

## **Indicative Conduit Design**

- DRAINS Information  
Model Layout Screenshot (Labels and worst case 50yr)

Job \_\_\_\_\_  
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Design \_\_\_\_\_  
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Date \_\_\_\_\_

Office Sydney  
Job No AA003760

# MOOREBANK INTERMODAL STAGE 2 SIZING MODEL



URBAN DRAINAGE

EXISTING

DRAINS OUTPUT

March 2016

<b>DRAINS File Path:</b>	F:\AA003760D-Calculations\Civil\A-Stormwater\A-MASTERPLAN\A-DRAINS\C-Models
<b>DRAINS Version:</b>	DRAINS Version 2015.11 - 7 October 2015
<b>Modeller's Name:</b>	George Dunstan
<b>Description:</b>	Stage 2 Sizing Model

PIT / NODE DETAILS														
Name	Type	Family	Version 12 Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Loss
B01\17	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6		0	0	308029.3	6241302.2	No	97180237	1 x Ku
B01\16	OnGrade	Surface Inlet Pits	Trench Grate		1.5	16.6		0	0	308022.9	6241252.6	No	97180236	1 x Ku
B01\15	OnGrade	Surface Inlet Pits	Trench Grate		1	16.6		0	0	308016.6	6241203	No	97180235	1 x Ku
B01\14	OnGrade	Surface Inlet Pits	Trench Grate		1	16.6		0	0	307946.6	6241211	No	97180234	1 x Ku
B01\13	OnGrade	Surface Inlet Pits	Trench Grate		1	16.6		0	0	307876.4	6241219	No	97180233	1 x Ku
B01\12	Sag	Standard Pits	2.4m lintel sag	5	0.3	15.963		0.15	0	307809.8	6241226.6	No	97180232	1 x Ku
B01\11	Sag	Standard Pits	2.4m lintel sag	5	0.3	15.687		0.15	0	307751.6	6241234	No	97180231	1 x Ku
B01\10	Sag	Standard Pits	2.4m lintel sag	5	0.8	15.15		0.15	0	307693.4	6241241.4	No	97180230	1 x Ku
B01\09	Sag	Standard Pits	2.4m lintel sag	5	0.3	14.8		0.15	0	307608.6	6241252.3	No	97180229	1 x Ku
B01\08	OnGrade	Surface Inlet Pits	Unlimited Entry Pit		0.6	14.705			0	307510.8	6241264.8	No	97180228	1 x Ku
B01\07	OnGrade	Surface Inlet Pits	Unlimited Entry Pit		0.3	14.6			0	307498.1	6241275.6	No	97180227	1 x Ku
B01\06	OnGrade	Surface Inlet Pits	Unlimited Entry Pit		0.6	14.5			0	307485.2	6241285.4	No	97180226	1 x Ku
B01\05	OnGrade	Standard Pits	1.8m lintel		0.3	15.115			0	307494.5	6241362	No	97180225	1 x Ku
B01\04	OnGrade	Standard Pits	1.8m lintel		0.3	14.856			0	307515.9	6241487.2	No	97180224	1 x Ku
B01\03	Sag	Standard Pits	2.4m lintel sag	24.004	1	14.343		0.15	0	307539.3	6241537.4	No	97180223	1 x Ku
B01\01	Node					12.1			0	307554.7	6241583.3		97180221	
B02\02	OnGrade	Standard Pits	1.8m lintel		2	14.849			0	307607.5	6241554.6	No	97180239	1 x Ku
B02\01	OnGrade	Standard Pits	1.8m lintel		2	14.816			0	307574.6	6241572.8	No	97180238	1 x Ku
B01\02	OnGrade	Standard Pits	1.8m lintel		0.6	14.82			0	307560.9	6241580.1	No	97180222	1 x Ku
N520291	Node					12.1			0	307558.6	6241585.8		113254781	
B03\14	OnGrade	Surface Inlet Pits	Trench Grate		3	16.6			0	308067.6	6241602.6	No	97180253	1 x Ku
B03\13	OnGrade	Surface Inlet Pits	Trench Grate		1.7	16.6			0	308061.3	6241553	No	97180252	1 x Ku
B03\12	OnGrade	Surface Inlet Pits	Trench Grate		1	16.6			0	308054.9	6241503.4	No	97180251	1 x Ku
B03\11	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	308048.6	6241453.8	No	97180250	1 x Ku
B03\10	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	307978.8	6241462.9	No	97180249	1 x Ku
B03\09	OnGrade	Surface Inlet Pits	Trench Grate		1.5	16.6			0	307909	6241472.1	No	97180248	1 x Ku
B03\08	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	0.3	16.456		0.15	0	307879.2	6241476	No	97180247	1 x Ku
B03\07	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	0.3	16.365		0.15	0	307831.1	6241482.4	No	97180246	1 x Ku
B03\06	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	1	16.269		0.15	0	307781.2	6241488.7	No	97180245	1 x Ku
B03\05	OnGrade	Surface Inlet Pits	Surface Inlet Pit 900x900		1	15.746			0	307726	6241496.4	No	97180244	1 x Ku
B03\04	OnGrade	Surface Inlet Pits	Unlimited Entry Pit		0.8	15.217			0	307699.5	6241500.2	No	97180243	1 x Ku
B03\03	OnGrade	Standard Pits	1.8m lintel		0.8	15.209			0	307678.8	6241510	No	97180242	1 x Ku
B03\02	OnGrade	Standard Pits	1.8m lintel		0.5	14.63			0	307621.4	6241517.4	No	97180241	1 x Ku
B03\01	OnGrade	Surface Inlet Pits	Unlimited Entry Pit		0.5	14.077			0	307564	6241524.7	No	97180240	1 x Ku
B04\02	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	2	15.277		0.15	0	307702.5	6241312.9	No	97180255	1 x Ku
B04\01	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	0.3	14.993		0.15	0	307695.9	6241260.7	No	97180254	1 x Ku
B05\02	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	307889.2	6241318.2	No	97180257	1 x Ku
B05\01	OnGrade	Surface Inlet Pits	Trench Grate		1.5	16.6			0	307883	6241269.9	No	97180256	1 x Ku
B06\02	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	307863.5	6241115.9	No	97180259	1 x Ku
B06\01	OnGrade	Surface Inlet Pits	Trench Grate		1.5	16.6			0	307870	6241168.7	No	97180258	1 x Ku
B07\02	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	307959.3	6241310.2	No	97180261	1 x Ku
B07\01	OnGrade	Surface Inlet Pits	Trench Grate		1.5	16.6			0	307952.9	6241260.6	No	97180260	1 x Ku
B08\02	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	307933.3	6241107	No	97180263	1 x Ku
B08\01	OnGrade	Surface Inlet Pits	Trench Grate		1.5	16.6			0	307939.9	6241159	No	97180262	1 x Ku
B09\02	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	308003.6	6241101	No	97180265	1 x Ku
B09\01	OnGrade	Surface Inlet Pits	Trench Grate		1.5	16.6			0	308009.9	6241150.6	No	97180264	1 x Ku
B10\02	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	2	15.526		0.15	0	307708.8	6241361.7	No	97180267	1 x Ku
B10\01	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	2	15.669		0.15	0	307716.5	6241422.1	No	97180266	1 x Ku
B11\03	OnGrade	Surface Inlet Pits	Trench Grate		3	16.6			0	307928	6241620.9	No	97180270	1 x Ku
B11\02	OnGrade	Surface Inlet Pits	Trench Grate		1.7	16.6			0	307921.6	6241571.3	No	97180269	1 x Ku
B11\01	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	307915.4	6241521.7	No	97180268	1 x Ku
B12\02	OnGrade	Surface Inlet Pits	Trench Grate		3	16.6			0	307895.7	6241367.7	No	97180272	1 x Ku
B12\01	OnGrade	Special	Unlimited		2	16.6			0	307902.4	6241421.2	No	97180271	1 x Ku
B13\03	OnGrade	Surface Inlet Pits	Trench Grate		3	16.6			0	307997.8	6241611.7	No	97180275	1 x Ku
B13\02	OnGrade	Surface Inlet Pits	Trench Grate		1.7	16.6			0	307991.4	6241562.1	No	97180274	1 x Ku
B13\01	OnGrade	Surface Inlet Pits	Trench Grate		1	16.6			0	307985.1	6241512.5	No	97180273	1 x Ku
B14\02	OnGrade	Surface Inlet Pits	Trench Grate		3	16.6			0	307965.5	6241359.3	No	97180277	1 x Ku
B14\01	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	307972.4	6241413.1	No	97180276	1 x Ku
B15\02	OnGrade	Surface Inlet Pits	Trench Grate		3	16.6			0	308035.6	6241351.8	No	97180279	1 x Ku
B15\01	OnGrade	Surface Inlet Pits	Trench Grate		2	16.6			0	308041.9	6241401.4	No	97180278	1 x Ku
B16\01	Sag	Standard Pits	2.4m lintel sag	5	2	14.416		0.15	0	307562.7	6241514.3	No	97180280	1 x Ku
B17\01	OnGrade	Standard Pits	1.8m lintel		2	14.901			0	307620.1	6241507	No	97180281	1 x Ku
B18\02	OnGrade	Special	Unlimited		2	17.22			0	307676.7	6241460.6	No	97180283	1 x Ku
B18\01	OnGrade	Standard Pits	1.8m lintel		2	15.42			0	307679.3	6241499.4	No	97180282	1 x Ku
B19\01	OnGrade	Standard Pits	1.8m lintel		5	15.123			0	307510	6241360.8	No	97180284	1 x Ku
B20\02	OnGrade	Special	Unlimited		2	17.22			0	307545.9	6241478.7	No	97180286	1 x Ku
B20\01	OnGrade	Standard Pits	1.8m lintel		2	14.737			0	307530.6	6241482.7	No	97180285	1 x Ku
B21\01	Sag	Standard Pits	2.4m lintel sag	10.441	2	13.954		0.205	0	307571.5	6241541.7	No	97180287	1 x Ku
B22\01	OnGrade	Standard Pits	1.8m lintel		2	14.63			0	307623.2	6241531.4	No	97180288	1 x Ku
B23\02	OnGrade	Special	Unlimited		2	17.92			0	307685.7	6241574.6	No	97180290	1 x Ku
B23\01	OnGrade	Surface Inlet Pits	Unlimited Entry Pit		2	15.519			0	307611.1	6241583.1	No	97180289	1 x Ku
B24\01	OnGrade	Special	Unlimited		2	17.22			0	307515.5	6241282.7	No	97180291	1 x Ku
B25\01	OnGrade	Special	Unlimited		2	17.22			0	307617.2	6241262.5	No	97180292	1 x Ku
B26\01	OnGrade	Special	Unlimited		2	17.22			0	307753.1	6241246.8	No	97180293	1 x Ku
B27\01	OnGrade	Special	Unlimited		2	17.22			0	307811.3	6241238.1	No	97180294	1 x Ku
B28\01	OnGrade	Special	Unlimited		2	17.22			0	307776.8	6241456.7	No	97180295	1 x Ku
B29\01	OnGrade	Special	Unlimited		2	17.22			0	307890.4	6241423	No	97180296	1 x Ku
B30\01	OnGrade	Special	Unlimited		2	16.637			0	307905.3	6241534.3	No	97180297	1 x Ku
B31\01	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	5	16.143		0.15	0	307783.7	6241506.8	No	97180298	1 x Ku
B32\01	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	5	16.236		0.15	0	307833.3	6241500.4	No	97180299	1 x Ku
B33\01	Sag	Surface Inlet Pits	Surface Inlet Pit 900	5	5	16.329		0.15	0	307881.4	6241494.3	No	97180300	1 x Ku
O B01\06	Node					14.284			0	307472	6241286.2		97180302	

DETENTION BASIN DETAILS														
Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length

SUB-CATCHMENT DETAILS														
Name	Pit or Node	Total Area (ha)	Paved Area (%)	Grass Area (%)	Supp Area (%)	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope (%)	Grass Slope (%)	Supp Slope (%)
C B01\17	B01\17	0.3877	100	0	0	4		8	0					
C B01\16	B01\16	0.3896	100	0	0	4		8	0					
C B01\15	B01\15	0.4008	100	0	0	4		8	0					
C B01\14	B01\14	0.3876	100	0	0	4		8	0					
C B01\13	B01\13	0.2241	100	0	0	4		8	0					
C B01\12														

