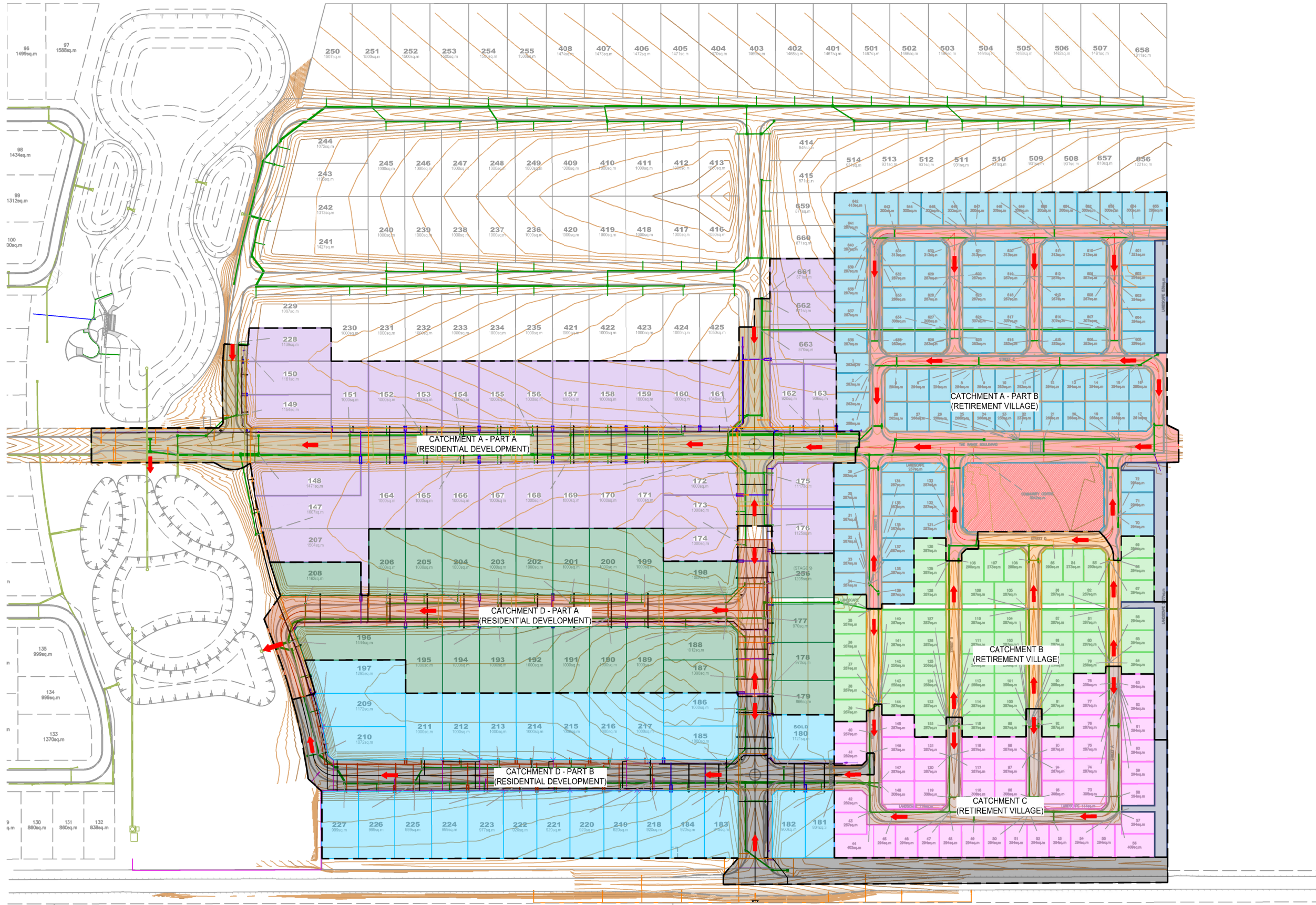


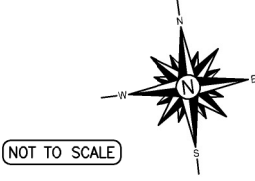
FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 01_Overall
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetirementVillageUpdate



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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23

WARNING
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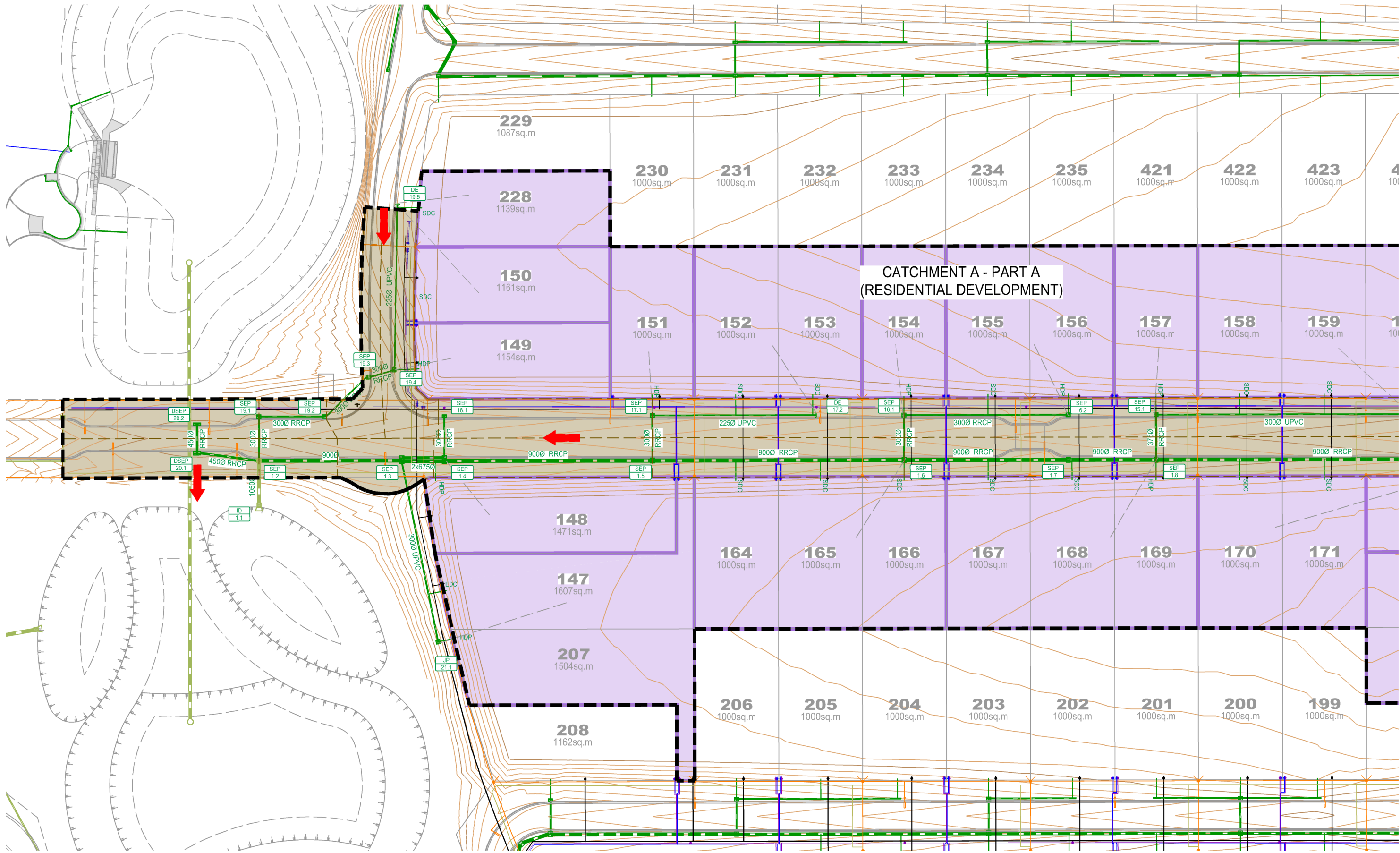
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OF ALL UNDERGROUND SERVICES

DESIGN BY: DSJ	DRAWN BY: DSJ	CHECKED BY:	PLOT DATE: 30/10/2024
			

THE RANGE - MOAMA STAGE 6-7-8 DRAINAGE CALCULATIONS OVERALL CATCHMENT			
DWG:1188_DRAINAGE.dwg	SHEET: 1 OF 23	SHEET SIZE: A1	REV: 2



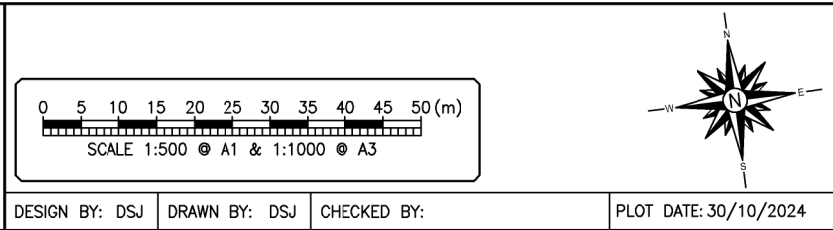
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FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetirementVillageUpdate



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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS - UPDATED - RETIREMENT VILLAGE	DSJ	14/11/23

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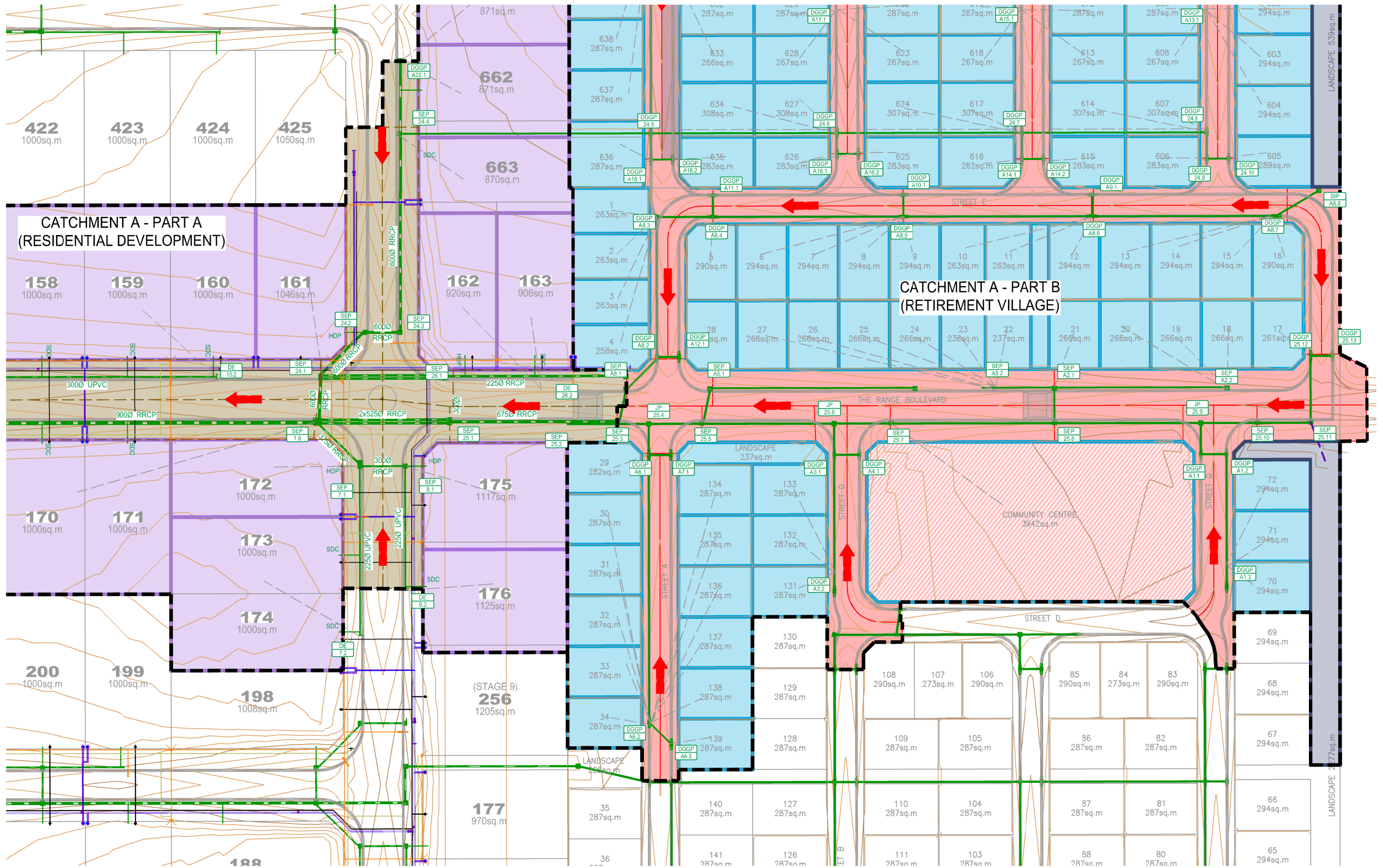
THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATCHMENT DETAIL - CATCHMENT A

DESIGN BY: DSJ DRAWN BY: DSJ CHECKED BY: PLOT DATE: 30/10/2024

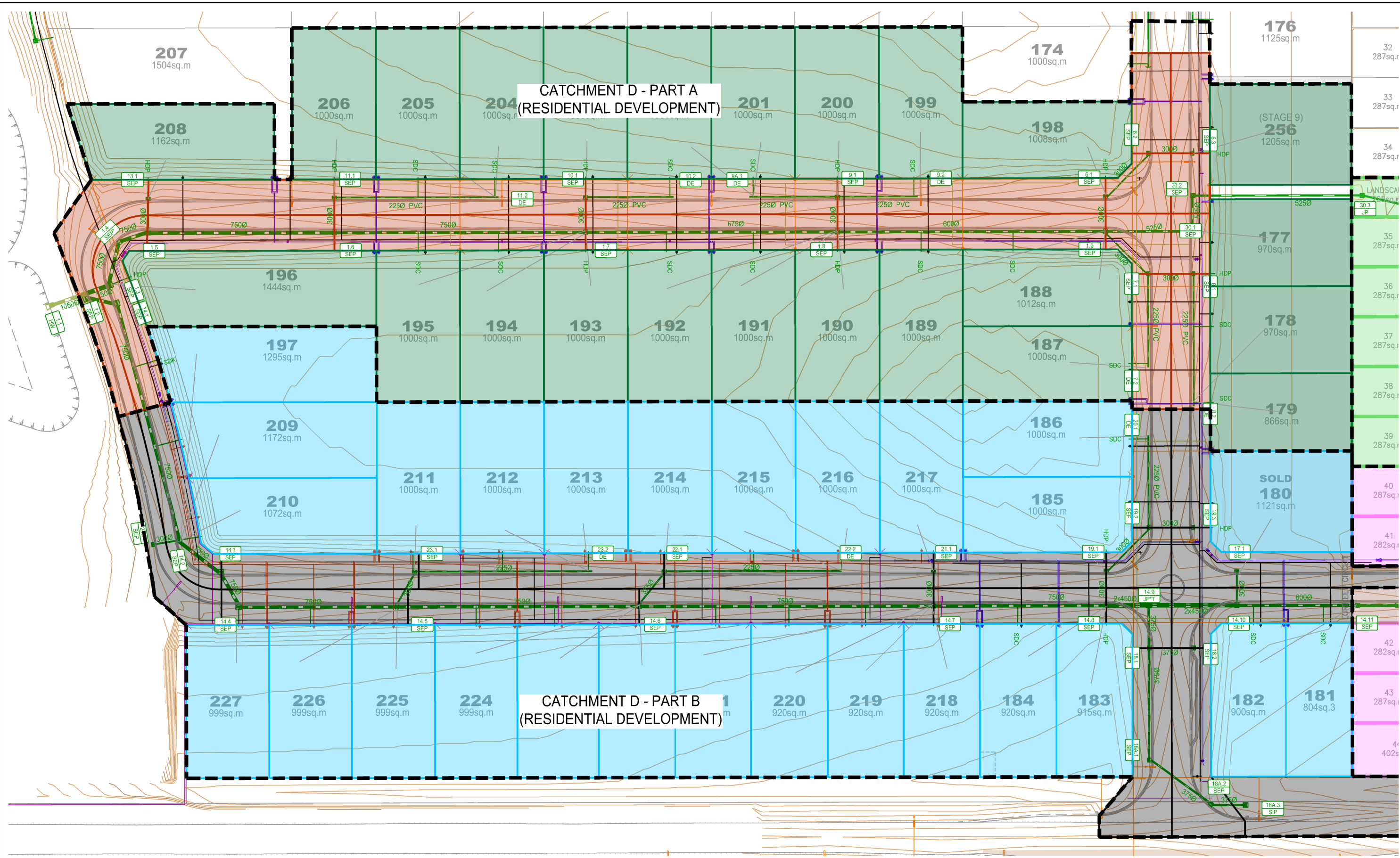
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FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 04
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetirementVillageUpdate



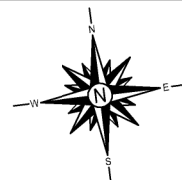
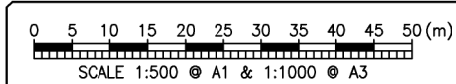
FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 05_Catchment-B
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetirementVillageUpdate



