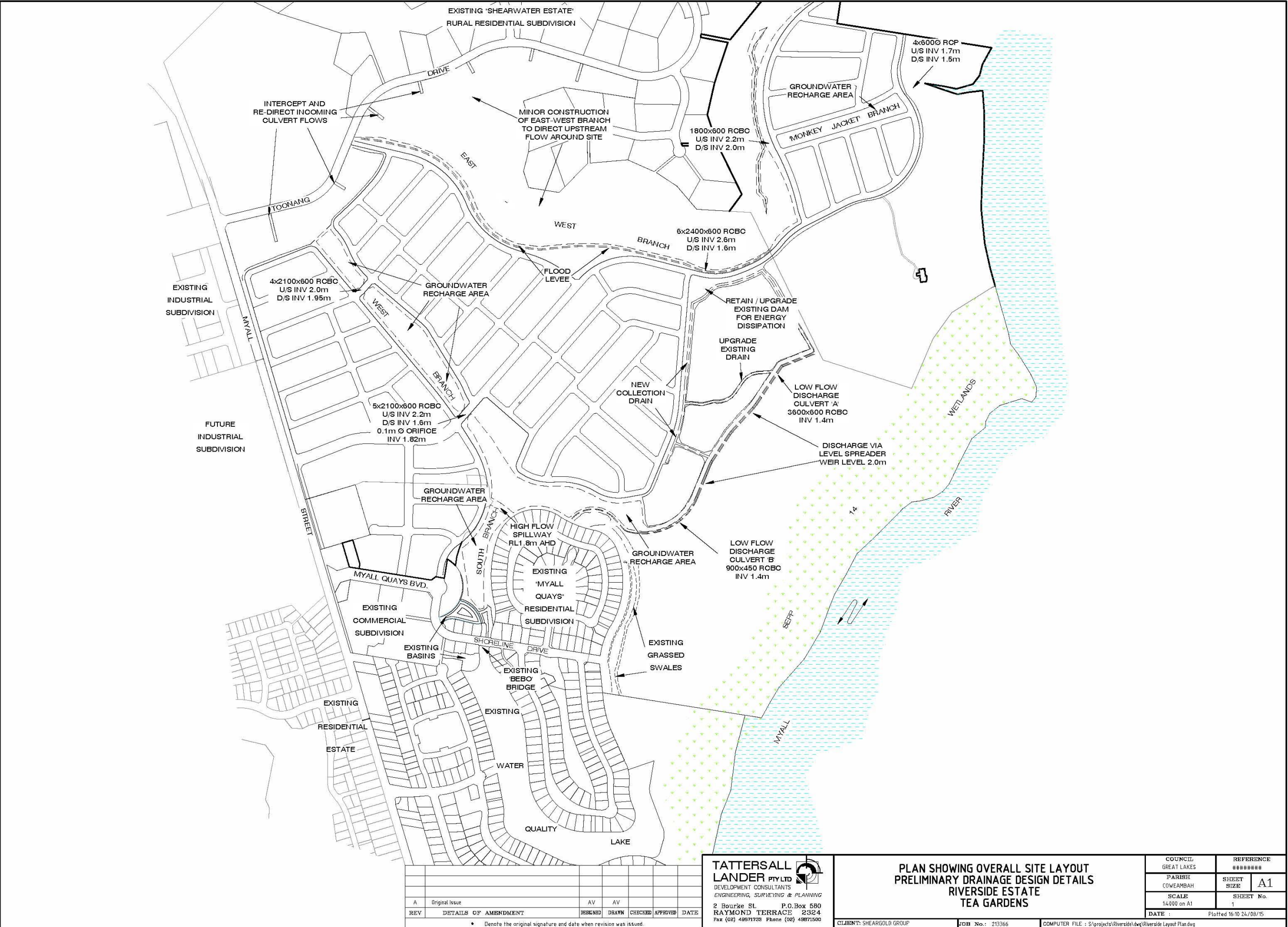


APPENDIX A: Preliminary Drainage Design Details Plan



APPENDIX B: Great Lakes Council IFD Data

19-NOV-2009 THU 15:19

GLO ENGINEERING

Proj No. 02000102-0

11.02

" RARE " - Rainfall & Runoff Estimation Program

INTENSITY - FREQUENCY - DURATION TABLE

(Results in mm/hour)

FILE REFERENCE: HAWKS-NEST

Values Used:

2 year I 1 hr : 37.00
I 12 hr : 7.30
I 72 hr : 2.20

50 year I 1 hr : 72.00
I 12 hr : 14.50
I 72 hr : 4.40

Co-efficient G : 0.00
F2 : 4.32
F50 : 16.10

TIME	AVERAGE RECURRENCE INTERVAL (ARI) years								
	1	2	5	10	20	50	100	200	500
5 mins	92.9	119	150	168	192	223	246	270	302
6 mins	87.1	111	141	158	180	210	232	254	284
7 mins	82.2	105	133	149	171	198	219	240	268
8 mins	78.0	99.9	127	142	162	189	208	229	256
9 mins	74.4	95.3	121	135	155	180	199	218	244
10 mins	71.2	91.3	116	130	148	173	191	210	234
12 mins	65.9	84.4	107	120	138	160	177	194	217
14 mins	61.5	78.8	100	112	129	150	166	182	204
15 mins	59.6	76.4	97.1	109	125	145	161	177	198
16 mins	57.8	74.1	94.3	106	121	141	156	172	192
18 mins	54.6	70.1	89.2	100	115	134	148	163	182
20 mins	51.9	66.6	84.8	95.3	109	127	141	155	173
25 mins	46.4	59.6	76.0	85.4	97.9	114	127	139	156
30 mins	42.2	54.2	69.2	77.8	89.3	104	116	127	142
40 mins	36.1	46.4	59.4	66.9	76.0	89.7	99.5	109	123
50 mins	31.9	41.0	52.6	59.3	68.1	79.6	88.3	97.2	109
1 hour	28.8	37.0	47.5	53.5	61.5	72.0	79.9	88.0	98.8
1.5 hours	22.2	28.6	36.7	41.5	47.7	55.8	62.0	68.2	76.7
2 hours	18.4	23.7	30.5	34.4	39.6	46.4	51.6	56.8	63.8
3 hours	14.1	18.2	23.4	26.4	30.4	35.7	39.7	43.7	49.1
4.5 hours	10.8	13.9	17.9	20.3	23.4	27.4	30.8	33.6	37.8
6 hours	8.9	11.5	14.9	16.8	19.4	22.7	25.3	27.9	31.4
9 hours	6.8	8.8	11.4	12.9	14.9	17.5	19.4	21.4	24.1
12 hours	5.7	7.3	9.4	10.7	12.3	14.5	16.1	17.8	20.1
15 hours	4.9	6.3	8.2	9.3	10.7	12.6	14.0	15.5	17.5
18 hours	4.4	5.7	7.3	8.3	9.6	11.3	12.5	13.8	15.6
24 hours	3.6	4.7	6.1	6.9	8.0	9.4	10.4	11.5	13.0
30 hours	3.2	4.1	5.3	6.0	6.9	8.1	9.0	10.0	11.2
36 hours	2.8	3.6	4.7	5.3	6.1	7.2	8.0	8.9	10.0
48 hours	2.3	3.0	3.8	4.4	5.0	5.9	6.6	7.3	8.2
72 hours	1.7	2.2	2.9	3.2	3.7	4.4	4.9	5.4	6.1