C B03\13	B03\13	0.3894	100	0	0	4	8	0									
C B03\12	B03\12	0.3898	100	0	0	4	8	0									
C B03\11	B03\11	0.3863	100	0	0	4	8	0									
C B03\10	B03\10	0.376	100	0	0	4	8	0									
C B03\09	B03\09	0.2209	100	0	0	4	8	0									
C B03\08	B03\08	0.1765	100	0	0	4	8	0									
C B03\07	B03\07	0.2126	100	0	0	4	8	0									
C B03\06	B03\06	0.2072	100	0	0	4	8	0									
C B03\04	B03\04	0.767	100	0	0	4	8	0									
C B03\03	B03\03	0.0643	100	0	0	4	8	0									
C B03\02	B03\02	0.1286	100	0	0	4	8	0									
C B03\01	B03\01	0.2416	100	0	0	4	8	0									
C B04\02	B04\02	0.3995	100	0	0	4	8	0									
C B04\01	B04\01	0.3639	100	0	0	4	8	0									
C B05\02	B05\02	0.2181	100	0	0	4	8	0									
C B05\01	B05\01	0.2157	100	0	0	4	8	0									
C B06\02	B06\02	0.2359	100	0	0	4	8	0									
C B06\01	B06\01	0.2257	100	0	0	4	8	0									
C B07\02	B07\02	0.3734	100	0	0	4	8	0									
C B07\01	B07\01	0.3728	100	0	0	4	8	0									
C B08\02	B08\02	0.4041	100	0	0	4	8	0									
C B08\01	B08\01	0.3916	100	0	0	4	8	0									
C B09\02	B09\02	0.4206	100	0	0	4	8	0									
C B09\01	B09\01	0.4129	100	0	0	4	8	0									
C B10\02	B10\02	0.4066	100	0	0	4	8	0									
C B10\01	B10\01	0.4104	100	0	0	4	8	0									
C B11\03	B11\03	0.2035	100	0	0	4	8	0									
C B11\02	B11\02	0.2177	100	0	0	4	8	0									
C B11\01	B11\01	0.2193	100	0	0	4	8	0									
C B12\02	B12\02	0.2269	100	0	0	4	8	0									
C B12\01	B12\01	0.2295	100	0	0	4	8	0									
C B13\03	B13\03	0.3494	100	0	0	4	8	0									
C B13\02	B13\02	0.375	100	0	0	4	8	0									
C B13\01	B13\01	0.3749	100	0	0	4	8	0									
C B14\02	B14\02	0.3889	100	0	0	4	8	0									
C B14\01	B14\01	0.3916	100	0	0	4	8	0									
C B15\02	B15\02	0.4092	100	0	0	4	8	0									
C B15\01	B15\01	0.3982	100	0	0	4	8	0									
C B16\01	B16\01	0.1331	100	0	0	4	8	0									
C B17\01	B17\01	0.2104	100	0	0	4	8	0									
C B18\02	B18\02	0.7328	100	0	0	4	8	0									
C B18\01	B18\01	0.1285	100	0	0	4	8	0									
C B19\01	B19\01	0.1004	100	0	0	4	8	0									
C B20\02	B20\02	0.7657	100	0	0	4	8	0									
C B20\01	B20\01	0.1477	100	0	0	4	8	0									
C B21\01	B21\01	0.2547	100	0	0	4	8	0									
C B22\01	B22\01	0.194	100	0	0	4	8	0									
C B23\02	B23\02	0.7921	100	0	0	4	8	0									
C B23\01	B23\01	0.3691	100	0	0	4	8	0									
C B24\01	B24\01	0.7638	100	0	0	4	8	0									
C B25\01	B25\01	0.7483	100	0	0	4	8	0									
C B26\01	B26\01	0.7512	100	0	0	4	8	0									
C B27\01	B27\01	0.7536	100	0	0	4	8	0									
C B28\01	B28\01	0.7493	100	0	0	4	8	0									
C B29\01	B29\01	0.747	100	0	0	4	8	0									
C B30\01	B30\01	0.7921	100	0	0	4	8	0									
C B31\01	B31\01	0.2149	100	0	0	4	8	0									
C B32\01	B32\01	0.2153	100	0	0	4	8	0									
C B33\01	B33\01	0.1782	100	0	0	4	8	0									

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg
P B01\17	B01\17	B01\16	50	15.19	14.69	1	RCP Class 2	600	600	0.3	New	1	B01\17	0
P B01\16	B01\16	B01\15	50	14.67	14.17	1	RCP Class 2	600	600	0.3	New	1	B01\16	0
P B01\15	B01\15	B01\14	70.444	14.121	13.417	1	Box Culverts	1.2W x 0.6H		0.3	Existing	2	B01\15	0
P B01\14	B01\14	B01\13	70.682	13.397	13.043	0.5	Box Culverts	1.5W x 0.75H		0.3	Existing	2	B01\14	0
P B01\13	B01\13	B01\12	67.004	13.023	12.889	0.2	Box Culverts	1.5W x 0.9H		0.3	NewFixed	2	B01\13	0
P B01\12	B01\12	B01\11	58.668	12.869	12.752	0.2	Box Culverts	1.5W x 0.9H		0.3	NewFixed	2	B01\12	0
P B01\11	B01\11	B01\10	58.668	12.732	12.615	0.2	Box Culverts	1.5W x 1.2H		0.3	NewFixed	2	B01\11	0
P B01\10	B01\10	B01\09	85.463	12.595	12.424	0.2	Box Culverts	1.8W x 1.2H		0.3	NewFixed	2	B01\10	0
P B01\09	B01\09	B01\08	98.656	12.404	12.206	0.2	Box Culverts	1.8W x 1.2H		0.3	NewFixed	2	B01\09	0
P B01\08	B01\08	B01\07	22.421	12.186	12.142	0.2	Box Culverts	1.8W x 1.2H		0.3	NewFixed	2	B01\08	0
P B01\07	B01\07	B01\06	14.714	12.122	12.092	0.2	Box Culverts	2.1W x 1.2H		0.3	NewFixed	2	B01\07	0
P B01\06	B01\06	B01\05	77.209	12.072	11.918	0.2	Box Culverts	2.1W x 1.2H		0.3	NewFixed	2	B01\06	0
P B01\05	B01\05	B01\04	126.981	11.898	11.644	0.2	Box Culverts	2.4W x 1.2H		0.3	NewFixed	2	B01\05	0
P B01\04	B01\04	B01\03	55.35	11.624	11.35	0.5	Box Culverts	2.4W x 1.2H		0.3	NewFixed	2	B01\04	0
P B01\03	B01\03	B01\01	47.894	11.33	11.234	0.2	Box Culverts	2.4W x 1.2H		0.3	NewFixed	3	B01\03	0
P B02\02	B02\02	B02\01	37.576	13.436	13.061	1	RCP Class 2	375	375	0.3	New	1	B02\02	0
P B02\01	B02\01	B01\02	15.55	12.875	12.72	1	RCP Class 2	600	600	0.3	New	1	B02\01	0
P B01\02	B01\02	N520291	10	11.214	11.2	0.14	Box Culverts	2.4W x 1.2H		0.3	NewFixed	2	B01\02	0
P B03\14	B03\14	B03\13	50	15.19	14.69	1	RCP Class 2	525	525	0.3	New	1	B03\14	0
P B03\13	B03\13	B03\12	50	14.67	14.17	1	RCP Class 2	600	600	0.3	New	1	B03\13	0
P B03\12	B03\12	B03\11	50	14.15	13.65	1	Box Culverts	0.6W x 0.6H		0.3	Existing	1	B03\12	0
P B03\11	B03\11	B03\10	70.439	13.63	12.926	1	Box Culverts	1.2W x 0.6H		0.3	NewFixed	2	B03\11	0
P B03\10	B03\10	B03\09	70.388	12.906	12.202	1	Box Culverts	1.5W x 0.75H		0.3	NewFixed	2	B03\10	0
P B03\09	B03\09	B03\08	30.077	12.182	12.122	0.2	Box Culverts	1.5W x 0.75H		0.3	NewFixed	2	B03\09	0
P B03\08	B03\08	B03\07	48.461	12.102	12.005	0.2	Box Culverts	1.5W x 1.2H		0.3	NewFixed	2	B03\08	0
P B03\07	B03\07	B03\06	50.304	11.985	11.884	0.2	Box Culverts	1.5W x 1.2H		0.3	NewFixed	2	B03\07	0
P B03\06	B03\06	B03\05	55.787	11.864	11.752	0.2	Box Culverts	2.1W x 1.2H		0.3	NewFixed	2	B03\06	0
P B03\05	B03\05	B03\04	26.701	11.732	11.679	0.2	Box Culverts	2.1W x 1.2H		0.3	NewFixed	2	B03\05	0
P B03\04	B03\04	B03\03	22.903	11.659	11.613	0.2	Box Culverts	2.1W x 1.2H		0.3	NewFixed	2	B03\04	0
P B03\03	B03\03	B03\02	57.901	11.593	11.477	0.2	Box Culverts	2.4W x 1.2H		0.3	NewFixed	2	B03\03	0
P B03\02	B03\02	B03\01	57.901	11.457	11.342	0.2	Box Culverts	2.4W x 1.2H		0.3	NewFixed	2	B03\02	0
P B03\01	B03\01	B01\03	27.737	11.322	11.35	-0.1	Box Culverts	2.4W x 1.2H		0.3	NewFixed	2	B03\01	0
P B04\02	B04\02	B04\01	52.697	13.867	13.34	1	RCP Class 2	450	450	0.3	New	1	B04\02	0
P B04\01	B04\01	B01\10	19.387	13.32	13.126	1	RCP Class 2	525	525	0.3	New	1	B04\01	0
P B05\02	B05\02	B05\01	48.694	15.19	14.703	1	RCP Class 2	600	600	0.3	New	1	B05\02	0
P B05\01	B05\01	B01\13	51.306	14.683	14.17	1	RCP Class 2	525	525	0.3	New	1	B05\01	0
P B06\02	B06\02	B06\01	53.175	15.19	14.658	1	RCP Class 2	600	600	0.3	New	1	B06\02	0
P B06\01	B06\01	B01\13	50.674	14.638	14.132	1	RCP Class 2	525	525	0.3	New	1	B06\01	0
P B07\02	B07\02	B07\01	50	15.19	14.69	1	RCP Class 2	600	600	0.3	New	1	B07\02	0
P B07\01	B07\01	B01\14	50	14.67	14.17	1	RCP Class 2	600	600	0.3	New	1	B07\01	0
P B08\02	B08\02	B08\01	52.409	15.19	14.666	1	RCP Class 2	600	600	0.3	New			