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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS - UPDATED - RETIREMENT VILLAGE	DSJ	14/11/23

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PLOT DATE: 30/10/2024

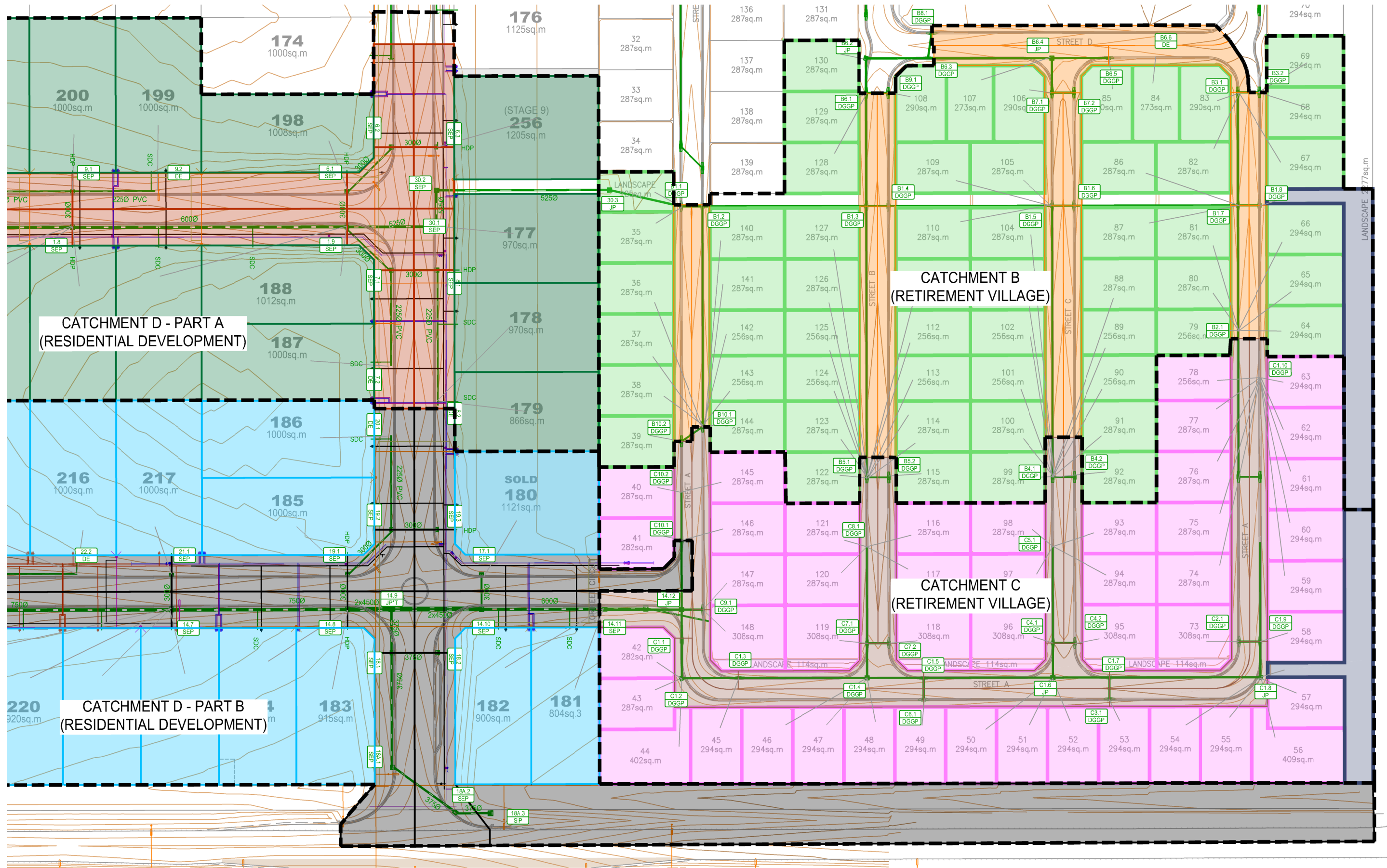
THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATCHMENT DETAIL - CATCHMENT A

DWG:1188_DRAINAGE.dwg

SHEET: 5 OF 23 SHEET SIZE: A1 REV: 2



FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 06
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetirementVillageUpdate

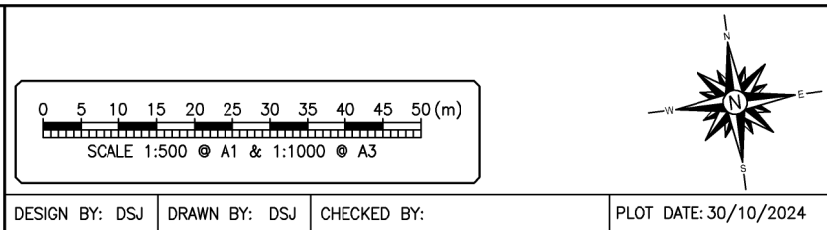


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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS - UPDATED - RETIREMENT VILLAGE	DSJ	14/11/23

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THE RANGE - MOAMA STAGE 6-7-8 DRAINAGE CALCULATIONS CATCHMENT DETAIL - CATCHMENT A			
DESIGN BY: DSJ	DRAWN BY: DSJ	CHECKED BY:	PLOT DATE: 30/10/2024
DWG:1188_DRAINAGE.dwg	SHEET: 6	OF 23	SHEET SIZE: A1
			REV: 2



DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE													
						PROJECT LOCATION								MOAMA - NSW													
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)													
						CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS		
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CATCHMENT AREA (TOTAL)	CATCHMENT AREA (SUB-CATCHMENT)	FRACTION IMPERVIOUS	OVERLAND FLOW LENGTH	OVERLAND FLOW SLOPE	OVERLAND FLOW ROUGHNESS	OVERLAND FLOW TIME (Tc)	GUTTER LENGTH	GUTTER SLOPE	GUTTER FLOW TIME (Tc)	PIT TIME OF CONCENTRATION (Tc)	PIT SPECIFIED INFLOW	RUNOFF COEFFICIENT	PIT EFFECTIVE AREA (CA)	RAINFALL INTENSITY (I)	TOTAL CATCHMENT FLOW	FLOW TO PIPE	(OVERLAND) FLOW TO PIT INLET	(OVERLAND) BYPASS FLOW RECEIVED	(OVERLAND) COMBINED FLOW TO PIT INLET	(OVERLAND) ACCEPTED PIT INFLOW	(OVERLAND) PIT BYPASS FLOW	GUTTER FLOW WIDTH	GUTTER FLOW DEPTH	
P20	P18	C09	(Ha)	(Ha)	(f)	(m)	(%)	(n)	(min)	(m)	(%)	(min)	P12	(l/s)	(C10)	(Ha)	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(m)	(m)		
DRAINAGE CATCHMENT A																											
1.2	SEP	RoadReserve	0.024	0.024	0.85				6.00				6.00		0.790	0.019	103.22	5.44		5.44		5.44	5.44				
1.3	SEP	RoadReserve	0.037	0.037	0.85				6.00				6.00		0.790	0.029	103.22	8.38		8.38		8.38	8.38				
1.4	SEP		0.215		0.56								6.00		0.560		103.22	34.79	19.39	15.40		15.40	15.40				
		RoadReserve		0.068	0.85				6.00						0.790	0.054											
		LargeLots		0.147	0.42				6.00						0.460	0.068											
1.5	SEP	RoadReserve	0.078	0.078	0.85				6.00				6.00		0.790	0.062	103.22	17.67		17.67		17.67	17.67				
1.6	SEP		0.378		0.51								6.00		0.530		103.22	57.24	39.57	17.67		17.67	17.67				
		LargeLots		0.300	0.42				6.00						0.460	0.138											
		RoadReserve		0.078	0.85				6.00						0.790	0.062											
1.7	SEP		0.000														103.22					0.00					
1.8	SEP		0.409		0.53								6.00		0.550		103.22	64.26	39.57	24.69		24.69	24.69				
		LargeLots		0.300	0.42				6.00						0.460	0.138											
		RoadReserve		0.109	0.85				6.00						0.790	0.086											
1.9	SEP	LargeLots	0.200	0.200	0.42				6.00				6.00		0.460	0.092	103.22	26.38	26.38			0.00					
25.1	SEP	RoadReserve	0.046	0.046	0.85				5.00	46.090	0.300	0.51	6.00		0.790	0.036	103.22	10.46		10.46		10.46	10.46				
25.2	SEP		0.000														103.22					0.00			0.16	0.02	
25.3	SEP	RoadReserve	0.027	0.027	0.85				5.00	23.400	0.300	0.26	6.00		0.790	0.021	103.22	6.14		6.14		6.14	6.14			0.74	0.05
25.4	JP		0.000														103.22					0.00	0.00				
25.5	SEP	RoadReserve	0.031	0.031	0.85				5.00	31.110	0.250	0.35	6.00		0.790	0.025	103.22	7.05		7.05		7.05	7.05			0.74	0.05
25.6	JP		0.000														103.22					0.00	0.00				
25.7	SEP		0.439		0.85								6.05		0.790		102.97	99.57	89.36	10.21		10.21	10.21			1.00	0.06
		RoadReserve		0.045	0.85				5.00	45.190	0.300	0.50			0.790	0.036											
		Centre		0.394	0.85				5.00	94.390	1.060	1.05			0.790	0.312											
25.8	SEP	RoadReserve	0.035	0.035	0.85				5.00	35.380	0.300	0.39	6.00		0.790	0.028	103.22	7.96		7.96		7.96	7.96			0.91	0.06
25.9	JP		0.000														103.22					0.00	0.00				
25.10	SEP	RoadReserve	0.030	0.030	0.85				5.00	30.120	0.230	0.33	6.00		0.790	0.024	103.22	6.82		6.82		6.82	6.82			0.74	0.05
25.11	SEP	LandscapeArea	0.082	0.082	0.57				5.00				6.00		0.590	0.049	103.22	13.97	13.97	0.00		0.00	0.00			0.16	0.02
25.12	DGGP		0.047		0.78								6.00		0.730		103.22	9.84	5.07	4.77		4.77	4.77			0.24	0.03
		RoadReserve		0.021	0.85				5.00	41.420	1.130	0.46			0.790	0.017											
		VillageLots		0.026	0.72				6.00						0.680	0.018											
25.13	DGGP	RoadReserve	0.030	0.030	0.85				5.00	51.870	0.990	0.58	6.00		0.790	0.024	103.22	6.82		6.82		6.82	6.82			0.28	0.04
7.1	SEP		0.166		0.59								6.00		0.590		103.22	28.20	13.19	15.01		15.01	15.01				
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		RoadReserve		0.066	0.85				5.00	33.560	0.500	0.37			0.790	0.052											
7.2	DE	LargeLots	0.200	0.200	0.42				6.00				6.00		0.460	0.092	103.22	26.38	26.38			0.00					
8.1	SEP		0.181		0.57								6.00		0.600		103.22	30.98	16.20	14.78		14.78	14.78				
		RoadReserve		0.065	0.85				5.00	33.560	0.500	0.37			0.790	0.052											
		LargeLots		0.116	0.42				6.00						0.490	0.056											
8.2	DE	LargeLots	0.113	0.113	0.42				6.00				6.00		0.490	0.055	103.22	15.78	15.78			0.00				0.16	0.02
26.1	SEP	RoadReserve	0.048	0.048	0.85				5.00	47.800	0.300	0.53	6.00		0.790	0.038	103.22	10.91		10.91		10.91	10.91			1.01	0.06
26.2	DE		0.183		0.42								6.00		0.490		103.22	25.55	25.55	0.00		0.00	0.00			0.14	0.02
		LargeLots		0.091	0.42				6.00						0.490	0.044											
		LargeLots		0.092	0.42				6.00						0.490	0.045											
24.1	SEP	LargeLots	0.105	0.105	0.42				6.00				6.00		0.490	0.051	103.22	14.66	14.66			0.00					
24.2	SEP	RoadReserve	0.084	0.084	0.85				5.00	56.440	0.680	0.63	6.00		0.790	0.067	103.22	19.10		19.10		19.10	19.10				
24.3	SEP	RoadReserve	0.085	0.085	0.85				5.00	56.440	0.680	0.63	6.00		0.790	0.067	103.22	19.33		19.33		19.33	19.33				

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 07_Catchments
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24	
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23	

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DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 7 OF 23

SHEET SIZE: A1

REV: 2

db

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Ph 0478 022 556, stuart@developmentoutcomes.com.au, www.developmentoutcomes.com.au

DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE															
						PROJECT LOCATION								MOAMA - NSW															
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)															
						CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS				
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CACHTMENT AREA (TOTAL) (Ha)	CATCHMENT AREA (SUB-CATCHMENT) (Ha)	FRACTION IMPERVIOUS (f)	OVERLAND FLOW LENGTH (m) C05	OVERLAND FLOW SLOPE (%) C06	OVERLAND FLOW ROUGHNESS (n) C07	OVERLAND FLOW TIME (Tc) (min) C04	GUTTER LENGTH (m) G01	GUTTER SLOPE (%) G02	GUTTER FLOW TIME (Tc) (min) G03	PIT TIME OF CONCERNTRATION (Tc) (min) P12	PIT SPECIFIED INFLOW (l/s) P07	RUNOFF COEFFICIENT (C10) P02	PIT EFFECTIVE AREA (CA) (Ha) P04	RAINFALL INTENSITY (I) (mm/hr) P14	TOTAL CATCHMENT FLOW (l/s) T01	FLOW TO PIPE (l/s) T02	(OVERLAND) FLOW TO PIT INLET (l/s) T03	(OVERLAND) BYPASS FLOW RECEIVED (l/s) BO6	(OVERLAND) COMBINED FLOW TO PIT INLET (l/s)	(OVERLAND) ACCEPTED PIT INFLOW (l/s) P11	(OVERLAND) PIT BYPASS FLOW (l/s) B04	GUTTER FLOW WIDTH (m) P17	GUTTER FLOW DEPTH (m) P16			
P20	P18	C09		P03	C08	C05	C06	C07	C04	G01	G02	G03	P12	P07	P02	P04	P14	T01	T02	T03	BO6		P11	B04	P17	P16			
24.4	SEP	LargeLots	0.087	0.087	0.42	6.00								6.00	0.490		0.042	103.22	12.15	12.15		0.00		0.00	0.16		0.02		
24.5	DGGP		0.000															103.22				0.00		0.00	0.11		0.02		
24.6	DGGP		0.062		0.72									6.00	0.680			103.22	12.09	12.09		0.00		0.00	0.11		0.02		
		VillageLots		0.031	0.72	6.00									0.680		0.021												
		VillageLots		0.031	0.72	6.00									0.680		0.021												
24.7	DGGP		0.062		0.72									6.00	0.680			103.22	12.09	12.09		0.00		0.00	0.11		0.02		
		VillageLots		0.031	0.72	6.00									0.680		0.021												
		VillageLots		0.031	0.72	6.00									0.680		0.021												
24.8	DGGP		0.062		0.72									6.00	0.680			103.22	12.09	12.09		0.00		0.00	0.11		0.02		
		VillageLots		0.031	0.72	6.00									0.680		0.021												
		VillageLots		0.031	0.72	6.00									0.680		0.021												
24.9	DGGP		0.061		0.79									6.00	0.740			103.22	12.96	5.46		7.50	7.50		7.50	0.61		0.06	
		RoadReserve		0.033	0.85	5.00								64.140	0.590	0.71		0.790		0.026									
		VillageLots		0.028	0.72	6.00									0.680		0.019												
24.10	DGGP		0.067		0.79									6.00	0.740			103.22	14.29	5.65		8.64	8.64		8.64	1.45		0.07	
		RoadReserve		0.038	0.85	5.00								71.640	0.680	0.80		0.790		0.030									
		VillageLots		0.029	0.72	6.00									0.680		0.020												
15.1	SEP		0.210		0.65									6.00	0.630			103.22	38.11	13.19		24.92	24.92		24.92				
		LargeLots		0.100	0.42	6.00									0.460		0.046												
		RoadReserve		0.110	0.85	6.00									0.790		0.087												
15.2	DE	LargeLots	0.300	0.300	0.42	6.00								6.00	0.460		0.138	103.22	39.57	39.57		0.00	0.00		0.00				
16.1	SEP		0.178		0.61									6.00	0.600			103.22	30.86	13.19		17.67	17.67		17.67				
		RoadReserve		0.078	0.85	6.00									0.790		0.062												
		LargeLots		0.100	0.42	6.00									0.460		0.046												
16.2	SEP	LargeLots	0.200	0.200	0.42	6.00								6.00	0.460		0.092	103.22	26.38	26.38			0.00		0.00				
17.1	SEP		0.178		0.61									6.00	0.600			103.22	30.86	13.19		17.67	17.67		17.67				
		RoadReserve		0.078	0.85	6.00									0.790		0.062												
		LargeLots		0.100	0.42	6.00									0.460		0.046												
17.2	DE	LargeLots	0.200	0.200	0.42	6.00								6.00	0.460		0.092	103.22	26.38			26.38	26.38		26.38				
18.1	SEP	RoadReserve	0.066	0.066	0.85	6.00								6.00	0.790		0.052	103.22	14.95			14.95	14.95		14.95				
19.1	SEP	RoadReserve	0.022	0.022	0.85	6.00								6.00	0.790		0.017	103.22	4.98			4.98	4.98		4.98				
19.2	SEP		0.000															103.22					0.00		0.00				
19.3	SEP	RoadReserve	0.049	0.049	0.85	6.00								6.00	0.790		0.039	103.22	11.10			11.10	11.10		11.10				
19.4	SEP		0.190		0.59									6.00	0.590			103.22	32.16	15.17		16.99	16.99		16.99				
		RoadReserve		0.075	0.85	6.00									0.790		0.059												
		LargeLots		0.115	0.42	6.00									0.460		0.053												
19.5	DE		0.230		0.42									6.00	0.470			103.22	31.22	31.22			0.00		0.00	3.00		0.02	
		LargeLots		0.116	0.42	6.00									0.460		0.053												
		LargeLots		0.114	0.42	6.00									0.490		0.056												
20.1	DSEP	RoadReserve	0.060	0.060	0.85	6.00								6.00	0.790		0.047	103.22	13.59			13.59	13.59		13.59				
20.2	DSEP	RoadReserve	0.060	0.060	0.85	6.00								6.00	0.790		0.047	103.22	13.59			13.59	13.59		13.59				
21.1	JP	LargeLots	0.312	0.312	0.42	6.00								6.00	0.460		0.144	103.22	41.15	41.15			0.00		0.00				
A1.1	DGGP	RoadReserve	0.035	0.035	0.85	5.00								43.150	0.680	0.48	6.00	0.790		0.028	103.22	7.96			7.96	7.96	1.80		0.09
A1.2	DGGP	RoadReserve	0.049	0.049	0.85	5.00								59.340	0.610	0.66	6.00	0.790		0.039	103.22	11.14			11.14	11.14	1.09		0.07
A1.3	DGGP		0.087		0.72									6.00	0.680			103.22	16.96	16.96			0.00		0.00	0.16		0.02	
		VillageLots		0.029	0.72	6.00									0.680		0.020												
		VillageLots		0.029	0.72	6.00									0.680		0.020												