APPENDIX C: PMF Generalised Short-Duration Method Calculation Sheet

Appendix 1

GSDM CALCULATION SHEET

LOCATION INFORMATION				
Catchment	Riverside		Area	4.4 km ²
State	NSW		Duration Limit	6 hrs
Latitude	32° 39' S		Longitude	152° 9' E
Portion of Area Considered: within 20km of Tomaree Peninsula				
Smooth, S =	0 (0.0 - 1.0)		Rough, R =	1.0 (0.0 - 1.0)
ELEVATION ADJUSTMENT FACTOR (EAF)				
Mean Elevation 10 m				
Adjustment for Elevation (-0.05 per 300m above 1500m) -				
EAF = 1.00 (0.85 - 1.00)				
MOISTURE ADJUSTMENT FACTOR (MAF)				
MAF = 0.75 (0.40 - 1.00)				
PMP VALUES (mm)				
Duration (hours)	Initial Depth - Smooth (D _S)	Initial Depth - Rough (D _R)	PMP Estimate = (D _S × S + D _R × R) × MAF × EAF	Rounded PMP Estimate (nearest 10 mm)
0.25	-	225	169	170
0.50	-	325	244	240
0.75	-	415	311	310
1.0	-	480	360	360
1.5	-	620	465	470
2.0	-	730	547	550
2.5	-	800	600	600
3.0	-	875	656	660
4.0	-	1005	754	750
5.0	-	1100	825	830
6.0	-	1170	877	880

Prepared by Adrian Varela

Date 10 / 9 / 12

Checked by Dave Kopsanely

Date 12 / 9 / 12

APPENDIX D: PMF Flood Hazard and Flood Depth Mapping Results



Figure E.1 – Flood Hazard Mapping Across the Developed Riverside Site
– 1hr PMF Storm, 100yr Tailwater

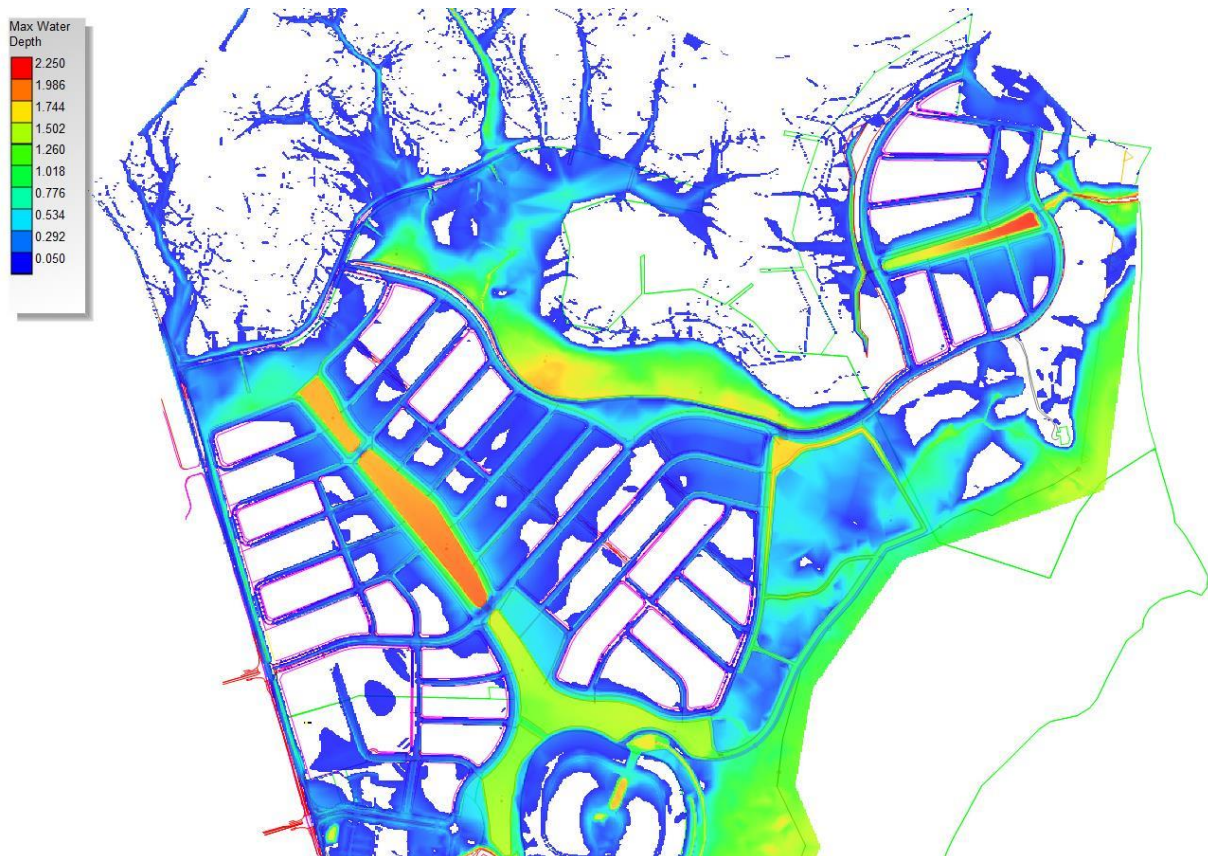
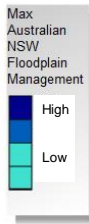
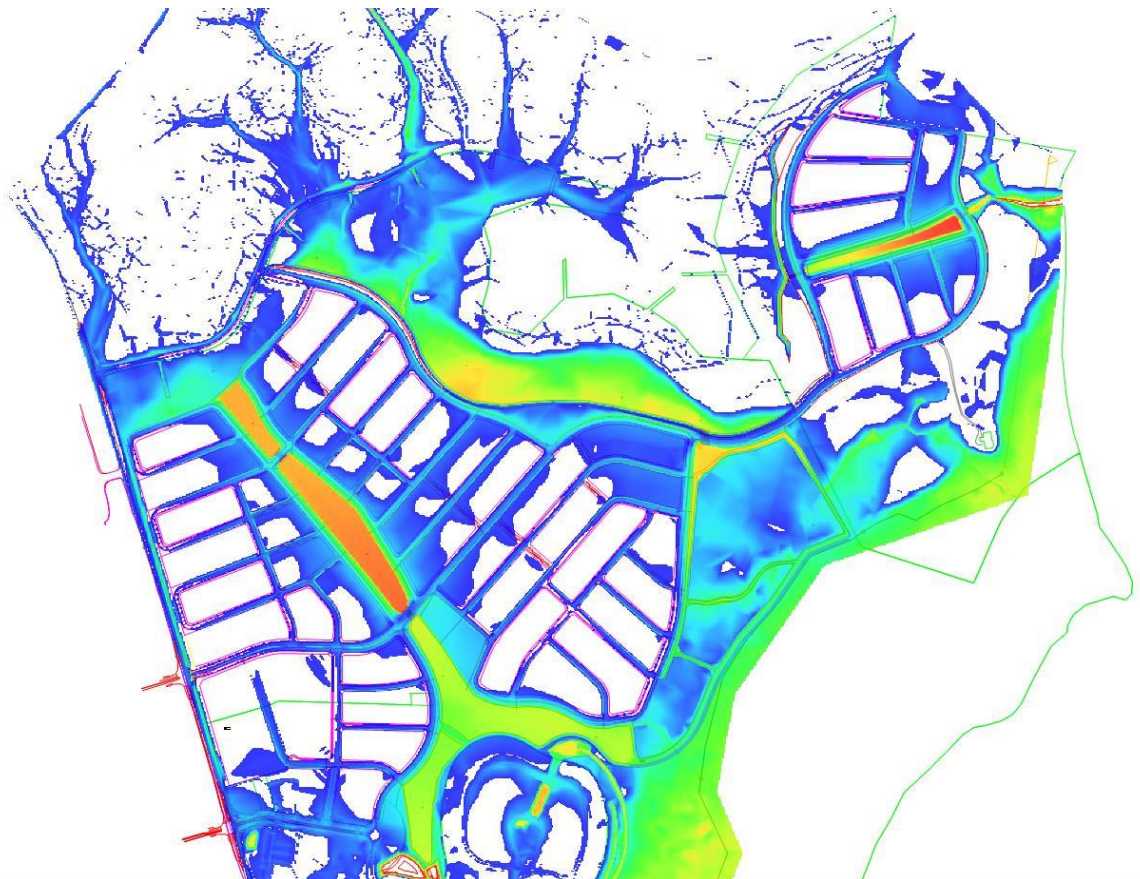
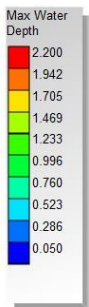