P B18\02	B18\02	B18\01	38.923	14.535	12.739	4.61	RCP Class 2	450	450	0.3	New	1	B18\02	0
P B18\01	B18\01	B03\03	10.618	12.719	12.612	1.01	RCP Class 2	525	525	0.3	New	1	B18\01	0
P B19\01	B19\01	B01\05	15.513	13.584	13.429	1	RCP Class 2	375	375	0.3	New	1	B19\01	0
P B20\02	B20\02	B20\01	15.828	14.599	13.2	8.84	RCP Class 2	450	450	0.3	New	1	B20\02	0
P B20\01	B20\01	B01\04	15.369	13.18	13	1.17	RCP Class 2	450	450	0.3	New	1	B20\01	0
P B21\01	B21\01	B03\01	18.593	12.583	12.397	1	RCP Class 2	375	375	0.3	New	1	B21\01	0
P B22\01	B22\01	B03\02	14.18	13.097	12.955	1	RCP Class 2	375	375	0.3	New	1	B22\01	0
P B23\02	B23\02	B23\01	75.017	15.688	13.295	3.19	RCP Class 2	450	450	0.3	New	1	B23\02	0
P B23\01	B23\01	B02\01	37.972	13.275	12.895	1	RCP Class 2	525	525	0.3	New	1	B23\01	0
P B24\01	B24\01	B01\07	15.694	13.671	13.2	3	RCP Class 2	450	450	0.3	New	1	B24\01	0
P B25\01	B25\01	B01\09	13.376	14.201	13.8	3	RCP Class 2	450	450	0.3	New	1	B25\01	0
P B26\01	B26\01	B01\11	12.941	14.388	14	3	RCP Class 2	450	450	0.3	New	1	B26\01	0
P B27\01	B27\01	B01\12	11.614	14.348	14	3	RCP Class 2	450	450	0.3	New	1	B27\01	0
P B28\01	B28\01	B03\06	32.304	15.189	14.241	2.93	RCP Class 2	450	450	0.3	New	1	B28\01	0
P B29\01	B29\01	B12\01	12.17	15.328	14.708	5.09	RCP Class 2	450	450	0.3	New	1	B29\01	0
P B30\01	B30\01	B11\01	16.165	15.142	14.981	1	RCP Class 2	450	450	0.3	New	1	B30\01	0
P B31\01	B31\01	B03\06	18.243	14.724	14.542	1	RCP Class 2	375	375	0.3	New	1	B31\01	0
P B32\01	B32\01	B03\07	18.197	14.82	14.638	1	RCP Class 2	375	375	0.3	New	1	B32\01	0
P B33\01	B33\01	B03\08	18.373	14.915	14.731	1	RCP Class 2	375	375	0.3	New	1	B33\01	0
DETAILS of SERVICES CROSSING PIPES														
Pipe	Chg	Bottom	Height of Service	Chg	Bottom	Height of S	Chg	Bottom	Height of S	etc				
	(m)	Elev (m)	(m)	(m)	Elev (m)	(m)	(m)	Elev (m)	(m)	etc				
CHANNEL DETAILS														
Name	From	To	Type	Length	U/S IL	D/S IL	Slope	Base Width	L.B. Slope	R.B. Slope	Manning	Depth	Roofed	
				(m)	(m)	(m)	(%)	(m)	(1:?)	(1:?)	n	(m)		
OVERFLOW ROUTE DETAILS														
Name	From	To	Travel	Spill	Crest	Weir	Cross	Safe Depth	SafeDepth	Safe	Bed	D/S Area		id
			Time	Level	Length	Coeff. C	Section	Major Storr	Minor Storr	DxV	Slope	Contributing		
			(min)	(m)	(m)			(m)	(m)	(sq.m/sec)	(%)	%		
F B01\17	B01\17	B15\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180475
F B01\16	B01\16	B01\17	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180474
F B01\15	B01\15	B01\16	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180473
F B01\14	B01\14	B07\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180472
F B01\13	B01\13	B05\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180471
F B01\12	B01\12	B01\11	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180470
F B01\11	B01\11	B01\10	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180469
F B01\10	B01\10	B01\09	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180468
F B01\09	B01\09	B01\08	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180467
F B01\08	B01\08	B01\07	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180466
F B01\07	B01\07	B01\06	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180465
F B01\06	B01\06	O B01\06	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180464
F B01\05	B01\05	B01\06	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180463
F B01\04	B01\04	B01\03	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180462
F B01\03	B01\03	B01\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180461
F B02\02	B02\02	B21\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180477
F B02\01	B02\01	B21\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180476
F B01\02	B01\02	B01\03	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180460
F B03\14	B03\14	B13\03	0.1	1			Dummy used to model flow across r	0.2	0.05	0.6	1	0		97180563
F B03\13	B03\13	B03\14	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180490
F B03\12	B03\12	B03\13	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180489
F B03\11	B03\11	B03\12	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180488
F B03\10	B03\10	B13\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180487
F B03\09	B03\09	B11\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180486
F B03\08	B03\08	B03\07	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180485
F B03\07	B03\07	B03\06	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180484
F B03\06	B03\06	B03\05	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180483
F B03\05	B03\05	B03\04	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180482
F B03\04	B03\04	B03\03	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180481
F B03\03	B03\03	B03\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180480
F B03\02	B03\02	B03\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180479
F B03\01	B03\01	B01\03	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180478
F B04\02	B04\02	B04\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180492
F B04\01	B04\01	B01\10	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180491
F B05\02	B05\02	B12\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180494
F B05\01	B05\01	B05\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180493
F B06\02	B06\02	B06\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180496
F B06\01	B06\01	B01\13	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180495
F B07\02	B07\02	B14\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180498
F B07\01	B07\01	B07\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180497
F B08\02	B08\02	B08\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180500
F B08\01	B08\01	B01\14	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180499
F B09\02	B09\02	B09\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180502
F B09\01	B09\01	B01\15	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180501
F B10\02	B10\02	B10\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180504
F B10\01	B10\01	B03\05	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180503
OF418424	B11\03	B01\01	0.1	1			Dummy used to model flow across r	0.2	0.05	0.6	1	0		97180570
F B11\02	B11\02	B11\03	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180506
F B11\01	B11\01	B11\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180505
F B12\02	B12\02	B12\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180508
F B12\01	B12\01	B03\09	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180507
OF418419	B13\03	B11\03	0.1	1			Dummy used to model flow across r	0.2	0.05	0.6	1	0		97180565
F B13\02	B13\02	B13\03	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180510
F B13\01	B13\01	B13\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180509
F B14\02	B14\02	B14\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180512
F B14\01	B14\01	B03\10	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180511
F B15\02	B15\02	B15\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180514
F B15\01	B15\01	B03\11	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180513
F B16\01	B16\01	B03\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180515
F B17\01	B17\01	B03\02	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180516
F B18\02	B18\02	B18\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180518
F B18\01	B18\01	B03\03	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180517
F B19\01	B19\01	B01\07	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180519
F B20\02	B20\02	B20\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180521
F B20\01	B20\01	B03\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180520
F B21\01	B21\01	B03\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180522
F B22\01	B22\01	B21\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180523
F B23\02	B23\02	B23\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180525
F B23\01	B23\01	B02\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180524
F B24\01	B24\01	B01\07	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180526
F B25\01	B25\01	B01\09	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180527
F B26\01	B26\01	B01\11	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180528
F B27\01	B27\01	B01\12	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180529
F B28\01	B28\01	B03\06	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		97180530
F B29\01	B29\01	B12\01	1	1			8 m wide road (half section)	0.2	0.2	0.6	1	0		971805

<b>DRAINS File Path:</b>	F:\AA003760\D-Calculations\CivilA-Stormwater\A-MASTERPLAN\A-DRAINS\C-Models
<b>DRAINS Version:</b>	DRAINS Version 2015.11 - 7 October 2015
<b>Modeller's Name:</b>	George Dunstan
<b>Description:</b>	Stage 2 Sizing Model

DRAINS results prepared 21 March, 2016 from Version 2015.11								RESULTS 10 YEAR ARI
PIT / NODE DETAILS							Version 8	
Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint	
B01\17	15.48		0.165		1.12	0	None	
B01\16	15.27		0.166		1.33	0	None	
B01\15	15.27		0.171		1.33	0	None	
B01\14	15.03		0.165		1.57	0	None	
B01\13	14.88		0.096		1.72	0	None	
B01\12	14.77	16.1	0.168	3.6	1.19	0	Inlet Capacity	
B01\11	14.63	15.8	0.13	2.7	1.06	0	Inlet Capacity	
B01\10	14.57	15.29	0.176	3.8	0.58	0	Inlet Capacity	
B01\09	14.4	14.95	0.218	4.3	0.4	0.032	Inlet Capacity	
B01\08	14.27		0.129		0.43	0	None	
B01\07	14.26		0.109		0.34	0	None	
B01\06	14.23		0.069		0.27	0	None	
B01\05	14.1		0.026		1.01	0	None	
B01\04	13.96		0.038		0.9	0	Inlet Capacity	
B01\03	13.84	14.43	0.056	7.4	0.5	0	Inlet Capacity	
B01\01	13.7		0					
B02\02	14.4		0.047		0.45	0.003	Inlet Capacity	
B02\01	14.31		0.096		0.51	0.027	Inlet Capacity	
B01\02	13.72		0.037		1.1	0	Inlet Capacity	
N520291	13.7		0					
B03\14	15.5		0.155		1.1	0	None	
B03\13	15.15		0.166		1.45	0	None	
B03\12	14.97		0.166		1.63	0	None	
B03\11	14.7		0.165		1.9	0	None	
B03\10	14.62		0.16		1.98	0	None	
B03\09	14.46		0.094		2.14	0	None	
B03\08	14.3	16.52	0.075	1.1	2.16	0	Inlet Capacity	
B03\07	14.25	16.44	0.091	1.2	2.12	0	Inlet Capacity	
B03\06	14.18	16.34	0.088	1.2	2.09	0	Inlet Capacity	
B03\05	14.1		0		1.65	0	None	
B03\04	14.05		0.327		1.17	0	None	
B03\03	14.01		0.033		1.19	0	None	
B03\02	13.94		0.078		0.69	0.014	Inlet Capacity	
B03\01	13.87		0.124		-13.87	0	Outlet System	
B04\02	14.99	15.38	0.17	2.3	0.28	0	Inlet Capacity	
B04\01	14.69	15.09	0.155	2.1	0.3	0	Inlet Capacity	
B05\02	15.42		0.093		1.18	0	None	
B05\01	15.06		0.092		1.54	0	None	
B06\02	15.42		0.101		1.18	0	None	
B06\01	15.1		0.096		1.5	0	None	
B07\02	15.48		0.159		1.12	0	None	
B07\01	15.17		0.159		1.43	0	None	
B08\02	15.49		0.172		1.11	0	None	
B08\01	15.22		0.167		1.38	0	None	
B09\02	15.5		0.179		1.1	0	None	
B09\01	15.31		0.176		1.29	0	None	
B10\02	15.57	15.67	0.173	4	-0.05	0	Outlet System	
B10\01	15.21	15.78	0.175	2.4	0.46	0	Inlet Capacity	
B11\03	15.72		0.087		0.88	0	None	
B11\02	15.23		0.093		1.37	0	None	
B11\01	15		0.094		1.6	0	None	
B12\02	15.72		0.097		0.88	0	None	
B12\01	15.22		0.098		1.38	0	None	
B13\03	15.81		0.149		0.79	0	None	
B13\02	15.34		0.16		1.26	0	None	
B13\01	14.88		0.16		1.72	0	None	
B14\02	15.81		0.166		0.79	0	None	
B14\01	15.34		0.167		1.26	0	None	
B15\02	15.82		0.174		0.78	0	None	
B15\01	15.39		0.17		1.21	0	None	
B16\01	13.92	14.51	0.057	1.8	0.5	0	Inlet Capacity	
B17\01	13.99		0.09		0.91	0.023	Inlet Capacity	
B18\02	15.06		0.312		2.16	0	None	
B18\01	14.34		0.055		1.08	0.005	Inlet Capacity	
B19\01	14.27		0.043		0.85	0.001	Inlet Capacity	
B20\02	15.32		0.327		1.9	0	None	
B20\01	14.67		0.063		0.06	0.008	Inlet Capacity	
B21\01	14.01	14.16	0.157	8.9	-0.05	0.015	Outlet System	
B22\01	14		0.083		0.63	0.018	Inlet Capacity	
B23\02	16.39		0.338		1.53	0	None	
B23\01	15.21		0.157		0.3	0	None	
B24\01	14.82		0.326		2.4	0	None	
B25\01	14.94		0.319		2.28	0	None	
B26\01	15.19		0.32		2.03	0	None	
B27\01	15.28		0.321		1.94	0	None	
B28\01	15.65		0.32		1.57	0	None	
B29\01	15.94		0.319		1.28	0	None	
B30\01	15.96		0.338		0.67	0	None	
B31\01	15.01	16.21	0.092	1.2	1.13	0	Inlet Capacity	
B32\01	15.11	16.31	0.092	1.3	1.13	0	Inlet Capacity	
B33\01	15.17	16.39	0.076	1.1	1.16	0	Inlet Capacity	



PIPE DETAILS											
Name	Max Q	Max V	Max U/S	Max D/S	Due to Storm						
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)							
P B01\17	0.192	2.25	15.395	15.271	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\16	0.409	1.53	15.208	15.275	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\15	1.833	1.27	15.263	15.028	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\14	2.587	1.15	15.007	14.883	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\13	2.971	1.1	14.872	14.775	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\12	3.457	1.28	14.767	14.631	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\11	3.881	1.08	14.622	14.567	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\10	4.396	1.02	14.554	14.399	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\09	4.882	1.13	14.391	14.273	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\08	5.091	1.18	14.265	14.258	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\07	5.399	1.07	14.254	14.231	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\06	5.484	1.09	14.223	14.102	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\05	5.607	0.97	14.096	13.957	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\04	5.922	1.03	13.95	13.84	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\03	11.468	1.33	13.775	13.7	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B02\02	0.048	0.44	14.387	14.306	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B02\01	0.62	2.19	13.849	13.72	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B01\02	0.676	0.12	13.72	13.7	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B03\14	0.156	4.06	15.313	15.154	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B03\13	0.368	2.3	15.001	14.967	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B03\12	0.617	1.71	14.853	14.703	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						
P B03\11	1.173	0.81	14.66	14.616	AR&R 10 year, 5 minutes storm, average 154 mm/h, Zone 1						