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 08
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23

WARNING

BEWARE OF UNDERGROUND SERVICES
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OF ALL UNDERGROUND SERVICES

DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 8 OF 23

SHEET SIZE: A1

REV: 2

db

DEVELOPMENT
OUTCOMES

DEVELOPMENT OUTCOMES PTY LTD, PO BOX 640, WODONGA, VIC, 3689, ABN 32 164 621 005
Ph 0478 022 556, stuart@developmentoutcomes.com.au, www.developmentoutcomes.com.au

DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE														
						PROJECT LOCATION								MOAMA - NSW														
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)														
						CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS			
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CATCHMENT AREA (TOTAL) (Ha)	CATCHMENT AREA (SUB-CATCHMENT) (Ha)	FRACTION IMPERVIOUS (f)	OVERLAND FLOW LENGTH (m) C05	OVERLAND FLOW SLOPE (%) C06	OVERLAND FLOW ROUGHNESS (n) C07	OVERLAND FLOW TIME (Tc) (min) C04	GUTTER LENGTH (m) G01	GUTTER SLOPE (%) G02	GUTTER FLOW TIME (Tc) (min) G03	PIT TIME OF CONCERNTRATION (Tc) (min) P12	PIT SPECIFIED INFLOW (l/s) P07	RUNOFF COEFFICIENT (C10) P02	PIT EFFECTIVE AREA (CA) (Ha) P04	RAINFALL INTENSITY (I) (mm/hr) P14	TOTAL CATCHMENT FLOW (l/s) T01	FLOW TO PIPE (l/s) T02	(OVERLAND) FLOW TO PIT INLET (l/s) T03	(OVERLAND) BYPASS FLOW RECEIVED (l/s) BO6	(OVERLAND) COMBINED FLOW TO PIT INLET (l/s) P11	(OVERLAND) ACCEPTED PIT INFLOW (l/s) B04	GUTTER FLOW WIDTH (m) P17	GUTTER FLOW DEPTH (m) P16			
P20	P18	C09		P03	C08	C05	C06	C07	C04	G01	G02	G03	P12	P07	P02	P04	P14	T01	T02	T03	BO6	P11	B04	P17	P16			
A2.1	SEP	VillageLots	0.119	0.029	0.72	6.00								6.00	0.680		0.020		103.22	26.18	5.26	20.92	0.00	20.92	20.92	1.56	0.08	
		RoadReserve		0.092	0.85	5.00								85.880	0.300	0.95		0.790	0.073									
		VillageLots		0.027	0.72	6.00												0.680	0.018									
A2.2	SEP	VillageLots	0.081		0.72									6.00	6.00	0.680			103.22	15.79	15.79	0.00		0.00	0.00	0.14	0.02	
		VillageLots		0.027	0.72	6.00												0.680	0.018									
		VillageLots		0.027	0.72	6.00												0.680	0.018									
A3.1	DGGP	RoadReserve	0.058	0.058	0.85	5.00								59.360	0.460	0.66	6.00	0.790	0.046	103.22	13.19		13.19		13.19		1.43	0.08
A3.2	DGGP		0.087		0.72	6.00											6.00	0.680		103.22	16.96	16.96			0.00	0.00	0.16	0.02
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
A4.1	DGGP	RoadReserve	0.043	0.043	0.85	5.00								50.340	0.450	0.56	6.00	0.790	0.034	103.22	9.78		9.78		9.78		1.66	0.08
A5.1	SEP	RoadReserve	0.094	0.094	0.85	5.00								93.990	0.300	1.04	6.04	0.790	0.075	102.99	21.33		21.33		21.33		1.56	0.08
A5.2	SEP		0.156		0.72									6.00				0.680		103.22	30.42	30.42			0.00	0.00	0.14	0.02
		VillageLots		0.024	0.72	6.00												0.680	0.016									
		VillageLots		0.024	0.72	6.00												0.680	0.016									
		VillageLots		0.027	0.72	6.00												0.680	0.018									
		VillageLots		0.027	0.72	6.00												0.680	0.018									
		VillageLots		0.027	0.72	6.00												0.680	0.018									
		VillageLots		0.027	0.72	6.00												0.680	0.018									
A6.1	DGGP	VillageLots	0.028	0.028	0.72	6.00								6.00				0.680	0.019	103.22	5.46	5.46			0.00	0.00	0.08	0.01
A6.2	DGGP		0.290		0.72									6.00				0.680		103.22	56.54	56.54			0.00	0.00	0.16	0.02
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
A6.3	DGGP	VillageLots	0.029	0.029	0.72	6.00								6.00				0.680	0.020	103.22	5.65	5.65	0.00		0.00	0.00	0.11	0.02
A7.1	DGGP		0.000																	103.22				0.00	0.00		0.11	0.02
A8.1	SEP	RoadReserve	0.028	0.028	0.85	5.00								23.730	0.300	0.26	6.00	0.790	0.022	103.22	6.37		6.37		6.37	6.37	0.70	0.05
A8.2	DGGP	RoadReserve	0.040	0.040	0.85	5.00								55.000	0.540	0.61	6.00	0.790	0.032	103.22	9.10		9.10		9.10	9.10	0.42	0.04
A8.3	JP		0.104		0.72									6.00				0.680		103.22	20.28	20.28	0.00		0.00	0.00		
		VillageLots		0.026	0.72	6.00												0.680	0.018									
		VillageLots		0.026	0.72	6.00												0.680	0.018									
		VillageLots		0.026	0.72	6.00												0.680	0.018									
A8.4	DGGP	VillageLots	0.055	0.026	0.72	6.00								6.00				0.730		103.22	11.57	5.65	5.91		5.91	5.91	0.56	0.05
		RoadReserve		0.026	0.85	5.00								52.500	0.480	0.58		0.790	0.021									
		VillageLots		0.029	0.72	6.00												0.680	0.020									
A8.5	DGGP		0.142		0.74									6.00				0.700		103.22	28.53	22.62	5.91		5.91	5.91	0.56	0.05

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 09
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23

WARNING

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DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 9 OF 23

SHEET SIZE: A1

REV: 2



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OUTCOMES

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Ph 0478 022 556, stuart@developmentoutcomes.com.au, www.developmentoutcomes.com.au

DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE												
						PROJECT LOCATION								MOAMA - NSW												
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)												
						CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS	
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CACHTMENT AREA (TOTAL)	CATCHMENT AREA (SUB-CATCHMENT)	FRACTION IMPERVIOUS	OVERLAND FLOW LENGTH	OVERLAND FLOW SLOPE	OVERLAND FLOW ROUGHNESS	OVERLAND FLOW TIME (Tc)	GUTTER LENGTH	GUTTER SLOPE	GUTTER FLOW TIME (Tc)	PIT TIME OF CONCENTRATION (Tc)	PIT SPECIFIED INFLOW	RUNOFF COEFFICIENT	PIT EFFECTIVE AREA (CA)	RAINFALL INTENSITY (I)	TOTAL CATCHMENT FLOW	FLOW TO PIPE	(OVERLAND) FLOW TO PIT INLET	(OVERLAND) BYPASS FLOW RECEIVED	(OVERLAND) COMBINED FLOW TO PIT INLET	(OVERLAND) ACCEPTED PIT INFLOW	(OVERLAND) PIT BYPASS FLOW	GUTTER FLOW WIDTH	GUTTER FLOW DEPTH
P20	P18	C09	(Ha)	P03	C08	(m)	(%)	(n)	(min)	G01	(%)	G03	P12	(l/s)	C10	(Ha)	(mm/hr)	(l/s)	T02	T03	BO6	(l/s)	P11	B04	P17	P16
		RoadReserve		0.026	0.85				5.00	52.000	0.490	0.58			0.790	0.021										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
A8.6	DGGP		0.108		0.75								6.00		0.710		103.22	21.93	15.79	6.14		6.14	6.14		0.56	0.05
		RoadReserve		0.027	0.85				5.00	53.680	0.480	0.60			0.790	0.021										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.026	0.72				6.00						0.680	0.018										
		VillageLots		0.026	0.72				6.00						0.680	0.018										
A8.7	DGGP		0.116		0.72								6.00		0.680		103.22	22.62	22.62	0.00		0.00	0.00		0.16	0.02
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
A8.8	SIP	MediumDensity	0.054	0.054	0.57				5.00				6.00		0.590	0.032	103.22	9.20	9.20	0.00		0.00	0.00			
A9.1	DGGP	RoadReserve	0.035	0.035	0.85				5.00	53.680	0.480	0.60	6.00		0.790	0.028	103.22	7.96		7.96		7.96	7.96		0.73	0.05
A10.1	DGGP	RoadReserve	0.035	0.035	0.85				5.00	52.000	0.480	0.58	6.00		0.790	0.028	103.22	7.96		7.96		7.96	7.96		0.73	0.05
A11.1	DGGP	RoadReserve	0.036	0.036	0.85				5.00	52.500	0.490	0.58	6.00		0.790	0.029	103.22	8.19		8.19		8.19	8.19		0.73	0.05
A12.1	DGGP		0.049		0.78				5.00				6.00		0.730		103.22	10.30	5.07	5.23		5.23	5.23		0.28	0.04
		RoadReserve		0.023	0.85				5.00	45.000	0.590	0.50			0.790	0.018										
		VillageLots		0.026	0.72				6.00						0.680	0.018										
A13.1	DGGP		0.143		0.72								6.00		0.680		103.22	27.88	27.88	0.00		0.00	0.00		0.11	0.02
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.027	0.72				6.00						0.680	0.018										
A14.1	DGGP		0.061		0.79				5.00	64.150	0.640	0.71	6.00		0.740		103.22	12.96	5.46	7.50		7.50	7.50		1.74	0.08
		RoadReserve		0.033	0.85				5.00						0.790	0.026										
		VillageLots		0.028	0.72				6.00						0.680	0.019										
A14.2	DGGP		0.067		0.80				5.00	72.370	0.740	0.80	6.00		0.750		103.22	14.33	5.46	8.87		8.87	8.87		1.09	0.07
		RoadReserve		0.039	0.85				5.00						0.790	0.031										
		VillageLots		0.028	0.72				6.00						0.680	0.019										
A15.1	DGGP		0.112		0.72								6.00		0.680		103.22	21.84	21.84			0.00	0.00		0.11	0.02
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.027	0.72				6.00						0.680	0.018										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.027	0.72				6.00						0.680	0.018										
A16.1	DGGP		0.061		0.79				5.00	62.630	0.750	0.70	6.00		0.740		103.22	12.96	5.46	7.50		7.50	7.50		1.49	0.08
		RoadReserve		0.033	0.85				5.00						0.790	0.026										
		VillageLots		0.028	0.72				6.00						0.680	0.019										
A16.2	DGGP		0.066		0.79				5.00	70.530	0.840	0.78	6.00		0.750		103.22	14.10	5.46	8.64		8.64	8.64		1.62	0.08
		RoadReserve		0.038	0.85				5.00						0.790	0.030										
		VillageLots		0.028	0.72				6.00						0.680	0.019										
A17.1	DGGP		0.112		0.72								6.00		0.680		103.22	21.84	21.84			0.00	0.00		0.11	0.02
		VillageLots		0.029	0.72				6.00						0.680	0.020										

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 10
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24	
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23	

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DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 10 OF 23

SHEET SIZE: A1

REV: 2



DEVELOPMENT
OUTCOMES

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DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE												
						PROJECT LOCATION								MOAMA - NSW												
														ARI YEAR RAIN EVENT								10 YEAR ARE (10%)				
CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS																CATCHMENT FLOWS				
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CACTHMENT AREA (TOTAL)	CATCHMENT AREA (SUB-CATCHMENT)	FRACTION IMPERVIOUS	OVERLAND FLOW LENGTH	OVERLAND FLOW SLOPE	OVERLAND FLOW ROUGHNESS	OVERLAND FLOW TIME (Tc)	GUTTER LENGTH	GUTTER SLOPE	GUTTER FLOW TIME (Tc)	PIT TIME OF CONCERNTRATION (Tc)	PIT SPECIFIED INFLOW	RUNOFF COEFFICIENT	PIT EFFECTIVE AREA (CA)	RAINFALL INTENSITY (I)	TOTAL CATCHMENT FLOW	FLOW TO PIPE	(OVERLAND) FLOW TO PIT INLET	(OVERLAND) BYPASS FLOW RECEIVED	(OVERLAND) COMBINED FLOW TO PIT INLET	(OVERLAND) ACCEPTED PIT INFLOW	(OVERLAND) PIT BYPASS FLOW	GUTTER FLOW WIDTH	GUTTER FLOW DEPTH
P20	P18	C09	(Ha)	(Ha)	(f)	(m)	(%)	(n)	(min)	(m)	(%)	(min)	P12	(l/s)	(C10)	(Ha)	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(m)	(m)	
		VillageLots		0.027	0.72				6.00						0.680	0.018										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.027	0.72				6.00						0.680	0.018										
A18.1	DGGP		0.083		0.79								6.00		0.740		103.22	17.64	7.41	10.23		10.23	10.23		0.98	0.06
		RoadReserve		0.045	0.85				5.00	82.590	0.410	0.92			0.790	0.036										
		VillageLots		0.038	0.72				6.00						0.680	0.026										
A18.2	DGGP		0.065		0.79								6.00		0.740		103.22	13.87	5.46	8.41		8.41	8.41		0.83	0.06
		RoadReserve		0.037	0.85				5.00	72.710	0.440	0.81			0.790	0.029										
		VillageLots		0.028	0.72				6.00						0.680	0.019										
A19.1	JP		0.242		0.72								6.00		0.680		103.22	47.18	47.18			0.00	0.00			
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.041	0.72				6.00						0.680	0.028										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.027	0.72				6.00						0.680	0.018										
A19.2	DGGP		0.049		0.77								6.00		0.720		103.22	10.14	6.04	4.09		4.09	4.09		0.38	0.04
		RoadReserve		0.018	0.85				5.00	34.640	0.380	0.38			0.790	0.014										
		VillageLots		0.031	0.72				6.00						0.680	0.021										
A19.3	DGGP		0.200		0.73								6.00		0.690		103.22	39.58	35.49	4.09		4.09	4.09		0.38	0.04
		RoadReserve		0.018	0.85				5.00	35.700	0.390	0.40			0.790	0.014										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.031	0.72				6.00						0.680	0.021										
		VillageLots		0.031	0.72				6.00						0.680	0.021										
A19.4	DGGP		0.140		0.74								6.00		0.690		103.22	27.88	23.79	4.09		4.09	4.09		0.38	0.04
		RoadReserve		0.018	0.85				5.00	35.470	0.400	0.39			0.790	0.014										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.031	0.72				6.00						0.680	0.021										
		VillageLots		0.031	0.72				6.00						0.680	0.021										
A19.5	DGGP		0.194		0.73								6.00		0.690		103.22	38.18	35.68	2.50		2.50	2.50		0.24	0.03
		RoadReserve		0.011	0.85				5.00	21.560	0.400	0.24			0.790	0.009										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.030	0.72				6.00						0.680	0.020										
		VillageLots		0.032	0.72				6.00						0.680	0.022										
		VillageLots		0.031	0.72				6.00						0.680	0.021										
A19.6	DE	VillageLots	0.029	0.029	0.72				6.00				6.00		0.680	0.020	103.22	5.65	5.65	0.00		0.00	0.00		0.16	0.02
A20.1	DGGP		0.066		0.79								6.00		0.740		103.22	14.04	5.85	8.19		8.19	8.19		0.73	0.05
		RoadReserve		0.036	0.85				5.00	71.810	0.410	0.80			0.790	0.029										
		VillageLots		0.030	0.72				6.00						0.680	0.020										