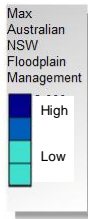
Figure E.2 – Flood Depth Mapping Across the Developed Riverside Site
– 1hr PMF Storm, 100yr Tailwater



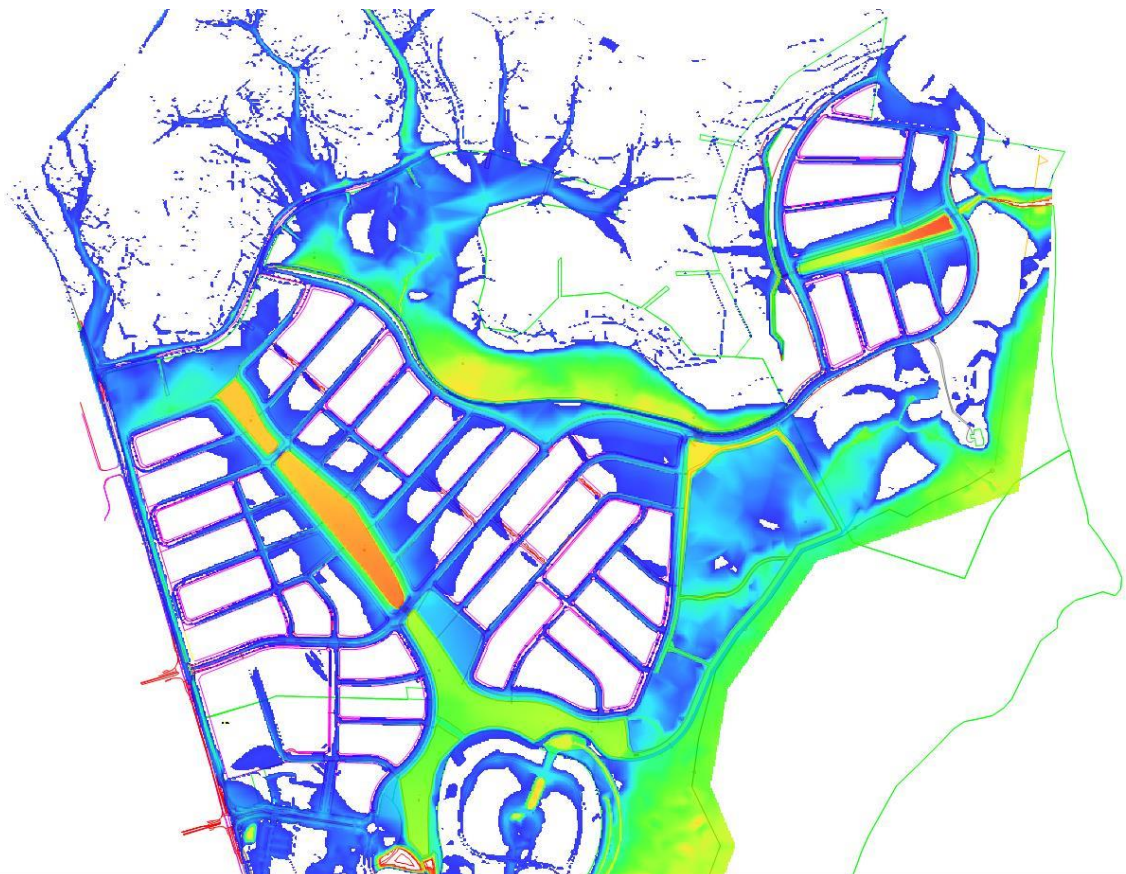
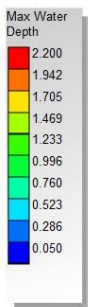
**Figure E.3 – Flood Hazard Mapping Across the Developed Riverside Site
– 2hr PMF Storm, 100yr Tailwater**



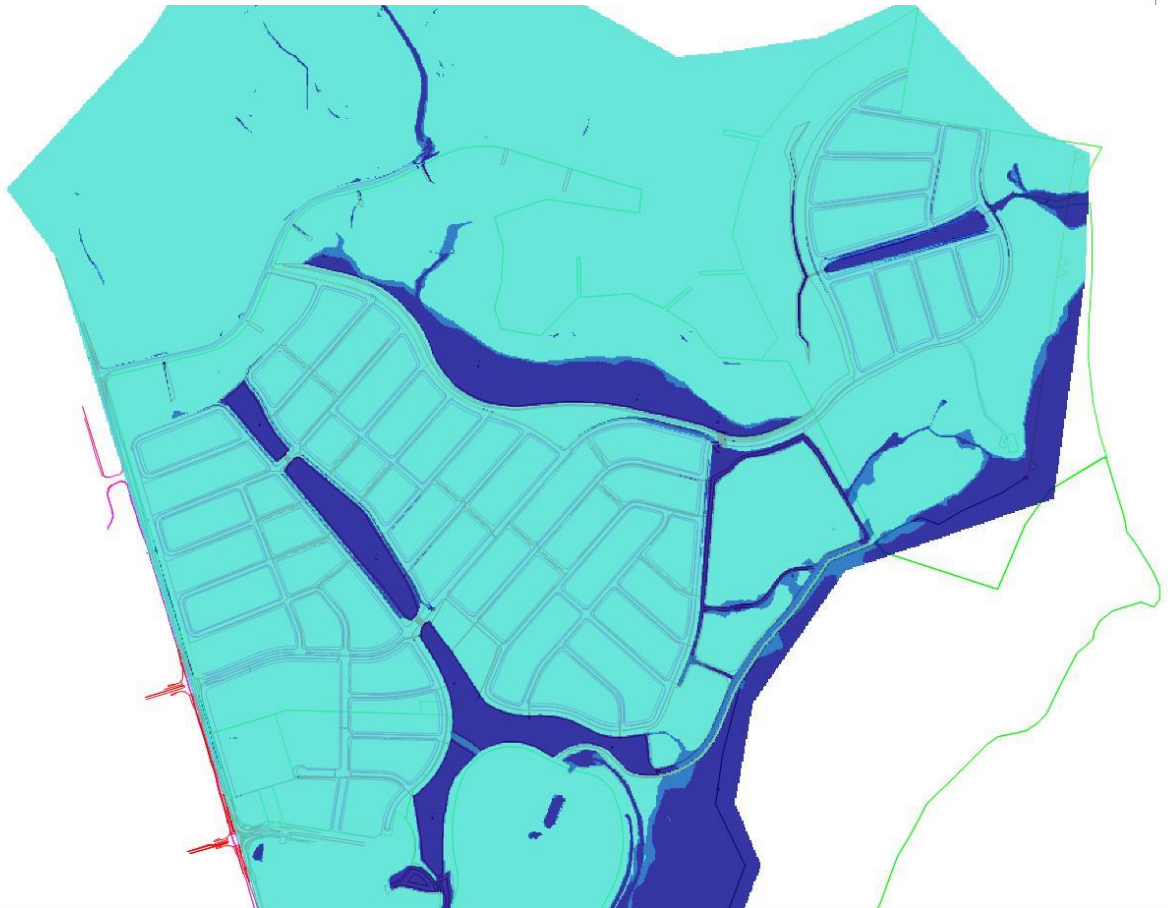
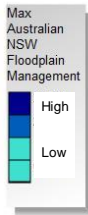
**Figure E.4 – Flood Depth Mapping Across the Developed Riverside Site
– 2hr PMF Storm, 100yr Tailwater**



