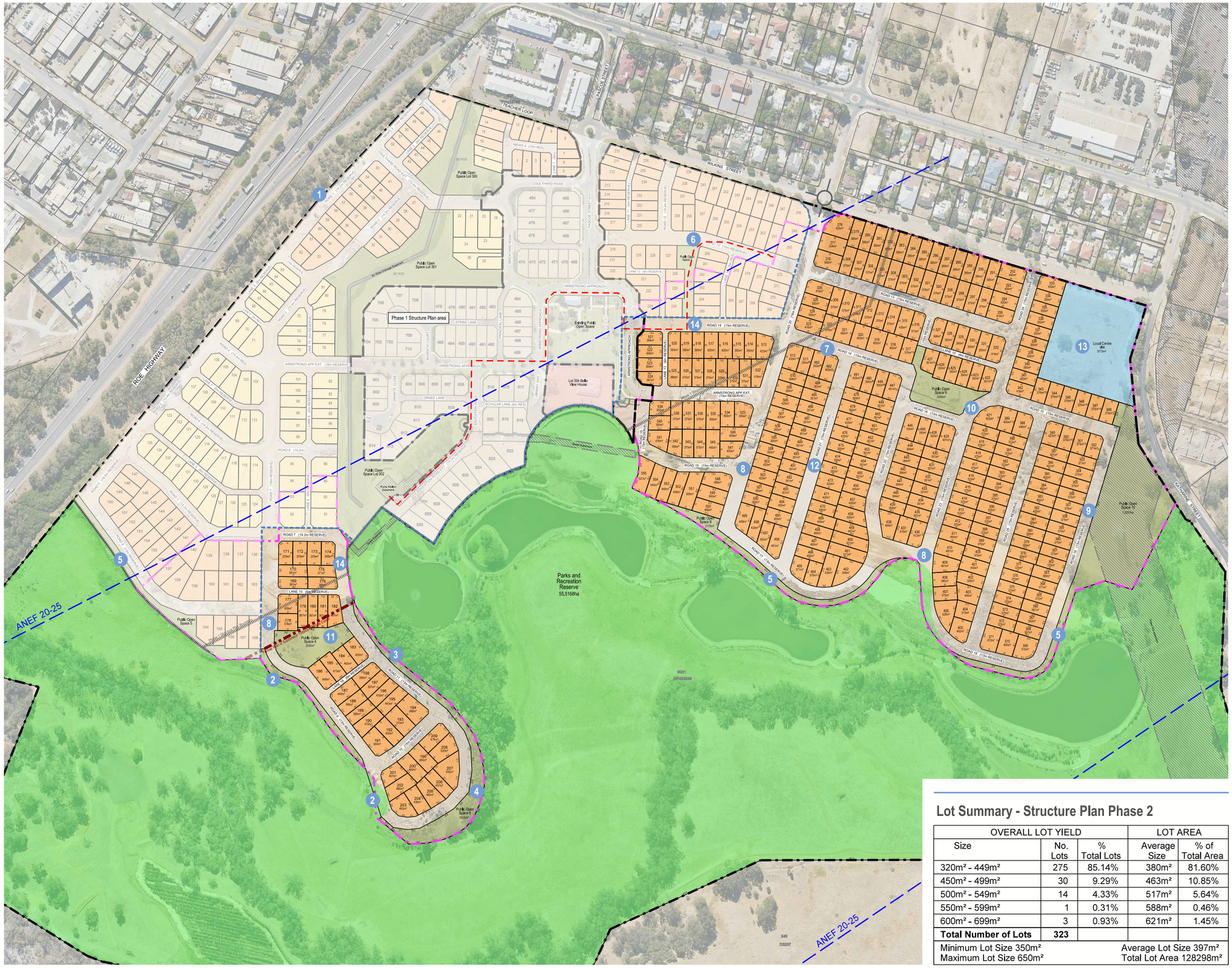
Appendix A: Concept plan



Legend

- Site Area (Existing 70 Lots)
- Phase 1 Lots unchanged (83 Lots)
- Phase 1 Lots changed (128 Lots)
- Phase 2 Lots (323 Lots)
- Local Centre Lot (*would otherwise yield 16-18 lots*)
- Lot 304 Belle View House
- Public Open Space
- Local Public Open Space
- Existing easements
- Existing sewer pressure main alignment
- Lots limited to R20 (by ANEF 20-25)
- Phase 1 Structure Plan Boundary
- Stage 2 Structure Plan Boundary
- Former Plan of Subdivision 158843 Approval Extent
- Potential Roundabout
- Australian Noise Exposure Forecast Units

Notes

1. Bushfire and noise interface to be considered. If a greater setback is required, a run of 20m deep squat lots might be lost (12-15 lots)
2. Minor discrepancy to road reserve only within MRS Parks and Recreation Reserve proposed. No part of any lot proposed outside of MRS Urban zone. Necessary to respond to awkward shape of existing Reserve in southern location that is based on a specific design, rather than a physical feature. An equal part of POS can be given up for any encroachment.
3. Very minor discrepancy to MRS Parks and Recreation Reserve, as above.
4. Small slither of local POS created, largely to give existing trees more room and a better chance of being retained.
5. 7m wide POS strip between road reserve and Regional Open Space assists in creating a more gentle interface using a mix of batters and rock retaining
6. Linear POS allows sewer pressure main to be retained in existing alignment.
7. Consider double run of trees either side of a dual use footpath on northern side of Road 3 and Road 16 to create a feature east-west street connecting two Parks.
8. Maintain views lines and public access out to Regional Open Space and River to the south.
9. Consider smaller lots in proximity to power line easements, particularly if Banks are not able to provide Lender's Mortgage Insurance to purchasers for lots within 50-100m of 330kv power lines.
10. Central eastern POS provides focal point for the estate and creates a walkable local destination between the local centre and heritage POS to the west.
11. Former Subdivision Approval 158843 allowed 2,731sqm of saleable land to be developed outside of the Phase 1 Structure Plan extents.
12. Lot mix proposed within ANEF 20-25 affected area complies with R20 minimum lot size (350sqm) but not the average (450sqm). A loss of 39 lots would occur if compliance with the R20 average lot size is required.
13. Local Centre layout warrants further concept design investigation.
14. Proposal is for Phase 2 Structure Plan to replace the Phase 1 Structure Plan in all overlapping areas.

Lot Summary - Structure Plan Phase 2

OVERALL LOT YIELD			LOT AREA	
Size	No. Lots	% Total Lots	Average Size	% of Total Area
320m² - 449m²	275	85.14%	380m²	81.60%
450m² - 499m²	30	9.29%	463m²	10.85%
500m² - 549m²	14	4.33%	517m²	5.64%
550m² - 599m²	1	0.31%	588m²	0.46%
600m² - 699m²	3	0.93%	621m²	1.45%
Total Number of Lots	**323**			
Minimum Lot Size 350m² Maximum Lot Size 650m²			Average Lot Size 397m² Total Lot Area 128298m²	

Concept Plan - Phase 2 Structure Plan Area

LOT 9001 KATHARINE STREET, ROBINSON GROVE

A Satterley Project

DRAFT

scale: 1:4000@A3 | 1:2000@A1

0 20 40 60 80m

plan: 24/063/030A

date: 07/05/2025

aerial: April 2024

Taylor Burrell Barnett Town Planning & Design
Level 7, 160 St Georges Terrace, Perth WA 6000
e: admin@tbbplanning.com.au
p: (08) 9226 4276

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Appendix B: Monitoring data

Table A Groundwater results; physic-chemical and nutrients

Notes:
Guideline values (FWG) have been adopted from the following guidance documentation:
Freshwater and Marine Water Quality Guidelines Chapter 3 (ANZECC/ARMCANZ 2000)
All results expressed as mg/L except for temperature (°C), pH (pH units), EC (µS/cm), Redox (mV), DO (ppm), DTW (m bTOC) and ratios (unitless)

		In-situ physical parameters									Nutrients					
Date	Bore	Appearance	Colour	Temperature	pH	EC (c)	TDS	ORP	DO	DO	Total nitrogen	TKN	NOx	Ammonical-N	Total Phosphorous	FRP
				°C		µS/cm	mg/L	mV	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Trigger values											**1.2**	**-**	**0.15**	**0.08**	**0.065**	**0.04**
25-Mar-22	CO-08	Turbid	L.Brown	21.0	5.42	912.0	591.5	96.7		70.6	2.2	0.5	1.7	< 0.02	0.64	0.02
	CO-09	Turbid	Yellow/Grey	20.8	5.87	2380.0	1547	58		70.5	7.6	2.2	5.4	0.22	3.5	0.01
	CO-10	Turbid	Yelllow	21.0	6.19	1664.0	1079	68.4		43.6	3.7	0.5	3.2	0.02	3.5	< 0.01
	CO-11	Turbid	Yellow/Brown	20.8	6.26	2322	1508	54		38.6	1.8	1.8	< 0.01	0.06	2.7	0.02
	Z1	Duplicate of CO-11									1.9	1.9	< 0.01	0.06	2.4	0.02
	Z2	Blank									0.2	< 0.2	< 0.01	< 0.02	< 0.01	< 0.01
20-Jun-22	CO-08	Turbid	L.Brown	21.1	6.07	691.0	448.5	55.9		31.2	0.4	0.4	0.02	0.05	0.15	0.04
	CO-09	Turbid	Sand brown	21.5	5.40	2678.0	1742	158.2		32.1	8.3	0.2	8.1	0.15	0.1	0.05
	CO-10	DRY									DRY					
	CO-11	Turbid	Brown/clay	20.8	6.14	2477	1612	114.4		13.7	0.4	0.4	<0.01	0.12	0.17	0.07
	Z1										0.5	0.5	<0.01	<0.02	0.19	0.03
	Z2										3.0	< 0.2	< 0.01	< 0.02	< 0.01	< 0.01
30-Sep-22	CO-08	Fully Turbid	Tan	19.8	4.83	3007.0	1956.5	226.6		64.3	0.7	0.7	0.01	<0.02	1.9	0.01
	CO-09	Fully Turbid	Beige	20.4	5.34	2881.0	1872	204.4		95.4	8.3	1.2	7.1	0.02	0.97	0.05
	CO-10	DRY														
	CO-11	Fully Turbid	Light Brown	20.8	6.03	2678	1742	147.5		30.6	0.6	0.6	0.03	0.04	0.53	0.06
	Z1										0.7	0.7	0.01	<0.02	1.7	<0.01
	Z2										0.2	<0.2	<0.01	<0.02	<0.01	<0.01
20-Dec-22	CO-08	Turbid	Tan	20.2	5.64	1320.0	858	181.7		23.4	0.7	0.6	0.06	<0.02	0.59	<0.01
	CO-09	Could not Find Bore														
	CO-10	Could not open Bore														
	CO-11	Turbid	Beige	21	6.34	2228	1449.5	101.1		16.4	0.4	0.4	<0.01	0.04	0.59	<0.01
	Z1	Duplicate of CO-08									0.6	0.5	0.06	0.02	1.2	<0.01
	Z2										0.2	<0.2	<0.01	<0.02	<0.01	<0.01

