

Catchment	Area (Ha)
1-1	0.3020ha
1-10	0.2327ha
1-11	0.3225ha
1-12	0.3111ha
1-13	0.1667ha
1-14	0.1483ha
1-15	0.2727ha
1-16	0.3391ha
1-17	0.2544ha
1-18	0.2618ha
1-19	0.1210ha
1-2	0.3208ha
1-20	0.1973ha
1-21	0.4385ha
1-22	0.2277ha
1-23	0.0784ha
1-3	0.1658ha
1-4	0.0361ha
1-5	0.3159ha
1-6	0.1551ha
1-7	0.2347ha
1-8	0.1267ha
1-9	0.2388ha
2-1	0.2211ha
2-11	0.2674ha
2-13	0.1295ha
2-15	0.2665ha
2-16	0.3460ha
2-19	0.1233ha
2-20	0.1279ha
2-21	0.4582ha
2-22	0.1401ha
2-5	0.3109ha
2-6	0.1198ha
2-7	0.3188ha
3-1	0.1274ha
3-13	0.0258ha
3-15	0.3526ha
3-16	0.2741ha
3-20	0.0542ha
3-21	0.3123ha
4-1	0.3572ha
4-15	0.1372ha
4-16	0.2239ha
4-20	0.0384ha
4-21	0.4134ha
4-22	0.2571ha
4-6	0.2167ha
5-1	0.2737ha
5-21	0.3333ha
5-22	0.2123ha
5-6	0.1122ha
6-1	0.1405ha
6-15	0.0466ha
6-16	0.2080ha
6-6	0.1634ha
7-1	0.3924ha
7-15	0.1924ha
7-6	0.1234ha

LEGEND	
---57.50---	FINISHED SURFACE CONTOURS (0.25m INTERVALS)
---	LOT BOUNDARY
⊙	STORMWATER MAINTENANCE HOLE
⊕	STORMWATER CATCHPITS
⌒	STORMWATER HEADWALL
■	STORMWATER FIELD INLET
---	STORMWATER DRAINAGE (375mm DIA RCP UNLESS NOTED OTHERWISE)
---	EXISTING STORMWATER DRAINAGE
---	STORMWATER CATCHMENT
---	ULTIMATE STORMWATER CATCHMENT
⊙	STORMWATER STRUCTURE NUMBER
---	BARRIER TYPE KERB AND CHANNEL
---	MOUNTABLE TYPE KERB AND CHANNEL
---	EDGE OF SURFACING
→	OPEN CHANNEL

AS CONSTRUCTED

I, RYAN MACHIN, OF SURVEY SOLUTIONS AUSTRALIA, HEREBY CERTIFY THAT THE WORKS AS SHOWN ON THE AS CONSTRUCTED DRAWINGS REFLECT ANY CHANGES THAT WERE MADE DURING THE COURSE OF CONSTRUCTION.

Ryan Machin DATE: 29.03.2023

RYANMACHIN 580 No 6700

SURVEYING SOLUTIONS AUSTRALIA

ABR: 78 632 363 916 M: 1401 428 258 517

49 Goicoechea Drive Buzhland Beach, QLD, 4818

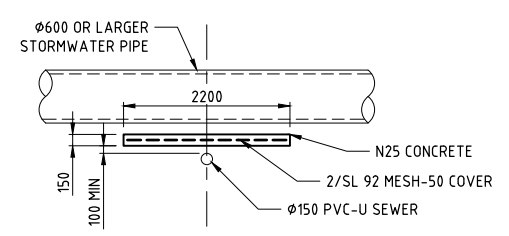
AS CONSTRUCTED CERTIFICATION

THE WORK ON THIS DRAWING HAS BEEN CONSTRUCTED GENERALLY IN ACCORDANCE WITH THE DESIGN DRAWINGS AND THE INTENT OF THE GUIDELINES OF TOWNSVILLE CITY COUNCIL

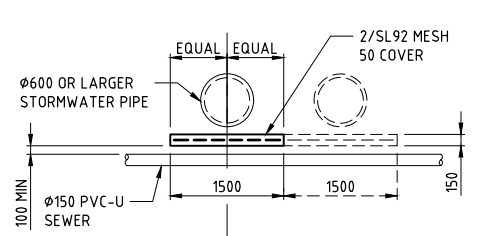
APPROVED: *[Signature]* RPEQ: 12732

for and on behalf of Empower Engineer & Project Managers **Empower**

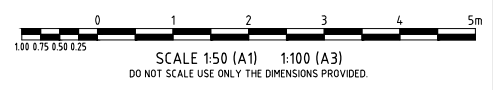
Accepted As Constructed



BRIDGING SLAB ELEVATION SCALE 1:50 (A1)



BRIDGING SLAB END ELEVATION SCALE 1:50 (A1)



NOTE:-
THIS AS CONSTRUCTED CERTIFICATION IS RELEVANT TO STAGE 13C ONLY.