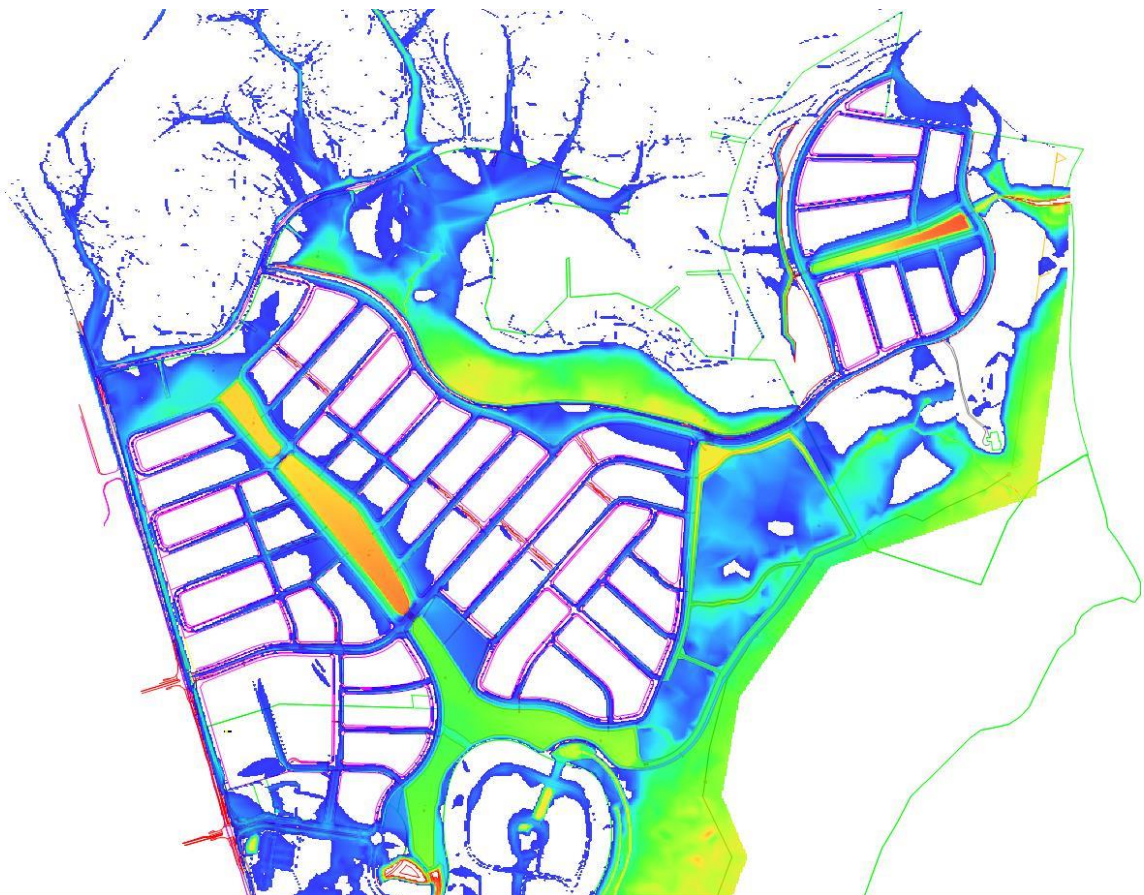
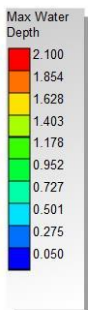
**Figure E.5 – Flood Hazard Mapping Across the Developed Riverside Site
– 3hr PMF Storm, 100yr Tailwater**



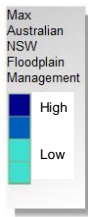
**Figure E.6 – Flood Depth Mapping Across the Developed Riverside Site
– 3hr PMF Storm, 100yr Tailwater**



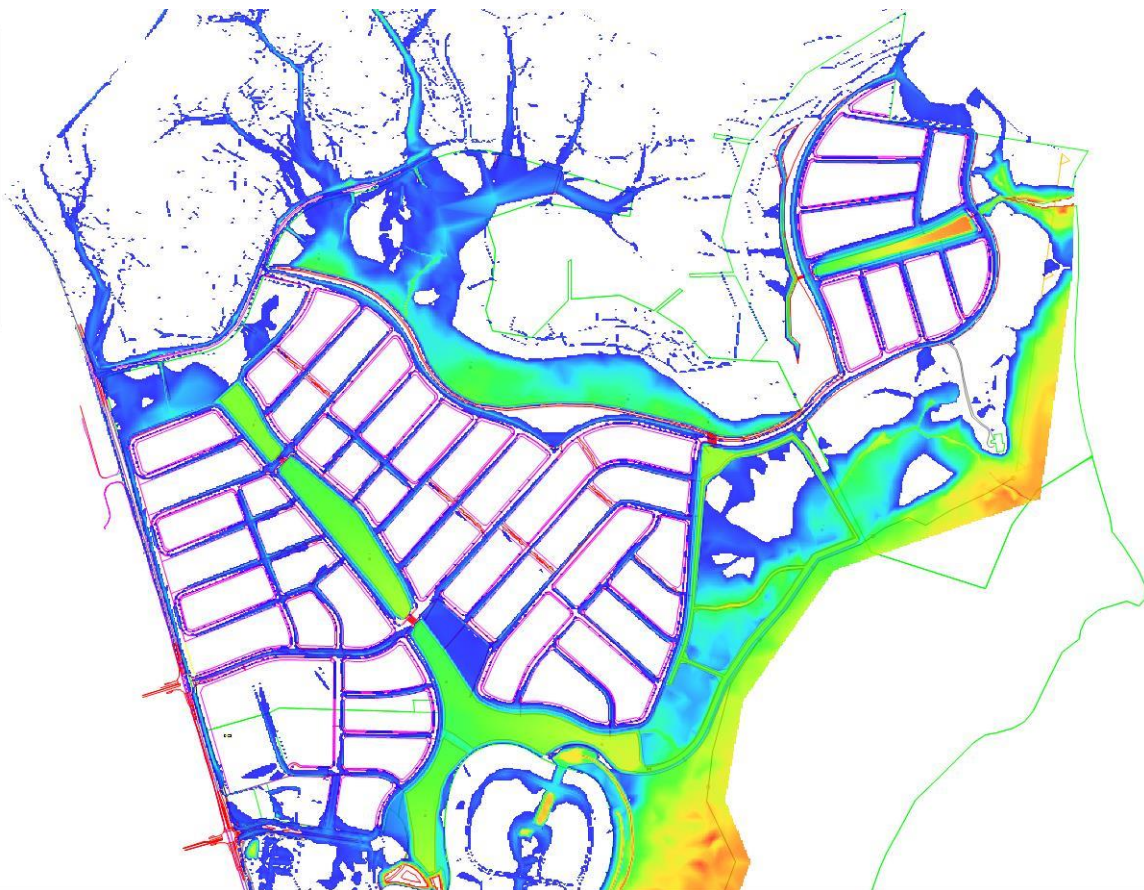
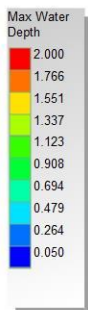
**Figure E.7 – Flood Hazard Mapping Across the Developed Riverside Site
– 6hr PMF Storm, 100yr Tailwater**



