 481m²
24 375m²
25 315m²
26 315m²
27 375m²
28 375m²
29 420m²
30 375m²
31 375m²
32 315m²
33 315m²
34 539m²
35 453m²
36 392m²
37 350m²
38 294m²
39 350m²
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64
65 350m²
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76 350m²
77 294m²
78 294m²
79 350m²
80 350m²
81 350m²
82 350m²
102 392m²
103 350m²
104 350m²
105 350m²
106 350m²
107 294m²
108 294m²
109 350m²
110 392m²
111 350m²
112 453m²
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122 294m²
123 350m²
124 350m²
125
137 399m²
138 356m²
139 356m²
140 356m²
141 299m²
142 399m²
143 513m²
144 399m²
145 356m²
146 299m²
147 299m²
148 356m²
149 356m²
150 461m²
151 674m²
152 294m²
153 350m²
154 294m²
155 294m²
156 350m²
157 350m²
158 651m²
159 616m²
160 616m²
161 616m²
162 695m²
163
164 477m²
165 601m²
166 725m²
167 755m²
168 567m²
169 508m²
900 3994m²
0 10 20 30 40 50m
Scale 1:1,000 at A3
North

LEGEND

- Application Boundary
- Stage Boundary
- 🟩 Open Space
- ▨ Bioretention Basin
- 🟨 Infrastructure
- ▨ Road

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

Southern Thornlands Precinct 1
Reconfiguration of a Lot - Application 1

DRAWING NO	STP01-RaL1 (Sht 2 of 3)
DATE	10.12.2025
FILE REF	STP01

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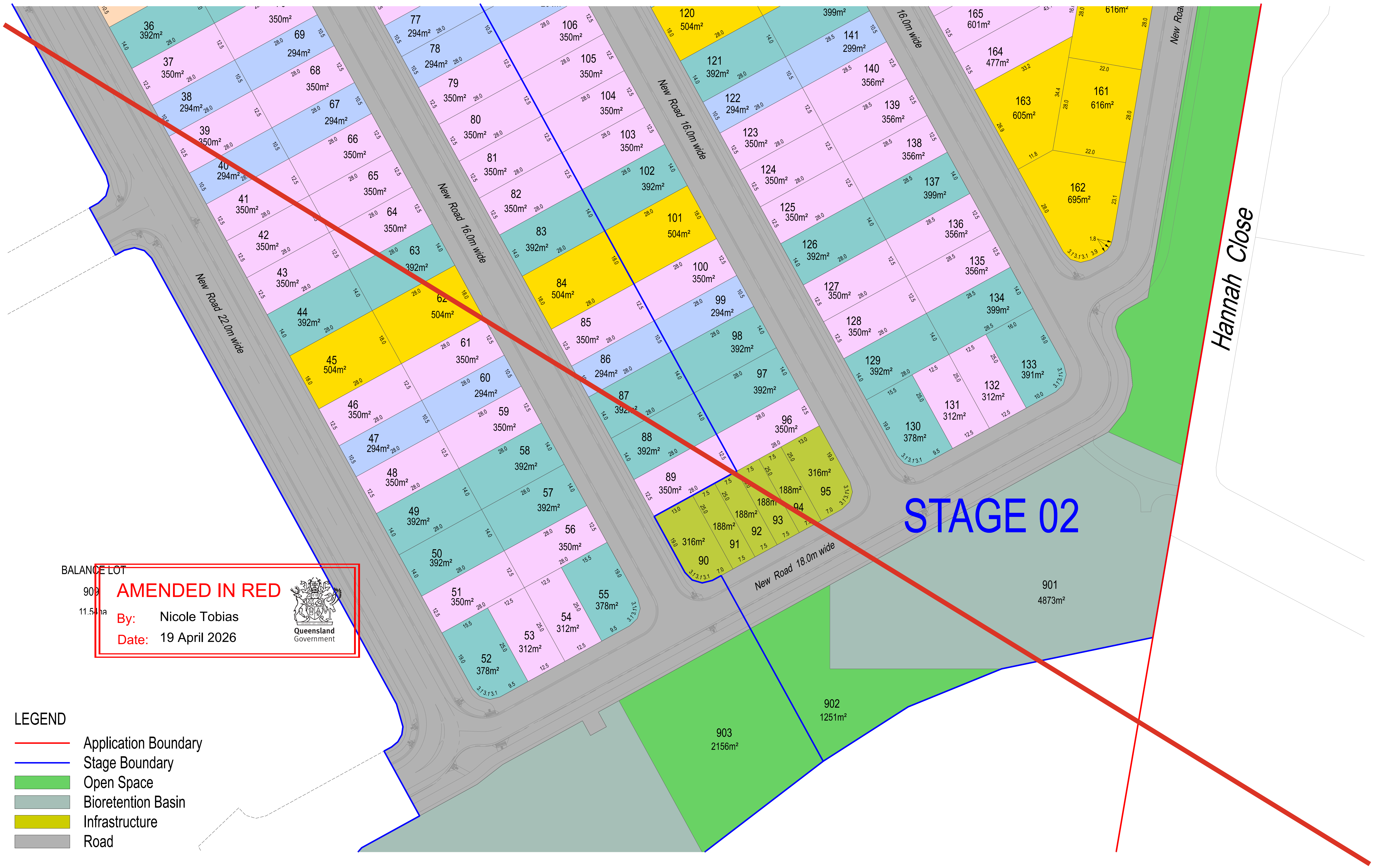
36 392m²
37 350m²
38 294m²
39 350m²
40 294m²
41 350m²
42 350m²
43 350m²
44 392m²
45 504m²
46 350m²
47 294m²
48 350m²
49 392m²
50 392m²
51 350m²
52 378m²
53 312m²
54 312m²
55 378m²
56 350m²
57 392m²
58 392m²
59 350m²
60 294m²
61 350m²
62 504m²
63 392m²
64 350m²
65 350m²
66 350m²
67 294m²
68 350m²
69 294m²
350m²
77 294m²
78 294m²
79 350m²
80 350m²
81 350m²
82 350m²
83 392m²
84 504m²
85 350m²
86 294m²
87 392m²
88 392m²
89 350m²
90 316m²
91 188m²
92 188m²
93 188m²
94 188m²
95 316m²
96 350m²
97 392m²
98 392m²
99 294m²
100 350m²
101 504m²
102 392m²
103 350m²
104 350m²
105 350m²
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120 504m²
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122 294m²
123 350m²
124 350m²
125 350m²
126 392m²
127 350m²
128 350m²
129 392m²
130 378m²
131 312m²
132 312m²
133 391m²
134 399m²
135 356m²
136 356m²
137 399m²
138 356m²
139 356m²
140 356m²
141 299m²
399m²
165 601m²
164 477m²
163 605m²
161 616m²
162 695m²
616m²
901 4873m²
902 1251m²
903 2156m²
New Road 22.0m wide
New Road 16.0m wide
New Road 16.0m wide
16.0m wide
New Road 18.0m wide
New Road
Hannah Close
STAGE 02
BALANCE LOT
909
11.54ha

AMENDED IN RED

By: Nicole Tobias

Date: 19 April 2026

Queensland Government

LEGEND

🟥	Application Boundary
🟦	Stage Boundary
🟩	Open Space
▨	Bioretention Basin
🟨	Infrastructure
▨	Road

URBEX

Southern Thornlands Precinct 1
Reconfiguration of a Lot - Application 1

DRAWING NO STP01-RaL1 (Sht 3 of 3)
DATE 07.12.2025
FILE REF STP01

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0 10 20 30 40 50m
Scale 1:1,000 at A3

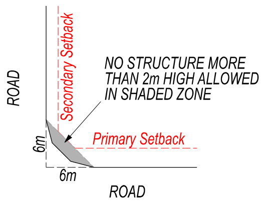
North

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

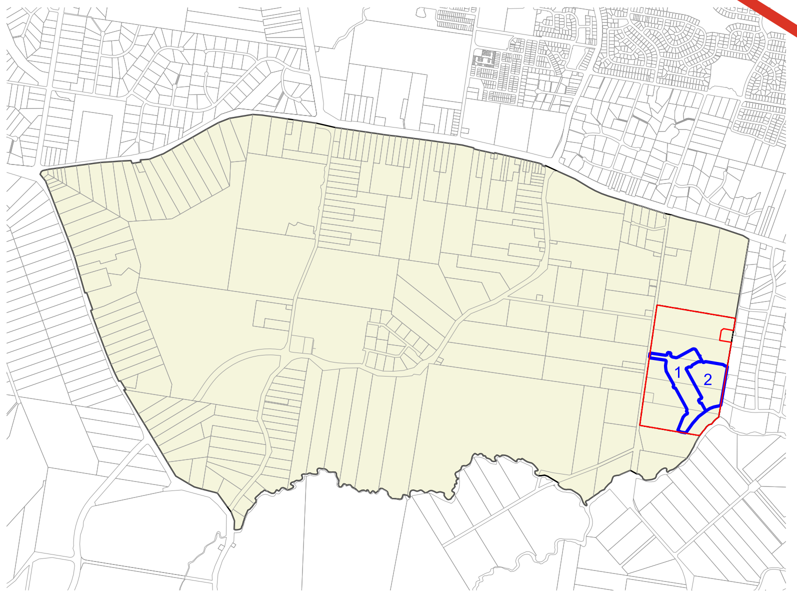
LEGEND

- 🟥 Application Boundary
- 🟦 Stage Boundary
- ▼ Optional Build to Boundary
- ▼ Mandatory Build to Boundary
- ▨ Indicative Driveway Location
- (3) Indicates maximum number of dwellings on multi-residential lots
- (S) Single Storey Dwellings only permitted
- ◄ Mandatory Primary Frontage
- * Multiple Residential lot
- B Refer to Bushfire plan for Building Requirements
- * Indicative Bin Pad location (to be confirmed at detail design)

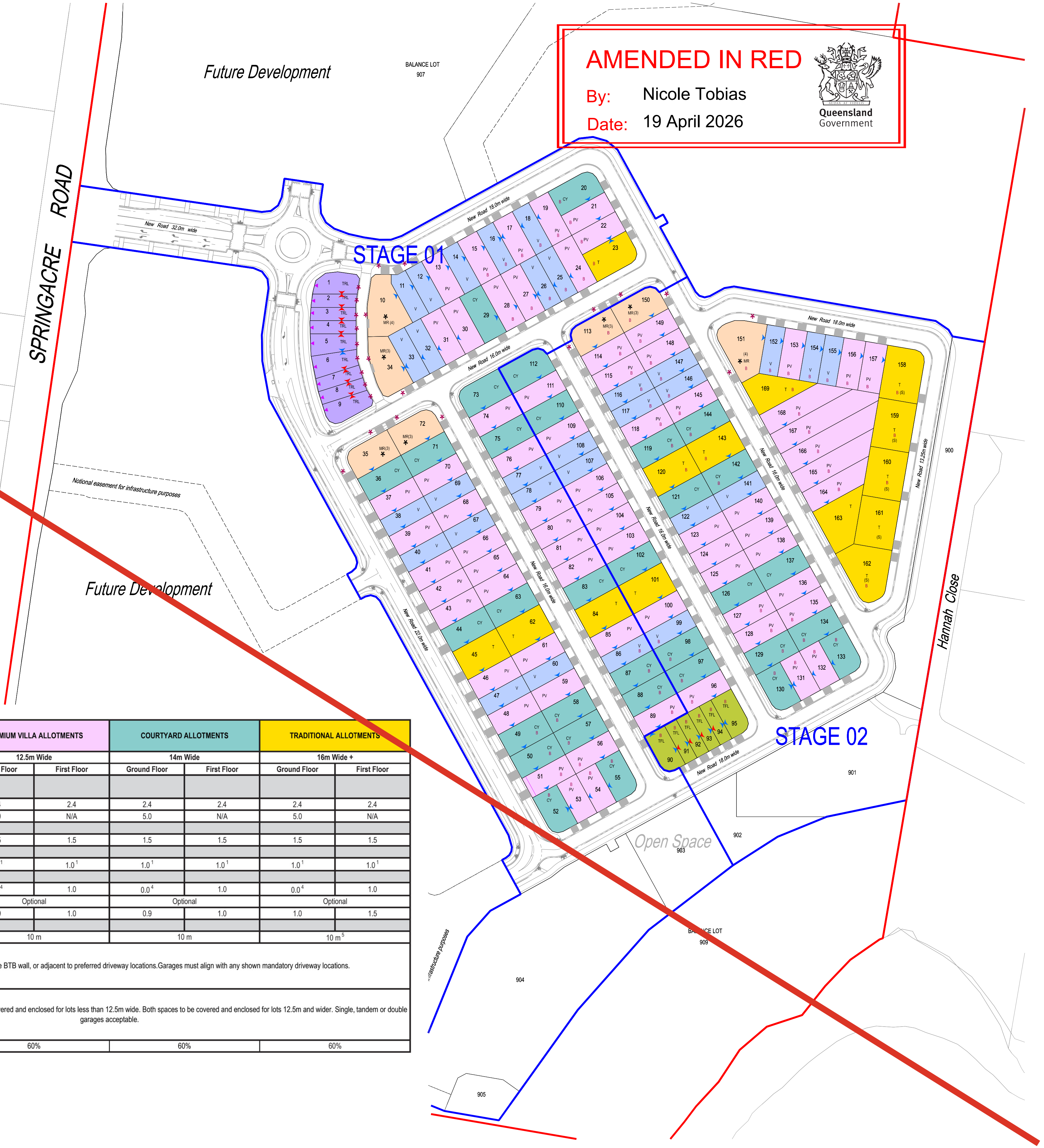
CORNER ALLOTMENTS


ROAD
Secondary Setback
NO STRUCTURE MORE THAN 2m HIGH ALLOWED IN SHADED ZONE
Primary Setback
6m
6m
ROAD

LOCALITY PLAN



PDA EXTENTS	PRECINCT 1	APPLICATION 1	STAGES


Future Development
BALANCE LOT 907
SPRINGACRE ROAD
New Road 32.0m wide
New Road 18.0m wide
New Road 16.0m wide
New Road 20.0m wide
New Road 13.0m wide
STAGE 01
STAGE 02
Notional easement for infrastructure purposes
Future Development
Hannah Close
Open Space
903
900
901
902
BALANCE LOT 909
904
905
infrastructure purposes

NOTE: This plan should be read in conjunction with Development Controls on Sheets 4 and 5

Plan of Development Table	FRONT-LOADED TERRACE ALLOTMENTS		REAR LOADED TERRACE ALLOTMENTS		MULTIPLE RESIDENTIAL		VILLA ALLOTMENTS		PREMIUM VILLA ALLOTMENTS		COURTYARD ALLOTMENTS		TRADITIONAL ALLOTMENTS	
	7.5m - 9m		7.5m - 9m Wide		VARIES		10.5m Wide		12.5m Wide		14m Wide		16m Wide +	
	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor
Primary Frontage Setback (metres)														
Front Wall	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Garage	5.0	N/A	N/A	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A
Corner Allotments (metres)														
Secondary Frontage (Road)	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Rear Setback (metres)														
Rear Setback	1.0[3]	1.0[3]	0.0	0.0	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]
Side - General Lots (metres)														
Build to Boundary	0.0	0.0	0.0	0.0	0.0[4]	1.0	0.0[4]	0.9	0.0[4]	1.0	0.0[4]	1.0	0.0[4]	1.0
	Mandatory[2]		Mandatory[2]		Optional		Optional		Optional		Optional		Optional	
Non Build to Boundary	0.9	0.9	0.9	0.9	1.5	1.5	0.9	1.0	0.9	1.0	0.9	1.0	1.0	1.5
Other Requirements														
Build to Boundary Length	80% of lot length		80% of lot length		10 m		10 m		10 m		10 m		10 m[5]	
Garage Location	Garages are to be located along one of the BTB walls, preferably on the low side.				Garages are to be located along the BTB wall where it is available. Additional garaging should align to preferred driveway locations.		Garages are preferred to be located along the BTB wall, or adjacent to preferred driveway locations.Garages must align with any shown mandatory driveway locations.							
On Site Parking Requirements (minimum)	1 space to be covered and enclosed. Single or tandem garages acceptable. Double garages are permitted on two storey dwellings only.		2 spaces, 1 space to be covered and enclosed. Garage to be located to laneway frontage unless noted on plan.		1 covered space per dwelling plus 0.5 addional spaces per dwelling		Minimum of two (2) car parking spaces on-site. 1 space to be covered and enclosed for lots less than 12.5m wide. Both spaces to be covered and enclosed for lots 12.5m and wider. Single, tandem or double garages acceptable.							
Site Cover (maximum)	75%		75%		75%		60%		60%		60%		60%	

1. Where adjoining a retaining wall >1.5m, the setback is 1.2m.
2. Except for ends of Terrace pack.
3. Where the rear of the lot adjoins a road or a park, the rear setback will be 1.5m.
4. Build to boundary length limited to 10m. Build to boundary length can be increased to 50% of the depth of the lot if such lengthening does not cause adverse impacts for winter solar access for adjacent lots.
5. Traditional lots with a primary frontage over 18m cannot Build to the Boundary.

URBEX

Southern Thornlands Precinct 1
Plan of Development - Application 1

DRAWING NO STP01-POD1 (Sht 1 of 5)
DATE 10.12.2025
FILE REF STP01

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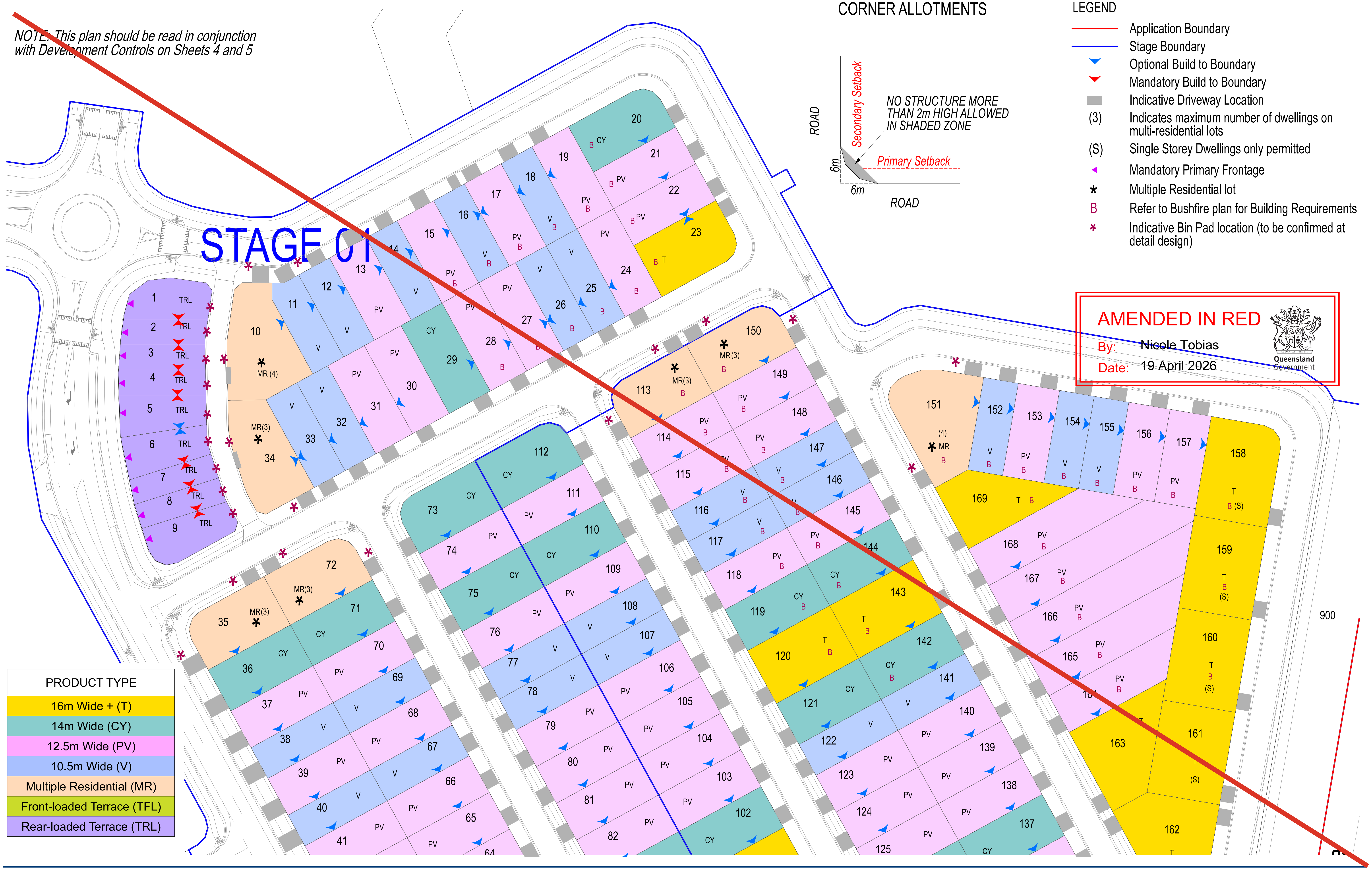
0 25 50 75 100 125 m
Scale 1:2,500 at A3
North

NOTE: This plan should be read in conjunction with Development Controls on Sheets 4 and 5


STAGE 01
CORNER ALLOTMENTS
ROAD
Secondary Setback
NO STRUCTURE MORE THAN 2m HIGH ALLOWED IN SHADED ZONE
Primary Setback
6m
6m
ROAD
TRL
MR (4)
MR(3)
CY
PV
V
T
B
(S)
900

LEGEND

—	Application Boundary
—	Stage Boundary
◢	Optional Build to Boundary
◢	Mandatory Build to Boundary
▬	Indicative Driveway Location
(3)	Indicates maximum number of dwellings on multi-residential lots
(S)	Single Storey Dwellings only permitted
◀	Mandatory Primary Frontage
*	Multiple Residential lot
B	Refer to Bushfire plan for Building Requirements
*	Indicative Bin Pad location (to be confirmed at detail design)

AMENDED IN RED

By: Nicole Tobias

Date: 19 April 2026

Queensland Government

PRODUCT TYPE
16m Wide + (T)
14m Wide (CY)
12.5m Wide (PV)
10.5m Wide (V)
Multiple Residential (MR)
Front-loaded Terrace (TFL)
Rear-loaded Terrace (TRL)

URBEX

Southern Thornlands Precinct 1
Plan of Development - Application 1

DRAWING NO	STP01-POD1 (Sht 2 of 5)
DATE	10.12.2025
FILE REF	STP01

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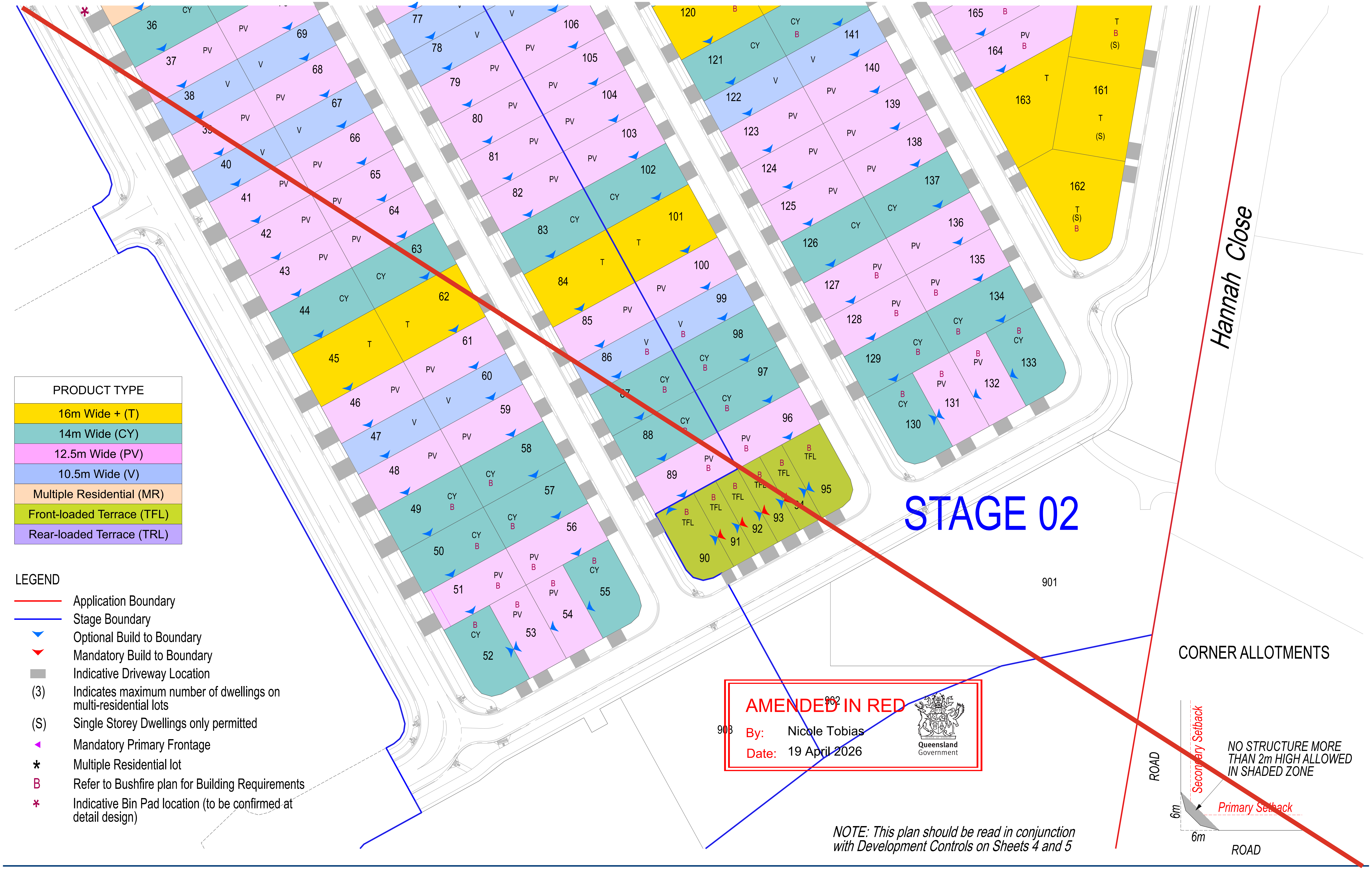
0 10 20 30 40 50m

Scale 1:1,000 at A3

North


STAGE 02
Hannah Close
ROAD
901
902
903
36
37
38
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48
49
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128
129
130
131
132
133
134
135
136
137
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164
165
CORNER ALLOTMENTS
Secondary Setback
Primary Setback
6m
6m
ROAD
ROAD
NO STRUCTURE MORE THAN 2m HIGH ALLOWED IN SHADED ZONE

PRODUCT TYPE
16m Wide + (T)
14m Wide (CY)
12.5m Wide (PV)
10.5m Wide (V)
Multiple Residential (MR)
Front-loaded Terrace (TFL)
Rear-loaded Terrace (TRL)

LEGEND

—	Application Boundary
—	Stage Boundary
▼	Optional Build to Boundary
▼	Mandatory Build to Boundary
▬	Indicative Driveway Location
(3)	Indicates maximum number of dwellings on multi-residential lots
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*	Indicative Bin Pad location (to be confirmed at detail design)

NOTE: This plan should be read in conjunction with Development Controls on Sheets 4 and 5

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

URBEX

Southern Thornlands Precinct 1
Plan of Development - Application 1

DRAWING NO	STP01-POD1 (Sht 3 of 5)
DATE	10.12.2025
FILE REF	STP01

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0 10 20 30 40 50m
Scale 1:1,000 at A3
North

1. General

1.1 All development is to be undertaken in accordance with the Development Approval, and Queensland Development Code (QDC), except as varied below.

1.2 The maximum height of buildings shall not exceed three (3) storeys or 10.5m above Natural Ground Level, except where noted on the POD. Lots marked with an (S) have a maximum building height of 1 storey or 6.0 m above natural grond level.

1.3 Maximum building location envelopes are subject to future proposed easements and/or other underground services.

1.4 Buildings shall be constructed in accordance with Bushfire AS3959. Refer to the BAL Rating advice relevant to the lot.

1.5 Secondary dwellings are not permitted on lots less than 400m².

1.6 Approved uses are Dwelling House, dual occupancy, display home, multiple dwelling, home-based business.

1.7 Advertising Devices, where associated with a display home/village and temporary in nature, are Exempt Development.

1.8 Where Mandatory Primary Frontage is required the dwelling must address the nominated frontage by incorporating an entry, portico / verandah, front door, windows, letter box, appropriate fencing and pedestrian entry facing this frontage.

2. Setbacks

2.1 Setbacks are as per the Plan of Development Table unless otherwise dimensioned. If a lot is not developed for a Multiple Residential (MR) site, then the equivalent size detached lot setbacks will apply.

2.2 The location of the built to boundary walls are indicated on the Plan of Development. Where built to boundary walls are not adopted, side setbacks shall be in accordance with the Plan of Development Table.

2.3.1 Boundary setbacks are measured to the Outermost Projection (OMP) of the structure.

2.3.2 Front verandah and covered areas to the front door are permitted to extend into the front setback on the condition that the roofed area is not enclosed. For front setbacks, this roofed area can extend to 1.0m from the front property line.

2.3.3 Eaves and window shades are permitted to extend into side and rear setbacks provided they do not encroach closer than 450mm to the lot boundary (other than where buildings are built to boundary).

2.4 Excluding Terrace product, the maximum length of a wall built on the BTB line shall not exceed 10 metres, unless it can be shown that a greater length will not adversely impact overshadowing of adjoining lots. Excluding Terraces, the maximum height of a wall built on the BTB line shall not exceed 4.0 m.

2.5 Where a retaining wall on the rear boundary is either terraced or a single face wall over 2.0m high, a 2.5m rear setback is required.

2.6 A corner lot, for the purposes of determining setbacks, is a lot that adjoins the intersection of two streets. For lots that abut a shared access driveway, laneway or a pedestrian link / landscape buffer, a secondary frontage setback does not apply. Buildings on corner lots are to be sited in accordance with the 'Special Siting Requirements for Corner Allotments'.

2.7 Setbacks on corner lots are determined by the frontage that the primary facade addresses. The primary facade is the frontage where the front door and letterbox are located, and requires Primary Frontage setbacks. Secondary frontage setbacks are required on the alternative frontage.

3. Private Open Space

3.1 Private open space must measure a minimum of 12m² with a minimum dimension in any direction of 2.4 metres. Private Open Space cannot include driveways and must have a minimum grade of less than 5%.

3.2 Private open space must be directly accessible from a living space.

4. On-site car parking and driveways

4.1 On-site car parking is to be provided in accordance the requirements setout in the Plan of Development table.

4.2 Driveways are to accord with Redland City Council's (RCC) standards. Prior to construction, approval from RCC for Vehicular Access to Residential Premises is required. Driveways within the verge must be built at the grade of the verge.

4.3 The maximum width of a driveway within the verge shall be 4.8 metres for a lot with a double car width garage and 3.0 metres for a lot with a single car width garage.

4.4 Double garages are permitted on terraces where they are accessed from the laneway.

4.5 Garages and carports accessed from a Laneway must be built setback 0.9 metres from the boundary unless otherwise dimensioned on the Plan of Development. Ingress/egress must be achieved for a B99 Vehicle.

4.6 Maximum of one driveway per dwelling.

4.7 Minimum distance of a driveway from an intersection of one street with another street is 6.0 metres. The Driveway must be laid at the grade of the adjacent verge area. No grade changes to the verge for the driveway will be allowed.

4.8 Where there is a footpath within the verge, the driveway prevails and the footpath should be cut at the nearest joint and the footpath reinstated to either side of the driveway without compromising the structural integrity of the footpath.

4.9 Driveways must be completed prior to occupation of the dwelling.

4.10 Driveways must be atleast 300mm from side property boundaries.

5. Onsite Parking lots 10 to 12.49m wide

5.1 Garages for any single storey dwelling on a Lot between 10.0m and 12.49m in width must adhere to the following design criteria:
a. The front facing building wall, which includes the garage door, must not exceed an external width of 5.7m
b. The garage door must have a sectional tilt or roller door and:
i. must not exceed 4.8m wide,
ii. must have a minimum 450mm eave above it, and
iii. must be setback a minimum of 240mm behind the pillar of the garage door.
c. The front façade of the dwelling must be forward of the alignment of the garage wall, and must include a front entry door with glass inserts, sidelights, other street facing windows or a habitable room with a window. Additionally a front veranda, portico or porch must be located over the front entry and extend 1.6m forward of the front wall/door and include front piers with distinct materials and/or colours.
d. Driveways cannot exceed 3.0m across the verge on Lots between 10.0m and 12.49m wide.

5.2 Double car garages are permitted on any double storey dwelling built on a Lot between 10.0m and 12.49m.

6. Fencing

6.1 Fencing erected by developer must not be altered, modified or removed without their prior written approval.

6.2 Fencing on all park or street frontages has a maximum height of 1.2 metres where solid or have a maximum height of 1.8 metres when containing openings that make the fence more than 50% transparent.

6.3 Fencing on lanes can be screen fencing at 1.8m high where along private open space, carparking and service areas.

6.4 Fencing on corner lots is to be designed as front fences addressing both streets (rather than a front and a side fence).

6.5 Where fencing is not proposed in front of the house, all side fencing must return to the house a minimum of 1.0 metre behind the front facade, unless a side fence is required for safety above a retaining wall.

6.6 If elevated construction is to be used, under floor services must be located or screened from adjoining properties and public spaces.

7. Retaining Walls

7.1 For retaining walls **not** constructed by the developer:
a. Retaining walls must not exceed more than 1.0m where fronted to a public street or park. Retaining walls to side and rear boundaries (which are not visible from a public street or park) can be up to 2.0m. Retaining in excess of 2.5m in height must be terraced.
b. Where retaining walls are terraced, the lower face is to be a maximum of 1.0m from the property boundary.

7.2 No timber retaining walls over 1.0m high or where visible from any public street or park.

7.3 Retaining walls 1.0m or higher require RPEQ certification.

8. Building Articulation

8.1 All buildings with a width of more than 10 metres that are visible from a street or park are to include articulation to reduce the mass of the building by one or more of the following:
- Balconies, porches or verandahs;
- Articulation of roof lines and walls

8.2 Where adjoining an area of open space, housing design must facilitate passive surveillance of the open space, through the incorporation of at least one (1) habitable room orientated towards the open space.

8.3 Carports and garages are to be compatible with the main building design in terms of height, roof form, detailing, materials and colours.

8.4 Air-conditioners, gas bottles, hot water systems, clothes lines, sheds, satellite dishes, water tanks and other household services must be screened and/or located to minimise visual impact to public streets or parks (solar panels and hot water system panels (not tanks) can be sited to optimise orientation).

8.5 Homes must include a clearly identifiable and addressed front door and undercover point of entry.

8.6 Screened drying areas and rubbish bins area must be behind the main face of the dwelling.

9. Slope and Building Footings

9.1 Buildings on sloping sites built to the boundary on the low side of the lot must project-the footing deep enough to be below the adjoining property building pad level. If the pad level is not nominated the pad level is assumed to be the average of the four corners of the adjoining property using as constructed levels.

9.2 Building footings are to be designed in accordance with the appropriate Australian Standard. Building footings are to be designed to ensure that there are no adverse impacts (functional, financial or construction limitations) on adjoining allotments, particularly in relation to retaining walls.

10. Electric Vehicle Readiness

10.1 All dwellings are to have a dedicated electrical circuit from the circuit board to the garage for at least one Basic (slow) EVSE charger per home, in accordance with the Australian Wiring Rules AS/NZS 3000: 2018.
The circuit is to be fitted with a minimum 20 Amp GPO outlet which can be replaced by a dedicated 7kW EVSE of the occupant's choice. Where not used for Electric Vehicle Supply Equipment, the circuit is to be terminated at an isolator.

11. Additional Criteria for Multiple Residential Allotments

11.1 Buildings must address all street frontages with driveways, pedestrian entries or both.

11.2 All dwellings must have a clearly identifiable front door, which is undercover.

11.3 Drying and rubbish bin areas must be located behind the main face of the dwelling or suitably screened from public streets and park frontages.

11.4 Maximum number of dwellings on each multiple residential lot is annotated on the Plan of Development.

12. Additional Criteria for Secondary Dwellings

12.1 Floor area must be between a minimum of 40m² and 75m².

12.2 Materials, detailing, colours and roof form are consistent with those of the primary house.

12.3 Outdoor living space must measure a minimum of 9m² with a minimum dimension in any direction of 3 metres.

12.4 Outdoor living space must be directly accessible from the main living space and can be combined with the primary dwelling outdoor space.

12.5 Outdoor living space on a corner allotment must be suitably screened if located within the secondary street boundary setback.

12.6 A minimum of one (5m x 3m) car parking space must be provided for the secondary dwelling, in addition to parking for the primary dwelling.

12.7 The driveway must be shared with the primary house, however on corner allotments a separate driveway may be provided with a minimum width of 3 metres and a maximum width of 4.8 metres.

12.8 Corner allotments must provide dedicated pedestrian entry and a visible door from and addressing the secondary street to the secondary dwelling.

12.9 Corner allotments must provide a minimum of one habitable room, with large windows or balconies, fronting the secondary street.

13. Definitions

13.1 Laneway Allotment - Allotments serviced by a laneway, typically rear loaded Terrace Allotments.

13.2 Site Cover - Site cover, of development, means the portion of the site, expressed as a percentage, that will be covered by a building or structure, measured to its outermost projection, after the development is carried out, other than a building or structure, or part of a building or structure, that is -
a. in a landscaped or open space area, including, for example, a gazebo or shade structure; or
b. a basement completely below ground level and used for car parking; or
c. the eaves of a building; or a sun shade.

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

URBEX

Southern Thornlands Precinct 1
Development Controls - Application 1

DRAWING NO STP01-POD1 (Sht 4 of 5)
DATE 10.12.2025
FILE REF STP01

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0 10 20 30 40 50m
Scale 1:1,000 at A3

North

Plan of Development Table	**FRONT-LOADED TERRACE ALLOTMENTS**		**REAR LOADED TERRACE ALLOTMENTS**		**MULTIPLE RESIDENTIAL**		**VILLA ALLOTMENTS**		**PREMIUM VILLA ALLOTMENTS**		**COURTYARD ALLOTMENTS**		**TRADITIONAL ALLOTMENTS**	
	7.5m - 9m		**7.5m - 9m Wide**		**VARIES**		**10.5m Wide**		**12.5m Wide**		**14m Wide**		**16m Wide +**	
	Ground Floor	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**
Primary Frontage Setback (metres)														
Front Wall	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Garage	5.0	N/A	N/A	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A
Corner Allotments (metres)														
Secondary Frontage (Road)	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Rear Setback (metres)														
Rear Setback	1.0[3]	1.0[3]	0.0	0.0	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]
Side - General Lots (metres)														
Build to Boundary	0.0	0.0	0.0	0.0	0.0[4]	1.0	0.0[4]	0.9	0.0[4]	1.0	0.0[4]	1.0	0.0[4]	1.0
	Mandatory[2]		Mandatory[2]		Optional		Optional		Optional		Optional		Optional	
Non Build to Boundary	0.9	0.9	0.9	0.9	1.5	1.5	0.9	1.0	0.9	1.0	0.9	1.0	1.0	1.5
Other Requirements														
Build to Boundary Length	80% of lot length		80% of lot length		10 m		10 m		10 m		10 m		10 m[5]	
Garage Location	Garages are to be located along one of the BTB walls, preferably on the low side.				Garages are to be located along the BTB wall where it is available. Additional garaging should align to preferred driveway locations.		Garages are preferred to be located along the BTB wall, or adjacent to preferred driveway locations.Garages must align with any shown mandatory driveway locations.							
On Site Parking Requirements (minimum)	1 space to be covered and enclosed. Single or tandem garages acceptable. Double garages are permitted on two storey dwellings only.		2 spaces, 1 space to be covered and enclosed. Garage to be located to laneway frontage unless noted on plan.		1 covered space per dwelling plus 0.5 additional spaces per dwelling		Minimum of two (2) car parking spaces on-site. 1 space to be covered and enclosed for lots less than 12.5m wide. Both spaces to be covered and enclosed for lots 12.5m and wider. Single, tandem or double garages acceptable.							
Site Cover (maximum)	75%		75%		75%		60%		60%		60%		60%	

1. Where adjoining a retaining wall >1.5m, the setback is 1.2m.
2. Except for ends of Terrace pack.
3. Where the rear of the lot adjoins a road or a park, the rear setback will be 1.5m.
4. Build to boundary length limited to 10m. Build to boundary length can be increased to 50% of the depth of the lot if such lengthening does not cause adverse impacts for winter solar access for adjacent lots.
5. Traditional lots with a primary frontage over 18m cannot Build to the Boundary.

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

URBEX

Southern Thornlands Precinct 1
Development Controls - Application 1

DRAWING NO STP01-POD1 (Sht 5 of 5)
DATE 10.12.2025
FILE REF STP01

Prepared by Place Plan for Urbex Pty Ltd
DISCLAIMER: This design and drawing is subject to Copyright and intellectual property laws and may not be reproduced for any purpose without the consent of Urbex Pty Ltd. This plan is indicative only, and specific uses, road alignment, boundaries, setbacks shown may vary due to detailed design consideration and relevant Authority approvals. c 2025

0 10 20 30 40 50m
Scale 1:1,000 at A3
North

Appendix C. Engineering Plans

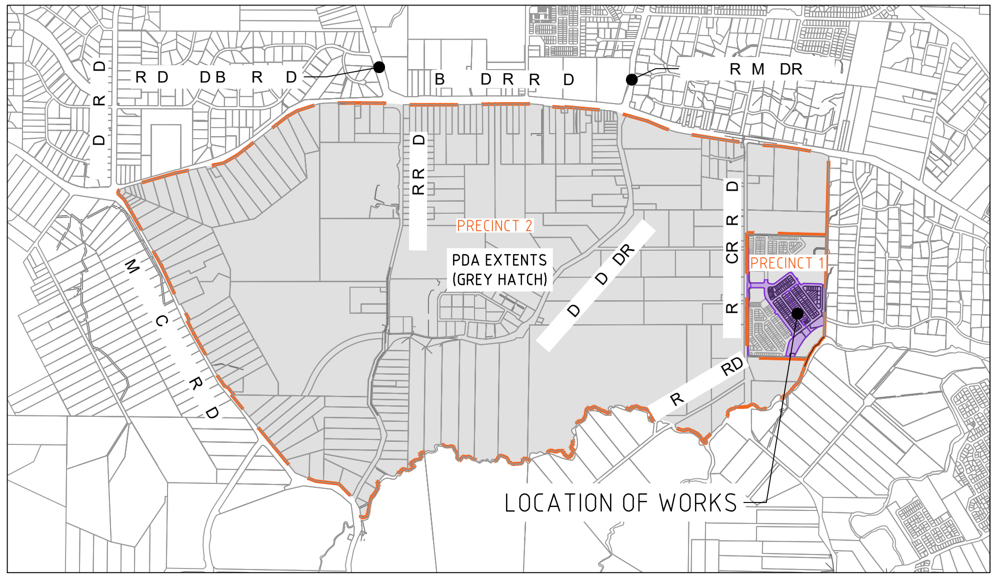
EMPOWER

www.bmdgroup.global

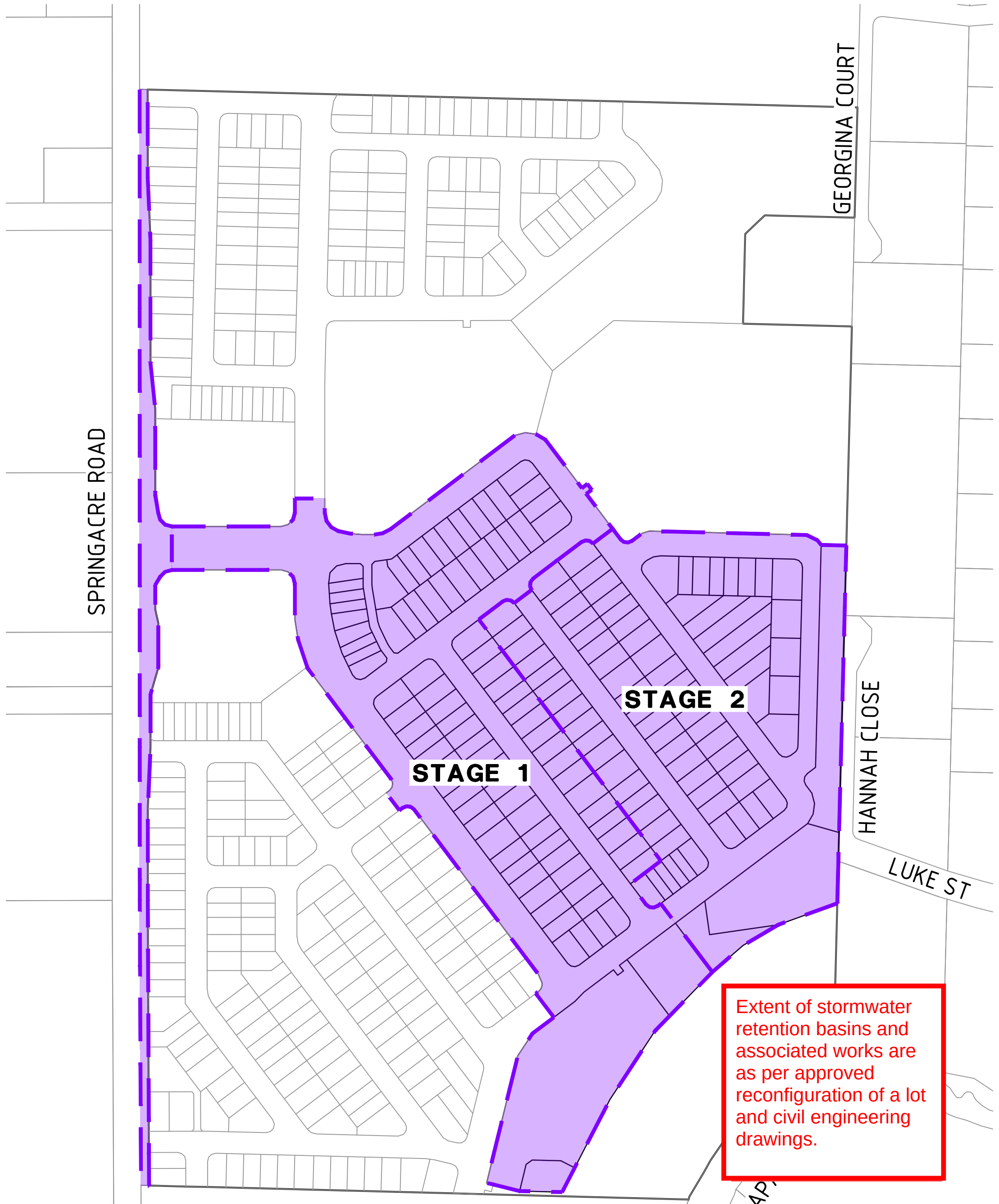
URBEX PTY LTD

SPRINGACRE RD, THORNLANDS, QLD, 4164

SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL APPLICATION



KEY PLAN
SCALE 1:25000 (A1)



Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

LOCALITY PLAN
SCALE 1:2500 (A1)

DRAWING INDEX

SHEET NUMBER	REVISION	SHEET TITLE
GENERAL ARRANGEMENT		
B00702-DA-CG01	A	TITLE SHEET, LOCALITY PLAN AND DRAWING INDEX
B00702-DA-CG02	A	STAGING PLAN
B00702-DA-CG03	A	GENERAL ARRANGEMENT PLAN - SHEET 1 OF 2
B00702-DA-CG04	A	GENERAL ARRANGEMENT PLAN - SHEET 2 OF 2
B00702-DA-CG05	A	TYPICAL DETAILS
EXISTING FEATURES		
B00702-DA-EF01	A	EXISTING FEATURES LAYOUT PLAN
EARTHWORKS MANAGEMENT		
B00702-DA-CE01	A	OVERALL EARTHWORKS LAYOUT PLAN
B00702-DA-CE02	A	EARTHWORKS DETAILED LAYOUT PLAN - SHEET 1 OF 4
B00702-DA-CE03	A	EARTHWORKS DETAILED LAYOUT PLAN - SHEET 2 OF 4
B00702-DA-CE04	A	EARTHWORKS DETAILED LAYOUT PLAN - SHEET 3 OF 4
B00702-DA-CE05	A	EARTHWORKS DETAILED LAYOUT PLAN - SHEET 4 OF 4
B00702-DA-CE06	A	EARTHWORKS - CROSS SECTIONS - SHEET 1 OF 2
B00702-DA-CE07	A	EARTHWORKS - CROSS SECTIONS - SHEET 2 OF 2
B00702-DA-RW01	A	RETAINING WALL - TYPICAL DETAILS - SHEET 1 OF 2
B00702-DA-RW02	A	RETAINING WALL - TYPICAL DETAILS - SHEET 2 OF 2
ROADWORKS		
B00702-DA-CR01	A	ROAD NETWORK LAYOUT
B00702-DA-CR02	A	ROAD NETWORK SECTIONS
B00702-DA-CR03	A	ROAD AND DRAINAGE PLAN - SHEET 1 OF 2
B00702-DA-CR04	A	ROAD AND DRAINAGE PLAN - SHEET 2 OF 2
B00702-DA-CR06	A	ENTRY ROAD INTERSECTION DETAIL
B00702-DA-CR07	A	ENTRY ROAD SECTIONS
B00702-DA-CR08	A	ROAD LONGITUDINAL SECTION - SHEET 1 OF 6
B00702-DA-CR09	A	ROAD LONGITUDINAL SECTION - SHEET 2 OF 6
B00702-DA-CR10	A	ROAD LONGITUDINAL SECTION - SHEET 3 OF 6
B00702-DA-CR11	A	ROAD LONGITUDINAL SECTION - SHEET 4 OF 6
B00702-DA-CR12	A	ROAD LONGITUDINAL SECTION - SHEET 5 OF 6
B00702-DA-CR13	A	ROAD LONGITUDINAL SECTION - SHEET 6 OF 6
STORMWATER DRAINAGE		
B00702-DA-SW01	A	PRE DEVELOPMENT CATCHMENT PLAN
B00702-DA-SW02	A	POST DEVELOPMENT CATCHMENT PLAN
B00702-DA-SW03	A	STORMWATER QUALITY CATCHMENT PLAN
BIORETENTION DETAILS		
B00702-DA-CB01	A	BIORETENTION BASIN A2 AND A3 LAYOUT PLAN
B00702-DA-CB02	A	BIORETENTION BASIN A2 AND A3 CROSS SECTIONS
B00702-DA-CB03	A	BIORETENTION BASIN B2 LAYOUT PLAN
B00702-DA-CB04	A	BIORETENTION BASIN B2 CROSS SECTIONS
TURN TEMPLATE		
B00702-DA-CT01	A	TURNING TEMPLATE - DESIGN VEHICLE 14.5M BUS - SHEET 1 OF 4
B00702-DA-CT02	A	TURNING TEMPLATE - DESIGN VEHICLE 14.5M BUS - SHEET 2 OF 4
B00702-DA-CT03	A	TURNING TEMPLATE - DESIGN VEHICLE 14.5M BUS - SHEET 3 OF 4
B00702-DA-CT04	A	TURNING TEMPLATE - DESIGN VEHICLE 14.5M BUS - SHEET 4 OF 4
B00702-DA-CT05	A	TURNING TEMPLATE - CHECK VEHICLE 19M SEMI TRUCK - SHEET 1 OF 2
B00702-DA-CT06	A	TURNING TEMPLATE - CHECK VEHICLE 19M SEMI TRUCK - SHEET 2 OF 2
B00702-DA-CT07	A	TURNING TEMPLATE - SERVICE VEHICLE 10.3M TRUCK - SHEET 1 OF 4
B00702-DA-CT08	A	TURNING TEMPLATE - SERVICE VEHICLE 10.3M TRUCK - SHEET 2 OF 4
B00702-DA-CT09	A	TURNING TEMPLATE - SERVICE VEHICLE 10.3M TRUCK - SHEET 3 OF 4
B00702-DA-CT10	A	TURNING TEMPLATE - SERVICE VEHICLE 10.3M TRUCK - SHEET 4 OF 4
B00702-DA-CT11	A	TURNING TEMPLATE - DESIGN VEHICLE 5.2M CAR
SEWERAGE RETICULATION		
B00702-DA-CS01	A	CONCEPT SEWER RETICULATION PLAN - SHEET 1 OF 2
B00702-DA-CS02	A	CONCEPT SEWER RETICULATION PLAN - SHEET 2 OF 2
WATER RETICULATION		
B00702-DA-CW01	A	CONCEPT WATER RETICULATION PLAN - SHEET 1 OF 2
-DA-CW02	A	CONCEPT WATER RETICULATION PLAN - SHEET 2 OF 2
ED SERVICES		
-DA-CM01	A	COMBINED SERVICES PLAN - SHEET 1 OF 2
-DA-CM02	A	COMBINED SERVICES PLAN - SHEET 2 OF 2
-DA-CM03	A	COMBINED SERVICES PLAN - TYPICAL DETAILS

AMENDED IN RED
By: **Tiana Hill**
Date: **5 August 2026**
Queensland Government

D M MM R
M R R D R C C R
C R CR RD R D D
R

M R R
C R R D D C C C

R R D CR
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R C D
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R R
M R
D M D
R R
R R R R C R
R D D CC D

REVISION: A DATE: 12/12/25

NOTE:
INDICATIVE STAGING ORDER SHOWN. ORDER MAY CHANGE DEPENDING ON TIMING OF EXTERNAL INFRASTRUCTURE REQUIREMENTS.

0 50 100 150 200 250m
50 37.5 25 12.5
SCALE 1:2500 (A1) 1:5000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

0 500 1000 1500 2000 2500m
500 375 250 125
SCALE 1:25000 (A1) 1:50000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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NOT FOR CONSTRUCTION

Project No. *Drawing No.*	*Rev*
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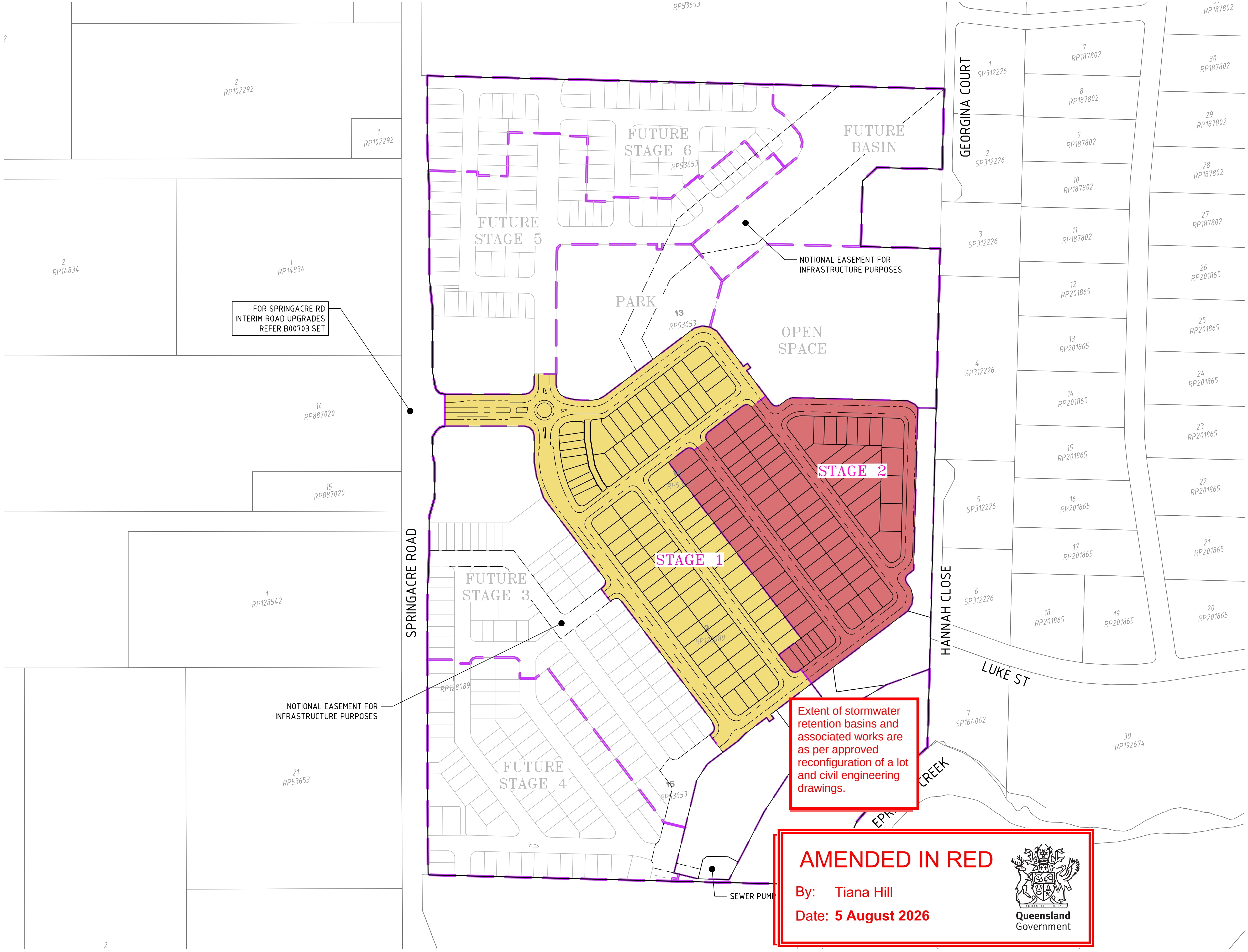
SPRINGACRE ROAD
GEORGINA COURT
HANNAH CLOSE
LUKE ST
CREEK
FUTURE STAGE 6
FUTURE STAGE 5
FUTURE BASIN
PARK
OPEN SPACE
STAGE 1
STAGE 2
FUTURE STAGE 3
FUTURE STAGE 4
FOR SPRINGACRE RD INTERIM ROAD UPGRADES REFER B00703 SET
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
SEWER PUMP
2 RP102292
1 RP102292
2 RP14834
1 RP14834
14 RP887020
15 RP887020
1 RP128542
21 RP53653
13 RP53653
16 RP53653
RP53653
RP128089
1 SP312226
2 SP312226
3 SP312226
4 SP312226
5 SP312226
6 SP312226
7 SP164062
39 RP192674
7 RP187802
8 RP187802
9 RP187802
10 RP187802
11 RP187802
12 RP201865
13 RP201865
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20 RP201865
21 RP201865
22 RP201865
23 RP201865
24 RP201865
25 RP201865
26 RP201865
27 RP187802
28 RP187802
29 RP187802
30 RP187802
RP187802

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED
By: Tiana Hill
Date: **5 August 2026**
Queensland Government

0 40 80 120 160 200m
40 30 20 10

SCALE 1:2000 (A1) 1:4000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

LEGEND

— — —	STAGE BOUNDARY
———	LOT BOUNDARY
———	EXISTING BOUNDARY
— · — · —	BARRIER TYPE 'B1' KERB AND CHANNEL
— — —	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
— — — —	EASEMENT
———	INDICATIVE FUTURE LOT BOUNDARY

TOTAL LOTS

🟨 STAGE 1	90
🟥 STAGE 2	79
TOTAL	169

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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **STAGING PLAN**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CG02	A

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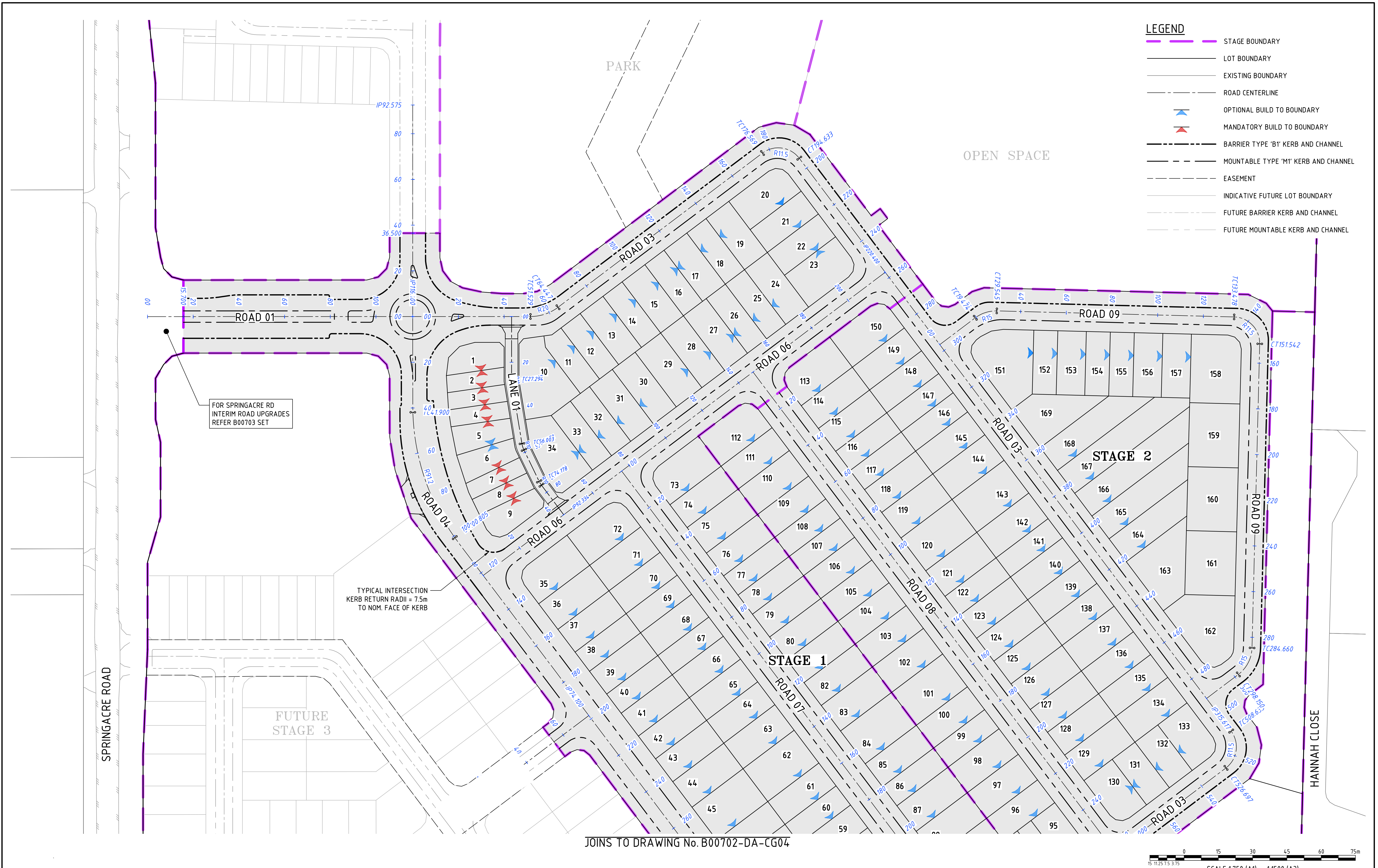
PARK
OPEN SPACE
SPRINGACRE ROAD
HANNAH CLOSE
ROAD 01
ROAD 03
ROAD 04
ROAD 06
ROAD 07
ROAD 08
ROAD 09
LANE 01
STAGE 1
STAGE 2
FUTURE STAGE 3
FOR SPRINGACRE RD INTERIM ROAD UPGRADES REFER B00703 SET
TYPICAL INTERSECTION KERB RETURN RADII = 7.5m TO NOM. FACE OF KERB
JOINS TO DRAWING No. B00702-DA-CG04
15 11.25 7.5 3.75
0
15
30
45
60
75m

LEGEND

▬ ▬ ▬	STAGE BOUNDARY
───	LOT BOUNDARY
───	EXISTING BOUNDARY
─ · ─ · ─	ROAD CENTERLINE
▲	OPTIONAL BUILD TO BOUNDARY
▲	MANDATORY BUILD TO BOUNDARY
─ · · ─	BARRIER TYPE 'B1' KERB AND CHANNEL
─ ─ ─	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
- - - -	EASEMENT
───	INDICATIVE FUTURE LOT BOUNDARY
─ · · ─	FUTURE BARRIER KERB AND CHANNEL
─ ─ ─	FUTURE MOUNTABLE KERB AND CHANNEL

SCALE 1:750 (A1) 1:1500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **GENERAL ARRANGEMENT PLAN**
SHEET 1 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

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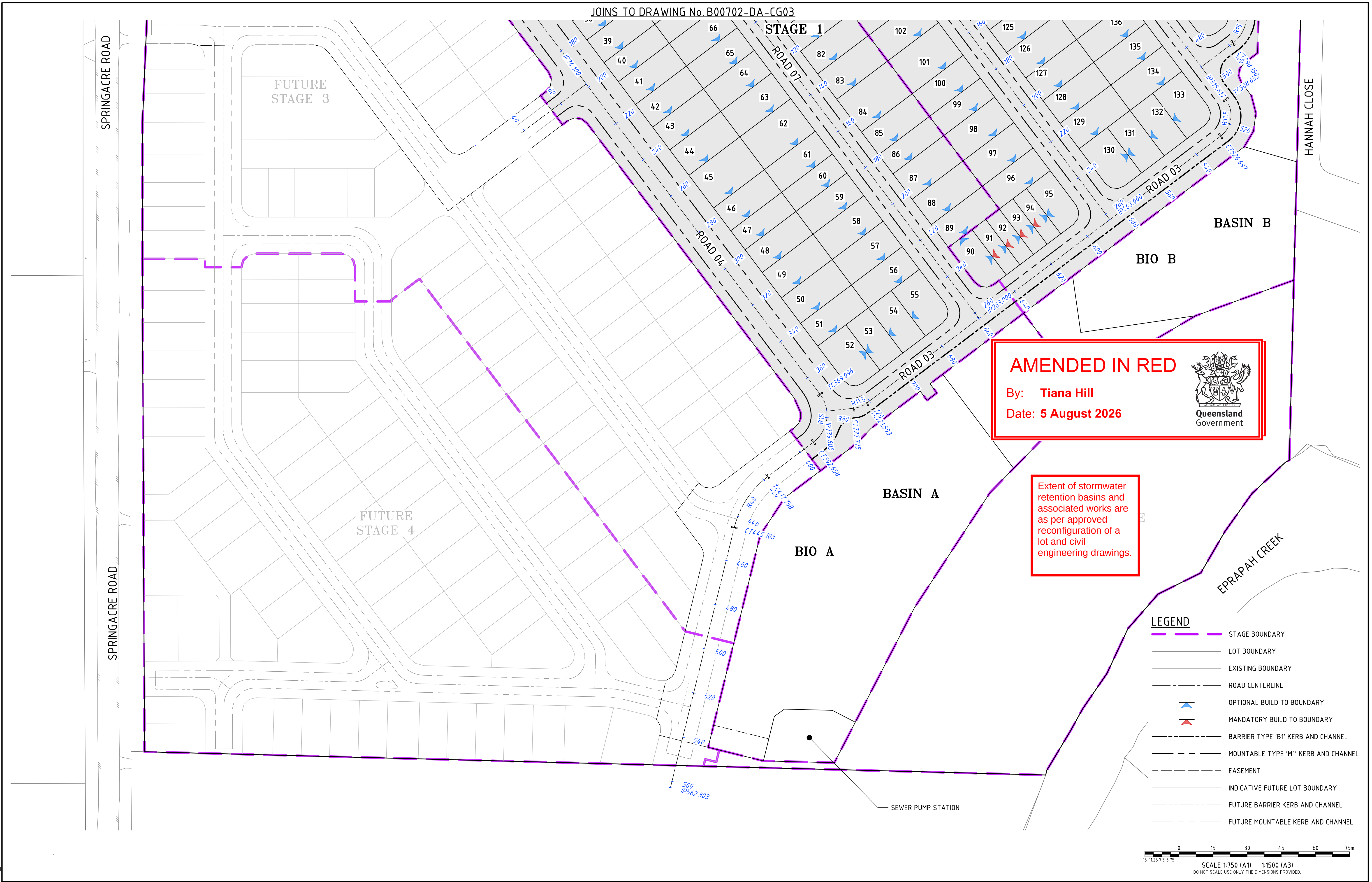
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STAGE 1
FUTURE STAGE 3
FUTURE STAGE 4
SPRINGACRE ROAD
SPRINGACRE ROAD
HANNAH CLOSE
ROAD 07
ROAD 04
ROAD 03
ROAD 03
BASIN A
BASIN B
BIO A
BIO B
EPRAPAH CREEK
SEWER PUMP STATION
39
40
41
42
43
44
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133
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135
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IP74.100
IP263.000
IP739.685
IP562.803
IP375.617
TC369.096
TC508.630
TC526.697
CT398.150
CT445.108
CT417.758
CT392.658
CT727.775
CT721.593
R115
R15
R40
560

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

LEGEND
- STAGE BOUNDARY
- LOT BOUNDARY
- EXISTING BOUNDARY
- ROAD CENTERLINE
- OPTIONAL BUILD TO BOUNDARY
- MANDATORY BUILD TO BOUNDARY
- BARRIER TYPE 'B1' KERB AND CHANNEL
- MOUNTABLE TYPE 'M1' KERB AND CHANNEL
- EASEMENT
- INDICATIVE FUTURE LOT BOUNDARY
- FUTURE BARRIER KERB AND CHANNEL
- FUTURE MOUNTABLE KERB AND CHANNEL

15 11.25 7.5 3.75 0 15 30 45 60 75m

SCALE 1:750 (A1) 1:1500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:25:39 PM User: WILLIAM GRIFFITH

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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **GENERAL ARRANGEMENT PLAN**
SHEET 2 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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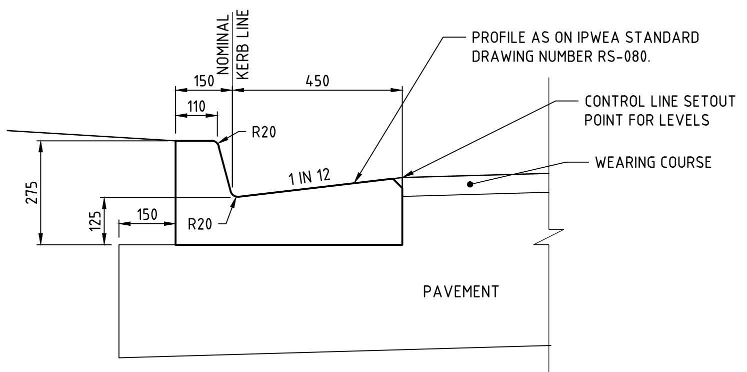
NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CG04**

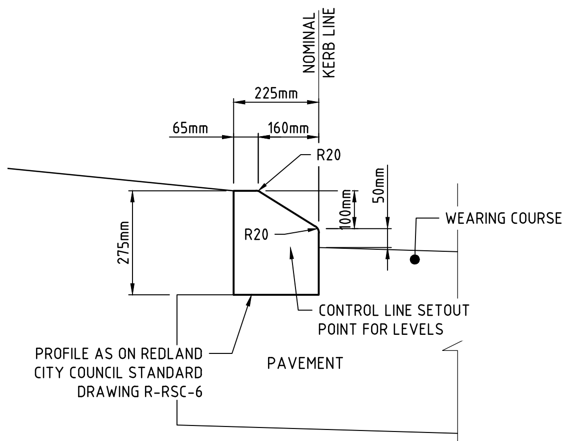
Rev **A**

" "


NOMINAL KERB LINE
150
110
450
PROFILE AS ON IPWEA STANDARD DRAWING NUMBER RS-080.
CONTROL LINE SETOUT POINT FOR LEVELS
WEARING COURSE
R20
1 IN 12
275
125
150
R20
PAVEMENT

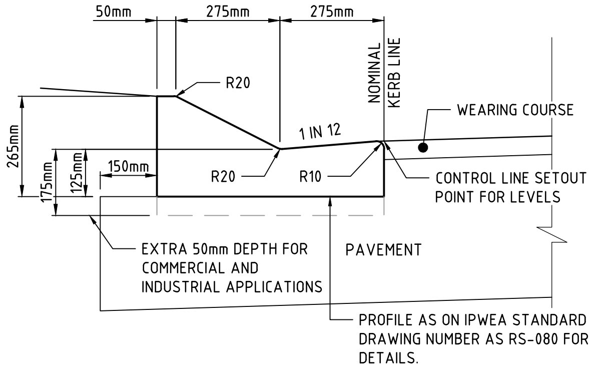
BARRIER TYPE B1 KERB AND CHANNEL

AS PER IPWEA STD DWG RS-080 (AS ADOPTED BY REDLAND CITY COUNCIL'S PS POLICY)
N.T.S.


NOMINAL KERB LINE
225mm
65mm
160mm
R20
100mm
50mm
WEARING COURSE
275mm
R20
CONTROL LINE SETOUT POINT FOR LEVELS
PROFILE AS ON REDLAND CITY COUNCIL STANDARD DRAWING R-RSC-6
PAVEMENT

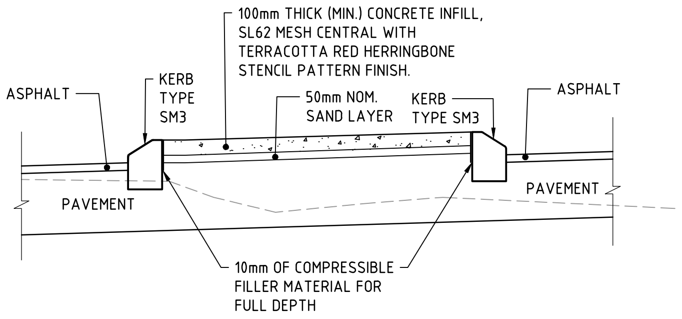
KERB TYPE SM3

SCALE 1:100 @ (A1)


50mm
275mm
275mm
NOMINAL KERB LINE
R20
WEARING COURSE
1 IN 12
265mm
175mm
125mm
150mm
R20
R10
CONTROL LINE SETOUT POINT FOR LEVELS
EXTRA 50mm DEPTH FOR COMMERCIAL AND INDUSTRIAL APPLICATIONS
PAVEMENT
PROFILE AS ON IPWEA STANDARD DRAWING NUMBER AS RS-080 FOR DETAILS.

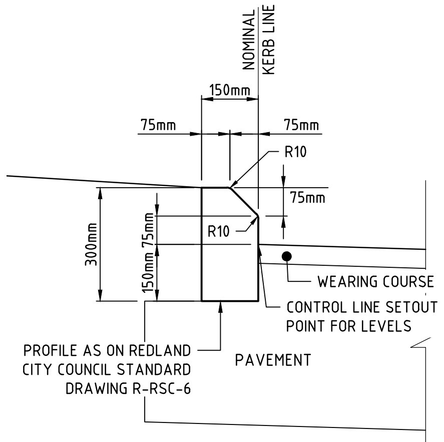
KERB AND CHANNEL TYPE M1

SCALE 1:100 @ (A1)


100mm THICK (MIN.) CONCRETE INFILL, SL62 MESH CENTRAL WITH TERRACOTTA RED HERRINGBONE STENCIL PATTERN FINISH.
ASPHALT
KERB TYPE SM3
50mm NOM. SAND LAYER
KERB TYPE SM3
ASPHALT
PAVEMENT
PAVEMENT
10mm OF COMPRESSIBLE FILLER MATERIAL FOR FULL DEPTH

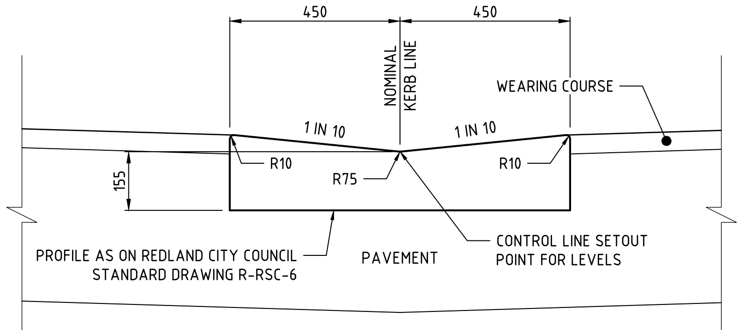
CONCRETE ISLAND DETAIL

N.T.S.


NOMINAL KERB LINE
150mm
75mm
75mm
R10
75mm
300mm
150mm
75mm
R10
WEARING COURSE
CONTROL LINE SETOUT POINT FOR LEVELS
PROFILE AS ON REDLAND CITY COUNCIL STANDARD DRAWING R-RSC-6
PAVEMENT

KERB TYPE SM2

SCALE 1:100 @ (A1)


450
450
NOMINAL KERB LINE
WEARING COURSE
1 IN 10
1 IN 10
R10
R75
R10
155
PROFILE AS ON REDLAND CITY COUNCIL STANDARD DRAWING R-RSC-6
PAVEMENT
CONTROL LINE SETOUT POINT FOR LEVELS

INVERT TYPE B1

SCALE 1:100 @ (A1)

0 2 4 6 8 10m
2.0 1.5 1.0 0.5
SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:26:08 PM User: WILLIAM GRIFFITH
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

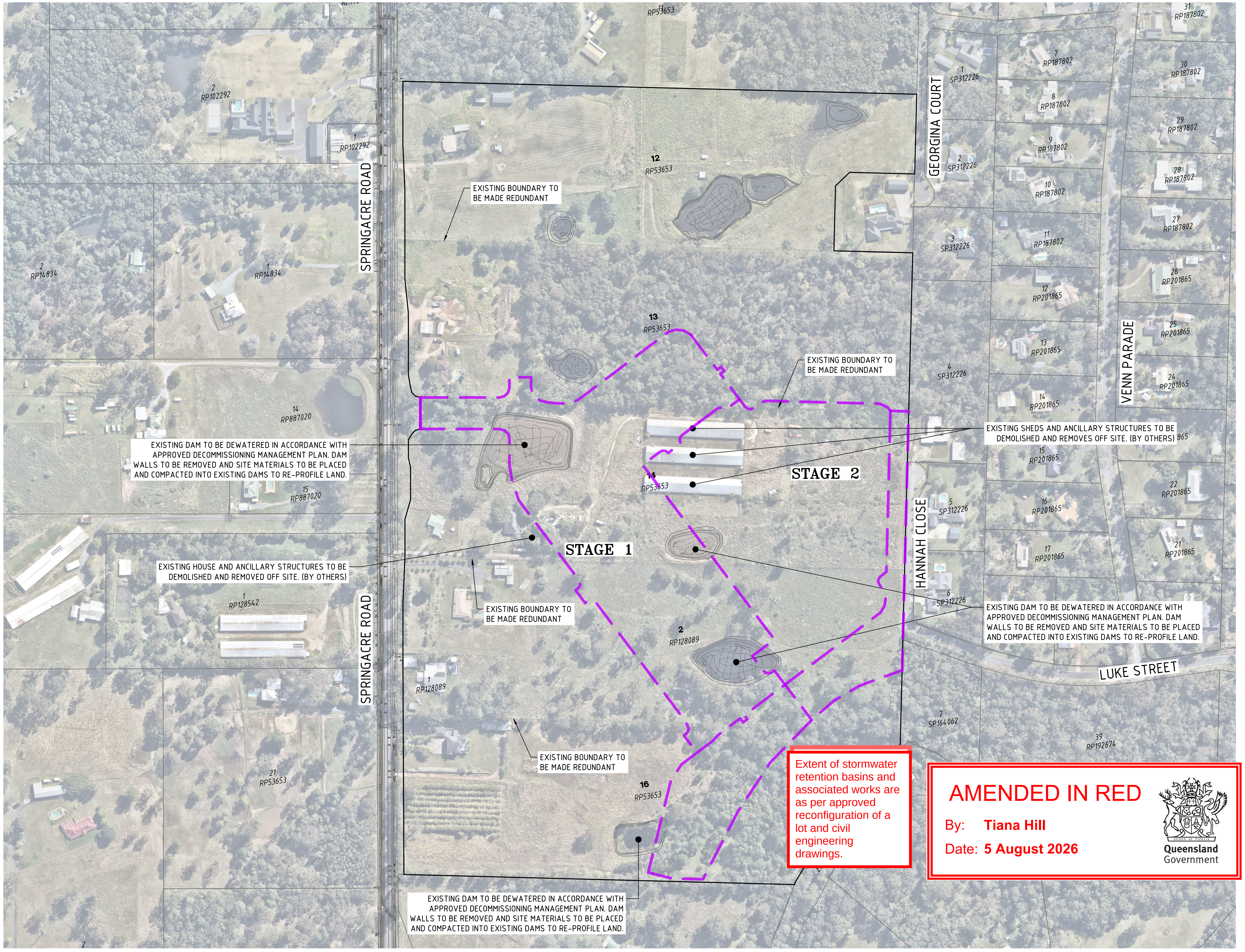
Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **TYPICAL DETAILS**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No. Rev
B00702-DA-CG05 **A**


SPRINGACRE ROAD
SPRINGACRE ROAD
GEORGINA COURT
VENN PARADE
HANNAH CLOSE
LUKE STREET
STAGE 1
STAGE 2
12 RP53653
13 RP53653
14 RP53653
16 RP53653
2 RP128089
1 RP128089
2 RP102292
1 RP102292
2 RP14834
1 RP14834
14 RP887020
15 RP887020
1 RP128542
21 RP53653
11 RP53653
1 SP312226
2 SP312226
3 SP312226
4 SP312226
5 SP312226
6 SP312226
7 SP164062
39 RP192674
7 RP187802
8 RP187802
9 RP187802
10 RP187802
11 RP187802
12 RP201865
13 RP201865
14 RP201865
15 RP201865
16 RP201865
17 RP201865
31 RP187802
30 RP187802
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28 RP187802
27 RP187802
26 RP201865
25 RP201865
24 RP201865
22 RP201865
21 RP201865
EXISTING BOUNDARY TO BE MADE REDUNDANT
EXISTING BOUNDARY TO BE MADE REDUNDANT
EXISTING BOUNDARY TO BE MADE REDUNDANT
EXISTING BOUNDARY TO BE MADE REDUNDANT
EXISTING DAM TO BE DEWATERED IN ACCORDANCE WITH APPROVED DECOMMISSIONING MANAGEMENT PLAN. DAM WALLS TO BE REMOVED AND SITE MATERIALS TO BE PLACED AND COMPACTED INTO EXISTING DAMS TO RE-PROFILE LAND.
EXISTING HOUSE AND ANCILLARY STRUCTURES TO BE DEMOLISHED AND REMOVED OFF SITE. (BY OTHERS)
EXISTING SHEDS AND ANCILLARY STRUCTURES TO BE DEMOLISHED AND REMOVES OFF SITE. (BY OTHERS)
EXISTING DAM TO BE DEWATERED IN ACCORDANCE WITH APPROVED DECOMMISSIONING MANAGEMENT PLAN. DAM WALLS TO BE REMOVED AND SITE MATERIALS TO BE PLACED AND COMPACTED INTO EXISTING DAMS TO RE-PROFILE LAND.
EXISTING DAM TO BE DEWATERED IN ACCORDANCE WITH APPROVED DECOMMISSIONING MANAGEMENT PLAN. DAM WALLS TO BE REMOVED AND SITE MATERIALS TO BE PLACED AND COMPACTED INTO EXISTING DAMS TO RE-PROFILE LAND.

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

AERIAL IMAGE SUPPLIED BY NEARMAP

LEGEND

- STAGE BOUNDARY
- EXISTING BOUNDARY
- REDUNDANT BOUNDARY
- PRECINCT 1 BOUNDARY

0 40 80 120 160 200m

40 30 20 10

SCALE 1:2000 (A1) 1:4000 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **EXISTING FEATURES LAYOUT PLAN**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-EF01**

Rev **A**

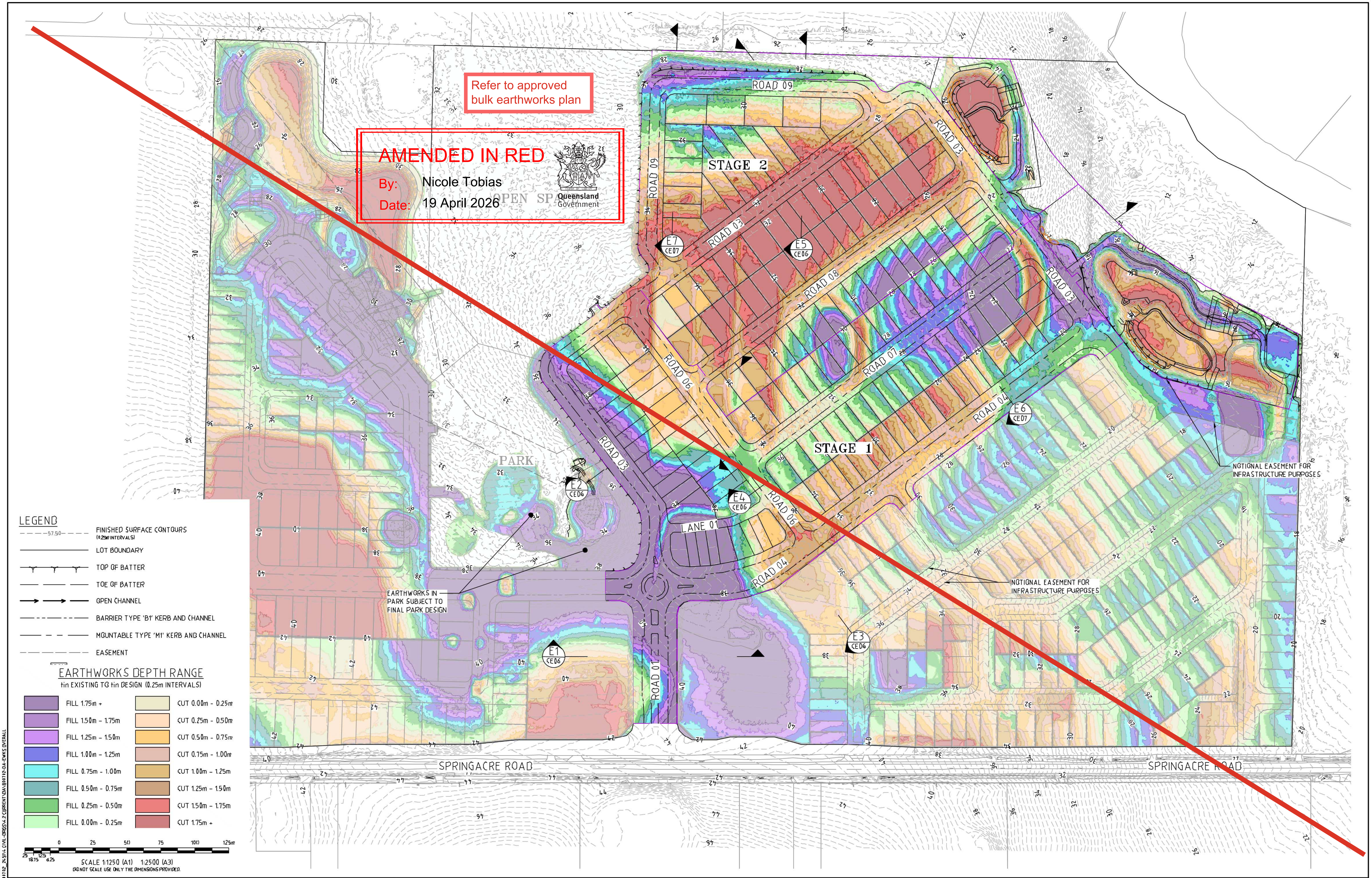
" "

Plot Date: 12/12/2025 12:26:28 PM User: WILLIAM GRIFFITH

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-EXF

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

Refer to approved bulk earthworks plan


ROAD 09
STAGE 2
ROAD 09
ROAD 03
ROAD 03
ROAD 08
ROAD 07
ROAD 06
ROAD 04
ROAD 03
STAGE 1
ROAD 03
ROAD 06
LANE 01
ROAD 04
ROAD 01
OPEN SP
PARK
E1 CE06
E2 CE06
E3 CE06
E4 CE06
E5 CE06
E6 CE07
E7 CE07
EARTHWORKS IN PARK SUBJECT TO FINAL PARK DESIGN
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
SPRINGACRE ROAD
SPRINGACRE ROAD

LEGEND

——57.50——	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
	LOT BOUNDARY
	TOP OF BATTER
	TOE OF BATTER
	OPEN CHANNEL
	BARRIER TYPE 'B1' KERB AND CHANNEL
	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
	EASEMENT

EARTHWORKS DEPTH RANGE

tin EXISTING TO tin DESIGN (0.25m INTERVALS)

▨	FILL 1.75m +	▨	CUT 0.00m - 0.25m
▨	FILL 1.50m - 1.75m	▨	CUT 0.25m - 0.50m
▨	FILL 1.25m - 1.50m	▨	CUT 0.50m - 0.75m
▨	FILL 1.00m - 1.25m	▨	CUT 0.75m - 1.00m
▨	FILL 0.75m - 1.00m	▨	CUT 1.00m - 1.25m
▨	FILL 0.50m - 0.75m	▨	CUT 1.25m - 1.50m
▨	FILL 0.25m - 0.50m	▨	CUT 1.50m - 1.75m
▨	FILL 0.00m - 0.25m	▨	CUT 1.75m +

0 25 50 75 100 125m
25 18.75 12.5 6.25

SCALE 1:1250 (A1) 1:2500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: WILLIAN GRIFFITH
Plot Date: 12/12/2025 1:14:26 PM
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client URBEX PTY LTD
Project SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL
Title EARTHWORKS OVERALL LAYOUT PLAN

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

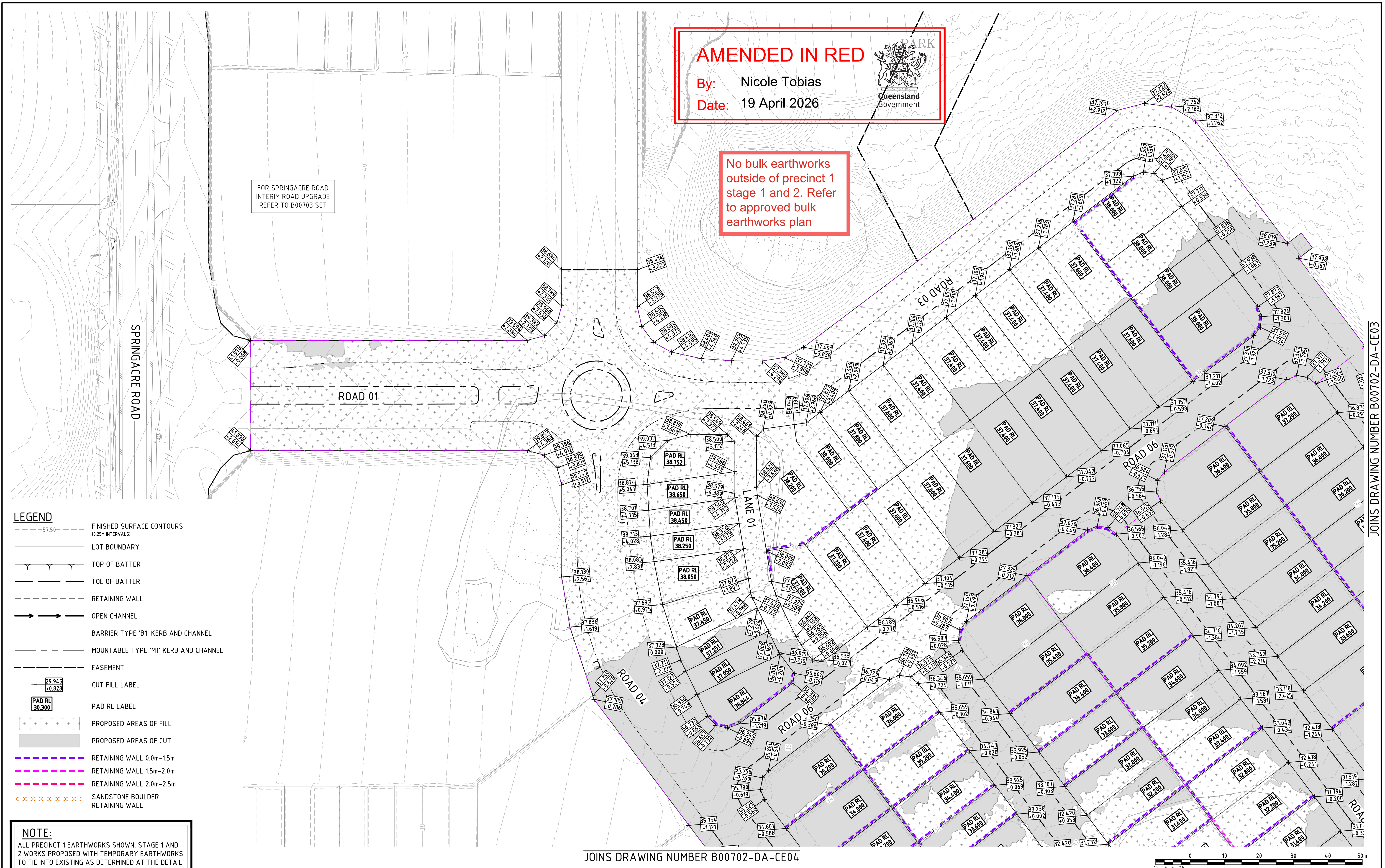
NOT FOR CONSTRUCTION

Project No. Drawing No. B00702-DA-CE01
Rev A

" "

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026

No bulk earthworks outside of precinct 1 stage 1 and 2. Refer to approved bulk earthworks plan


SPRINGACRE ROAD
ROAD 01
ROAD 03
ROAD 04
ROAD 06
LANE 01
JOINS DRAWING NUMBER B00702-DA-CE03
JOINS DRAWING NUMBER B00702-DA-CE04
PAD RL 38.752
PAD RL 38.650
PAD RL 38.450
PAD RL 38.250
PAD RL 38.050
0 10 20 30 40 50m
10 7.5 5 2.5

FOR SPRINGACRE ROAD
INTERIM ROAD UPGRADE
REFER TO B00703 SET

LEGEND

- FINISHED SURFACE CONTOURS (0.25m INTERVALS) — 57.50
- LOT BOUNDARY
- TOP OF BATTER
- TOE OF BATTER
- RETAINING WALL
- OPEN CHANNEL
- BARRIER TYPE 'B1' KERB AND CHANNEL
- MOUNTABLE TYPE 'M1' KERB AND CHANNEL
- EASEMENT
- CUT FILL LABEL — 29.945 +0.828
- PAD RL LABEL — PAD RL 30.300
- PROPOSED AREAS OF FILL
- PROPOSED AREAS OF CUT
- RETAINING WALL 0.0m-1.5m
- RETAINING WALL 1.5m-2.0m
- RETAINING WALL 2.0m-2.5m
- SANDSTONE BOULDER RETAINING WALL

NOTE:

ALL PRECINCT 1 EARTHWORKS SHOWN. STAGE 1 AND 2 WORKS PROPOSED WITH TEMPORARY EARTHWORKS TO TIE INTO EXISTING AS DETERMINED AT THE DETAIL DESIGN PHASE OF THE PROJECT

SCALE 1:500 (A1) 1:1000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **EARTHWORKS DETAILED LAYOUT PLAN**
SHEET 1 OF 4

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CE02** Rev **A**

" "

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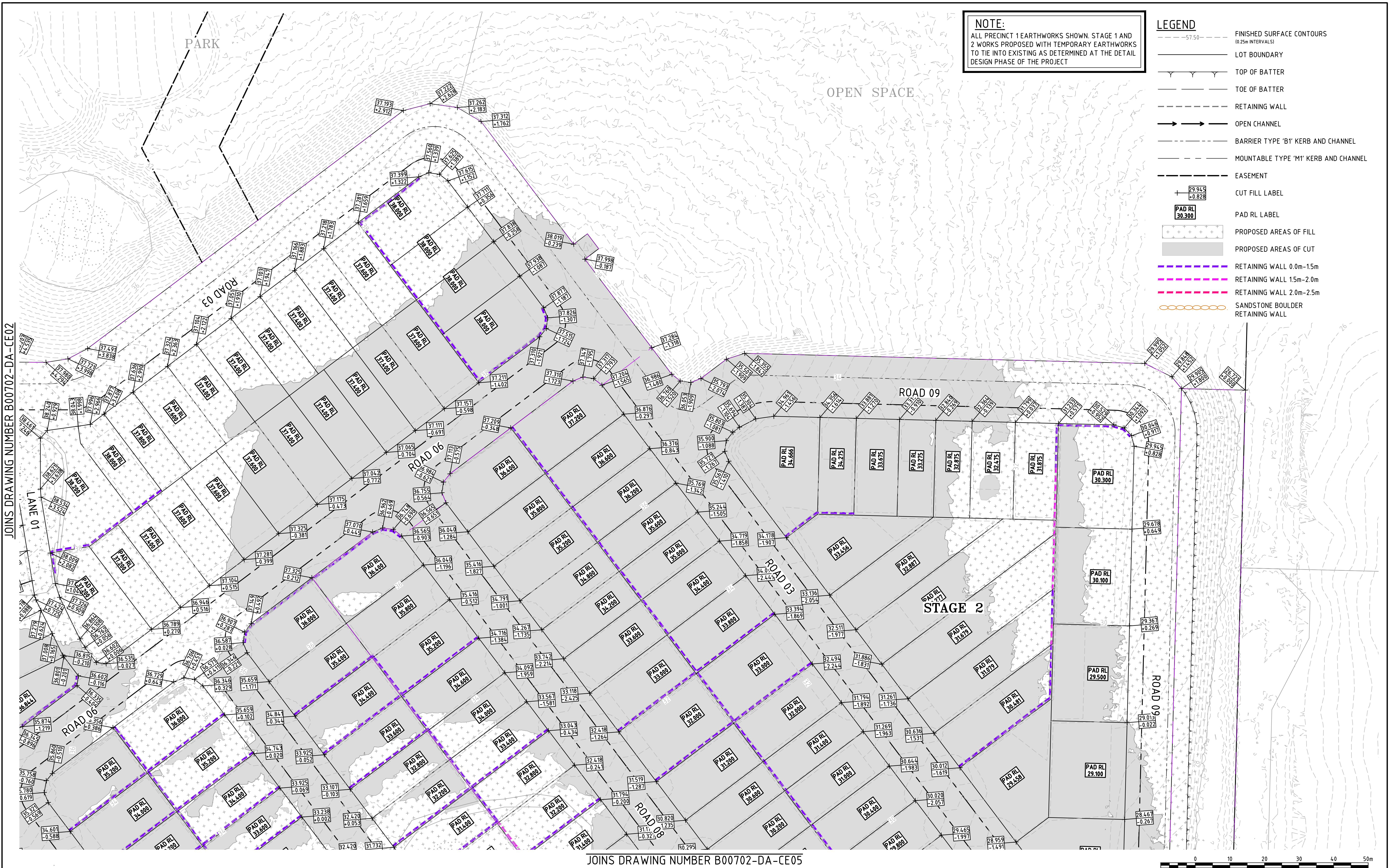

PARK
OPEN SPACE
ROAD 03
ROAD 06
ROAD 08
ROAD 09
LANE 01
STAGE 2
JOINS DRAWING NUMBER B00702-DA-CE02
JOINS DRAWING NUMBER B00702-DA-CE05
PAD RL 38.000
PAD RL 37.800
PAD RL 37.600
PAD RL 37.400
PAD RL 37.200
PAD RL 36.400
PAD RL 36.000
PAD RL 35.200
PAD RL 34.666
PAD RL 34.275
PAD RL 33.675
PAD RL 33.275
PAD RL 32.875
PAD RL 32.475
PAD RL 31.875
PAD RL 30.300
PAD RL 30.100
PAD RL 29.500
PAD RL 29.100
PAD RL 29.458
PAD RL 30.481
PAD RL 31.079
PAD RL 31.679
PAD RL 32.887
PAD RL 33.456

NOTE:

ALL PRECINCT 1 EARTHWORKS SHOWN. STAGE 1 AND 2 WORKS PROPOSED WITH TEMPORARY EARTHWORKS TO TIE INTO EXISTING AS DETERMINED AT THE DETAIL DESIGN PHASE OF THE PROJECT

LEGEND

57.50	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
——	LOT BOUNDARY
⊤ ⊤ ⊤	TOP OF BATTER
——	TOE OF BATTER
– – –	RETAINING WALL
→ →	OPEN CHANNEL
– · –	BARRIER TYPE 'B1' KERB AND CHANNEL
– –	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
— —	EASEMENT
29.945 +0.828	CUT FILL LABEL
PAD RL 30.300	PAD RL LABEL
▨	PROPOSED AREAS OF FILL
▩	PROPOSED AREAS OF CUT
- - -	RETAINING WALL 0.0m-1.5m
- - -	RETAINING WALL 1.5m-2.0m
- - -	RETAINING WALL 2.0m-2.5m
○○○○○○	SANDSTONE BOULDER RETAINING WALL

0 10 20 30 40 50m
10 7.5 5 2.5

SCALE 1:500 (A1) 1:1000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: WILLIAM GRIFFITH
Plot Date: 12/12/2025 12:28:36 PM
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-EWKS HATCHING

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **EARTHWORKS DETAILED LAYOUT PLAN**
SHEET 2 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CE03	A

" "

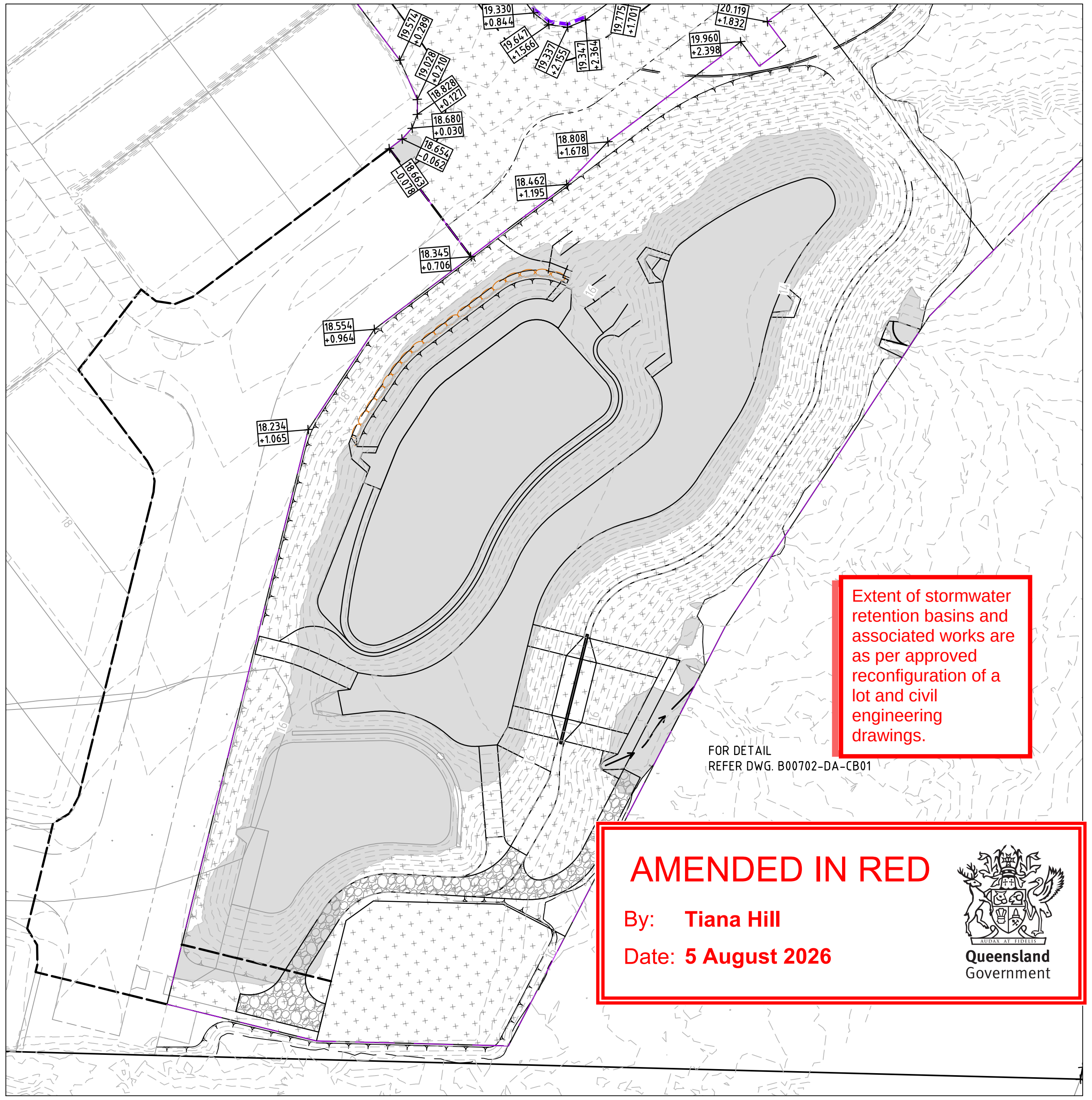
LEGEND

– – –57.50– – –	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
———	LOT BOUNDARY
⊤ ⊤ ⊤	TOP OF BATTER
— — —	TOE OF BATTER
- - - - -	RETAINING WALL
→ → —	OPEN CHANNEL
— · — · —	BARRIER TYPE 'B1' KERB AND CHANNEL
— — —	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
— — —	EASEMENT
+ 29.945 / +0.828	CUT FILL LABEL
PAD RL 30.300	PAD RL LABEL

▨	PROPOSED AREAS OF FILL
▩	PROPOSED AREAS OF CUT
- - - -	RETAINING WALL 0.0m-1.5m
- - - -	RETAINING WALL 1.5m-2.0m
- - - -	RETAINING WALL 2.0m-2.5m
○○○○○○○	SANDSTONE BOULDER RETAINING WALL

NOTE:

ALL PRECINCT 1 EARTHWORKS SHOWN. STAGE 1 AND 2 WORKS PROPOSED WITH TEMPORARY EARTHWORKS TO TIE INTO EXISTING AS DETERMINED AT THE DETAIL DESIGN PHASE OF THE PROJECT


FOR DETAIL
REFER DWG. B00702-DA-CB01
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18.234 +1.065
18.345 +0.706
18.462 +1.195
18.808 +1.678
19.330 +0.844
19.960 +2.398
20.119 +1.832

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

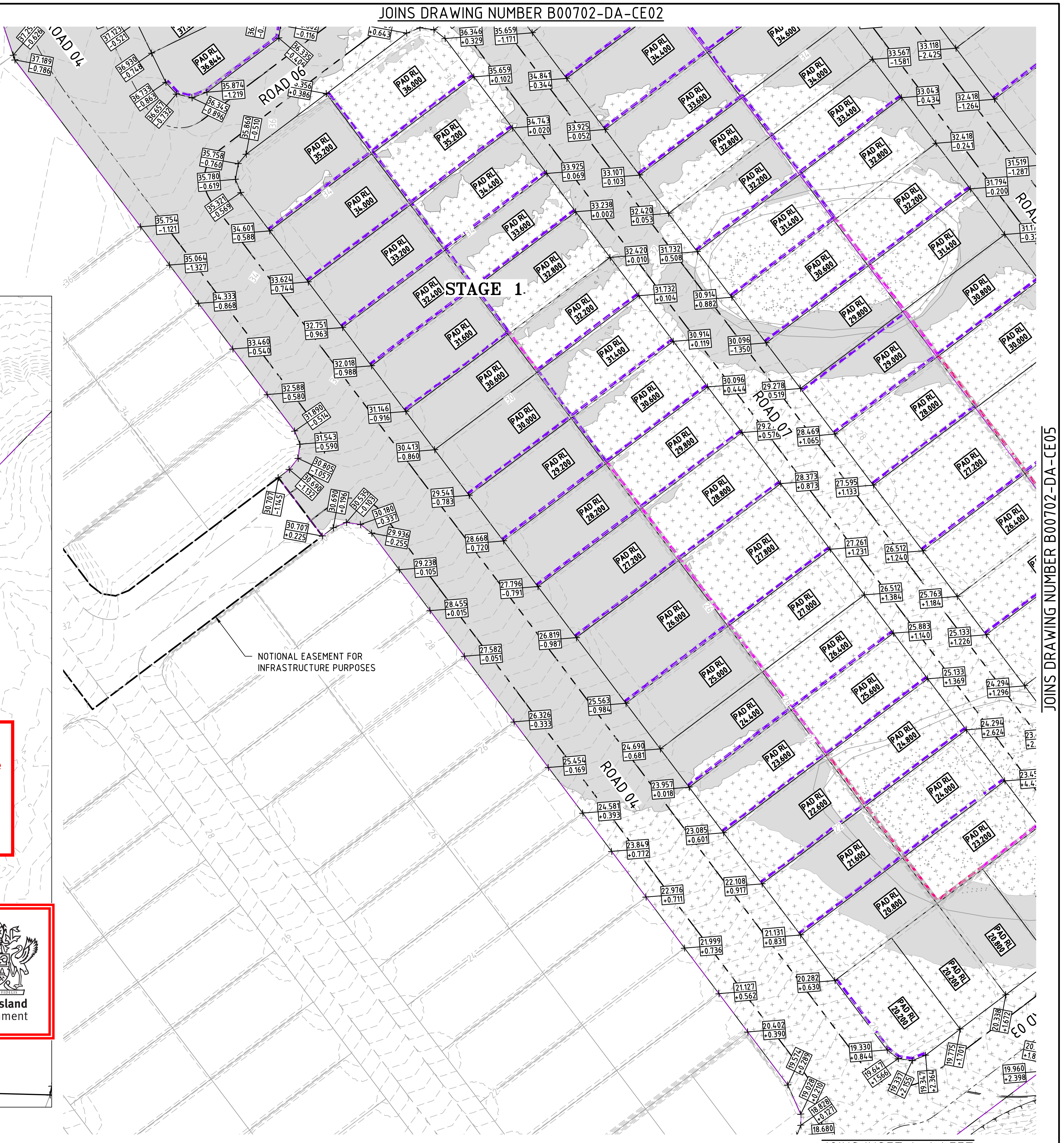
INSET A-A

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government


JOINS DRAWING NUMBER B00702-DA-CE02
JOINS DRAWING NUMBER B00702-DA-CE05
JOINS INSET A-A LEFT
ROAD 04
ROAD 06
ROAD 07
STAGE 1
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
PAD RL 36.000
PAD RL 35.200
PAD RL 34.400
PAD RL 34.000
PAD RL 33.600
PAD RL 33.200
PAD RL 32.800
PAD RL 32.400
PAD RL 32.200
PAD RL 31.600
PAD RL 31.400
PAD RL 30.600
PAD RL 30.000
PAD RL 29.800
PAD RL 29.200
PAD RL 28.800
PAD RL 28.200
PAD RL 27.800
PAD RL 27.200
PAD RL 27.000
PAD RL 26.400
PAD RL 26.000
PAD RL 25.600
PAD RL 25.000
PAD RL 24.800
PAD RL 24.400
PAD RL 24.000
PAD RL 23.800
PAD RL 23.200
PAD RL 22.600
PAD RL 21.600
PAD RL 20.800
18.680

0 10 20 30 40 50m
10 7.5 5 2.5

SCALE 1:500 (A1) 1:1000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **EARTHWORKS DETAILED LAYOUT PLAN**
SHEET 3 OF 4

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CE04**

Rev **A**

" "

Plot Date: 12/12/2025 12:29:00 PM User: WILLIAM GRIFFITH
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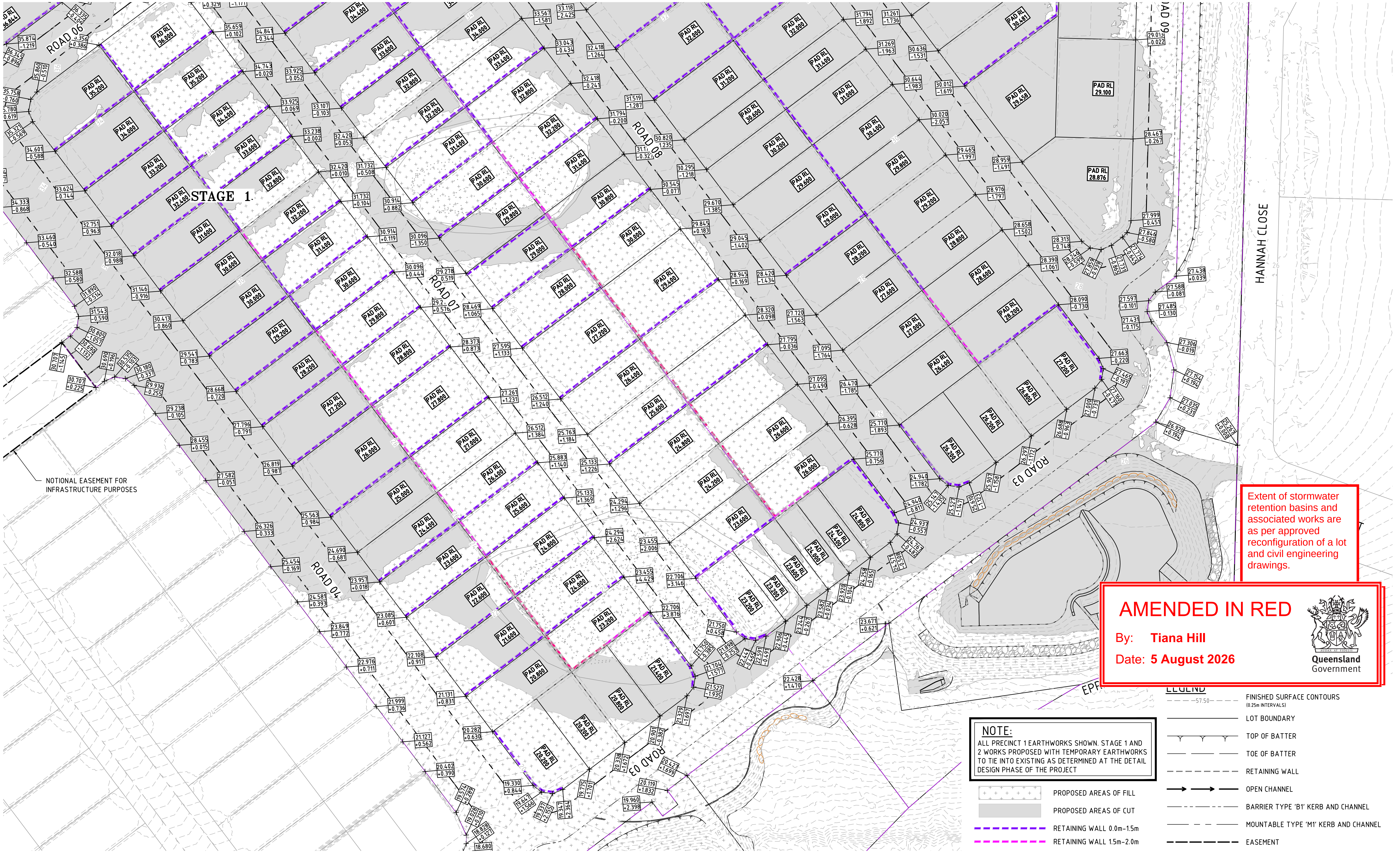
JOINS DRAWING NUMBER B00702-DA-CE03

JOINS DRAWING NUMBER B00702-DA-CE04



JOINS INSET A-A B00702-DA-CE04

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: Tiana Hill

Date: 5 August 2026

Queensland Government

NOTE:

ALL PRECINCT 1 EARTHWORKS SHOWN. STAGE 1 AND 2 WORKS PROPOSED WITH TEMPORARY EARTHWORKS TO TIE INTO EXISTING AS DETERMINED AT THE DETAIL DESIGN PHASE OF THE PROJECT

LEGEND

▨	PROPOSED AREAS OF FILL
▨	PROPOSED AREAS OF CUT
— — — —	RETAINING WALL 0.0m-1.5m
— — — —	RETAINING WALL 1.5m-2.0m
— — — —	RETAINING WALL 2.0m-2.5m
○○○○○○○○	SANDSTONE BOULDER RETAINING WALL
— — —57.50— — —	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
———	LOT BOUNDARY
‒Y‒Y‒Y‒	TOP OF BATTER
— — —	TOE OF BATTER
— — — —	RETAINING WALL
→ → —	OPEN CHANNEL
— - - — - - —	BARRIER TYPE 'B1' KERB AND CHANNEL
— - - —	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
— — — —	EASEMENT
29.945 +0.828	CUT FILL LABEL
PAD RL 30.300	PAD RL LABEL

0 10 20 30 40 50m

10 7.5 5 2.5

SCALE 1:500 (A1) 1:1000 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: WILLIAM GRIFFITH

Plot Date: 12/12/2025 12:29:16 PM

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-EWKS HATCHING

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **EARTHWORKS DETAILED LAYOUT PLAN**
SHEET 4 OF 4

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

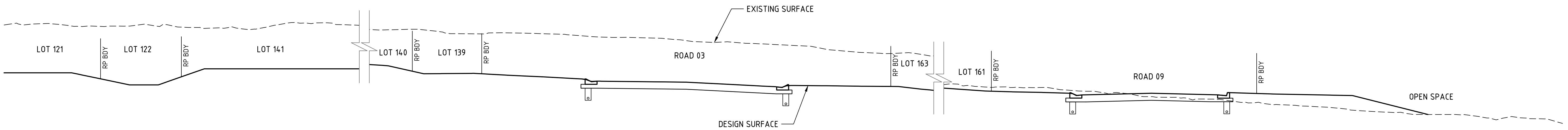
N

NOT FOR CONSTRUCTION

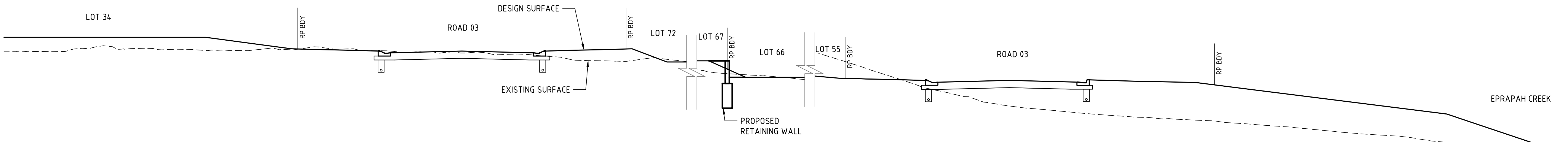
Project No. Drawing No. **B00702-DA-CE05**

Rev **A**

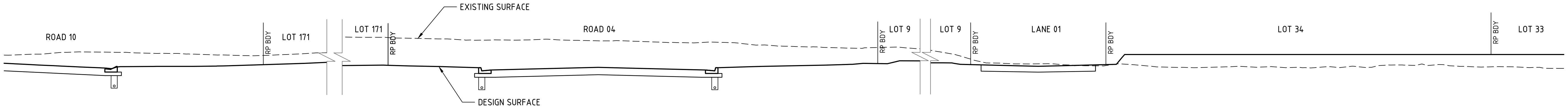
" "


EXISTING SURFACE
LOT 121
RP BDY
LOT 122
RP BDY
LOT 141
LOT 140
RP BDY
LOT 139
RP BDY
ROAD 03
RP BDY
LOT 163
LOT 161
RP BDY
ROAD 09
RP BDY
OPEN SPACE
DESIGN SURFACE

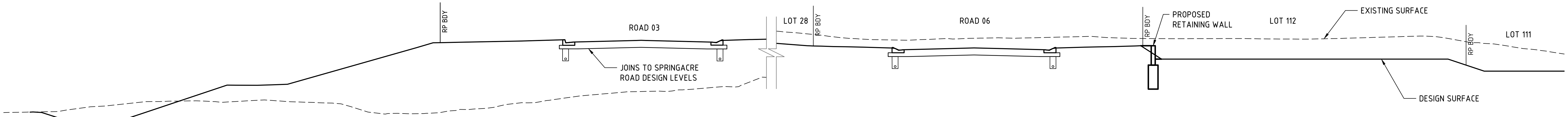
E5 CE01 SECTION
SCALE 1:100


LOT 34
RP BDY
DESIGN SURFACE
ROAD 03
RP BDY
LOT 72
LOT 67
RP BDY
LOT 66
LOT 55
RP BDY
ROAD 03
RP BDY
EPRAPAH CREEK
EXISTING SURFACE
PROPOSED
RETAINING WALL

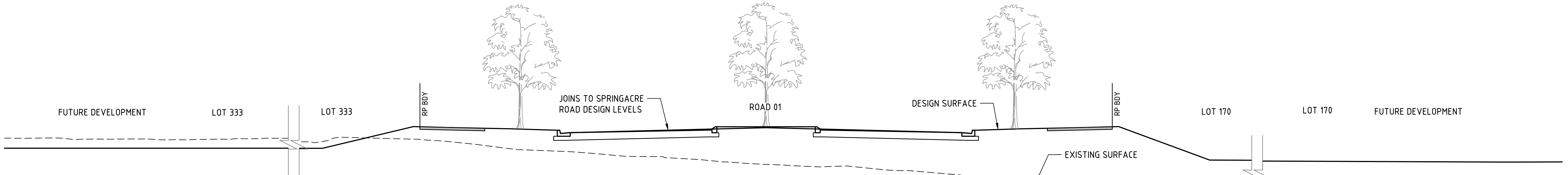
E4 CE01 SECTION
SCALE 1:100


EXISTING SURFACE
ROAD 10
RP BDY
LOT 171
LOT 171
RP BDY
ROAD 04
RP BDY
LOT 9
LOT 9
RP BDY
LANE 01
RP BDY
LOT 34
RP BDY
LOT 33
DESIGN SURFACE

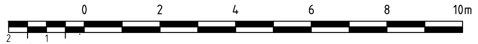
E3 CE01 SECTION
SCALE 1:100


RP BDY
ROAD 03
JOINS TO SPRINGACRE
ROAD DESIGN LEVELS
LOT 28
RP BDY
ROAD 06
RP BDY
PROPOSED
RETAINING WALL
LOT 112
EXISTING SURFACE
RP BDY
LOT 111
DESIGN SURFACE

E2 CE01 SECTION
SCALE 1:100


FUTURE DEVELOPMENT
LOT 333
LOT 333
RP BDY
JOINS TO SPRINGACRE
ROAD DESIGN LEVELS
ROAD 01
DESIGN SURFACE
RP BDY
LOT 170
LOT 170
FUTURE DEVELOPMENT
EXISTING SURFACE

E1 CE01 SECTION
SCALE 1:100


0
2
4
6
8
10m
2
1.5
1
0.5

SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25
No.	*Amendments*	*Drawn*	*Design*	*Design Chk*	*Appd*	*Date*

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

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URBEX

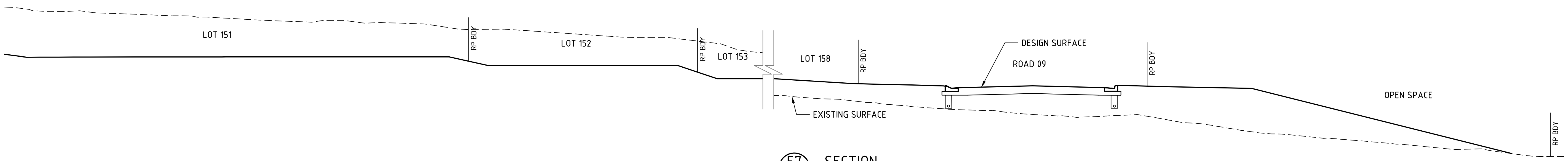
EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **EARTHWORKS CROSS SECTIONS**
SHEET 1 OF 2

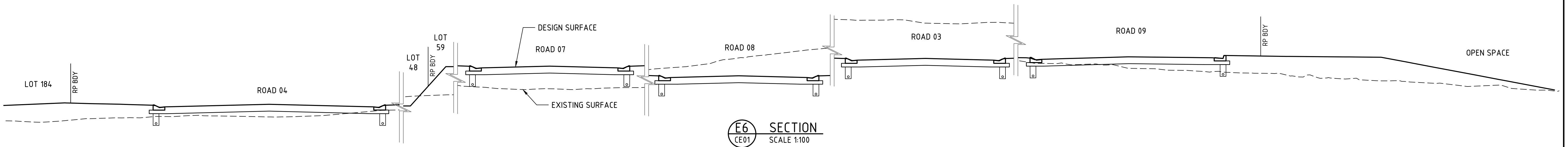
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

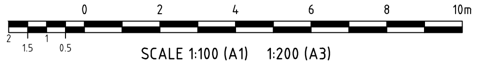
Project No.	*Drawing No.*	*Rev*
B00702-DA-CE06		**A**


LOT 151
RP BDY
LOT 152
RP BDY
LOT 153
LOT 158
RP BDY
DESIGN SURFACE
ROAD 09
RP BDY
OPEN SPACE
RP BDY
EXISTING SURFACE

E7
CE01
SECTION
SCALE 1:100


LOT 184
RP BDY
ROAD 04
LOT 48
RP BDY
LOT 59
DESIGN SURFACE
ROAD 07
EXISTING SURFACE
ROAD 08
ROAD 03
ROAD 09
RP BDY
OPEN SPACE

E6
CE01
SECTION
SCALE 1:100


0
2
4
6
8
10m
2
1.5
1
0.5

SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

Client
URBEX PTY LTD
Project
SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL
Title
EARTHWORKS CROSS SECTIONS
SHEET 2 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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Project No.	Drawing No.	Rev
	B00702-DA-CE07	**A**

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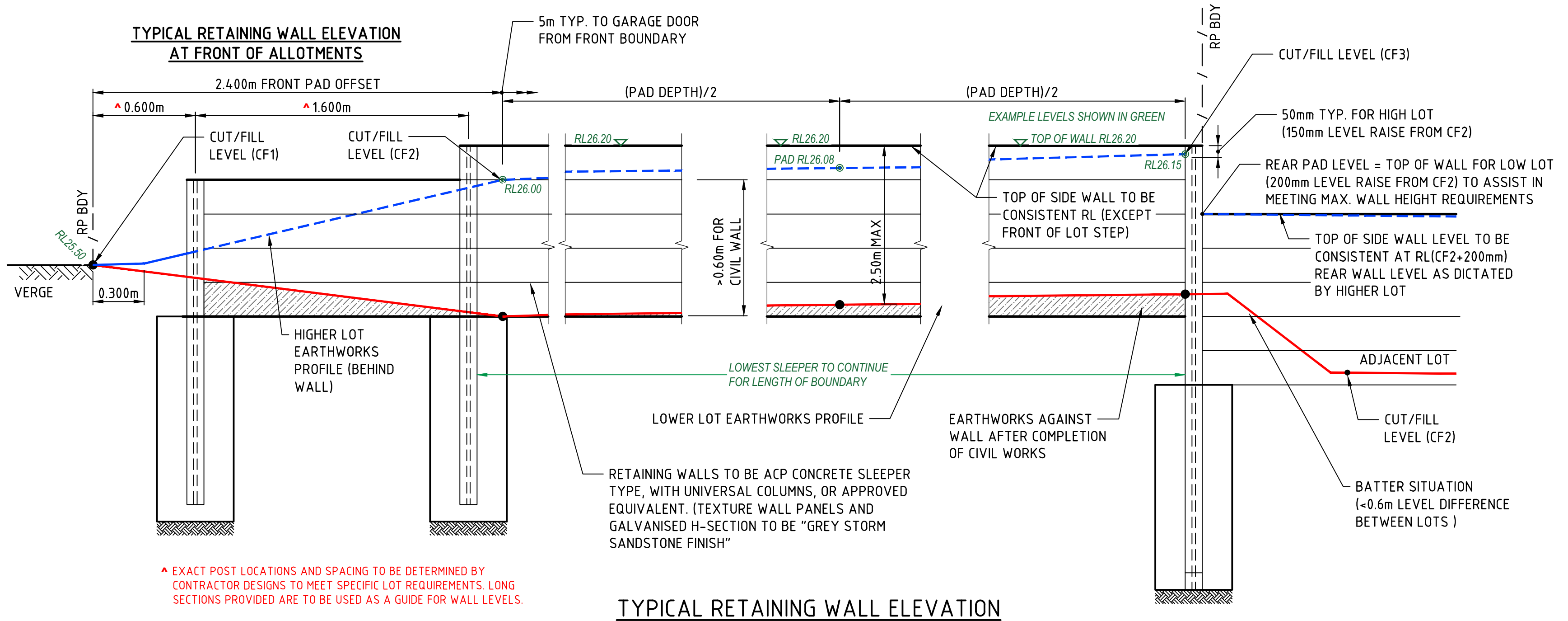
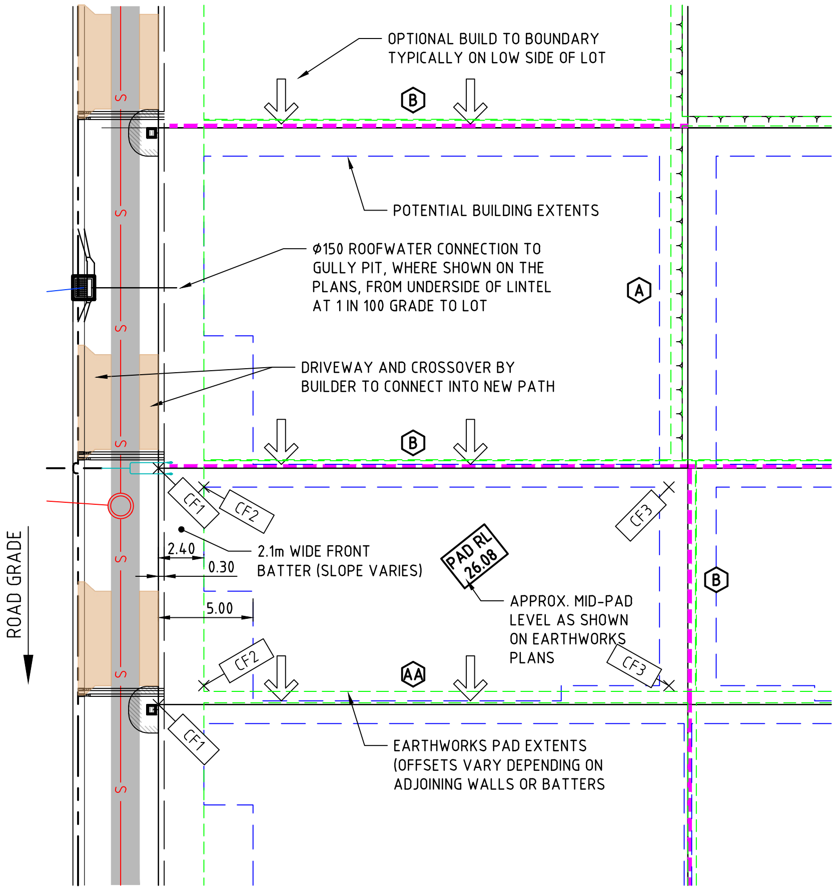
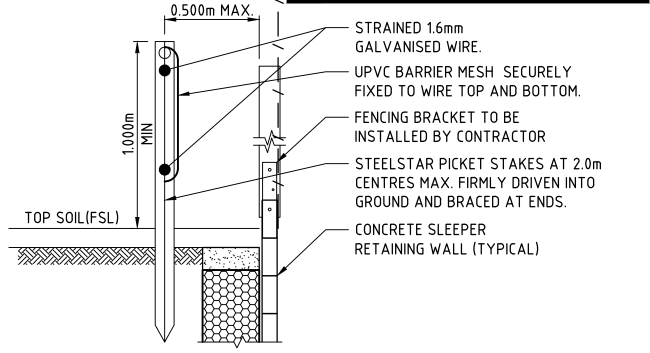

TYPICAL RETAINING WALL ELEVATION
AT FRONT OF ALLOTMENTS
2.400m FRONT PAD OFFSET
^0.600m
^1.600m
5m TYP. TO GARAGE DOOR FROM FRONT BOUNDARY
(PAD DEPTH)/2
(PAD DEPTH)/2
RP BDY
CUT/FILL LEVEL (CF1)
CUT/FILL LEVEL (CF2)
RL25.50
VERGE
0.300m
RL26.00
RL26.20
RL26.20
PAD RL26.08
EXAMPLE LEVELS SHOWN IN GREEN
TOP OF WALL RL26.20
RL26.15
>0.60m FOR CIVIL WALL
2.50m MAX
CUT/FILL LEVEL (CF3)
50mm TYP. FOR HIGH LOT (150mm LEVEL RAISE FROM CF2)
REAR PAD LEVEL = TOP OF WALL FOR LOW LOT (200mm LEVEL RAISE FROM CF2) TO ASSIST IN MEETING MAX. WALL HEIGHT REQUIREMENTS
TOP OF SIDE WALL TO BE CONSISTENT RL (EXCEPT FRONT OF LOT STEP)
TOP OF SIDE WALL LEVEL TO BE CONSISTENT AT RL(CF2+200mm) REAR WALL LEVEL AS DICTATED BY HIGHER LOT
ADJACENT LOT
HIGHER LOT EARTHWORKS PROFILE (BEHIND WALL)
LOWEST SLEEPER TO CONTINUE FOR LENGTH OF BOUNDARY
LOWER LOT EARTHWORKS PROFILE
EARTHWORKS AGAINST WALL AFTER COMPLETION OF CIVIL WORKS
CUT/FILL LEVEL (CF2)
RETAINING WALLS TO BE ACP CONCRETE SLEEPER TYPE, WITH UNIVERSAL COLUMNS, OR APPROVED EQUIVALENT. (TEXTURE WALL PANELS AND GALVANISED H-SECTION TO BE "GREY STORM SANDSTONE FINISH"
BATTER SITUATION (<0.6m LEVEL DIFFERENCE BETWEEN LOTS)
^ EXACT POST LOCATIONS AND SPACING TO BE DETERMINED BY CONTRACTOR DESIGNS TO MEET SPECIFIC LOT REQUIREMENTS. LONG SECTIONS PROVIDED ARE TO BE USED AS A GUIDE FOR WALL LEVELS.