		In-situ physical parameters									Nutrients					
Date	Bore	Appearance	Colour	Temperature	pH	EC (c)	TDS	ORP	DO	DO	Total nitrogen	TKN	NOx	Ammonical-N	Total Phosphorous	FRP
				°C		µS/cm	mg/L	mV	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
22-Mar-23	CO-02	Turbid	Grey	19.7	5.48	3270.0	2125.5	131.9		9	12.0	<0.2	12	<0.02	0.44	0.01
	CO-08	Turbid	Orange	20.8	5.86	2090.0	1358.5	97.5		28	0.4	0.4	<0.01	<0.02	0.11	0.01
	CO-10	DRY														
	CO-11	Turbid	Tan	21.5	6.33	2250	1456	91.2	NA - stopped working		0.7	0.7	<0.01	0.04	1.1	0.05
	Z1	Duplicate of CO-11									0.4	0.4	<0.01	0.04	0.78	0.06
	Z2	Blank									0.2	<0.2	<0.01	<0.02	<0.01	<0.01
22-Jun-23	CO-02	S.Turbid	Grey	19.6	5.48	1877.0	1222	72.9		34	12.0	< 0.2	12	0.04	0.02	0.65
	CO-08	Turbid	Red / Clay	20.5	6.01	1073.0	695.5	52.8		52	5.8	5.8	0.04	0.12	2.3	0.12
	CO-10	Turbid	Orange / Clay	20.7	6.85	3409.0	2216.5	64.3		62	4.5	4.2	0.27	0.05	3.8	0.23
	CO-11	Turbid	Red / Clay	20.8	6.27	1350	864.5	54.4		26.3	0.2	-	0.06	0.04	0.03	0.59
	Z1	Duplicate of CO-10									3.2	2.9	0.26	0.05	0.15	0.21
	Z2	Blank									0.2	-	0.04	< 0.02	< 0.01	< 0.01
20-Sep-23	CO-02	Turbid	White	19.3	5.39	3016.0	3861	114.4	1.71	18.3	13.0	< 0.2	13	0.17	0.08	0.06
	CO-08	Turbid	Orange / Brown	19.4	6.05	1965.0	1950.3	107.3	7.89	39.5	1.5	1.5	0.04	0.19	0.18	0.01
	CO-10	V.Turbid	Red / Brown	20.0	5.96	1441.0	1772	110	-	22.9	4.8	< 0.2	4.8	3.2	0.2	0.05
	CO-11	S.Turbid	Whitish	20.5	6.11	2193	2653	116.2	-	8.7	0.2	< 0.2	0.05	0.28	0.17	0.06
	Z1	Duplicate of CO-02									13.0	< 0.2	13	0.17	0.06	0.06
	Z2	Blank									0.2	< 0.2	< 0.01	< 0.02	< 0.01	< 0.01
19-Dec-23	CO-02	Turbid	L. Brown	19.8	5.25	3727.0	2424.5	206.5	2.36	25.9	12.0	4.2	8	<0.0050	0.066	<0.0050
	CO-08	V.Turbid /Thick	Red / Brown	20.2	5.79	1940.0	1261	114.3	6.07	67.4	2.1	2.1	0.054	0.011	0.25	<0.0050
	CO-10	Turbid	L. Brown	20.4	6.04	2825.0	1833	168.8	4.86	51.4	8.7	5.1	3.6	<0.0050	0.73	<0.0050
	CO-11	Turbid	Tan	21	6.05	2565	1670.5	107.2	2.33	26.1	0.6	0.58	0.014	0.017	<0.050	<0.0050
	Z1	Duplicate of OW3-S									1.5	1.5	<0.0050	<0.0050	0.1	<0.0050
	Z2	Blank									0.1	<0.10	<0.0050	<0.0050	<0.050	<0.0050

		In-situ physical parameters									Nutrients					
Date	Bore	Appearance	Colour	Temperature	pH	EC (c)	TDS	ORP	DO	DO	Total nitrogen	TKN	NOx	Ammonical-N	Total Phosphorous	FRP
				°C		µS/cm	mg/L	mV	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
26-Mar-24	CO-02	Turbid	Light Brown	20.5	5.49	3929.0	2558	30.4	4.94	53.7	13.0	2.7	11	0.038	0.062	0.0062
	CO-08	Turbid	Red-Brown	20.6	5.53	2736.0	1779	50.9	6.87	76.9	3.1	3	0.052	0.049	0.09	<0.0050
	CO-10	Turbid	Brown	20.7	6.06	2914.0	1895	58.5	6.59	74	7.0	2.9	4.2	0.04	0.29	<0.0050
	CO-11	Turbid	Light Brown	20	6.12	2568	1669	29.8	3.64	40.7	1.0	0.67	0.018	0.052	0.089	<0.0050
	Z1	Duplicate of OW02									3.8	3.8	0.022	0.13	0.22	<0.0050
	Z2	Blank									0.1	<0.10	0.006	0.13	<0.050	<0.0050
5-Jun-24	CO-02	Turbid	Light Brown	20.4	5.18	2024.0	1314	243.9	3.43	37.7	16.0	3	13	<0.0050	0.11	0.0065
	CO-08	Turbid	Red-Brown	21.0	5.17	2530.0	1653	216.1	7.26	81	2.8	2.8	0.036	0.0085	<0.50	<0.0050
	CO-10	Too low to sample									8.2	8	0.21	0.017	1.1	0.0077
	CO-11	Turbid	Light Red-Brown	21.1	5.88	2797	1818	159.8	2.57	28.4	0.8	0.75	0.015	0.016	<0.50	<0.0050
	Z1	Duplicate of CO-02									17.0	3	14	<0.0050	0.096	<0.0050
	Z2	Trip Blank									0.1	<0.10	<0.0050	<0.0050	<0.050	<0.0050
16-Sep-24	CO-02	Turbid	Light Brown	20.6	5.60	3780.0	2457	140.6	3.46	38.6	18.0	3	15	0.026	0.11	0.0085
	CO-08	Turbid	Orange	20.4	6.58	2151.0	1534	132	6.78	75.5	1.8	1.8	0.036	0.0083	0.12	<0.0050
	CO-10	Turbid	Orange/Brown	20.8	6.17	2210.0	1560	188	5.55	62.1	10.0	7.4	2.8	0.011	0.81	0.0057
	CO-11	Turbid	Red/Brown	21	6.28	2611	1696.5	153	3.18	35.6	1.5	0.98	0.54	0.025	0.084	0.0052
	Z1	Duplicate of CO-10									9.7	6.7	3	0.031	0.65	0.0053
	Z2	Trip Blank									0.1	<0.10	0.0083	<0.0050	<0.050	<0.0050
9-Dec-24	CO-02	Turbid	L.Brown/Milky	20.2	5.98	3322.0	2375	8.7	4.23	46.7	19	3.4	16	<0.0050	0.12	0.0088
	CO-08	S.Turbid	Reddish	20.2	5.77	1997.0	1423	12.5	8.52	94.7	0.59	0.56	0.032	0.0074	<0.050	<0.0050
	CO-10	Turbid	Brown	20.2	6.77	2329.0	1663	-69.5	6.63	73.5	8.5	4.7	3.8	<0.0050	0.68	<0.0050
	CO-11	Turbid	Light Brown	20.9	6.70	2457	1731	-135	3.16	35.3	0.29	0.17	0.12	0.014	0.078	0.0067
	Z1	Duplicate of OW3-Shallow														
	Z2	Trip Blank														
10-Apr-25	CO-08										0.7	0.7	0.0081	<0.005	0.089	0.042
	CO-09										19.0	0.85	19	0.031	<0.05	0.0075
	CO-10										7.3	4.8	2.5	<0.005	0.49	<0.005
	CO-11										0.3	0.15	0.15	0.035	<0.05	0.0055
	GW1										1.0	0.49	0.53	0.046	0.21	<0.005
26-Jun-25	CO-08										1.8	1.7	0.076	0.018	0.099	<0.005
	CO-09										17.0	0.28	17	0.0085	<0.05	0.0062
	CO-10										5.1	3.1	2.1	0.01	0.31	0.0061
	CO-11															
	GW1										1.1	0.49	0.59	0.04	0.12	<0.005

Table B Groundwater levels

				Measurement (mBTOC)					mAHD				
								TOC height (mAHD):	18.687	18.011	17.22	17.619	15.165
Year	**Month**	**Sampling Date**	**Notes**	**CO-08**	**CO-09**	**CO-10**	**CO-11**	**CO-02**	**CO-08**	**CO-09**	**CO-10**	**CO-02**	**CO-11**
2022	**Mar**	28/03/2022		6.124	6.726	6.766	5.361	lost	12.563	11.285	10.454		9.804
2022	**Jun**	20/06/2022		7.065	6.819	DRY	5.056		11.622	11.192			10.109
2022	**Sep**	30/09/2022		4.048	5.571	DRY	3.812		14.639	12.440			11.353
2022	**Dec**	20/12/2022		4.641	-	DRY	4.375		14.046	destroyed			10.790
2023	**Mar**	22/03/2023	C0-O2 replaces CO-09	5.640	-	DRY (6.897)	5.175	6.930	13.047				9.990
2023	**June**	22/06/2023		5.265	-	5.545	4.800	6.640	13.422		11.675	10.979	10.365
2023	**Sep**	20/09/2023		4.955	-	5.165	3.921	5.786	13.732		12.055	11.833	11.244
2023	**Dec**	19/12/2023		3.924	-	5.253	4.855	6.474	14.763		11.967	11.145	10.310
2024	**March**	26/03/2024		5.858	-	5.816	5.863	7.224	12.829		11.404	10.395	9.302
2024	**Jun**	5/06/2024		5.704	-	6.673	5.975	7.704	12.983		10.547	9.915	9.190
2024	**Sep**	16/09/2024		4.641	-	5.437	4.635	6.323	14.046		11.783	11.296	10.530
2024	**Dec**	9/12/2024		3.160		5.760	5.094	6.524	15.527		11.46	11.095	10.071