No.	Amendments	Drawn	Design	Design Chk	Appd	Date
0	AS CONSTRUCTED					27/03/23

AS CONSTRUCTED

[Signature]
Registered Engineer
29/3/2023
Date Register 12732

ENGINEERING CERTIFICATION

THE RESERVE
From the developers of Kalynda Chase
urbex

Empower
ENGINEERS & PROJECT MANAGERS
ABN 23 010 743 692

Client: **URBEX PTY LTD**

Project: **THE RESERVE - STAGE 13C**

Title: **Q2 STORMWATER DRAINAGE CATCHMENT PLAN**

Da'um
AHD
PSM 200645
RL 14.410
(MGA) COORD

AS CONSTRUCTED

Project No. Drawing No. Rev
B00393-CD301 0

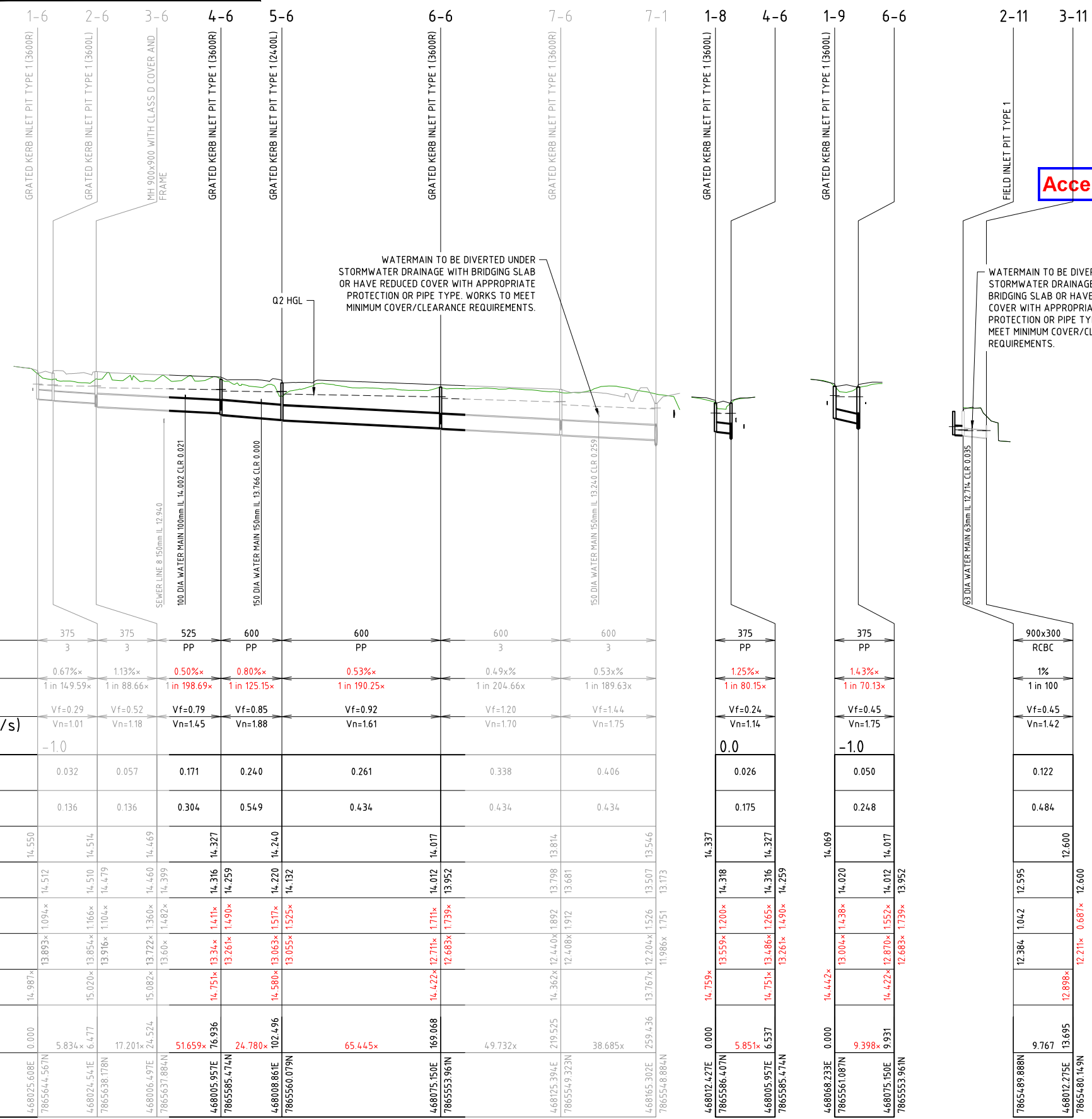
User: WILLIAM GRIFFITH File Name: C:\Users\wgriffith\Documents\13B14_Civil_Stage 13A\B00393-ASCON-SWP-Q2 Date: 27/03/2023 14:44 PM