TYPICAL RETAINING WALL ELEVATION
INTER-ALLOTMENT SIDE WALLS

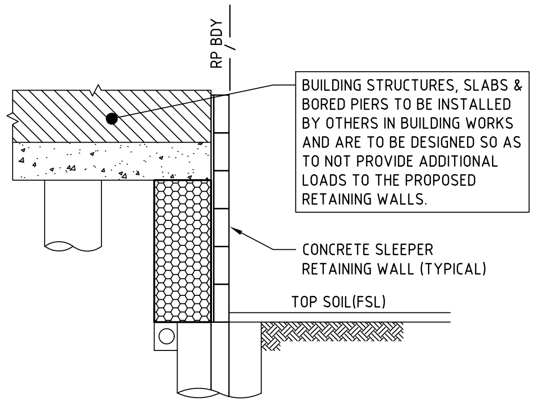

OPTIONAL BUILD TO BOUNDARY TYPICALLY ON LOW SIDE OF LOT
B
POTENTIAL BUILDING EXTENTS
Ø150 ROOFWATER CONNECTION TO GULLY PIT, WHERE SHOWN ON THE PLANS, FROM UNDERSIDE OF LINTEL AT 1 IN 100 GRADE TO LOT
A
DRIVEWAY AND CROSSOVER BY BUILDER TO CONNECT INTO NEW PATH
B
CF1
CF2
CF3
2.40
0.30
2.1m WIDE FRONT BATTER (SLOPE VARIES)
PAD RL 26.08
B
5.00
APPROX. MID-PAD LEVEL AS SHOWN ON EARTHWORKS PLANS
ROAD GRADE
CF2
AA
CF3
CF1
EARTHWORKS PAD EXTENTS (OFFSETS VARY DEPENDING ON ADJOINING WALLS OR BATTERS

TYPICAL EARTHWORKS PAD SETOUT

NOTE:-
INSTALL TEMPORARY SAFETY FENCING AT THE TOP OF ALL RETAINING WALLS GREATER THAN 1m HIGH.

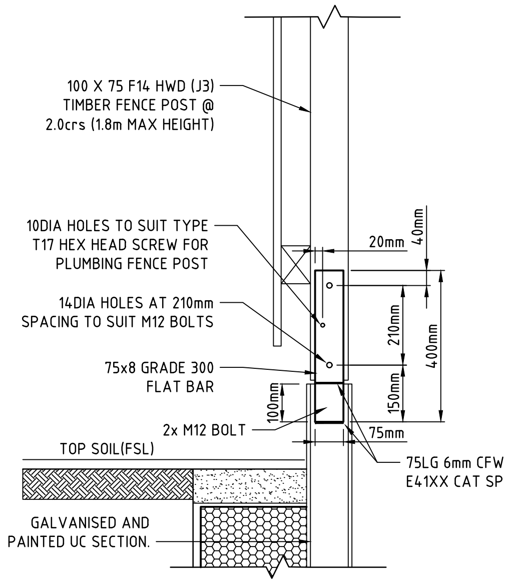

RP BDY
0.500m MAX.
1.000m MIN
STRAINED 1.6mm GALVANISED WIRE.
UPVC BARRIER MESH SECURELY FIXED TO WIRE TOP AND BOTTOM.
FENCING BRACKET TO BE INSTALLED BY CONTRACTOR
STEELSTAR PICKET STAKES AT 2.0m CENTRES MAX. FIRMLY DRIVEN INTO GROUND AND BRACED AT ENDS.
TOP SOIL(FSL)
CONCRETE SLEEPER RETAINING WALL (TYPICAL)

TEMPORARY SAFETY BARRIER TO
RETAINING WALLS TYPICAL SECTION


RP BDY
BUILDING STRUCTURES, SLABS & BORED PIERS TO BE INSTALLED BY OTHERS IN BUILDING WORKS AND ARE TO BE DESIGNED SO AS TO NOT PROVIDE ADDITIONAL LOADS TO THE PROPOSED RETAINING WALLS.
CONCRETE SLEEPER RETAINING WALL (TYPICAL)
TOP SOIL(FSL)

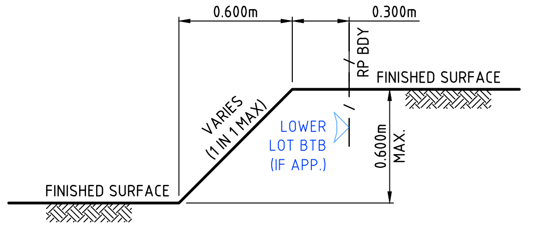
BUILD TO BOUNDARY
TYPICAL SECTION

RETAINING WALL DESIGN IS INDICATIVE ONLY. DESIGN AND CONSTRUCTION OF ALL RETAINING WALLS TO BE UNDERTAKEN BY CONTRACTOR.

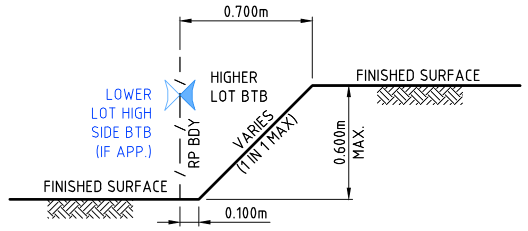

100 X 75 F14 HWD (J3) TIMBER FENCE POST @ 2.0crs (1.8m MAX HEIGHT)
10DIA HOLES TO SUIT TYPE T17 HEX HEAD SCREW FOR PLUMBING FENCE POST
14DIA HOLES AT 210mm SPACING TO SUIT M12 BOLTS
75x8 GRADE 300 FLAT BAR
2x M12 BOLT
TOP SOIL(FSL)
GALVANISED AND PAINTED UC SECTION.
20mm
40mm
210mm
400mm
150mm
100mm
75mm
75LG 6mm CFW E41XX CAT SP

FENCING BRACKET TYPICAL DETAIL

DESIGN AND CONSTRUCT BY OTHERS


0.600m
0.300m
RP BDY
FINISHED SURFACE
VARIES (1 IN 1 MAX)
LOWER LOT BTB (IF APP.)
0.600m MAX.
FINISHED SURFACE

A < 0.6m BATTER TYPICAL
SECTION (NON-ZERO BOUNDARY
OR REAR BOUNDARY)


0.700m
LOWER LOT HIGH SIDE BTB (IF APP.)
HIGHER LOT BTB
FINISHED SURFACE
RP BDY
VARIES (1 IN 1 MAX)
0.600m MAX.
FINISHED SURFACE
0.100m

AA < 0.6m BATTER TYPICAL
SECTION (ZERO-BOUNDARY)

NOTE:-
REFER NEXT SHEET FOR RETAINING WALL NOTES AND ADDITIONAL SECTIONS

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A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **RETAINING WALL**
TYPICAL DETAILS
1 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-RW01	A

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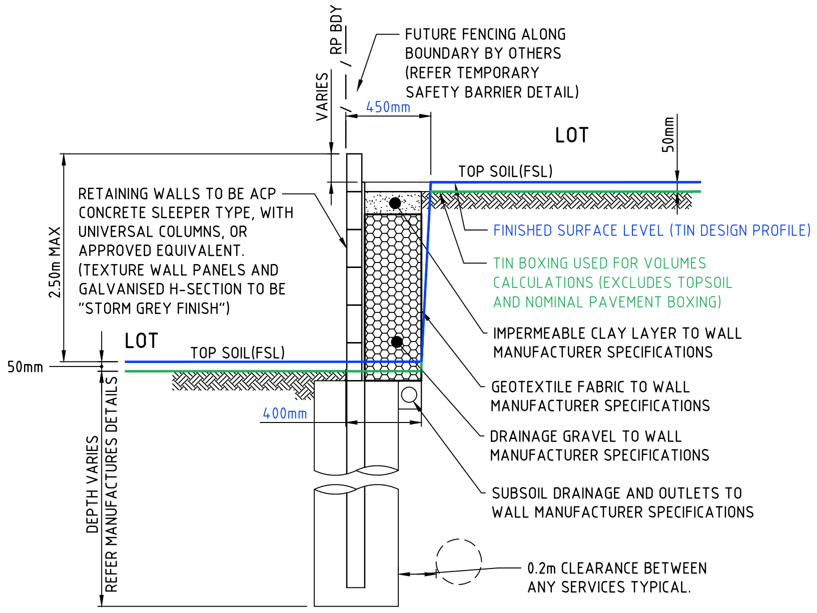
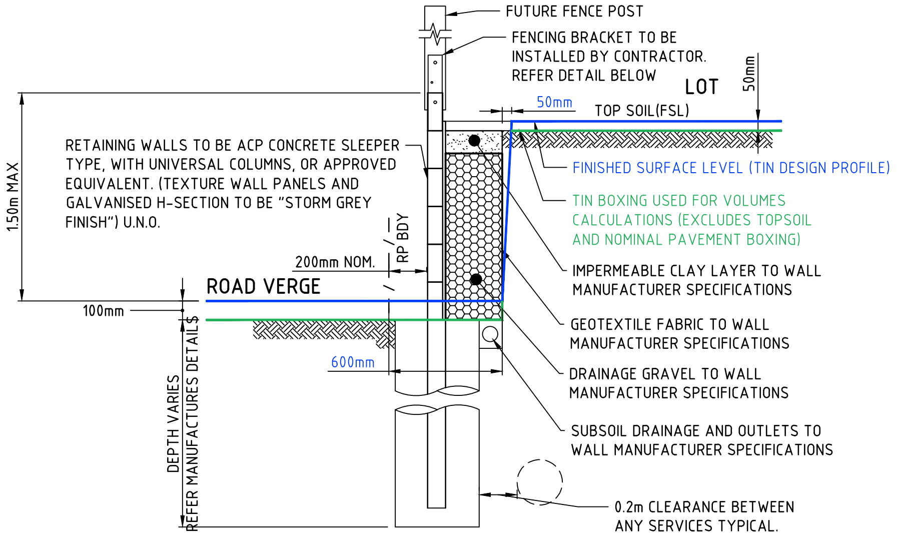

RP BDY
VARIES
450mm
FUTURE FENCING ALONG BOUNDARY BY OTHERS (REFER TEMPORARY SAFETY BARRIER DETAIL)
LOT
50mm
TOP SOIL(FSL)
RETAINING WALLS TO BE ACP CONCRETE SLEEPER TYPE, WITH UNIVERSAL COLUMNS, OR APPROVED EQUIVALENT. (TEXTURE WALL PANELS AND GALVANISED H-SECTION TO BE "STORM GREY FINISH")
2.50m MAX
FINISHED SURFACE LEVEL (TIN DESIGN PROFILE)
TIN BOXING USED FOR VOLUMES CALCULATIONS (EXCLUDES TOPSOIL AND NOMINAL PAVEMENT BOXING)
IMPERMEABLE CLAY LAYER TO WALL MANUFACTURER SPECIFICATIONS
LOT
TOP SOIL(FSL)
50mm
GEOTEXTILE FABRIC TO WALL MANUFACTURER SPECIFICATIONS
400mm
DRAINAGE GRAVEL TO WALL MANUFACTURER SPECIFICATIONS
SUBSOIL DRAINAGE AND OUTLETS TO WALL MANUFACTURER SPECIFICATIONS
DEPTH VARIES REFER MANUFACTURES DETAILS
0.2m CLEARANCE BETWEEN ANY SERVICES TYPICAL.

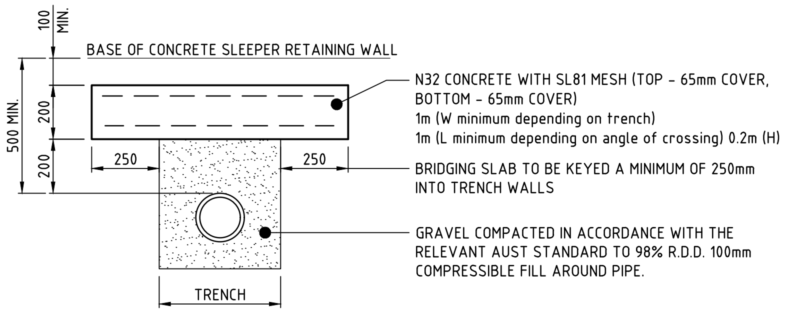
B

2.5m MAX. HEIGHT RETAINING WALL TYPICAL SECTION


FUTURE FENCE POST
FENCING BRACKET TO BE INSTALLED BY CONTRACTOR. REFER DETAIL BELOW
LOT
50mm
50mm
TOP SOIL(FSL)
RETAINING WALLS TO BE ACP CONCRETE SLEEPER TYPE, WITH UNIVERSAL COLUMNS, OR APPROVED EQUIVALENT. (TEXTURE WALL PANELS AND GALVANISED H-SECTION TO BE "STORM GREY FINISH") U.N.O.
1.50m MAX
FINISHED SURFACE LEVEL (TIN DESIGN PROFILE)
TIN BOXING USED FOR VOLUMES CALCULATIONS (EXCLUDES TOPSOIL AND NOMINAL PAVEMENT BOXING)
RP BDY
200mm NOM.
ROAD VERGE
IMPERMEABLE CLAY LAYER TO WALL MANUFACTURER SPECIFICATIONS
100mm
GEOTEXTILE FABRIC TO WALL MANUFACTURER SPECIFICATIONS
600mm
DRAINAGE GRAVEL TO WALL MANUFACTURER SPECIFICATIONS
SUBSOIL DRAINAGE AND OUTLETS TO WALL MANUFACTURER SPECIFICATIONS
DEPTH VARIES REFER MANUFACTURES DETAILS
0.2m CLEARANCE BETWEEN ANY SERVICES TYPICAL.

C

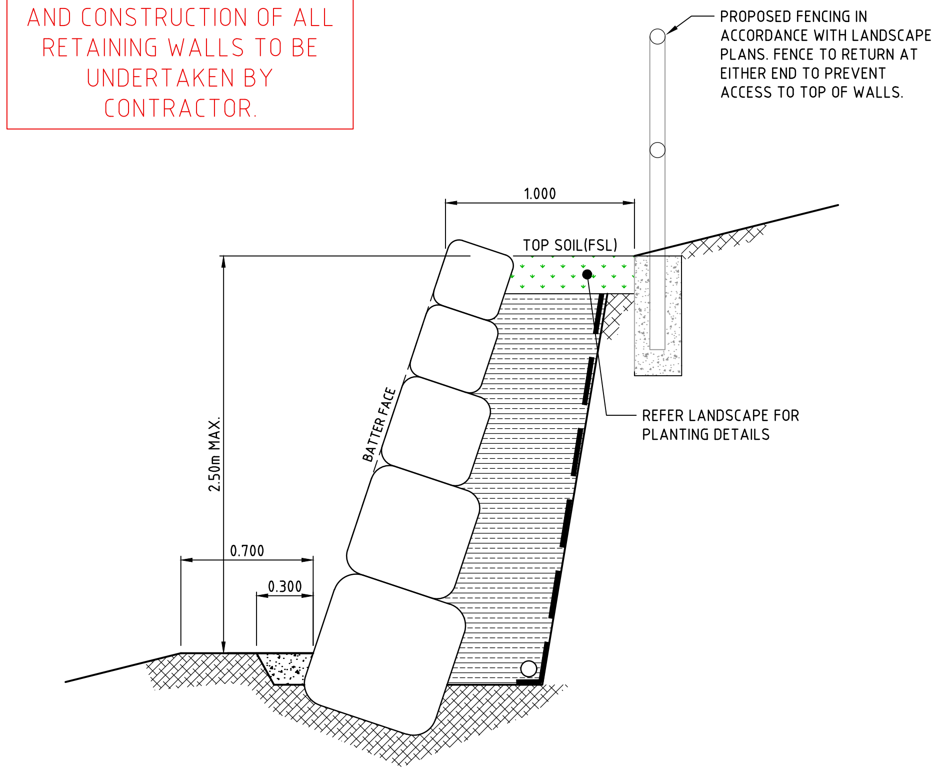
1.5m MAX. RETAINING WALL ADJACENT TO ROAD RESERVE TYPICAL SECTION


100 MIN.
BASE OF CONCRETE SLEEPER RETAINING WALL
500 MIN.
200
200
N32 CONCRETE WITH SL81 MESH (TOP - 65mm COVER, BOTTOM - 65mm COVER)
1m (W minimum depending on trench)
1m (L minimum depending on angle of crossing) 0.2m (H)
250
250
BRIDGING SLAB TO BE KEYED A MINIMUM OF 250mm INTO TRENCH WALLS
GRAVEL COMPACTED IN ACCORDANCE WITH THE RELEVANT AUST STANDARD TO 98% R.D.D. 100mm COMPRESSIBLE FILL AROUND PIPE.
TRENCH

TYPE-1 BRIDGING SLAB DETAIL

NOT TO SCALE

RETAINING WALL DESIGN IS INDICATIVE ONLY. DESIGN AND CONSTRUCTION OF ALL RETAINING WALLS TO BE UNDERTAKEN BY CONTRACTOR.

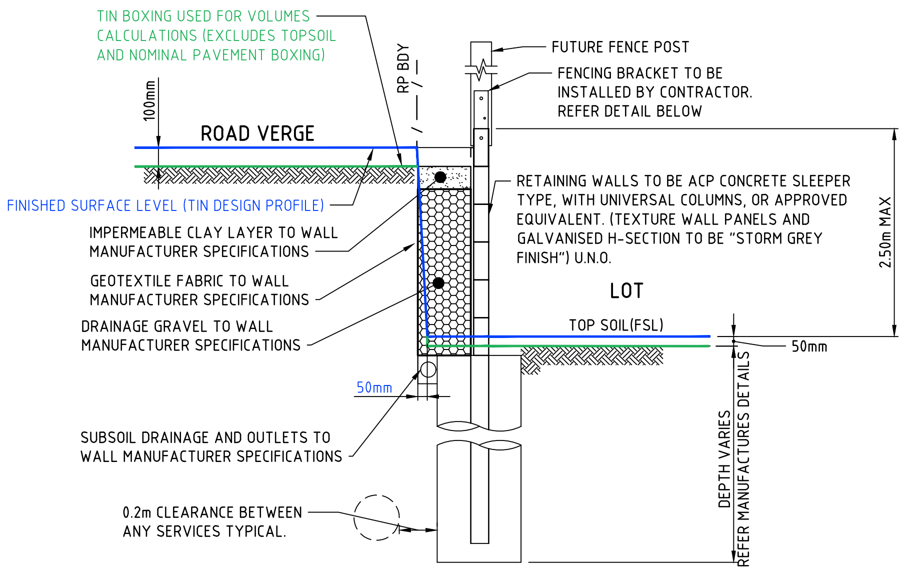

PROPOSED FENCING IN ACCORDANCE WITH LANDSCAPE PLANS. FENCE TO RETURN AT EITHER END TO PREVENT ACCESS TO TOP OF WALLS.
1.000
TOP SOIL(FSL)
BATTER FACE
2.50m MAX.
REFER LANDSCAPE FOR PLANTING DETAILS
0.700
0.300

E

2.5m MAX. SANDSTONE RETAINING WALL IN DRAINAGE RESERVE - TYPICAL SECTION

RETAINING WALL DESIGN PARAMETERS

1. COMPLY WITH AS4678-2002 "EARTH RETAINING STRUCTURES".
2. MINIMUM DESIGN LIFE OF 60 YEARS.
3. MINIMUM SUPERIMPOSED DESIGN LIVE LOAD OF 5kPa FOR CUT WALLS.
4. ALL WALLS RETAINING ROAD RESERVE TO HAVE MIN. 20KPa LIVE LOAD.
5. DESIGN TO CARRY WIND LOADS IMPOSED BY A 2m (MAX) HIGH FENCE.
6. COMPLY WITH REDLAND CITY COUNCIL PLANNING SCHEME AND ALL RELEVANT COUNCIL STANDARDS.
7. PROVIDE RPEQ CERTIFICATION FOR DESIGN & CONSTRUCTION AND PROVIDE APPROPRIATE CERTIFIED FORMS.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS SHOWN OTHERWISE.
9. FENCE BRACKETS TO BE PROVIDED AT THE INTERSECTION OF LOT BOUNDARIES, SO AS TO PROVIDE A SUITABLE POINT OF CONNECTION FOR THE FUTURE INSTALLATION OF FENCING. INTERMEDIATE SPACING OF BRACKETS ARE TO ALLOW FOR TYPICAL FENCE RAIL LENGTHS WHERE POSSIBLE.
10. RETAINING WALL DESIGNER MUST UNDERTAKE A GLOBAL STABILITY ASSESSMENT FOR ALL RETAINING WALLS COGNISANT OF ALL PRE-EXISTING AND ULTIMATE EARTHWORKS GEOMETRY, SERVICES WITHIN THE ZONE OF INFLUENCE, AND ANY RAPID DRAW-DOWN OF WATER LEVELS WHICH MAY IMPACT THE STABILITY OF THE WALL.
11. SUBSOIL DRAINS ARE TO BE CONNECTED TO KERB ADAPTORS WHERE POSSIBLE.


TIN BOXING USED FOR VOLUMES CALCULATIONS (EXCLUDES TOPSOIL AND NOMINAL PAVEMENT BOXING)
RP BDY
100mm
FUTURE FENCE POST
FENCING BRACKET TO BE INSTALLED BY CONTRACTOR. REFER DETAIL BELOW
ROAD VERGE
FINISHED SURFACE LEVEL (TIN DESIGN PROFILE)
IMPERMEABLE CLAY LAYER TO WALL MANUFACTURER SPECIFICATIONS
GEOTEXTILE FABRIC TO WALL MANUFACTURER SPECIFICATIONS
DRAINAGE GRAVEL TO WALL MANUFACTURER SPECIFICATIONS
RETAINING WALLS TO BE ACP CONCRETE SLEEPER TYPE, WITH UNIVERSAL COLUMNS, OR APPROVED EQUIVALENT. (TEXTURE WALL PANELS AND GALVANISED H-SECTION TO BE "STORM GREY FINISH") U.N.O.
2.50m MAX
LOT
TOP SOIL(FSL)
50mm
50mm
SUBSOIL DRAINAGE AND OUTLETS TO WALL MANUFACTURER SPECIFICATIONS
DEPTH VARIES REFER MANUFACTURES DETAILS
0.2m CLEARANCE BETWEEN ANY SERVICES TYPICAL.

D

2.5m MAX. RETAINING WALL TYPICAL SECTION ADJACENT TO ROAD RESERVE

0 0.02 0.04 0.06 0.08 0.1m
0.02 0.015 0.01 0.005

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Date " "
Registered Accreditation

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Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **RETAINING WALL - TYPICAL DETAILS SHEET 2 OF 2**

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Project No.
Drawing No. B00702-DA-RW02
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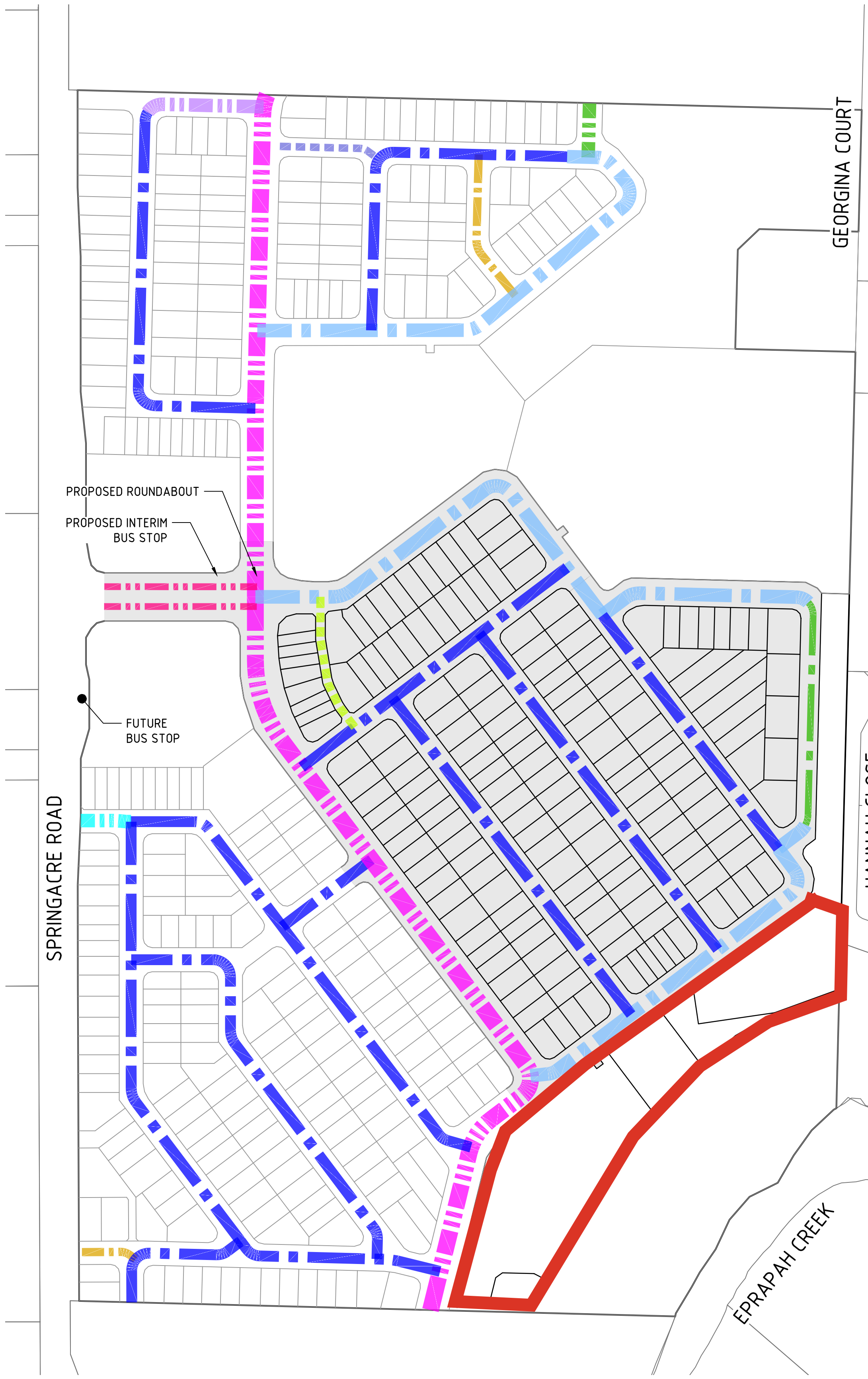


ROAD NETWORK LAYOUT
SCALE 1:2000 (A1) 1:4000(A3)

LEGEND - ROAD NETWORK

PROPOSED STAGE BOUNDARY

PROPOSED LOT BOUNDARY

CENTRE CONNECTOR
32.0m WIDE ROAD RESERVE
2x7m WIDE ROAD PAVEMENTS
5.0m MEDIAN
2x6.5m WIDE VERGES

PARKING COLLECTOR (NEIGHBOURHOOD CONNECTOR)
22.0m WIDE ROAD RESERVE
11.2m WIDE ROAD PAVEMENT
2x2.3m WIDE PARKINGS
4.5m AND 6.3m WIDE VERGES

ACCESS STREET - 7.5m
16.0m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m WIDE VERGES

ACCESS STREET - 7.5m WITH 3m PATH
18.0m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m AND 6.25m WIDE VERGES

ACCESS STREET - 7.5m WITH 3m PATH
16.0m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m WIDE VERGES

ACCESS STREET - 6m
15.5m WIDE ROAD RESERVE
8.3m WIDE ROAD PAVEMENT
4.25m AND 2.95m WIDE VERGES

ACCESS STREET - 6m WITH 2 PATHS
15.5m WIDE ROAD RESERVE
8.3m WIDE ROAD PAVEMENT
4.75m AND 2.95m WIDE VERGES

ACCESS STREET - 13.25m
13.25m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m AND 1.50m WIDE VERGE

ACCESS LANEWAY
DRIVEWAYS
6.5m WIDE ROAD RESERVE
5.5m WIDE ROAD PAVEMENT
0.5m WIDE VERGES

ACCESS LANEWAY
DRIVEWAYS
12.5m WIDE ROAD RESERVE
5.0m WIDE ROAD PAVEMENT
4.00m AND 3.50m WIDE VERGES

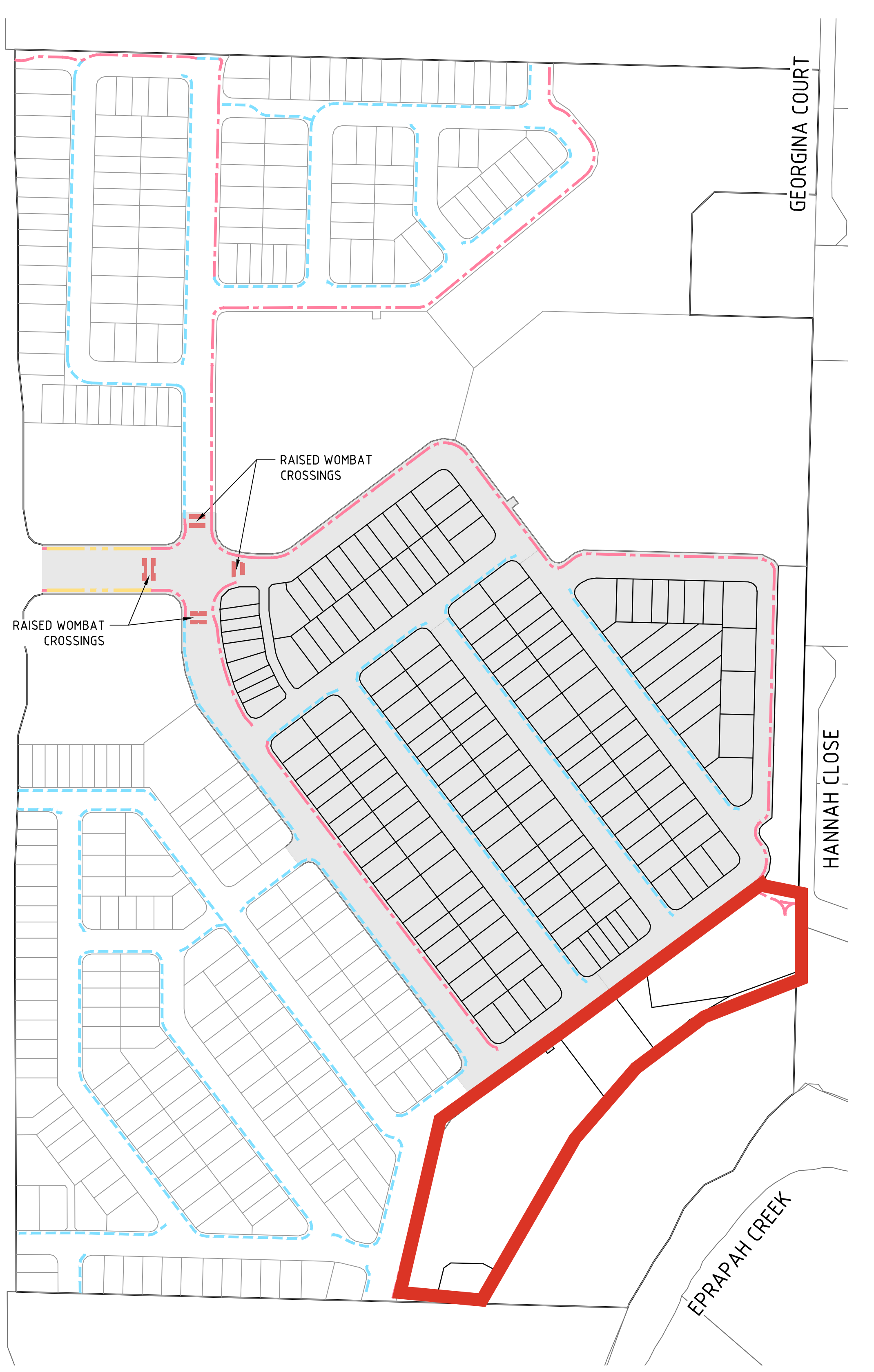
ACCESS STREET - 7.5m WITH 3m PATH
16.7m WIDE ROAD RESERVE
7.5m WIDE ROAD PAVEMENT
4.25m AND 4.95m WIDE VERGES

LEGEND - PATH NETWORK

CONCRETE PATHWAY - 1.5m WIDE

CONCRETE PATHWAY - 3m WIDE

CONCRETE PATHWAY - 4m WIDE



PATH NETWORK LAYOUT
SCALE 1:2000 (A1) 1:4000(A3)

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED
By: **Tiana Hill**
Date: **5 August 2026**
Queensland
Government

40 30 20 10 0 40 80 120 160 200m
SCALE 1:2000 (A1) 1:4000 (A3)
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Date " "
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URBEX
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Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **ROAD NETWORK LAYOUT**

Datum
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(RCC) COORD

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Project No. Drawing No. **B00702-DA-CR01**
Rev **A**

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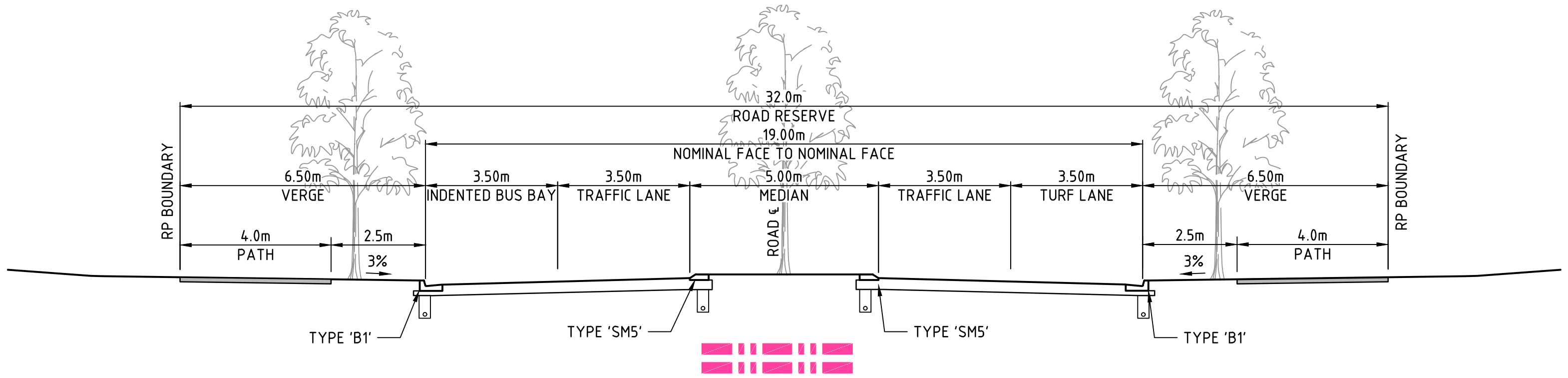
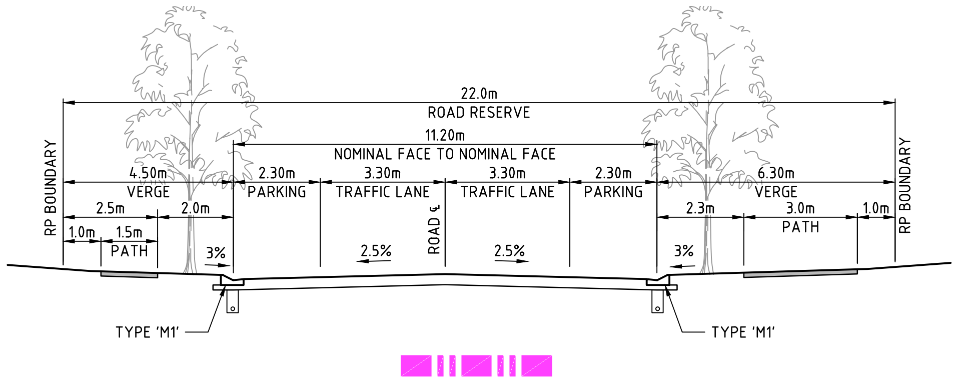
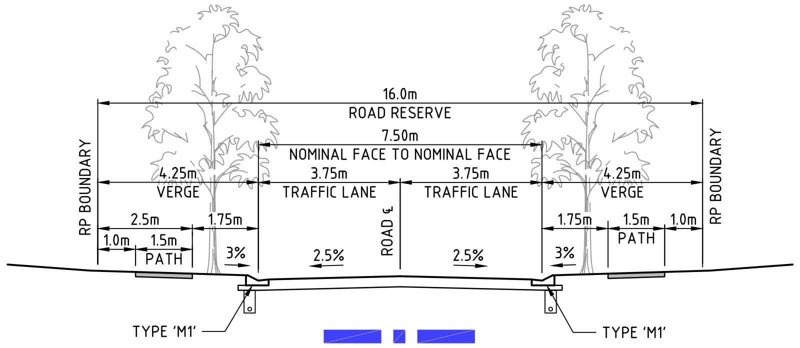

32.0m
ROAD RESERVE
19.00m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
6.50m
VERGE
3.50m
INDENTED BUS BAY
3.50m
TRAFFIC LANE
5.00m
MEDIAN
3.50m
TRAFFIC LANE
3.50m
TURF LANE
6.50m
VERGE
RP BOUNDARY
4.0m
PATH
2.5m
3%
ROAD ℄
2.5m
3%
4.0m
PATH
TYPE 'B1'
TYPE 'SM5'
TYPE 'SM5'
TYPE 'B1'

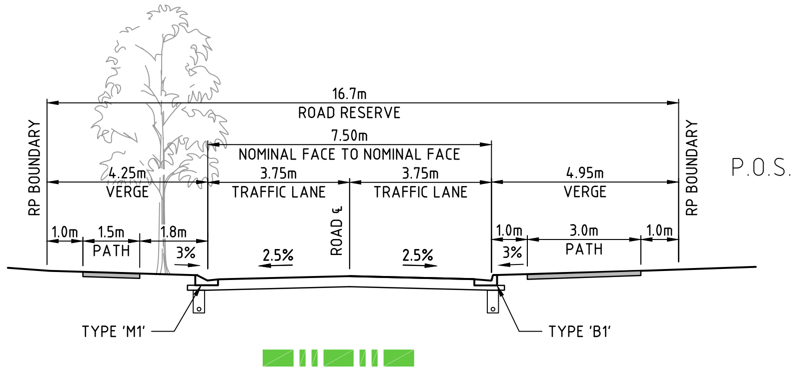
① CR01 CENTRE CONNECTOR
SCALE 1:100 (A1) 1:200(A3)


22.0m
ROAD RESERVE
11.20m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
4.50m
VERGE
2.30m
PARKING
3.30m
TRAFFIC LANE
3.30m
TRAFFIC LANE
2.30m
PARKING
6.30m
VERGE
RP BOUNDARY
2.5m
2.0m
1.0m
1.5m
PATH
3%
2.5%
ROAD ℄
2.5%
2.3m
3%
3.0m
PATH
1.0m
TYPE 'M1'
TYPE 'M1'

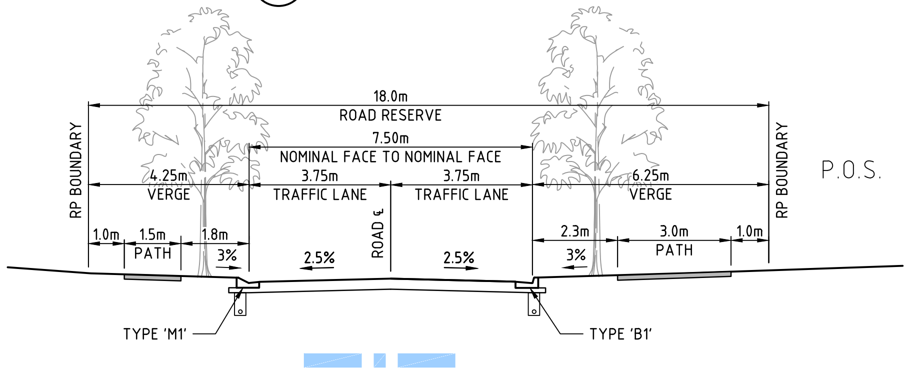
② CR01 PARKING COLLECTOR (NEIGHBOURHOOD CONNECTOR)
SCALE 1:100 (A1) 1:200(A3)


16.0m
ROAD RESERVE
7.50m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
4.25m
VERGE
3.75m
TRAFFIC LANE
3.75m
TRAFFIC LANE
4.25m
VERGE
RP BOUNDARY
2.5m
1.75m
1.0m
1.5m
PATH
3%
2.5%
ROAD ℄
2.5%
1.75m
3%
1.5m
PATH
1.0m
TYPE 'M1'
TYPE 'M1'

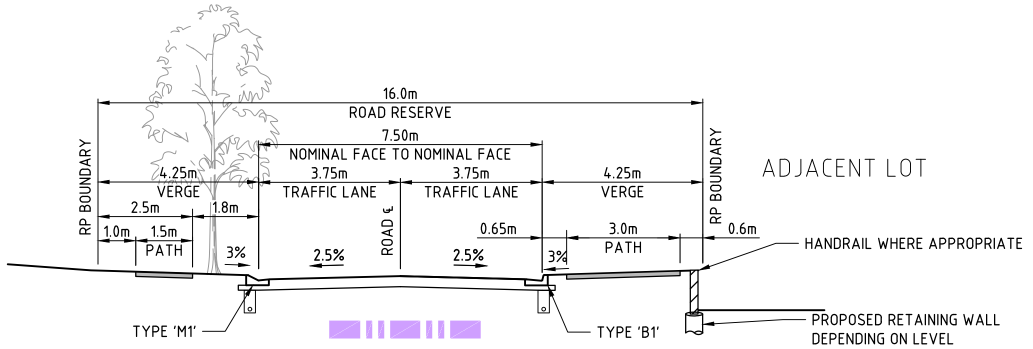
③ CR01 ACCESS STREET - 7.5m
SCALE 1:100 (A1) 1:200(A3)


16.7m
ROAD RESERVE
7.50m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
4.25m
VERGE
3.75m
TRAFFIC LANE
3.75m
TRAFFIC LANE
4.95m
VERGE
RP BOUNDARY
P.O.S.
1.0m
1.5m
PATH
1.8m
3%
2.5%
ROAD ℄
2.5%
1.0m
3%
3.0m
PATH
1.0m
TYPE 'M1'
TYPE 'B1'

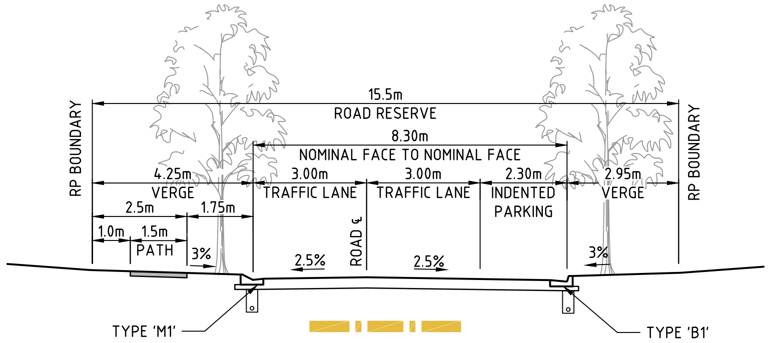
⑪ CR01 ACCESS STREET - 7.5m WITH 3m PATH
SCALE 1:100 (A1) 1:200(A3)


18.0m
ROAD RESERVE
7.50m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
4.25m
VERGE
3.75m
TRAFFIC LANE
3.75m
TRAFFIC LANE
6.25m
VERGE
RP BOUNDARY
P.O.S.
1.0m
1.5m
PATH
1.8m
3%
2.5%
ROAD ℄
2.5%
2.3m
3%
3.0m
PATH
1.0m
TYPE 'M1'
TYPE 'B1'

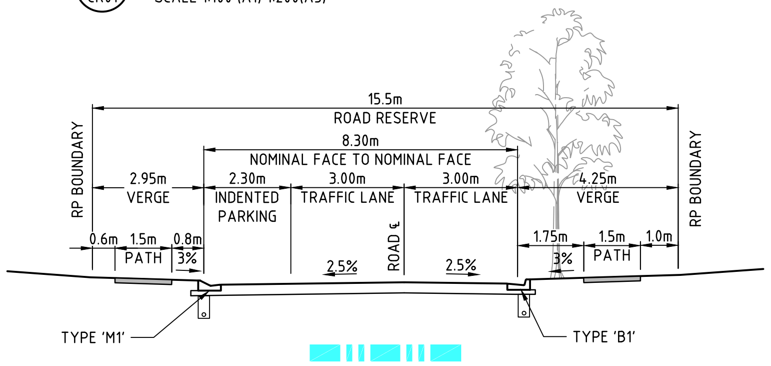
④ CR01 ACCESS STREET - 7.5m WITH 3m PATH
SCALE 1:100 (A1) 1:200(A3)


16.0m
ROAD RESERVE
7.50m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
4.25m
VERGE
3.75m
TRAFFIC LANE
3.75m
TRAFFIC LANE
4.25m
VERGE
RP BOUNDARY
ADJACENT LOT
2.5m
1.8m
1.0m
1.5m
PATH
3%
2.5%
ROAD ℄
2.5%
0.65m
3%
3.0m
PATH
0.6m
HANDRAIL WHERE APPROPRIATE
PROPOSED RETAINING WALL
DEPENDING ON LEVEL
TYPE 'M1'
TYPE 'B1'

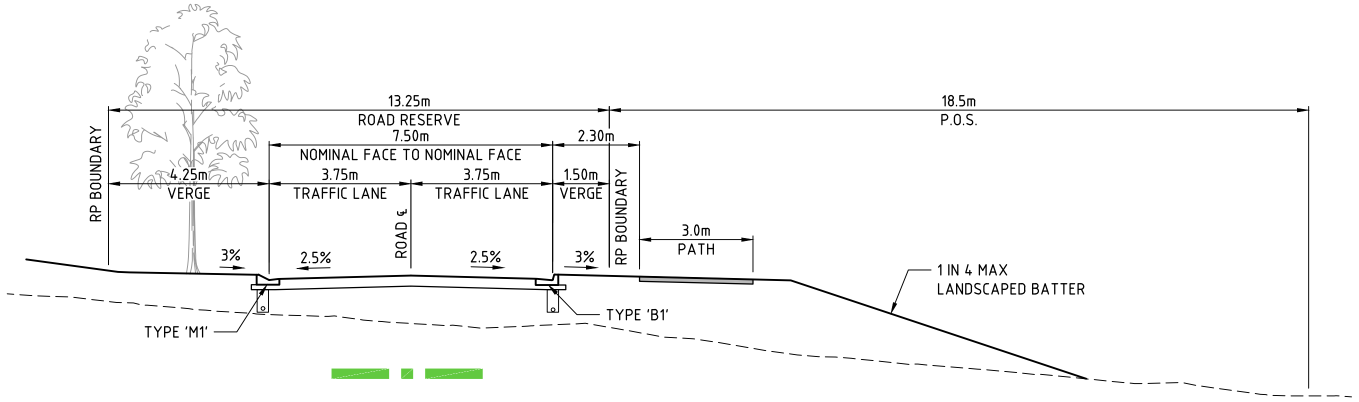
⑤ CR01 ACCESS STREET - 7.5m WITH 3m PATH
SCALE 1:100 (A1) 1:200(A3)


15.5m
ROAD RESERVE
8.30m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
4.25m
VERGE
3.00m
TRAFFIC LANE
3.00m
TRAFFIC LANE
2.30m
INDENTED
PARKING
2.95m
VERGE
RP BOUNDARY
2.5m
1.75m
1.0m
1.5m
PATH
3%
2.5%
ROAD ℄
2.5%
3%
TYPE 'M1'
TYPE 'B1'

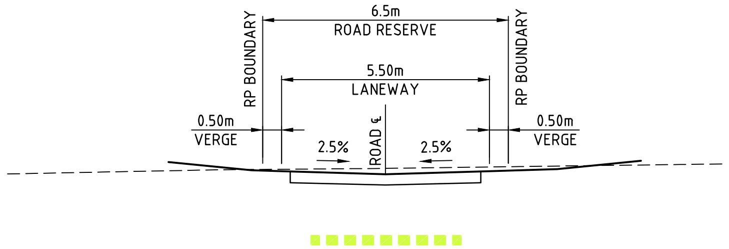
⑥ CR01 ACCESS STREET - 6m
SCALE 1:100 (A1) 1:200(A3)


15.5m
ROAD RESERVE
8.30m
NOMINAL FACE TO NOMINAL FACE
RP BOUNDARY
2.95m
VERGE
2.30m
INDENTED
PARKING
3.00m
TRAFFIC LANE
3.00m
TRAFFIC LANE
4.25m
VERGE
RP BOUNDARY
0.6m
1.5m
PATH
0.8m
3%
2.5%
ROAD ℄
2.5%
1.75m
3%
1.5m
PATH
1.0m
TYPE 'M1'
TYPE 'B1'

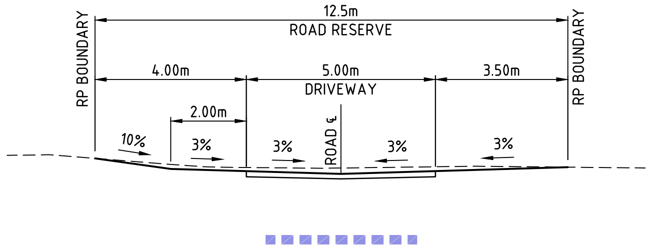
⑦ CR01 ACCESS STREET - 6m WITH 2 PATHS
SCALE 1:100 (A1) 1:200(A3)


13.25m
ROAD RESERVE
7.50m
NOMINAL FACE TO NOMINAL FACE
2.30m
18.5m
P.O.S.
RP BOUNDARY
4.25m
VERGE
3.75m
TRAFFIC LANE
3.75m
TRAFFIC LANE
1.50m
VERGE
RP BOUNDARY
3.0m
PATH
3%
2.5%
ROAD ℄
2.5%
3%
1 IN 4 MAX
LANDSCAPED BATTER
TYPE 'M1'
TYPE 'B1'

⑧ CR01 ACCESS STREET - 13.25m
SCALE 1:100 (A1) 1:200(A3)


6.5m
ROAD RESERVE
RP BOUNDARY
5.50m
LANEWAY
RP BOUNDARY
0.50m
VERGE
2.5%
ROAD ℄
2.5%
0.50m
VERGE

⑨ CR01 ACCESS LANEWAY
SCALE 1:100 (A1) 1:200(A3)


12.5m
ROAD RESERVE
RP BOUNDARY
4.00m
5.00m
DRIVEWAY
3.50m
RP BOUNDARY
2.00m
10%
3%
3%
ROAD ℄
3%
3%

⑩ CR01 CONCRETE DRIVEWAY
SCALE 1:100 (A1) 1:200(A3)

0 2 4 6 8 10m
2 1.5 1 0.5

SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

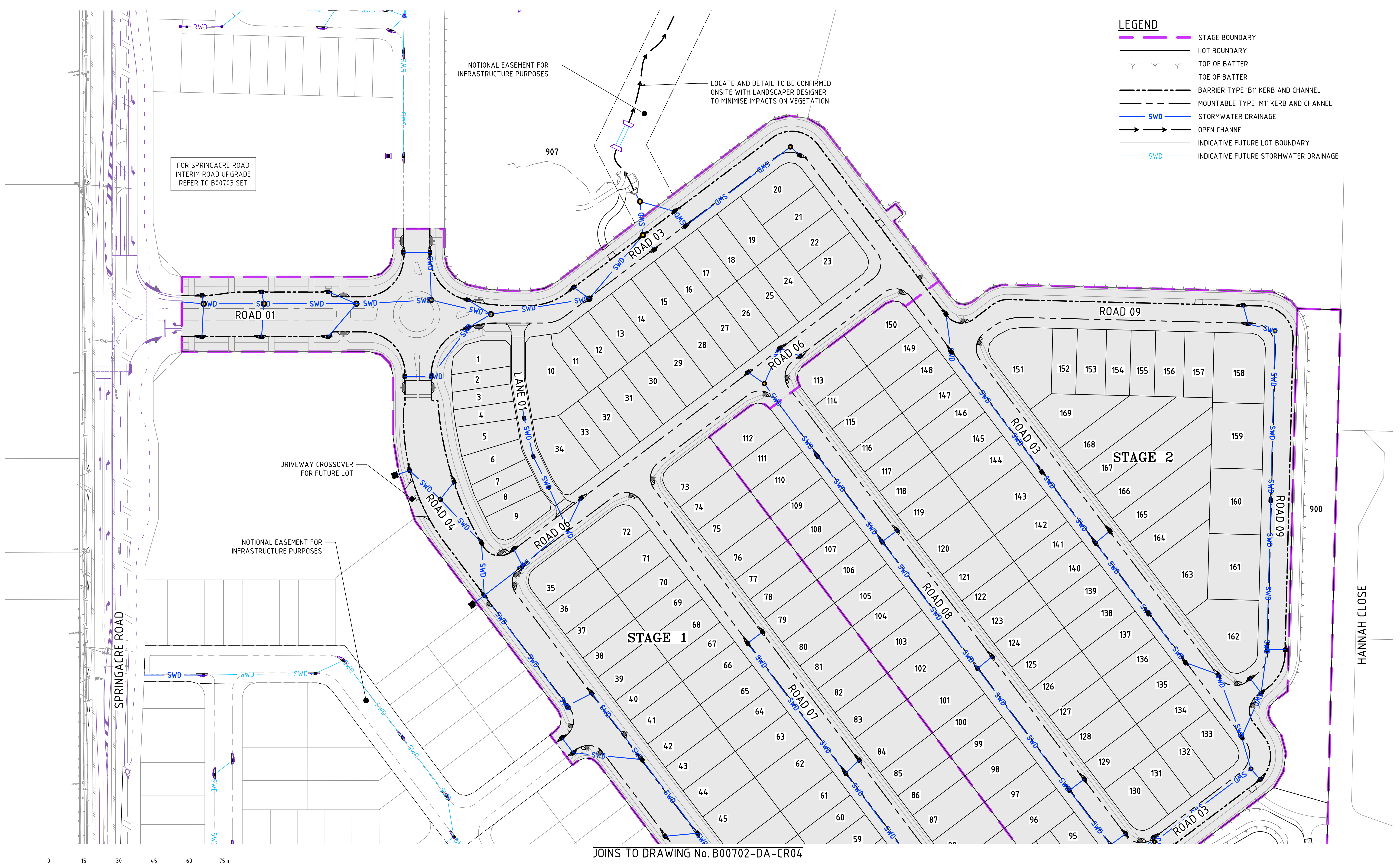
Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **ROAD NETWORK SECTIONS**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No.
Drawing No. **B00702-DA-CR02**
Rev **A**

Plot Date: 12/12/2025 12:29:50 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-RNET


LEGEND
STAGE BOUNDARY
LOT BOUNDARY
TOP OF BATTER
TOE OF BATTER
BARRIER TYPE 'B1' KERB AND CHANNEL
MOUNTABLE TYPE 'M1' KERB AND CHANNEL
SWD
STORMWATER DRAINAGE
OPEN CHANNEL
INDICATIVE FUTURE LOT BOUNDARY
SWD
INDICATIVE FUTURE STORMWATER DRAINAGE
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
LOCATE AND DETAIL TO BE CONFIRMED ONSITE WITH LANDSCAPER DESIGNER TO MINIMISE IMPACTS ON VEGETATION
907
FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET
RWD
ROAD 01
ROAD 03
ROAD 04
ROAD 06
ROAD 07
ROAD 08
ROAD 09
LANE 01
SPRINGACRE ROAD
HANNAH CLOSE
DRIVEWAY CROSSOVER FOR FUTURE LOT
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
STAGE 1
STAGE 2
900
SWD

JOINS TO DRAWING No. B00702-DA-CR04

0 15 30 45 60 75m
15 11.25 7.5 3.75

SCALE 1:750 (A1) 1:1500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25
No.	*Amendments*	*Drawn*	*Design*	*Design Chk*	*Appd*	*Date*

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **ROADWORKS AND DRAINAGE PLAN**
SHEET 1 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

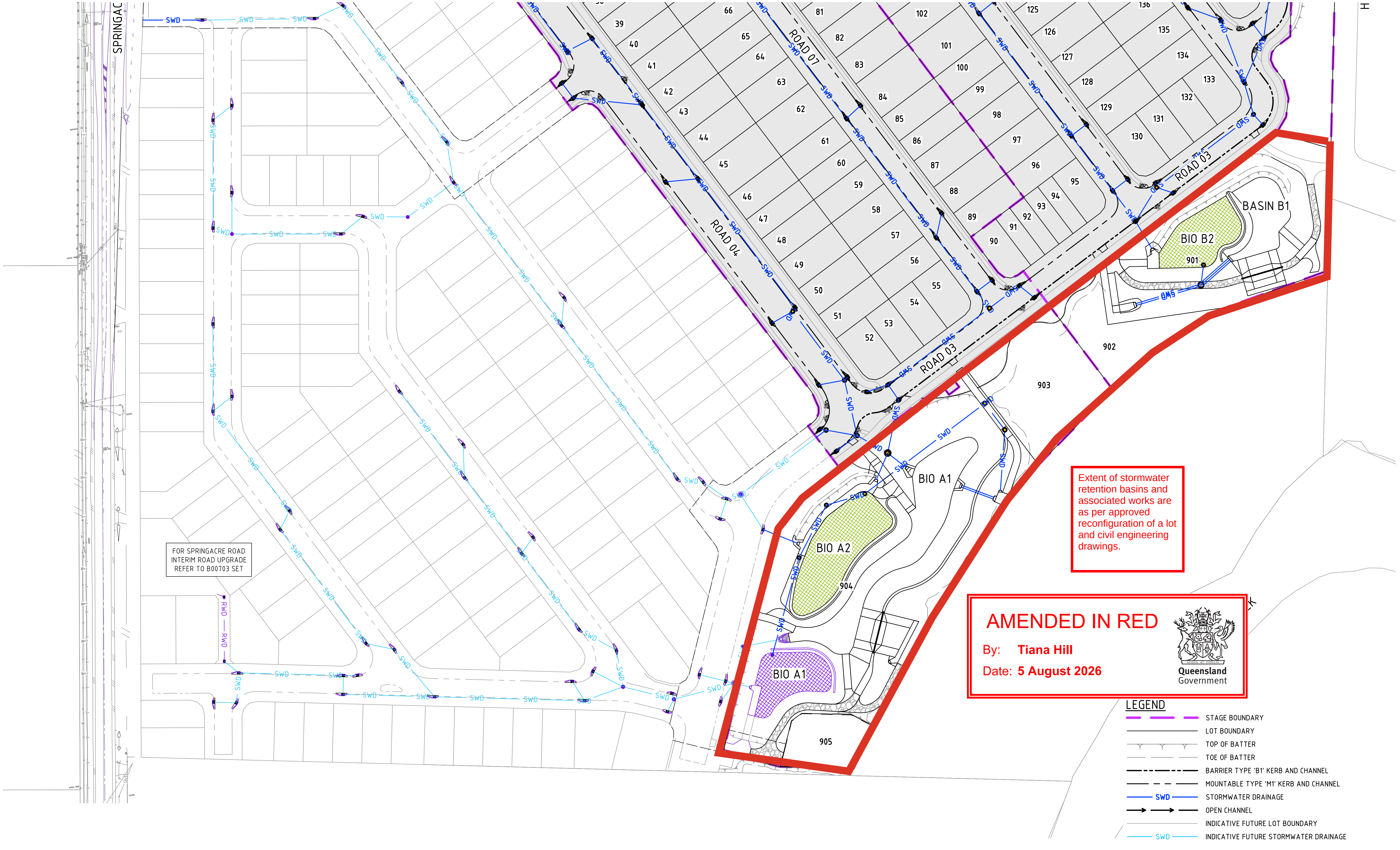
N

NOT FOR CONSTRUCTION

Project No. *Drawing No.* *Rev*
B00702-DA-CR03 A

Plot Date: 12/12/2025 12:30:15 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-RDP

JOINS TO DRAWING No. B00702-DA-CR03


SPRINGACRE ROAD
ROAD 03
ROAD 04
ROAD 07
BASIN B1
BIO B2
BIO A1
BIO A2
901
902
903
904
905
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
125
126
127
128
129
130
131
132
133
134
135
136
SWD
RWD
FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

LEGEND

	STAGE BOUNDARY
	LOT BOUNDARY
	TOP OF BATTER
	TOE OF BATTER
	BARRIER TYPE 'B1' KERB AND CHANNEL
	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
SWD	STORMWATER DRAINAGE
→ →	OPEN CHANNEL
	INDICATIVE FUTURE LOT BOUNDARY
SWD	INDICATIVE FUTURE STORMWATER DRAINAGE

0 15 30 45 60 75m
15 11.25 7.5 3.75

SCALE 1:750 (A1) 1:1500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:30:28 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-RDP

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client
URBEX PTY LTD
Project
SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL
Title
ROADWORKS AND DRAINAGE PLAN
SHEET 2 OF 2

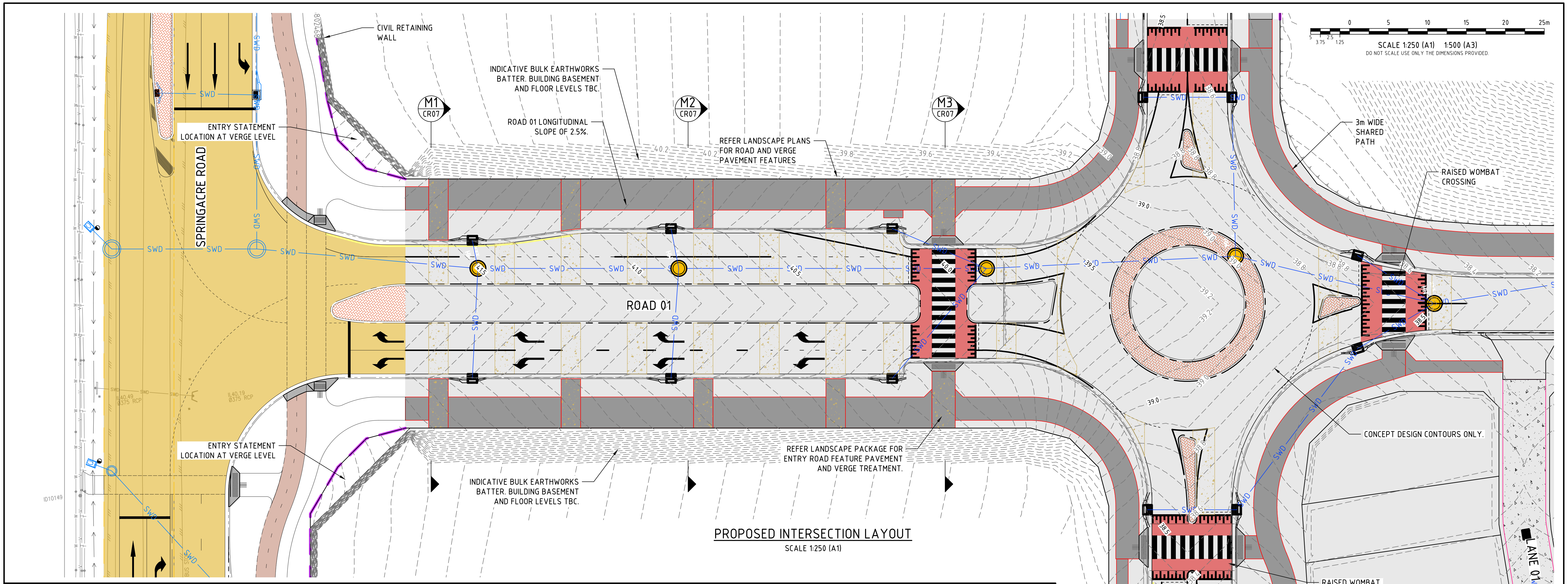
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

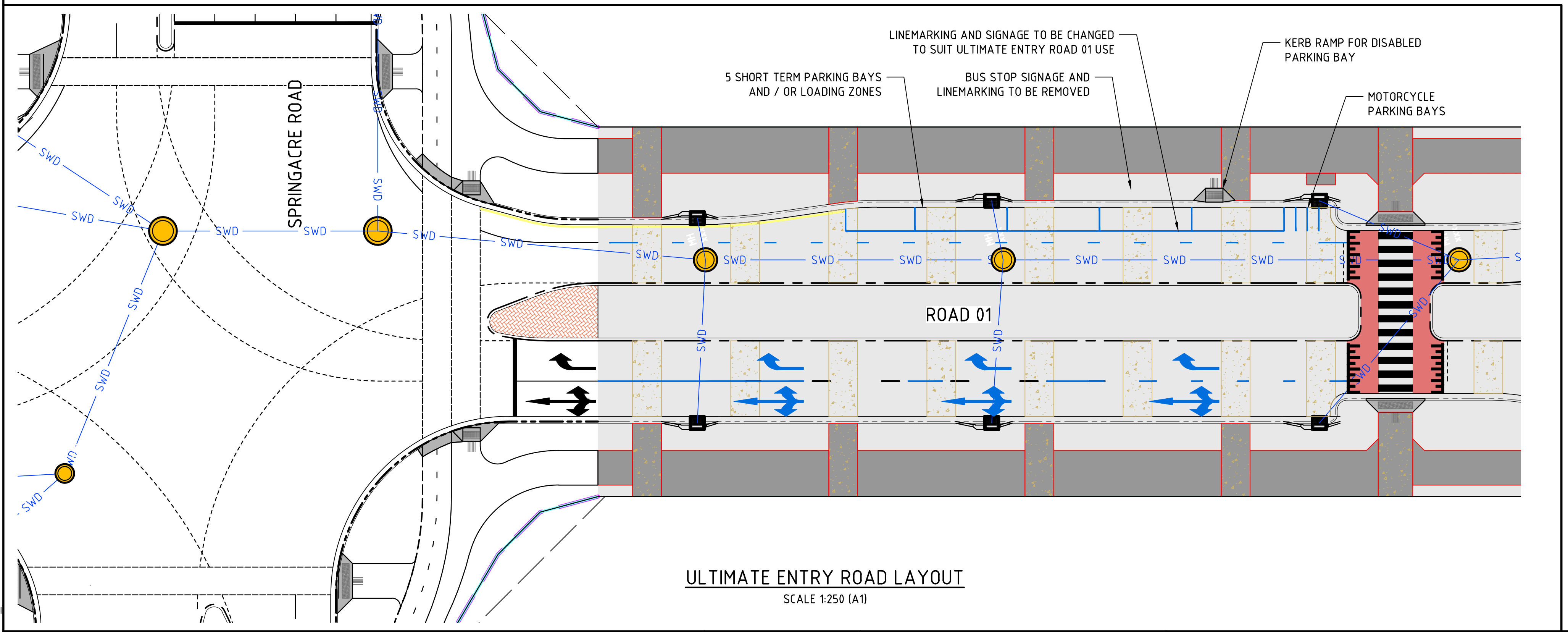
Project No. Drawing No.	Rev
B00702-DA-CR04	A

" "


CIVIL RETAINING WALL
INDICATIVE BULK EARTHWORKS BATTER. BUILDING BASEMENT AND FLOOR LEVELS TBC.
M1 CR07
M2 CR07
M3 CR07
ROAD 01 LONGITUDINAL SLOPE OF 2.5%.
REFER LANDSCAPE PLANS FOR ROAD AND VERGE PAVEMENT FEATURES
ENTRY STATEMENT LOCATION AT VERGE LEVEL
SPRINGACRE ROAD
ROAD 01
SWD
3m WIDE SHARED PATH
RAISED WOMBAT CROSSING
CONCEPT DESIGN CONTOURS ONLY.
REFER LANDSCAPE PACKAGE FOR ENTRY ROAD FEATURE PAVEMENT AND VERGE TREATMENT.
INDICATIVE BULK EARTHWORKS BATTER. BUILDING BASEMENT AND FLOOR LEVELS TBC.
ENTRY STATEMENT LOCATION AT VERGE LEVEL
RAISED WOMBAT CROSSING
LANE 01
ROAD 04
40.2
39.8
39.6
39.4
39.2
39.0
38.8
38.5
37.8
37.6
37.4
37.2
0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

PROPOSED INTERSECTION LAYOUT

SCALE 1:250 (A1)


LINEMARKING AND SIGNAGE TO BE CHANGED TO SUIT ULTIMATE ENTRY ROAD 01 USE
KERB RAMP FOR DISABLED PARKING BAY
5 SHORT TERM PARKING BAYS AND / OR LOADING ZONES
BUS STOP SIGNAGE AND LINEMARKING TO BE REMOVED
MOTORCYCLE PARKING BAYS
SPRINGACRE ROAD
ROAD 01
SWD

ULTIMATE ENTRY ROAD LAYOUT

SCALE 1:250 (A1)

Plot Date: 12/12/2025 12:30:59 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-INT

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **ENTRY ROAD INTERSECTION DETAILS**

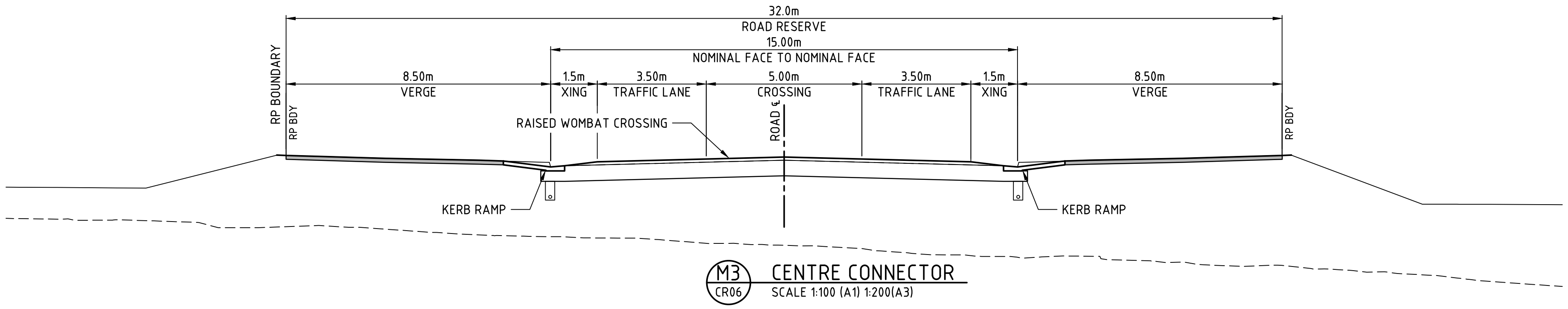
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

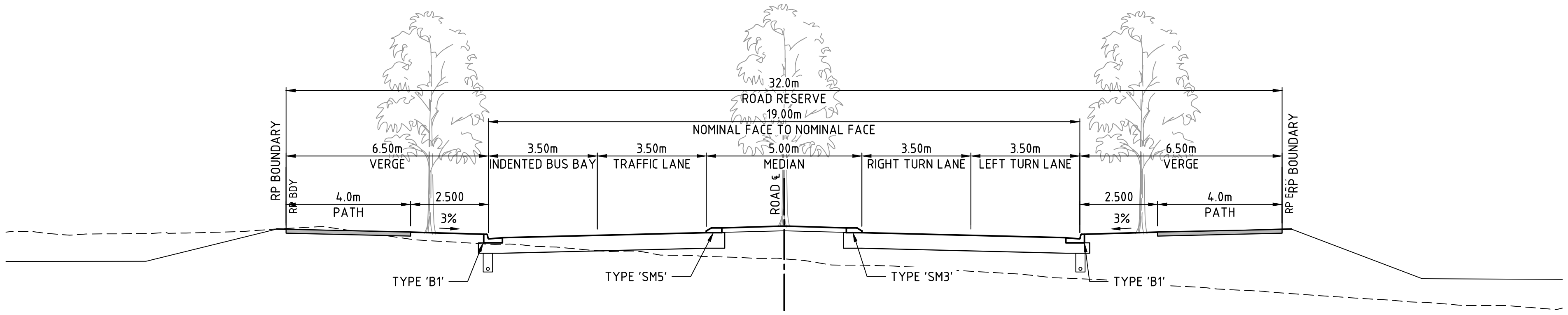
NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CR06	A

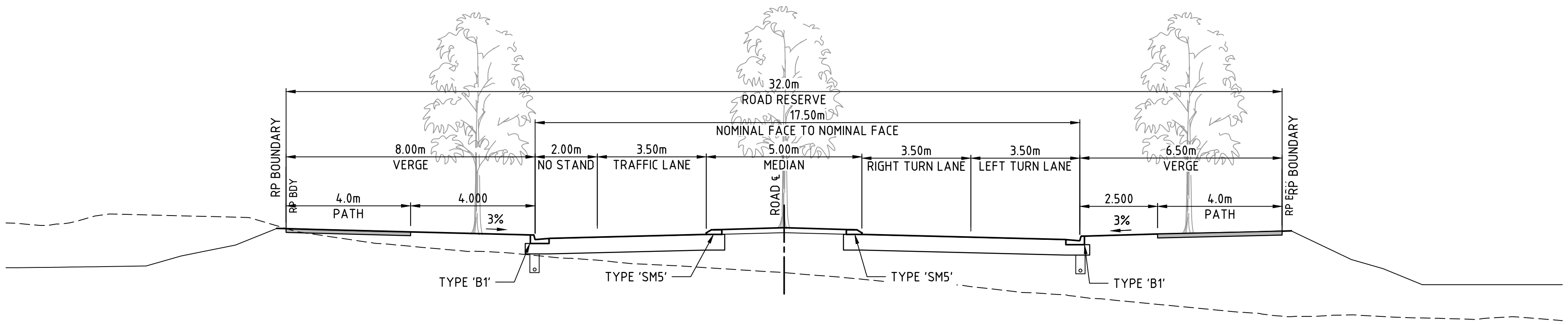
" "


32.0m
ROAD RESERVE
15.00m
NOMINAL FACE TO NOMINAL FACE
8.50m
VERGE
1.5m
XING
3.50m
TRAFFIC LANE
5.00m
CROSSING
3.50m
TRAFFIC LANE
1.5m
XING
8.50m
VERGE
RP BOUNDARY
RP BDY
RAISED WOMBAT CROSSING
ROAD ℄
RP BDY
KERB RAMP
KERB RAMP

M3
CR06
CENTRE CONNECTOR
SCALE 1:100 (A1) 1:200(A3)


32.0m
ROAD RESERVE
19.00m
NOMINAL FACE TO NOMINAL FACE
6.50m
VERGE
3.50m
INDENTED BUS BAY
3.50m
TRAFFIC LANE
5.00m
MEDIAN
3.50m
RIGHT TURN LANE
3.50m
LEFT TURN LANE
6.50m
VERGE
RP BOUNDARY
RP BDY
4.0m
PATH
2.500
3%
ROAD ℄
2.500
3%
4.0m
PATH
RP BDY
RP BOUNDARY
TYPE 'B1'
TYPE 'SM5'
TYPE 'SM3'
TYPE 'B1'

M2
CR06
CENTRE CONNECTOR
SCALE 1:100 (A1) 1:200(A3)


32.0m
ROAD RESERVE
17.50m
NOMINAL FACE TO NOMINAL FACE
8.00m
VERGE
2.00m
NO STAND
3.50m
TRAFFIC LANE
5.00m
MEDIAN
3.50m
RIGHT TURN LANE
3.50m
LEFT TURN LANE
6.50m
VERGE
RP BOUNDARY
RP BDY
4.0m
PATH
4.000
3%
ROAD ℄
2.500
3%
4.0m
PATH
RP BDY
RP BOUNDARY
TYPE 'B1'
TYPE 'SM5'
TYPE 'SM5'
TYPE 'B1'

M1
CR06
CENTRE CONNECTOR
SCALE 1:100 (A1) 1:200(A3)

H. SCALE 1:200 (A1) 1:400 (A3)
4 3 2 1 0 4 8 12 16 20m
2 1.5 1 0.5 0 2 4 6 8 10m
V. SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:31:18 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-INT

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angelman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **ENTRY ROAD SECTIONS**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

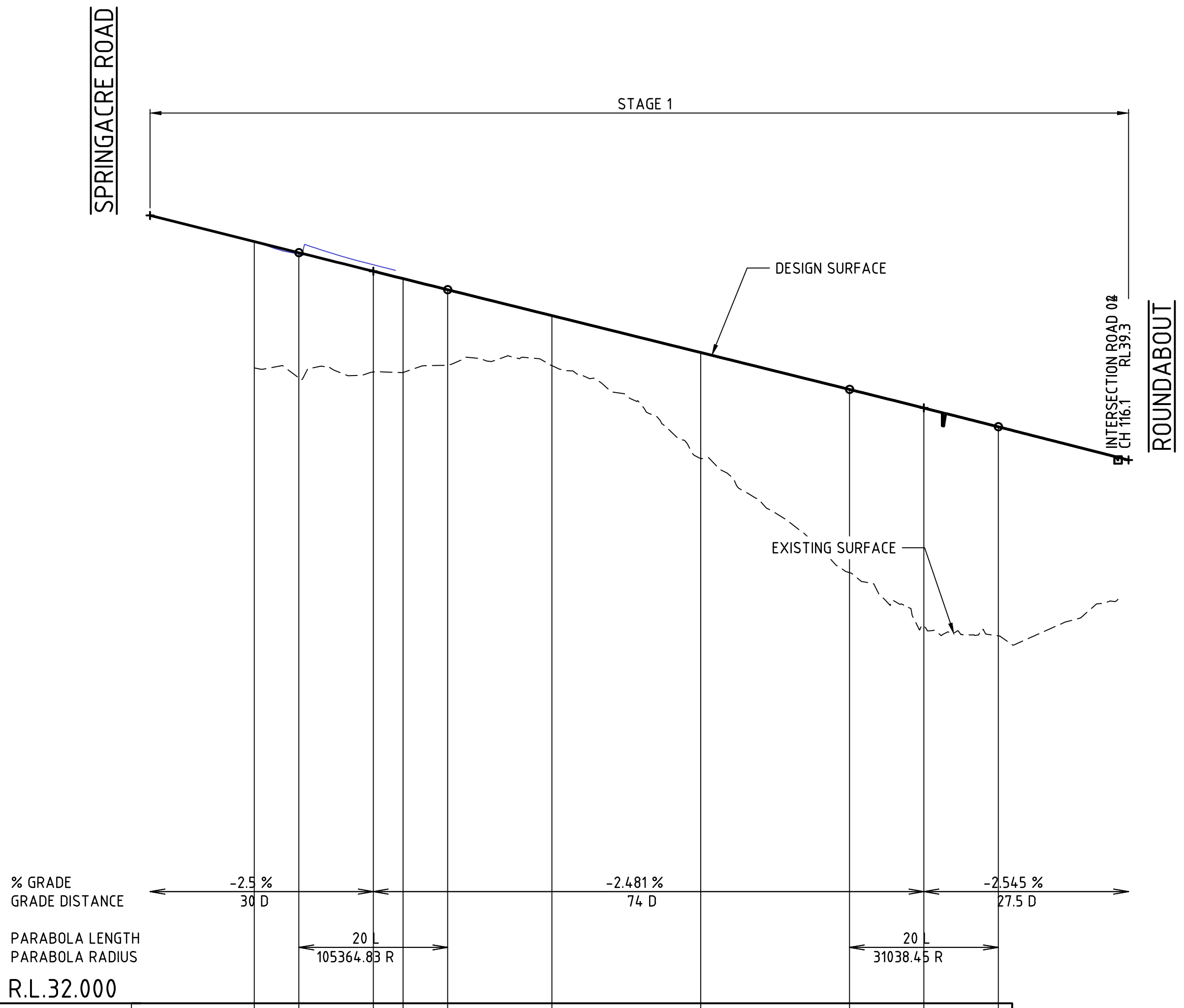
N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CR07**
Rev **A**

" "

FOR SPRINGACRE ROAD
INTERIM ROAD UPGRADE
REFER TO B00703 SET


SPRINGACRE ROAD
STAGE 1
DESIGN SURFACE
EXISTING SURFACE
INTERSECTION ROAD 02
CH 116.1 RL39.3
ROUNDABOUT
% GRADE
GRADE DISTANCE
-2.5 %
30 D
-2.481 %
74 D
-2.545 %
27.5 D
PARABOLA LENGTH
PARABOLA RADIUS
20 L
105364.83 R
20 L
31038.45 R

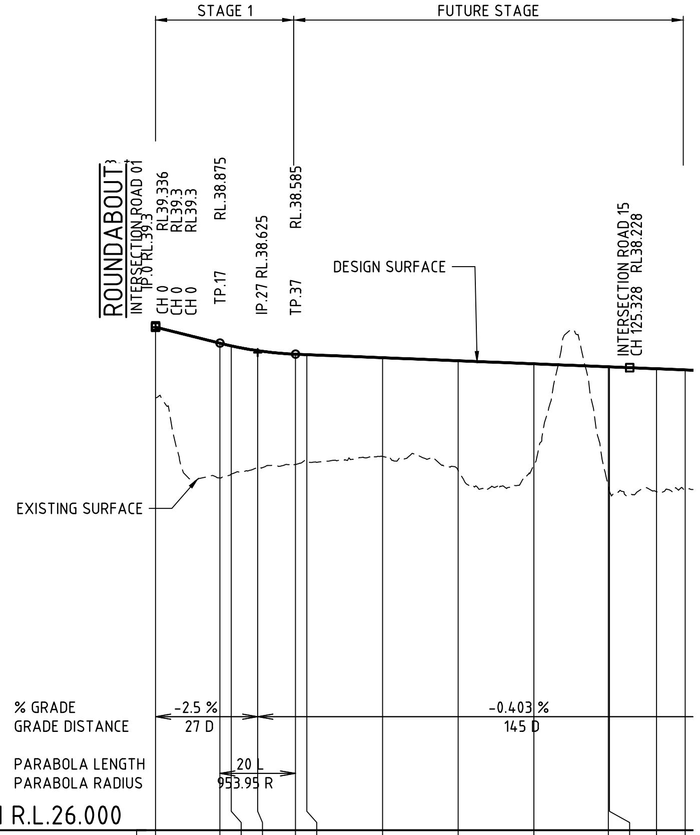
DATUM R.L.32.000

LIP OF KERB RHS								40.069	39.822	
LIP OF KERB LHS			41.648	41.548	41.398			40.069	39.822	
EXISTING SURFACE	40.539	40.405	40.482	40.477	40.576	40.568	39.322	37.786	37.066	36.936
CUT/FILL DEPTH	1.697	1.681	1.354	1.26	1.011	0.672	1.422	2.462	2.933	2.809
FINISHED CENTRELINE RL	42.236	42.086	41.836	41.737	41.588	41.241	40.744	40.248	39.998	39.745
PEGGED CHAINAGE	0	6	16	20	26	40	60	80	90	100

HORIZ. CURVE RADIUS

ROAD 01 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)


STAGE 1
FUTURE STAGE
ROUNDABOUT
INTERSECTION ROAD 01
TP.0 RL.39.3
CH 0 RL39.336
CH 0 RL39.3
CH 0 RL39.3
TP.17 RL.38.875
IP.27 RL.38.625
TP.37 RL.38.585
DESIGN SURFACE
INTERSECTION ROAD 15
CH 125.328 RL38.228
EXISTING SURFACE
% GRADE
GRADE DISTANCE
-2.5 %
27 D
-0.403 %
145 D
PARABOLA LENGTH
PARABOLA RADIUS
20 L
953.95 R

DATUM R.L.26.000

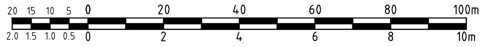
LIP OF KERB RHS				38.549	38.456	38.444	38.363	38.282	38.202	38.122	38.121	38.071	38.04
LIP OF KERB LHS				38.549	38.456	38.444	38.363	38.282	38.202	38.121	38.12	38.067	38.036
EXISTING SURFACE	37.428	35.313	35.416	35.59	35.667	35.729	35.882	35.507	35.659	35.095	34.966	34.95	34.989
CUT/FILL DEPTH	1.872	3.562	3.389	3.087	2.917	2.843	2.61	2.904	2.671	3.156	3.284	3.25	3.18
FINISHED CENTRELINE RL	39.3	38.875	38.805	38.677	38.585	38.573	38.492	38.411	38.33	38.251	38.25	38.2	38.169
PEGGED CHAINAGE	0	17	20	27	37	40	60	80	100	119.693	120	132.421	140

HORIZ. CURVE RADIUS 500 R

ROAD 02 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)

SCALE 1:1000 (A1) 1:2000 (A3)


20 15 10 5 0 20 40 60 80 100m
2.0 1.5 1.0 0.5 0 2 4 6 8 10m

SCALE 1:100 (A1) 1:200 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **ROAD LONGITUDINAL SECTION**
SHEET 1 OF 6

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CR08**
Rev **A**

" "

Plot Date: 12/12/2025 12:31:24 PM User: WILLIAM GRIFFITH
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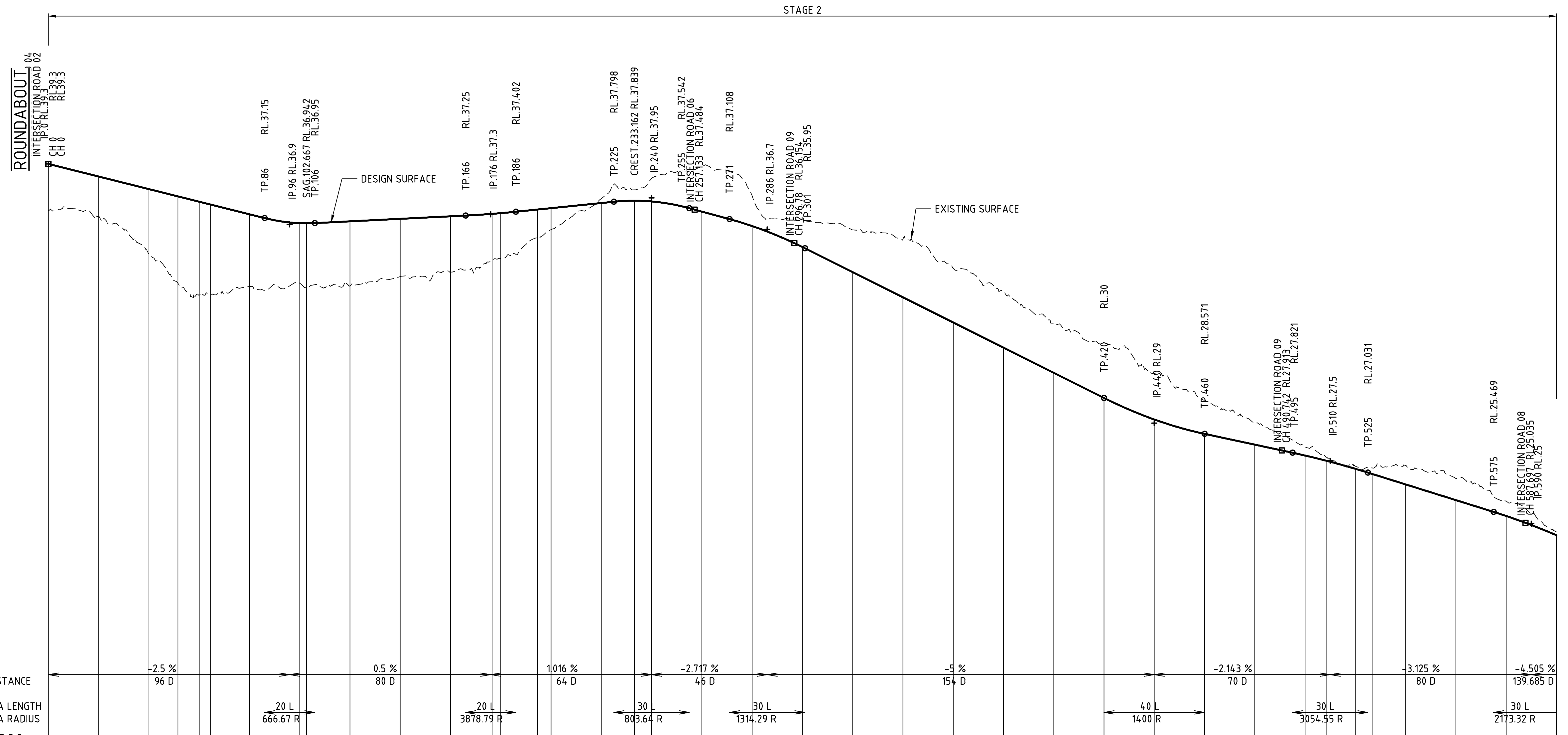

STAGE 2
ROUNDABOUT
INTERSECTION ROAD 02
04
IP.0 RL.39.3
CH 0 RL39.3
CH 0 RL39.3
TP.86 RL.37.15
IP.96 RL.36.9
SAG.102.667 RL.36.942
TP.106 RL.36.95
DESIGN SURFACE
TP.166 RL.37.25
IP.176 RL.37.3
TP.186 RL.37.402
TP.225 RL.37.798
CREST.233.162 RL.37.839
IP.240 RL.37.95
TP.255 RL.37.542
INTERSECTION ROAD 06
CH 257.133 RL37.484
TP.271 RL.37.108
IP.286 RL.36.7
INTERSECTION ROAD 09
CH 296.78 RL36.154
TP.301 RL.35.95
EXISTING SURFACE
TP.420 RL.30
IP.440 RL.29
TP.460 RL.28.571
INTERSECTION ROAD 09
CH 490.742 RL27.913
TP.495 RL.27.821
IP.510 RL.27.5
TP.525 RL.27.031
TP.575 RL.25.469
INTERSECTION ROAD 08
CH 587.697 RL25.035
IP.590 RL.25
% GRADE
GRADE DISTANCE
-2.5 %
96 D
0.5 %
80 D
1.016 %
64 D
-2.717 %
46 D
-5 %
154 D
-2.143 %
70 D
-3.125 %
80 D
-4.505 %
139.685 D
PARABOLA LENGTH
PARABOLA RADIUS
20 L
666.67 R
20 L
3878.79 R
30 L
803.64 R
30 L
1314.29 R
40 L
1400 R
30 L
3054.55 R
30 L
2173.32 R

DATUM R.L.16.000

PEGGED CHAINAGE	0	20	40	51.529	60	64.447	80	100	102.667	120	140	160	176.569
LIP OF KERB RHS			38.213	37.925	37.713	37.602	37.213	36.86	36.855	36.933	37.033	37.133	37.23
LIP OF KERB LHS			38.217	37.929	37.717	37.606	37.217	36.864	36.859	36.938	37.038	37.138	37.235
EXISTING SURFACE	37.428	37.212	35.703	34.554	34.085	34.112	34.427	34.561	34.379	34.456	34.825	34.992	35.483
CUT/FILL DEPTH	1.872	1.588	2.597	3.458	3.715	3.577	2.873	2.386	2.563	2.564	2.295	2.228	1.834
FINISHED CENTRELINE RL	39.3	38.8	38.3	38.012	37.8	37.689	37.3	36.947	36.942	37.02	37.12	37.22	37.317

PEGGED CHAINAGE	180	194.633	200	220	233.162	240	260	280	300	320	340	360	380
LIP OF KERB RHS	37.258	37.402	37.457	37.66	37.752	37.723	37.32	36.745	35.913	34.913	33.913	32.913	31.913
LIP OF KERB LHS	37.263	37.407	37.461	37.664	37.757	37.728	37.324	36.75	35.914	34.913	33.913	32.913	31.913
EXISTING SURFACE	35.543	36.342	36.692	37.925	38.272	38.728	39.197	38.034	37.024	36.682	36.313	35.151	34.224
CUT/FILL DEPTH	1.802	1.148	0.852	-0.178	-0.433	-0.918	-1.791	-1.201	-1.025	-1.682	-2.313	-2.151	-2.224
FINISHED CENTRELINE RL	37.345	37.489	37.544	37.747	37.839	37.81	37.407	36.832	36	35	34	33	32

PEGGED CHAINAGE	400	420	440	460	480	500	508.633	520	526.697	540	560	580	600
LIP OF KERB RHS	30.913	29.913	29.056	28.484	28.056	27.623	27.412	27.096	26.891	26.476	25.851	25.22	24.457
LIP OF KERB LHS	30.913	29.913	29.056	28.484	28.056	27.627	27.416	27.101	26.896	26.48	25.855	25.224	24.461
EXISTING SURFACE	32.976	32.198	30.947	29.92	28.987	28.052	27.612	27.286	27.215	27.317	26.792	25.906	24.674
CUT/FILL DEPTH	-1.976	-2.198	-1.804	-1.349	-0.845	-0.341	-0.113	-0.103	-0.237	-0.754	-0.854	-0.599	-0.13
FINISHED CENTRELINE RL	31	30	29.143	28.571	28.143	27.71	27.499	27.183	26.978	26.563	25.938	25.307	24.544

HORIZ. CURVE RADIUS
-20 R
11.5 R
11.5 R

ROAD 03 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)

SCALE 1:1000 (A1) 1:2000 (A3)
20 15 10 5 0 20 40 60 80 100m
2.0 1.5 1.0 0.5 0 2 4 6 8 10m
SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

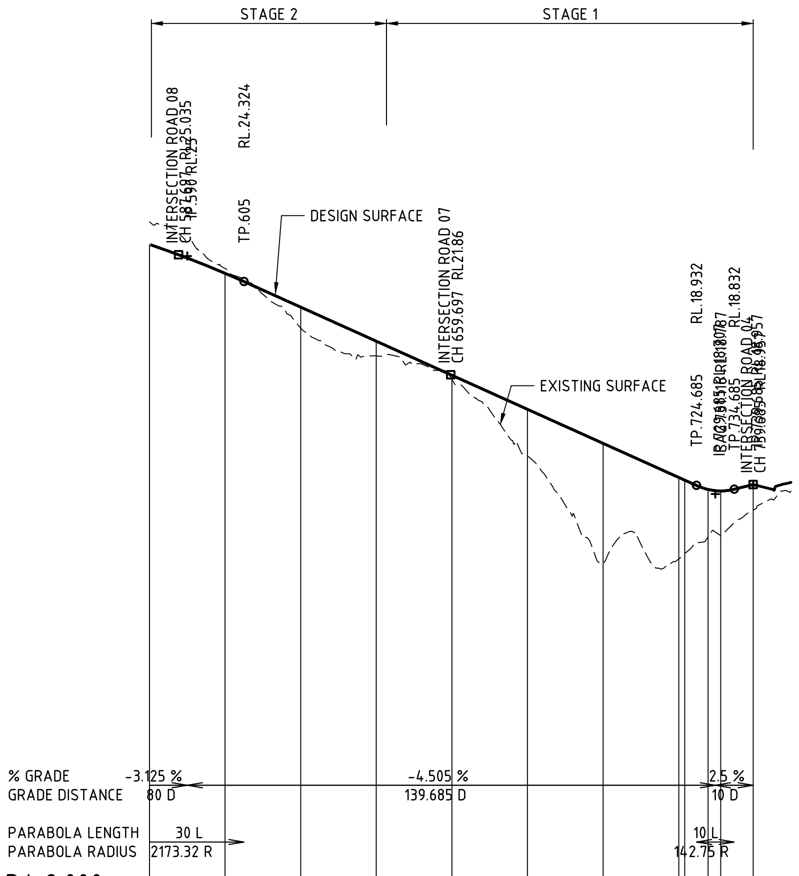
Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **ROAD LONGITUDINAL SECTION**
SHEET 2 OF 6

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CR09**
Rev **A**

" "


STAGE 2
STAGE 1
INTERSECTION ROAD 08
CH 587.687 RL.25.035
TP.590 RL.25
RL.24.324
TP.605
DESIGN SURFACE
INTERSECTION ROAD 07
CH 659.697 RL21.86
EXISTING SURFACE
TP.724.685
RL.18.932
IP.729.185 RL.18.787
SAG.730.1 RL.18.787
TP.734.685
RL.18.832
INTERSECTION ROAD 04
CH 739.685 RL.18.957
% GRADE
GRADE DISTANCE
-3.125 %
80 D
-4.505 %
139.685 D
2.5 %
10 D
PARABOLA LENGTH
PARABOLA RADIUS
30 L
2173.32 R
10 L
142.75 R

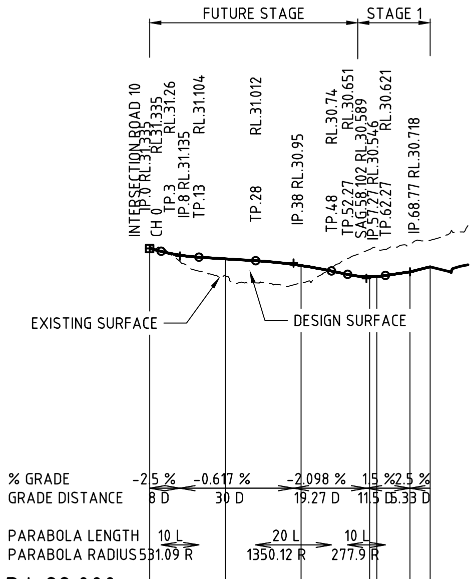
DATUM R.L.8.000

LIP OF KERB RHS	25.22	24.457	23.561	22.66	21.759	20.858	19.957	19.056	18.984	18.739			
LIP OF KERB LHS	25.224	24.461	23.566	22.665	21.764	20.863	19.962	19.061	18.989	18.744			
EXISTING SURFACE	25.906	24.674	23.096	22.361	21.736	19.715	16.854	16.988	17.128	17.571	17.612	18.279	
CUT/FILL DEPTH	-0.599	-0.13	0.552	0.386	0.11	1.23	3.19	2.155	1.944	1.256	1.175	0.677	
FINISHED CENTRELINE RL	25.307	24.544	23.648	22.747	21.846	20.945	20.044	19.143	19.071	18.826	18.787	18.957	
PEGGED CHAINAGE	580	600	620	640	660	680	700	720	721.593	727.775	731.116	739.685	

HORIZ. CURVE RADIUS 11.5 R

ROAD 03 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)


FUTURE STAGE
STAGE 1
INTERSECTION ROAD 10
CH 0
TP.0 RL.31.335
RL.31.335
TP.3
RL.31.26
IP.8 RL.31.135
TP.13
RL.31.104
TP.28
RL.31.012
IP.38 RL.30.95
TP.48
RL.30.74
TP.52.27
RL.30.651
SAG.58.102 RL.30.589
IP.57.27 RL.30.546
TP.62.27
RL.30.621
IP.68.77 RL.30.718
EXISTING SURFACE
DESIGN SURFACE
% GRADE
GRADE DISTANCE
-2.5 %
8 D
-0.617 %
30 D
-2.098 %
19.27 D
1.5 %
11.5 D
2.5 %
5.33 D
PARABOLA LENGTH
PARABOLA RADIUS
10 L
531.09 R
20 L
1350.12 R
10 L
277.9 R

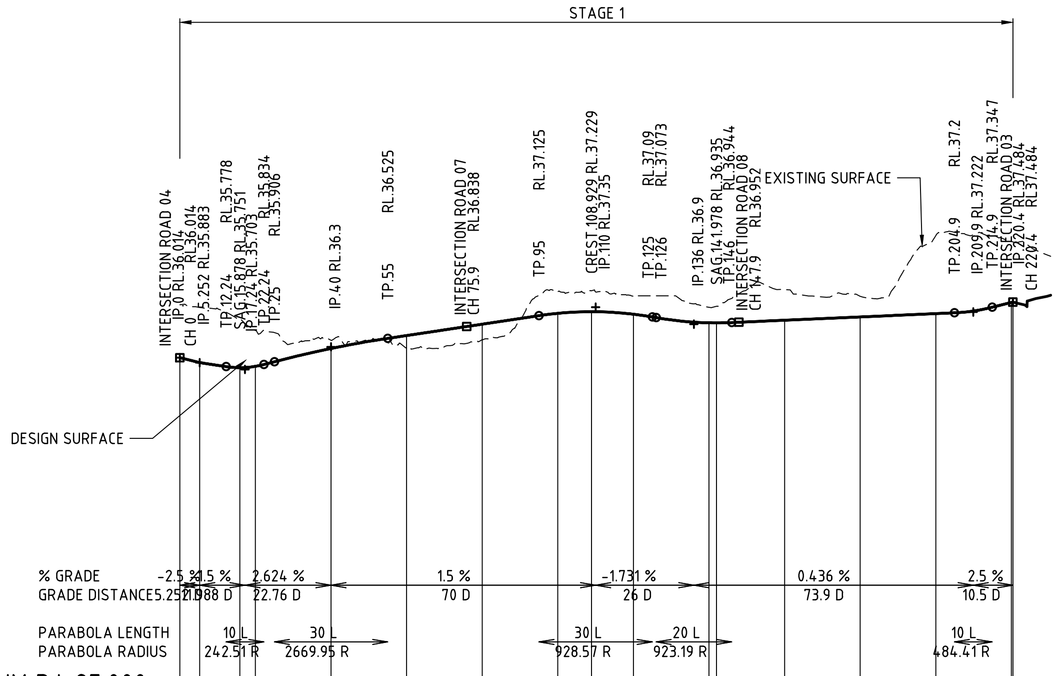
DATUM R.L.22.000

LIP OF KERB RHS		30.974	30.797	30.502	30.509		
LIP OF KERB LHS		30.974	30.797	30.502	30.509		
EXISTING SURFACE	31.392	30.618	30.424	31.311	31.368	31.468	31.55
CUT/FILL DEPTH	-0.057	0.443	0.461	-0.721	-0.772	-0.75	-0.699
FINISHED CENTRELINE RL	31.335	31.061	30.884	30.589	30.596	30.718	30.851
PEGGED CHAINAGE	0	20	40	58.102	60	68.77	74.1

HORIZ. CURVE RADIUS

ROAD 05 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)


STAGE 1
INTERSECTION ROAD 04
CH 0
IP.0 RL.36.014
RL.36.014
IP.5.252 RL.35.883
TP.12.24
RL.35.778
SAG.15.878 RL.35.751
IP.17.24 RL.35.703
TP.22.24
RL.35.834
TP.25
RL.35.906
IP.40 RL.36.3
TP.55
RL.36.525
INTERSECTION ROAD 07
CH 75.9
RL36.838
TP.95
RL.37.125
CREST.108.929 RL.37.229
IP.110 RL.37.35
TP.125
RL.37.09
TP.126
RL.37.073
IP.136 RL.36.9
SAG.141.978 RL.36.935
TP.146
RL.36.944
INTERSECTION ROAD 08
CH 147.9
RL36.952
EXISTING SURFACE
TP.204.9
RL.37.2
IP.209.9 RL.37.222
TP.214.9
RL.37.347
INTERSECTION ROAD 03
CH 220.4
IP.220.4 RL.37.484
RL37.484
DESIGN SURFACE
% GRADE
GRADE DISTANCE
-2.5 %
5.252 D
1.5 %
11.988 D
2.624 %
22.76 D
1.5 %
70 D
-1.731 %
26 D
0.436 %
73.9 D
2.5 %
10.5 D
PARABOLA LENGTH
PARABOLA RADIUS
10 L
242.51 R
30 L
2669.95 R
30 L
928.57 R
20 L
923.19 R
10 L
484.41 R

DATUM R.L.27.000

LIP OF KERB RHS			35.664	35.699	36.171	36.513	36.813	37.1	37.142	37.076	36.85	36.848	36.918	37.005	37.092		
LIP OF KERB LHS			35.664	35.699	36.171	36.513	36.813	37.1	37.142	37.076	36.85	36.848	36.918	37.005	37.092		
EXISTING SURFACE	37.413	37.343	37.056	36.733	36.476	36.273	36.487	37.757	37.784	37.641	37.346	37.374	37.815	37.637	39.243	39.086	39.074
CUT/FILL DEPTH	-1.399	-1.461	-1.306	-0.948	-0.218	0.327	0.413	-0.57	-0.555	-0.477	-0.409	-0.439	-0.81	-0.545	-2.064	-1.611	-1.59
FINISHED CENTRELINE RL	36.014	35.883	35.751	35.786	36.258	36.6	36.9	37.187	37.229	37.163	36.937	36.935	37.005	37.092	37.179	37.474	37.484
PEGGED CHAINAGE	0	5.252	15.878	20	40	60	80	100	108.929	120	140	141.978	160	180	200	220	220.4

HORIZ. CURVE RADIUS

ROAD 06 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)

SCALE 1:1000 (A1) 1:2000 (A3)

20 15 10 5 0 20 40 60 80 100m

2.0 1.5 1.0 0.5 0 2 4 6 8 10m

SCALE 1:100 (A1) 1:200 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **ROAD LONGITUDINAL SECTION**
SHEET 3 OF 6

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CR10**

Rev **A**

" "

User: WILLIAM GRIFFITH
Plot Date: 12/12/2025 12:31:26 PM
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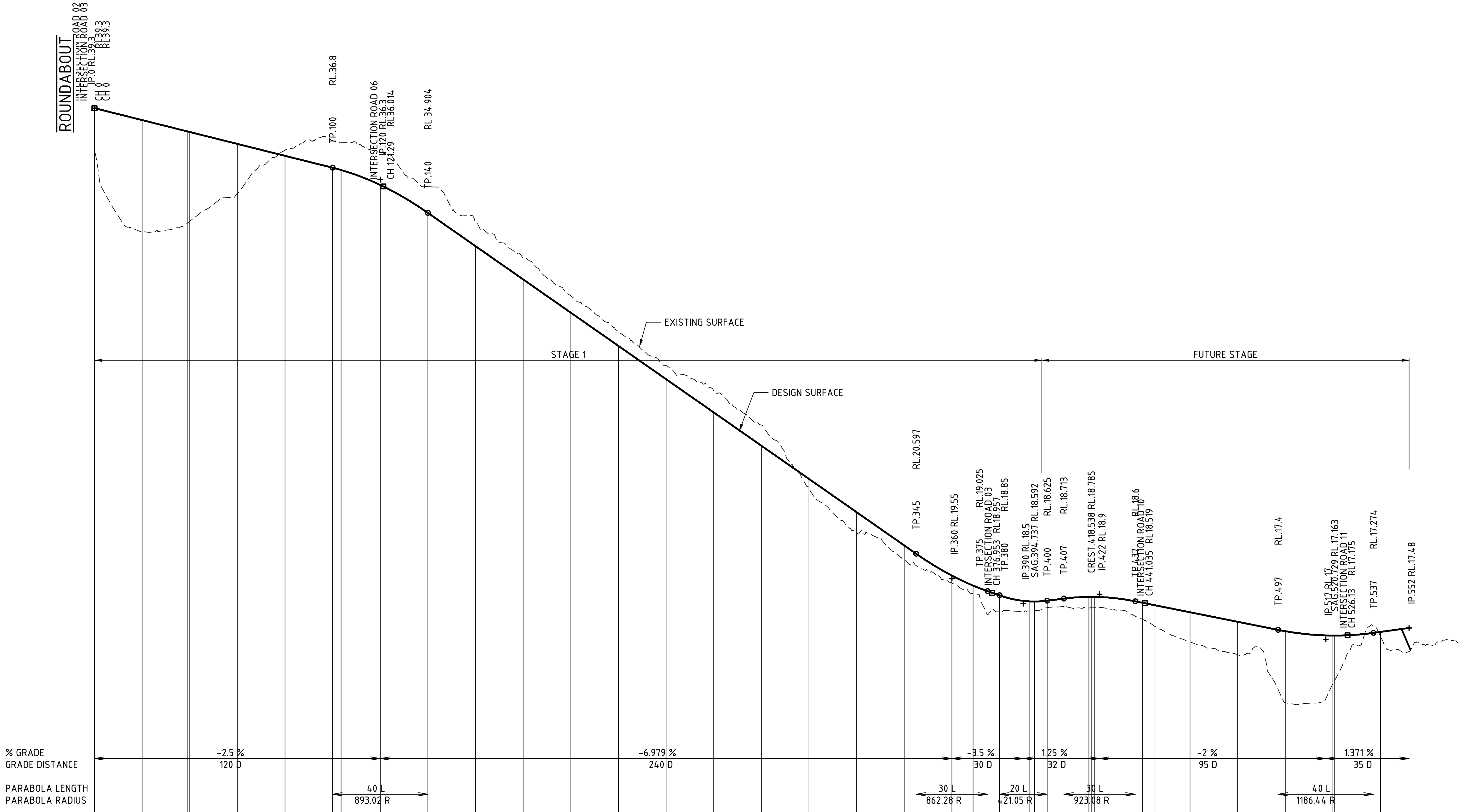

ROUNDABOUT
INTERSECTION ROAD 02
INTERSECTION ROAD 03
IP.0 RL.39.3
CH 0 RL39.3
CH 0 RL39.3
TP.100
RL.36.8
INTERSECTION ROAD 06
IP.120 RL.36.3
CH 121.29 RL36.014
TP.140
RL.34.904
EXISTING SURFACE
STAGE 1
FUTURE STAGE
DESIGN SURFACE
TP.345
RL.20.597
IP.360 RL.19.55
TP.375
RL.19.025
INTERSECTION ROAD 03
CH 376.953 RL18.957
TP.380
RL.18.85
IP.390 RL.18.5
SAG.394.737 RL.18.592
TP.400
RL.18.625
TP.407
RL.18.713
CREST.418.538 RL.18.785
IP.422 RL.18.9
TP.437
RL.18.6
INTERSECTION ROAD 10
CH 441.035 RL18.519
TP.497
RL.17.4
IP.517 RL.17
SAG.520.729 RL.17.163
INTERSECTION ROAD 11
CH 526.13 RL17.175
TP.537
RL.17.274
IP.552 RL.17.48
% GRADE
GRADE DISTANCE
-2.5 %
120 D
-6.979 %
240 D
-3.5 %
30 D
1.25 %
32 D
-2 %
95 D
1.371 %
35 D
PARABOLA LENGTH
PARABOLA RADIUS
40 L
893.02 R
30 L
862.28 R
20 L
421.05 R
30 L
923.08 R
40 L
1186.44 R

DATUM R.L.9.000

LIP OF KERB RHS			38.197	38.171	37.671	37.171	36.671	36.576	35.947	34.771	33.375	31.979	30.583
LIP OF KERB LHS							36.619	36.535	35.945	34.771	33.375	31.979	30.583
EXISTING SURFACE	37.428	34.141	34.469	34.552	35.71	37.531	37.943	37.848	37.446	36	34.525	33.008	31.424
CUT/FILL DEPTH	1.872	4.659	3.857	3.748	2.09	-0.231	-1.143	-1.143	-1.37	-1.095	-1.016	-0.895	-0.708
FINISHED CENTRELINE RL	39.3	38.8	38.326	38.3	37.8	37.3	36.8	36.704	36.076	34.904	33.508	32.112	30.717
PEGGED CHAINAGE	0	20	38.955	40	60	80	100	103.544	120	140	160	180	200

LIP OF KERB RHS	29.188	27.792	26.396	25	23.604	22.208	20.813	19.547	19.127	18.717	18.465	18.459	18.492
LIP OF KERB LHS	29.188	27.792	26.396	25	23.604	22.208	20.813	19.547	19.127	18.72	18.47	18.463	18.496
EXISTING SURFACE	29.926	28.497	27.446	26	23.358	21.468	20.351	19.371	18.925	18.15	18.193	18.216	18.33
CUT/FILL DEPTH	-0.605	-0.572	-0.917	-0.867	0.379	0.873	0.595	0.309	0.336	0.7	0.405	0.376	0.295
FINISHED CENTRELINE RL	29.321	27.925	26.529	25.133	23.737	22.342	20.946	19.68	19.261	18.85	18.598	18.592	18.625
PEGGED CHAINAGE	220	240	260	280	300	320	340	360	368.89	380	392.452	394.737	400

LIP OF KERB RHS	18.651	18.651	18.65	18.407	18.309	18.007	17.607	17.211	17.03	17.029	17.182		
LIP OF KERB LHS	18.655	18.656	18.655	18.411	18.313	18.011	17.611	17.215	17.034	17.034	17.187		
EXISTING SURFACE	18.319	18.329	18.331	17.862	17.566	16.896	16.357	14.34	15.133	15.269	17.132	16.782	16.767
CUT/FILL DEPTH	0.465	0.456	0.453	0.678	0.876	1.244	1.383	3.004	2.03	1.894	0.184		
FINISHED CENTRELINE RL	18.784	18.785	18.783	18.54	18.442	18.14	17.74	17.344	17.163	17.163	17.315		
PEGGED CHAINAGE	417.551	418.538	420	440	444.902	460	480	500	520	520.729	540	560	562.597

HORIZ. CURVE RADIUS -100 R 15 R -40 R

ROAD 04 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)

SCALE 1:1000 (A1) 1:2000 (A3)
20 15 10 5 0 20 40 60 80 100m
2.0 1.5 1.0 0.5 0 2 4 6 8 10m
SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:31:26 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-RDP-LX

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angelman
Registered Engineer
Date " "
Registered Accreditation

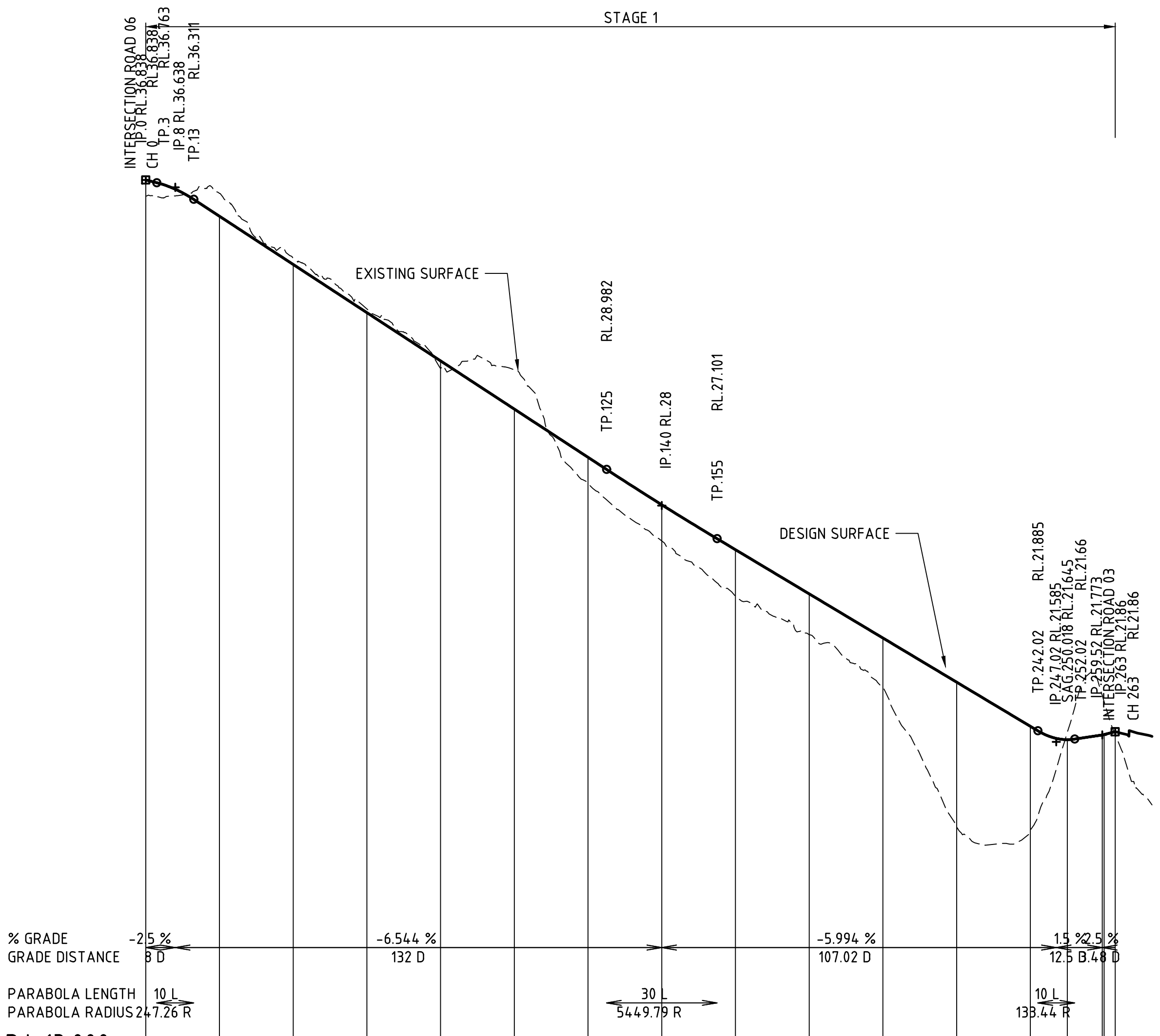
Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **ROAD LONGITUDINAL SECTION**
SHEET 4 OF 6

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CR11**
Rev **A**

" "


STAGE 1
INTERSECTION ROAD 06
CH 0
IP.0 RL.36.838
RL.36.838
TP.3
RL.36.763
IP.8 RL.36.638
TP.13
RL.36.311
EXISTING SURFACE
RL.28.982
TP.125
IP.140 RL.28
RL.27.101
TP.155
DESIGN SURFACE
RL.21.885
TP.242.02
IP.247.02 RL.21.585
SAG.250.018 RL.21.645
TP.252.02
RL.21.66
IP.259.52 RL.21.773
INTERSECTION ROAD 03
IP.263 RL.21.86
CH 263
RL21.86
% GRADE
GRADE DISTANCE
-2.5 %
8 D
-6.544 %
132 D
-5.994 %
107.02 D
1.5 %
12.5 D
2.5 %
3.48 D
PARABOLA LENGTH
PARABOLA RADIUS
10 L
247.26 R
30 L
5449.79 R
10 L
133.44 R

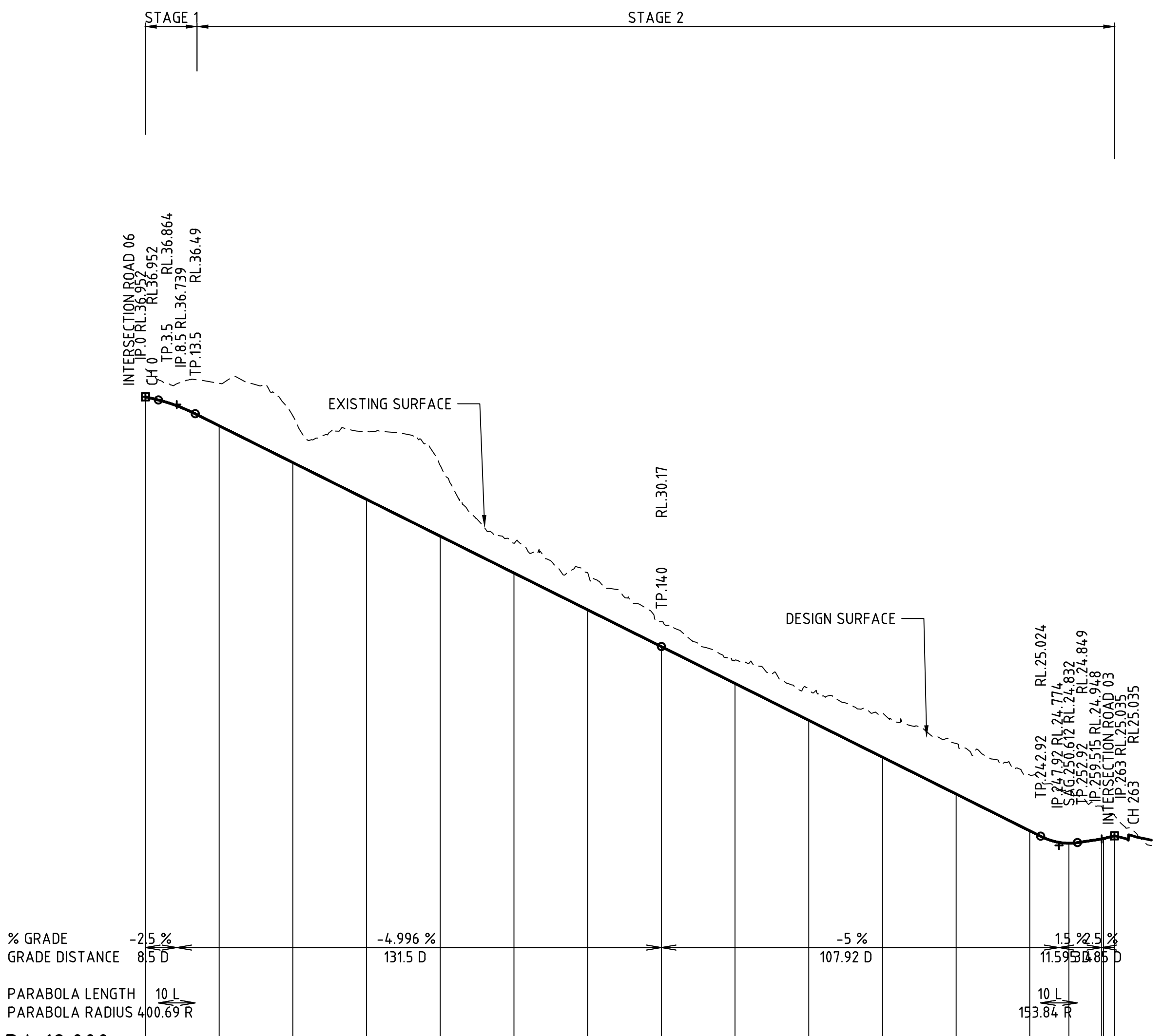
DATUM R.L.13.000

LIP OF KERB RHS		35.766	34.457	33.148	31.84	30.531	29.222	27.934	26.714	25.515	24.317	23.118	21.919	21.558			
LIP OF KERB LHS		35.766	34.457	33.148	31.84	30.531	29.222	27.934	26.714	25.515	24.317	23.118	21.919	21.558			
EXISTING SURFACE	36.391	36.475	34.718	33.337	31.723	31.685	28.58	27.037	25.535	24.498	23.058	19.283	19.174	21.851	22.835	22.677	21.786
CUT/FILL DEPTH	0.448	-0.622	-0.173	-0.102	0.204	-1.067	0.729	0.983	1.266	1.105	1.346	3.922	2.832	-0.205	-1.062	-0.893	0.074
FINISHED CENTRELINE RL	36.839	35.853	34.544	33.235	31.927	30.618	29.309	28.021	26.801	25.602	24.404	23.205	22.006	21.645	21.773	21.785	21.86
PEGGED CHAINAGE	0	20	40	60	80	100	120	140	160	180	200	220	240	250.018	259.52	260	263

HORIZ. CURVE RADIUS

ROAD 07 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)


STAGE 1
STAGE 2
INTERSECTION ROAD 06
CH 0
IP.0 RL.36.952
RL.36.952
TP.3.5
RL.36.864
IP.8.5 RL.36.739
TP.13.5
RL.36.49
EXISTING SURFACE
RL.30.17
TP.140
DESIGN SURFACE
RL.25.024
TP.242.92
IP.247.92 RL.24.774
SAG.250.612 RL.24.832
TP.252.92
RL.24.849
IP.259.515 RL.24.948
INTERSECTION ROAD 03
IP.263 RL.25.035
CH 263
RL25.035
% GRADE
GRADE DISTANCE
-2.5 %
8.5 D
-4.996 %
131.5 D
-5 %
107.92 D
1.5 %
11.595
2.5 %
3.485 D
PARABOLA LENGTH
PARABOLA RADIUS
10 L
400.69 R
10 L
153.84 R

DATUM R.L.19.000

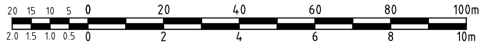
LIP OF KERB RHS		36.078	35.079	34.08	33.08	32.081	31.082	30.083	29.083	28.083	27.083	26.083	25.083	24.745			
LIP OF KERB LHS		36.078	35.079	34.08	33.08	32.081	31.082	30.083	29.083	28.083	27.083	26.083	25.083	24.745			
EXISTING SURFACE	37.705	37.316	36.436	36.005	35.087	32.976	32.174	30.845	29.8	29.009	28.371	27.54	26.684	26.235	25.833	25.724	25.612
CUT/FILL DEPTH	-0.754	-1.152	-1.27	-1.838	-1.92	-0.808	-1.005	-0.675	-0.63	-0.839	-1.202	-1.37	-1.514	-1.403	-0.886	-0.764	-0.577
FINISHED CENTRELINE RL	36.952	36.165	35.166	34.167	33.167	32.168	31.169	30.17	29.17	28.17	27.17	26.17	25.17	24.832	24.948	24.96	25.035
PEGGED CHAINAGE	0	20	40	60	80	100	120	140	160	180	200	220	240	250.612	259.515	260	263

HORIZ. CURVE RADIUS

ROAD 08 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)

SCALE 1:1000 (A1) 1:2000 (A3)


20 15 10 5 0 20 40 60 80 100m
2.0 1.5 1.0 0.5 0 2 4 6 8 10m

SCALE 1:100 (A1) 1:200 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

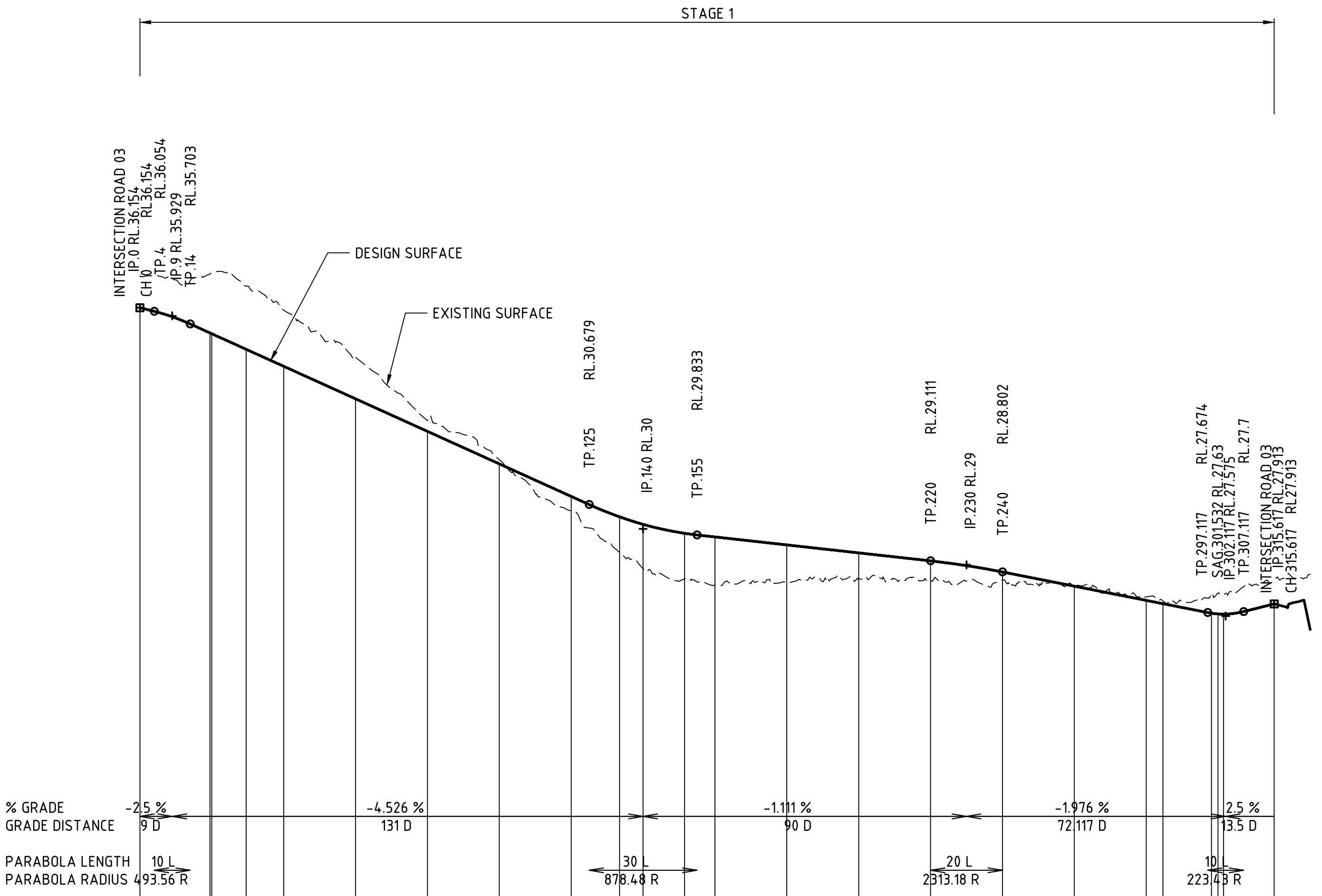
Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **ROAD LONGITUDINAL SECTION**
SHEET 5 OF 6

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. *Drawing No.* **B00702-DA-CR12**
Rev **A**

Plot Date: 12/12/2025 12:31:27 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-RDP-LX


STAGE 1
INTERSECTION ROAD 03
IP.0 RL.36.154
CH 0
RL.36.154
TP.4
RL.36.054
IP.9 RL.35.929
TP.14
RL.35.703
DESIGN SURFACE
EXISTING SURFACE
TP.125
RL.30.679
IP.140 RL.30
TP.155
RL.29.833
TP.220
RL.29.111
IP.230 RL.29
TP.240
RL.28.802
TP.297.117
RL.27.674
SAG.301.532 RL.27.63
IP.302.117 RL.27.575
TP.307.117
RL.27.7
INTERSECTION ROAD 03
IP.315.617 RL.27.913
CH 315.617
RL27.913
% GRADE
GRADE DISTANCE
-2.5 %
9 D
-4.526 %
131 D
-1.111 %
90 D
-1.976 %
72.117 D
2.5 %
13.5 D
PARABOLA LENGTH
PARABOLA RADIUS
10 L
493.56 R
30 L
878.48 R
20 L
2313.18 R
10 L
223.43 R

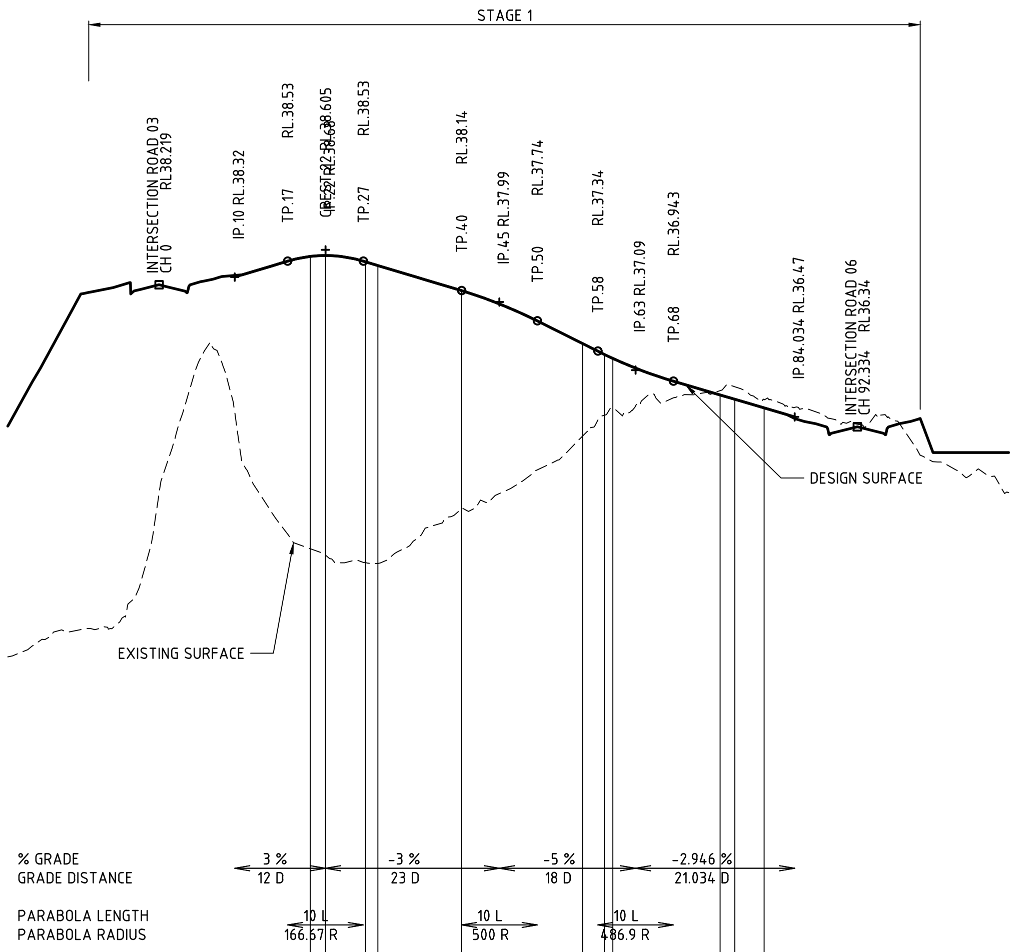
DATUM R.L.19.000

LIP OF KERB RHS		35.368	35.344	34.912	34.439	33.534	32.629	31.723	30.818	30.249	30.041	29.792	29.691	29.469	29.246	29.024	28.715	28.32	27.925	27.833	27.569	27.549	27.543	
LIP OF KERB LHS		35.373	35.349	34.917	34.444	33.538	32.633	31.728	30.823	30.254	30.046	29.796	29.695	29.473	29.251	29.029	28.72	28.325	27.93	27.838	27.573	27.553	27.548	
EXISTING SURFACE	37.042	37.092	37.133	36.754	36.088	34.78	33.02	31.922	30.502	29.348	28.893	28.607	28.435	28.502	28.603	28.569	28.573	28.419	28.106	27.995	28.185	28.214	28.17	28.572
CUT/FILL DEPTH	-0.888	-1.636	-1.702	-1.755	-1.562	-1.159	-0.304	-0.111	0.403	0.988	1.235	1.271	1.343	1.054	0.73	0.542	0.23	-0.012	-0.093	-0.075	-0.529	-0.578	-0.54	-0.66
FINISHED CENTRELINE RL	36.154	35.455	35.431	34.999	34.526	33.621	32.716	31.81	30.905	30.336	30.128	29.879	29.778	29.556	29.333	29.111	28.802	28.407	28.012	27.92	27.656	27.636	27.63	27.913
PEGGED CHAINAGE	0	19.474	20	29.545	40	60	80	100	120	133.478	140	151.542	160	180	200	220	240	260	280	284.66	298.15	300	301.532	315.617

HORIZ. CURVE RADIUS 15 R 11.5 R 15 R

ROAD 09 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)


STAGE 1
INTERSECTION ROAD 03
CH 0
RL.38.219
IP.10 RL.38.32
TP.17
RL.38.53
CREST.22 RL.38.605
IP.22 RL.38.68
TP.27
RL.38.53
TP.40
RL.38.14
IP.45 RL.37.99
TP.50
RL.37.74
TP.58
RL.37.34
IP.63 RL.37.09
TP.68
RL.36.943
IP.84.034 RL.36.47
INTERSECTION ROAD 06
CH 92.334
RL.36.34
DESIGN SURFACE
EXISTING SURFACE
% GRADE
GRADE DISTANCE
3 %
12 D
-3 %
23 D
-5 %
18 D
-2.946 %
21.034 D
PARABOLA LENGTH
PARABOLA RADIUS
10 L
166.67 R
10 L
500 R
10 L
486.9 R

DATUM R.L.29.000

EDGE OF CONCRETE RHS		38.662	38.674	38.59	38.541	38.209	37.509	37.366	37.313	36.829	36.772	36.658	
EDGE OF CONCRETE LHS		38.662	38.674	38.59	38.541	38.209	37.509	37.366	37.313	36.829	36.772	36.658	
EXISTING SURFACE	35.458	34.727	34.643	34.543	34.533	35.257	36.217	36.493	36.584	36.818	36.869	36.701	36.374
CUT/FILL DEPTH		3.866	3.962	3.978	3.939	2.883	1.223	0.805	0.66	-0.057	-0.166	-0.112	
FINISHED CENTRELINE RL		38.593	38.605	38.521	38.472	38.14	37.44	37.297	37.244	36.761	36.703	36.589	
PEGGED CHAINAGE	0	20	22	27.294	28.927	40	56.003	58.872	60	74.178	76.134	80	92.334

HORIZ. CURVE RADIUS -10 R -10 R -10 R

LANE 01 LONGITUDINAL SECTION

SCALE 1:100(VERT.) SCALE 1:1000(HORIZ.)