Table C Wetland surface water quality

Notes:
Guideline values (FWG) have been adopted from the following guidance documentation:
Freshwater and Marine Water Quality Guidelines Chapter 3 (ANZECC/ARMCANZ 2000)
All results expressed as mg/L except for temperature (°C), pH (pH units), EC (µS/cm), Redox (mV), DO (ppm), DTW (m bTOC) and ratios (unitless)

Date	Location	Surface/Deep	In-situ physical parameters											Nutrients									
			Appearance	Colour	Depth	Temp	pH	EC (C)	TDS	ORP	SAL	DO	DO	TN	TKN	NOx	Ammonical-N	TP	FRP	Salinity	Chlorophyll-a	Chlorophyll-a	Lab pH
						°C		µS/cm	mg/L	mV	ppt	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/m3	
						7-8.5						90-120		1.5		0.1	0.04	0.06	0.03		0.03	0.03	
28-Mar-22	Wangalia	-	Dry											Dry									
	OW1	S	S.Turbid	Tea		20.8	8.1	3098	2015	39.1		67		1.5	1.3	0.2	0.2	0.05	0.02	1700.0	0.006		8.3
		D	S.Turbid	Tea		20.8	8.03	3098	2015	39.1		67.2		1.2	0.9	0.3	0.04	0.07	0.02	1600.0	0.008		8.3
	OW2	S	S.Turbid	L.Brown		21.2	8.37	5466	3555.5	34		74.8		1.4	1.4	< 0.01	0.2	0.13	< 0.01	2900.0	0.037		8.5
		D	S.Turbid	L.Brown		21	8.34	5461	3549	35.3		73.2		1.3	1.3	< 0.01	0.03	0.17	< 0.01	2900	0.06		8.5
	OW3	S	Turbid	Brown		22.2	8.09	3528	2288	35.2		74.3		1.1	1.1	< 0.01	0.1	0.16	< 0.01	1900.0	0.036		8.2
		D	Turbid	Brown		21.5	7.97	3525	2294.5	35.2		70.3		1.2	1.2	< 0.01	0.1	0.22	0.05	1900.0	0.043		8.0
	OW4	S	Turbid	Brown		20.7	8.26	3800	2470	33.2		70.1		2.1	2.1	< 0.01	0.3	0.15	< 0.01	2000.0	0.097		8.4
		D	Turbid	Brown		20.4	8.19	3798	2470	34.8		67.5		2	2	0.02	0.38	0.23	0.03	2000	0.11		8.3
20-Jun-22	Wangalia	-				15.7	7.71	1228	799.5	154.6	0.62	84.5	8.23	0.4	0.4	< 0.01	<0.02	0.14	0.03	610			6.8
	OW1	S				16.8	8.18	2570	1670.5	180.5	1.33	75.6	7.32	0.8	0.8	< 0.01	0.1	0.06	<0.01	1300.0	<0.001		8.1
		D				16.3	8.15	2572	1670.5	176.1	1.34	71.6	7.01	0.6	0.6	< 0.01	0.1	0.08	<0.01	1300.0	<0.001		8.0
	OW2	S				16.54	7.92	2222	1443	148.2	1.15	74.5	7.26	0.9	0.8	0.1	0.2	0.08	<0.01	1100.0	<0.001		7.9
		D				16.1	7.32	2159	1398	142	1.13	71.9	6.97	1.3	1.3	0.05	0.22	0.13	<0.01	1100	<0.001		7.8
	OW3	S				17.7	8.1	350.2	227.5	125.1	0.17	83.9	8.04	1.0	0.6	0.4	0.04	0.10	<0.01	180.0	<0.001		8.0
		D				15.5	7.97	363.7	236.6	127.8	0.18	79.6	7.98	1.8	1.4	0.4	0.1	0.08	<0.01	170.0	<0.001		7.2
	OW4	S				16.2	7.67	808	526.5	165.3	0.4	54.5	5.36	1.3	0.9	0.4	0.3	0.08	<0.01	380.0	<0.001		7.8
		D				15.8	7.41	799	526.5	161.4	0.47	50.7	5.04	1.4	1.1	0.32	0.37	0.10	<0.01	400	<0.001		7.4
30-Sep-22	Wangalia	-				18.3	7.61	1254	812.5	207	0.74	110.5	10.35	0.7	0.7	0.01	<0.02	1.90	0.01				
	OW1	S				19.3	8.07	1432	929.5	177	0.72	94.3	8.66	0.8	0.7	0.1	<0.02	0.19	0.02	610.0	<0.001		8.2
		D				18.8	8.05	1448	942.5	177.7	0.73	95	8.88	0.9	0.9	0.0	<0.02	0.21	0.02	610.0	0.001		8.2
	OW2	S				20.1	8.16	87.1	565.5	189.7	0.43	286.4	25.9	1.1	0.8	0.3	<0.02	0.12	0.01	380.0	<0.001		8.1
		D				18.6	7.97	948	617.5	195.6	0.47	128.1	11.94	1.1	0.8	0.26	<0.02	0.11	<0.01	380	0.001		8.1
	OW3	S				24.3	8.44	523	338	186.6	0.25	193.5	16.19	0.8	0.8	0.03	<0.02	0.09	<0.01	330.0	0.009		8.2
		D				19.5	8.36	520.9	338.65	193.7	0.25	137.5	12.62	1.6	1.6	<0.01	<0.02	0.24	<0.01	320.0	0.110		8.0
	OW4	S												1.3	0.9	0.4	<0.02	0.05	0.04	410.0	0.002		8.1
		D												1	0.6	0.36	<0.02	0.08	<0.01	420	0.001		8.1
20-Dec-22	Wangalia	-				Not flowing																	
	OW1	S	Not measured	Not measured	Not measured	23.8	8.87	1380	897	71.6	0.69	75		0.5	0.5	<0.01	<0.02	0.01	<0.01	760	0.002		8.4
		D	Not measured	Not measured	Not measured	24	8.93	1365	884	114.1		96.9		0.7	0.7	<0.01	<0.02	0.08	<0.01	730	0.017		8.5
	OW2	S	Not measured	Not measured	Not measured	22.8	8.55	1091	708.5	71.8	0.54			0.6	0.6	<0.01	0.03	<0.01	<0.01	590	0.001		8.4
		D	Not measured	Not measured	Not measured	24.6	8.4	1686	708.5	78.9		78.3		8.9	8.9	<0.01	0.05	1.70	<0.01	600	0.000		7.9
	OW3	S	Not measured	Not measured	Not measured	22.2	8.25	1385	897	61.2	0.69	53.6		0.5	0.5	<0.01	<0.02	0.07	0.02	1200	0.038		8.2
		D	Not measured	Not measured	Not measured	24.1	8.34	2033	1319.5	122.4				0.4	0.4	<0.01	<0.02	0.19	0.02	1200	0.004		7.8
	OW4	S	Not measured	Not measured	Not measured	22.2	8.26	2152	1397.5	75.6	1.1			1.0	0.8	0.16	0.12	0.05	0.01	770	0.001		8.2
		D	Not measured	Not measured	Not measured	22.6	7.91	1338	871	-45.6				1	0.8	0.16	<0.02	0.19	0.02	750	0.004		8.1