NOTE:

1. ALL DRAINAGE PIPES ARE 375 UNLESS NOTED OTHERWISE.
2. ALL DRAINAGE PIPES ARE CLASS 3 RCP UNLESS NOTED OTHERWISE
3. ALL REINFORCED CONCRETE PIPES ARE RUBBER RING JOINTED UNLESS NOTED OTHERWISE.
4. REFER TCC STANDARD DRAWING NUMBER SD-205 FOR MANHOLE DETAILS.
5. REFER TCC STANDARD DRAWING NUMBER SD-200 FOR GULLY PIT DETAILS.
6. REFER TCC STANDARD DRAWING NUMBER SD-200 FOR PRECAST LINTEL DETAILS.
7. REFER TCC STANDARD DRAWING NUMBER SD-215 FOR FIELD INLET DETAILS.
8. REFER TCC STANDARD DRAWING NUMBER SD-085 FOR KERB ADAPTOR DETAILS.
9. ALL MANHOLES WERE BENCHMARKED TO TCC REQUIREMENTS.

EXISTING SERVICES LOCATIONS SHOWN ARE APPROXIMATE ONLY. THEY HAVE BEEN DERIVED FROM TYPICAL SERVICE LEVEL DEPTHS.

NOTE:
THIS AS CONSTRUCTED CERTIFICATION IS RELEVANT TO STAGE 13C ONLY.



Accepted As Constructed

WATERMAIN TO BE DIVERTED UNDER STORMWATER DRAINAGE WITH BRIDGING SLAB OR HAVE REDUCED COVER WITH APPROPRIATE PROTECTION OR PIPE TYPE. WORKS TO MEET MINIMUM COVER/CLEARANCE REQUIREMENTS.

WATERMAIN TO BE DIVERTED UNDER STORMWATER DRAINAGE WITH BRIDGING SLAB OR HAVE REDUCED COVER WITH APPROPRIATE PROTECTION OR PIPE TYPE. WORKS TO MEET MINIMUM COVER/CLEARANCE REQUIREMENTS.

PIPE SIZE (mm)	375	375	525	600	600	600	600	375	375	900x300
PIPE CLASS	3	3	PP	PP	PP	3	3	PP	PP	RCBC
PIPE GRADE (%)	0.67%	1.13%	0.50%	0.80%	0.53%	0.49%	0.53%	1.25%	1.43%	1%
PIPE GRADE (1 in)	1 in 149.59x	1 in 88.66x	1 in 198.69x	1 in 125.15x	1 in 190.25x	1 in 204.66x	1 in 189.63x	1 in 80.15x	1 in 70.13x	1 in 100
FULL PIPE VELOCITY (m/s)	Vf=0.29	Vf=0.52	Vf=0.79	Vf=0.85	Vf=0.92	Vf=1.20	Vf=1.44	Vf=0.24	Vf=0.45	Vf=0.45
NORMAL DEPTH VELOCITY (m/s)	Vn=1.01	Vn=1.18	Vn=1.45	Vn=1.88	Vn=1.61	Vn=1.70	Vn=1.75	Vn=1.14	Vn=1.75	Vn=1.42
DATUM (m)	-1.0							0.0	-1.0	
PIPE FLOW (Cumecs)	0.032	0.057	0.171	0.240	0.261	0.338	0.406	0.026	0.050	0.122
PIPE CAPACITY AT GRADE (Cumecs)	0.136	0.136	0.304	0.549	0.434	0.434	0.434	0.175	0.248	0.484
WATER LEVEL IN STRUCTURE	14.550									
HYDRAULIC GRADE LEVEL	14.512	14.510	14.460	14.420	14.220	13.798	13.814	14.318	14.020	12.595
DEPTH TO INVERT	13.893x	13.954x	13.722x	13.60x	13.055x	12.440x	12.408x	13.559x	13.004x	12.384
INVERT LEVEL OF DRAIN	13.893x	13.954x	13.722x	13.60x	13.055x	12.440x	12.408x	13.559x	13.004x	12.384
FINISHED SURFACE LEVEL	14.987x	15.020x	15.082x	14.751x	14.580x	14.362x	14.323x	14.422x	14.422x	12.898x
PIPE LENGTH RUNNING CHAINAGE	0.000	5.834x	17.201x	24.524x	51.659x	76.936x	24.780x	169.068x	9.931x	9.767x
EASTING	468025.608E	7865644.567N	468006.497E	7865637.884N	468005.957E	7865585.474N	468008.861E	7865560.079N	468007.510E	7865553.961N
NORTHING	7865644.567N	7865638.178N	7865637.884N	7865637.884N	7865585.474N	7865585.474N	7865560.079N	7865553.961N	7865553.961N	7865480.149N