SCALE 1:1000 (A1) 1:2000 (A3)

20 15 10 5 0 20 40 60 80 100m

2.0 1.5 1.0 0.5 0 2 4 6 8 10m

SCALE 1:100 (A1) 1:200 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **ROAD LONGITUDINAL SECTION**
SHEET 6 OF 6

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CR13**

Rev **A**

" "

Plot Date: 12/12/2025 12:31:28 PM User: WILLIAM GRIFFITH
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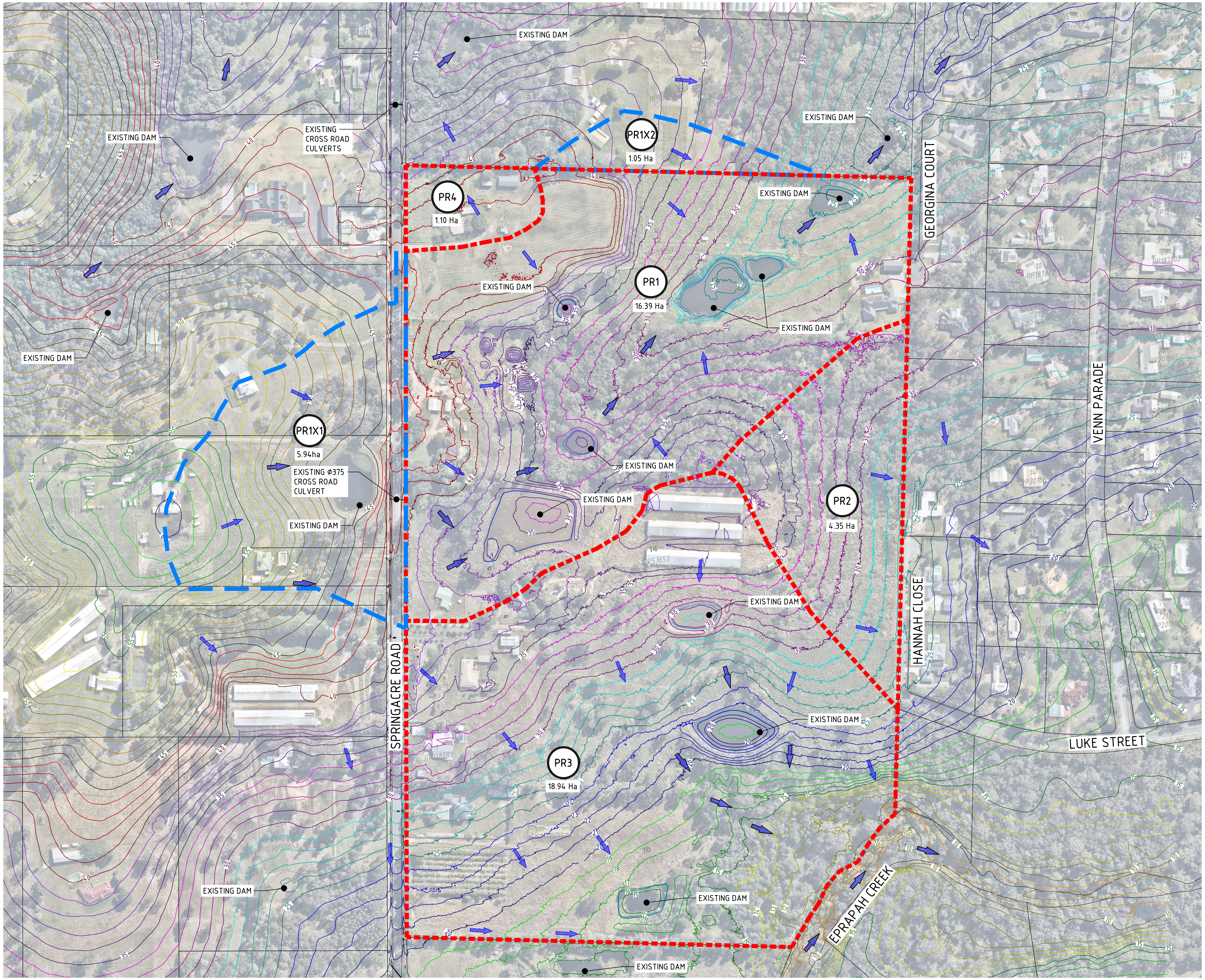

EXISTING DAM
EXISTING CROSS ROAD CULVERTS
EXISTING DAM
PR1X2
1.05 Ha
EXISTING DAM
EXISTING DAM
GEORGINA COURT
PR4
1.10 Ha
PR1
16.39 Ha
EXISTING DAM
EXISTING DAM
EXISTING DAM
PR1X1
5.94ha
EXISTING Ø375 CROSS ROAD CULVERT
EXISTING DAM
EXISTING DAM
EXISTING DAM
PR2
4.35 Ha
VENN PARADE
EXISTING DAM
HANNAH CLOSE
SPRINGACRE ROAD
EXISTING DAM
LUKE STREET
PR3
18.94 Ha
EXISTING DAM
EXISTING DAM
EPRAPAH CREEK
EXISTING DAM

CATCHMENT TABLE

INTERNAL		EXTERNAL	
CATCHMENT No.	AREA (Ha)	CATCHMENT NO.	AREA (Ha)
PR1	16.39 Ha	PR1X1	5.94 Ha
PR2	4.35 Ha	PR1X2	1.05 Ha
PR3	18.94 Ha		
PR4	1.10 Ha		

LEGEND

—	EXISTING CONTOURS
—	LOT BOUNDARY
▬ ▬ ▬	INTERNAL STORMWATER CATCHMENT
— — —	EXTERNAL STORMWATER CATCHMENT
(PR1)	CATCHMENT NUMBER
←	STORMWATER OVERLAND FLOW
←	CONCENTRATED STORMWATER FLOW

40 30 20 10 0 40 80 120 160 200m

SCALE 1:2000 (A1) 1:4000 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:31:47 PM User: WILLIAM GRIFFITH

File Name: S:\12ds\data\MAN12DSYN01\B00702__2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-SWC-PRE

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **PRE DEVELOPMENT CATCHMENT PLAN**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-SW01**

Rev **A**

" "

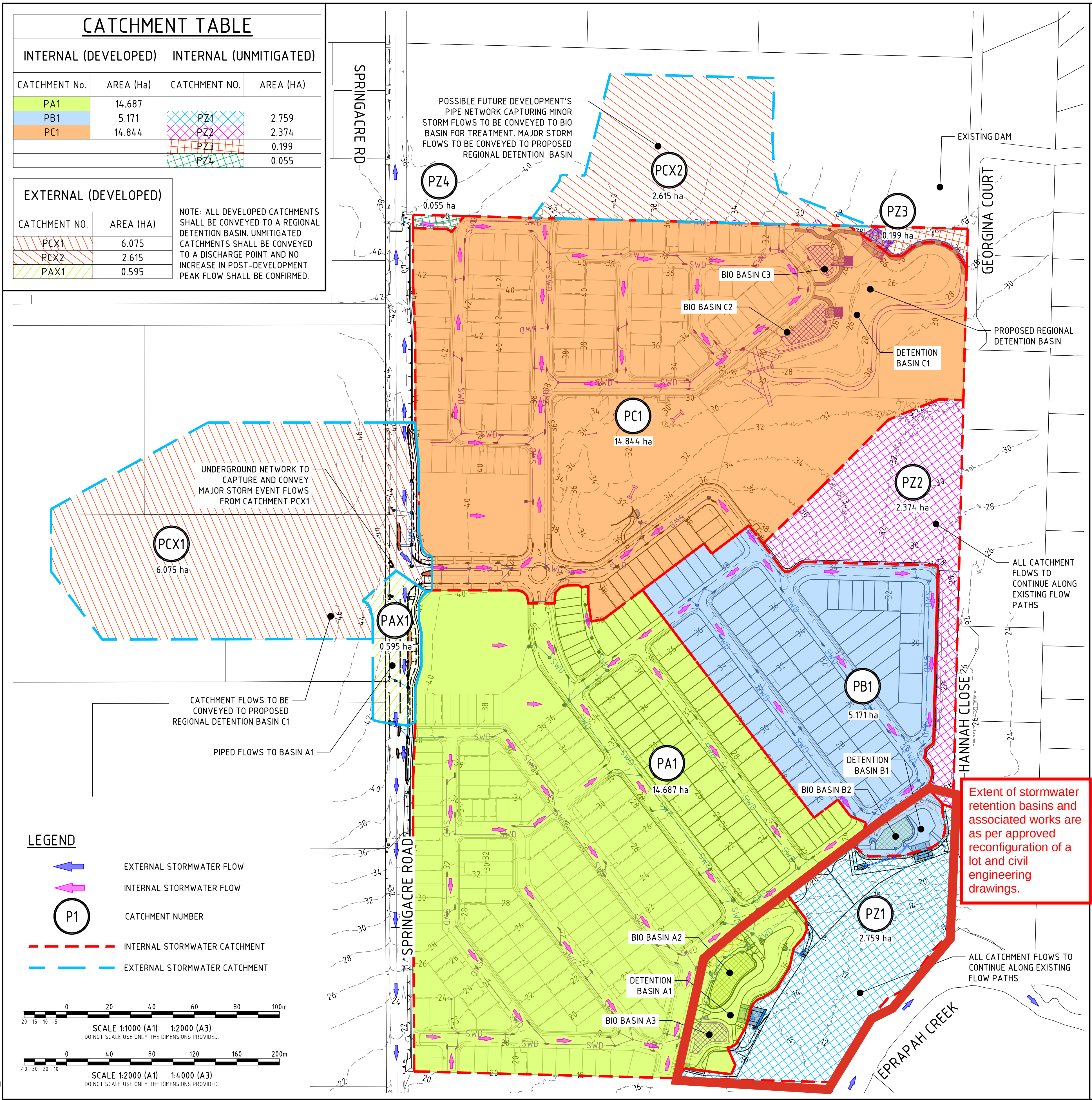
CATCHMENT TABLE

INTERNAL (DEVELOPED)		INTERNAL (UNMITIGATED)	
CATCHMENT No.	AREA (Ha)	CATCHMENT NO.	AREA (HA)
PA1	14.687		
PB1	5.171	PZ1	2.759
PC1	14.844	PZ2	2.374
		PZ3	0.199
		PZ4	0.055

EXTERNAL (DEVELOPED)

CATCHMENT NO.	AREA (HA)
PCX1	6.075
PCX2	2.615
PAX1	0.595

NOTE: ALL DEVELOPED CATCHMENTS SHALL BE CONVEYED TO A REGIONAL DETENTION BASIN. UNMITIGATED CATCHMENTS SHALL BE CONVEYED TO A DISCHARGE POINT AND NO INCREASE IN POST-DEVELOPMENT PEAK FLOW SHALL BE CONFIRMED.


SPRINGACRE RD
SPRINGACRE ROAD
GEORGINA COURT
HANNAH CLOSE
EPRAPAH CREEK
POSSIBLE FUTURE DEVELOPMENT'S PIPE NETWORK CAPTURING MINOR STORM FLOWS TO BE CONVEYED TO BIO BASIN FOR TREATMENT. MAJOR STORM FLOWS TO BE CONVEYED TO PROPOSED REGIONAL DETENTION BASIN
EXISTING DAM
PZ4
0.055 ha
PCX2
2.615 ha
PZ3
0.199 ha
BIO BASIN C3
BIO BASIN C2
DETENTION BASIN C1
PROPOSED REGIONAL DETENTION BASIN
PC1
14.844 ha
PZ2
2.374 ha
ALL CATCHMENT FLOWS TO CONTINUE ALONG EXISTING FLOW PATHS
UNDERGROUND NETWORK TO CAPTURE AND CONVEY MAJOR STORM EVENT FLOWS FROM CATCHMENT PCX1
PCX1
6.075 ha
PAX1
0.595 ha
CATCHMENT FLOWS TO BE CONVEYED TO PROPOSED REGIONAL DETENTION BASIN C1
PIPED FLOWS TO BASIN A1
PB1
5.171 ha
DETENTION BASIN B1
BIO BASIN B2
PA1
14.687 ha
PZ1
2.759 ha
BIO BASIN A2
DETENTION BASIN A1
BIO BASIN A3
ALL CATCHMENT FLOWS TO CONTINUE ALONG EXISTING FLOW PATHS
SWD
RWD

LEGEND

- ⬅ EXTERNAL STORMWATER FLOW
- ⬅ INTERNAL STORMWATER FLOW
- (P1) CATCHMENT NUMBER
- – – – INTERNAL STORMWATER CATCHMENT
- – – – EXTERNAL STORMWATER CATCHMENT

20 15 10 5 0 20 40 60 80 100m

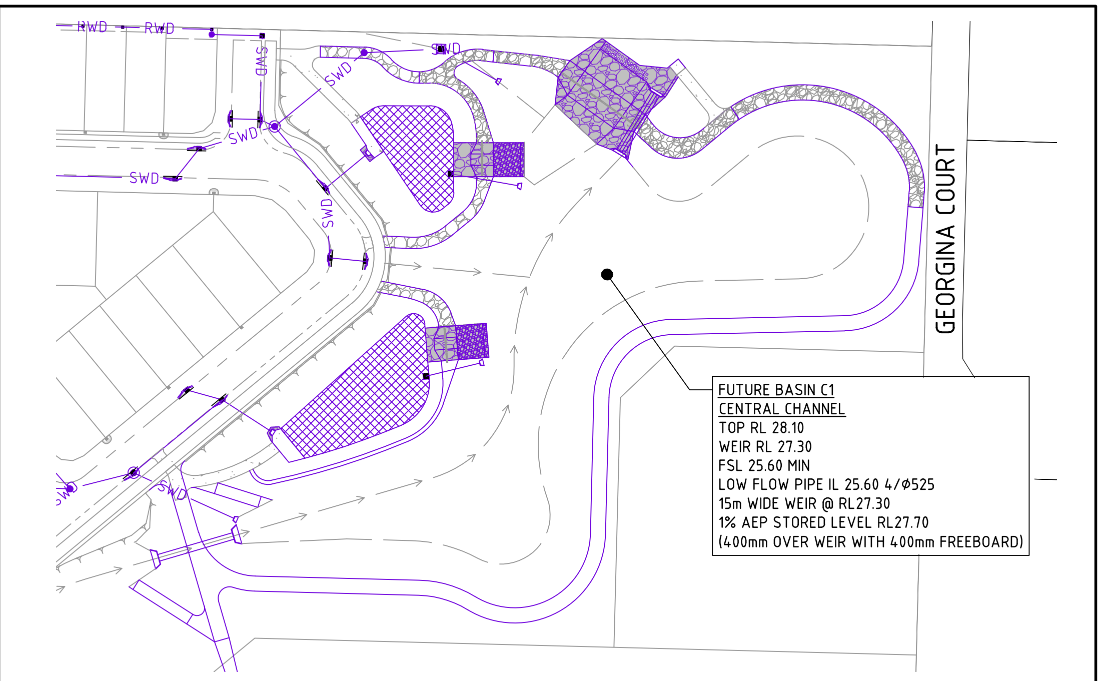
SCALE 1:1000 (A1) 1:2000 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

40 30 20 10 0 40 80 120 160 200m

SCALE 1:2000 (A1) 1:4000 (A3)

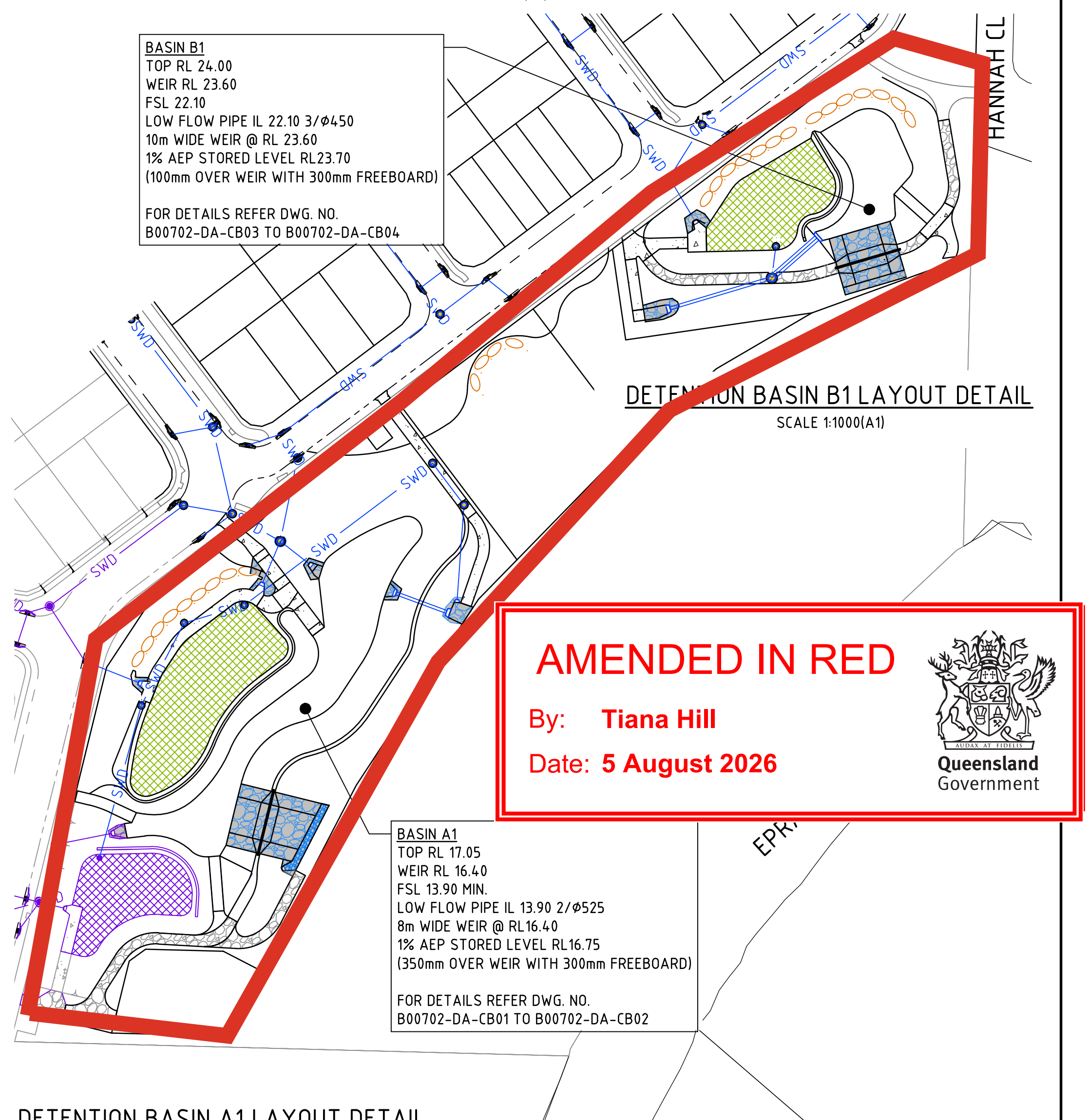
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.


GEORGINA COURT
SWD
RWD

FUTURE BASIN C1
CENTRAL CHANNEL
TOP RL 28.10
WEIR RL 27.30
FSL 25.60 MIN
LOW FLOW PIPE IL 25.60 4/Ø525
15m WIDE WEIR @ RL27.30
1% AEP STORED LEVEL RL27.70
(400mm OVER WEIR WITH 400mm FREEBOARD)

DETENTION BASIN C1 LAYOUT DETAIL

SCALE 1:1000(A1)


HANNAH CL
EPR
SWD

BASIN B1
TOP RL 24.00
WEIR RL 23.60
FSL 22.10
LOW FLOW PIPE IL 22.10 3/Ø450
10m WIDE WEIR @ RL 23.60
1% AEP STORED LEVEL RL23.70
(100mm OVER WEIR WITH 300mm FREEBOARD)

FOR DETAILS REFER DWG. NO.
B00702-DA-CB03 TO B00702-DA-CB04

DETENTION BASIN B1 LAYOUT DETAIL

SCALE 1:1000(A1)

BASIN A1
TOP RL 17.05
WEIR RL 16.40
FSL 13.90 MIN.
LOW FLOW PIPE IL 13.90 2/Ø525
8m WIDE WEIR @ RL16.40
1% AEP STORED LEVEL RL16.75
(350mm OVER WEIR WITH 300mm FREEBOARD)

FOR DETAILS REFER DWG. NO.
B00702-DA-CB01 TO B00702-DA-CB02

DETENTION BASIN A1 LAYOUT DETAIL

SCALE 1:1000(A1)

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **POST DEVELOPMENT CATCHMENT PLAN**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-SW02	**A**

" "

Plot Date: 12/12/2025 12:32:21 PM User: WILLIAM GRIFFITH
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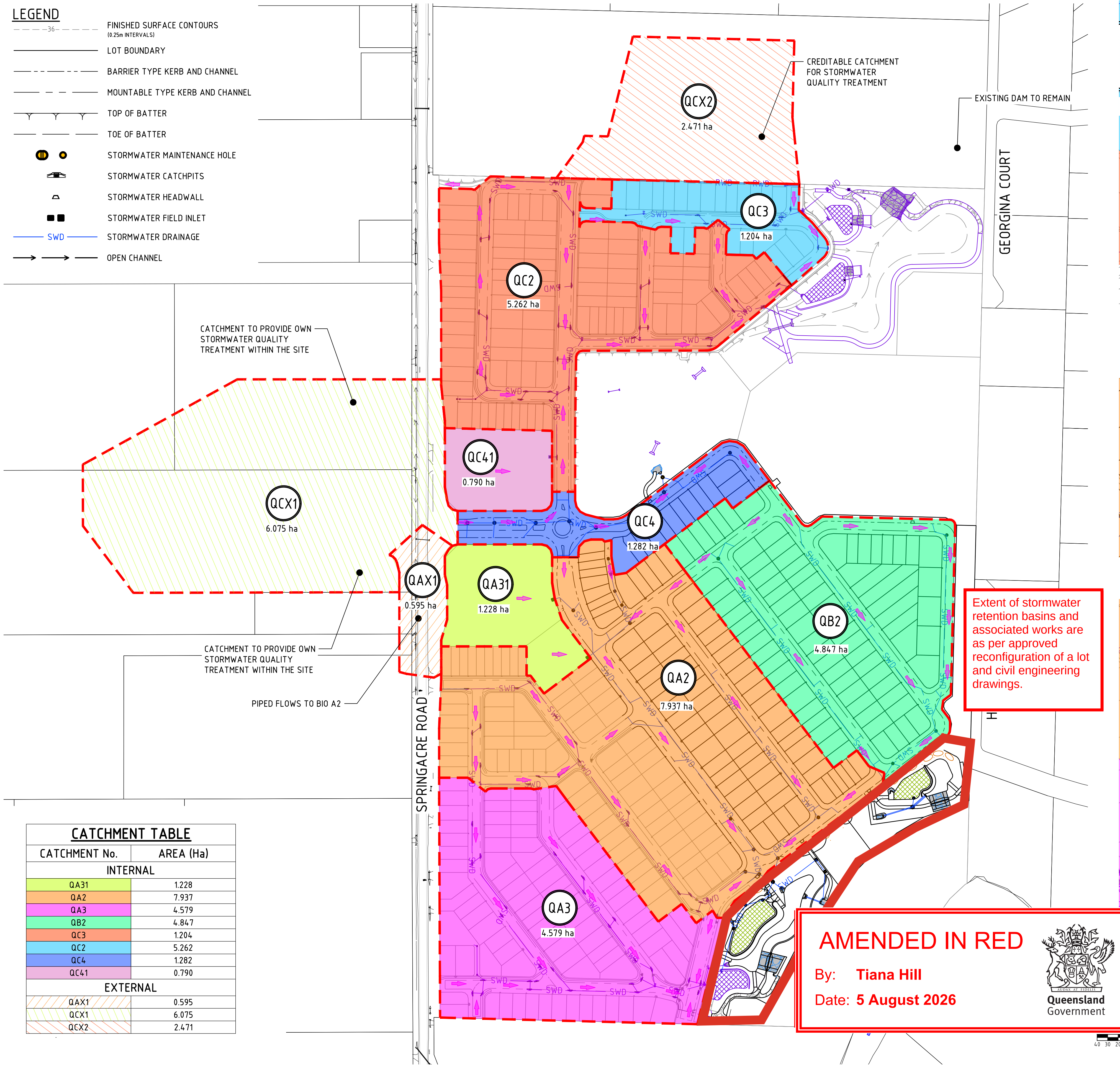


CREDITABLE CATCHMENT
FOR STORMWATER
QUALITY TREATMENT

EXISTING DAM TO REMAIN

CATCHMENT TO PROVIDE OWN
STORMWATER QUALITY
TREATMENT WITHIN THE SITE

CATCHMENT TO PROVIDE OWN
STORMWATER QUALITY
TREATMENT WITHIN THE SITE

PIPED FLOWS TO BIO A2

LEGEND

— — —36— — —	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
———	LOT BOUNDARY
—— - - —— - - ——	BARRIER TYPE KERB AND CHANNEL
—— — — ——	MOUNTABLE TYPE KERB AND CHANNEL
—Y—Y—Y—	TOP OF BATTER
—— —— ——	TOE OF BATTER
● ●	STORMWATER MAINTENANCE HOLE
▬	STORMWATER CATCHPITS
⏢	STORMWATER HEADWALL
■ ■	STORMWATER FIELD INLET
—— SWD ——	STORMWATER DRAINAGE
→ → ——	OPEN CHANNEL

CATCHMENT TABLE

CATCHMENT No.	AREA (Ha)
INTERNAL	
QA31	1.228
QA2	7.937
QA3	4.579
QB2	4.847
QC3	1.204
QC2	5.262
QC4	1.282
QC41	0.790
EXTERNAL	
QAX1	0.595
QCX1	6.075
QCX2	2.471

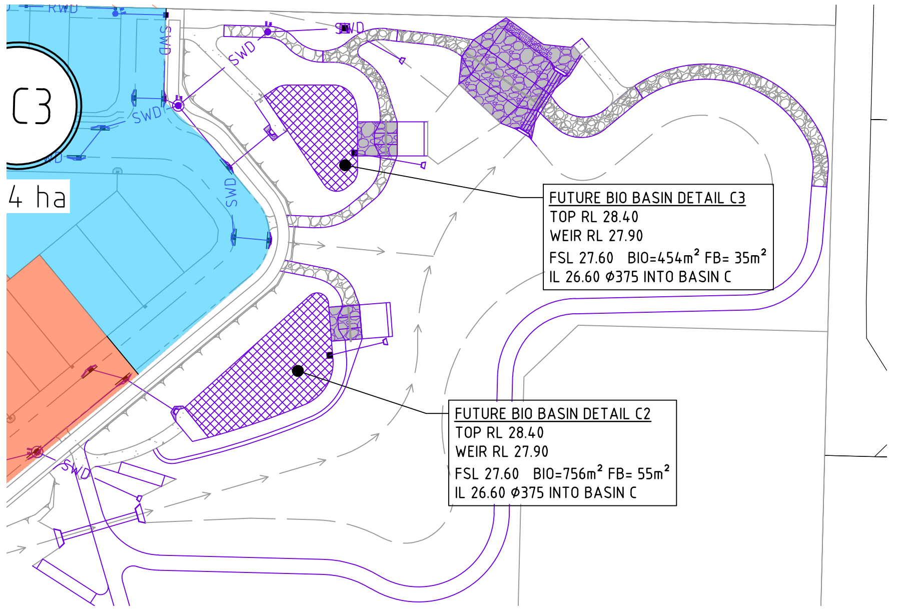
Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland
Government

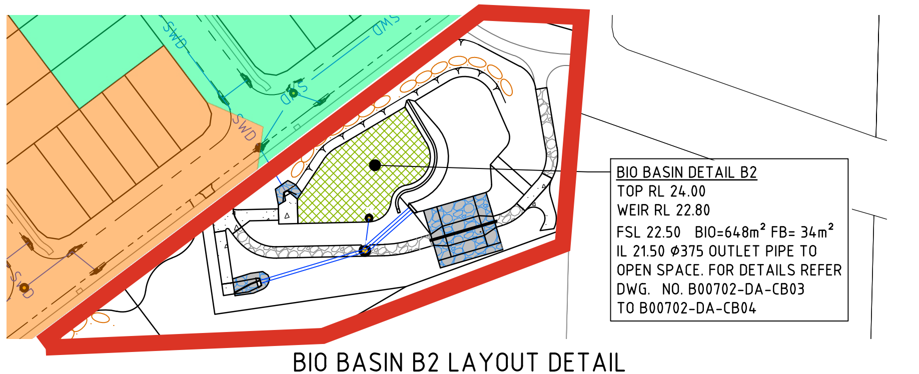


FUTURE BIO BASIN DETAIL C3
TOP RL 28.40
WEIR RL 27.90
FSL 27.60 BIO=454m^2 FB= 35m^2
IL 26.60 ⌀375 INTO BASIN C

FUTURE BIO BASIN DETAIL C2
TOP RL 28.40
WEIR RL 27.90
FSL 27.60 BIO=756m^2 FB= 55m^2
IL 26.60 ⌀375 INTO BASIN C

FUTURE BIO BASIN C2 AND C3 LAYOUT DETAIL

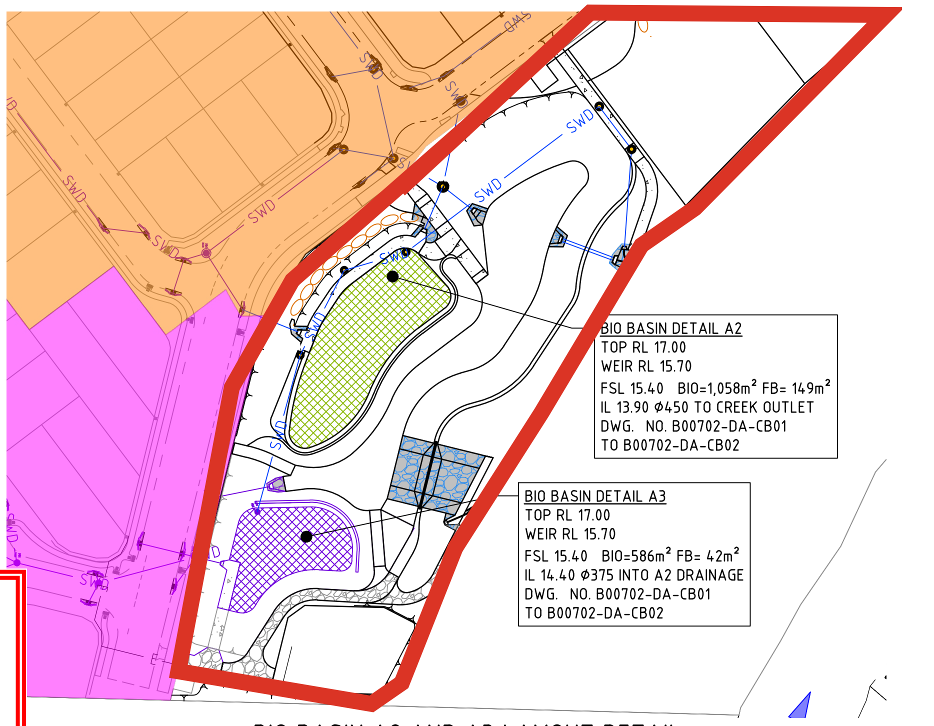
SCALE 1:1000(A1)



BIO BASIN DETAIL B2
TOP RL 24.00
WEIR RL 22.80
FSL 22.50 BIO=648m^2 FB= 34m^2
IL 21.50 ⌀375 OUTLET PIPE TO
OPEN SPACE. FOR DETAILS REFER
DWG. NO. B00702-DA-CB03
TO B00702-DA-CB04

BIO BASIN B2 LAYOUT DETAIL

SCALE 1:1000(A1)



BIO BASIN DETAIL A2
TOP RL 17.00
WEIR RL 15.70
FSL 15.40 BIO=1,058m^2 FB= 149m^2
IL 13.90 ⌀450 TO CREEK OUTLET
DWG. NO. B00702-DA-CB01
TO B00702-DA-CB02

BIO BASIN DETAIL A3
TOP RL 17.00
WEIR RL 15.70
FSL 15.40 BIO=586m^2 FB= 42m^2
IL 14.40 ⌀375 INTO A2 DRAINAGE
DWG. NO. B00702-DA-CB01
TO B00702-DA-CB02

BIO BASIN A2 AND A3 LAYOUT DETAIL

SCALE 1:1000(A1)

0 40 80 120 160 200m
40 30 20 10

SCALE 1:2000 (A1) 1:4000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

0 20 40 60 80 100m
20 15 10 5

SCALE 1:1000 (A1) 1:2000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:33:01 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-SWC-QUAL

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **STORMWATER QUALITY CATCHMENT PLAN**

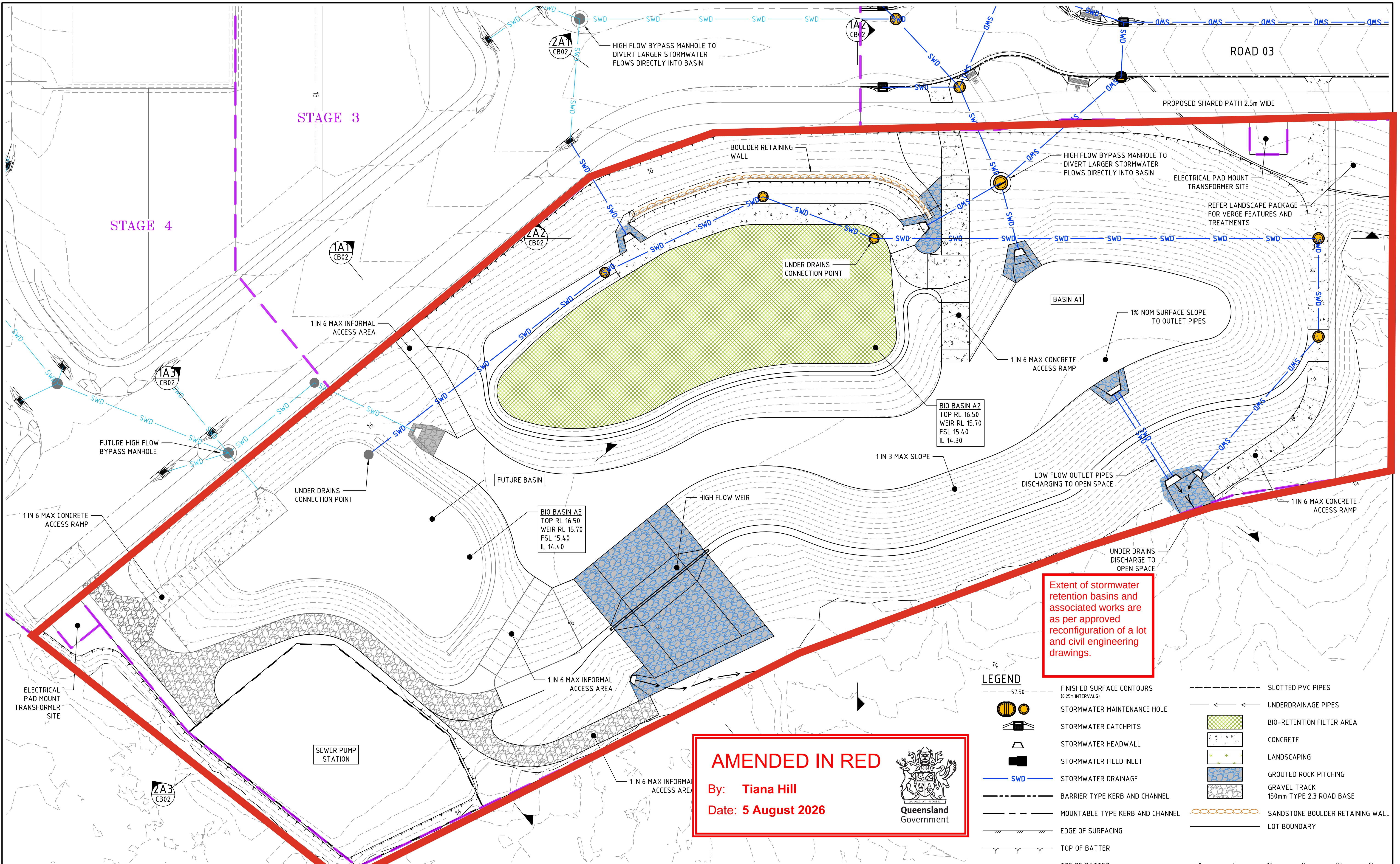
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-SW03	A

" "


STAGE 3
STAGE 4
ROAD 03
PROPOSED SHARED PATH 2.5m WIDE
HIGH FLOW BYPASS MANHOLE TO DIVERT LARGER STORMWATER FLOWS DIRECTLY INTO BASIN
HIGH FLOW BYPASS MANHOLE TO DIVERT LARGER STORMWATER FLOWS DIRECTLY INTO BASIN
2A1 CB02
1A2 CB02
2A2 CB02
1A1 CB02
1A3 CB02
2A3 CB02
BOULDER RETAINING WALL
ELECTRICAL PAD MOUNT TRANSFORMER SITE
REFER LANDSCAPE PACKAGE FOR VERGE FEATURES AND TREATMENTS
UNDER DRAINS CONNECTION POINT
BASIN A1
1% NOM SURFACE SLOPE TO OUTLET PIPES
1 IN 6 MAX INFORMAL ACCESS AREA
1 IN 6 MAX CONCRETE ACCESS RAMP
BIO BASIN A2
TOP RL 16.50
WEIR RL 15.70
FSL 15.40
IL 14.30
1 IN 3 MAX SLOPE
LOW FLOW OUTLET PIPES DISCHARGING TO OPEN SPACE
1 IN 6 MAX CONCRETE ACCESS RAMP
UNDER DRAINS DISCHARGE TO OPEN SPACE
FUTURE HIGH FLOW BYPASS MANHOLE
UNDER DRAINS CONNECTION POINT
FUTURE BASIN
HIGH FLOW WEIR
BIO BASIN A3
TOP RL 16.50
WEIR RL 15.70
FSL 15.40
IL 14.40
1 IN 6 MAX CONCRETE ACCESS RAMP
ELECTRICAL PAD MOUNT TRANSFORMER SITE
1 IN 6 MAX INFORMAL ACCESS AREA
SEWER PUMP STATION
1 IN 6 MAX INFORMAL ACCESS AREA
SWD
18
16
14
LEGEND
57.50 FINISHED SURFACE CONTOURS (0.25m INTERVALS)
STORMWATER MAINTENANCE HOLE
STORMWATER CATCHPITS
STORMWATER HEADWALL
STORMWATER FIELD INLET
SWD STORMWATER DRAINAGE
BARRIER TYPE KERB AND CHANNEL
MOUNTABLE TYPE KERB AND CHANNEL
EDGE OF SURFACING
TOP OF BATTER
TOE OF BATTER
OPEN CHANNEL
SLOTTED PVC PIPES
UNDERDRAINAGE PIPES
BIO-RETENTION FILTER AREA
CONCRETE
LANDSCAPING
GROUTED ROCK PITCHING
GRAVEL TRACK 150mm TYPE 2.3 ROAD BASE
SANDSTONE BOULDER RETAINING WALL
LOT BOUNDARY
0 5 10 15 20 25m
5 3.75 2.5 1.25

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED
By: **Tiana Hill**
Date: **5 August 2026**
Queensland Government

DETENTION BASIN A1 AND BIORETENTION BASINS A2 AND A3 – LAYOUT PLAN

SCALE 1:250 (A1) 1:500 (A3)

SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:33:27 PM User: WILLIAM GRIFFITH
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **BIORETENTION BASIN A2 AND A3 LAYOUT PLAN**

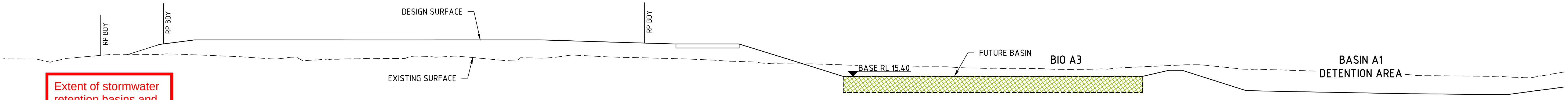
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

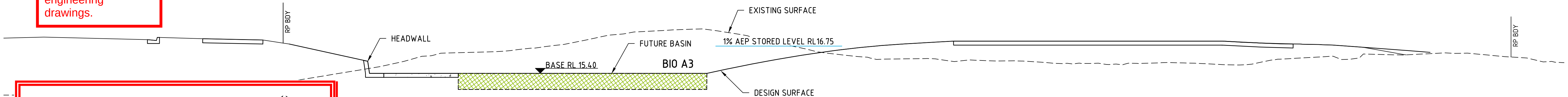
Project No. Drawing No. **B00702-DA-CB01**
Rev **A**

" "

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

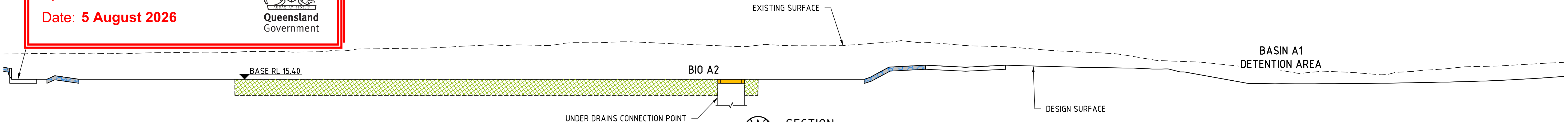

RP BDY
RP BDY
DESIGN SURFACE
RP BDY
EXISTING SURFACE
FUTURE BASIN
BASE RL 15.40
BIO A3
BASIN A1
DETENTION AREA

2A3 CB01 SECTION
SCALE 1:100 (A1)

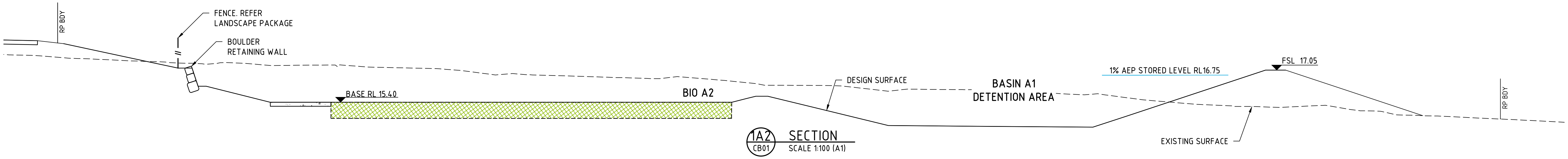

RP BDY
EXISTING SURFACE
HEADWALL
FUTURE BASIN
1% AEP STORED LEVEL RL16.75
BASE RL 15.40
BIO A3
DESIGN SURFACE
RP BDY

1A3 CB01 SECTION
SCALE 1:100 (A1)

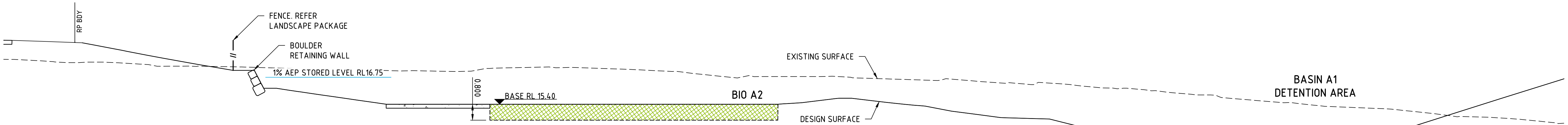
AMENDED IN RED
By: **Tiana Hill**
Date: **5 August 2026**
Queensland Government


EXISTING SURFACE
BASE RL 15.40
BIO A2
BASIN A1
DETENTION AREA
UNDER DRAINS CONNECTION POINT
DESIGN SURFACE

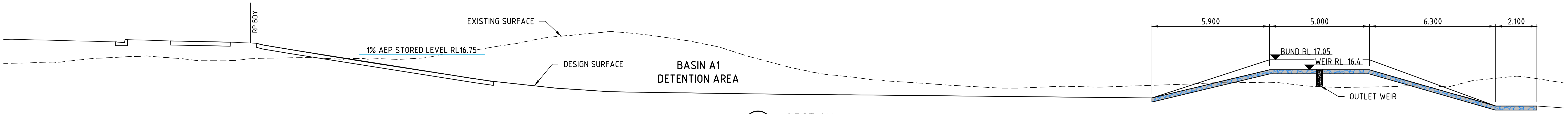
2A2 CB01 SECTION
SCALE 1:100 (A1)


RP BDY
FENCE. REFER LANDSCAPE PACKAGE
BOULDER RETAINING WALL
BASE RL 15.40
BIO A2
DESIGN SURFACE
BASIN A1
DETENTION AREA
1% AEP STORED LEVEL RL16.75
FSL 17.05
RP BDY
EXISTING SURFACE

1A2 CB01 SECTION
SCALE 1:100 (A1)


RP BDY
FENCE. REFER LANDSCAPE PACKAGE
BOULDER RETAINING WALL
1% AEP STORED LEVEL RL16.75
0.800
BASE RL 15.40
BIO A2
EXISTING SURFACE
DESIGN SURFACE
BASIN A1
DETENTION AREA

2A1 CB01 SECTION
SCALE 1:100 (A1)


RP BDY
EXISTING SURFACE
1% AEP STORED LEVEL RL16.75
DESIGN SURFACE
BASIN A1
DETENTION AREA
5.900
5.000
6.300
2.100
BUND RL 17.05
WEIR RL 16.4
OUTLET WEIR

1A1 CB01 SECTION
SCALE 1:100 (A1)

0 2 4 6 8 10m
2.0 1.5 1.0 0.5
SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:33:43 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-BIO-1

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

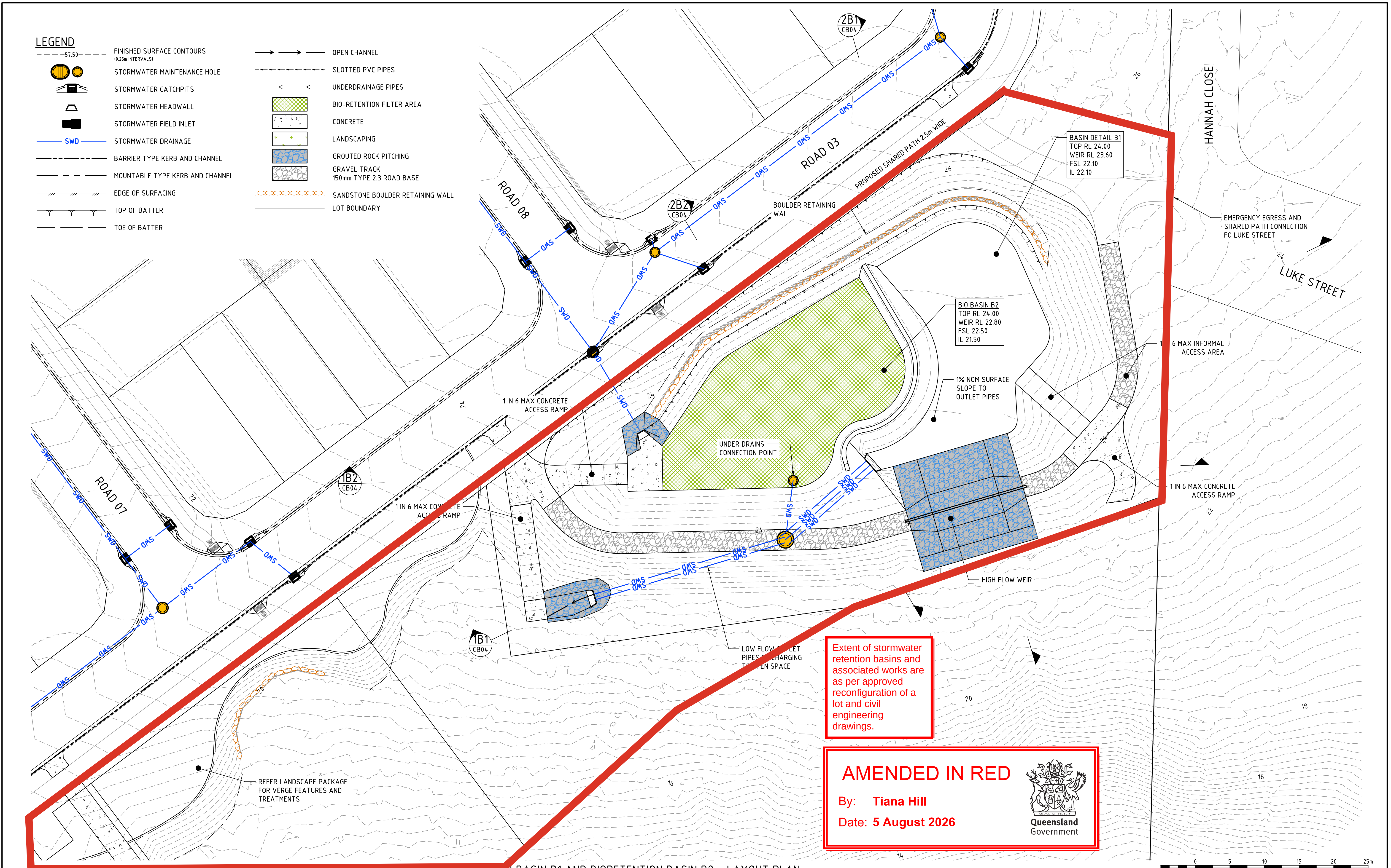
URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **BIORETENTION BASIN A2 AND A3 CROSS SECTIONS**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CB02**
Rev **A**


LEGEND
57.50
FINISHED SURFACE CONTOURS (0.25m INTERVALS)
STORMWATER MAINTENANCE HOLE
STORMWATER CATCHPITS
STORMWATER HEADWALL
STORMWATER FIELD INLET
SWD
STORMWATER DRAINAGE
BARRIER TYPE KERB AND CHANNEL
MOUNTABLE TYPE KERB AND CHANNEL
EDGE OF SURFACING
TOP OF BATTER
TOE OF BATTER
OPEN CHANNEL
SLOTTED PVC PIPES
UNDERDRAINAGE PIPES
BIO-RETENTION FILTER AREA
CONCRETE
LANDSCAPING
GROUTED ROCK PITCHING
GRAVEL TRACK 150mm TYPE 2.3 ROAD BASE
SANDSTONE BOULDER RETAINING WALL
LOT BOUNDARY
2B1 CB04
2B2 CB04
1B2 CB04
1B1 CB04
ROAD 08
ROAD 07
ROAD 03
HANNAH CLOSE
LUKE STREET
PROPOSED SHARED PATH 2.5m WIDE
BOULDER RETAINING WALL
BASIN DETAIL B1
TOP RL 24.00
WEIR RL 23.60
FSL 22.10
IL 22.10
BIO BASIN B2
TOP RL 24.00
WEIR RL 22.80
FSL 22.50
IL 21.50
EMERGENCY EGRESS AND SHARED PATH CONNECTION FO LUKE STREET
1 IN 6 MAX INFORMAL ACCESS AREA
1% NOM SURFACE SLOPE TO OUTLET PIPES
1 IN 6 MAX CONCRETE ACCESS RAMP
1 IN 6 MAX CONCRETE ACCESS RAMP
1 IN 6 MAX CONCRETE ACCESS RAMP
UNDER DRAINS CONNECTION POINT
HIGH FLOW WEIR
LOW FLOW OUTLET PIPES DISCHARGING TO OPEN SPACE
REFER LANDSCAPE PACKAGE FOR VERGE FEATURES AND TREATMENTS
SWD
OMS
26
24
22
20
18
16
14

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

DETENTION BASIN B1 AND BIORETENTION BASIN B2 – LAYOUT PLAN

SCALE 1:250 (A1) 1:500 (A3)

0 5 10 15 20 25m

5 3.75 2.5 1.25

SCALE 1:250 (A1) 1:500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:34:02 PM User: WILLIAM GRIFFITH

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-BIO-2

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angelman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **BIORETENTION BASIN B2**
LAYOUT PLAN

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

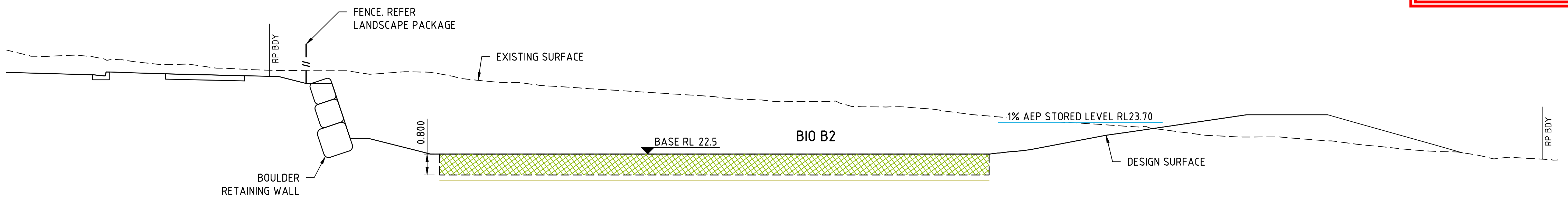
NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CB03	A

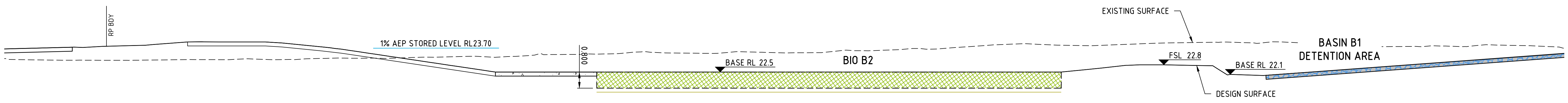
" "

AMENDED IN RED
By: **Tiana Hill**
Date: **5 August 2026**
Queensland Government

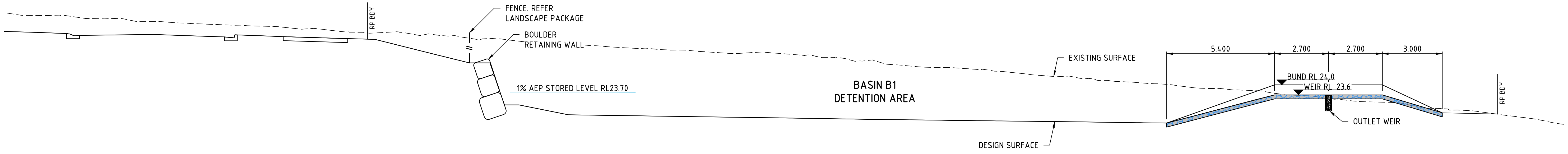
Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.


FENCE. REFER
LANDSCAPE PACKAGE
RP BDY
EXISTING SURFACE
1% AEP STORED LEVEL RL23.70
0.800
BASE RL 22.5
BIO B2
BOULDER
RETAINING WALL
DESIGN SURFACE
RP BDY

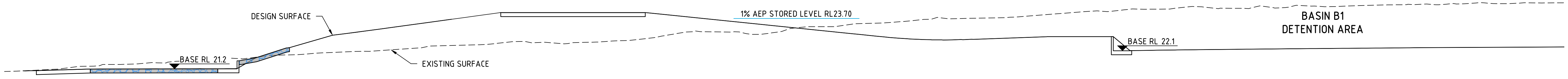
2B2 SECTION
CB03 SCALE 1:100 (A1)


RP BDY
1% AEP STORED LEVEL RL23.70
0.800
BASE RL 22.5
BIO B2
EXISTING SURFACE
BASIN B1
DETENTION AREA
FSL 22.8
BASE RL 22.1
DESIGN SURFACE

1B2 SECTION
CB03 SCALE 1:100 (A1)


RP BDY
FENCE. REFER
LANDSCAPE PACKAGE
BOULDER
RETAINING WALL
1% AEP STORED LEVEL RL23.70
BASIN B1
DETENTION AREA
EXISTING SURFACE
DESIGN SURFACE
5.400
2.700
2.700
3.000
BUND RL 24.0
WEIR RL 23.6
OUTLET WEIR
RP BDY

2B1 SECTION
CB03 SCALE 1:100 (A1)


DESIGN SURFACE
BASE RL 21.2
EXISTING SURFACE
1% AEP STORED LEVEL RL23.70
BASIN B1
DETENTION AREA
BASE RL 22.1

1B1 SECTION
CB03 SCALE 1:100 (A1)

0 2 4 6 8 10m
2.0 1.5 1.0 0.5
SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:34:09 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-BIO-2

A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25
No.	*Amendments*	*Drawn*	*Design*	*Design Chk*	*Appd*	*Date*

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

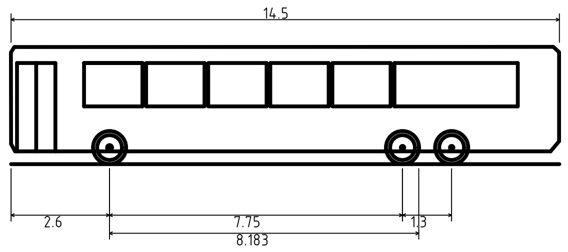
Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **BIORETENTION BASIN B2**
CROSS SECTIONS

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

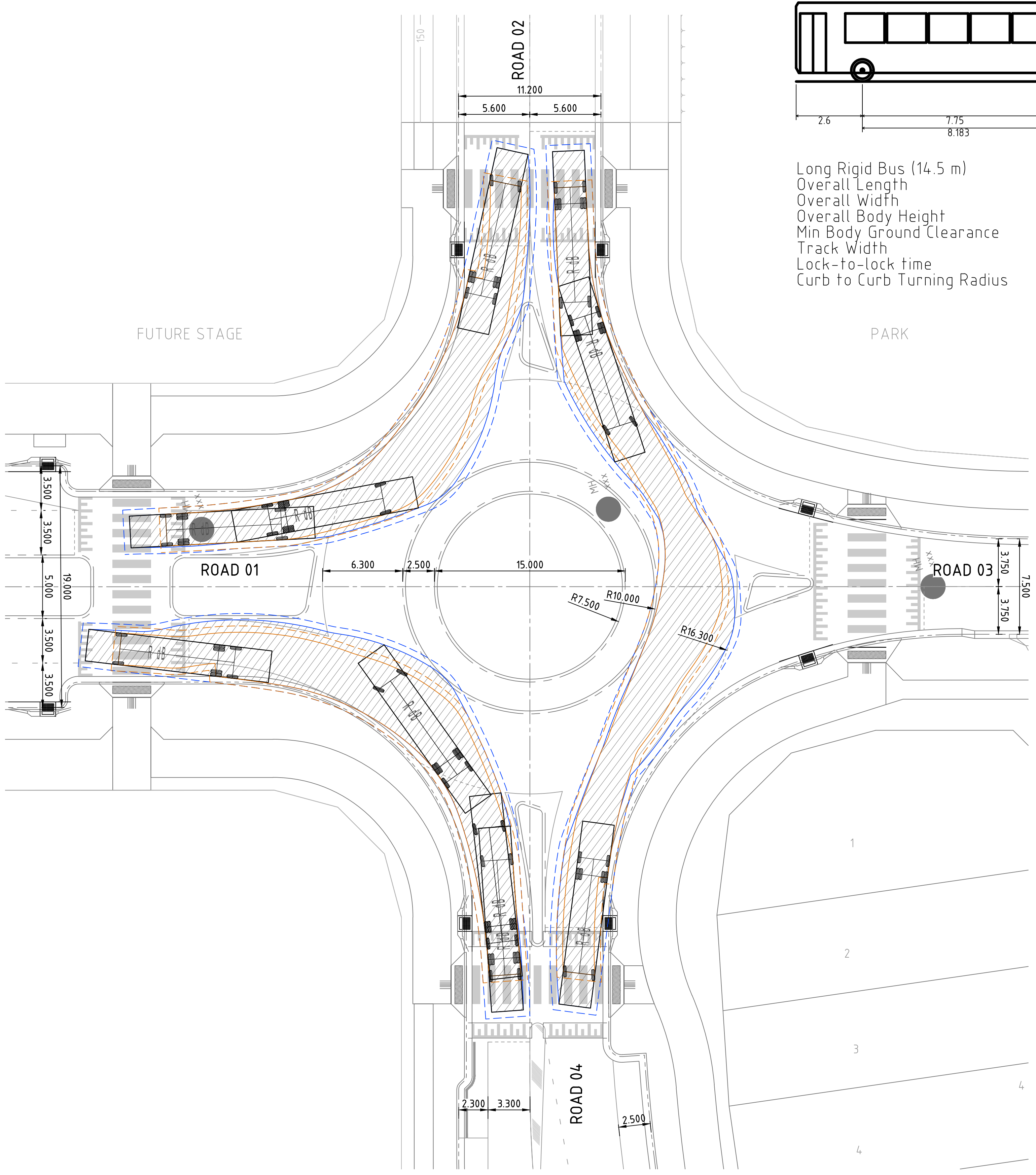
NOT FOR CONSTRUCTION

Project No. *Drawing No.* **B00702-DA-CB04**
Rev **A**

" "

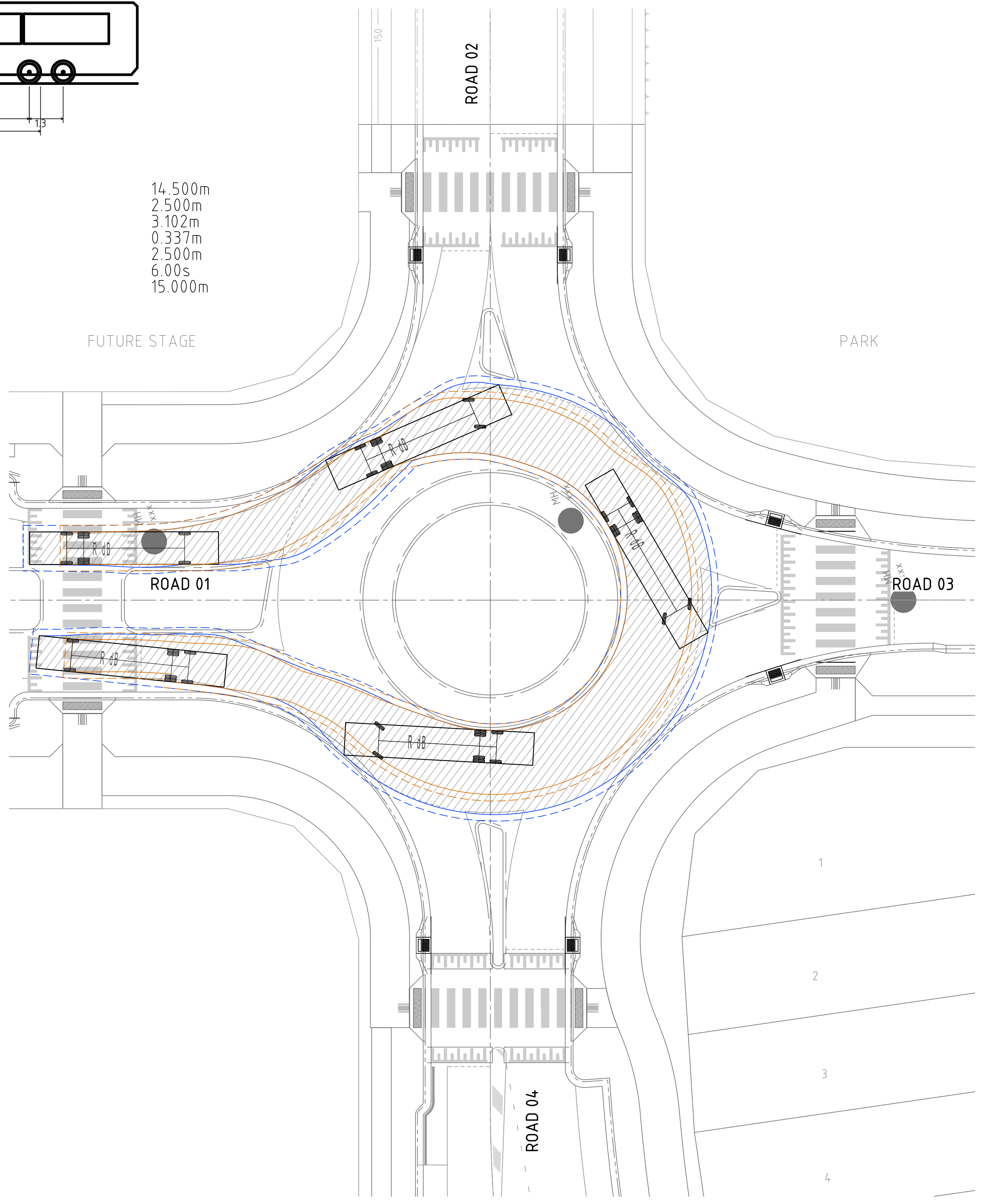

14.5
2.6
7.75
8.183
1.3

Long Rigid Bus (14.5 m)	
Overall Length	14.500m
Overall Width	2.500m
Overall Body Height	3.102m
Min Body Ground Clearance	0.337m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m


ROAD 02
11.200
5.600
5.600
FUTURE STAGE
PARK
ROAD 01
ROAD 03
3.500
3.500
5.000
19.000
3.500
3.500
6.300
2.500
15.000
R7.500
R10.000
R16.300
3.750
3.750
7.500
ROAD 04
2.300
3.300
2.500
1
2
3
4
4

14.5m BUS TURNING TEMPLATE - ROAD 01, 02, 04

SCALE 1:200


ROAD 02
FUTURE STAGE
PARK
ROAD 01
ROAD 03
ROAD 04
1
2
3
4
4

14.5m BUS TURNING TEMPLATE - ROAD 01 to ROAD 01

SCALE 1:200

0 4 8 12 16 20m
4 3 2 1

SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

NOTE

14.5m BUS CHECK VEHICLE
FOR REFERENCE ONLY

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING User: WILLIAM GRIFFITH
D M

A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25
No.	Amendments	Drawn	Design	Design Chk	Appd	Date

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
DESIGN VEHICLE 14.5M BUS
SHEET 1 OF 4

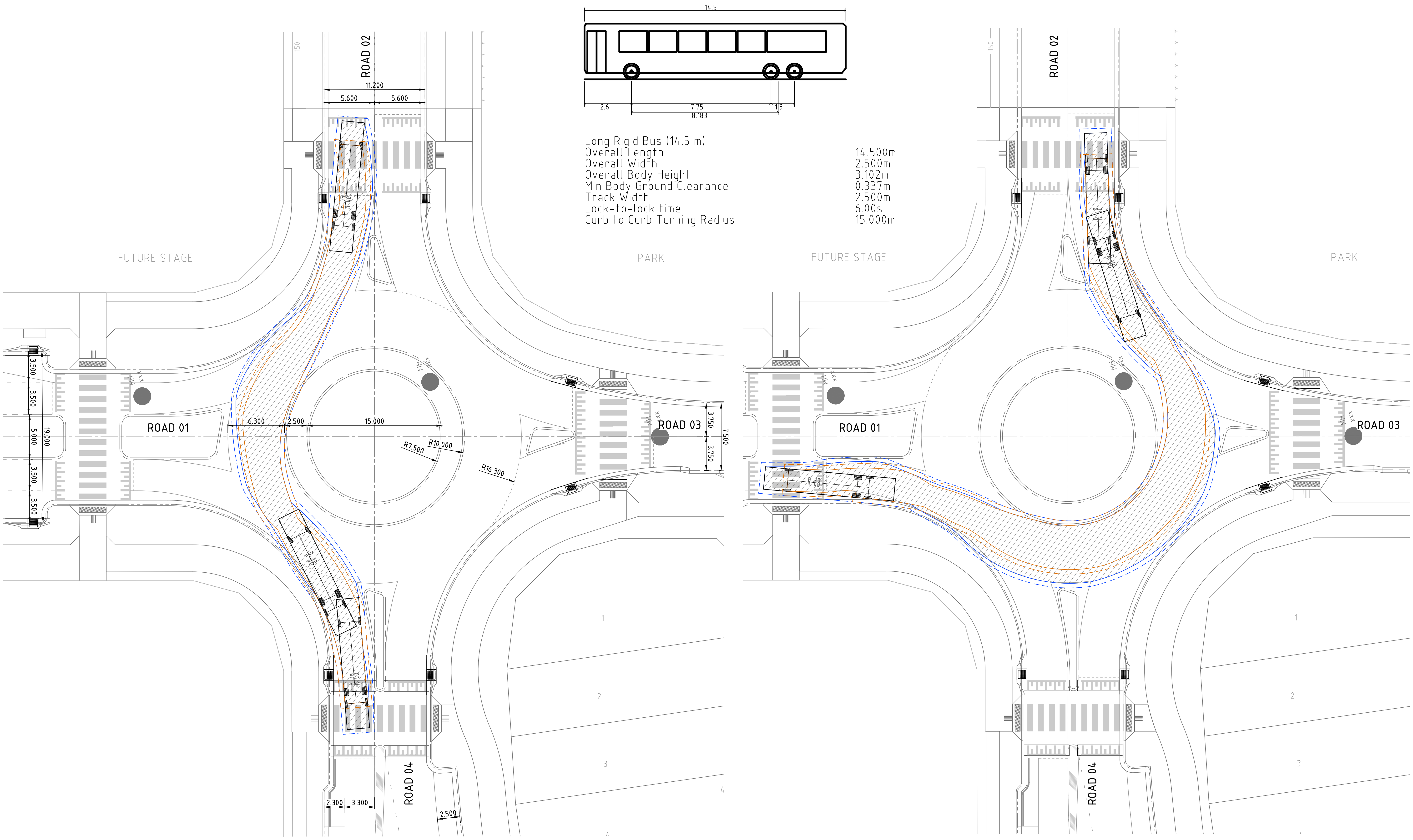
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CT01**
Rev **A**

" "


14.5
2.6
7.75
8.183
1.3
ROAD 02
ROAD 01
ROAD 03
ROAD 04
FUTURE STAGE
PARK
11.200
5.600
5.600
6.300
2.500
15.000
R7.500
R10.000
R16.300
3.500
3.500
5.000
3.500
3.500
19.000
3.750
3.750
7.500
2.300
3.300
2.500
150
1
2
3
4

Long Rigid Bus (14.5 m)

Overall Length	14.500m
Overall Width	2.500m
Overall Body Height	3.102m
Min Body Ground Clearance	0.337m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m

14.5m BUS TURNING TEMPLATE - ROAD 04 to ROAD 02

SCALE 1:200

14.5m BUS TURNING TEMPLATE - ROAD 02 to ROAD 01

SCALE 1:200

NOTE

14.5m BUS CHECK VEHICLE
FOR REFERENCE ONLY

0 4 8 12 16 20m
4 3 2 1

SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING

User: WILLIAM GRIFFITH

D M

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
DESIGN VEHICLE 14.5M BUS
SHEET 2 OF 4

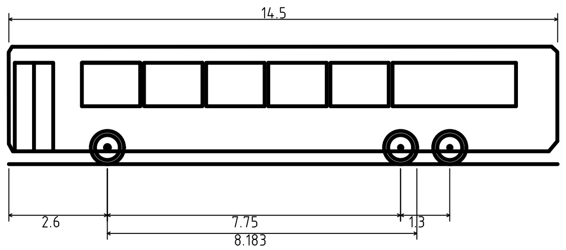
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

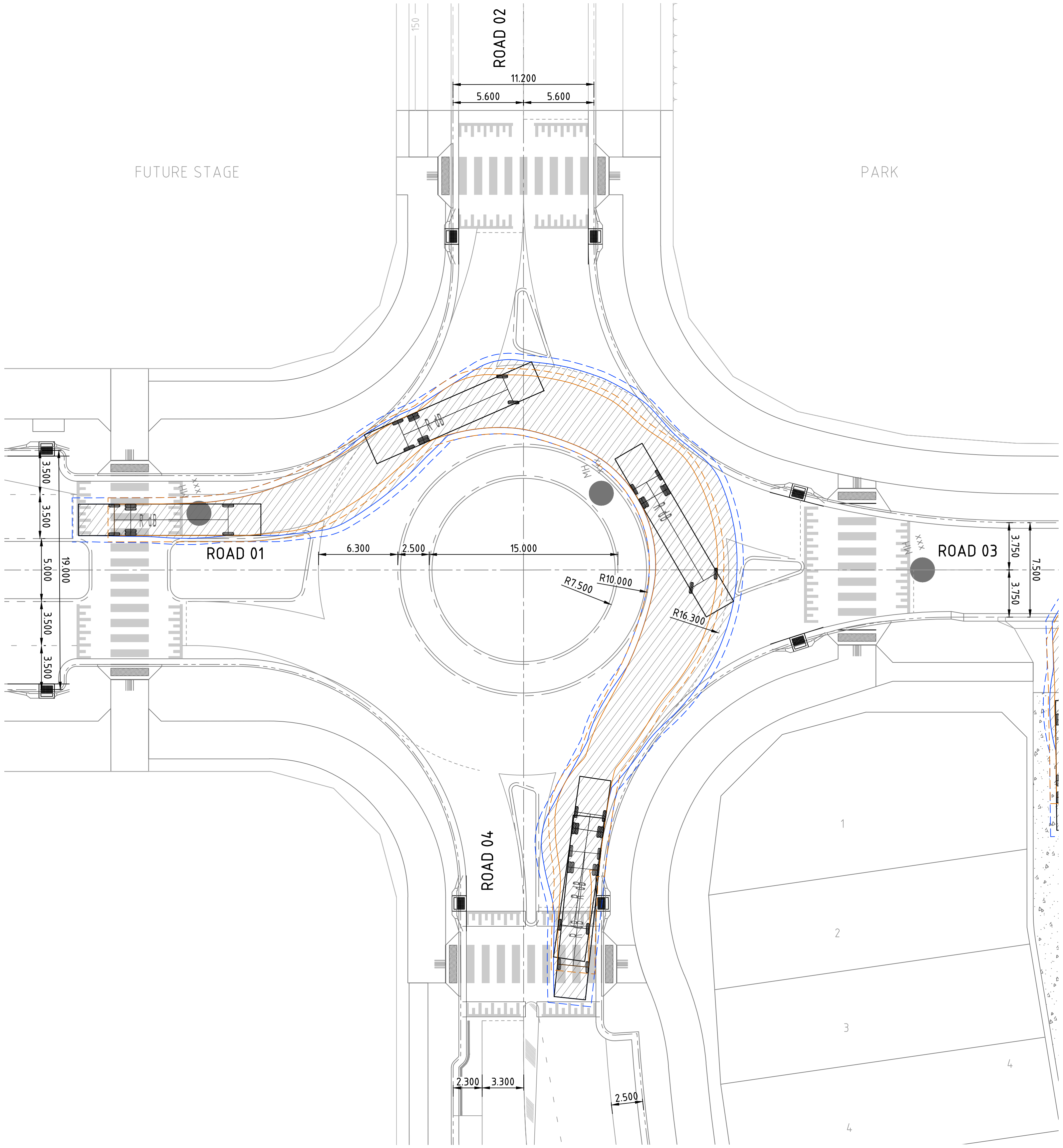
NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CT02	A

" "


14.5
2.6
7.75
1.3
8.183

Long Rigid Bus (14.5 m)	
Overall Length	14.500m
Overall Width	2.500m
Overall Body Height	3.102m
Min Body Ground Clearance	0.337m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m


ROAD 02
150
11.200
5.600
5.600
FUTURE STAGE
PARK
ROAD 01
ROAD 03
ROAD 04
3.500
3.500
5.000
3.500
3.500
19.000
6.300
2.500
15.000
R7.500
R10.000
R16.300
3.750
3.750
7.500
2.300
3.300
2.500
1
2
3
4
4

14.5m BUS TURNING TEMPLATE - ROAD 01 to ROAD 04

SCALE 1:200

0 4 8 12 16 20m
4 3 2 1

SCALE 1:200 (A1) 1:400 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

NOTE
14.5m BUS CHECK VEHICLE
FOR REFERENCE ONLY

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING
User: WILLIAM GRIFFITH
D M

A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25
No.	Amendments	Drawn	Design	Design Chk	Appd	Date

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **TURNING TEMPLATE**
DESIGN VEHICLE 14.5M BUS
SHEET 3 OF 4

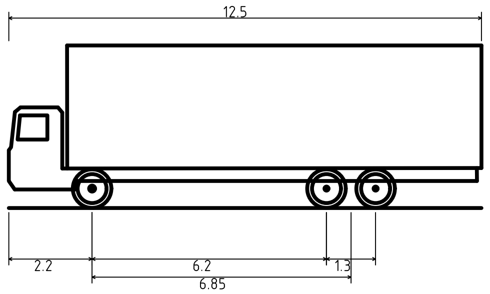
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

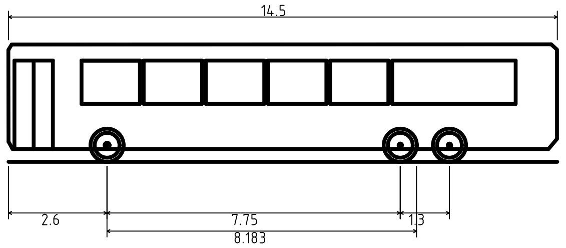
Project No. Drawing No.	Rev
B00702-DA-CT03	A

" "


12.5
2.2
6.2
1.3
6.85

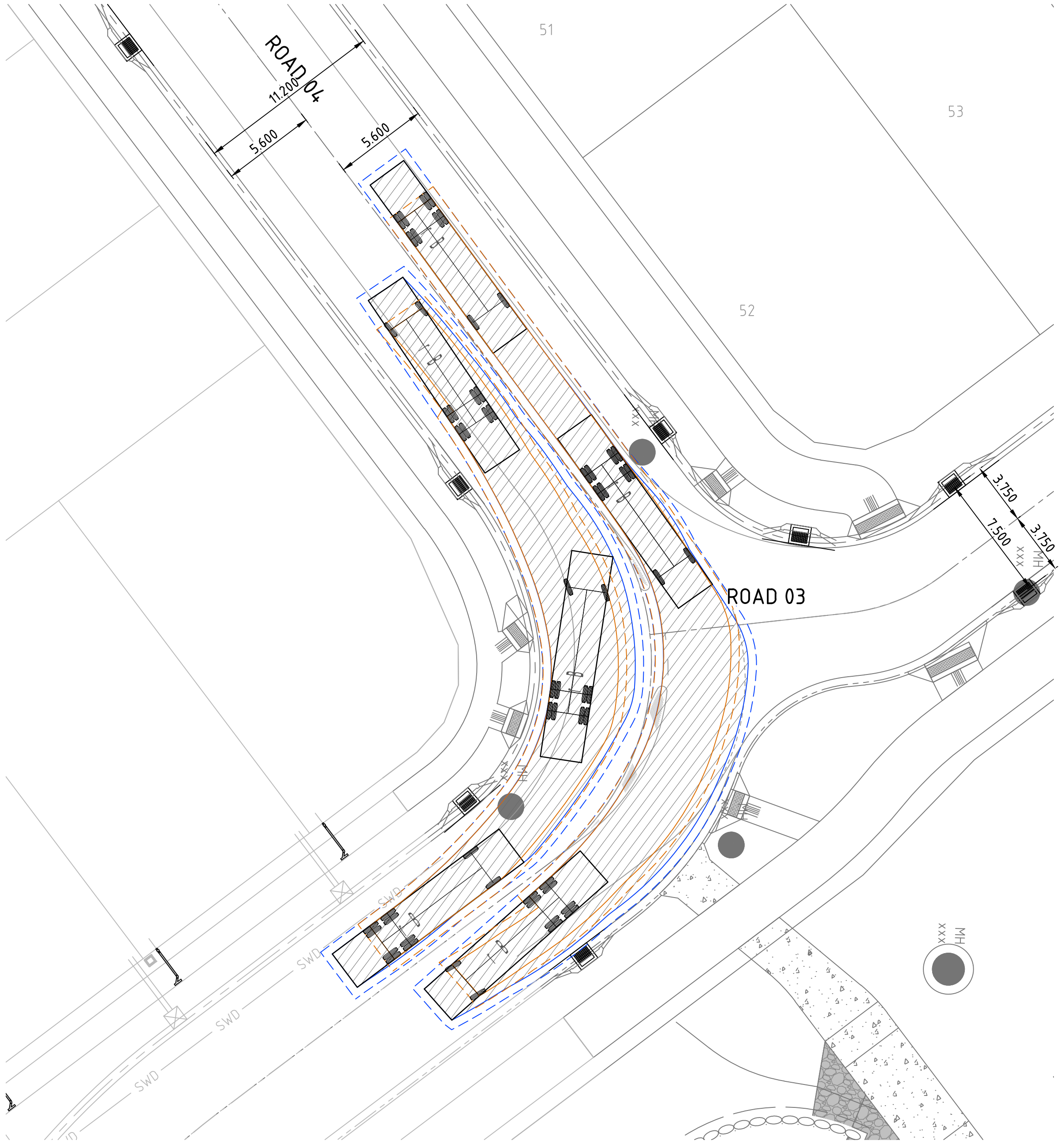
Single Unit Truck/Bus (12.5 m)

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.490m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m


14.5
2.6
7.75
1.3
8.183

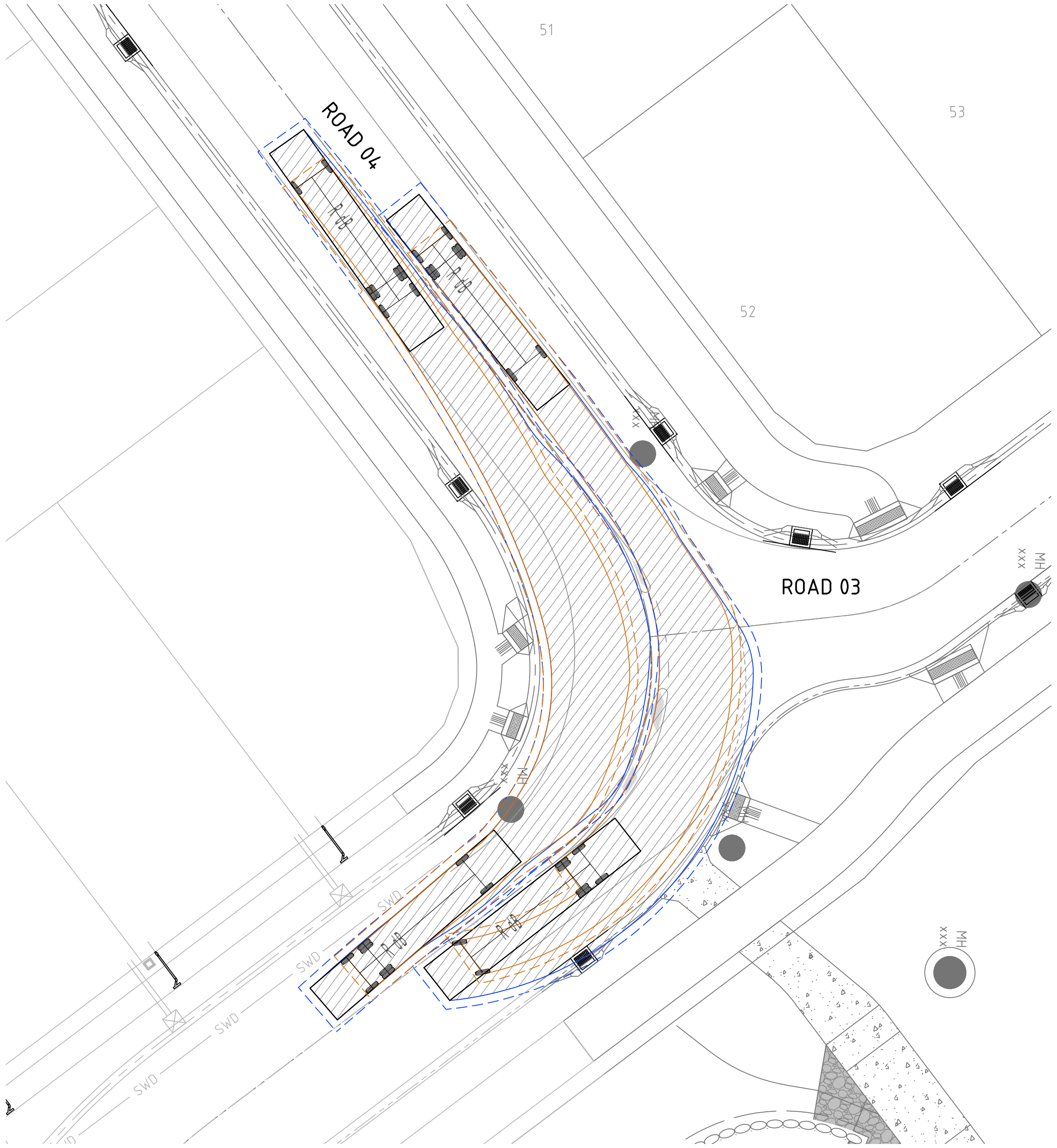
Long Rigid Bus (14.5 m)

Overall Length	14.500m
Overall Width	2.500m
Overall Body Height	3.102m
Min Body Ground Clearance	0.337m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	15.000m


ROAD 04
11.200
5.600
5.600
51
53
52
ROAD 03
3.750
7.500
3.750
MH
XXX
SWD

12.5m TRUCK/BUS TURNING TEMPLATE - ROAD 04

SCALE 1:200

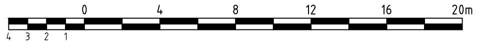

ROAD 04
51
53
52
ROAD 03
MH
XXX
SWD

14.5m BUS TURNING TEMPLATE - ROAD 04

SCALE 1:200

NOTE

14.5m BUS CHECK VEHICLE
FOR REFERENCE ONLY


0
4
8
12
16
20m
4
3
2
1

SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING
User: WILLIAM GRIFFITH
D
M

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
DESIGN VEHICLE 14.5M BUS
SHEET 4 OF 4

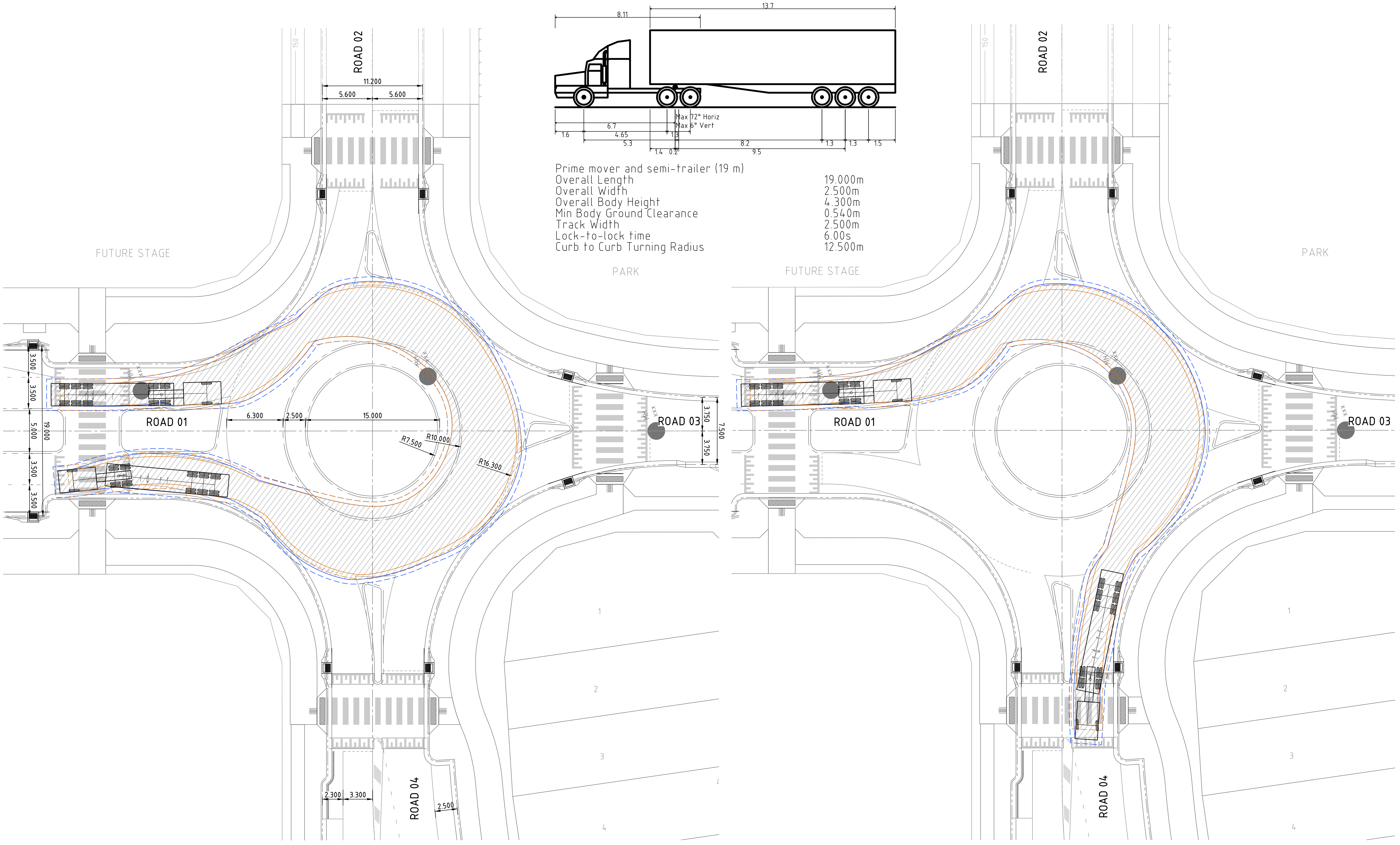
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CT04	A

" "


8.11
13.7
Max 72° Horiz
Max 6° Vert
1.6
6.7
4.65
5.3
1.3
1.4
0.2
8.2
9.5
1.3
1.3
1.5
ROAD 02
ROAD 01
ROAD 03
ROAD 04
FUTURE STAGE
PARK
11.200
5.600
5.600
3.500
3.500
5.000
19.000
3.500
3.500
6.300
2.500
15.000
R7.500
R10.000
R16.300
3.750
3.750
7.500
2.300
3.300
2.500
150
1
2
3
4

Prime mover and semi-trailer (19 m)	
Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

19m CHECK VEHICLE TURNING TEMPLATE – ROAD 01 to ROAD 01

SCALE 1:200

19m CHECK VEHICLE TURNING TEMPLATE – ROAD 01 to ROAD 04

SCALE 1:200

0 4 8 12 16 20m
4 3 2 1

SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING
User: WILLIAM GRIFFITH
D M

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
CHECK VEHICLE 19M SEMI TRUCK
SHEET 1 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CT05	**A**

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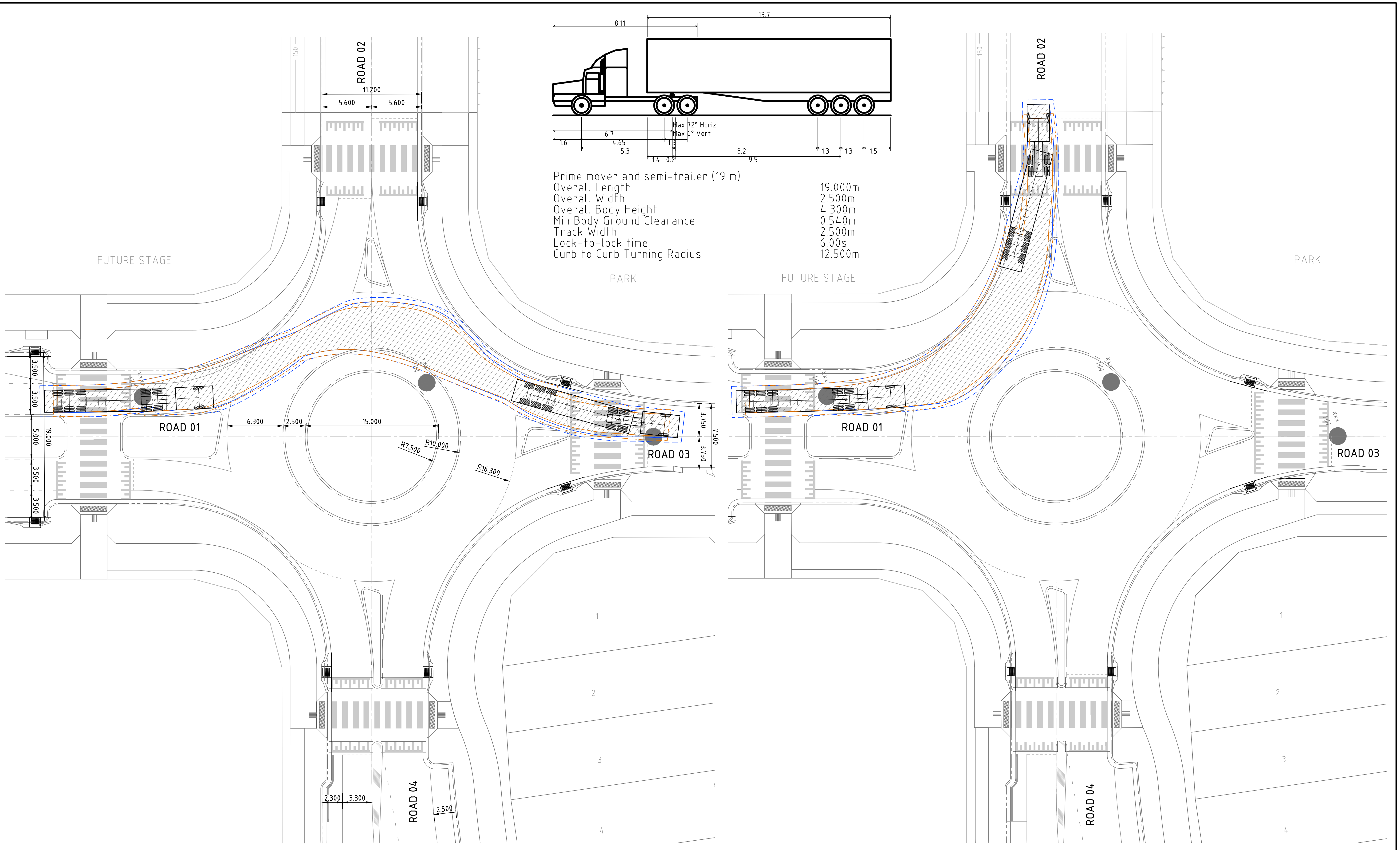
8.11
13.7
Max 72° Horiz
Max 6° Vert
1.6
6.7
4.65
5.3
1.3
1.4
0.2
8.2
9.5
1.3
1.3
1.5
ROAD 02
11.200
5.600
5.600
FUTURE STAGE
PARK
ROAD 01
ROAD 03
ROAD 04
6.300
2.500
15.000
R7.500
R10.000
R16.300
3.500
3.500
5.000
19.000
3.500
3.500
3.750
3.750
7.500
2.300
3.300
2.500
1
2
3
4

Prime mover and semi-trailer (19 m)

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

19m CHECK VEHICLE TURNING TEMPLATE - ROAD 01 to ROAD 03

SCALE 1:200

19m CHECK VEHICLE TURNING TEMPLATE - ROAD 01 to ROAD 02

SCALE 1:200

0 4 8 12 16 20m

4 3 2 1

SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING

D M User: WILLIAM GRIFFITH

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
CHECK VEHICLE 19M SEMI TRUCK
SHEET 2 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CT06	A

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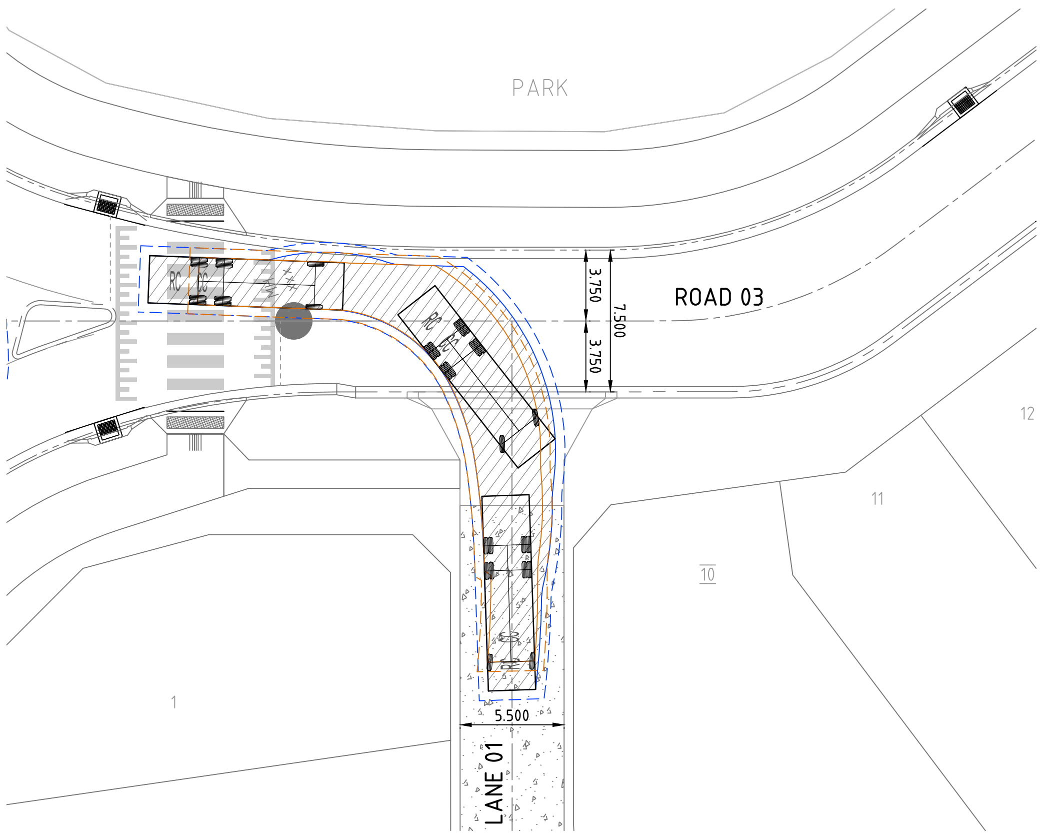
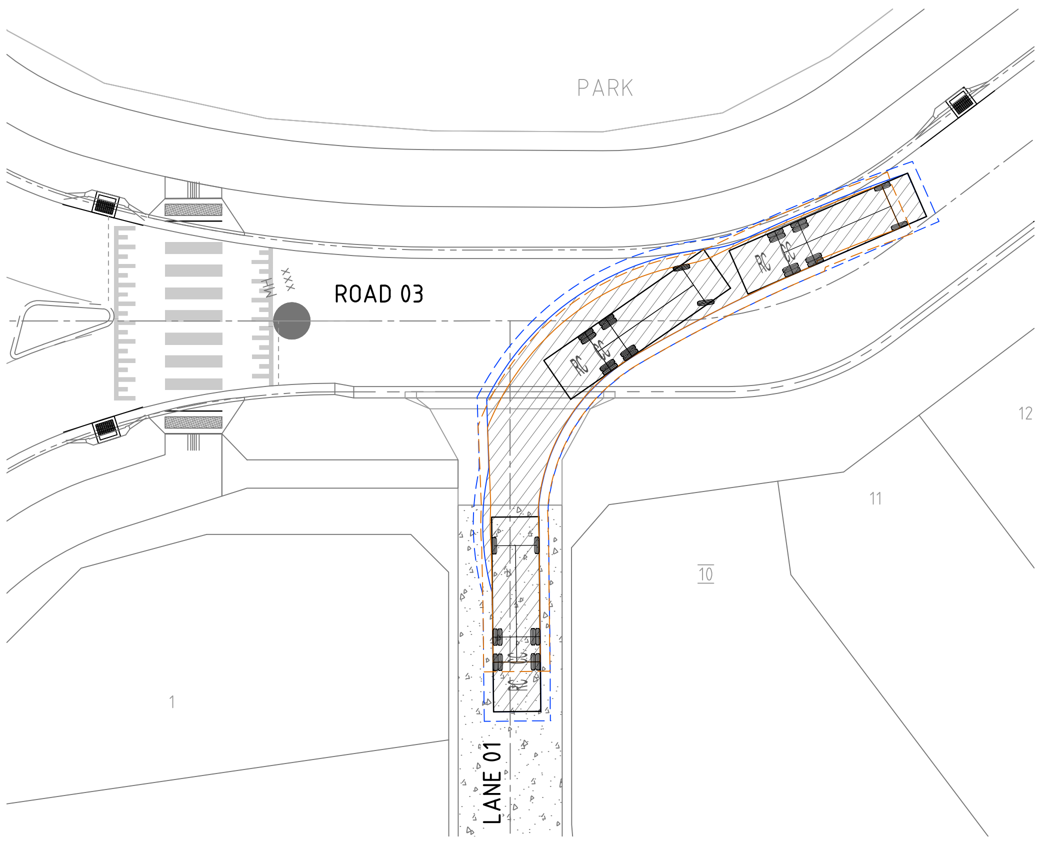
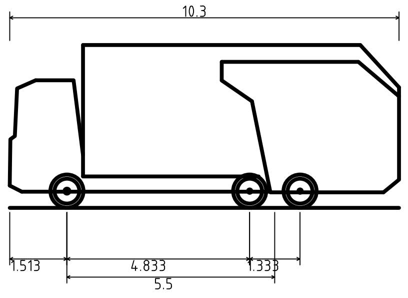

PARK
ROAD 03
3.750
7.500
3.750
5.500
LANE 01
12
11
10
1

10.3m SERVICE VEHICLE TURNING TEMPLATE – ROAD 03 to LANE 01
SCALE 1:200

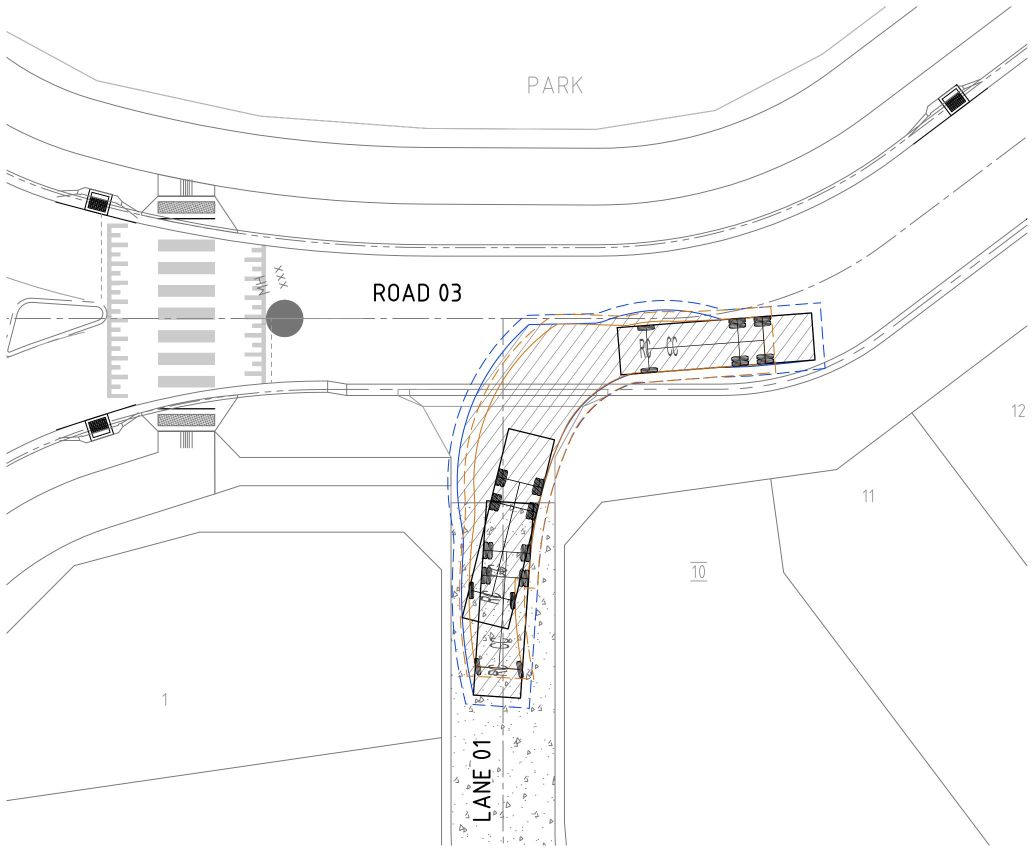

PARK
ROAD 03
LANE 01
12
11
10
1

10.3m SERVICE VEHICLE TURNING TEMPLATE – LANE 01 to ROAD 03
SCALE 1:200

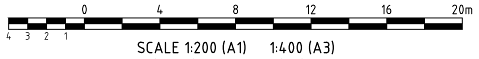

10.3
1.513
4.833
1.333
5.5

RCV (ACCO 2350 10.3 m) 5km/h R 9.757 kerb

Overall Length	10.300m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.410m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	9.757m


PARK
ROAD 03
LANE 01
12
11
10
1

10.3m SERVICE VEHICLE TURNING TEMPLATE – ROAD 03 to LANE 01
SCALE 1:200


0
4
8
12
16
20m
4
3
2
1

SCALE 1:200 (A1) 1:400 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING
User: WILLIAM GRIFFITH
D M

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angelman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **TURNING TEMPLATE**
SERVICE VEHICLE 10.3M TRUCK
SHEET 1 OF 4

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. *Drawing No.*	*Rev*
B00702-DA-CT07	**A**

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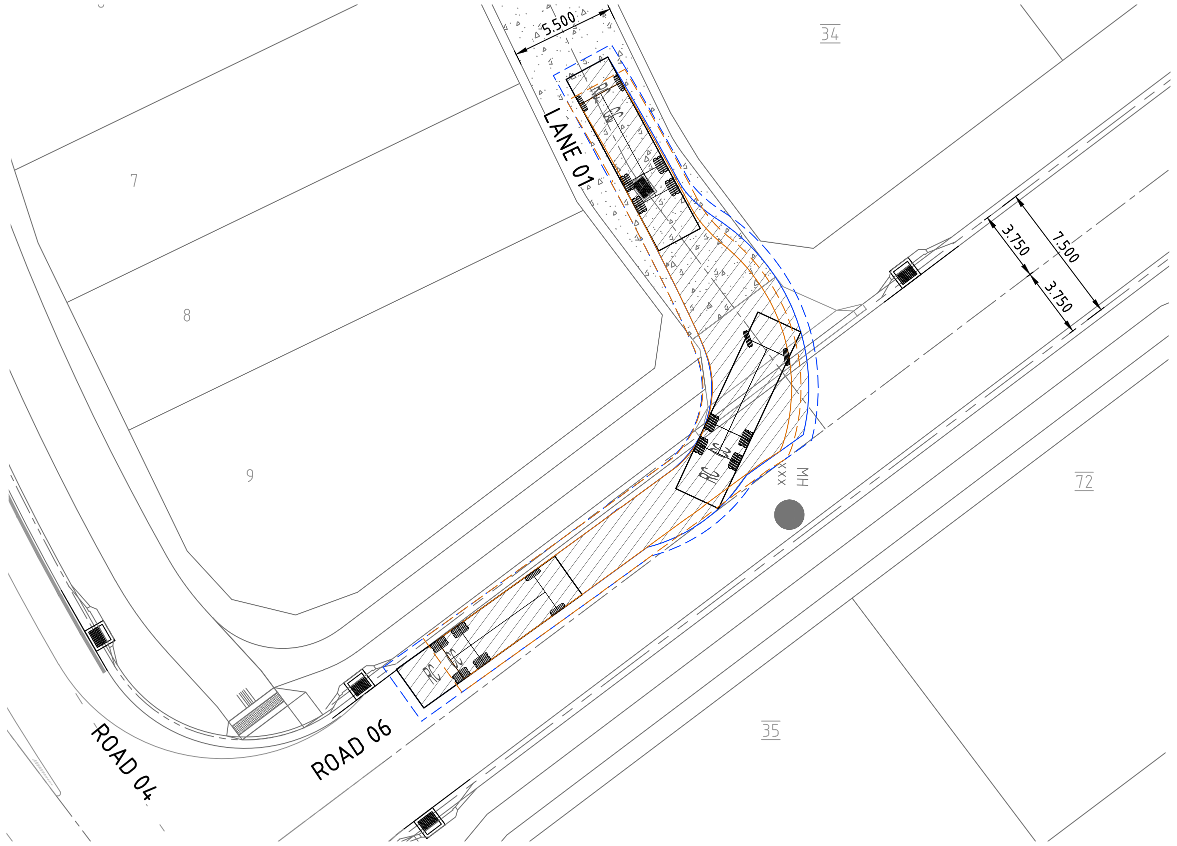
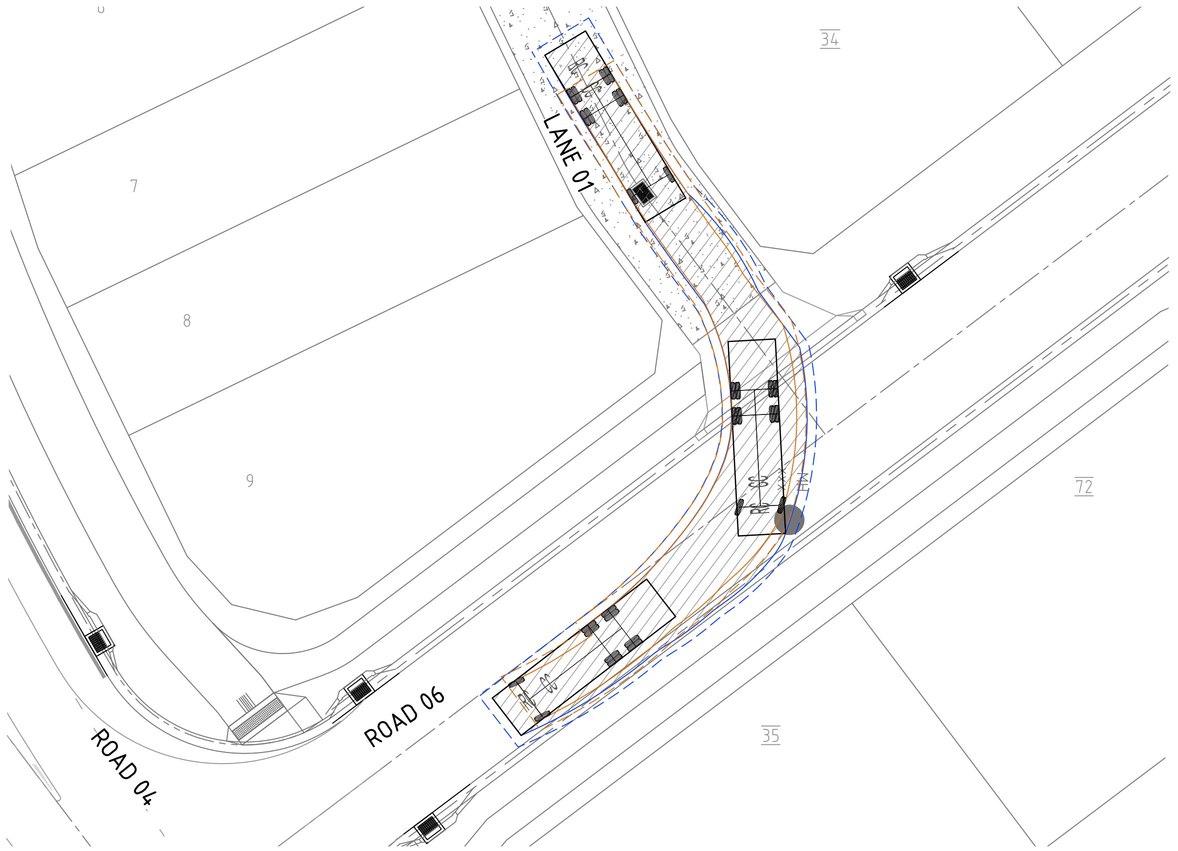

5.500
LANE 01
34
7
8
9
3.750
7.500
3.750
MH
XX
72
35
ROAD 06
ROAD 04

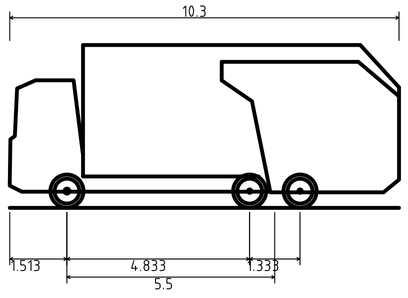
10.3m SERVICE VEHICLE TURNING TEMPLATE – ROAD 06 to LANE 01

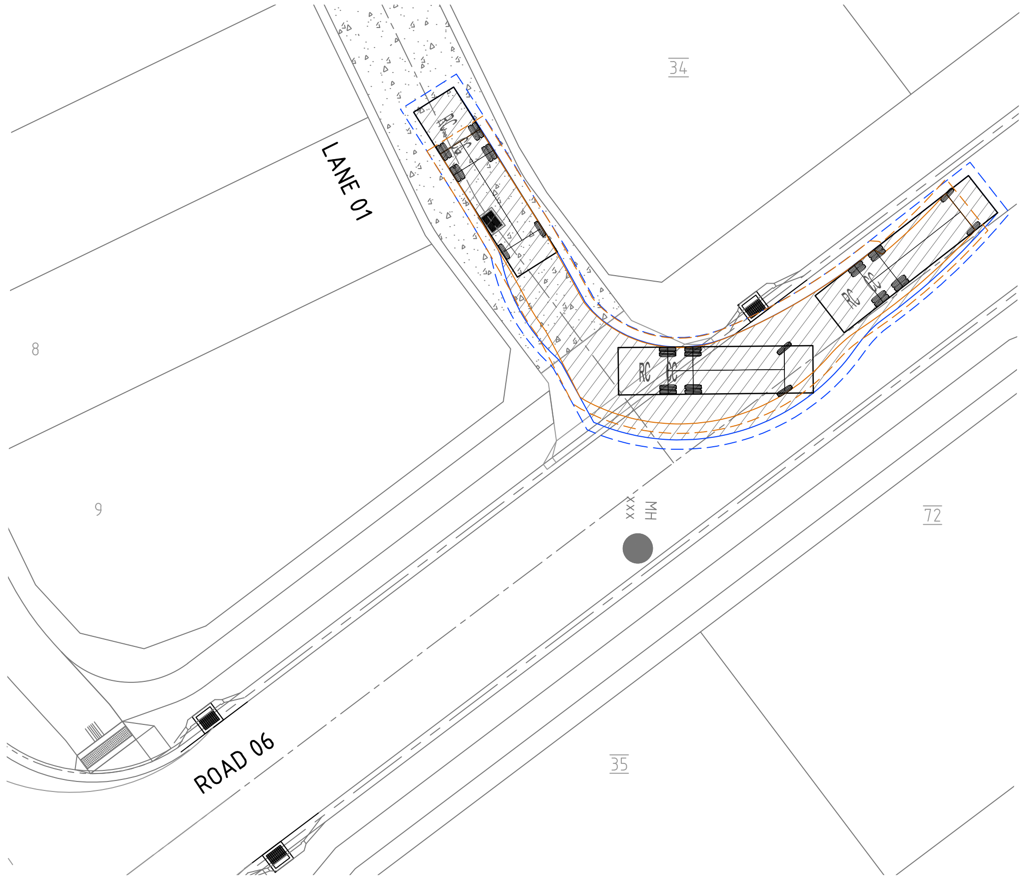
SCALE 1:200


LANE 01
34
7
8
9
MH
72
35
ROAD 06
ROAD 04

10.3m SERVICE VEHICLE TURNING TEMPLATE – LANE 01 to ROAD 06

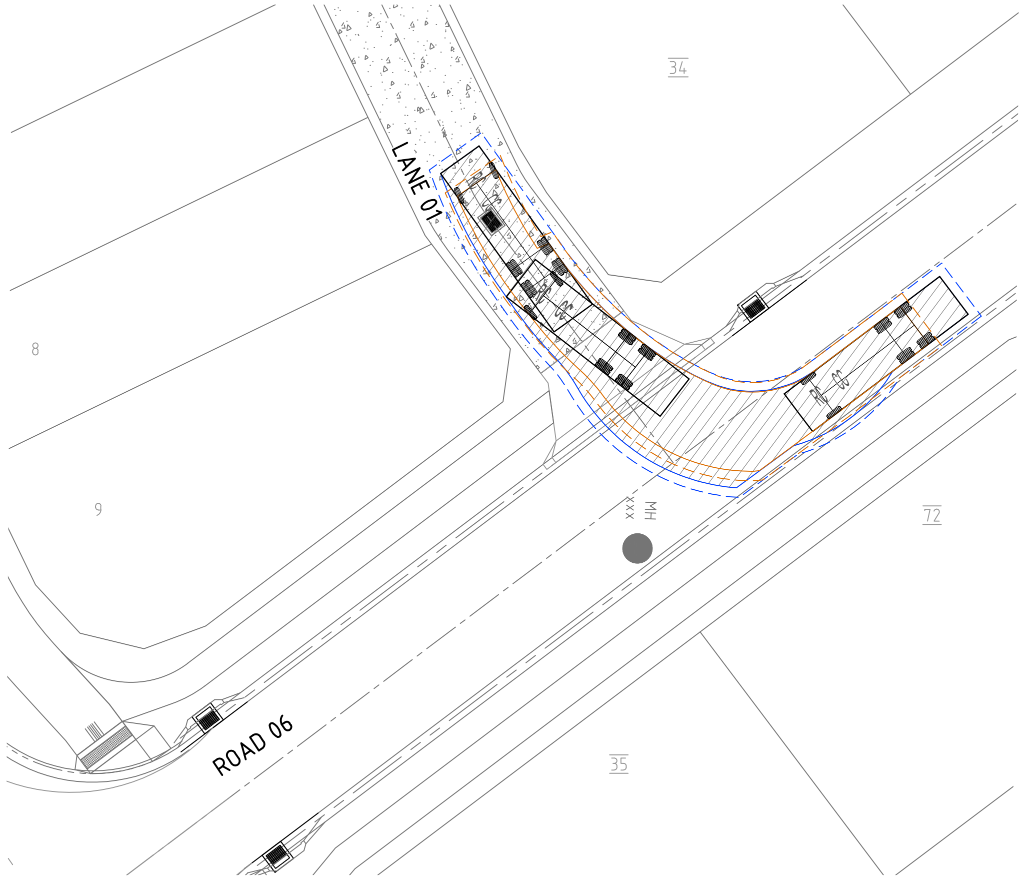
SCALE 1:200


10.3
1.513
4.833
1.333
5.5


LANE 01
34
8
9
MH
XX
72
35
ROAD 06

10.3m SERVICE VEHICLE TURNING TEMPLATE – LANE 01 to ROAD 06

SCALE 1:200


LANE 01
34
8
9
MH
XX
72
35
ROAD 06

10.3m SERVICE VEHICLE TURNING TEMPLATE – ROAD 06 to LANE 01

SCALE 1:200

RCV (ACCO 2350 10.3 m) 5km/h R 9.757 kerb

Overall Length	10.300m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.410m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	9.757m

4 3 2 1 0 4 8 12 16 20m

SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING D M User: WILLIAM GRIFFITH

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
SERVICE VEHICLE 10.3M TRUCK
SHEET 2 OF 4

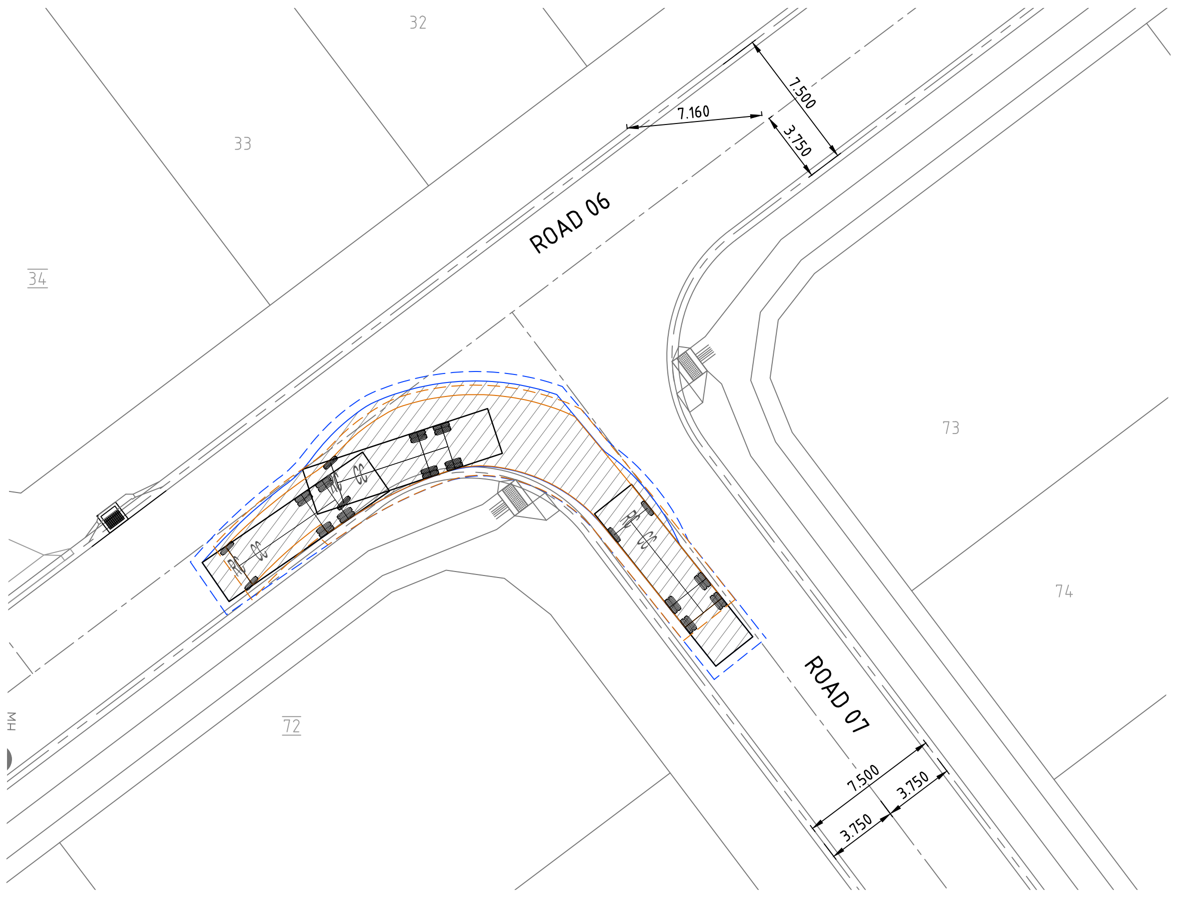
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

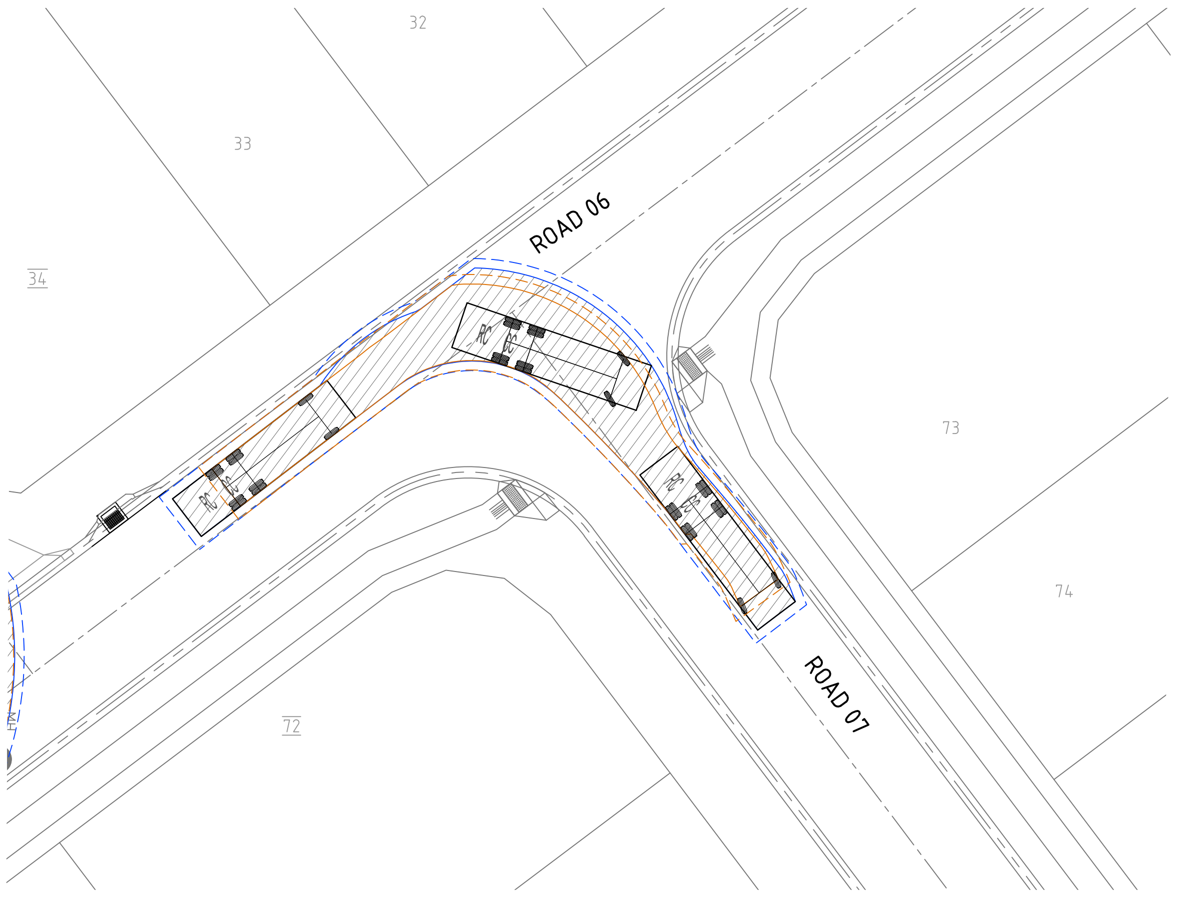
Project No. *Drawing No.*	*Rev*
B00702-DA-CT08	**A**

" "


32
33
34
ROAD 06
7.160
7.500
3.750
73
74
72
ROAD 07
7.500
3.750
3.750

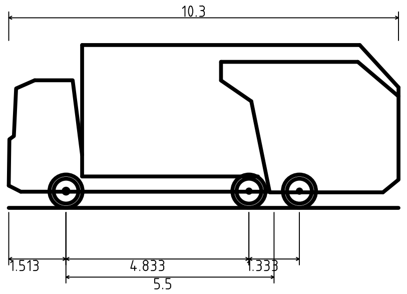
10.3m SERVICE VEHICLE TURNING TEMPLATE - ROAD 07 to ROAD 06

SCALE 1:200

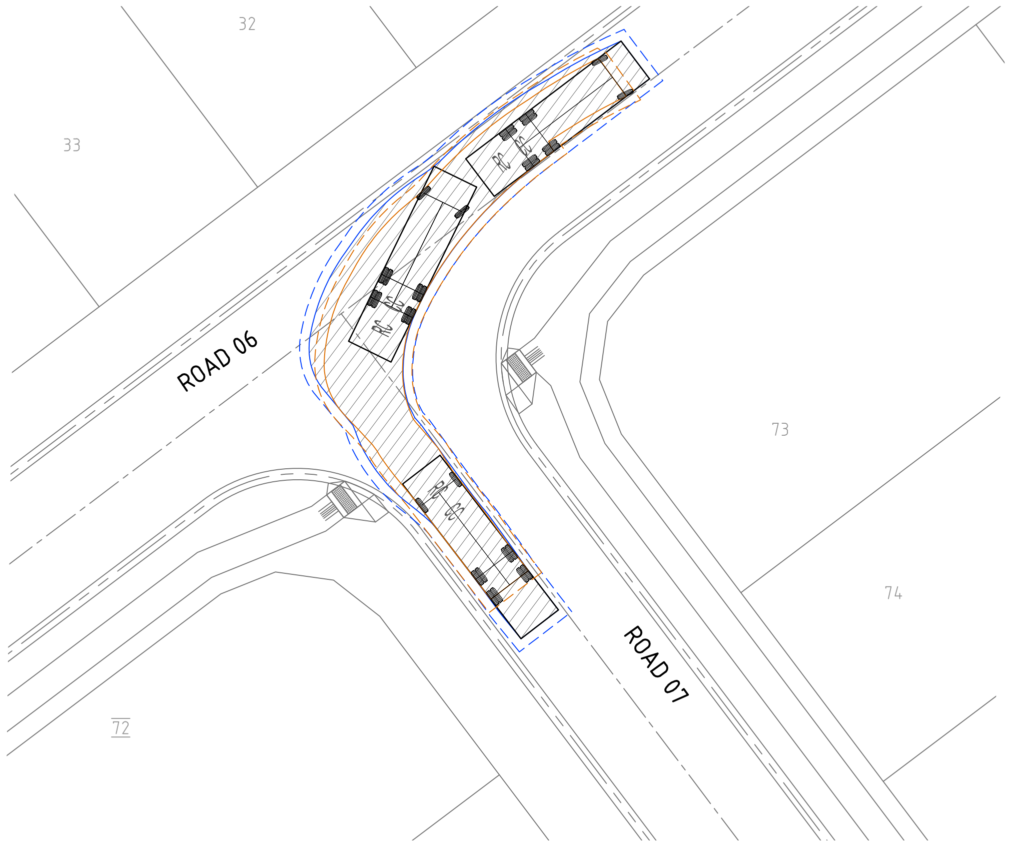

32
33
34
ROAD 06
73
74
72
ROAD 07

10.3m SERVICE VEHICLE TURNING TEMPLATE - ROAD 06 to ROAD 07

SCALE 1:200

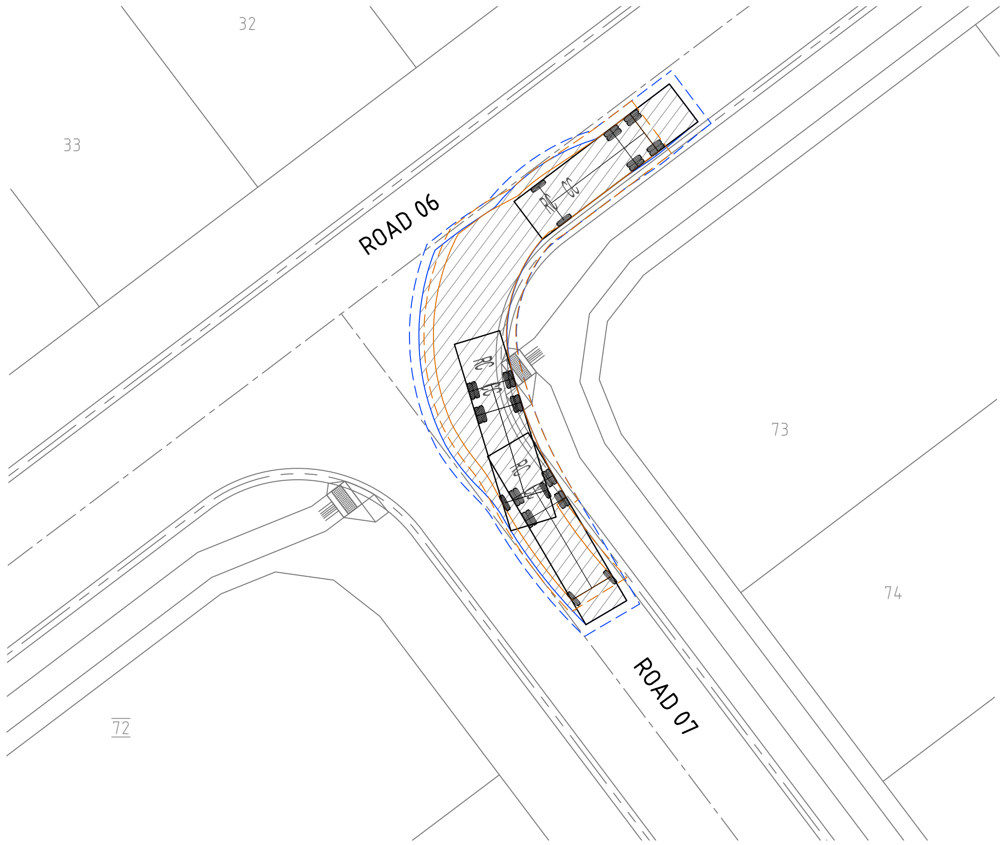

10.3
1.513
4.833
1.333
5.5

RCV (ACCO 2350 10.3 m) 5km/h R 9.757 kerb	
Overall Length	10.300m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.410m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	9.757m


32
33
ROAD 06
73
74
72
ROAD 07

10.3m SERVICE VEHICLE TURNING TEMPLATE - ROAD 07 to ROAD 06

SCALE 1:200


32
33
ROAD 06
73
74
72
ROAD 07

10.3m SERVICE VEHICLE TURNING TEMPLATE - ROAD 06 to ROAD 07

SCALE 1:200

0 4 8 12 16 20m
4 3 2 1

SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING

D M User: WILLIAM GRIFFITH

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION

Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
SERVICE VEHICLE 10.3M TRUCK
SHEET 3 OF 4