Date	Location	Surface/Deep	In-situ physical parameters											Nutrients									
			Appearance	Colour	Depth	Temp	pH	EC (C)	TDS	ORP	SAL	DO	DO	TN	TKN	NOx	Ammonical-N	TP	FRP	Salinity	Chlorophyll-a	Chlorophyll-a	Lab pH
						°C		µS/cm	mg/L	mV	ppt	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/m3	
						7-8.5						90-120		1.5		0.1	0.04	0.06	0.03		0.03	0.03	
22-Mar-23	Wangalia	-				Not flowing																	
	OW1	S	S.Turbid	Brown	1.2	22.9	8.59	2320		87.9	1.19	82		1.7	1.7	<0.01	<0.02	0.09	<0.01	1500	0.01		8.6
		D	Turbid	Brown		23	8.57	2240		8.38	1.15	65		1.5	1.5	<0.01	<0.02	0.09	<0.01	1500	0.010		8.6
	OW2	S	S.Turbid	Green	1.2	24.3	8.6	2200		74.4	1.13	106		1.2	1.2	<0.01	<0.02	0.11	<0.01	1400	0.003		8.6
		D	Turbid	Green		23.2	8.82	2200		73.9	1.13	91		1.9	1.9	<0.01	<0.02	0.18	<0.01	1400	0.210		8.4
	OW3	S	S.Turbid	Brown Green	0.7	24.4	8.16	2670		87.2	1.38	90		0.7	0.7	<0.01	<0.02	0.12	0.03	1700	0.006		8.2
		D	Turbid	Brown		23.5	8	2670		0.5	1.38	66		0.9	0.9	<0.01	<0.02	0.26	0.03	1700	0.120		7.9
	OW4	S	S.Turbid	Brown Green	1.1	24.2	8.32	3300		68	1.7	8		1.4	1.4	<0.01	0.03	0.16	0.02	2100	0.009		8.3
		D	Turbid	Brown		21.9	8.21	3350		0	1.76	66		2.2	2.2	<0.01	0.07	0.48	0.02	2100	0.024		8.1
22-Jun-23	Wangalia	-	Not measured	Not measured	0.2	12.9	7.55	437	-	61.2	0.57	100.9	10.63	2.3	1.9	0.45	< 0.02	0.05	0.29	580			8
	OW1	S	Not measured	Not measured	0.66	12.9	7.94	1068	-	42.6	0.53	91.9	9.74	1.6	1.4	0.2	0.5	0.04	0.1	540	0.01		7.7
		D	Not measured	Not measured		12.7	7.9	1063	-	28.6	0.53	75.2	7.99	3.4	3.2	0.2	0.3	0.05	0.1	540	0.004		8.0
	OW2	S	Not measured	Not measured	0.81	12.6	8	1130	-	35.5	0.56	105.3	11.21	0.9	0.6	0.3	0.4	0.04	0.1	560	0.005		7.6
		D	Not measured	Not measured		12.4	8	1131	-	34.7	0.57	104.1	11.14	1	0.7	0.3	0.27	0.05	0.06	570	0.004		8.1
	OW3	S	Not measured	Not measured	0.49	13	7.85	391	-	51.2	0.19	100.4	10.62	1.0	0.2	0.8	0.1	0.05	0.06	190	0.003		6.6
		D	Not measured	Not measured		12.8	7.84	389.5	-	51.7	0.19	99.8	10.6	1.8	1.0	0.8	< 0.02	0.11	0.06	210	0.016		8.0
	OW4	S	Not measured	Not measured	0.67	12.7	7.53	549.3	-	64.1	0.27	102	10.86	1.5	0.7	0.8	0.19	0.05	0.07	270	0.003		7.3
		D	Not measured	Not measured		12.4	7.53	577.2	-	64.9	0.28	98.9	10.6	0.9	< 0.2	0.77	0.15	0.06	0.07	270	0.003		8
20-Sep-23	Wangalia	-	Not measured	Not measured	0.15	15.6	7.67	1688	-	107.5	0.64	76.4	-	0.4	0.4	< 0.01	0.08	0.06	0.03	690			7.5
	OW1	S	Not measured	Not measured		21.4	8.19	978	1128.6	109.7	0.52	92.3	-	0.3	0.3	< 0.01	0.1	0.02	0.02	570	< 0.001		8.2
		D	Not measured	Not measured		19	8.08	957	1247.4	110.4	0.54	79.3	-	0.3	0.3	< 0.01	0.1	0.03	0.02	570	< 0.001		8.1
	OW2	S	Not measured	Not measured		21.4	8.02	819	950.4	112.2	0.43	80	-	0.4	0.4	0.04	0.1	0.02	< 0.01	460	0.001		8.1
		D	Not measured	Not measured		18.5	8	771	1029.6	113.5	0.43	80.6	-	0.3	0.3	0.03	0.36	< 0.01	< 0.01	470	< 0.001		8
	OW3	S	Not measured	Not measured		20.4	8.47	350.6	436.59	111.7	0.19	94.5	-	3.1	2.9	0.2	0.1	0.03	< 0.01	210	0.008		8.1
		D	Not measured	Not measured		18	8.05	344.6	475.2	115.1	0.19	86.1	-	2.9	2.7	0.2	0.1	0.03	0.01	210	0.019		8.0
	OW4	S	Not measured	Not measured		20.6		13	15.84	128.8	0.01	91.2	-	1.6	1.3	0.3	0.12	0.02	< 0.01	350	0.001		8.1
		D	Not measured	Not measured		18	7.83	591	801.9	110	0.33	77.8	-	1.2	0.9	0.3	0.22	< 0.01	< 0.01	350	0.005		8
19-Dec-23	Wangalia	-	Not measured	Not measured		DRY								-	-	-	-	-	-	-	-	-	-
	OW1	S	S.Turbid	Turquoise	1.5	23.4	8.64	1792	1163.5	153.1	0.81	100.3	9.43	1.2	1.2	<0.0050	<0.0050	0.061	<0.0050	1100	0.025	25	8.8
		D	S.Turbid	Turquoise		23	8.62	1797	1170	164.2	0.81	97	9.16	9.1	9.1	<0.0050	<0.0050	0.075	<0.0050	1100	0.038	38	8.8
	OW2	S	S.Turbid	Turquoise	1.3	23.8	8.3	1419	923	81.9	0.71	96.3	8.1	1	1	<0.0050	<0.0050	0.06	<0.0050	870	0.011	11	8.5
		D	S.Turbid	Turquoise		23.9	8.18	1412	916.5	65.2	0.71	99.3	8.53	1.1	1.2	<0.0050	<0.0050	0.13	<0.0050	870	0.028	28	8.4
	OW3	S	S.Turbid	Turquoise	1.6	23.9	7.64	1674	1057	150.5	0.85	93.6	-	1.1	1.1	0.045	<0.0050	0.11	<0.0050	1100	0.028	28	8.4
		D	S.Turbid	Turquoise		23.5	7.59	1687	1051	167.2	0.85	90	-	2.4	2.4	<0.0050	<0.0050	0.41	<0.0050	1100	0.046	46	8.2
	OW4	S	S.Turbid	Turquoise	0.98	22	7.98	1680	1092	75.4	0.85	81.6	7.1	1.8	1.7	0.12	0.24	0.09	<0.0050	1000	0.009	9.4	8.2
		D	S.Turbid	Turquoise		20.8	7.32	1674	1020.6	69.1	0.74	10.8	0.97	1.8	1.7	0.11	0.3	0.12	<0.0050	1000	0.013	13	8.2

Date	Location	Surface/Deep	In-situ physical parameters											Nutrients									
			Appearance	Colour	Depth	Temp	pH	EC (C)	TDS	ORP	SAL	DO	DO	TN	TKN	NOx	Ammonical-N	TP	FRP	Salinity	Chlorophyll-a	Chlorophyll-a	Lab pH
						°C		µS/cm	mg/L	mV	ppt	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/m3	
						7-8.5						90-120		1.5		0.1	0.04	0.06	0.03		0.03	0.03	
26-Mar-24	Wangalia	-	Dry		DRY									-	-	-	-	-	-	-	-	-	-
	OW1	S	Algae		~ 0.3	22.6	8.25	4362	2835	38.1	2.32	100.6	8.58	3.6	3.6	<0.0050	0.15	0.15	<0.0050	2700	0.037	37	8.5
		D				22.3	8.19	4164	2706	42.4	2.21	55.6	4.77	3.2	3.2	<0.0050	0.16	0.18	<0.0050	2700	0.051	51	8.5
	OW2	S	Algae		~ 0.3	30.3	9.41	3824	2455	33.7	2	261.4	19.61	3.8	3.8	<0.0050	0.16	0.22	<0.0050	2400	0.040	40	9.4
		D				26.6	8.17	3784	2442	30	1.95	17.8	1.78	5.6	5.6	<0.0050	0.15	0.32	<0.0050	2400	0.053	53	9.4
	OW3	S	Algae		~ 1.2	25.1	8.43	1917	1246	-25.4	0.97	126.1	10.7	1.8	1.8	<0.0050	0.13	0.12	<0.0050	1200	0.032	32	8.6
		D				21.3	8.36	1889	1228	-35.2	0.96	112.4	9.9	1.6	1.6	<0.0050	0.035	0.14	<0.0050	1200	0.083	83	8.1
	OW4	S	Algae		~ 0.7	24.6	8.75	3903	2537	54.8	2.06	125.1	10.3	3.4	3.4	<0.0050	0.15	0.21	<0.0050	2400	0.088	88	8.9
		D				23.5	8.76	3917	2538	56.3	2.06	101.7	8.65	3.9	3.9	<0.0050	0.15	0.24	<0.0050	2500	0.150	150	8.9
5-Jun-24	Wangalia	-	Not flowing																		-		
	OW1	S			0.6	18	7.73	1708	1110	207.2	0.87	83	7.89	1.4	1.2	0.2	0.07	<0.050	<0.0050	970	0.003	3.20	8.1
		D				17.3	7.59	1860	1209	208.6	0.95	37.1	3.58	1.3	1.2	0.12	0.19	<0.050	0.0069	1100	<0.001	<1.0	8
	OW2	S			0.78	18	7.62	1337	869	213.4	0.67	78.9	7.51	1.2	0.84	0.39	0.11	<0.050	0.019	820	0.002	2.10	7.8
		D				17.2	7.6	1640	1066	-40.1	0.83	19.2	1.85	1.5	1.3	0.23	0.3	0.071	0.0096	950	<0.001	<1.0	7.9
	OW3	S			0.6	18	7.67	341.6	222	119.5	0.16	92	8.78	3	1.8	1.2	0.0054	0.092	0.0067	210	0.080	80	7.8
		D				17.5	7.55	345.4	224	107.7	0.17	83.5	8.04	2.3	0.35	1.9	0.011	0.074	0.021	210	0.025	25	7.6
	OW4	S			0.72	17.4	7.54	611	397	179.1	0.3	84.4	8.14	1.3	0.7	0.58	0.08	0.067	0.023	370	0.010	9.6	7.7
		D				17.3	7.44	613	399	179.8	0.3	80.1	7.75	1.3	0.75	0.58	0.088	0.069	0.022	360	<0.001	<1.0	7.7
16-Sep-24	Wangalia	-												1.2	1.2	0.019	0.0097	<0.050	0.0071	1000	-		8.1
	OW1	S	S.Turbid	Brown	-0.3	18.6	7.95	964	715	164	0.55	91.2	8.46	1.7	1.4	0.32	0.1	<0.050	<0.0050	690	0.003	2.7	8.1
		D	S.Turbid	Brown	-1.5	17.2	7.95	953	728	151	0.56	68.2	6.48	1.7	1.3	0.32	0.15	<0.050	<0.0050	710	<0.002	1.6	8.1
	OW2	S	V.S.Turbid	Grey	-0.3	19.1	8.26	934	390	142	0.29	100.1	8.52	1.4	1.2	0.26	0.097	<0.050	<0.0050	380	0.003	2.70	8.1
		D	V.S.Turbid	Grey	-1.5	18.1	8.2	521	390	133	0.29	81.2	7.49	0.89	0.58	0.31	0.14	<0.050	0.051	380	<0.002	2.1	8.2
	OW3	S	V.S.Turbid	Grey	-0.3	20.4	9.21	655	468	145	0.36	133.6	11.84	0.85	0.57	0.28	0.022	<0.050	<0.0050	450	0.013	13	9
		D	V.S.Turbid	Grey		18.5	9.35	640	474	138	0.36	161.1	15.4	1.2	0.9	0.26	0.0073	0.077	<0.0050	460	0.081	81	9
	OW4	S	Clearish	Grey	-0.3	18.5	8.43	542	403	136	0.3	108.7	10.05	1.4	1.1	0.31	0.039	<0.050	<0.0050	390	0.002	1.6	8.2
		D	Clearish	Grey		17.5	8.4	525	396	119	0.3	96.9	9.17	0.85	0.54	0.31	0.035	<0.050	<0.0050	390	<0.002	2.1	8.2
9-Dec-24	Wangalia	-			DRY																		
	OW1	S	Clear	Clear	0.9	27.6	8.16	1523	943	32.8	0.72	90.2	7.1	0.83	0.82	0.013	0.0087	<0.050	<0.0050	940	0.006	5.9	8.5
		D	Clear	Clear	1.7	25.4	8.53	1443	935	-62	0.72	95.9	7.7	0.83	0.81	0.022	0.016	<0.050	<0.0050	940	0.036	36	8.6
	OW2	S	Clear	Clear	0.9	29	8.72	1066	645	-19.9	0.49	110.4	8.5	0.64	0.62	0.024	<0.0050	<0.050	<0.0050	640	0.004	4.3	8.8
		D	Clear	Clear	1.6	26	8.76	995	637	34.4	0.48	161.4	12.85	0.62	0.58	0.037	0.014	<0.050	<0.0050	650	0.004	3.7	8.8
	OW3	S	Clear	Clear	0.705	27.7	8.62	1559	964	46.3	0.74	122	9.74	0.54	0.44	0.099	0.0065	<0.050	<0.0050	960	0.005	5.3	8.7
		D	Clear	Clear	1.3	26.1	8.36	1469	947	8.6	0.73	145	11.9	0.54	0.45	0.092	0.010	<0.050	<0.0050	970	0.005	4.8	8.9
	OW4	S	Clear	Clear	0.83	25.8	8.85	1389	893	81.8	0.69	126	10.22	0.68	0.65	0.029	<0.0050	<0.050	<0.0050	900	0.008	8.0	9.0
		D	Clear	Clear	1.6	25.3	8.83	1348	892	97.8	0.68	140	11.2	0.72	0.71	0.0074	0.0068	0.062	<0.0050	900	0.007	6.9	9.0
	Z1		Duplicate of OW3 Shallow											0.52	0.39	0.13	<0.0050	<0.050	<0.0050	960	0.004	3.7	8.8
	Z2		Trip Blank											<0.10	<0.10	0.0063	<0.0050	<0.050	<0.0050	3.6	0.001	1.1	6.4