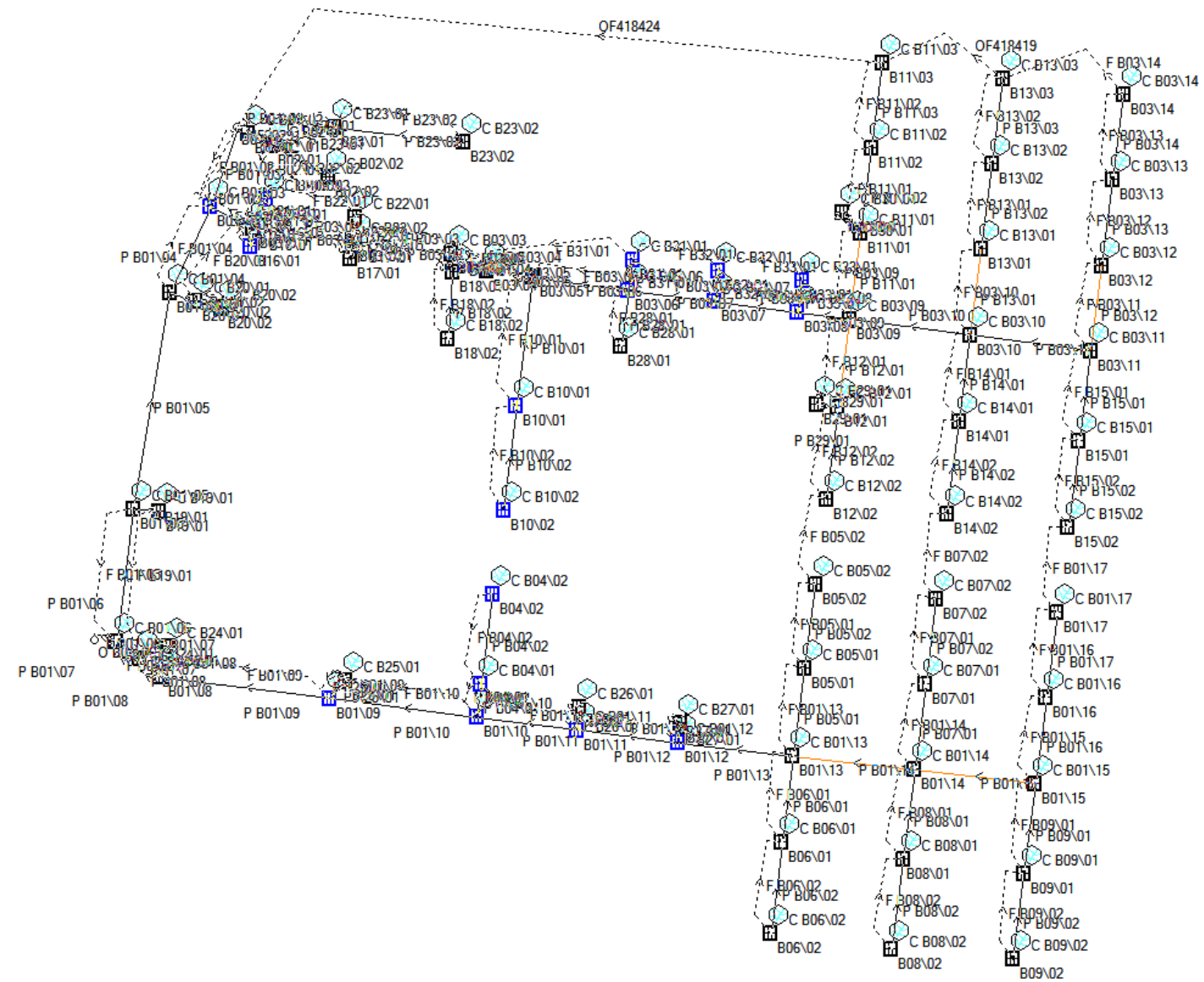


<b>DRAINS File Path:</b>	F:\AA003760\D-Calculations\CivilA-StormwaterA-MASTERPLAN\A-DRAINS\C-Models
<b>DRAINS Version:</b>	DRAINS Version 2015.11 - 7 October 2015
<b>Modeller's Name:</b>	George Dunstan
<b>Description:</b>	Stage 2 Sizing Model

DRAINS results prepared 21 March, 2016 from Version 2015.11								RESULTS 50 YEAR ARI
PIT / NODE DETAILS							Version 8	
Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint	
B01\17	16.26		0.219		0.34	0	None	
B01\16	16.12		0.22		0.48	0	None	
B01\15	15.64		0.226		0.96	0	None	
B01\14	15.52		0.219		1.08	0	None	
B01\13	15.36		0.126		1.24	0	None	
B01\12	15.16	16.11	0.223	4.3	0.8	0.037	Inlet Capacity	
B01\11	15.01	15.83	0.209	4.1	0.67	0	Inlet Capacity	
B01\10	14.93	15.3	0.232	4.3	0.22	0.047	Inlet Capacity	
B01\09	14.78	14.95	0.335	4.3	0.02	0.125	Inlet Capacity	
B01\08	14.63		0.25		0.08	0	None	
B01\07	14.54		0.147		0.06	0	None	
B01\06	14.5		0.091		0	0.104	Outlet System	
B01\05	14.33		0.034		0.79	0	Inlet Capacity	
B01\04	14.15		0.05		0.71	0.004	Inlet Capacity	
B01\03	14.04	14.49	0.755	20.6	0.3	0.619	Inlet Capacity	
B01\01	13.85		0.619					
B02\02	14.29		0.063		0.56	0.008	Inlet Capacity	
B02\01	14.18		0.175		0.64	0.069	Inlet Capacity	
B01\02	11.39		0.049		3.43	0.004	Inlet Capacity	
N520291	11.34		0					
B03\14	16.35		0.205		0.25	0	None	
B03\13	16.13		0.22		0.47	0	None	
B03\12	15.66		0.22		0.94	0	None	
B03\11	15.23		0.218		1.37	0	None	
B03\10	15.11		0.212		1.49	0	None	
B03\09	14.91		0.125		1.69	0	None	
B03\08	14.63	16.53	0.1	1.3	1.83	0	Inlet Capacity	
B03\07	14.57	16.45	0.12	1.6	1.8	0	Inlet Capacity	
B03\06	14.49	16.35	0.117	1.6	1.78	0	Inlet Capacity	
B03\05	14.4		0.104		1.35	0.094	Inlet Capacity	
B03\04	14.32		0.432		0.89	0	None	
B03\03	14.26		0.049		0.95	0.003	Inlet Capacity	
B03\02	14.17		0.116		0.46	0.033	Inlet Capacity	
B03\01	14.08		0.528		-14.08	0.685	Outlet System	
B04\02	15.31	15.43	0.225	4.3	-0.03	0.039	Outlet System	
B04\01	15.02	15.14	0.244	4	-0.03	0	Outlet System	
B05\02	15.59		0.123		1.01	0	None	
B05\01	15.66		0.122		0.94	0	None	
B06\02	15.68		0.133		0.92	0	None	
B06\01	15.68		0.127		0.92	0	None	
B07\02	16.25		0.211		0.35	0	None	
B07\01	16.07		0.21		0.53	0	None	
B08\02	16.24		0.228		0.36	0	None	
B08\01	16.08		0.221		0.52	0	None	
B09\02	16.33		0.237		0.27	0	None	
B09\01	16.11		0.233		0.49	0	None	
B10\02	15.6	15.68	0.229	4.3	-0.08	0.133	Outlet System	
B10\01	15.43	15.82	0.364	4.3	0.24	0.104	Inlet Capacity	
B11\03	16.17		0.115		0.43	0	None	
B11\02	15.77		0.123		0.83	0	None	
B11\01	15.62		0.128		0.98	0	None	
B12\02	15.78		0.128		0.82	0	None	
B12\01	15.45		0.129		1.15	0	None	
B13\03	16.2		0.197		0.4	0	None	
B13\02	15.72		0.211		0.88	0	None	
B13\01	15.4		0.211		1.2	0	None	
B14\02	15.89		0.219		0.71	0	None	
B14\01	15.48		0.221		1.12	0	None	
B15\02	16		0.231		0.6	0	None	
B15\01	15.62		0.224		0.98	0	None	
B16\01	14.14	14.53	0.075	2.4	0.27	0	Inlet Capacity	
B17\01	14.24		0.119		0.66	0.041	Inlet Capacity	
B18\02	16.04		0.413		1.18	0	None	
B18\01	14.83		0.072		0.59	0.013	Inlet Capacity	
B19\01	14.4		0.057		0.72	0.006	Inlet Capacity	
B20\02	15.86		0.432		1.36	0	None	
B20\01	14.74		0.083		0	0.192	Outlet System	
B21\01	14.09	14.16	0.233	8.9	-0.14	0.184	Outlet System	
B22\01	14.24		0.109		0.39	0.034	Inlet Capacity	
B23\02	17.67		0.447		0.25	0	None	
B23\01	15.5		0.208		0.01	0.049	Inlet Capacity	
B24\01	15.54		0.431		1.68	0	None	
B25\01	15.7		0.422		1.52	0	None	
B26\01	15.93		0.423		1.29	0	None	
B27\01	16.08		0.425		1.14	0	None	
B28\01	15.74		0.422		1.48	0	None	
B29\01	16.39		0.421		0.83	0	None	
B30\01	16.61		0.447		0.02	0.004	Inlet Capacity	
B31\01	15.11	16.23	0.121	1.6	1.04	0	Inlet Capacity	
B32\01	15.2	16.32	0.121	1.6	1.03	0	Inlet Capacity	
B33\01	15.23	16.4	0.1	1.4	1.1	0	Inlet Capacity	



PIPE DETAILS											
Name	Max Q	Max V	Max U/S	Max D/S	Due to Storm						
	(cu.m/s)	(m/s)	HGL (m)	HGL (m)							
P B01\17	0.269	0.95	16.188	16.125	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\16	0.487	1.72	15.983	15.639	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\15	1.936	1.34	15.607	15.525	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\14	2.65	1.18	15.476	15.358	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\13	3.408	1.26	15.297	15.164	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\12	3.948	1.46	15.138	15.014	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\11	4.614	1.28	14.992	14.932	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\10	5.336	1.24	14.906	14.781	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\09	6.019	1.39	14.766	14.627	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\08	6.273	1.45	14.592	14.544	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\07	6.809	1.35	14.527	14.5	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\06	6.902	1.37	14.471	14.33	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\05	7.074	1.23	14.317	14.147	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\04	7.584	1.32	14.129	14.043	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\03	14.093	1.63	13.932	13.85	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B02\02	0.066	0.59	14.26	14.18	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B02\01	0.758	2.8	13.472	13.267	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B01\02	0.811	1.18	11.36	11.343	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B03\14	0.234	1.08	16.201	16.129	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B03\13	0.456	1.61	15.94	15.657	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B03\12	0.679	1.89	15.521	15.227	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						
P B03\11	1.268	0.88	15.149	15.106	AR&R 50 year, 5 minutes storm, average 203 mm/h, Zone 1						