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 11
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23

WARNING

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OF ALL UNDERGROUND SERVICES

DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 11 OF 23

SHEET SIZE: A1

REV: 2



DEVELOPMENT
OUTCOMES

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Ph 0478 022 556, stuart@developmentoutcomes.com.au, www.developmentoutcomes.com.au

DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE															
						PROJECT LOCATION								MOAMA - NSW															
														ARI YEAR RAIN EVENT								10 YEAR ARE (10%)							
CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS																CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS		
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CATCHMENT AREA (TOTAL) (Ha)	CATCHMENT AREA (SUB-CATCHMENT) (Ha)	FRACTION IMPERVIOUS (f)	OVERLAND FLOW LENGTH (m) C05	OVERLAND FLOW SLOPE (%) C06	OVERLAND FLOW ROUGHNESS (n) C07	OVERLAND FLOW TIME (Tc) (min) C04	GUTTER LENGTH (m) G01	GUTTER SLOPE (%) G02	GUTTER FLOW TIME (Tc) (min) G03	PIT TIME OF CONCERNTRATION (Tc) (min) P12	PIT SPECIFIED INFLOW (l/s) P07	RUNOFF COEFFICIENT (C10) P02	PIT EFFECTIVE AREA (CA) (Ha) P04	RAINFALL INTENSITY (I) (mm/hr) P14	TOTAL CATCHMENT FLOW (l/s) T01	FLOW TO PIPE (l/s) T02	(OVERLAND) FLOW TO PIT INLET (l/s) T03	(OVERLAND) BYPASS FLOW RECEIVED (l/s) BO6	(OVERLAND) COMBINED FLOW TO PIT INLET (l/s) (l/s)	(OVERLAND) ACCEPTED PIT INFLOW (l/s) P11	(OVERLAND) PIT BYPASS FLOW (l/s) B04	GUTTER FLOW WIDTH (m) P17	GUTTER FLOW DEPTH (m) P16			
P20	P18	C09		P03	C08																								
A21.1	DGGP		0.081		0.80									6.13		0.750		102.57	17.33	5.81	11.52		11.52	11.52		0.98	0.06		
		RoadReserve		0.051	0.85											0.790	0.040												
		VillageLots		0.030	0.72									6.00		0.680	0.020												
A22.1	DGGP		0.211		0.46									6.00		0.510		103.22	31.04	26.95	4.09		4.09	4.09		0.74	0.05		
		RoadReserve		0.018	0.85									5.00	18.160	0.390	0.20		0.790	0.014									
		LargeLots		0.087	0.42									6.00		0.490	0.042												
		LargeLots		0.106	0.42									6.00		0.490	0.052												
			9.869	9.869												0.635	6.263												
DRAINAGE CATCHMENT B																													
30.3	JP																	103.220							0.00				
B1.1	DGGP		0.084		0.77									6.00		0.720		103.220	17.42	10.14	7.28		7.28	7.28		0.74	0.05		
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.023	0.72									6.00		0.680	0.016												
		RoadReserve		0.032	0.85									5.00	64.960	0.280	0.72		0.790	0.025									
B1.2	DGGP	RoadReserve	0.030	0.030	0.85									5.00	60.940	0.290	0.68	6.00	0.790	0.024	103.220	6.82		6.82		6.82		0.73	0.05
B1.3	DGGP	RoadReserve	0.034	0.034	0.85									5.00	68.940	0.300	0.77	6.00	0.790	0.027	103.220	7.73		7.73		7.73		0.86	0.06
B1.4	DGGP	RoadReserve	0.034	0.034	0.85									5.00	68.940	0.300	0.77	6.00	0.790	0.027	103.220	7.73		7.73		7.73		0.91	0.06
B1.5	DGGP		0.119		0.75									6.00		0.710		103.220	24.24	16.96	7.28		7.28	7.28		0.86	0.06		
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		RoadReserve		0.032	0.85									5.00	63.520	0.300	0.71		0.790	0.025									
B1.6	DGGP	RoadReserve	0.032	0.032	0.85									5.00	63.520	0.300	0.71	6.00	0.790	0.025	103.220	7.28		7.28		7.28		0.74	0.05
B1.7	DGGP		0.076		0.75									6.00		0.710		103.220	15.40	11.31	4.09		4.09	4.09		0.48	0.05		
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		RoadReserve		0.018	0.85									5.00	36.680	0.300	0.41		0.790	0.014									
B1.8	DGGP		0.096		0.74									6.00		0.700		103.220	19.30	15.21	4.09		4.09	4.09		0.38	0.04		
		RoadReserve		0.018	0.85									5.00	36.570	0.300	0.41		0.790	0.014									
		Landscape		0.078	0.72									6.00		0.680	0.053												
B2.1	DGGP		0.171		0.72									6.00		0.680		103.220	33.34	33.34			0.00	0.00		0.11	0.02		
		LotsVillage		0.026	0.72									6.00		0.680	0.018												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
B3.1	DGGP		0.103		0.74									6.00		0.700		103.220	20.60	16.96	3.64		3.64	3.64		0.48	0.05		
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		RoadReserve		0.016	0.85									5.00	31.010	0.300	0.34		0.790	0.013									
B3.2	DGGP		0.074		0.75									6.00		0.700		103.220	14.95	11.31	3.64		3.64	3.64		0.38	0.04		
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		LotsVillage		0.029	0.72									6.00		0.680	0.020												
		RoadReserve		0.016	0.85									5.00	30.980	0.300	0.34		0.790	0.013									
B4.1	DGGP		0.278		0.72									6.00		0.680		103.220	54.20	54.20			0.00	0.00		0.11	0.02		

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 12
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23

WARNING

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DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 12 OF 23

SHEET SIZE: A1

REV: 2

db

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Ph 0478 022 556, stuart@developmentoutcomes.com.au, www.developmentoutcomes.com.au

DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE												
						PROJECT LOCATION								MOAMA - NSW												
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)												
						CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS	
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CATCHMENT AREA (TOTAL)	CATCHMENT AREA (SUB-CATCHMENT)	FRACTION IMPERVIOUS	OVERLAND FLOW LENGTH	OVERLAND FLOW SLOPE	OVERLAND FLOW ROUGHNESS	OVERLAND FLOW TIME (Tc)	GUTTER LENGTH	GUTTER SLOPE	GUTTER FLOW TIME (Tc)	PIT TIME OF CONCERNTRATION (Tc)	PIT SPECIFIED INFLOW	RUNOFF COEFFICIENT	PIT EFFECTIVE AREA (CA)	RAINFALL INTENSITY (I)	TOTAL CATCHMENT FLOW	FLOW TO PIPE	(OVERLAND) FLOW TO PIT INLET	(OVERLAND) BYPASS FLOW RECEIVED	(OVERLAND) COMBINED FLOW TO PIT INLET	(OVERLAND) ACCEPTED PIT INFLOW	(OVERLAND) PIT BYPASS FLOW	GUTTER FLOW WIDTH	GUTTER FLOW DEPTH
P20	P18	C09	(Ha)	(Ha)	(f)	(m)	(%)	(n)	(min)	(m)	(%)	(min)	P12	(l/s)	(C10)	(Ha)	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(m)	(m)	
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
B4.2	DGGP	LotsVillage	0.029	0.029	0.72				6.00				6.00		0.680	0.020	103.220	5.65	5.65	0.00		0.00	0.00		0.16	0.02
B5.1	DGGP		0.278		0.72								6.00		0.680		103.220	54.20	54.20			0.00	0.00		0.11	0.02
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
B5.2	DGGP	LotsVillage	0.029	0.029	0.72				6.00				6.00		0.680	0.020	103.220	5.65	5.65	0.00		0.00	0.00		0.16	0.02
B6.1	DGGP		0.073		0.75								6.00		0.700		103.220	14.72	11.31	3.41		3.41	3.41		0.48	0.05
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		RoadReserve		0.015	0.85				5.00	30.980	0.300	0.34			0.790	0.012										
B6.2	JP	LotsVillage	0.029	0.029	0.72				6.00				6.00		0.680	0.020	103.220	5.65	5.65	0.00		0.00	0.00			
B6.3	DGGP	RoadReserve	0.035	0.035	0.85				5.00	38.080	0.580	0.42	6.00		0.790	0.028	103.220	7.96		7.96		7.96	7.96		0.74	0.05
B6.4	JP	LotsVillage	0.027	0.027	0.72				6.00				6.00		0.680	0.018	103.220	5.26	5.26			0.00	0.00			
B6.5	DGGP		0.053		0.78								6.00		0.730		103.220	11.11	5.65	5.46		5.46	5.46		0.56	0.05
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		RoadReserve		0.024	0.85				5.00	41.850	0.580	0.47			0.790	0.019										
B6.6	DE	LotsVillage	0.027	0.027	0.72				6.00				6.00		0.680	0.018	103.220	5.26	5.26				0.00		0.16	0.02
B7.1	DGGP		0.045		0.77								6.00		0.720		103.220	9.29	5.65	3.64		3.64	3.64		0.23	0.03
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		RoadReserve		0.016	0.85				5.00	31.040	0.440	0.34			0.790	0.013										
B7.2	DGGP	RoadReserve	0.016	0.016	0.85				5.00	31.040	0.440	0.34	6.00		0.790	0.013	103.220	3.64		3.64		3.64	3.64		0.24	0.03
B8.1	DGGP	RoadReserve	0.044	0.044	0.85				5.00	79.830	0.420	0.89	6.00		0.790	0.035	103.220	10.00		10.00		10.00	10.00		0.95	0.06
B9.1	DGGP		0.044		0.76								6.00		0.720		103.220	9.07	5.65	3.41		3.41	3.41		0.38	0.04
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		RoadReserve		0.015	0.85				5.00	30.840	0.300	0.34			0.790	0.012										
B10.1	DGGP		0.226		0.72								6.00		0.680		103.220	44.07	44.07	0.00		0.00	0.00	0.00	0.11	0.02
		LotsVillage		0.029	0.72				6.00						0.680	0.020										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.026	0.72				6.00						0.680	0.018										
		LotsVillage		0.029	0.72				6.00						0.680	0.020										

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 13
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23

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DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 13 OF 23

SHEET SIZE: A1

REV: 2



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DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE															
						PROJECT LOCATION								MOAMA - NSW															
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)															
						CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS				
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CACHTMENT AREA (TOTAL)	CATCHMENT AREA (SUB-CATCHMENT)	FRACTION IMPERVIOUS	OVERLAND FLOW LENGTH	OVERLAND FLOW SLOPE	OVERLAND FLOW ROUGHNESS	OVERLAND FLOW TIME (Tc)	GUTTER LENGTH	GUTTER SLOPE	GUTTER FLOW TIME (Tc)	PIT TIME OF CONCERNTRATION (Tc)	PIT SPECIFIED INFLOW	RUNOFF COEFFICIENT	PIT EFFECTIVE AREA (CA)	RAINFALL INTENSITY (I)	TOTAL CATCHMENT FLOW	FLOW TO PIPE	(OVERLAND) FLOW TO PIT INLET	(OVERLAND) BYPASS FLOW RECEIVED	(OVERLAND) COMBINED FLOW TO PIT INLET	(OVERLAND) ACCEPTED PIT INFLOW	(OVERLAND) PIT BYPASS FLOW	GUTTER FLOW WIDTH	GUTTER FLOW DEPTH			
P20	P18	C09	(Ha)	(Ha)	(f)	C05	C06	C07	C04	G01	G02	G03	P12	(l/s)	(C10)	(Ha)	(mm/hr)	(l/s)	T02	T03	BO6	(l/s)	(l/s)	P11	B04	P17	P16		
		LotsVillage		0.029	0.72				6.00						0.680	0.020													
		LotsVillage		0.029	0.72				6.00						0.680	0.020													
		LotsVillage		0.029	0.72				6.00						0.680	0.020													
		LotsVillage		0.029	0.72				6.00						0.680	0.020													
B10.2	DGGP	LotsVillage	0.029	0.029	0.72				6.00				6.00		0.680	0.020	103.220	5.65	5.65	0.00		0.00	0.00		0.16	0.02			
			2.115	2.115											0.710	1.502													
DRAINAGE CATCHMENT C																													
14.11	SEP		0.197		0.48								6.00		0.530		103.220	29.88	23.74	6.14		6.14	6.14		0.70	0.05			
		RoadReserve		0.027	0.85				5.00	23.920	1.080	0.27			0.790	0.021													
		LargeLots		0.080	0.42				6.00						0.490	0.039													
		LargeLots		0.090	0.42				6.00						0.490	0.044													
14.12	JP																103.220					0.00	0.00						
C1.1	DGGP	RoadReserve	0.043	0.043	0.85				5.00	78.810	0.340	0.88	6.00		0.790	0.034	103.220	9.78		9.78		9.78	9.78		1.00	0.06			
C1.2	JP		0.097		0.72								6.00		0.680		103.220	18.91	18.91	0.00		0.00	0.00						
		VillageLots		0.040	0.72				6.00						0.680	0.027													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.028	0.72				6.00						0.680	0.019													
C1.3	DGGP		0.063		0.79								6.00		0.740		103.220	13.39	5.65	7.73		7.73	7.73	0.00	0.86	0.06			
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		RoadReserve		0.034	0.85				5.00	50.900	0.290	0.57			0.790	0.027													
C1.4	JP		0.087		0.72								6.00		0.680		103.220	16.96	16.96			0.00	0.00						
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
C1.5	DGGP	RoadReserve	0.034	0.034	0.85				5.00	51.140	0.300	0.57	6.00		0.790	0.027	103.220	7.73		7.73		7.73	7.73		0.86	0.06			
C1.6	JP		0.087		0.72								6.00		0.680		103.220	16.96	16.96			0.00	0.00						
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
C1.7	DGGP	RoadReserve	0.022	0.022	0.85				5.00	44.980	0.320	0.50	6.00		0.790	0.017	103.220	5.00		5.00		5.00	5.00		0.61	0.05			
C1.8	JP		0.196		0.72								6.00		0.680		103.220	38.22	38.22			0.00	0.00						
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.041	0.72				6.00						0.680	0.028													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
C1.9	DGGP	Landscape		0.068	0.72				6.00						0.680	0.046													
			0.071		0.80								6.00		0.750		103.220	15.20	5.65	9.55		9.55	9.55		1.00	0.06			
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		RoadReserve		0.042	0.85				5.00	83.170	0.300	0.92			0.790	0.033													
C1.10	DGGP		0.287		0.72								6.00		0.680		103.220	55.96	55.96	0.00		0.00	0.00	0.00	0.16	0.02			
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.029	0.72				6.00						0.680	0.020													
		VillageLots		0.026	0.72				6.00						0.680	0.018													

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 14
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24	
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23	

