
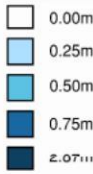



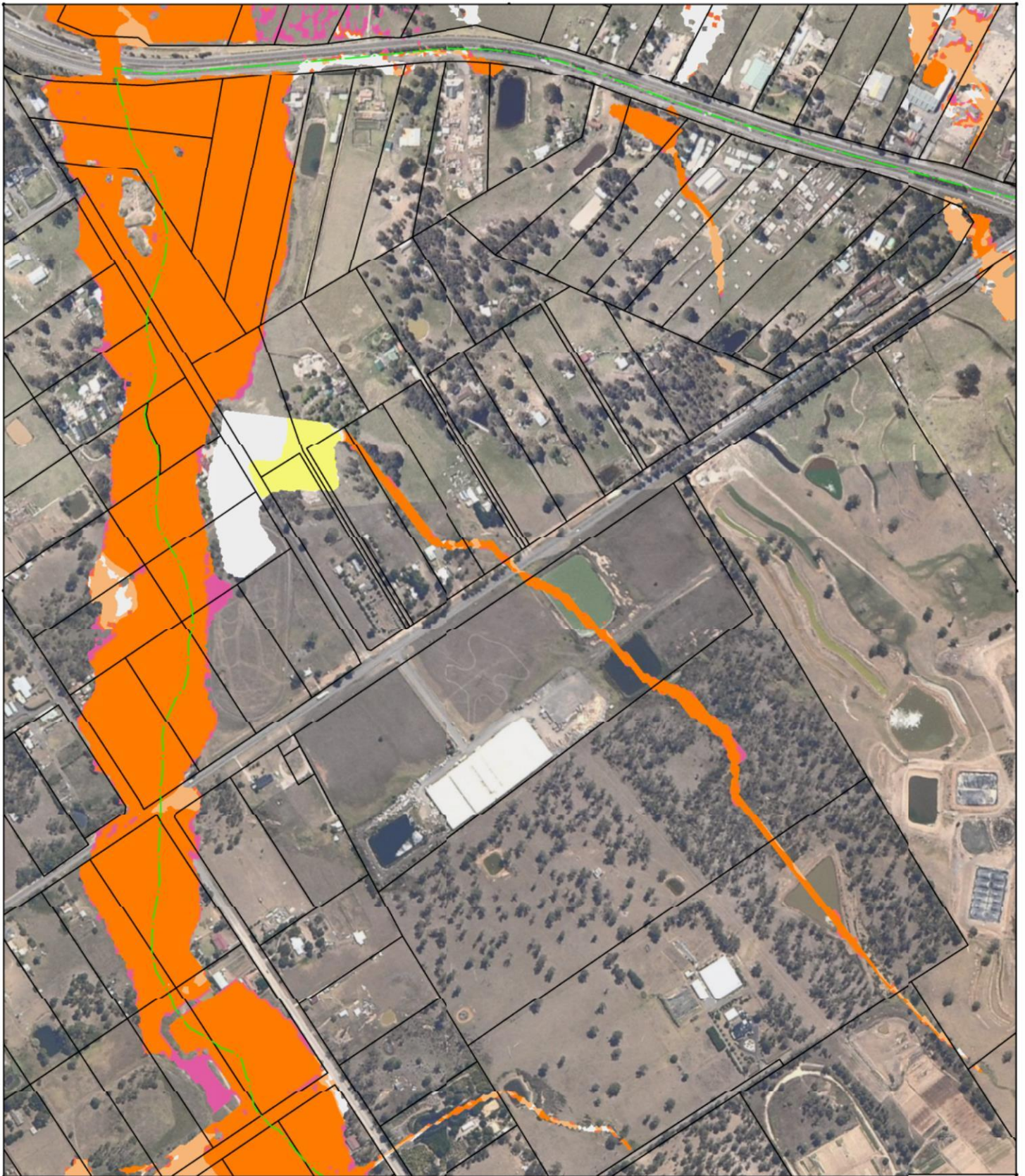

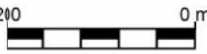



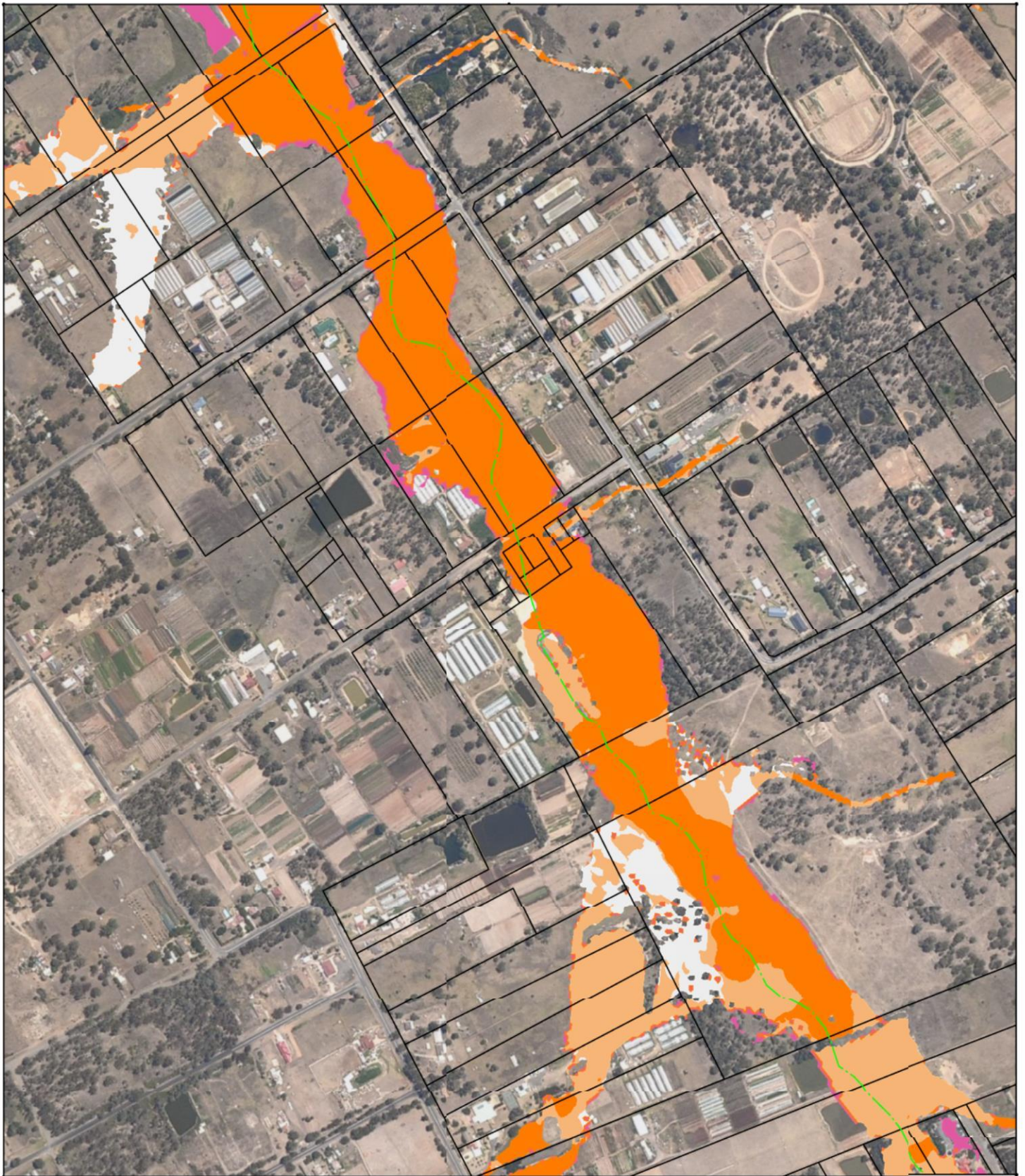



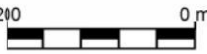





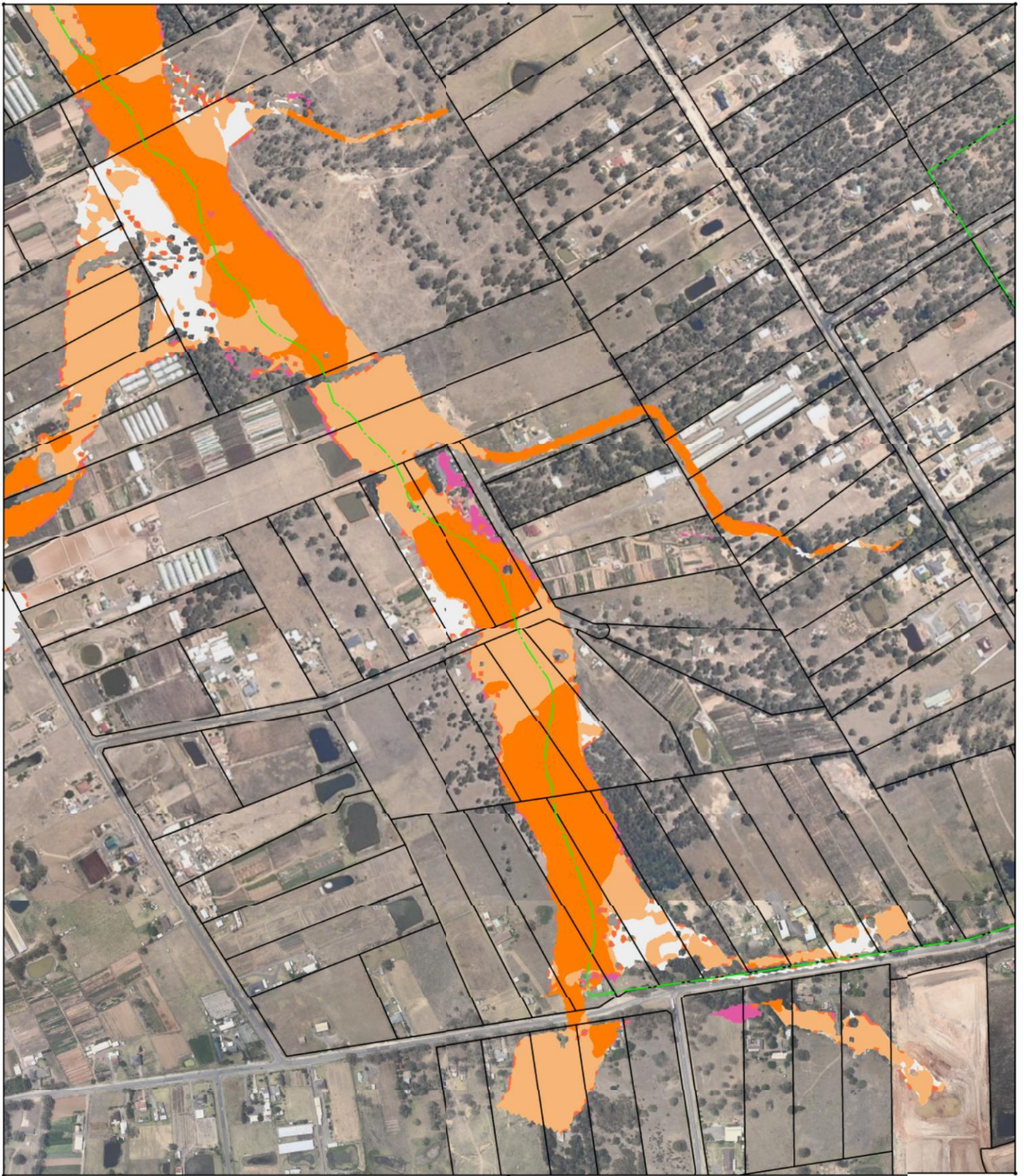
Title Rivestone East ILP 1% AEP Proposed Flood Depth Climate Change Scenario 2				 Mott MacDonald					
<small>WALTON CONSULTANTS PROPRIETARY LIMITED, JULY 2014, 1:2000 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_PRL_100yrCC3_120m_D	FI	B		