AS CONSTRUCTED CERTIFICATION

THE WORK ON THIS DRAWING HAS BEEN CONSTRUCTED GENERALLY IN ACCORDANCE WITH THE DESIGN DRAWINGS AND THE INTENT OF THE GUIDELINES OF TOWNSVILLE CITY COUNCIL

APPROVED: *Chad Smith* RPEQ: 12732

for and on behalf of Empower Engineer & Project Managers

Empower
ENGINEERS & PROJECT MANAGERS

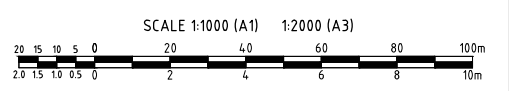
AS CONSTRUCTED

I, RYAN MACHIN OF SURVEY SOLUTIONS AUSTRALIA, HEREBY CERTIFY THAT THE WORKS AS SHOWN ON THE AS CONSTRUCTED DRAWINGS REFLECT ANY CHANGES THAT WERE MADE DURING THE COURSE OF CONSTRUCTION.

Ryan Machin DATE: 29.03.2023
RYAN MACHIN SQ No. 6760

SURVEYING SOLUTIONS AUSTRALIA

ABR: 78 632 363 916 M: (+61) 428 258 917
49 Goicoechea Drive Buzhland Beach, QLD, 4818