WARNING

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OF ALL UNDERGROUND SERVICES

DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 14 OF 23

SHEET SIZE: A1

REV: 2

db

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DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE												
						PROJECT LOCATION								MOAMA - NSW												
														10 YEAR ARE (10%)												
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT																				
CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS							
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CATCHMENT AREA (TOTAL) (Ha)	CATCHMENT AREA (SUB-CATCHMENT) (Ha)	FRACTION IMPERVIOUS (f)	OVERLAND FLOW LENGTH (m) C05	OVERLAND FLOW SLOPE (%) C06	OVERLAND FLOW ROUGHNESS (n) C07	OVERLAND FLOW TIME (Tc) (min) C04	GUTTER LENGTH (m) G01	GUTTER SLOPE (%) G02	GUTTER FLOW TIME (Tc) (min) G03	PIT TIME OF CONCERNTRATION (Tc) (min) P12	PIT SPECIFIED INFLOW (l/s) P07	RUNOFF COEFFICIENT (C10) P02	PIT EFFECTIVE AREA (CA) (Ha) P04	RAINFALL INTENSITY (I) (mm/hr) P14	TOTAL CATCHMENT FLOW (l/s) T01	FLOW TO PIPE (l/s) T02	(OVERLAND) FLOW TO PIT INLET (l/s) T03	(OVERLAND) BYPASS FLOW RECEIVED (l/s) BO6	(OVERLAND) COMBINED FLOW TO PIT INLET (l/s)	(OVERLAND) ACCEPTED PIT INFLOW (l/s) P11	(OVERLAND) PIT BYPASS FLOW (l/s) B04	GUTTER FLOW WIDTH (m) P17	GUTTER FLOW DEPTH (m) P16
P20	P18	C09		P03	C08																					
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
C2.1	DGGP		0.078		0.79								6.00		0.740		103.220	16.57	7.02	9.55		9.55	9.55		0.98	0.06
		VillageLots		0.036	0.72				6.00						0.680	0.024										
		RoadReserve		0.042	0.85				5.00	83.140	0.300	0.92			0.790	0.033										
C3.1	DGGP		0.059		0.79								6.00		0.740		103.220	12.48	5.65	6.82		6.82	6.82		0.74	0.05
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		RoadReserve		0.030	0.85				5.00	52.970	0.370	0.59			0.790	0.024										
C4.1	DGGP		0.064		0.78								6.00		0.730		103.220	13.39	7.02	6.37		6.37	6.37		0.28	0.04
		VillageLots		0.036	0.72				6.00						0.680	0.024										
		RoadReserve		0.028	0.85				5.00	56.490	0.380	0.63			0.790	0.022										
C4.2	DGGP		0.064		0.78								6.00		0.730		103.220	13.39	7.02	6.37		6.37	6.37		0.28	0.04
		VillageLots		0.036	0.72				6.00						0.680	0.024										
		RoadReserve		0.028	0.85				5.00	56.510	0.380	0.63			0.790	0.022										
C5.1	DGGP		0.116		0.72								6.00		0.680		103.220	22.62	22.62	0.00		0.00	0.00		0.11	0.02
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
C6.1	DGGP		0.054		0.78								6.00		0.730		103.220	11.34	5.65	5.68		5.68	5.68		0.74	0.05
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		RoadReserve		0.025	0.85				5.00	50.970	0.300	0.57			0.790	0.020										
C7.1	DGGP		0.062		0.77								6.00		0.730		103.220	12.93	7.02	5.91		5.91	5.91		0.28	0.04
		VillageLots		0.036	0.72				6.00						0.680	0.024										
		RoadReserve		0.026	0.85				5.00	51.060	0.380	0.57			0.790	0.021										
C7.2	DGGP		0.062		0.77								6.00		0.730		103.220	12.93	7.02	5.91		5.91	5.91		0.28	0.04
		VillageLots		0.036	0.72				6.00						0.680	0.024										
		RoadReserve		0.026	0.85				5.00	51.060	0.380	0.57			0.790	0.021										
C8.1	DGGP		0.116		0.72								6.00		0.680		103.220	22.62	22.62	0.00		0.00	0.00		0.11	0.02
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
C9.1	DGGP		0.103		0.77								6.00		0.720		103.220	21.31	12.67	8.64		8.64	8.64		0.98	0.06
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.036	0.72				6.00						0.680	0.024										
		RoadReserve		0.025	0.85				5.00	50.060	0.240	0.56			0.790	0.020										
		RoadReserve		0.013	0.85				5.00	26.970	0.480	0.30			0.790	0.010										
C10.1	DGGP		0.071		0.75								6.00		0.700		103.220	14.30	11.11	3.18		3.18	3.18		0.38	0.04
		VillageLots		0.028	0.72				6.00						0.680	0.019										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		RoadReserve		0.014	0.85				5.00	27.210	0.350	0.30			0.790	0.011										
C10.2	DGGP		0.058		0.72								6.00		0.680		103.220	11.31	11.31	0.00		0.00	0.00		0.16	0.02
		VillageLots		0.029	0.72				6.00						0.680	0.020										
		VillageLots		0.029	0.72				6.00						0.680	0.020										
			2.091	2.091											0.692	1.447										

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 15
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS - UPDATED - RETIREMENT VILLAGE	DSJ	14/11/23

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DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 15 OF 23

SHEET SIZE: A1

REV: 2



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DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE													
						PROJECT LOCATION								MOAMA - NSW													
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)													
						CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS		
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CACHTMENT AREA (TOTAL)	CATCHMENT AREA (SUB-CATCHMENT)	FRACTION IMPERVIOUS	OVERLAND FLOW LENGTH	OVERLAND FLOW SLOPE	OVERLAND FLOW ROUGHNESS	OVERLAND FLOW TIME (Tc)	GUTTER LENGTH	GUTTER SLOPE	GUTTER FLOW TIME (Tc)	PIT TIME OF CONCENTRATION (Tc)	PIT SPECIFIED INFLOW	RUNOFF COEFFICIENT	PIT EFFECTIVE AREA (CA)	RAINFALL INTENSITY (I)	TOTAL CATCHMENT FLOW	FLOW TO PIPE	(OVERLAND) FLOW TO PIT INLET	(OVERLAND) BYPASS FLOW RECEIVED	(OVERLAND) COMBINED FLOW TO PIT INLET	(OVERLAND) ACCEPTED PIT INFLOW	(OVERLAND) PIT BYPASS FLOW	GUTTER FLOW WIDTH	GUTTER FLOW DEPTH	
P20	P18	C09	(Ha)	(Ha)	(f)	(m)	(%)	(n)	(min)	(m)	(%)	(min)	P12	(l/s)	(C10)	(Ha)	(mm/hr)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(l/s)	(m)	(m)		
DRAINAGE CATCHMENT D																											
1.2	SEP	RoadReserve	0.066	0.066	0.85				5.00	44.930	0.500	0.50	6.00		0.790	0.052	103.220	14.86		14.86		14.86		14.86			
1.3	SEP	RoadReserve	0.064	0.064	0.85				5.00	45.480	0.500	0.51	6.00		0.790	0.050	103.220	14.41		14.41		14.41		14.41			
1.4	JP		0.000														103.220					0.00		0.00			
1.5	SEP	RoadReserve	0.052	0.052	0.85				5.00	52.460	0.340	0.58	6.00		0.790	0.041	103.220	11.70		11.70		11.70		11.70			
1.6	SEP	RoadReserve	0.071	0.071	0.85				5.00	70.590	0.340	0.78	6.00		0.790	0.056	103.220	15.98		15.98		15.98		15.98			
1.7	SEP		0.371		0.50								6.00		0.520		103.220	55.21	39.23	15.98		15.98		15.98			
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		RoadReserve		0.071	0.85				5.00	70.600	0.340	0.78			0.790	0.056											
1.8	SEP		0.375		0.51								6.00		0.520		103.220	56.11	39.23	16.88		16.88		16.88			
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		RoadReserve		0.075	0.85				5.00	75.250	0.340	0.84			0.790	0.059											
1.9	SEP		0.228		0.47								6.00		0.490		103.220	32.36	26.28	6.08		6.08		6.08			
		LargeLots		0.101	0.42				6.00						0.460	0.046											
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		RoadReserve		0.027	0.85				5.00	20.990	1.160	0.23			0.790	0.021											
30.1	JP	RoadReserve	0.071	0.071	0.85				5.00	44.100	0.370	0.49	6.00		0.790	0.056	103.220	15.98		15.98		15.98		15.98			
30.2	SEP	RoadReserve	0.071	0.071	0.85				5.00	44.090	0.360	0.49	6.00		0.790	0.056	103.220	15.98		15.98		15.98		15.98			
30.3	DGGP		1.486	1.486	1.00	CATCHMENT B			11.50				11.50		0.900	1.337	77.580	288.21	288.21				0.00		0.00		
6.1	SEP		0.128		0.51								6.00		0.530		103.220	19.28	13.21	6.08		6.08		6.08			
		LargeLots		0.101	0.42				6.00						0.460	0.046											
		RoadReserve		0.027	0.85				5.00	20.940	1.070	0.23			0.790	0.021											
6.2	SEP	RoadReserve	0.017	0.017	0.85				5.00	15.720	0.320	0.17	6.00		0.790	0.013	103.220	3.83		3.83		3.83		3.83			
6.3	SEP		0.129		0.48								6.00		0.500		103.220	18.47	14.64	3.83		3.83		3.83			
		LargeLots		0.112	0.42				6.00						0.460	0.051											
		RoadReserve		0.017	0.85				5.00	15.720	0.320	0.17			0.790	0.013											
7.1	SEP	RoadReserve	0.042	0.042	0.85				5.00	37.980	0.500	0.42	6.00		0.790	0.033	103.220	9.45		9.45		9.45		9.45			
7.2	DE	LargeLots	0.100	0.100	0.42				6.00				6.00		0.460	0.046	103.220	13.08	13.08				0.00		0.00		
8.1	SEP		0.154		0.54								6.00		0.550		103.220	24.10	14.64	9.45		9.45		9.45			
		LargeLots		0.112	0.42				6.00						0.460	0.051											
		RoadReserve		0.042	0.85				5.00	37.980	0.500	0.42			0.790	0.033											
8.2	DE	LargeLots	0.113	0.113	0.42				6.00				6.00		0.460	0.052	103.220	14.77	14.77				0.00		0.00		
9.1	SEP		0.175		0.60								6.00		0.600		103.220	29.96	13.08	16.88		16.88		16.88			
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		RoadReserve		0.075	0.85				5.00	75.250	0.340	0.84			0.790	0.059											
9.2	DE	LargeLots	0.100	0.100	0.42				6.00				6.00		0.460	0.046	103.220	13.08	13.08				0.00		0.00		
9A.1	DE		0.000														103.220							0.00		0.00	
10.1	SEP		0.171		0.60								6.00		0.590		103.220	29.06	13.08	15.98		15.98		15.98			
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		RoadReserve		0.071	0.85				5.00	70.590	0.340	0.78			0.790	0.056											
10.2	DE		0.200		0.42								6.00		0.460		103.220	26.15	26.15				0.00		0.00		
		LargeLots		0.100	0.42				6.00						0.460	0.046											
		LargeLots		0.100	0.42				6.00						0.460	0.046											

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 16
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24	
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23	

WARNING

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OF ALL UNDERGROUND SERVICES

DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 16 OF 23

SHEET SIZE: A1

REV: 2



DEVELOPMENT
OUTCOMES

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Ph 0478 022 556, stuart@developmentoutcomes.com.au, www.developmentoutcomes.com.au

DRAINAGE CALCULATIONS: CATHMENT HYDROLOGY:						PROJECT NAME								1188 THE RANGE ESTATE																
						PROJECT LOCATION								MOAMA - NSW																
														ARI YEAR RAIN EVENT								10 YEAR ARE (10%)								
CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS																CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS			
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CACHTMENT AREA (TOTAL) (Ha)	CATCHMENT AREA (SUB-CATCHMENT) (Ha)	FRACTION IMPERVIOUS (f)	OVERLAND FLOW LENGTH (m) C05	OVERLAND FLOW SLOPE (%) C06	OVERLAND FLOW ROUGHNESS (n) C07	OVERLAND FLOW TIME (Tc) (min) C04	GUTTER LENGTH (m) G01	GUTTER SLOPE (%) G02	GUTTER FLOW TIME (Tc) (min) G03	PIT TIME OF CONCENTRATION (Tc) (min) P12	PIT SPECIFIED INFLOW (l/s) P07	RUNOFF COEFFICIENT (C10) P02	PIT EFFECTIVE AREA (CA) (Ha) P04	RAINFALL INTENSITY (I) (mm/hr) P14	TOTAL CATCHMENT FLOW (l/s) T01	FLOW TO PIPE (l/s) T02	(OVERLAND) FLOW TO PIT INLET (l/s) T03	(OVERLAND) BYPASS FLOW RECEIVED (l/s) BO6	(OVERLAND) COMBINED FLOW TO PIT INLET (l/s)	(OVERLAND) ACCEPTED PIT INFLOW (l/s) P11	(OVERLAND) PIT BYPASS FLOW (l/s) B04	GUTTER FLOW WIDTH (m) P17	GUTTER FLOW DEPTH (m) P16				
P20	P18	C09		P03	C08	C05	C06	C07	C04	G01	G02	G03	P12	P07	P02	P04	P14	T01	T02	T03	BO6		P11	B04	P17	P16				
11.1	SEP		0.171		0.60									6.00	0.590			103.220	29.06	13.08	15.98	15.98		15.98						
		LargeLots		0.100	0.42									6.00	0.460		0.046													
		RoadReserve		0.071	0.85									5.00	70.590	0.340	0.78	0.790		0.056										
11.2	DE		0.200		0.42									6.00	0.460		0.091	103.220	26.15	26.15			0.00		0.00					
		LargeLots		0.100	0.42									6.00	0.460		0.046													
		LargeLots		0.100	0.42									6.00	0.460		0.046													
13.1	SEP		0.168		0.55									6.00	0.560			103.220	26.87	15.17	11.70	11.70		11.70						
		LargeLots		0.116	0.42									6.00	0.460		0.053													
		RoadReserve		0.052	0.85									5.00	52.260	0.340	0.58	0.790		0.041										
14.1	SEP		0.274		0.42									6.00	0.460			103.220	35.83	35.83			0.00		0.00					
		LargeLots		0.130	0.42									6.00	0.460		0.059													
		LargeLots		0.144	0.42									6.00	0.460		0.066													
14.2	SEP		0.267		0.49									6.00	0.510			103.220	38.97	29.29	9.68	9.68		9.68						
		LargeLots		0.107	0.42									6.00	0.460		0.049													
		LargeLots		0.117	0.42									6.00	0.460		0.053													
		RoadReserve		0.043	0.85									5.00	28.620	0.500	0.32	0.790		0.034										
14.3	SEP	RoadReserve	0.055	0.055	0.85									5.00	55.610	0.340	0.62	6.00	0.790		0.043	103.220	12.38			12.38	12.38			
14.4	SEP	RoadReserve	0.052	0.052	0.85									5.00	52.470	0.340	0.58	6.00	0.790		0.041	103.220	11.70	11.70		11.70	11.70			
14.5	SEP		0.365		0.50									6.00	0.510			103.220	53.86	39.23	14.63	14.63		14.63						
		LargeLots		0.100	0.42									6.00	0.460		0.046													
		LargeLots		0.100	0.42									6.00	0.460		0.046													
		LargeLots		0.100	0.42									6.00	0.460		0.046													
		RoadReserve		0.065	0.85									5.00	64.900	0.340	0.72	0.790		0.051										
14.6	SEP		0.373		0.52									6.00	0.530			103.220	56.60	37.92	18.68	18.68		18.68						
		LargeLots		0.092	0.42									6.00	0.460		0.042													
		LargeLots		0.098	0.42									6.00	0.460		0.045													
		LargeLots		0.100	0.42									6.00	0.460		0.046													
		RoadReserve		0.083	0.85									5.00	82.640	0.340	0.92	0.790		0.065										
14.7	SEP		0.416		0.47									6.00	0.490			103.220	58.92	48.12	10.80	10.80		10.80						
		LargeLots		0.092	0.42									6.00	0.460		0.042													
		LargeLots		0.092	0.42									6.00	0.460		0.042													
		LargeLots		0.092	0.42									6.00	0.460		0.042													
		LargeLots		0.092	0.42									6.00	0.460		0.042													
		RoadReserve		0.048	0.85									5.00	48.380	0.340	0.54	0.790		0.038										
14.8	SEP		0.210		0.47									6.00	0.500			103.220	29.91	24.06	5.85	5.85		5.85						
		LargeLots		0.092	0.42									6.00	0.460		0.042													
		LargeLots		0.092	0.42									6.00	0.460		0.042													
		RoadReserve		0.026	0.85									5.00	20.970	1.110	0.23	0.790		0.020										
14.9	JP		0.000															103.220					0.00	0.00						
14.1	SEP	RoadReserve	0.072	0.072	0.85									5.00	45.100	0.460	0.50	6.00	0.790		0.057	103.220	16.21	16.21		16.21	16.21			
14.11	SEP		0.180		0.42									6.00	0.460			103.220	23.54	23.54			0.00		0.00					
		LargeLots		0.090	0.42									6.00	0.460		0.041													
		LargeLots		0.090	0.42									6.00	0.460		0.041													
14.12	JP		1.441	1.441	1.00	CATCHMENT C									9.50	0.900		1.297	84.830	305.59	305.59			0.00		0.00				
17.1	SEP		0.184		0.59									6.00	0.580			103.220	30.85	14.64	16.21	16.21		16.21						
		LargeLots		0.112	0.42									6.00	0.460		0.051													
		RoadReserve		0.072	0.85									5.00	45.100	0.460	0.50	0.790		0.057										

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 17
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23

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DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
CATHMENT CALCULATIONS

DWG:1188_DRAINAGE.dwg

SHEET: 17 OF 23

SHEET SIZE: A1

REV: 2

db

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OUTCOMES

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Ph 0478 022 556, stuart@developmentoutcomes.com.au, www.developmentoutcomes.com.au