Date	Location	Surface/Deep	In-situ physical parameters											Nutrients									
			Appearance	Colour	Depth	Temp	pH	EC (C)	TDS	ORP	SAL	DO	DO	TN	TKN	NOx	Ammonical-N	TP	FRP	Salinity	Chlorophyll-a	Chlorophyll-a	Lab pH
						°C		µS/cm	mg/L	mV	ppt	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/m3	
							7-8.5					90-120		1.5		0.1	0.04	0.06	0.03		0.03	0.03	
9-Apr-25	OW1	S												3.5	3.5	0.0075	1.2	0.066	<0.005	1400			7.5
	OW1D	D												3.5	3.5	0.0056	1.2	0.096	0.0095	1400			12
	OW2	S												2	2	0.008	0.0084	0.15	<0.005	1200			69
	OW2D	D												2.4	2.4	<0.005	<0.005	0.17	<0.005	1200			75
	OW3	S												1.3	1.3	0.018	0.12	<0.05	<0.005	960			3.7
	OW3D	D												1.1	1.1	0.019	0.15	0.056	0.012	950			4.8
	OW4	S												0.74	0.74	<0.005	<0.005	0.071	<0.005	870			20
	OW4D	D												0.65	0.65	<0.005	<0.005	0.076	<0.005	880			25
26-Jun-25	OW1	S												1.7	1.3	0.41	0.42	<0.05	0.0059	600			7.7
	OW1D	D												1.9	1.5	0.4	0.42	<0.05	0.0059	600			7.7
	OW2	S												1.5	1.3	0.18	0.28	<0.05	0.0094	420			7.7
	OW2D	D												1.5	1.3	0.19	0.29	<0.05	0.0068	420			7.7
	OW3	S												1.6	0.79	0.83	0.086	<0.05	<0.005	290			7.7
	OW3D	D												1.5	0.66	0.82	0.084	<0.05	<0.005	<1.0			13.6
	OW4	S												1.6	0.97	0.61	0.2	<0.05	0.015	270			7.6
	OW4D	D												1.7	1.2	0.57	0.19	<0.05	0.013	280			7.6

Table D Living stream water quality results

Notes:

Guideline values (FWG) have been adopted from the following guidance documentation:
Freshwater and Marine Water Quality Guidelines Chapter 3 (ANZECC/ARMCANZ 2000)
All results expressed as mg/L except for temperature (°C), pH (pH units), EC (µS/cm), Redox (mV), DO (ppm)

Date	Location	In-situ physical parameters									
		Appearance	Colour	Temp	pH	EC (c)	TDS	ORP	DO	Flow	TN
				°C		µS/cm	mg/L	mV	%	m/s	mg/L
											1.5
13-May-22	BEL01 (US)	N.Turbid	Clear/ L.Brown	17.1	7.97	236.7	154.05	202.1	45	0.0	1
	BEL03 (GW)	N.Turbid	Clear/ L.Brown	21	7.91	343.5	223.6	204.0	115	0.1	1.1
	BEL02 (DS)	N.Turbid	Clear/ L.Brown	17.7	7.79	409.1	268.85	203.4	81	0.1	1.1
20-Jun-22	BEL01 (US)		Stagnant	16.9	7.6	313.6	204.1	102.1	68.1	0	0.7
	BEL03 (GW)	S.Tirbid	L.Brown	19.3	9.2	718	468	100	150.3	0.1	1.6
	BEL02 (DS)	S.Tirbid	L.Brown	18.8	9	739	481	119.8	139.8	0.1	1.6
26-Jul-22	BEL01 (US)	N.Turbid	Clear	15	17.9	496.2	322.4	87.6	69.9	<0.1	1
	BEL03 (GW)	Not required									
	BEL02 (DS)	N.Turbid	Clear	13	8.34	777	507	111.5	110.3	<0.1	3.0
18-Aug-22	BEL01 (US)	N.Turbid	Clear	13.2	6.71	434.8	6.3	205.3	82.5	0.1	1.5
	BEL03 (GW)	Not running									
	BEL02 (DS)	N.Turbid	Clear	15.7	76.81	481.4	76.81	218.3	12.75	0.1	1.6
25-May-23	BEL01 (US)	N.Turbid	Clear	14.4	7.4	110	-	60.8	38.4	<0.1	6
	BEL03 (GW)	Turbid	Clay/Tan	14.8	7.86	988	-	150.6	90.2	0.2	11.0
	BEL02 (DS)	Turbid	Grey/Brown	14.3	8.37	672	-	141.3	124	<0.1	4.1
23-Jun-23	BEL01 (US)	-	-	14.6	7.56	481.2	-	29.0	74.2	0.2	0.7
	BEL03 (GW)	-	-	14.4	8.99	599.3	-	48.0	172	<0.1	1.7
	BEL02 (DS)	-	-	15.9	8.28	55.21	-	38.4	138.5	<0.1	3.1
19-Jul-23	BEL01 (US)	-	-	14.6	7.75	173.1	-	79.8	62.3	0.1	1.1
	BEL03 (GW)	-	-	14.5	7.54	177.6	-	84.9	73.2	0.2	0.6
	BEL02 (DS)	-	-	14.2	7.59	198.4	-	108.8	8	0.2	0.7
	Z1										1.3
16-Aug-23	BEL01 (US)	-	Cloudy	14.6	7.46	208.1	135.85	134.1	57	0.2	1.7
	BEL03 (GW)	-	Cloudy	15.3	7.37	233.3	190.2	168.4	99	0.1	1.6
	BEL02 (DS)	-	Cloudy	15.7	7.88	248.8	161.85	175.7	118	<0.1	0.6
	Z1										1.7
	Z2										< 0.2
15-May-24	BEL01 (US)	N.Turbid	Clear	21.6	6.04	1473	963	104.7	45.9	~0.1	6.1
	BEL03 (GW)	N.Turbid	Clear	16.4	7.92	1566	1017	106.3	134.9	<0.1	3.5
	BEL02 (DS)	N.Turbid	Clear	17.5	8.85	1579	1026	75.7	144.2	<0.1	3.3
	Z1	Duplicate of BEL02 (DS)									3.1
	Z2										<0.10
6-Jun-24	BEL01 (US)	N.Turbid	Clear	18.1	6.61	1644	1068	96.9	56.7	<0.1	3.5
	BEL03 (GW)	N.Turbid	Clear	18.8	8.15	1624	1055	95.2	141.2	<0.1	7.7
	BEL02 (DS)	N.Turbid	Clear	20.2	8.79	1443	936	84.6	195.8	<0.1	7.2
	Z1	Duplicate of CO-02									
	Z2	Trip Blank									
12-Jul-24	BEL01 (US)	Turbid	Tan	15.2	7.34	390.5	254	161.9	85.7	<0.1	2
	BEL03 (GW)	Not Turbid	Clear	14.2	7.39	460.2	299	138.1	101.3	<0.1	1.6
	BEL02 (DS)	urbid, sediment se	lear, brown sedimen	13.9	7.78	526	342	113.6	80.7	<0.1	2.5
	Z1	Duplicate of BEL02 (DS)									2.9
	Z2	Trip Blank									<0.10
15-Aug-24	BEL01 (US)	N.Turbid	Clear	15.8	7.53	348.4	227.5	-107.1	74.3	<0.1	1.3
	BEL03 (GW)	N.Turbid	Clear	18.9	9.2	370.2	240.5	-94.5	130.1	0.3	1.4
	BEL02 (DS)	N.Turbid	Clear	19.1	9.42	359.8	234	92.4	128.5	<0.1	1.4
	Z1	Duplicate of BEL02 (DS)									1.1
	Z2	Trip Blank									0.13
25-Jun-25	BEL01 (US)	S.Turbid	Brown	20.5	6.56	1722	1119.3	NA	NA	<0.1	1.3
	BEL03 (GW)	S. Turbid	Pale Brown	17.5	7.43	974	633.1	NA	NA	0.1	1.9
	BEL02 (DS)	S. Turbid	Pale Brown	17.9	8.55	988	642.2	NA	NA	<0.1	1.7
	Z1	Duplicate of BEL02 (DS)									1.1
	Z2	Trip Blank									
18-Jul-25	BEL01 (US)	N.Turbid	Pale Brown	17.1	7.12	819	532.35	-122.0	NA	0.1	
	BEL03 (GW)	N.Turbid	Pale Brown	15.3	7.61	937	609.05	-111.0	NA	0.1	
	BEL02 (DS)	N.Turbid	Pale Brown	14.7	7.9	893	580.45	-118.0	NA	0.1	
	Z1	Duplicate of BEL02 (DS)									
	Z2	Trip Blank									