AS CONSTRUCTED

Chad Smith
Registered Engineer
29/3/2023 12732
Date Register

ENGINEERING CERTIFICATION

No. Amendments Drawn Design Design Chk Appd Date



Client: **URBEX PTY LTD**

Project: **THE RESERVE - STAGE 13C**

Title: **STORMWATER DRAINAGE LONGITUDINAL SECTION**

Datum: **AHD**

PSM: **200645**

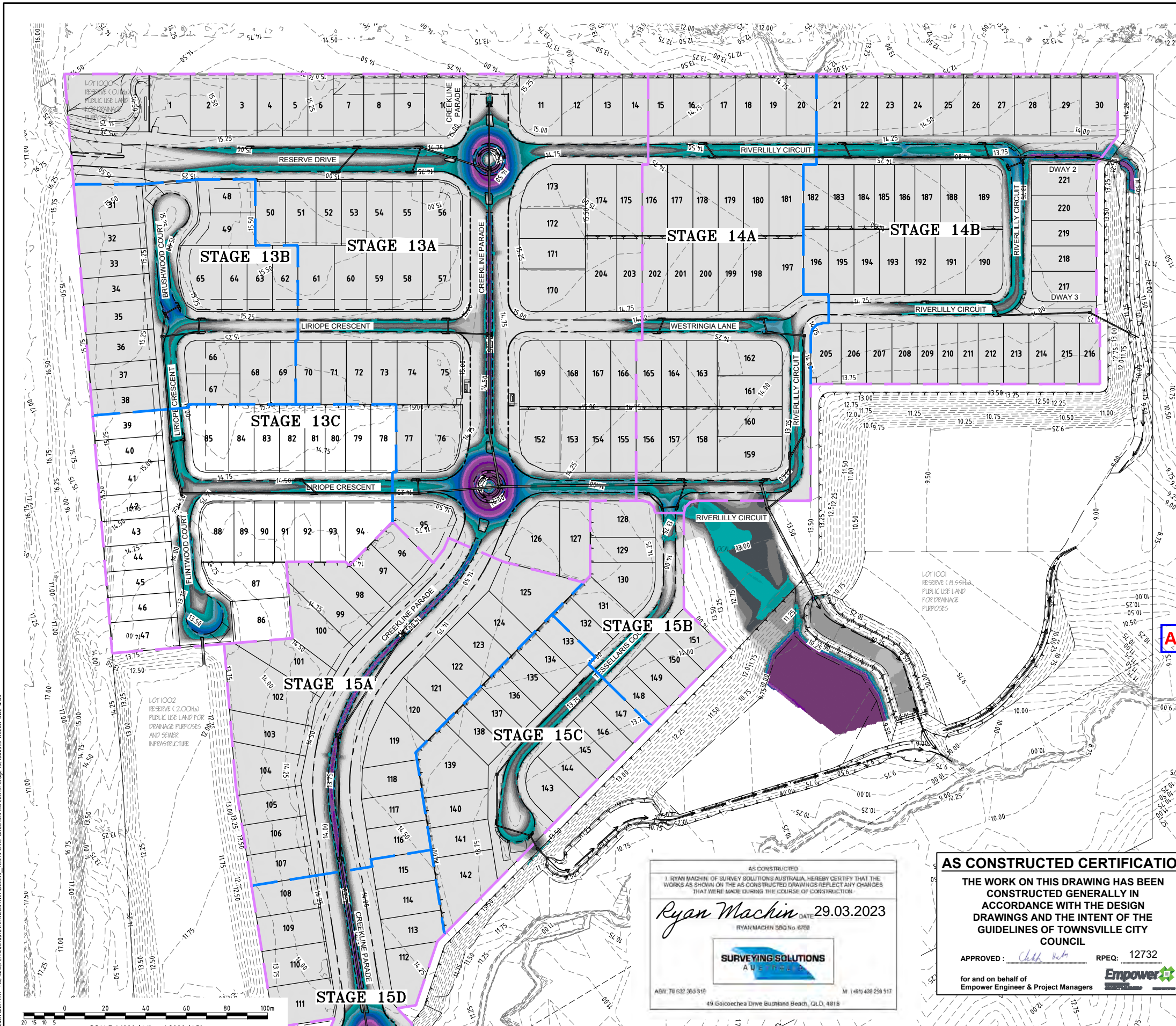
RL: **14.410**

(MGA) COORD

AS CONSTRUCTED

Project No. Drawing No. Rev
B00393-CD302 0

User: WILLIAM GRIFFITH File Name: C:\2023\Drawings\MANHOLE\13B13\13B13_CIVIL_0165\14_45_C0N3_Stage 13C\B00393-ASCON-SW1.k
Date: 27/03/2023 4:43:52 PM



LEGEND

- STAGE BOUNDARY
- SUBSTAGE BOUNDARY
- LOT BOUNDARY
- TOP OF BATTER
- BARRIER TYPE KERB AND CHANNEL
- MOUNTABLE TYPE KERB AND CHANNEL
- STORMWATER DRAINAGE (375mm DIA RCP UNLESS NOTED OTHERWISE)
- ESTIMATED EXTENT OF Q100 STORM EVENT