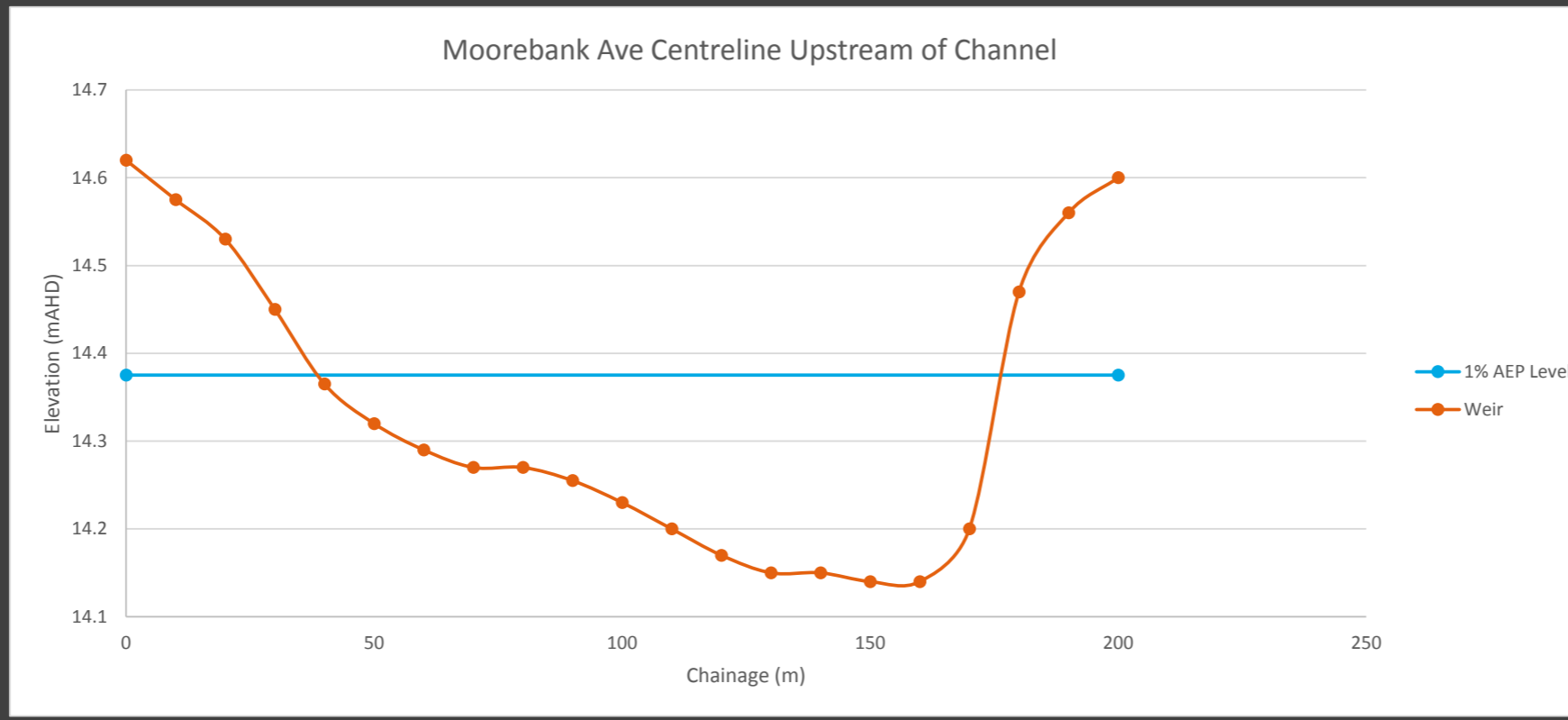
## **Moorebank Avenue Flow Depth Analyses**

- Location B (Channel Sag)
- Location C (Bapaume Road)

Name	Existing
Length of Weir	200
Number of Segments	20

Event	Flow (m <sup>3</sup> /s)	Water Level
1% AEP	14.0	14.38
PMF	68	14.65

Chainage	Elevation
0	14.62
10	14.58
20	14.53
30	14.45
40	14.37
50	14.32
60	14.29
70	14.27
80	14.27
90	14.26
100	14.23
110	14.20
120	14.17
130	14.15
140	14.15
150	14.14
160	14.14
170	14.20
180	14.47
190	14.56
200	14.60

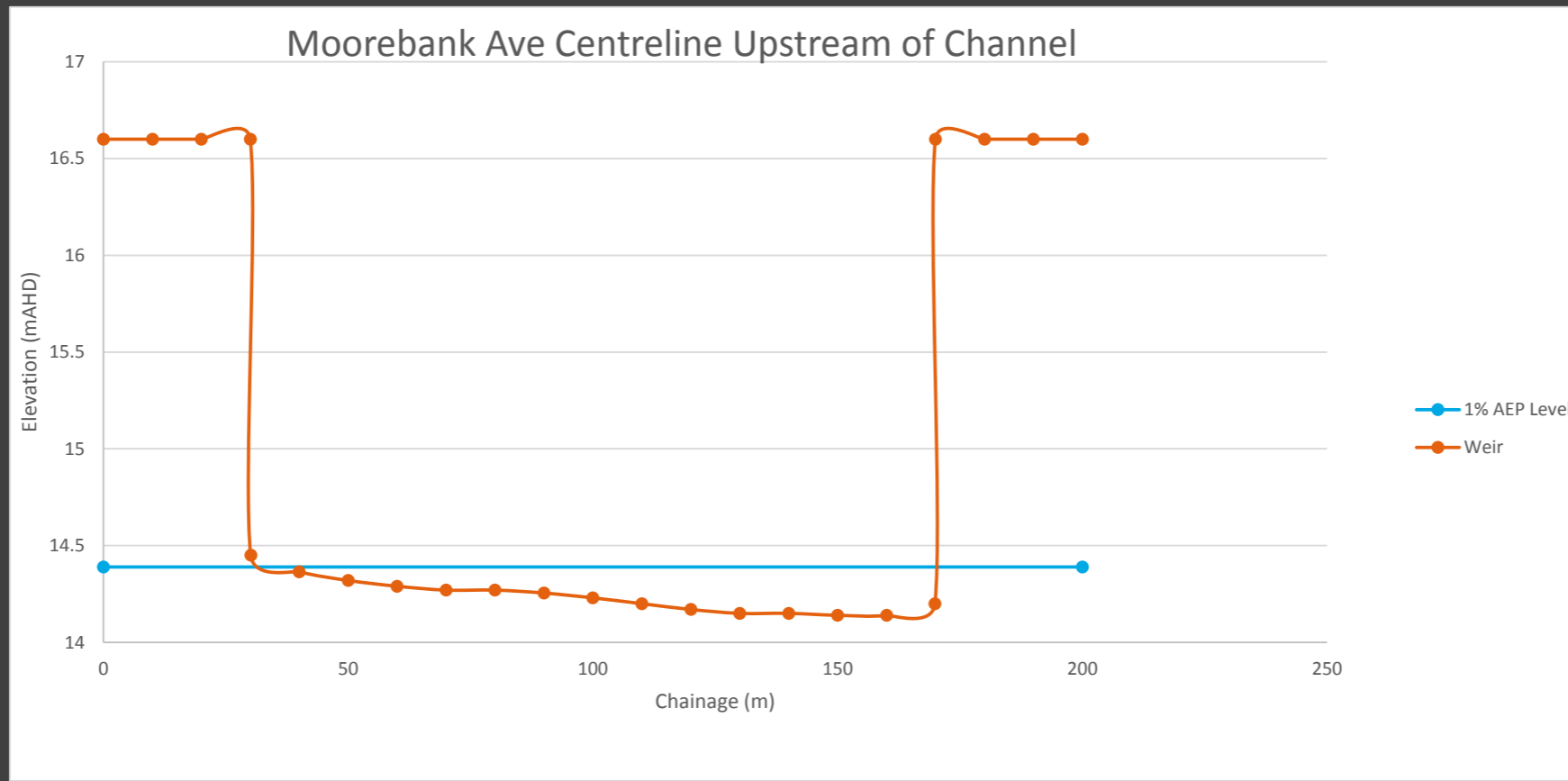


Water Level (mAHD)	Flow (m <sup>3</sup> /s)
14.140	0.000
14.164	0.132
14.188	0.546
14.212	1.232
14.236	2.158
14.260	3.329
14.284	4.807
14.308	6.654
14.332	8.838
14.356	11.369
14.380	14.257
14.404	17.427
14.428	20.895
14.452	24.649
14.476	28.651
14.500	32.896
14.524	37.438
14.548	42.289
14.572	47.446
14.596	52.932
14.620	58.793

Name	Proposed
Length of Weir	200
Number of Segments	20

Chainage	Elevation
0	16.60
10	16.60
20	16.60
30	16.60
30.1	14.45
40	14.37
50	14.32
60	14.29
70	14.27
80	14.27
90	14.26
100	14.23
110	14.20
120	14.17
130	14.15
140	14.15
150	14.14
160	14.14
169.9	14.20
170	16.60
180	16.60
190	16.60
200	16.60

Event	Flow (m <sup>3</sup> /s)	Water Level
1% AEP	14.0	14.39
PMF	68	14.72



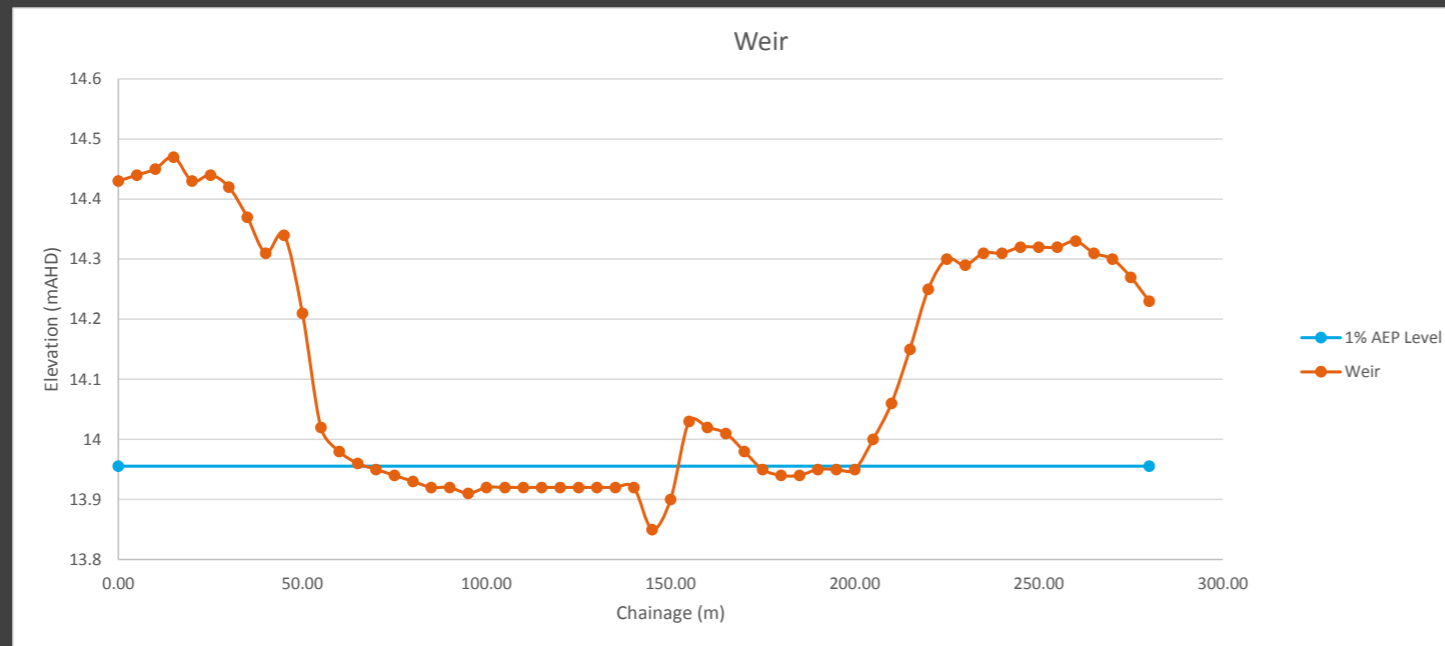
Water Level (mAHD)	Flow (m <sup>3</sup> /s)
14.140	0.000
14.164	0.132
14.188	0.507
14.212	1.094
14.236	1.887
14.260	2.897
14.284	4.192
14.308	5.834
14.332	7.795
14.356	10.037
14.380	12.565
14.404	15.326
14.428	18.298
14.452	21.463
14.476	24.808
14.500	28.325
14.524	32.003
14.548	35.836
14.572	39.817
14.596	43.942
14.620	48.204



Weir Coefficient	1.6
Length of Weir	280
Number of Segments	56

Event	Flow (m <sup>3</sup> /s)	Water Level (mAHD)
1% AEP	1.32	13.96
PMF	18.6	14.12

Chainage	Elevation
0	14.43
5	14.44
10	14.45
15	14.47
20	14.43
25	14.44
30	14.42
35	14.37
40	14.31
45	14.34
50	14.21
55	14.02
60	13.98
65	13.96
70	13.95
75	13.94
80	13.93
85	13.92
90	13.92
95	13.91
100	13.92
105	13.92
110	13.92
115	13.92
120	13.92
125	13.92
130	13.92
135	13.92
140	13.92
145	13.85
150	13.9
155	14.03
160	14.02
165	14.01
170	13.98
175	13.95
180	13.94
185	13.94
190	13.95
195	13.95
200	13.95
205	14
210	14.06
215	14.15
220	14.25
225	14.3
230	14.29
235	14.31
240	14.31
245	14.32
250	14.32
255	14.32
260	14.33
265	14.31
270	14.3
275	14.27
280	14.23