Table D

Date	Location	Nutrients										Alkali Metals		
		TKN	NOx	Ammonical-N	TP	FRP	Salinity	pH	Chlorophyll-a	Nitrate-N	Nitrite-N	Manganese	Magnesium (Fltered)	Aluminium (flitered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			0.1	0.04	0.06	0.03						1.9		0.055
13-May-22	BEL01 (US)	1	<0.01	<0.02	0.14	<0.01							4.5	
	BEL03 (GW)	1.1	<0.01	<0.001	0.14	<0.01							6.2	
	BEL02 (DS)	0.9	0.3	0.1	0.15	0.03							8.1	
20-Jun-22	BEL01 (US)	0.7	0.03	<0.02	0.06	<0.01							5.5	0.26
	BEL03 (GW)	0.6	1.0	<0.02	0.06	<0.01							13	1.5
	BEL02 (DS)	0.8	0.7	<0.02	0.07	<0.01							13	2.7
26-Jul-22	BEL01 (US)	0.2	0.77	<0.02	0.06	0.02							8	<0.05
	BEL03 (GW)													
	BEL02 (DS)	0.7	2.3	<0.02	0.06	<0.01							12	<0.05
18-Aug-22	BEL01 (US)	0.6	0.89	<0.02	0.11	0.01								
	BEL03 (GW)													
	BEL02 (DS)	0.6	1.0	<0.02	0.10	0.01								
25-May-23	BEL01 (US)	3.2	2.8	0.11	0.11	0.05								0.08
	BEL03 (GW)	9.1	1.9	0.1	0.35	<0.01								36
	BEL02 (DS)	4.1	<0.01	<0.02	0.17	<0.01								2.3
23-Jun-23	BEL01 (US)	< 0.2	0.67	0.05	0.06	0.09	260	7.7	< 0.001					
	BEL03 (GW)	0.8	1.0	< 0.02	0.04	0.06	310.0	8.2	0.0					
	BEL02 (DS)	2.2	0.9	< 0.02	0.05	0.07	270.0	8.2	0.0					
19-Jul-23	BEL01 (US)	0.8	0.29	0.05	0.13	0.08							2.6	0.56
	BEL03 (GW)	0.2	0.4	0.02	0.27	0.04							3.7	2.4
	BEL02 (DS)	0.4	0.3	0.03	1.80	0.04							3.6	1.8
	Z1	1.1	0.3	0.03	0.05	0.04							2.5	0.48
16-Aug-23	BEL01 (US)	0.9	0.85	0.06	0.05	< 0.01				0.85	< 0.01		4.8	0.23
	BEL03 (GW)	< 0.2	1.5	0.02	0.06	< 0.01				1.5	< 0.01		5	0.43
	BEL02 (DS)	0.3	0.3	< 0.02	0.06	0.01				0.3	< 0.01		5.3	0.26
	Z1	0.3	1.4	0.1	0.05	< 0.01				1.4	< 0.01		4.6	0.31
	Z2	< 0.2	< 0.01	< 0.02	< 0.01	< 0.01				< 0.01	< 0.01		< 0.5	< 0.05
15-May-24	BEL01 (US)	0.85	5.3	0.018	<0.050	0.022				5.3	<0.0050	0.036		<0.01
	BEL03 (GW)	0.85	2.6	0.051	0.16	0.0099				2.6	0.047	0.046		<0.01
	BEL02 (DS)	1.1	2.2	0.024	0.062	0.0091				2.2	0.083	0.0023		<0.01
	Z1	0.89	2.2	0.023	0.057	0.0082				2.1	0.085	0.0022		<0.01
	Z2	<0.10	<0.0050	<0.0050	<0.050	<0.0050				<0.0050	<0.0050	<0.001		<0.01
6-Jun-24	BEL01 (US)	1.1	2.4	0.06	0.086	0.033				2.4	0.015	0.036		<0.01
	BEL03 (GW)	2.5	5.3	0.079	0.055	0.009				5.1	0.19	0.091		<0.01
	BEL02 (DS)	2.7	4.5	0.064	0.075	0.0059				4.2	0.3	0.0081		0.011
	Z1													
	Z2													
12-Jul-24	BEL01 (US)	1.6	0.44	0.056	0.13	0.027				0.42	0.026	0.0075		0.012
	BEL03 (GW)	0.76	0.8	0.059	0.053	0.017				0.77	0.027	0.02		0.012
	BEL02 (DS)	1.1	1.4	0.053	0.24	0.01				1.4	0.051	0.016		0.017
	Z1	1.4	1.5	0.056	0.13	0.0089				1.4	0.05	0.024		0.017
	Z2	<0.10	<0.0050	<0.0050	<0.050	<0.0050				<0.0050	<0.0050	<0.001		<0.01
15-Aug-24	BEL01 (US)	0.69	0.65	<0.0050	0.073	0.049				0.64	0.015	0.0055		0.0150
	BEL03 (GW)	0.73	0.67	<0.0050	0.084	0.033				0.66	0.017	0.0076		0.0390
	BEL02 (DS)	0.78	0.66	<0.0050	0.12	0.031				0.65	0.018	0.0042		0.0520
	Z1	0.49	0.63	<0.0050	0.07	0.039				0.62	0.015	0.0055		0.0150
	Z2	0.12	0.0071	<0.0050	<0.050	0.0085				0.0066	<0.0050	<0.001		<0.01
25-Jun-25	BEL01 (US)	0.71	0.55	0.04	0.94	0.0059				0.55	0.0086	0.0430		<0.01
	BEL03 (GW)	0.78	1.1	0.058	0.096	<0.005				1.1	0.025	0.0120		<0.01
	BEL02 (DS)	0.49	1.2	0.11	<0.005	0.0071				1.2	0.019	0.0180		<0.01
	Z1	0.93	0.2	0.27	<0.05	0.0092				0.17	0.033			
	Z2													
18-Jul-25	BEL01 (US)													
	BEL03 (GW)													
	BEL02 (DS)													
	Z1													
	Z2													

Table D

Date	Location	Heavy Metals							
		Arsenic (flitered)	Cadmium (flitered)	Chromium (flitered)	Copper (filtered)	Lead (filtered)	Iron (flitered)	Nickle (flitered)	Zinc (flitered)
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		0.024	0.0002		0.0014	0.0034		0.011	0.008
13-May-22	BEL01 (US)	<0.001	<0.0001	0.001			0.33	0.001	0.013
	BEL03 (GW)	<0.001	<0.0001	0.002			0.61	0.002	0.013
	BEL02 (DS)	<0.001	<0.0001	0.002			0.66	0.001	0.010
20-Jun-22	BEL01 (US)	<0.001	<0.0001	<0.001			0.22	<0.001	0.028
	BEL03 (GW)	<0.001	<0.0001	0.002			0.56	0.001	0.008
	BEL02 (DS)	<0.001	<0.0001	0.002			0.93	0.001	0.017
26-Jul-22	BEL01 (US)	<0.001	<0.0001	0.001			0.07	<0.001	0.038
	BEL03 (GW)								
	BEL02 (DS)	<0.001	<0.0001	0.003			0.03	<0.001	0.03
18-Aug-22	BEL01 (US)	<0.001	<0.0001	<0.001	0.007	0.001		<0.001	0.042
	BEL03 (GW)								
	BEL02 (DS)	<0.001	<0.0001	<0.001	0.006	0.002		<0.001	0.024
25-May-23	BEL01 (US)	<0.001	<0.0001	<0.001			0.76	0.001	0.033
	BEL03 (GW)	0.005	0.0001	0.031			45	0.013	0.078
	BEL02 (DS)	<0.001	<0.0001	0.003			3.7	0.003	0.11
23-Jun-23	BEL01 (US)								
	BEL03 (GW)								
	BEL02 (DS)								
19-Jul-23	BEL01 (US)	< 0.001	< 0.0001	0.003			0.76	0.002	0.064
	BEL03 (GW)	< 0.001	< 0.0001	0.003			2.9	0.002	0.063
	BEL02 (DS)	< 0.001	< 0.0001	0.003			2.3	0.002	0.044
	Z1	< 0.001	< 0.0001	0.002			0.63	0.002	0.063
16-Aug-23	BEL01 (US)	< 0.001	< 0.0001	0.001			0.37	0.002	0.058
	BEL03 (GW)	< 0.001	< 0.0001	< 0.001			0.64	0.001	0.046
	BEL02 (DS)	< 0.001	< 0.0001	< 0.001			0.31	< 0.001	0.025
	Z1	< 0.001	< 0.0001	< 0.001			0.4	0.001	0.042
	Z2	< 0.001	< 0.0001	< 0.001			< 0.01	< 0.001	< 0.005
15-May-24	BEL01 (US)	< 0.001	<0.01	< 0.001			0.029	<0.001	0.024
	BEL03 (GW)	< 0.001	<0.01	< 0.001			0.034	<0.001	0.02
	BEL02 (DS)	< 0.001	<0.01	< 0.001			0.028	<0.001	0.0037
	Z1	< 0.001	<0.01	< 0.001			0.027	<0.001	0.0016
	Z2	< 0.001	<0.01	< 0.001			<0.01	<0.001	<0.001
6-Jun-24	BEL01 (US)	< 0.001	<0.01	< 0.001			0.11	0.0026	0.14
	BEL03 (GW)	< 0.001	<0.01	< 0.001			0.94	0.001	0.0089
	BEL02 (DS)	< 0.001	<0.01	< 0.001			0.022	<0.001	0.006
	Z1								
	Z2								
12-Jul-24	BEL01 (US)	<0.001	<0.0001	<0.001			0.074	0.0012	0.012
	BEL03 (GW)	<0.001	<0.0001	<0.001			0.093	<0.001	0.02
	BEL02 (DS)	<0.001	<0.0001	<0.001			0.057	<0.001	0.0034
	Z1	<0.001	<0.0001	<0.001			0.059	<0.001	0.0051
	Z2	<0.001	<0.0001	<0.001			<0.01	<0.001	<0.001
15-Aug-24	BEL01 (US)	<0.001	<0.0001	<0.001			0.0690	<0.001	0.0790
	BEL03 (GW)	<0.001	<0.0001	<0.001			0.0570	<0.001	0.0150
	BEL02 (DS)	<0.001	<0.0001	<0.001			0.1100	<0.001	0.0089
	Z1	<0.001	<0.0001	<0.001			0.0690	0.0010	0.0790
	Z2	<0.001	<0.0001	<0.001			<0.01	<0.001	<0.001
25-Jun-25	BEL01 (US)	<0.001	<0.0001	<0.001			0.0390	<0.001	0.0063
	BEL03 (GW)	<0.001	<0.0001	<0.001			<0.01	<0.001	0.0030
	BEL02 (DS)	<0.001	<0.0001	<0.001			0.0140	<0.001	0.0160
	Z1								
	Z2								
18-Jul-25	BEL01 (US)								
	BEL03 (GW)								
	BEL02 (DS)								
	Z1								
	Z2								