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

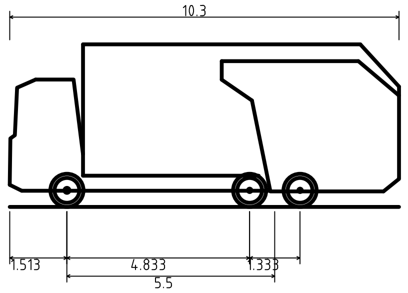
N

NOT FOR CONSTRUCTION

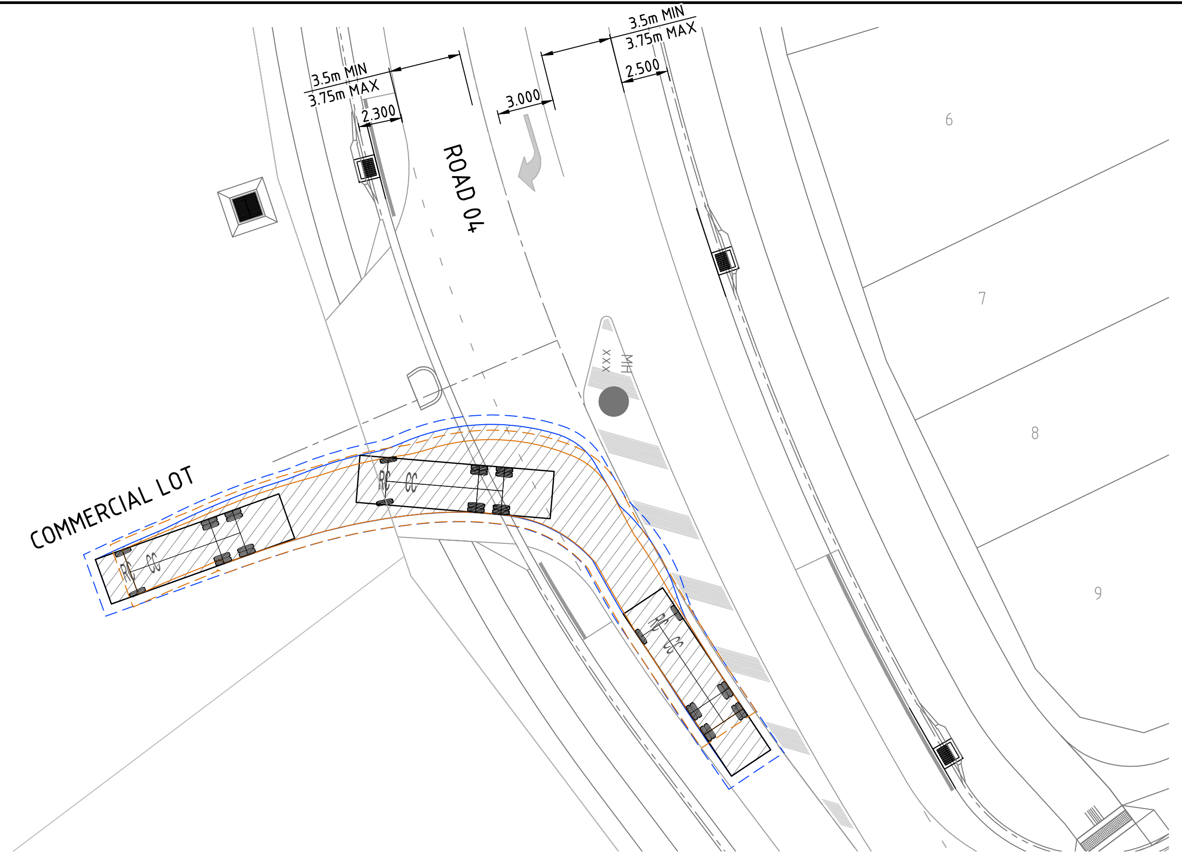
Project No. Drawing No. **B00702-DA-CT09**

Rev **A**

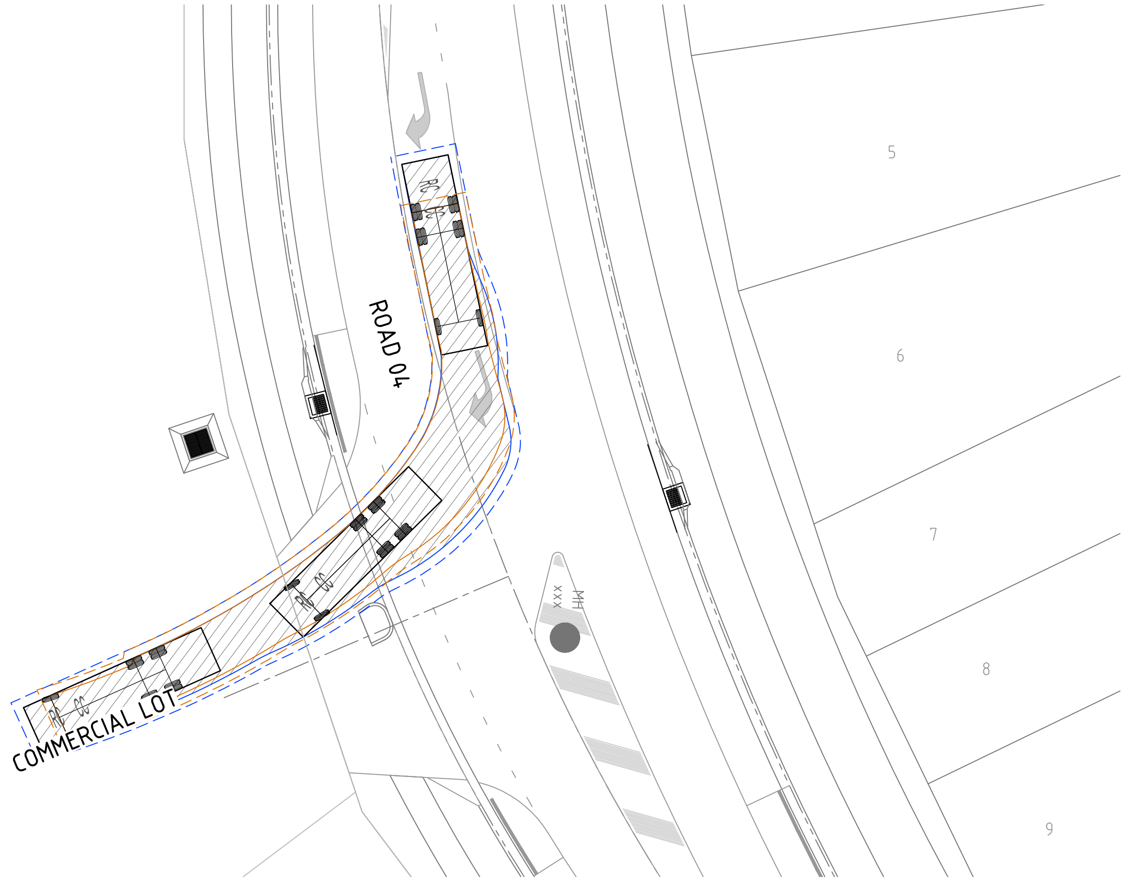
" "


10.3
1.513
4.833
1.333
5.5

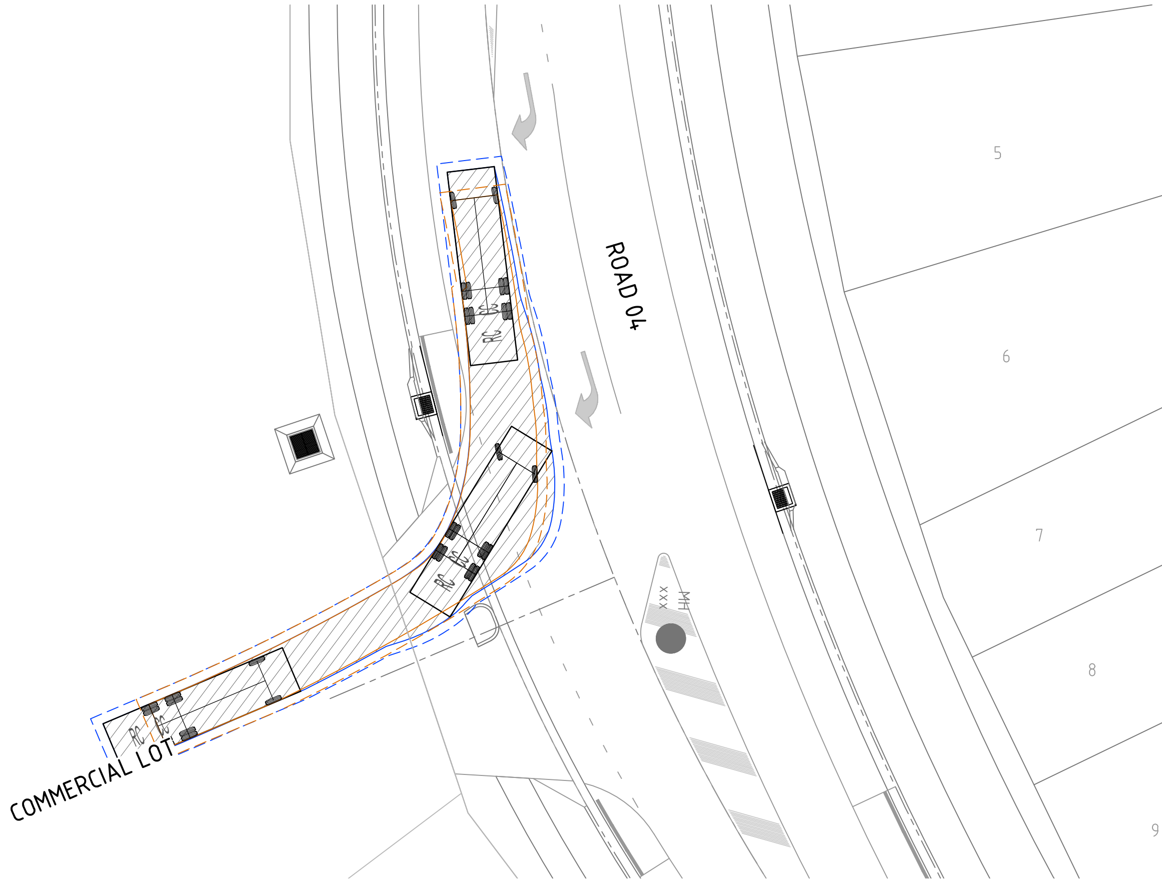
RCV (ACCO 2350 10.3 m) 5km/h R 9.757 kerb	
Overall Length	10.300m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.410m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	9.757m


3.5m MIN
3.75m MAX
2.300
3.000
3.5m MIN
3.75m MAX
2.500
ROAD 04
COMMERCIAL LOT
XXX
MH
6
7
8
9

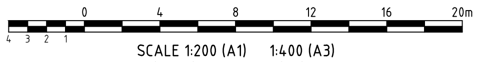
10.3m SERVICE VEHICLE TURNING TEMPLATE – ROAD 04 to COMMERCIAL DRIVEWAY
SCALE 1:200


ROAD 04
COMMERCIAL LOT
XXX
MH
5
6
7
8
9

10.3m SERVICE VEHICLE TURNING TEMPLATE – ROAD 04 to COMMERCIAL DRIVEWAY
SCALE 1:200


ROAD 04
COMMERCIAL LOT
XXX
MH
5
6
7
8
9

10.3m SERVICE VEHICLE TURNING TEMPLATE – COMMERCIAL DRIVEWAY to ROAD 04
SCALE 1:200


0
4
8
12
16
20m
4
3
2
1

SCALE 1:200 (A1) 1:400 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING
D M User: WILLIAM GRIFFITH

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25

ENGINEERING CERTIFICATION
Peter Angerman
Registered Engineer
Date " "
Registered Accreditation

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**
Title **TURNING TEMPLATE**
SERVICE VEHICLE 10.3M TRUCK
SHEET 4 OF 4

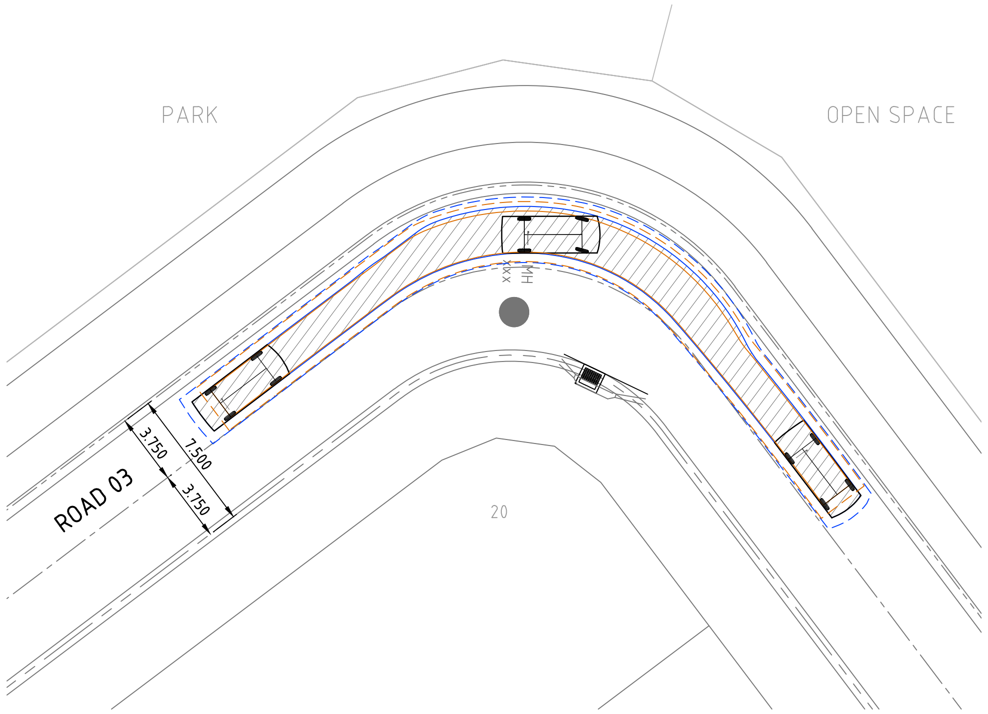
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

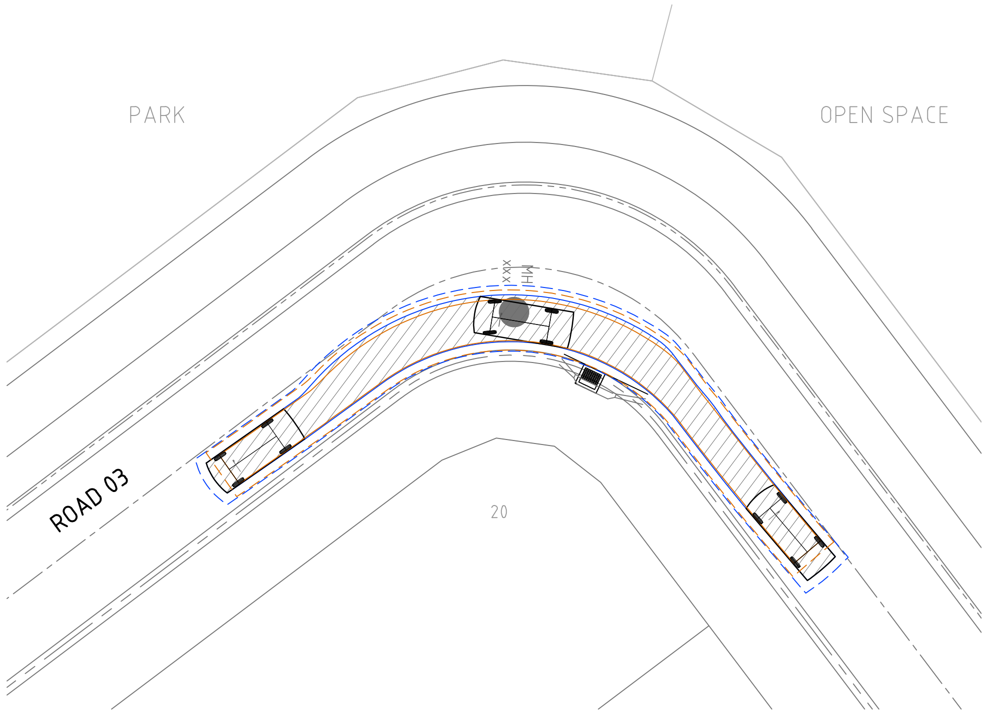
Project No. *Drawing No.*	*Rev*
B00702-DA-CT10	**A**

" "



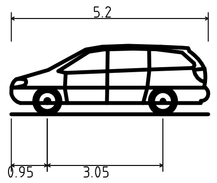
5.2m PASSENGER VEHICLE TURNING TEMPLATE - ROAD 03

SCALE 1:200

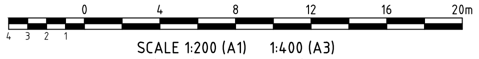


5.2m PASSENGER VEHICLE TURNING TEMPLATE - ROAD 03

SCALE 1:200



Passenger vehicle (5.2 m)	
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.300m



SCALE 1:200 (A1) 1:400 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: WILLIAM GRIFFITH M D

File Name: S:\12ds\data\MAN12DSYN01\B00702__2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-TURNING

A	ORIGINAL ISSUE	ES	PDW	PDW	PI	12/12/25
No.	Amendments	Drawn	Design	Design Chk	Appd	Date

ENGINEERING CERTIFICATION

Peter Angerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **TURNING TEMPLATE**
DESIGN VEHICLE 5.2M CAR

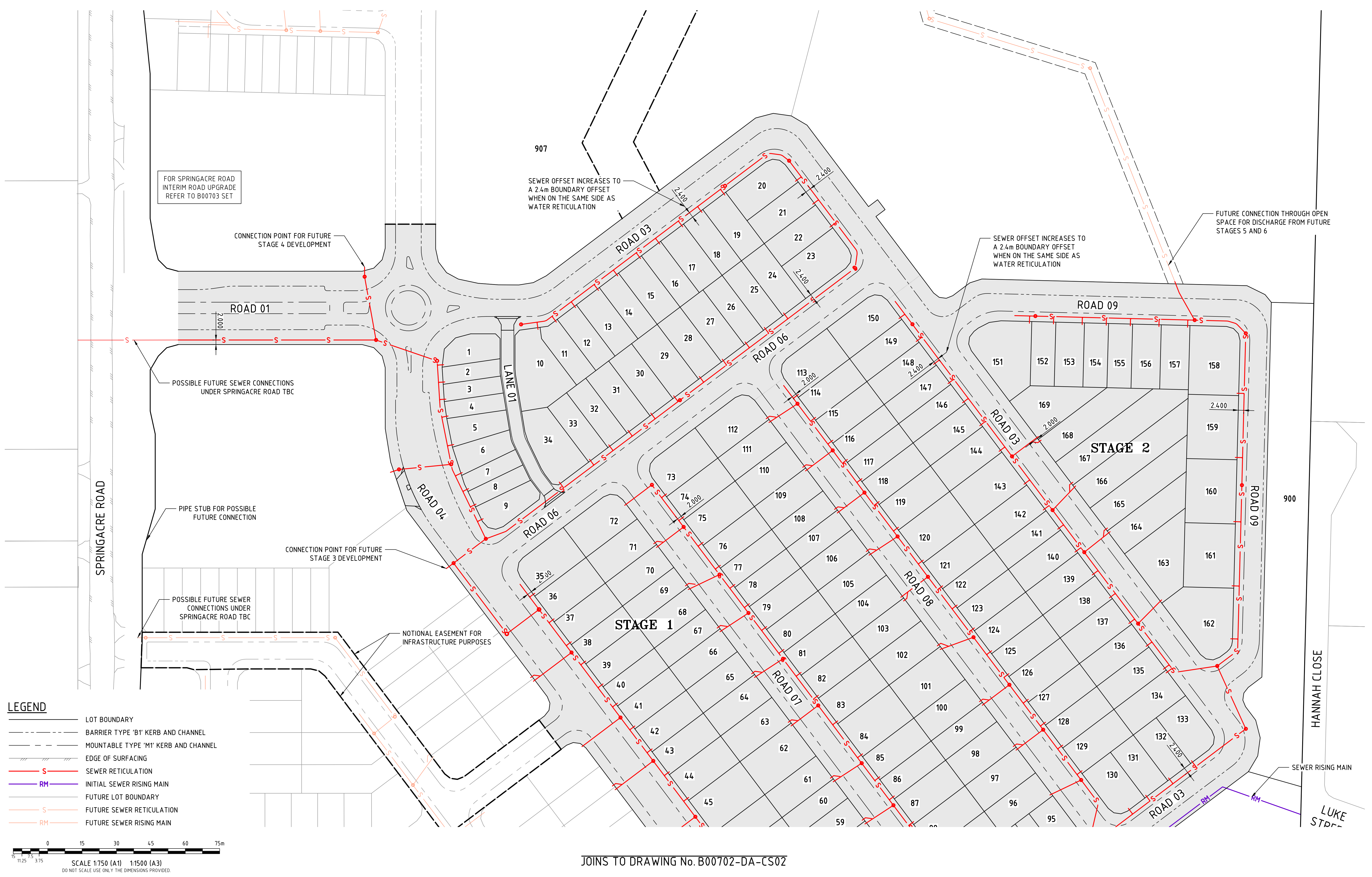
Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CT11	A

" "


FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET
CONNECTION POINT FOR FUTURE STAGE 4 DEVELOPMENT
907
SEWER OFFSET INCREASES TO A 2.4m BOUNDARY OFFSET WHEN ON THE SAME SIDE AS WATER RETICULATION
SEWER OFFSET INCREASES TO A 2.4m BOUNDARY OFFSET WHEN ON THE SAME SIDE AS WATER RETICULATION
FUTURE CONNECTION THROUGH OPEN SPACE FOR DISCHARGE FROM FUTURE STAGES 5 AND 6
ROAD 01
ROAD 03
ROAD 04
ROAD 06
ROAD 07
ROAD 08
ROAD 09
LANE 01
SPRINGACRE ROAD
HANNAH CLOSE
LUKE STREET
900
STAGE 1
STAGE 2
2.000
2.400
3.500
POSSIBLE FUTURE SEWER CONNECTIONS UNDER SPRINGACRE ROAD TBC
PIPE STUB FOR POSSIBLE FUTURE CONNECTION
CONNECTION POINT FOR FUTURE STAGE 3 DEVELOPMENT
POSSIBLE FUTURE SEWER CONNECTIONS UNDER SPRINGACRE ROAD TBC
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
SEWER RISING MAIN
RM
S
0 15 30 45 60 75m
15 11.25 7.5 3.75
SCALE 1:750 (A1) 1:1500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

LEGEND

————	LOT BOUNDARY
— - —	BARRIER TYPE 'B1' KERB AND CHANNEL
— — —	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
——///	EDGE OF SURFACING
—S—	SEWER RETICULATION
—RM—	INITIAL SEWER RISING MAIN
————	FUTURE LOT BOUNDARY
—S—	FUTURE SEWER RETICULATION
—RM—	FUTURE SEWER RISING MAIN

JOINS TO DRAWING No. B00702-DA-CS02

Plot Date: 12/12/2025 12:38:02 PM User: WILLIAM GRIFFITH
File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-SEW

A	ORIGINAL ISSUE	ES	PDW	PI	DH	12/12/25
No.	*Amendments*	*Drawn*	*Design*	*Design Chk*	*Appd*	*Date*

ENGINEERING CERTIFICATION

Darryl Hayter
Registered Engineer
Date " "
Registered Accreditation

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URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **CONCEPT SEWER RETICULATION PLAN**
SHEET 1 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

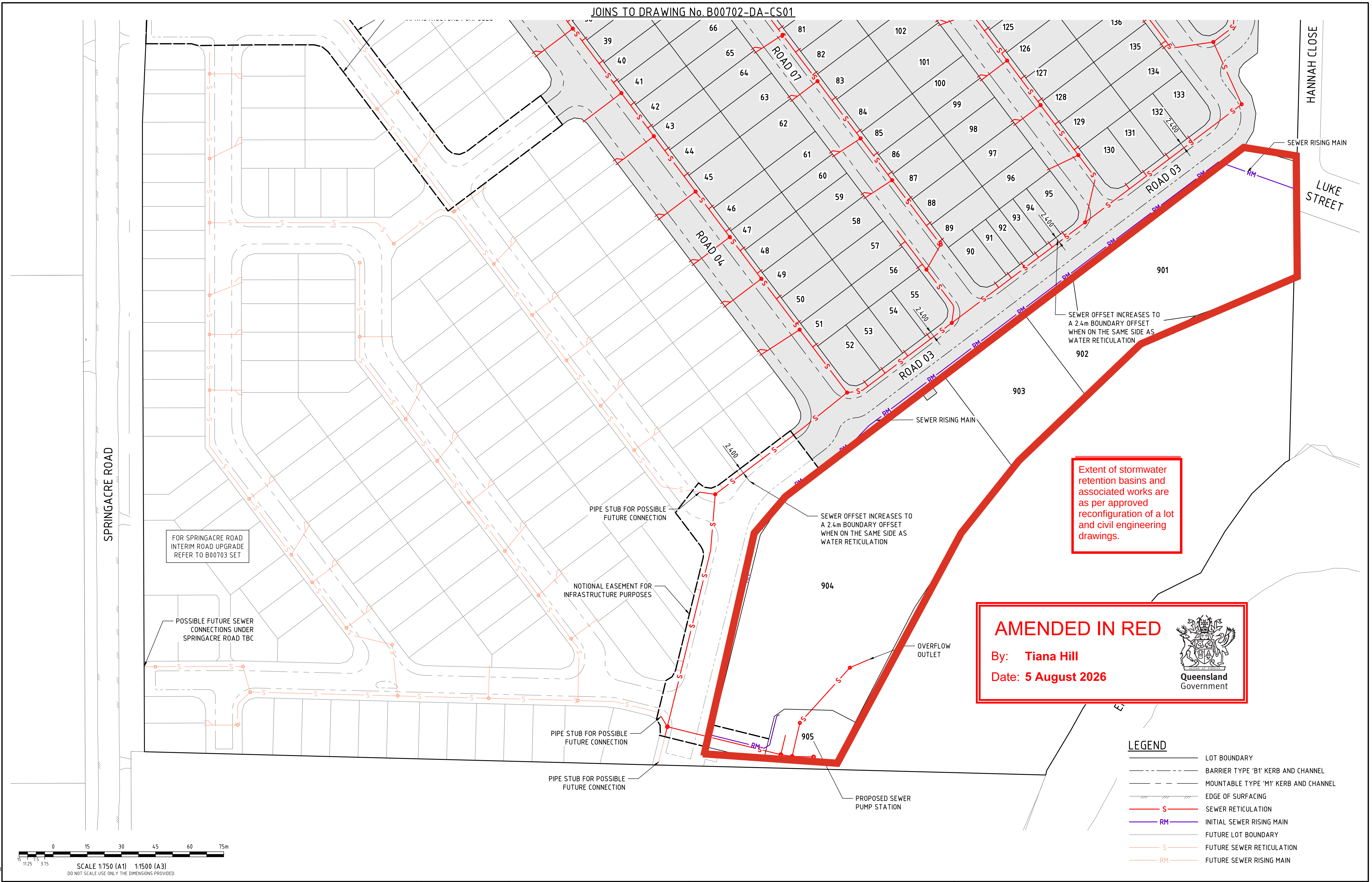
N

NOT FOR CONSTRUCTION

Project No. *Drawing No.* **B00702-DA-CS01** *Rev* **A**

" "

JOINS TO DRAWING No. B00702-DA-CS01


SPRINGACRE ROAD
HANNAH CLOSE
LUKE STREET
ROAD 04
ROAD 07
ROAD 03
ROAD 03
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
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94
95
96
97
98
99
100
101
102
125
126
127
128
129
130
131
132
133
134
135
136
901
902
903
904
905
2.400
SEWER RISING MAIN
SEWER OFFSET INCREASES TO A 2.4m BOUNDARY OFFSET WHEN ON THE SAME SIDE AS WATER RETICULATION
SEWER RISING MAIN
SEWER OFFSET INCREASES TO A 2.4m BOUNDARY OFFSET WHEN ON THE SAME SIDE AS WATER RETICULATION
PIPE STUB FOR POSSIBLE FUTURE CONNECTION
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET
POSSIBLE FUTURE SEWER CONNECTIONS UNDER SPRINGACRE ROAD TBC
OVERFLOW OUTLET
PIPE STUB FOR POSSIBLE FUTURE CONNECTION
PIPE STUB FOR POSSIBLE FUTURE CONNECTION
PROPOSED SEWER PUMP STATION
S
RM
LEGEND
LOT BOUNDARY
BARRIER TYPE 'B1' KERB AND CHANNEL
MOUNTABLE TYPE 'M1' KERB AND CHANNEL
EDGE OF SURFACING
SEWER RETICULATION
INITIAL SEWER RISING MAIN
FUTURE LOT BOUNDARY
FUTURE SEWER RETICULATION
FUTURE SEWER RISING MAIN
0
15
30
45
60
75m
15
11.25
7.5
3.75

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

SCALE 1:750 (A1) 1:1500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:38:41 PM User: WILLIAM GRIFFITH

File Name: S:\12ds\data\MAN12DSYN01\B00702_2451\4 CIVIL-DRGS\4.2 CURRENT\DA\B00702-DA-SEW

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PI	DH	12/12/25

ENGINEERING CERTIFICATION

Darryl Hayter

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **CONCEPT SEWER RETICULATION PLAN**
SHEET 2 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

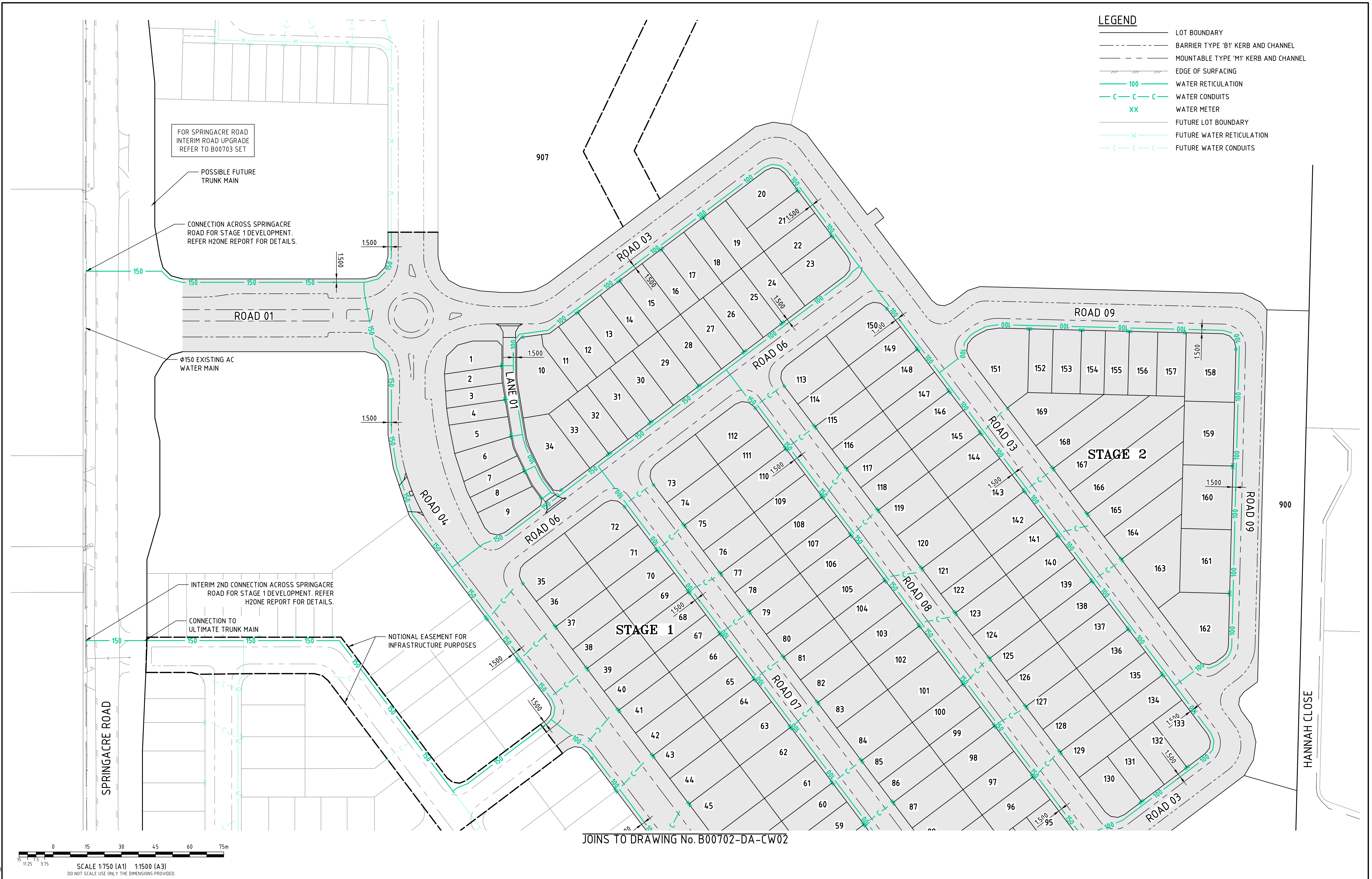
N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00702-DA-CS02**

Rev **A**

" "



LEGEND
LOT BOUNDARY
BARRIER TYPE 'B1' KERB AND CHANNEL
MOUNTABLE TYPE 'M1' KERB AND CHANNEL
EDGE OF SURFACING
100 WATER RETICULATION
C C C WATER CONDUITS
XX WATER METER
FUTURE LOT BOUNDARY
W FUTURE WATER RETICULATION
C C C FUTURE WATER CONDUITS
FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET
POSSIBLE FUTURE TRUNK MAIN
CONNECTION ACROSS SPRINGACRE ROAD FOR STAGE 1 DEVELOPMENT. REFER H2ONE REPORT FOR DETAILS.
Ø150 EXISTING AC WATER MAIN
INTERIM 2ND CONNECTION ACROSS SPRINGACRE ROAD FOR STAGE 1 DEVELOPMENT. REFER H2ONE REPORT FOR DETAILS.
CONNECTION TO ULTIMATE TRUNK MAIN
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
SPRINGACRE ROAD
ROAD 01
LANE 01
ROAD 03
ROAD 04
ROAD 06
ROAD 07
ROAD 08
ROAD 09
HANNAH CLOSE
STAGE 1
STAGE 2
907
900
150
100
1.500
JOINS TO DRAWING No. B00702-DA-CW02
0 15 30 45 60 75m
15 11.25 7.5 3.75
SCALE 1:750 (A1) 1:1500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: WILLIAM GRIFFITH
Plot Date: 12/12/2025 12:39:22 PM
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PI	DH	12/12/25

ENGINEERING CERTIFICATION

Darryl Hayter
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL**

Title **CONCEPT WATER RETICULATION PLAN**
SHEET 1 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

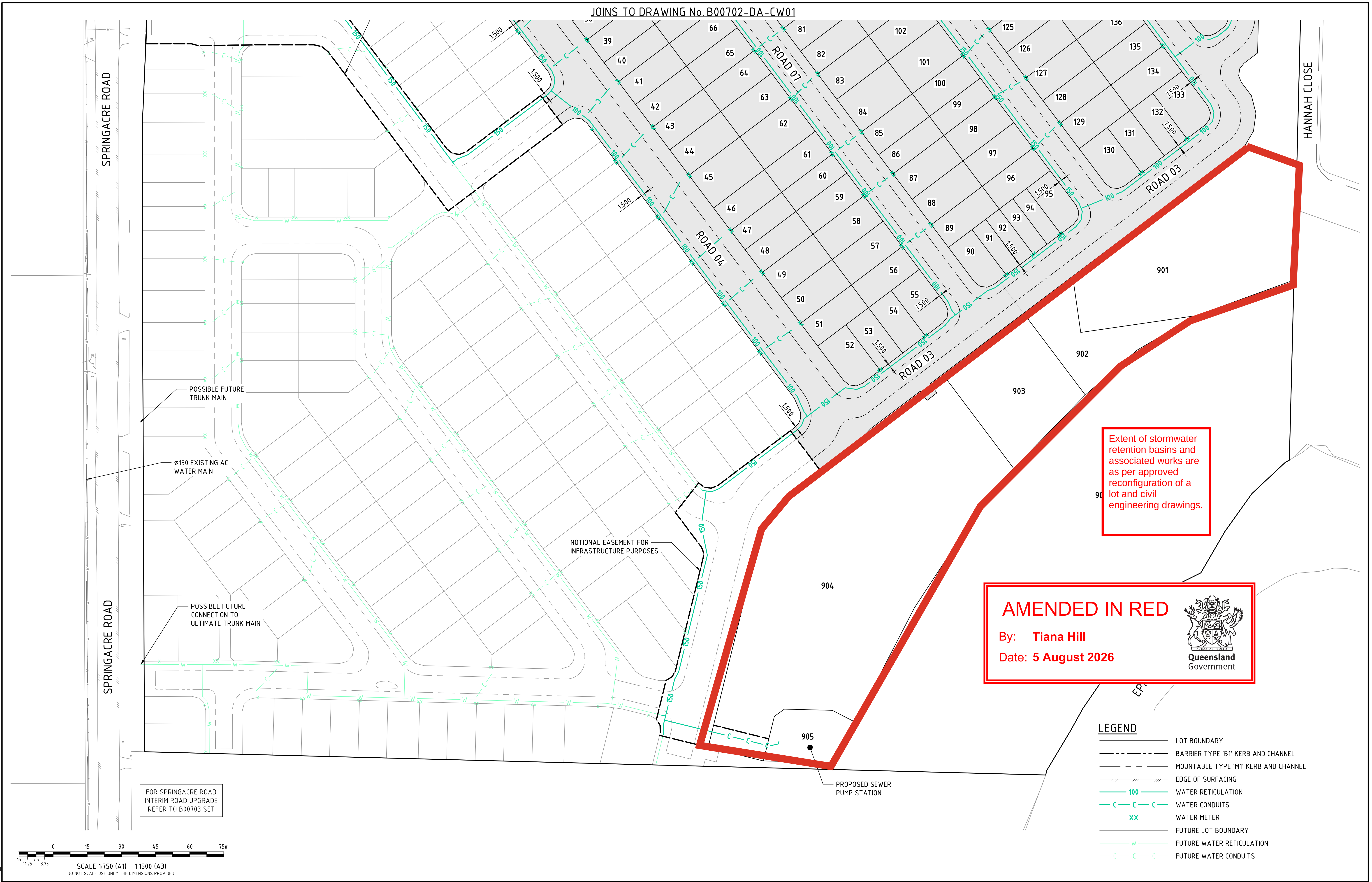
N

NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CW01	A

" "

JOINS TO DRAWING No. B00702-DA-CW01


SPRINGACRE ROAD
SPRINGACRE ROAD
HANNAH CLOSE
ROAD 03
ROAD 03
ROAD 04
ROAD 07
POSSIBLE FUTURE TRUNK MAIN
Ø150 EXISTING AC WATER MAIN
POSSIBLE FUTURE CONNECTION TO ULTIMATE TRUNK MAIN
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
PROPOSED SEWER PUMP STATION
901
902
903
904
905
100
150
1.500
LEGEND
LOT BOUNDARY
BARRIER TYPE 'B1' KERB AND CHANNEL
MOUNTABLE TYPE 'M1' KERB AND CHANNEL
EDGE OF SURFACING
WATER RETICULATION
WATER CONDUITS
WATER METER
FUTURE LOT BOUNDARY
FUTURE WATER RETICULATION
FUTURE WATER CONDUITS
0
15
30
45
60
75m

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET

SCALE 1:750 (A1) 1:1500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PI	DH	12/12/25

ENGINEERING CERTIFICATION

Darryl Hayter

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client URBEX PTY LTD

Project SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL

Title CONCEPT WATER RETICULATION PLAN
SHEET 2 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

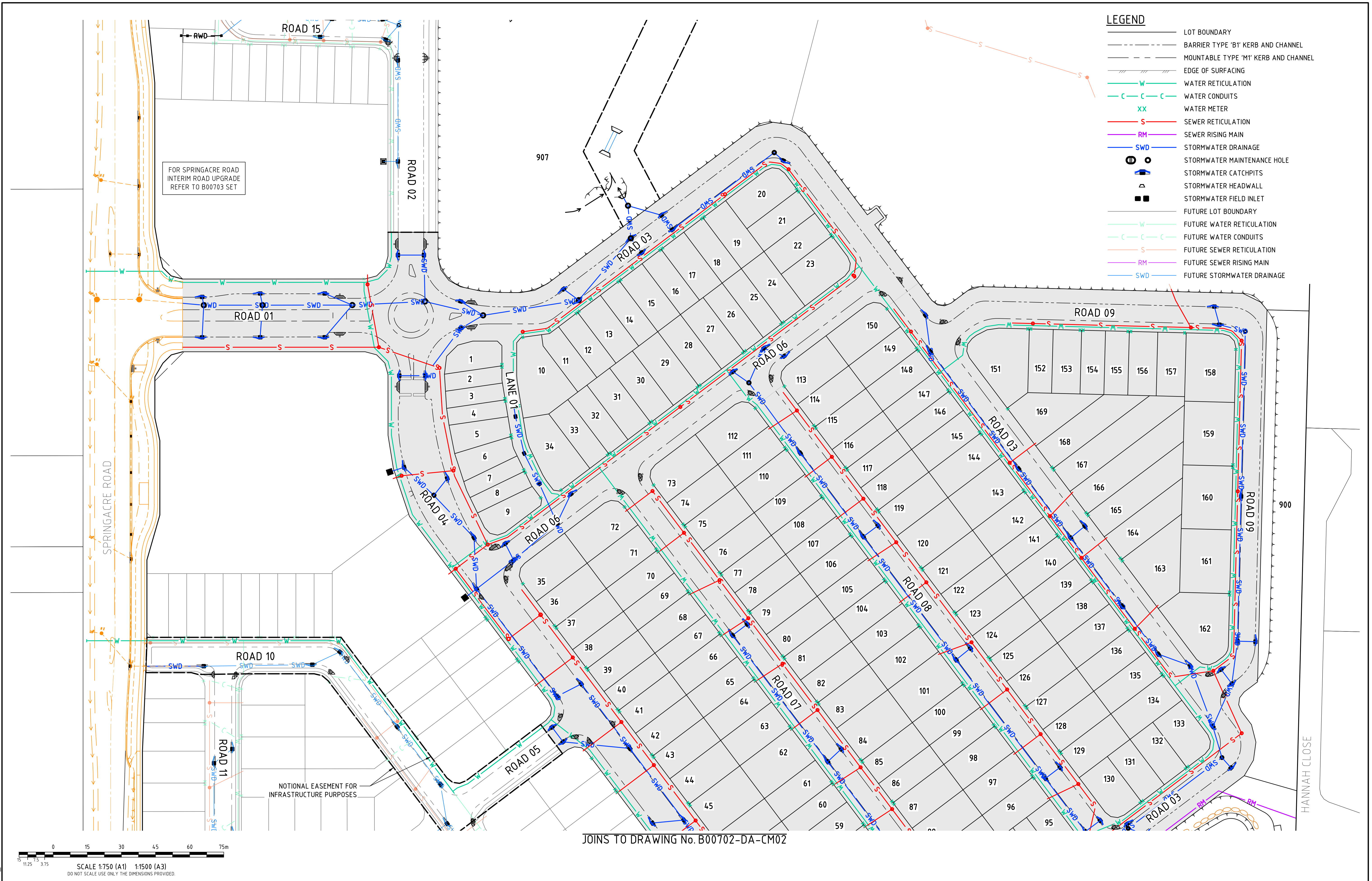
N

NOT FOR CONSTRUCTION

Project No. Drawing No. B00702-DA-CW02

Rev A

" "


LEGEND
LOT BOUNDARY
BARRIER TYPE 'B1' KERB AND CHANNEL
MOUNTABLE TYPE 'M1' KERB AND CHANNEL
EDGE OF SURFACING
WATER RETICULATION
WATER CONDUITS
WATER METER
SEWER RETICULATION
SEWER RISING MAIN
STORMWATER DRAINAGE
STORMWATER MAINTENANCE HOLE
STORMWATER CATCHPITS
STORMWATER HEADWALL
STORMWATER FIELD INLET
FUTURE LOT BOUNDARY
FUTURE WATER RETICULATION
FUTURE WATER CONDUITS
FUTURE SEWER RETICULATION
FUTURE SEWER RISING MAIN
FUTURE STORMWATER DRAINAGE
ROAD 15
RWD
ROAD 02
FOR SPRINGACRE ROAD INTERIM ROAD UPGRADE REFER TO B00703 SET
907
ROAD 03
ROAD 01
ROAD 06
ROAD 09
LANE 01
ROAD 04
ROAD 08
ROAD 07
ROAD 05
ROAD 10
ROAD 11
SPRINGACRE ROAD
HANNAH CLOSE
900
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
JOINS TO DRAWING No. B00702-DA-CM02
0 15 30 45 60 75m
SCALE 1:750 (A1) 1:1500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 12:40:12 PM User: WILLIAM GRIFFITH
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PI	DH	12/12/25

ENGINEERING CERTIFICATION

Darryl Hayter
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client
URBEX PTY LTD

Project
SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL

Title
COMBINED SERVICES PLAN
SHEET 1 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

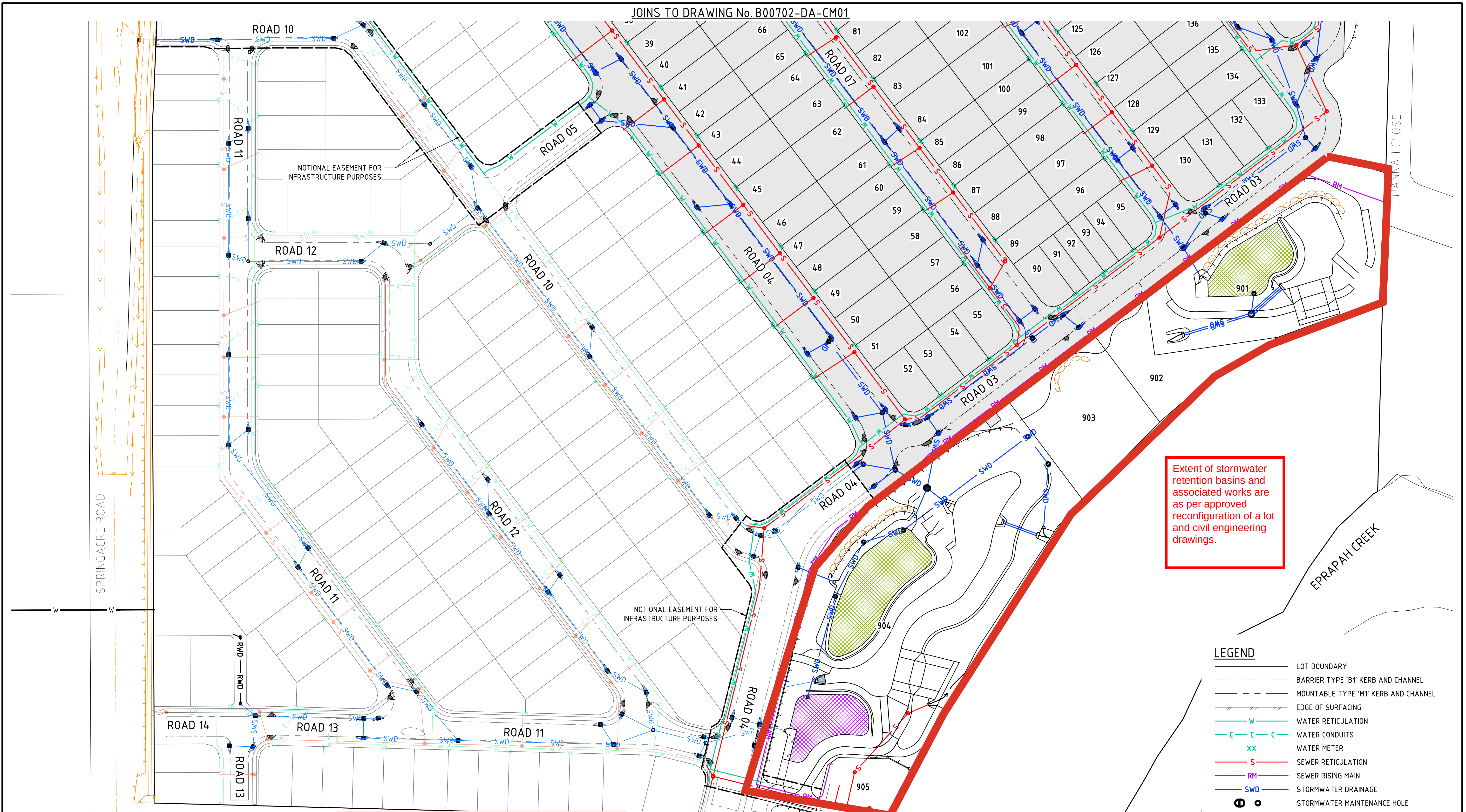
N

NOT FOR CONSTRUCTION

Project No. Drawing No.
B00702-DA-CM01

Rev
A

" "


JOINS TO DRAWING No. B00702-DA-CM01
ROAD 10
ROAD 11
ROAD 12
ROAD 05
ROAD 07
ROAD 04
ROAD 03
ROAD 13
ROAD 14
SPRINGACRE ROAD
HANNAH CLOSE
EPRAPAH CREEK
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
NOTIONAL EASEMENT FOR INFRASTRUCTURE PURPOSES
SWD
S
W
RM
RWD
39
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100
101
102
125
126
127
128
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131
132
133
134
135
136
901
902
903
904
905

Extent of stormwater retention basins and associated works are as per approved reconfiguration of a lot and civil engineering drawings.

LEGEND

———	LOT BOUNDARY
—·—·—	BARRIER TYPE 'B1' KERB AND CHANNEL
— — —	MOUNTABLE TYPE 'M1' KERB AND CHANNEL
⁄⁄ ⁄⁄	EDGE OF SURFACING
—W—	WATER RETICULATION
—C—C—C—	WATER CONDUITS
XX	WATER METER
—S—	SEWER RETICULATION
—RM—	SEWER RISING MAIN
—SWD—	STORMWATER DRAINAGE
◉ ○	STORMWATER MAINTENANCE HOLE
▬	STORMWATER CATCHPITS
△	STORMWATER HEADWALL
■■	STORMWATER FIELD INLET
———	FUTURE LOT BOUNDARY
—W—	FUTURE WATER RETICULATION
—C—C—C—	FUTURE WATER CONDUITS
—S—	FUTURE SEWER RETICULATION
—RM—	FUTURE SEWER RISING MAIN
—SWD—	FUTURE STORMWATER DRAINAGE

FOR SPRINGACRE ROAD
INTERIM ROAD UPGRADE
REFER TO B00703 SET

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

0 15 30 45 60 75m
15 11.25 7.5 3.75

SCALE 1:750 (A1) 1:1500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: WILLIAM GRIFFITH
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	PI	DH	12/12/25

ENGINEERING CERTIFICATION
Darryl Hayter
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client URBEX PTY LTD
Project SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL
Title COMBINED SERVICES PLAN
SHEET 2 OF 2

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

N

NOT FOR CONSTRUCTION

Project No. Drawing No.
B00702-DA-CM02

Rev
A

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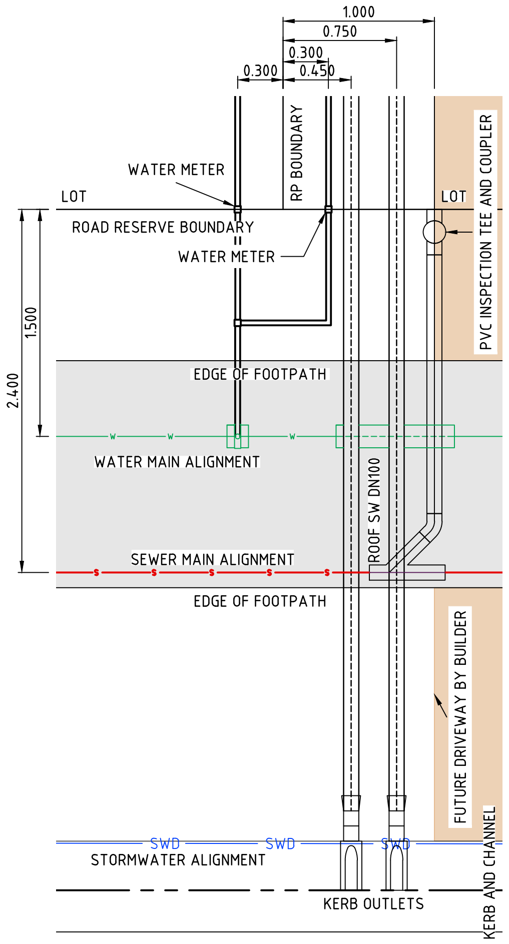
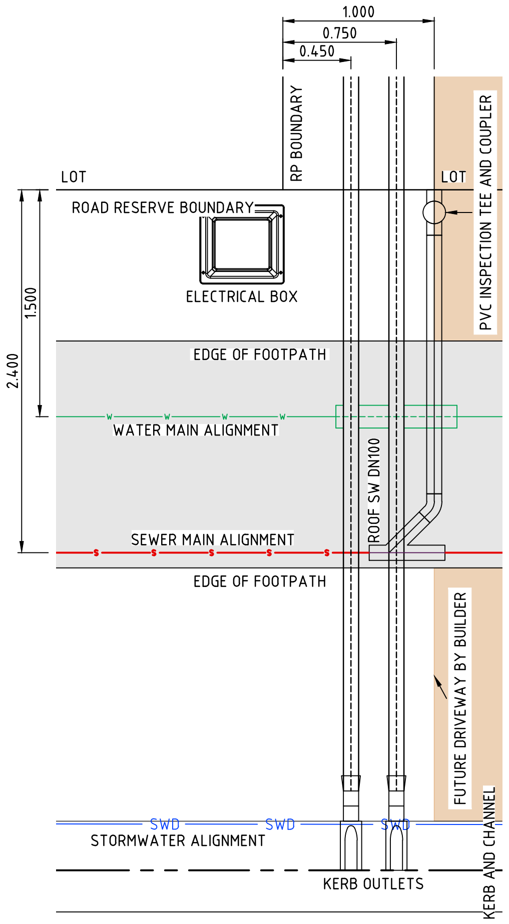
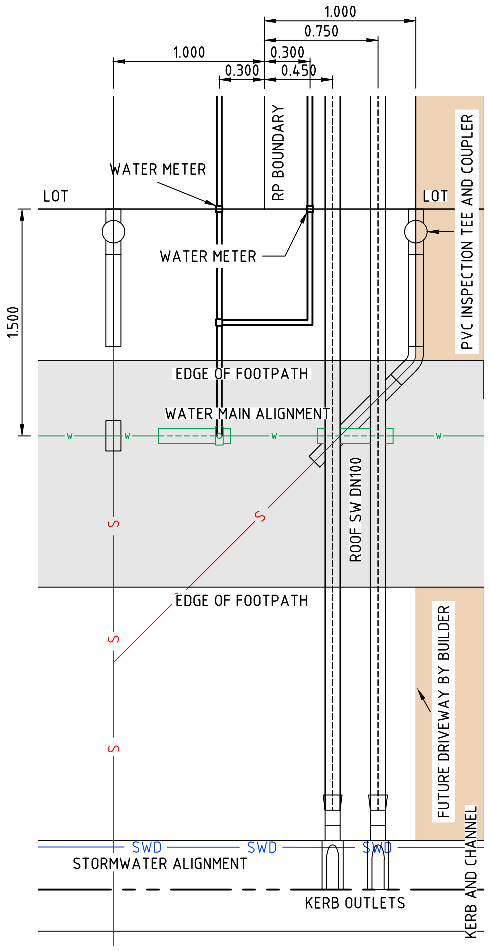

1.000
0.750
0.300
0.450
0.300
WATER METER
RP BOUNDARY
LOT
LOT
PVC INSPECTION TEE AND COUPLER
ROAD RESERVE BOUNDARY
WATER METER
1.500
2.400
EDGE OF FOOTPATH
WATER MAIN ALIGNMENT
ROOF SW DN100
SEWER MAIN ALIGNMENT
EDGE OF FOOTPATH
FUTURE DRIVEWAY BY BUILDER
SWD
SWD
SWD
STORMWATER ALIGNMENT
KERB OUTLETS
KERB AND CHANNEL

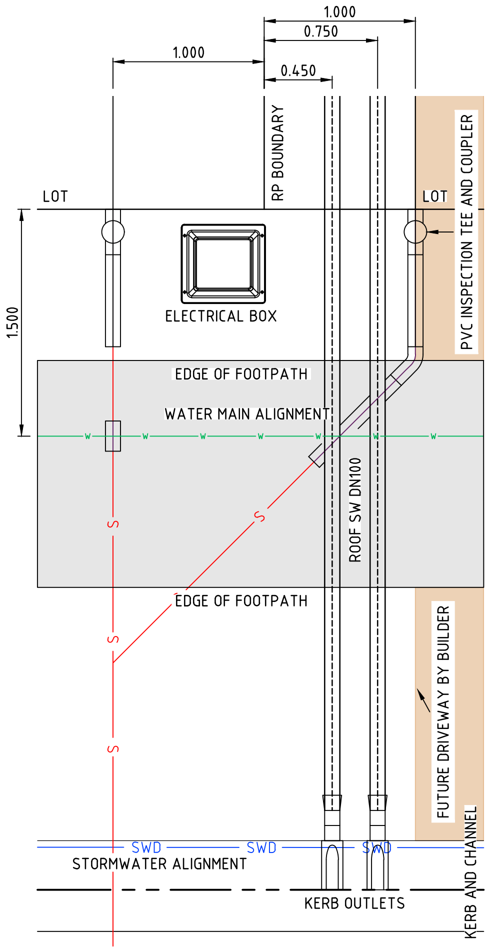
1 CM03 TYPICAL DETAIL
SCALE 1:25


1.000
0.750
0.450
RP BOUNDARY
LOT
LOT
PVC INSPECTION TEE AND COUPLER
ROAD RESERVE BOUNDARY
ELECTRICAL BOX
1.500
2.400
EDGE OF FOOTPATH
WATER MAIN ALIGNMENT
ROOF SW DN100
SEWER MAIN ALIGNMENT
EDGE OF FOOTPATH
FUTURE DRIVEWAY BY BUILDER
SWD
SWD
SWD
STORMWATER ALIGNMENT
KERB OUTLETS
KERB AND CHANNEL

2 CM03 TYPICAL DETAIL
SCALE 1:25


1.000
0.750
1.000
0.300
0.300
0.450
WATER METER
RP BOUNDARY
LOT
LOT
PVC INSPECTION TEE AND COUPLER
WATER METER
1.500
EDGE OF FOOTPATH
WATER MAIN ALIGNMENT
S
ROOF SW DN100
EDGE OF FOOTPATH
FUTURE DRIVEWAY BY BUILDER
SWD
SWD
SWD
STORMWATER ALIGNMENT
KERB OUTLETS
KERB AND CHANNEL

3 CM03 TYPICAL DETAIL
SCALE 1:25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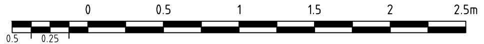
0.750
1.000
0.450
RP BOUNDARY
LOT
LOT
PVC INSPECTION TEE AND COUPLER
ELECTRICAL BOX
1.500
EDGE OF FOOTPATH
WATER MAIN ALIGNMENT
S
ROOF SW DN100
EDGE OF FOOTPATH
FUTURE DRIVEWAY BY BUILDER
SWD
SWD
SWD
STORMWATER ALIGNMENT
KERB OUTLETS
KERB AND CHANNEL

4 CM03 TYPICAL DETAIL
SCALE 1:25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A	ORIGINAL ISSUE	ES	PDW	PI	DH	12/12/25
No.	*Amendments*	*Drawn*	*Design*	*Design Chk*	*Appd*	*Date*

ENGINEERING CERTIFICATION

Darryl Hayter
Registered Engineer
Date " "

Registered Accreditation

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URBEX

EMPOWER

Client
URBEX PTY LTD

Project
SOUTHERN THORNLANDS PRECINCT 1 - ST 1 & 2 RAL

Title
COMBINED SERVICES PLAN
TYPICAL DETAILS - SHEET 1 OF 1

Datum
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RL 67.474
(RCC) COORD

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Project No. *Drawing No.*
B00702-DA-CM03

Rev
A

" "

Stormwater Management Plan is as per approved Site Based Stormwater Management Plan.

Appendix D. Stormwater Management Plan

AMENDED IN RED

By: **Tiana Hill**

Date: **5 August 2026**

Queensland Government

EMPOWER

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ENGENY

URBEX

Southern Thornlands

Site Based Stormwater Management Plan – Early Release Stages

BNE01174_0005-REP-001-1

11 DECEMBER 2025

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Rev	Date	Description	Author	Reviewer	Project Mgr.	Approver
0	10/12/2025	Client Issue	Ramya Srinivasan	Kelsey Mundt	Kelsey Mundt RPEQ 32142	Daniel Niven
0	10/12/2025	Client Issue	Ramya Srinivasan	Kelsey Mundt	Kelsey Mundt RPEQ 32142	Daniel Niven
Signatures:			Ramya			

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1. INTRODUCTION

Engeny Australia Pty Ltd (Engeny) have been engaged by Urbex Pty Ltd to provide the stormwater management strategy as supporting information to the development application for the Early Release stages (the Site) of the proposed Southern Thornlands Priority Development Area (PDA). This report outlines the ultimate stormwater infrastructure plan for the proposed development in accordance with the Redland City Council (RCC) City Plan.

The layout for the proposed development which consists of multiple delivery stages for multiple catchments is shown within Appendix A.

This document has been prepared with the following objectives:

- Provide a stormwater treatment train which aims to protect receiving waters by limiting the quantity of key pollutants discharged in stormwater from urban developments.
- Prevent potential instream erosion downstream of urban developments by controlling the magnitude and duration of sediment transporting flows.
- Provide protection to instream ecosystems from significant effects of increased runoff frequency by capturing the initial portion of runoff from impervious areas. This approach aims to ensure the frequency of hydraulic disturbance to instream ecosystems in developed catchments is similar to that of the undeveloped catchment.
- Demonstrate compliance with non-worsening of stormwater quantity for modelled events over any existing discharge points to the site.

Stormwater quality and quantity will be demonstrated in compliance with the following documents and planning schemes:

- Redland City Plan Version 10
- Australian Rainfall and Runoff 2019 v4.2
- Redland City Council Planning Scheme Policy 2 – Infrastructure Works
- Queensland State Planning Policy 2017
- Queensland Urban Drainage Manual (QUDM) 2017
- Water by Design MUSIC Modelling Guidelines - November 2018.
- Economic Development Guidelines 13 – Engineering Standards – September 2017.

2. SITE DESCRIPTION

2.1 Site Location

The proposed early release development site is located on the eastern side of Springacre Road, Thornlands on five allotments. The street address and RP descriptions of the allotments are listed in Table 2.1 below.

TABLE 2.1: PROPERTY DATA

Item	Street Address	RP Description
1	62 - 74 Springacre Road, Thornlands	Lot 12 on RP 53653
2	76 - 94 Springacre Road, Thornlands	Lot 13 on RP 53653
3	96 - 108 Springacre Road, Thornlands	Lot 14 on RP 53653
4	110 - 118 Springacre Road, Thornlands	Lot 2 on RP 128089
5	124 - 138 Springacre Road, Thornlands	Lot 16 on RP 53653

The Site is bounded by public road to the west (Springacre Road) and Eprapah Creek to south-east, with potential for future urban residential on lots to the north, west and south, as part of a future Priority Development Area (PDA).

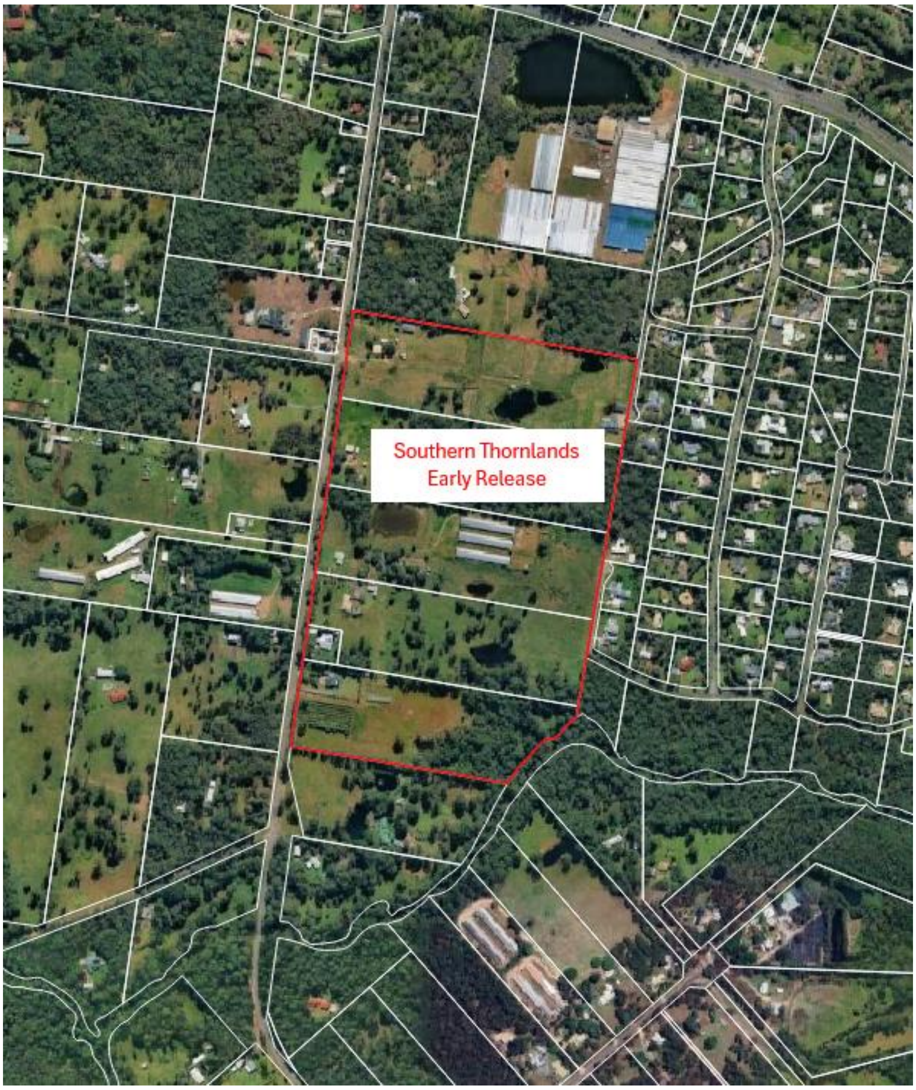


Figure 2.1: Aerial Photo of the Proposed Development Sites and Surrounds

2.2 Site Condition

2.2.1 Existing

The existing site has a combined area of approximately 40.4 ha and is currently occupied by a combination of pasture and cultivated fields, native and exotic vegetation, small and large farming sheds, farm dams and single dwelling houses. The Site also has several unsealed internal access tracks. There are several dams onsite however based on the provided survey information none the dams have low flows pipes or formed overflow weirs and as such are not considered to attenuate flows in the predevelopment scenario.

The existing properties and allotments on the western side of Springacre Road are not part of this early release development application. Figure 2.2 below details the existing structures and vegetation of the Site.

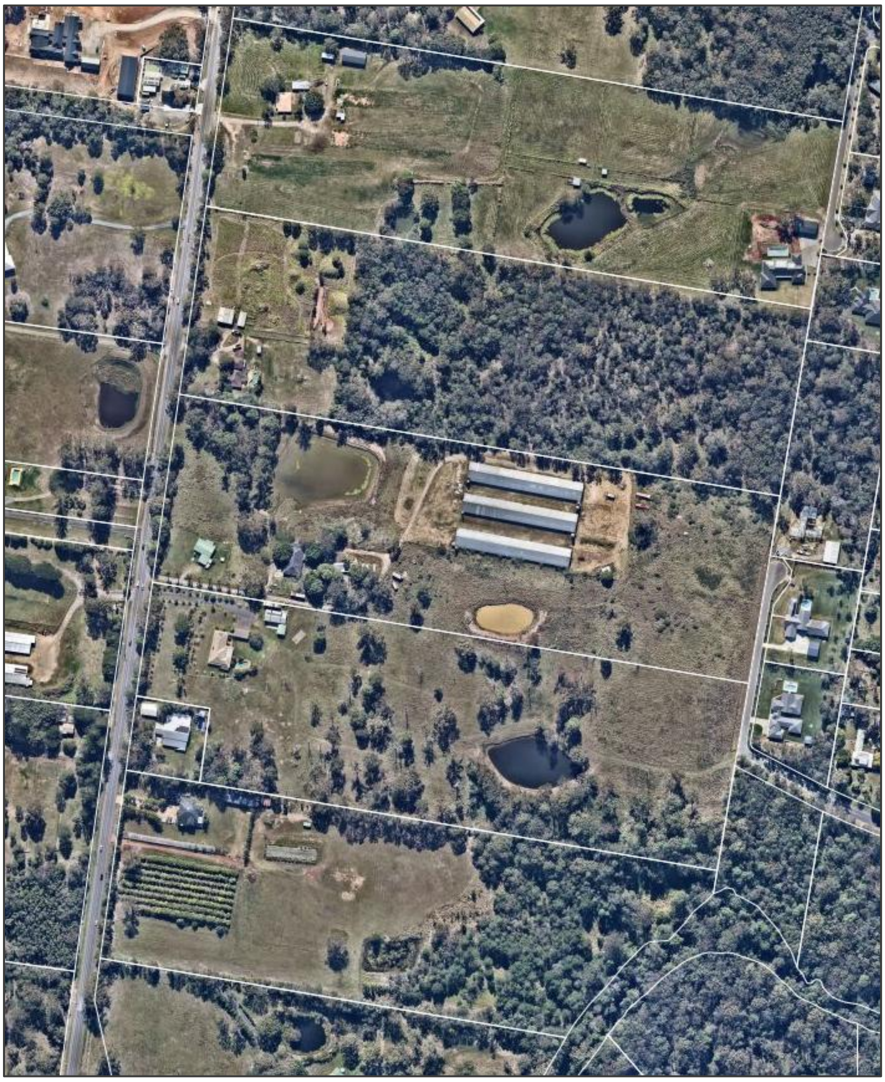


Figure 2.2: Proposed Development Sites Existing Condition

2.2.2 Proposed Development

The proposed development is to consist of internal road networks, residential lots of mixed sizes and density, parks, open space conservation zones, and stormwater management zones. All engineering services are to be provided to each allotment as part of the proposed development. This includes the following:

- Access via Springacre Road and the internal road network.
- Stormwater drainage.
- Sewer connection.
- Reticulated water connection.
- Electrical and communication services.

2.3 Local Government Infrastructure Plan

The Stormwater Local Government Infrastructure Plan (LGIP) for Redland City Council details the proposed major infrastructure items to service the region. An extract of the LGIP can be seen in Figure 2.3 below. As shown in Figure 2.3, there are no LGIP items within or adjacent to the proposed development site.

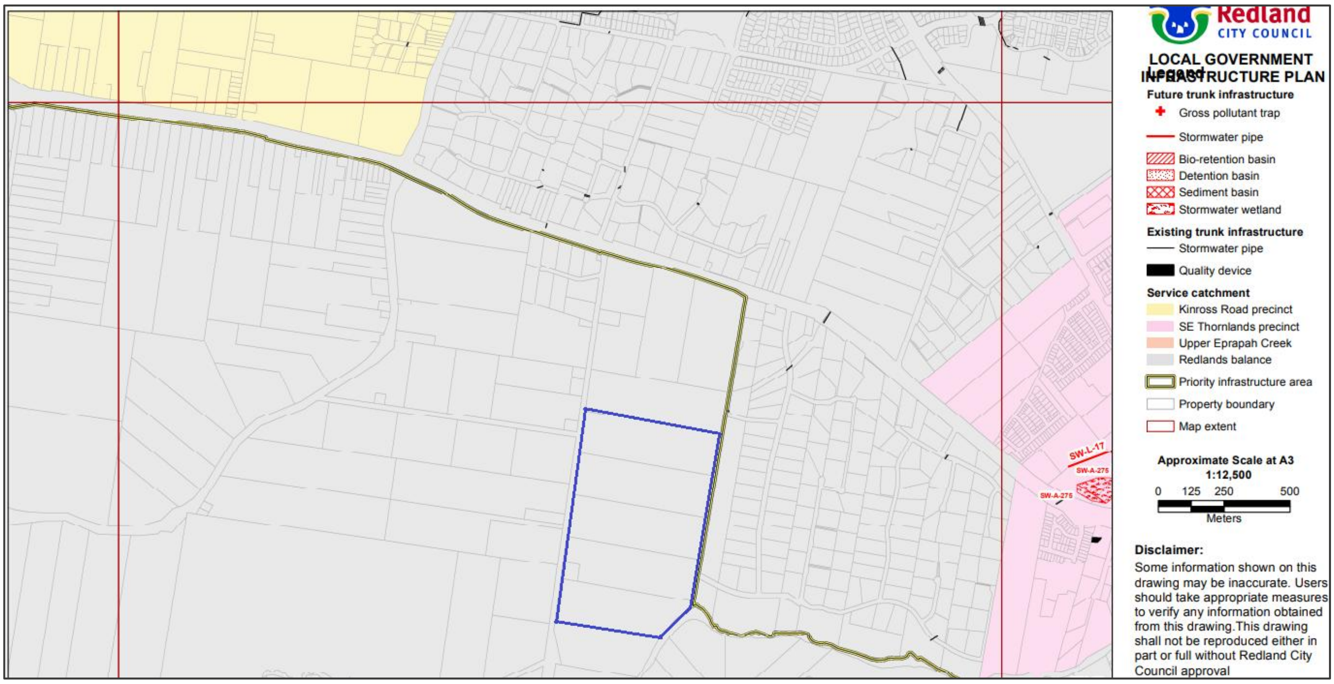

Redland
CITY COUNCIL
LOCAL GOVERNMENT INFRASTRUCTURE PLAN
Legend
Future trunk infrastructure
Gross pollutant trap
Stormwater pipe
Bio-retention basin
Detention basin
Sediment basin
Stormwater wetland
Existing trunk infrastructure
Stormwater pipe
Quality device
Service catchment
Kinross Road precinct
SE Thornlands precinct
Upper Eprapah Creek
Redlands balance
Priority infrastructure area
Property boundary
Map extent
SW-L-17
SW-A-275
SW-A-276
Approximate Scale at A3
1:12,500
0 125 250 500
Meters
Disclaimer:
Some information shown on this drawing may be inaccurate. Users should take appropriate measures to verify any information obtained from this drawing.This drawing shall not be reproduced either in part or full without Redland City Council approval

Figure 2.3: Extraction from the RCC LGIP for Stormwater

2.4 Topography and Site Drainage

The Site is divided by a central ridge which runs east-west and splits the Site into two distinct north/south catchments. The levels across the northern part of the site vary from RL 44.0 at the western boundary to RL 39.5 at the southern boundary and RL 25.0 at the north-eastern boundary.

The levels across the southern part of the site vary from RL 39.5 at the northern boundary to RL 15.0 at the south-eastern boundary.

The site falls with an approximate grade of 6.0% on average with surface water currently flowing to four discharge locations across the sites:

- The north-eastern boundary of the development discharging to an existing private property (40-60 Springacre Road) and channel near Georgina Court.
- The eastern boundary of the development discharging to the existing drainage infrastructure adjacent to Hannah Close and ultimately Eprapah Creek.
- The southern boundary of the development drains towards Eprapah Creek.
- The north-western boundary of the development discharging to an existing property (40-60 Springacre Road) and road reserve adjacent to Springacre Road.

It is noted that there is an external catchment which flows naturally to the proposed development site from the west via cross drainage under Springacre Road and overland flow.

For the purposes of stormwater modelling it shall be assumed that external flows entering the Site are doing so at undeveloped flow rates in the pre-development scenario. However, due to the nature of the potential for the upstream catchment to be developed as part of an overall PDA, the post development flow from this catchment shall be assumed to be developed in a similar nature to the internal catchments, to allow for conveyance through the Site and stormwater detention of the regional flows.

This information is shown in Figure 2.4 below.

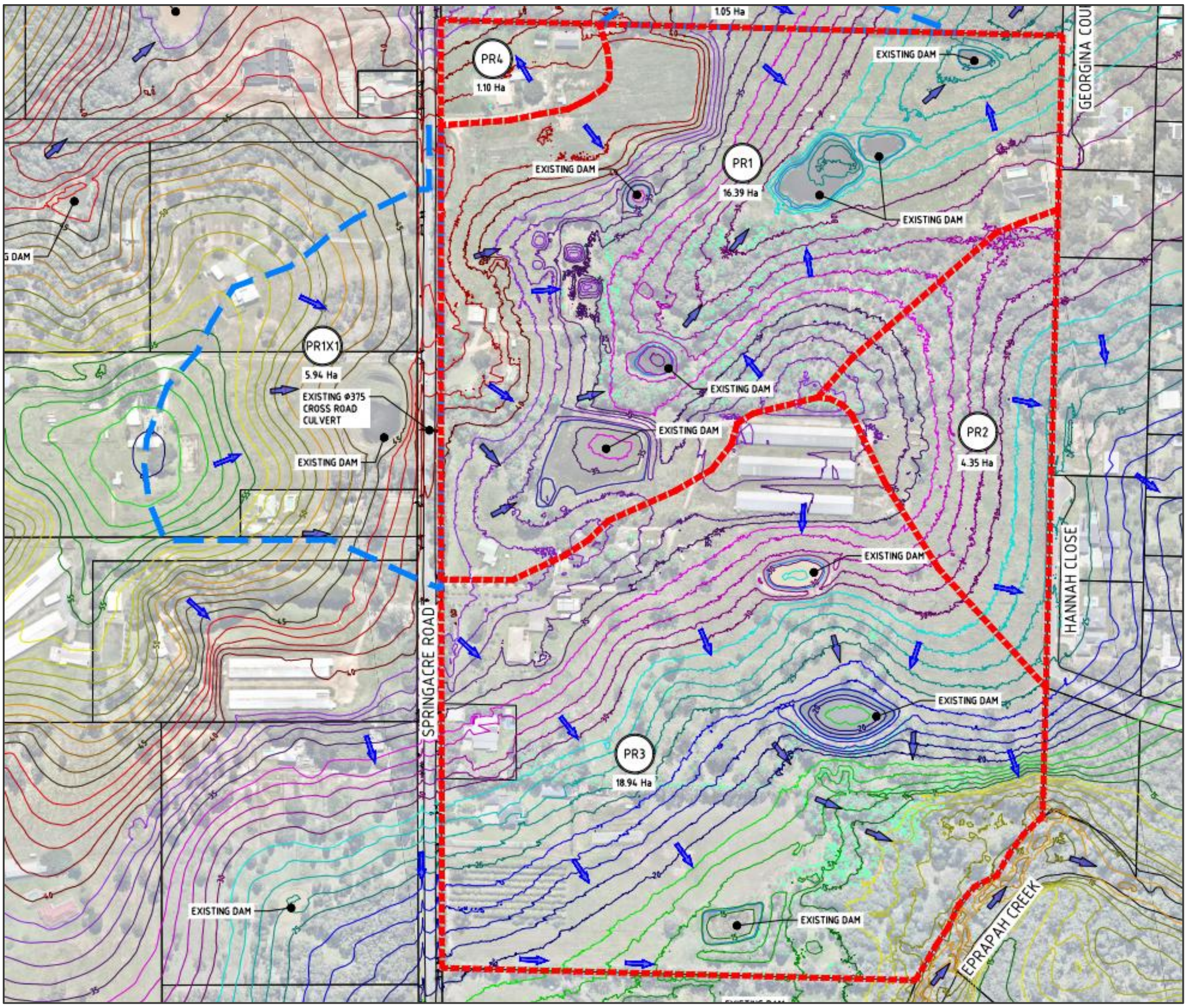

1.05 Ha
PR4
1.10 Ha
EXISTING DAM
GEORGINA COU
EXISTING DAM
PR1
16.39 Ha
EXISTING DAM
EXISTING DAM
G DAM
PR1X1
5.94 Ha
EXISTING Φ375
CROSS ROAD
CULVERT
EXISTING DAM
EXISTING DAM
EXISTING DAM
PR2
4.35 Ha
EXISTING DAM
HANNAH CLOSE
SPRINGACRE ROAD
EXISTING DAM
PR3
18.94 Ha
EXISTING DAM
EXISTING DAM
EPRAPAH CREEK

Figure 2.4: Catchment Diagram and Discharge Points

2.5 Base Data

Detailed survey of the proposed development site has been used for the purpose of determining catchments and stormwater modelling associated with this conceptual report.

2.6 Lawful Points of Discharge

The Site is separated by a ridge line which is shown in Figure 2.4 above. The proposed development site has four distinct discharge points:

- North-Eastern discharge point to defined waterway on adjacent private property and future development area (40-60 Springacre Road).
- Eastern discharge point to the existing drainage infrastructure adjacent to Hannah Close and ultimately Eprapah Creek.
- Southern discharge point via Eprapah Creek.
- North-Western discharge point to Springacre Road reserve and future development area (40-60 Springacre Road).

It is not proposed to create any additional points of discharge as part of the proposed development.

It is noted that at discharge point 4 nominated above, the north-western Discharge point to Springacre Road reserve and future development area, shall not be utilised in the post development scenario.

2.7 Earthworks and Soils

To assist in the stormwater management within the catchments of the proposed development sites, bulk earthworks will be required. Earthworks for the proposed development will ensure, where possible, all lots fall towards the street to alleviate the need for rear of lot roof water drainage systems and the associated easements.

A detailed geotechnical investigation is yet to be undertaken for the proposed development site. Given the reduced levels of the site, acid sulphate soils have not been considered. Should acid sulphate soils be identified during the construction phase of this development an acid sulphate soils management plan is to be developed and this stormwater management plan is to be revised.

2.8 Waterways

Stormwater which is discharged through the north-eastern discharge point is conveyed to the defined waterway on the adjacent private property / future development area and ultimately north-east under Boundary Road and ultimately Moreton Bay.

Stormwater discharged from the eastern and southern discharge points is discharged directly to Epapah Creek and ultimately Moreton Bay.

As part of the proposed development, stormwater quantity and quality are to be managed to ensure the likelihood of any potential adverse impacts to the downstream waterways are avoided.

2.9 Vegetation

The Site consists of a mixture of grassed areas with scattered trees and vegetation, with some isolated pockets of dense trees. There are also several dams located onsite. As part of the proposed development the Site is to be predominantly cleared. Vegetation is to be retained wherever possible in the future greenspace and conservation areas of the site.

2.10 Asset Handover

The proposed bioretention/detention systems are not to be planted out until such time as 80% of the upstream catchment is developed. It is proposed that bioretention/detention systems are to be taken on as an asset, monitored and maintained by the Council after acceptance off maintenance. Following excavation and revegetation works, the detention basins are to be maintained by Council.

2.11 Flooding

In accordance with Redland City Council's REDeMAP interface, the proposed development site is subject to flooding from Eprapah Creek as part of the City Plan's "Flood and Storm Tide Hazard Overlay" however the extents of the creek flooding are not within the area of the Site being developed. Furthermore, internal overland flow is identified within the northern section of the Site and the conveyance of this overland flow within the pit, pipe and channel network will be included in the overall detailed design of the development. A preliminary assessment of the ultimate development flows and the subsequent containment within the central channel to the detention basin can be found in section 3 of this report.

An extract of the REDeMAP "Flood and Storm Tide Hazard Overlay" is provided in the figure below.

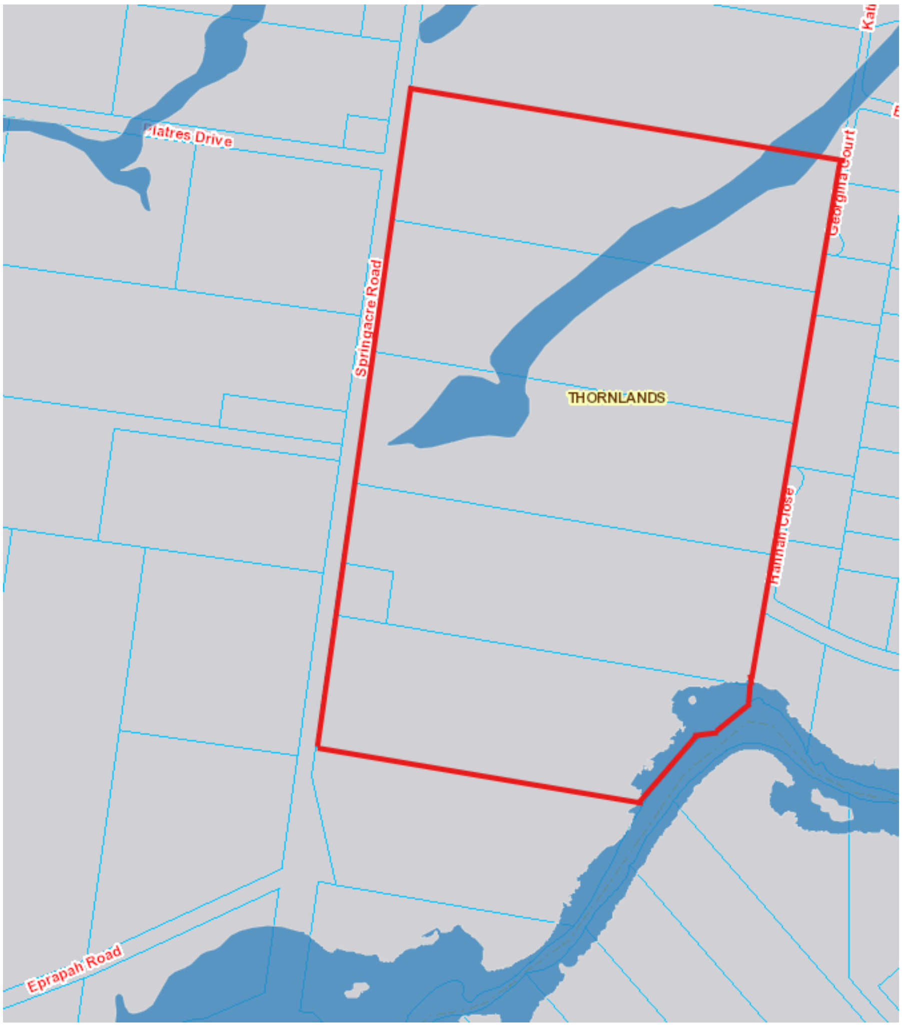

Flatres Drive
Springacre Road
THORNLANDS
Georgina Court
Hallinan Close
Eprapah Road

Figure 2.5: REDeMAP - Flood and Storm Tide Hazard Overlay

3. STORMWATER QUANTITY MANAGEMENT

3.1 General Stormwater Strategy

The earthworks design for the proposed development site shall look to retain the natural topography on-site and direct flow towards the existing discharge points. Where pre-development discharge is exceeded in the post development condition, it is proposed to install appropriately sized detention basins to ensure that the post development peak flows are mitigated to pre-development flow rates for the modelled events. This strategy shall ensure compliance with non-worsening of pre-development flows.

3.2 Proposed Catchment Hydrology

The proposed development increases the impervious area when compared with the pre-development scenario. Road pit and pipe drainage will collect the minor flows (1:2 AEP) generated by the development, while the road reserve will collect major flows (1:100 AEP) and convey stormwater towards the proposed discharge points. A conservative impervious fraction has been assigned to all areas of the development to best model the density of the proposed development in accordance with Redland City Council's Planning Scheme policy for Infrastructure. The impervious fraction selected for all developed catchments has been taken as 85%. The proposed post development catchment plan as well as the summary of predevelopment and post development catchments can be seen in Table 3.1 and Table 3.2, and Figure 3.1 and Figure 3.2 below.

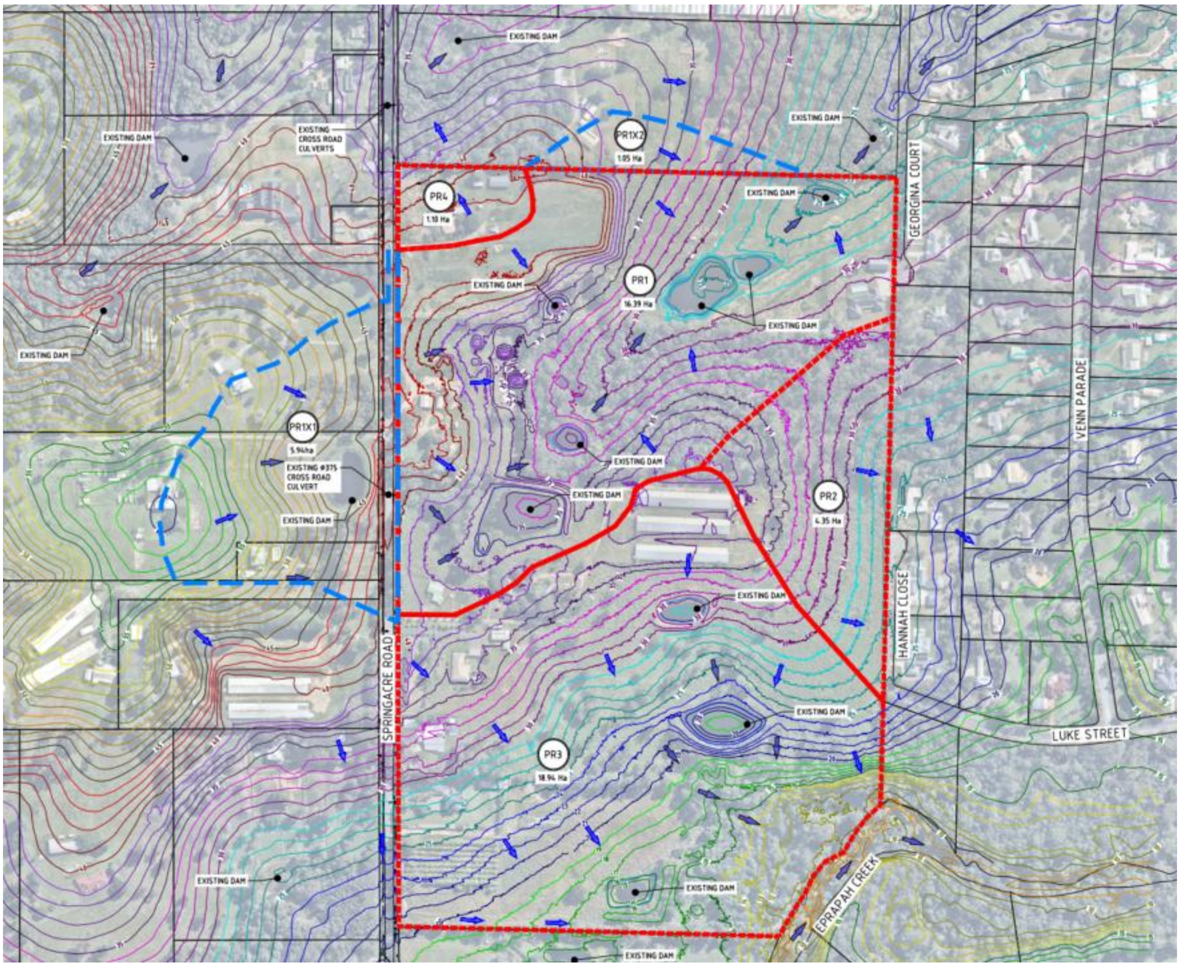
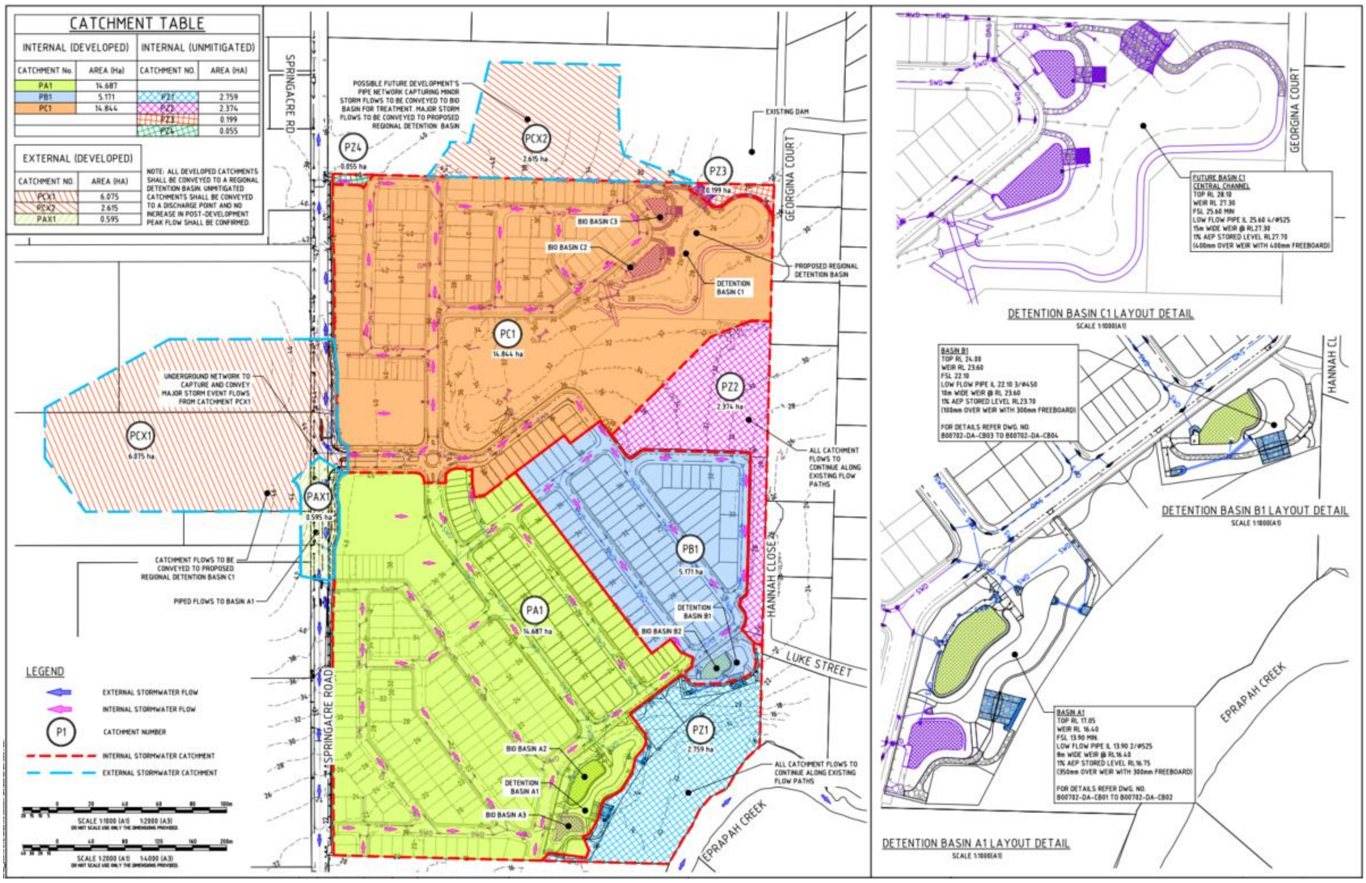

EXISTING DAM
EXISTING CROSS ROAD CULVERTS
PR1X2
1.05 Ha
PR4
1.10 Ha
PR1
16.39 Ha
PR1X1
5.94ha
EXISTING Ø375 CROSS ROAD CULVERT
PR2
4.35 Ha
PR3
18.94 Ha
GEORGINA COURT
VENN PARADE
HANNAH CLOSE
LUKE STREET
SPRINGACRE ROAD
EPRAPAH CREEK

Figure 3.1: Pre-Development Catchment Plan



CATCHMENT TABLE

INTERNAL (DEVELOPED)		INTERNAL (UNMITIGATED)	
CATCHMENT No.	AREA (Ha)	CATCHMENT NO.	AREA (HA)
🟩 PA1	14.687		
🟦 PB1	5.171	PZ1	2.759
🟧 PC1	14.844	PZ2	2.374
		PZ3	0.199
		PZ4	0.055

EXTERNAL (DEVELOPED)	
CATCHMENT NO.	AREA (HA)
PCX1	6.075
PCX2	2.615
PAX1	0.595

NOTE: ALL DEVELOPED CATCHMENTS SHALL BE CONVEYED TO A REGIONAL DETENTION BASIN. UNMITIGATED CATCHMENTS SHALL BE CONVEYED TO A DISCHARGE POINT AND NO INCREASE IN POST-DEVELOPMENT PEAK FLOW SHALL BE CONFIRMED.

POSSIBLE FUTURE DEVELOPMENT'S PIPE NETWORK CAPTURING MINOR STORM FLOWS TO BE CONVEYED TO BIO BASIN FOR TREATMENT. MAJOR STORM FLOWS TO BE CONVEYED TO PROPOSED REGIONAL DETENTION BASIN

UNDERGROUND NETWORK TO CAPTURE AND CONVEY MAJOR STORM EVENT FLOWS FROM CATCHMENT PCX1

CATCHMENT FLOWS TO BE CONVEYED TO PROPOSED REGIONAL DETENTION BASIN C1

PIPED FLOWS TO BASIN A1

ALL CATCHMENT FLOWS TO CONTINUE ALONG EXISTING FLOW PATHS

ALL CATCHMENT FLOWS TO CONTINUE ALONG EXISTING FLOW PATHS

LEGEND

- ⬅ EXTERNAL STORMWATER FLOW
- ⬅ INTERNAL STORMWATER FLOW
- (P1) CATCHMENT NUMBER
- 🟥 INTERNAL STORMWATER CATCHMENT
- 🟦 EXTERNAL STORMWATER CATCHMENT

SCALE 1:1000 (A1) 1:2000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

SCALE 1:2000 (A1) 1:4000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

FUTURE BASIN C1
CENTRAL CHANNEL
TOP RL 28.10
WEIR RL 27.30
FSL 25.60 MIN
LOW FLOW PIPE IL 25.60 4/#525
15m WIDE WEIR @ RL27.30
1% AEP STORED LEVEL RL27.70
(400mm OVER WEIR WITH 400mm FREEBOARD)

DETENTION BASIN C1 LAYOUT DETAIL
SCALE 1:1000(A1)

BASIN B1
TOP RL 24.00
WEIR RL 23.60
FSL 22.10
LOW FLOW PIPE IL 22.10 3/#450
10m WIDE WEIR @ RL 23.60
1% AEP STORED LEVEL RL23.70
(100mm OVER WEIR WITH 300mm FREEBOARD)

FOR DETAILS REFER DWG. NO.
B00702-DA-CB03 TO B00702-DA-CB04

DETENTION BASIN B1 LAYOUT DETAIL
SCALE 1:1000(A1)

BASIN A1
TOP RL 17.05
WEIR RL 16.40
FSL 13.90 MIN.
LOW FLOW PIPE IL 13.90 2/#525
8m WIDE WEIR @ RL16.40
1% AEP STORED LEVEL RL16.75
(350mm OVER WEIR WITH 300mm FREEBOARD)

FOR DETAILS REFER DWG. NO.
B00702-DA-CB01 TO B00702-DA-CB02

DETENTION BASIN A1 LAYOUT DETAIL
SCALE 1:1000(A1)

SPRINGACRE RD
SPRINGACRE ROAD
GEORGINA COURT
HANNAH CLOSE
HANNAH CL
LUKE STREET
EPRAPAH CREEK
EXISTING DAM
PROPOSED REGIONAL DETENTION BASIN
PCX2
2.615 ha
PZ4
0.055 ha
PZ3
0.199 ha
PC1
14.844 ha
PCX1
6.075 ha
PZ2
2.374 ha
PAX1
0.595 ha
PB1
5.171 ha
PA1
14.687 ha
PZ1
2.759 ha
BIO BASIN C3
BIO BASIN C2
DETENTION BASIN C1
DETENTION BASIN B1
BIO BASIN B2
BIO BASIN A2
DETENTION BASIN A1
BIO BASIN A3
SWD

Figure 3.2: Post Development Catchment Plan

TABLE 3.1: PRE-DEVELOPMENT CATCHMENT DATA SUMMARY

	Catchment	Area (ha)	Average Slope (%)	Impervious (%)	Impervious Area (ha)	Pervious Area (ha)
Internal	Pre PR1	16.39	6.00	5%	0.82	15.57
	Pre PR2	4.35	6.00	5%	0.22	4.13
	Pre PR3	18.94	6.50	10%	1.89	17.05
	Pre PR4	1.10	6.50	10%	0.11	0.99
External	Pre PR1X1	5.94	8.50	5%	0.30	5.64
	Pre PR1X2	1.05	5.50	5%	0.05	1.00

TABLE 3.2: POST-DEVELOPMENT CATCHMENT DATA SUMMARY

Catchment		Area (ha)	Average Slope (%)	Impervious (%)	Impervious Area (ha)	Pervious Area (ha)
Internal	PST PA1	14.58	5.00	85%	12.39	2.19
	PST PB1	5.17	3.00	85%	4.40	0.78
	PST PZ1	2.87	4.00	5%	0.14	2.73
	PST PZ2	2.37	6.00	5%	0.12	2.26
	PST PC1	14.84	3.00	85%	12.62	2.23
	PST PZ3	0.20	3.00	5%	0.01	0.19
External	PST PCX1	6.08	4.00	85%	5.16	0.91
	PST PCX2	2.62	4.00	85%	2.22	0.39
	PST PAX1	0.60	3.00	85%	0.51	0.09

3.3 Detailed Assessment

3.3.1 Hydrological Model Parameters

The hydrologic software package XPRAFTS was utilised to determine the peak discharge for a range of storm durations between 5 minutes and 3 hours. The analysis utilises the principles outlined in the Australian Rainfall and Runoff Guidelines 2019 v4.2 to determine the undeveloped and developed peak flows. Peak flows for each design storm event in the pre-development case and post-development case were determined in the model.

Storm rainfall losses adopted for the pre-developed (existing) and post-developed (proposed) catchments are listed in Table 3.3 and Table 3.4 below. Consistent with the recommendations in the Australian Rainfall and Runoff Guidelines, initial and continuing loss rates have been included within the model.

TABLE 3.3: RAINFALL LOSS DATA

Design Scenarios	Pervious Areas Initial Loss (mm)	Pervious Areas Continuing Loss (mm/hr)	Impervious Areas Initial Loss (mm)	Impervious Areas Continuing Loss (mm/hr)
1:2 – 1:100 AEP	26.5	1.8	1.0	0.0

TABLE 3.4: CATCHMENT MANNING'S "N" VALUE

Design Scenarios	Impervious Mannings n	Pervious Mannings n
Pre Development	0.025	0.050
Post Development	0.030	0.060

3.3.2 External Catchment Considerations

As shown in Figure 3.2 above, external catchments to the west and north of the Site have been included within the stormwater model. Each of the external catchments have been described below:

- Catchment PCX1
  - The Location of the likely ultimate Crest of Springacre Road will result in all flows from Catchment PCX1 being directed into the proposed development site. On this basis, this catchment has been assumed to be fully developed in the post-development scenario with an impervious fraction of 85%. It is assumed that all flows up to the 1:100 AEP design event are captured and conveyed under Springacre Road to the proposed development site.
- Catchment PCX2
  - Based on the existing ridgeline, it is reasonable to expect that the ultimate development of the property to the north shall result in Catchment PCX2 discharging to the proposed development site. On this basis, this catchment has been assumed to be fully developed in the post-development scenario with an impervious fraction of 85%. It is assumed that all flows up to the 1:100 AEP design event are captured and conveyed to the proposed development site.
- Catchment PAX1
  - Based on the likely vertical geometry of Springacre Road, it is reasonable to expect that flows from external catchment PAX1 shall ultimately be directed to the proposed development site. On this basis, this catchment has been assumed to be fully developed in the post-development scenario with an impervious fraction of 85%. It is assumed that all flows up to the 1:100 AEP design event are captured and conveyed under Springacre Road to the proposed development site.

3.3.3 Model Discharge Points

The XP-Rafts Model considers the peak discharge at the three main discharge points for the site, as shown in Figure 3.3 below. The four discharge points modelled in the pre-development scenario can be described as:

- Discharge Point 1 - north-eastern corner of site, discharge to existing waterway
- Discharge Point 2 - eastern boundary of site, discharge to Road Reserve
- Discharge Point 3 – south-eastern corner of site, discharge to Eprapah Creek
- Discharge Point 4 - north-western corner of site, discharge to Springacre Road.

It is noted that Discharge Point 4 conveys flow from a small catchment in the pre-development scenario (1.1 Ha) which shall be re-directed to Discharge Point 1 as part of the development works. Discharge Point 4 shall not be retained in the post development scenario.

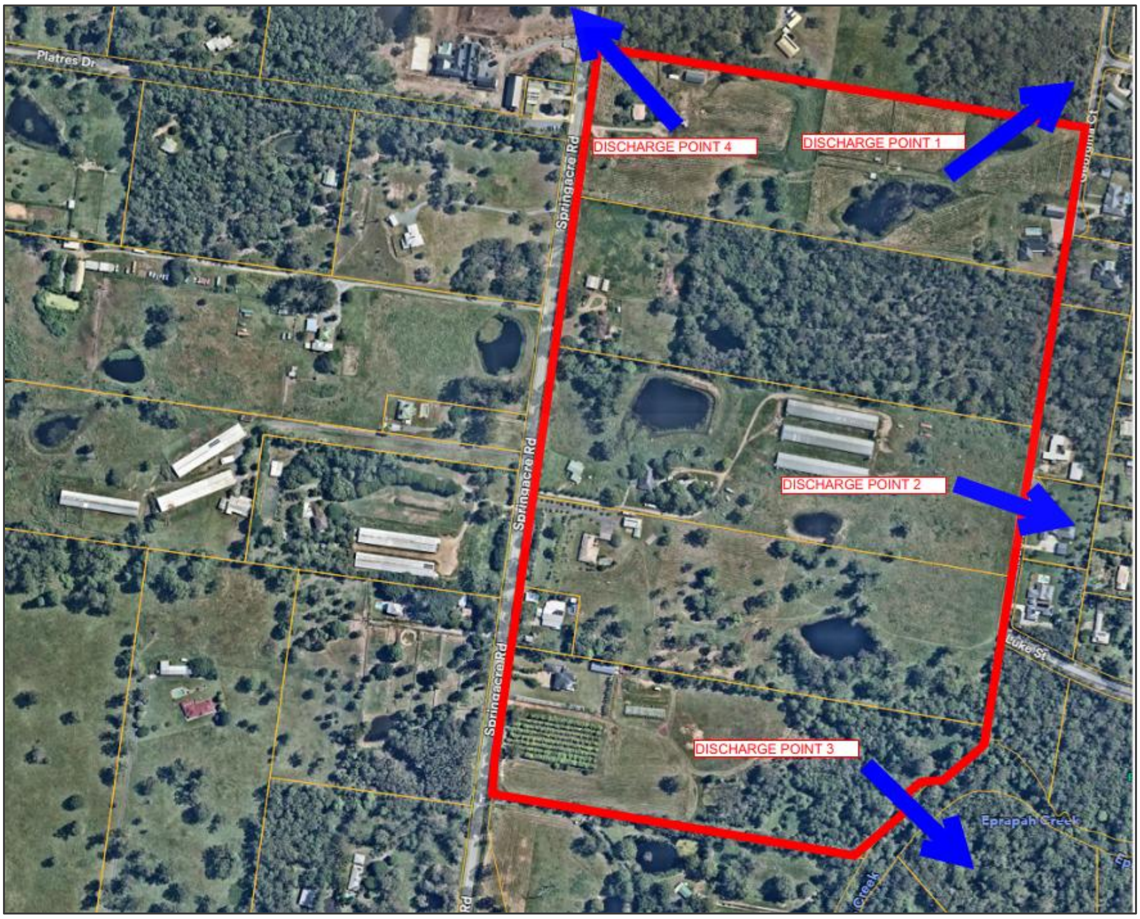


Figure 3.3: Discharge Point Summary

3.4 Hydrologic Model Validation

Validation of peak flows from the XPRAFTS hydrologic model was undertaken using the Rational Method in accordance with the Queensland Urban Drainage Manual (QUDM 2016). The Rational Method provides peak flow estimations based on the catchment area, a catchment dependent coefficient of discharge, the time of concentration (estimated time for flow from the highest point of the catchments to reach the outlet) and its corresponding rainfall intensity. Validation was undertaken for two pre-development catchments and one post-development catchment, with relevant inputs shown in Table 3.5.

TABLE 3.5: RATIONAL METHOD INPUTS

Catchment ID	Area (ha)	C_{10}	Time of Concentration (mins)
PR1 (Pre-Development)	23.4	0.45	21
PR3 (Pre-Development)	18.9	0.40	18
PA1 (Post-Development)	14.6	0.86	17

Table 3.6 provides the results of the validation assessment. Peak flows from the XPRAFTS model are within 37% of the Rational Method peak flow estimates for all modelled design events, with most being within 20% or less. The XPRAFTS model is therefore considered suitable to assess the flows and mitigation sizing for this proposed development.

TABLE 3.6: PEAK FLOW COMPARISON

Catchment ID	Design Event (1:x AEP)	XPRAFTS Peak Flow (m³/s)	Rational Method Peak Flow Estimate (m³/s)	Difference (%)
PR1 (Pre-Development)	1:2	2.69	2.99	-10%
	1:5	4.32	4.26	1%
	1:10	5.35	5.05	6%
	1:20	6.76	6.17	9%
	1:50	8.18	7.56	8%
	1:100	9.36	8.53	10%
PR3 (Pre-Development)	1:2	2.22	2.38	-7%
	1:5	3.49	3.40	3%
	1:10	4.36	4.01	9%
	1:20	5.54	4.91	13%
	1:50	6.54	5.98	9%
	1:100	7.50	6.74	11%
PA1 (Post-Development)	1:2	5.67	4.13	37%
	1:5	7.15	5.91	21%
	1:10	8.21	6.97	18%
	1:20	9.38	8.53	10%
	1:50	10.86	10.38	5%
	1:100	12.02	11.67	3%

3.5 Detention Basin Design Parameters

A series of detention basins were implemented to mitigate peak flows across the full range of events modelled. The location of these basins are shown in Figure 3.2 and Appendix A. Through an iterative design process, the detention basins were given the discharge parameters outlined within Table 3.5 below. Concept design of the basins is provided in Appendix B. 300 mm freeboard from the 1:100 AEP stored water level to the crest has been achieved.

TABLE 3.7: DETENTION BASIN SUMMARY

Detention Basin Name	A1	B1	C1
Catchment ID	PA1	PB1	PAX1, PCX1, PC1, PCX2
Basin Characteristics			
Basin Base Level	RL 13.9	RL 22.1	RL 25.6
Top of Crest Level	RL 17.05	RL 24.0	RL 28.1
Basin Maximum Depth to Crest	2.85	1.60	2.10
Water Volume Stored in 1% AEP Flood Event	9,200 m³	2,200 m³	9,800 m³
Water Level in 1% AEP Flood Event	16.75	23.7	27.7

Detention Basin Name	A1	B1	C1
Low Flow Discharge			
Pipe Size and Type	DN 525 RCP	DN 450 RCP	DN 525 RCP
No. Barrels	2	3	4
High Flow Discharge			
Weir Crest Level	RL 16.4	RL 23.6	RL 27.3
Weir Width	8.0 m	10.0 m	15.0 m

3.6 Peak Flow Reporting

A summary of the peak flows at each discharge point, for the pre-development, post-development, and post-development mitigated scenarios are provided in Table 3.8 to Table 3.11. As shown in the below tables, the development is expected to increase peak flows discharging from site, but with incorporation of the proposed detention basins, peak flows are mitigated. Preliminary sizing of the detention basins and integration in the overall proposed site layout indicate that there are sufficient space and volume available within the development to facilitate appropriate attention of the stormwater flows.

TABLE 3.8: PEAK FLOW REPORTING – DISCHARGE POINT 1 (NORTH-EAST)

Design Event (1:x AEP)	Pre-development Scenario Peak Flow (m^3/s)	Post-development Scenario Peak Flow (m^3/s)	Post-development Mitigated Scenario Peak Flow (m^3/s)	% Reduction (Mitigated – Pre-Development)
1:2	2.72	7.20	2.61	-4.1%
1:5	4.37	9.09	3.07	-29.8%
1:10	5.44	10.53	4.61	-15.3%
1:20	6.93	12.06	6.52	-5.9%
1:50	8.86	14.44	8.27	-6.7%
1:100	10.19	16.02	9.65	-5.3%

TABLE 3.9: PEAK FLOW REPORTING – DISCHARGE POINT 2 (EAST)

Design Event (1:x AEP)	Pre-development Scenario Peak Flow (m^3/s)	Post-development Scenario Peak Flow (m^3/s)	Post-development Mitigated Scenario Peak Flow (m^3/s)	% Reduction (Mitigated – Pre-Development)
1:2	0.62	0.34	0.34	-45.5%
1:5	0.99	0.54	0.54	-45.7%
1:10	1.23	0.67	0.67	-45.7%
1:20	1.47	0.80	0.80	-45.5%
1:50	1.74	0.95	0.95	-45.6%
1:100	2.04	1.11	1.11	-45.7%

TABLE 3.10: PEAK FLOW REPORTING – DISCHARGE POINT 3 (SOUTH-EAST)

Design Event (1:x AEP)	Pre-development Scenario Peak Flow (m^3/s)	Post-development Scenario Peak Flow (m^3/s)	Post-development Mitigated Scenario Peak Flow (m^3/s)	% Reduction (Mitigated – Pre-Development)
1:2	2.83	7.72	2.76	-2.3%
1:5	3.49	9.69	3.21	-8.0%
1:10	4.45	11.41	3.62	-18.7%
1:20	5.61	13.00	4.52	-19.4%
1:50	6.70	15.50	6.16	-8.1%
1:100	7.52	17.12	7.31	-2.8%

TABLE 3.11: PEAK FLOW REPORTING – DISCHARGE POINT 4 (NORTH-WEST)

Design Event (1:x AEP)	Pre-development Scenario Peak Flow (m^3/s)	Post-development Scenario Peak Flow (m^3/s)	Post-development Mitigated Scenario Peak Flow (m^3/s)	% Reduction (Mitigated – Pre-Development)
1:2	0.21	0.01	N/A	-95.1%
1:5	0.29	0.02	N/A	-94.9%
1:10	0.35	0.02	N/A	-94.0%
1:20	0.48	0.03	N/A	-94.6%
1:50	0.53	0.03	N/A	-94.5%
1:100	0.60	0.03	N/A	-94.4%

3.7 Eprapah Creek Impacts

Due to the substantial difference in size of the Eprapah Creek catchment compared to the Site local catchment, the critical duration for Eprapah Creek is expected to be significantly longer than the Site local catchment critical duration. The relative catchment sizes and expected time of concentrations are summarised below:

- Local Catchment – 24 ha. Critical duration of 1 hour.
- Eprapah Creek Catchment (sub-catchment reporting to Site boundary) - 1,470 ha. Critical duration of 3 hours (informed by *Upper Eprapah Creek Catchment Study* (Engeny, 2012)).

Due to the above differences in time of concentration, this would result in the peak flows from the Site local catchment discharging prior to the peak flows from Eprapah Creek, meaning that no observed increases to Eprapah Creek peak flows or levels are expected. Therefore, a hydrologic assessment showing local catchment peak flow mitigation from the Site is sufficient to demonstrate no external impacts and a hydraulic assessment is not needed.

3.8 Flooding and Overland Flow

An analysis of the current Redland City Council City Plan - Flood and Stormtide Hazard Overlay indicates that all the proposed Early Release works are outside of the Flood Overlay extent. Furthermore, the creek flooding on the south-east site boundary is set back significantly from the proposed lots and stormwater detention infrastructure. The overlay indicates a flood level of approximately 11.5m RL while the development site is generally above 17.5m RL, with only minor stormwater infrastructure below this level at approximately 14.5m RL. As such, a flood assessment has not been undertaken during this phase of the development.

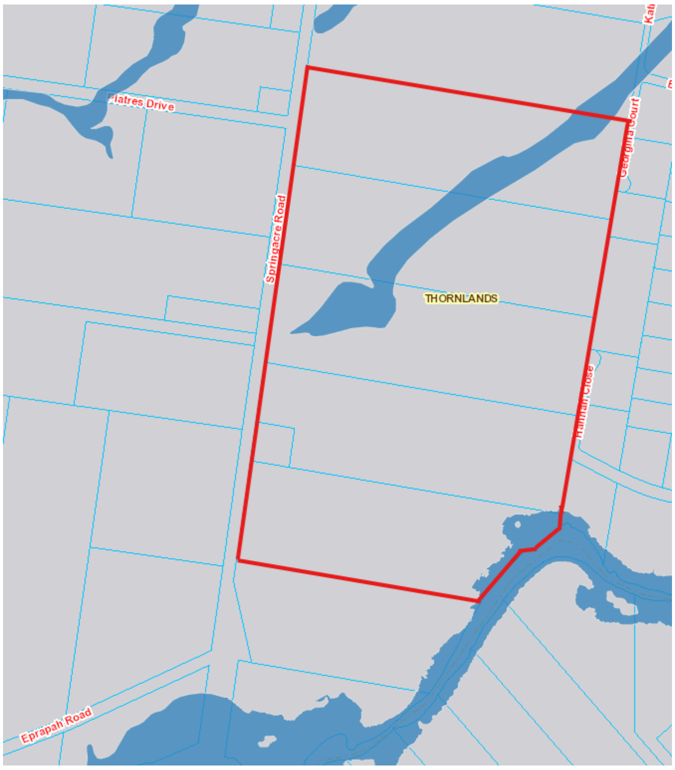


Figure 3.4: Redland City Council City Plan - Flood and Stormtide Hazard Overlay

It is anticipated that a flood model and associated reporting will be undertaken as part of the overall Southern Thornlands Priority Development Area (PDA) in the future. This report will deal with not only the extents of flooding and overland flow within the PDA, but also the afflux on adjacent properties with the potential to reduce the number and extent of detention basins throughout the overall catchment.

Overland flow within the proposed development is to be contained wholly within the road reserve and the drainage reserves. As part of the current application, a preliminary 2D analysis of the development flows during a 1:100 AEP event has been undertaken by others, including preliminary sizing of major culverts, as well as determining the flood extents of the main centre channel.

Additionally, as part of the operational works submission, a detailed hydraulic/hydrologic model shall be prepared to confirm the overland flow characteristics within the central drainage channel of the proposed development site, including confirmation of the major culverts and subsequent immunity levels.

Based on the information within the above sections, the storage area provided internally within the road reserve and within the drainage channel / detention basins shall be sufficient to convey both internal flows and flows generated within the developed external catchment.

4. STORMWATER QUALITY MANAGEMENT

4.1 Stormwater Quality Management Strategy

4.1.1 Environmental Values

The proposed development site flows to a number of discharge points, as identified in above sections of this report. All flow discharged from the Site is eventually conveyed to nearby waterways and subsequently discharged to Moreton Bay. The development of the Site will involve land disturbance for the purpose of creating residential and commercial lots and the associated access roads. During the construction phase, the most significant water quality objective will be that of suspended solids. To ameliorate any environmental harm that may occur, it is proposed that a series of bunded areas and sediment control devices within the sites be used to control stormwater quality during the construction period.

Dedicated temporary sediment basins will also be installed on the bottom of each catchment and will have sufficient capacity to contain the treatment within the sites. These temporary sediment basins, for construction phase erosion and sediment control, will be designed in accordance with Appendix B of Best Practise Erosion and Sediment Control (IECA Australasia, Nov 2008). Where practical, it is planned that the sediment basins will be decommissioned and replaced with bio-retention/detention basins when construction of a majority (>80%) of residential dwellings and commercial buildings has been completed. If sedimentation basins are not to be converted to bioretention they are to be de-watered, de-silted and decommissioned in accordance with the IECA Guidelines.

During the operational phase, pollutants from a development of this type are not expected to be a significant concern. As per the RCC City Plan and to be consistent with best practices with respect to water quality, the MUSIC modelling package has been used for the water quality objective analysis.

4.1.2 Water Quality Objectives

The treatment train performance will also be assessed against the State Planning Policy 2017 (SPP) Stormwater Management Design Objectives, as the SPP benchmarks have been triggered by the proposed development. As such the development will adopt formal stormwater quality treatment in accordance with the Water by Design guidelines.

The applicable Water Quality treatment objectives are:

TABLE 4.1: WATER QUALITY OBJECTIVES

Indicator	% Reduction
TSS (Total Suspended Solids)	80%
TP (Total Phosphorus)	60%
TN (Total Nitrogen)	45%
GP (Gross Pollutants)	90%

4.1.3 Strategy

The Model for Urban Stormwater Improvement Conceptualisation (MUSIC), version 6.3.0, developed by eWater, has been used to quantify the water quality output for the developed catchment. The model's algorithms are based on the known performance characteristics of common stormwater quality improvement measures and modelled based on the Water by Design – MUSIC Modelling Guidelines Version 3.0 – 2018.

For the post-developed condition, water sensitive urban design has been employed using Stormwater Quality Improvement Devices. The stormwater management strategy is summarised as follows:

- Internal Catchment
  - Stormwater which falls within the internal catchment shall fall towards the pit and pipe network
  - Stormwater shall be conveyed via a pit and pipe network to a number of appropriately sized bioretention cells located within the central drainage channel in the case of the northern catchment, and in the combined quality / quantity stormwater pods located around the development discharge points for the southern catchment.
  - Once appropriately treated, stormwater shall be discharged from the stormwater quality treatment basins and subsequently from site.
- External Catchment
  - It is assumed that any treatment of the major western external catchments shall be undertaken by the adjacent landowner prior to discharge to the proposed development site.
  - Given the catchment characteristics and limited potential for treatment of the future northern external catchment, it has been assumed that the current proposed development will treat the post development stormwater runoff of the minor external catchment to the north. Refer to the Quality Catchment plan within the Appendix A.
  - All stormwater from external catchments discharged into the proposed development site shall be conveyed via pit and pipe network and overland flow through the site to the drainage corridor and discharged from site.

In order to control course sediment and gross pollutants entering the bio-retention system, a pre-treatment course sediment forebay will be installed at the pipe inlets to each of the bio-retention basins.

Access to the bioretention zones for the combined bioretention/detention basins will be provided.

4.1.4 Climate Data

Climate data for the catchment was sourced from the Bureau of Meteorology (BoM). Rainfall data was obtained from Redlands HRS Station (Station ID: 40265) for the 10 years between 1997 and 2006 at six (6) minute intervals as specified by MUSIC Modelling Guidelines for South East Queensland (Water By Design, 2018).

4.1.5 Catchment Properties

The catchment areas for the water quality are based on the proposed development layout and is presented in Appendix A. A lumped catchment approach was considered appropriate and adopted for the assessment of the urban residential catchments. Catchment QC4 discharges directly to the local flow path through the Site, and is therefore modelled as bypassing treatment by bioretention in the MUSIC model.

Rainfall-runoff and pollutant export parameters were adopted from the recommended values identified in Tables 3.8 and Table 3.9 Music Modelling Guidelines for South East Queensland (Water by Design, 2018).

Table 4.2 provides a summary of the MUSIC Modelling parameters adopted with the various land uses throughout the study area. Fraction impervious was adopted based on the recommended values provided by MUSIC Modelling Guidelines for South East Queensland (Water by Design, 2018).

TABLE 4.2: MUSIC MODEL CATCHMENT PARAMETERS

Catchment ID	MUSIC Land Use	Area (ha)	Impervious Fraction (%)	Basin
QCX3	Urban Residential	2.473	65% (Based on Table3.7, Water by Design MUSIC Modelling guidelines, 2018)	C3
QC3	Urban Residential	1.207	65%	
QC2	Urban Residential	5.261	65%	C2
QC41	Urban Residential	0.79	65%	
QB2	Urban Residential	5.171	65%	OFF-SITE
QA3	Urban Residential	4.582	65%	A3
QA2	Urban Residential	7.936	65%	A2
QAX1	Urban Residential	0.595	65%	
QA31	Urban Residential	1.228	65%	
QC4	Urban Residential	1.283	65%	Bypasses Treatment

A summary of the catchments can be seen in Figure 4.1 below.

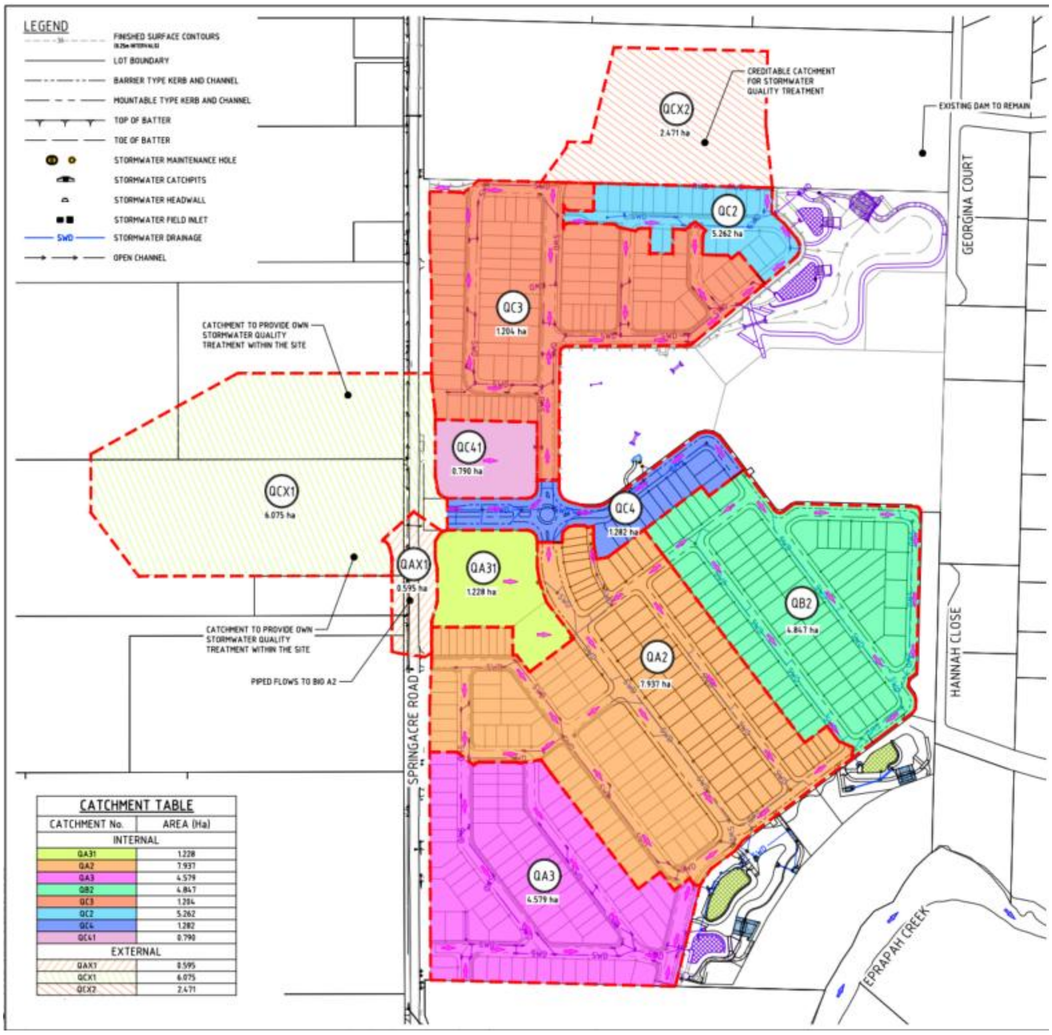

LEGEND
FINISHED SURFACE CONTOURS (0.25m INTERVALS)
LOT BOUNDARY
BARRIER TYPE KERB AND CHANNEL
MOUNTABLE TYPE KERB AND CHANNEL
TOP OF BATTER
TOE OF BATTER
STORMWATER MAINTENANCE HOLE
STORMWATER CATCHPITS
STORMWATER HEADWALL
STORMWATER FIELD INLET
SWD
STORMWATER DRAINAGE
OPEN CHANNEL
CREDITABLE CATCHMENT FOR STORMWATER QUALITY TREATMENT
EXISTING DAM TO REMAIN
QCX2
2.471 ha
QC2
5.262 ha
QC3
1.204 ha
CATCHMENT TO PROVIDE OWN STORMWATER QUALITY TREATMENT WITHIN THE SITE
QC41
0.790 ha
QCX1
6.075 ha
QC4
1.282 ha
QAX1
0.595 ha
QA31
1.228 ha
QB2
4.847 ha
QA2
7.937 ha
QA3
4.579 ha
CATCHMENT TO PROVIDE OWN STORMWATER QUALITY TREATMENT WITHIN THE SITE
PIPED FLOWS TO BIO A2
GEORGINA COURT
HANNAH CLOSE
SPRINGACRE ROAD
EPRAPAH CREEK
CATCHMENT TABLE
CATCHMENT No.
AREA (Ha)
INTERNAL
QA31 1.228
QA2 7.937
QA3 4.579
QB2 4.847
QC3 1.204
QC2 5.262
QC4 1.282
QC41 0.790
EXTERNAL
QAX1 0.595
QCX1 6.075
QCX2 2.471

Figure 4.1: Water Quality Catchment Layout

The network diagram of the MUSIC Model can be seen in Figure 4.2 below.

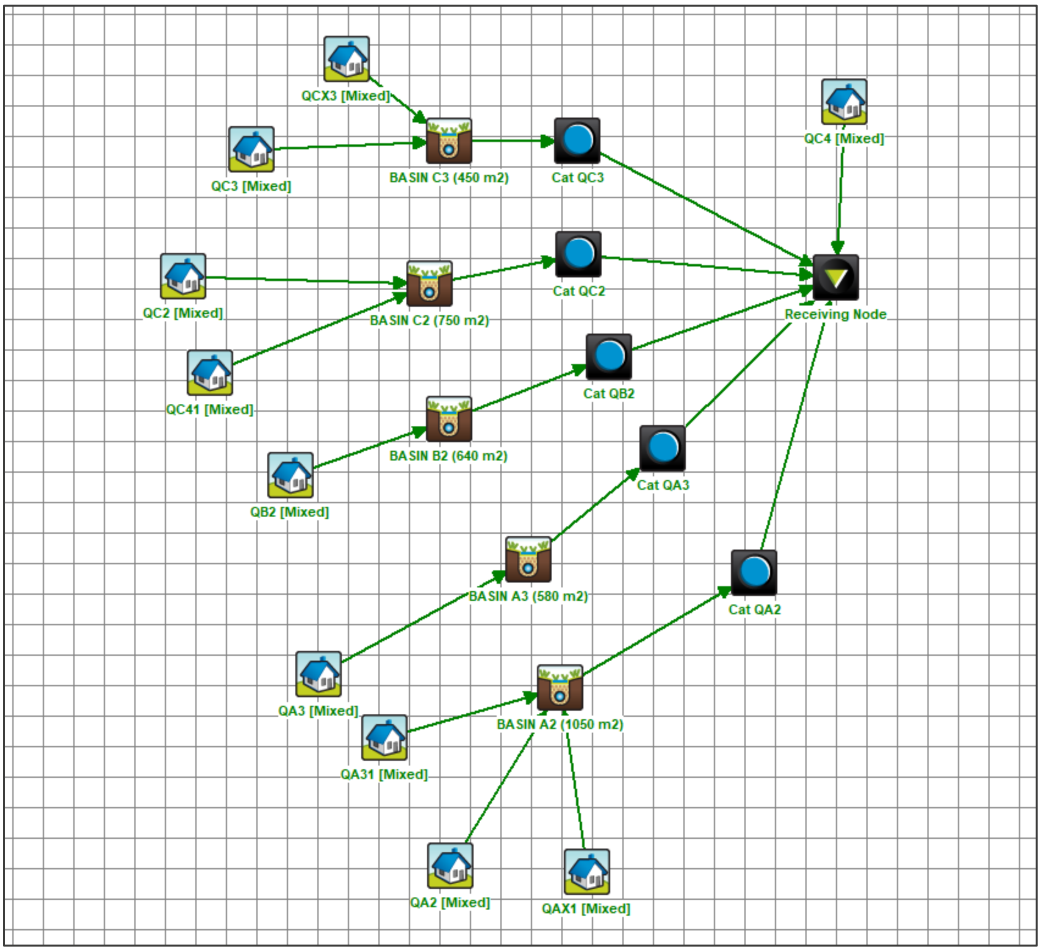


Figure 4.2: MUSIC Model Network Diagram

4.2 Developed Treated Case

Water Sensitive Urban Design (WSUD) aims to minimise the impact of a subdivision development on the natural water cycle by reducing the export of pollutants, sediments and nutrients from the site released into the natural watercourse. To treat the stormwater runoff from the Site, various treatment devices can be used throughout the development area, and these concepts can be integrated into the overall design of the road layouts, road cross sections, stormwater layouts and water supply reticulation systems.

There can be several individual devices that can be placed together to form an overall 'stormwater treatment train'. By using a series of devices, the sediment, pollutants and nutrients in the stormwater run-off can be treated so that the final discharge from the site will meet environmental guidelines.

4.2.1 Bioretention Areas

Opportunity exists at stormwater drainage outlet points of the proposed development to provide bioretention. Modelling of the proposed bioretention basins was carried out over a range of sizes based on the proposed development layout. The location of the bioretention basins can be seen in Figure 4.1 and Appendix A. When sizing bioretention basins in the MUSIC model, the surface area allocated for each of the bioretention basins was calculated from the filter area, batter slopes and extended detention areas to ensure an appropriate value was assigned.

The overall treatment of pollutants within the music model indicated that the use of Gross Pollutant Traps is not required as part of the stormwater quality treatment train. In order to control course sediment and gross pollutants entering the bioretention system, a pre-treatment course sediment forebay will be installed at the inlet of the bioretention basins. Course sediment forebays will be sized to a 3-month recurrence interval storm and with a clean out frequency of no less than one year. Detailed design of course sediment forebays will be undertaken during the detailed design phase. Figure 4.3 below details the typical cross section for bioretention basins.