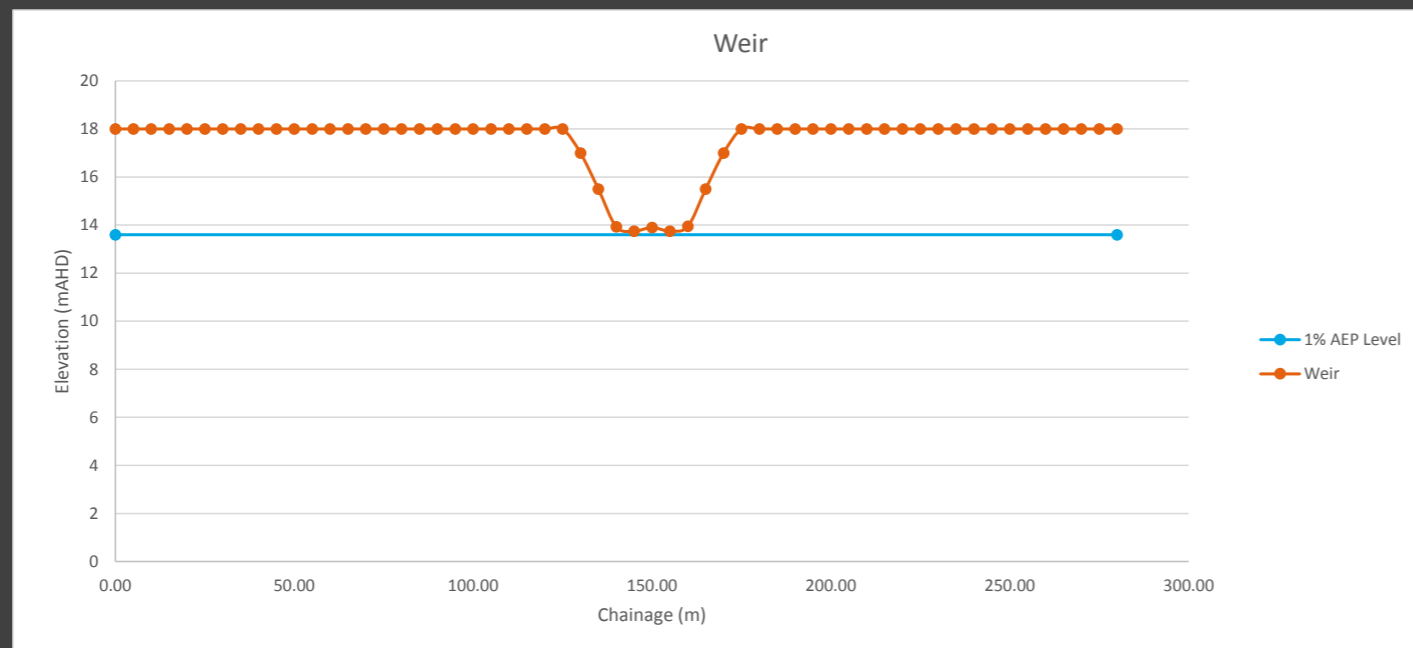


Water Level (mAHD)	Flow (m <sup>3</sup> /s)
13.85	0.000
13.88	0.004
13.91	0.092
13.94	0.606
13.97	2.008
14.01	4.267
14.04	7.259
14.07	10.937
14.10	15.161
14.13	19.901
14.16	25.160
14.19	30.864
14.22	36.999
14.25	43.559
14.28	50.560
14.32	58.141
14.35	66.574
14.38	75.835
14.41	85.755
14.44	96.308
14.47	107.624

Name	Proposed
Length of Weir	280
Number of Segments	56

Event	Flow (m³/s)	Water Level
1% AEP	0	13.60
PMF	15	14.44

Chainage	Elevation
0	18.00
5	18.00
10	18.00
15	18.00
20	18.00
25	18.00
30	18.00
35	18.00
40	18.00
45	18.00
50	18.00
55	18.00
60	18.00
65	18.00
70	18.00
75	18.00
80	18.00
85	18.00
90	18.00
95	18.00
100	18.00
105	18.00
110	18.00
115	18.00
120	18.00
125	18.00
130	17
135	15.5
140	13.93
145	13.75
150	13.9
155	13.75
160	13.95
165	15.5
170	17
175	18
180	18
185	18
190	18
195	18
200	18
205	18
210	18
215	18
220	18
225	18
230	18
235	18
240	18
245	18
250	18
255	18
260	18
265	18
270	18
275	18
280	18

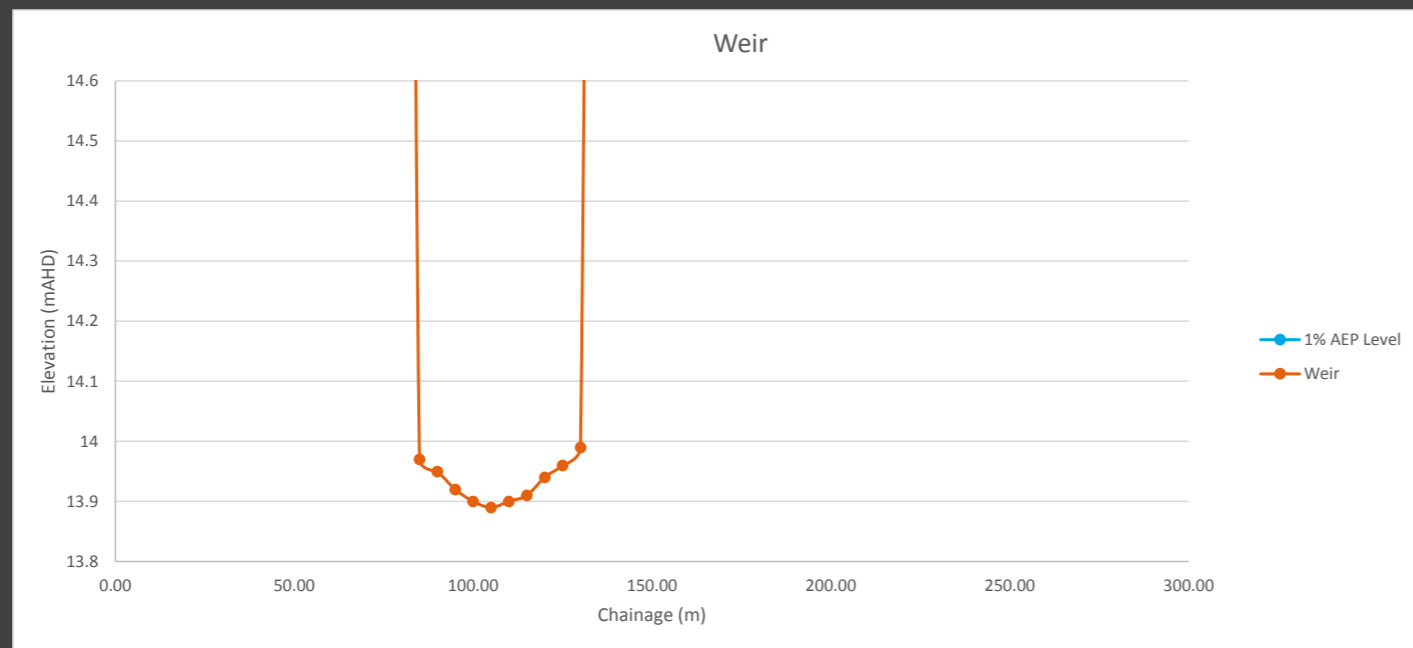


Water Level (mAHD)	Flow (m³/s)
13.750	0.000
13.763	0.000
13.775	0.000
13.788	0.000
13.800	0.000
13.813	0.000
13.825	0.000
13.838	0.022
13.850	0.071
13.863	0.154
13.875	0.263
13.888	0.391
13.900	0.536
13.913	0.695
13.925	0.869
13.938	1.054
13.950	1.252
13.963	1.461
13.975	1.680
13.988	1.909
14.000	2.148

Name	Proposed
Length of Weir	280
Number of Segments	56

Event	Flow (m³/s)	Water Level
1% AEP	0	13.60
PMF	15	14.28

Chainage	Elevation
0	18.00
5	18.00
10	18.00
15	18.00
20	18.00
25	18.00
30	18.00
35	18.00
40	18.00
45	18.00
50	18.00
55	18.00
60	18.00
65	18.00
70	18.00
75	18.00
80	18.00
85	13.97
90	13.95
95	13.92
100	13.90
105	13.89
110	13.9
115	13.91
120	13.94
125	13.96
130	13.99
135	18
140	18
145	18
150	18
155	18
160	18
165	18
170	18
175	18
180	18
185	18
190	18
195	18
200	18.00
205	18.00
210	18.00
215	18.00
220	18.00
225	18.00
230	18.00
235	18.00
240	18.00
245	18.00
250	18.00
255	18.00
260	18.00
265	18.00
270	18.00
275	18.00
280	18.00

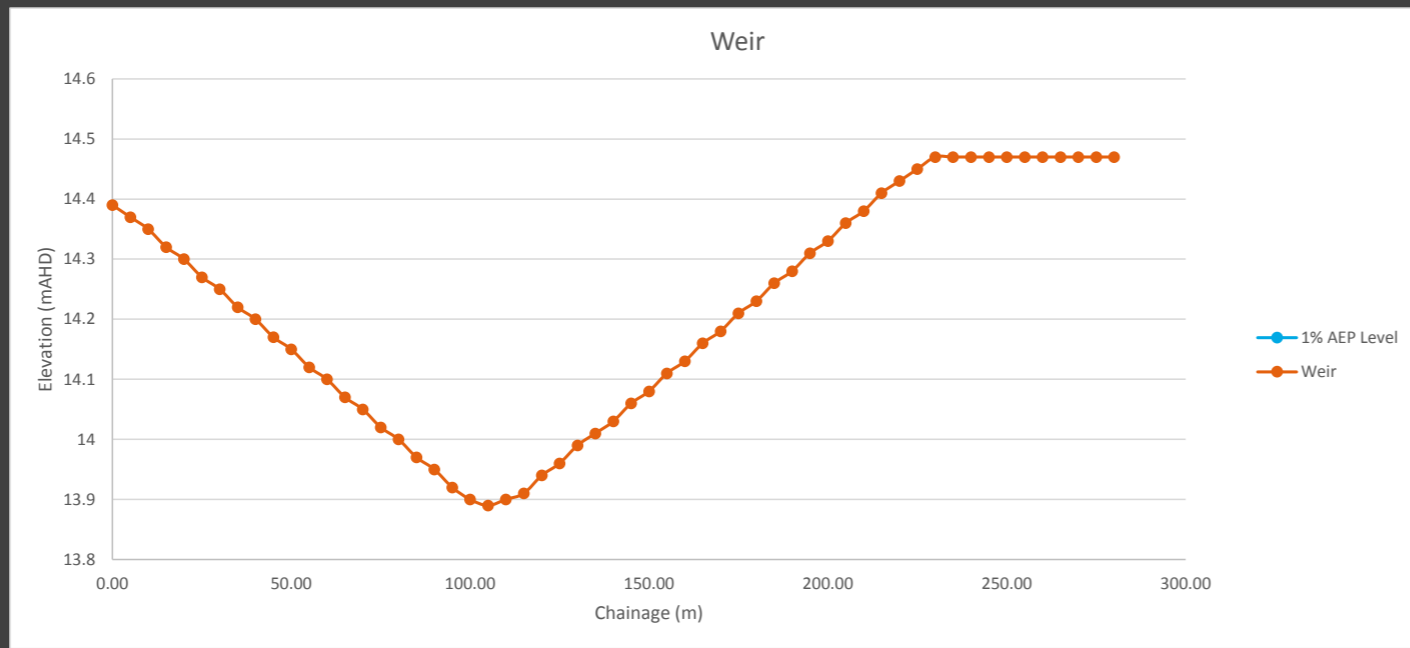


Water Level (mAHD)	Flow (m³/s)
13.890	0.000
13.931	0.171
13.972	0.779
14.013	1.863
14.054	3.287
14.095	4.974
14.136	6.886
14.177	8.999
14.218	11.295
14.259	13.761
14.300	16.384
14.341	19.157
14.382	22.072
14.423	25.121
14.464	28.300
14.505	31.602
14.546	35.025
14.587	38.562
14.628	42.212
14.669	45.971
14.710	49.834