Appendix C: Landscape plan and irrigation schedule

ROBINSON GROVE OVERALL IRRIGATED AREAS

SATTERLEY
REFERENCE PLANS ATTACHED

2409101
REV C
07.10.2025

POS AREA / LOCATION	TYPOLOGY / CLASSIFICATION	LOT AREA M2	VERGE AREA M2 (10%)	TOTAL AREA M2	RETAINED VEGETATION M2 (non irrigated)	HARD WORKS OR NON IRRIGATED AREAS (incl drainage) M2		PERMANENT TURF IRRIGATION M2	PERMANENT TREE & SHRUB IRRIGATION M2	PERMANENT ALLOCATION kl/Ha/Yr. (@ 7500kl/ha/yr.)	COMMENTS
HOMESTEAD POS	**High Level** : Feature areas of hardstand associated with historical structures large irrigated turf areas and large trees.	3,275	328	3,603	-	685		2,335	600	1,981.13	CONSTRUCTED - HOMESTEAD TO BE REMOVED FROM BORE SYSTEM
STABLES POS	**High Level** : Feature areas of hardstand associated with historical structures large irrigated turf areas and large trees.	5,940	594	6,534	-	1,540		4,245	800	3,405.38	CONSTRUCTED - REMEDIAL WORKS REQUIRED
ENTRY STREETSCAPE	**High Level** : Feature areas of planting with large irrigated turf areas and large trees.	-	-	-	-	-		1,745	340	1,563.75	CONSTRUCTED - VERGE AREAS TO BE REMOVED FROM BORE SYSTEM
LIVING STREAM 01	**Medium Level**: Main drain, associated pathways, planting, trees and localised pockets of turf (596m2 water)	4,635	464	5,099	-	1,547		950	1,300	1,687.50	DESIGNED - documented
LIVING STREAM 02	**Medium Level**: Main drain, associated pathways, planting, trees and localised pockets of turf (1770m2 water)	9,300	930	10,230	-	2,795		2,700	2,850	4,162.50	DESIGNED - documented
LIVING STREAM 03	**Medium Level**: Main drain, associated pathways, planting, trees and localised pockets of turf (1105m2 water)	8,975	898	9,873	-	2,585		720	2,700	2,565.00	DESIGNED - documented
AMPHITHEATRE POS (WITHIN ROS BOUNDARY)	**High Level**: Mainly feature hard pavements and trees.	16,100	1,610	17,710	-	3,377		6,300	5,200	8,625.00	DESIGNED - detail design
STAGE 2 PUMP STATION POS	**Medium Level** : Existing trees	4,270	425	4,695	-	2,530		1,000	1,500	1,875.00	ALLOWANCE
WESTERN POWER EASEMENT	**Medium Level**: Existing trees, drainage swale, paths and open turf under powerlines	11,660	1,165	12,825	-	7,235		3,700	2,200	4,425.00	ALLOWANCE
Stage 7-8 ROS interface (WITHIN ROS BOUNDARY)	**High Level** ACTIVE: Local Park with playground, active irrigated turf area new shade trees, and park furniture to be provided.		-	-	400	4,163		4,600	8,800	10,050.00	ALLOWANCE
LOCAL PARK (stage 11)	**High Level** ACTIVE: Local Park with active irrigated turf area new shade trees, and park furniture to be provided.	2,540	255	2,795	-	-		1,400	2,500	2,925.00	ALLOWANCE
Stage 11-12 ROS interface (WITHIN ROS BOUNDARY)	**Medium Level**: Existing trees, drainage swale, paths and open turf.	-	-	-	-	-		650	2,800	2,587.50	ALLOWANCE
Commercial Area - Pocket Park	**High Level** : Local Park with sculpture, irrigated turf area new shade trees, and park furniture to be provided.	1,620	162	1,782	-	340		640	850	1,117.50	ALLOWANCE
PAW	**Medium Level**: pathways, planting, trees and localised pockets of P planting	545	55	600	-	140		-	460	345.00	ALLOWANCE
	SUB TOTAL	68,860	6,884	75,744	400	26,937		30,985	32,900	45,334	
OTHER											
Establishment irrigation (2yrs)	Tubestock planted areas, or small tree planting	-	-	-	-				11,345	8,508.75	

NOTES:

GWL200996 = 45000kl
ADDITIONAL TEMP GWL OF 10,000KL

EXCLUSIONS

Streetscapes to any verge areas incl Street Trees - to be included in front yard packages and house retic system

LEGEND

LANDSCAPE WORKS CONSTRUCTED TO DATE:

'STABLES POS', with retained heritage stables structure, arbor structure and associated landscaping to reflect heritage precinct.

'HOMESTEAD', original Homestead that has been refurbished and currently used as sales centre.

LS- Living stream watercourse (formalised historical open drain) feeds lake/wetland system. Associated Landscaping is approved and due for imminent construction.

OW- Open Wetlands and small area of adjacent landscaping.

PROPOSED LANDSCAPE SPACES

'STAGE 2 POS', open space contains existing trees identified for retention, adjacent water corp pump station and minor landscape works.

'AMPHITHEATRE POS', proposed open grassed sloped amphitheatre for community events, shade structures, screen planting to adjacent lots and connections to greater pathway network.

01 Pocket park opposite commercial site has proposed public art, resting areas, shade trees and small open turf area.

02 Public Access Way provides pedestrian connection.

03 Proposed works within Western Power Easement are limited to pathways, some open grass and low shrub planting. No trees proposed in easement, no rehabilitation works proposed in easement.

04 Proposed active open space with shade structures, play equipment, open turf and pathway connections.

05 Connecting open space bridging promontory provides a formal space with views between two areas of regional open space.

06 Area of retained trees and slope with low fuel rehabilitation planting.

07 Interface treatments between development and regional open space include rehabilitated batters, pathways, tree planting and in areas bio retention basins.

ROBINSON GROVE

PREPARED FOR SATTERLEY

LOCAL STRUCTURE PLAN 2: LANDSCAPE INFORMATION

OCTOBER 2025

JOB NO. 2409103

1:2500 @ A1

REV C

0 50 100 200 300 500m

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PLAN E

LANDSCAPE ARCHITECTS

LEVEL 1 278 RAILWAY PARADE WEST LEEDERVILLE 6007

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LEGEND

01 Living stream watercourse feeds lake/wetland system, (already constructed) and to be retained

02 Sedge species along waterline to provide habitat and help filter water for higher quality.

03 Circulating dual use red asphalt pathways.

04 Open turf for active or passive recreation, and provide clear sightlines into POS and low fuel buffers.

05 Shade structure with picnic seating and in locations play equipment. Locations provide focal meeting node and themes to reflect the sites heritage.

06 Maintenance or DFES access.

07 Proposed bio filtration drainage basins as per LWMS.

08 Pedestrian Footbridges provide further access for walking/bike riding routes.

09 Existing trees & vegetation to be retained. Weed removal and fuel management with low fuel rehab planting where required.

10 Pedestrian footpaths located at road level to provide views over the regional open space.

11 Helena River and associated existing trees and vegetation to be maintained. Refer to foreshore management plan for details.

12 Street trees to provide shady streets, consistent with approved street tree masterplan species. Spacing of trees subject to bush fire management requirements.

13 Rehabilitation planting with native, resilient and low bush fire threat species. Revegetation to areas where earthworking is required to soften slopes, which vary from 1:4 to 1:6 gradient. Refer Foreshore Management Plan for details.

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LEGEND

- Existing Approved Structure Plan Boundary
- Regional Open Space boundary
- Existing Helena River Water Way - to be managed by DBCA/Swan River Trust
- OW — Existing open wetlands (with LWMS No.)
- Existing natural depressions that seasonally hold water.
- X — Proposed seasonal wetlands, bio retention or wetland associated drainage system with native sedge planting to assist with nutrient stripping, (with UWMP catchment No).
- Helena River & associated vegetation, assume class A forest, all trees and native vegetation to be retained with weed treatment undertaken where required.
- Existing trees surveyed and identified for retention.
- L-S — Existing Living Stream, constant water flow with rock riffles and culverts already constructed. Additional native sedge planting to be installed to assist with nutrient stripping.

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BILLARDIA FUSIFORMIS

DAMPIERA LINEARIS

FICINIA NODOSA

LEPIDOSPERMA SQUAMATUM

CENTELLATA ASIATICA

JUNCUS CAESPITICIUS

LEPIDOSPERMA LATERITA

LOMANDRA SERICEA

ALLOCASUARINA FRASERIANA

EUCALYPTUS RUDIS

EUCALYPTUS CAMALDULENSIS

MELALEUCA QUINQUINERVIA

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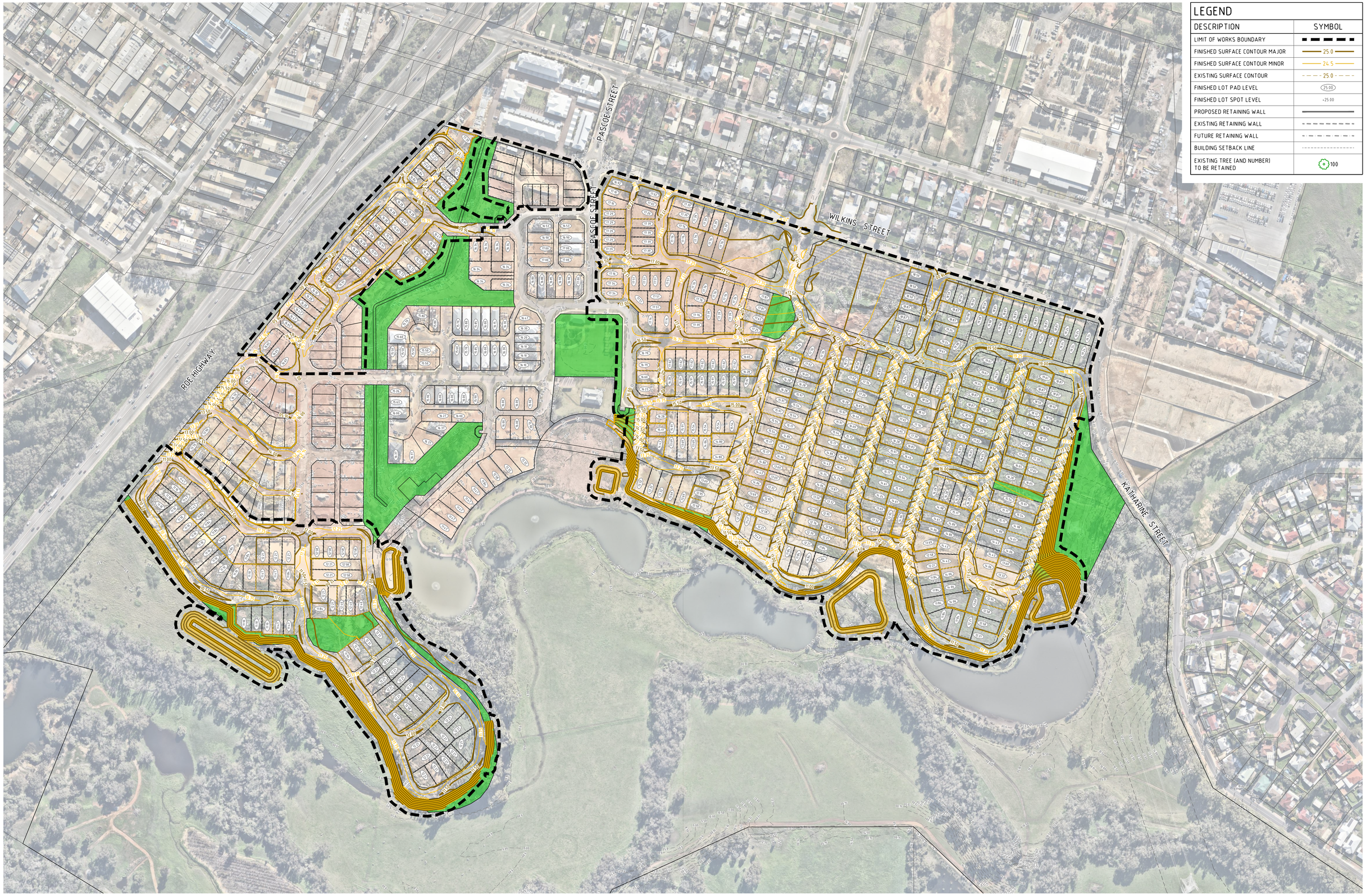
Appendix D: Engineering plans