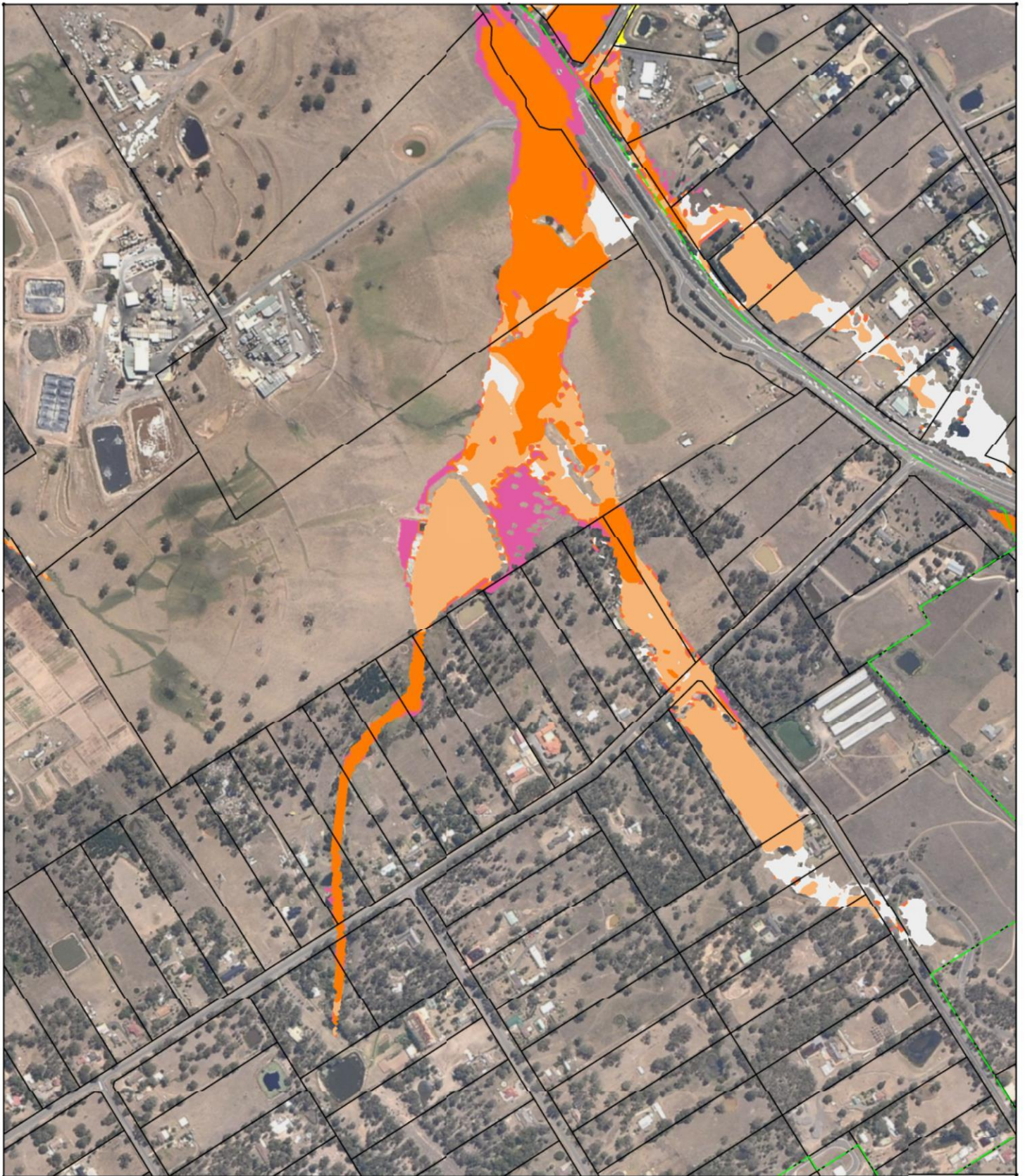
Title Riverstone East ILP 1% AEP Proposed Depth Diff Climate Change (+20%) - Proposed				  					
<small>WALSH & PARTNERS ENGINEERING ARCHITECTURE PLANNING PTY LTD (WALSH) 120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200/201/202/203/204/205/206/207/208/209/210/211/212/213/214/215/216/217/218/219/220/221/222/223/224/225/226/227/228/229/230/231/232/233/234/235/236/237/238/239/240/241/242/243/244/245/246/247/248/249/250/251/252/253/254/255/256/257/258/259/260/261/262/263/264/265/266/267/268/269/270/271/272/273/274/275/276/277/278/279/280/281/282/283/284/285/286/287/288/289/290/291/292/293/294/295/296/297/298/299/300/301/302/303/304/305/306/307/308/309/310/311/312/313/314/315/316/317/318/319/320/321/322/323/324/325/326/327/328/329/330/331/332/333/334/335/336/337/338/339/340/341/342/343/344/345/346/347/348/349/350/351/352/353/354/355/356/357/358/359/360/361/362/363/364/365/366/367/368/369/370/371/372/373/374/375/376/377/378/379/380/381/382/383/384/385/386/387/388/389/390/391/392/393/394/395/396/397/398/399/400/401/402/403/404/405/406/407/408/409/410/411/412/413/414/415/416/417/418/419/420/421/422/423/424/425/426/427/428/429/430/431/432/433/434/435/436/437/438/439/440/441/442/443/444/445/446/447/448/449/450/451/452/453/454/455/456/457/458/459/460/461/462/463/464/465/466/467/468/469/470/471/472/473/474/475/476/477/478/479/480/481/482/483/484/485/486/487/488/489/490/491/492/493/494/495/496/497/498/499/500/501/502/503/504/505/506/507/508/509/510/511/512/513/514/515/516/517/518/519/520/521/522/523/524/525/526/527/528/529/530/531/532/533/534/535/536/537/538/539/540/541/542/543/544/545/546/547/548/549/550/551/552/553/554/555/556/557/558/559/560/561/562/563/564/565/566/567/568/569/570/571/572/573/574/575/576/577/578/579/580/581/582/583/584/585/586/587/588/589/590/591/592/593/594/595/596/597/598/599/600/601/602/603/604/605/606/607/608/609/610/611/612/613/614/615/616/617/618/619/620/621/622/623/624/625/626/627/628/629/630/631/632/633/634/635/636/637/638/639/640/641/642/643/644/645/646/647/648/649/650/651/652/653/654/655/656/657/658/659/660/661/662/663/664/665/666/667/668/669/670/671/672/673/674/675/676/677/678/679/680/681/682/683/684/685/686/687/688/689/690/691/692/693/694/695/696/697/698/699/700/701/702/703/704/705/706/707/708/709/710/711/712/713/714/715/716/717/718/719/720/721/722/723/724/725/726/727/728/729/730/731/732/733/734/735/736/737/738/739/740/741/742/743/744/745/746/747/748/749/750/751/752/753/754/755/756/757/758/759/760/761/762/763/764/765/766/767/768/769/770/771/772/773/774/775/776/777/778/779/780/781/782/783/784/785/786/787/788/789/790/791/792/793/794/795/796/797/798/799/800/801/802/803/804/805/806/807/808/809/810/811/812/813/814/815/816/817/818/819/820/821/822/823/824/825/826/827/828/829/830/831/832/833/834/835/836/837/838/839/840/841/842/843/844/845/846/847/848/849/850/851/852/853/854/855/856/857/858/859/860/861/862/863/864/865/866/867/868/869/870/871/872/873/874/875/876/877/878/879/880/881/882/883/884/885/886/887/888/889/890/891/892/893/894/895/896/897/898/899/900/901/902/903/904/905/906/907/908/909/910/911/912/913/914/915/916/917/918/919/920/921/922/923/924/925/926/927/928/929/930/931/932/933/934/935/936/937/938/939/940/941/942/943/944/945/946/947/948/949/950/951/952/953/954/955/956/957/958/959/960/961/962/963/964/965/966/967/968/969/970/971/972/973/974/975/976/977/978/979/980/981/982/983/984/985/986/987/988/989/990/991/992/993/994/995/996/997/998/999/1000</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_DIFCC_100yr_120m	FI	B		


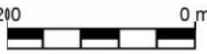





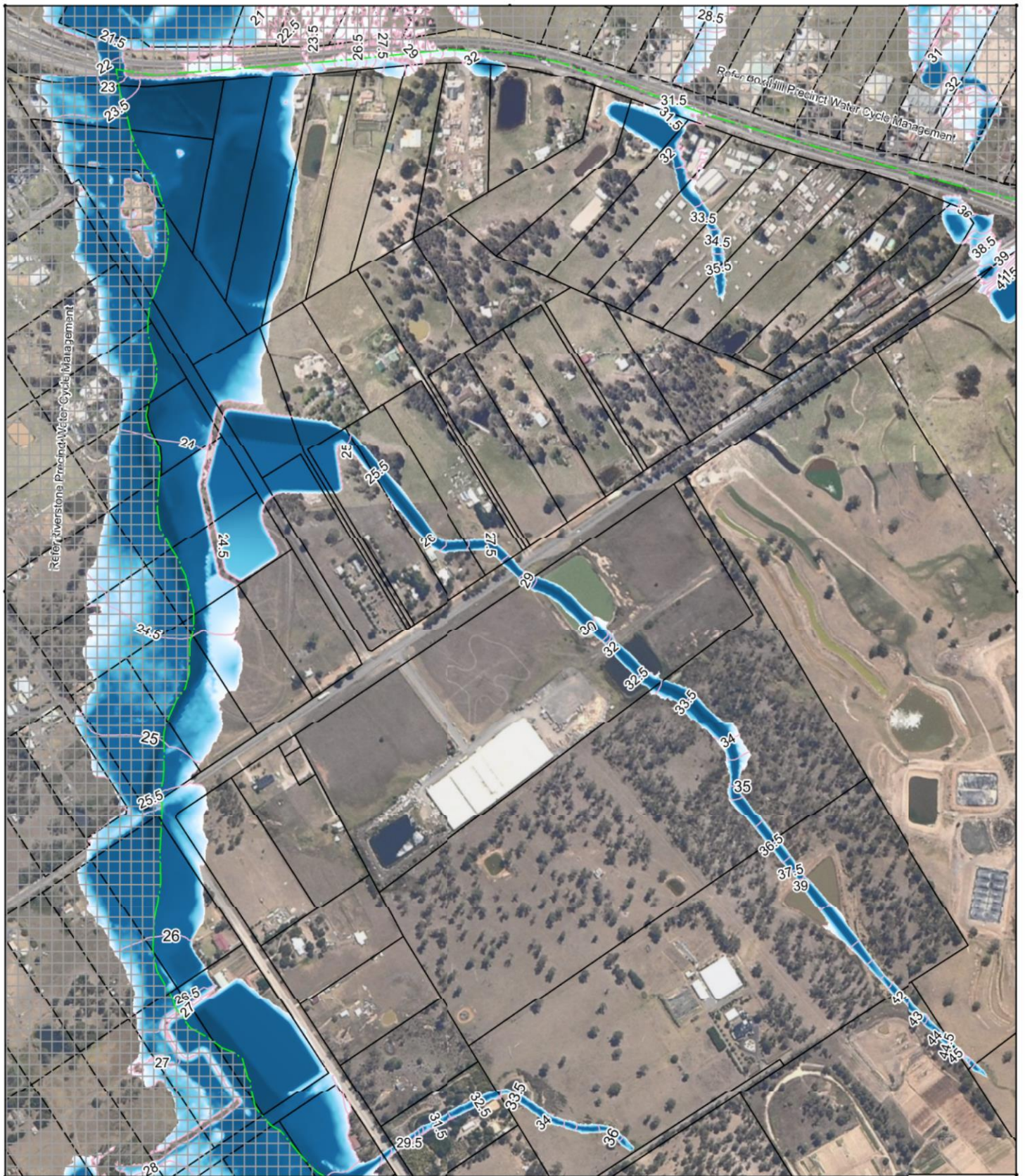
Title Riverstone East ILP 1% AEP Proposed Depth Diff Climate Change (+20%) - Proposed				  					
<small>WALSH & PARTNERS ENGINEERS ARCHITECTS PLANNERS 120/121/122/123/124/125/126/127/128/129/130/131/132/133/134/135/136/137/138/139/140/141/142/143/144/145/146/147/148/149/150/151/152/153/154/155/156/157/158/159/160/161/162/163/164/165/166/167/168/169/170/171/172/173/174/175/176/177/178/179/180/181/182/183/184/185/186/187/188/189/190/191/192/193/194/195/196/197/198/199/200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_DIFCC_100yr_120m	FI	B		