Name	Proposed
Length of Weir	280
Number of Segments	56

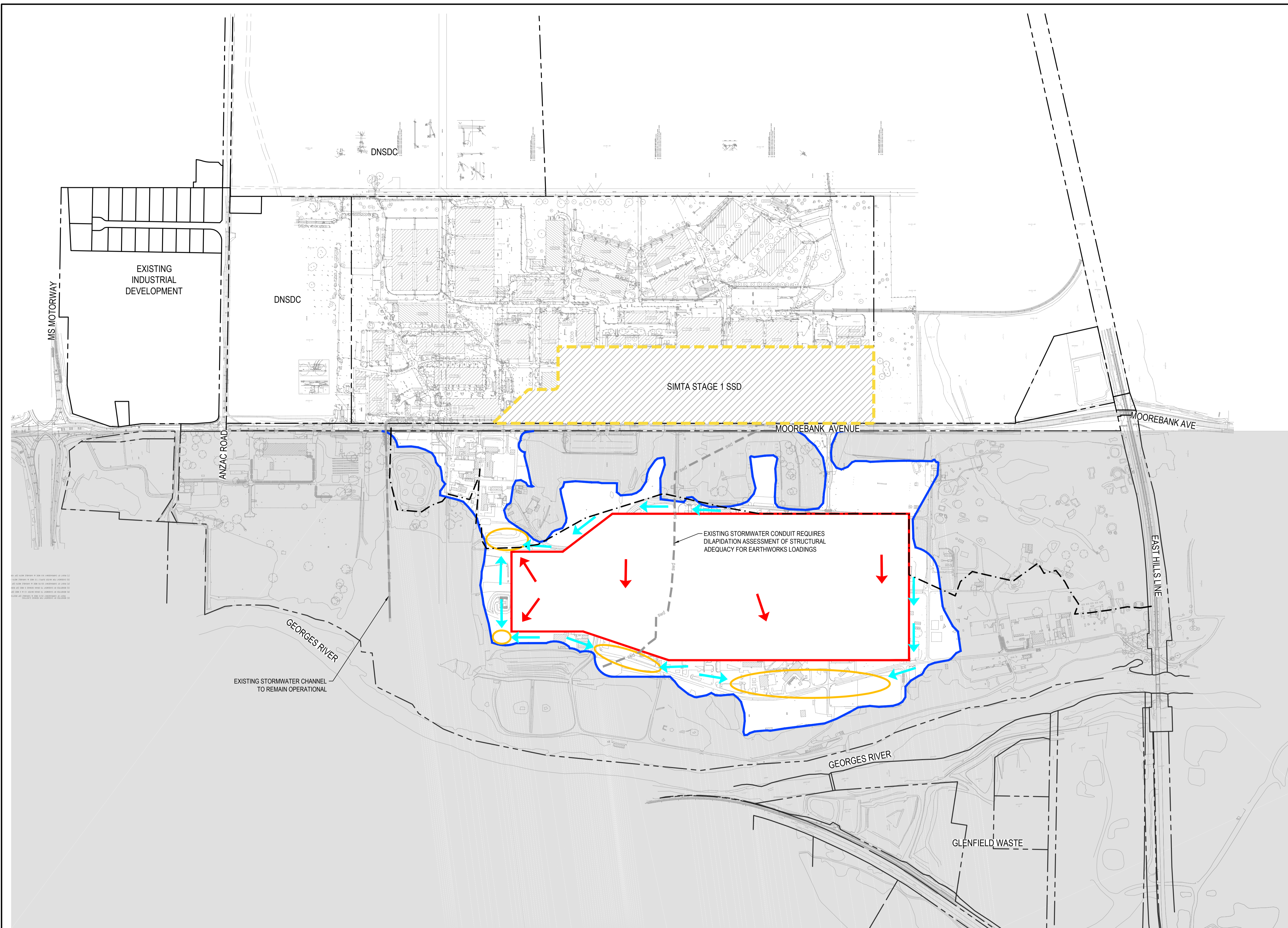
Event	Flow (m³/s)	Water Level
1% AEP	0	13.60
PMF	15	14.19

Chainage	Elevation
0	14.39
5	14.37
10	14.35
15	14.32
20	14.30
25	14.27
30	14.25
35	14.22
40	14.20
45	14.17
50	14.15
55	14.12
60	14.10
65	14.07
70	14.05
75	14.02
80	14.00
85	13.97
90	13.95
95	13.92
100	13.90
105	13.89
110	13.90
115	13.91
120	13.94
125	13.96
130	13.99
135	14.01
140	14.03
145	14.06
150	14.08
155	14.11
160	14.13
165	14.16
170	14.18
175	14.21
180	14.23
185	14.26
190	14.28
195	14.31
200	14.33
205	14.36
210	14.38
215	14.41
220	14.43
225	14.45
230	14.47
235	14.47
240	14.47
245	14.47
250	14.47
255	14.47
260	14.47
265	14.47
270	14.47
275	14.47
280	14.47



Water Level (mAHD)	Flow (m³/s)
13.890	0.000
13.896	0.001
13.902	0.009
13.908	0.025
13.914	0.051
13.920	0.086
13.926	0.128
13.932	0.180
13.938	0.241
13.944	0.313
13.950	0.393
13.956	0.484
13.962	0.585
13.968	0.698
13.974	0.821
13.980	0.956
13.986	1.102
13.992	1.261
13.998	1.432
14.004	1.615
14.010	1.811

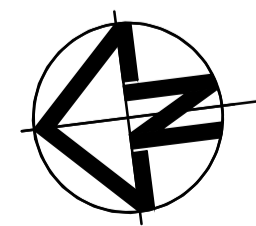
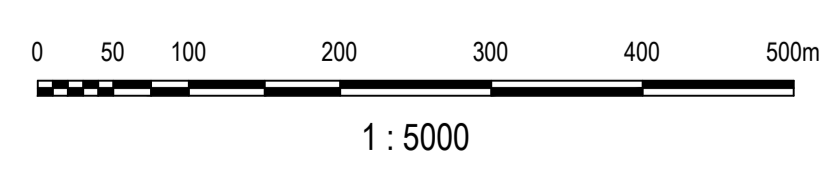
## Early Works Layout Plan



- LEGEND**
- EXTENT OF WORK FOR APPROVALS
  - INDICATIVE EXTENT OF FILL PLACEMENT
  - INDICATIVE SEDIMENT BASIN
  - - - EXISTING STORMWATER CHANNEL / PIPE
  - SWALE
  - INDICATIVE TOP OF PILE GRADING
  - - - EXISTING CREST

- NOTES**
1. ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH:
    - a. LOCAL AUTHORITY REQUIREMENTS
    - b. EPA REQUIREMENTS
    - c. NSW DEPARTMENT OF HOUSING MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
  2. SEDIMENT BASIN OVERFLOW LOCATIONS ARE TO DISCHARGE VIA EXISTING SITE FLOW PATHS WHICH ARE TO BE DETERMINED BY THE BUILDING CONTRACTOR.

Issue	Description	Date
01	ISSUE FOR INFORMATION	XXXX/XXXX



Client

**SIMTA** SYDNEY INTERMODAL TERMINAL ALLIANCE

**TACTICAL GROUP**

Status		PRELIMINARY NOT TO BE USED FOR CONSTRUCTION	
Original Size	A1	Designed	G.DUNSTAN
Height Datum	AHD	Checked	
Grid	MGA	Approved	
Filename:	Skc-mic1-001-ErosionAndSedimentControlPlan.dwg		

Project	MPW INTERMODAL TERMINAL FACILITY STAGE 1 EARLY WORKS
Title	EROSION & SEDIMENT CONTROL PLAN

**ARCADIS**

Arcadis Australia Pacific Pty Limited  
Level 5, 141 Walker St  
NORTH SYDNEY NSW 2060  
ABN 76 104 485 289  
Tel No: +61 2 8907 9000  
Fax No: +61 2 8907 9001  
arcadis.com

Drawing No.	Project No.	Issue
SKC-MIC1-001	AA003760	01

# APPENDIX C

## MUSIC Modelling

-

# MUSIC MODELLING DATA & PARAMETERS

Input data and parameters used in the MUSIC model for **MPW Stage 2** are generally in accordance with 'Using MUSIC in Sydney's Drinking Water Catchment' (Sydney Catchment Authority, December 2012). A discussion of the input data and parameters is given below.

## 1.1 Model Layouts

The MUSIC models proposed for the Existing and Developed scenarios of the proposed development are as indicated in **Figure C1** and **Figure C2** respectively.

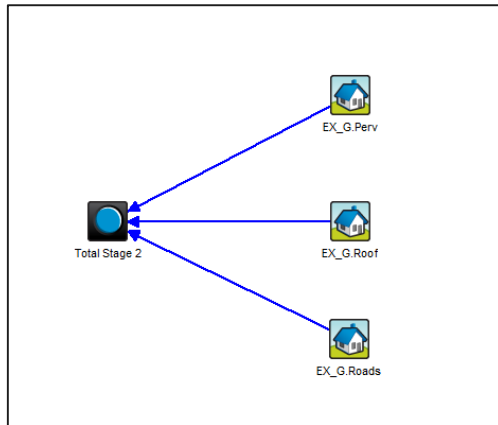


Figure C1: MUSIC Model Layout for Existing Conditions

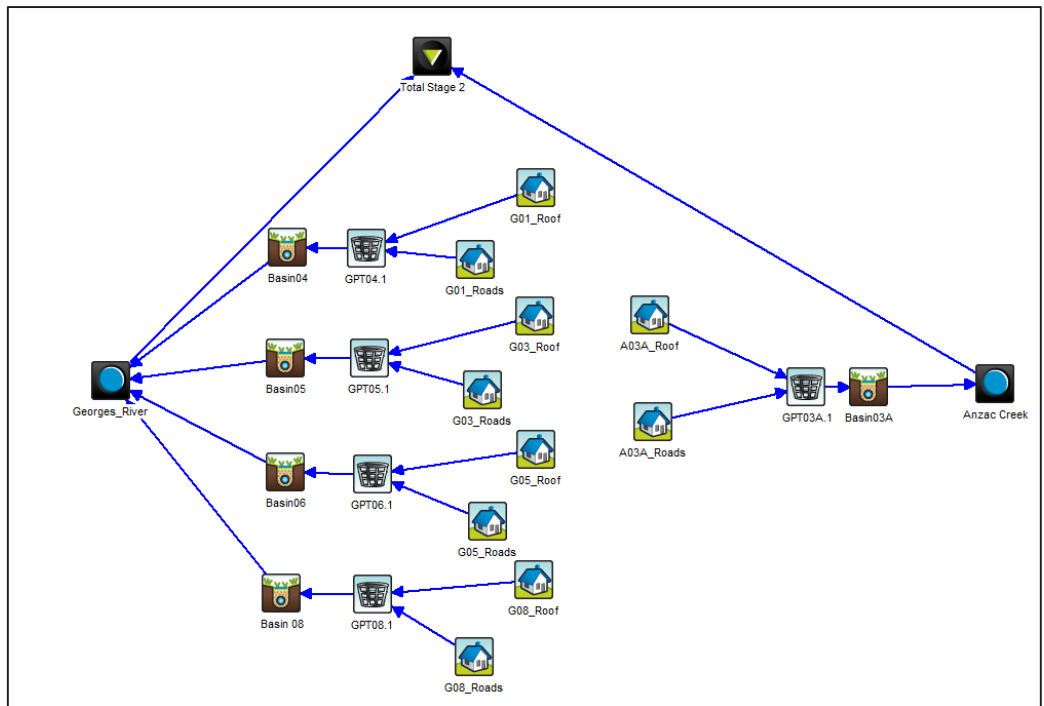


Figure C1: MUSIC Model Layout for Proposed Conditions



## 1.2 Climate Data

### Rainfall Data

6-minute interval pluviograph data from Liverpool's Whitlam Centre (Station No. 067035), which is situated about 3 km north of the MIC Project site was used in the MUSIC model. The pluviograph record from 1 January 1967 until 31 December 1976 was selected for the MUSIC modelling. The mean annual rainfall for this data period is 857mm, while the 40-year average annual rainfall for Liverpool is 868 mm.

A summary of the rainfall data is given in Table C1 and graphed in Figure C3.