**Figure E.8 – Flood Depth Mapping Across the Developed Riverside Site
– 6hr PMF Storm, 100yr Tailwater**



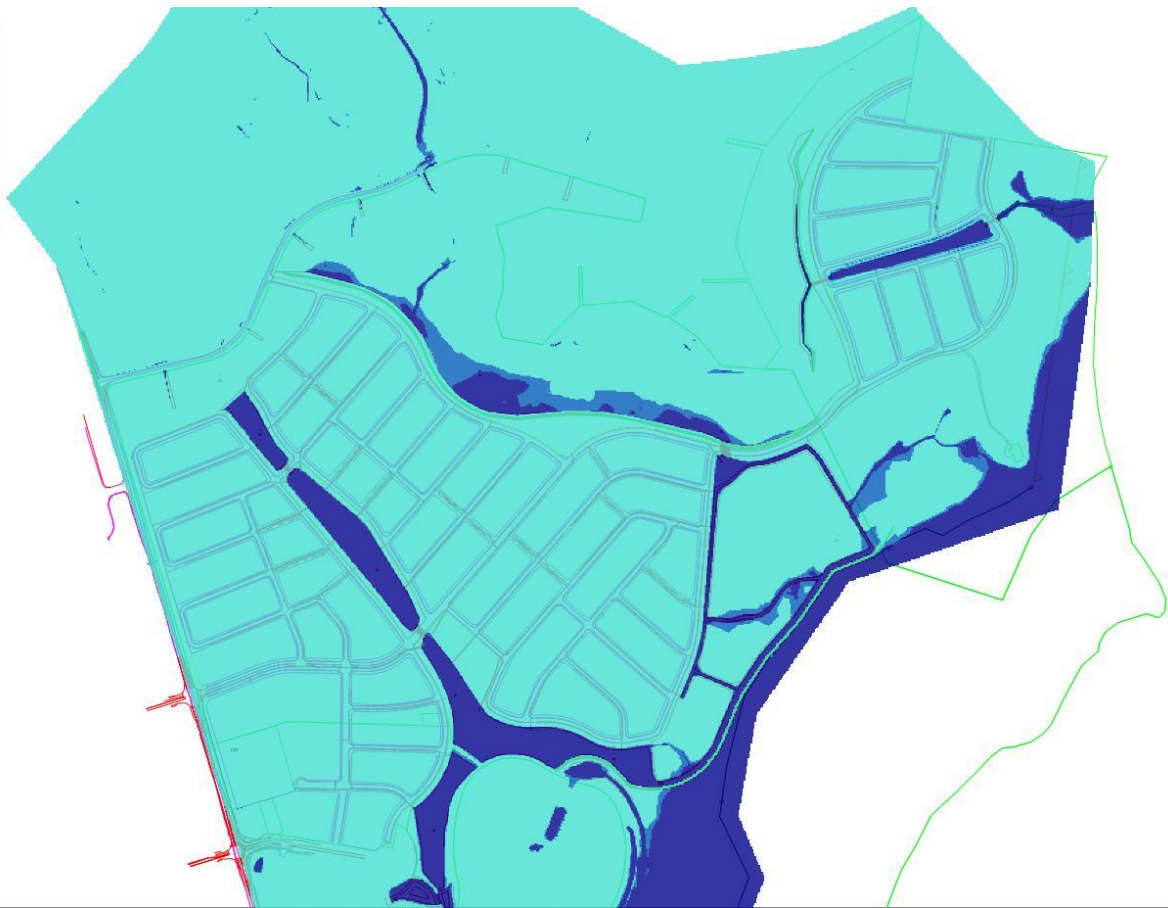
**Figure E.9 – Flood Hazard Mapping Across the Developed Riverside Site
– 1hr 100yr Storm, Extreme Tailwater**