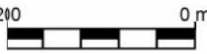

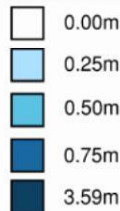



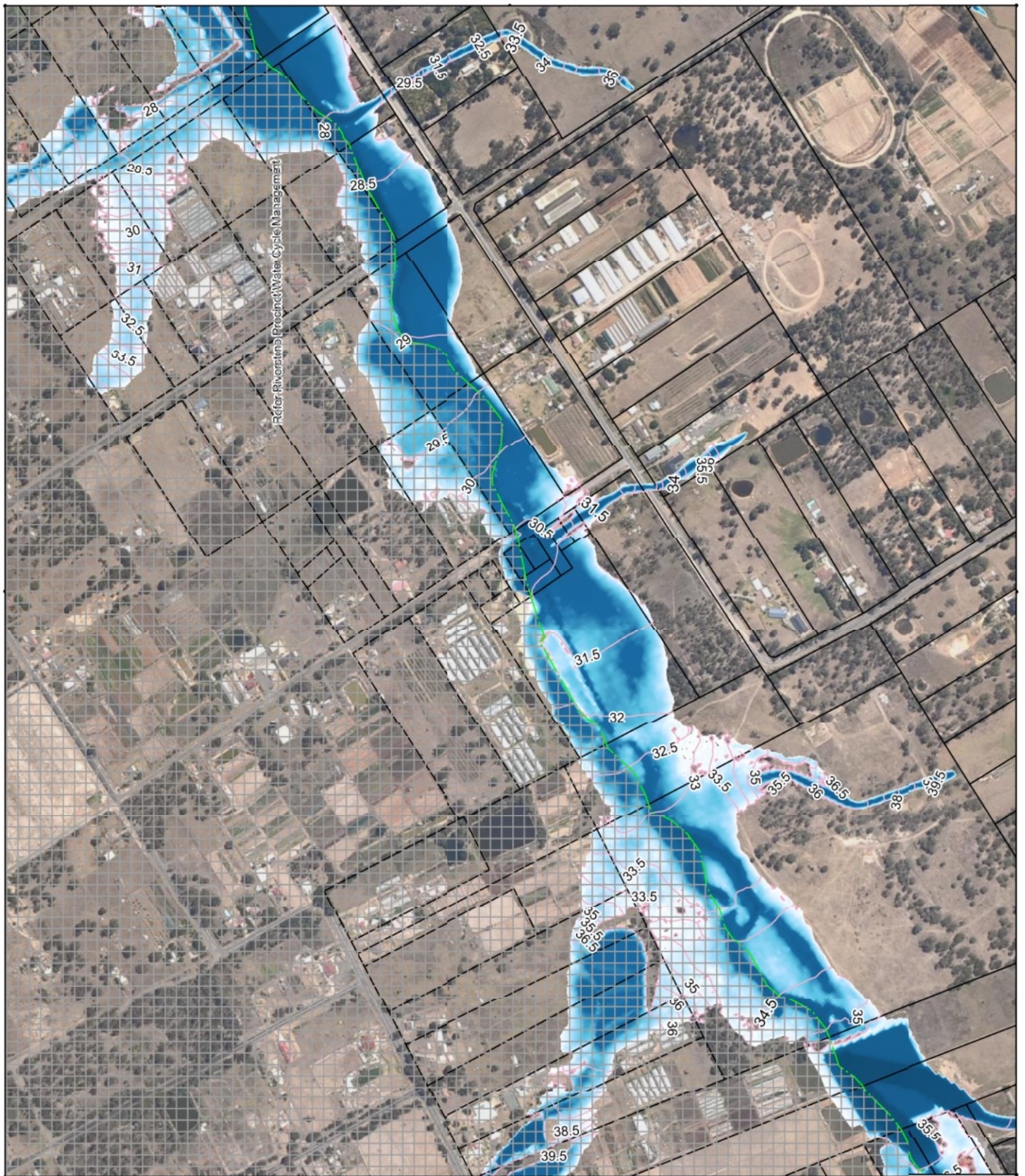
Title Riverstone East ILP 1% AEP Proposed Depth Diff Climate Change (+20%) - Proposed				 Mott MacDonald					
<small>WALSH & PARTNERS ENGINEERS PTY LIMITED, P/L 124 120 200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>				 210 0 m					
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_DIFCC_100yr_120m	FI	B		


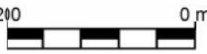





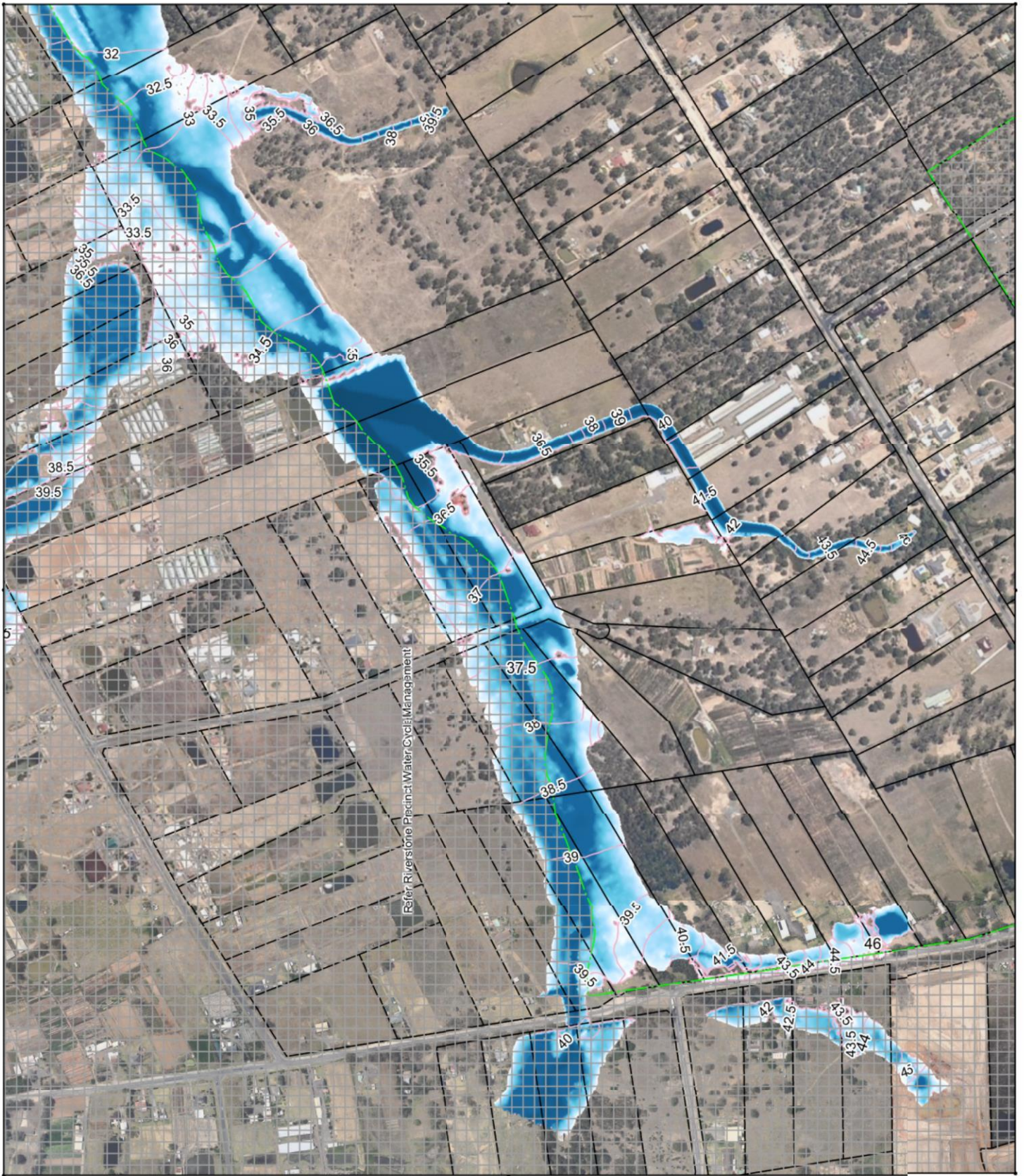
Title Rivestone East ILP 1% AEP Proposed Depth Diff Climate Change (+20%) - Proposed				  					
<small>WALBURN CONSULTING ENGINEERS PTY LIMITED, JULY 1, 2014, 120/200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number		Status	Rev	
16/01/2015	GL	GL	CA	1:8000	RE_DIFCC_100yr_120m		FI	B	







Title Riverstone East ILP 0.2% AEP Proposed Flood Flood Level				  					
<small>WALBURN CONSULTANTS PTY LTD 1/10/12 PLAN 120/120/200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>	Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev	
	16/01/2015	GL	GL	CA	1:8000	RE_PRL_500yr_120m_D	FI	B	


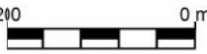

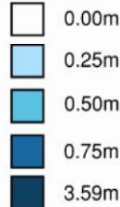



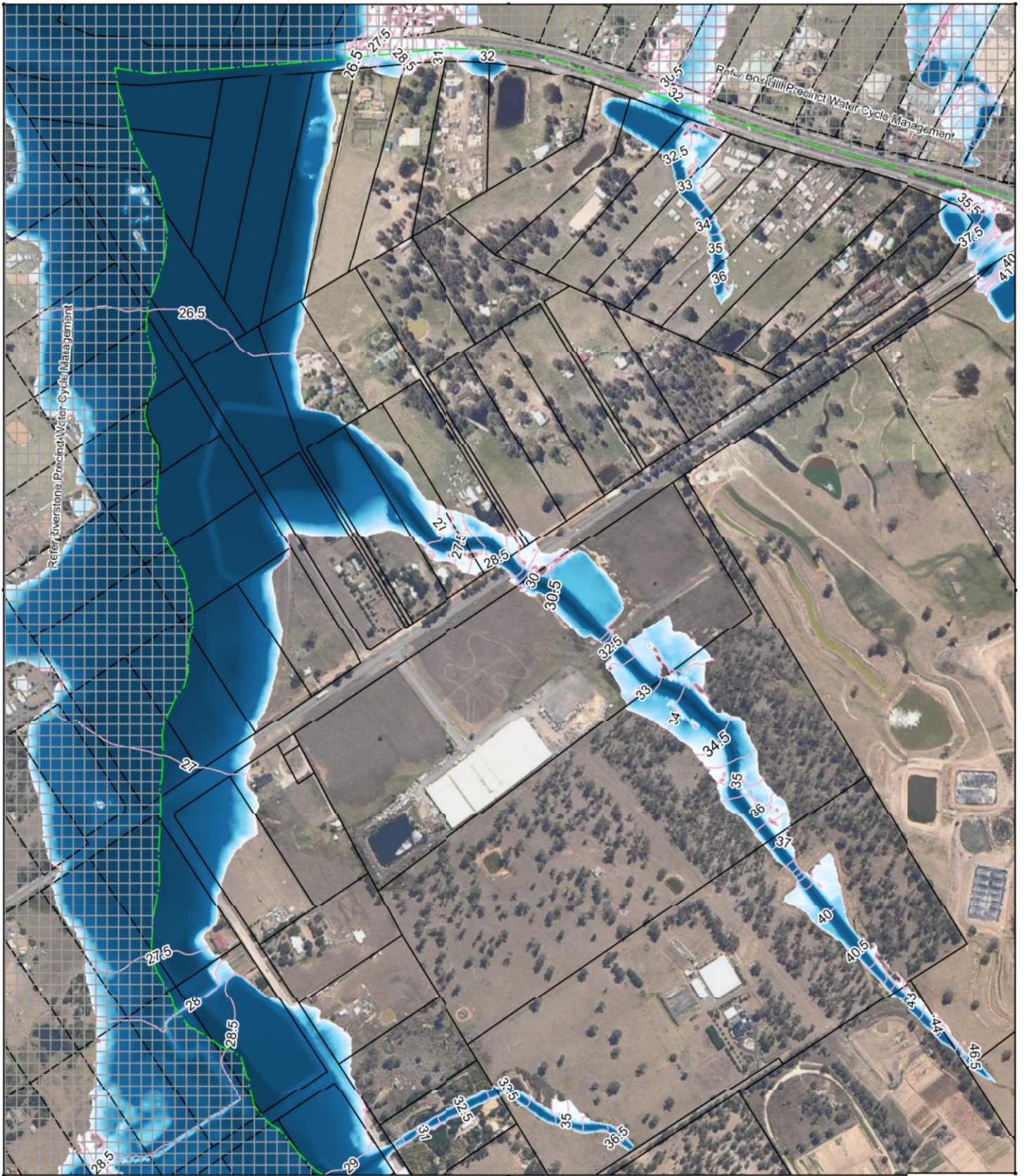
Title Riverstone East ILP 0.2% AEP Proposed Flood Flood Level				  					
<small>WALBROOK CONSULTING ENGINEERS PTY LIMITED, P/L 120 120 200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_PRL_500yr_120m_D	FI	B		