*Table C1 Rainfall data used in the MUSIC model*

Station No.	Location	Years of Record	Type of Data
67035	Liverpool	1967-1976	6 minute

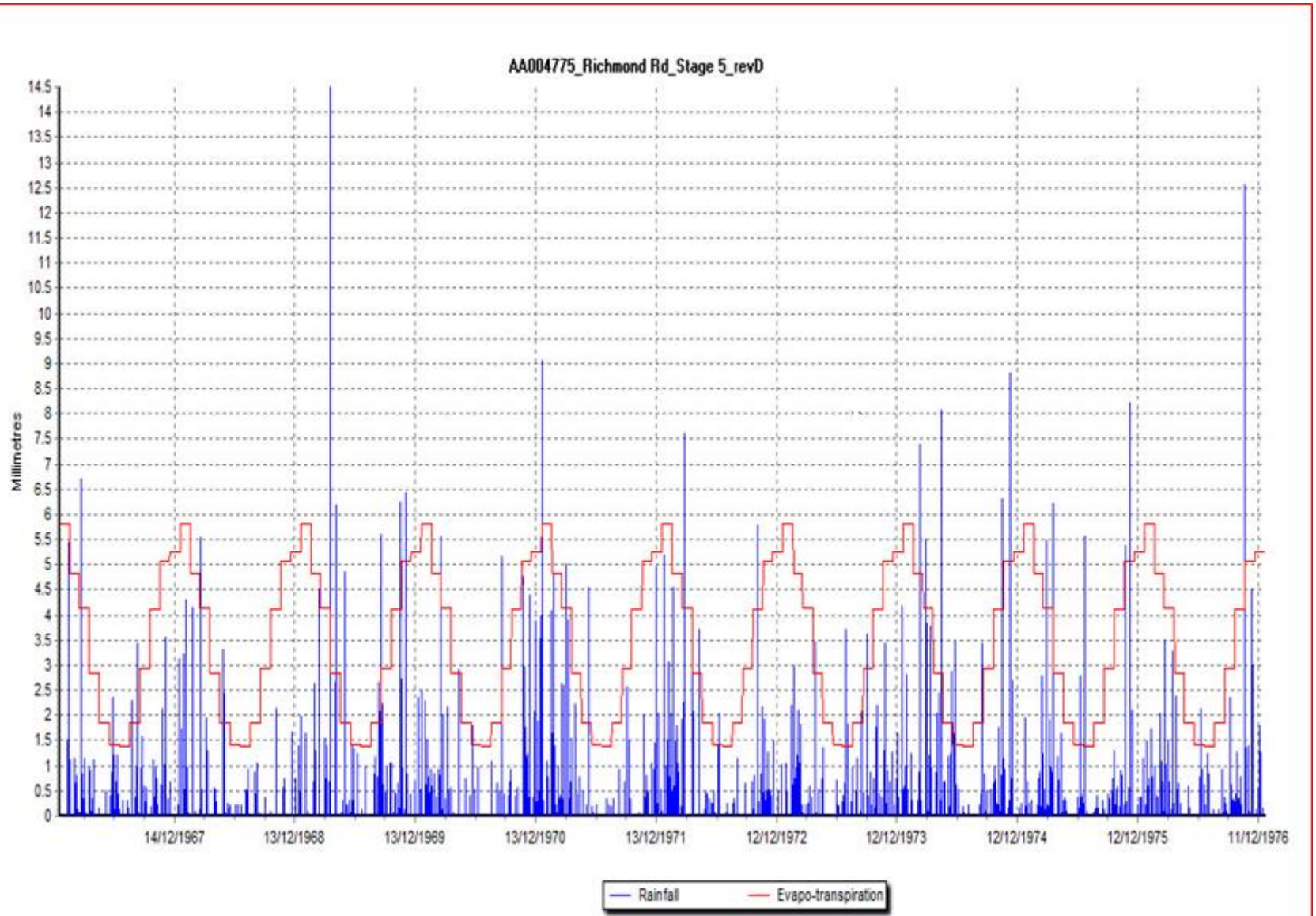
### Evapotranspiration Data

Monthly average potential evapotranspiration (PET) data for Sydney was used in the MUSIC model. These PET values are shown in Table C2 and plotted in Figure C3.

*Table C2 Monthly potential evapotranspiration (PET) values for Sydney*

Month	Jan	Feb	Mar	Apr	May	Jun
PET (mm)	180	135	128	85	58	43
Month	Jul	Aug	Sep	Oct	Nov	Dec
PET (mm)	43	58	88	127	152	163

Figure C3 Rainfall and potential evapotranspiration data used in MUSIC for the 1967-1976 period



### 1.3 Rainfall-Runoff Parameters and Pollutant Concentrations

The rainfall-runoff parameters corresponding to Clayey Sand have been adopted from 'Using MUSIC in Sydney's Drinking Water Catchment' (Sydney Catchment Authority, 2012). The rainfall-runoff parameters are summarised in Table C3.

The pollutant loading rates adopted for TSS, TP and TN for various land use categories are also based on 'Using MUSIC in Sydney's Drinking Water Catchment' (Sydney Catchment Authority, 2012). The event mean concentrations (EMCs) for TSS, TP and TN for both baseflow and stormflow (wet and dry conditions) are summarised in Table C4. It should be noted that baseflows are generated from pervious areas only. Hence pollutant EMC values for impervious areas during dry weather are irrelevant and are left blank in Table C4.

Table C3 Soil and Groundwater Parameters

Parameter	Units	Value
<b>Impervious Areas</b>		
Rainfall Threshold	mm	0.3 (roofs) 1.5 (roads)
<b>Pervious Areas</b>		
Soil Storage Capacity	mm	107
Initial Storage	% of Storage Capacity	30
Field Capacity	mm	75
Infiltration Capacity Coefficient – a	-	250
Infiltration Capacity Coefficient – b	-	1.3
<b>Groundwater Properties</b>		
Initial Depth	mm	10
Daily Recharge Rate	%	60
Daily Baseflow Rate	%	45
Daily Deep Seepage Rate	%	0

Table C4 Adopted Pollutant Event Mean Concentrations for MUSIC source nodes

Surface Type	Weather	Event Mean Concentration (mg/L)		
		TSS	TP	TN
Roads / Carparks	Stormflow	270	0.5	2.2
	Baseflow	-	-	-
Roofs	Stormflow	20	0.13	2
	Baseflow	-	-	-
General Pervious	Stormflow	141	0.25	2
	Baseflow	16	0.14	1.3

Pollutant	Pollutant Concentration (mg/L)		
	Roads / Carparks		Roofs
	Wet Weather	Dry Weather	Wet Weather
TSS	270	-	20
TP	0.5	-	0.13
TN	2.2	-	2

## 1.4 Stormwater Treatment Device Properties

The properties of the rain garden/bioretention systems and gross pollutant traps (GPTs) used in the MUSIC model are summarised in **Table C5** and **Table C6** respectively.

*Table C5 Raingarden General Properties*

Parameter	Units	Value
<b>Inlet Properties</b>		
Low Flow Bypass	m <sup>3</sup> /s	0
High Flow Bypass	m <sup>3</sup> /s	100
<b>Storage Properties</b>		
Extended Detention Depth	m	0.3
<b>Filter and Media Properties</b>		
Unlined Filter Media Perimeter	m	0.01
Saturated Hydraulic Conductivity	mm/hr	100
Filter Depth	m	0.4
TN Content of Filter Media	mg/kg	600
Orthophosphate Content of Filter Media	mg/kg	9
<b>Infiltration Properties</b>		
Exfiltration Rate	mm/hr	0
<b>Lining Properties</b>		
Is base lined?	-	Yes
<b>Vegetation Properties</b>		
Vegetated with Effective Nutrient Removal Plants?	-	Yes
<b>Outlet Properties</b>		
Underdrain present?	-	Yes
Submerged Zone with Carbon Present?	-	No

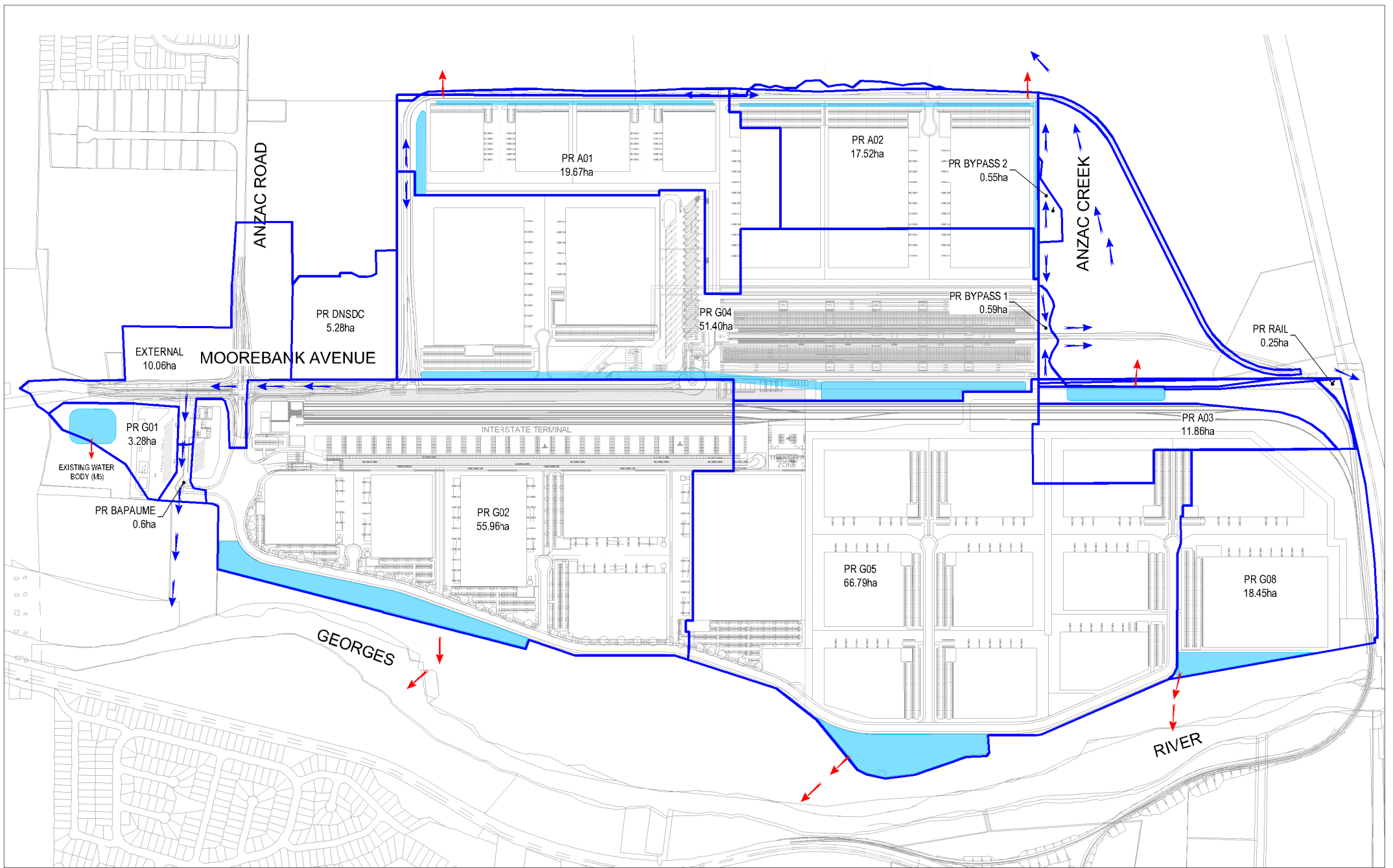
*Table C6 Gross Pollutant Trap General Properties*

Parameter	Units	Value
<b>General Properties</b>		

Type	-	CDS Vortex
High Flow Bypass	m <sup>3</sup> /s	Approx. 3 - 6 month flow
<b>Transfer Functions (% Removal)</b>		
TSS (concentrations > 75 mg/L)	-	70%
TP (concentrations > 0.5 mg/L)	-	34%
TN (all concentrations)	-	0%
Gross Pollutants	-	90%

# APPENDIX D

## Concept Masterplan

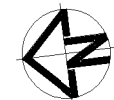


— PROPOSED CATCHMENT BOUNDARY

— PROPOSED OSD

→ INDICATIVE FLOW PATH

→ INDICATIVE BASIN DISCHARGE LOCATION



0 250 500  
Metres

## **APPENDIX E**

### **Flood Estimation Terminology**

**(Extract from Australian Rainfall and Runoff ‘Terminology Draft Discussion Paper’  
ARR Website 18/06/2015)**



Table 1.1 Australian Rainfall and Runoff Preferred Terminology

EY	AEP (%)	AEP (1 in x)	ARI	Use
6	99.75	1.002	0.17	WSUD
4	98.17	1.02	0.25	
3	95.02	1.05	0.33	
2	86.47	1.16	0.50	
1	63.21	1.58	1.00	
0.69	50.00	2	1.44	Stormwater/pit and pipe design
0.5	39.35	2.54	2.00	
0.22	20.00	5	4.48	
0.2	18.13	5.52	5.00	
0.11	10.00	10	9.49	Flooding
0.05	5.00	20	20	
0.02	2.00	50	50	
0.01	1.00	100	100	
0.005	0.50	200	200	
0.002	0.20	500	500	
0.001	0.10	1000	1000	
0.0005	0.05	2000	2000	
0.0002	0.02	5000	5000	
				Extreme risk /Dams