**Figure E.10 – Flood Depth Mapping Across the Developed Riverside Site
– 1hr 100yr Storm, Extreme Tailwater**

Max
Australian
NSW
Floodplain
Management

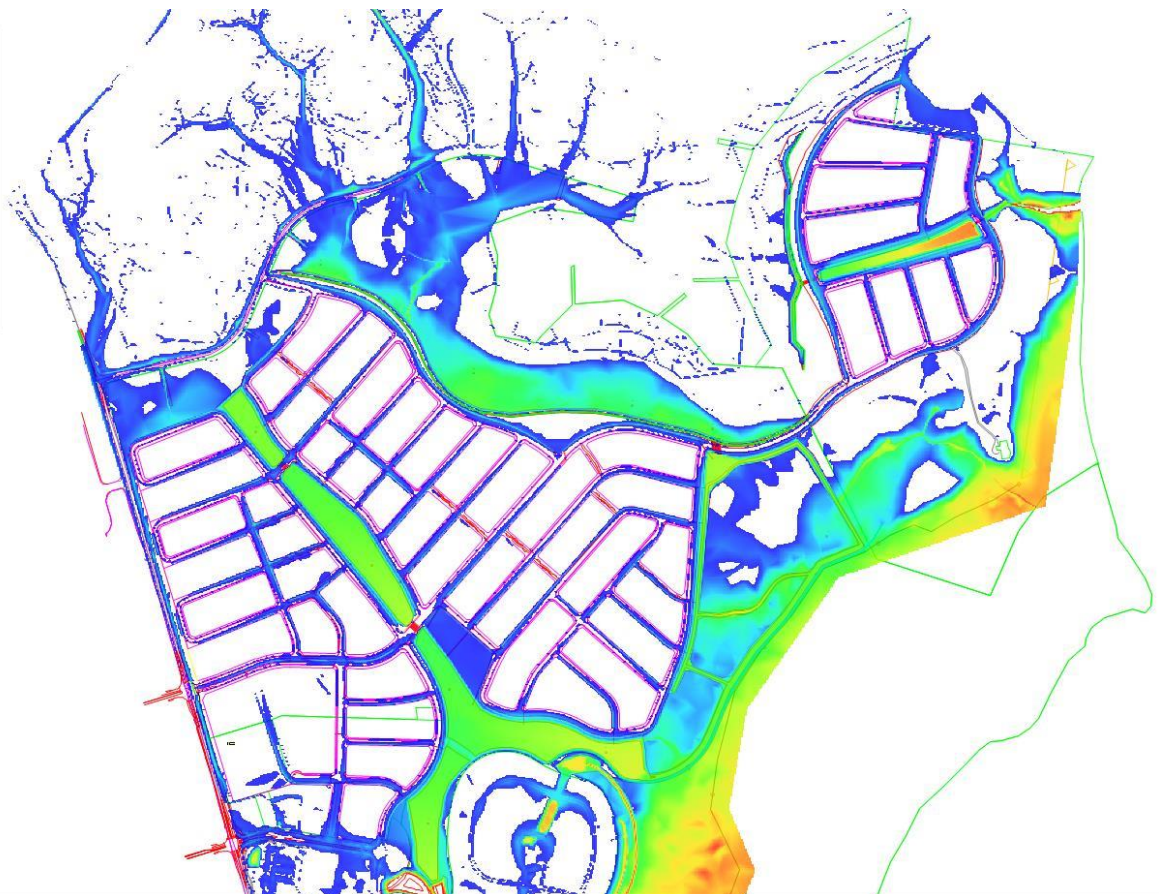
High
Low



**Figure E.11 – Flood Hazard Mapping Across the Developed Riverside Site
– 2hr 100yr Storm, Extreme Tailwater**

Max Water
Depth

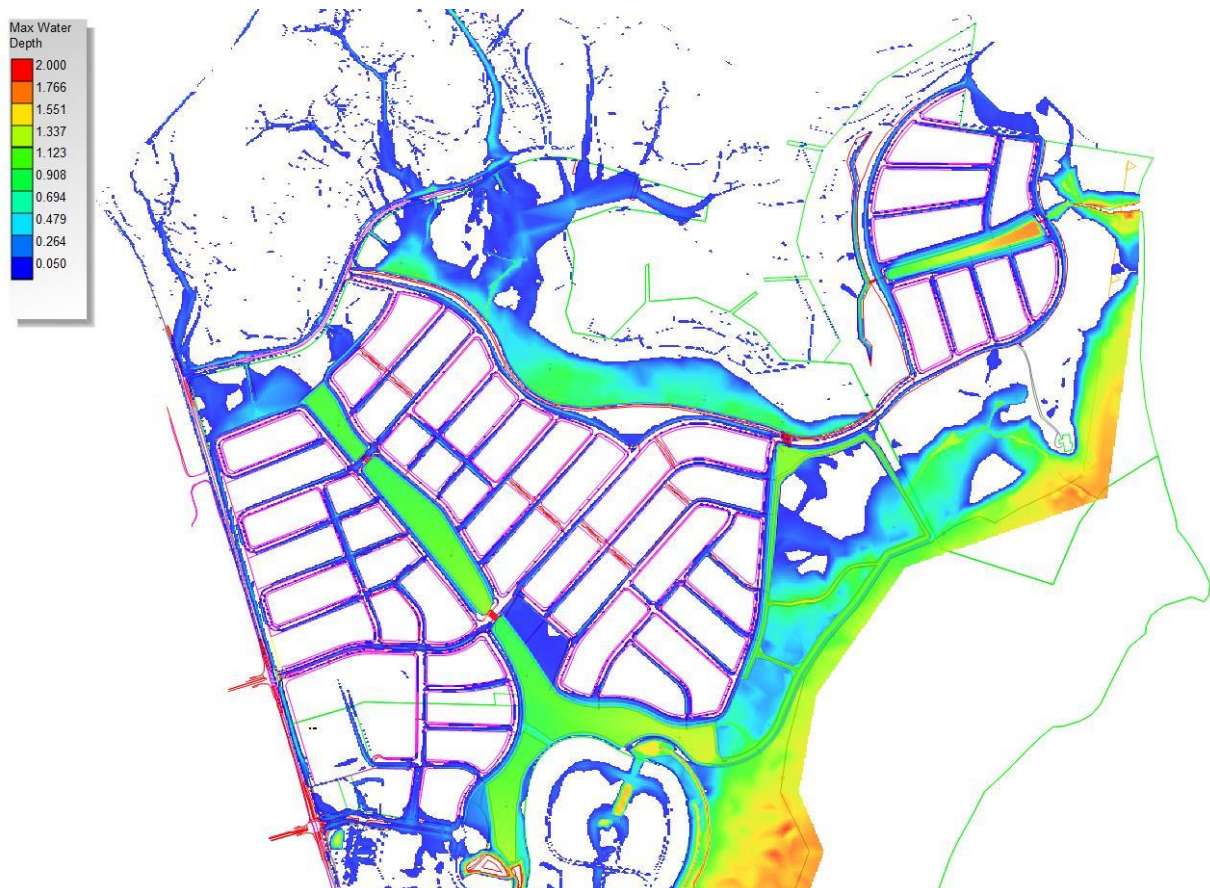
2.000
1.766
1.551
1.337
1.123
0.908
0.694
0.479
0.264
0.050



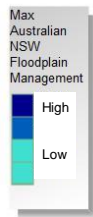
**Figure E.12 – Flood Depth Mapping Across the Developed Riverside Site
– 2hr 100yr Storm, Extreme Tailwater**



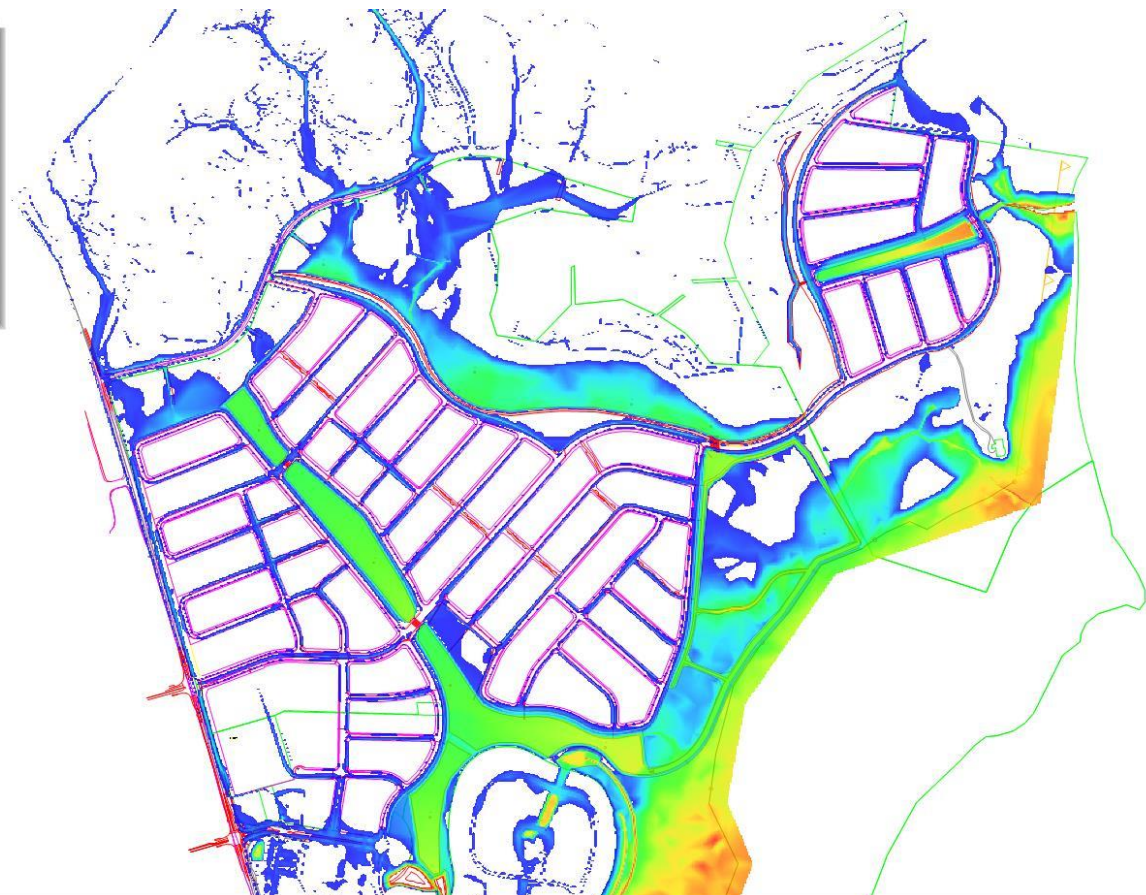
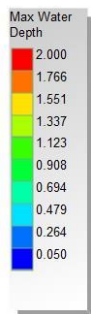
**Figure E.13 – Flood Hazard Mapping Across the Developed Riverside Site
– 3hr 100yr Storm, Extreme Tailwater**