LEGEND

DESCRIPTION	SYMBOL
LIMIT OF WORKS BOUNDARY	
FINISHED SURFACE CONTOUR MAJOR	25.0
FINISHED SURFACE CONTOUR MINOR	24.5
EXISTING SURFACE CONTOUR	25.0
FINISHED LOT PAD LEVEL	25.00
FINISHED LOT SPOT LEVEL	+25.00
PROPOSED RETAINING WALL	
EXISTING RETAINING WALL	
FUTURE RETAINING WALL	
BUILDING SETBACK LINE	
EXISTING TREE (AND NUMBER) TO BE RETAINED	100

REV	DATE	DRN	CKD	APP	AMENDMENT
E	31.10.25	JAE	-	TT	ISSUED FOR INFORMATION
D	24.06.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION
C	29.05.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION
B	25.04.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION
A	13.02.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION

N

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1:2000

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COSSILL & WEBLEY
CONSULTING ENGINEERS

Mailing Address
PO Box 680
Subiaco WA 6904

Street Address
Level 1, 502 Hay Street
Subiaco WA 6008

T (08) 9422 5800
E perth.reception@cosweb.com.au

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SATTERLEY

APPROVED
THEO THAM

DESIGNED
JAE

SCALE
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PROJECT
ROBINSON GROVE ESTATE - STRATEGIES

TITLE
EARTHWORKS STRATEGY - PLAN
SHEET 1 OF 1

WAPC No.
-

DRAWING No.
6535-ST-200

REVISION
E

ORIGINAL SIZE
A1

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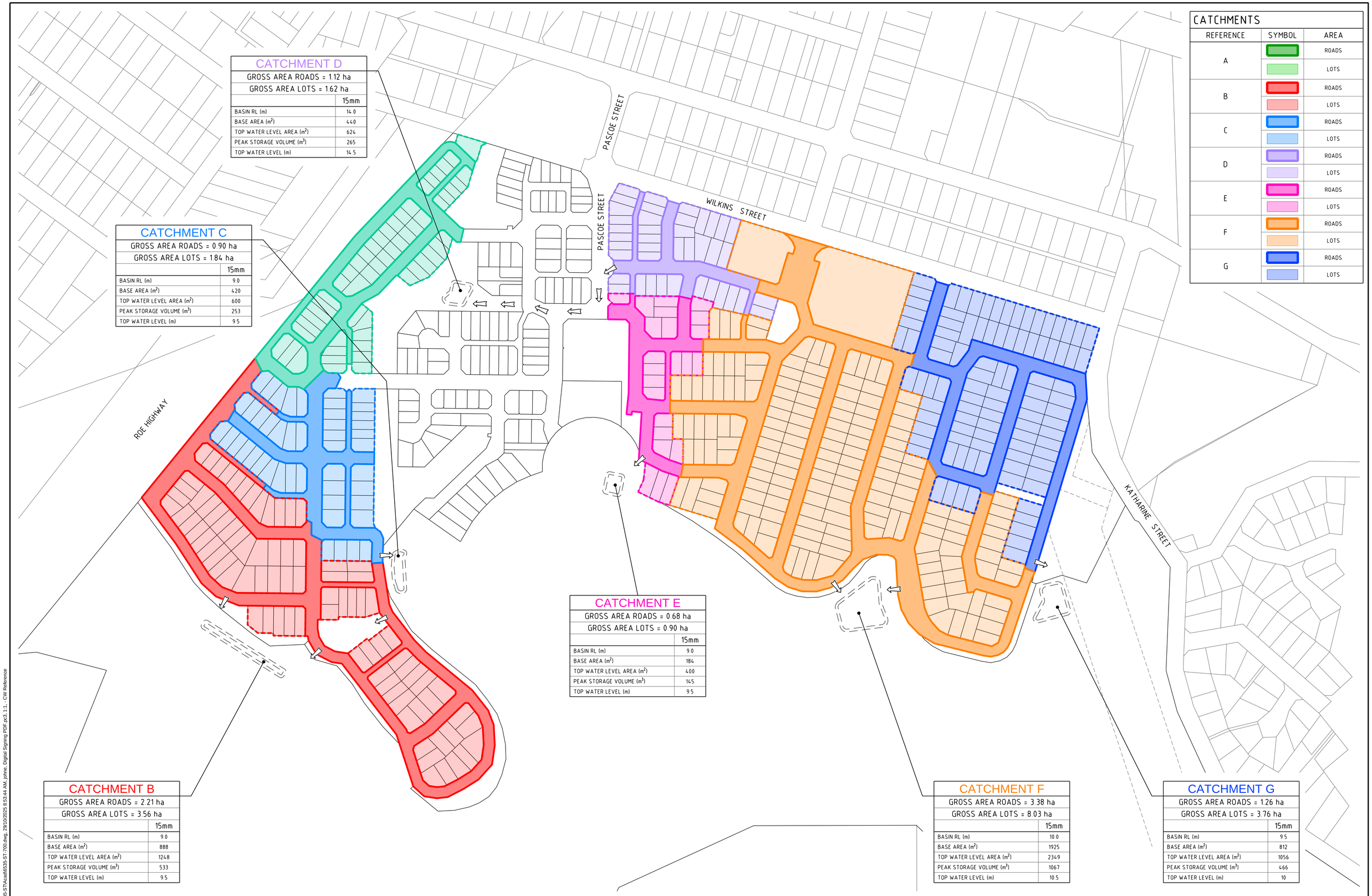

CATCHMENTS

REFERENCE	SYMBOL	AREA
A		ROADS
		LOTS
B		ROADS
		LOTS
C		ROADS
		LOTS
D		ROADS
		LOTS
E		ROADS
		LOTS
F		ROADS
		LOTS
G		ROADS
		LOTS

CATCHMENT D

GROSS AREA ROADS = 1.12 ha
GROSS AREA LOTS = 1.62 ha

	15mm
BASIN RL (m)	14.0
BASE AREA (m^2)	440
TOP WATER LEVEL AREA (m^2)	624
PEAK STORAGE VOLUME (m^3)	265
TOP WATER LEVEL (m)	14.5

CATCHMENT C

GROSS AREA ROADS = 0.90 ha
GROSS AREA LOTS = 1.84 ha

	15mm
BASIN RL (m)	9.0
BASE AREA (m^2)	420
TOP WATER LEVEL AREA (m^2)	600
PEAK STORAGE VOLUME (m^3)	253
TOP WATER LEVEL (m)	9.5

CATCHMENT E

GROSS AREA ROADS = 0.68 ha
GROSS AREA LOTS = 0.90 ha

	15mm
BASIN RL (m)	9.0
BASE AREA (m^2)	184
TOP WATER LEVEL AREA (m^2)	400
PEAK STORAGE VOLUME (m^3)	145
TOP WATER LEVEL (m)	9.5

CATCHMENT B

GROSS AREA ROADS = 2.21 ha
GROSS AREA LOTS = 3.56 ha

	15mm
BASIN RL (m)	9.0
BASE AREA (m^2)	888
TOP WATER LEVEL AREA (m^2)	1248
PEAK STORAGE VOLUME (m^3)	533
TOP WATER LEVEL (m)	9.5

CATCHMENT F

GROSS AREA ROADS = 3.38 ha
GROSS AREA LOTS = 8.03 ha

	15mm
BASIN RL (m)	10.0
BASE AREA (m^2)	1925
TOP WATER LEVEL AREA (m^2)	2349
PEAK STORAGE VOLUME (m^3)	1067
TOP WATER LEVEL (m)	10.5

CATCHMENT G

GROSS AREA ROADS = 1.26 ha
GROSS AREA LOTS = 3.76 ha

	15mm
BASIN RL (m)	9.5
BASE AREA (m^2)	812
TOP WATER LEVEL AREA (m^2)	1056
PEAK STORAGE VOLUME (m^3)	466
TOP WATER LEVEL (m)	10

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F	29.10.25	JAE	-	TT	ISSUED FOR INFORMATION
E	14.10.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION
D	23.06.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION
C	24.04.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION
B	26.03.25	JAE	TT	T. THAM	ISSUED FOR INFORMATION

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Mailing Address
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Subiaco WA 6904

Street Address
Level 1, 502 Hay Street
Subiaco WA 6008

T (08) 9422 5800
E perth.reception@cosweb.com.au

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DESIGNED: JAE

SCALE: 1:2000

PROJECT: ROBINSON GROVE ESTATE - STRATEGIES

TITLE: DRAINAGE STRATEGY - PLAN
SHEET 1 OF 1

WAPC No. -

DRAWING No. 6535-ST-700

REVISION F

ORIGINAL SIZE A1

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