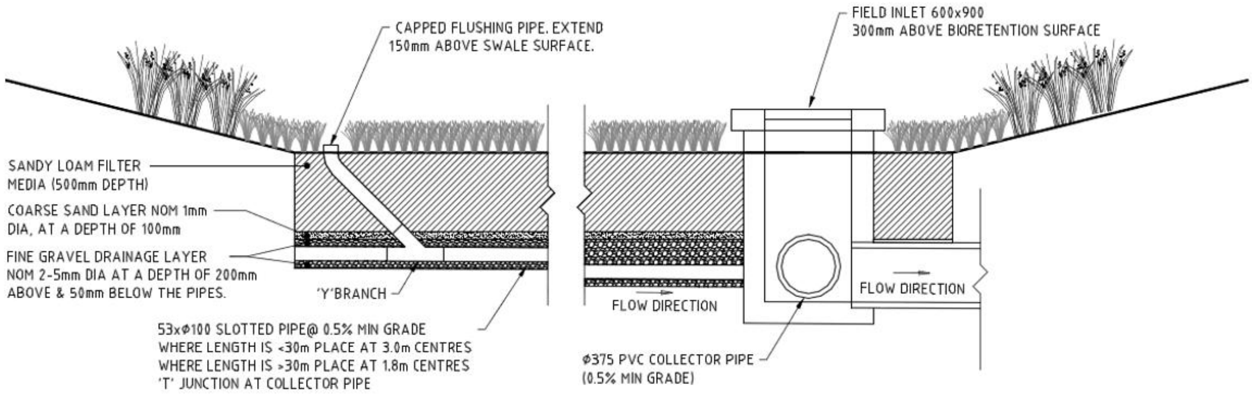

CAPPED FLUSHING PIPE. EXTEND
150mm ABOVE SWALE SURFACE.
FIELD INLET 600x900
300mm ABOVE BIORETENTION SURFACE
SANDY LOAM FILTER
MEDIA (500mm DEPTH)
COARSE SAND LAYER NOM 1mm
DIA, AT A DEPTH OF 100mm
FINE GRAVEL DRAINAGE LAYER
NOM 2-5mm DIA AT A DEPTH OF 200mm
ABOVE & 50mm BELOW THE PIPES.
'Y'BRANCH
FLOW DIRECTION
FLOW DIRECTION
53xΦ100 SLOTTED PIPE@ 0.5% MIN GRADE
WHERE LENGTH IS <30m PLACE AT 3.0m CENTRES
WHERE LENGTH IS >30m PLACE AT 1.8m CENTRES
'T' JUNCTION AT COLLECTOR PIPE
Φ375 PVC COLLECTOR PIPE
(0.5% MIN GRADE)

Figure 4.3: Typical Bioretention Basin Section

In order to model conditions expected during the lifespan of the bioretention basin, filter media parameters within the MUSIC model have been selected based on conformance test reports provided by local suppliers. Table 4.3 below details the proposed parameters of the bioretention basins used within the MUSIC model. Concept design of the basins is provided in Appendix B.

TABLE 4.3: BIORETENTION BASIN MODELLING PARAMETERS

Parameter	Basin A2	Basin A3	Basin B2	Basin C2	Basin C3
Catchment IDs	QA31/QAX1/QA2	QA3	QB2	QC41/QC2	QCX3/QC3
Filter Area (m2)	1050	580	640	750	450
Surface Area (m2)	1050	580	640	750	450
Unlined filter media perimeter (m)	0.01	0.01	0.01	0.01	0.01
Extended Detention Depth (m)	0.3	0.3	0.3	0.3	0.3
Filter Depth (m)	0.5	0.5	0.5	0.5	0.5
Filter Media Hydraulic Conductivity (mm/hr)	200	200	200	200	200
Equivalent Overflow Weir Width (m)	105	58	64	75	45
Course Sediment Management	Sediment Forebay	Sediment Forebay	Sediment Forebay	Sediment Forebay	Sediment Forebay

4.2.2 Coarse Sediment Management

Coarse sediment forebays are to be installed at the pipe outlet for each basin in accordance with the Healthy Land and Water Bioretention Technical Design Guidelines 2014. Course sediment forebays shall be appropriately sized for the upstream catchments. Coarse Sediment forebays shall have the following design characteristics:

Removal Efficiency:	80%
Sediment Loading Rate:	0.6 m^3/Ha/yr
Design Flow:	Q_{3Month}
Turbulence Factor:	0.5
Minimum Cleanout:	Annual
Minimum Forebay Depth:	200 mm.

Preliminary sizing of the basins is shown in Table 4.4 below:

TABLE 4.4: PRELIMINARY SEDIMENT FOREBAY SIZING

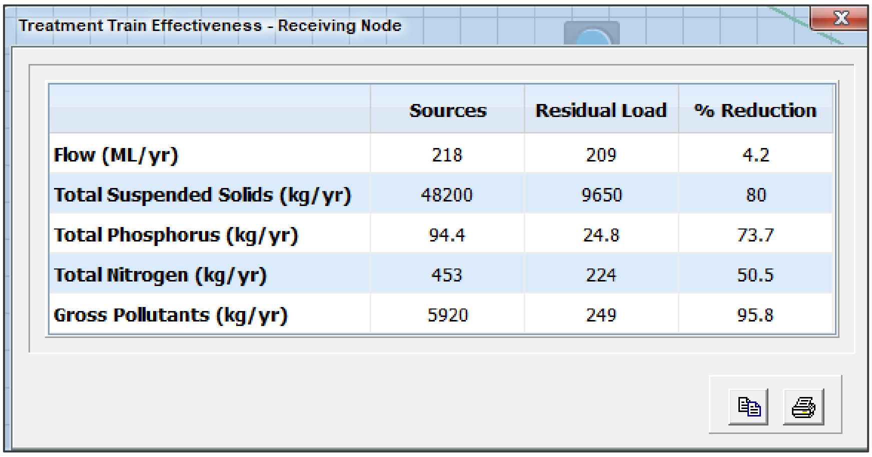
Basin	A2	A3	B2	C2	C3
Area (m2)	50	25	25	25	15

4.2.3 MUSIC Analysis and Results

A MUSIC analysis was carried out on the proposed development site based on the ‘treatment train’ shown in Table 4.5. The results of the annual pollutant load reductions based on the above design calculations are shown in Table 4.5.

TABLE 4.5: SUMMARY OF POLLUTANT TARGETS FOR TREATMENT TRAIN

Indicator	WQO’s Target	WQO’s Achieved	Objectives Met
TSS (Total Suspended Solids)	80%	80%	YES
TP (Total Phosphorus)	60%	73.7%	YES
TN (Total Nitrogen)	45%	50.5%	YES
GP (Gross Pollutants)	90%	95.8%	YES



	Sources	Residual Load	% Reduction
Flow (ML/yr)	218	209	4.2
Total Suspended Solids (kg/yr)	48200	9650	80
Total Phosphorus (kg/yr)	94.4	24.8	73.7
Total Nitrogen (kg/yr)	453	224	50.5
Gross Pollutants (kg/yr)	5920	249	95.8

Figure 4.4: Treatment Train Effectiveness

4.3 Construction of Bioretention Basins

4.3.1 Bioretention Basin Layers

The layers of the bioretention basin have been selected based on the recommendations within the Bioretention Technical Design Guidelines Version 1.1 and are as follows:

- Filter Layer
  - 500 mm thick Sandy Loam Layer in accordance with the FAWB Guidelines.
- Transition Layer
  - 100 mm thick layer of well graded sands containing less than 2% fines.
- Drainage Layer

  - 300 mm thick layer of fine gravel (2-5mm) with less than 2% fines and minimum saturated hydraulic conductivity of 4000 mm/hr
- Underdrainage System
  - An underdrain system of slotted drainage pipes (100mm diameter)
    - 1% longitudinal grade;
    - 2.5 m centres; and
    - maximum run length of 25m.
  - Slotted pipes are to flow to larger PVC collector pipes with 1% longitudinal grades and the following maximum collection areas:
    - DN 100 78m2
    - DN 150 229m2
    - DN 225 343 m2
    - DN 300 1455 m2
  - The underdrainage layout for the basins can be seen within Appendix B.

The bioretention basin has been modelled within MUSIC with an exfiltration rate of 0 mm/hr. Geofabric or any other liner is not to be used between the layers within the bioretention system due to elevated risks associated with clogging.

The following parameters must all be satisfied with the selection of the transition and drainage layers:

- D15 (Transition Layer) ≤ 5 x D85 (Filter Media)
- D15 (Drainage Layer) ≤ 5 x D85 (Transition Layer)

4.3.2 Bioretention Filter Media

The filter media used within the bioretention basin is to be in accordance with the Facility for Advancing Water Biofiltration (FAWB) “Guideline Specifications for Soil Media in Bioretention Systems” – 2009 Version.

4.3.3 Construction Methodology

On completion of civil works, the bioretention shall be excavated to the base with the underdrainage system, drainage media, transition layer, and filter media installed. Landscape works are to be installed along the batters of the bioretention basin in accordance with the Water by Design / Healthy Land and Water - Guidelines for the construction and establishment of bioretention systems and wetlands v2 2022.

The top of the filter media is to have geofabric installed and overlain by topsoil and turf. At such time that the upstream catchment of the bioretention basin reaches 80% buildout, the topsoil, turf and geofabric are to be removed and the bioretention basin is to be planted out in accordance with the Water by Design / Healthy Land and Water - Guidelines for the construction and establishment of bioretention systems and wetlands v2 2022. Reference is made to the landscape plans which detail final planting of the bioretention basin batters and surface area.

4.4 Construction Phase Erosion and Sediment Control

4.4.1 Construction Management Plan

As previously specified, the major stormwater pollutant during the construction phase will be that of suspended solids. To ensure adverse impacts to downstream waterways are mitigated during the construction phase, best practice erosion and sediment control measures are required.

It should be noted that an erosion and sediment control strategy has been prepared as part of this conceptual management plan. It shall be the responsibility of the developer, through their principal contractor, to ensure that temporary sediment and erosion controls are installed and maintained correctly.

4.4.2 Water Quality Management Plan

Internal catchments where surface disturbance and earthworks are occurring are to incorporate temporary sediment basin/s for construction phase erosion and sediment control in accordance with IECA best practices for erosion and sediment control (IECA Australasia, Nov 2008).

Sediment control should be able to be achieved by applying the following best practice sediment and erosion control management measures during the construction phase:

(1) Establish a single stabilised entry/ exit point for the site works.

(2) Construct a shake-down grid at the entrance to facilitate the removal of sediment from vehicles leaving the site. The access road extending from the end of existing road or kerb to the grid should comprise a 150-200mm deep pad of 40mm crushed rock.

(3) Install sediment fences along the lower boundary of the development works.

(4) Install bins and/ or wind-proof litter areas on-site to minimise the dispersion of gross pollutants.

(5) Maintain on site spare materials necessary for the emergency repair of all erosion control devices. This includes silt fences, clean crushed rock for reapplication to the entrance road and for replacement of rock within temporary drainage channels.

(6) Following each days’ construction works, ensure that any material on road surfaces is swept from the road, and not permitted to be washed down the gutters and piped drainage systems.

(7) Quality of pooled water within sediment basins are to be monitored prior to dewatering, sufficient time should be given to allow sediment to settle (possibly with the assistance of a suitable flocculent if necessary) and/ or filtering during pumping operations.

(8) Final establishment of basins at outlets should not occur until full stabilisation of upstream catchments has occurred; preferably these should be temporarily turfed during the maintenance period while dwelling construction is occurring.

While the above provides general guidance on the management of stormwater during the construction phase, detailed Erosion and Sediment Control Management Plans will be required during the operation works application stage for each precinct/stage in accordance with International Erosion Control Association Australia (IECA) Guidelines.

5. WORKS SCHEDULE

The Contractor will be responsible for the maintenance of stormwater quality control devices from the possession of the Site until the Site are accepted 'Off Maintenance' by Redland City Council or until stabilisation has occurred to the satisfaction of the site superintendent. A defined sequence of actions in relation to construction of the Site has been established and the contractor is responsible for ensuring adherence to a sequence of actions for development of the Site.

TABLE 5.1: WORKS SCHEDULE OF KEY CONSTRUCTION EVENTS FOR THE SITE

Construction Phase	Required Action
Site Possession	• Installation of construction exit. • Construct temporary erosion and sediment control measures such as silt fencing and perimeter banks. • Construct temporary works to sediment basin to dimensions nominated by superintendent.
Construction	• Topsoil to be stripped and stockpiled in locations agreed with the superintendent. A sediment fence is to be constructed around the bottom of the stockpile to trap sediment. A diversion drain is to be installed upstream of the stockpile. • Sediment control devices require removal to allow construction access and will be reinstated at the completion of each workday. • Bulk earthworks complete. • Drainage structures in place. • Movement of construction equipment shall be limited to the area of work and existing roads. • Disturbed areas are to be stabilised following final trimming. Areas are to be restored progressively. • Surface stabilisation treatment complete. • Planting to be undertaken in accordance with the vegetation management plan. • Kerb sediment traps are to be provided at each drainage pit adjacent disturbed areas.
Maintenance	• Regularly check capacity of erosion control devices. • Disturbed areas are to have 80% coverage within 30 days of trimming. • Ensure permanent erosion control structures are stable.

In addition to the above table, the "*Guidelines for the construction and establishment of bioretention systems and wetlands v2 2022*" from Water by Design / Healthy Land and Water will be used as a guide during the construction and establishment phase of the works.

6. CONCLUSION

The stormwater management plan for the Early Release stages (the Site) of the proposed Southern Thornlands Priority Development Area has been prepared to support the Development Application and provide recommendations to the management of stormwater quality and quantity. The various methods recommended as part of this stormwater management plan are considered best practices for developments of this type. The proposed stormwater strategy is also consistent with the Redland City Council City Plan.

The combined bioretention/detention basins proposed for installation at strategic locations within the subject site are predicted to result in:

(1) Stormwater detention to ensure post development peak flows do not exceed the pre-development peak flows discharged from the Site for the modelled storm events.

(2) Appropriate stormwater quality treatment in accordance with the State Planning Policy (SPP).

(3) No interaction of development extents and infrastructure within the Eprapah Creek flood extent, nor impacts to Eprapah Creek flood behaviour as a result of discharge from the Site.

A summary of the proposed stormwater bioretention basins for the Site is provided in Table 6.1, and the detention basins in Table 6.2.

TABLE 6.1: BIORETENTION BASIN SUMMARY

Parameter	Basin A2	Basin A3	Basin B2	Basin C2	Basin C3
Catchment ID	QA31/QAX1/QA2	QA3	QB2	QC41/QC2	QCX3/QC3
Filter Area (m^2)	1050	580	640	750	450

A summary of the proposed stormwater bioretention basins for the Site is provided in Table 6.2.

TABLE 6.2: DETENTION BASIN SUMMARY

Parameter	Basin A1	Basin B1	Basin C1
Catchment ID	PA1	PB1	PAX1, PCX1, PC1, PCX2
Detention Basin Volume (m^3)	9,200	2,200	9,800

7. QUALIFICATIONS

(a) In preparing this document, including all relevant calculation and modelling, Engeny Australia Pty Ltd (Engeny) has exercised the degree of skill, care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering principles.

(b) Engeny has used reasonable endeavours to inform itself of the parameters and requirements of the project and has taken reasonable steps to ensure that the works and document is as accurate and comprehensive as possible given the information upon which it has been based including information that may have been provided or obtained by any third party or external sources which has not been independently verified.

(c) Engeny reserves the right to review and amend any aspect of the works performed including any opinions and recommendations from the works included or referred to in the works if:

  (i) Additional sources of information not presently available (for whatever reason) are provided or become known to Engeny; or

  (ii) Engeny considers it prudent to revise any aspect of the works in light of any information which becomes known to it after the date of submission.

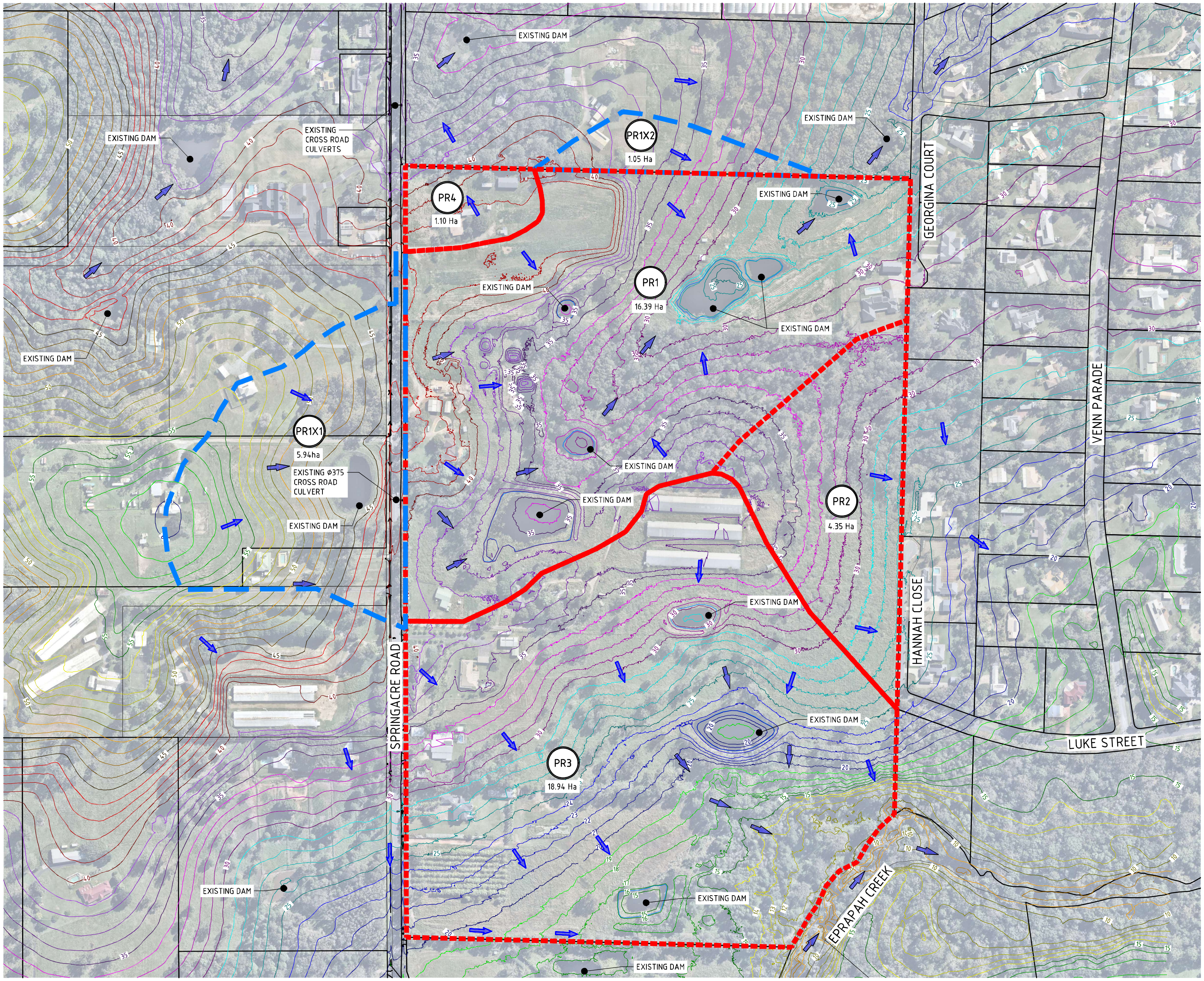
(d) Engeny does not give any warranty nor accept any liability in relation to the completeness or accuracy of the works, which may be inherently reliant upon the completeness and accuracy of the input data and the agreed scope of works. All limitations of liability shall apply for the benefit of the employees, agents and representatives of Engeny to the same extent that they apply for the benefit of Engeny.

(e) This document is for the use of the party to whom it is addressed and for no other persons. No responsibility is accepted to any third party for the whole or part of the contents of this Report.

(f) If any claim or demand is made by any person against Engeny on the basis of detriment sustained or alleged to have been sustained as a result of reliance upon the Report or information therein, Engeny will rely upon this provision as a defence to any such claim or demand.

(g) This Report does not provide legal advice.

APPENDIX A: SITE LAYOUT AND CATCHMENTS


EXISTING DAM
PR1X2
1.05 Ha
EXISTING DAM
EXISTING CROSS ROAD CULVERTS
EXISTING DAM
PR4
1.10 Ha
EXISTING DAM
PR1
16.39 Ha
EXISTING DAM
EXISTING DAM
GEORGINA COURT
EXISTING DAM
PR1X1
5.94ha
EXISTING Ø375 CROSS ROAD CULVERT
EXISTING DAM
EXISTING DAM
EXISTING DAM
PR2
4.35 Ha
EXISTING DAM
VENN PARADE
HANNAH CLOSE
SPRINGACRE ROAD
LUKE STREET
EXISTING DAM
PR3
18.94 Ha
EXISTING DAM
EXISTING DAM
EPRAPAH CREEK
EXISTING DAM

CATCHMENT TABLE

INTERNAL		EXTERNAL	
CATCHMENT No.	AREA (Ha)	CATCHMENT NO.	AREA (Ha)
PR1	16.39 Ha	PR1X1	5.94 Ha
PR2	4.35 Ha	PR1X2	1.05 Ha
PR3	18.94 Ha		
PR4	1.10 Ha		

LEGEND

──	EXISTING CONTOURS
──	LOT BOUNDARY
▬ ▬ ▬	INTERNAL STORMWATER CATCHMENT
— — —	EXTERNAL STORMWATER CATCHMENT
PR1	CATCHMENT NUMBER
←	STORMWATER OVERLAND FLOW
←	CONCENTRATED STORMWATER FLOW

0 40 80 120 160 200m
40 30 20 10

SCALE 1:2000 (A1) 1:4000 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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REVISION IN PROGRESS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUE FOR DISCUSSION	ES	PDW	PI	PI	16/10/25

ENGINEERING CERTIFICATION

Registered Engineer

Date

Registered Accreditation

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1**

Title **PRE DEVELOPMENT CATCHMENT PLAN**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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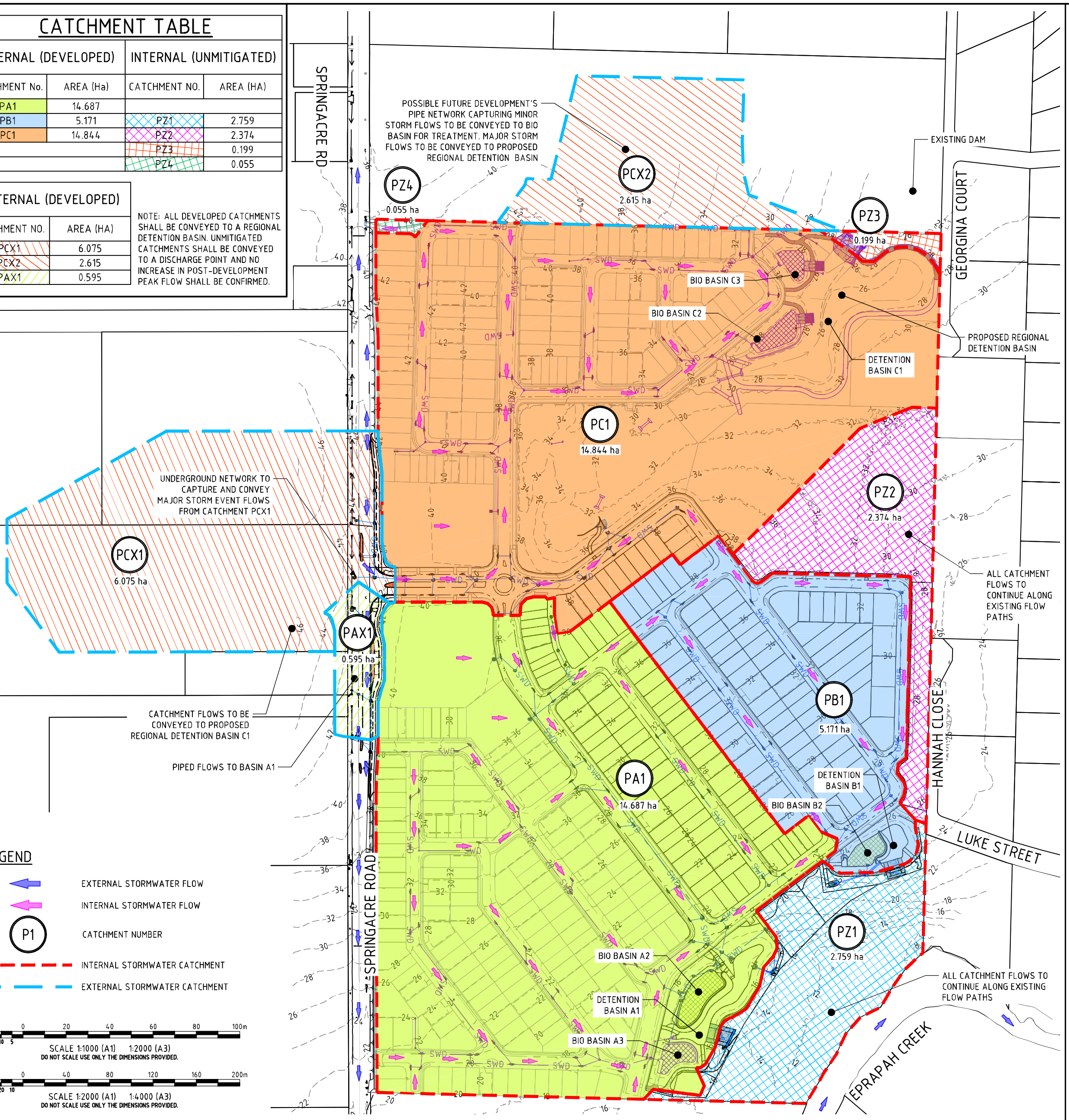
Project No. Drawing No.	Rev
B00702-DA-SW01	A

CATCHMENT TABLE

INTERNAL (DEVELOPED)		INTERNAL (UNMITIGATED)	
CATCHMENT No.	AREA (Ha)	CATCHMENT NO.	AREA (HA)
PA1	14.687		
PB1	5.171	PZ1	2.759
PC1	14.844	PZ2	2.374
		PZ3	0.199
		PZ4	0.055

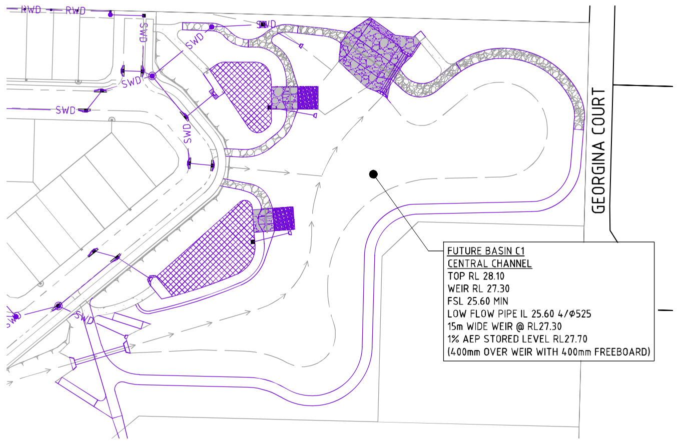
EXTERNAL (DEVELOPED)	
CATCHMENT NO.	AREA (HA)
PCX1	6.075
PCX2	2.615
PAX1	0.595

NOTE: ALL DEVELOPED CATCHMENTS SHALL BE CONVEYED TO A REGIONAL DETENTION BASIN. UNMITIGATED CATCHMENTS SHALL BE CONVEYED TO A DISCHARGE POINT AND NO INCREASE IN POST-DEVELOPMENT PEAK FLOW SHALL BE CONFIRMED.


SPRINGACRE RD
SPRINGACRE ROAD
GEORGINA COURT
HANNAH CLOSE
LUKE STREET
EPRAPAH CREEK
EXISTING DAM
POSSIBLE FUTURE DEVELOPMENT'S PIPE NETWORK CAPTURING MINOR STORM FLOWS TO BE CONVEYED TO BIO BASIN FOR TREATMENT. MAJOR STORM FLOWS TO BE CONVEYED TO PROPOSED REGIONAL DETENTION BASIN
PZ4
0.055 ha
PCX2
2.615 ha
PZ3
0.199 ha
BIO BASIN C3
BIO BASIN C2
DETENTION BASIN C1
PROPOSED REGIONAL DETENTION BASIN
PC1
14.844 ha
PZ2
2.374 ha
ALL CATCHMENT FLOWS TO CONTINUE ALONG EXISTING FLOW PATHS
UNDERGROUND NETWORK TO CAPTURE AND CONVEY MAJOR STORM EVENT FLOWS FROM CATCHMENT PCX1
PCX1
6.075 ha
PAX1
0.595 ha
CATCHMENT FLOWS TO BE CONVEYED TO PROPOSED REGIONAL DETENTION BASIN C1
PIPED FLOWS TO BASIN A1
PB1
5.171 ha
DETENTION BASIN B1
BIO BASIN B2
PA1
14.687 ha
PZ1
2.759 ha
ALL CATCHMENT FLOWS TO CONTINUE ALONG EXISTING FLOW PATHS
BIO BASIN A2
DETENTION BASIN A1
BIO BASIN A3
SWD
0
20
40
60
80
100m
20 15 10 5
SCALE 1:1000 (A1) 1:2000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.
0
40
80
120
160
200m
40 30 20 10
SCALE 1:2000 (A1) 1:4000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

LEGEND

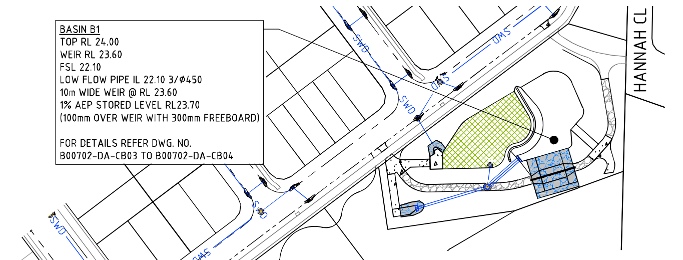
- ⬅ EXTERNAL STORMWATER FLOW
- ⬅ INTERNAL STORMWATER FLOW
- (P1) CATCHMENT NUMBER
- — — INTERNAL STORMWATER CATCHMENT
- — — EXTERNAL STORMWATER CATCHMENT


RWD
SWD
GEORGINA COURT

FUTURE BASIN C1
CENTRAL CHANNEL
TOP RL 28.10
WEIR RL 27.30
FSL 25.60 MIN
LOW FLOW PIPE IL 25.60 4/Φ525
15m WIDE WEIR @ RL27.30
1% AEP STORED LEVEL RL27.70
(400mm OVER WEIR WITH 400mm FREEBOARD)

DETENTION BASIN C1 LAYOUT DETAIL

SCALE 1:1000(A1)

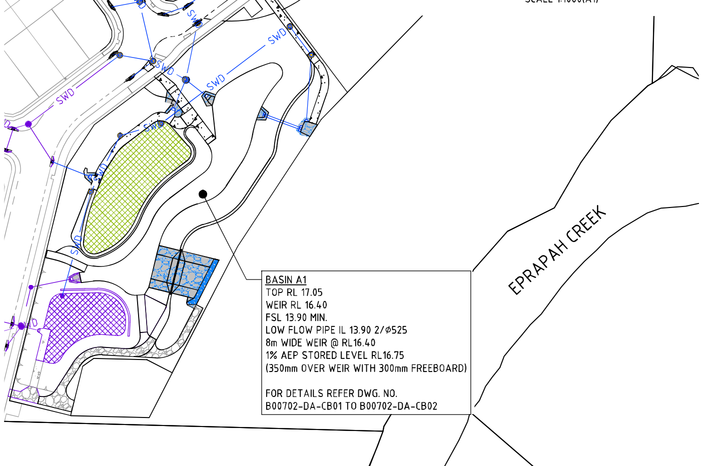

HANNAH CL
SWD
DMS

BASIN B1
TOP RL 24.00
WEIR RL 23.60
FSL 22.10
LOW FLOW PIPE IL 22.10 3/Φ450
10m WIDE WEIR @ RL 23.60
1% AEP STORED LEVEL RL23.70
(100mm OVER WEIR WITH 300mm FREEBOARD)

FOR DETAILS REFER DWG. NO.
B00702-DA-CB03 TO B00702-DA-CB04

DETENTION BASIN B1 LAYOUT DETAIL

SCALE 1:1000(A1)


SWD
EPRAPAH CREEK

BASIN A1
TOP RL 17.05
WEIR RL 16.40
FSL 13.90 MIN.
LOW FLOW PIPE IL 13.90 2/Φ525
8m WIDE WEIR @ RL16.40
1% AEP STORED LEVEL RL16.75
(350mm OVER WEIR WITH 300mm FREEBOARD)

FOR DETAILS REFER DWG. NO.
B00702-DA-CB01 TO B00702-DA-CB02

DETENTION BASIN A1 LAYOUT DETAIL

SCALE 1:1000(A1)

REVISION IN PROGRESS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUE FOR DISCUSSION	ES	PDW	PI	PI	16/10/25

ENGINEERING CERTIFICATION

Registered Engineer

Date

Registered Accreditation

URBEX

EMPOWER

Client URBEX PTY LTD
Project SOUTHERN THORNLANDS PRECINCT 1
Title POST DEVELOPMENT CATCHMENT PLAN

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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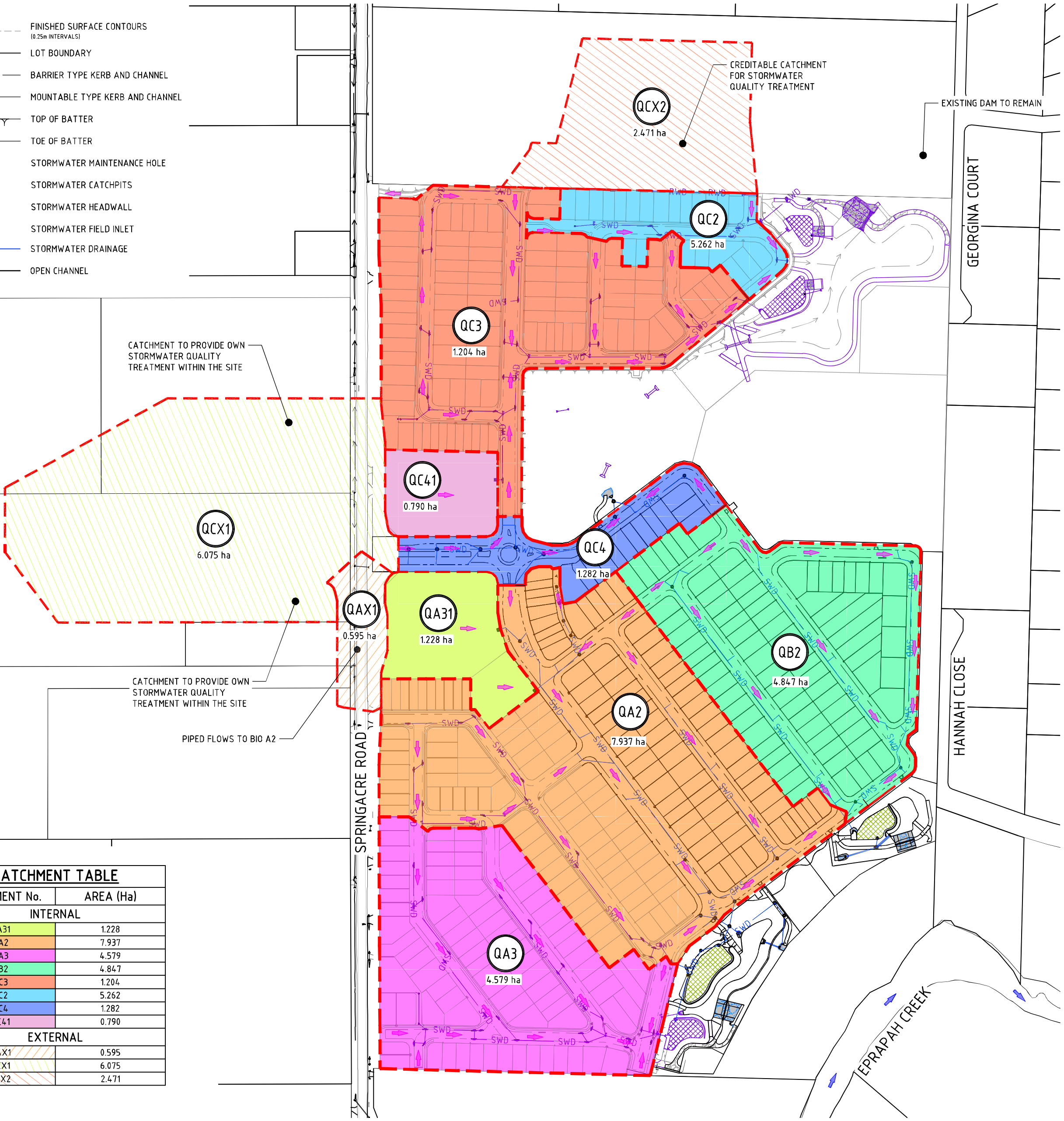
LEGEND

– – –36– – –	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
———	LOT BOUNDARY
— · — · —	BARRIER TYPE KERB AND CHANNEL
— — —	MOUNTABLE TYPE KERB AND CHANNEL
—Y—Y—Y—	TOP OF BATTER
———	TOE OF BATTER
●	STORMWATER MAINTENANCE HOLE
▬	STORMWATER CATCHPITS
▵	STORMWATER HEADWALL
■ ■	STORMWATER FIELD INLET
—— SWD ——	STORMWATER DRAINAGE
—→—→—	OPEN CHANNEL



CREDITABLE CATCHMENT FOR STORMWATER QUALITY TREATMENT

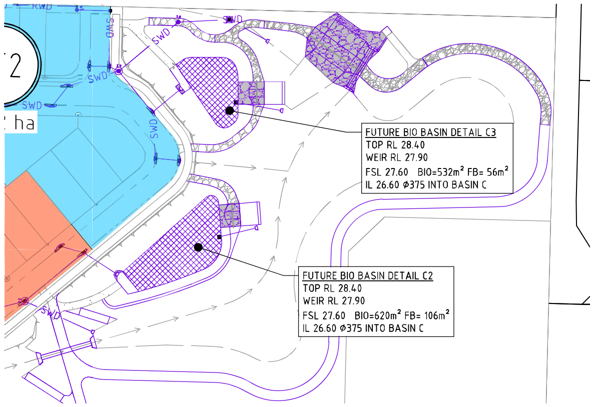
EXISTING DAM TO REMAIN

CATCHMENT TO PROVIDE OWN STORMWATER QUALITY TREATMENT WITHIN THE SITE

CATCHMENT TO PROVIDE OWN STORMWATER QUALITY TREATMENT WITHIN THE SITE

PIPED FLOWS TO BIO A2

CATCHMENT TABLE	
CATCHMENT No.	AREA (Ha)
INTERNAL	
QA31	1.228
QA2	7.937
QA3	4.579
QB2	4.847
QC3	1.204
QC2	5.262
QC4	1.282
QC41	0.790
EXTERNAL	
QAX1	0.595
QCX1	6.075
QCX2	2.471



FUTURE BIO BASIN DETAIL C3
TOP RL 28.40
WEIR RL 27.90
FSL 27.60 BIO=532m² FB= 56m²
IL 26.60 Ø375 INTO BASIN C

FUTURE BIO BASIN DETAIL C2
TOP RL 28.40
WEIR RL 27.90
FSL 27.60 BIO=620m² FB= 106m²
IL 26.60 Ø375 INTO BASIN C

FUTURE BIO BASIN C2 AND C3 LAYOUT DETAIL

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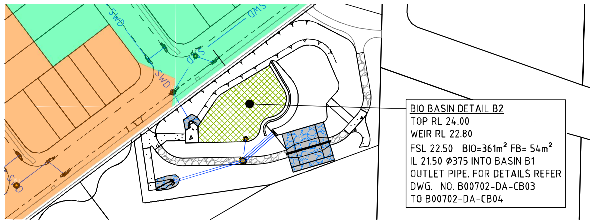
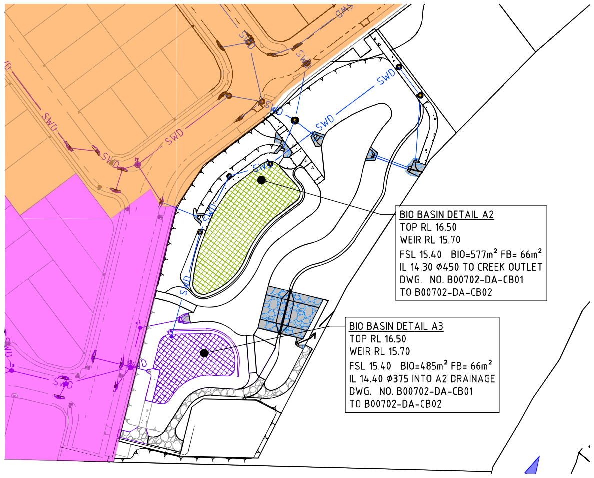


BIO BASIN DETAIL B2
TOP RL 24.00
WEIR RL 22.80
FSL 22.50 BIO=361m² FB= 54m²
IL 21.50 Ø375 INTO BASIN B1
OUTLET PIPE. FOR DETAILS REFER
DWG. NO. B00702-DA-CB03
TO B00702-DA-CB04

BIO BASIN B2 LAYOUT DETAIL

SCALE 1:1000(A1)



BIO BASIN DETAIL A2
TOP RL 16.50
WEIR RL 15.70
FSL 15.40 BIO=577m² FB= 66m²
IL 14.30 Ø450 TO CREEK OUTLET
DWG. NO. B00702-DA-CB01
TO B00702-DA-CB02

BIO BASIN DETAIL A3
TOP RL 16.50
WEIR RL 15.70
FSL 15.40 BIO=485m² FB= 66m²
IL 14.40 Ø375 INTO A2 DRAINAGE
DWG. NO. B00702-DA-CB01
TO B00702-DA-CB02

BIO BASIN A2 AND A3 LAYOUT DETAIL

SCALE 1:1000(A1)

40 30 20 10 0 40 80 120 160 200m
SCALE 1:2000 (A1) 1:4000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

20 15 10 5 0 20 40 60 80 100m
SCALE 1:1000 (A1) 1:2000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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REVISION IN PROGRESS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUE FOR DISCUSSION	ES	PDW	PI	PI	16/10/25

ENGINEERING CERTIFICATION

Registered Engineer
Date
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1**
Title **STORMWATER QUALITY CATCHMENT PLAN**

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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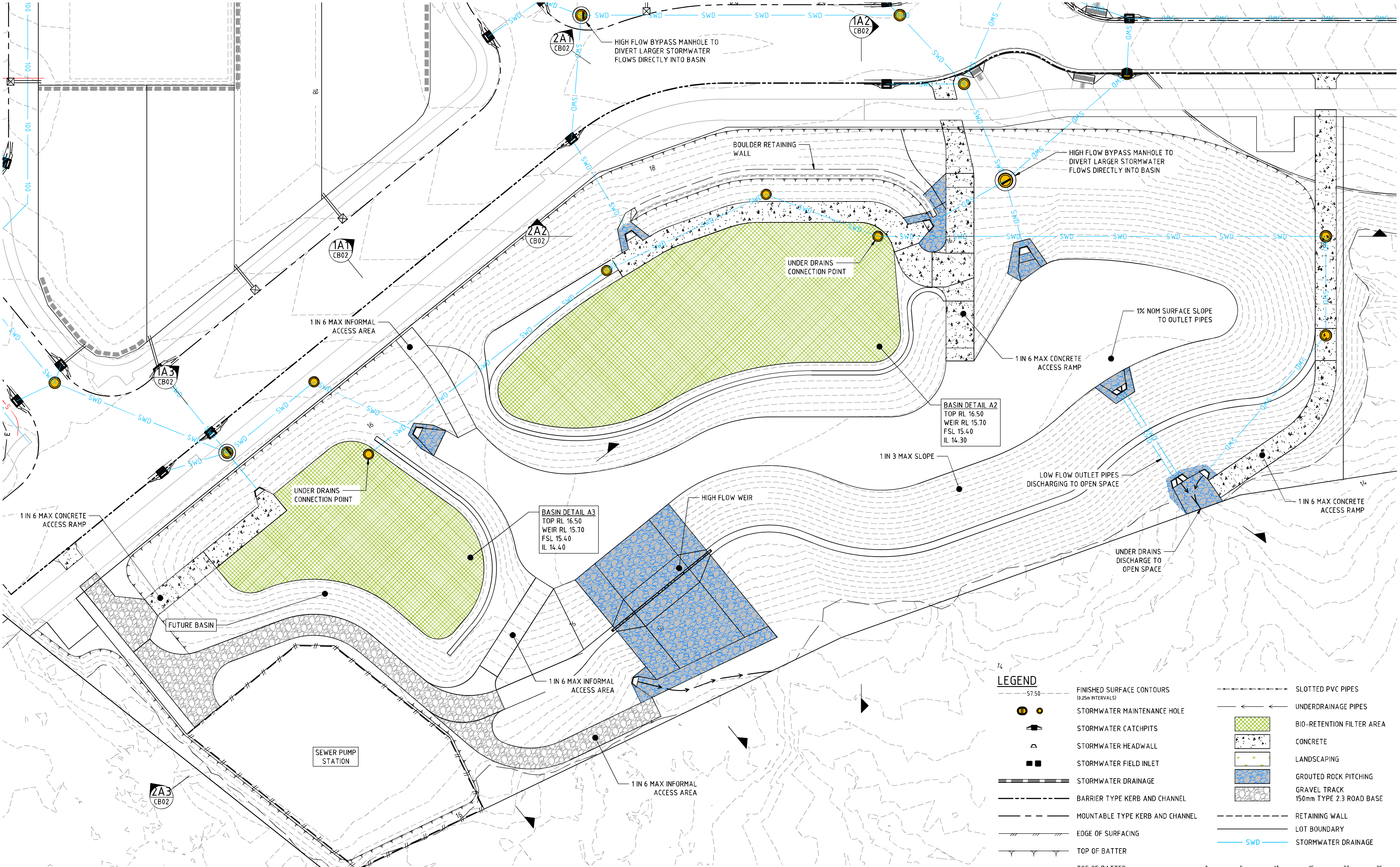
Project No. Drawing No.	Rev
B00702-DA-SW03	A

APPENDIX B: CONCEPT ENGINEERING PLANS


HIGH FLOW BYPASS MANHOLE TO DIVERT LARGER STORMWATER FLOWS DIRECTLY INTO BASIN
2A1 CB02
1A2 CB02
BOULDER RETAINING WALL
HIGH FLOW BYPASS MANHOLE TO DIVERT LARGER STORMWATER FLOWS DIRECTLY INTO BASIN
2A2 CB02
1A1 CB02
UNDER DRAINS CONNECTION POINT
1% NOM SURFACE SLOPE TO OUTLET PIPES
1 IN 6 MAX INFORMAL ACCESS AREA
1 IN 6 MAX CONCRETE ACCESS RAMP
1A3 CB02
BASIN DETAIL A2
TOP RL 16.50
WEIR RL 15.70
FSL 15.40
IL 14.30
1 IN 3 MAX SLOPE
LOW FLOW OUTLET PIPES DISCHARGING TO OPEN SPACE
UNDER DRAINS CONNECTION POINT
HIGH FLOW WEIR
1 IN 6 MAX CONCRETE ACCESS RAMP
BASIN DETAIL A3
TOP RL 16.50
WEIR RL 15.70
FSL 15.40
IL 14.40
1 IN 6 MAX CONCRETE ACCESS RAMP
UNDER DRAINS DISCHARGE TO OPEN SPACE
FUTURE BASIN
1 IN 6 MAX INFORMAL ACCESS AREA
SEWER PUMP STATION
1 IN 6 MAX INFORMAL ACCESS AREA
2A3 CB02
SWD
18
16
15
14

DETENTION BASIN A1 AND BIORETENTION BASINS A2 AND A3 – LAYOUT PLAN

SCALE 1:250 (A1) 1:500 (A3)

LEGEND

— — —57.50— — —	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
● ●	STORMWATER MAINTENANCE HOLE
■	STORMWATER CATCHPITS
⏢	STORMWATER HEADWALL
■ ■	STORMWATER FIELD INLET
▬ ▬ ▬	STORMWATER DRAINAGE
—— - - ——	BARRIER TYPE KERB AND CHANNEL
—— — — ——	MOUNTABLE TYPE KERB AND CHANNEL
—⫽—⫽—	EDGE OF SURFACING
—Y—Y—Y—	TOP OF BATTER
—— —— ——	TOE OF BATTER
→ → ——	OPEN CHANNEL
-◂-◂-◂-	SLOTTED PVC PIPES
—— ← ←	UNDERDRAINAGE PIPES
▩	BIO-RETENTION FILTER AREA
▨	CONCRETE
▢	LANDSCAPING
▦	GROUTED ROCK PITCHING
▧	GRAVEL TRACK 150mm TYPE 2.3 ROAD BASE
— — — —	RETAINING WALL
——	LOT BOUNDARY
—— SWD ——	STORMWATER DRAINAGE

0 5 10 15 20 25m
5 3.75 2.5 1.25

SCALE 1:250 (A1) 1:500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: WILLIAM GRIFFITH
Plot Date: 9/12/2025 3:06:23 PM
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REVISION IN PROGRESS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUE FOR DISCUSSION	ES	PDW	PI	PI	16/10/25

ENGINEERING CERTIFICATION

Registered Engineer

Date

Registered Accreditation

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Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1**

Title **BIORETENTION BASIN A2 AND A3**
LAYOUT PLAN

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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Project No. Drawing No.	Rev
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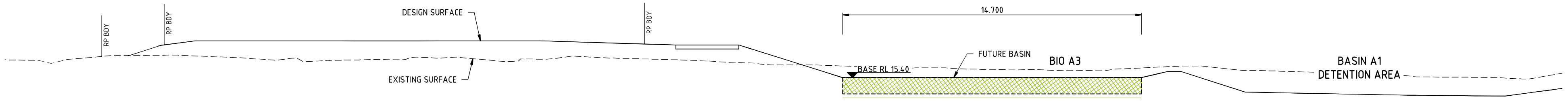
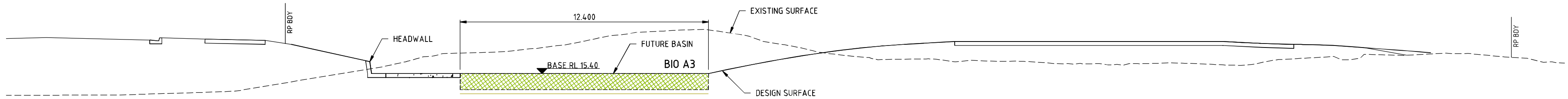


RP BDY
RP BDY
DESIGN SURFACE
RP BDY
14.700
FUTURE BASIN
BASE RL 15.40
BIO A3
BASIN A1
DETENTION AREA
EXISTING SURFACE

2A3 CB01 SECTION
SCALE 1:100 (A1)



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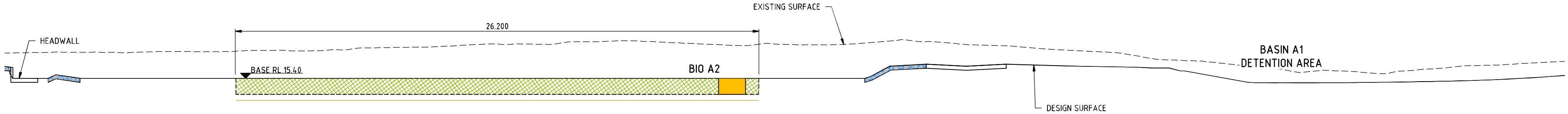

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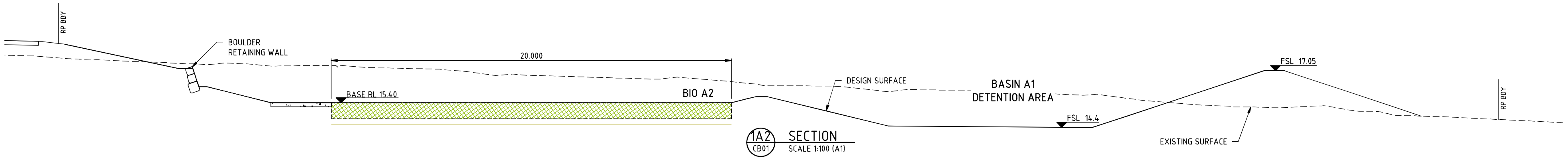

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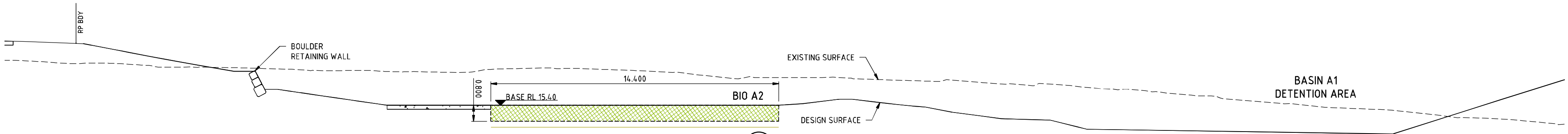

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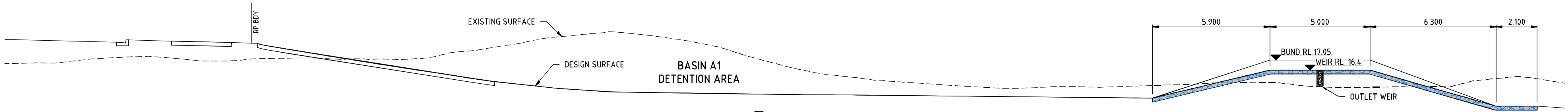

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No.	*Amendments*	*Drawn*	*Design*	*Design Chk*	*Appd*	*Date*

ENGINEERING CERTIFICATION

Registered Engineer

Date

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SOUTHERN THORNLANDS PRECINCT 1**

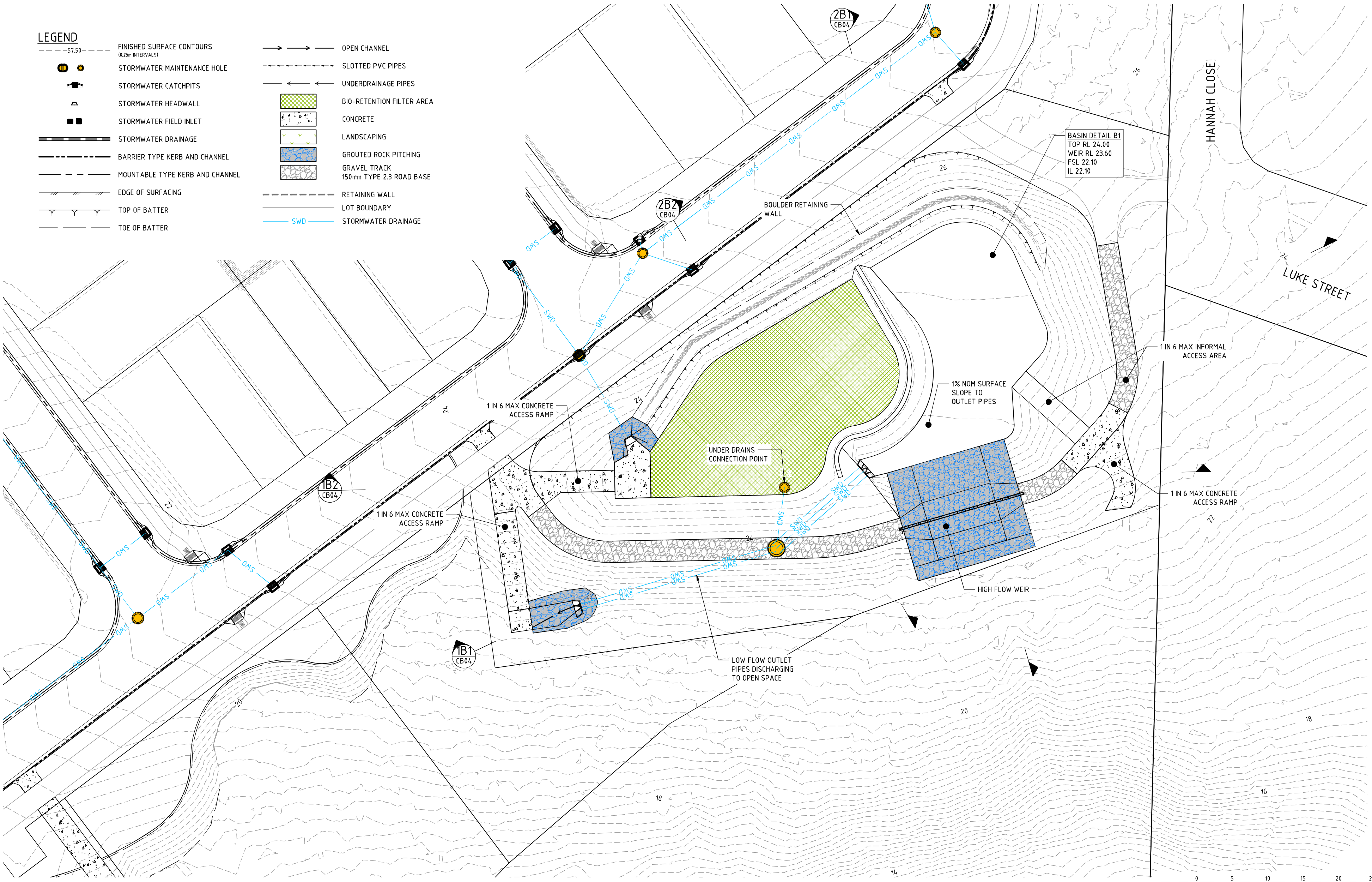
Title **BIORETENTION BASIN A2 AND A3**
CROSS SECTIONS

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. *Drawing No.* **B00702-DA-CB02**

Rev **A**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1 IN 6 MAX CONCRETE ACCESS RAMP
UNDER DRAINS CONNECTION POINT
1 IN 6 MAX CONCRETE ACCESS RAMP
1 IN 6 MAX CONCRETE ACCESS RAMP
HIGH FLOW WEIR
LOW FLOW OUTLET PIPES DISCHARGING TO OPEN SPACE
SWD
26
24
22
20
18
16
14
0
5
10
15
20
25m
5
3.75
2.5
1.25

LEGEND

57.50	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
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	STORMWATER CATCHPITS
	STORMWATER HEADWALL
	STORMWATER FIELD INLET
	STORMWATER DRAINAGE
	BARRIER TYPE KERB AND CHANNEL
	MOUNTABLE TYPE KERB AND CHANNEL
	EDGE OF SURFACING
	TOP OF BATTER
	TOE OF BATTER
	OPEN CHANNEL
	SLOTTED PVC PIPES
	UNDERDRAINAGE PIPES
🟩	BIO-RETENTION FILTER AREA
	CONCRETE
	LANDSCAPING
🟦	GROUTED ROCK PITCHING
	GRAVEL TRACK 150mm TYPE 2.3 ROAD BASE
	RETAINING WALL
	LOT BOUNDARY
SWD	STORMWATER DRAINAGE

DETENTION BASIN B1 AND BIORETENTION BASIN B2 - LAYOUT PLAN

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SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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REVISION IN PROGRESS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUE FOR DISCUSSION	ES	PDW	PI	PI	16/10/25

ENGINEERING CERTIFICATION

Registered Engineer
Date

Registered Accreditation

Client **URBEX PTY LTD**
Project **SOUTHERN THORNLANDS PRECINCT 1**
Title **BIORETENTION BASIN B2**
LAYOUT PLAN

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

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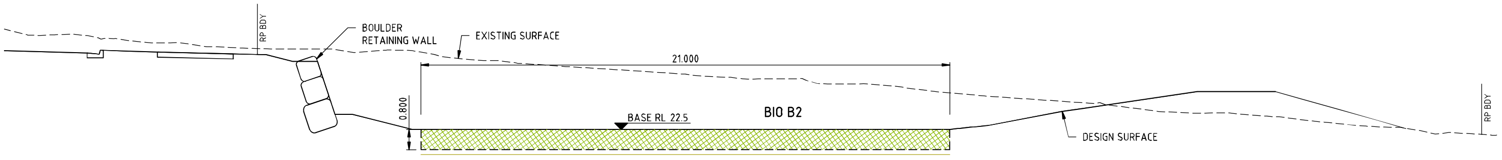
NOT FOR CONSTRUCTION

Project No. Drawing No.	Rev
B00702-DA-CB03	A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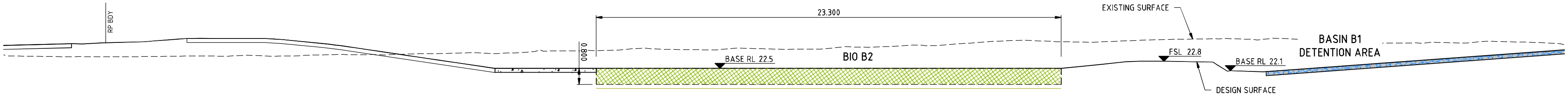
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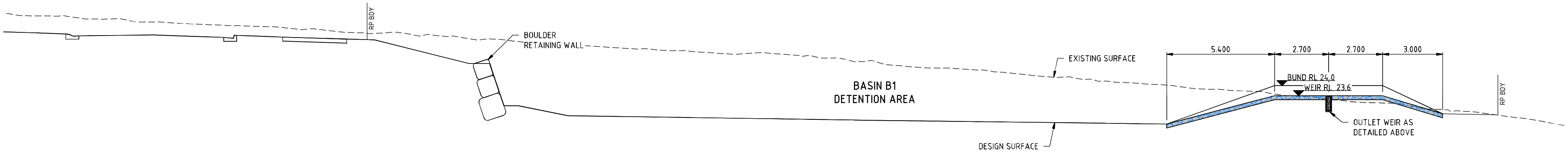
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RP BDY
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DETAILED ABOVE
DESIGN SURFACE

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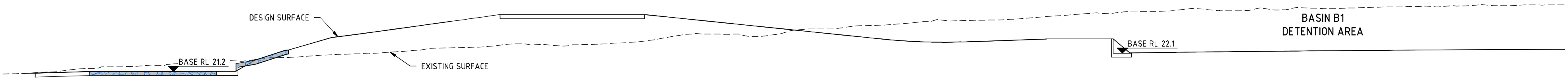
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ENGINEERING CERTIFICATION

Registered Engineer
Date

Registered Accreditation

URBEX
EMPOWER

Client URBEX PTY LTD
Project SOUTHERN THORNLANDS PRECINCT 1
Title BIORETENTION BASIN B2
CROSS SECTIONS

Datum
AHD
PSM 79006
RL 67.474
(RCC) COORD

NOT FOR CONSTRUCTION

Project No. Drawing No. B00702-DA-CB04
Rev A

Amended Sewer Network
Capacity Assessment Required

Appendix E. Sewer Network Capacity Assessment

AMENDED IN RED
By: Nicole Tobias
Date: 19 April 2026
Queensland Government

EMPOWER

www.bmdgroup.global

Precinct 1 Southern Thornlands PDA

Sewer Network Capacity Assessment

FINAL Report V1 - 9 December, 2025

H2One Pty Ltd

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Reviewed by RPEQ	Reg. No.	Signed	Date
Joshua May	18064		9 December, 2025

Version	Date	Author	Reviewer
DRAFT - V1	14 November, 2025	J Meesamphan	J May
FINAL - V1	9 December, 2025	J Meesamphan	J May

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1 INTRODUCTION

1.1 Background

Stages 1 and 2 of Precinct 1 of the Southern Thornlands Priority Development Area (PDA) is currently in the planning phase of the development approval process. The relevant lots are located at 76–94 Springacre Road, 96–108 Springacre Road, 110–118 Springacre Road and 124–138 Springacre Road, Thornlands QLD 4164, comprising of Lot 13 on RP53653, Lot 14 on RP53653, Lot 2 on RP128089 and Lot 16 on RP53653.

The development will comprise of a total of 11 x duplex lots and 165 x residential freehold lots, delivered over two separate stages, as per the following breakdown. Refer to Appendix 1 for the development layout plan and relevant staging.

Stage 1

- 5 × lots with duplex unit
- 88 × residential freehold lots

Stage 2

- 6 × lots with duplex unit
- 77 × residential freehold lots

Empower Engineers and Project Managers Pty Ltd developed a temporary service strategy for the sewer network of Stages 1 and 2. This strategy involves the construction of the proposed regional Sewer Pump Station (SPS), and utilising a temporary pump set and rising main that will extend east and discharges to the Victoria Point Sewage Treatment Plant (STP) catchment. Refer to Appendix 1 for an overview of the proposed strategy.

As part of the infrastructure planning process, a capacity assessment was undertaken on Redland City Council's (RCC) downstream sewer network, to determine if the additional sewage loading from the regional SPS will adversely impact system performance and trigger the need for infrastructure upgrades.

H2One Pty Ltd was engaged to undertake the hydraulic modelling assessment, in accordance with RCC's Design Standards; "*South East Queensland Water Supply and Sewerage Design and Construction Code*" (2025). The results of the study are presented in this report.

1.2 Objectives

The objectives of the project were as follows.

1. Assess the capacity of downstream gravity mains, pressure mains, pumps and wet wells for the relevant sewer catchment; Victoria Point STP pump station (PS).
2. Determine infrastructure upgrades necessary to achieve RCC's minimum Design Standards, where system performance failures have occurred due to the additional loadings of Precinct 1, within the Southern Thornlands PDA.
3. Prepare a network capacity assessment report.

Note: This assessment did *not* *consider the capacity of the sewage treatment plant (STP) or associated treatment processes. The scope of work was limited to assessment of upstream trunk sewer infrastructure only.*

1.3 Sewer Service Strategy

A temporary sewer service arrangement has been proposed to facilitate the initial development of Precinct 1 (Stages 1 and 2), within the Southern Thornlands PDA. The strategy includes the construction of a regional SPS at the southern boundary of Precinct 1, which will ultimately service the wider PDA at full development.

During the interim period, the SPS is planned to operate under a temporary configuration utilising a smaller pump set and rising main that discharges to the existing DN300 gravity main along Intrepid Drive, Victoria Point. From this connection point, flows will be conveyed east through a DN300 to DN600 trunk gravity system to the Victoria Point lift station located on-site of the treatment plant.

This temporary system is expected to remain in operation for approximately five to seven years, providing service until future stages of the Southern Thornlands PDA are developed and the ultimate trunk infrastructure is constructed. Under the ultimate arrangement, the regional SPS will discharge to the Cleveland STP catchment, via planned trunk network extensions.

Based on Redland City Council's (RCC) 2022 Netserv model, the Victoria Point STP PS currently services a catchment population of 34,760 EP, increasing to approximately 39,140 EP by the 2036 planning horizon. An overview of the proposed servicing configuration is provided in Appendices 1 and 2.

1.4 Sewage Generation

A sewage generation assessment was undertaken on the proposed development, to determine the approximate loading attributed to the land-use type and density. This was calculated using RCC's Equivalent Persons (EP) unit rates and average "per capita" sewage generation (200 L/EP/day). For completeness, the ultimate demand of Precinct 1 was adopted for the assessment.

Refer to Table 1 below for a summary of the relevant EP estimates.

Table 1. Estimated sewage generation for Precinct 1 (Ultimate) of the Southern Thornlands PDA

Site Land-use and Density	Demand Rate	EP	ADWF (L/s)	PWWF (L/s)
418 x res. freehold lots	2.7	1,128.6	2.6	13.1
47 x duplex units	2.51 EP/Apt.	197.7	0.5	2.3
140 x 1 bedroom apt.	1.31 EP/Apt.	183.4	0.4	2.1
40 x 2 bedroom apt.	1.76 EP/Apt.	70.4	0.2	0.8
70 x 3 bedroom apt.	2.51 EP/Apt.	175.7	0.4	2.0
3,400 m^2 GFA com.	1.68 EP/100 m^2 GFA	57.1	0.1	0.7
	TOTAL	1,812.9	4.2	21.0

Note: As per the SEQ Code, PWWF flow rates were based on 5 x ADWF @ 200 L/EP/day.

2 METHODOLOGY

2.1 Desired Standards of Service

The design standards adopted for the hydraulic assessment were based on the "*South East Queensland Water Supply and Sewerage Design and Construction Code*" (2025), with exception to the maximum depth of gravity pipe flow at 1.0 m freeboard. This requirement is merely a standard industry practice adopted by water authorities in South-east Queensland, and is not a specific design standard from either the SEQ Code or Water Service Association of Australia (WSAA) Sewerage Code.

A summary of the relevant design provisions utilised for the project is as follows.

Table 2. Design provisions adopted for the hydraulic assessment

	Provision	Specification
Sewerage	ET to EP conversion factor	2.7
	Average Dry Weather Flow (ADWF)	200 L/EP/day
	Peak Wet Weather Flow (PWWF)	5 x ADWF
	Single pump capacity	C1 x ADWF (L/s) where; C1 = 3.5 to 5.0 C1 = 15 x (EP)$^{-0.1587}$
	Pump station operational storage (m^3)	0.9 x Q / N where; Q = Single pump capacity (L/s) N = Number of pump starts per hour, where N = 12 for duty pump motor < 100 kW N = 8 for duty pump motor 100 – 200 kW N = 5 for duty pump motor > 200 kW
	Pump station emergency storage (m^3)	4 hours ADWF
	Total pump station capacity (L/s)	PWWF
	Maximum depth of gravity flow (proposed system)	75% pipe diameter
	Maximum depth of gravity flow (existing system)	1.0 m below manhole level
	Maximum pressure main flow velocity	3.0 m/s

2.2 Network Modelling Assessment

The methodology adopted for the hydraulic analysis of the sewer network is as follows.

1. RCC's latest LGIP MIKE+ sewer network model ("*VP206P_211022_(Netserv_Model_v3)*") was adopted for the hydraulic analysis. This model incorporates the 2022 Netserv planning demands and approved infrastructure upgrades.

   The modelling assessment considered the 2021 and 2036 planning horizons only, as the study relates to a temporary servicing arrangement that will not be relevant to long-term infrastructure planning. For the post-development scenarios, the total sewage loading generated by Precinct 1 was applied to the proposed discharge manhole (Node 114619).

2. The pump capacity of the Victoria Point STP PS was assessed by running the model at PWWF and determining if wet well levels operated within the stand-by pump start/stop settings. This approach was adopted as the STP pump station receives inflows from multiple upstream

pump stations, and therefore represents the most appropriate method for assessing the combined pumping capacity of the system.

If the pump station/s could not maintain acceptable levels and surcharging occurred, pump and/or rising main capacity upgrades were investigated until design standards were achieved.

3. The operational storage of the Victoria Point STP PS wet wells was subsequently evaluated by comparing the required storage capacity, post-development, against wet well volumes between the duty pump start/stop levels.

   If the wet well's operational storage volume was above the minimum requirement, compliance was achieved. If it was below the minimum requirement, upgrades were investigated until design standards were achieved.

4. The flow depth of gravity mains was assessed from the proposed connection point to Victoria Point STP PS, pre- and post-development. To avoid surcharging from potential deficiencies downstream, the relevant pump station was deactivated and the gravity mains discharged directly to an outlet.

   If flow depths could not be maintained within RCC's specifications, pipe augmentations were investigated until Design Standards were achieved.

5. An emergency storage assessment was not undertaken as the proposed regional SPS will be designed to cater for this requirement.

6. Modelling results were verified and findings reported.

3 RESULTS

3.1 Pumps and Rising Mains

A pump capacity assessment was undertaken on the Victoria Point STP PS, as per the methodology described in Section 2.2 of this report. The analysis identified that the existing pump set has sufficient capacity to service the temporary service strategy, up to the 2036 planning horizon. No pump capacity upgrades are therefore required to temporarily service Precinct 1 of the PDA.

Refer to Appendix 3 for detailed modelling results.

3.2 Wet Wells

An assessment on the operational storage capacity of the Victoria Point STP PS wet well was undertaken with the inclusion of the additional EP loading from Precinct 1. Table 3 below shows a summary of results and Appendix 4 provides detailed calculations.

Table 3. Operational storage capacity results (post-development)

Planning Horizon	Storage Available (kL)	Storage Required (kL)	Difference (kL)
2021	30.1	23.3	+6.8
2036	30.1	26.2	+4.0

Note 1: The Precinct 1 sewage loading contributed approximately 1.4 kL towards the operational storage requirement.

Note 2: The duty pump power rating (< 100 kW) was estimated based on model flow and discharge pressure results presented in the model.

The results in the above table demonstrate that there is sufficient operational storage capacity to incorporate the additional sewage loading, up to the 2036 planning horizon. No wet well capacity upgrades are therefore required to temporarily service Precinct 1.

3.3 Gravity Mains

As outlined in Section 2.2, gravity main flow depths were assessed against RCC’s minimum design requirements, from the discharge point to the Victoria Point STP PS. The analysis confirmed that the existing gravity main system has sufficient capacity to accommodate the proposed site loading up to the 2036 planning horizon. Accordingly, no gravity main upgrades are required to accommodate the temporary service strategy.

At the 2036 planning scenario, a single overflow event was observed at the manhole located immediately downstream of the proposed discharge point (MH ID: *1_3021C*). However, this was determined to be a likely model anomaly, as no ground cover was present at the manhole, and RCC’s online mapping indicated no physical manhole at the reported location. A subsequent sensitivity check was completed, assuming 600 mm of cover, which confirmed that the system operates satisfactorily under these conditions.

The gravity system was also assessed under a 4 × ADWF peaking factor (16.8 L/s) for Precinct 1. The results showed that all gravity mains operated with a Hydraulic Grade Line (HGL) contained within pipe. As the development area will be of new construction, the short-term PWWF is expected to be closer to 4 × ADWF, rather than 5 × ADWF, consistent with the SEQ Code provisions for “NuSewer” systems.

Refer to Appendix 5 for detailed modelling results and gravity main profiles.

4 CONCLUSION

Stages 1 and 2 of Precinct 1 of the Southern Thornlands Priority Development Area (PDA) is currently in the planning phase of the development approval process. The relevant lots are located at 76–94 Springacre Road, 96–108 Springacre Road, 110–118 Springacre Road and 124–138 Springacre Road, Thornlands QLD 4164, comprising of Lot 13 on RP53653, Lot 14 on RP53653, Lot 2 on RP128089 and Lot 16 on RP53653.

The development will comprise of a total of 11 x duplex lots and 165 x residential freehold lots, delivered over two separate stages, as per the following breakdown. Refer to Appendix 1 for the development layout plan and relevant staging.

Stage 1

- 5 × lots with duplex unit
- 88 × residential freehold lots

Stage 2

- 6 × lots with duplex unit
- 77 × residential freehold lots

Empower Engineers and Project Managers Pty Ltd developed a temporary service strategy for the sewer network of Precinct 1 (Stages 1 and 2). This strategy involves the construction of the proposed regional Sewer Pump Station (SPS), and utilising a temporary pump set and rising main that will extend east and discharges to the Victoria Point Sewage Treatment Plant (STP) catchment.

As part of the infrastructure planning process, a capacity assessment was undertaken on Redland City Council’s (RCC) downstream sewer network, to determine if the additional sewage loading from the regional SPS will adversely impact system performance and trigger the need for infrastructure upgrades. For completeness, it was assumed that the ultimate demand of Precinct 1 would be utilised for the assessment (1,813 EP). H2One Pty Ltd was engaged to undertake the hydraulic modelling assessment, in accordance with RCC’s Design Standards; “*South East Queensland Water Supply and Sewerage Design and Construction Code*” (2025).

The hydraulic analysis determined that there was sufficient capacity in the downstream sewer network to incorporate the additional loading of Precinct 1, up to the 2036 planning horizon. The gravity main assessment did identify an over flow event at a manhole downstream of the proposed connection point, however further investigation identified that this was likely to be a model error, as no ground cover was present at the manhole, and RCC’s online mapping indicated no physical manhole at the reported location. A subsequent sensitivity check was completed, assuming 600 mm of cover, which confirmed that the system operates satisfactorily under these conditions. In addition, the adoption of 4 x ADWF for a “NuSewer” system determined that all gravity main pipes operated with flow depths below pipe obvert. No sewer infrastructure upgrades are therefore required to service the proposed temporary pumping strategy, up to the 2036 planning horizon.

It is recommended that RCC reviews the findings presented in this report and approves the proposed temporary service strategy for Precinct 1 of the Southern Thornlands PDA. Detailed modelling results and system plans can be observed in Appendices 1 through 5.

5 REFERENCE LIST

RCC. (2025). *SEQ Water Supply and Sewerage Design and Construction Code*. Cleveland, QLD

RCC. (2018). *Redland City Plan 2018, Version 12*. Cleveland, QLD

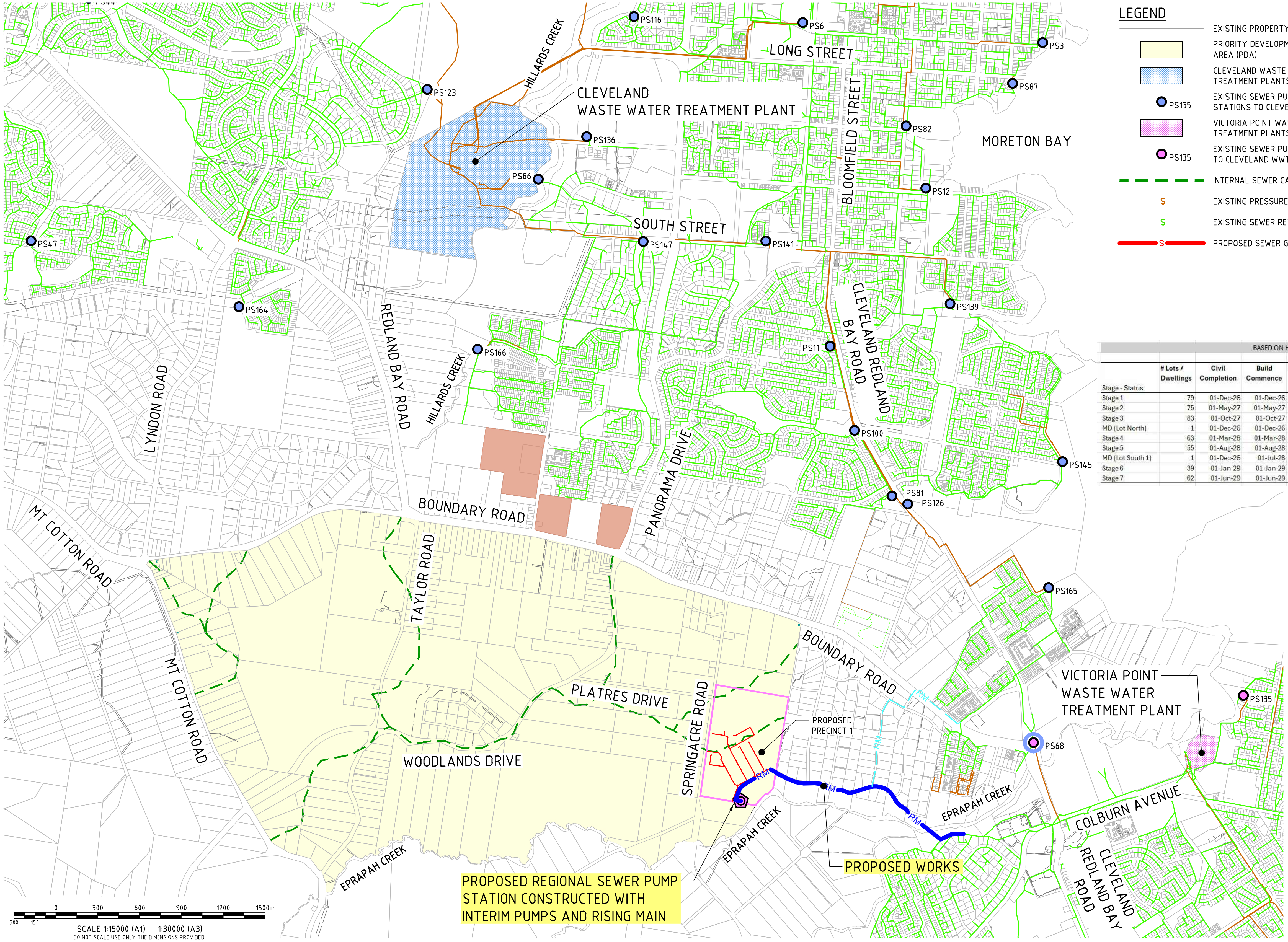
6 APPENDICES

Appendix 1. Proposed temporary service strategy for sewer infrastructure

SOUTHERN THORNLANDS SEWER STRATEGY

PRECINCT 1 SEWER STAGING OPTIONS

PHASE □ □SEWER RISING MAIN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PS6
PS3
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HILLARDS CREEK
PS123
PS87
CLEVELAND
WASTE WATER TREATMENT PLANT
BLOOMFIELD STREET
PS82
PS136
MORETON BAY
PS86
PS12
SOUTH STREET
PS47
PS147
PS141
CLEVELAND REDLAND BAY ROAD
PS139
PS164
REDLAND BAY ROAD
HILLARDS CREEK
PS166
PS11
LYNDON ROAD
PANORAMA DRIVE
PS100
PS145
BOUNDARY ROAD
PS81
PS126
MT COTTON ROAD
TAYLOR ROAD
PS165
BOUNDARY ROAD
PLATRES DRIVE
SPRINGACRE ROAD
PROPOSED PRECINCT 1
VICTORIA POINT
WASTE WATER
TREATMENT PLANT
PS135
PS68
MT COTTON ROAD
WOODLANDS DRIVE
RM
EPRAPAH CREEK
COLBURN AVENUE
EPRAPAH CREEK
EPRAPAH CREEK
CLEVELAND REDLAND BAY ROAD

PROPOSED WORKS

PROPOSED REGIONAL SEWER PUMP STATION CONSTRUCTED WITH INTERIM PUMPS AND RISING MAIN

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300 150

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DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

LEGEND

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▨	CLEVELAND WASTE WATER TREATMENT PLANTS
● PS135	EXISTING SEWER PUMP STATIONS TO CLEVELAND WWTP
▨	VICTORIA POINT WASTE WATER TREATMENT PLANTS
● PS135	EXISTING SEWER PUMP STATIONS TO CLEVELAND WWTP
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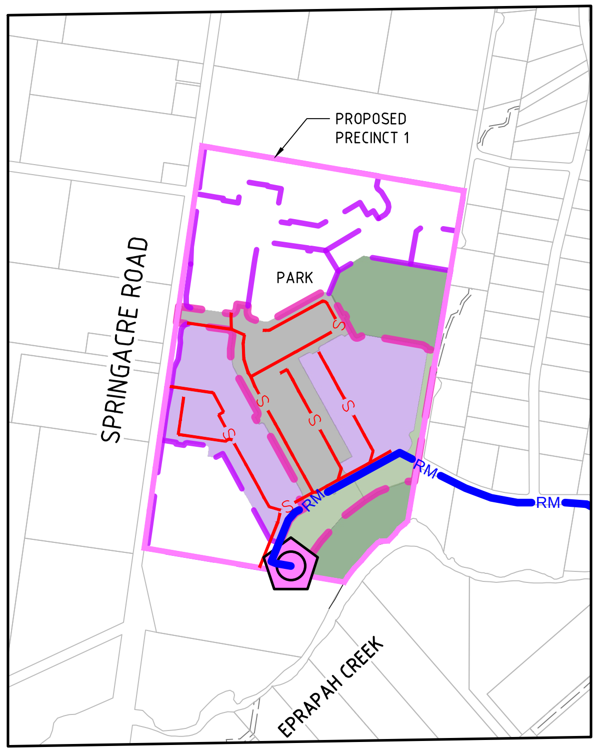
—S—	EXISTING PRESSURED SEWER RETICULATION
—S—	EXISTING SEWER RETICULATION
—S—	PROPOSED SEWER GRAVITY MAIN
🟫	KNOWN DEVELOPMENT APPLICATIONS WITH SEWER ACCESS
⬠	PROPOSED SEWER RISING PUMP STATION
—RM—	PROPOSED SEWER RISING MAIN
– –RM– –	PROPOSED SEWER RISING MAIN (ALTERNATE ALIGNMENT)
—	PROPOSED PRECINCT 1 SITE AREA

BASED ON HOUSE/BUILDING LIKLEY OCCUPIED - (APPROX people moving andusing)

Stage - Status	# Lots / Dwellings	Civil Completion	Build Commence	House / MD Build timeframe (months)	*House / MD first occupied date*	EP / dwelling	EP	EP (cummulative)	Months to requirement	Refer below for phased lot extents
Stage 1	79	01-Dec-26	01-Dec-26	6	*01-Jul-27*	2.7	213.3	213	23	▨
Stage 2	75	01-May-27	01-May-27	6	*01-Dec-27*	2.7	202.5	416	28	🟪
Stage 3	83	01-Oct-27	01-Oct-27	6	*01-May-28*	2.7	224.1	640	33	🟪
MD (Lot North)	1	01-Dec-26	01-Dec-26	18	*01-Jul-28*		573	1,213	35	▨
Stage 4	63	01-Mar-28	01-Mar-28	6	*01-Oct-28*	2.7	170.1	1,383	38	
Stage 5	55	01-Aug-28	01-Aug-28	6	*01-Mar-29*	2.7	148.5	1,532	43	
MD (Lot South 1)	1	01-Dec-26	01-Jul-28	12	*01-Aug-29*		242	1,774	48	▨
Stage 6	39	01-Jan-29	01-Jan-29	6	*01-Aug-29*	2.7	105.3	1,879	48	
Stage 7	62	01-Jun-29	01-Jun-29	6	*01-Jan-30*	2.7	167.4	2,046	53	


PROPOSED PRECINCT 1
PARK
SPRINGACRE ROAD
S
RM
EPRAPAH CREEK

CONCEPT ONLY SUBJECT TO DETAIL INVESTIGATION AND DESIGN

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File Name: S:\12ds\data\MAN12DSYN01\B00705_2644\4 CIVIL-DRGS\4.1 SKETCHES\B00705-SK-SEW

REVISION IN PROGRESS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ORIGINAL ISSUE	ES	PDW	DH	MKB	04/08/25

ENGINEERING CERTIFICATION

Registered Engineer

Date

Registered Accreditation

EMPOWER

Client

Project **SOUTHERN THORNLANDS SEWER STRATEGY**

Title **PRECINCT 1 SEWER STAGING OPTIONS**
PHASE 2 - SEWER RISING MAIN

Datum
AHD
PSM .
RL .
(MGA) COORD

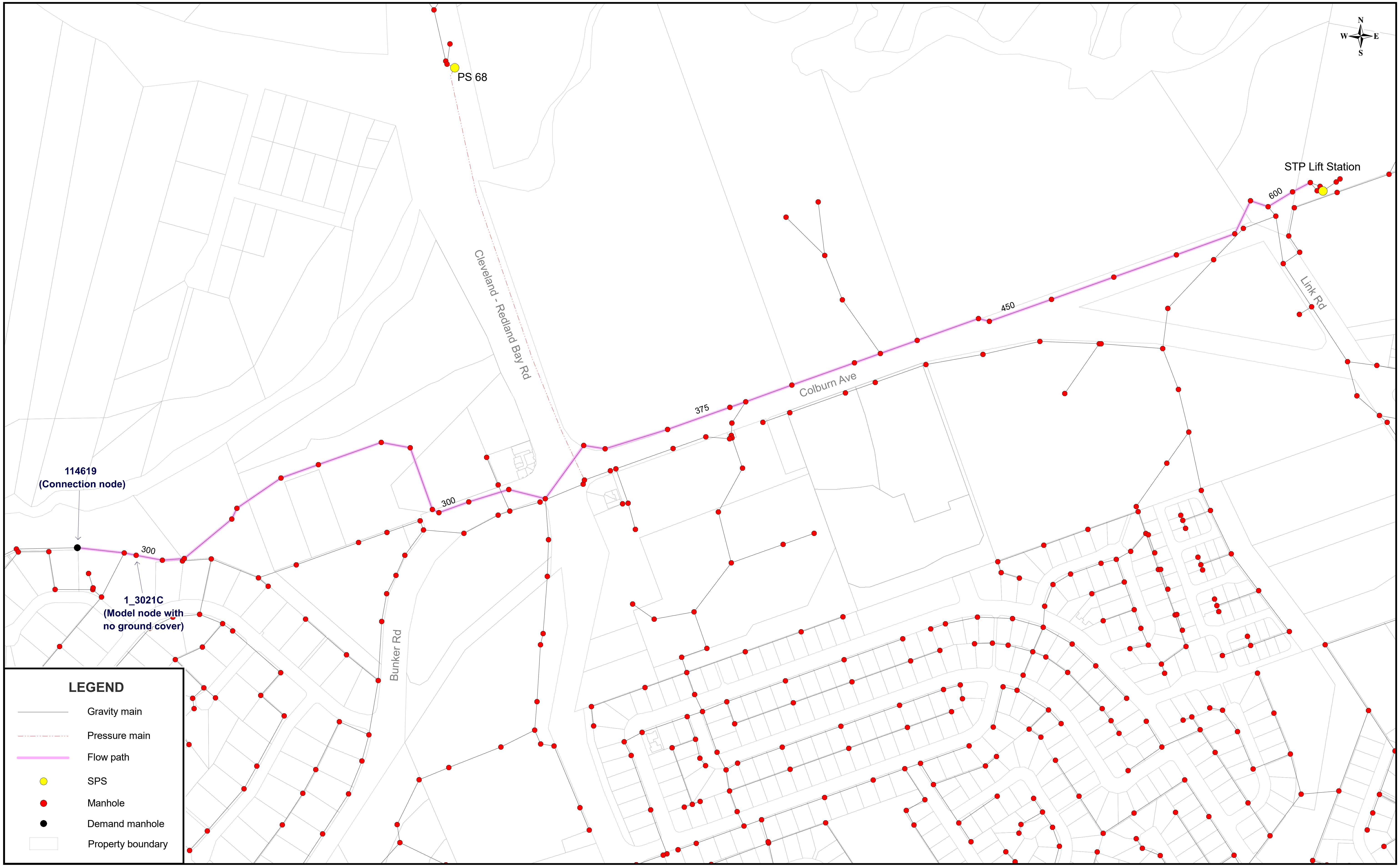
N

NOT FOR CONSTRUCTION

Project No. Drawing No. **B00705-SK-S112**

Rev **A**

Appendix 2. Sewer network model layout plan


N
W
E
S
PS 68
STP Lift Station
600
Link Rd
450
Colburn Ave
375
Cleveland - Redland Bay Rd
114619
(Connection node)
300
300
1_3021C
(Model node with
no ground cover)
Bunker Rd
LEGEND
Gravity main
Pressure main
Flow path
SPS
Manhole
Demand manhole
Property boundary

H2ONE

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H2One Pty Ltd gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

DESIGNED:
J Meesamphan

DRAWN:
J Meesamphan

CHECKED:
J May

APPROVED:
J May

CLIENT PM:

H2ONE PM:
J May

NOTE: DESIGN NOT TO BE AMENDED WITHOUT H2ONE ACCEPTANCE

No.	REVISION	APPROVED
A	ORIGINAL ISSUE - 14 NOV, 2025	

DATUM:
HORIZ: MGA94 (ZONE 56)
HEIGHT: AHD

SCALE:
0 100 200
Metres

SURVEYED BY / DATE:

SURVEY CHECKED:

H2ONE REFERENCES

PROJECT NO:
2307576

FILE REFERENCE:

CAD FILE:

Redland
CITY COUNCIL

Redland City Council
PO Box 21
Cleveland QLD 4163

Precinct 1, Southern Thornlands PDA
Sewer Network Capacity Assessment

Appendix 2. Sewer network model layout plan

ORIGINAL ISSUE DATE:
NOV, 2025

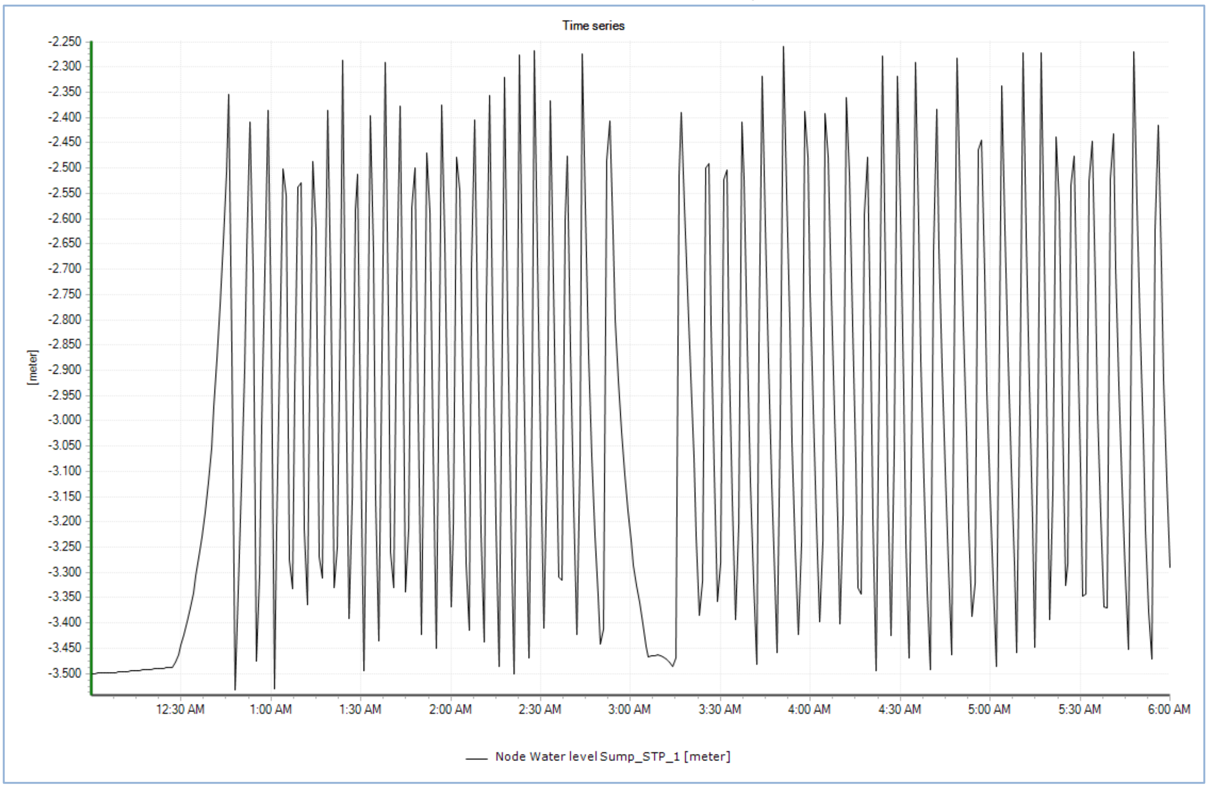
DATE SCANNED:

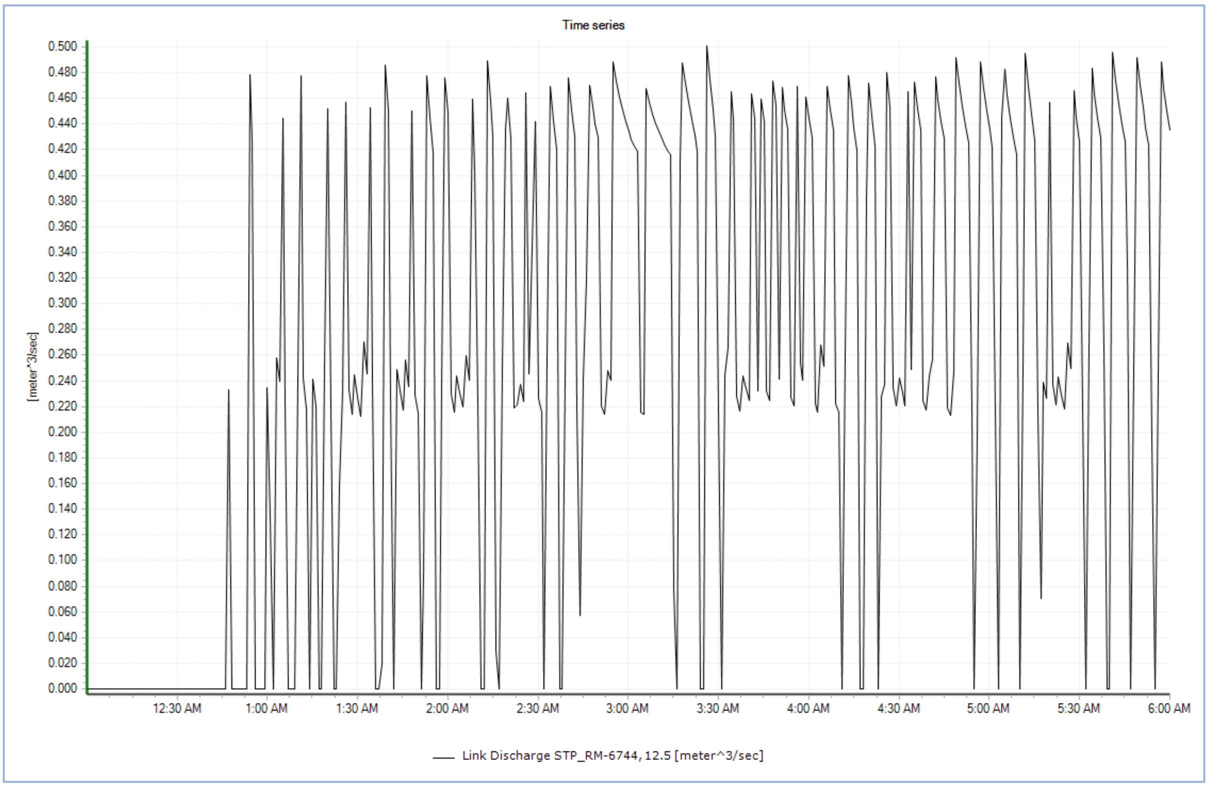
DRG No:

REV:

Appendix 3. Pump capacity assessment results

Victoria Point STP PS @ 2021 Pre-develop. (5 x ADWF)





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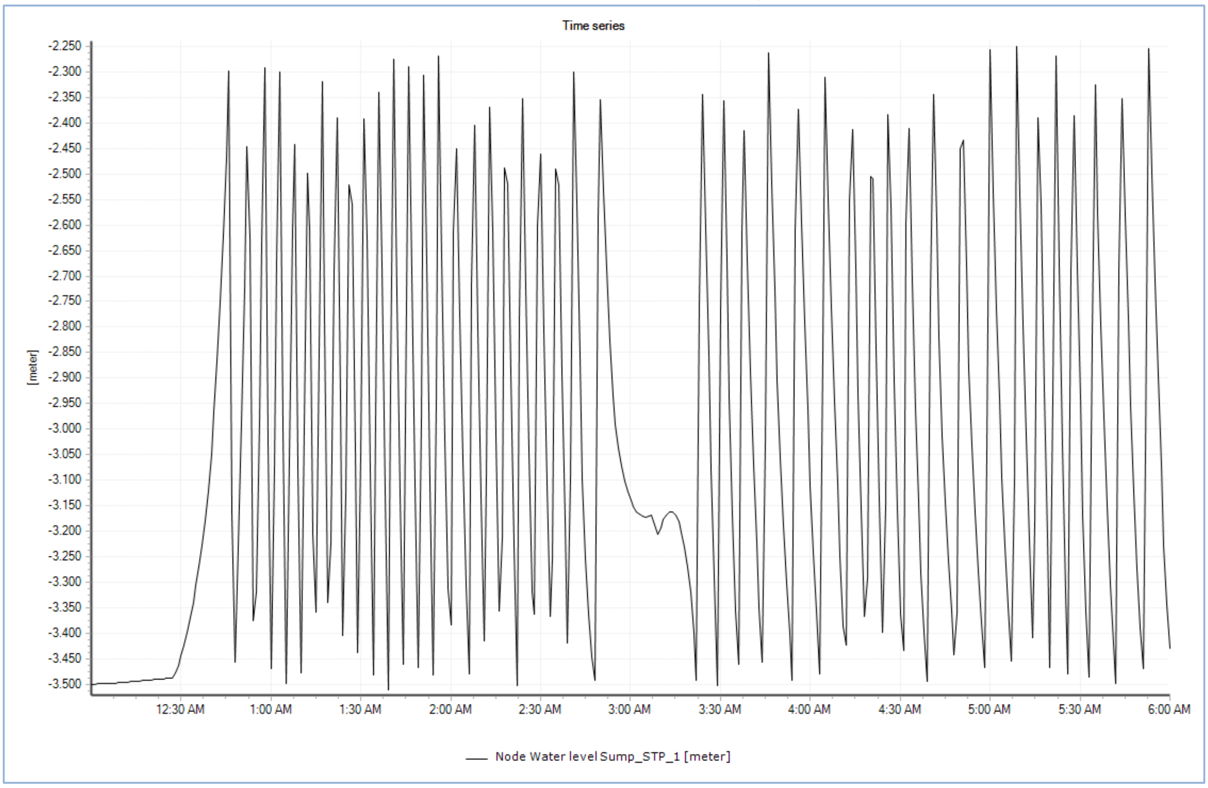

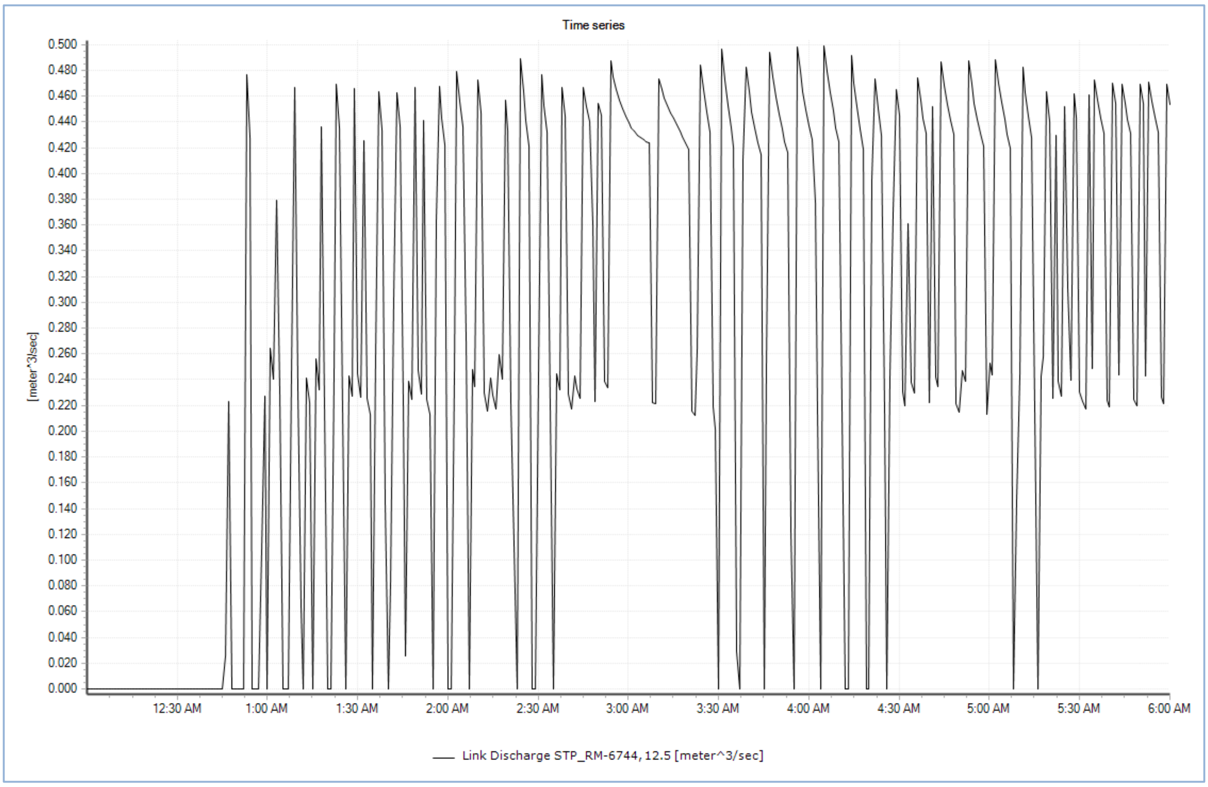

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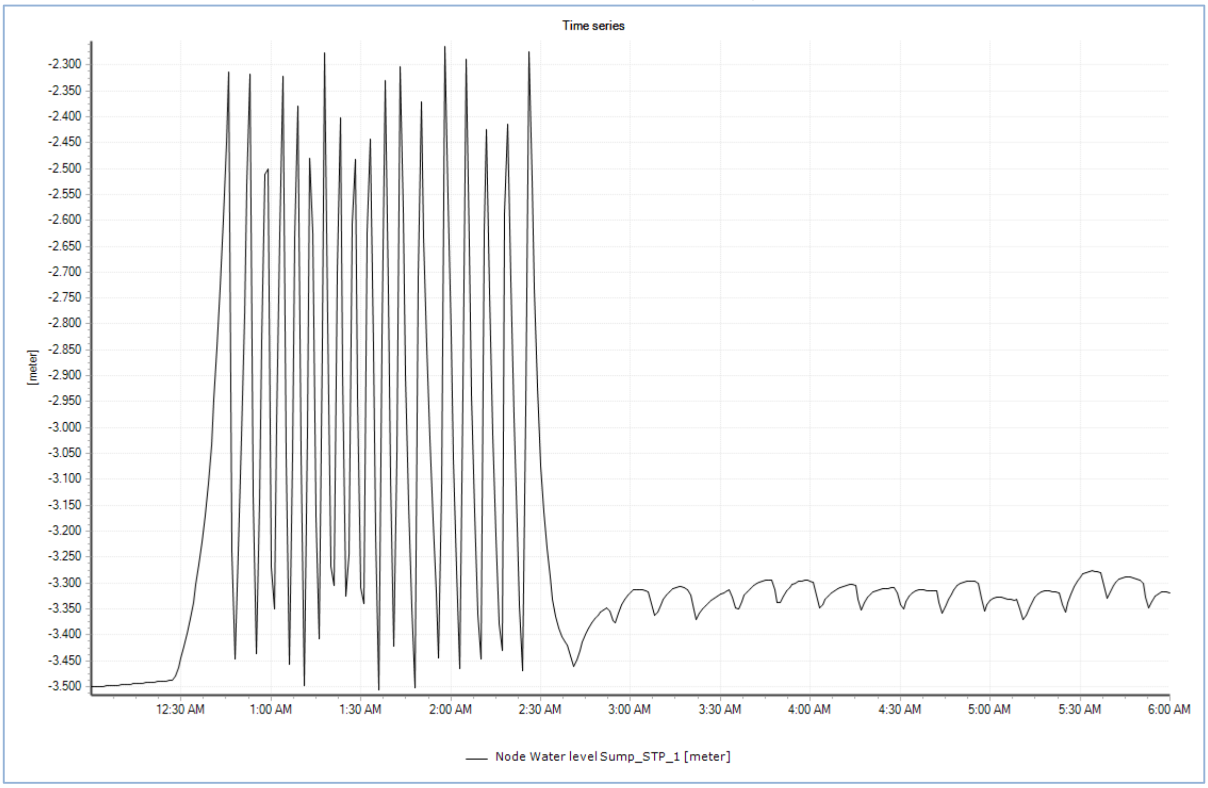

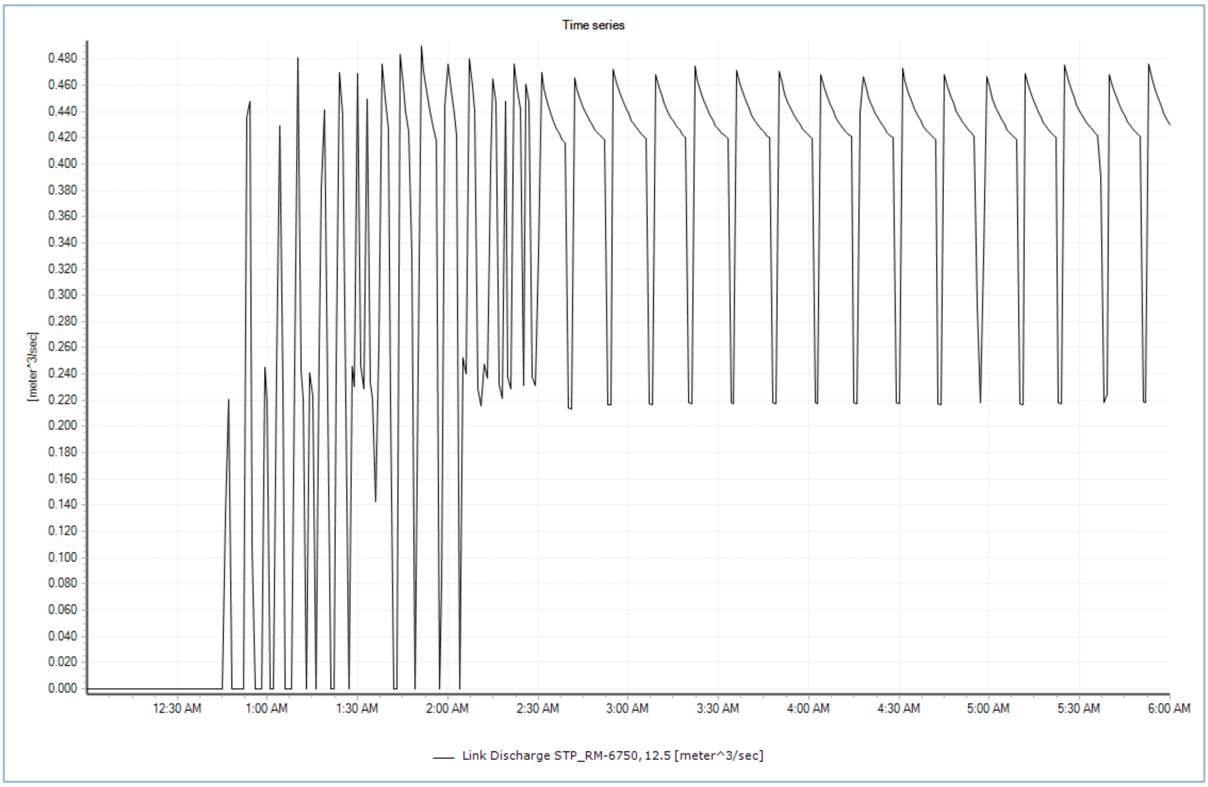

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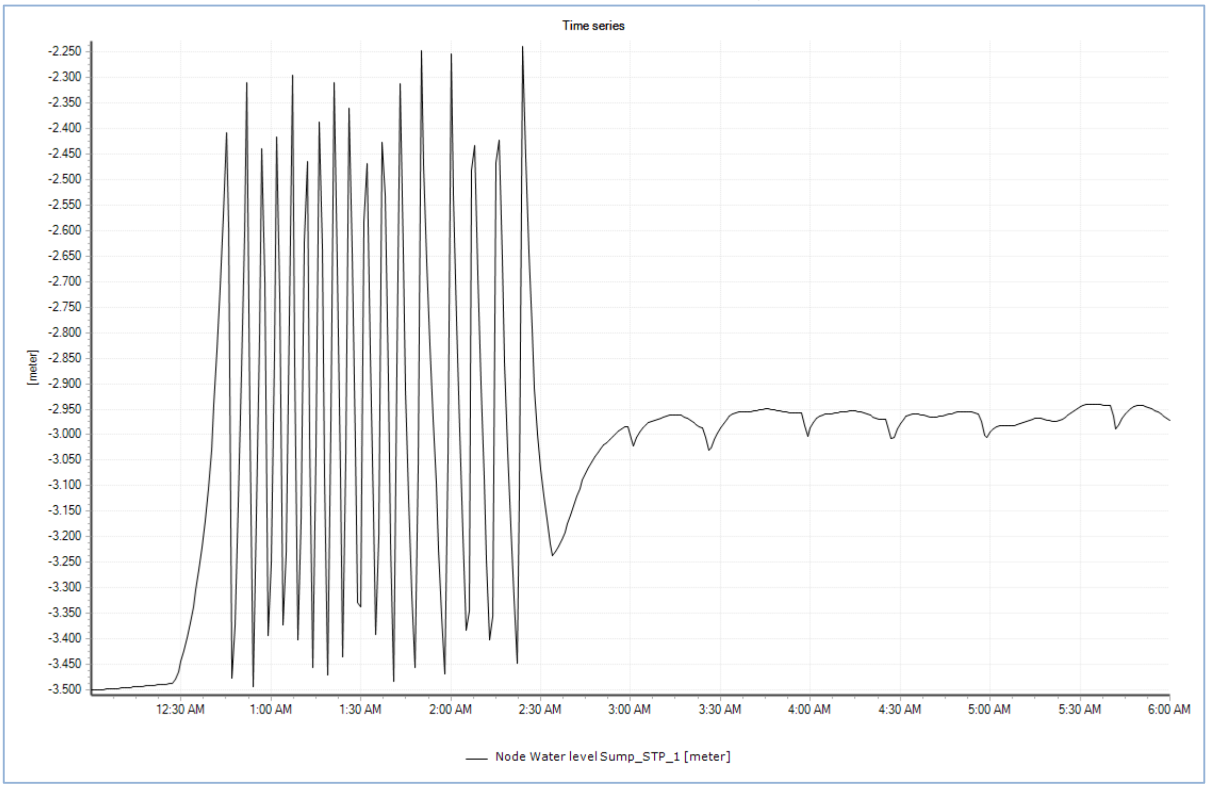
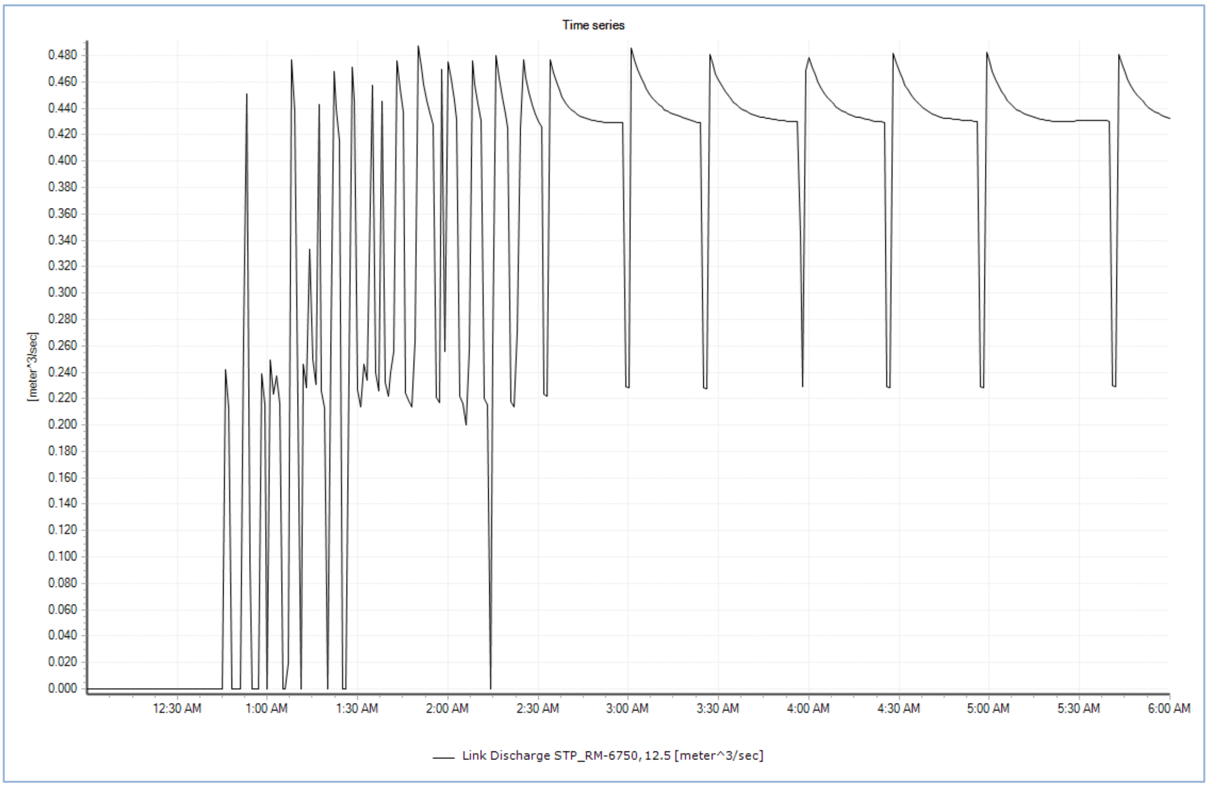
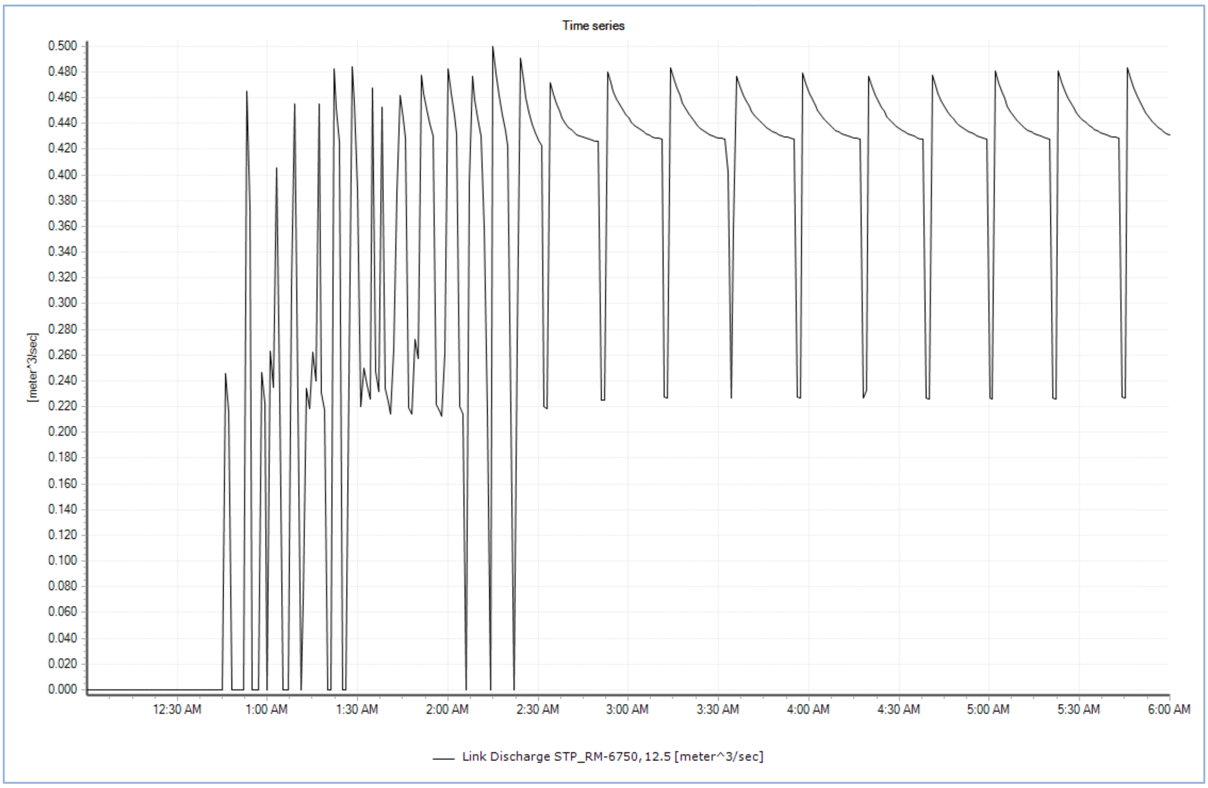
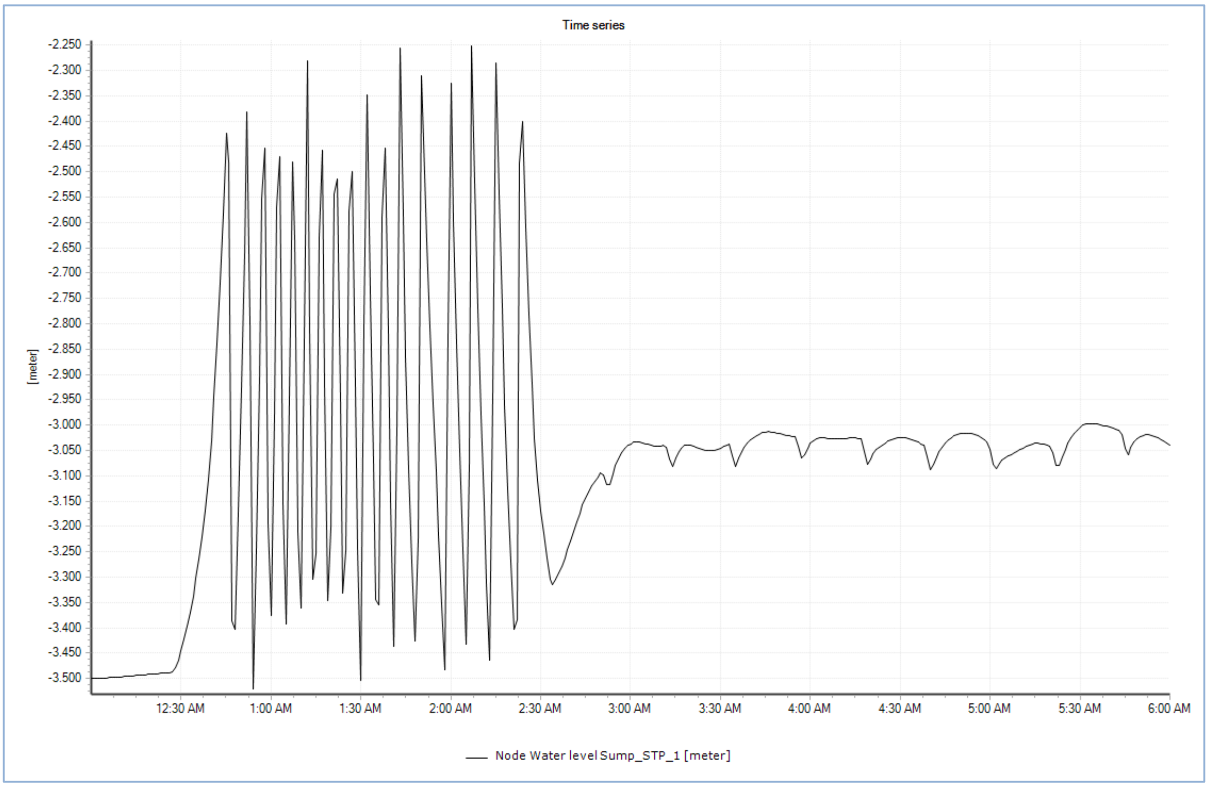


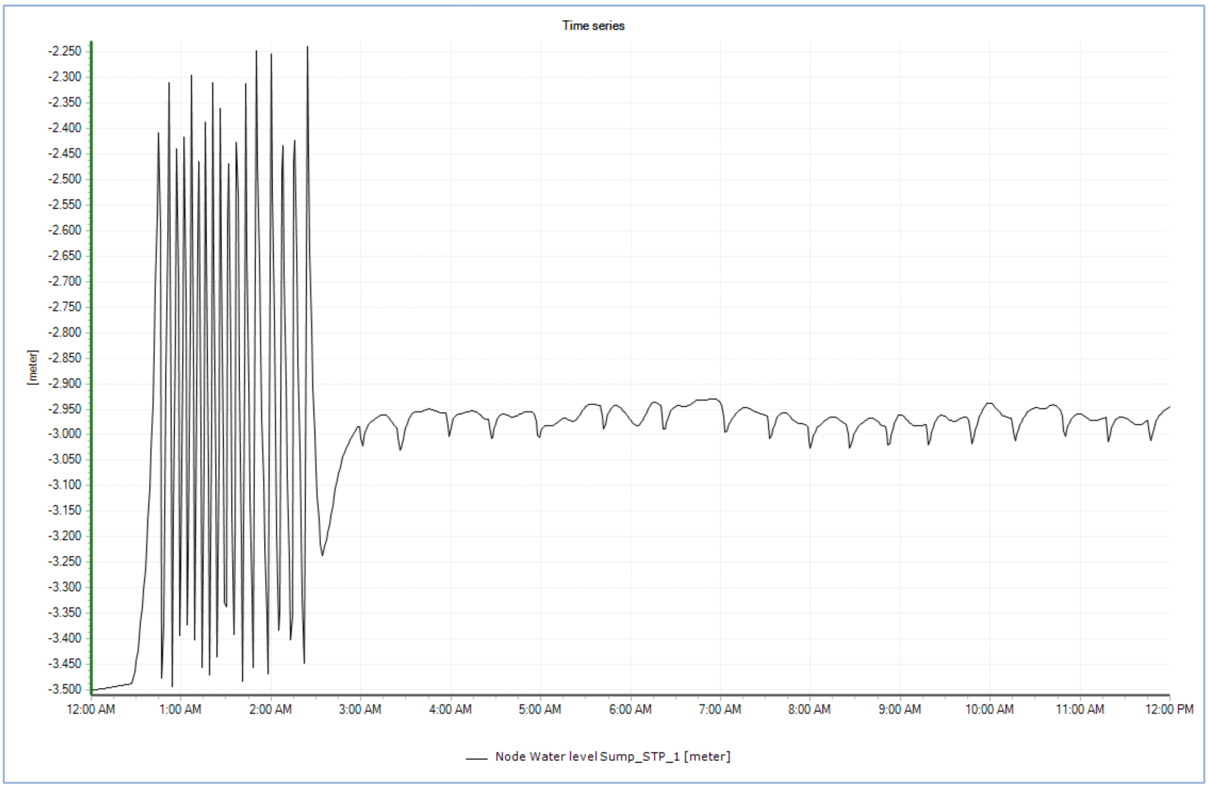


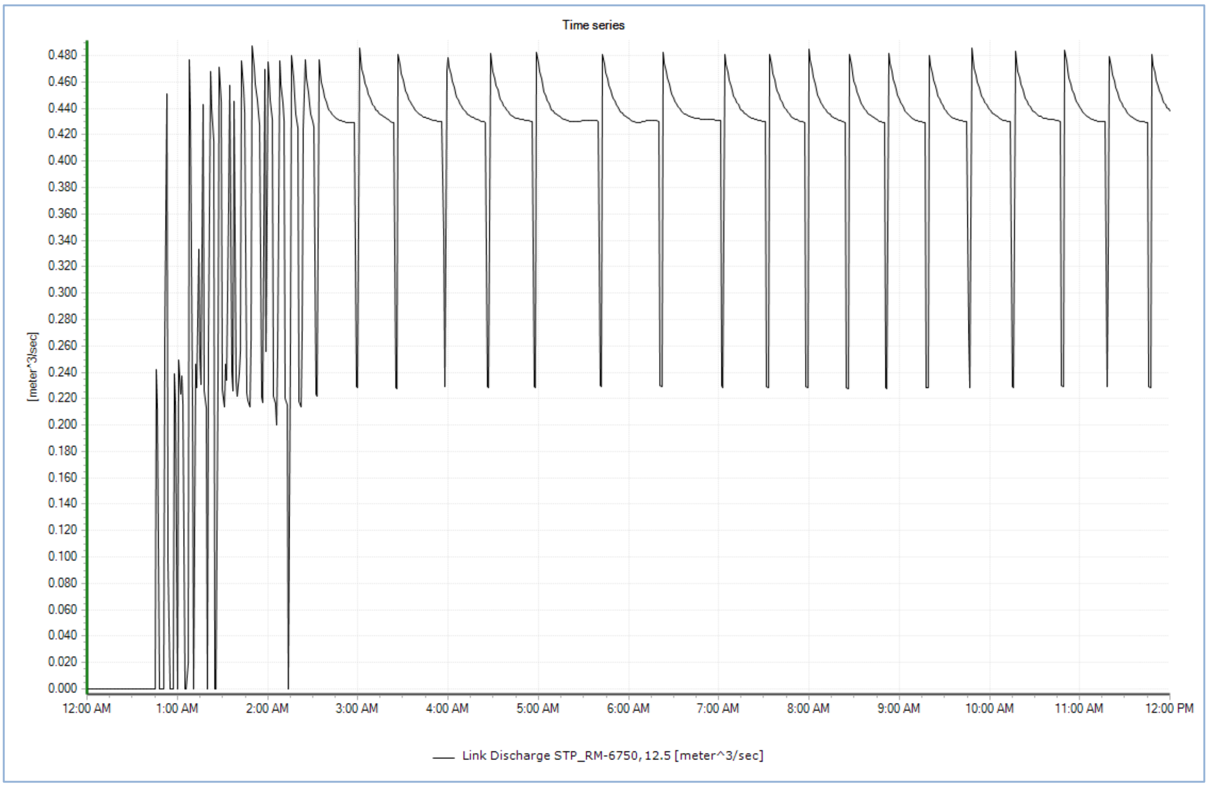
Victoria Point STP PS @ 2036 Post-develop. (4 x ADWF)





Victoria Point STP PS @ 2036 Post-develop. – With Corrected Manhole (Extended 12Hr Model Run Duration)





Appendix 4. Operational storage capacity assessment results

		2021	2036
Single Pump Capacity Required	C1	3.50	3.50
	ADWF (L/s)	88.90	99.78
	Q (L/s)	311.14	349.22
Storage Capacity Required	Pump Setup	Duty-assist	Duty-assist
	Duty Head (m)	NA	NA
	Pump Efficiency (%)	NA	NA
	Duty Power (kW)	<100.00	<100.00
	No. pump starts (n)	12.00	12.00
	Volume (kL)	23.34	26.19
Storage Capacity Available	Duty Start (RL m)	-2.30	-2.30
	Duty Stop (RL m)	-3.50	-3.50
	Duty Height (m)	1.20	1.20
	WW Diam. (m)	4.00	4.00
	Volume (kL)	30.14	30.14
OUTCOME	**Difference (kL)**	**+6.84**	**+3.95**
	Pass / Fail	**Pass**	**Pass**

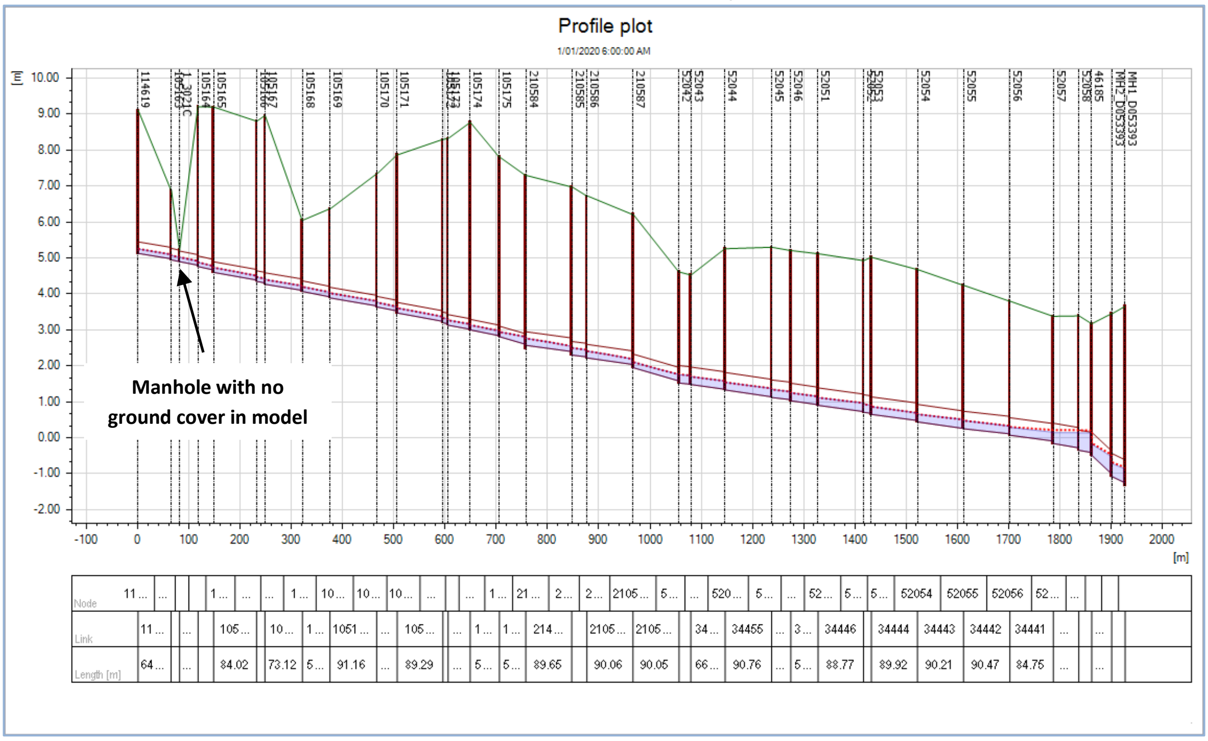
Note 1: Wet well and pump details were sourced from RCC’s hydraulic model.

Note 2: The above table shows results at post-development.

Note 3: The duty pump power rating (< 100 kW) was estimated based on model flow and discharge pressure results presented in the model.