**Figure E.14 – Flood Depth Mapping Across the Developed Riverside Site
– 3hr 100yr Storm, Extreme Tailwater**

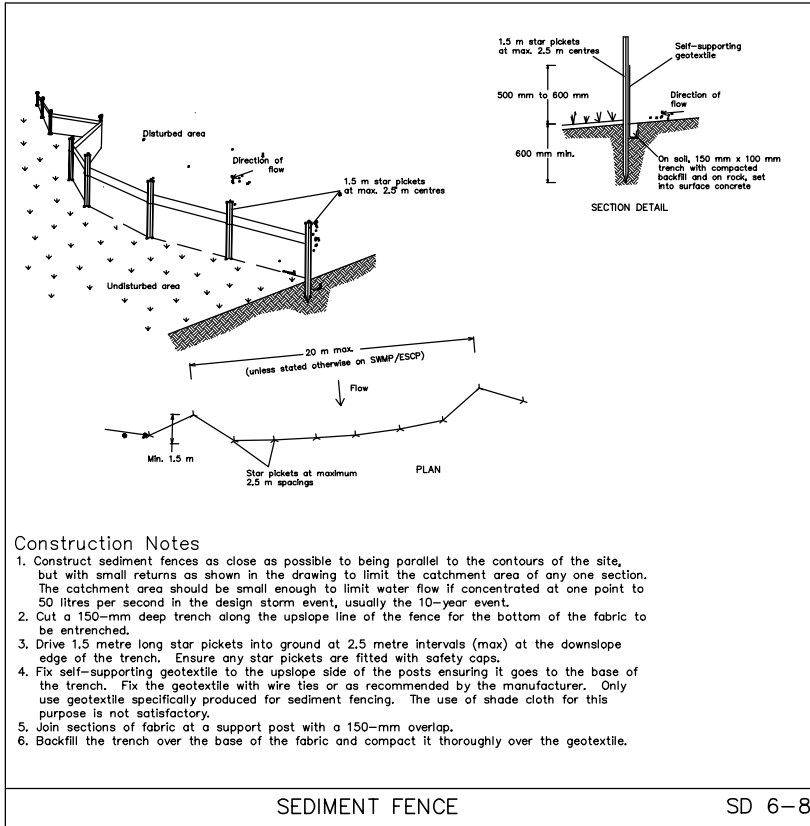
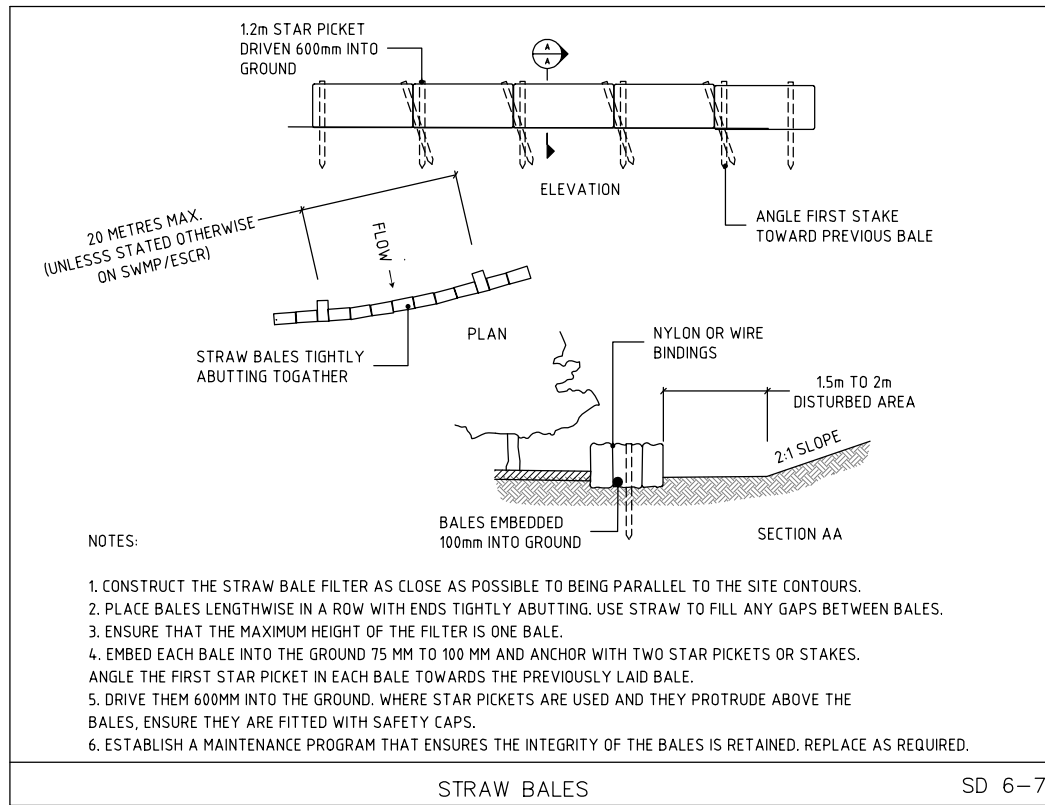
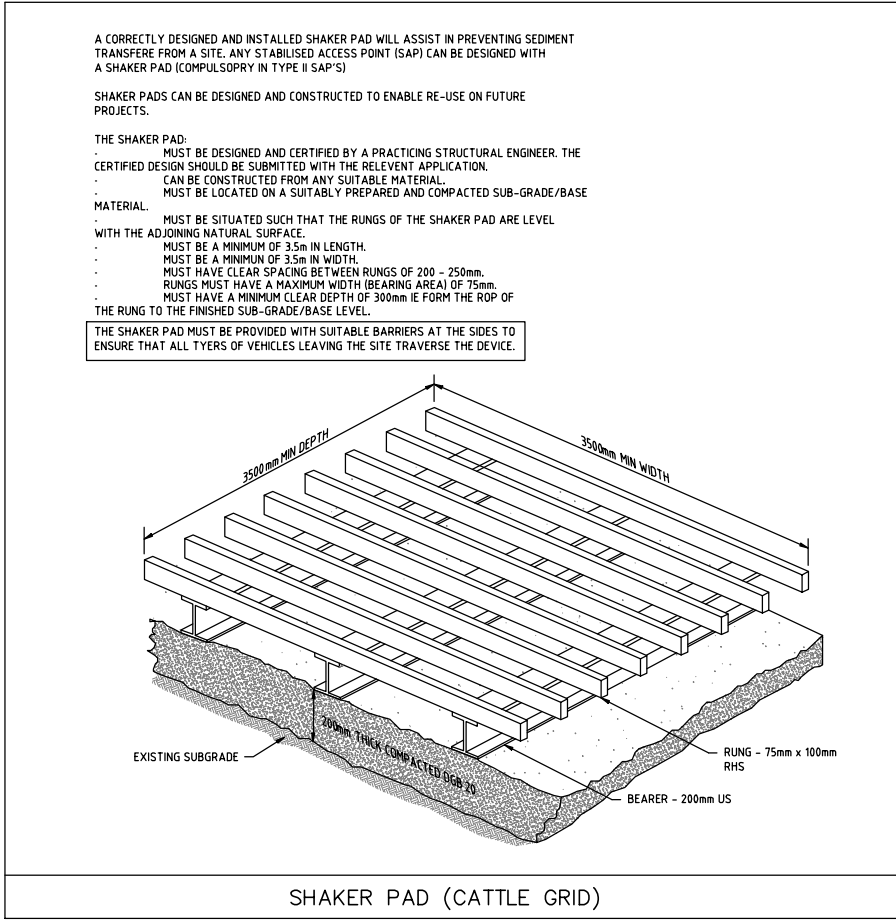
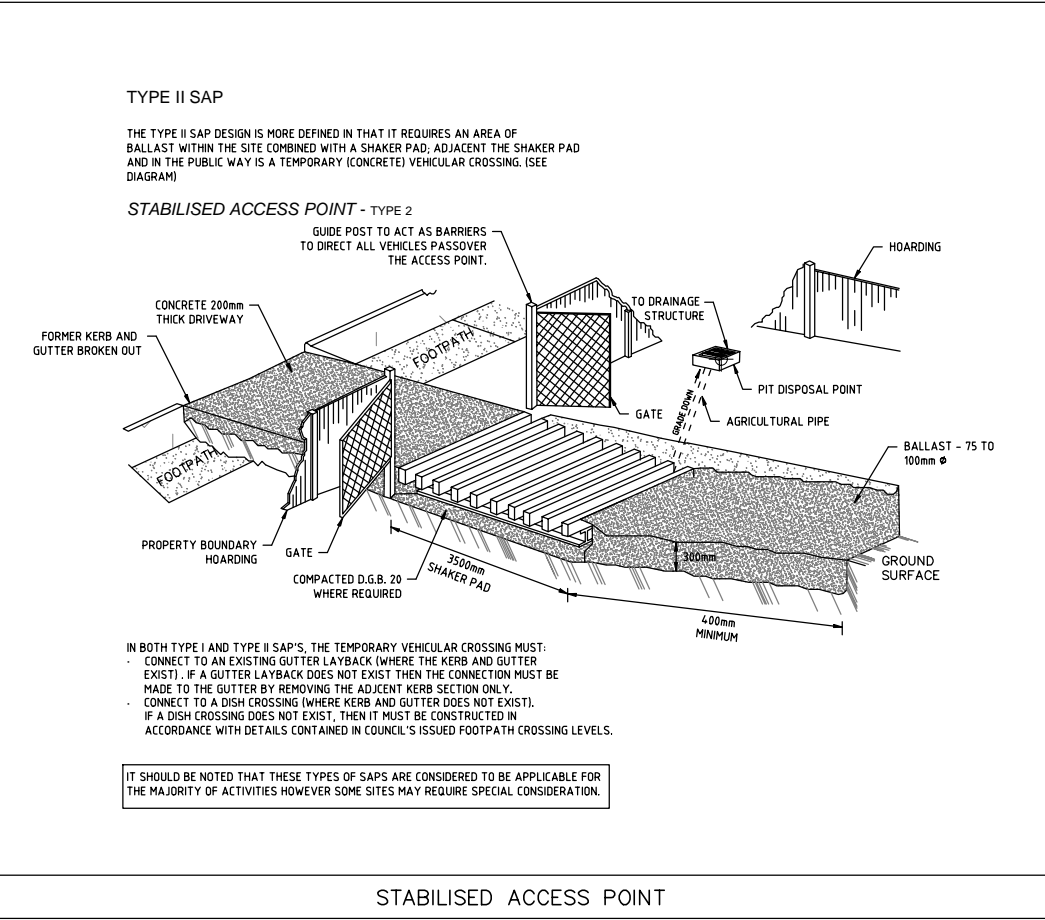
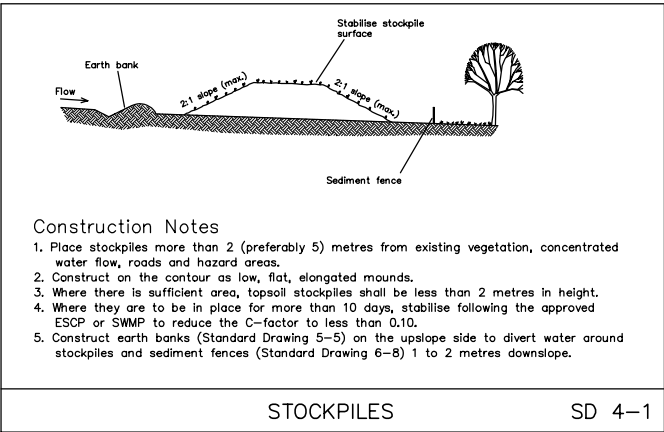
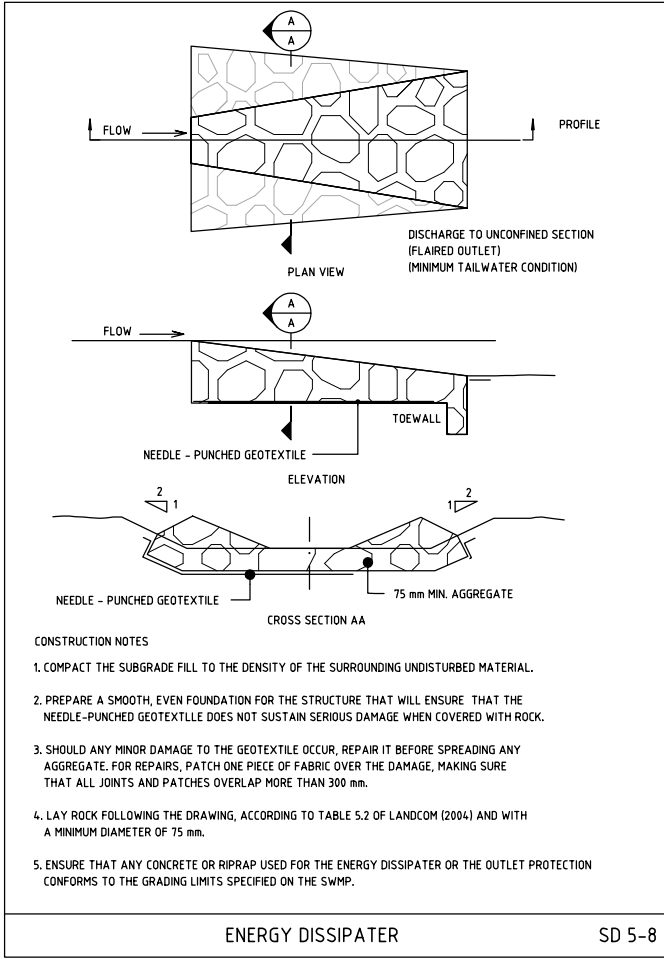