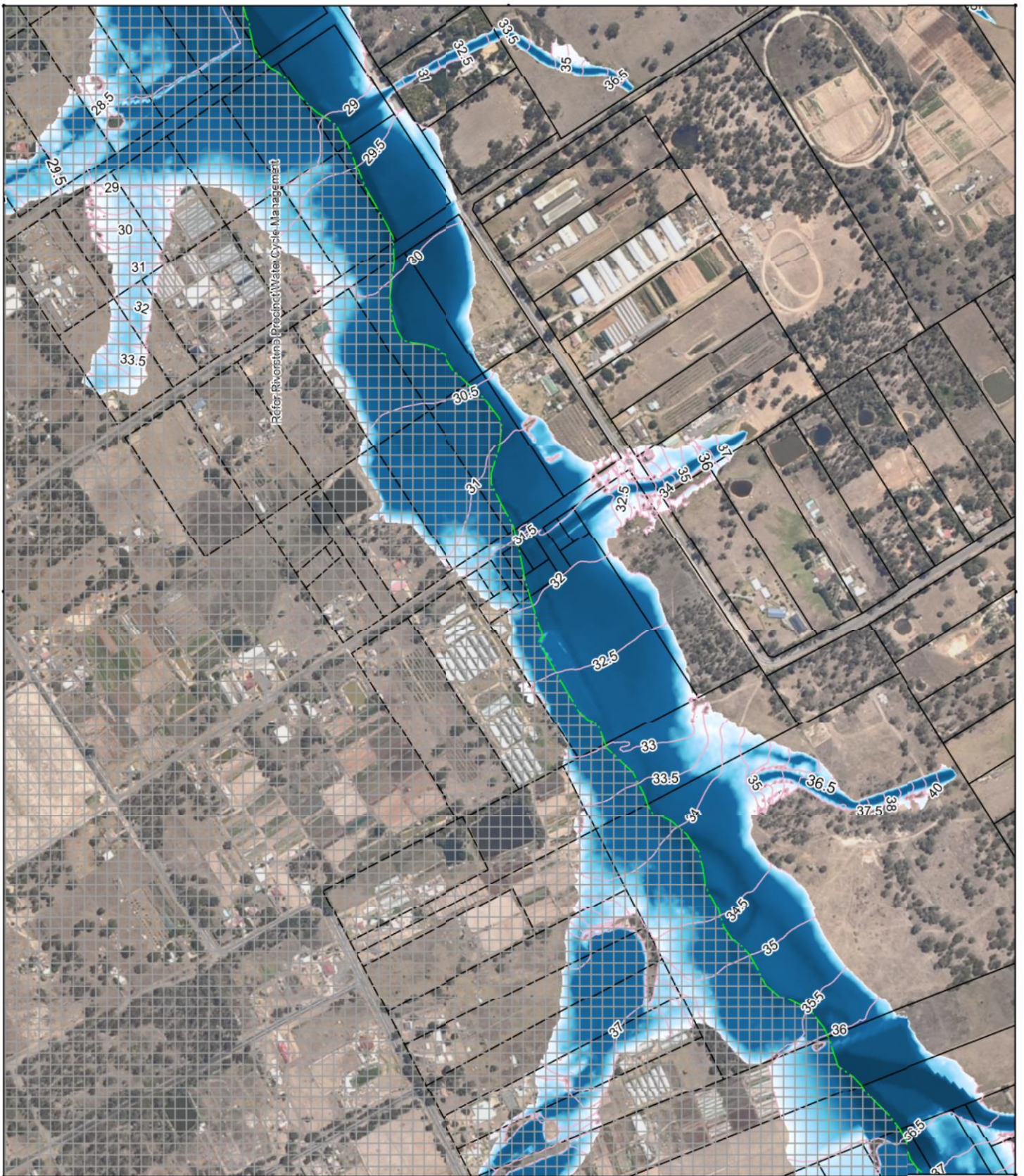
Title Riverstone East ILP 0.2% AEP Proposed Flood Flood Level				 Mott MacDonald		<ul style="list-style-type: none"> 0.00m 0.25m 0.50m 0.75m 3.59m 			
<small>WALBERRILL ROAD PROJECT PTY LIMITED, PLAN 120/140/200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_PRL_500yr_120m_D	FI	B		


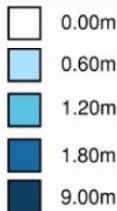





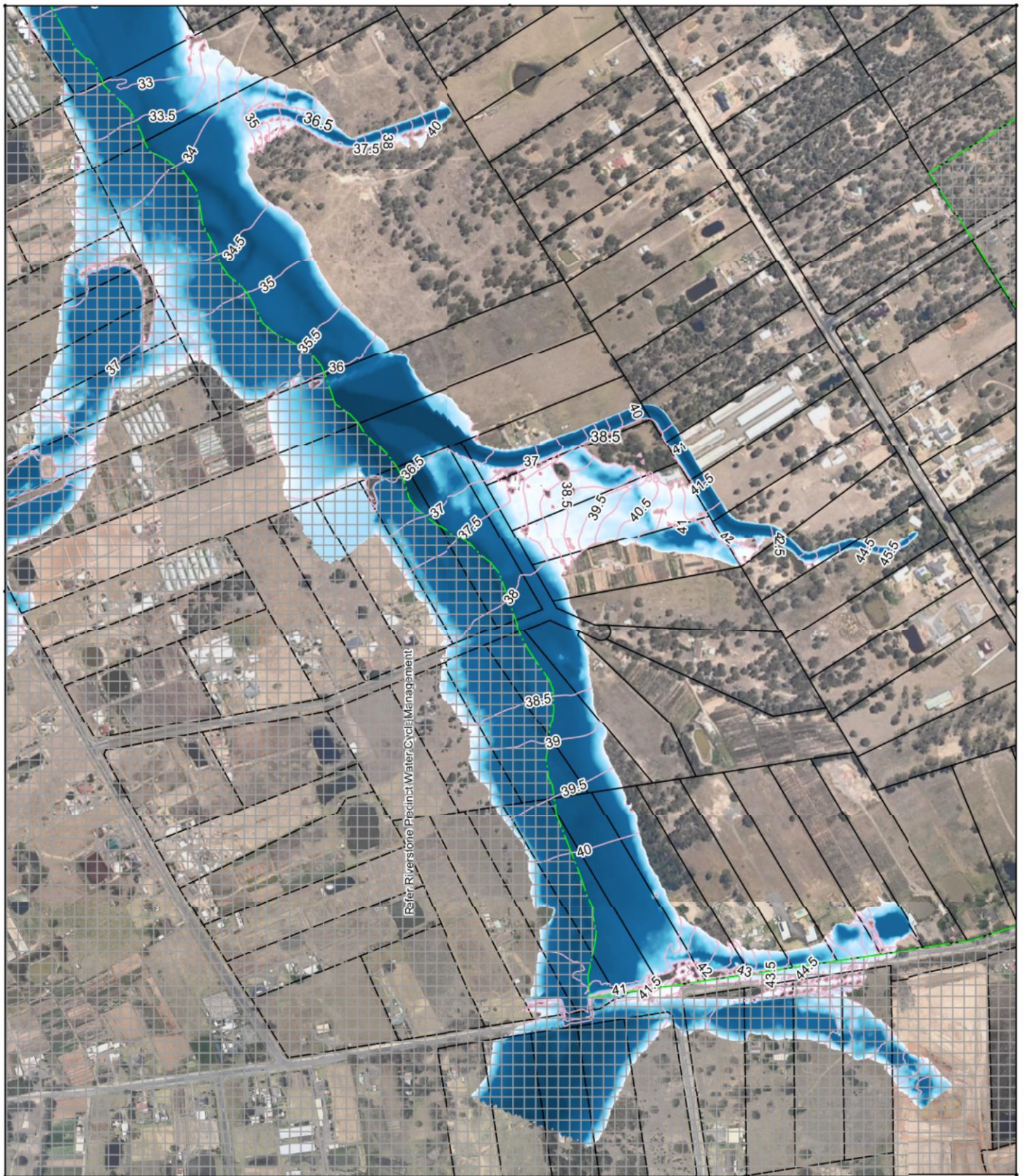
Title Rivestone East ILP 0.2% AEP Proposed Flood Flood Level				  					
<small>WALBERRILL ROAD PROJECT PTY LIMITED, PLAN 120/140/200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_PRL_500yr_120m_D	FI	B		


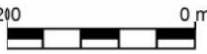





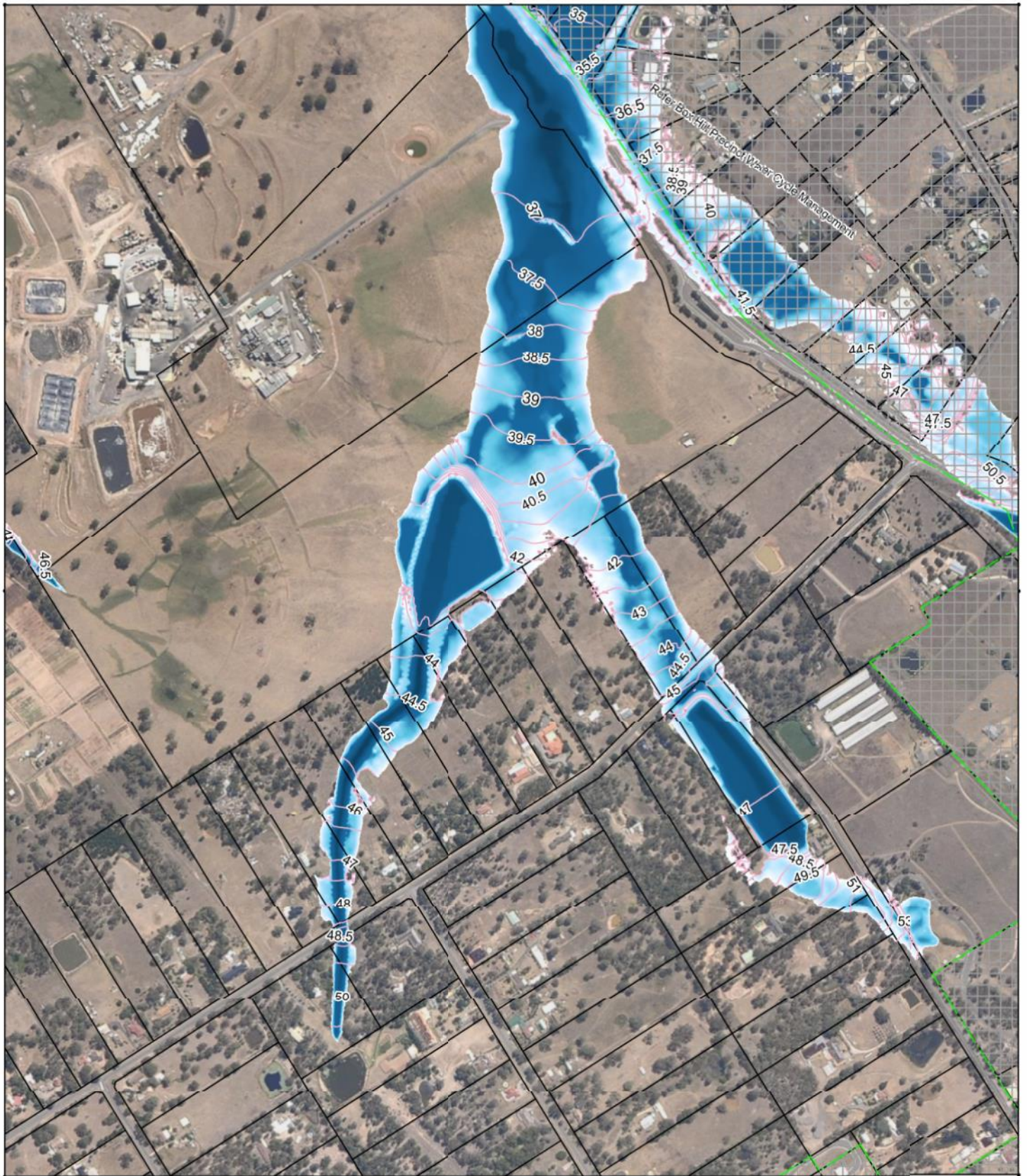
Title			Mott MacDonald			Legend		Inset Map	
Riverstone East ILP							0.00m		
PMF Proposed Flood							0.60m		
Flood Level				1.20m					
<small>WAL/REGISTRATION NUMBER: PMF/15/0001 - PLAN 120/15/0001 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>				1.80m					
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_PRL_PMF_120m_D	FI	B		