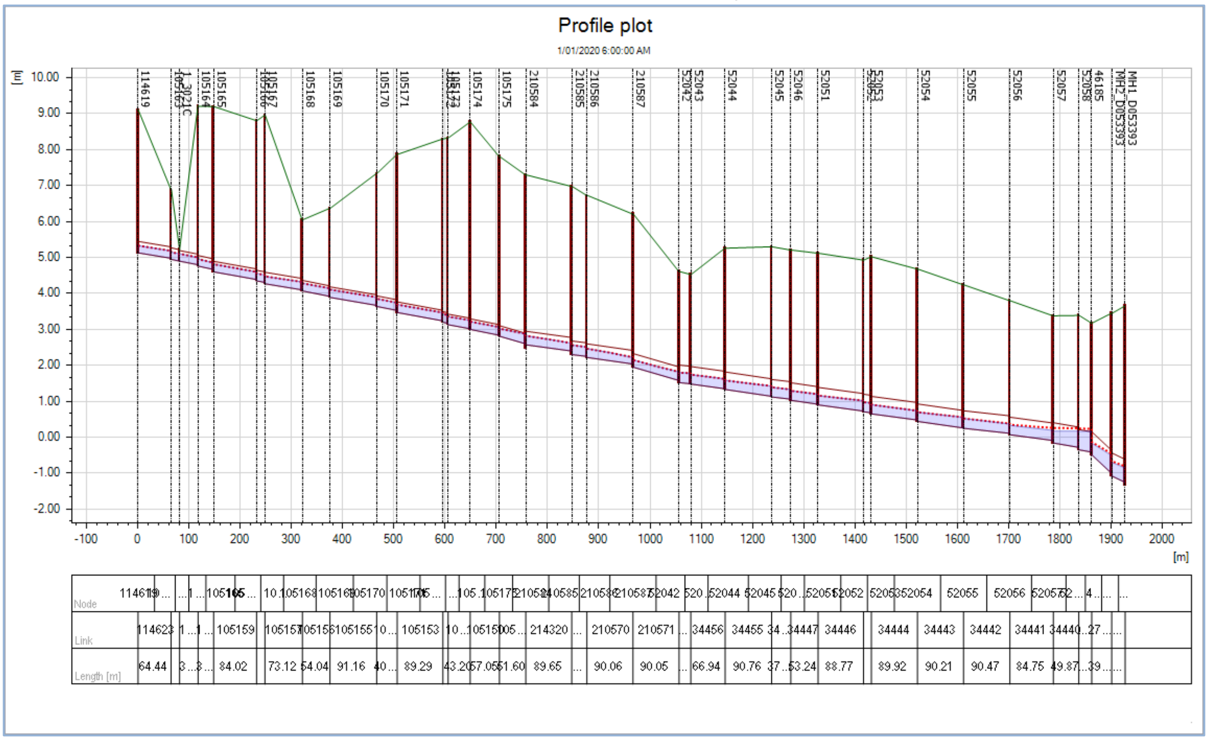
Appendix 5. Gravity main capacity assessment results

Victoria Point STP PS @ 2021, Pre-development (5 x ADWF)

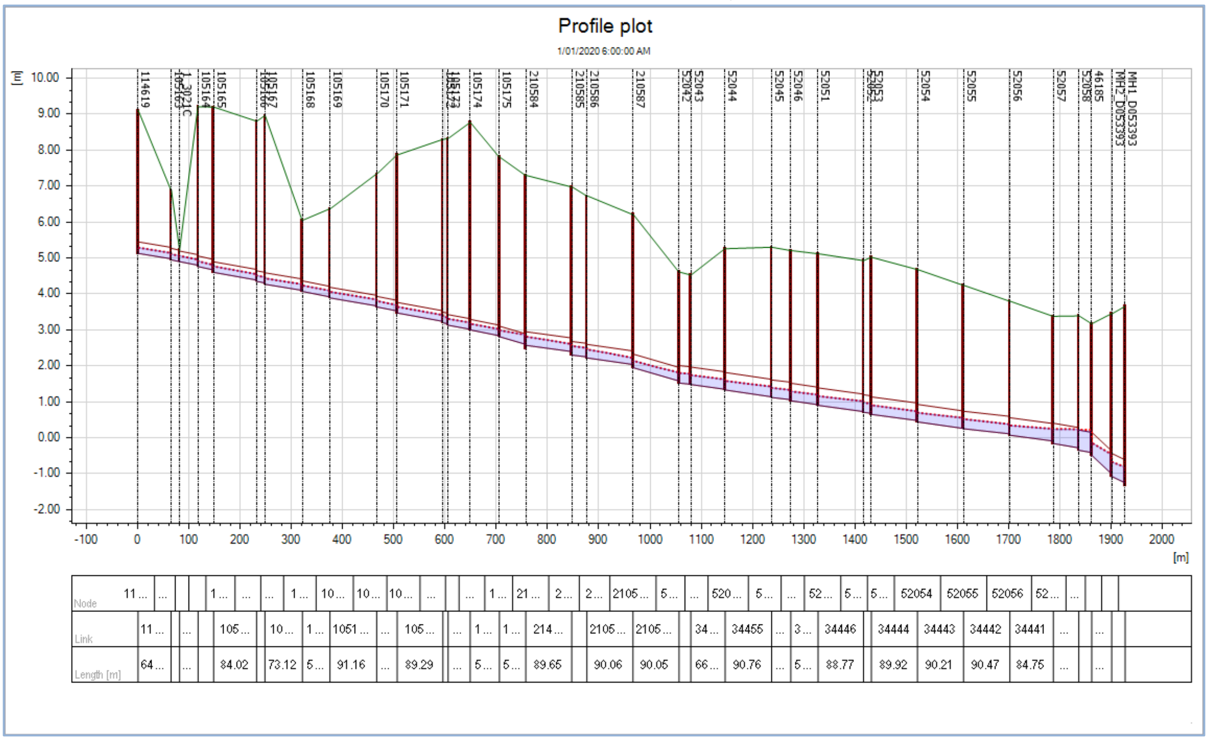


Manhole with no ground cover in model

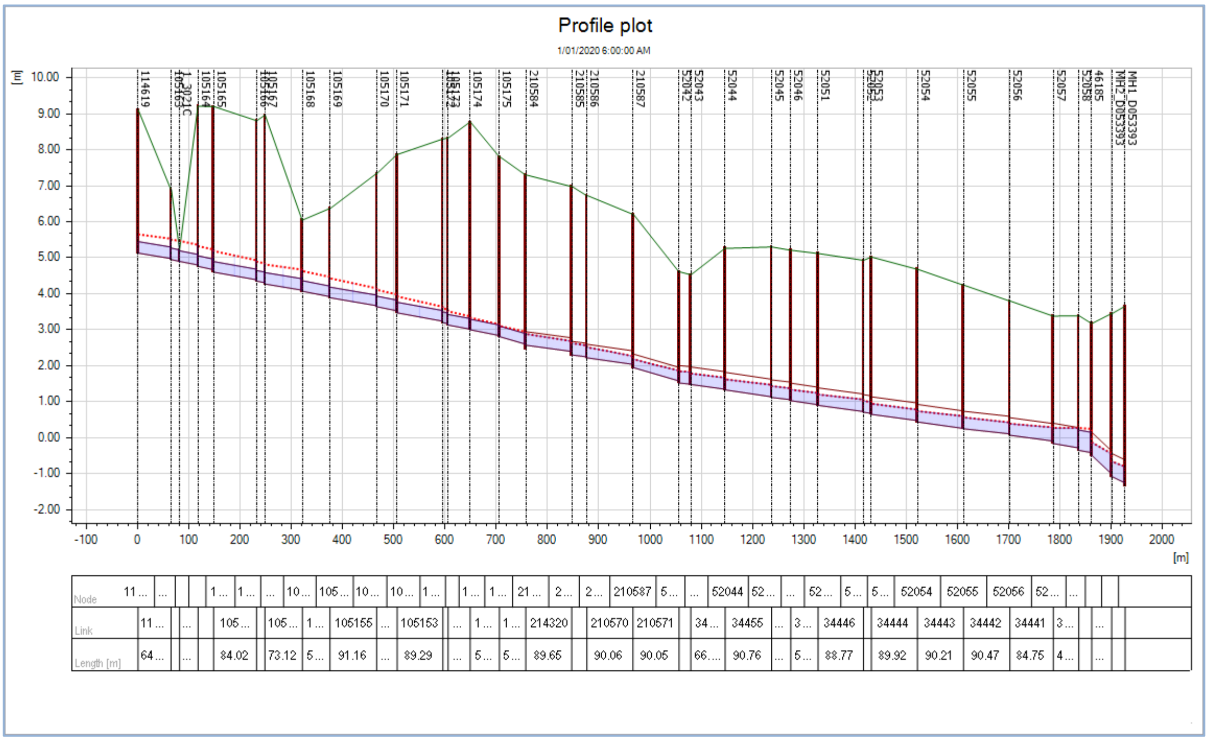
Victoria Point STP PS @ 2021, Post-development (5 x ADWF)



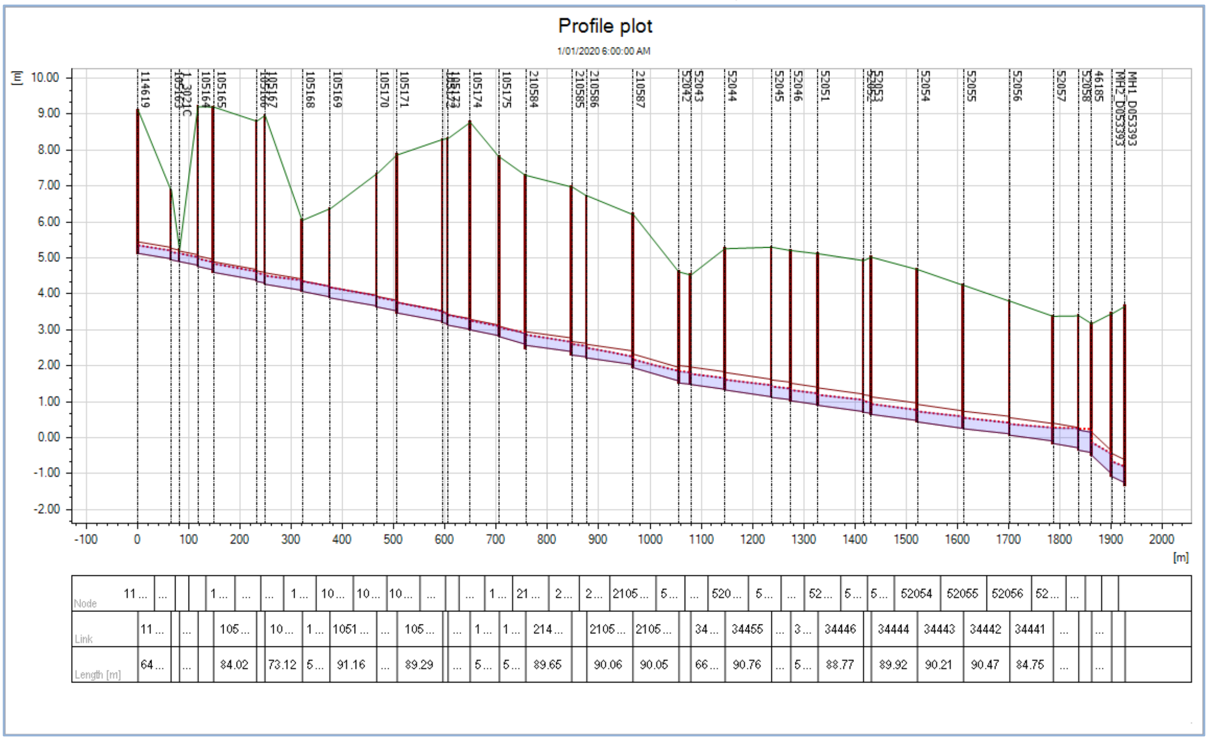
Victoria Point STP PS @ 2036, Pre-development (5 x ADWF)



Victoria Point STP PS @ 2036, Post-development (5 x ADWF)



Victoria Point STP PS @ 2036, Post-development (4 x ADWF)


Profile plot

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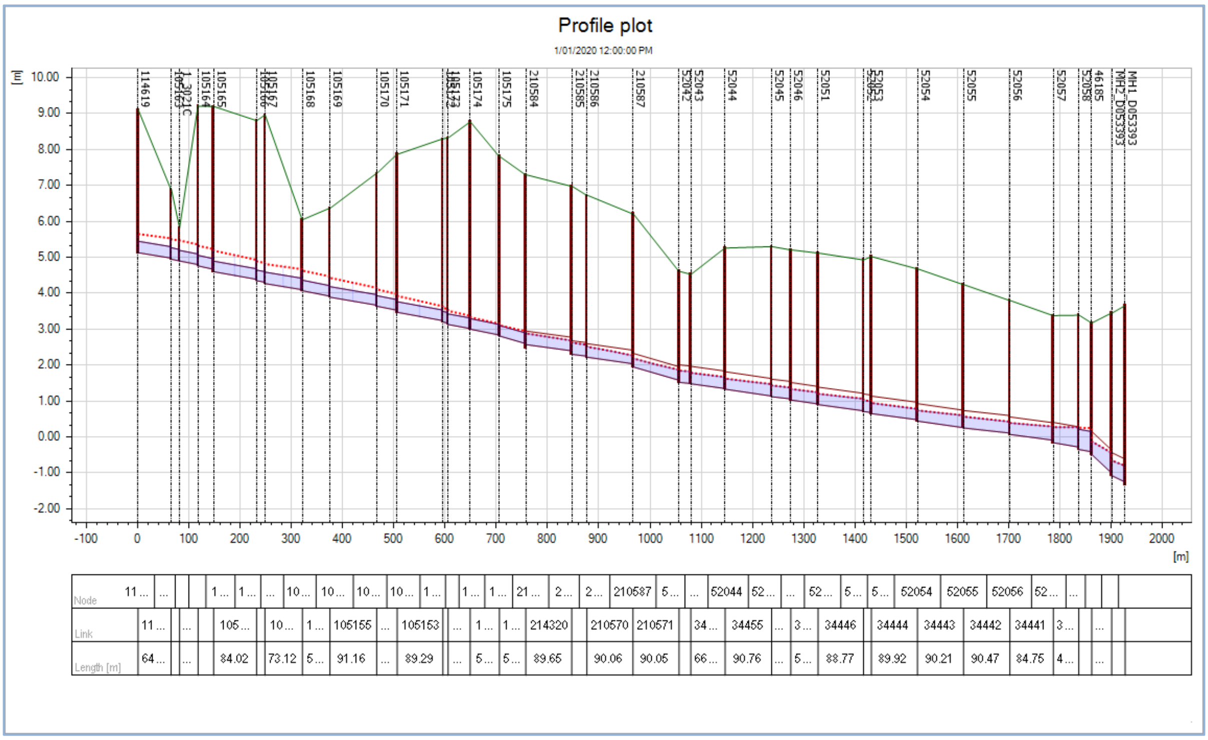
Node: 11 ... | ... | 1 ... | ... | ... | 1 ... | 10 ... | 10 ... | 10 ... | ... | ... | 1 ... | 21 ... | 2 ... | 2 ... | 2105 ... | 5 ... | ... | 520 ... | 5 ... | ... | 52 ... | 5 ... | 5 ... | 52054 | 52055 | 52056 | 52 ... | ...

Link: 11 ... | ... | 105 ... | 10 ... | 1 ... | 1051 ... | ... | 105 ... | ... | 1 ... | 1 ... | 214 ... | 2105 ... | 2105 ... | 34 ... | 34455 | ... | 3 ... | 34446 | 34444 | 34443 | 34442 | 34441 | ... | ...

Length [m]: 64 ... | ... | 84.02 | 73.12 | 5 ... | 91.16 | ... | 89.29 | ... | 5 ... | 5 ... | 89.65 | 90.06 | 90.05 | 66 ... | 90.76 | ... | 5 ... | 88.77 | 89.92 | 90.21 | 90.47 | 84.75 | ... | ...

Victoria Point STP PS @ 2036, Post-development - Corrected Manhole with 600 mm Cover (5 x ADWF)


Profile plot

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Node: 11 ... | ... | 1 ... | 1 ... | ... | 10 ... | 10 ... | 10 ... | 10 ... | 1 ... | 1 ... | 1 ... | 21 ... | 2 ... | 2 ... | 210587 | 5 ... | ... | 52044 | 52 ... | ... | 52 ... | 5 ... | 5 ... | 52054 | 52055 | 52056 | 52 ... | ...

Link: 11 ... | ... | 105 ... | 10 ... | 1 ... | 105155 | ... | 105153 | ... | 1 ... | 1 ... | 214320 | 210570 | 210571 | 34 ... | 34455 | ... | 3 ... | 34446 | 34444 | 34443 | 34442 | 34441 | 3 ... | ...

Length [m]: 64 ... | ... | 84.02 | 73.12 | 5 ... | 91.16 | ... | 89.29 | ... | 5 ... | 5 ... | 89.65 | 90.06 | 90.05 | 66 ... | 90.76 | ... | 5 ... | 88.77 | 89.92 | 90.21 | 90.47 | 84.75 | 4 ... | ...

Appendix F. Water Supply Service Assessment

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Precinct 1 Southern Thornlands PDA

Water Supply Service Assessment

FINAL Report V1 - 9 December, 2025

H2One Pty Ltd

Water, Sewer and Stormwater Engineering Specialists

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Reviewed by RPEQ	Reg. No.	Signed	Date
Joshua May	18064		9 December, 2025

Version	Date	Author	Reviewer
DRAFT - V1	16 September, 2025	J Meesamphan	J May
FINAL - V1	9 December, 2025	J Meesamphan	J May

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1 INTRODUCTION

1.1 Background

A residential subdivision at 76–94 Springacre Road, 96–108 Springacre Road, 110–118 Springacre Road and 124–138 Springacre Road, Thornlands QLD 4164 is currently in the planning phase of the development approval process. The site is legally described as Lot 13 on RP53653, Lot 14 on RP53653, Lot 2 on RP128089 and Lot 16 on RP53653, and forms part of the initial stages for the Southern Thornlands Priority Development Area (PDA).

The development will comprise of a total of 11 x duplex lots and 165 x residential freehold lots, delivered over two separate stages, as per the following breakdown. Refer to Appendix 1 for the development layout plan and relevant staging.

Stage 1

- 5 × lots with duplex unit
- 88 × residential freehold lots

Stage 2

- 6 × lots with duplex unit
- 77 × residential freehold lots

As part of the infrastructure planning process, a water supply modelling assessment was undertaken to confirm the proposed service strategy for the development site. This consisted of the following.

- A capacity assessment on Redland City Council's (RCC) external water supply network, to determine if the site's additional demand will impact the existing system and trigger the need for infrastructure upgrades.
- A hydraulic modelling assessment of the development's internal pipe reticulation, to ensure adequate service will be provided to each allotment.

Empower Engineers and Project Managers Pty Ltd developed a concept water supply pipe layout, with a connection to the existing nominal diameter (DN) 150 mm asbestos cement (AC) reticulation main along Springacre Drive, adjacent to the western property boundary. Refer to Appendix 2 for further details.

Using this concept plan, H2One Pty Ltd was engaged to undertake the hydraulic modelling assessment to confirm the proposed service strategy, in accordance with RCC's Design Standards; "*South East Queensland Water Supply and Sewerage Design and Construction Code*" (2025). The results of this study are presented in this report.

1.2 Objectives

The main objectives of the project were as follows.

1. Introduce the development's pipe layout to RCC's latest planning model and complete a standard flow and fire flow hydraulic analysis to determine if the proposed internal pipe network performs within the minimum Design Standards.
2. Assess standard flow and fire flow capacity of RCC's external water supply network, and where required, determine infrastructure upgrades necessary to achieve the minimum design standards, where system performance failures have occurred due to the additional loading of the new development.

3. Issue an RPEQ certified hydraulic assessment report, with concept layout plans.

1.3 Water Supply Service Strategy

The development site is located within District Metered Area (DMA) 208, serviced by the Mount Cotton Water Supply Tanks (6.8 ML @ RL 106 m surface level), located approximately 8.7 km's to the south along Tallow Rood Court, Mount Cotton. From this water supply tank, a DN450 and DN375 trunk pipe system delivers bulk water to the local reticulation network.

Two connect points are proposed for Stage 1 of the development site, located on the existing DN150 reticulation main along Springacre Drive, at an approximate ground level of RL 40 m. The development's internal reticulation network will consist of DN100 and DN150 PVCU pipes.

The Southern Thornlands ultimate water supply trunk infrastructure master plan has yet to be finalised, however the preferred strategy will likely consist of a DN525 trunk main traversing the property frontage of the development, providing supply from the Heinemann Road tanks. For the purpose of this study, it was assumed that the Mount Cotton tanks will service the development site, via the DN150 along Woodlands Drive, prior to the trunk upgrades being implemented within the next 5 to 10 years. The modelling assessment was therefore undertaken at the 2031 planning horizon only, as ample network capacity should be available to service the site after the installation of the DN525 trunk main.

Refer to Appendices 2 and 3 for an overview of the proposed service strategy.

1.4 Demand Assessment

A demand assessment was undertaken to estimate the water consumption attributed to the development's proposed land-use type and density, based on the demand rates in RCC's Design Standards. Table 1 shows a summary of that estimation.

Table 1. Demand estimate for the proposed development.

Site Land Use and Density	Demand Rate	EP	Peak Flow (L/s)
165 x res. freehold lot	2.7 EP/Lot	445.5	4.51
22 x duplex units	1.84 EP/unit	40.5	0.41
	TOTAL	**486.0**	**4.92**

Note 1: Based on the demand rate from RCC's hydraulic model, i.e. 215 L/EP/day revenue water and 15 L/EP/day of non-revenue water, with an Average Day (AD) to Peak Hour (PH) factor of 4.0.

Note 2: Demand rates were sourced from the *SEQ Water Supply and Sewerage Design and Construction Code* (2013).

As per RCC's latest Netserv Plan, the development lots had a planning demand allocation of 34.8 EP, at the 2031 planning horizon. These demands were removed from the hydraulic model for the post-development scenarios.

2 METHODOLOGY

2.1 Design Standards

The design standards adopted for the hydraulic assessment were based on the "*South East Queensland Water Supply and Sewerage Design and Construction Code*" (2025). A summary of the relevant provisions are as follows.

Table 2. SEQ Code provisions relevant to the hydraulic analysis

	Provision	Specification
Water Supply	ET to EP conversion factor	2.7
	Average Day (AD) Demand	230 L/EP/day (including non-revenue water)
	Maximum pipe velocity (m/s)	2.5 m/s
	Standard flow minimum service pressure and background demand	22m at the property boundary at PH demand
	Standard flow maximum service pressure	55 m
	Residential fire flow minimum network pressure and background demand	12m at 2/3 PH demand Positive pressure at PH demand Reservoir at Minimum Operating Level (15%)
	Commercial fire flow minimum network pressure and background demand	12m at PH demand
	Fire flows	Residential (<= 3 storey) - 15 L/s Residential (> 3 storey) - 30 L/s Commercial/industrial - 30 L/s

2.2 Hydraulic Modelling Assessment

2.2.1 Internal Pipe Network

The methodology adopted for the hydraulic assessment of the development's internal water supply network is as follows.

1. The concept pipe layout was converted to shape file and introduced to RCC's latest Netserv planning model ("*RCC WD LGIP Model_2021 FINAL v5*") as a background layer. Pipe and node elements were then manually drawn and details added, e.g. node surface levels, pipe diameters, pipe lengths etc.
2. DN100 and DN150 pipe sizes were allocated a Hazen Williams Roughness co-efficient of 100 and 110, respectively.
3. Planning demands (EP) were evenly distributed to each model node and a residential diurnal pattern ("RES_SEQ") allocated.
4. A standard flow and fire flow hydraulic analysis was undertaken on the internal reticulation network, where pipe sizes were systematically increased and/or connections adjusted to achieve RCC's minimum Design Standards.
5. Modelling results were verified and deliverables prepared.

2.2.2 External Pipe Network

The methodology adopted for the hydraulic assessment of RCC's external water supply network is as follows.

1. For the 2031 planning horizon, a 1 x Peak Day (PD) demand standard flow hydraulic analysis was undertaken on the property connection point/s and local pipe network, at both pre- and post-development. Any deficiencies in the network were investigated and appropriate solutions determined.

   Note: An assessment on the capacity of the Mt Cotton supply tank was not undertaken, as the development's additional loading was considered negligible for the existing storage capacity.

2. Residential (15 L/s) and commercial (30 L/s) fire flow rates were applied to the surrounding network as per the native allocations in RCC's hydraulic model. Hydrants directly servicing the subject site were allocated 15 L/s fire flow @ 2/3 PH demand.
3. For the 2031 planning horizon, a fire flow hydraulic analysis was undertaken on all hydrants servicing the local network, at pre- and post-development. Any deficiencies in the network were investigated and appropriate solutions determined.
4. Modelling results were verified and findings reported.

3 RESULTS

3.1 Internal Pipe Network

As per the methodology described in Section 2.2 of this report, a standard flow and fire flow hydraulic analysis was undertaken on the development's proposed internal water supply network, at the 2031 planning horizon. The analysis identified that the infrastructure presented in Table 3 and Appendix 3 achieved RCC's minimum Design Standards, across both development stages. Key outcomes are as follows.

- The proposed reticulation layout presented a standard flow minimum pressure of 51.5 m, at node Junction_114, across all development stages. This is in compliance with RCC's minimum pressure standard of 22.0 m.
- The proposed reticulation layout presented a 2/3 peak hour and peak hour fire flow minimum pressure of 25.0 m and 17.7 m, respectively. This occurred at node Junction_156 and is in compliance with RCC's minimum design standard of 12.0 m and positive pressure, respectively.
- The maximum service pressure was 91.3 m at node Junction_124, based on a ground level of RL 19.25 m, across all development stages. This is not in compliance with RCC's maximum service pressure standard of 55.0 m and may trigger the need for pressure management.
- The proposed reticulation layout presented a peak hour maximum pipe velocity of 0.2 m/s on pipe "Pipe_279", which is well below RCC's maximum velocity requirement of 2.5 m/s.

Table 3. Summary of recommended infrastructure for the development's internal water supply network

Description	Location	Diameter (DN)	Length (m)
Reticulation pipe	Within the development site	100	1,440.0
Reticulation pipe		150	1,150.0

Refer to Appendix 4 for the raw network modelling results.

3.2 External Pipe Network

As per the methodology described in Section 2.2 of this report, a standard flow and fire flow hydraulic analysis was undertaken on RCC's external water supply network, at the 2041 planning horizon. A summary of results is presented in Tables 4 and 5 below.

Table 4. Standard flow network modelling results for RCC's external network

	Planning Scenario	
Provision	**2031 Network Pre-develop.**	**2031 Network Post-develop.**
Connection point 1 (*Junction_58*) min. pressure (m)	54.5	49.8
Connection point 2 (*J7699)* min. pressure (m)	55.7	50.9
Network min. pressure (m)	26.3	25.5
Network min. pressure node ID	Junction_14	Junction_14
Network no. min. pressure failures	0	0
Max. pipe velocity (m/s)	2.4	2.4
Network max. velocity ID	9754	9754
Network no. max. velocity failures	0	0

Table 5. Fire flow network modelling results for RCC's external network

		Planning Scenarios	
Scenario		**2031 Network Pre-develop.**	**2031 Network Post-develop.**
2/3 Peak Hour	Site hydrant 1 (*Junction_58*) min. pressure (m)	35.8	27.3
	Site hydrant 1 (*J7699)* min. pressure (m)	35.1	27.6
	Network hydrants min. pressure (m)	21.9	21.4
	Network hydrant min. pressure node ID	J4604	J4604
	Network hydrants no. failures	0	0
Peak Hour	Network hydrants min. pressure (m)	16.8	16.1
	Network hydrant min. pressure node ID	wNode_247	wNode_247
	Network hydrants no. failures	0	0

Note: At peak hour, the same nodes failed with a minimum pressure around -8.0 m. All remaining nodes had positive pressure with the next lowest being 8.5 m.

The results in Tables 4 and 5 demonstrate that the external network performed within RCC's Design Standards, across all scenarios. No water supply infrastructure upgrades are therefore required to service the proposed development.

4 CONCLUSION

A residential subdivision at 76–94 Springacre Road, 96–108 Springacre Road, 110–118 Springacre Road and 124–138 Springacre Road, Thornlands QLD 4164 is currently in the planning phase of the development approval process. The site is legally described as Lot 13 on RP53653, Lot 14 on RP53653, Lot 2 on RP128089 and Lot 16 on RP53653, and forms part of the initial stages for the Southern Thornlands Priority Development Area (PDA).

The development will comprise of a total of 11 x duplex lots and 165 x residential freehold lots, delivered over two separate stages, as per the following breakdown.

Stage 1

- 5 × lots with duplex unit
- 88 × residential freehold lots

Stage 2

- 6 × lots with duplex unit
- 77 × residential freehold lots

As part of the infrastructure planning process, a water supply modelling assessment was undertaken to confirm the proposed service strategy for the development site. This consisted of the following.

- A capacity assessment on Redland City Council's (RCC) external water supply network, to determine if the site's additional demand will impact the existing system and trigger the need for infrastructure upgrades.
- A hydraulic modelling assessment of the development's internal pipe reticulation, to ensure adequate service will be provided to each allotment.

H2One Pty Ltd was engaged to undertake the hydraulic modelling assessment to confirm the proposed service strategy, in accordance with RCC's Design Standards; "*South East Queensland Water Supply and Sewerage Design and Construction Code*" (2025). The hydraulic analysis identified that the external water supply network and the development's proposed internal pipe layout achieved RCC's minimum design standards. Water supply infrastructure upgrades are not required to service the proposed development.

It is recommended that RCC independently confirms the modelling outcomes presented in this report, and approves the proposed water supply service strategy for the development at 76 - 94 Springacre Road, 96 - 108 Springacre Road, 110 - 118 Springacre Road and 124 - 138 Springacre Road, Thornlands QLD, with consideration to the overall trunk infrastructure master plan for the Thornlands PDA.

Detailed modelling results and system plans can be observed in Appendices 1 through 4.

5 REFERENCE LIST

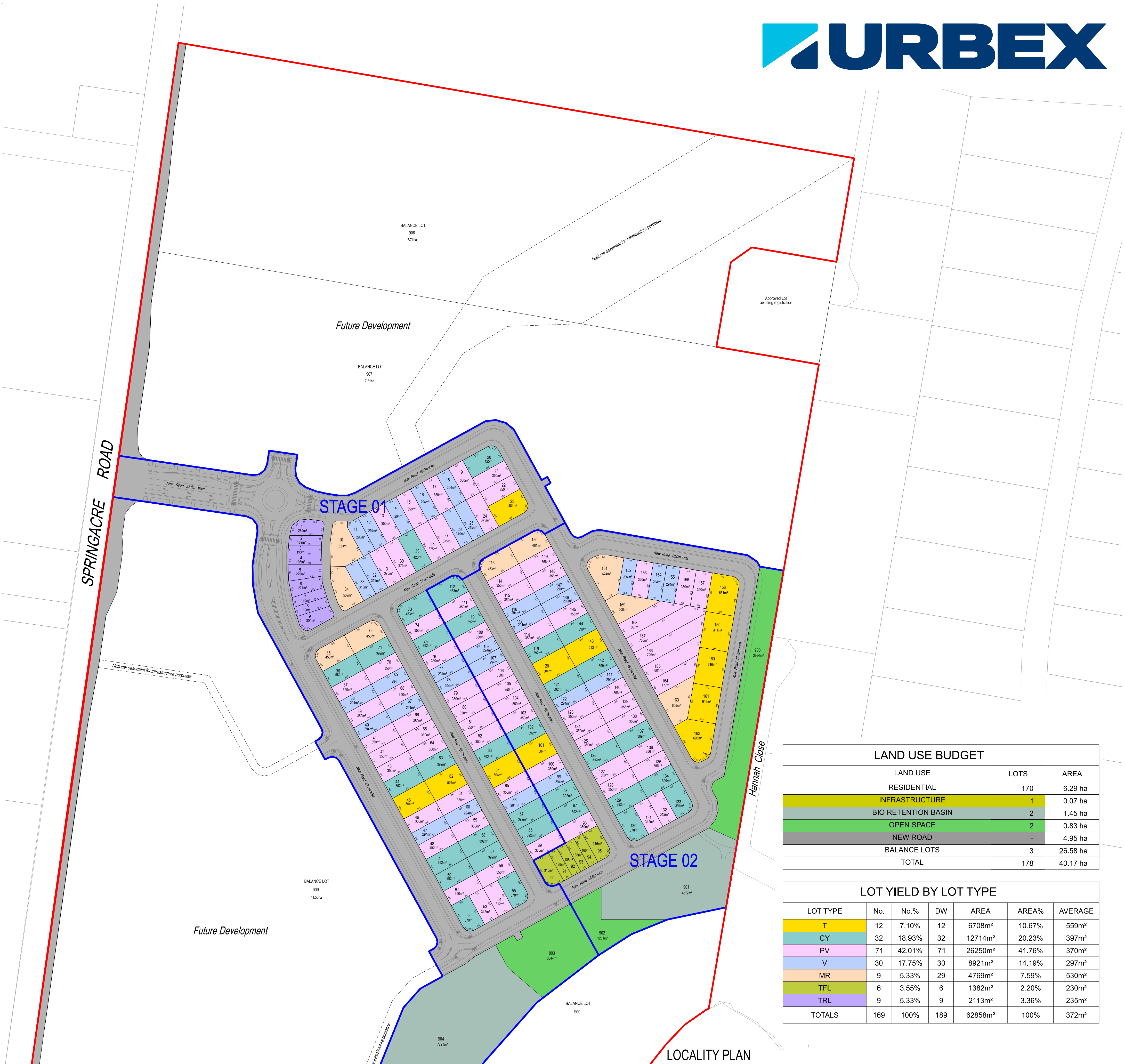
RCC. (2025). *SEQ Water Supply and Sewerage Design and Construction Code*. Cleveland, QLD

RCC. (2013). *SEQ Water Supply and Sewerage Design and Construction Code*. Cleveland, QLD

6 APPENDICES

Appendix 1. Development layout plan

URBEX


BALANCE LOT
906
7.71ha
Notional easement for infrastructure purposes
Approved Lot awaiting registration
Future Development
BALANCE LOT
907
7.31ha
SPRINGACRE ROAD
New Road 32.0m wide
New Road 18.0m wide
New Road 13.25m wide
STAGE 01
STAGE 02
Hannah Close
900
3994m²
901
4872m²
902
1251m²
903
3044m²
904
7721m²
905
672m²
BALANCE LOT
909
11.59ha
BALANCE LOT
909
Future Development
Notional easement for infrastructure purposes

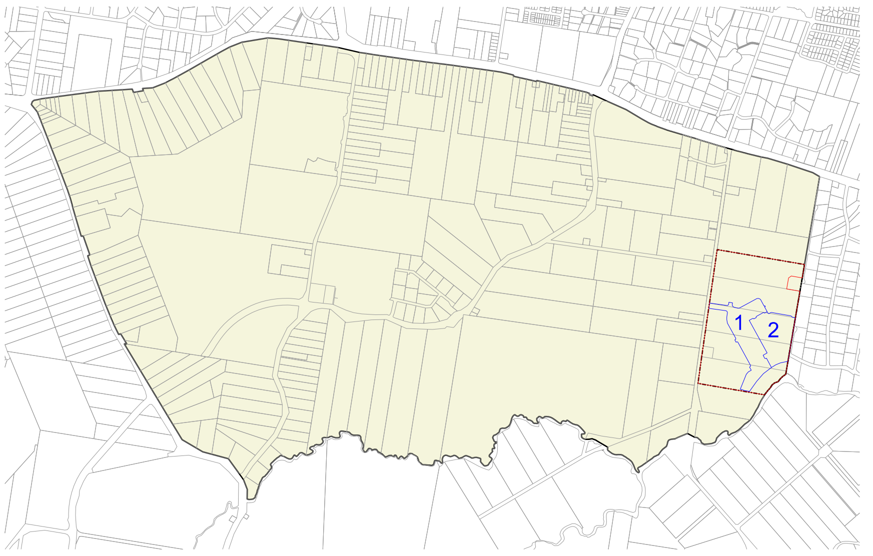
LAND USE BUDGET

LAND USE	LOTS	AREA
RESIDENTIAL	170	6.29 ha
INFRASTRUCTURE	1	0.07 ha
BIO RETENTION BASIN	2	1.45 ha
OPEN SPACE	2	0.83 ha
NEW ROAD	-	4.95 ha
BALANCE LOTS	3	26.58 ha
TOTAL	178	40.17 ha

LOT YIELD BY LOT TYPE

LOT TYPE	No.	No.%	DW	AREA	AREA%	AVERAGE
T	12	7.10%	12	6708m²	10.67%	559m²
CY	32	18.93%	32	12714m²	20.23%	397m²
PV	71	42.01%	71	26250m²	41.76%	370m²
V	30	17.75%	30	8921m²	14.19%	297m²
MR	9	5.33%	29	4769m²	7.59%	530m²
TFL	6	3.55%	6	1382m²	2.20%	230m²
TRL	9	5.33%	9	2113m²	3.36%	235m²
TOTALS	169	100%	189	62858m²	100%	372m²

LOCALITY PLAN



PDA EXTENTS
PRECINCT 1
APPLICATION 1
STAGE

LEGEND

🟥	Application Boundary
🟦	Stage Boundary
🟩	Open Space
▨	Bioretention Basin
🟨	Infrastructure
▨	Road

0 30 60 90 120 150m

Scale 1:3,000 at A3

North

Southern Thornlands Precinct 1
Reconfiguration of a Lot - Application 1

DRAWING NO STP01-RaL1 (Sht 1 of 3)
DATE 04.12.2025
FILE REF STP01

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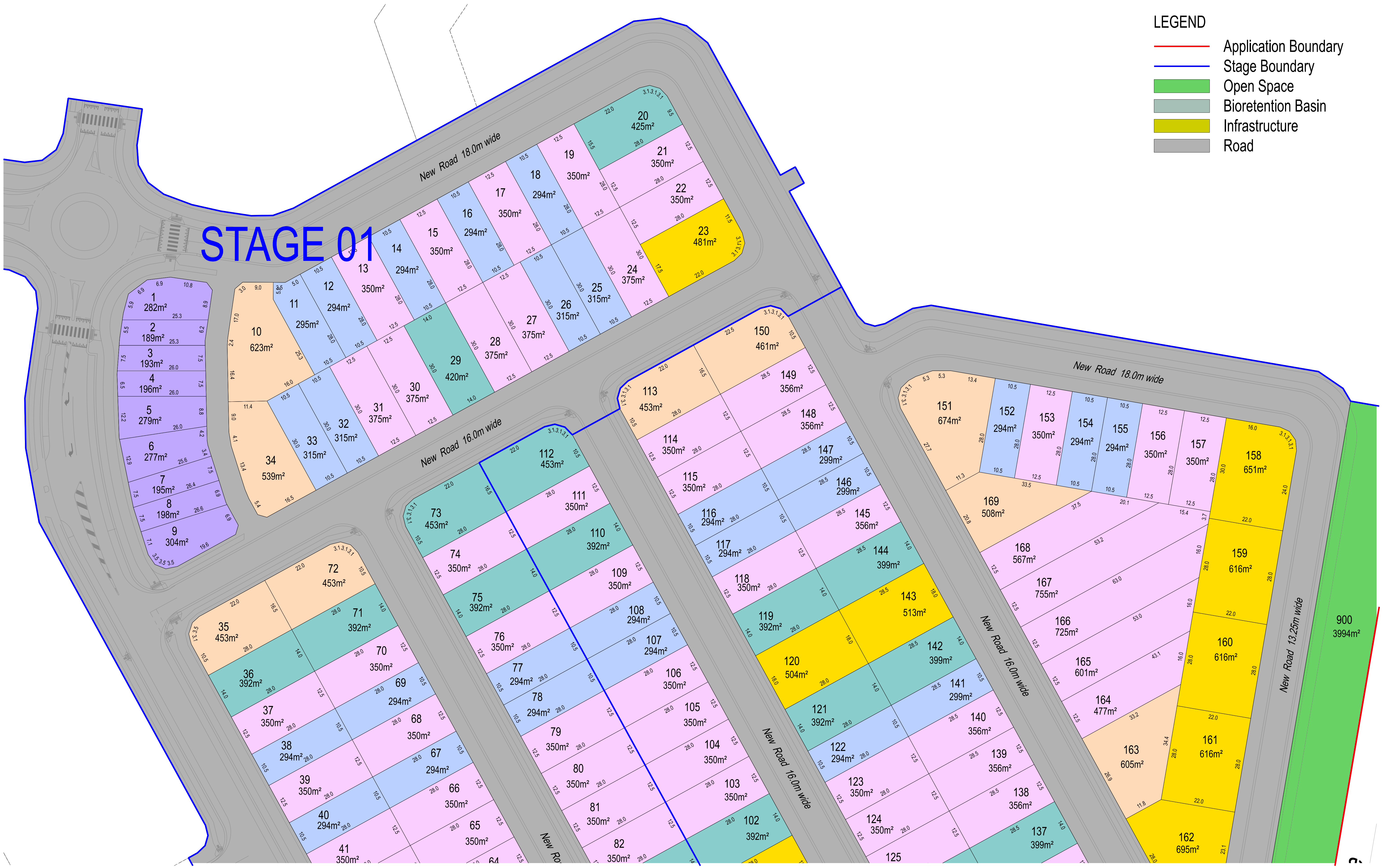
LEGEND
Application Boundary
Stage Boundary
🟩 Open Space
Bioretention Basin
Infrastructure
Road
STAGE 01
New Road 18.0m wide
New Road 16.0m wide
New Road 16.0m wide
New Road 16.0m wide
New Road 18.0m wide
New Road 13.25m wide
New Ro
1 282m²
2 189m²
3 193m²
4 196m²
5 279m²
6 277m²
7 195m²
8 198m²
9 304m²
10 623m²
11 295m²
12 294m²
13 350m²
14 294m²
15 350m²
16 294m²
17 350m²
18 294m²
19 350m²
20 425m²
21 350m²
22 350m²
23 481m²
24 375m²
25 315m²
26 315m²
27 375m²
28 375m²
29 420m²
30 375m²
31 375m²
32 315m²
33 315m²
34 539m²
35 453m²
36 392m²
37 350m²
38 294m²
39 350m²
40 294m²
41 350m²
64
65 350m²
66 350m²
67 294m²
68 350m²
69 294m²
70 350m²
71 392m²
72 453m²
73 453m²
74 350m²
75 392m²
76 350m²
77 294m²
78 294m²
79 350m²
80 350m²
81 350m²
82 350m²
102 392m²
103 350m²
104 350m²
105 350m²
106 350m²
107 294m²
108 294m²
109 350m²
110 392m²
111 350m²
112 453m²
113 453m²
114 350m²
115 350m²
116 294m²
117 294m²
118 350m²
119 392m²
120 504m²
121 392m²
122 294m²
123 350m²
124 350m²
125
137 399m²
138 356m²
139 356m²
140 356m²
141 299m²
142 399m²
143 513m²
144 399m²
145 356m²
146 299m²
147 299m²
148 356m²
149 356m²
150 461m²
151 674m²
152 294m²
153 350m²
154 294m²
155 294m²
156 350m²
157 350m²
158 651m²
159 616m²
160 616m²
161 616m²
162 695m²
163 605m²
164 477m²
165 601m²
166 725m²
167 755m²
168 567m²
169 508m²
900 3994m²

URBEX

Southern Thornlands Precinct 1
Reconfiguration of a Lot - Application 1

DRAWING NO	STP01-RaL1 (Sht 2 of 3)
DATE	04.12.2025
FILE REF	STP01

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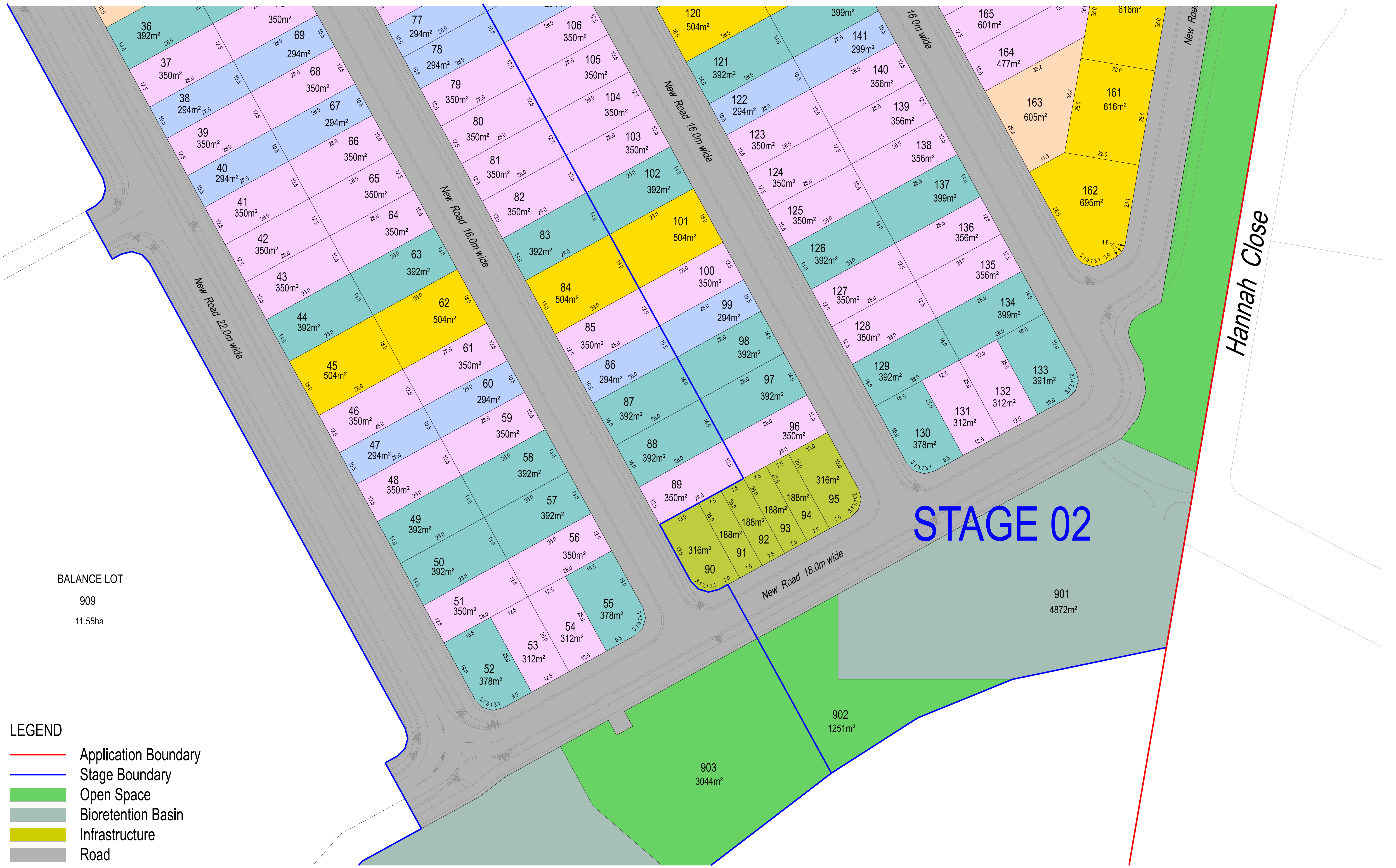
0
10
20
30
40
50m
Scale 1:1,000 at A3
North


STAGE 02
New Road 22.0m wide
New Road 16.0m wide
New Road 16.0m wide
16.0m wide
New Road 18.0m wide
New Road
Hannah Close
BALANCE LOT
909
11.55ha
36 392m²
37 350m²
38 294m²
39 350m²
40 294m²
41 350m²
42 350m²
43 350m²
44 392m²
45 504m²
46 350m²
47 294m²
48 350m²
49 392m²
50 392m²
51 350m²
52 378m²
53 312m²
54 312m²
55 378m²
56 350m²
57 392m²
58 392m²
59 350m²
60 294m²
61 350m²
62 504m²
63 392m²
64 350m²
65 350m²
66 350m²
67 294m²
68 350m²
69 294m²
350m²
77 294m²
78 294m²
79 350m²
80 350m²
81 350m²
82 350m²
83 392m²
84 504m²
85 350m²
86 294m²
87 392m²
88 392m²
89 350m²
90 316m²
91 188m²
92 188m²
93 188m²
94 188m²
95 316m²
96 350m²
97 392m²
98 392m²
99 294m²
100 350m²
101 504m²
102 392m²
103 350m²
104 350m²
105 350m²
106 350m²
120 504m²
399m²
121 392m²
122 294m²
123 350m²
124 350m²
125 350m²
126 392m²
127 350m²
128 350m²
129 392m²
130 378m²
131 312m²
132 312m²
133 391m²
134 399m²
135 356m²
136 356m²
137 399m²
138 356m²
139 356m²
140 356m²
141 299m²
161 616m²
162 695m²
163 605m²
164 477m²
165 601m²
616m²
901 4872m²
902 1251m²
903 3044m²

LEGEND

🟥 Application Boundary
🟦 Stage Boundary
🟩 Open Space
▨ Bioretention Basin
🟨 Infrastructure
▨ Road

Southern Thornlands Precinct 1
Reconfiguration of a Lot - Application 1

DRAWING NO	STP01-RaL1 (Sht 3 of 3)
DATE	04.12.2025
FILE REF	STP01

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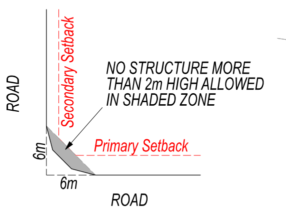
0 10 20 30 40 50m
Scale 1:1,000 at A3

North

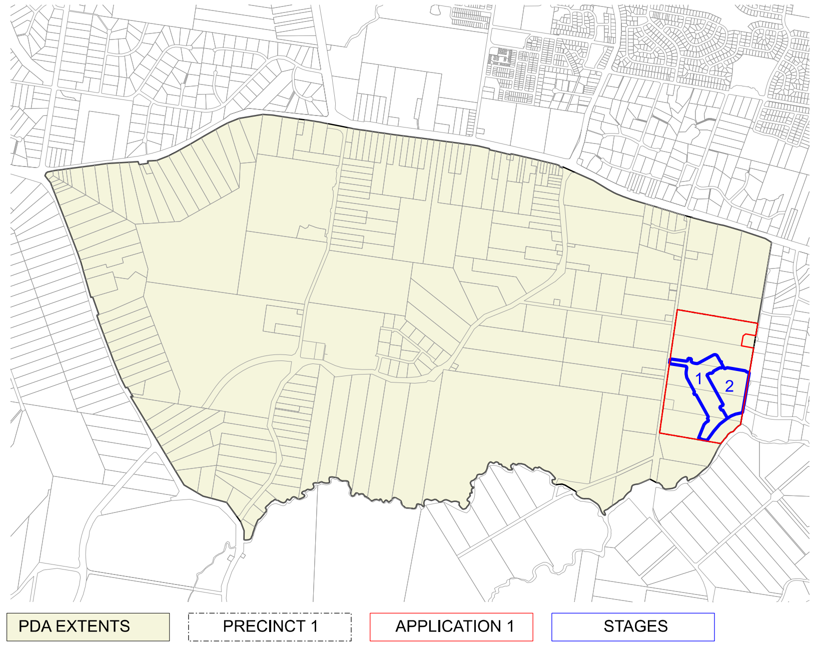
LEGEND

- 🟥 Application Boundary
- 🟦 Stage Boundary
- ▼ Optional Build to Boundary
- ▼ Mandatory Build to Boundary
- ▬ Indicative Driveway Location
- (3) Indicates maximum number of dwellings on multi-residential lots
- (S) Single Storey Dwellings only permitted
- (S*) Single Storey Dwellings only permitted within 10m of eastern rear boundary
- ◂ Mandatory Primary Frontage
- * Multiple Residential lot
- B Refer to Bushfire plan for Building Requirements
- * Indicative Bin Pad location (to be confirmed at detail design)

CORNER ALLOTMENTS

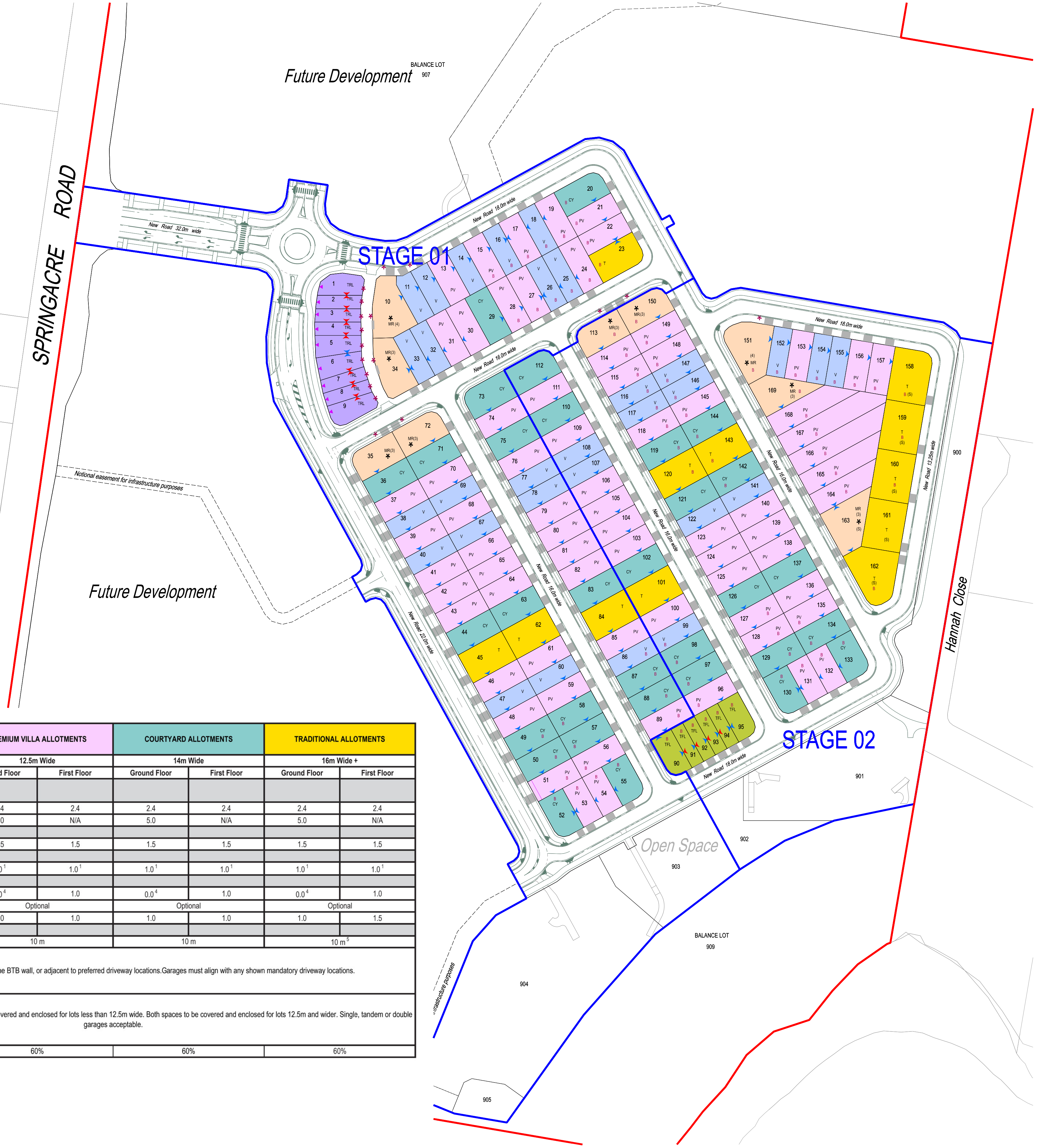

ROAD
Secondary Setback
NO STRUCTURE MORE THAN 2m HIGH ALLOWED IN SHADED ZONE
6m
Primary Setback
6m
ROAD

LOCALITY PLAN



PDA EXTENTS | PRECINCT 1 | APPLICATION 1 | STAGES

NOTE: This plan should be read in conjunction with Development Controls on Sheets 4 and 5


Future Development
BALANCE LOT
907
SPRINGACRE ROAD
New Road 32.0m wide
STAGE 01
STAGE 02
New Road 18.0m wide
New Road 16.0m wide
New Road 13.25m wide
New Road 22.0m wide
Notional easement for infrastructure purposes
Future Development
Hannah Close
900
901
902
903
904
905
Open Space
BALANCE LOT
909
infrastructure purposes

Plan of Development Table	FRONT-LOADED TERRACE ALLOTMENTS		REAR LOADED TERRACE ALLOTMENTS		MULTIPLE RESIDENTIAL		VILLA ALLOTMENTS		PREMIUM VILLA ALLOTMENTS		COURTYARD ALLOTMENTS		TRADITIONAL ALLOTMENTS	
	7.5m - 9m		7.5m - 9m Wide		VARIES		10.5m Wide		12.5m Wide		14m Wide		16m Wide +	
	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor	Ground Floor	First Floor
Primary Frontage Setback (metres)														
Front Wall	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Garage	5.0	N/A	N/A	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A
Corner Allotments (metres)														
Secondary Frontage (Road)	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Rear Setback (metres)														
Rear Setback	1.0[3]	1.0[3]	0.0	0.0	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]
Side - General Lots (metres)														
Build to Boundary	0.0	0.0	0.0	0.0	0.0[4]	1.0	0.0[4]	0.9	0.0[4]	1.0	0.0[4]	1.0	0.0[4]	1.0
	Mandatory[2]		Mandatory[2]		Optional		Optional		Optional		Optional		Optional	
Non Build to Boundary	0.9	0.9	0.9	0.9	1.5	1.5	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.5
Other Requirements														
Build to Boundary Length	80% of lot length		80% of lot length		10 m		10 m		10 m		10 m		10 m[5]	
Garage Location	Garages are to be located along one of the BTB walls, preferably on the low side.				Garages are to be located along the BTB wall where it is available. Additional garaging should align to preferred driveway locations.		Garages are preferred to be located along the BTB wall, or adjacent to preferred driveway locations.Garages must align with any shown mandatory driveway locations.							
On Site Parking Requirements (minimum)	1 space to be covered and enclosed. Single or tandem garages acceptable. Double garages are permitted on two storey dwellings only.		2 spaces, 1 space to be covered and enclosed. Garage to be located to laneway frontage unless noted on plan.		1 covered space per dwelling plus 0.5 addional spaces per dwelling		Minimum of two (2) car parking spaces on-site. 1 space to be covered and enclosed for lots less than 12.5m wide. Both spaces to be covered and enclosed for lots 12.5m and wider. Single, tandem or double garages acceptable.							
Site Cover (maximum)	75%		75%		75%		60%		60%		60%		60%	

1. Where adjoining a retaining wall >1.5m, the setback is 1.2m.
2. Except for ends of Terrace pack.
3. Where the rear of the lot adjoins a road or a park, the rear setback will be 1.5m.
4. Build to boundary length limited to 10m. Build to boundary length can be increased to 50% of the depth of the lot if such lengthening does not cause adverse impacts for winter solar access for adjacent lots.
5. Traditional lots with a primary frontage over 18m cannot Build to the Boundary.

URBEX

Southern Thornlands Precinct 1
Plan of Development - Application 1

DRAWING NO STP01-POD1 (Sht 1 of 5)
DATE 04.12.2025
FILE REF STP01

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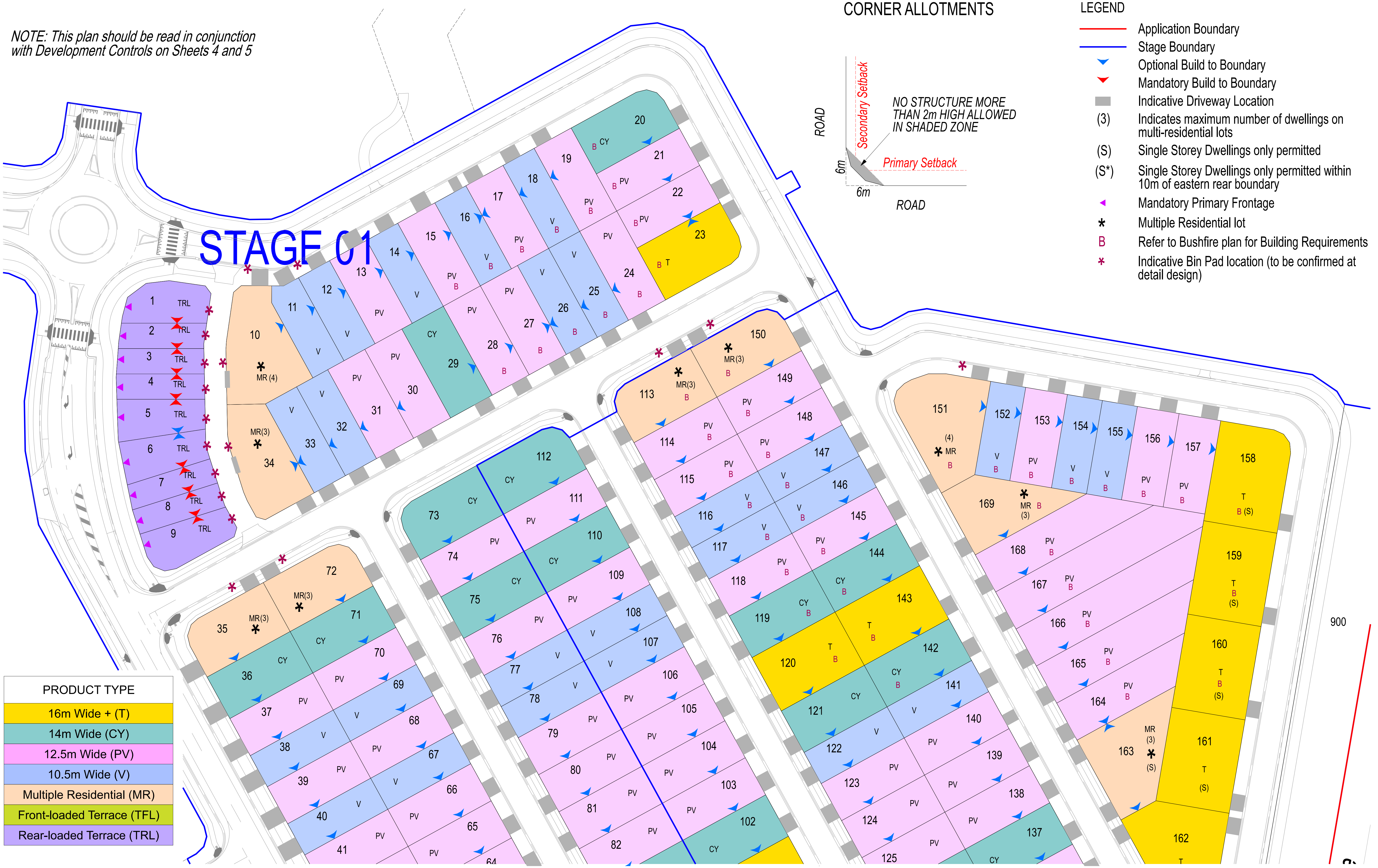
0 25 50 75 100 125 m
Scale 1:2,500 at A3
North

NOTE: This plan should be read in conjunction with Development Controls on Sheets 4 and 5


STAGE 01
CORNER ALLOTMENTS
ROAD
Secondary Setback
NO STRUCTURE MORE THAN 2m HIGH ALLOWED IN SHADED ZONE
Primary Setback
6m
6m
ROAD
1 TRL
2 TRL
3 TRL
4 TRL
5 TRL
6 TRL
7 TRL
8 TRL
9 TRL
10 MR (4)
11
12
13 PV
14 V
15 PV B
16 V B
17 PV B
18 V B
19 PV B
20 B CY
21 B PV
22 B PV
23 B T
24 PV B
25 V B
26 V B
27 PV B
28 PV B
29 CY
30 PV
31 PV
32 V
33 V
34 MR(3)
35 MR(3)
36 CY
37 PV
38 V
39 PV
40 V
41 PV
64
65 PV
66 V
67 PV
68 V
69 PV
70 CY
71 CY
72 MR(3)
73 CY
74 PV
75 CY
76 PV
77 V
78 V
79 PV
80 PV
81 PV
82 PV
102 CY
103 PV
104 PV
105 PV
106 PV
107 V
108 V
109 PV
110 CY
111 PV
112 CY
113 MR(3) B
114 PV B
115 PV B
116 V B
117 V B
118 PV B
119 CY B
120 T B
121 CY
122 V
123 PV
124 PV
125 PV
137 CY
138 PV
139 PV
140 PV
141 V
142 CY B
143 T B
144 CY B
145 PV B
146 V B
147 V B
148 PV B
149 PV B
150 MR (3) B
151 (4) MR B
152 V B
153 PV B
154 V B
155 V B
156 PV B
157 PV B
158 T B (S)
159 T B (S)
160 T B (S)
161 T (S)
162 T
163 MR (3) (S)
164 PV B
165 PV B
166 PV B
167 PV B
168 PV B
169 MR (3) B
900

LEGEND

🟥	Application Boundary
🟦	Stage Boundary
▼	Optional Build to Boundary
▼	Mandatory Build to Boundary
▬	Indicative Driveway Location
(3)	Indicates maximum number of dwellings on multi-residential lots
(S)	Single Storey Dwellings only permitted
(S*)	Single Storey Dwellings only permitted within 10m of eastern rear boundary
◀	Mandatory Primary Frontage
*	Multiple Residential lot
B	Refer to Bushfire plan for Building Requirements
*	Indicative Bin Pad location (to be confirmed at detail design)

PRODUCT TYPE
16m Wide + (T)
14m Wide (CY)
12.5m Wide (PV)
10.5m Wide (V)
Multiple Residential (MR)
Front-loaded Terrace (TFL)
Rear-loaded Terrace (TRL)

URBEX

Southern Thornlands Precinct 1
Plan of Development - Application 1

DRAWING NO	STP01-POD1 (Sht 2 of 5)
DATE	04.12.2025
FILE REF	STP01

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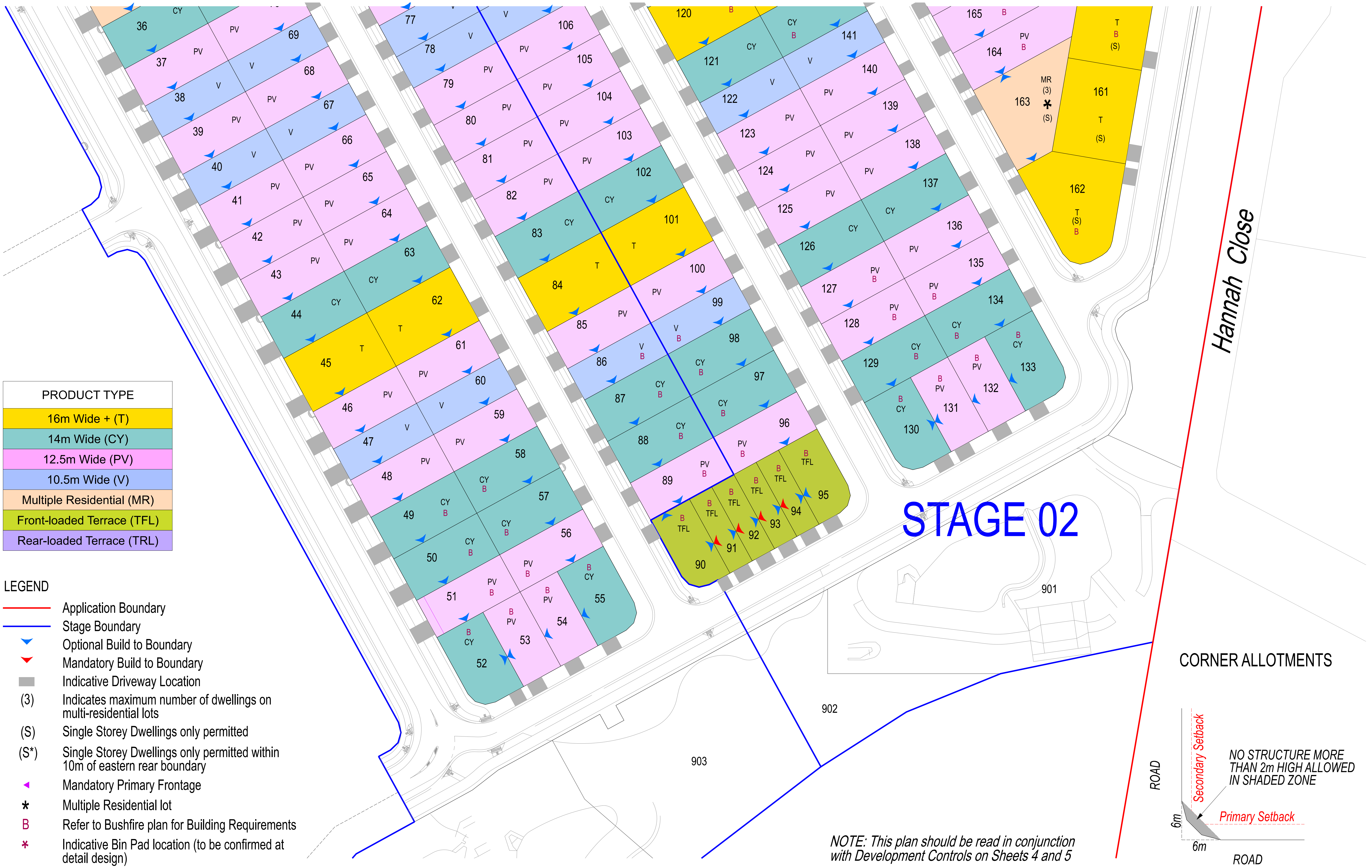
0 10 20 30 40 50m
Scale 1:1,000 at A3

North


36 CY
37 PV
38 V
39 PV
40 V
41 PV
42 PV
43 PV
44 CY
45 T
46 PV
47 V
48 PV
49 CY B
50 CY B
51 PV B
52 B CY
53 B PV
54 B PV
55 B CY
56 PV B
57 CY B
58 CY B
59 PV
60 V
61 PV
62 T
63 CY
64 PV
65 PV
66 V
67 PV
68 V
69 PV
77 V
78 V
79 PV
80 PV
81 PV
82 PV
83 CY
84 T
85 PV
86 V B
87 CY B
88 CY B
89 PV B
90 B TFL
91 B TFL
92 B TFL
93 B TFL
94 B TFL
95 B TFL
96 PV B
97 CY B
98 CY B
99 V B
100 PV
101 T
102 CY
103 PV
104 PV
105 PV
106 PV
120 B
121 CY
122 V
123 PV
124 PV
125 PV
126 CY
127 PV B
128 PV B
129 CY B
130 B CY
131 B PV
132 B PV
133 B CY
134 CY B
135 PV B
136 PV
137 CY
138 PV
139 PV
140 V
141 CY B
165 B
164 PV B
163 MR (3) * (S)
T B (S)
161 T (S)
162 T (S) B
Hannah Close
STAGE 02
901
902
903
ROAD
Secondary Setback
Primary Setback
6m
6m
ROAD

PRODUCT TYPE
16m Wide + (T)
14m Wide (CY)
12.5m Wide (PV)
10.5m Wide (V)
Multiple Residential (MR)
Front-loaded Terrace (TFL)
Rear-loaded Terrace (TRL)

LEGEND

―	Application Boundary
―	Stage Boundary
▼	Optional Build to Boundary
▼	Mandatory Build to Boundary
■	Indicative Driveway Location
(3)	Indicates maximum number of dwellings on multi-residential lots
(S)	Single Storey Dwellings only permitted
(S*)	Single Storey Dwellings only permitted within 10m of eastern rear boundary
◂	Mandatory Primary Frontage
*	Multiple Residential lot
B	Refer to Bushfire plan for Building Requirements
*	Indicative Bin Pad location (to be confirmed at detail design)

CORNER ALLOTMENTS

NO STRUCTURE MORE THAN 2m HIGH ALLOWED IN SHADED ZONE

NOTE: This plan should be read in conjunction with Development Controls on Sheets 4 and 5

URBEX

Southern Thornlands Precinct 1
Plan of Development - Application 1

DRAWING NO STP01-POD1 (Sht 3 of 5)
DATE 04.12.2025
FILE REF STP01

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0 10 20 30 40 50m
Scale 1:1,000 at A3

North

1. General

1.1 All development is to be undertaken in accordance with the Development Approval, and Queensland Development Code (QDC), except as varied below.

1.2 The maximum height of buildings shall not exceed three (3) storeys or 10.5m above Natural Ground Level, except where noted on the POD. Lots marked with an (S) have a maximum building height of 1 storey or 6.0 m above natural grond level. Lots marked with an (S*) are required to limit any portion of the dwelling within 10 metres of their eastern rear boundary to single storey construction up to 6.0 m above natural ground level.

1.3 Maximum building location envelopes are subject to future proposed easements and/or other underground services.

1.4 Buildings shall be constructed in accordance with Bushfire AS3959. Refer to the BAL Rating advice relevant to the lot.

1.5 Secondary dwellings are not permitted on lots less than 400m².

1.6 Approved uses are Dwelling House, dual occupancy, display home, multiple dwelling, home-based business.

1.7 Advertising Devices, where associated with a display home/village and temporary in nature, are Exempt Development.

1.8 Where Mandatory Primary Frontage is required the dwelling must address the nominated frontage by incorporating an entry, portico / verandah, front door, windows, letter box, appropriate fencing and pedestrian entry facing this frontage.

2. Setbacks

2.1 Setbacks are as per the Plan of Development Table unless otherwise dimensioned. If a lot is not developed for a Multiple Residential (MR) site, then the equivalent size detached lot setbacks will apply.

2.2 The location of the built to boundary walls are indicated on the Plan of Development. Where built to boundary walls are not adopted, side setbacks shall be in accordance with the Plan of Development Table.

2.3.1 Boundary setbacks are measured to the Outermost Projection (OMP) of the structure.

2.3.2 Front verandah and covered areas to the front door are permitted to extend into the front setback on the condition that the roofed area is not enclosed. For front setbacks, this roofed area can extend to 1.0m from the front property line.

2.3.3 Eaves and window shades are permitted to extend into side and rear setbacks provided they do not encroach closer than 450mm to the lot boundary (other than where buildings are built to boundary).

2.4 Excluding Terrace product, the maximum length of a wall built on the BTB line shall not exceed 10 metres, unless it can be shown that a greater length will not adversely impact overshadowing of adjoining lots. Excluding Terraces, the maximum height of a wall built on the BTB line shall not exceed 4.0 m.

2.5 Where a retaining wall on the rear boundary is either terraced or a single face wall over 2.0m high, a 2.5m rear setback is required.

2.6 A corner lot, for the purposes of determining setbacks, is a lot that adjoins the intersection of two streets. For lots that abut a shared access driveway, laneway or a pedestrian link / landscape buffer, a secondary frontage setback does not apply. Buildings on corner lots are to be sited in accordance with the 'Special Siting Requirements for Corner Allotments'.

2.7 Setbacks on corner lots are determined by the frontage that the primary facade addresses. The primary facade is the frontage where the front door and letterbox are located, and requires Primary Frontage setbacks. Secondary frontage setbacks are required on the alternative frontage.

3. Private Open Space

3.1 Private open space must measure a minimum of 12m² with a minimum dimension in any direction of 2.4 metres. Private Open Space cannot include driveways and must have a minimum grade of less than 5%.

3.2 Private open space must be directly accessible from a living space.

4. On-site car parking and driveways

4.1 On-site car parking is to be provided in accordance the requirements setout in the Plan of Development table.

4.2 Driveways are to accord with Redland City Council's (RCC) standards. Prior to construction, approval from RCC for Vehicular Access to Residential Premises is required. Driveways within the verge must be built at the grade of the verge.

4.3 The maximum width of a driveway within the verge shall be 4.8 metres for a lot with a double car width garage and 3.0 metres for a lot with a single car width garage.

4.4 Double garages are permitted on terraces where they are accessed from the laneway.

4.5 Garages and carports accessed from a Laneway must be built setback 0.9 metres from the boundary unless otherwise dimensioned on the Plan of Development. Ingress/egress must be achieved for a B99 Vehicle.

4.6 Maximum of one driveway per dwelling.

4.7 Minimum distance of a driveway from an intersection of one street with another street is 6.0 metres. The Driveway must be laid at the grade of the adjacent verge area. No grade changes to the verge for the driveway will be allowed.

4.8 Where there is a footpath within the verge, the driveway prevails and should be cut at the nearest joint and the footpath reinstated to either side of the driveway without compromising the structural integrity of the footpath.

4.9 Driveways must be completed prior to occupation of the dwelling.

4.10 Driveways must be atleast 300mm from side property boundaries.

5. Onsite Parking lots 10 to 12.49m wide

5.1 Garages for any single storey dwelling on a Lot between 10.0m and 12.49m in width must adhere to the following design criteria:
a. The front facing building wall, which includes the garage door, must not exceed an external width of 5.7m
b. The garage door must have a sectional tilt or roller door and:
i. must not exceed 4.8m wide,
ii. must have a minimum 450mm eave above it, and
iii. must be setback a minimum of 240mm behind the pillar of the garage door
c. The front façade of the dwelling must be forward of the alignment of the garage wall, and must include a front entry door with glass inserts, sidelights, other street facing windows or a habitable room with a window. Additionally a front veranda, portico or porch must be located over the front entry and extend 1.6m forward of the front wall/door and include front piers with distinct materials and/or colours.
d. Driveways cannot exceed 3.0m across the verge on Lots between 10.0m and 12.49m wide.

5.2 Double car garages are permitted on any double storey dwelling built on a Lot between 10.0m and 12.49m.

6. Fencing

6.1 Fencing erected by developer must not be altered, modified or removed without their prior written approval.

6.2 Fencing on all park or street frontages has a maximum height of 1.2 metres where solid or have a maximum height of 1.8 metres where containing openings that make the fence more than 50% transparent.

6.3 Fencing on lanes can be screen fencing at 1.8m high where along private open space, carparking and service areas.

6.4 Fencing on corner lots is to be designed as front fences addressing both streets (rather than a front and a side fence).

6.5 Where fencing is not proposed in front of the house, all side fencing must return to the house a minimum of 1.0 metre behind the front building, unless a side fence is required sfaety above a retaining wall.

6.6 If elevated construction is to be used, under floor services must be located or screened from adjoining properties and public spaces.

7. Retaining Walls

7.1 For retaining walls **not** constructed by the developer:
a. Retaining walls must not exceed more than 1.0m where fronted to a public street or park. Retaining walls to side and rear boundaries (which are not visible from a public street or park) can be up to 2.0m. Retaining in excess of 2.5m in height must be terraced.
b. Where retaining walls are terraced, the lower face is to be a maximum of 1.0m from the property boundary.

7.2 No timber retaining walls over 1.0m high or where visible from any public street or park.

7.3 Retaining walls 1.0m or higher require RPEQ certification.

8. Building Articulation

8.1 All buildings with a width of more than 10 metres that are visible from a street or park are to include articulation to reduce the mass of the building by one or more of the following:
- Balconies, porches or verandahs;
- Articulation of roof lines and walls

8.2 Where adjoining an area of open space, housing design must facilitate passive surveillance of the open space, through the incorporation of at least one (1) habitable room orientated towards the open space.

8.3 Carports and garages are to be compatible with the main building design in terms of height, roof form, detailing, materials and colours.

8.4 Air-conditioners, gas bottles, hot water systems, clothes lines, sheds, satellite dishes, water tanks and other household services must be screened and/or located to minimise visual impact to public streets or parks (solar panels and hot water system panels (not tanks) can be sited to optimise orientation).

8.5 Homes must include a clearly identifiable and addressed front door and undercover point of entry.

8.6 Screened drying areas and rubbish bins area must be behind the main face of the dwelling.

9. Slope and Building Footings

9.1 Buildings on sloping sites built to the boundary on the low side of the lot must project-the footing deep enough to be below the adjoining property building pad level. If the pad level is not nominated the pad level is assumed to be the average of the four corners of the adjoining property using as constructed levels.

9.2 Building footings are to be designed in accordance with the appropriate Australian Standard. Building footings are to be designed to ensure that there are no adverse impacts (functional, financial or construction limitations) on adjoining allotments, particularly in relation to retaining walls.

10. Electric Vehicle Readiness

10.1 All dwellings are to have a dedicated electrical circuit from the circuit board to the garage for at least one Basic (slow) EVSE charger per home, in accordance with the Australian Wiring Rules AS/NZS 3000: 2018.
The circuit is to be fitted with a minimum 20 Amp GPO outlet which can be replaced by a dedicated 7kW EVSE of the occupant's choice. Where not used for Electric Vehicle Supply Equipment, the circuit is to be terminated at an isolator.

11. Additional Criteria for Multiple Residential Allotments

11.1 Buildings must address all street frontages with driveways, pedestrian entries or both.

11.2 All dwellings must have a clearly identifiable front door, which is undercover.

11.3 Drying and rubbish bin areas must be located behind the main face of the dwelling or suitably screened from public streets and park frontages.

11.4 Maximum number of dwellings on each multiple residential lot is annotated on the Plan of Development.

12. Additional Criteria for Secondary Dwellings

12.1 Floor area must be between a minimum of 40m² and 75m².

12.2 Materials, detailing, colours and roof form are consistent with those of the primary house.

12.3 Outdoor living space must measure a minimum of 9m² with a minimum dimension in any direction of 3 metres.

12.4 Outdoor living space must be directly accessible from the main living space and can be combined with the primary dwelling outdoor space.

12.5 Outdoor living space on a corner allotment must be suitably screened if located within the secondary street boundary setback.

12.6 A minimum of one (5m x 3m) car parking space must be provided for the secondary dwelling, in addition to parking for the primary dwelling.

12.7 The driveway must be shared with the primary house, however on corner allotments a separate driveway may be provided with a minimum width of 3 metres and a maximum width of 5 metres.

12.8 Corner allotments must provide dedicated pedestrian entry and a visible door from and addressing the secondary street to the secondary dwelling.

12.9 Corner allotments must provide a minimum of one habitable room, with large windows or balconies, fronting the secondary street.

13. Definitions

13.1 Laneway Allotment - Allotments serviced by a laneway, typically rear loaded Terrace Allotments.

13.2 Site Cover - Site cover, of development, means the portion of the site, expressed as a percentage, that will be covered by a building or structure, measured to its outermost projection, after the development is carried out, other than a building or structure, or part of a building or structure, that is -
a. in a landscaped or open space area, including, for example, a gazebo or shade structure; or
b. a basement completely below ground level and used for car parking; or
c. the eaves of a building; or a sun shade.

URBEX

Southern Thornlands Precinct 1
Development Controls - Application 1

DRAWING NO STP01-POD1 (Sht 4 of 5)
DATE 04.12.2025
FILE REF STP01

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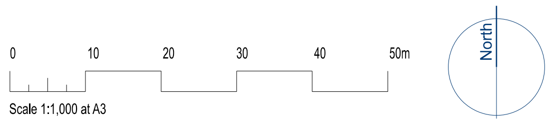

Plan of Development Table	**FRONT-LOADED TERRACE ALLOTMENTS**		**REAR LOADED TERRACE ALLOTMENTS**		**MULTIPLE RESIDENTIAL**		**VILLA ALLOTMENTS**		**PREMIUM VILLA ALLOTMENTS**		**COURTYARD ALLOTMENTS**		**TRADITIONAL ALLOTMENTS**	
	7.5m - 9m		**7.5m - 9m Wide**		**VARIES**		**10.5m Wide**		**12.5m Wide**		**14m Wide**		**16m Wide +**	
	Ground Floor	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**	**Ground Floor**	**First Floor**
Primary Frontage Setback (metres)														
Front Wall	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Garage	5.0	N/A	N/A	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A	5.0	N/A
Corner Allotments (metres)														
Secondary Frontage (Road)	1.2	1.2	1.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Rear Setback (metres)														
Rear Setback	1.0[3]	1.0[3]	0.0	0.0	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]	1.0[1]
Side - General Lots (metres)														
Build to Boundary	0.0	0.0	0.0	0.0	0.0[4]	1.0	0.0[4]	0.9	0.0[4]	1.0	0.0[4]	1.0	0.0[4]	1.0
	Mandatory[2]		Mandatory[2]		Optional		Optional		Optional		Optional		Optional	
Non Build to Boundary	0.9	0.9	0.9	0.9	1.5	1.5	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.5
Other Requirements														
Build to Boundary Length	80% of lot length		80% of lot length		10 m		10 m		10 m		10 m		10 m[5]	
Garage Location	Garages are to be located along one of the BTB walls, preferably on the low side.				Garages are to be located along the BTB wall where it is available. Additional garaging should align to preferred driveway locations.		Garages are preferred to be located along the BTB wall, or adjacent to preferred driveway locations.Garages must align with any shown mandatory driveway locations.							
On Site Parking Requirements (minimum)	1 space to be covered and enclosed. Single or tandem garages acceptable. Double garages are permitted on two storey dwellings only.		2 spaces, 1 space to be covered and enclosed. Garage to be located to laneway frontage unless noted on plan.		1 covered space per dwelling plus 0.5 addional spaces per dwelling		Minimum of two (2) car parking spaces on-site. 1 space to be covered and enclosed for lots less than 12.5m wide. Both spaces to be covered and enclosed for lots 12.5m and wider. Single, tandem or double garages acceptable.							
Site Cover (maximum)	75%		75%		75%		60%		60%		60%		60%	

1. Where adjoining a retaining wall >1.5m, the setback is 1.2m.
2. Except for ends of Terrace pack.
3. Where the rear of the lot adjoins a road or a park, the rear setback will be 1.5m.
4. Build to boundary length limited to 10m. Build to boundary length can be increased to 50% of the depth of the lot if such lengthening does not cause adverse impacts for winter solar access for adjacent lots.
5. Traditional lots with a primary frontage over 18m cannot Build to the Boundary.

URBEX

Southern Thornlands Precinct 1
Development Controls - Application 1

DRAWING NO STP01-POD1 (Sht 5 of 5)
DATE 04.12.2025
FILE REF STP01

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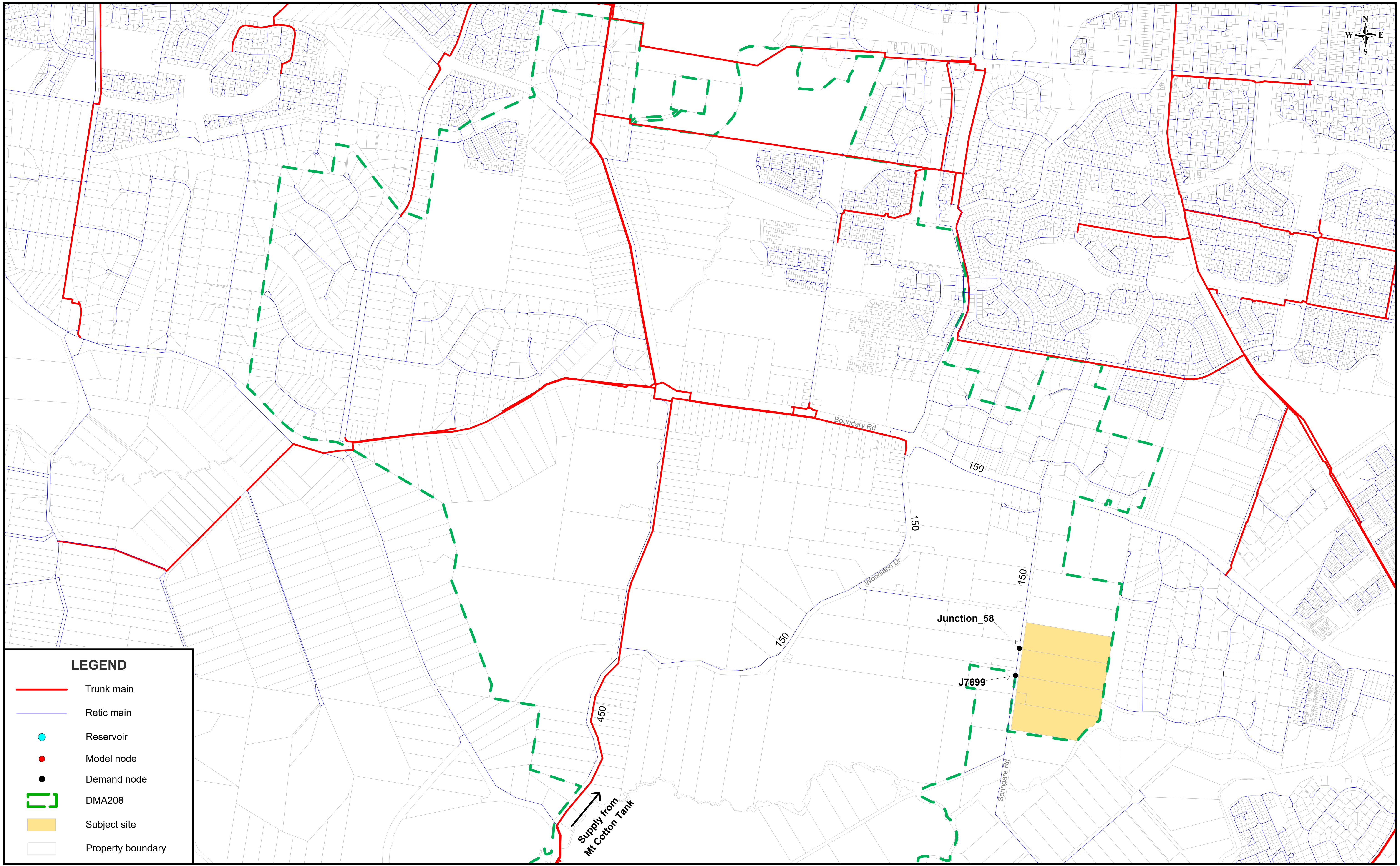
0 10 20 30 40 50m
Scale 1:1,000 at A3

North

Appendix 2. Local water supply network servicing the development site (DMA208)


N
E
S
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Boundary Rd
150
150
150
150
Woodland Dr
Junction_58
J7699
450
Springare Rd
Supply from Mt Cotton Tank
LEGEND
Trunk main
Retic main
Reservoir
Model node
Demand node
DMA208
Subject site
Property boundary

H2ONE

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DRAWN:
J Meesamphan

CHECKED:
J May

APPROVED:
J May

CLIENT PM:

H2ONE PM:
J May

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A	ORIGINAL ISSUE - 16 SEP, 2025	

DATUM:
HORIZ: MGA94 (ZONE 56)
HEIGHT: AHD

SCALE:
0 425 850
Metres

SURVEYED BY / DATE:
SURVEY CHECKED:

H2ONE REFERENCES
PROJECT NO:
2307576
FILE REFERENCE:
CAD FILE:

Redland
CITY COUNCIL

Redland City Council
PO Box 21
Cleveland QLD 4163

Precinct 1, Sth Thornlands PDA
Thornlands QLD 4164
Water Supply Service Assessment

Appendix 2. Local water supply network servicing the development site (DMA208)

ORIGINAL ISSUE DATE:
SEP, 2025
DATE SCANNED:
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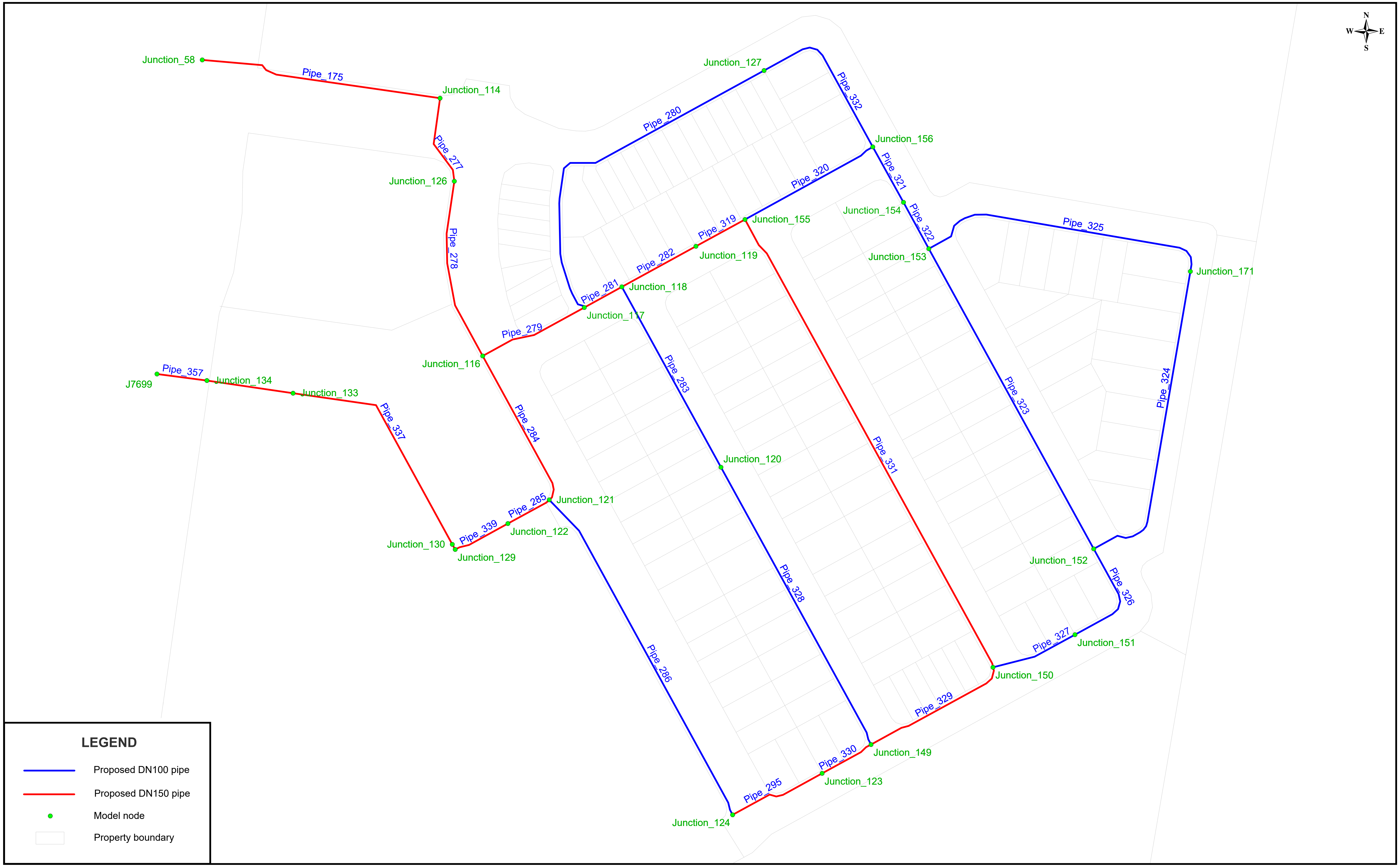
Appendix 3. Water supply pipe layout for the development


N
W
E
S
Junction_58
Pipe_175
Junction_114
Pipe_277
Junction_126
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J7699
Pipe_357
Junction_134
Junction_133
Pipe_337
Junction_130
Pipe_339
Junction_129
Pipe_285
Junction_122
Junction_121
Pipe_286
Junction_124
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Pipe_330
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Pipe_326
Junction_152
Pipe_323
Pipe_324
Junction_171
Pipe_325
Junction_153
Pipe_322
Junction_154
Pipe_321
Junction_156
Pipe_332
Junction_127
Pipe_280
Pipe_320
Junction_155
Pipe_319
Junction_119
Pipe_282
Junction_118
Pipe_281
Junction_117
Pipe_283
Junction_120
Pipe_328
Pipe_331
LEGEND
Proposed DN100 pipe
Proposed DN150 pipe
Model node
Property boundary

H2ONE

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J Meesamphan
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CHECKED:
J May
APPROVED:
J May
CLIENT PM:
H2ONE PM:
J May

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A	ORIGINAL ISSUE - 16 SEP, 2025	

DATUM:
HORIZ: MGA94 (ZONE 56)
HEIGHT: AHD

SCALE:
0 30 60
Metres

SURVEYED BY / DATE:
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PROJECT NO:
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Precinct 1, Sth Thornlands PDA
Thornlands QLD 4164
Water Supply Service Assessment

Appendix 3. Water supply pipe layout for the development

ORIGINAL ISSUE DATE:
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DATE SCANNED:
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Appendix 4. Raw modelling results for the development's internal pipe reticulation

Pipes

Stage	ID	Diameter (DN)	HW Co-efficient	Length (m)	SF PH Flow Rate (L/s)	SF PH Velocity (m/s)	SF PH Head Loss (m/km)
Stage 1	Pipe_175	150	110	122.2	1.7	0.10	0.14
	Pipe_277	150	110	45.2	1.7	0.10	0.14
	Pipe_278	150	110	92.1	1.5	0.08	0.11
	Pipe_279	150	110	56.9	1.6	0.09	0.12
	Pipe_280	100	100	187.4	0.2	0.03	0.02
	Pipe_281	150	110	21.5	1.2	0.07	0.07
	Pipe_282	150	110	42.5	0.6	0.04	0.02
	Pipe_283	100	100	103.5	0.4	0.05	0.07
	Pipe_284	150	110	82.1	0.1	0.02	0.01
	Pipe_285	150	110	24.0	0.1	0.06	0.05
	Pipe_286	100	100	184.0	0.5	0.06	0.10
	Pipe_295	150	110	50.6	0.2	0.01	0.00
	Pipe_319	150	110	28.1	0.4	0.02	0.01
	Pipe_320	100	100	74.0	0.2	0.03	0.02
	Pipe_328	100	100	158.6	0.2	0.02	0.02
	Pipe_330	150	110	28.6	0.1	0.00	0.00
	Pipe_332	100	100	86.2	0.1	0.00	0.00
	Pipe_336	150	110	43.7	1.0	0.06	0.05
	Pipe_337	150	110	122.0	1.0	0.06	0.05
	Pipe_338	150	110	3.0	1.0	0.06	0.05
	Pipe_339	150	110	29.7	1.0	0.06	0.05
	Pipe_357	150	110	25.3	0.1	0.06	0.05
Stage 1 & 2	Pipe_175	150	110	122.2	3.1	0.17	0.40
	Pipe_277	150	110	45.2	3.1	0.17	0.40
	Pipe_278	150	110	92.1	2.8	0.16	0.34
	Pipe_279	150	110	56.9	3.5	0.20	0.51
	Pipe_280	100	100	187.4	0.6	0.08	0.17
	Pipe_281	150	110	21.5	2.7	0.15	0.31
	Pipe_282	150	110	42.5	2.0	0.11	0.18
	Pipe_283	100	100	103.5	0.5	0.06	0.12
	Pipe_284	150	110	82.1	0.1	0.05	0.04
	Pipe_285	150	110	24.0	0.1	0.11	0.17
	Pipe_286	100	100	184.0	0.8	0.11	0.31
	Pipe_295	150	110	50.6	0.6	0.04	0.02
	Pipe_319	150	110	28.1	1.8	0.10	0.15
	Pipe_320	100	100	74.0	0.8	0.10	0.26
	Pipe_321	100	100	31.8	0.9	0.12	0.38
	Pipe_322	100	100	26.6	0.6	0.07	0.15
	Pipe_323	100	100	172.1	0.1	0.00	0.00
	Pipe_324	100	100	160.1	0.2	0.02	0.02
	Pipe_325	100	100	149.5	0.1	0.02	0.02
	Pipe_326	100	100	59.1	0.1	0.07	0.15
	Pipe_327	100	100	44.7	0.1	0.12	0.38
	Pipe_328	100	100	158.6	0.3	0.04	0.04
	Pipe_329	150	110	75.3	0.1	0.03	0.01
	Pipe_330	150	110	28.6	0.1	0.02	0.01
	Pipe_331	150	110	257.6	0.1	0.05	0.03
	Pipe_332	100	100	86.2	0.1	0.05	0.07
	Pipe_336	150	110	43.7	1.9	0.11	0.17
	Pipe_337	150	110	122.0	1.9	0.11	0.17
	Pipe_338	150	110	3.0	1.9	0.11	0.17
	Pipe_339	150	110	29.7	1.9	0.11	0.17
	Pipe_357	150	110	25.3	0.1	0.11	0.17

Note: "SF" is "standard flow", "PH" is "peak hour" and "HW" is "Hazen-Williams"

Nodes

Stage	ID	Demand (EP)	RL AHD (m)	SF PH Demand (L/s)	SF PH Pressure (m)	Fire Flow (L/s)	FF 2/3 PH Pressure (m)
Stage 1	Junction_114	0.0	40.00	0.00	54.1	15.0	30.7
	Junction_116	19.7	36.00	0.21	58.1	15.0	34.3
	Junction_117	19.7	36.50	0.21	57.6	15.0	33.3
	Junction_118	19.7	36.75	0.21	57.4	15.0	32.9
	Junction_119	19.7	36.75	0.21	57.4	15.0	32.7
	Junction_120	19.7	31.25	0.21	62.9	15.0	35.4
	Junction_121	19.7	31.25	0.21	62.9	15.0	38.8
	Junction_122	0.0	33.00	0.00	61.1	15.0	37.0
	Junction_123	19.7	20.00	0.21	74.1	15.0	45.7
	Junction_124	19.7	19.25	0.21	74.9	15.0	44.7
	Junction_126	19.7	38.00	0.21	56.1	15.0	30.4
	Junction_127	19.7	37.25	0.21	56.9	15.0	27.2
	Junction_129	0.0	32.00	0.00	62.1	15.0	36.1
	Junction_130	0.0	32.00	0.00	62.1	15.0	36.1
	Junction_133	0.0	38.00	0.00	56.1	15.0	30.1
	Junction_134	0.0	39.00	0.00	55.1	15.0	29.1
	Junction_149	19.7	22.00	0.21	72.1	15.0	41.7
	Junction_155	19.7	37.25	0.21	56.9	15.0	32.0
	Junction_156	19.7	37.50	0.21	56.6	15.0	29.7
Stage 1 & 2	Junction_114	0.0	40.00	0.00	51.5	15.0	28.4
	Junction_116	19.7	36.00	0.21	55.5	15.0	32.0
	Junction_117	19.7	36.50	0.21	54.9	15.0	31.1
	Junction_118	19.7	36.75	0.21	54.7	15.0	30.7
	Junction_119	19.7	36.75	0.21	54.7	15.0	30.5
	Junction_120	19.7	31.25	0.21	60.2	15.0	33.8
	Junction_121	19.7	31.25	0.21	60.2	15.0	36.7
	Junction_122	0.0	33.00	0.00	58.5	15.0	35.0
	Junction_123	19.7	20.00	0.21	71.4	15.0	46.7
	Junction_124	19.7	19.25	0.21	72.2	15.0	47.3
	Junction_126	19.7	38.00	0.21	53.5	15.0	28.2
	Junction_127	19.7	37.25	0.21	54.2	15.0	25.3
	Junction_129	0.0	32.00	0.00	59.5	15.0	33.9
	Junction_130	0.0	32.00	0.00	59.5	15.0	33.9
	Junction_133	0.0	38.00	0.00	53.5	15.0	28.0
	Junction_134	0.0	39.00	0.00	52.5	15.0	27.1
	Junction_149	19.7	22.00	0.21	69.4	15.0	42.7
	Junction_150	38.3	25.50	0.37	65.9	15.0	39.2
	Junction_151	38.3	27.00	0.37	64.4	15.0	36.3
	Junction_152	38.3	28.00	0.37	63.4	15.0	34.6
	Junction_153	38.3	36.00	0.37	55.4	15.0	26.7
	Junction_154	38.3	36.75	0.37	54.6	15.0	26.3
	Junction_155	19.7	37.25	0.21	54.2	15.0	26.6
	Junction_156	19.7	37.50	0.21	53.9	15.0	25.0
	Junction_171	38.3	30.00	0.37	61.4	15.0	28.9

Appendix G. Springacre Road Design and Checks

URBEX PTY LTD
SPRINGACRE ROAD, THORNLANDS, QLD, 4164
CIVIL WORKS

DRAWING INDEX

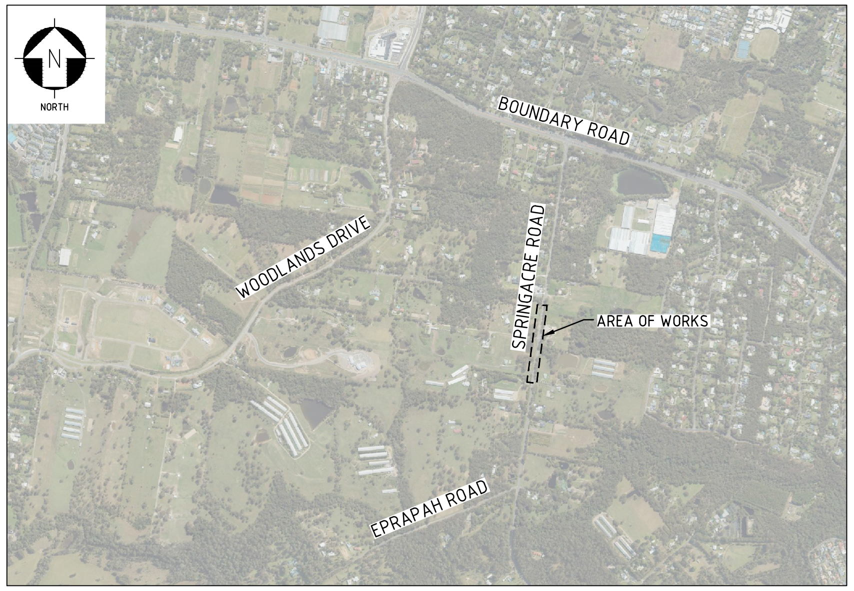
SHEET NUMBER	REVISION	SHEET TITLE
COVER SHEET AND DRAWING INDEX		
B00703-DD-DI01	A	COVER SHEET AND DRAXING INDEX
B00703-DD-DI01	A	GENERAL NOTES
TYPICAL SECTION		
B00703-DD-TC01	A	TYPICAL SECTIONS - SHEET 1 OF 3
B00703-DD-TC02	A	TYPICAL SECTIONS - SHEET 2 OF 3
B00703-DD-TC03	A	TYPICAL SECTIONS - SHEET 3 OF 3
ROADWORKS		
B00703-DD-GA01	A	GENERAL ARRANGEMENT & DRAWING KEY PLAN
B00703-DD-GA02	A	ROADWORKS - PLAN & PROFILE - SHEET 1 OF 6
B00703-DD-GA03	A	ROADWORKS - PLAN & PROFILE - SHEET 2 OF 6
B00703-DD-GA04	A	ROADWORKS - PLAN & PROFILE - SHEET 3 OF 6
B00703-DD-GA05	A	ROADWORKS - PLAN & PROFILE - SHEET 4 OF 6
B00703-DD-GA06	A	ROADWORKS - PLAN & PROFILE - SHEET 5 OF 6
B00703-DD-GA07	A	ROADWORKS - PLAN & PROFILE - SHEET 6 OF 6
B00703-DD-GA08	A	PAVEMENT DETAILS
B00703-DD-GA09	A	SIGNAGE & LINEMARKING
DRAINAGE		
B00703-DD-SW01	A	DRAINAGE LAYOUT - SHEET 1 OF 3
B00703-DD-SW02	A	DRAINAGE LAYOUT - SHEET 2 OF 3

DRAWING INDEX

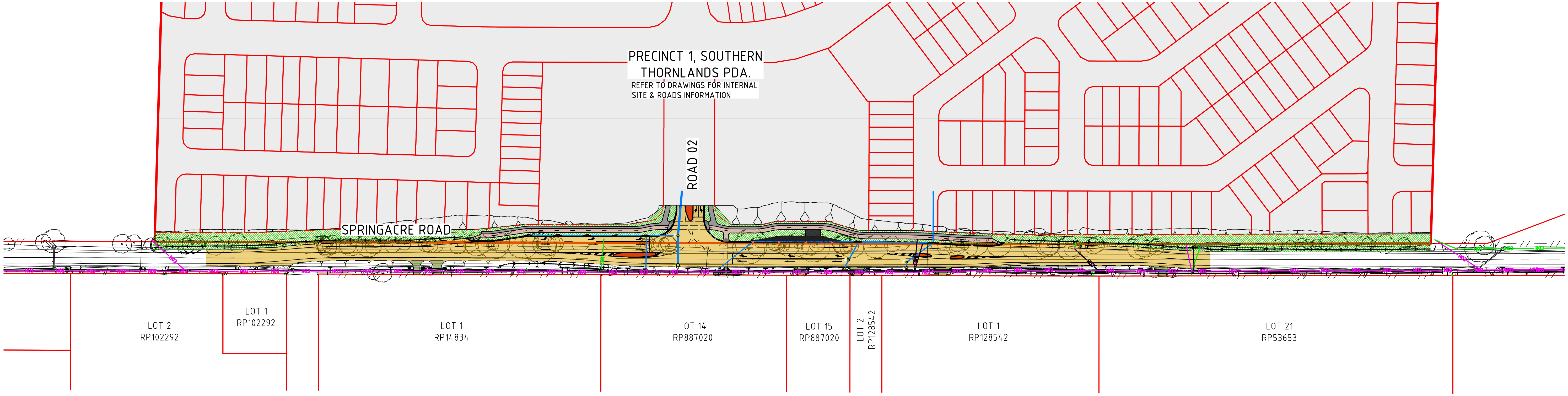
SHEET NUMBER	REVISION	SHEET TITLE
B00703-DD-SW03	A	DRAINAGE LAYOUT - SHEET 3 OF 3
B00703-DD-SW04	A	DRAINAGE LONGITUDINAL SECTIONS - SHEET 1 OF 3
B00703-DD-SW05	A	DRAINAGE LONGITUDINAL SECTIONS - SHEET 2 OF 3
B00703-DD-SW06	A	DRAINAGE LONGITUDINAL SECTIONS - SHEET 3 OF 3
ANNOTATED SECTIONS		
B00703-DD-XS01	A	ANNOTATED SECTIONS - RD01 - SHEET 1 OF 12
B00703-DD-XS02	A	ANNOTATED SECTIONS - RD01 - SHEET 2 OF 12
B00703-DD-XS03	A	ANNOTATED SECTIONS - RD01 - SHEET 3 OF 12
B00703-DD-XS04	A	ANNOTATED SECTIONS - RD01 - SHEET 4 OF 12
B00703-DD-XS05	A	ANNOTATED SECTIONS - RD01 - SHEET 5 OF 12
B00703-DD-XS06	A	ANNOTATED SECTIONS - RD01 - SHEET 6 OF 12
B00703-DD-XS07	A	ANNOTATED SECTIONS - RD01 - SHEET 7 OF 12
B00703-DD-XS08	A	ANNOTATED SECTIONS - RD01 - SHEET 8 OF 12
B00703-DD-XS09	A	ANNOTATED SECTIONS - RD01 - SHEET 9 OF 12
B00703-DD-XS10	A	ANNOTATED SECTIONS - RD01 - SHEET 10 OF 12
B00703-DD-XS11	A	ANNOTATED SECTIONS - RD01 - SHEET 11 OF 12
B00703-DD-XS12	A	ANNOTATED SECTIONS - RD01 - SHEET 12 OF 12
B00703-DD-XS13	A	ANNOTATED SECTIONS - RD02
MISCELLANEOUS		
B00703-DD-UL01	A	ULTIMATE ARRANGEMENT
B00703-DD-TP01	A	SWEPT-PATH ANALYSIS

NOTES

1. DIMENSIONS SHOWN IN METERS UNLESS NOTED OTHERWISE.
2. VERTICAL DATUM IS AUSTRALIAN HEIGHT DATUM (AHD).
3. COORDINATE SYSTEM & SURVEY SUPPLIED BY 'RPS AAP CONSULTING' PACKAGE NO> AU011113.
4. THE CONTRACTOR SHALL ESTABLISH SURVEY BASELINES AND BENCHMARKS. PRIOR TO THE COMMENCEMENT OF WORK THE CONTRACTOR SHALL VERIFY THE EXISTING SURVEY LEVELS AND AGREE WITH THE COMPANY'S REPRESENTATIVE ON ANY VARIATIONS FORM THOSE SHOWN ON THE DRAWINGS.
5. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH TMR SPECIFICATIONS & RELEVANT STATURTORY AUTHORITIES.
6. SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY THE SITE CONTRACTOR.
7. REFER ALL DISCREPANCIES TO THE COMPANY'S REPRESENTATIVE BEFORE PROCEEDING WITH THE WORKS.
8. LOCATION OF ALL EXISTING SERVICES TO BE CONFIRMED PRIOR TO CONSTRUCTION AND ANY TREATMENT SHALL BE APPROVED BY COMPANY'S REPRESENTATIVE.



LOCALITY PLAN
NOT TO SCALE



LAYOUT PLAN
SCALE 1 : 1250

20 0 20 40 60 70 80 100m
SCALE 1:1250 (A1) 1:2500(A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 10:33:59 AM User: DESIGN CIVIL
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

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URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **COVERSHEET & DRAWING INDEX**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-DI01	A

"

GENERAL NOTES

GN1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL SPECIFICATIONS, ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR DECISION BEFORE PROCEEDING WITH THE WORK.

GN2 THE ACCURACY AND COMPLETENESS OF EXISTING SERVICE INFORMATION SHOWN ON THE DRAWINGS IS NOT GUARANTEED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL SERVICES PRIOR TO CONSTRUCTION AND ADVISE THE SUPERINTENDENT OF ANY DIFFERENCES FROM THE DRAWINGS.

GN3 THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK, BEFORE CONSTRUCTION AND/OR FABRICATION IS COMMENCED.

GN4 THE ENGINEER'S DRAWINGS SHALL NOT BE SCALED UNLESS SPECIFICALLY NOTED OTHERWISE.

GN5 DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING NO PART SHALL BE OVERSTRESSED UNDER CONSTRUCTION ACTIVITIES.

GN6 WORKMANSHIP AND MATERIALS TO BE IN ACCORDANCE WITH THE RELEVANT CURRENT STANDARDS AUSTRALIA CODES INCLUDING ALL AMENDMENTS, AND THE LOCAL STATUTORY AUTHORITIES,EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

GN7 THE APPROVAL OF A SUBSTITUTION SHALL BE SOUGHT FROM THE ENGINEER BUT IS NOT AN AUTHORISATION FOR AN EXTRA. ANY EXTRA INVOLVED MUST BE TAKEN UP WITH THE ARCHITECT BEFORE THE WORK COMMENCES.

GN8 ABBREVIATIONS:
- UNO - UNLESS NOTED OTHERWISE
- AHD - AUSTRALIAN HEIGHT DATUM
- NTS - NOT TO SCALE
- ULS - ULTIMATE LIMIT STATE
- SLS - SERVICEABILITY LIMIT STATE
- APE - ANNUAL PROBABILITY OF EXCEEDENCE
- EDC - EARTHQUAKE DESIGN CATEGORY
- AS - AUSTRALIAN STANDARD

GN9 ALL NON-LOAD BEARING WALLS SHALL BE KEPT 20 MM CLEAR OF THE UNDERSIDE OF SLABS AND BEAMS UNO.

GN10 ALL DIMENSIONS ON STRUCTURAL DRAWINGS ARE IN MILLIMETRES UNO. ALL DIMENSIONS ON CIVIL DRAWINGS ARE IN METRES UNO. ALL REDUCED LEVELS IN METRES TO AHD UNO. DIMENSIONS TO BE CONFIRMED ON SITE BY THE CONTRACTOR PRIOR TO CONSTRUCTION WORKS.

GEOTECHNICAL NOTES

GE1 EARTHWORKS LIMITS OF CUTTING AND FILLING AS SHOWN ON THE DRAWING TO BE VERIFIED ON SITE. THE ACTUAL LIMITS TO BE DETERMINED ON SITE BY THE SUPERINTENDENT DURING CONSTRUCTION.

GE2 THE FILL MATERIAL WILL COMPRISE ONLY OF NATURAL EARTH AND ROCK AND SHALL BE FREE OF ALL CONTAMINATES, NOXIOUS, HAZARDOUS, DELETERIOUS AND ORGANIC MATERIAL. THE FILL SHALL BE COMPACTED IN LAYERS NOT EXCEEDING 300MM TO A MAXIMUM DRY DENSITY SPECIFIED BY THE LOCAL AUTHORITY OR THE RELEVANT AUSTRALIAN STANDARD IN ACCORDANCE WITH AS1289 LEVEL 1 CERTIFICATION.

GE3 THE PLACEMENT OF FILL TO BE EXECUTED SUCH THAT TO BE FREE DRAINING AT ALL TIMES, WON'T CAUSE PONDING AND TO NOT CAUSE NUISANCE TO ADJOINING PROPERTY OR ROADS.

GE4 NO DEMOLITION MATERIAL TO BE USED AS FILL MATERIAL.

GE5 WHERE UNSUITABLE MATERIAL IS ENCOUNTER WITHIN THE FILL, IT WILL BE REMOVED AND REPLACED WITH SUITABLE FILL.

GE6 ALL VEHICLES EXITING FROM THE SITE TO BE CLEAN - TO PREVENT MATERIAL BEING TRACKED OR DEPOSITED ON THE ADJOINING PUBLIC ROADS. REFER ENVIRONMENTAL MANAGEMENT NOTES. ACCESS TRACKS THROUGH THE SITE WILL BE LIMITED TO THOSE APPROVED BY THE SUPERINTENDENT AND THE CONTRACTOR PRIOR TO ANY WORK COMMENCING.

LOCATION	DENSITY & FREQUENCY
PAVEMENT	98% MODIFIED
SUBGRADE	95% MODIFIED
GRAVEL BELOW CONCRETE PAVEMENT	95% MODIFIED
TRENCH BACKILL	95% MODIFIED
BELOW STRUCTURES	95% MODIFIED
ELSEWHERE	90% MODIFIED

GE7 GEOTECHNICAL ENGINEER TO SUPERVISE AND INSPECT FOUNDING MATERIALS TO ENSURE ADEQUATELY STIFF/DENSE SOIL IS REACHED. MINIMUM ALLOWABLE BEARING CAPACITY = 250KPA.

GE8 IF GROUND WATER FOUND DURING EXCAVATION OF STRUCTURES, THE DESIGN ENGINEER IS TO BE ADVISED.

REFINEMENT OF THESE NOTES
TO BE FINALISED IN THE
DETAIL DESIGN PHASE

CONCRETE NOTES

CN1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS3600. SIZES OF CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES. THE DESIGN & CERTIFICATION OF TEMPORARY SUPPORTS & STRIPPING OF FORMWORK IS THE RESPONSIBILITY OF THE CONTRACTOR

CN2 CONCRETE STRENGTH UNO.
N50

CN3 CONCRETE COVER UNO.
70mm COVER

CN4 CONCRETE EXPOSURE CLASSIFICATIONS UNO:
B2

CN5 READY-MIX CONCRETE IN ACCORDANCE WITH AS1379. REFER ALSO ELEMENTS FOR GRADES.
SLUMP 80 +/- 15 UNO
20 AGGREGATE UNO
NO ADDITION OF WATER PERMITTED ON SITE. ALL CONCRETE MUST BE VIBRATED. NON LOADBEARING ELEMENTS SHALL BE KEPT 20mm CLEAR OF SOFFIT OF STRUCTURE. ALLOWANCE TO BE MADE IN ANY CONNECTIONS TO SOFFIT FOR 20mm DEFLECTION.

CN6 ALL REINFORCEMENT SHALL BE SUPPORTED IN ITS CORRECT POSITION DURING CONCRETING BY PLASTIC BAR CHAIRS. WIRE CHAIRS NOT PERMITTED. COVERS MUST BE MAINTAINED AT ALL TIMES INCLUDING DRIP GROOVES. ENSURE TIE WIRES DO NOT PROTRUDE INTO THE COVER ZONES. PENETRATIONS ARE TO BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR APPROVAL. DOCUMENTED REINFORCEMENT TO BE DISPLACED AT PENETRATIONS.

CN7 IN HOT AND/OR WINDY WEATHER APPLY ALIPHATIC ALCOHOL TO THE SCREEDED CONCRETE TO MINIMISE MOISTURE LOSS AND PLASTIC SHRINKAGE CRACKING. ALIPHATIC ALCOHOL MUST BE RE-APPLIED AFTER EACH CONCRETE OPERATION. THE SURFACE OF THE CONCRETE MUST NOT BE LEFT IN AN UNPROTECTED STATE.
NOTE - THIS DOES NOT REPLACE CURING.

CN8 CURE ALL SLABS FOR 7 DAYS MINIMUM BY AN APPROVED METHOD.
NOTE - CURING MUST BE IN PLACE WITHIN 3 HOURS OF COMPLETING THE SLABS. LEAVE FORMWORK IN PLACE. COVER WITH PLASTIC SHEET (SECURELY HELD DOWN). SPRAYED CURING COMPOUND COMPLYING WITH AS3799.

CN9 NO HOLES, CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE ENGINEER.

CN10 CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND USED ONLY WHERE SHOWN OR SPECIFICALLY APPROVED BY THE ENGINEER. SHEAR KEYS AND SCABBLING OF CONCRETE REQUIRED TO ALL VERTICAL JOINTS IN SUSPENDED SLABS AND BEAMS. THE FACE OF ALL CONCRETE AGAINST WHICH NEW CONCRETE IS TO BE CAST IS TO BE THOROUGHLY MECHANICALLY SCABBLED, FULLY EXPOSING THE AGGREGATE MATRIX.

CN11 CONCRETE FINISHED TO BE CLASS 2 AS PER AS3640-1995

CN12 ALL CONCRETE WORK IS COMPLY WITH THE FOLLOWING AUSTRALIAN STANDARDS, BUT NOT LIMITED TO:
AS 1012, AS1289, AS3600, AS3610, AS3735, AS/NZS4671

REINFORCEMENT NOTES

RE1 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION OR SCALE.

RE2 SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN OR AS OTHERWISE APPROVED IN WRITING BY THE DESIGN ENGINEER.

RE3 WELDING OR SITE BENDING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE DESIGN ENGINEER.

RE4 UNO ALL COGS AND HOOKS ARE TO BE IN ACCORDANCE WITH AS3600. REFER ALSO TO SECTION & BEAM ELEVATIONS.

RE5 ALL REINFORCEMENT IS TO BE IN ACCORDANCE WITH AS4671.
REINFORCEMENT SYMBOLS:

S	GRADE D250N DEFORMED BAR
R	GRADE R250N PLAN BAR
N	GRADE D500N DEFORMED BAR
SL,RL	GRADE D500L DEFORMED MESH

RE6 ALL REINFORCEMENT SHALL BE GRADE D500N TO AS4671 UNO.

RE7 EXPOSURE CLASSIFICATIONS TO AS3600:
ALL B2

RE8 UNO THE MINIMUM LAP LENGTH OF ALL REINFORCING SHALL BE IN ACCORDANCE WITH THE BELOW TABLE:

MINIMUM LAPPED SPLICE LENGTHS FOR REINFORCING BARS

EXPOSURE CLASSIFCATION	f'c	DEFORMED BAR DIAMETER								
		10	12	16	20	24	28	32	36	40
B1	32 MPa	450	550	800	1000	1250	1500	1800	2100	2400
B2	40 MPa	400	500	700	900	1100	1350	1600	1850	2150
	50 MPa	400	500	650	800	1000	1200	1450	1700	1950
C, C1, AND C2	50 MPa	400	500	650	800	1000	1200	1450	1700	1950

# FOR TOP/HORIZONTAL BARS WITH MORE THAT 300 OF CONCRETE BELOW THE ABOVE BARS, THE LAP LENGTHS IN THIS TABLE SHALL BE MULTIPLIED BY 1.3. WHERE LAPS ARE REQUIRED BUT NOT SHOWN ON THE DRAWINGS, THEY SHOULD BE STAGGERED AND POSITIONED AWAY FROM POINTS OF MAXIMUM STRESS. WHERE MORE THAN 50% OF REINFORCEMENT IS SPLICED AT POINTS OF MAXIMUM STRESS, LAP LENGTHS SHOWN IN THE TABLE ABOVE ARE TO BE MULTIPLIED BY 1.3.

FORMWORK NOTES

FW1 FORMWORK DESIGN, CONSTRUCTION AND STRIPPING SHALL COMPLY WITH AS3610. THE FORMWORK DESIGN SHALL BE UNDERTAKEN BY AN EXPERIENCED FORMWORK DESIGNER AND SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALSO REFER TO THE SPECIFICATION.

FW2 FORMWORK CLASSES:
CLASS 3 ALL EXPOSED FACES.
CLASS 4 ALL CONCEALED FACES.

FW3 19MM CHAMFER TO ALL EDGES.
12MM DRIP GROOVE TO ALL SOFFIT EDGES.

FW4 PROPS TO REMAIN IN PLACE FOR 12 DAYS MINIMUM (IF AVERAGE AIR TEMPERATURE IS MORE THAN 20°C) OR 18 DAYS MINIMUM IF LOWER.

RETAINING WALL DESIGN PARAMETERS

1. COMPLY WITH AS4678-2002 "EARTH RETAINING STRUCTURES"
2. MINIMUM DESIGN LIFE OF 100 YEARS
3. DESIGN TO CARRY WIND LOADS IMPOSED BY A 2m (MAX) HIGH FENCE
4. COMPLY WITH REDLAND CITY COUNCIL PLANNING SCHEME AND ALL RELEVANT COUNCIL STANDARDS.
5. PROVIDE RPEQ CERTIFICATION FOR DESIGN & CONSTRUCTION AND PROVIDE FORM 15 AND 16 CERTIFICATION.
6. WALL LOADING TO BE MIN. 20 KPa AND IS TO BE DESIGNED TO ALLOW FOR LOADING OF GUARD RAIL, ROAD LIVE & DEAD LOADS, STREET LIGHT FOOTINGS AND FENCING AS REQUIRED.

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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

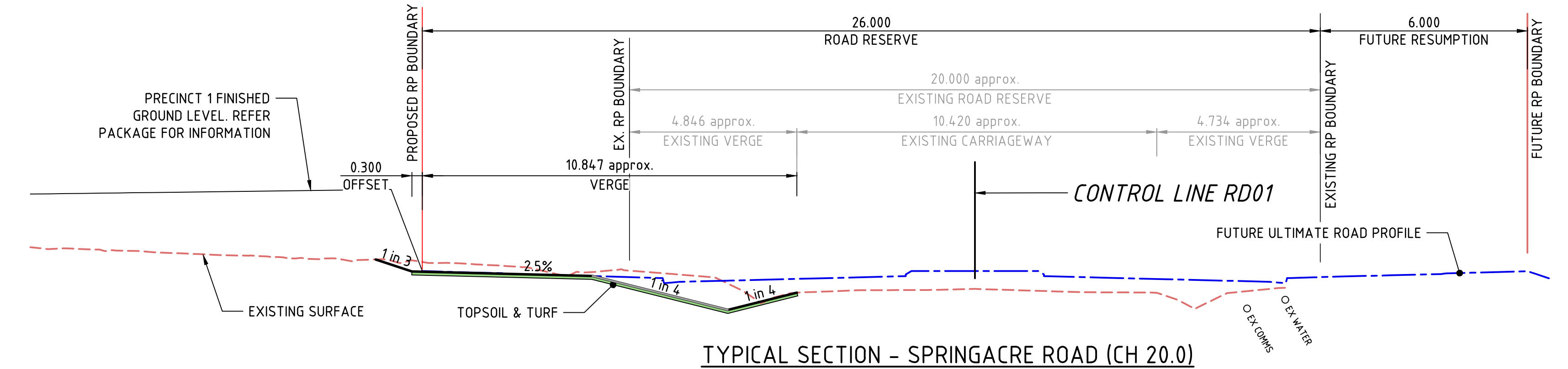
URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **GENERAL NOTES**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

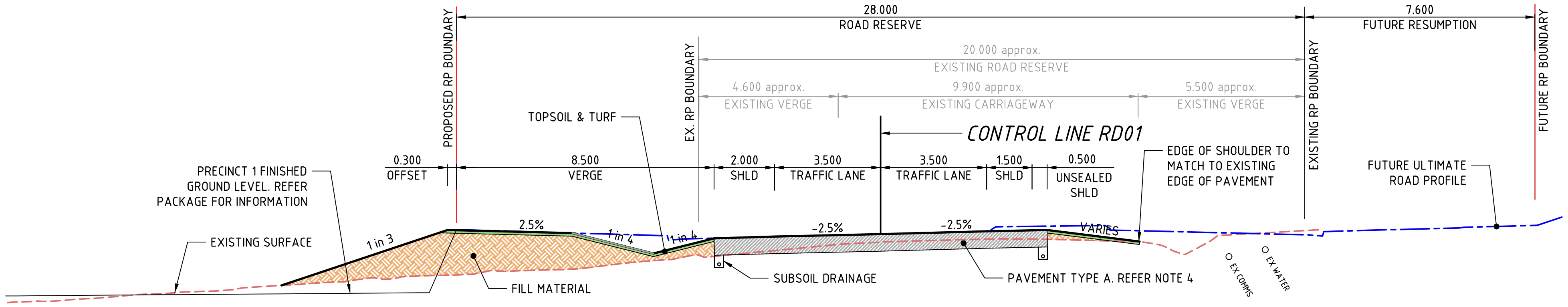
ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-DI02**
Rev **A**


PROPOSED RP BOUNDARY
26.000
ROAD RESERVE
6.000
FUTURE RESUMPTION
FUTURE RP BOUNDARY
EX. RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
4.846 approx.
EXISTING VERGE
10.420 approx.
EXISTING CARRIAGEWAY
4.734 approx.
EXISTING VERGE
EXISTING RP BOUNDARY
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
0.300
OFFSET
10.847 approx.
VERGE
CONTROL LINE RD01
FUTURE ULTIMATE ROAD PROFILE
1 in 3
2.5%
1 in 4
1 in 4
EXISTING SURFACE
TOPSOIL & TURF
EX COMMS
EX WATER

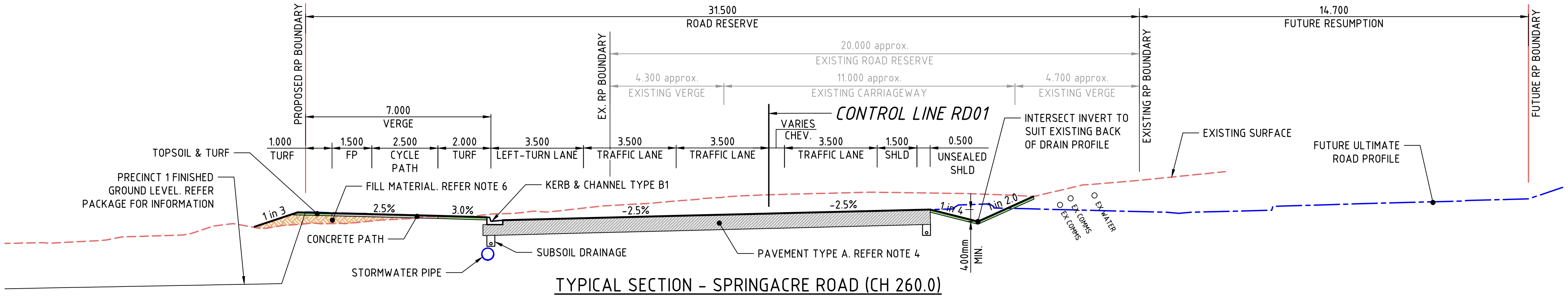
TYPICAL SECTION - SPRINGACRE ROAD (CH 20.0)
CH 0.0 TO CH33.0 (APPROX)

SCALE 1:100


PROPOSED RP BOUNDARY
28.000
ROAD RESERVE
7.600
FUTURE RESUMPTION
FUTURE RP BOUNDARY
EX. RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
4.600 approx.
EXISTING VERGE
9.900 approx.
EXISTING CARRIAGEWAY
5.500 approx.
EXISTING VERGE
EXISTING RP BOUNDARY
TOPSOIL & TURF
CONTROL LINE RD01
0.300
OFFSET
8.500
VERGE
2.000
SHLD
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
1.500
SHLD
0.500
UNSEALED SHLD
EDGE OF SHOULDER TO MATCH TO EXISTING EDGE OF PAVEMENT
FUTURE ULTIMATE ROAD PROFILE
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
EXISTING SURFACE
1 in 3
2.5%
1 in 4
1 in 4
-2.5%
-2.5%
VARIES
SUBSOIL DRAINAGE
PAVEMENT TYPE A. REFER NOTE 4
FILL MATERIAL
EX COMMS
EX WATER

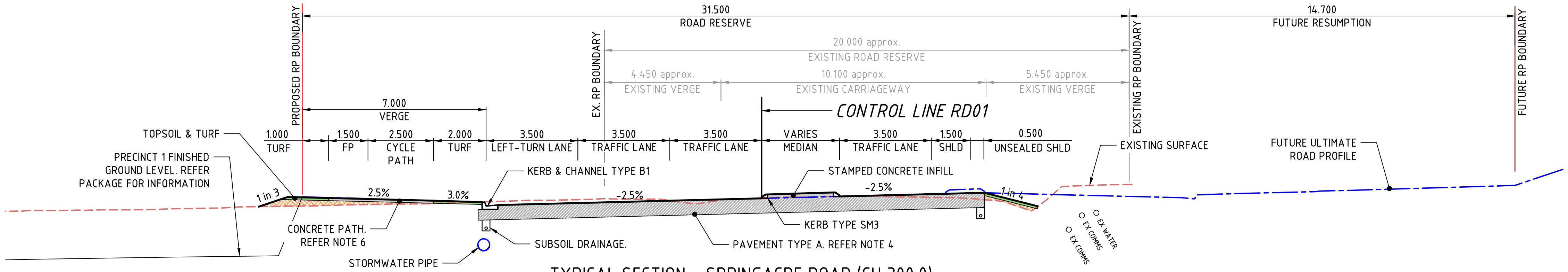
TYPICAL SECTION - SPRINGACRE ROAD (CH 140.0)
CH 85.0 TO CH190.0 (APPROX)

SCALE 1:100


PROPOSED RP BOUNDARY
31.500
ROAD RESERVE
14.700
FUTURE RESUMPTION
FUTURE RP BOUNDARY
EX. RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
4.300 approx.
EXISTING VERGE
11.000 approx.
EXISTING CARRIAGEWAY
4.700 approx.
EXISTING VERGE
EXISTING RP BOUNDARY
7.000
VERGE
CONTROL LINE RD01
VARIES
CHEV.
INTERSECT INVERT TO SUIT EXISTING BACK OF DRAIN PROFILE
EXISTING SURFACE
FUTURE ULTIMATE ROAD PROFILE
TOPSOIL & TURF
1.000
TURF
1.500
FP
2.500
CYCLE PATH
2.000
TURF
3.500
LEFT-TURN LANE
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
1.500
SHLD
0.500
UNSEALED SHLD
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
FILL MATERIAL. REFER NOTE 6
KERB & CHANNEL TYPE B1
1 in 3
2.5%
3.0%
-2.5%
-2.5%
1 in 4
1 in 2.0
CONCRETE PATH
SUBSOIL DRAINAGE
PAVEMENT TYPE A. REFER NOTE 4
400mm MIN.
STORMWATER PIPE
EX COMMS
EX COMMS
EX WATER

TYPICAL SECTION - SPRINGACRE ROAD (CH 260.0)
CH 235.0 TO CH290.0 (APPROX)

SCALE 1:100


PROPOSED RP BOUNDARY
31.500
ROAD RESERVE
14.700
FUTURE RESUMPTION
FUTURE RP BOUNDARY
EX. RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
4.450 approx.
EXISTING VERGE
10.100 approx.
EXISTING CARRIAGEWAY
5.450 approx.
EXISTING VERGE
EXISTING RP BOUNDARY
7.000
VERGE
CONTROL LINE RD01
TOPSOIL & TURF
1.000
TURF
1.500
FP
2.500
CYCLE PATH
2.000
TURF
3.500
LEFT-TURN LANE
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
VARIES
MEDIAN
3.500
TRAFFIC LANE
1.500
SHLD
0.500
UNSEALED SHLD
EXISTING SURFACE
FUTURE ULTIMATE ROAD PROFILE
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
KERB & CHANNEL TYPE B1
STAMPED CONCRETE INFILL
1 in 3
2.5%
3.0%
-2.5%
-2.5%
1 in 4
CONCRETE PATH. REFER NOTE 6
SUBSOIL DRAINAGE.
KERB TYPE SM3
PAVEMENT TYPE A. REFER NOTE 4
STORMWATER PIPE
EX COMMS
EX COMMS
EX WATER

TYPICAL SECTION - SPRINGACRE ROAD (CH 300.0)
CH 290.0 TO CH315.0 (APPROX)

SCALE 1:100

NOTES

1. FOR DRAINAGE INFORMATION REFER DRGS B00703-DD-SW01 TO B00703-DD-SW06.
2. FOR ROADWORKS INFORMATION REFER DRGS B00703-DD-GA01 TO B00703-DD-GA11.
3. FOR PAVEMENT INFORMATION REFER TO DRG B00703-DD-PA01.
4. FILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SPECIFICATIONS.