DRAINAGE CALCULATIONS:						PROJECT NAME								1188 THE RANGE ESTATE												
						PROJECT LOCATION								MOAMA - NSW												
CATHMENT HYDROLOGY:						ARI YEAR RAIN EVENT								10 YEAR ARE (10%)												
CATCHMENT DETAILS						TIME CONCERNTRATION CALCULATIONS								CATCHMENT FLOWS					OVERLAND INLET & BYPASS FLOW CHECKS							
PIT NUMBER	PIT TYPE	SUB-CATCHMENT TYPE (CATCHMENT COMMENT)	CACHMENT AREA (TOTAL)	CATCHMENT AREA (SUB-CATCHMENT)	FRACTION IMPERVIOUS	OVERLAND FLOW LENGTH	OVERLAND FLOW SLOPE	OVERLAND FLOW ROUGHNESS	OVERLAND FLOW TIME (Tc)	GUTTER LENGTH	GUTTER SLOPE	GUTTER FLOW TIME (Tc)	PIT TIME OF CONCERNTRATION (Tc)	PIT SPECIFIED INFLOW	RUNOFF COEFFICIENT	PIT EFFECTIVE AREA (CA)	RAINFALL INTENSITY (I)	TOTAL CATCHMENT FLOW	FLOW TO PIPE	(OVERLAND) FLOW TO PIT INLET	(OVERLAND) BYPASS FLOW RECEIVED	(OVERLAND) COMBINED FLOW TO PIT INLET	(OVERLAND) ACCEPTED PIT INFLOW	(OVERLAND) PIT BYPASS FLOW	GUTTER FLOW WIDTH	GUTTER FLOW DEPTH
P20	P18	C09	(Ha)	(Ha) P03	(f) C08	(m) C05	(%) C06	(n) C07	(min) C04	(m) G01	(%) G02	(min) G03	(min) P12	(l/s) P07	(C10) P02	(Ha) P04	(mm/hr) P14	(l/s) T01	(l/s) T02	(l/s) T03	(l/s) BO6	(l/s) (OVERLAND) FLOW TO PIT INLET	(l/s) (OVERLAND) ACCEPTED PIT INFLOW	(l/s) (OVERLAND) PIT BYPASS FLOW	(m) P17	(m) P16
18.1	SEP	RoadReserve	0.069	0.069	0.85				5.00	30.830	0.660	0.34	6.00		0.790	0.054	103.220	15.53		15.53		15.53	15.53			
18.2	SEP	RoadReserve	0.068	0.068	0.85				5.00	32.510	0.610	0.36	6.00		0.790	0.053	103.220	15.31		15.31		15.31	15.31			
18A.1	SEP																103.220					0.00	0.00			
18A.2	JP																103.220				14.04	14.04	14.04			
18A.3	SIP	RoadReserve	0.405	0.405	0.85	238.650	0.220	0.100	10.00				10.00		0.790	0.318	82.200	72.59		72.59		72.59	58.56	14.04		
19.1	SEP		0.126		0.51								6.00		0.520		103.220	18.93	13.08	5.85		5.85	5.85			
		LargeLots		0.100	0.42				6.00						0.460	0.046										
		RoadReserve		0.026	0.85				5.00	20.930	1.210	0.23			0.790	0.020										
19.2	SEP	RoadReserve	0.037	0.037	0.85				5.00	33.520	0.590	0.37	6.00		0.790	0.029	103.220	8.33		8.33		8.33	8.33			
19.3	SEP	RoadReserve	0.037	0.037	0.85				5.00	33.220	0.590	0.37	6.00		0.790	0.029	103.220	8.33		8.33		8.33	8.33			
20.1	DE	LargeLots	0.100	0.100	0.42				6.00				6.00		0.460	0.046	103.220	13.08	13.08			0.00	0.00			
21.1	SEP		0.148		0.56								6.00		0.560		103.220	23.88	13.08	10.80		10.80	10.80			
		LargeLots		0.100	0.42				6.00						0.460	0.046										
		RoadReserve		0.048	0.85				5.00	48.380	0.340	0.54			0.790	0.038										
22.1	SEP		0.176		0.61								6.00		0.600		103.220	30.18	13.08	17.11		17.11	17.11			
		LargeLots		0.100	0.42				6.00						0.460	0.046										
		RoadReserve		0.076	0.85				5.00	75.690	0.340	0.84			0.790	0.060										
22.2	DE		0.200		0.42								6.00		0.460		103.220	26.15	26.15			0.00	0.00			
		LargeLots		0.100	0.42				6.00						0.460	0.046										
		LargeLots		0.100	0.42				6.00						0.460	0.046										
23.1	SEP		0.169		0.60								6.00		0.590		103.220	28.61	13.08	15.53		15.53	15.53			
		LargeLots		0.100	0.42				6.00						0.460	0.046										
		RoadReserve		0.069	0.85				5.00	68.830	0.340	0.76			0.790	0.054										
23.2	DE		0.200		0.42								6.00		0.460		103.220	26.15	26.15			0.00	0.00			
		LargeLots		0.100	0.42				6.00						0.460	0.046										
		LargeLots		0.100	0.42				6.00						0.460	0.046										
24.1	SEP	RoadReserve	0.040	0.040	0.85				5.00	28.190	0.500	0.31	6.00		0.790	0.031	103.220	9.00		9.00		9.00	9.00			
10.387 10.387														0.666 6.921												

DRAINAGE CALCULATIONS										PROJECT NAME						1188 THE RANGE ESTATE							
										PROJECT LOCATION						MOAMA - NSW							
HGL CALCULATIONS:										ARI YEAR RAIN EVENT						10 YEAR ARE (10%)							
PIPE DETAILS					PIPE Tc & FLOW CALCULATIONS					PIPE HGL CALCULATIONS										PIPE CAPACITY CHECK			
PIPE ID	PIPE SIZE	PIPE LENGTH	PIPE SLOPE	PIPE MANNINGS	TOTAL UPSTREAM AREA	TOTAL EFFECTIVE AREA (CA)	PIPE TIME OF CONCENTRATION (Tc)	PIPE RAINFALL INTENSITY (I)	TOTAL PIPE FLOW	PIPE VELOCITY	PARTIAL FLOW PIPE VELOCITY	DOWNSTREAM PIT HGL	DOWNSTREAM PIPE OBVERT	HEAD LOSS CO-EFFICIENT	VELOCITY HEAD	UPSTREAM STRUCTURE HEAD LOSS	UPSTREAM PIT HGL-A	UPSTREAM PIT FINISHED SURFACE LEVEL	UPSTREAM ADOPTED SURCHARGE LEVEL	UPSTREAM PIT FREEBOARD	CALCULATED DESIGN FLOW	PIPE MANNING CAPACITY	PIPE HGL CAPACITY
@R02	@03 (mm)	@32 (m)	@04 (%)	@33 (n)	@14 (Ha)	@15 (Ha)	@18 (min)	@17 (mm/hr)	@12 (l/s)	@30 (m/s)	@22 (m/s)	H01 (m)	R03 (m)	P69 (Ku)	@28 (m)	@25 (m)	@45 (m)	R10 (m)	(m)	(m)	@12 (l/s)	@24 (l/s)	@23 (l/s)
DRAINAGE CACTHMENT A																							
1.1-1.2	1050	13.99	0.50	0.01	9.87	6.26	19.66	57.68	1002.64	1.12		93.070	93.070	2.23	0.06	0.14	93.140	94.006	93.856	0.716	1002.64	2031.54	2648.55
1.2-1.3	900	40.10	0.34	0.01	9.23	5.87	19.20	58.57	954.56	1.47		93.282	92.982	1.00	0.11	0.11	93.340	94.242	94.092	0.752	954.56	1085.74	1419.49
1.3-1.4	675	11.76	0.26	0.01	8.89	5.70	19.04	58.87	931.27	1.26		93.455	92.905	1.20	0.08	0.10	93.470	94.242	94.092	0.622	931.27	883.01	1163.85
1.4-1.5	900	58.33	0.31	0.01	8.60	5.52	18.36	60.21	923.48	1.42		93.572	93.190	1.00	0.10	0.10	93.660	94.427	94.277	0.617	923.48	1044.28	1363.44
1.5-1.6	900	70.59	0.30	0.01	8.15	5.26	17.51	61.87	904.02	1.39		93.762	93.403	1.00	0.10	0.10	93.860	94.638	94.488	0.628	904.02	1019.34	1329.74
1.6-1.7	900	46.03	0.30	0.01	7.39	4.86	16.93	63.02	850.92	1.31		93.961	93.644	1.00	0.09	0.09	94.020	94.770	94.620	0.600	850.92	1020.90	1331.85
1.7-1.8	900	24.56	0.30	0.01	7.39	4.86	16.62	63.63	859.12	1.32		94.106	93.782	1.00	0.09	0.09	94.140	94.850	94.700	0.560	859.12	1023.34	1335.15
1.8-1.9	900	98.78	0.30	0.01	6.47	4.37	15.28	66.24	803.31	1.24		94.227	93.886	1.00	0.08	0.08	94.340	95.146	94.996	0.656	803.31	1020.64	1331.50
1.9-25.1	525	36.80	0.30	0.01	2.96	2.12	14.60	68.04	399.93	0.89		94.400	93.836	1.28	0.04	0.05	94.460	95.280	95.130	0.670	399.93	494.29	660.71
25.1-25.2	675	31.33	0.50	0.01	2.68	1.95	14.09	69.61	377.52	1.02		94.500	94.118	1.00	0.05	0.05	94.550	95.400	95.250	0.700	377.52	618.82	826.19
25.2-25.3	675	14.90	0.47	0.01	2.68	1.95	13.85	70.35	381.52	1.04		94.600	94.285	1.00	0.06	0.05	94.620	95.440	95.290	0.670	381.52	599.18	799.09
25.3-25.4	600	8.60	0.58	0.01	1.85	1.36	12.43	74.72	282.08	0.97		94.700	94.300	1.00	0.05	0.05	94.680	95.410	95.260	0.580	282.08	489.25	658.56
25.4-25.5	525	14.60	0.55	0.01	1.50	1.12	12.20	75.43	235.33	1.05		94.700	94.294	1.00	0.06	0.06	94.750	95.510	95.360	0.610	235.33	333.09	450.68
25.5-25.6	525	36.40	0.52	0.01	1.22	0.92	11.51	77.55	197.73	0.88		94.800	94.394	1.00	0.04	0.04	94.850	95.520	95.370	0.520	197.73	325.12	439.49
25.6-25.7	450	15.60	0.51	0.01	1.03	0.78	11.27	78.30	169.36	1.07		94.900	94.520	1.26	0.06	0.07	94.920	95.670	95.520	0.600	169.36	204.16	277.91
25.7-25.8	375	45.02	0.51	0.01	0.60	0.43	10.41	80.94	96.80	0.88		95.000	94.545	1.00	0.04	0.04	95.070	95.800	95.650	0.580	96.80	125.32	171.78
25.8-25.9	300	40.38	0.52	0.01	0.36	0.26	9.62	84.21	59.98	0.85		95.100	94.720	1.85	0.04	0.07	95.200	95.820	95.670	0.470	59.98	69.74	96.35
25.9-25.10	300	15.60	0.51	0.01	0.19	0.13	9.04	87.26	31.66	0.45	0.96	95.300	94.950	1.00	0.01	0.01	95.270	95.970	95.820	0.550	31.66	69.25	95.64
25.10-25.11	300	14.57	0.55	0.01	0.16	0.11	8.40	90.62	26.89	0.38	0.94	95.300	95.050	2.20	0.01	0.02	95.290	96.010	95.860	0.570	26.89	71.66	99.14
25.11-25.12	300	18.25	0.49	0.01	0.08	0.06	7.04	97.78	15.79	0.22	0.78	95.300	95.150	2.20	0.00	0.01	95.310	96.030	95.880	0.570	15.79	67.91	93.71
25.12-25.13	300	6.00	0.50	0.01	0.03	0.02	6.00	103.22	6.82	0.10	0.62	95.300	95.260	18.00	0.00	0.01	95.330	96.030	95.880	0.550	6.82	68.38	94.39
1.9-24.1	600	12.59	0.50	0.01	2.66	1.80	14.31	68.92	345.41	1.18		94.400	93.912	1.00	0.07	0.07	94.440	95.150	95.000	0.560	345.41	453.92	609.41
24.1-24.2	600	17.18	0.50	0.01	2.55	1.75	14.07	69.68	339.32	1.16		94.500	94.005	1.00	0.07	0.07	94.540	95.130	94.980	0.440	339.32	451.32	605.80
24.2-24.3	600	9.50	0.53	0.01	2.47	1.69	13.92	70.12	328.46	1.12		94.600	94.110	2.20	0.06	0.14	94.620	95.130	94.980	0.360	328.46	465.52	625.55
24.3-24.4	600	54.60	0.51	0.01	2.38	1.62	13.11	72.62	326.61	1.12		94.800	94.180	2.28	0.06	0.15	94.850	95.520	95.370	0.520	326.61	459.52	617.20
24.4-24.5	600	69.23	0.51	0.01	2.09	1.47	12.02	75.97	309.89	1.06		95.000	94.480	1.36	0.06	0.08	95.090	95.900	95.750	0.660	309.89	456.26	612.67
24.5-24.6	450	51.00	0.51	0.01	0.94	0.66	8.63	89.39	164.04	1.03		95.200	94.690	1.00	0.05	0.05	95.260	95.780	95.630	0.370	164.04	203.57	277.06
24.6-24.7	375	51.00	0.51	0.01	0.64	0.45	7.83	93.62	116.50	1.06		95.300	94.895	1.00	0.06	0.06	95.440	96.060	95.910	0.470	116.50	125.19	171.59
24.7-24.8	300	51.00	0.51	0.01	0.33	0.23	6.83	98.85	64.38	0.91		95.500	95.100	2.30	0.04	0.10	95.620	96.300	96.150	0.530	64.38	69.04	95.35
24.8-24.9	225	7.20	0.56	0.01	0.13	0.10	6.29	101.71	26.86	0.65		95.700	95.309	2.20	0.02	0.05	95.730	96.270	96.120	0.390	26.86	35.08	48.92
24.9-24.10	225	6.00	1.00	0.01	0.07	0.05	6.00	103.22	14.29	0.35	1.00	95.800	95.369	12.64	0.01	0.08	95.860	96.270	96.120	0.260	14.29	47.06	66.56
1.8-15.1	375	12.50	0.50	0.01	0.51	0.27	8.13	92.02	69.25	0.63		94.227	93.351	2.20	0.02	0.04	94.240	94.850	94.700	0.460	69.25	123.48	169.15
15.1-15.2	300	71.59	0.50	0.01	0.30	0.14	6.00	103.22	39.57	0.56	1.00	94.283	93.368	10.26	0.02	0.16	94.520	95.065	94.915	0.395	39.57	68.38	94.39
1.6-16.1	300	12.50	0.50	0.01	0.38	0.20	8.06	92.42	51.25	0.72		93.961	93.034	2.20	0.03	0.06	93.980	94.638	94.488	0.508	51.25	68.10	93.99
16.1-16.2	300	46.03	0.52	0.01	0.20	0.09	6.00	103.22	26.38	0.37	0.92	94.039	93.126	13.0.									