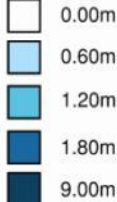

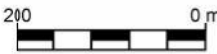



Title Riverstone East ILP PMF Proposed Flood Flood Level			 Mott MacDonald					
<small>WALBERRILL ROAD PROJECT PTY LIMITED, PLAN 120/150/200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>								
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev	
16/01/2015	GL	GL	CA	1:8000	RE_PRL_PMF_120m_D	FI	B	



Title Riverstone East ILP PMF Proposed Flood Flood Level				  					
<small>WALSH & PARTNERS ENGINEERING PTY LIMITED, P/LN 120 140 200 This document is issued for the party which commissioned it and for specific purposes connected with the project only. It should not be relied upon by any other party or used for any other purpose. We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing an error or omission which is due to an error or omission in data supplied to us by other parties.</small>									
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev		
16/01/2015	GL	GL	CA	1:8000	RE_PRL_PMF_120m_D	FI	B		



Title Rivestone East ILP PMF Proposed Flood Flood Level			 Mott MacDonald					
<small>THIS DOCUMENT IS ISSUED FOR THE EXCLUSIVE USE OF THE PARTY WHICH COMMISSIONED IT AND FOR SPECIFIC PURPOSES CONNECTED WITH THE PROJECT ONLY. IT SHOULD NOT BE RELIED UPON BY ANY OTHER PARTY OR USED FOR ANY OTHER PURPOSE. WE ACCEPT NO RESPONSIBILITY FOR THE CONSEQUENCES OF THIS DOCUMENT BEING RELIED UPON BY ANY OTHER PARTY OR BEING USED FOR ANY OTHER PURPOSE, OR CONTAINING AN ERROR OR OMISSION WHICH IS DUE TO AN ERROR OR OMISSION IN DATA SUPPLIED TO US BY OTHER PARTIES.</small>								
Date	Drawn	Checked	Approved	Scale at A4	Drawing Number	Status	Rev	
16/01/2015	GL	GL	CA	1:8000	RE_PRL_PMF_120m_D	Fl	B	

Appendix E. Channel Cross Section Calculations

Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CA15

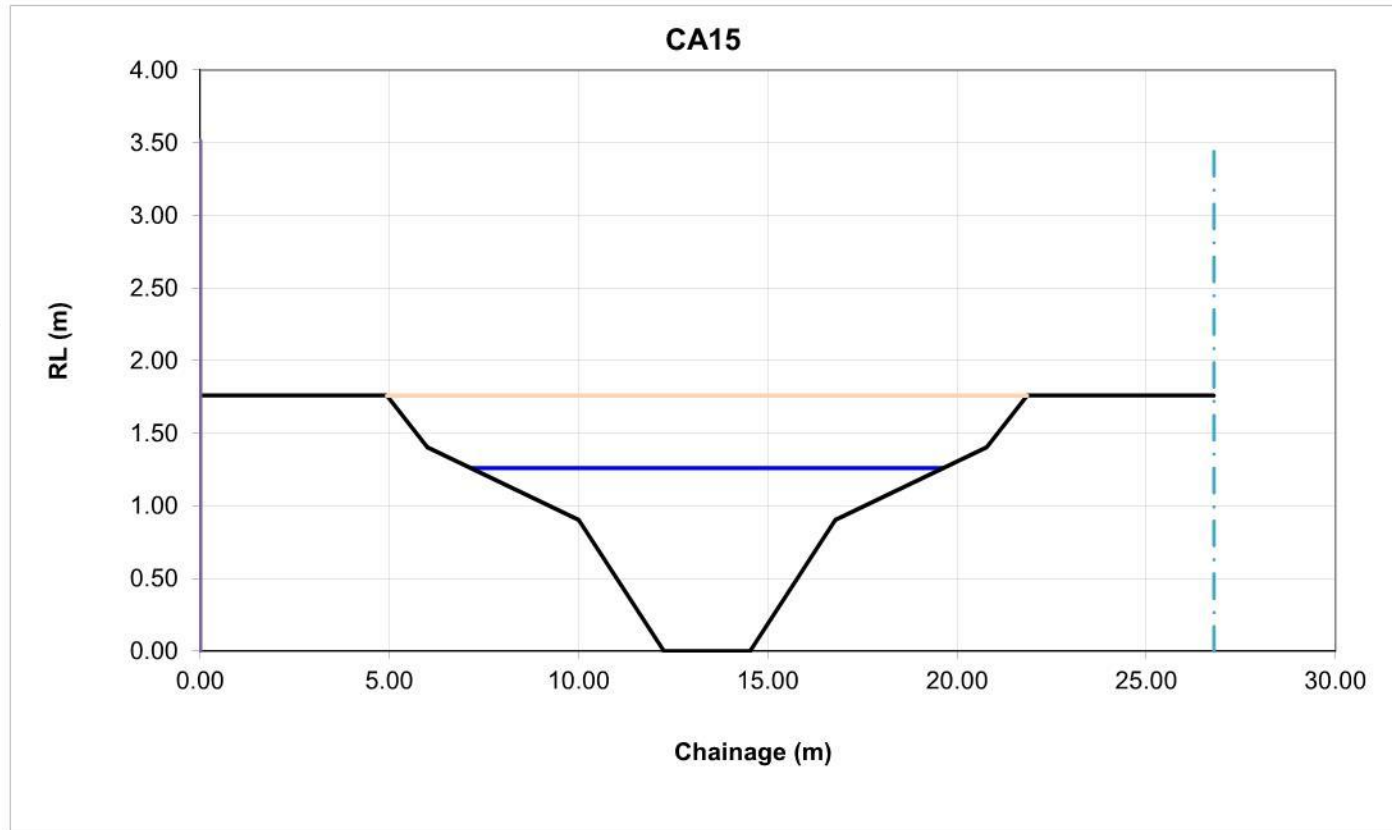


Geometry	
Main Channel (m)	8.52
Riparian (m)	28.52
Slope (m/m)	0.015
Water Level (m)	1.26

Channel Markers	
Left	10.00
Right	16.78

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.50	0.10	0.050	2.14155	0.26	0.52
Main Channel	6.49	0.83	0.050	114.528	14.03	2.16
Right Overbank	0.50	0.18	0.050	3.14652	0.39	0.77
Total	7.50	0.50	0.039	119.816	14.674	1.96

Chainage (m)	RL (m)	n
0.00	1.76	
4.94	1.76	0.05
6.00	1.40	0.05
10.00	0.90	0.05
12.26	0.00	0.05
13.39	0.00	0.05
14.52	0.00	0.05
16.78	0.90	0.05
20.78	1.40	0.05
21.85	1.76	0.05
26.78	1.76	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: **CA16**

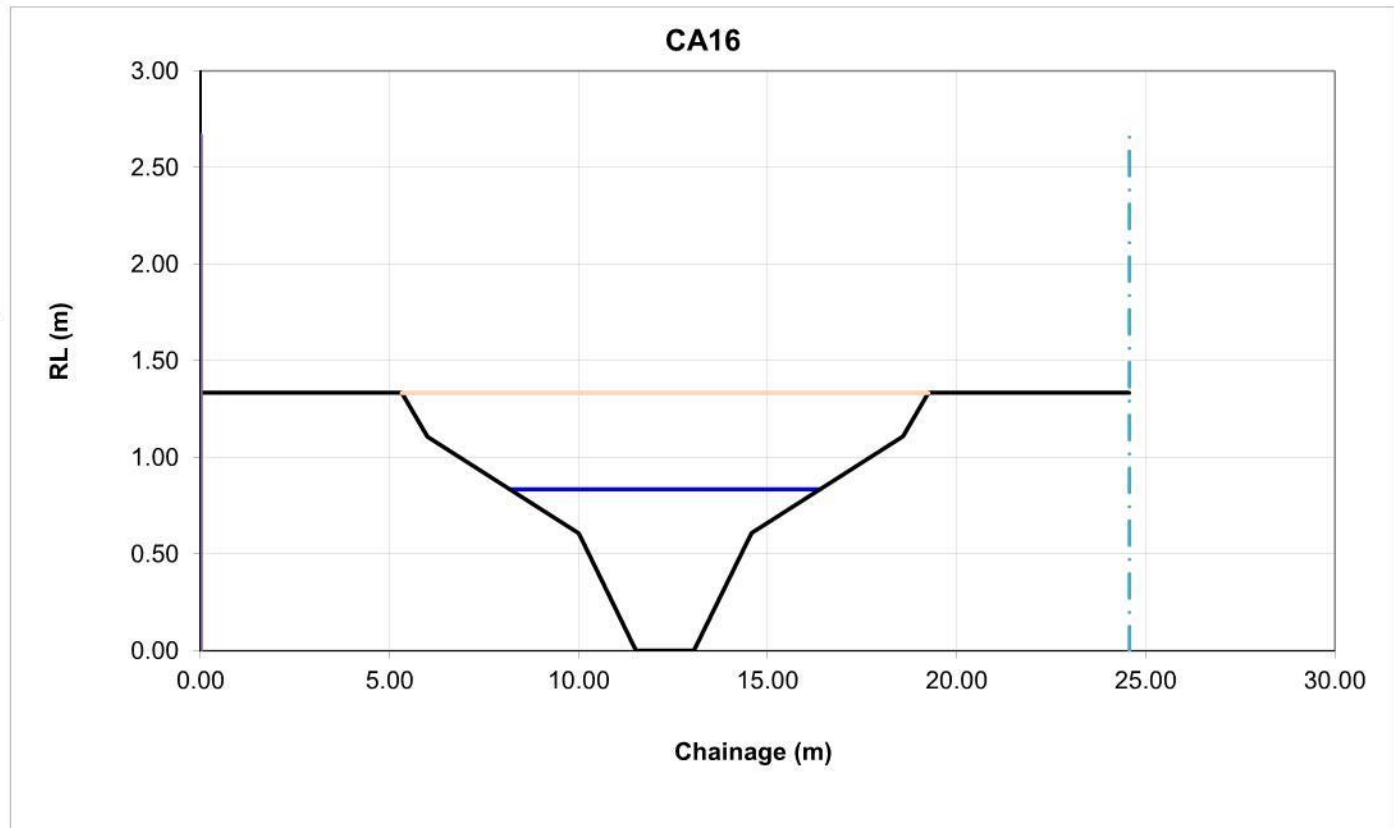


Geometry	
Main Channel (m)	7.04
Riparian (m)	27.04
Slope (m/m)	0.015
Water Level (m)	0.83

Channel Markers	
Left	10.00
Right	14.56

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.20	0.04	0.050	0.50574	0.06	0.30
Main Channel	2.88	0.55	0.050	38.6796	4.74	1.64
Right Overbank	0.20	0.11	0.050	0.95015	0.12	0.57
Total	3.29	0.29	0.036	40.1355	4.916	1.49