0 2 4 6 8 10m
2.0 1.5 1.0 0.5

SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION

Peter Ingerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client
URBEX PTY LTD

Project
SPRINGACRE ROAD, THORNLANDS, QLD, 4161

Title
TYPICAL SECTIONS & DETAILS
SHEET 1 OF 3

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

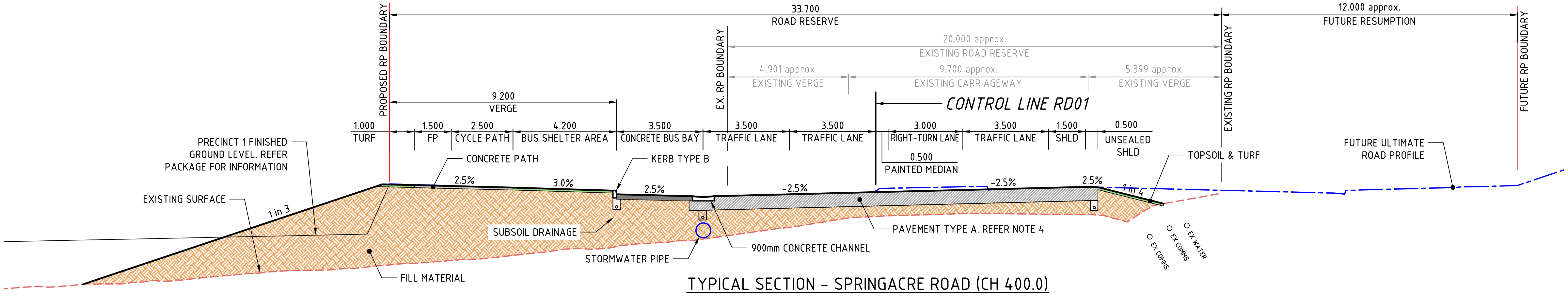
Project No. Drawing No.	Rev
B00703-DD-TC01	A

"

Plot Date: 12/12/2025 11:43:19 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\TYPICALS

NOTES

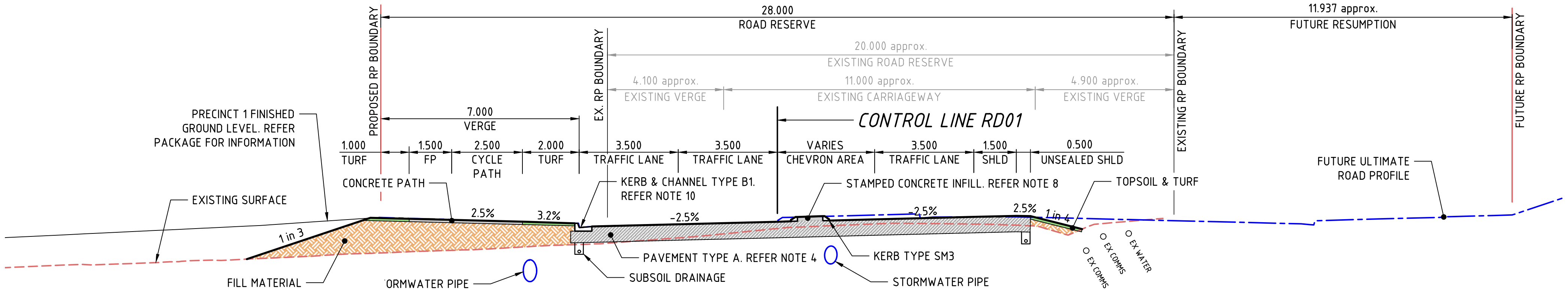
1. FOR DRAINAGE INFORMATION REFER DRGS B00703-DD-SW01 TO B00703-DD-SW06.
2. FOR ROADWORKS INFORMATION REFER DRGS B00703-DD-GA01 TO B00703-DD-GA11.
3. FOR PAVEMENT INFORMATION REFER TO DRG B00703-DD-PA01.
4. FILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SPECIFICATIONS.


33.700
ROAD RESERVE
12.000 approx.
FUTURE RESUMPTION
PROPOSED RP BOUNDARY
EX. RP BOUNDARY
EXISTING RP BOUNDARY
FUTURE RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
4.901 approx.
EXISTING VERGE
9.700 approx.
EXISTING CARRIAGEWAY
5.399 approx.
EXISTING VERGE
CONTROL LINE RD01
9.200
VERGE
1.000
TURF
1.500
FP
2.500
CYCLE PATH
4.200
BUS SHELTER AREA
3.500
CONCRETE BUS BAY
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
3.000
RIGHT-TURN LANE
3.500
TRAFFIC LANE
1.500
SHLD
0.500
UNSEALED SHLD
0.500
PAINTED MEDIAN
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
EXISTING SURFACE
CONCRETE PATH
KERB TYPE B
TOPSOIL & TURF
FUTURE ULTIMATE ROAD PROFILE
1 in 3
2.5%
3.0%
2.5%
-2.5%
-2.5%
2.5%
1 in 4
SUBSOIL DRAINAGE
STORMWATER PIPE
900mm CONCRETE CHANNEL
PAVEMENT TYPE A. REFER NOTE 4
FILL MATERIAL
EX WATER
EX COMMS
EX COMMS

TYPICAL SECTION - SPRINGACRE ROAD (CH 400.0)

CH 365.0 TO CH460.0 (APPROX)

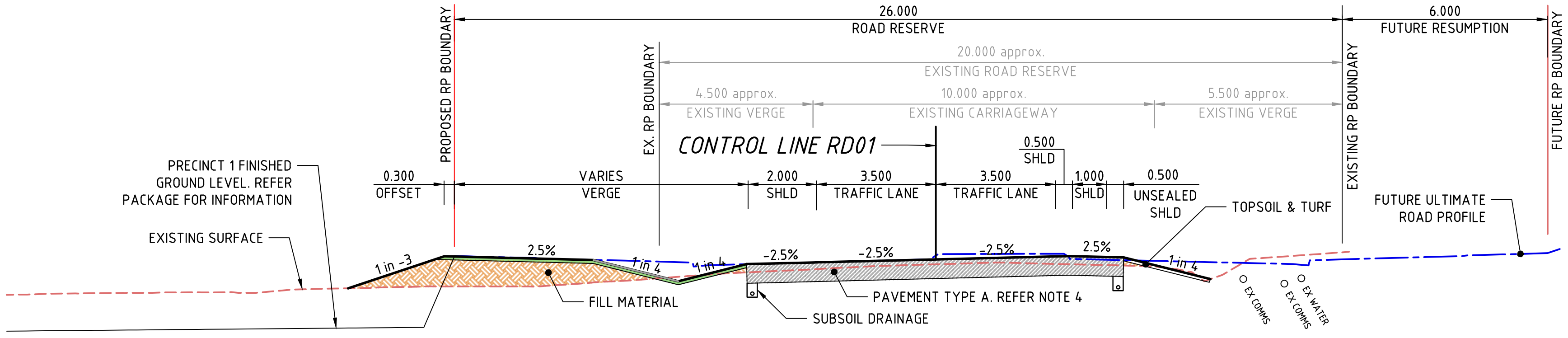
SCALE 1:100


28.000
ROAD RESERVE
11.937 approx.
FUTURE RESUMPTION
PROPOSED RP BOUNDARY
EX. RP BOUNDARY
EXISTING RP BOUNDARY
FUTURE RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
4.100 approx.
EXISTING VERGE
11.000 approx.
EXISTING CARRIAGEWAY
4.900 approx.
EXISTING VERGE
CONTROL LINE RD01
7.000
VERGE
1.000
TURF
1.500
FP
2.500
CYCLE PATH
2.000
TURF
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
VARIES
CHEVRON AREA
3.500
TRAFFIC LANE
1.500
SHLD
0.500
UNSEALED SHLD
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
EXISTING SURFACE
CONCRETE PATH
KERB & CHANNEL TYPE B1. REFER NOTE 10
STAMPED CONCRETE INFILL. REFER NOTE 8
TOPSOIL & TURF
FUTURE ULTIMATE ROAD PROFILE
1 in 3
2.5%
3.2%
-2.5%
-2.5%
2.5%
1 in 4
FILL MATERIAL
ORMWATER PIPE
PAVEMENT TYPE A. REFER NOTE 4
SUBSOIL DRAINAGE
KERB TYPE SM3
STORMWATER PIPE
EX WATER
EX COMMS
EX COMMS

TYPICAL SECTION - SPRINGACRE ROAD (CH 480.0)

CH 480.0 TO CH510.0 (APPROX)

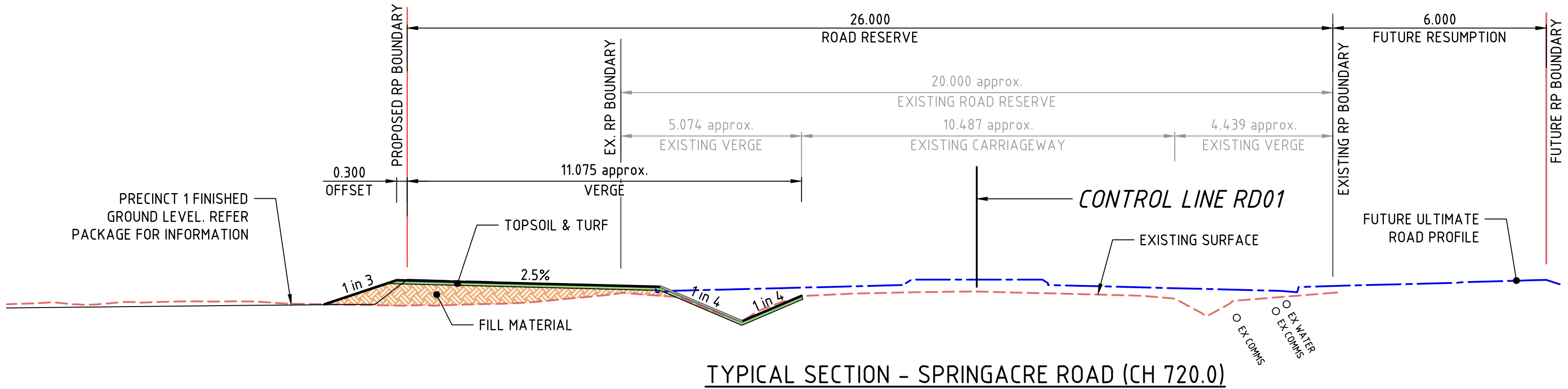
SCALE 1:100


26.000
ROAD RESERVE
6.000
FUTURE RESUMPTION
PROPOSED RP BOUNDARY
EX. RP BOUNDARY
EXISTING RP BOUNDARY
FUTURE RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
4.500 approx.
EXISTING VERGE
10.000 approx.
EXISTING CARRIAGEWAY
5.500 approx.
EXISTING VERGE
CONTROL LINE RD01
0.500
SHLD
0.300
OFFSET
VARIES
VERGE
2.000
SHLD
3.500
TRAFFIC LANE
3.500
TRAFFIC LANE
1.000
SHLD
0.500
UNSEALED SHLD
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
EXISTING SURFACE
TOPSOIL & TURF
FUTURE ULTIMATE ROAD PROFILE
1 in -3
2.5%
1 in 4
1 in 4
-2.5%
-2.5%
-2.5%
2.5%
1 in 4
FILL MATERIAL
PAVEMENT TYPE A. REFER NOTE 4
SUBSOIL DRAINAGE
EX COMMS
EX COMMS
EX WATER

TYPICAL SECTION - SPRINGACRE ROAD (CH 620.0)

CH 615.0 TO CH666.0 (APPROX)

SCALE 1:100


26.000
ROAD RESERVE
6.000
FUTURE RESUMPTION
PROPOSED RP BOUNDARY
EX. RP BOUNDARY
EXISTING RP BOUNDARY
FUTURE RP BOUNDARY
20.000 approx.
EXISTING ROAD RESERVE
5.074 approx.
EXISTING VERGE
10.487 approx.
EXISTING CARRIAGEWAY
4.439 approx.
EXISTING VERGE
0.300
OFFSET
11.075 approx.
VERGE
CONTROL LINE RD01
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
TOPSOIL & TURF
EXISTING SURFACE
FUTURE ULTIMATE ROAD PROFILE
1 in 3
2.5%
1 in 4
1 in 4
FILL MATERIAL
EX COMMS
EX COMMS
EX WATER

TYPICAL SECTION - SPRINGACRE ROAD (CH 720.0)

CH 666.0 TO END

SCALE 1:100

2.0 1.5 1.0 0.5 0 2 4 6 8 10m

SCALE 1:100 (A1) 1:200 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION

Peter Ingerman

Registered Engineer

Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**

Title **TYPICAL SECTIONS & DETAILS**
SHEET 2 OF 3

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No.	Drawing No.	Rev
	B00703-DD-TC02	A

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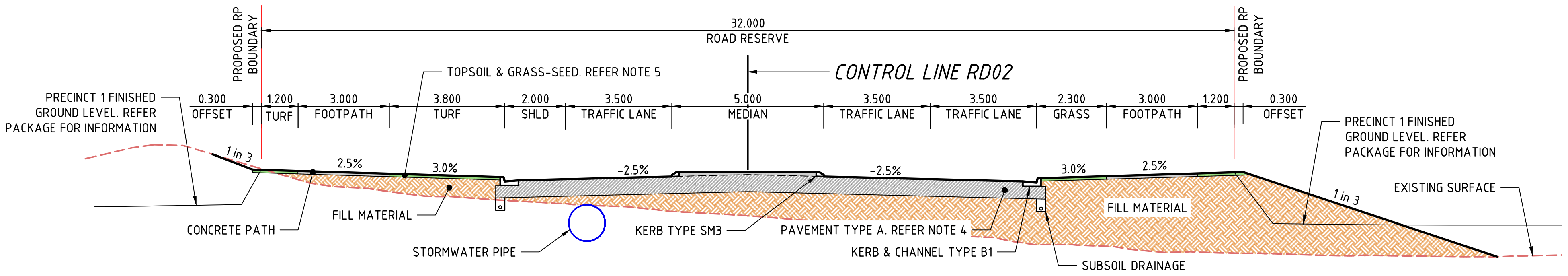
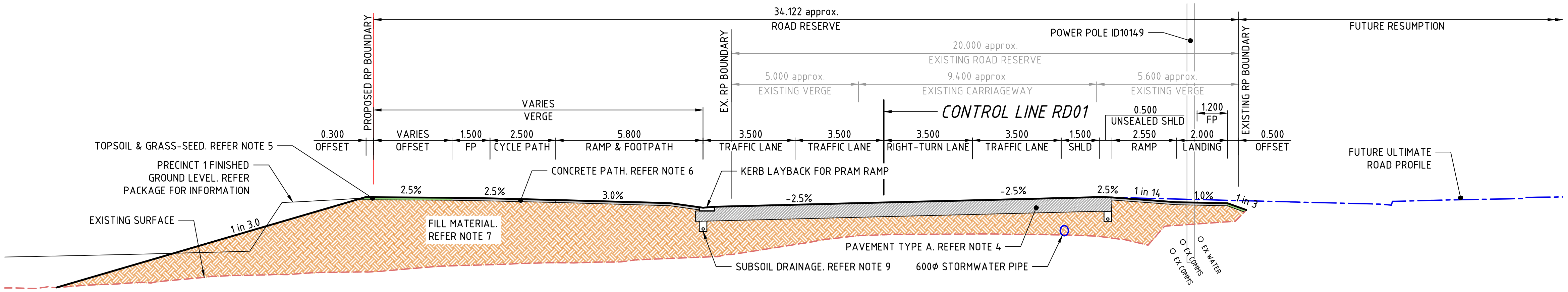

PROPOSED RP BOUNDARY
32.000
ROAD RESERVE
PROPOSED RP BOUNDARY
CONTROL LINE RD02
TOPSOIL & GRASS-SEED. REFER NOTE 5
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
0.300 OFFSET
1.200 TURF
3.000 FOOTPATH
3.800 TURF
2.000 SHLD
3.500 TRAFFIC LANE
5.000 MEDIAN
3.500 TRAFFIC LANE
3.500 TRAFFIC LANE
2.300 GRASS
3.000 FOOTPATH
1.200
0.300 OFFSET
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
1 in 3
2.5%
3.0%
-2.5%
-2.5%
3.0%
2.5%
1 in 3
EXISTING SURFACE
FILL MATERIAL
FILL MATERIAL
CONCRETE PATH
STORMWATER PIPE
KERB TYPE SM3
PAVEMENT TYPE A. REFER NOTE 4
KERB & CHANNEL TYPE B1
SUBSOIL DRAINAGE

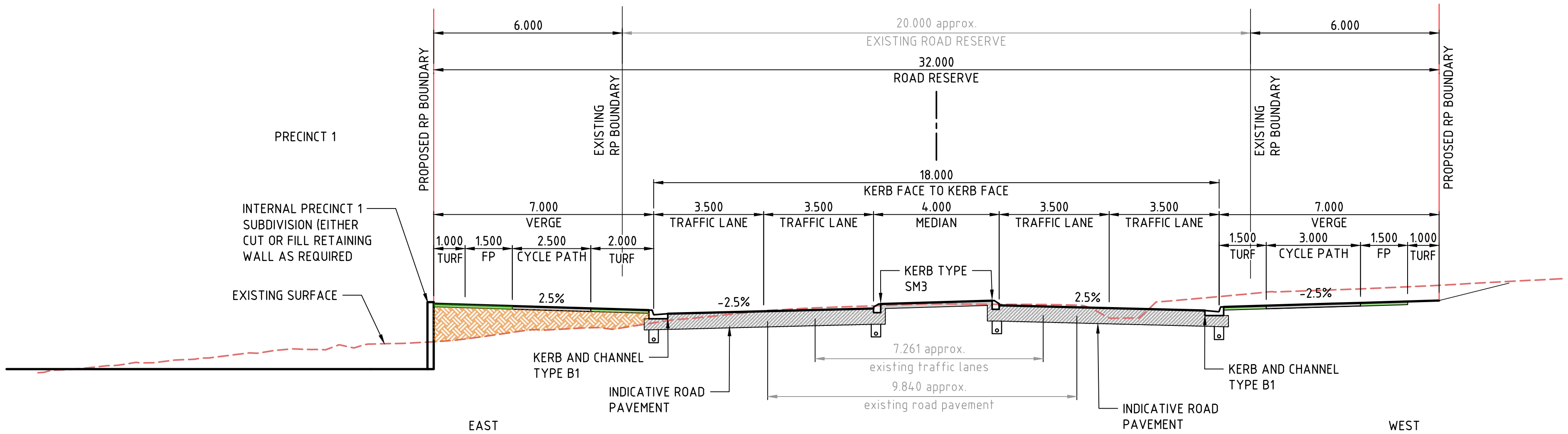
TYPICAL SECTION - ROAD 02 (CH 30.0)
CH 20.0 TO END

SCALE 1:100


34.122 approx.
ROAD RESERVE
PROPOSED RP BOUNDARY
EX. RP BOUNDARY
POWER POLE ID10149
20.000 approx.
EXISTING ROAD RESERVE
5.000 approx.
EXISTING VERGE
9.400 approx.
EXISTING CARRIAGEWAY
5.600 approx.
EXISTING VERGE
EXISTING RP BOUNDARY
FUTURE RESUMPTION
VARIES
VERGE
CONTROL LINE RD01
0.500
UNSEALED SHLD
1.200
FP
0.300 OFFSET
VARIES OFFSET
1.500 FP
2.500 CYCLE PATH
5.800 RAMP & FOOTPATH
3.500 TRAFFIC LANE
3.500 TRAFFIC LANE
3.500 RIGHT-TURN LANE
3.500 TRAFFIC LANE
1.500 SHLD
2.550 RAMP
2.000 LANDING
0.500 OFFSET
TOPSOIL & GRASS-SEED. REFER NOTE 5
PRECINCT 1 FINISHED GROUND LEVEL. REFER PACKAGE FOR INFORMATION
CONCRETE PATH. REFER NOTE 6
KERB LAYBACK FOR PRAM RAMP
FUTURE ULTIMATE ROAD PROFILE
EXISTING SURFACE
1 in 3.0
2.5%
2.5%
3.0%
-2.5%
-2.5%
2.5%
1 in 14
1.0%
1 in 3
FILL MATERIAL. REFER NOTE 7
PAVEMENT TYPE A. REFER NOTE 4
SUBSOIL DRAINAGE. REFER NOTE 9
600Ø STORMWATER PIPE
EX COMMS
EX COMMS
EX WATER

TYPICAL SECTION - SPRINGACRE ROAD (CH 400.0)
PEDESTRIAN CROSSING

SCALE 1:100


6.000
20.000 approx.
EXISTING ROAD RESERVE
6.000
32.000
ROAD RESERVE
PROPOSED RP BOUNDARY
EXISTING RP BOUNDARY
EXISTING RP BOUNDARY
PROPOSED RP BOUNDARY
PRECINCT 1
18.000
KERB FACE TO KERB FACE
7.000 VERGE
3.500 TRAFFIC LANE
3.500 TRAFFIC LANE
4.000 MEDIAN
3.500 TRAFFIC LANE
3.500 TRAFFIC LANE
7.000 VERGE
INTERNAL PRECINCT 1 SUBDIVISION (EITHER CUT OR FILL RETAINING WALL AS REQUIRED
1.000 TURF
1.500 FP
2.500 CYCLE PATH
2.000 TURF
1.500 TURF
3.000 CYCLE PATH
1.500 FP
1.000 TURF
EXISTING SURFACE
KERB TYPE SM3
2.5%
-2.5%
2.5%
-2.5%
KERB AND CHANNEL TYPE B1
7.261 approx.
existing traffic lanes
9.840 approx.
existing road pavement
KERB AND CHANNEL TYPE B1
INDICATIVE ROAD PAVEMENT
INDICATIVE ROAD PAVEMENT
EAST
WEST

TYPICAL SECTION - MID BLOCK
SPRINGACRE ROAD ULTIMATE
(EDQ NOMINATED CROSS SECTION AS OF 20/08/25)

SCALE 1:100

NOTES

1. FOR DRAINAGE INFORMATION REFER DRGS B00703-DD-SW01 TO B00703-DD-SW06.
2. FOR ROADWORKS INFORMATION REFER DRGS B00703-DD-GA01 TO B00703-DD-GA11.
3. FOR PAVEMENT INFORMATION REFER TO DRG B00703-DD-PA01.
4. FILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SPECIFICATIONS.

0 2 4 6 8 10m
2.0 1.5 1.0 0.5

SCALE 1:100 (A1) 1:200 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION

Peter Ingerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **TYPICAL SECTIONS & DETAILS**
SHEET 3 OF 3

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-TC03**
Rev **A**

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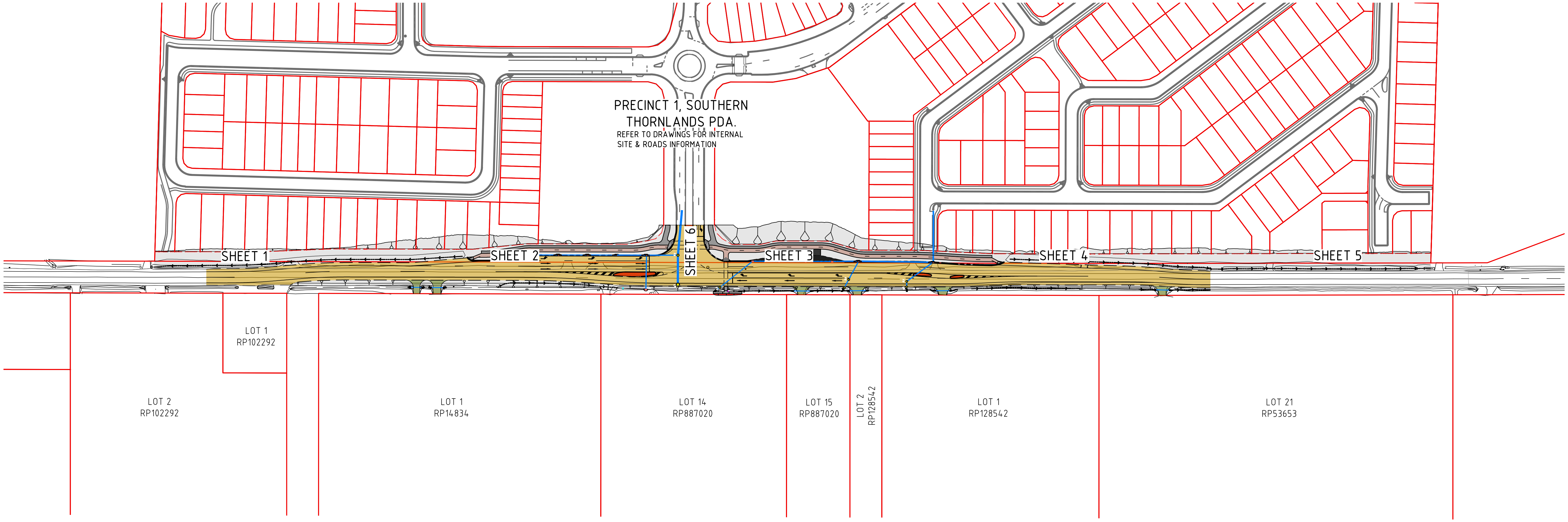
PRECINCT 1, SOUTHERN THORNLANDS PDA.
REFER TO DRAWINGS FOR INTERNAL SITE & ROADS INFORMATION
SHEET 1
SHEET 2
SHEET 6
SHEET 3
SHEET 4
SHEET 5
LOT 1 RP102292
LOT 2 RP102292
LOT 1 RP14834
LOT 14 RP887020
LOT 15 RP887020
LOT 2 RP128542
LOT 1 RP128542
LOT 21 RP53653

DRAWING KEY PLAN

SCALE 1 : 1250

EXISTING FEATURES LEGEND

—— OHP ——	EXISTING OVERHEAD ELECTRICITY
—— E ——	EXISTING UNDERGROUND ELECTRICITY
—— T ——	EXISTING UNDERGROUND TELECOMMUNICATIONS
—— W ——	EXISTING UNDERGROUND WATER MAIN
—— SWD ——	EXISTING STORMWATER CULVERT
—— G ——	EXISTING UNDERGROUND GAS
—— S ——	EXISTING SEWER MAIN
————	EXISTING PROPERTY BOUNDARY
– – – – – –	EXISTING CONTOURS (200mm INC)

PROPOSED FEATURES LEGEND

————	PROPERTY BOUNDARY
— — — —	RESUMPTION BOUNDARY
→—→—→	DRAINAGE INVERT
—·—·—	CONTROL LINE
– – – –	EDGE OF PAVEMENT
————	SURFACE CONTOURS (200mm INC.)
▨	TRAFFIC ISLAND
🟨	PAVEMENT TYPE A
■	CONCRETE BUS BAY
■	PEDESTRIAN PATHWAY
■	CYCLE PATHWAY
▨	BUS SHELTER SLAB
▬	CULVERT/CROSSING

NOTES

1. FOR DRAINAGE INFORMATION REFER DRGS B00703-DD-SW01 TO B00703-DD-SW06.
2. FOR PAVEMENT INFORMATION REFER TO DRG B00703-DD-PA01.
3. FILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SPECIFICATIONS.

User: DESIGN CIVIL
Plot Date: 12/12/2025 11:28:30 AM
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\GENERAL__ARRANGEMENT

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION

Peter Ingerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **GENERAL ARRANGEMENT & KEY PLAN**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

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ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-GA01	**A**

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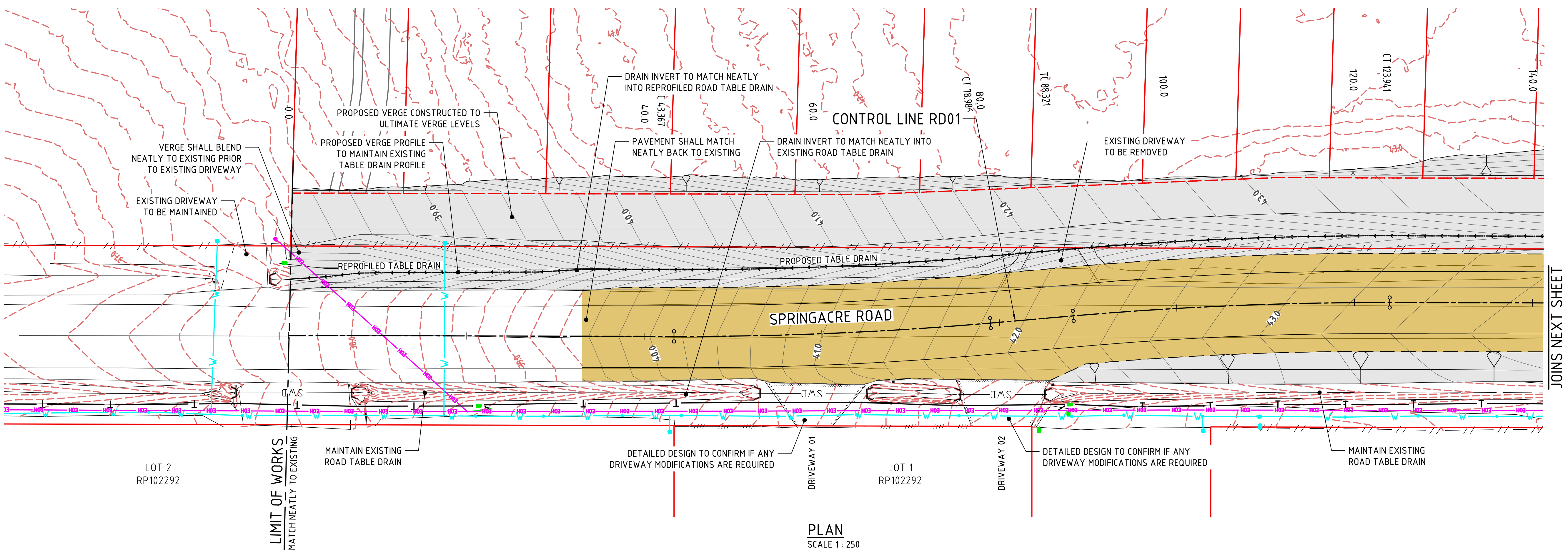
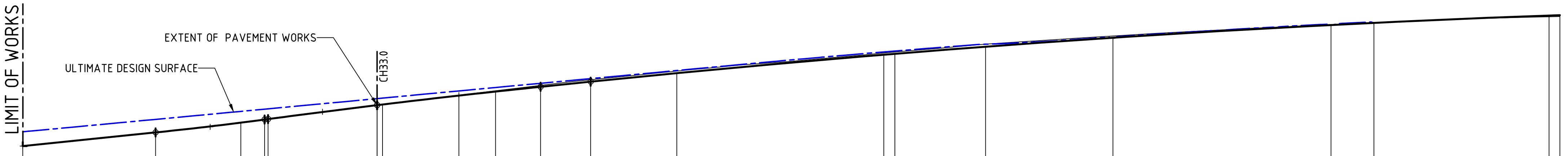
REFER TO DWG No. B00703-DD-GA01
FOR LEGEND AND NOTES


DRAIN INVERT TO MATCH NEATLY INTO REPROFILED ROAD TABLE DRAIN
PROPOSED VERGE CONSTRUCTED TO ULTIMATE VERGE LEVELS
PROPOSED VERGE PROFILE TO MAINTAIN EXISTING TABLE DRAIN PROFILE
VERGE SHALL BLEND NEATLY TO EXISTING PRIOR TO EXISTING DRIVEWAY
EXISTING DRIVEWAY TO BE MAINTAINED
PAVEMENT SHALL MATCH NEATLY BACK TO EXISTING
DRAIN INVERT TO MATCH NEATLY INTO EXISTING ROAD TABLE DRAIN
CONTROL LINE RD01
EXISTING DRIVEWAY TO BE REMOVED
0.0
C 43.367
40.0
60.0
CT 78.986
80.0
TC 88.321
100.0
120.0
CT 123.941
140.0
39.0
40.0
41.0
42.0
43.0
REPROFILED TABLE DRAIN
PROPOSED TABLE DRAIN
SPRINGACRE ROAD
SWD
JOINS NEXT SHEET
LOT 2
RP102292
LOT 1
RP102292
LIMIT OF WORKS
MATCH NEATLY TO EXISTING
MAINTAIN EXISTING ROAD TABLE DRAIN
DETAILED DESIGN TO CONFIRM IF ANY DRIVEWAY MODIFICATIONS ARE REQUIRED
DRIVEWAY 01
DRIVEWAY 02
DETAILED DESIGN TO CONFIRM IF ANY DRIVEWAY MODIFICATIONS ARE REQUIRED
MAINTAIN EXISTING ROAD TABLE DRAIN

PLAN
SCALE 1 : 250


LIMIT OF WORKS
EXTENT OF PAVEMENT WORKS
ULTIMATE DESIGN SURFACE
CH33.0

Horiz Curve Data: R400m; R400m

Vertical Geometry Grade (%) / Vertical Grade Length: 5.157 % 17.187m; 6.694 % 10.311m; 6.12 % 12.502m; 5.128 % 94.345m; -1.1 % 402.429m

Vertical Curve Length (m) / Vertical Curve Radius (m): 10m VC R = 650.53; 10m VC R = 1743.01; 15m VC R = 1510.68; 164.5m VC R = 2641.48

DATUM R.L. 35.00

SUPERELEVATION						LHS EXIST. -2.5% RHS EXIST. -3.0%	CH33.0			
NORTHING	148498.315	148486.254	148478.521	148476.357	148476.049	148466.152	148466.15		148458.727	148455.396
EASTING	25390.2	25388.454	25387.335	25387.022	25386.977	25385.545	25385.545		25384.47	25383.988
CUT/FILL DEPTH	-0.000	-0.003	-0.001	0.002	0.002	0.003	0.003	0.003	0.019	0.036
EXISTING SURFACE	37.641	38.266	38.718	38.864	38.884	39.526	39.526	39.557	39.983	40.185
DESIGN HEIGHT	37.641	38.269	38.719	38.862	38.883	39.523	39.524	39.554	39.964	40.150
CHAINAGE	0	12.187	20	22.187	22.498	32.498	32.5	33	40	43.367

SUPERELEVATION				CH66.0 LHS -2.5% RHS 2.5%							
NORTHING	148451.302	148446.744	148438.889	148419.963	148418.951	148410.642	148398.991	148379.112	148375.209	148359.316	
EASTING	25383.417	25382.832	25381.948	25380.461	25380.405	25379.95	25379.142	25376.968	25376.423	25374.123	
CUT/FILL DEPTH	0.067	0.090	0.095	0.077	0.082	0.120	0.083	0.021	0.012	-0.057	-0.065
EXISTING SURFACE	40.434	40.693	41.091	41.922	41.968	42.332	42.707	43.233	43.321	43.590	43.600
DESIGN HEIGHT	40.367	40.603	40.996	41.845	41.886	42.212	42.625	43.212	43.310	43.647	43.665
CHAINAGE	47.5	52.095	60	78.986	80	88.321	100	120	123.941	140	141

LONGITUDINAL SECTION RD01
SCALE 1 : 250 (HORIZ.), 2:1 (VERT. EXAGGERATION)

NOTES

1. REFER TO GENERAL ARRANGEMENT KEY PLAN FOR ROADWORKS NOTES.
2. FOR ROAD 2 CONTINUATION REFER TO 'PRECINCT 1' INTERNAL SITE DRAWINGS.

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 11:46:05 AM User: DESIGN CIVIL
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

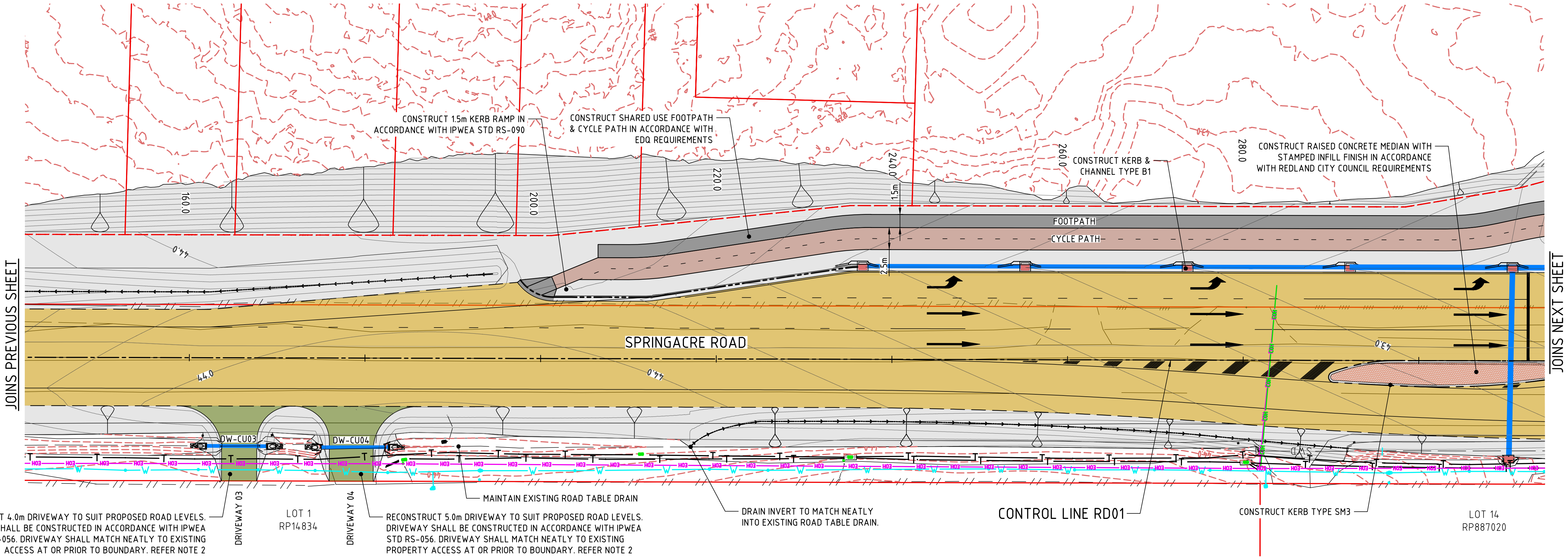
Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ROADWORKS PLAN & LONGITUDINAL SECTION**
SHEET 1 OF 6

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-GA02**
Rev **A**

REFER TO DWG No. B00703-DD-GA01
FOR LEGEND AND NOTES



CONSTRUCT 1.5m KERB RAMP IN ACCORDANCE WITH IPWEA STD RS-090

CONSTRUCT SHARED USE FOOTPATH & CYCLE PATH IN ACCORDANCE WITH EDQ REQUIREMENTS

CONSTRUCT KERB & CHANNEL TYPE B1

CONSTRUCT RAISED CONCRETE MEDIAN WITH STAMPED INFILL FINISH IN ACCORDANCE WITH REDLAND CITY COUNCIL REQUIREMENTS

RECONSTRUCT 4.0m DRIVEWAY TO SUIT PROPOSED ROAD LEVELS. DRIVEWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD RS-056. DRIVEWAY SHALL MATCH NEATLY TO EXISTING ACCESS AT OR PRIOR TO BOUNDARY. REFER NOTE 2

MAINTAIN EXISTING ROAD TABLE DRAIN

RECONSTRUCT 5.0m DRIVEWAY TO SUIT PROPOSED ROAD LEVELS. DRIVEWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD RS-056. DRIVEWAY SHALL MATCH NEATLY TO EXISTING PROPERTY ACCESS AT OR PRIOR TO BOUNDARY. REFER NOTE 2

DRAIN INVERT TO MATCH NEATLY INTO EXISTING ROAD TABLE DRAIN.

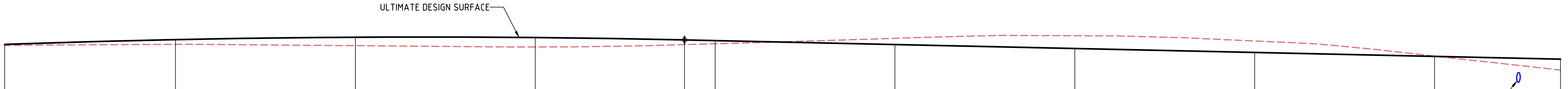
CONSTRUCT KERB TYPE SM3

PLAN

SCALE 1 : 250

NOTES

1. REFER TO GENERAL ARRANGEMENT KEY PLAN FOR ROADWORKS NOTES.
2. FOR ROAD 2 CONTINUATION REFER TO 'PRECINCT 1' INTERNAL SITE DRAWINGS.



Horiz Curve Data

Vertical Geometry Grade (%) -1.1 %
Vertical Grade Length 402.429m

Vertical Curve Length (m) 164.5m VC
Vertical Curve Radius (m) R = 2641.48

DATUM R.L. 39.00

SUPERELEVATION						(LHS -2.5%) (RHS 2.5%)					
NORTHING		148339.525	148319.732	148299.938	148283.514	148280.144	148260.35	148240.557	148220.763	148200.969	
EASTING		25371.258	25368.393	25365.528	25363.151	25362.663	25359.798	25356.933	25354.068	25351.203	
CUT/FILL DEPTH	-0.065	-0.264	-0.469	-0.524	-0.264	-0.179	0.347	0.709	0.636	0.017	-0.603
EXISTING SURFACE	43.600	43.667	43.595	43.522	43.652	43.699	44.005	44.147	43.854	43.015	42.241
DESIGN HEIGHT	43.665	43.932	44.064	44.046	43.915	43.878	43.658	43.438	43.218	42.998	42.844
CHAINAGE	141	160	180	200	216.595	220	240	260	280	300	314

LONGITUDINAL SECTION RD01

SCALE 1 : 250 (HORIZ.), 2:1 (VERT. EXAGGERATION)

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ROADWORKS PLAN & LONGITUDINAL SECTION SHEET 2 OF 6**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-GA03**
Rev **A**

Plot Date: 12/12/2025 11:46:52 AM User: DESIGN CIVIL
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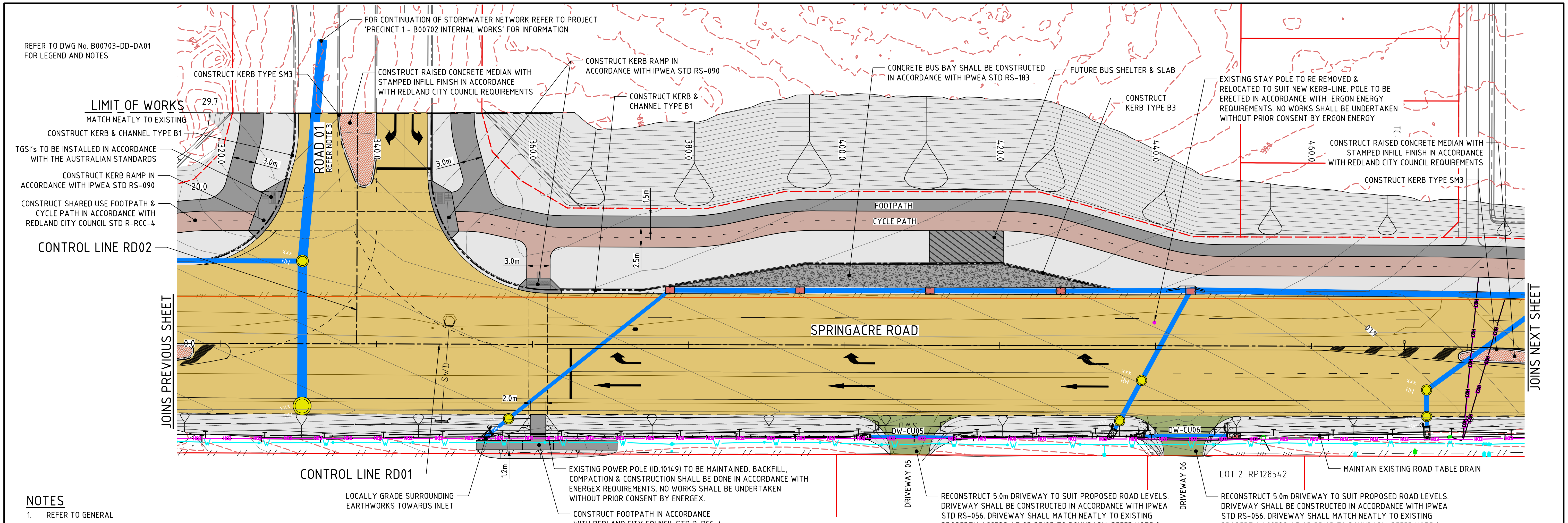
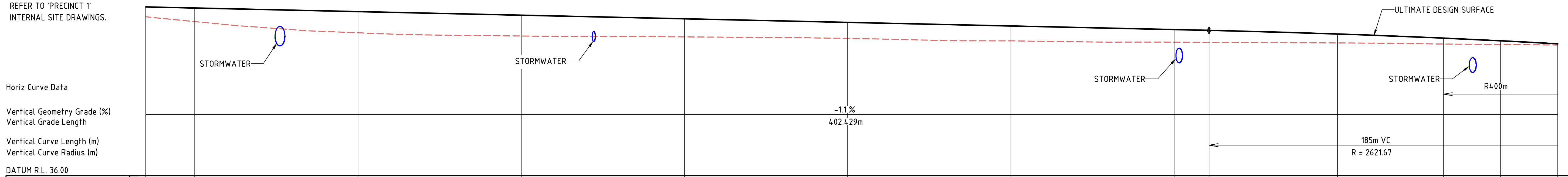
REFER TO DWG No. B00703-DD-DA01
FOR LEGEND AND NOTES


FOR CONTINUATION OF STORMWATER NETWORK REFER TO PROJECT 'PRECINCT 1 - B00702 INTERNAL WORKS' FOR INFORMATION
CONSTRUCT KERB TYPE SM3
CONSTRUCT RAISED CONCRETE MEDIAN WITH STAMPED INFILL FINISH IN ACCORDANCE WITH REDLAND CITY COUNCIL REQUIREMENTS
CONSTRUCT KERB RAMP IN ACCORDANCE WITH IPWEA STD RS-090
CONSTRUCT KERB & CHANNEL TYPE B1
CONCRETE BUS BAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD RS-183
FUTURE BUS SHELTER & SLAB
CONSTRUCT KERB TYPE B3
EXISTING STAY POLE TO BE REMOVED & RELOCATED TO SUIT NEW KERB-LINE. POLE TO BE ERECTED IN ACCORDANCE WITH ERGON ENERGY REQUIREMENTS. NO WORKS SHALL BE UNDERTAKEN WITHOUT PRIOR CONSENT BY ERGON ENERGY
CONSTRUCT RAISED CONCRETE MEDIAN WITH STAMPED INFILL FINISH IN ACCORDANCE WITH REDLAND CITY COUNCIL REQUIREMENTS
CONSTRUCT KERB TYPE SM3
LIMIT OF WORKS
MATCH NEATLY TO EXISTING
CONSTRUCT KERB & CHANNEL TYPE B1
TGSI's TO BE INSTALLED IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS
CONSTRUCT KERB RAMP IN ACCORDANCE WITH IPWEA STD RS-090
CONSTRUCT SHARED USE FOOTPATH & CYCLE PATH IN ACCORDANCE WITH REDLAND CITY COUNCIL STD R-RCC-4
CONTROL LINE RD02
29.7
20.0
3.0m
3.0m
3.0m
2.0m
1.5m
2.5m
1.2m
ROAD 01
REFER NOTE 3
320.0
340.0
360.0
380.0
400.0
420.0
440.0
460.0
FOOTPATH
CYCLE PATH
SPRINGACRE ROAD
SWD
JOINS PREVIOUS SHEET
JOINS NEXT SHEET
DW-CU05
DW-CU06
CONTROL LINE RD01
LOCALLY GRADE SURROUNDING EARTHWORKS TOWARDS INLET
EXISTING POWER POLE (ID.10149) TO BE MAINTAINED. BACKFILL, COMPACTION & CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH ENERGEX REQUIREMENTS. NO WORKS SHALL BE UNDERTAKEN WITHOUT PRIOR CONSENT BY ENERGEX.
CONSTRUCT FOOTPATH IN ACCORDANCE WITH REDLAND CITY COUNCIL STD R-RCC-4
DRIVEWAY 05
DRIVEWAY 06
RECONSTRUCT 5.0m DRIVEWAY TO SUIT PROPOSED ROAD LEVELS. DRIVEWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD RS-056. DRIVEWAY SHALL MATCH NEATLY TO EXISTING PROPERTY ACCESS AT OR PRIOR TO BOUNDARY. REFER NOTE 2
LOT 2 RP128542
MAINTAIN EXISTING ROAD TABLE DRAIN
RECONSTRUCT 5.0m DRIVEWAY TO SUIT PROPOSED ROAD LEVELS. DRIVEWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD RS-056. DRIVEWAY SHALL MATCH NEATLY TO EXISTING PROPERTY ACCESS AT OR PRIOR TO BOUNDARY. REFER NOTE 2

PLAN
SCALE 1 : 250

NOTES

1. REFER TO GENERAL ARRANGEMENT KEY PLAN FOR ROADWORKS NOTES.
2. FOR ROAD 2 CONTINUATION REFER TO 'PRECINCT 1' INTERNAL SITE DRAWINGS.


ULTIMATE DESIGN SURFACE
STORMWATER
STORMWATER
STORMWATER
STORMWATER
Horiz Curve Data
R400m
Vertical Geometry Grade (%)
Vertical Grade Length
-1.1 %
402.429m
Vertical Curve Length (m)
Vertical Curve Radius (m)
185m VC
R = 2621.67
DATUM R.L. 36.00

SUPERELEVATION						(LHS -2.5%) (RHS 2.5%)							
NORTHING		148181.176	148161.382	148141.588	148121.794	148102.001	148082.207	148062.413	148058.184	148042.619	148029.777	148022.836	
EASTING		25348.338	25345.473	25342.608	25339.743	25336.878	25334.013	25331.148	25330.536	25328.283	25326.424	25325.352	
CUT/FILL DEPTH	-0.603	-0.829	-1.295	-1.271	-1.107	-0.981	-0.912	-0.770	-0.734	-0.549	-0.364	-0.233	-0.079
EXISTING SURFACE	42.241	41.949	41.262	41.066	41.011	40.917	40.765	40.688	40.677	40.642	40.574	40.541	40.513
DESIGN HEIGHT	42.844	42.778	42.558	42.338	42.118	41.898	41.678	41.458	41.411	41.191	40.938	40.774	40.593
CHAINAGE	314	320	340	360	380	400	420	440	444.274	460	471.941	480	487

LONGITUDINAL SECTION RD01
SCALE 1 : 250 (HORIZ.), 2:1 (VERT. EXAGGERATION)

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: DESIGN CIVIL
Plot Date: 12/12/2025 11:47:43 AM
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\GENERAL_ARRANGEMENT

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ROADWORKS PLAN & LONGITUDINAL SECTION**
SHEET 3 OF 6

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-GA04**
Rev **A**

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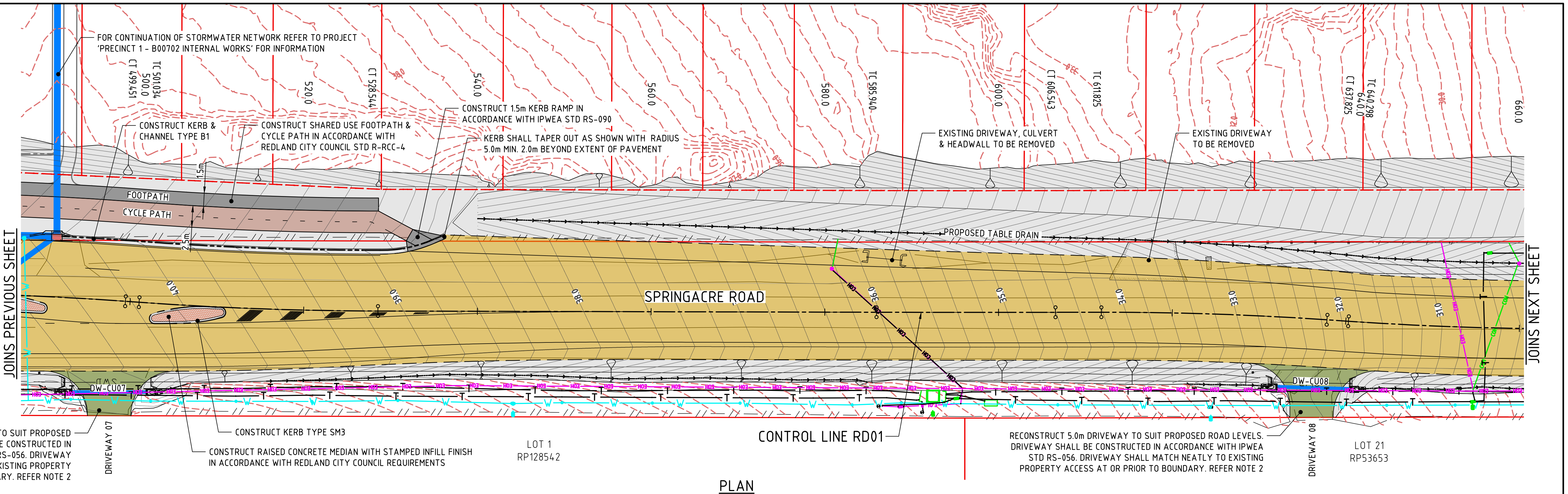
REFER TO DWG No. B00703-DA-GA01
FOR LEGEND AND NOTES

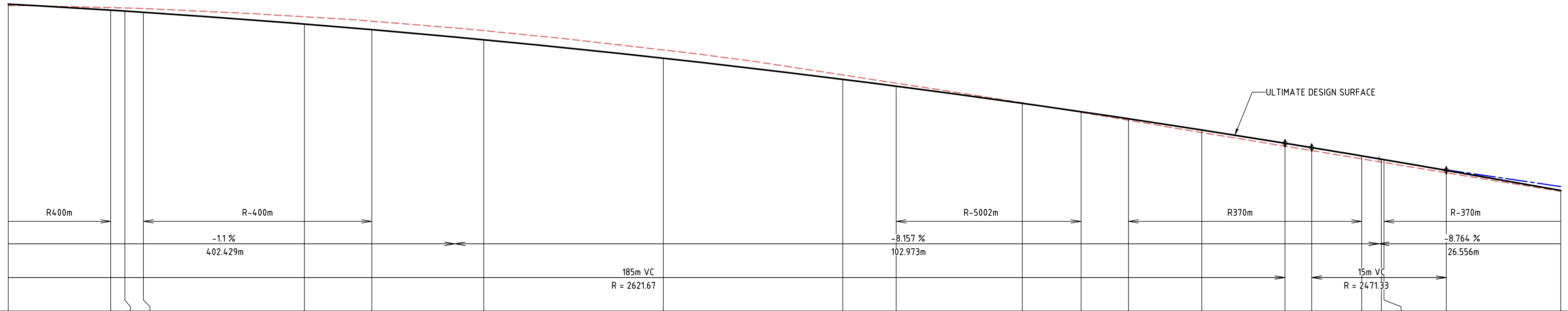

FOR CONTINUATION OF STORMWATER NETWORK REFER TO PROJECT 'PRECINCT 1 - B00702 INTERNAL WORKS' FOR INFORMATION
CT 499.451
TC 501.034
500.0
520.0
CT 528.544
540.0
560.0
580.0
TC 585.940
600.0
CT 606.543
TC 611.825
CT 637.825
640.0
TC 640.298
660.0
CONSTRUCT KERB & CHANNEL TYPE B1
CONSTRUCT SHARED USE FOOTPATH & CYCLE PATH IN ACCORDANCE WITH REDLAND CITY COUNCIL STD R-RCC-4
CONSTRUCT 1.5m KERB RAMP IN ACCORDANCE WITH IPWEA STD RS-090
KERB SHALL TAPER OUT AS SHOWN WITH RADIUS 5.0m MIN. 2.0m BEYOND EXTENT OF PAVEMENT
EXISTING DRIVEWAY, CULVERT & HEADWALL TO BE REMOVED
EXISTING DRIVEWAY TO BE REMOVED
1.5m
FOOTPATH
CYCLE PATH
2.5m
PROPOSED TABLE DRAIN
JOINS PREVIOUS SHEET
JOINS NEXT SHEET
SPRINGACRE ROAD
40.0
39.0
38.0
36.0
35.0
34.0
33.0
32.0
31.0
DW-CU07
DW-CU08
RECONSTRUCT 5.0m DRIVEWAY TO SUIT PROPOSED ROAD LEVELS. DRIVEWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD RS-056. DRIVEWAY SHALL MATCH NEATLY TO EXISTING PROPERTY ACCESS AT OR PRIOR TO BOUNDARY. REFER NOTE 2
DRIVEWAY 07
CONSTRUCT KERB TYPE SM3
CONSTRUCT RAISED CONCRETE MEDIAN WITH STAMPED INFILL FINISH IN ACCORDANCE WITH REDLAND CITY COUNCIL REQUIREMENTS
LOT 1
RP128542
CONTROL LINE RD01
RECONSTRUCT 5.0m DRIVEWAY TO SUIT PROPOSED ROAD LEVELS. DRIVEWAY SHALL BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD RS-056. DRIVEWAY SHALL MATCH NEATLY TO EXISTING PROPERTY ACCESS AT OR PRIOR TO BOUNDARY. REFER NOTE 2
DRIVEWAY 08
LOT 21
RP53653

PLAN

SCALE 1 : 250

NOTES

1. REFER TO GENERAL ARRANGEMENT KEY PLAN FOR ROADWORKS NOTES.
2. FOR ROAD 2 CONTINUATION REFER TO 'PRECINCT 1' INTERNAL SITE DRAWINGS.



Horiz Curve Data: R400m; R-400m; R-5002m; R370m; R-370m

Vertical Geometry Grade (%): -1.1 %; -8.157 %; -8.764 %
Vertical Grade Length: 402.429m; 102.973m; 26.556m

Vertical Curve Length (m): 185m VC; 15m VC
Vertical Curve Radius (m): R = 2621.67; R = 2471.33

DATUM R.L. 23.50

SUPERELEVATION: (LHS -2.5%) (RHS 2.5%); (LHS -2.5%) RHS 2.5%; CH633.0

CHAINAGE	487	499.451	500	501.034	520	528.544	540	560	580	585.944	600	606.547	611.828	620	629.274	632.246	637.829	640	640.302	647.246	660
NORTHING		148004.737	148003.196	148001.173	147983.562	147976.134	147963.779	147943.985	147924.192	147918.309	147904.395	147897.913	147892.683	147884.604	147875.471	147872.552	147867.083	147864.96	147864.665	147857.859	147845.299
EASTING		25321.916	25321.583	25321.147	25317.791	25316.639	25314.85	25311.985	25309.12	25308.269	25306.275	25305.36	25304.625	25303.398	25301.79	25301.227	25300.105	25299.652	25299.589	25298.206	25296
CUT/FILL DEPTH	-0.079	0.144	0.175	0.209	0.405	0.467	0.505	0.457	0.244	0.168	0.024	-0.034	-0.085	-0.144	-0.167	-0.166	-0.166	-0.163	-0.162	-0.131	-0.049
EXISTING SURFACE	40.513	40.400	40.380	40.347	39.889	39.641	39.115	38.041	36.648	36.193	35.097	34.570	34.129	33.445	32.681	32.440	31.978	31.798	31.773	31.206	30.171
DESIGN HEIGHT	40.593	40.256	40.206	40.138	39.484	39.174	38.610	37.584	36.405	36.025	35.073	34.604	34.213	33.589	32.849	32.606	32.144	31.961	31.936	31.337	30.219

LONGITUDINAL SECTION RD01

SCALE 1 : 250 (HORIZ.), 2:1 (VERT. EXAGGERATION)

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ROADWORKS PLAN & LONGITUDINAL SECTION SHEET 4 OF 6**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-GA05**
Rev **A**

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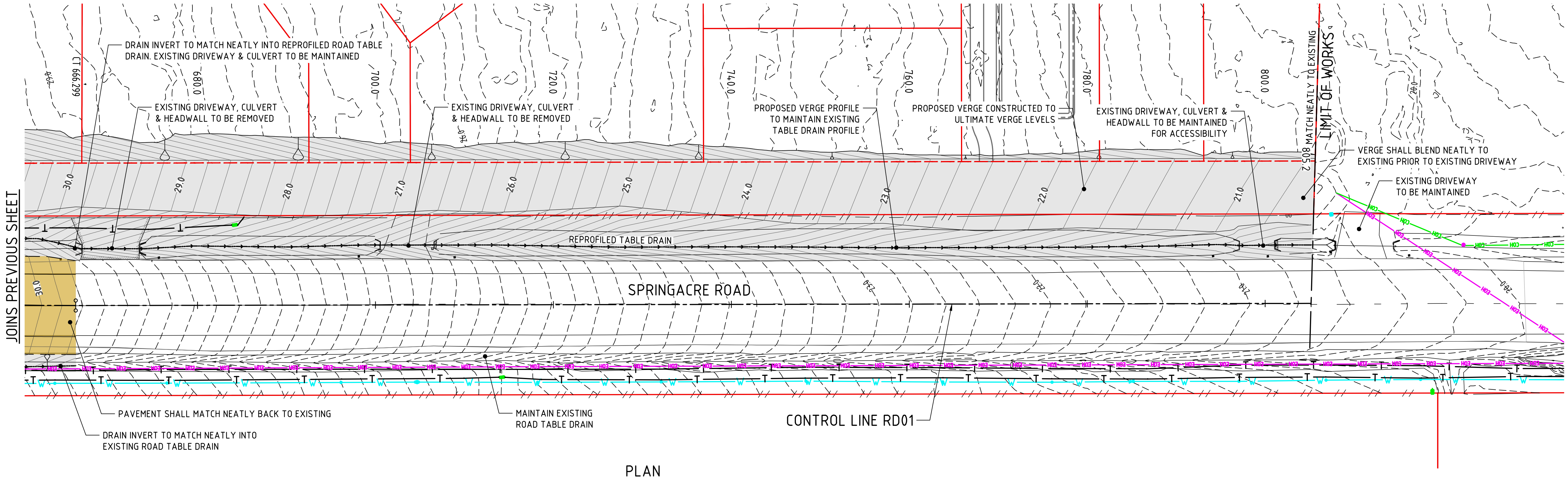
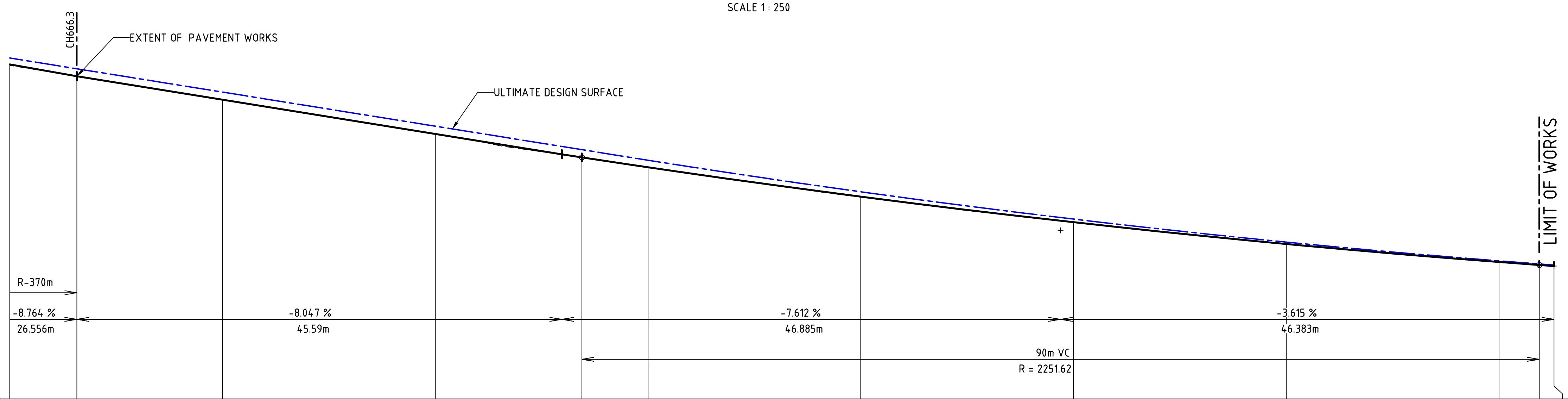
REFER TO DWG No. B00703-DA-GA01
FOR LEGEND AND NOTES


DRAIN INVERT TO MATCH NEATLY INTO REPROFILED ROAD TABLE DRAIN. EXISTING DRIVEWAY & CULVERT TO BE MAINTAINED
EXISTING DRIVEWAY, CULVERT & HEADWALL TO BE REMOVED
EXISTING DRIVEWAY, CULVERT & HEADWALL TO BE REMOVED
PROPOSED VERGE PROFILE TO MAINTAIN EXISTING TABLE DRAIN PROFILE
PROPOSED VERGE CONSTRUCTED TO ULTIMATE VERGE LEVELS
EXISTING DRIVEWAY, CULVERT & HEADWALL TO BE MAINTAINED FOR ACCESSIBILITY
MATCH NEATLY TO EXISTING
LIMIT OF WORKS
VERGE SHALL BLEND NEATLY TO EXISTING PRIOR TO EXISTING DRIVEWAY
EXISTING DRIVEWAY TO BE MAINTAINED
CT 666.299
680.0
700.0
720.0
740.0
760.0
780.0
800.0
805.2
JOINS PREVIOUS SHEET
REPROFILED TABLE DRAIN
SPRINGACRE ROAD
30.0
29.0
28.0
27.0
26.0
25.0
24.0
23.0
22.0
21.0
PAVEMENT SHALL MATCH NEATLY BACK TO EXISTING
DRAIN INVERT TO MATCH NEATLY INTO EXISTING ROAD TABLE DRAIN
MAINTAIN EXISTING ROAD TABLE DRAIN
CONTROL LINE RD01

PLAN
SCALE 1 : 250

NOTES
1. REFER TO GENERAL ARRANGEMENT KEY PLAN FOR ROADWORKS NOTES.
2. FOR ROAD 2 CONTINUATION REFER TO 'PRECINCT 1' INTERNAL SITE DRAWINGS.


CH666.3
EXTENT OF PAVEMENT WORKS
ULTIMATE DESIGN SURFACE
LIMIT OF WORKS

Horiz Curve Data: R-370m

Vertical Geometry Grade (%)	-8.764 %	-8.047 %	-7.612 %	-3.615 %
Vertical Grade Length	26.556m	45.59m	46.885m	46.383m

Vertical Curve Length (m): 90m VC
Vertical Curve Radius (m): R = 2251.62

DATUM R.L. 14.50

SUPERELEVATION: CH666.0 LHS EXIST. -2.5% RHS -2.5%

NORTHING	147845.299		147825.501	147805.696	147792.052	147785.89	147766.085	147746.28	147726.474	147706.669	147702.928	147701.558
EASTING	25296		25293.163	25290.38	25288.462	25287.596	25284.813	25282.029	25279.246	25276.462	25275.937	25275.744
CUT/FILL DEPTH	-0.049	-0.000	0.016	0.001	-0.001	-0.001	-0.024	0.011	0.018	-0.004	-0.001	-0.001
EXISTING SURFACE	30.171	29.667	28.581	26.956	25.853	25.389	23.987	22.822	21.806	20.938	20.801	20.751
DESIGN HEIGHT	30.219	29.667	28.565	26.955	25.855	25.390	24.011	22.811	21.788	20.942	20.803	20.753
CHAINAGE	660	666.3	680	700	713.778	720	740	760	780	800	803.778	805.161

LONGITUDINAL SECTION RD01
SCALE 1 : 250 (HORIZ.), 2:1 (VERT. EXAGGERATION)

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ROADWORKS PLAN & LONGITUDINAL SECTION SHEET 5 OF 6**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

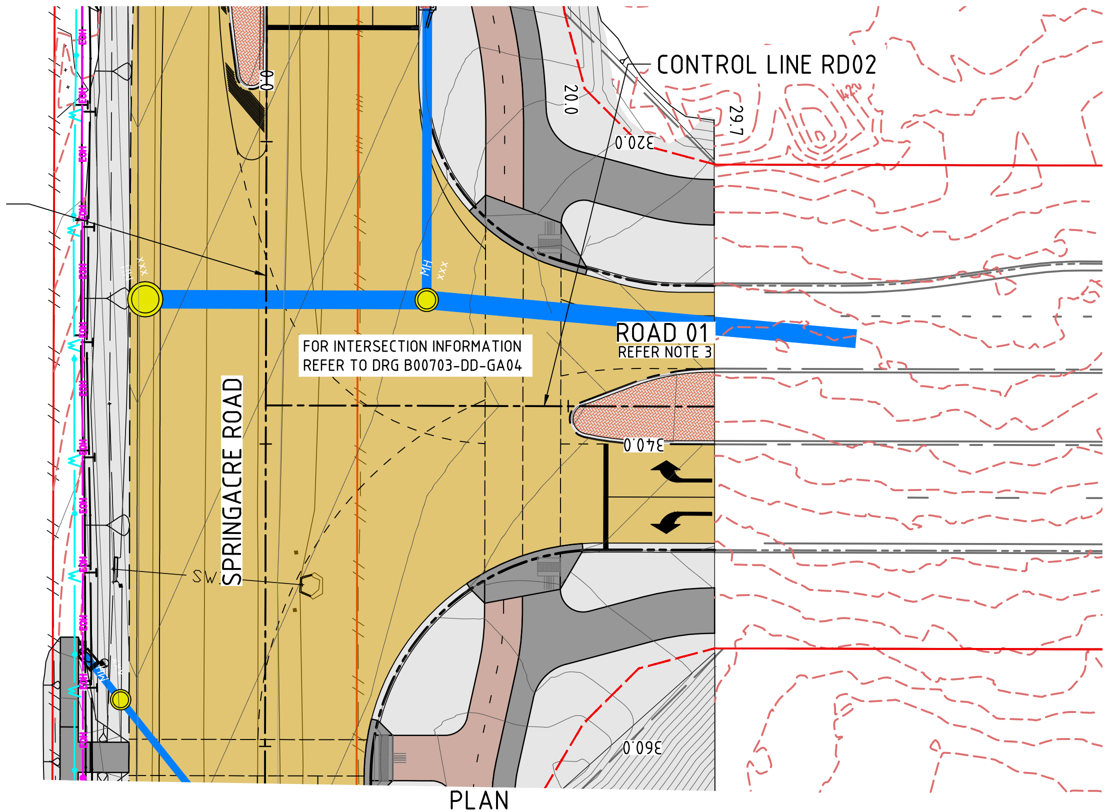
Project No. Drawing No. **B00703-DD-GA06**
Rev **A**

"

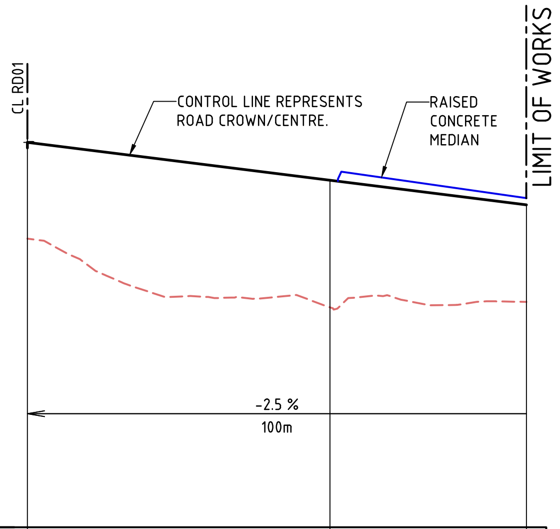
REFER TO DWG No. B00703-DD-GA01
FOR LEGEND AND NOTES

NOTES

1. REFER TO GENERAL ARRANGEMENT KEY PLAN FOR ROADWORKS NOTES.
2. FOR ROAD 2 CONTINUATION REFER TO 'PRECINCT 1' INTERNAL SITE DRAWINGS.


CONTROL LINE RD02
CONTROL LINE RD01
20.0
29.7
320.0
ROAD 01
REFER NOTE 3
FOR INTERSECTION INFORMATION
REFER TO DRG B00703-DD-GA04
SPRINGACRE ROAD
340.0
360.0
SW

PLAN
SCALE 1 : 250


CL RD01
LIMIT OF WORKS
CONTROL LINE REPRESENTS ROAD CROWN/CENTRE.
RAISED CONCRETE MEDIAN
-2.5 %
100m

Horiz Curve Data

Vertical Geometry Grade (%) -2.5 %
Vertical Grade Length 100m

Vertical Curve Length (m)
Vertical Curve Radius (m)

DATUM R.L. 14.50

SUPERELEVATION	LHS -2.5% RHS -2.5%		
NORTHING	148163.911	148161.046	
EASTING	25345.839	25365.633	
CUT/FILL DEPTH	-1.272	-1.681	-1.284
EXISTING SURFACE	41.314	40.405	40.477
DESIGN HEIGHT	42.586	42.086	41.761
CHAINAGE	0	20	33

LONGITUDINAL SECTION RD02
SCALE 1 : 250 (HORIZ.), 2:1 (VERT. EXAGGERATION)

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

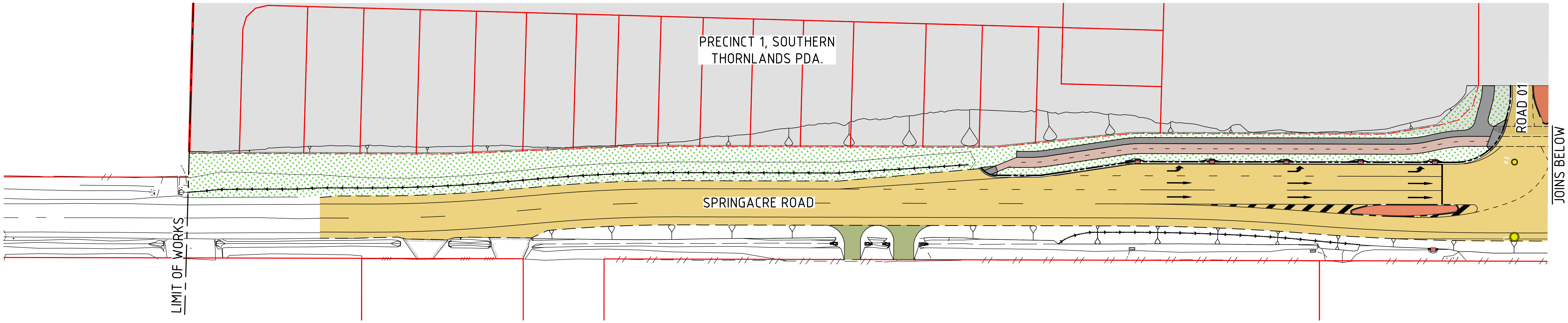
URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ROADWORKS PLAN & LONGITUDINAL SECTION SHEET 6 OF 6**

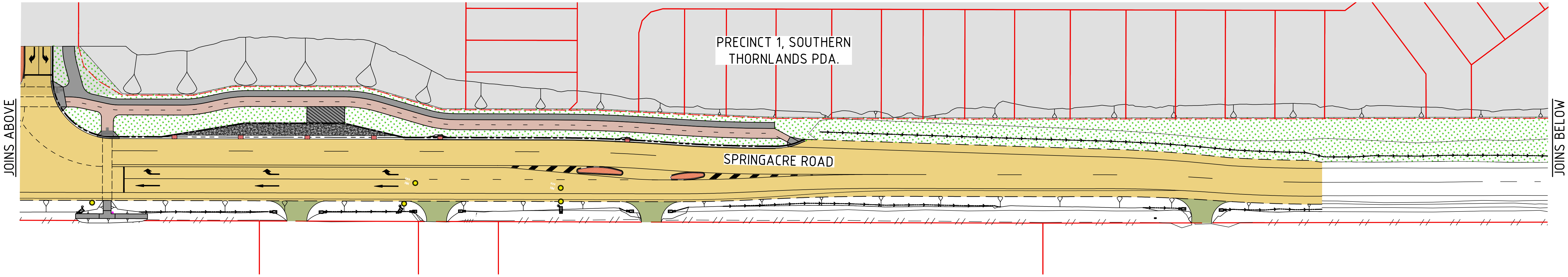
Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

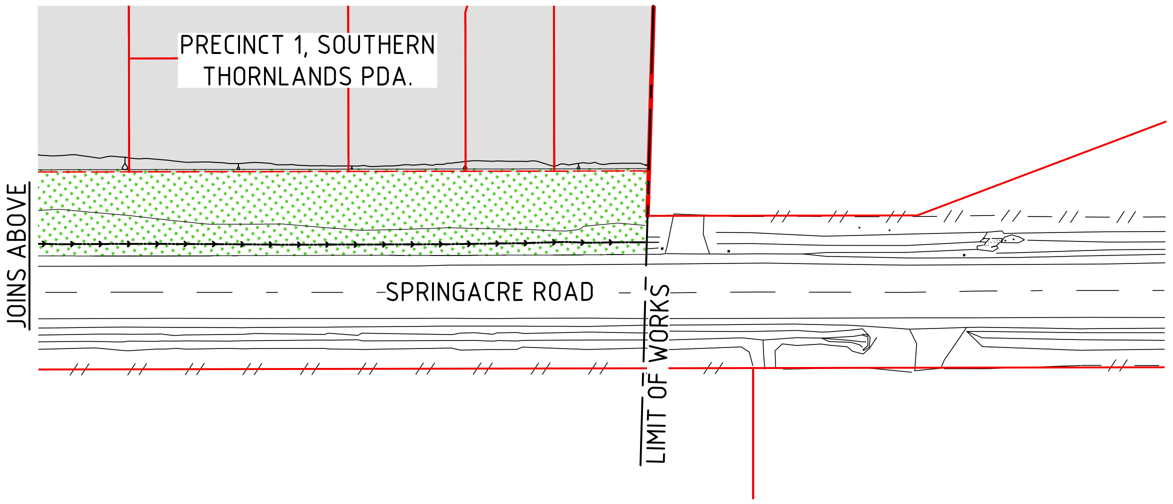
Project No. Drawing No. **B00703-DD-GA07**
Rev **A**


PRECINCT 1, SOUTHERN THORNLANDS PDA.
SPRINGACRE ROAD
ROAD 01
JOINS BELOW
LIMIT OF WORKS

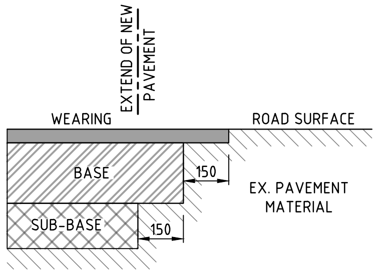
PLAN
SCALE 1 : 500


PRECINCT 1, SOUTHERN THORNLANDS PDA.
SPRINGACRE ROAD
JOINS ABOVE
JOINS BELOW

PLAN – CONTINUED
SCALE 1 : 500


PRECINCT 1, SOUTHERN THORNLANDS PDA.
SPRINGACRE ROAD
JOINS ABOVE
LIMIT OF WORKS

PLAN – CONTINUED
SCALE 1 : 500


EXTEND OF NEW PAVEMENT
WEARING
ROAD SURFACE
BASE
150
SUB-BASE
150
EX. PAVEMENT MATERIAL

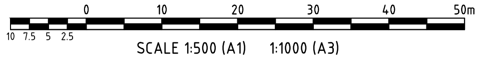
PAVEMENT TIE-IN DETAIL
NOT TO SCALE

NOTES

1. FOR DRAINAGE INFORMATION REFER DRGS B00703-DD-SW01 TO B00703-DD-SW06.
2. FOR ROADWORKS INFORMATION REFER DRGS B00703-DD-GA01 TO B00703-DD-GA11

FEATURES LEGEND

⬜	PRECINCT 1 AREA – REFER TO RESPECTIVE PACKAGE
🟩	TURFED AREA
🟩	DRIVEWAY PAVEMENT
🟥	CONCRETE STAMPED TRAFFIC ISLAND
🟨	PAVEMENT TYPE A
⬛	CONCRETE BUS BAY
⬛	PEDESTRIAN PATHWAY
🟫	CYCLE PATHWAY
▨	BUS SHELTER SLAB


0
10
20
30
40
50m
10
7.5
5
2.5

SCALE 1:500 (A1)   1:1000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 11:03:12 AM   User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\PAVEMENT

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

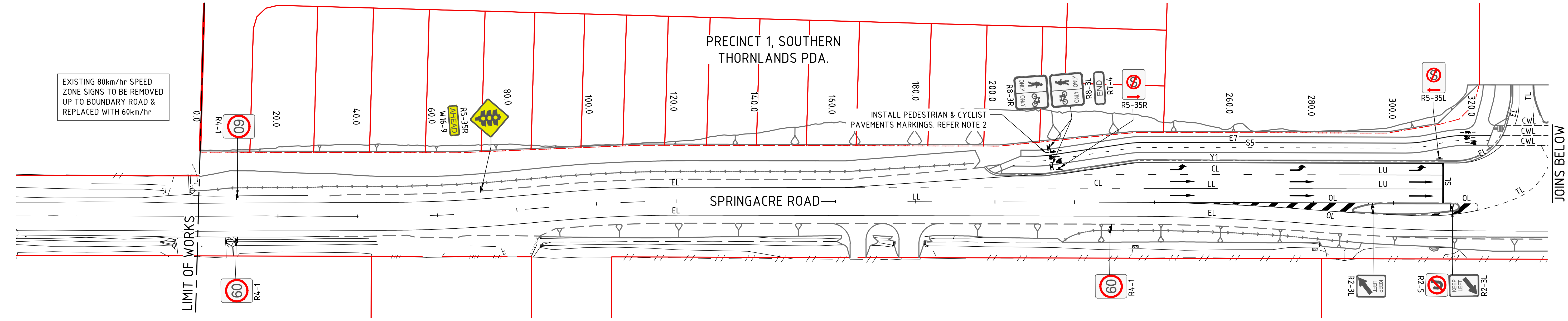
Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **PAVEMENT DETAILS**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-PA01	A

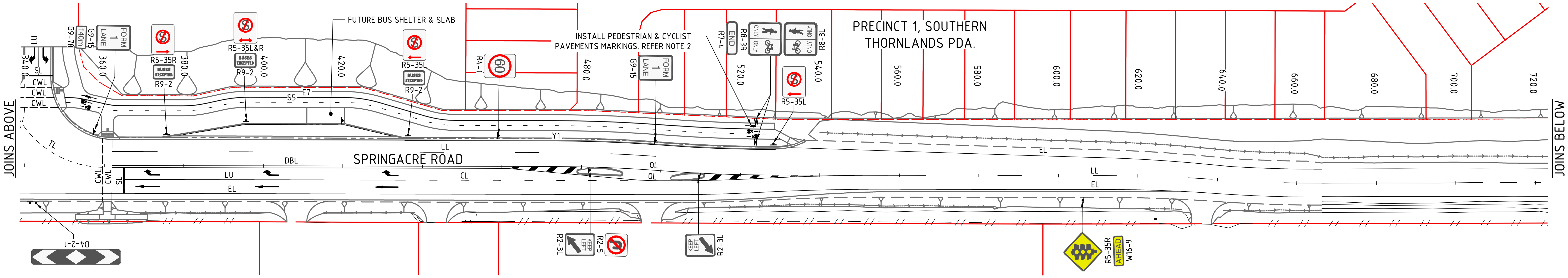
"


PRECINCT 1, SOUTHERN THORNLANDS PDA.
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
260.0
280.0
300.0
320.0
R4-1
60
W16-9
AHEAD
R5-35R
R8-3R
ONLY
R8-3L
END
R7-4
R5-35R
R5-35L
SPRINGACRE ROAD
LIMIT OF WORKS
EL
LL
CL
LU
OL
Y1
E7
S5
CWL
TL
SL
JOINS BELOW
R2-3L
KEEP LEFT
R2-5
R2-3L

EXISTING 80km/hr SPEED
ZONE SIGNS TO BE REMOVED
UP TO BOUNDARY ROAD &
REPLACED WITH 60km/hr

INSTALL PEDESTRIAN & CYCLIST
PAVEMENTS MARKINGS. REFER NOTE 2

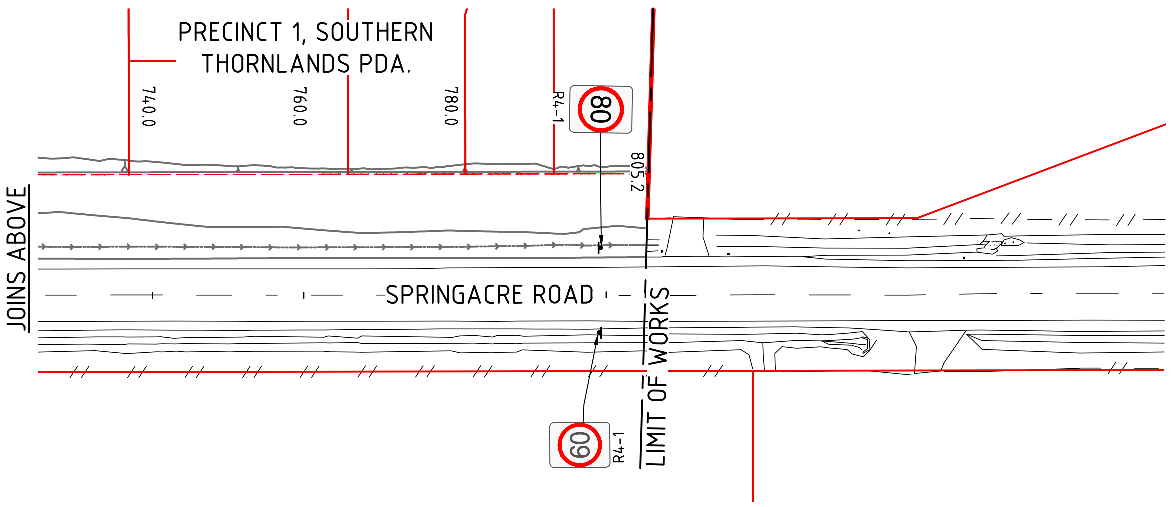
PLAN
SCALE 1 : 500


JOINS ABOVE
340.0
360.0
380.0
400.0
420.0
480.0
520.0
540.0
560.0
580.0
600.0
620.0
640.0
660.0
680.0
700.0
720.0
LU
SL
CWL
G9-78
G9-15
140m
FORM 1 LANE
R5-35R
BUSES EXCEPTED
R9-2
R5-35L&R
R9-2
R5-35L
R9-2
R4-1
60
G9-15
R7-4
END
R8-3R
ONLY
R8-3L
R5-35L
PRECINCT 1, SOUTHERN THORNLANDS PDA.
E7
S5
Y1
LL
TL
DBL
SPRINGACRE ROAD
LU
EL
CL
OL
JOINS BELOW
D4-2-1
R2-3L
KEEP LEFT
R2-5
R2-3L
R5-35R
AHEAD
W16-9

FUTURE BUS SHELTER & SLAB

INSTALL PEDESTRIAN & CYCLIST
PAVEMENTS MARKINGS. REFER NOTE 2

PLAN - CONTINUED
SCALE 1 : 500


PRECINCT 1, SOUTHERN THORNLANDS PDA.
740.0
760.0
780.0
805.2
R4-1
80
JOINS ABOVE
SPRINGACRE ROAD
LIMIT OF WORKS
60
R4-1

PLAN - CONTINUED
SCALE 1 : 500

NOTES

1. FOR ROADWORKS INFORMATION REFER DRGS B00703-DD-GA01 TO B00703-DD-GA11.
2. ALL SIGNAGE & LINEMARKING SHALL BE INSTALLED OR ERECTED IN ACCORDANCE WITH THE CURRENT MUTCD.
3. BUS SHELTER SIGNAGE SHALL BE IN ACCORDANCE WITH TRANSLINK REQUIREMENTS.

LINEMARKING LEGEND

CL	CONTINUITY LINE	TL	TURN LINE
LU	LANE LINE (UNBROKEN)	SL	STOP LINE
LL	LANE LANE (BROKEN)	E7	EDGE LINE FOR OFF-ROAD CYCLE-PATH
EL	EDGE LINE	S5	OFF-ROAD CYCLE-PATH BROKEN SEPARATION LINE
OL	OUTLINE MARKING	CWL	PEDESTRAIAN CROSSWALK LINE
Y1	YELLOW 'NO STOPPING' LINE	DBL	DOUBLE BARRIER LINE

0 10 20 30 40 50m
10 7.5 5 2.5
SCALE 1:500 (A1) 1:1000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **SIGNAGE & LINEMARKING PLAN**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

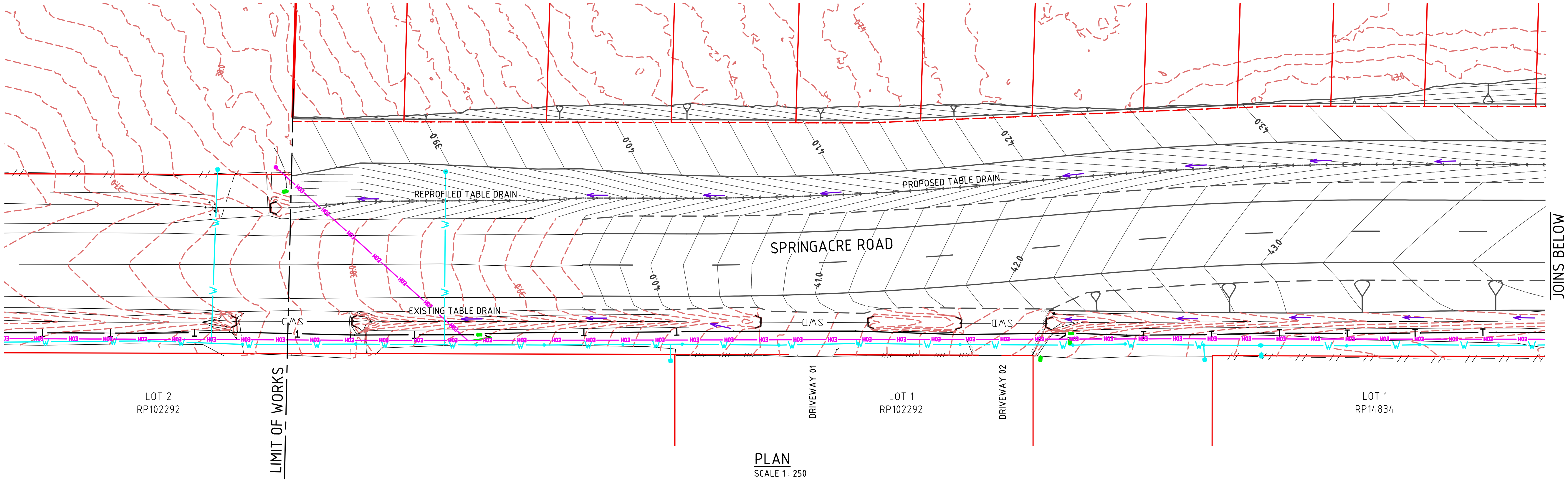
Project No. Drawing No.	Rev
B00703-DD-SL01	A

Plot Date: 12/12/2025 11:04:00 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\SIGNAGE

"

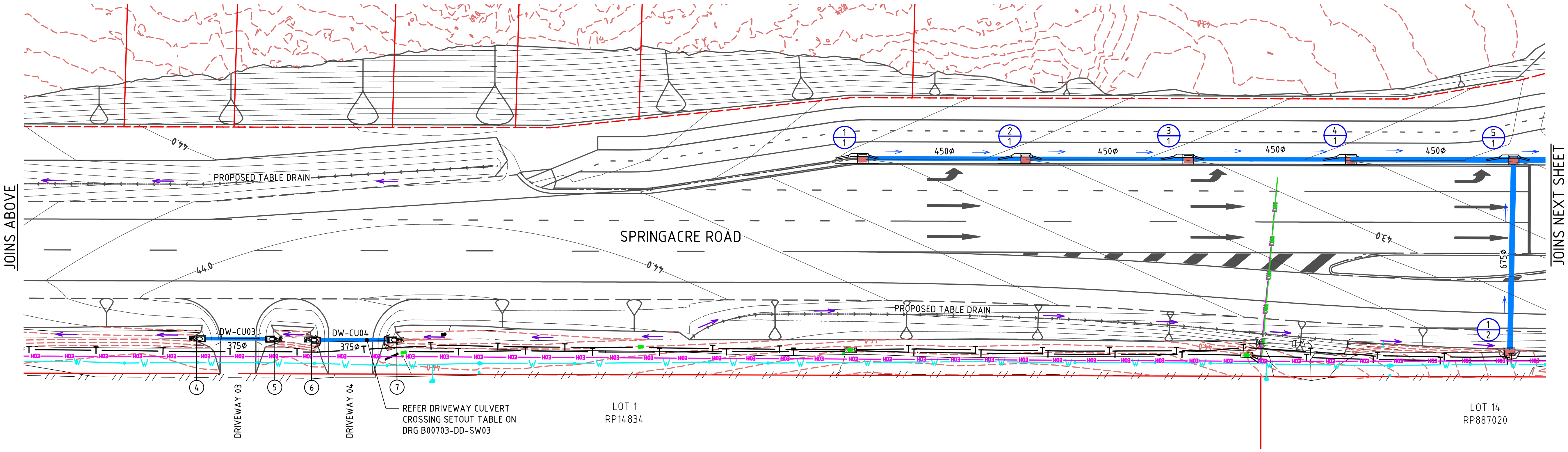
NOTE:
REFER TO DWG No. B00703-DD-SW03
FOR LEGEND AND NOTES

FURTHER REFINEMENT OF
STORMWATER NETWORK TO BE
FINALISED IN THE DETAIL DESIGN



REPROFILED TABLE DRAIN
PROPOSED TABLE DRAIN
EXISTING TABLE DRAIN
SPRINGACRE ROAD
39.0
40.0
41.0
42.0
43.0
SWD
H03
LIMIT OF WORKS
JOINS BELOW
DRIVEWAY 01
DRIVEWAY 02
LOT 2
RP102292
LOT 1
RP102292
LOT 1
RP14834

PLAN
SCALE 1 : 250



JOINS ABOVE
JOINS NEXT SHEET
PROPOSED TABLE DRAIN
SPRINGACRE ROAD
44.0
43.0
450ø
675ø
375ø
DW-CU03
DW-CU04
1/1
2/1
3/1
4/1
5/1
1/2
4
5
6
7
DRIVEWAY 03
DRIVEWAY 04
REFER DRIVEWAY CULVERT CROSSING SETOUT TABLE ON DRG B00703-DD-SW03
LOT 1
RP14834
LOT 14
RP887020
H03
SWD

PLAN
SCALE 1 : 250

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

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Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **DRAINAGE PLAN**
SHEET 1 OF 3

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

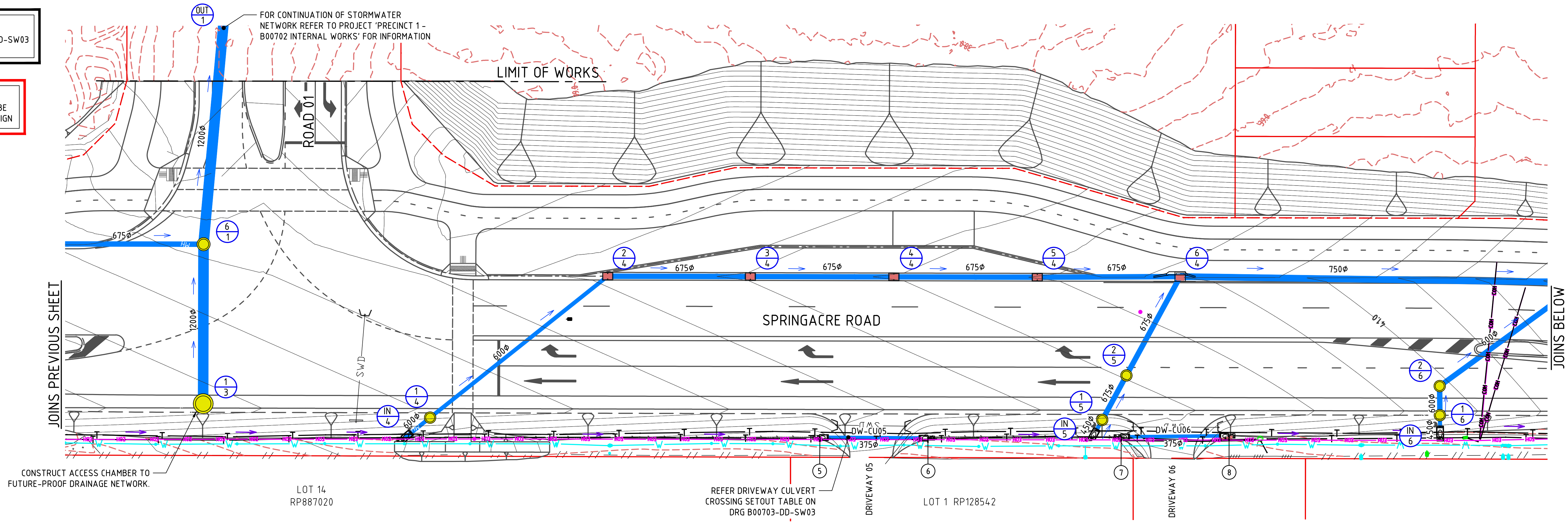
Project No. *Drawing No.*
B00703-DD-SW01
Rev **A**

Plot Date: 12/12/2025 11:06:51 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\STORMWATER

"

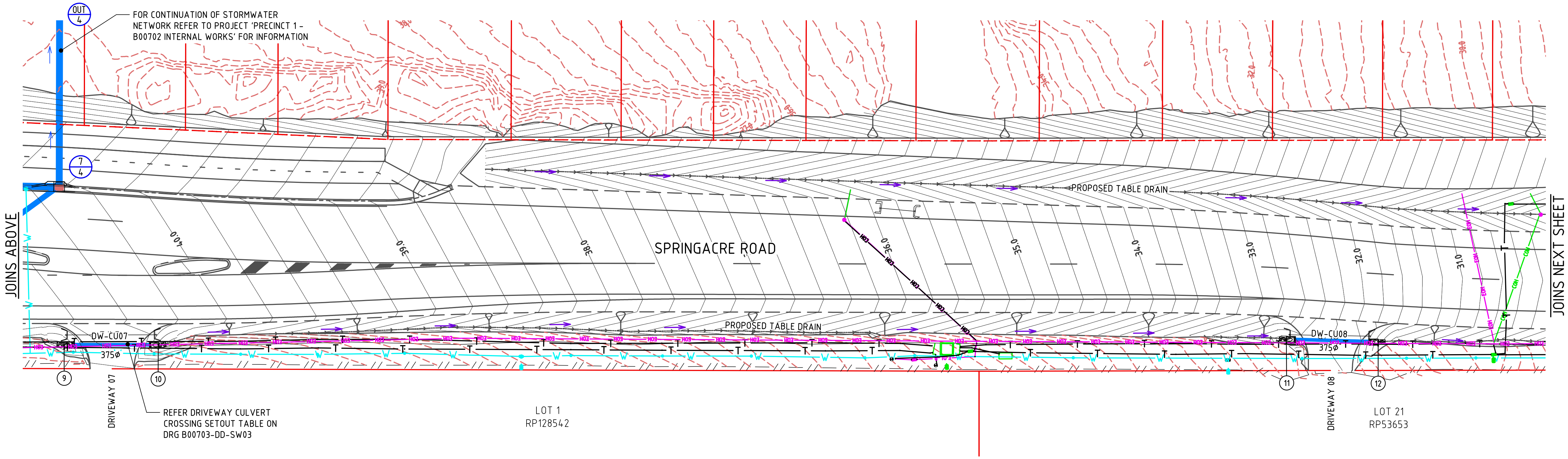
NOTE:
REFER TO DWG No. B00703-DD-SW03
FOR LEGEND AND NOTES

FURTHER REFINEMENT OF
STORMWATER NETWORK TO BE
FINALISED IN THE DETAIL DESIGN


OUT 1
FOR CONTINUATION OF STORMWATER NETWORK REFER TO PROJECT 'PRECINCT 1 - B00702 INTERNAL WORKS' FOR INFORMATION
LIMIT OF WORKS
ROAD 01
1200Ø
675Ø
6 1
2 4
3 4
4 4
5 4
6 4
750Ø
600Ø
SPRINGACRE ROAD
1 3
1 4
IN 4
SWD
2 5
1 5
IN 5
450Ø
2 6
1 6
IN 6
DW-CU05
375Ø
DW-CU06
5
6
7
8
JOINS PREVIOUS SHEET
JOINS BELOW
CONSTRUCT ACCESS CHAMBER TO FUTURE-PROOF DRAINAGE NETWORK.
LOT 14
RP887020
REFER DRIVEWAY CULVERT CROSSING SETOUT TABLE ON DRG B00703-DD-SW03
DRIVEWAY 05
LOT 1 RP128542
DRIVEWAY 06

PLAN

SCALE 1 : 250


OUT 4
FOR CONTINUATION OF STORMWATER NETWORK REFER TO PROJECT 'PRECINCT 1 - B00702 INTERNAL WORKS' FOR INFORMATION
7 4
JOINS ABOVE
PROPOSED TABLE DRAIN
SPRINGACRE ROAD
PROPOSED TABLE DRAIN
JOINS NEXT SHEET
DW-CU07
375Ø
DW-CU08
375Ø
9
10
11
12
DRIVEWAY 07
REFER DRIVEWAY CULVERT CROSSING SETOUT TABLE ON DRG B00703-DD-SW03
LOT 1
RP128542
DRIVEWAY 08
LOT 21
RP53653

PLAN

SCALE 1 : 250

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

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Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **DRAINAGE PLAN**
SHEET 2 OF 3

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-SW02	A

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Xref s:\12dS\data\MAN12DSYN01\B00703__2452\4 CIVIL-DRGS\4.2 CURRENT\DA\X-B00703-LS-SPRINGACRE INTERIM-3.dwg

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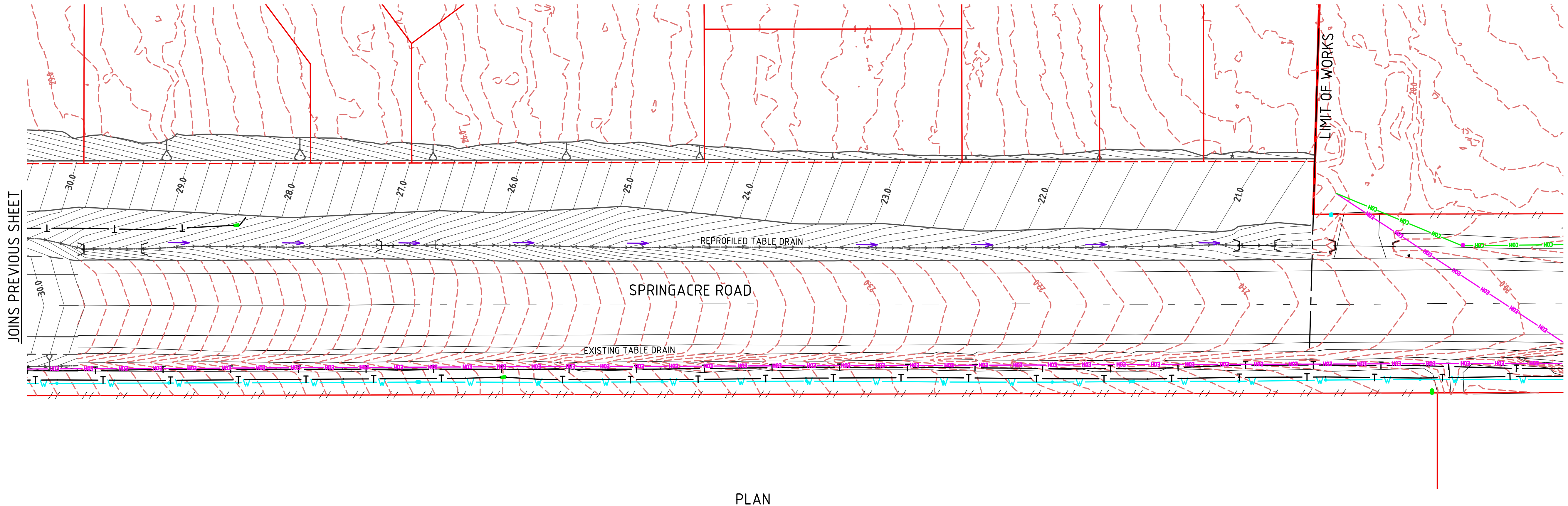
FURTHER REFINEMENT OF
STORMWATER NETWORK TO BE
FINALISED IN THE DETAIL DESIGN



PLAN
SCALE 1 : 250

EXISTING FEATURES LEGEND

OHP	EXISTING OVERHEAD ELECTRICITY
E	EXISTING UNDERGROUND ELECTRICITY
T	EXISTING UNDERGROUND TELECOMMUNICATIONS
W	EXISTING UNDERGROUND WATER MAIN
SWD	EXISTING STORMWATER CULVERT
G	EXISTING UNDERGROUND GAS
S	EXISTING SEWER MAIN

LEGEND

━━	ROAD RESERVE BOUNDARY
– – –	RESUMPTION BOUNDARY
──	PROPOSED SURFACE CONTOURS (200mm INC.)
- - -	EX. SURFACE CONTOURS (200mm INC.)
━━	CULVERT/CROSSING
	KERB INLET GULLY. REFER NOTE 1
▨	TYPE 2 FIELD INLET. REFER NOTE 1
●	MANHOLE. REFER NOTE 1
⏢	HEADWALL. REFER NOTE 2
▣	SLOPED ENDWALL. REFER NOTE 2
▨	DUMP ROCK (D_{50}=200mm) 0.8m LONG x 0.5m WIDE @ 400mm THICK
2 1	PIT/STRUCTURE I.D
→	PIPE FLOW DIRECTION
→	DRAIN FLOW DIRECTION

DRIVEWAY CULVERT CROSSING SETOUT TABLE

POINT	EASTING	NORTHING	LEVEL (m)	COMMENT	CROSSING	TYPE	SIZE
1	25361.165	148340.029	43.244	DS INVERT	DW-CU03	RCP, CL3	375ϕ
2	25359.885	148331.232	43.337	US INVERT			
3	25359.189	148327.128	43.315	DS INVERT	DW-CU04	RCP, CL3	375ϕ
4	25357.824	148317.496	43.390	US INVERT			
5	25324.894	148101.252	41.382	US INVERT	DW-CU05	RCP, CL3	375ϕ
6	25323.029	148088.775	41.231	DS INVERT			
7	25320.009	148066.418	41.034	US INVERT	DW-CU06	RCP, CL3	375ϕ
8	25318.340	148053.936	40.921	DS INVERT			
9	25312.369	148012.459	40.171	US INVERT	DW-CU07	RCP, CL3	375ϕ
10	25310.894	148001.853	39.988	DS INVERT			
11	25293.461	147874.870	31.502	US INVERT	DW-CU08	RCP, CL3	375ϕ
12	25291.708	147864.593	31.096	DS INVERT			

(TO BE CONFIRMED IN DETAIL DESIGN)

NOTES

1. FOR ROADWORKS INFORMATION REFER DRGS B00703-DD-GA01 TO B00703-DD-GA11.

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **DRAINAGE PLAN**
SHEET 3 OF 3

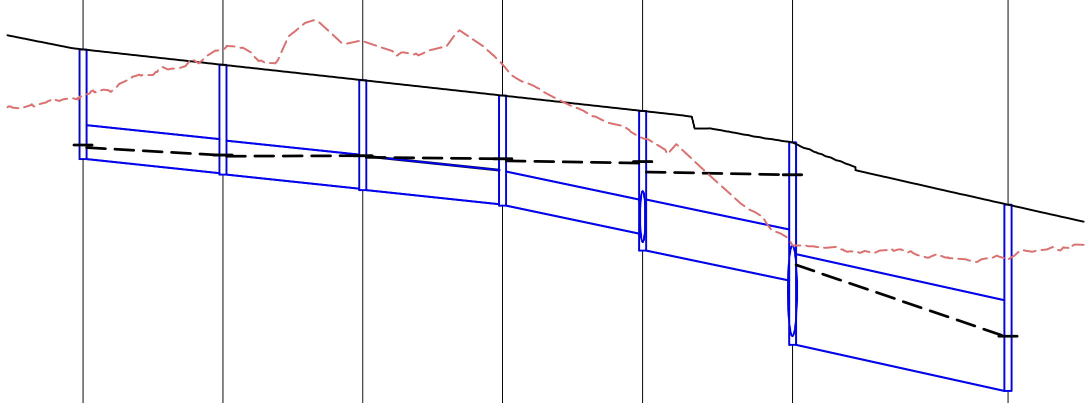
Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-SW03**
Rev **A**

"

STRUCTURE NAME & SETOUT COORDINATES	1/1	2/1	3/1	4/1	5/1	6/1	OUT/1
	KERB INLET 25368.780 E 148248.290 N	KERB INLET	KERB INLET	KERB INLET 25364.483 E 148218.599 N	KERB INLET 25360.185 E 148188.908 N	ACCESS CHAMBER 25357.350 E 148169.318 N	ACCESS CHAMBER
STRUCTURE DESCRIPTION	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061	1500mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015	1500mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015



	1/1 – 2/1	2/1 – 3/1	3/1 – 4/1	4/1 – 5/1	5/1 – 6/1	6/1 – OUT/1
PIPE CLASS & TYPE	CL3 RCP	CL3 RCP	CL3 RCP	CL3 RCP	CL3 RCP	CL3 RCP
FLOW (CUMECS)	0.0 m3/s	0.1 m3/s	0.1 m3/s	0.1 m3/s	0.4 m3/s	3.9 m3/s
PIPE GRADE	1.00%	1.00%	1.00%	2.00%	2.00%	2.14%
PIPE DIAMETER	450 DIA.	450 DIA.	450 DIA.	450 DIA.	675 DIA.	1200 DIA.
FULL PIPE VELOCITY	0.3 m/s	0.4 m/s	0.6 m/s	0.7 m/s	1.0 m/s	3.4 m/s

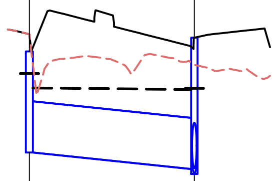
DATUM RL 33.000

	1/1	2/1	3/1	4/1	5/1	6/1	OUT/1
HGL IN PIPE	42.289 42.254	42.156 42.141	42.148 42.126	42.108 42.080	42.050 42.069 41.933	41.895 40.704	39.761
FINISHED SURFACE LEVEL	43.554 (42.939)	43.350 (43.559)	43.147 (43.661)	42.943 (43.352)	42.740 (42.379)	42.324 (40.963)	41.500 (40.774)
DEPTH OF INVERT BELOW FSL	1.451	1.433 1.453	1.434 1.454	1.436 1.456	1.622 1.847	1.828 2.679	2.464 2.464
INVERT LEVEL	42.102	41.917 41.897	41.712 41.692	41.507 41.487	41.117 40.892	40.496 39.645	39.036 39.036
CHAINAGE	0.000	18.500	37.000	55.500	74.000	93.795	122.299

DRAINAGE LONGITUDINAL SECTION – LINE 1

SCALE 1 : 500 (HORIZ.), 2:1 (VERT. EXAGGERATION)

STRUCTURE NAME & SETOUT COORDINATES	1/2	5/1
	FIELD INLET 25341.921 E 148191.864 N	KERB INLET 25360.185 E 148188.908 N
STRUCTURE DESCRIPTION	TYPE 2 GRATE IN ACCORDANCE WITH IPWEA STD DS-050. DOME TOP COVER SHALL BE INSTALLED IN ACCORDANCE WITH IPWEA STD DS-069	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061



	1/2 – 5/1
PIPE CLASS & TYPE	CL3 RCP
FLOW (CUMECS)	0.3 m3/s
PIPE GRADE	1.00%
PIPE DIAMETER	675 DIA.
FULL PIPE VELOCITY	0.7 m/s

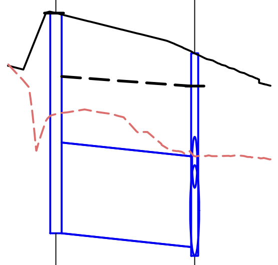
DATUM RL 33.000

	1/2	5/1
HGL IN PIPE	42.265 42.075	42.054 42.071 41.933
FINISHED SURFACE LEVEL	42.771	42.740 (42.379)
DEPTH OF INVERT BELOW FSL	1.548	1.734 1.799
INVERT LEVEL	41.224	41.006 40.940
CHAINAGE	0.000	21.821

DRAINAGE LONGITUDINAL SECTION – LINE 2

SCALE 1 : 500 (HORIZ.), 2:1 (VERT. EXAGGERATION)

	1/3	6/1
	MANHOLE 25339.214 E 148171.943 N	ACCESS CHAMBER 25357.350 E 148169.318 N
	HEADWALL 1500mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015	1500mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015



	1/3 – 6/1
PIPE CLASS & TYPE	CL3 RCP
FLOW (CUMECS)	3.5 m3/s
PIPE GRADE	1.00%
PIPE DIAMETER	1200 DIA.
FULL PIPE VELOCITY	3.1 m/s

DATUM RL 32.000

	1/3	6/1
HGL IN PIPE	42.856 42.017	41.890 40.703
FINISHED SURFACE LEVEL	42.856 (41.520)	42.324 (40.963)
DEPTH OF INVERT BELOW FSL	2.911	2.563 2.679
INVERT LEVEL	39.944	39.761 39.645
CHAINAGE	0.000	18.325

DRAINAGE LONGITUDINAL SECTION – LINE 3

SCALE 1 : 500 (HORIZ.), 2:1 (VERT. EXAGGERATION)

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

Plot Date: 12/12/2025 11:09:39 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\STORMWATER

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **DRAINAGE LONGITUDINAL SECTIONS**
SHEET 1 OF 3

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-SW04	**A**

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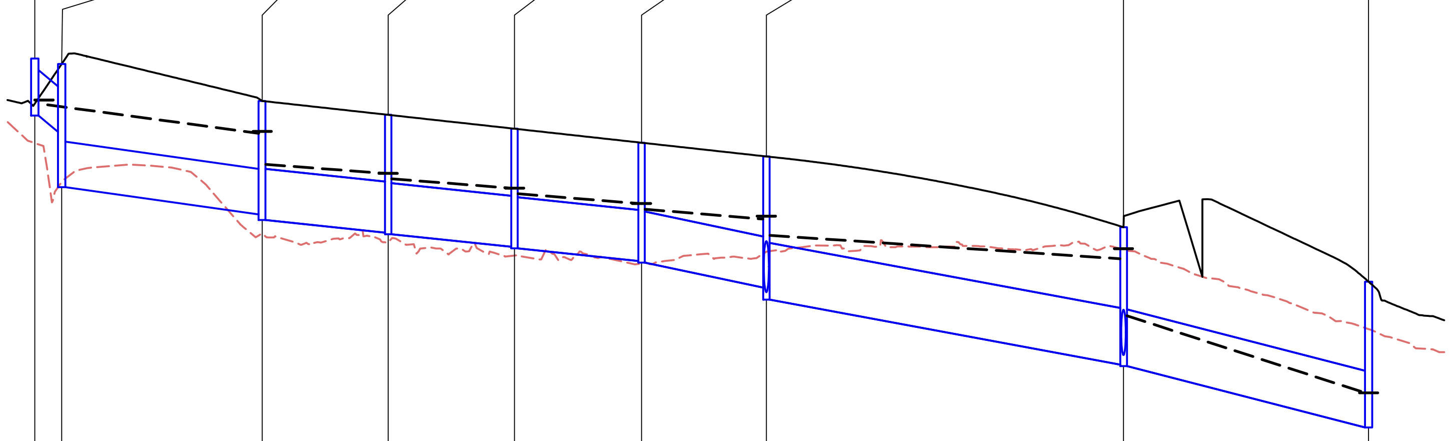
IN/4	1/4	2/4	3/4	4/4	5/4	6/4	7/4	OUT/4
HEADWALL	MANHOLE	FIELD INLET	FIELD INLET	FIELD INLET	FIELD INLET	KERB INLET	KERB INLET	FIELD INLET (REFER PRECINCT 1 INTERNAL DRAINAGE)
	900mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015	TYPE 2 GRATE IN ACCORDANCE WITH IPWEA STD DS-050.	TYPE 2 GRATE IN ACCORDANCE WITH IPWEA STD DS-050.	TYPE 2 GRATE IN ACCORDANCE WITH IPWEA STD DS-050.	TYPE 2 GRATE IN ACCORDANCE WITH IPWEA STD DS-050.	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061	TYPE 2 GRATE IN ACCORDANCE WITH IPWEA STD DS-050. DOME TOP COVER SHALL BE INSTALLED IN ACCORDANCE WITH IPWEA STD DS-069

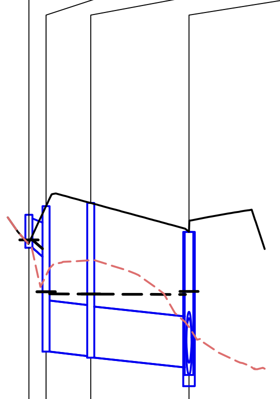


PIPE CLASS & TYPE		CL3 RCP		CL3 RCP		CL3 RCP		CL3 RCP		CL3 RCP		CL3 RCP		CL3 RCP		CL3 RCP		
FLOW (CUMECS)		0.7 m3/s		0.7 m3/s		0.7 m3/s		0.7 m3/s		0.7 m3/s		0.7 m3/s		0.9 m3/s		1.2 m3/s		
PIPE GRADE		4.00%		1.25%		1.00%		1.00%		1.00%		2.00%		1.82%		2.50%		
PIPE DIAMETER		600 DIA.		600 DIA.		675 DIA.		675 DIA.		675 DIA.		675 DIA.		750 DIA.		750 DIA.		
FULL PIPE VELOCITY		2.5 m/s		2.5 m/s		2.0 m/s		2.0 m/s		2.1 m/s		2.1 m/s		2.0 m/s		2.7 m/s		
DATUM RL		31.000																
HGL IN PIPE	42.500	42.372	42.370 42.430	41.837	41.513 41.537	41.102	40.983	40.912	40.788	40.714	40.585	40.510	40.379 40.418	40.164	39.855 39.988	39.102		38.083
FINISHED SURFACE LEVEL	41.903	(41.384)	42.430	(40.871)	41.940	(40.187)	41.757	(40.071)	41.573	(39.897)	41.388	(39.793)	41.207	(39.949)	40.271	(39.982)	39.552	(38.926)
DEPTH OF INVERT BELOW FSL		0.156	0.897	1.628	1.499	1.574	1.557	1.577	1.560	1.580	1.564	1.584	1.732	1.892	1.815	1.835	1.926	1.926
INVERT LEVEL		41.748	41.532	40.802	40.441	40.366	40.200	40.180	40.013	39.993	39.825	39.805	39.475	39.315	38.456	38.436	37.626	37.626
CHAINAGE	0.000		3.565		30.076		46.731		63.436		80.231		96.738		143.967		176.378	

DRAINAGE LONGITUDINAL SECTION - LINE 4

SCALE 1 : 500 (HORIZ.), 2:1 (VERT. EXAGGERATION)

IN/5	1/5	2/5	6/4
25320.748 E 148069.472 N	MANHOLE 25322.263 E 148068.344 N	MANHOLE 25327.005 E 148064.815 N	KERB INLET
	900mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015	900mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061



PIPE CLASS & TYPE		CL3 RCP		CL3 RCP		CL3 RCP		
FLOW (CUMECS)		0.2 m3/s		0.2 m3/s		0.2 m3/s		
PIPE GRADE		5.16%		1.00%		1.00%		
PIPE DIAMETER		450 DIA.		675 DIA.		675 DIA.		
FULL PIPE VELOCITY		5.4 m/s		0.4 m/s		0.4 m/s		
DATUM RL		32.000						
HGL IN PIPE		41.100	40.983 40.414	40.387	40.385	40.383	40.379 40.418	40.164
FINISHED SURFACE LEVEL	41.062	(41.040)	41.548	(40.630)	41.589	(40.833)	41.207	(39.949)
DEPTH OF INVERT BELOW FSL		0.066	0.668	1.925	2.025	2.045	1.793	1.892
INVERT LEVEL		40.996	40.879	39.622	39.563	39.543	39.414	39.315
CHAINAGE	0.000		2.262		8.174		21.135	

DRAINAGE LONGITUDINAL SECTION - LINE 5

SCALE 1 : 500 (HORIZ.), 2:1 (VERT. EXAGGERATION)

5 3.75 2.5 1.25 0 5 10 15 20 25m

SCALE 1:250 (A1) 1:500 (A3)

DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25
No.	*Amendments*	*Drawn*	*Design*	*Design Chk*	*Appd*	*Date*

ENGINEERING CERTIFICATION

Peter Ingerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**

Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**

Title **DRAINAGE LONGITUDINAL SECTIONS**
SHEET 2 OF 3

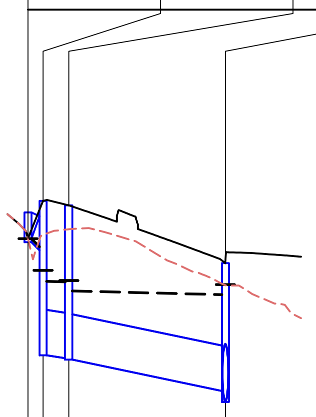
Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. *Drawing No.*	*Rev*
B00703-DD-SW05	**A**

"

IN 6	1 6	2 6	7 4
HEADWALL 25315.278 E 148029.502 N	MANHOLE 25316.802 E 148029.296 N	MANHOLE 25320.625 E 148028.779 N	KERB INLET
	900mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015	900mm DIA ACCESS CHAMBER IN ACCORDANCE WITH IPWEA STD DS-015	AT GRADE IN ACCORDANCE WITH IPWEA STD DS-063. INLET SHALL HAVE TYPE 'S' LINTEL IN ACCORDANCE WITH IPWEA STD DS-061



	IN/6 – 1/6	1/6 – 2/6	2/6 – 7/4
PIPE CLASS, TYPE	RCP	RCP	RCP
FLOW (CUMECS)	0.3 m3/s	0.3 m3/s	0.3 m3/s
PIPE GRADE	5.42%	1.13%	2.00%
PIPE DIAMETER	450 DIA.	600 DIA.	600 DIA.
FULL PIPE VELOCITY	33.6 m/s	1.0 m/s	1.1 m/s
DATUM RL	31.000		

HGL IN PIPE		40.597	40.489 40.176	40.032	40.024 40.041	39.904	39.855 39.988	39.102
FINISHED SURFACE LEVEL	40.597	(40.595)	41.095	(40.651)	41.037	(40.721)	40.271	(39.982)
DEPTH OF INVERT BELOW FSL		0.047	0.653	2.041	2.021	2.041	1.689	1.835
INVERT LEVEL		40.550	40.442	39.054	39.016	38.996	38.582	38.436
CHAINAGE	0.000		1.991		5.395		26.069	

DRAINAGE LONGITUDINAL SECTION – LINE 6

SCALE 1 : 500 (HORIZ.), 2:1 (VERT. EXAGGERATION)

0 5 10 15 20 25m
5 3.75 2.5 1.25
SCALE 1:250 (A1) 1:500 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

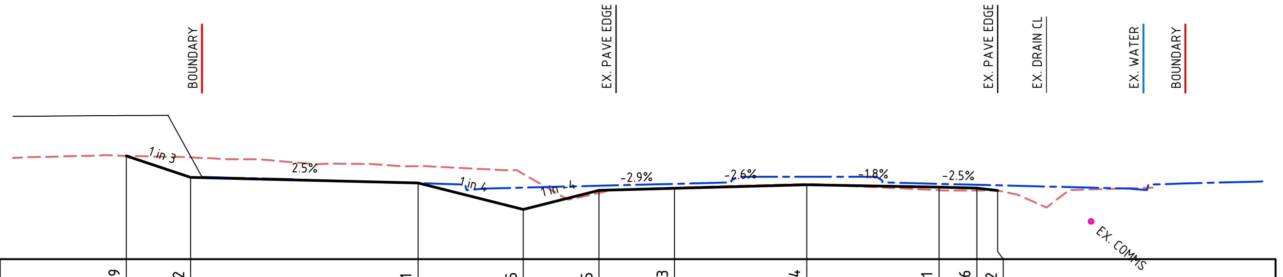
Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **DRAINAGE LONGITUDINAL SECTIONS**
SHEET 3 OF 3

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-SW06	**A**

"

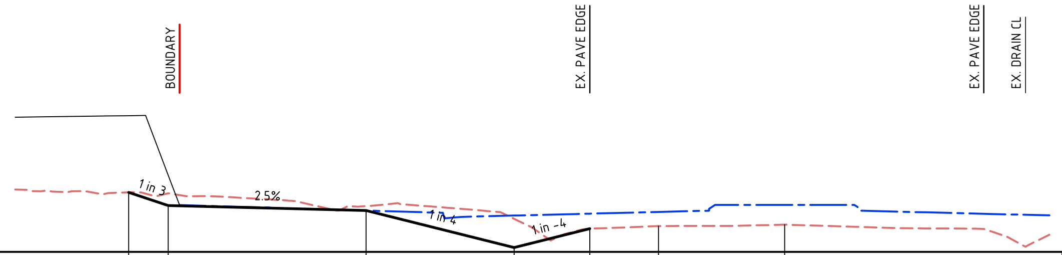

BOUNDARY
EX. PAVE EDGE
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in 3
2.5%
1 in 4
1 in -4
-2.9%
-2.6%
-1.8%
-2.5%
EX. COMMS

CONTROL LINE
X = 25384.470
Y = 148458.727
Z = 39.964

Datum 38.00

DESIGN HEIGHT	40.729	40.162	40.011	39.315	39.815	39.873	39.964	39.901	39.876	39.812
EX. SURFACE	40.729	40.688	40.458	40.250	39.750	39.886	39.983	39.821	39.813	39.812
OFFSETS	-18.003	-16.301	-10.285	-7.500	-5.500	-3.500	0.000	3.500	4.500	5.052

CH 40.0

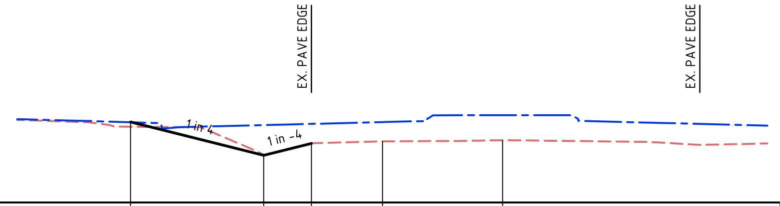

BOUNDARY
EX. PAVE EDGE
EX. PAVE EDGE
EX. DRAIN CL
1 in 3
2.5%
1 in 4
1 in -4

CONTROL LINE
X = 25387.335
Y = 148478.521
Z = 38.719

Datum 38.00

DESIGN HEIGHT	39.571	39.222	39.091	38.112	38.612	38.682	38.719
EX. SURFACE	39.571	39.546	39.207	38.872	38.612	38.682	38.718
OFFSETS	-17.348	-16.301	-11.070	-7.154	-5.154	-3.338	0.000

CH 20.0


EX. PAVE EDGE
EX. PAVE EDGE
1 in 4
1 in -4

CONTROL LINE
X = 25390.200
Y = 148498.315
Z = 37.641

Datum 36.00

DESIGN HEIGHT	38.122	37.242	37.557	37.611	37.641
EX. SURFACE	37.997	37.258	37.557	37.611	37.641
OFFSETS	-9.837	-6.317	-5.054	-3.176	0.000

CH 0.0

Plot Date: 12/12/2025 11:16:39 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\CROSS_SECTIONS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 1 OF 12

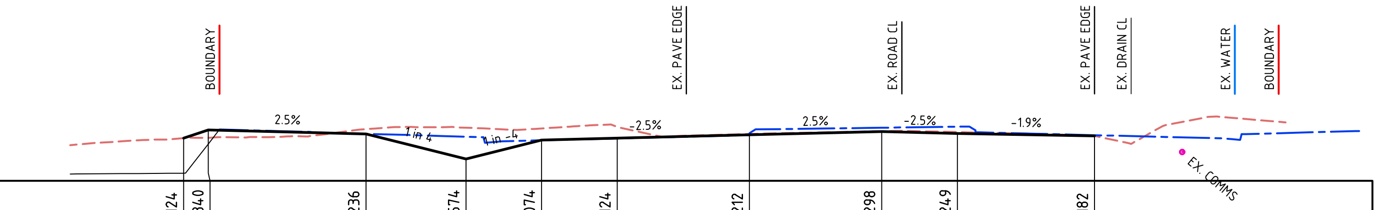
Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No.	Drawing No.	Rev
B00703-DD-XS01		A

CONTROL LINE
X = 25376.968
Y = 148379.112
Z = 43.212

Datum 42.00

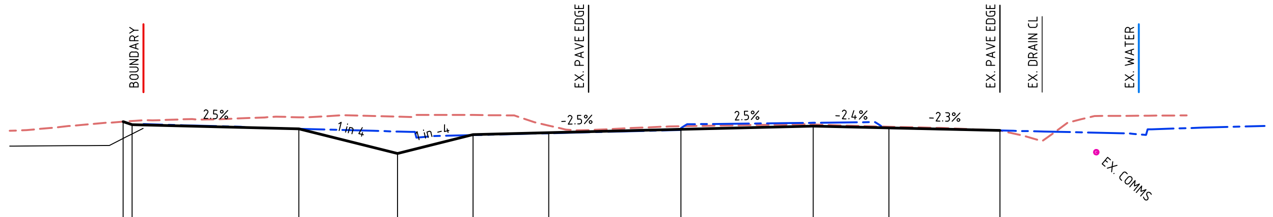

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
2.5%
1 in 4
1 in -4
-2.5%
2.5%
-2.5%
-1.9%
EX. COMMS

DESIGN HEIGHT	43.124	43.340	43.236	42.574	43.074	43.124	43.212	43.298	43.249	43.182
EX. SURFACE	43.124	43.133	43.363	43.399	43.381	43.418	43.233	43.307	43.285	43.182
OFFSETS	-14.971	-14.321	-10.147	-7.500	-5.500	-3.500	0.000	3.500	5.500	9.131

CH 120.0

CONTROL LINE
X = 25379.142
Y = 148398.991
Z = 42.625

Datum 40.00

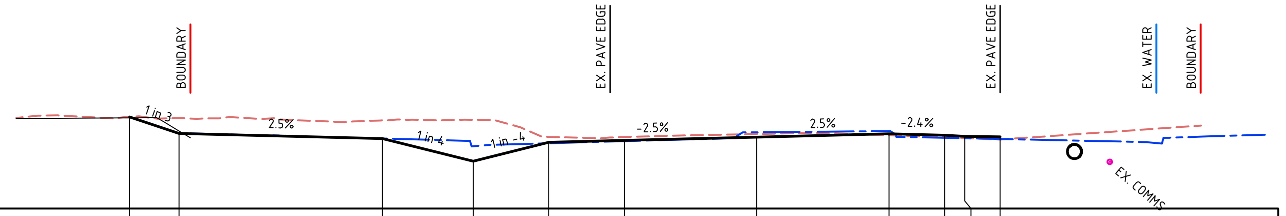

BOUNDARY
EX. PAVE EDGE
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
2.5%
1 in 4
1 in -4
-2.5%
2.5%
-2.4%
-2.3%
EX. COMMS

DESIGN HEIGHT	42.830	42.750	42.640	41.987	42.487	42.538	42.625	42.711	42.662	42.595
EX. SURFACE	42.830	42.846	42.943	42.961	43.005	42.725	42.707	42.753	42.693	42.595
OFFSETS	-14.761	-14.523	-10.110	-7.500	-5.500	-3.500	0.000	3.500	5.500	8.441

CH 100.0

CONTROL LINE
X = 25380.405
Y = 148418.951
Z = 41.886

Datum 40.00

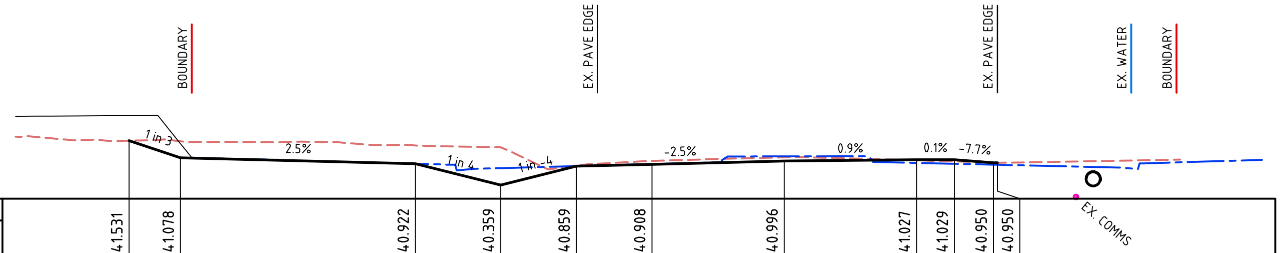

BOUNDARY
EX. PAVE EDGE
EX. PAVE EDGE
EX. WATER
BOUNDARY
1 in 3
2.5%
1 in 4
1 in -4
-2.5%
2.5%
-2.4%
EX. COMMS

DESIGN HEIGHT	42.419	41.983	41.848	41.249	41.749	41.799	41.886	41.972	41.937	41.907	41.895
EX. SURFACE	42.419	42.388	42.330	42.343	41.890	41.888	41.968	41.936	41.884	41.863	41.821
OFFSETS	-16.586	-15.278	-9.899	-7.500	-5.500	-3.500	0.000	3.500	4.967	5.500	6.439

CH 80.0

CONTROL LINE
X = 25381.948
Y = 148438.889
Z = 40.996

Datum 40.00


BOUNDARY
EX. PAVE EDGE
EX. PAVE EDGE
EX. WATER
BOUNDARY
1 in 3
2.5%
1 in 4
1 in -4
-2.5%
0.9%
0.1%
-7.7%
EX. COMMS

DESIGN HEIGHT	41.531	41.078	40.922	40.359	40.859	40.908	40.996	41.027	41.029	40.950	40.950
EX. SURFACE	41.531	41.515	41.404	41.354	40.870	40.998	41.091	41.014	40.985	40.947	40.941
OFFSETS	-17.329	-15.969	-9.755	-7.500	-5.500	-3.500	0.000	3.500	4.500	5.530	5.636

CH 60.0

Plot Date: 12/12/2025 11:16:39 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\CROSS_SECTIONS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client URBEX PTY LTD
Project SPRINGACRE ROAD, THORNLANDS, QLD, 4161
Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 2 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