DRAINAGE CALCULATIONS										PROJECT NAME						1188 THE RANGE ESTATE									
																PROJECT LOCATION						MOAMA - NSW			
HGL CALCULATIONS:										ARI YEAR RAIN EVENT												10 YEAR ARE (10%)			
PIPE DETAILS					PIPE Tc & FLOW CALCULATIONS											PIPE HGL CALCULATIONS									
PIPE ID	PIPE SIZE	PIPE LENGTH	PIPE SLOPE	PIPE MANNINGS	TOTAL UPSTREAM AREA	TOTAL EFFECTIVE AREA (CA)	PIPE TIME OF CONCENTRATION (Tc)	PIPE RAINFALL INTENSITY (I)	TOTAL PIPE FLOW	PIPE VELOCITY	PARTIAL FLOW PIPE VELOCITY	DOWNSTREAM PIT HGL	DOWNSTREAM PIPE OBVERT	HEAD LOSS CO-EFFICIENT	VELOCITY HEAD	UPSTREAM STRUCTURE HEAD LOSS	UPSTREAM PIT HGL-A	UPSTREAM PIT FINISHED SURFACE LEVEL	UPSTREAM ADOPTED SURCHARGE LEVEL	UPSTREAM PIT FREEBOARD	CALCULATED DESIGN FLOW	PIPE MANNING CAPACITY	PIPE HGL CAPACITY		
@R02	@03 (mm)	@32 (m)	@04 (%)	@33 (n)	@14 (Ha)	@15 (Ha)	@18 (min)	@17 (mm/hr)	@12 (l/s)	@30 (m/s)	@22 (m/s)	H01 (m)	R03 (m)	P69 (Ku)	@28 (m)	@25 (m)	@45 (m)	R10 (m)	(m)	(m)	@12 (l/s)	@24 (l/s)	@23 (l/s)		
1.9-7.1	375	17.18	0.51	0.01	0.66	0.35	7.77	93.91	92.19	0.83		94.417	93.677	1.00	0.04	0.04	94.440	95.086	94.936	0.496	92.19	125.47	172.00		
7.1-7.2	225	46.58	0.52	0.01	0.20	0.09	6.00	103.22	26.38	0.66		94.480	93.645	8.11	0.02	0.18	94.750	95.188	95.038	0.288	26.38	46.56	45.62		
7.1-8.1	300	12.50	0.56	0.01	0.29	0.16	7.43	95.70	43.35	0.61		94.480	93.720	2.20	0.02	0.04	94.490	95.086	94.936	0.446	43.35	72.36	100.16		
8.1-8.2	225	34.10	0.50	0.01	0.11	0.06	6.00	103.22	15.78	0.40	1.04	94.536	93.745	11.72	0.01	0.09	94.650	95.250	95.100	0.450	15.78	45.79	44.83		
25.1-26.1	300	9.05	1.03	0.01	0.23	0.13	6.64	99.86	35.28	0.50	1.27	94.512	93.947	2.01	0.01	0.03	94.520	95.305	95.155	0.635	35.28	98.04	137.46		
26.1-26.2	225	24.72	0.97	0.01	0.18	0.09	6.00	103.22	25.55	0.64		94.545	94.035	8.35	0.02	0.18	94.760	95.380	95.230	0.470	25.55	63.91	63.76		
25.9-A1.1	300	8.60	0.58	0.01	0.17	0.13	8.48	90.19	31.51	0.45	1.00	95.264	94.950	2.20	0.01	0.02	95.270	95.664	95.514	0.244	31.51	73.73	102.14		
A1.1-A1.2	300	7.00	0.57	0.01	0.14	0.10	8.15	91.92	25.03	0.35	0.94	95.292	95.020	2.20	0.01	0.01	95.290	95.664	95.514	0.224	25.03	73.10	101.22		
A1.2-A1.3	300	30.96	0.52	0.01	0.09	0.06	6.00	103.22	16.96	0.24	0.81	95.309	95.080	15.62	0.00	0.05	95.360	95.831	95.681	0.321	16.96	69.52	96.04		
A8.5-A10.1	225	6.00	0.50	0.01	0.04	0.03	6.00	103.22	7.96	0.19	0.67	95.118	94.669	16.08	0.00	0.03	95.150	96.004	95.854	0.704	7.96	33.28	46.28		
A8.4-A11.1	225	6.00	0.50	0.01	0.04	0.03	6.00	103.22	8.19	0.20	0.67	95.039	94.389	15.88	0.00	0.03	95.070	95.753	95.603	0.533	8.19	33.28	46.28		
A8.2-A12.1	300	6.00	1.08	0.01	0.05	0.04	6.00	103.22	10.30	0.15	0.92	94.829	94.195	17.46	0.00	0.02	94.850	95.490	95.340	0.490	10.30	100.65	141.26		
24.8-A13.1	225	33.79	0.50	0.01	0.14	0.10	6.00	103.22	27.88	0.68		95.582	95.360	8.04	0.02	0.19	95.830	96.507	96.357	0.527	27.88	33.28	46.28		
24.7-A14.1	300	7.21	0.62	0.01	0.13	0.10	6.49	100.63	26.60	0.38	0.98	95.361	95.155	2.20	0.01	0.02	95.360	96.022	95.872	0.512	26.60	76.40	106.00		
A14.1-A14.2	300	6.00	1.00	0.01	0.07	0.05	6.00	103.22	14.33	0.20	0.98	95.380	95.220	16.42	0.00	0.03	95.420	96.022	95.872	0.452	14.33	96.70	135.52		
24.7-A15.1	300	33.86	0.52	0.01	0.11	0.08	6.00	103.22	21.84	0.31	0.87	95.361	95.155	14.29	0.00	0.07	95.440	96.288	96.138	0.698	21.84	69.52	96.04		
24.6-A16.1	300	5.70	0.53	0.01	0.13	0.09	6.50	100.59	26.37	0.37	0.92	95.180	94.950	2.20	0.01	0.02	95.180	95.759	95.609	0.429	26.37	70.15	96.96		
A16.1-A16.2	300	6.00	1.00	0.01	0.07	0.05	6.00	103.22	14.10	0.20	0.97	95.198	95.000	16.48	0.00	0.03	95.230	95.759	95.609	0.379	14.10	96.70	135.52		
24.6-A17.1	300	33.93	0.50	0.01	0.11	0.08	6.00	103.22	21.84	0.31	0.86	95.180	94.950	14.29	0.00	0.07	95.260	96.056	95.906	0.646	21.84	68.38	94.39		
24.5-A18.1	300	7.20	0.50	0.01	0.15	0.11	6.51	100.55	30.70	0.43	0.94	95.030	94.754	2.20	0.01	0.02	95.030	95.872	95.722	0.692	30.70	68.38	94.39		
A18.1-A18.2	300	6.00	1.00	0.01	0.07	0.05	6.00	103.22	13.87	0.20	0.97	95.056	94.810	16.54	0.00	0.03	95.090	95.872	95.722	0.632	13.87	96.70	135.52		
24.5-A19.1	450	58.50	0.51	0.01	1.00	0.70	11.01	79.09	153.31	0.96		95.030	94.690	2.20	0.05	0.10	95.130	96.276	96.126	0.996	153.31	204.17	277.92		
A19.1-A19.2	450	15.80	0.51	0.01	0.76	0.53	10.66	80.18	118.77	0.75		95.231	95.010	1.00	0.03	0.03	95.250	96.182	96.032	0.782	118.77	202.87	276.07		
A19.2-A19.3	375	51.03	0.51	0.01	0.63	0.44	9.73	83.61	101.51	0.92		95.276	95.035	1.11	0.04	0.05	95.370	96.386	96.236	0.866	101.51	125.15	171.54		
A19.3-A19.4	375	51.00	0.51	0.01	0.43	0.30	8.48	90.19	74.93	0.68		95.419	95.315	1.00	0.02	0.02	95.580	96.590	96.440	0.860	74.93	125.19	171.59		
A19.4-A19.5	300	51.00	0.51	0.01	0.22	0.15	7.03	97.80	41.53	0.59	1.02	95.598	95.520	2.13	0.02	0.04	95.780	96.794	96.644	0.864	41.53	69.04	95.35		
A19.5-A19.6	225	8.81	1.08	0.01	0.03	0.02	6.00	103.22	5.65	0.14	1.02	95.818	95.780	17.13	0.00	0.02	95.890	96.830	96.680	0.790	5.65	67.35	67.37		
25.8-A2.1	300	9.50	0.53	0.01	0.20	0.15	9.55	84.58	34.40	0.49	0.99	95.111	94.720	2.20	0.01	0.03	95.120	95.802	95.652	0.532	34.40	70.15	96.96		
A2.1-A2.2	300	47.55	0.60	0.01	0.08	0.06	6.00	103.22	15.79	0.22	0.84	95.144	94.790	15.96	0.00	0.04	95.190	95.930	95.780	0.590	15.79	75.00	103.97		
A19.4-A20.1	300	6.00	1.00	0.01	0.07	0.05	6.00	103.22	14.04	0.20	0.97	95.598	95.520	16.50	0.00	0.03	95.630	96.590	96.440	0.810	14.04	96.70	135.52		
A19.2-A21.1	300	6.00	1.08	0.01	0.08	0.06	6.13	102.57	17.33	0.25	1.07	95.276	95.015	15.52	0.00	0.05	95.320	96.182	96.032	0.712	17.33	100.65	141.26		
24.4-A22.1	300	20.10	0.48	0.01	0.21	0.11	6.00	103.22	31.04	0.44	0.93	94.857	94.434	12.00	0.01	0.12	94.990	95.436	95.286	0.296	31.04	66.83	92.15		
25.6-A3.1	300	8.60	0.58	0.01	0.19	0.14	8.24	91.43	35.37	0.50	1.03	94.890	94.370	1.25	0.01	0.02	94.900	95.369	95.219	0.319	35.37	73.73	102.14		
A3.1-A3.2	300	32.32	0.53	0.01	0.09	0.06	6.00	103.22	16.96	0.24	0.82	94.913	94.440	15.62	0.00	0.05	94.970	95.493	95.343	0					

DRAINAGE CALCULATIONS										PROJECT NAME						1188 THE RANGE ESTATE							
										PROJECT LOCATION						MOAMA - NSW							
HGL CALCULATIONS:										ARI YEAR RAIN EVENT						10 YEAR ARE (10%)							
PIPE DETAILS					PIPE Tc & FLOW CALCULATIONS					PIPE HGL CALCULATIONS										PIPE CAPACITY CHECK			
PIPE ID	PIPE SIZE	PIPE LENGTH	PIPE SLOPE	PIPE MANNINGS	TOTAL UPSTREAM AREA	TOTAL EFFECTIVE AREA (CA)	PIPE TIME OF CONCENTRATION (Tc)	PIPE RAINFALL INTENSITY (I)	TOTAL PIPE FLOW	PIPE VELOCITY	PARTIAL FLOW PIPE VELOCITY	DOWNSTREAM PIT HGL	DOWNSTREAM PIPE OBVERT	HEAD LOSS CO-EFFICIENT	VELOCITY HEAD	UPSTREAM STRUCTURE HEAD LOSS	UPSTREAM PIT HGL-A	UPSTREAM PIT FINISHED SURFACE LEVEL	UPSTREAM ADOPTED SURCHARGE LEVEL	UPSTREAM PIT FREEBOARD	CALCULATED DESIGN FLOW	PIPE MANNING CAPACITY	PIPE HGL CAPACITY
@R02	@03 (mm)	@32 (m)	@04 (%)	@33 (n)	@14 (Ha)	@15 (Ha)	@18 (min)	@17 (mm/hr)	@12 (l/s)	@30 (m/s)	@22 (m/s)	H01 (m)	R03 (m)	P69 (Ku)	@28 (m)	@25 (m)	@45 (m)	R10 (m)	(m)	(m)	@12 (l/s)	@24 (l/s)	@23 (l/s)
A8.6-A8.7	300	49.60	0.56	0.01	0.17	0.11	7.87	93.38	28.78	0.41	0.97	95.219	95.020	2.02	0.01	0.02	95.300	96.492	96.342	1.042	28.78	72.66	100.58
A8.7-A8.8	300	14.62	0.50	0.01	0.05	0.03	6.00	103.22	9.20	0.13	0.67	95.320	95.320	17.65	0.00	0.02	95.410	96.598	96.448	1.038	9.20	68.38	94.39
A8.6-A9.1	300	6.00	0.50	0.01	0.04	0.03	6.00	103.22	7.96	0.11	0.65	95.219	95.020	17.95	0.00	0.01	95.230	96.254	96.104	0.874	7.96	68.38	94.39
DRAINAGE CACTHMENT B																							
30.2-30.3	525	47.48	0.55	0.01	2.12	1.49	12.88	73.32	302.74	1.35		94.623	93.844	1.00	0.09	0.09	94.740	95.795	95.710	0.970	302.74	333.00	450.55
30.3-B1.1	525	20.01	0.50	0.01	2.12	1.49	12.64	74.07	305.84	1.37		94.837	94.104	1.00	0.10	0.10	94.890	95.779	95.694	0.804	305.84	318.10	429.65
B1.1-B1.2	525	6.00	0.50	0.01	2.03	1.43	12.56	74.31	294.28	1.31		94.985	94.224	1.00	0.09	0.09	95.000	95.779	95.694	0.694	294.28	318.20	429.79
B1.2-B1.3	525	45.00	0.51	0.01	1.75	1.23	11.92	76.29	260.36	1.16		95.087	94.274	1.15	0.07	0.08	95.170	95.800	95.715	0.545	260.36	321.72	434.72
B1.3-B1.4	525	6.00	0.50	0.01	1.01	0.71	9.82	83.14	163.25	0.73		95.253	94.524	1.00	0.03	0.03	95.260	95.800	95.715	0.455	163.25	318.20	429.79
B1.4-B1.5	525	45.00	0.51	0.01	0.98	0.68	8.82	88.42	167.01	0.75		95.284	94.574	1.06	0.03	0.03	95.320	95.985	95.900	0.580	167.01	321.72	434.72
B1.5-B1.6	450	6.00	0.50	0.01	0.55	0.39	8.39	90.65	97.36	0.61		95.352	94.740	1.00	0.02	0.02	95.360	95.985	95.900	0.540	97.36	201.60	274.28
B1.6-B1.7	375	45.00	0.51	0.01	0.52	0.36	7.53	95.20	95.54	0.87		95.375	94.715	1.00	0.04	0.04	95.450	96.168	96.083	0.633	95.54	125.35	171.82
B1.7-B1.8	300	6.00	1.00	0.01	0.10	0.07	6.00	103.22	19.30	0.27	1.07	95.488	94.890	14.94	0.00	0.06	95.550	96.168	96.083	0.533	19.30	96.70	135.52
B1.2-B10.1	300	60.50	0.51	0.01	0.26	0.17	7.50	95.33	45.92	0.65		95.087	94.040	2.18	0.02	0.05	95.160	95.609	95.524	0.364	45.92	69.22	95.61
B10.1-B10.2	300	7.21	1.11	0.01	0.03	0.02	6.00	103.22	5.65	0.08	0.78	95.212	94.370	18.00	0.00	0.01	95.220	95.597	95.512	0.292	5.65	101.85	143.02
B1.7-B2.1	300	34.75	1.09	0.01	0.17	0.12	6.00	103.22	33.34	0.47	1.28	95.488	94.890	11.47	0.01	0.13	95.640	96.273	96.188	0.548	33.34	101.12	141.95
B1.7-B3.1	300	31.01	0.52	0.01	0.18	0.12	6.47	100.74	34.69	0.49	0.98	95.488	94.890	2.20	0.01	0.03	95.510	96.075	95.990	0.480	34.69	69.46	95.95
B3.1-B3.2	300	6.00	1.00	0.01	0.07	0.05	6.00	103.22	14.95	0.21	0.99	95.539	95.070	16.26	0.00	0.04	95.580	96.075	95.990	0.410	14.95	96.70	135.52
B1.5-B4.1	300	74.50	0.51	0.01	0.31	0.21	7.25	96.65	56.05	0.79		95.352	94.590	2.20	0.03	0.07	95.490	96.143	96.058	0.568	56.05	69.06	95.38
B4.1-B4.2	300	6.00	1.00	0.01	0.03	0.02	6.00	103.22	5.65	0.08	0.75	95.561	94.990	18.00	0.00	0.01	95.570	96.143	96.058	0.488	5.65	96.70	135.52
B1.3-B5.1	300	74.50	0.51	0.01	0.31	0.21	7.25	96.65	56.05	0.79		95.253	94.290	2.20	0.03	0.07	95.390	95.990	95.905	0.515	56.05	69.06	95.38
B5.1-B5.2	300	6.00	1.00	0.01	0.03	0.02	6.00	103.22	5.65	0.08	0.75	95.462	94.690	18.00	0.00	0.01	95.470	95.990	95.905	0.435	5.65	96.70	135.52
B1.3-B6.1	375	31.01	0.52	0.01	0.39	0.29	11.01	79.09	62.81	0.57	1.14	95.253	94.365	1.00	0.02	0.02	95.280	95.707	95.622	0.342	62.81	125.94	172.67
B6.1-B6.2	300	9.49	0.53	0.01	0.28	0.20	10.76	79.86	45.02	0.64		95.293	94.470	2.20	0.02	0.05	95.300	95.690	95.605	0.305	45.02	70.19	97.01
B6.2-B6.3	300	17.00	0.53	0.01	0.25	0.18	10.28	81.35	41.40	0.59	1.03	95.350	94.540	1.13	0.02	0.02	95.370	95.586	95.501	0.131	41.40	70.36	97.26
B6.3-B6.4	300	34.00	0.50	0.01	0.17	0.12	8.92	87.90	29.44	0.42	0.93	95.388	94.650	1.57	0.01	0.01	95.410	95.763	95.678	0.268	29.44	68.38	94.39
B6.4-B6.5	300	15.49	0.52	0.01	0.08	0.06	7.70	94.31	14.96	0.21	0.79	95.421	94.840	1.78	0.00	0.00	95.420	95.784	95.699	0.279	14.96	69.49	96.00
B6.5-B6.6	225	13.01	1.00	0.01	0.03	0.02	6.00	103.22	5.26	0.13	0.75	95.427	94.869	17.45	0.00	0.01	95.440	95.836	95.751	0.311	5.26	47.06	66.56
B6.4-B7.1	300	9.49	0.53	0.01	0.06	0.05	7.94	93.01	11.65	0.16	0.74	95.421	94.840	2.20	0.00	0.00	95.420	95.849	95.764	0.344	11.65	70.19	97.01
B7.1-B7.2	300	6.00	1.00	0.01	0.02	0.01	6.00	103.22	3.64	0.05	0.65	95.425	94.910	18.00	0.00	0.00	95.430	95.849	95.764	0.334	3.64	96.70	135.52
B6.3-B8.1	300	7.07	1.13	0.01	0.04	0.04	6.00	103.22	10.00	0.14	0.92	95.388	94.650	17.53	0.00	0.02	95.410	95.590	95.505	0.095	10.00	102.87	144.50
B6.1-B9.1	300	6.00	1.00	0.01	0.04	0.03	6.00	103.22	9.07	0.13	0.86	95.293	94.470	17.68	0.00	0.01	95.310	95.707	95.622	0.312	9.07	96.70	135.52
DRAINAGE CACTHMENT C																							
14.10-14.11	600	34.03	0.31	0.01	2.09	1.44	12.16	75.56	302.42	1.03		94.499	93.920	1.00	0.05	0.05	94.540	95.392	95.477	0.937	302.42	357.27	475.22
14.11-14.12	525	20.80	0.53	0.01	1.89	1.34	11.88	76.40	283.68	1.27		94.598	93.974	1.00	0.08	0.08	94.650	95.521	95.606	0.956	283.68	327.22	442.44
14.12-C1.1	525	8.59	0.58	0.01	1.66	1.17	11.76	76.79	250.24	1.12		94.727	94.104	1.00	0.06	0.06	94.740	95.515	95.600	0.860	250.24	343.33	465.03
C1.1-C1.2	525	10.21	0.59	0.01	1.62	1.14	11.60	77.27	244.48	1.09		94.806	94.174	2.20	0.06	0.13	94.820	95.634	95.719	0.899	244.48	344.98	467.36
C1.2-C1.3	525	15.79	0.51	0.01	1.52	1.07	11.35	78.05	232.65	1.04		94.957											