Chainage (m)	RL (m)	n
0.00	1.33	
5.32	1.33	0.05
6.00	1.11	0.05
10.00	0.61	0.05
11.52	0.00	0.05
12.28	0.00	0.05
13.04	0.00	0.05
14.56	0.61	0.05
18.56	1.11	0.05
19.24	1.33	0.05
24.56	1.33	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF05

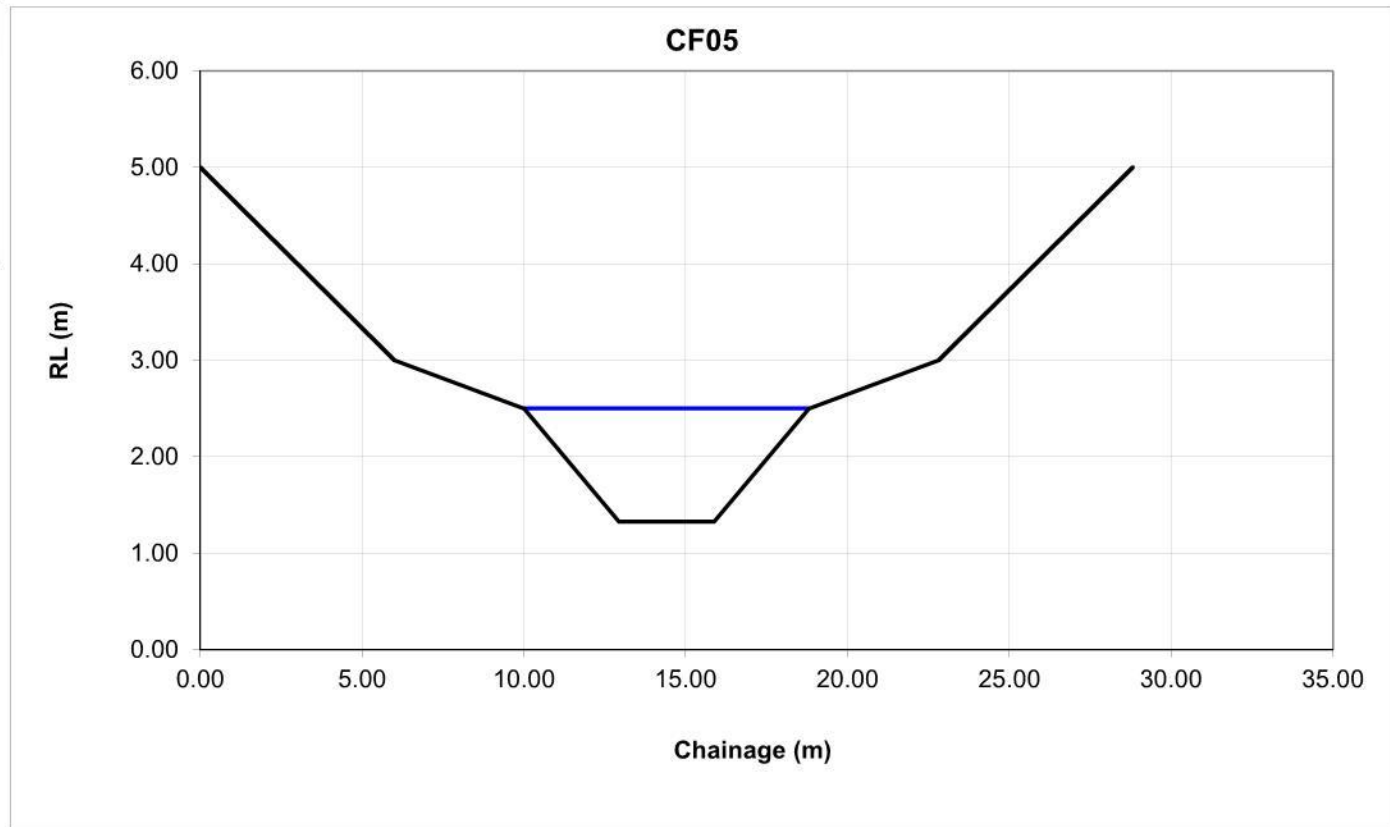


Geometry	
Main Channel (m)	8.81
Riparian (m)	28.81
Slope (m/m)	0.005
Water Level (m)	2.50

Channel Markers	
Left	10.00
Right	18.81

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.00	0.00	0.000	0	0.00	0.00
Main Channel	6.89	0.74	0.050	113.286	8.01	1.16
Right Overbank	0.00	0.00	0.000	0	0.00	0.00
Total	6.89	0.52	0.039	113.286	8.011	1.16

Chainage (m)	RL (m)	n
0.00	5.00	
6.00	3.00	0.05
10.00	2.50	0.05
12.94	1.33	0.05
14.40	1.33	0.05
15.87	1.33	0.05
18.81	2.50	0.05
22.81	3.00	0.05
28.81	5.00	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF08

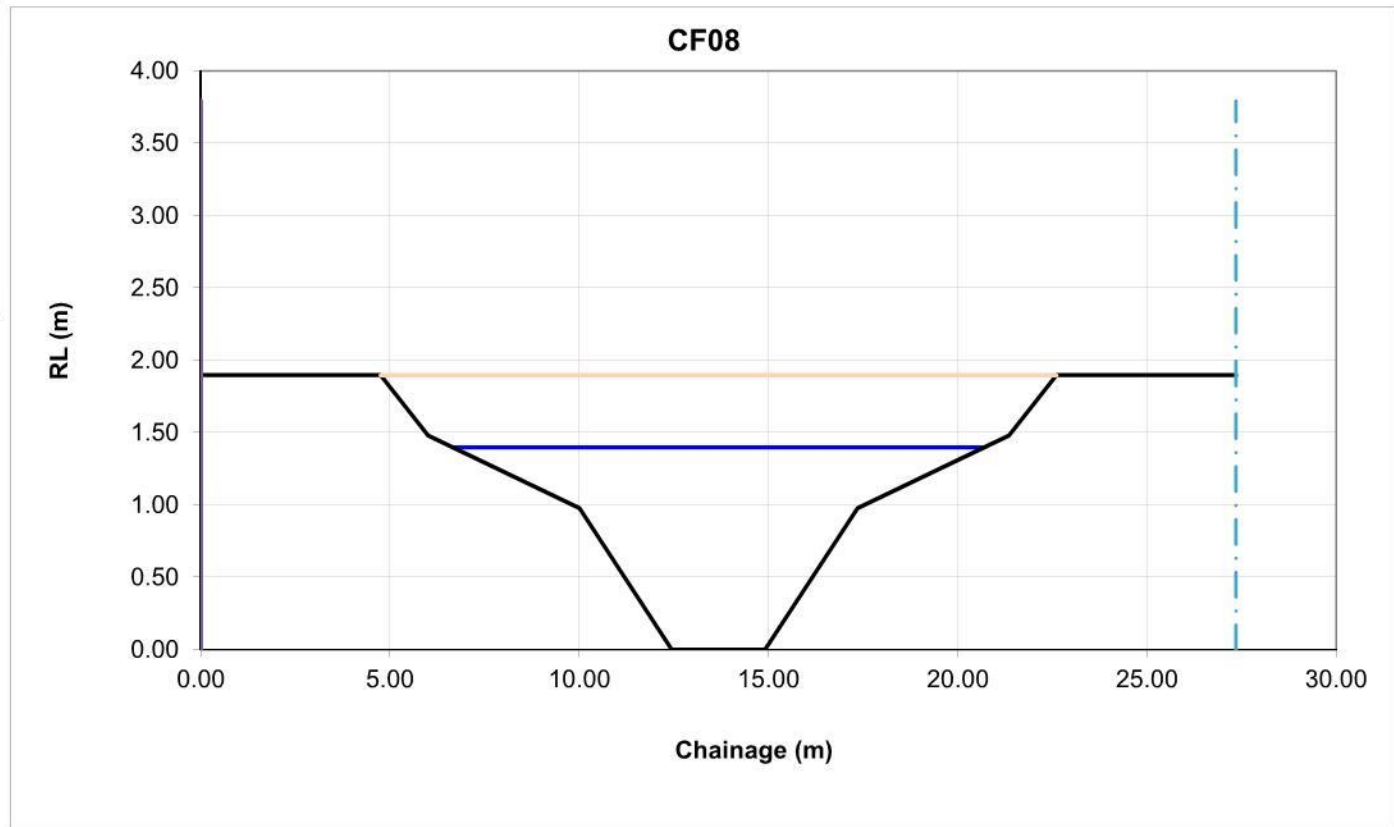


Geometry	
Main Channel (m)	8.90
Riparian (m)	28.90
Slope (m/m)	0.01
Water Level (m)	1.40

Channel Markers	
Left	10.00
Right	17.35

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.69	0.13	0.050	3.59685	0.36	0.52
Main Channel	7.86	0.92	0.050	148.52	14.85	1.89
Right Overbank	0.69	0.21	0.050	4.85923	0.49	0.70
Total	9.25	0.57	0.040	156.976	15.698	1.70

Chainage (m)	RL (m)	n
0.00	1.90	
4.75	1.90	0.05
6.00	1.48	0.05
10.00	0.98	0.05
12.45	0.00	0.05
13.67	0.00	0.05
14.90	0.00	0.05
17.35	0.98	0.05
21.35	1.48	0.05
22.60	1.90	0.05
27.35	1.90	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF09

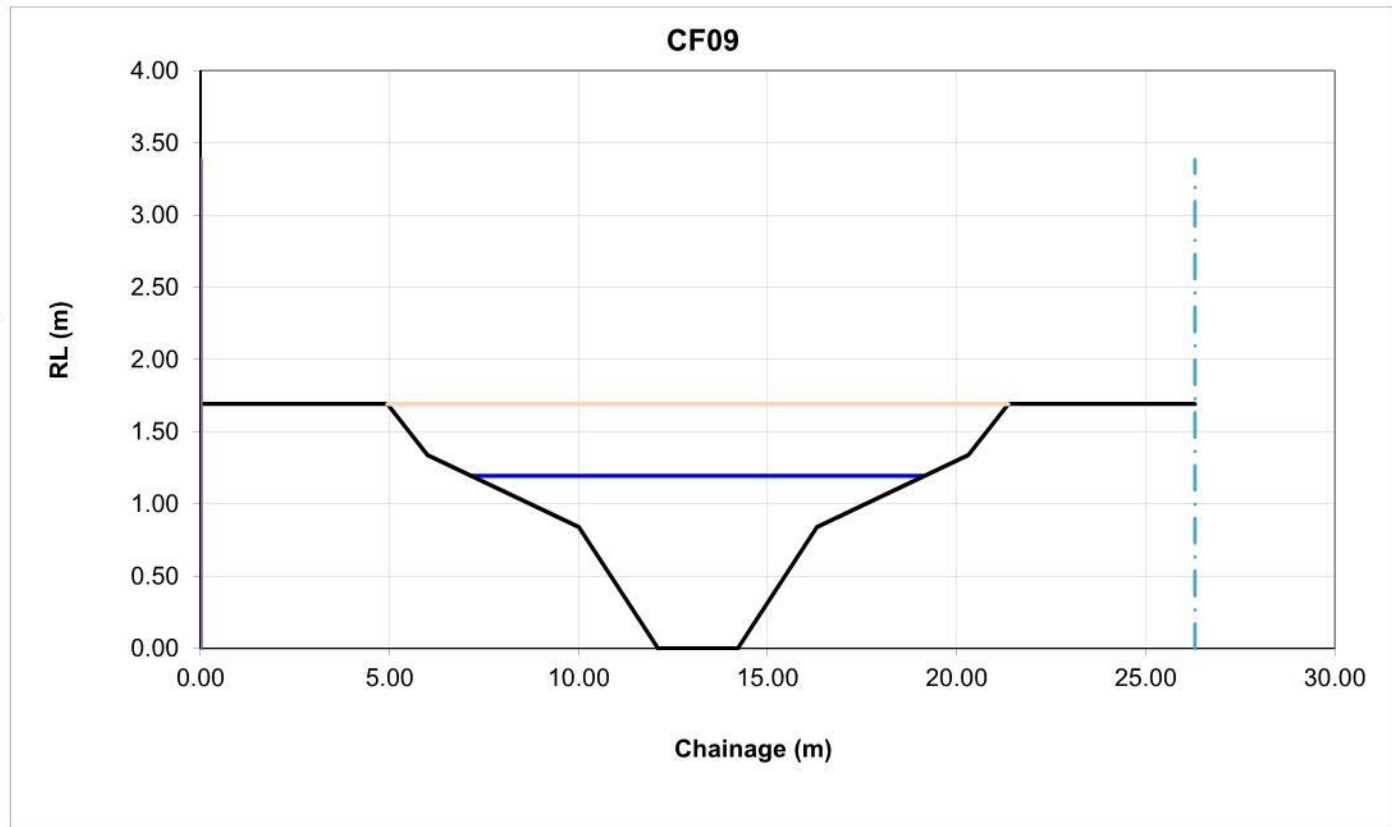


Geometry	
Main Channel (m)	8.20
Riparian (m)	28.20
Slope (m/m)	0.01
Water Level (m)	1.19