**Figure E.15 – Flood Hazard Mapping Across the Developed Riverside Site
– 6hr 100yr Storm, Extreme Tailwater**



**Figure E.16 – Flood Depth Mapping Across the Developed Riverside Site
– 6hr 100yr Storm, Extreme Tailwater**

25 **Attachment 7A – Erosion and Sediment Control Devices**



Martens & Associates Pty Ltd	
ABN 85 070 240 890	
Drawn:	KT
Approved:	DG
Date:	07.09.2015
Scale @ A3:	N.T.S

Environment Water Wastewater Geotechnical Civil Management			
SEDIMENT AND EROSION CONTROL SPECIFICATIONS RIVERSIDE ESTATE, TEA GARDENS, NSW		Drawing No./ID: SK001	
Project: P1404136	File: JD04V01	Revision: A	

Attachment 8 – Monitoring Data Sample Table

Date:		Time:		Weather:		
Sample Type	Sampling Location	Sampling Frequency	Parameter	Target Value (mg/L)	Laboratory Result (mg/L)	Complies (Y/N)
Treated water	Myall Creek Wetland Inlet collection chamber	Fortnightly ¹	Suspended Solids	≤ 9.060		
			Total Nitrogen (TKN + NO _x)	≤ 0.037		
			Total Phosphorous	≤ 0.442		
Treated water	Wetland 1 Outlet collection chamber	Fortnightly ¹	Suspended Solids	≤ 5.720		
			Total Nitrogen (TKN + NO _x)	≤ 0.022		
			Total Phosphorous	≤ 0.247		
Treated water	Wetland 2 mid - wetland	Fortnightly ¹	Suspended Solids	≤ 15.600		
			Total Nitrogen (TKN + NO _x)	≤ 0.065		
			Total Phosphorous	≤ 0.755		
Treated water	Wetland 3 collection chamber	Fortnightly ¹	Suspended Solids	≤ 11.000		
			Total Nitrogen (TKN + NO _x)	≤ 0.046		
			Total Phosphorous	≤ 0.526		
Treated water	J-Lake collection Chamber	Fortnightly ¹	Suspended Solids	≤ 17.100		
			Total Nitrogen (TKN + NO _x)	≤ 0.074		
			Total Phosphorous	≤ 0.678		
Treated water	Bio-retention collection chamber	Fortnightly ^{1,2}	Suspended Solids	≤ 17.100		
			Total Nitrogen (TKN + NO _x)	≤ 0.074		
			Total Phosphorous	≤ 0.678		

Notes:

¹. Testing for wetlands should be done fortnightly for the first 3 - 6 months, monthly between 6 – 24 months and annually after 24 months.

². Testing for bioretention areas should be performed as per the manufacturer's specifications.