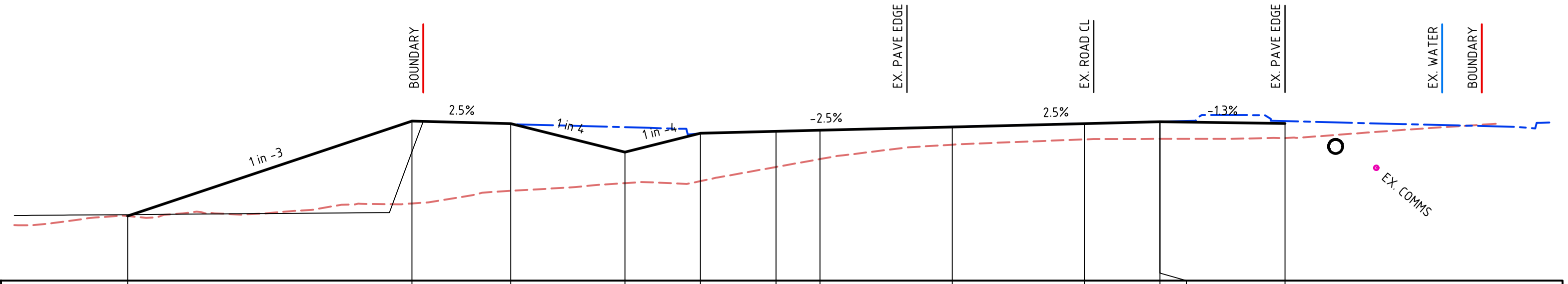
ISSUE FOR REVIEW

Project No. Drawing No. B00703-DD-XS02
Rev A

"

CONTROL LINE
X = 25368.393
Y = 148319.728
Z = 44.064

Datum 40.00

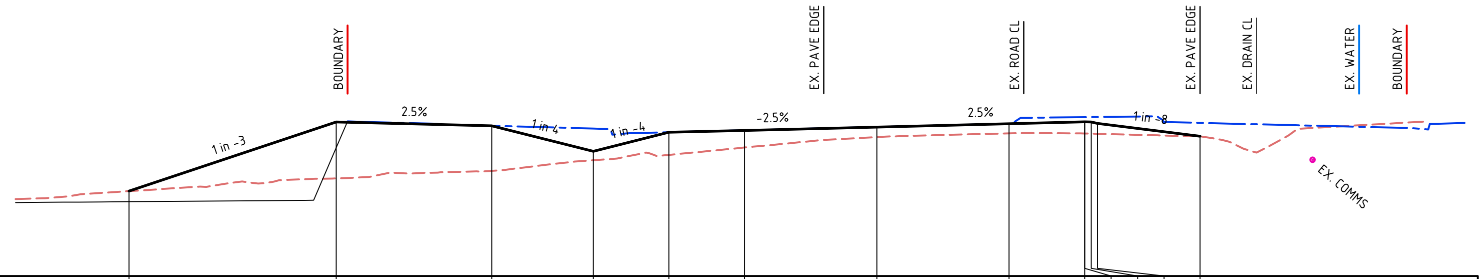

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
2.5%
-1.3%
EX. COMMS

DESIGN HEIGHT	41.709	44.219	44.154	43.398	43.898	43.948	43.977	44.064	44.152	44.202	44.202	44.158
EX. SURFACE	41.709	42.041	42.375	42.579	42.631	43.005	43.215	43.595	43.736	43.749	43.749	43.770
OFFSETS	-21.831	-14.300	-11.688	-8.664	-6.664	-4.664	-3.500	0.000	3.500	5.500	5.500	8.809

CH 180.0

CONTROL LINE
X = 25371.258
Y = 148339.522
Z = 43.932

Datum 40.00

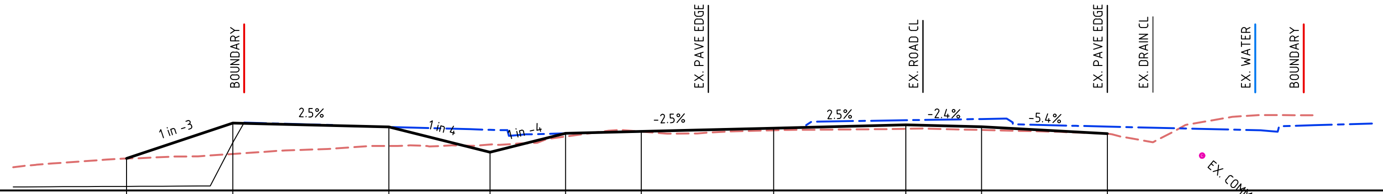

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
2.5%
1 in -8
EX. COMMS

DESIGN HEIGHT	42.241	44.069	43.966	43.294	43.794	43.844	43.932	44.019	44.069	44.069	44.066	44.027	43.689
EX. SURFACE	42.241	42.581	42.776	43.056	43.197	43.392	43.667	43.768	43.763	43.763	43.758	43.754	43.689
OFFSETS	-19.785	-14.300	-10.188	-7.500	-5.500	-3.500	0.000	3.500	5.500	5.500	5.675	5.839	8.552

CH 160.0

CONTROL LINE
X = 25374.123
Y = 148359.316
Z = 43.647

Datum 42.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
2.5%
-2.4%
-5.4%
EX. COMMS

DESIGN HEIGHT	42.844	43.781	43.678	43.010	43.510	43.560	43.647	43.734	43.685	43.504
EX. SURFACE	42.844	42.965	43.175	43.214	43.426	43.555	43.590	43.630	43.599	43.504
OFFSETS	-17.112	-14.301	-10.173	-7.500	-5.500	-3.500	0.000	3.500	5.500	8.827

CH 140.0

Plot Date: 12/12/2025 11:16:39 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\CROSS__SECTIONS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION

Peter Ingerman
Registered Engineer
Date " "

Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 3 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-XS03	**A**

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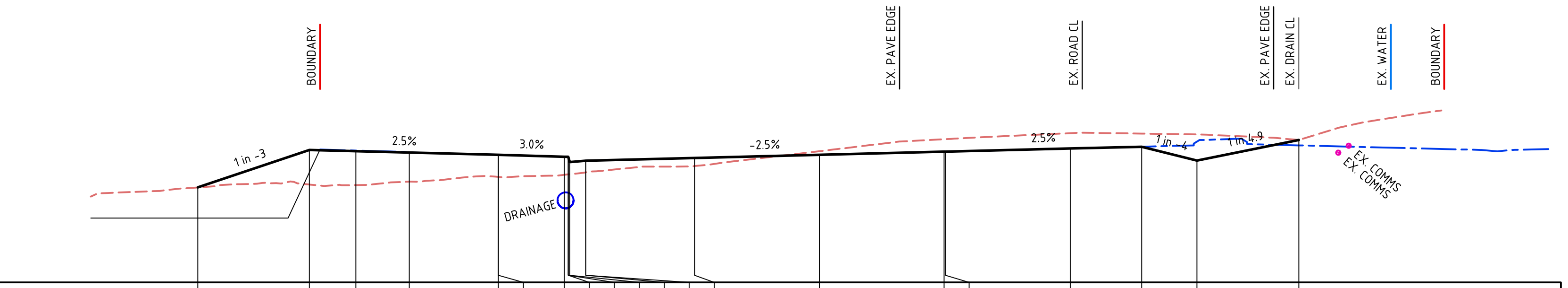
CONTROL LINE
X = 25359.798
Y = 148260.347
Z = 43.658

Datum 40.00

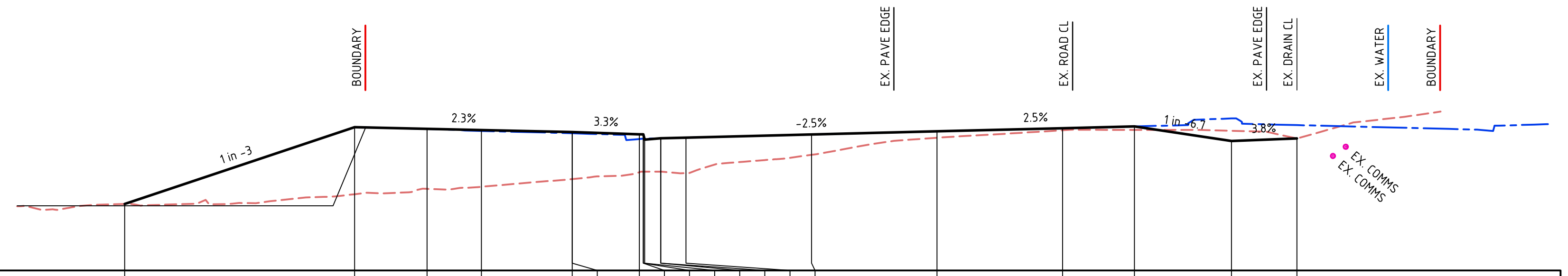

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
3.0%
DRAINAGE
-2.5%
2.5%
1 in -4
1 in 4.9
EX. COMMS
EX. COMMS

DESIGN HEIGHT	42.661	43.704	43.671	43.634	43.571	43.571	43.517	43.517	43.517	43.367	43.407	43.407	43.483	43.570	43.658	43.659	43.746	43.796	43.409	43.987
EX. SURFACE	42.657	42.739	42.724	42.819	42.950	42.950	43.009	43.022	43.022	43.026	43.079	43.079	43.257	43.670	44.005	44.007	44.174	44.164	44.139	43.987
OFFSETS	-20.930	-17.800	-16.500	-15.000	-12.500	-12.500	-10.650	-10.540	-10.540	-10.500	-10.050	-10.050	-7.000	-3.500	0.000	0.038	3.538	5.538	7.088	9.946

CH 240.0

CONTROL LINE
X = 25362.663
Y = 148280.141
Z = 43.878

Datum 40.00

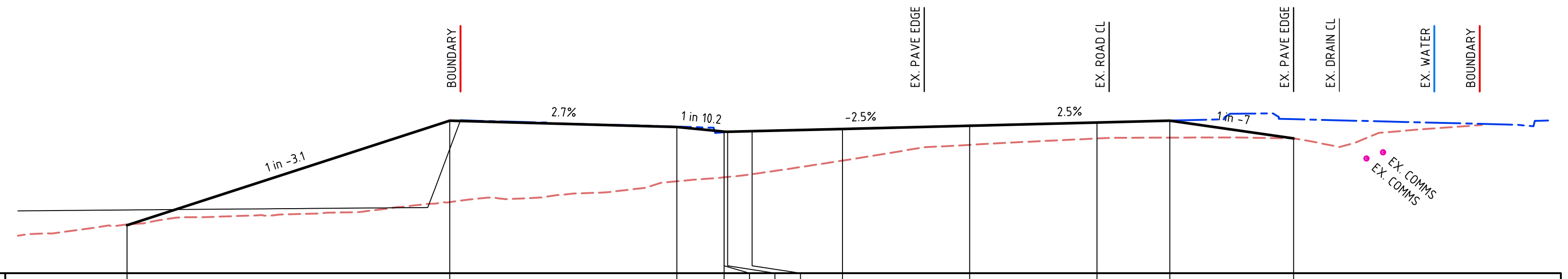

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.3%
3.3%
-2.5%
2.5%
1 in -6.7
3.8%
EX. COMMS
EX. COMMS

DESIGN HEIGHT	41.852	43.994	43.949	43.915	43.858	43.858	43.795	43.795	43.795	43.645	43.685	43.685	43.703	43.790	43.878	43.965	44.015	43.609	43.679
EX. SURFACE	41.852	42.125	42.275	42.332	42.545	42.545	42.739	42.754	42.754	42.754	42.753	42.753	42.713	43.222	43.699	43.908	43.917	43.891	43.679
OFFSETS	-22.643	-16.235	-14.218	-12.700	-10.172	-10.172	-8.300	-8.190	-8.190	-8.150	-7.700	-7.700	-7.000	-3.500	0.000	3.500	5.500	8.208	10.029

CH 220.0

CONTROL LINE
X = 25365.528
Y = 148299.934
Z = 44.046

Datum 40.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3.1
2.7%
1 in 10.2
-2.5%
2.5%
1 in -7
EX. COMMS
EX. COMMS

DESIGN HEIGHT	41.314	44.183	44.012	43.885	43.885	43.879	43.896	43.958	44.046	44.133	44.183	43.699
EX. SURFACE	41.336	41.949	42.521	42.630	42.630	42.639	42.717	43.089	43.522	43.697	43.720	43.699
OFFSETS	-23.169	-14.297	-8.051	-6.755	-6.755	-6.657	-5.984	-3.500	0.000	3.500	5.500	8.904

CH 200.0

Plot Date: 12/12/2025 11:16:39 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\CROSS_SECTIONS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX
EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 4 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

N

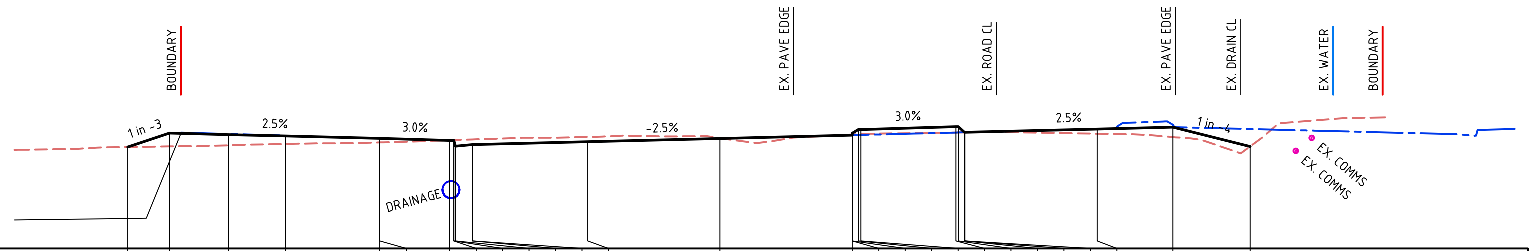
ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-XS04	A

"

CONTROL LINE
X = 25351.202
Y = 148200.966
Z = 42.998

Datum 40.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
3.0%
-2.5%
3.0%
2.5%
1 in -4
DRAINAGE
EX. COMMS
EX. COMMS

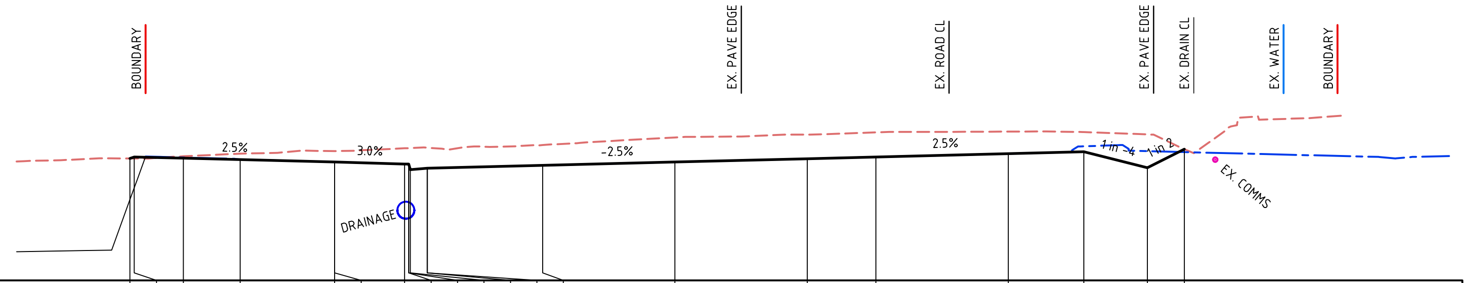
DESIGN HEIGHT	42.684	43.051	43.012	42.975	42.912	42.912	42.857	42.857	42.857	42.707	42.747	42.747	42.823	42.910
EX. SURFACE	42.684	42.701	42.730	42.764	42.805	42.805	42.863	42.867	42.867	42.869	42.885	42.885	42.950	42.919
OFFSETS	-19.167	-18.064	-16.500	-15.000	-12.500	-12.500	-10.650	-10.540	-10.540	-10.500	-10.050	-10.050	-7.000	-3.500

DESIGN HEIGHT	42.998	42.998	43.048	43.148	43.148	43.222	43.222	43.072	43.072	43.072	43.160	43.210	42.699
EX. SURFACE	43.015	43.015	43.015	43.023	43.027	43.067	43.068	43.070	43.070	43.070	43.037	42.946	42.699
OFFSETS	0.000	0.000	0.001	0.161	0.226	2.741	2.806	2.966	2.967	2.981	6.481	8.481	10.525

CH 300.0

CONTROL LINE
X = 25354.067
Y = 148220.759
Z = 43.218

Datum 40.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
2.5%
3.0%
-2.5%
2.5%
1 in -4
1 in 2
DRAINAGE
EX. COMMS

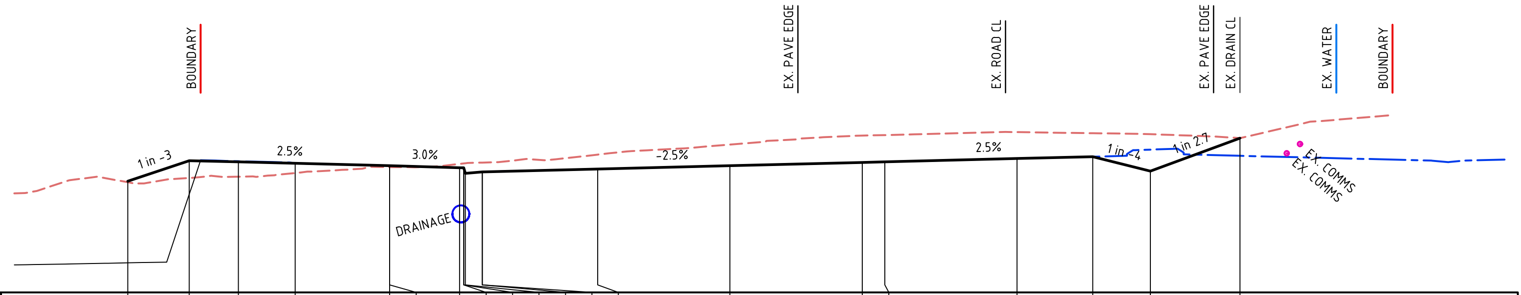
DESIGN HEIGHT	43.226	43.264	43.232	43.194	43.132	43.132	43.077	43.077	43.077	42.927	42.967	42.967	43.043	43.130
EX. SURFACE	43.225	43.224	43.282	43.353	43.419	43.419	43.494	43.499	43.499	43.501	43.511	43.511	43.580	43.781
OFFSETS	-17.914	-17.800	-16.500	-15.000	-12.500	-12.500	-10.650	-10.540	-10.540	-10.500	-10.050	-10.050	-7.000	-3.500

DESIGN HEIGHT	43.218	43.263	43.351	43.401	42.980	43.469
EX. SURFACE	43.854	43.915	43.935	43.923	43.861	43.469
OFFSETS	0.000	1.815	5.315	7.315	8.996	9.974

CH 280.0

CONTROL LINE
X = 25356.933
Y = 148240.553
Z = 43.438

Datum 40.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
3.0%
-2.5%
2.5%
1 in -4
1 in 2.7
DRAINAGE
EX. COMMS
EX. COMMS

DESIGN HEIGHT	42.942	43.484	43.452	43.414	43.352	43.352	43.297	43.297	43.297	43.147	43.187	43.187	43.263	43.350
EX. SURFACE	42.914	43.028	43.059	43.157	43.316	43.316	43.399	43.412	43.412	43.417	43.434	43.434	43.645	43.912
OFFSETS	-19.427	-17.800	-16.500	-15.000	-12.500	-12.500	-10.650	-10.540	-10.540	-10.500	-10.050	-10.050	-7.000	-3.500

DESIGN HEIGHT	43.438	43.453	43.540	43.590	43.209	44.078
EX. SURFACE	44.147	44.162	44.239	44.212	44.185	44.078
OFFSETS	0.000	0.594	4.094	6.094	7.620	9.988

CH 260.0

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION

Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

Client **URBEX PTY LTD**

Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**

Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 5 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-XS05**

Rev **A**

Plot Date: 12/12/2025 11:16:46 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\CROSS__SECTIONS

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CONTROL LINE
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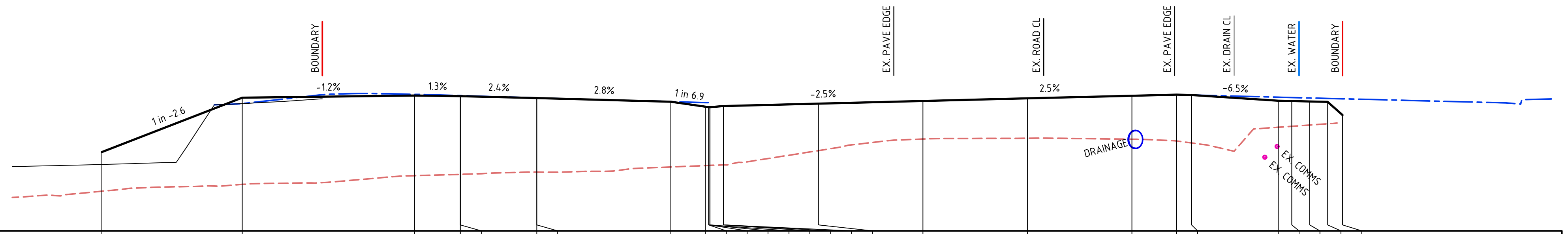
Y = 148141.585
Z = 42.338

Datum 38.00


BOUNDARY
1 in -2.6
-1.2%
1.3%
2.4%
2.8%
1 in 6.9
-2.5%
EX. PAVE EDGE
EX. ROAD CL
2.5%
EX. PAVE EDGE
EX. DRAIN CL
-6.5%
EX. WATER
BOUNDARY
DRAINAGE
EX. COMMS
EX. COMMS

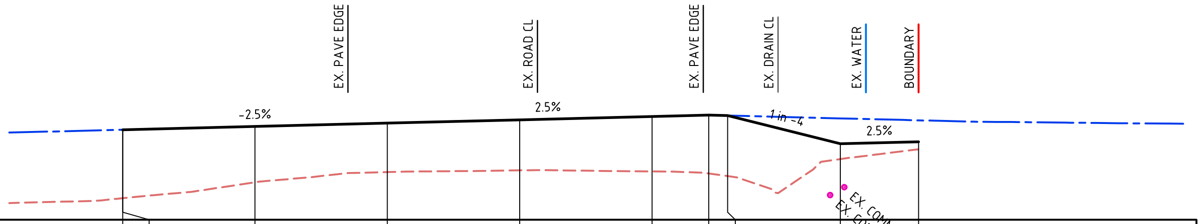
DESIGN HEIGHT	40.631	42.449	42.519	42.498	42.498	42.437	42.437	42.313	42.146	42.130	42.129	42.129	42.129	42.168
EX. SURFACE	39.322	39.551	39.843	39.887	39.887	39.963	39.963	40.133	40.180	40.184	40.185	40.186	40.186	40.204
OFFSETS	-27.510	-22.804	-17.033	-15.498	-15.498	-12.940	-12.940	-8.445	-7.290	-7.179	-7.173	-7.139	-7.132	-6.686

DESIGN HEIGHT	42.169	42.171	42.250	42.338	42.425	42.513	42.550	42.537	42.349	42.337	42.322	42.307	41.867
EX. SURFACE	40.205	40.205	40.681	41.066	41.095	41.061	41.002	40.936	41.460	41.492	41.534	41.576	
OFFSETS	-6.679	-6.678	-3.500	0.000	3.500	7.000	8.500	9.000	11.901	12.356	12.956	13.556	14.056

CH 360.0

CONTROL LINE
X = 25345.472
Y = 148161.378
Z = 42.558

Datum 40.00

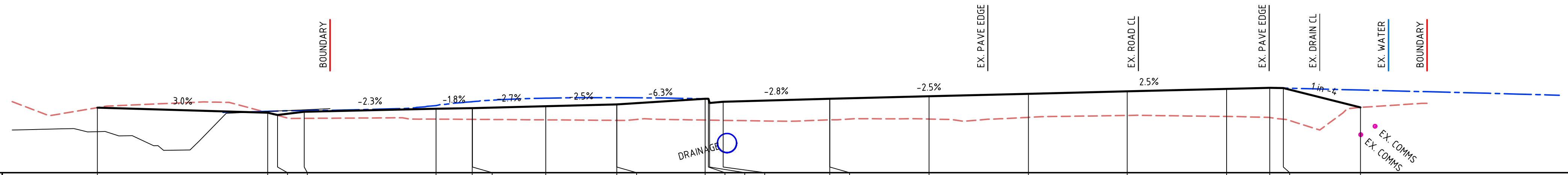

EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
-2.5%
2.5%
1 in -4
2.5%
EX. COMMS
EX. COMMS

DESIGN HEIGHT	42.383	42.383	42.470	42.558	42.645	42.733	42.770	42.758	42.013	42.065
EX. SURFACE	40.571	40.571	40.992	41.262	41.309	41.280	41.226	41.158	41.607	
OFFSETS	-7.000	-7.000	-3.500	0.000	3.500	7.000	8.500	9.000	11.979	14.048

CH 340.0

CONTROL LINE
X = 25348.337
Y = 148181.172
Z = 42.778

Datum 40.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
3.0%
-2.3%
-1.8%
-2.7%
-2.5%
-6.3%
-2.8%
-2.5%
2.5%
1 in -4
DRAINAGE
EX. COMMS
EX. COMMS

DESIGN HEIGHT	42.291	42.112	42.034	42.145	42.250	42.273	42.273	42.342	42.405	42.405	42.602	42.603
EX. SURFACE	42.291	42.112	42.019	41.913	41.887	41.878	41.878	41.860	41.843	41.843	41.852	41.851
OFFSETS	-32.798	-26.799	-26.448	-25.509	-20.868	-19.590	-19.582	-17.000	-14.500	-14.500	-11.389	-11.272

DESIGN HEIGHT	42.453	42.498	42.603	42.603	42.690	42.778	42.865	42.952	42.990	42.978	42.299
EX. SURFACE	41.850	41.843	41.861	41.861	41.889	41.948	42.016	41.980	41.943	41.882	42.299
OFFSETS	-11.230	-10.752	-7.000	-7.000	-3.500	0.000	3.480	6.980	8.500	8.980	11.697

CH 320.0

Plot Date: 12/12/2025 11:16:46 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\CROSS_SECTIONS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client URBEX PTY LTD
Project SPRINGACRE ROAD, THORNLANDS, QLD, 4161
Title ANNOTATED CROSS SECTIONS - RD01
SHEET 6 OF 12

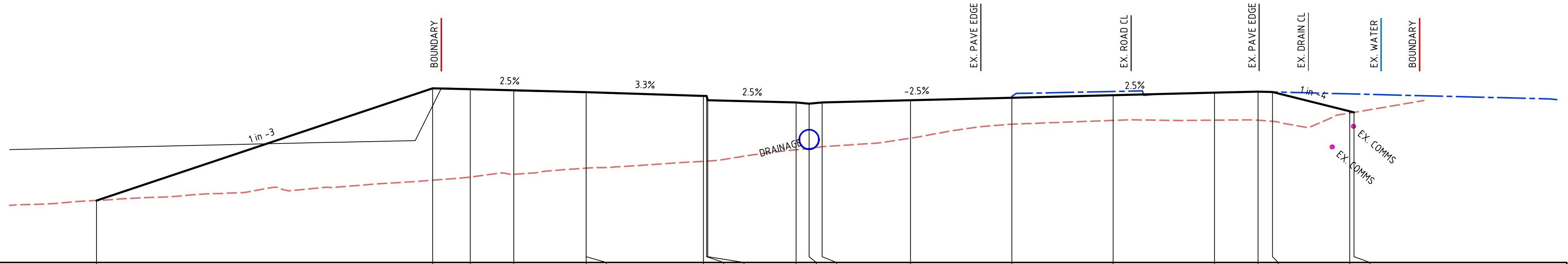
Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. B00703-DD-XS06
Rev A

CONTROL LINE
X = 25334.012
Y = 148082.203
Z = 41.678

Datum 36.00

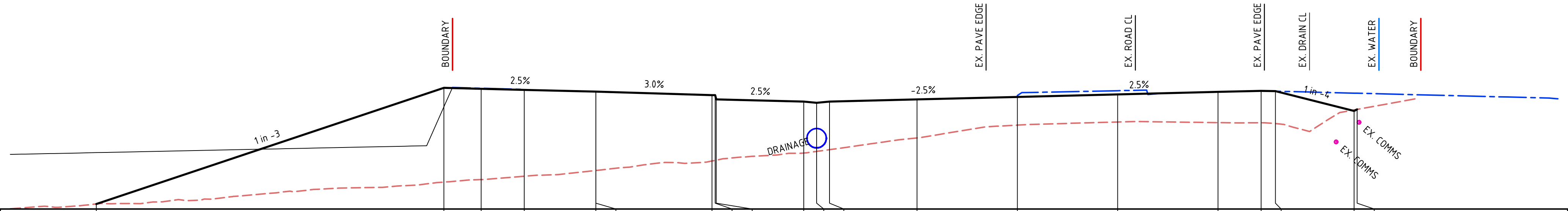

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
2.5%
3.3%
2.5%
-2.5%
2.5%
1 in -3
1 in -4
DRAINAGE
EX. COMMS
EX. COMMS

DESIGN HEIGHT	38.135	42.005	41.972	41.935	41.872	41.872	41.740	41.740	41.590	41.514	41.474	41.514	41.590	41.678	41.765	41.853	41.890	41.878	41.211	41.174
EX. SURFACE	38.137	38.836	38.942	39.036	39.251	39.251	39.485	39.491	39.494	39.884	39.928	39.990	40.282	40.765	40.896	40.905	40.904	40.866	41.151	41.174
OFFSETS	-31.609	-20.000	-18.700	-17.200	-14.700	-14.700	-10.650	-10.540	-10.500	-7.450	-7.000	-6.550	-3.500	0.000	3.500	7.000	8.500	9.000	11.667	11.816

CH 420.0

CONTROL LINE
X = 25336.877
Y = 148101.997
Z = 41.898

Datum 38.00

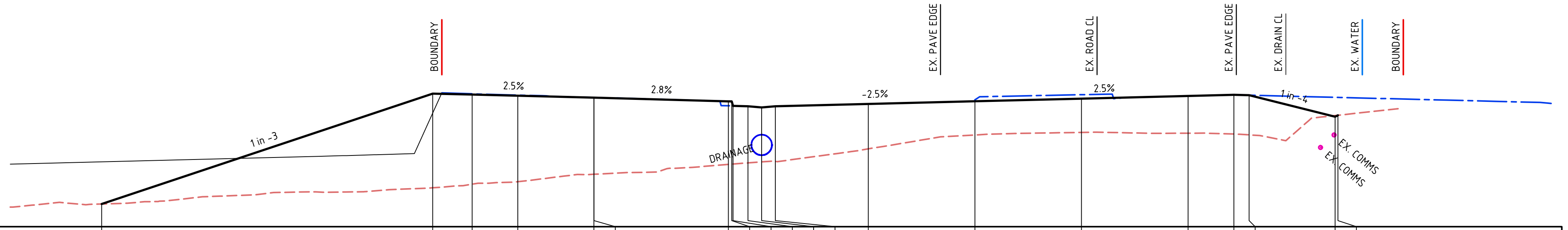

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
2.5%
3.0%
2.5%
-2.5%
2.5%
1 in -3
1 in -4
DRAINAGE
EX. COMMS
EX. COMMS

DESIGN HEIGHT	38.173	42.214	42.182	42.144	42.082	42.082	41.960	41.960	41.810	41.734	41.694	41.734	41.810	41.898	41.985	42.073	42.110	42.098	41.412	41.464
EX. SURFACE	38.174	38.934	39.022	39.137	39.339	39.339	39.668	39.691	39.699	39.946	40.003	40.063	40.471	40.917	41.026	41.003	41.001	40.970	41.445	41.464
OFFSETS	-32.125	-20.000	-18.700	-17.200	-14.700	-14.700	-10.650	-10.540	-10.500	-7.450	-7.000	-6.550	-3.500	0.000	3.500	7.000	8.500	9.000	11.745	11.850

CH 400.0

CONTROL LINE
X = 25339.742
Y = 148121.791
Z = 42.118

Datum 38.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
2.5%
2.8%
-2.5%
2.5%
1 in -3
1 in -4
DRAINAGE
EX. COMMS
EX. COMMS

DESIGN HEIGHT	38.744	42.370	42.338	42.301	42.238	42.238	42.116	42.116	41.966	41.954	41.914	41.954	42.030	42.118	42.205	42.293	42.330	42.318	41.612	41.659
EX. SURFACE	38.744	39.278	39.394	39.477	39.721	39.721	40.045	40.054	40.057	40.094	40.127	40.153	40.555	41.011	41.095	41.069	41.044	41.015	41.649	41.659
OFFSETS	-28.666	-17.800	-16.505	-15.005	-12.506	-12.504	-8.093	-7.981	-7.941	-7.450	-7.000	-6.550	-3.500	0.000	3.500	7.000	8.500	9.000	11.823	11.916

CH 380.0

Plot Date: 12/12/2025 11:16:46 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\CROSS_SECTIONS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client
URBEX PTY LTD

Project
SPRINGACRE ROAD, THORNLANDS, QLD, 4161

Title
ANNOTATED CROSS SECTIONS - RD01
SHEET 7 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

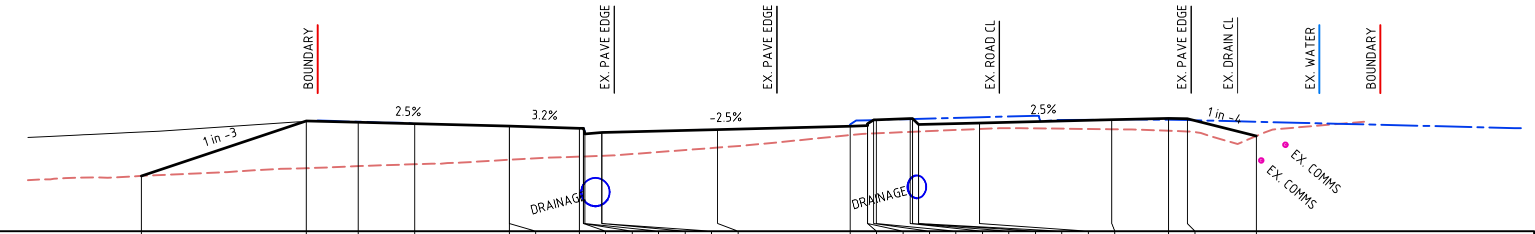
ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-XS07	**A**

"

CONTROL LINE
X = 25325.337
Y = 148022.834
Z = 40.775

Datum 38.00

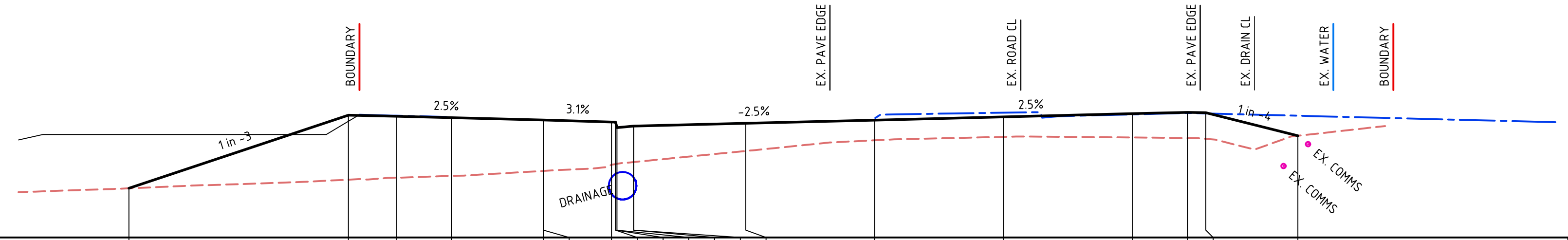

BOUNDARY
EX. PAVE EDGE
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
3.2%
-2.5%
2.5%
1 in -4
DRAINAGE
DRAINAGE
EX. COMMS
EX. COMMS

DESIGN HEIGHT	39.460	40.914	40.880	40.842	40.780	40.780	40.720	40.720	40.720	40.570	40.610	40.610	40.687	40.775	40.793	40.843	40.944	40.944	40.977	40.977	40.820	40.820	40.860	40.948	40.985	40.972	40.517
EX. SURFACE	39.462	39.665	39.721	39.771	39.889	39.889	39.971	39.975	39.975	39.976	39.992	39.992	40.211	40.542	40.579	40.579	40.586	40.589	40.626	40.629	40.636	40.636	40.703	40.696	40.656	40.637	40.517
OFFSETS	-18.746	-14.384	-13.014	-11.514	-9.014	-9.014	-7.165	-7.055	-7.055	-7.015	-6.565	-6.564	-3.500	0.000	0.460	0.461	0.625	0.691	1.586	1.651	1.811	1.812	3.420	6.920	8.421	8.920	10.742

CH 480.0

CONTROL LINE
X = 25328.282
Y = 148042.616
Z = 41.191

Datum 38.00

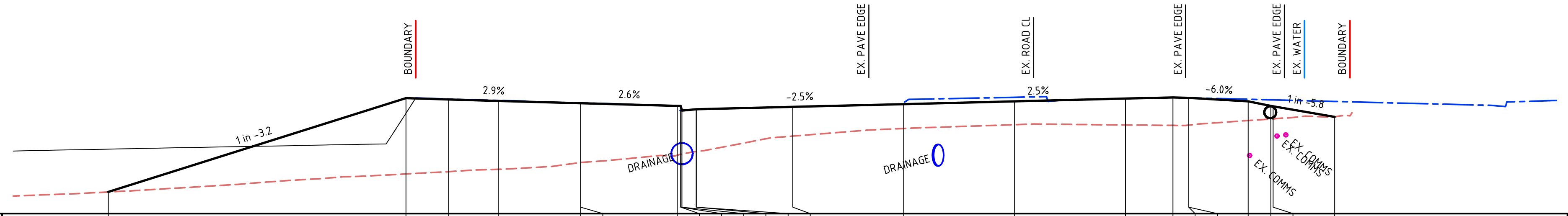

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
3.1%
-2.5%
2.5%
1 in -4
DRAINAGE
EX. COMMS
EX. COMMS

DESIGN HEIGHT	39.338	41.327	41.294	41.257	41.194	41.194	41.137	41.137	41.137	40.987	41.027	41.027	41.103	41.191	41.278	41.366	41.403	41.391	40.765
EX. SURFACE	39.338	39.573	39.626	39.677	39.811	39.811	39.977	39.996	39.996	40.003	40.051	40.051	40.353	40.642	40.736	40.719	40.702	40.683	40.765
OFFSETS	-20.265	-14.300	-13.000	-11.500	-9.000	-9.000	-7.150	-7.040	-7.040	-7.000	-6.550	-6.550	-3.500	0.000	3.500	7.000	8.500	9.000	11.501

CH 460.0

CONTROL LINE
X = 25331.147
Y = 148062.410
Z = 41.458

Datum 38.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. PAVE EDGE
EX. WATER
BOUNDARY
1 in -3.2
2.9%
2.6%
-2.5%
2.5%
-6.0%
1 in -5.8
DRAINAGE
DRAINAGE
EX. COMMS
EX. COMMS
EX. COMMS

DESIGN HEIGHT	38.685	41.646	41.606	41.561	41.485	41.485	41.404	41.404	41.404	41.254	41.294	41.294	41.370	41.458	41.545	41.633	41.670	41.658	41.658	41.546	41.403	41.390	41.054
EX. SURFACE	38.682	39.251	39.324	39.398	39.613	39.613	39.842	39.872	39.872	39.883	39.964	39.964	40.448	40.688	40.809	40.799	40.787	40.795	40.795	40.939	40.988	40.993	41.054
OFFSETS	-25.113	-15.715	-14.362	-12.801	-10.199	-10.199	-7.150	-7.040	-7.040	-7.000	-6.550	-6.550	-3.500	0.000	3.500	7.000	8.500	9.000	9.000	10.876	11.589	11.661	13.603

CH 440.0

Plot Date: 12/12/2025 11:16:48 AM User: DESIGN CIVIL
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

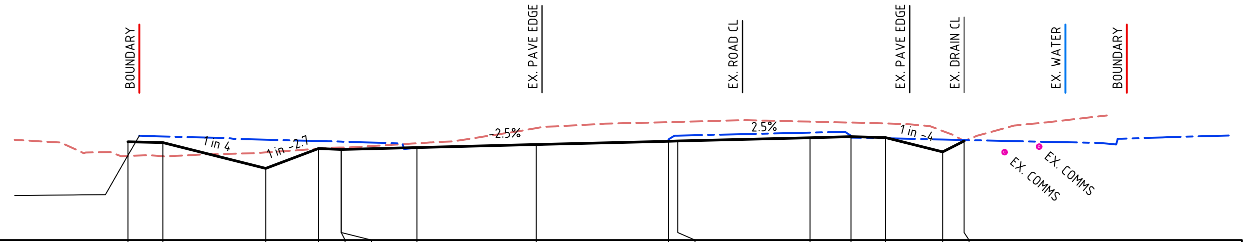
Client URBEX PTY LTD
Project SPRINGACRE ROAD, THORNLANDS, QLD, 4161
Title ANNOTATED CROSS SECTIONS - RD01
SHEET 8 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. B00703-DD-XS08
Rev A

"

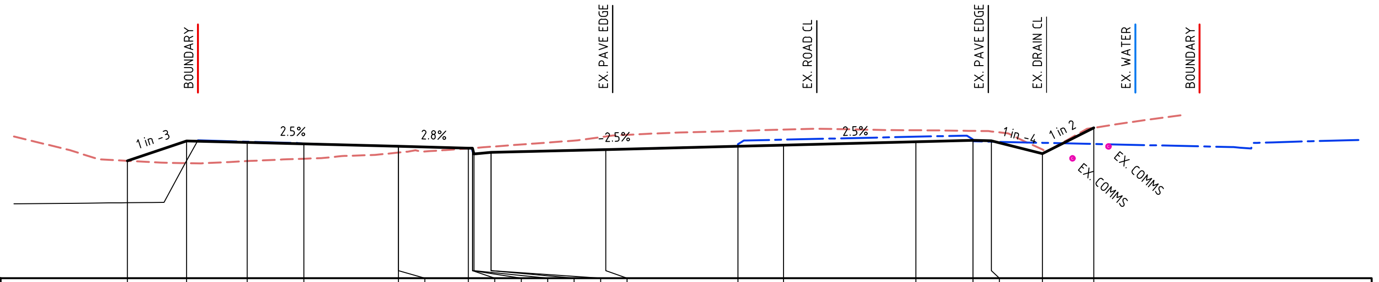

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in 4
1 in -2.7
-2.5%
2.5%
1 in -4
EX. COMMS
EX. COMMS

CONTROL LINE
X = 25314.850
Y = 147963.774
Z = 38.610

Datum 36.00

DESIGN HEIGHT	38.597	38.574	37.894	38.417	38.394	38.394	38.444	38.522	38.610	38.616	38.704	38.731	38.708	38.331	38.615		
EX. SURFACE	38.223	38.214	38.315	38.411	38.443	38.443	38.556	38.958	39.115	39.121	39.127	39.103	39.079	38.880	38.615		
OFFSETS	-14.300	-13.378	-10.658	-9.259	-8.658	-8.658	-6.658	-3.500	0.000	0.244	3.744	4.829	5.744	7.253	7.821		

CH 540.0

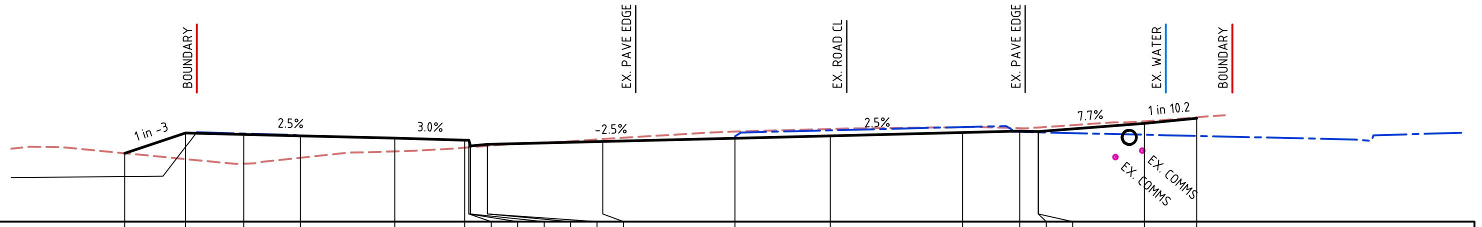

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
2.8%
-2.5%
2.5%
1 in -4
1 in 2
EX. COMMS
EX. COMMS

CONTROL LINE
X = 25317.805
Y = 147983.554
Z = 39.484

Datum 36.00

DESIGN HEIGHT	39.099	39.623	39.583	39.545	39.483	39.483	39.431	39.431	39.431	39.281	39.321	39.321	39.396	39.484	39.514	39.601	39.640	39.627	39.290	39.971
EX. SURFACE	39.099	39.036	39.093	39.154	39.316	39.316	39.427	39.435	39.435	39.438	39.470	39.470	39.740	39.889	39.922	39.906	39.888	39.874	39.397	39.971
OFFSETS	-16.157	-14.588	-12.985	-11.485	-8.985	-8.985	-7.135	-7.025	-7.025	-6.985	-6.535	-6.535	-3.500	0.000	1.204	4.704	6.215	6.705	8.053	9.415

CH 520.0


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. WATER
BOUNDARY
1 in -3
2.5%
3.0%
-2.5%
2.5%
7.7%
1 in 10.2
EX. COMMS
EX. COMMS

CONTROL LINE
X = 25321.582
Y = 148003.192
Z = 40.205

Datum 38.00

DESIGN HEIGHT	39.808	40.345	40.307	40.269	40.207	40.152	40.152	40.152	40.002	40.042	40.042	40.118	40.205	40.269	40.356	40.394	40.382	40.382	40.598	40.733
EX. SURFACE	39.808	39.653	39.531	39.689	39.858	39.955	39.964	39.964	39.967	40.002	40.002	40.182	40.380	40.450	40.498	40.470	40.489	40.489	40.653	40.759
OFFSETS	-16.148	-14.537	-13.000	-11.500	-9.000	-7.150	-7.040	-7.040	-7.000	-6.550	-6.550	-3.500	0.000	2.523	6.023	7.534	8.023	8.023	10.829	12.214

CH 500.0

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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client
URBEX PTY LTD
Project
SPRINGACRE ROAD, THORNLANDS, QLD, 4161
Title
ANNOTATED CROSS SECTIONS - RD01
SHEET 9 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

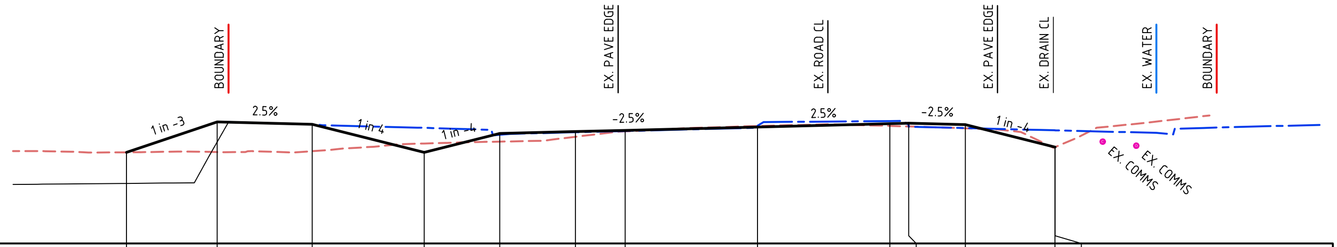
ISSUE FOR REVIEW

Project No. Drawing No.
B00703-DD-XS09
Rev
A

"

CONTROL LINE
X = 25306.274
Y = 147904.390
Z = 35.073

Datum 32.00

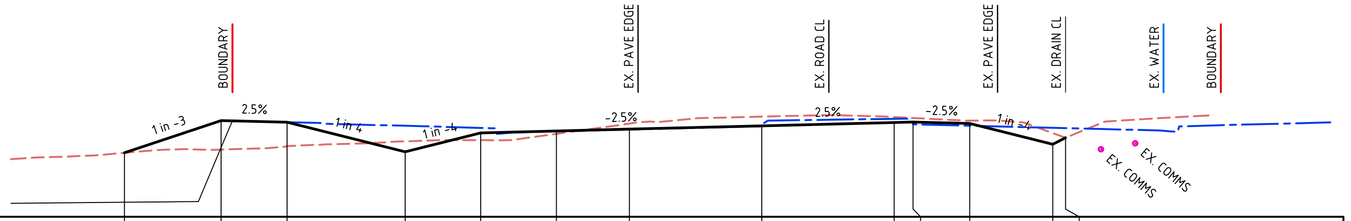

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
2.5%
-2.5%
1 in -4
EX. COMMS
EX. COMMS

DESIGN HEIGHT	34.405	35.205	35.142	34.402	34.902	34.952	34.985	35.073	35.160	35.173	35.135	34.543	34.542	
EX. SURFACE	34.405	34.411	34.434	34.637	34.687	34.815	34.958	35.097	35.102	35.087	35.039	34.540	34.542	
OFFSETS	-16.697	-14.296	-11.779	-8.819	-6.819	-4.819	-3.500	0.000	3.500	4.000	5.500	7.868	7.872	

CH 600.0

CONTROL LINE
X = 25309.120
Y = 147924.187
Z = 36.405

Datum 34.00

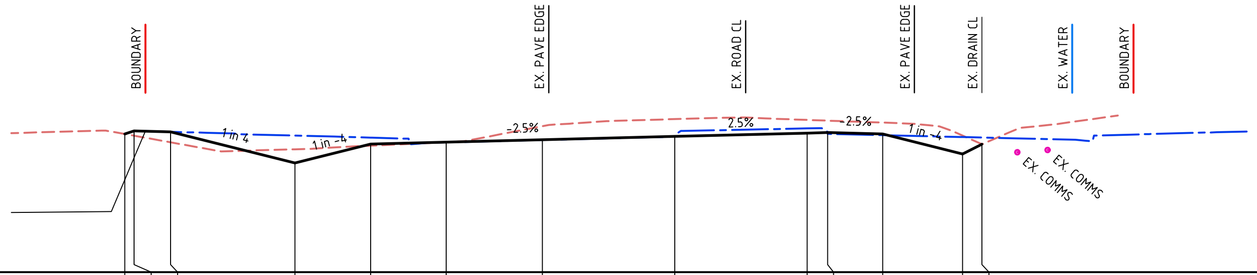

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
2.5%
-2.5%
1 in -4
EX. COMMS
EX. COMMS

DESIGN HEIGHT	35.691	36.544	36.500	35.719	36.219	36.269	36.317	36.405	36.492	36.505	36.467	35.918	36.088	
EX. SURFACE	35.691	35.776	35.864	35.994	36.025	36.193	36.464	36.648	36.637	36.612	36.541	36.209	36.088	
OFFSETS	-16.858	-14.300	-12.557	-9.432	-7.432	-5.432	-3.500	0.000	3.500	4.000	5.500	7.695	8.035	

CH 580.0

CONTROL LINE
X = 25311.985
Y = 147943.980
Z = 37.583

Datum 34.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in 4
1 in -4
-2.5%
2.5%
2.5%
1 in -4
EX. COMMS
EX. COMMS

DESIGN HEIGHT	37.647	37.729	37.705	36.883	37.383	37.433	37.496	37.583	37.671	37.685	37.648	37.120	37.377	
EX. SURFACE	37.647	37.602	37.428	37.244	37.338	37.431	37.855	38.041	38.019	38.000	37.950	37.605	37.377	
OFFSETS	-14.546	-14.300	-13.334	-10.045	-8.045	-6.045	-3.500	0.000	3.500	4.044	5.500	7.612	8.125	

CH 560.0

Plot Date: 12/12/2025 11:16:44 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\CAD\CROSS_SECTIONS

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 10 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No. **B00703-DD-XS10**
Rev **A**

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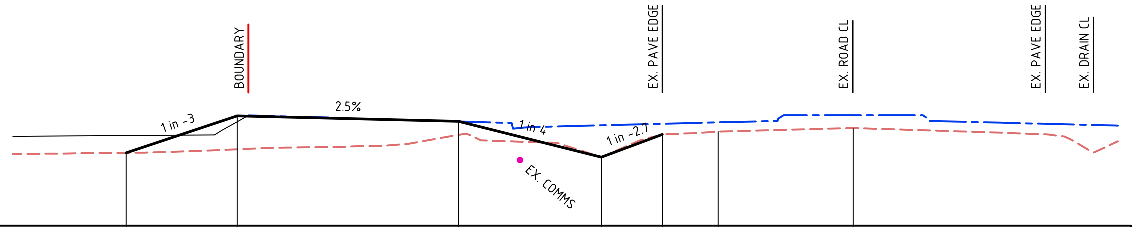
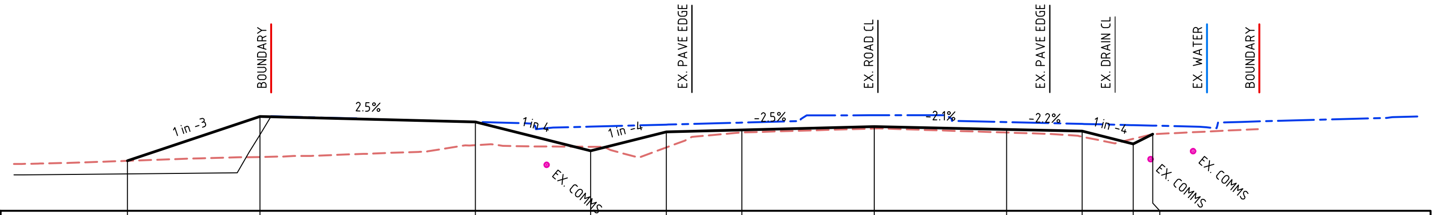

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
1 in -3
2.5%
1 in 4
1 in -2.7
EX. COMMS

CONTROL LINE
X = 25293.162
Y = 147825.496
Z = 28.565

Datum 26.00

DESIGN HEIGHT	27.926	28.904	28.758	27.812	28.412	28.488	28.565
EX. SURFACE	27.926	28.019	28.400	27.812	28.412	28.488	28.581
OFFSETS	-19.235	-16.300	-10.445	-6.662	-5.049	-3.573	0.000

CH 680.0

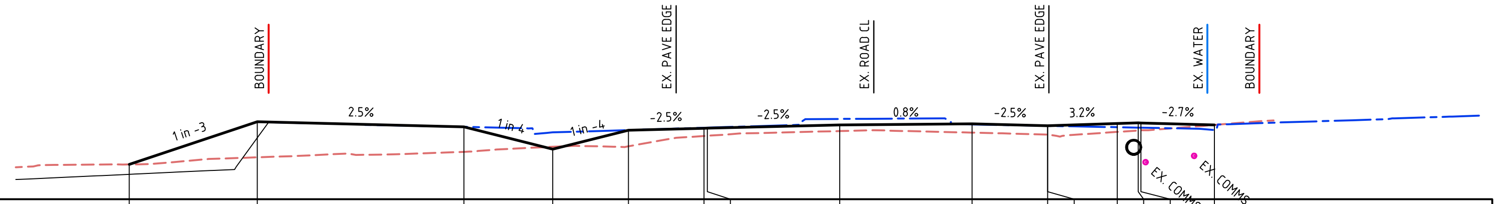

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
-2.1%
-2.2%
1 in -4
EX. COMMS
EX. COMMS
EX. COMMS

CONTROL LINE
X = 25295.999
Y = 147845.294
Z = 30.219

Datum 28.00

DESIGN HEIGHT	29.318	30.486	30.344	29.582	30.082	30.131	30.219	30.146	30.102	29.765	30.022
EX. SURFACE	29.318	29.419	29.732	29.689	29.670	30.067	30.170	30.065	29.953	29.898	30.022
OFFSETS	-19.754	-16.249	-10.548	-7.500	-5.500	-3.500	0.000	3.500	5.500	6.850	7.364

CH 660.0

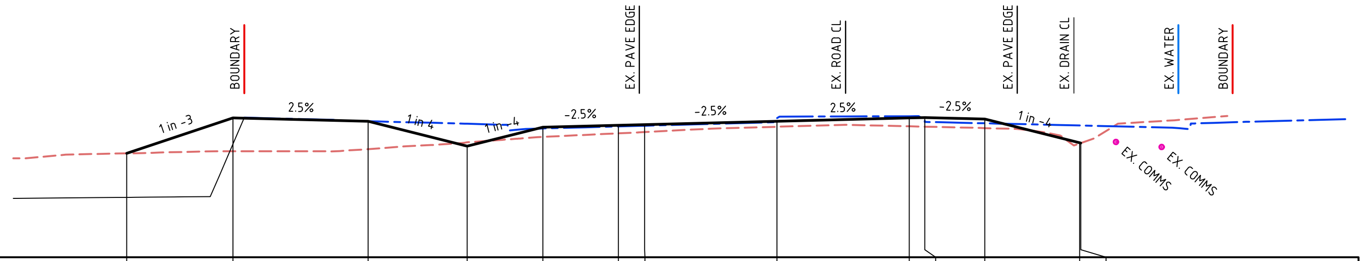

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
-2.5%
0.8%
-2.5%
3.2%
-2.7%
EX. COMMS
EX. COMMS

CONTROL LINE
X = 25299.651
Y = 147864.955
Z = 31.961

Datum 30.00

DESIGN HEIGHT	30.916	32.046	31.910	31.322	31.822	31.872	31.873	31.961	31.988	31.939	31.939	31.998	32.016	32.011	31.960
EX. SURFACE	30.916	31.105	31.249	31.385	31.395	31.667	31.673	31.798	31.757	31.704	31.704	31.776	31.813	31.818	31.960
OFFSETS	-18.792	-15.403	-9.941	-7.589	-5.589	-3.589	-3.500	0.000	3.500	5.500	5.500	7.340	7.894	7.966	9.908

CH 640.0


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
EX. WATER
BOUNDARY
1 in -3
2.5%
1 in 4
1 in -4
-2.5%
-2.5%
2.5%
-2.5%
1 in -4
EX. COMMS
EX. COMMS

CONTROL LINE
X = 25303.397
Y = 147884.599
Z = 33.588

Datum 30.00

DESIGN HEIGHT	32.741	33.678	33.589	32.934	33.434	33.484	33.501	33.588	33.676	33.686	33.647	33.020	33.012
EX. SURFACE	32.741	32.797	32.853	33.033	33.176	33.271	33.303	33.444	33.455	33.446	33.409	33.002	33.012
OFFSETS	-17.205	-14.394	-10.814	-8.194	-6.194	-4.194	-3.500	0.000	3.500	3.911	5.500	8.008	8.038

CH 620.0

Plot Date: 12/12/2025 11:16:44 AM User: DESIGN CIVIL
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

EMPOWER

Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 11 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

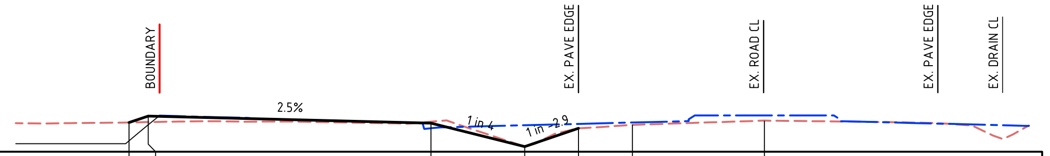
ISSUE FOR REVIEW

Project No. Drawing No.
B00703-DD-XS11
Rev
A

"

CONTROL LINE
X = 25282.029
Y = 147746.275
Z = 22.811

Datum 22.00

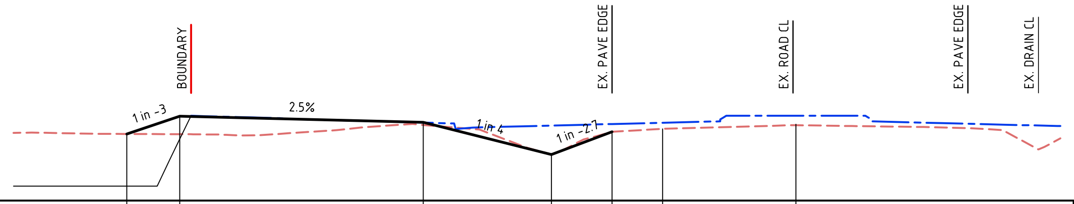

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
2.5%
1 in 4
1 in -2.9

DESIGN HEIGHT	22.774	22.943	22.756	22.135	22.621	22.710	22.811
EX. SURFACE	22.774	22.783	22.793	22.135	22.621	22.710	22.822
OFFSETS	-16.808	-16.300	-8.820	-6.339	-4.919	-3.493	0.000

CH 760.0

CONTROL LINE
X = 25284.812
Y = 147766.080
Z = 24.011

Datum 22.00

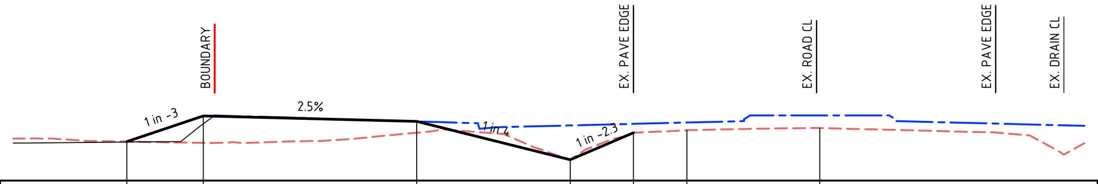

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
1 in -3
2.5%
1 in 4
1 in -2.7

DESIGN HEIGHT	23.757	24.224	24.063	23.215	23.816	23.892	24.011
EX. SURFACE	23.757	23.751	23.993	23.215	23.816	23.892	23.987
OFFSETS	-17.701	-16.300	-9.858	-6.466	-4.865	-3.525	0.000

CH 740.0

CONTROL LINE
X = 25287.595
Y = 147785.885
Z = 25.390

Datum 24.00

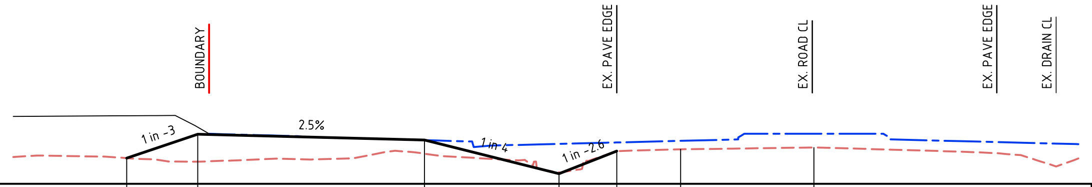

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
1 in -3
2.5%
1 in 4
1 in -2.3

DESIGN HEIGHT	25.030	25.705	25.564	24.549	25.264	25.329	25.390
EX. SURFACE	25.030	24.995	25.264	24.549	25.264	25.329	25.388
OFFSETS	-18.327	-16.300	-10.659	-6.600	-4.926	-3.513	0.000

CH 720.0

CONTROL LINE
X = 25290.379
Y = 147805.691
Z = 26.955

Datum 26.00

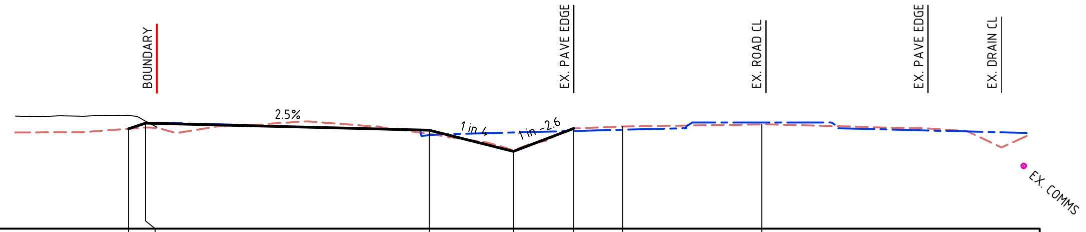

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
1 in -3
2.5%
1 in 4
1 in -2.6

DESIGN HEIGHT	26.676	27.304	27.154	26.264	26.861	26.909	26.955
EX. SURFACE	26.676	26.582	26.793	26.298	26.861	26.909	26.956
OFFSETS	-18.183	-16.300	-10.304	-6.743	-5.216	-3.523	0.000

CH 700.0

CONTROL LINE
X = 25275.744
Y = 147701.558
Z = 20.753

Datum 18.00

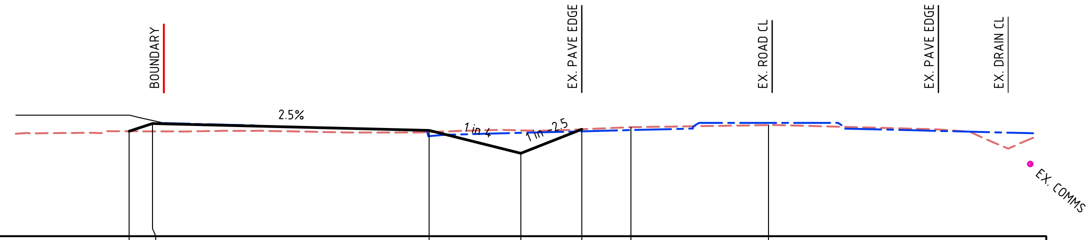

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
2.5%
1 in 4
1 in -2.6
EX. COMMS

DESIGN HEIGHT	20.636	20.785	20.598	20.041	20.644	20.697	20.753
EX. SURFACE	20.636	20.667	20.498	20.063	20.644	20.697	20.751
OFFSETS	-16.747	-16.300	-8.796	-6.569	-4.974	-3.678	0.000

CH 805.2

CONTROL LINE
X = 25276.462
Y = 147706.664
Z = 20.942

Datum 18.00

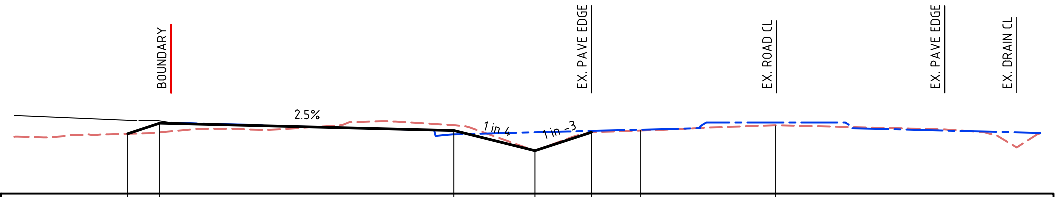

BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
2.5%
1 in 4
1 in -2.5
EX. COMMS

DESIGN HEIGHT	20.775	20.980	20.797	20.191	20.826	20.882	20.942
EX. SURFACE	20.775	20.772	20.754	20.797	20.826	20.882	20.938
OFFSETS	-16.916	-16.300	-8.979	-6.555	-4.943	-3.643	0.000

CH 800.0

CONTROL LINE
X = 25279.245
Y = 147726.469
Z = 21.788

Datum 20.00


BOUNDARY
EX. PAVE EDGE
EX. ROAD CL
EX. PAVE EDGE
EX. DRAIN CL
2.5%
1 in 4
1 in -3

DESIGN HEIGHT	21.580	21.862	21.667	21.130	21.621	21.666	21.788
EX. SURFACE	21.580	21.617	21.808	21.130	21.621	21.666	21.805
OFFSETS	-17.146	-16.300	-8.520	-6.373	-4.877	-3.585	0.000

CH 780.0

Plot Date: 12/12/2025 11:16:44 AM User: DESIGN CIVIL
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

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Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ANNOTATED CROSS SECTIONS - RD01**
SHEET 12 OF 12

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

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ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-XS12	A

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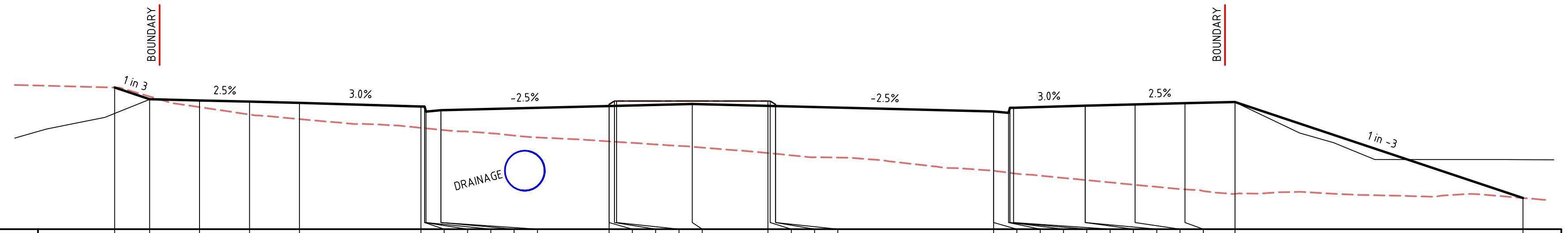
CONTROL LINE
X = 25378.489
Y = 148159.185
Z = 41.849

Datum 38.00



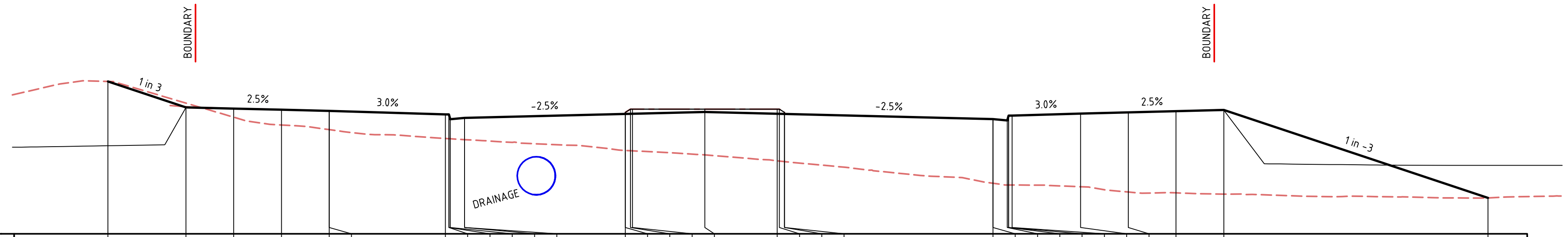
DESIGN HEIGHT	42.256	41.906	41.868	41.831	41.793	41.682	41.682	41.682	41.532	41.572	41.572	41.699	41.749	41.849	41.849	41.849
EX. SURFACE	42.256	41.986	41.667	41.445	41.307	41.046	41.035	41.035	41.031	40.986	40.986	40.638	40.638	40.628	40.623	40.477
OFFSETS	-17.351	-16.300	-14.800	-13.300	-11.800	-8.150	-8.040	-8.040	-8.000	-7.550	-7.550	-2.500	-2.499	-2.339	-2.274	0.000

DESIGN HEIGHT	41.849	41.849	41.749	41.699	41.535	41.535	41.495	41.645	41.645	41.645	41.709	41.709	41.747	41.784	41.822	38.939
EX. SURFACE	40.287	40.280	40.265	40.265	39.762	39.762	39.700	39.694	39.694	39.679	39.478	39.478	39.333	39.196	39.063	38.939
OFFSETS	2.274	2.339	2.499	2.500	9.050	9.050	9.500	9.540	9.540	9.650	11.800	11.800	13.300	14.800	16.300	24.950

CH 33.0

CONTROL LINE
X = 25375.530
Y = 148159.613
Z = 41.923

Datum 38.00



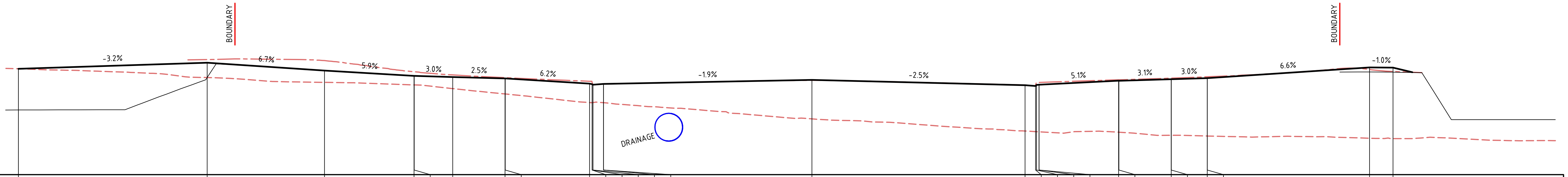
DESIGN HEIGHT	42.796	41.980	41.942	41.905	41.867	41.867	41.757	41.757	41.757	41.607	41.647	41.647	41.773	41.823	41.923	41.923
EX. SURFACE	42.796	42.114	41.670	41.425	41.278	41.278	41.000	40.993	40.993	40.990	40.964	40.964	40.624	40.624	40.615	40.612
OFFSETS	-18.751	-16.300	-14.800	-13.300	-11.800	-11.800	-8.150	-8.040	-8.040	-8.000	-7.550	-7.550	-2.500	-2.499	-2.339	-2.274

DESIGN HEIGHT	41.923	41.923	41.923	41.823	41.773	41.610	41.610	41.570	41.720	41.720	41.720	41.784	41.822	41.859	41.897	39.131
EX. SURFACE	40.482	40.297	40.290	40.271	40.271	39.591	39.591	39.535	39.535	39.535	39.535	39.481	39.314	39.289	39.248	39.127
OFFSETS	0.000	2.274	2.339	2.499	2.500	9.050	9.050	9.500	9.540	9.540	9.650	11.800	13.300	14.800	16.300	24.597

CH 30.0

CONTROL LINE
X = 25365.633
Y = 148161.046
Z = 42.086

Datum 38.00



DESIGN HEIGHT	42.567	42.827	42.487	42.258	42.258	42.209	42.152	42.151	41.928	41.902	41.902	41.879	41.913	41.913
EX. SURFACE	42.568	42.187	41.980	41.871	41.871	41.711	41.481	41.480	41.110	41.103	41.103	41.107	41.104	41.104
OFFSETS	-34.218	-26.080	-21.019	-17.159	-17.152	-15.493	-13.236	-13.226	-9.590	-9.480	-9.480	-9.440	-8.990	-8.990

DESIGN HEIGHT	42.086	41.859	41.825	41.871	41.880	41.880	42.055	42.047	42.118	42.118	42.164	42.164	42.624	42.614
EX. SURFACE	40.405	39.882	39.857	39.855	39.849	39.848	39.832	39.831	39.698	39.698	39.667	39.667	39.572	39.554
OFFSETS	0.000	9.188	9.644	9.684	9.792	9.795	13.225	13.235	15.493	15.493	17.046	17.046	24.043	25.058

CH 20.0

Plot Date: 12/12/2025 11:16:44 AM User: DESIGN CIVIL
File Name: C:\Users\Design Civil\OneDrive - Design Civil__PROJECTS\Empower\Springacre Rd\CAD\CROSS_SECTIONS

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A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

URBEX

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Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ANNOTATED CROSS SECTIONS - RD02**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

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Project No. Drawing No.	Rev
B00703-DD-XS13	**A**

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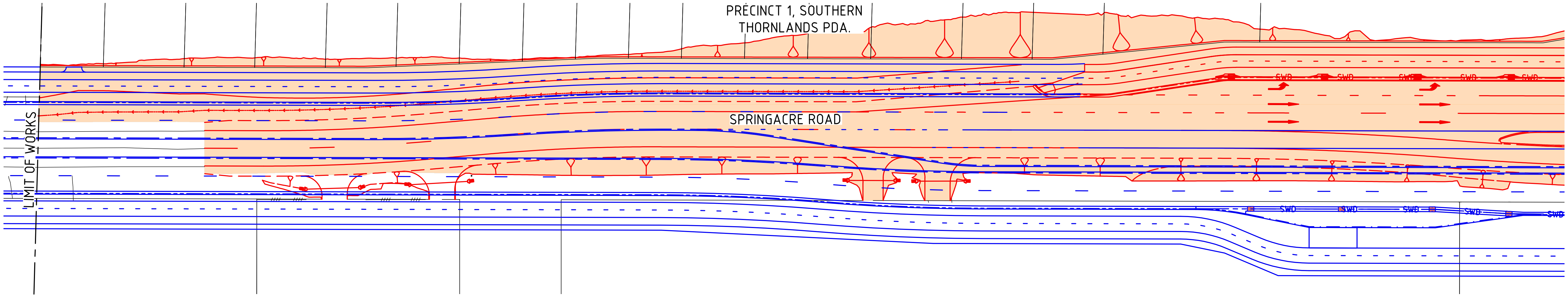
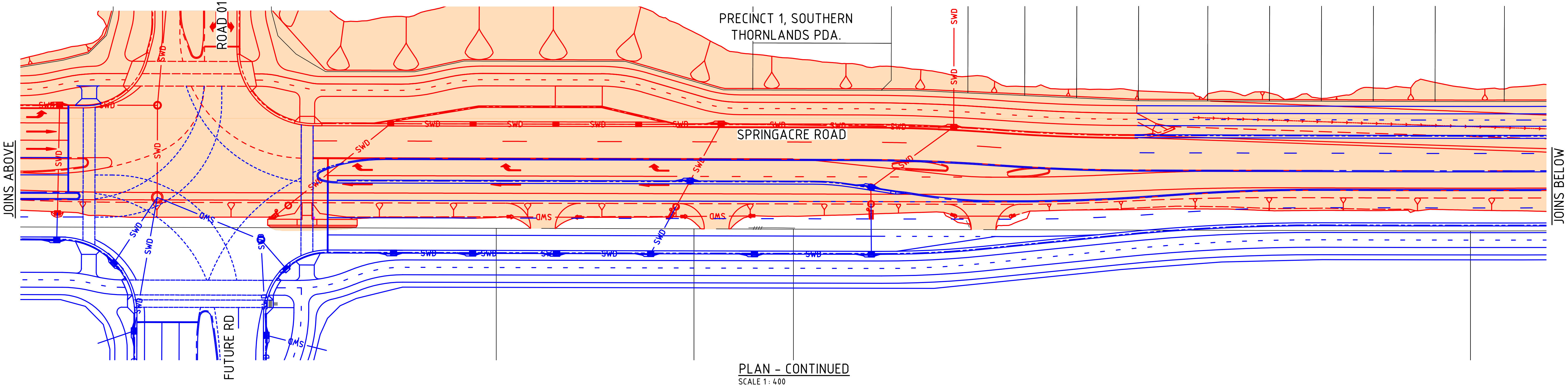
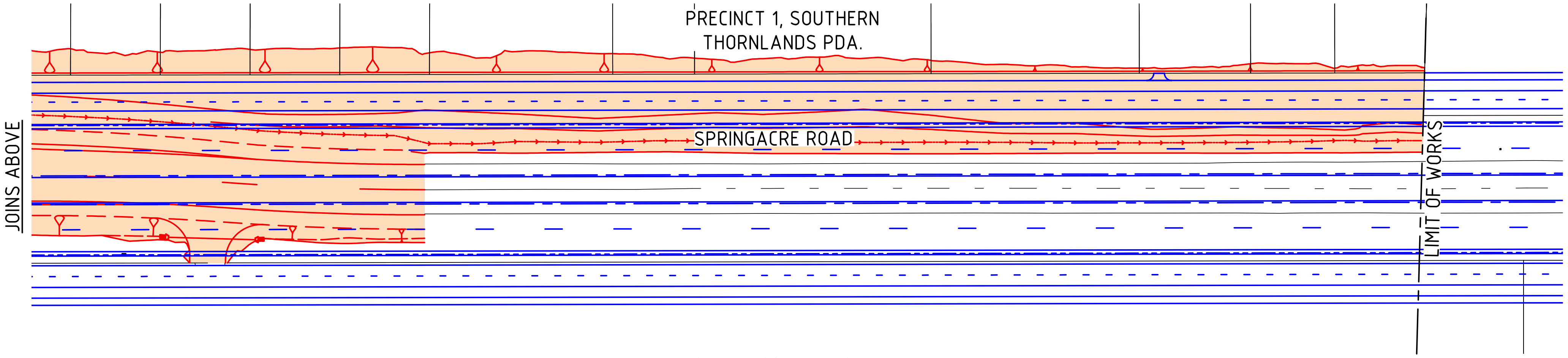

PRECINCT 1, SOUTHERN
THORNLANDS PDA.
SPRINGACRE ROAD
LIMIT OF WORKS
JOINS BELOW
SWD

PLAN
SCALE 1 : 400


PRECINCT 1, SOUTHERN
THORNLANDS PDA.
ROAD 01
SPRINGACRE ROAD
JOINS ABOVE
JOINS BELOW
FUTURE RD
SWD
OMS

PLAN - CONTINUED
SCALE 1 : 400


PRECINCT 1, SOUTHERN
THORNLANDS PDA.
SPRINGACRE ROAD
JOINS ABOVE
LIMIT OF WORKS

PLAN - CONTINUED
SCALE 1 : 400

NOTES

1. ULTIMATE LAYOUT IS SUBJECT TO CHANGE & CURRENT AS AT TIME OF REVISION.

LEGEND

— ROINTERIM ARRANGEMENT
— ULTIMATE ARRANGEMENT
— BOUNDARIES

4 3 2 1 0 8 16 24 32 40m
SCALE 1:400 (A1) 1:800 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
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ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

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Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **ULTIMATE ARRANGEMENT**

Datum
AHD
PSM 79006
RL 67.474
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B00703-DD-UL01	**A**

User: DESIGN CIVIL
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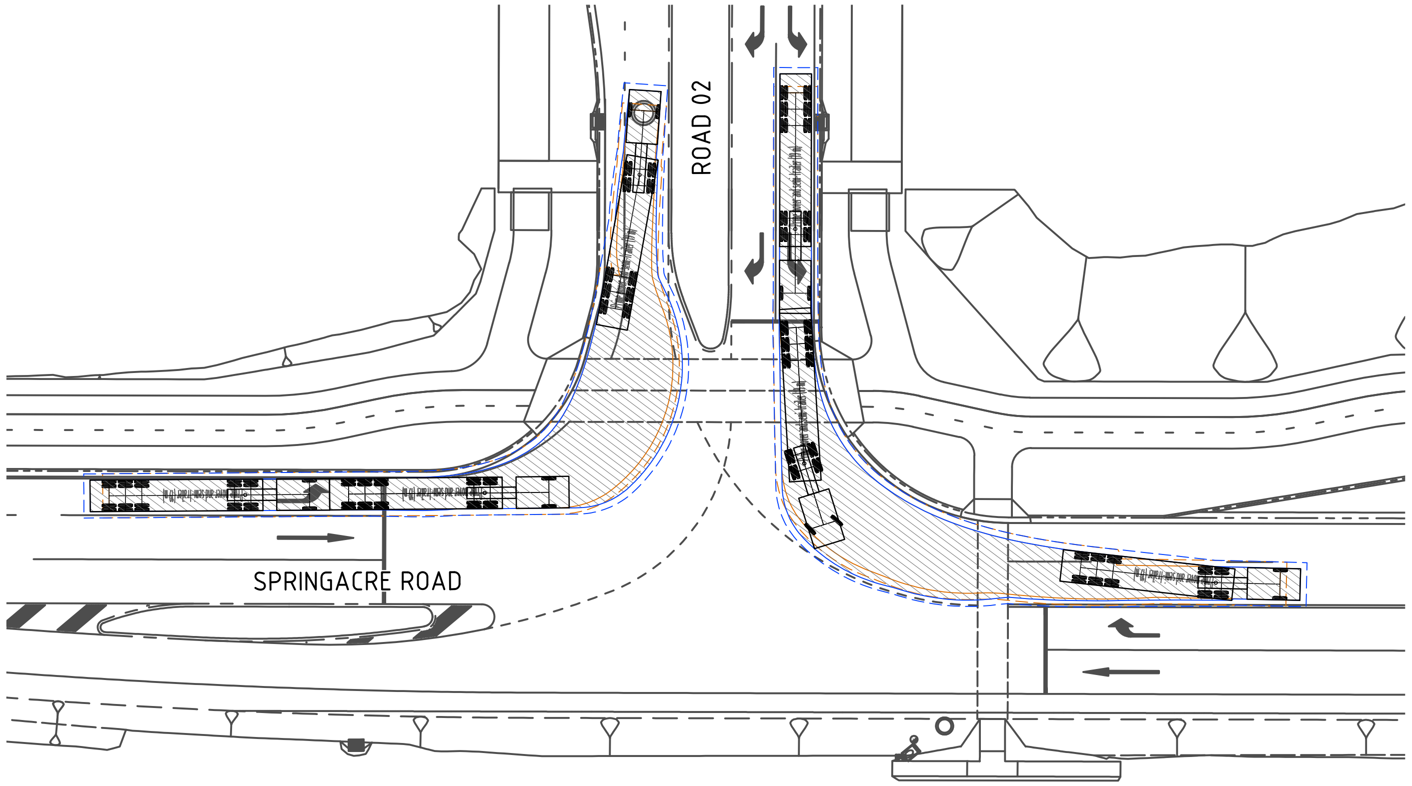
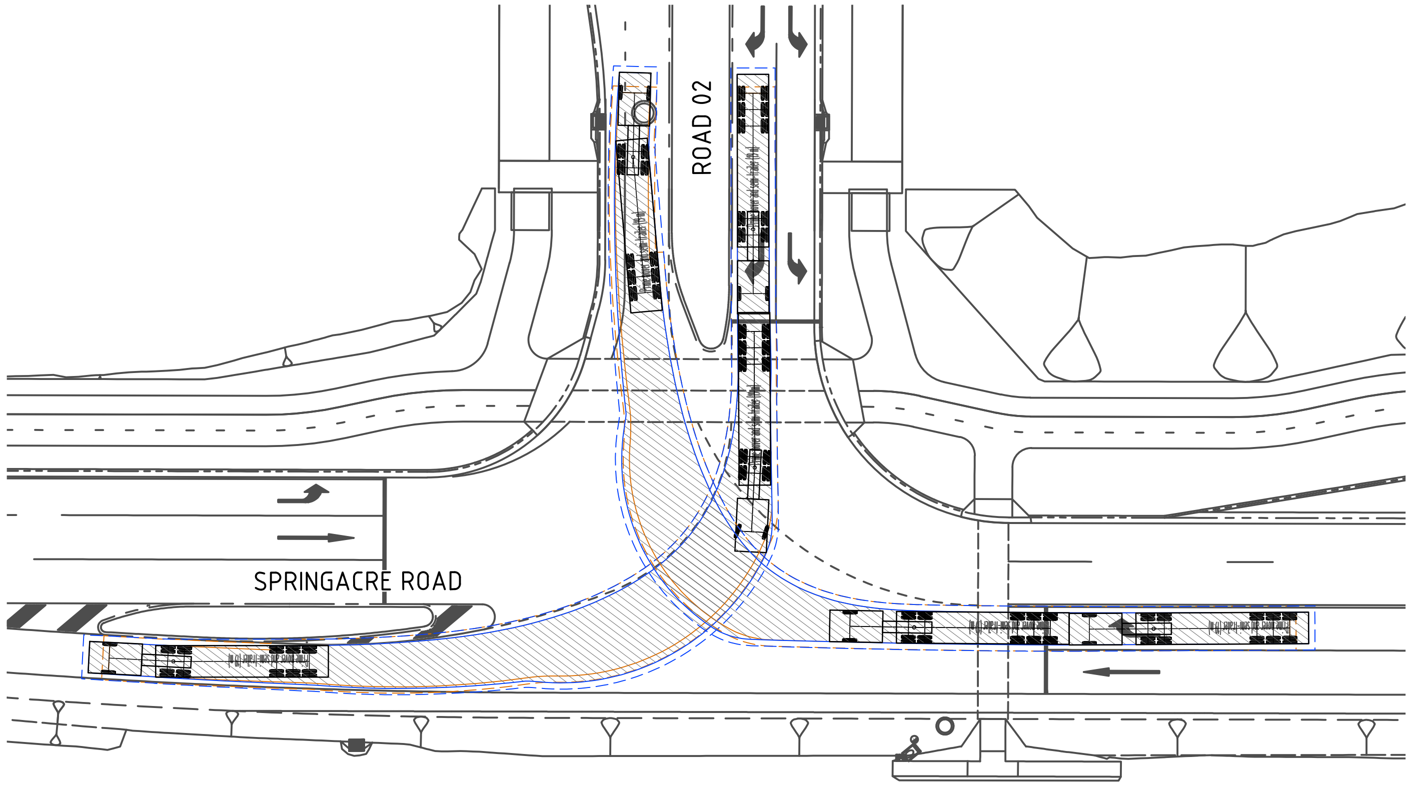
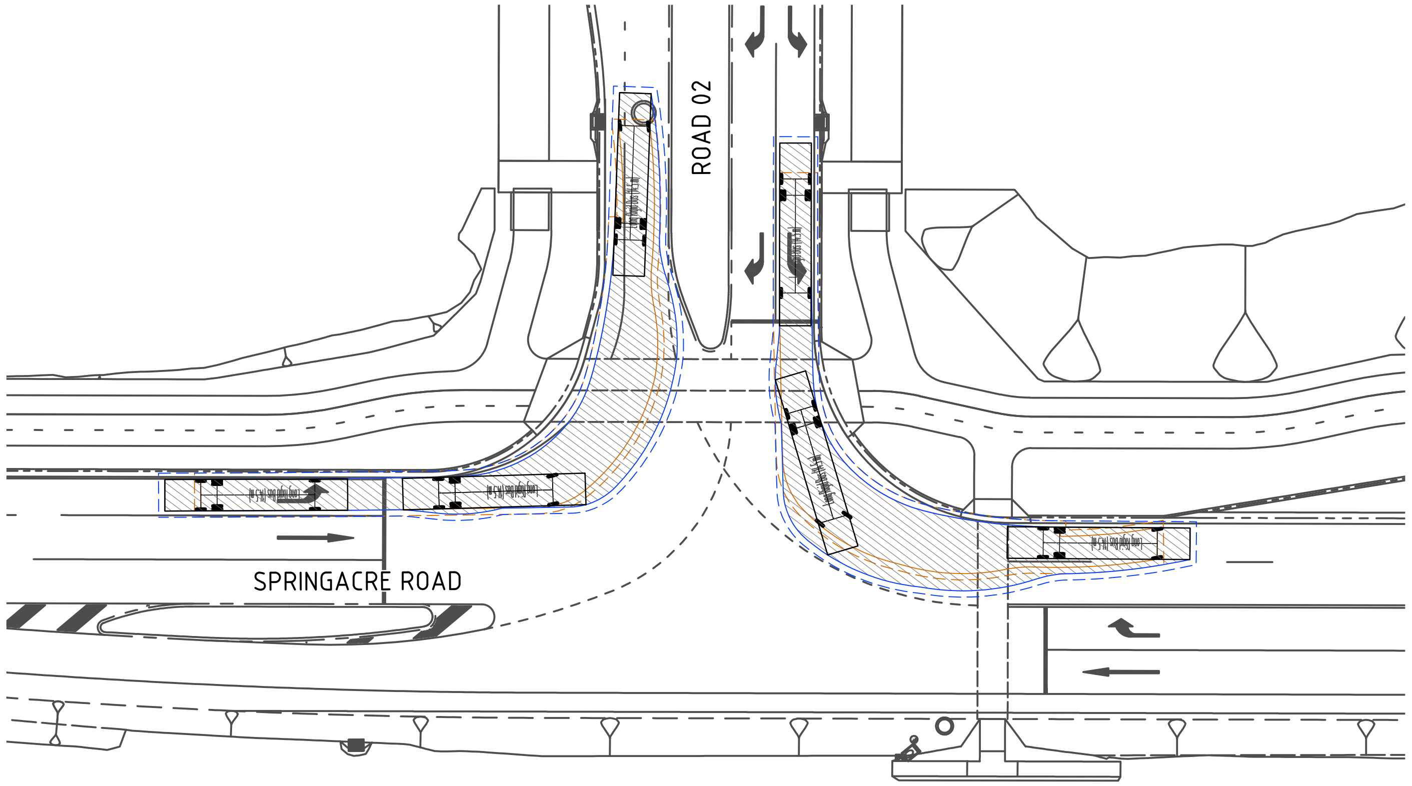


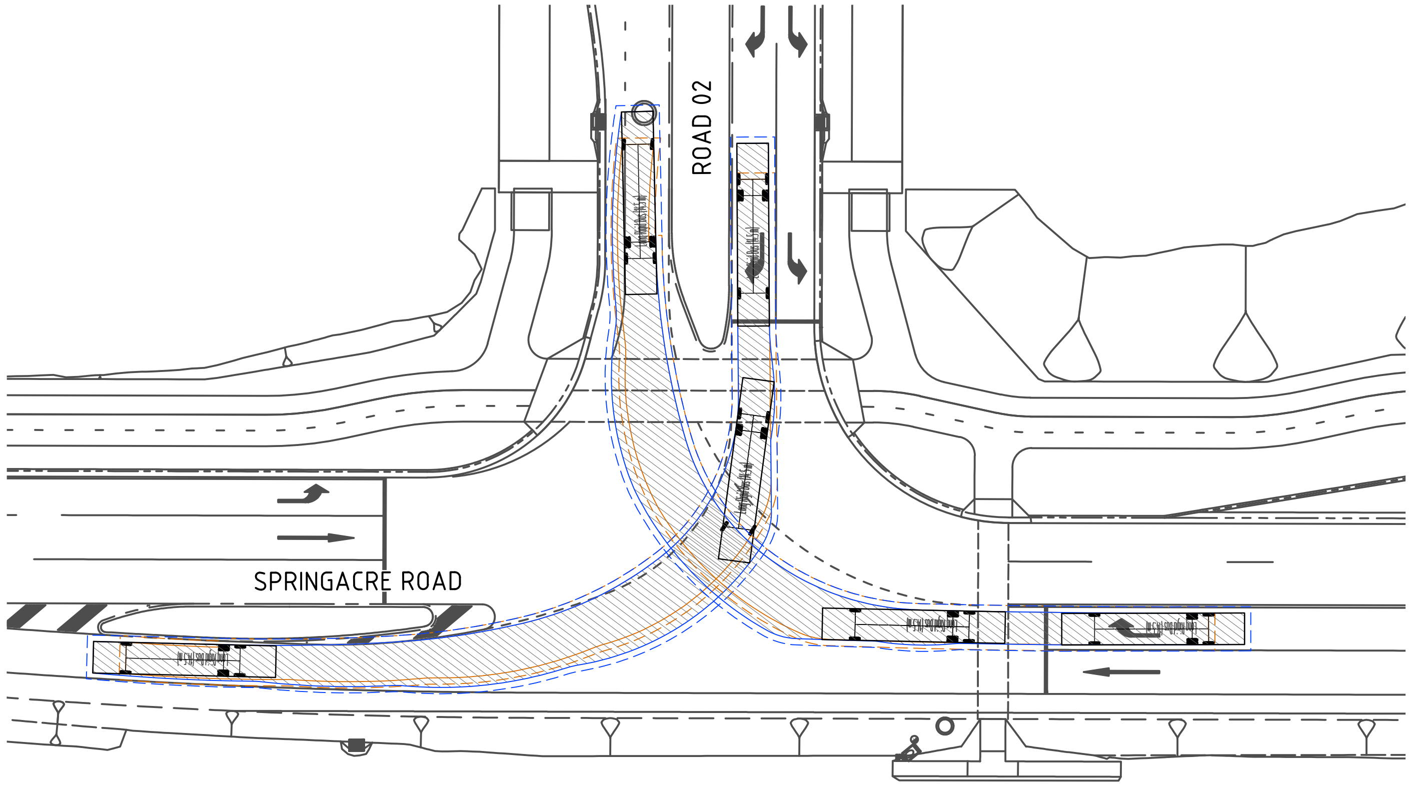
SWEPT-PATH ANALYSIS - 19.0m SEMI - LEFT TURNS
SCALE 1 : 300



SWEPT-PATH ANALYSIS - 19.0m SEMI - RIGHT TURNS
SCALE 1 : 300



SWEPT-PATH ANALYSIS - 14.5m BUS - LEFT TURNS
SCALE 1 : 300



SWEPT-PATH ANALYSIS - 14.5m BUS - RIGHT TURNS
SCALE 1 : 300

NOTES

1. NOMINATED VEHICLE DIMENSIONS, BODY & CLEARANCES IN ACCORDANCE WITH THE AUSTROADS STANDARDS.

0 6 12 18 24 30m
SCALE 1:300 (A1) 1:600 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

User: DESIGN CIVIL
Plot Date: 12/12/2025 11:18:21 AM
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No.	Amendments	Drawn	Design	Design Chk	Appd	Date
A	ISSUED FOR INFORMATION	SM	SM	LD	PI	8/12/25

ENGINEERING CERTIFICATION
Peter Ingerman
Registered Engineer
Date " "
Registered Accreditation

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Client **URBEX PTY LTD**
Project **SPRINGACRE ROAD, THORNLANDS, QLD, 4161**
Title **SWEPT-PATH ANALYSIS**

Datum
AHD
PSM 79006
RL 67.474
(MGA) COORD

ISSUE FOR REVIEW

Project No. Drawing No.	Rev
B00703-DD-TP01	**A**

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Xref s:\12dS\data\MAN12DSYN01\Autodesk__807\ACAD\Blocks\Title Block\URBEX Logo.dwg

Sight Distance Report

Project: Springacre Rd
Directory: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\12d\Design\Springacre Rd
User: Design Civil
Created: 2025-12-08T12:59:09

Parameters

General

Centreline: CONTROL/ROAD->RD01
Ground tin: tin super ALL
Start chainage: 0.000
End chainage: 805.161
Chainage interval: 5.000
Trial interval: 10.000
Minimum distance: Calculated by safe limit
Maximum distance: 200.000
Assumed safe at ends? true

Eye & Target

Eye height: 1.100
Eye offset: -1.750
Target height: 1.250
Target offset: -1.750

Safe Limit

Speed value: 70
Reaction time: 2.00
Deceleration coefficient: 0.41
Safe distance rounding: 5 (up)

Sight distance forward

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
5.000	161.959	85.000	passed	Tin	89.660	-1.309	42.229	tin super ALL
10.000	158.975	85.000	passed	Tin	91.844	-1.088	42.315	tin super ALL
15.000	156.328	85.000	passed	Tin	94.000	-0.877	42.397	tin super ALL

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
20.000	154.799	85.000	passed	Tin	97.000	-0.625	42.508	tin super ALL
25.000	154.145	85.000	passed	Tin	101.000	-0.352	42.649	tin super ALL
30.000	154.053	85.000	passed	Tin	105.485	-0.104	42.798	tin super ALL
35.000	154.209	85.000	passed	Tin	110.000	0.092	42.939	tin super ALL
40.000	154.271	85.000	passed	Tin	114.500	0.231	43.071	tin super ALL
45.000	154.140	85.000	passed	Tin	118.545	0.321	43.182	tin super ALL
50.000	153.913	85.000	passed	Tin	122.597	0.345	43.286	tin super ALL
55.000	154.007	85.000	passed	Tin	127.500	0.293	43.400	tin super ALL
60.000	154.188	85.000	passed	Tin	132.973	0.192	43.516	tin super ALL
65.000	154.480	85.000	passed	Tin	138.000	0.068	43.612	tin super ALL
70.000	155.179	85.000	passed	Tin	143.500	-0.097	43.706	tin super ALL
75.000	156.424	85.000	passed	Tin	149.000	-0.293	43.787	tin super ALL
80.000	158.339	85.000	passed	Tin	154.000	-0.508	43.850	tin super ALL
85.000	161.050	85.000	passed	Tin	159.500	-0.736	43.908	tin super ALL
90.000	164.801	85.000	passed	Tin	165.000	-0.964	43.955	tin super ALL
95.000	169.880	85.000	passed	Tin	170.500	-1.176	43.991	tin super ALL
100.000	176.746	85.000	passed	Tin	175.500	-1.353	44.014	tin super ALL
105.000	186.165	85.000	passed	Tin	181.000	-1.501	44.030	tin super ALL
110.000	199.402	85.000	passed	Tin	186.000	-1.616	44.034	tin super ALL
115.000	200.000	85.000	passed	Object				
120.000	200.000	85.000	passed	Object				
125.000	200.000	85.000	passed	Object				
130.000	200.000	90.000	passed	Object				
135.000	200.000	90.000	passed	Object				
140.000	200.000	90.000	passed	Object				
145.000	200.000	90.000	passed	Object				
150.000	200.000	90.000	passed	Object				
155.000	200.000	90.000	passed	Object				
160.000	200.000	90.000	passed	Object				
165.000	200.000	90.000	passed	Object				
170.000	200.000	90.000	passed	Object				
175.000	200.000	90.000	passed	Object				

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
180.000	200.000	90.000	passed	Object				
185.000	200.000	90.000	passed	Object				
190.000	200.000	90.000	passed	Object				
195.000	200.000	90.000	passed	Object				
200.000	200.000	90.000	passed	Object				
205.000	200.000	90.000	passed	Object				
210.000	200.000	90.000	passed	Object				
215.000	200.000	90.000	passed	Object				
220.000	200.000	90.000	passed	Object				
225.000	200.000	90.000	passed	Object				
230.000	200.000	90.000	passed	Object				
235.000	200.000	90.000	passed	Object				
240.000	200.000	90.000	passed	Object				
245.000	200.000	90.000	passed	Object				
250.000	200.000	90.000	passed	Object				
255.000	200.000	90.000	passed	Object				
260.000	200.000	90.000	passed	Object				
265.000	200.000	90.000	passed	Object				
270.000	200.000	90.000	passed	Object				
275.000	200.000	90.000	passed	Object				
280.000	200.000	90.000	passed	Object				
285.000	200.000	90.000	passed	Object				
290.000	200.000	90.000	passed	Object				
295.000	200.000	90.000	passed	Object				
300.000	200.000	90.000	passed	Object				
305.000	200.000	90.000	passed	Object				
310.000	200.000	90.000	passed	Object				
315.000	200.000	90.000	passed	Object				
320.000	200.000	90.000	passed	Object				
325.000	200.000	90.000	passed	Object				
330.000	200.000	90.000	passed	Object				
335.000	200.000	90.000	passed	Object				
340.000	200.000	90.000	passed	Object				
345.000	200.000	90.000	passed	Object				
350.000	200.000	90.000	passed	Object				
355.000	196.494	90.000	passed	Tin	472.000	-0.559	40.945	tin super ALL
360.000	192.730	90.000	passed	Tin	473.500	-0.572	40.912	tin super ALL
365.000	189.068	90.000	passed	Tin	474.586	-0.594	40.887	tin super ALL
370.000	185.523	90.000	passed	Tin	476.000	-0.619	40.854	tin super ALL
375.000	182.106	90.000	passed	Tin	477.094	-0.651	40.828	tin super ALL

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
380.000	178.832	90.000	passed	Tin	478.599	-0.690	40.791	tin super ALL
385.000	175.720	90.000	passed	Tin	480.106	-0.736	40.753	tin super ALL
390.000	172.787	90.000	passed	Tin	482.000	-0.795	40.705	tin super ALL
395.000	170.054	90.000	passed	Tin	484.125	-0.870	40.648	tin super ALL
400.000	167.544	90.000	passed	Tin	486.000	-0.953	40.596	tin super ALL
405.000	165.280	90.000	passed	Tin	488.152	-1.055	40.535	tin super ALL
410.000	163.292	90.000	passed	Tin	490.500	-1.179	40.465	tin super ALL
415.000	161.603	90.000	passed	Tin	493.192	-1.335	40.383	tin super ALL
420.000	160.243	90.000	passed	Tin	496.500	-1.545	40.278	tin super ALL
425.000	159.250	90.000	passed	Tin	499.754	-1.780	40.169	tin super ALL
430.000	158.633	90.000	passed	Tin	503.707	-2.058	40.032	tin super ALL
435.000	158.337	90.000	passed	Tin	508.666	-2.344	39.853	tin super ALL
440.000	158.299	90.000	passed	Tin	514.500	-2.588	39.633	tin super ALL
445.000	158.497	90.000	passed	Tin	520.608	-2.746	39.391	tin super ALL
450.000	158.704	90.000	passed	Tin	526.600	-2.809	39.142	tin super ALL
455.000	158.737	90.000	passed	Tin	532.500	-2.807	38.886	tin super ALL
460.000	158.744	90.000	passed	Tin	537.500	-2.788	38.658	tin super ALL
465.000	158.699	95.000	passed	Tin	542.500	-2.736	38.422	tin super ALL
470.000	158.604	95.000	passed	Tin	547.500	-2.652	38.177	tin super ALL
475.000	158.562	95.000	passed	Tin	552.500	-2.533	37.923	tin super ALL
480.000	158.502	95.000	passed	Tin	557.500	-2.353	37.661	tin super ALL
485.000	158.302	95.000	passed	Tin	562.500	-2.136	37.391	tin super ALL
490.000	158.060	95.000	passed	Tin	567.500	-1.914	37.111	tin super ALL
495.000	158.002	95.000	passed	Tin	572.500	-1.685	36.822	tin super ALL
500.000	158.262	95.000	passed	Tin	577.000	-1.465	36.554	tin super ALL
505.000	158.856	95.000	passed	Tin	581.500	-1.279	36.278	tin super ALL

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
510.000	162.133	95.000	passed	Tin	586.500	-1.172	35.959	tin super ALL
515.000	169.414	95.000	passed	Tin	591.339	-1.125	35.640	tin super ALL
520.000	179.864	95.000	passed	Tin	596.000	-1.119	35.323	tin super ALL
525.000	200.000	95.000	passed	Object				
530.000	200.000	95.000	passed	Object				
535.000	200.000	95.000	passed	Object				
540.000	200.000	95.000	passed	Object				
545.000	200.000	95.000	passed	Object				
550.000	200.000	95.000	passed	Object				
555.000	200.000	100.000	passed	Object				
560.000	200.000	100.000	passed	Object				
565.000	200.000	100.000	passed	Object				
570.000	200.000	100.000	passed	Object				
575.000	200.000	100.000	passed	Object				
580.000	200.000	100.000	passed	Object				
585.000	200.000	100.000	passed	Object				
590.000	200.000	100.000	passed	Object				
595.000	200.000	100.000	passed	Object				
600.000	200.000	100.000	passed	Object				
605.000	200.000	100.000	passed	Object				
610.000	190.000	100.000	passed	Object				
615.000	190.000	100.000	passed	Object				
620.000	180.000	100.000	passed	Object				
625.000	180.000	100.000	passed	Object				
630.000	170.000	100.000	passed	Object				
635.000	170.000	100.000	passed	Object				
640.000	160.000	100.000	passed	Object				
645.000	160.000	100.000	passed	Object				
650.000	150.000	100.000	passed	Object				
655.000	150.000	100.000	passed	Object				
660.000	140.000	100.000	passed	Object				
665.000	140.000	100.000	passed	Object				
670.000	130.000	100.000	passed	Object				
675.000	130.000	100.000	passed	Object				
680.000	120.000	100.000	passed	Object				
685.000	120.000	100.000	passed	Object				
690.000	110.000	100.000	passed	Object				
695.000	110.000	100.000	passed	Object				
700.000	100.000	95.000	passed	Object				
705.000	100.000	95.000	passed	Object				
710.000	90.000	95.000	passed	Object				
715.000	90.000	95.000	passed	Object				

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
720.000	80.000	95.000	passed	Object				
725.000	80.000	95.000	passed	Object				
730.000	70.000	95.000	passed	Object				
735.000	70.000	95.000	passed	Object				
740.000	60.000	95.000	passed	Object				
745.000	60.000	95.000	passed	Object				
750.000	50.000	95.000	passed	Object				
755.000	50.000	95.000	passed	Object				
760.000	40.000	95.000	passed	Object				
765.000	40.000	95.000	passed	Object				
770.000	30.000	95.000	passed	Object				
775.000	30.000	95.000	passed	Object				
780.000	20.000	95.000	passed	Object				
785.000	20.000	95.000	passed	Object				
790.000	10.000	95.000	passed	Object				
795.000	10.000	95.000	passed	Object				
800.000	0.000	95.000	passed	Object				
805.000	0.000	95.000	passed	Object				

Sight distance reverse

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
805.000	200.000	85.000	passed	Object				
800.000	200.000	85.000	passed	Object				
795.000	200.000	85.000	passed	Object				
790.000	200.000	80.000	passed	Object				
785.000	200.000	80.000	passed	Object				
780.000	200.000	80.000	passed	Object				
775.000	200.000	80.000	passed	Object				
770.000	200.000	80.000	passed	Object				
765.000	200.000	80.000	passed	Object				
760.000	200.000	80.000	passed	Object				
755.000	200.000	80.000	passed	Object				
750.000	200.000	80.000	passed	Object				
745.000	200.000	80.000	passed	Object				
740.000	200.000	80.000	passed	Object				
735.000	200.000	80.000	passed	Object				
730.000	200.000	80.000	passed	Object				
725.000	199.850	80.000	passed	Tin	606.547	2.387	34.663	tin super ALL
720.000	194.922	80.000	passed	Tin	606.547	2.411	34.664	tin super ALL

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
715.000	190.054	80.000	passed	Tin	606.000	2.430	34.704	tin super ALL
710.000	185.698	80.000	passed	Tin	605.500	2.450	34.741	tin super ALL
705.000	181.653	80.000	passed	Tin	604.500	2.465	34.814	tin super ALL
700.000	177.922	80.000	passed	Tin	603.500	2.479	34.886	tin super ALL
695.000	174.239	80.000	passed	Tin	602.000	2.486	34.993	tin super ALL
690.000	170.844	80.000	passed	Tin	600.500	2.490	35.100	tin super ALL
685.000	167.476	80.000	passed	Tin	599.000	2.493	35.205	tin super ALL
680.000	164.111	80.000	passed	Tin	597.000	2.488	35.344	tin super ALL
675.000	160.789	80.000	passed	Tin	595.500	2.488	35.448	tin super ALL
670.000	157.737	80.000	passed	Tin	593.500	2.477	35.584	tin super ALL
665.000	160.883	80.000	passed	Tin	591.000	2.338	35.749	tin super ALL
660.000	157.614	80.000	passed	Tin	587.500	2.267	35.980	tin super ALL
655.000	154.734	80.000	passed	Tin	582.000	2.116	36.331	tin super ALL
650.000	160.541	80.000	passed	Tin	577.000	1.781	36.636	tin super ALL
645.000	161.088	80.000	passed	Tin	571.500	1.556	36.963	tin super ALL
640.000	160.018	80.000	passed	Tin	566.000	1.331	37.279	tin super ALL
635.000	157.394	80.000	passed	Tin	560.158	1.109	37.603	tin super ALL
630.000	158.023	80.000	passed	Tin	554.636	0.956	37.898	tin super ALL
625.000	158.385	80.000	passed	Tin	549.500	0.857	38.163	tin super ALL
620.000	158.535	80.000	passed	Tin	544.092	0.788	38.432	tin super ALL
615.000	157.453	80.000	passed	Tin	510.534	0.791	40.035	tin super ALL
610.000	154.871	80.000	passed	Tin	510.540	0.835	40.036	tin super ALL
605.000	152.503	85.000	passed	Tin	510.549	0.887	40.038	tin super ALL
600.000	150.406	85.000	passed	Tin	510.557	0.941	40.040	tin super ALL
595.000	148.692	85.000	passed	Tin	510.573	0.999	40.040	tin super ALL
590.000	147.394	85.000	passed	Tin	510.187	1.072	40.057	tin super ALL

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
585.000	146.701	85.000	passed	Tin	509.945	1.144	40.067	tin super ALL
580.000	146.860	85.000	passed	Tin	509.665	1.223	40.079	tin super ALL
575.000	147.451	85.000	passed	Tin	502.596	1.609	40.332	tin super ALL
570.000	148.858	85.000	passed	Tin	502.582	1.686	40.336	tin super ALL
565.000	152.149	85.000	passed	Tin	502.580	1.772	40.339	tin super ALL
560.000	158.491	85.000	passed	Tin	502.608	1.867	40.341	tin super ALL
555.000	170.223	85.000	passed	Tin	502.676	1.972	40.342	tin super ALL
550.000	193.386	85.000	passed	Tin	502.766	2.092	40.340	tin super ALL
545.000	200.000	85.000	passed	Object				
540.000	200.000	85.000	passed	Object				
535.000	200.000	85.000	passed	Object				
530.000	200.000	85.000	passed	Object				
525.000	200.000	85.000	passed	Object				
520.000	200.000	85.000	passed	Object				
515.000	200.000	85.000	passed	Object				
510.000	200.000	85.000	passed	Object				
505.000	200.000	85.000	passed	Object				
500.000	200.000	85.000	passed	Object				
495.000	200.000	85.000	passed	Object				
490.000	200.000	85.000	passed	Object				
485.000	200.000	85.000	passed	Object				
480.000	200.000	85.000	passed	Object				
475.000	200.000	85.000	passed	Object				
470.000	200.000	85.000	passed	Object				
465.000	200.000	85.000	passed	Object				
460.000	200.000	85.000	passed	Object				
455.000	200.000	85.000	passed	Object				
450.000	200.000	85.000	passed	Object				
445.000	200.000	85.000	passed	Object				
440.000	200.000	85.000	passed	Object				
435.000	200.000	85.000	passed	Object				
430.000	200.000	85.000	passed	Object				
425.000	200.000	85.000	passed	Object				
420.000	200.000	85.000	passed	Object				
415.000	200.000	85.000	passed	Object				
410.000	200.000	85.000	passed	Object				
405.000	200.000	85.000	passed	Object				
400.000	200.000	85.000	passed	Object				
395.000	200.000	85.000	passed	Object				

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
390.000	200.000	85.000	passed	Object				
385.000	200.000	85.000	passed	Object				
380.000	200.000	85.000	passed	Object				
375.000	200.000	85.000	passed	Object				
370.000	200.000	85.000	passed	Object				
365.000	200.000	85.000	passed	Object				
360.000	200.000	85.000	passed	Object				
355.000	200.000	85.000	passed	Object				
350.000	200.000	85.000	passed	Object				
345.000	200.000	85.000	passed	Object				
340.000	200.000	85.000	passed	Object				
335.000	200.000	85.000	passed	Object				
330.000	200.000	85.000	passed	Object				
325.000	200.000	85.000	passed	Object				
320.000	200.000	85.000	passed	Object				
315.000	200.000	85.000	passed	Object				
310.000	200.000	85.000	passed	Object				
305.000	200.000	85.000	passed	Object				
300.000	197.300	85.000	passed	Tin	183.500	2.065	44.124	tin super ALL
295.000	193.717	85.000	passed	Tin	182.000	2.107	44.122	tin super ALL
290.000	190.187	85.000	passed	Tin	180.500	2.153	44.120	tin super ALL
285.000	183.203	85.000	passed	Tin	182.500	2.076	44.122	tin super ALL
280.000	179.854	85.000	passed	Tin	181.000	2.124	44.120	tin super ALL
275.000	176.637	85.000	passed	Tin	179.000	2.180	44.116	tin super ALL
270.000	173.568	85.000	passed	Tin	177.000	2.244	44.110	tin super ALL
265.000	170.659	85.000	passed	Tin	174.500	2.320	44.101	tin super ALL
260.000	167.927	85.000	passed	Tin	172.500	2.404	44.092	tin super ALL
255.000	165.380	85.000	passed	Tin	169.642	2.506	44.077	tin super ALL
250.000	163.045	85.000	passed	Tin	167.000	2.616	44.061	tin super ALL
245.000	160.942	90.000	passed	Tin	163.608	2.741	44.035	tin super ALL
240.000	159.088	90.000	passed	Tin	160.500	2.870	44.009	tin super ALL
235.000	157.497	90.000	passed	Tin	156.569	3.017	43.969	tin super ALL
230.000	156.206	90.000	passed	Tin	152.500	3.167	43.922	tin super ALL
225.000	155.138	90.000	passed	Tin	148.528	3.301	43.870	tin super ALL

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
220.000	154.181	90.000	passed	Tin	144.011	3.426	43.802	tin super ALL
215.000	153.689	90.000	passed	Tin	140.510	3.510	43.743	tin super ALL
210.000	153.330	90.000	passed	Tin	137.000	3.564	43.678	tin super ALL
205.000	153.057	90.000	passed	Tin	132.031	3.625	43.576	tin super ALL
200.000	152.870	90.000	passed	Tin	127.000	3.658	43.465	tin super ALL
195.000	152.617	90.000	passed	Tin	122.608	3.649	43.361	tin super ALL
190.000	152.182	90.000	passed	Tin	116.500	3.632	43.204	tin super ALL
185.000	151.526	90.000	passed	Tin	111.011	3.522	43.053	tin super ALL
180.000	150.708	90.000	passed	Tin	107.000	3.359	42.931	tin super ALL
175.000	151.410	90.000	passed	Tin	102.445	3.119	42.783	tin super ALL
170.000	151.274	90.000	passed	Tin	97.401	2.814	42.608	tin super ALL
165.000	158.008	90.000	passed	Tin	93.343	2.411	42.456	tin super ALL
160.000	160.000	90.000	passed	Object				
155.000	150.000	90.000	passed	Object				
150.000	150.000	90.000	passed	Object				
145.000	140.000	90.000	passed	Object				
140.000	140.000	95.000	passed	Object				
135.000	130.000	95.000	passed	Object				
130.000	130.000	95.000	passed	Object				
125.000	120.000	95.000	passed	Object				
120.000	120.000	95.000	passed	Object				
115.000	110.000	95.000	passed	Object				
110.000	110.000	95.000	passed	Object				
105.000	100.000	95.000	passed	Object				
100.000	100.000	95.000	passed	Object				
95.000	90.000	95.000	passed	Object				
90.000	90.000	95.000	passed	Object				
85.000	80.000	95.000	passed	Object				
80.000	80.000	95.000	passed	Object				
75.000	70.000	95.000	passed	Object				
70.000	70.000	95.000	passed	Object				
65.000	60.000	95.000	passed	Object				
60.000	60.000	95.000	passed	Object				
55.000	50.000	95.000	passed	Object				
50.000	50.000	95.000	passed	Object				
45.000	40.000	95.000	passed	Object				

CHAINAGE	SIGHT DISTANCE ACHIEVED	SIGHT DISTANCE REQUIRED	STATUS	OBSTRUCTION				
				TYPE	CHAINAGE	OFFSET	HEIGHT	NAME
40.000	40.000	95.000	passed	Object				
35.000	30.000	95.000	passed	Object				
30.000	30.000	95.000	passed	Object				
25.000	20.000	95.000	passed	Object				
20.000	20.000	95.000	passed	Object				
15.000	10.000	95.000	passed	Object				
10.000	10.000	95.000	passed	Object				
5.000	0.000	95.000	passed	Object				

Generated by 12d Model at 2025-12-08T12:59:09

12D AQUAPLANING RISK ASSESSMENT

12D MODEL VERSION 15.0C1t

12D PROJECT: Springacre Rd

12D WORKING FOLDER: C:\Users\Design Civil\OneDrive - Design Civil_PROJECTS\Empower\Springacre Rd\12d\Design\Springacre Rd

DATE: 08-DEC-2025 13:37:50

ASSESSOR: DESIGN CIVIL

VERIFIER:

MODEL OF FLOW PATHS: AQUA/PATH/FLOW

ROAD PAVEMENT TIN: tin super ALL

REFERENCE STRING: CONTROL/ROAD->RD01

RAINFALL INTENSITY (mm/hr): 211.0

PAVEMENT TEXTURE DEPTH (mm): 0.4

FLOW PATH SLOPE: EQUAL-AREA SLOPE

WATER FILM DEPTH RISKS

UNACCEPTABLE RISK >= 4.00 mm

HIGH (ACCEPTABLE) RISK >= 3.25 mm

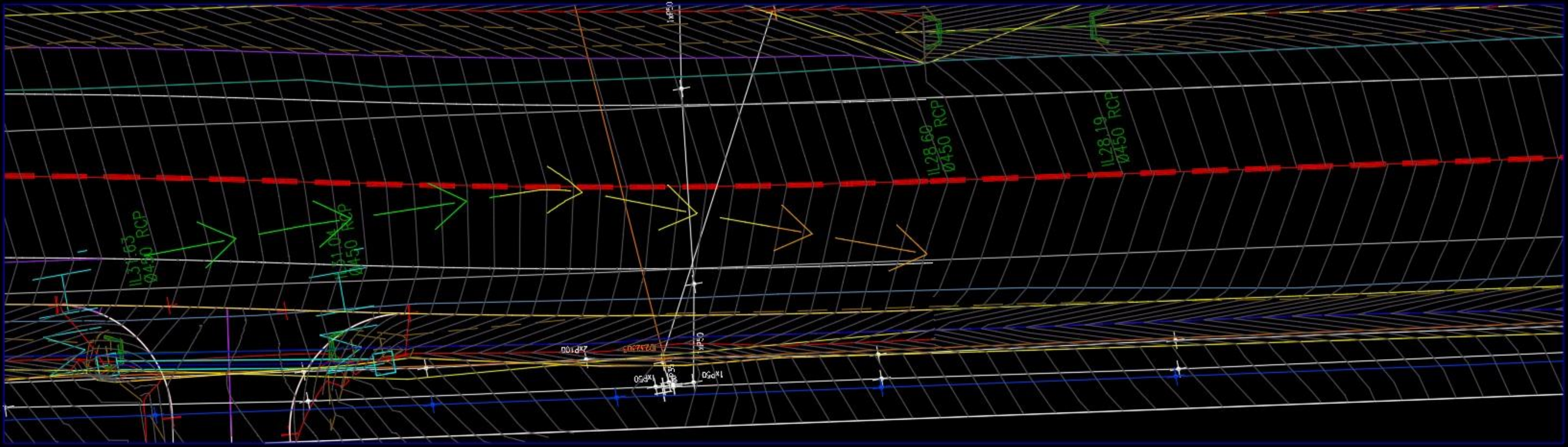
MODERATE (ACCEPTABLE) RISK >= 2.50 mm

LOW (DESIRABLE) RISK < 2.50 mm

WATER FILM DEPTH PREDICTION

GALLAWAY (1979)

FLOW PATH	ID	POINT	LENGTH (m)	DESIGN RL (m)	SLOPE (%)	DEPTH (mm)	DEPTH RISK	DEPTH RATE (mm/m)	WARNING
50	R0	1	2.578	41.044	5.46	1.21	LOW	0.39	
50	R0	2	5.155	40.905	5.40	1.78	LOW	0.35	
50	R0	3	7.733	40.769	5.34	2.21	LOW	0.29	
50	R0	4	10.310	40.637	5.24	2.58	MODERATE	0.25	
50	R0	5	12.888	40.505	5.20	2.89	MODERATE	0.22	
50	R0	6	15.465	40.372	5.19	3.16	MODERATE	0.20	
50	R0	7	18.043	40.233	5.24	3.39	HIGH	0.19	
50	R0	8	20.621	40.085	5.36	3.58	HIGH	0.17	
50	R0	9	23.198	39.926	5.53	3.73	HIGH	0.16	
50	R0	10	25.776	39.759	5.71	3.86	HIGH	0.15	
650	R0	1	3.546	32.377	8.92	1.11	LOW	0.31	
650	R0	2	7.091	32.059	8.96	1.62	LOW	0.23	
650	R0	3	10.637	31.744	8.91	2.02	LOW	0.19	
650	R0	4	14.182	31.432	8.86	2.34	LOW	0.16	
650	R0	5	17.728	31.122	8.81	2.62	MODERATE	0.15	
650	R0	6	21.273	30.811	8.80	2.87	MODERATE	0.13	
650	R0	7	24.819	30.494	8.84	3.09	MODERATE	0.12	
650	R0	8	28.364	30.170	8.91	3.28	HIGH	0.12	
650	R0	9	31.910	29.839	9.00	3.46	HIGH	0.11	
650	R0	10	35.456	29.509	9.06	3.63	HIGH	0.10	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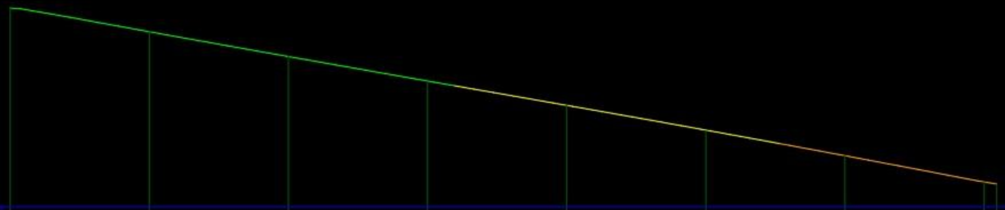
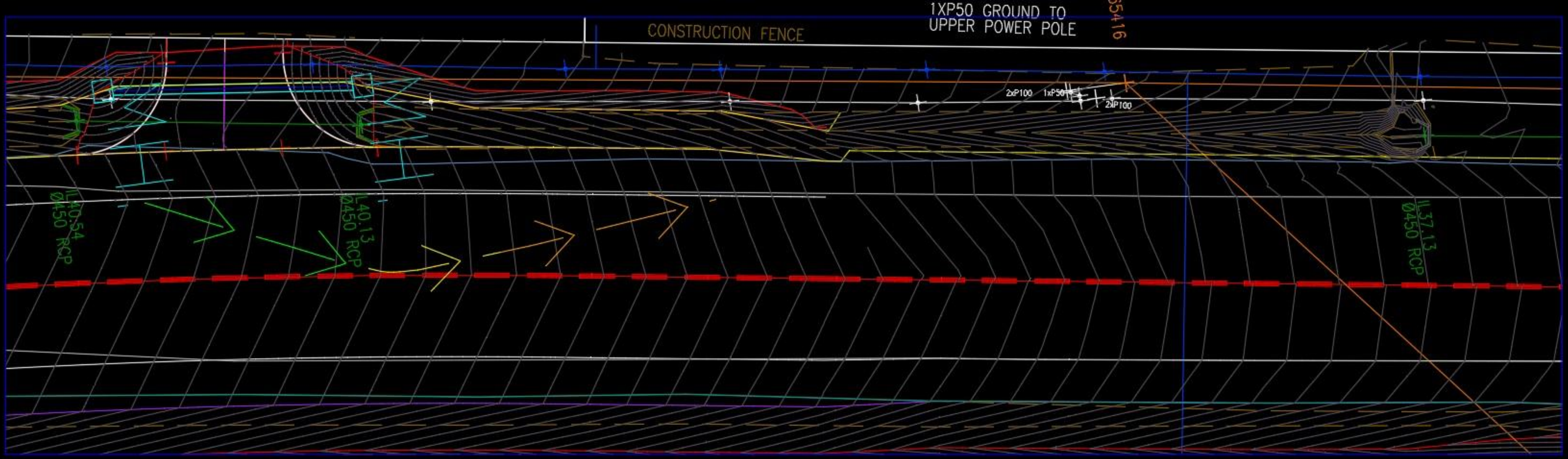


DESIGN RL	32.671	32.245	31.800	31.360	30.923	30.478	30.018	29.547	29.509
LENGTH	0.000	5.000	10.000	15.000	20.000	25.000	30.000	35.000	35.456

FLOW PATH ID: AQUA/PATH/FLOW->650 R0

Aquaplane Check 1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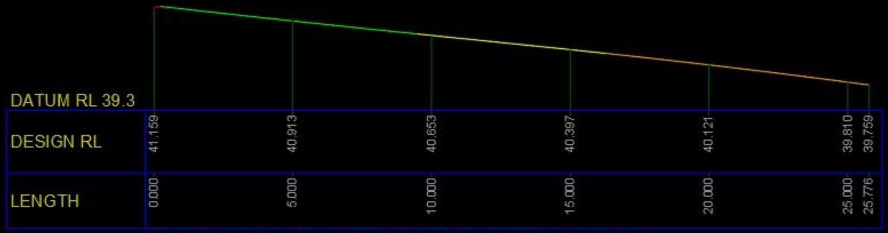

DATUM RL 39.3

DESIGN RL	41.159	40.913	40.653	40.397	40.121	39.810	39.759
LENGTH	0.000	5.000	10.000	15.000	20.000	25.000	25.776

FLOW PATH ID: AQUA/PATH/FLOW->50 R0

Aquaplane Check 2

12D MODEL - HYDROLOGICAL DESIGN SHEET

Project: Springacre Rd
Drainage Model: STORMWATER/MAIN
Rainfall File: AUS QLD Brisbane.12dhydro
Rainfall Method: IFD Table
Runoff C Method: QUDM 2007

Minor 10 Year Storm Event

Node Name	Node Type	Setout Easting	Setout Northing	Setout RL	Grate RL	Catch ID	Tc Method	Catch Length	Catch Slope	Catch Retardance	Time Tc	Intensity I	Runoff C	Area A	Full CA	Full Sum CA	Full Qc=CIA	Partial CA	Partial Sum CA	Partial Qc=CIA	Catchment Flow Qc	Direct Flow Qdg	Approach Flow Qa	Road Capacity	Flooded Depth	Flooded Width	Flooded Vel.Dep	Road Grade	Road Xfall	Inlet Curve Name	Inlet Flow Qg	Bypass Node
(-)	(-)	(m)	(m)	(m)	(m)	(-)	(-)	(m)	(%)	(-)	(min)	(mm/hr)	(-)	(ha)	(ha)	(ha)	(L/s)	(ha)	(ha)	(L/s)	(L/s)	(L/s)	(L/s)	(L/s)	(m)	(m)	(sq.m/s)	(%)	(%)	(-)	(L/s)	(-)
1/2	RD PIT	25341.92	148191.86	41.22	42.56	2P	Kinematic Wave	170.00	4.0	0.150	18.13	130.47	0.70	0.8500	0.5950	0.7300	264.6	0.1641	0.2991	178.6	264.6		264.6								264.6	-
						2I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.1500	0.1350			0.1350														
IN/4	HW	25331.77	148149.06	42.50	42.50	2P	Kinematic Wave	140.00	6.0	0.150	13.58	148.08	0.70	1.5817	1.1072	1.4630	601.8	0.4075	0.7634	455.9	601.8	100.0	701.8								701.8	-
						2I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.3954	0.3559			0.3559														
1/4	MH	25333.58	148145.98	42.43	42.43																											-
2/4	RD PIT	25347.01	148123.13	41.94	41.94	1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0435	0.0392	0.0392	23.4	0.0392	0.0392	23.4	23.4		23.4	2611.1	0.057	1.68	0.03	1.0	3.0	1G,3.3X	23.4	3/4
3/4	RD PIT	25344.62	148106.64	41.76	41.76	1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0394	0.0355	0.0355	21.2	0.0355	0.0355	21.2	21.2		21.2	3788.3	0.056	2.15	0.03	1.0	3.0	1G,3.3X	21.2	4/4
4/4	RD PIT	25342.23	148090.11	41.57	41.57	1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0406	0.0365	0.0365	21.8	0.0365	0.0365	21.8	21.8		21.8	3915.8	0.056	2.19	0.03	1.0	3.0	1G,3.3X	21.8	5/4
5/4	RD PIT	25339.82	148073.49	41.39	41.39	1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0404	0.0364	0.0364	21.7	0.0364	0.0364	21.7	21.7		21.7	3155.7	0.056	2.19	0.03	1.0	3.0	1G,3.3X	21.7	6/4
6/4	RD PIT	25337.46	148057.15	41.21	41.21	1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0412	0.0370	0.0370	22.1	0.0370	0.0370	22.1	22.1		22.1	2608.0	0.069	1.61	0.04	1.0	3.0	1G,3.3X	22.1	7/4
7/4	AL2D	25330.24	148010.48	40.27	40.27	1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0773	0.0696	0.0696	41.5	0.0696	0.0696	41.5	41.5		41.5	3782.8	0.071	1.78	0.07				41.5	-
OUT/4	SAL2E	25362.32	148005.83	39.55	39.55																											-
IN/5	HW inlet	25320.75	148069.47	41.00	41.10	1P	Direct				10.00	168.00	0.70	0.0031	0.0021	0.4091	150.8	0.0021	0.2666	124.4	150.8		150.8								150.8	-
						1I	Direct				5.00	215.00	0.90	0.0276	0.0249			0.0249														
						2P	Kinematic Wave	180.00	5.0	0.150	17.43	132.71	0.70	0.4777	0.3344			0.1918														
						2I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0531	0.0478			0.0478														
1/5	MH	25322.26	148068.34	41.55	41.55																											-
2/5	MH	25327.01	148064.81	41.59	41.59																											-
1/3	HW IN	25339.21	148171.94	42.86	42.86																	3500.0	3500.0								3500.0	-
1/1	AL2D	25368.78	148248.29	43.55	43.55	1P	QUDM Standard Inlet Times		3.0		15.00	142.00	0.70	0.0294	0.0206	0.0698	27.5	0.0069	0.0561	33.5	33.5		33.5	2448.5	0.077	1.95	0.05	1.0	3.0	1G,3.3X	33.5	2/1
						1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0547	0.0492			0.0492														
2/1	AL2D	25368.14	148243.84	43.35	43.35	1P	QUDM Standard Inlet Times		3.0		15.00	142.00	0.70	0.0154	0.0108	0.0431	17.0	0.0036	0.0359	21.4	21.4		21.4	2472.1	0.068	1.58	0.04	1.0	3.0	1G,3.3X	21.4	3/1
						1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0359	0.0323			0.0323														
3/1	AL2D	25365.49	148225.53	43.15	43.15	1P	QUDM Standard Inlet Times		3.0		15.00	142.00	0.70	0.0100	0.0070	0.0431	17.0	0.0023	0.0384	23.0	23.0		23.0	2531.0	0.069	1.64	0.04	1.0	3.0	1G,3.3X	23.0	4/1
						1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0401	0.0361			0.0361														
4/1	AL2D	25364.48	148218.60	42.94	42.94	1P	QUDM Standard Inlet Times		3.0		15.00	142.00	0.70	0.0099	0.0069	0.0425	16.8	0.0023	0.0379	22.6	22.6		22.6	2543.7	0.069	1.63	0.04	1.0	3.0	1G,3.3X	22.6	5/1
						1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0396	0.0356			0.0356														
5/1	AL2D	25360.19	148188.91	42.74	42.74	1P	QUDM Standard Inlet Times		3.0		15.00	142.00	0.70	0.0101	0.0071	0.0435	17.2	0.0024	0.0388	23.2	23.2		23.2	2581.0	0.069	1.65	0.04				23.2	-
						1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0405	0.0364			0.0364														
6/1	AL2D	25357.35	148169.32	42.32	42.33																		0.0								0.0	-
OUT/1	HW outlet	25385.09	148162.78	39.04	41.50																											-
IN/6	HW inlet	25315.28	148029.50	40.55	40.60	2P	Kinematic Wave	160.00	5.0	0.150	15.99	138.05	0.70	0.5494	0.3846	0.5082	194.9	0.1203	0.2439	145.7	194.9	100.0	294.9								294.9	-
						2I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.1374	0.1236			0.1236														
1/6	MH	25316.80	148029.30	41.10	41.10																											-
2/6	AL2D	25320.62	148028.78	41.04	41.04	1I	QUDM Standard Inlet Times				5.00	215.00	0.90	0.0134	0.0121	0.0121	7.2	0.0121	0.0121	7.2	7.2		7.2								7.2	-

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