Channel Markers	
Left	10.00
Right	16.30

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.50	0.10	0.050	2.11344	0.21	0.42
Main Channel	5.75	0.78	0.050	97.8242	9.78	1.70
Right Overbank	0.50	0.17	0.050	3.11196	0.31	0.63
Total	6.74	0.46	0.039	103.05	10.305	1.53

Chainage (m)	RL (m)	n
0.00	1.69	
4.94	1.69	0.05
6.00	1.34	0.05
10.00	0.84	0.05
12.10	0.00	0.05
13.15	0.00	0.05
14.20	0.00	0.05
16.30	0.84	0.05
20.30	1.34	0.05
21.36	1.69	0.05
26.30	1.69	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF11

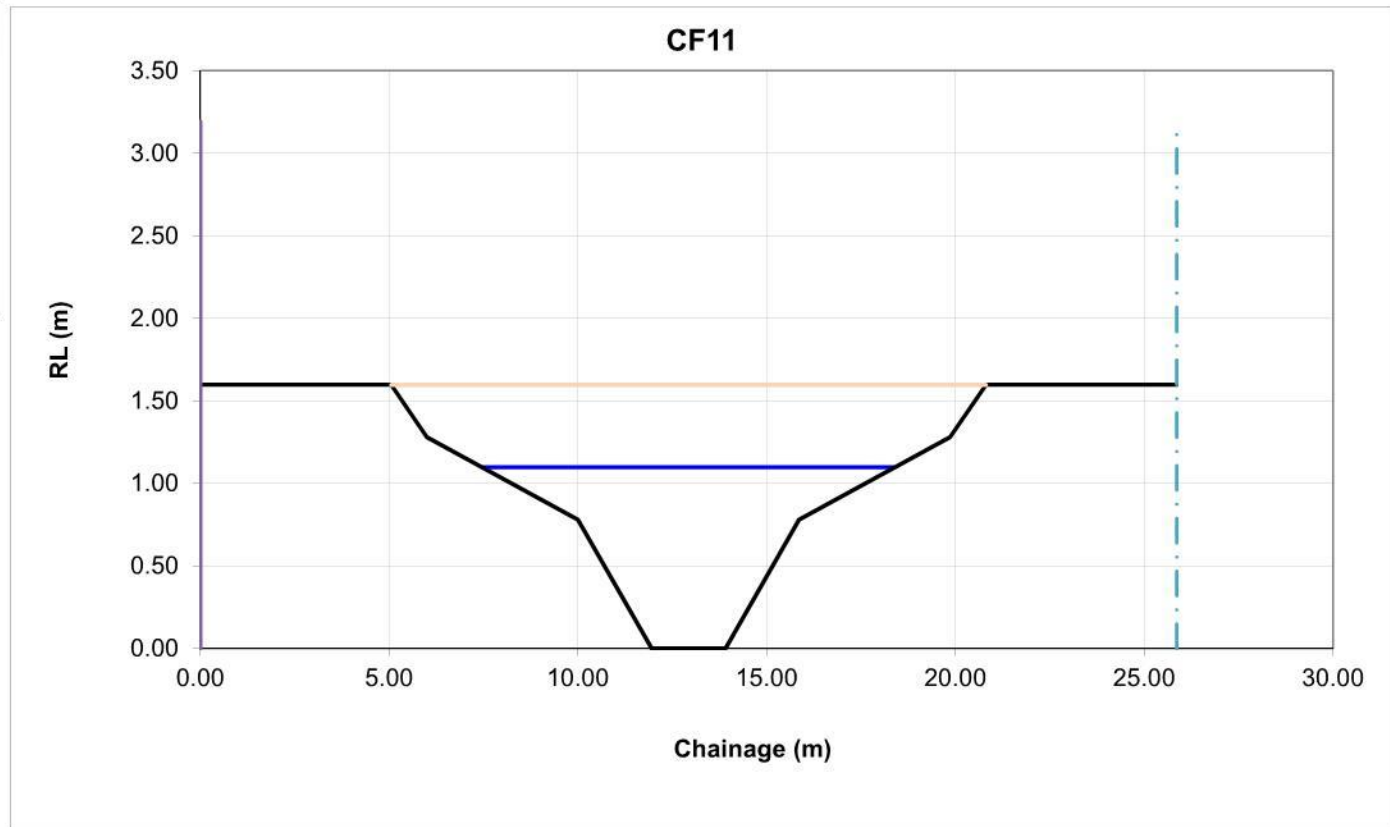


Geometry	
Main Channel (m)	7.90
Riparian (m)	27.90
Slope (m/m)	0.01
Water Level (m)	1.10

Channel Markers	
Left	10.00
Right	15.86

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.40	0.08	0.050	1.47587	0.15	0.37
Main Channel	4.89	0.72	0.050	78.7193	7.87	1.61
Right Overbank	0.40	0.16	0.050	2.3067	0.23	0.58
Total	5.69	0.42	0.038	82.5018	8.250	1.45

Chainage (m)	RL (m)	n
0.00	1.60	
5.05	1.60	0.05
6.00	1.28	0.05
10.00	0.78	0.05
11.95	0.00	0.05
12.93	0.00	0.05
13.90	0.00	0.05
15.86	0.78	0.05
19.86	1.28	0.05
20.80	1.60	0.05
25.86	1.60	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS
 100-YR

X-section: CF24

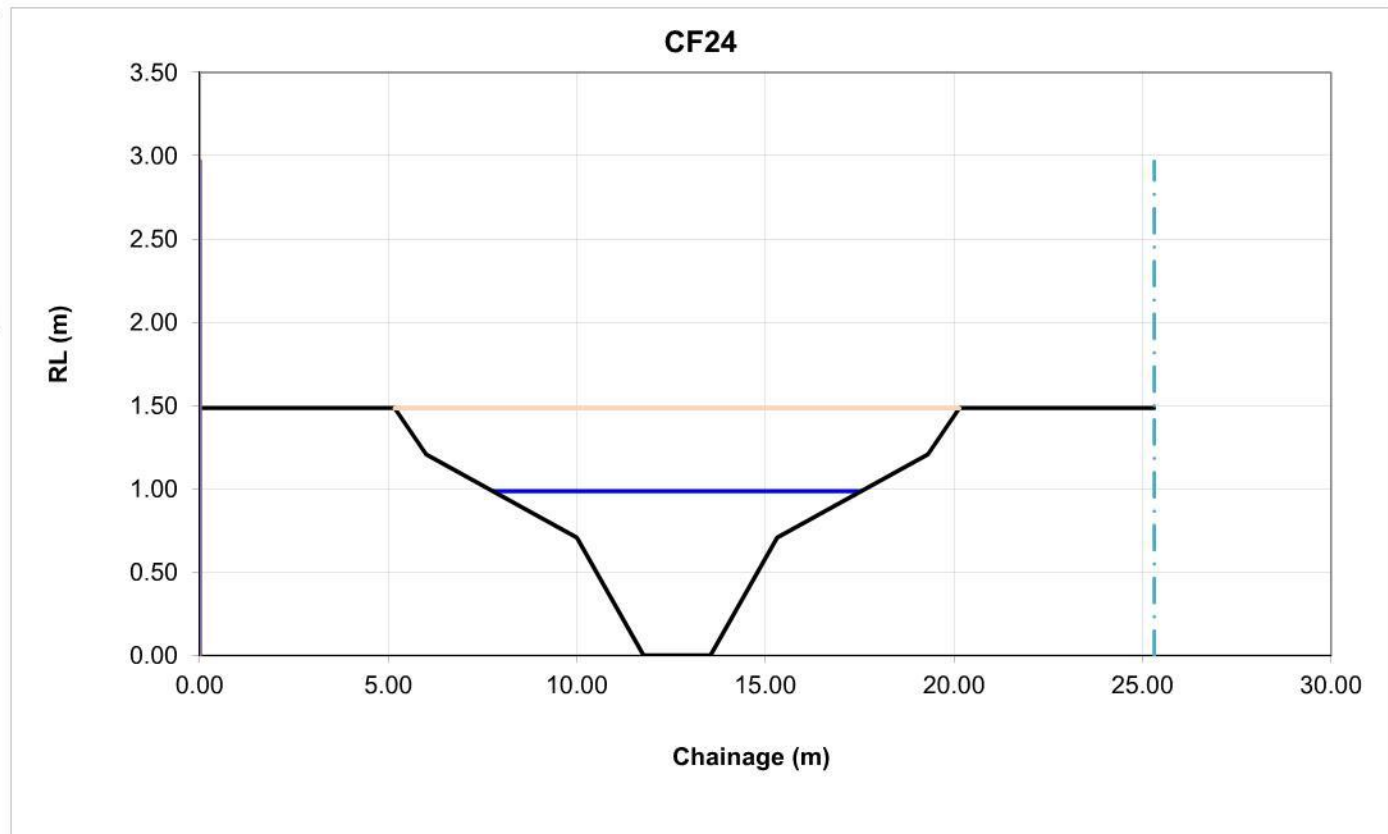


Geometry	
Main Channel (m)	7.54
Riparian (m)	27.54
Slope (m/m)	0.015
Water Level (m)	0.98

Channel Markers	
Left	10.00
Right	15.31

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.31	0.06	0.050	0.97539	0.12	0.39
Main Channel	3.97	0.65	0.050	59.5164	7.29	1.83
Right Overbank	0.31	0.14	0.050	1.63524	0.20	0.65
Total	4.59	0.36	0.038	62.127	7.609	1.66

Chainage (m)	RL (m)	n
0.00	1.48	
5.17	1.48	0.05
6.00	1.21	0.05
10.00	0.71	0.05
11.77	0.00	0.05
12.65	0.00	0.05
13.54	0.00	0.05
15.31	0.71	0.05
19.31	1.21	0.05
20.14	1.48	0.05
25.31	1.48	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF37