DRAINAGE CALCULATIONS										PROJECT NAME		1188 THE RANGE ESTATE											
										PROJECT LOCATION		MOAMA - NSW											
HGL CALCULATIONS:										ARI YEAR RAIN EVENT		10 YEAR ARE (10%)											
PIPE DETAILS					PIPE Tc & FLOW CALCULATIONS					PIPE HGL CALCULATIONS										PIPE CAPACITY CHECK			
PIPE ID	PIPE SIZE	PIPE LENGTH	PIPE SLOPE	PIPE MANNINGS	TOTAL UPSTREAM AREA	TOTAL EFFECTIVE AREA (CA)	PIPE TIME OF CONCENTRATION (Tc)	PIPE RAINFALL INTENSITY (I)	TOTAL PIPE FLOW	PIPE VELOCITY	PARTIAL FLOW PIPE VELOCITY	DOWNSTREAM PIT HGL	DOWNSTREAM PIPE OBVERT	HEAD LOSS CO-EFFICIENT	VELOCITY HEAD	UPSTREAM STRUCTURE HEAD LOSS	UPSTREAM PIT HGL-A	UPSTREAM PIT FINISHED SURFACE LEVEL	UPSTREAM ADOPTED SURCHARGE LEVEL	UPSTREAM PIT FREEBOARD	CALCULATED DESIGN FLOW	PIPE MANNING CAPACITY	PIPE HGL CAPACITY
@R02	@03 (mm)	@32 (m)	@04 (%)	@33 (n)	@14 (Ha)	@15 (Ha)	@18 (min)	@17 (mm/hr)	@12 (l/s)	@30 (m/s)	@22 (m/s)	H01 (m)	R03 (m)	P69 (Ku)	@28 (m)	@25 (m)	@45 (m)	R10 (m)	(m)	(m)	@12 (l/s)	@24 (l/s)	@23 (l/s)
C1.9-C2.1	300	6.00	1.00	0.01	0.08	0.06	6.00	103.22	16.57	0.23	1.02	95.549	95.020	15.74	0.00	0.04	95.590	96.028	96.113	0.523	16.57	96.70	135.52
C1.7-C3.1	300	6.00	1.00	0.01	0.06	0.04	6.00	103.22	12.48	0.18	0.94	95.422	94.720	16.91	0.00	0.03	95.450	95.886	95.971	0.521	12.48	96.70	135.52
C1.6-C4.1	300	9.50	0.53	0.01	0.24	0.17	7.38	95.97	45.92	0.65		95.379	94.620	1.30	0.02	0.03	95.390	95.964	96.049	0.659	45.92	70.15	96.96
C4.1-C4.2	225	6.00	1.00	0.01	0.06	0.05	6.00	103.22	13.39	0.33	0.99	95.419	94.619	13.09	0.01	0.07	95.490	95.964	96.049	0.559	13.39	47.06	66.56
C4.1-C5.1	300	26.50	1.02	0.01	0.12	0.08	6.00	103.22	22.62	0.32	1.12	95.419	94.690	14.09	0.01	0.07	95.500	96.086	96.171	0.671	22.62	97.61	136.84
C1.5-C6.1	300	6.00	1.00	0.01	0.05	0.04	6.00	103.22	11.34	0.16	0.92	95.240	94.420	17.20	0.00	0.02	95.260	95.733	95.818	0.558	11.34	96.70	135.52
C1.4-C7.1	300	9.50	0.53	0.01	0.24	0.17	7.38	95.97	45.07	0.64		95.141	94.320	1.28	0.02	0.03	95.150	95.811	95.896	0.746	45.07	70.15	96.96
C7.1-C7.2	300	6.00	1.00	0.01	0.06	0.05	6.00	103.22	12.93	0.18	0.95	95.180	94.390	16.79	0.00	0.03	95.210	95.811	95.896	0.686	12.93	96.70	135.52
C7.1-C8.1	300	26.50	1.02	0.01	0.12	0.08	6.00	103.22	22.62	0.32	1.12	95.180	94.390	14.09	0.01	0.07	95.260	95.933	96.018	0.758	22.62	97.61	136.84
14.12-C9.1	300	6.00	1.00	0.01	0.10	0.07	6.00	103.22	21.31	0.30	1.10	94.727	93.870	14.43	0.00	0.07	94.800	95.489	95.574	0.774	21.31	96.70	135.52
DRAINAGE CACTHMENT D																							
1.1-1.2	1050	9.94	0.50	0.01	10.39	6.82	16.73	63.42	1200.87	1.34		93.070	93.070	1.00	0.09	0.09	93.120	94.206	94.291	1.171	1200.87	2036.46	2655.14
1.2-1.3	750	7.20	0.42	0.01	4.66	3.09	14.77	67.52	578.57	1.28		93.211	92.830	1.15	0.08	0.10	93.220	94.179	94.264	1.044	578.57	744.35	985.57
1.3-1.4	750	12.49	0.32	0.01	4.59	3.04	14.60	68.03	573.42	1.26		93.317	92.880	1.14	0.08	0.09	93.340	94.224	94.309	0.969	573.42	652.64	860.05
1.4-1.5	750	8.29	0.36	0.01	4.59	3.04	14.49	68.36	576.25	1.27		93.428	92.940	1.00	0.08	0.08	93.440	94.258	94.343	0.903	576.25	693.73	916.26
1.5-1.6	750	52.48	0.30	0.01	4.37	2.90	13.79	70.52	568.03	1.25		93.523	92.990	1.00	0.08	0.08	93.600	94.437	94.522	0.922	568.03	636.79	838.37
1.6-1.7	750	70.59	0.31	0.01	3.93	2.65	12.81	73.55	541.75	1.19		93.678	93.170	1.00	0.07	0.07	93.770	94.677	94.762	0.992	541.75	643.85	848.02
1.7-1.8	675	70.60	0.31	0.01	3.19	2.27	11.91	76.33	480.58	1.30		93.844	93.335	1.00	0.09	0.09	93.970	94.918	95.003	1.033	480.58	488.01	645.88
1.8-1.9	600	75.25	0.31	0.01	2.54	1.92	11.04	79.01	421.56	1.44		94.056	93.500	1.00	0.11	0.11	94.240	94.681	94.766	0.526	421.56	354.77	471.75
1.710.1	300	9.50	0.58	0.01	0.37	0.19	6.62	99.96	53.46	0.76		93.844	93.130	2.20	0.03	0.06	93.860	94.678	94.763	0.903	53.46	73.58	101.92
10.110.2	225	24.53	1.96	0.01	0.20	0.09	6.00	103.22	26.15	0.66		93.925	93.185	8.20	0.02	0.18	94.150	94.761	94.846	0.696	26.15	90.73	91.99
1.6-11.1	300	9.50	0.58	0.01	0.37	0.19	7.17	97.08	51.92	0.73		93.678	92.890	2.20	0.03	0.06	93.690	94.437	94.522	0.832	51.92	73.44	101.73
11.1-11.2	225	46.10	1.04	0.01	0.20	0.09	6.00	103.22	26.15	0.66		93.754	92.945	8.20	0.02	0.18	94.020	94.594	94.679	0.659	26.15	66.20	66.15
1.5-13.1	300	9.37	1.62	0.01	0.17	0.09	6.00	103.22	26.87	0.38	1.39	93.523	93.048	12.95	0.01	0.10	93.620	94.315	94.400	0.780	26.87	123.14	174.07
1.2-14.1	750	9.12	0.33	0.01	5.66	3.68	16.62	63.63	650.45	1.43		93.211	92.840	1.16	0.10	0.12	93.230	94.198	94.283	1.053	650.45	661.35	871.95
14.1-14.2	750	68.70	0.26	0.01	5.39	3.56	15.81	65.21	643.98	1.42		93.350	92.890	1.00	0.10	0.10	93.480	94.179	94.264	0.784	643.98	590.34	774.90
14.214.3	750	14.74	0.27	0.01	5.08	3.39	15.63	65.56	617.01	1.36		93.579	93.090	1.00	0.09	0.09	93.600	94.258	94.343	0.743	617.01	600.73	789.10
14.3-14.4	750	10.79	0.28	0.01	5.03	3.35	15.50	65.82	611.57	1.35		93.698	93.150	1.24	0.09	0.12	93.720	94.276	94.361	0.641	611.57	608.11	799.18
14.4-14.5	750	44.39	0.32	0.01	4.98	3.30	14.95	66.95	614.43	1.35		93.831	93.200	1.00	0.09	0.09	93.910	94.434	94.519	0.609	614.43	647.65	853.22
14.5-14.6	750	67.99	0.25	0.01	4.24	2.93	14.04	69.74	566.69	1.25		93.999	93.360	1.00	0.08	0.08	94.100	94.675	94.760	0.660	566.69	576.67	756.25
14.6-14.7	750	82.64	0.25	0.01	3.49	2.53	12.84	73.47	516.58	1.14		94.177	93.550	1.00	0.07	0.07	94.280	94.968	95.053	0.773	516.58	581.39	762.69
14.7-14.8	750	48.38	0.25	0.01	2.93	2.24	12.06	75.85	472.51	1.04		94.343	93.780	1.00	0.06	0.06	94.390	95.139	95.224	0.834	472.51	574.39	753.13
14.8-14.9	450	12.00	0.25	0.01	2.42	1.97	11.91	76.32	417.34	1.31		94.447	93.620	1.07	0.09	0.09	94.480	95.079	95.164	0.684	417.34	285.10	381.78
14.9-14.10	450	24.80	0.28	0.01	1.88	1.54	10.27	81.36	348.74	1.10		94.577	93.670	1.40	0.06	0.09	94.630	95.270	95.355	0.725	348.74	302.94	406.90
14.10-14.11	600	34.03	0.41	0.01	1.62	1.38	9.75	83.49	319.82	1.09		94.715	93.920	1.00	0.06	0.06	94.760	95.403	95.488	0.728	319.82	411.57	550.55
14.11-14.12	525	20.80	0.53	0.01	1.44	1.30	9.50	84.83															

DRAINAGE CALCULATIONS										PROJECT NAME						1188 THE RANGE ESTATE							
										PROJECT LOCATION						MOAMA - NSW							
HGL CALCULATIONS:										ARI YEAR RAIN EVENT						10 YEAR ARE (10%)							
PIPE DETAILS					PIPE Tc & FLOW CALCULATIONS					PIPE HGL CALCULATIONS										PIPE CAPACITY CHECK			
PIPE ID	PIPE SIZE	PIPE LENGTH	PIPE SLOPE	PIPE MANNINGS	TOTAL UPSTREAM AREA	TOTAL EFFECTIVE AREA (CA)	PIPE TIME OF CONCENTRATION (Tc)	PIPE RAINFALL INTENSITY (I)	TOTAL PIPE FLOW	PIPE VELOCITY	PARTIAL FLOW PIPE VELOCITY	DOWNSTREAM PIT HGL	DOWNSTREAM PIPE OBVERT	HEAD LOSS CO-EFFICIENT	VELOCITY HEAD	UPSTREAM STRUCTURE HEAD LOSS	UPSTREAM PIT HGL-A	UPSTREAM PIT FINISHED SURFACE LEVEL	UPSTREAM ADOPTED SURCHARGE LEVEL	UPSTREAM PIT FREEBOARD	CALCULATED DESIGN FLOW	PIPE MANNING CAPACITY	PIPE HGL CAPACITY
@R02	@03	@32	@04	@33	@14	@15	@18	@17	@12	@30	@22	H01	R03	P69	@28	@25	@45	R10			@12	@24	@23
	(mm)	(m)	(%)	(n)	(Ha)	(Ha)	(min)	(mm/hr)	(l/s)	(m/s)	(m/s)	(m)	(m)	(Ku)	(m)	(m)	(m)	(m)	(m)	(m)	(l/s)	(l/s)	(l/s)
14.6-22.1	375	11.77	0.51	0.01	0.38	0.20	7.26	96.58	52.71	0.48	1.09	94.177	93.365	1.39	0.01	0.02	94.180	94.699	94.784	0.604	52.71	125.19	171.60
22.1-22.2	225	49.87	0.99	0.01	0.20	0.09	6.00	103.22	26.15	0.66		94.199	93.425	8.20	0.02	0.18	94.470	94.876	94.961	0.491	26.15	64.69	64.57
14.5-23.1	300	10.71	0.51	0.01	0.37	0.19	7.26	96.59	51.24	0.72		93.999	92.970	1.77	0.03	0.05	94.020	94.451	94.536	0.516	51.24	69.29	95.71
23.1-23.2	225	49.81	1.00	0.01	0.20	0.09	6.00	103.22	26.15	0.66		94.064	93.025	8.20	0.02	0.18	94.340	94.628	94.713	0.373	26.15	64.98	64.88
14.2-24.1	300	7.35	1.12	0.01	0.04	0.03	6.00	103.22	9.00	0.13	0.90	93.579	93.168	17.70	0.00	0.01	93.590	94.199	94.284	0.694	9.00	102.14	143.44
1.9-30.1	600	24.97	0.52	0.01	1.63	1.45	10.66	80.17	322.64	1.10		94.347	93.750	1.84	0.06	0.11	94.380	94.927	95.012	0.632	322.64	462.98	622.01
30.1-30.2	600	4.99	0.60	0.01	1.56	1.39	10.58	80.41	311.16	1.06		94.499	93.910	2.19	0.06	0.13	94.510	94.953	95.038	0.528	311.16	497.76	670.41
30.2-30.3	525	47.61	0.50	0.01	1.49	1.34	10.00	82.20	305.37	1.36		94.633	93.894	6.37	0.09	0.60	95.360	95.660	95.745	0.385	305.37	318.17	429.74
1.9-6.1	300	9.50	0.32	0.01	0.27	0.15	7.74	94.06	37.89	0.54	0.83	94.347	93.470	1.75	0.01	0.03	94.360	94.681	94.766	0.406	37.89	54.34	74.12
6.1-6.2	300	17.18	0.35	0.01	0.15	0.08	6.80	99.03	21.39	0.30	0.75	94.382	93.520	1.15	0.00	0.01	94.390	95.019	95.104	0.714	21.39	57.14	78.15
6.2-6.3	300	12.50	1.52	0.01	0.13	0.06	6.00	103.22	18.47	0.26	1.23	94.392	93.580	15.19	0.00	0.05	94.450	95.019	95.104	0.654	18.47	119.22	168.34
1.9-7.1	300	17.18	0.35	0.01	0.41	0.21	8.08	92.30	54.90	0.78		94.347	93.420	1.34	0.03	0.04	94.380	95.018	95.103	0.723	54.90	57.14	78.16
7.1-7.2	225	26.20	1.28	0.01	0.10	0.05	6.00	103.22	13.08	0.33	1.39	94.419	93.480	12.95	0.01	0.07	94.500	95.151	95.236	0.736	13.08	73.33	73.65
7.1-8.1	300	12.50	3.00	0.01	0.27	0.14	7.66	94.48	35.58	0.50	1.88	94.419	93.500	2.20	0.01	0.03	94.430	95.018	95.103	0.673	35.58	167.49	238.89
8.1-8.2	225	37.10	1.27	0.01	0.11	0.05	6.00	103.22	14.77	0.37	1.43	94.458	93.875	12.16	0.01	0.09	94.570	95.207	95.292	0.722	14.77	73.00	73.31
1.8-9.1	300	9.50	0.37	0.01	0.28	0.15	7.14	97.22	40.53	0.57	0.90	94.056	93.555	2.30	0.02	0.04	94.070	94.918	95.003	0.933	40.53	58.70	80.39
9.1-9.2	225	22.53	1.35	0.01	0.10	0.05	6.00	103.22	13.08	0.33	1.43	94.104	93.590	12.95	0.01	0.07	94.190	94.977	95.062	0.872	13.08	75.46	75.90
9.1-9A.1	225	24.53	1.00	0.01	0.00	0.00	6.00	103.22	0.00	0.00	0.00	94.104	93.590	18.00	0.00	0.00	94.100	94.835	94.920	0.820	0.00	0.00	64.75

FILE NAME 1188_DrainageCalculations_V2.dwg LAYOUT NAME 23
FILE LOCATION Z:\1188 - 24 Lane Moama Stage 6\Acad_RetiementVillageUpdate

10				
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2	LINE 9 RENUMBERED TO LINE 26	PS	13/09/24	
1	DRAINAGE CALCULATIONS -- UPDATED -- RETIREMENT VILLAGE	DSJ	14/11/23	

WARNING

BEWARE OF UNDERGROUND SERVICES
DIAL BEFORE YOU DIG
THE LOCATION OF UNDERGROUND SERVICES, WHERE SHOWN
ARE APPROXIMATE ONLY.

ALL AUTHORITIES MUST BE CONTACTED PRIOR TO
CONSTRUCTION TO DETERMINE THE EXACT LOCATION
OF ALL UNDERGROUND SERVICES

DESIGN BY: DSJ

DRAWN BY: DSJ

CHECKED BY:

PLOT DATE: 30/10/2024

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THE RANGE - MOAMA
STAGE 6-7-8
DRAINAGE CALCULATIONS
HGL CALCULATIONS

DWG:1188_DRAINAGE.dwg SHEET: 23 OF 23 SHEET SIZE: A1 REV: 2



DEVELOPMENT
OUTCOMES

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