DEPTH COLOURING NOTES

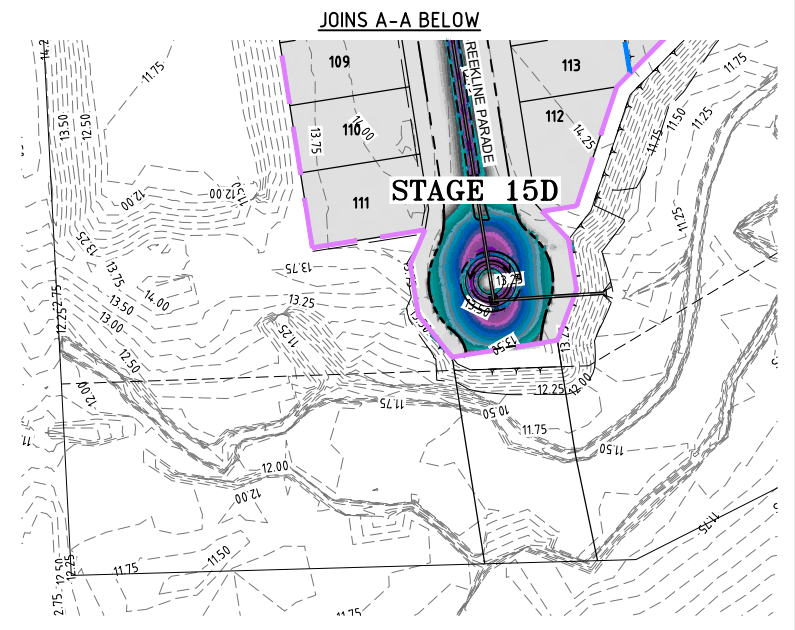
1. THE DEPTH COLOURING SHOWN HAS BEEN DERIVED USING XPSTORM SOFTWARE.
2. THE COLOURING SHOWN REPRESENTS THE RESULTS ONLY WHERE A CONCENTRATION OF FLOWS ACROSS THE PROPOSED DESIGN PROFILE WILL OCCUR, IGNORING SHALLOW SHEET FLOWS AT TOP OF CATCHMENTS.
3. THE FLOWS USED TO DETERMINE DEPTHS ARE CALCULATED TOTAL Q100 CATCHMENT FLOWS MINUS Q2 PIPED FLOWS. THIS IS CONSERVATIVE, AS PIT AND PIPE FLOWS WILL CONVEY MORE THAN Q2 DURING HIGHER A Q100 EVENT. CONSERVATIVELY, FLOWS USED IN THE MODELLING ARE PEAK FLOWS AND ARE NOT CALCULATED USING HYDROGRAPHS FOR THE DIFFERING CATCHMENTS.
4. BASED ON PREVIOUS FLOOD MODELLING BY OTHERS, Q100 FLOOD LEVELS SOUTH OF THE SITE IN THREE MILE CREEK VARY FROM RL 13.3m (WESTERN SIDE) TO RL 13.2m (EASTERN SIDE)

Q100 FLOOD DEPTH RANGE
FLOOD WATER DEPTH (WIDTHS AS SHOWN)

	-0.02m
	0.02m - 0.04m
	0.04m - 0.06m
	0.06m - 0.08m
	0.08m - 0.10m
	0.10m - 0.12m
	0.12m - 0.14m
	0.14m - 0.16m
	0.16m - 0.18m
	0.18m - 0.20m
	0.20m - 0.22m
	0.22m - 0.24m
	0.24m - 0.26m
	0.26m - 0.28m
	0.28m - 0.30m
	0.30m - 0.32m
	0.32m - 0.34m
	0.34m - 0.36m
	0.36m - 0.38m
	0.38m - 0.40m
	-0.40m

NOTE:-
THIS AS CONSTRUCTED CERTIFICATION IS RELEVANT TO STAGE 13C ONLY.

Accepted As Constructed



AS CONSTRUCTED
I, RYAN MACHIN, OF SURVEYING SOLUTIONS AUSTRALIA, HEREBY CERTIFY THAT THE WORKS AS SHOWN ON THE AS CONSTRUCTED DRAWINGS REFLECT ANY CHANGES THAT WERE MADE DURING THE COURSE OF CONSTRUCTION.

Ryan Machin 29.03.2023
RYAN MACHIN SQ NO. 6700

SURVEYING SOLUTIONS AUSTRALIA
ABR: 78 632 363 916 M (481) 428 258 517
49 Galochecha Drive Buzhland Beach, QLD, 4818

AS CONSTRUCTED CERTIFICATION

THE WORK ON THIS DRAWING HAS BEEN CONSTRUCTED GENERALLY IN ACCORDANCE WITH THE DESIGN DRAWINGS AND THE INTENT OF THE GUIDELINES OF TOWNSVILLE CITY COUNCIL

APPROVED: *Chelliah* RPEQ: 12732

for and on behalf of
Empower Engineer & Project Managers

Empower

0	AS CONSTRUCTED	JT	PDW	OR	OR	27/03/23	ENGINEERING CERTIFICATION
No.	Amendments	Drawn	Design	Design	Chk	Appd	Date

This drawing cannot be copied or reproduced in any form or used for any purpose other than that originally intended without the written permission of Empower Engineers and Project Managers ©COPYRIGHT 2022

THE Reserve
From the developers of Kalynda Chase

urbex designed for life

Empower
ENGINEERS & PROJECT MANAGERS
ABN 23 010 743 692

Client	URBEX PTY LTD	Datum	AHD
Project	THE RESERVE - STAGE 13C	PSM	200645
Title	ESTIMATED EXTENT OF Q100 STORMWATER EVENT PLAN	RL	14.410
		(MGA) COORD	
		AS CONSTRUCTED	
Project No.	B00393-CD303	Drawing No.	0
Rev			