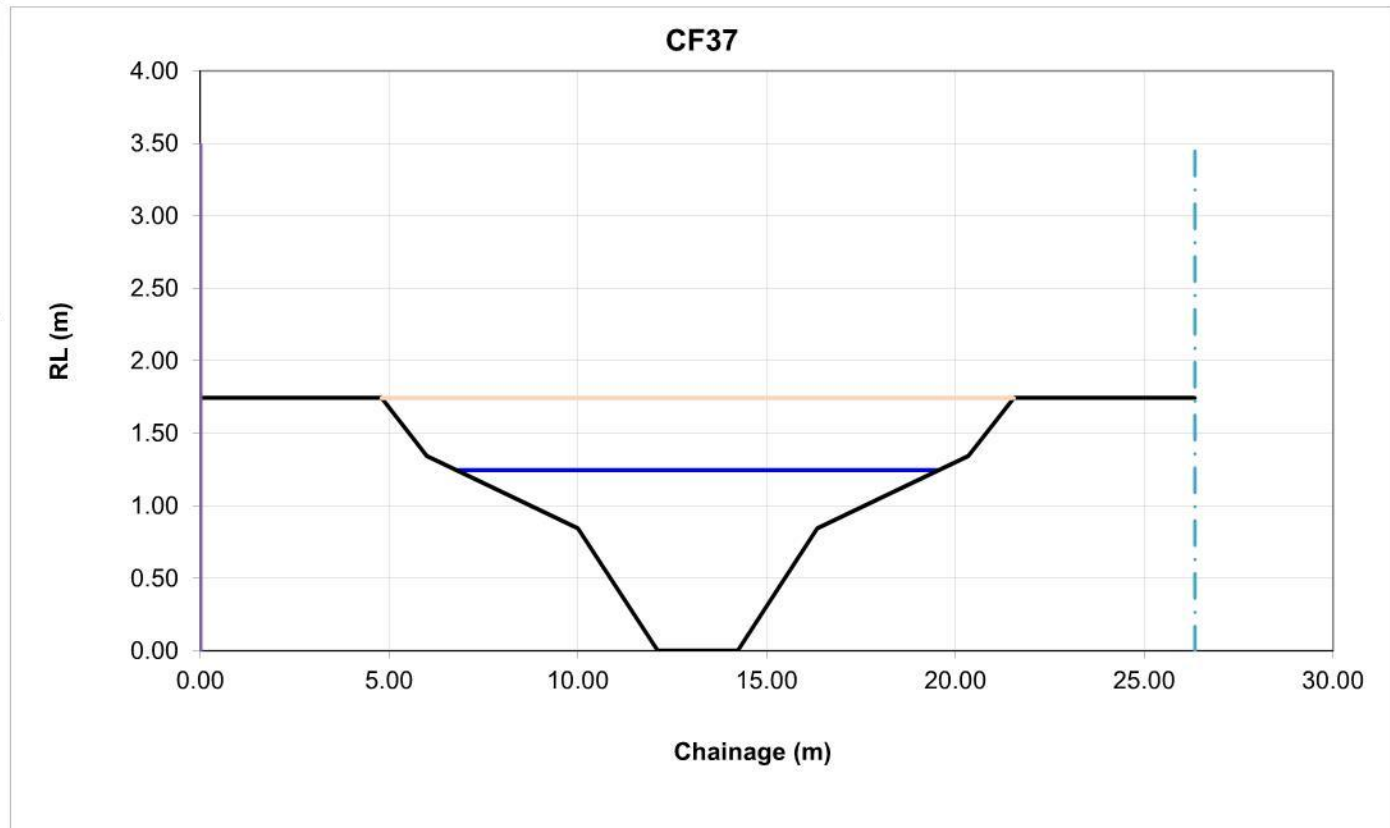


Geometry	
Main Channel (m)	8.23
Riparian (m)	28.23
Slope (m/m)	0.015
Water Level (m)	1.25

Channel Markers	
Left	10.00
Right	16.34

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.64	0.12	0.050	3.15062	0.39	0.60
Main Channel	6.11	0.82	0.050	106.843	13.09	2.14
Right Overbank	0.64	0.20	0.050	4.34755	0.53	0.83
Total	7.39	0.49	0.040	114.341	14.004	1.90

Chainage (m)	RL (m)	n
0.00	1.75	
4.80	1.75	0.05
6.00	1.35	0.05
10.00	0.85	0.05
12.11	0.00	0.05
13.17	0.00	0.05
14.23	0.00	0.05
16.34	0.85	0.05
20.34	1.35	0.05
21.54	1.75	0.05
26.34	1.75	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: **CF38**

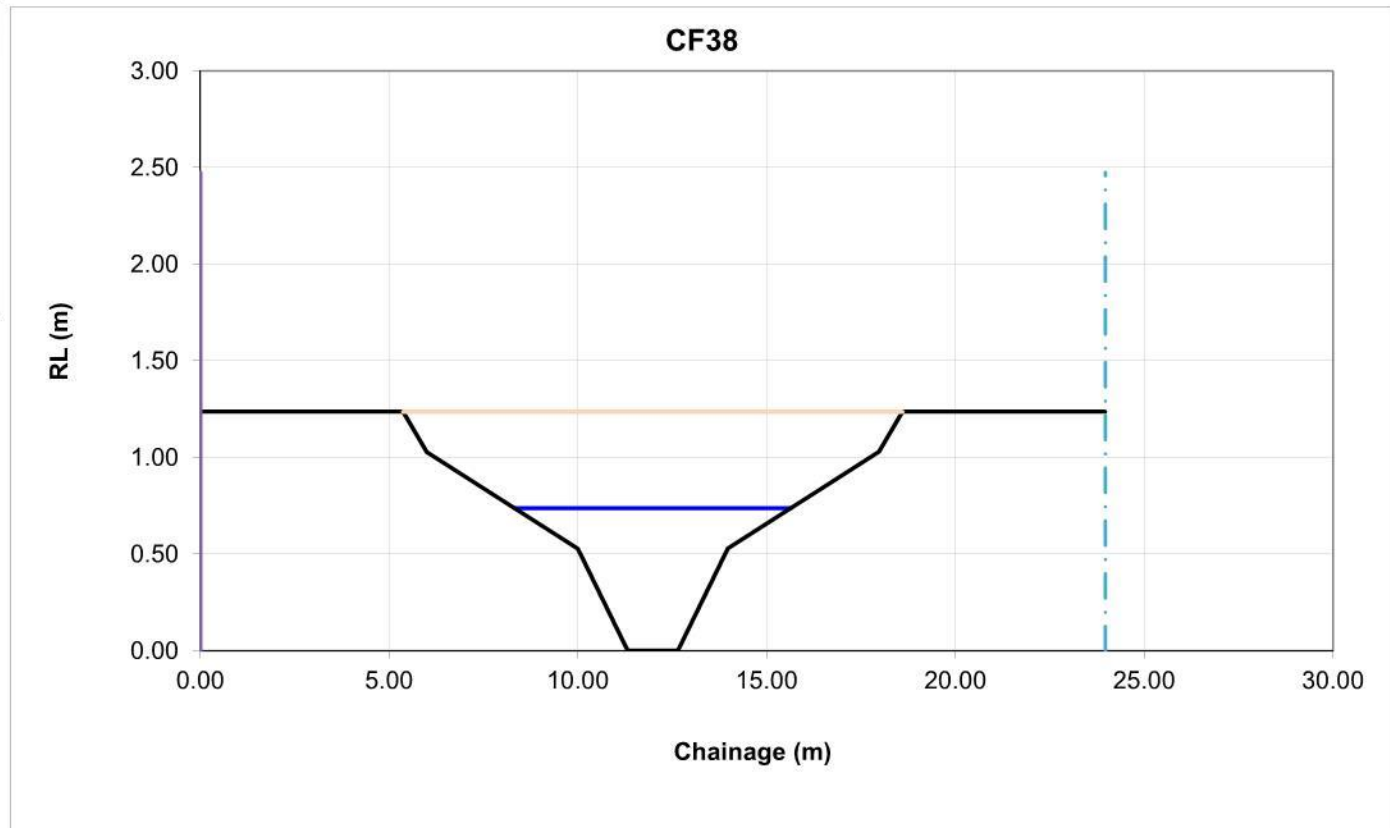


Geometry	
Main Channel (m)	6.65
Riparian (m)	26.65
Slope (m/m)	0.015
Water Level (m)	0.74

Channel Markers	
Left	10.00
Right	13.97

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.17	0.04	0.050	0.39111	0.05	0.27
Main Channel	2.23	0.49	0.050	27.5254	3.37	1.51
Right Overbank	0.17	0.10	0.050	0.76889	0.09	0.54
Total	2.58	0.25	0.035	28.6854	3.513	1.36

Chainage (m)	RL (m)	n
0.00	1.24	
5.37	1.24	0.05
6.00	1.03	0.05
10.00	0.53	0.05
11.32	0.00	0.05
11.98	0.00	0.05
12.65	0.00	0.05
13.97	0.53	0.05
17.97	1.03	0.05
18.59	1.24	0.05
23.97	1.24	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF40

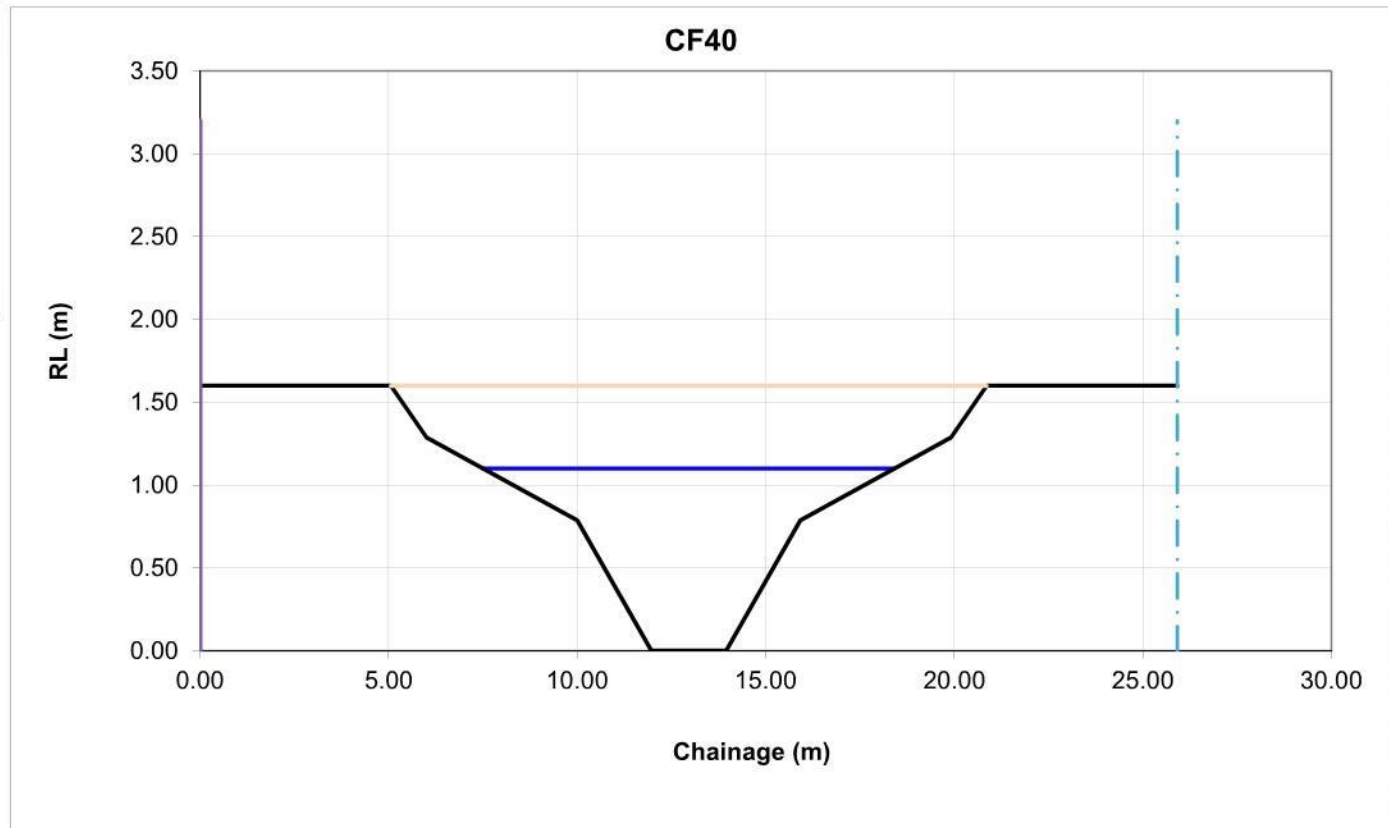


Geometry	
Main Channel (m)	7.94
Riparian (m)	27.94
Slope (m/m)	0.015
Water Level (m)	1.10

Channel Markers	
Left	10.00
Right	15.91

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.39	0.08	0.050	1.43061	0.18	0.45
Main Channel	4.95	0.72	0.050	79.8544	9.78	1.98
Right Overbank	0.39	0.15	0.050	2.24768	0.28	0.71
Total	5.73	0.42	0.038	83.5327	10.231	1.79

Chainage (m)	RL (m)	n
0.00	1.60	
5.06	1.60	0.05
6.00	1.29	0.05
10.00	0.79	0.05
11.97	0.00	0.05
12.96	0.00	0.05
13.94	0.00	0.05
15.91	0.79	0.05
19.91	1.29	0.05
20.85	1.60	0.05
25.91	1.60	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: [CF41A](#)

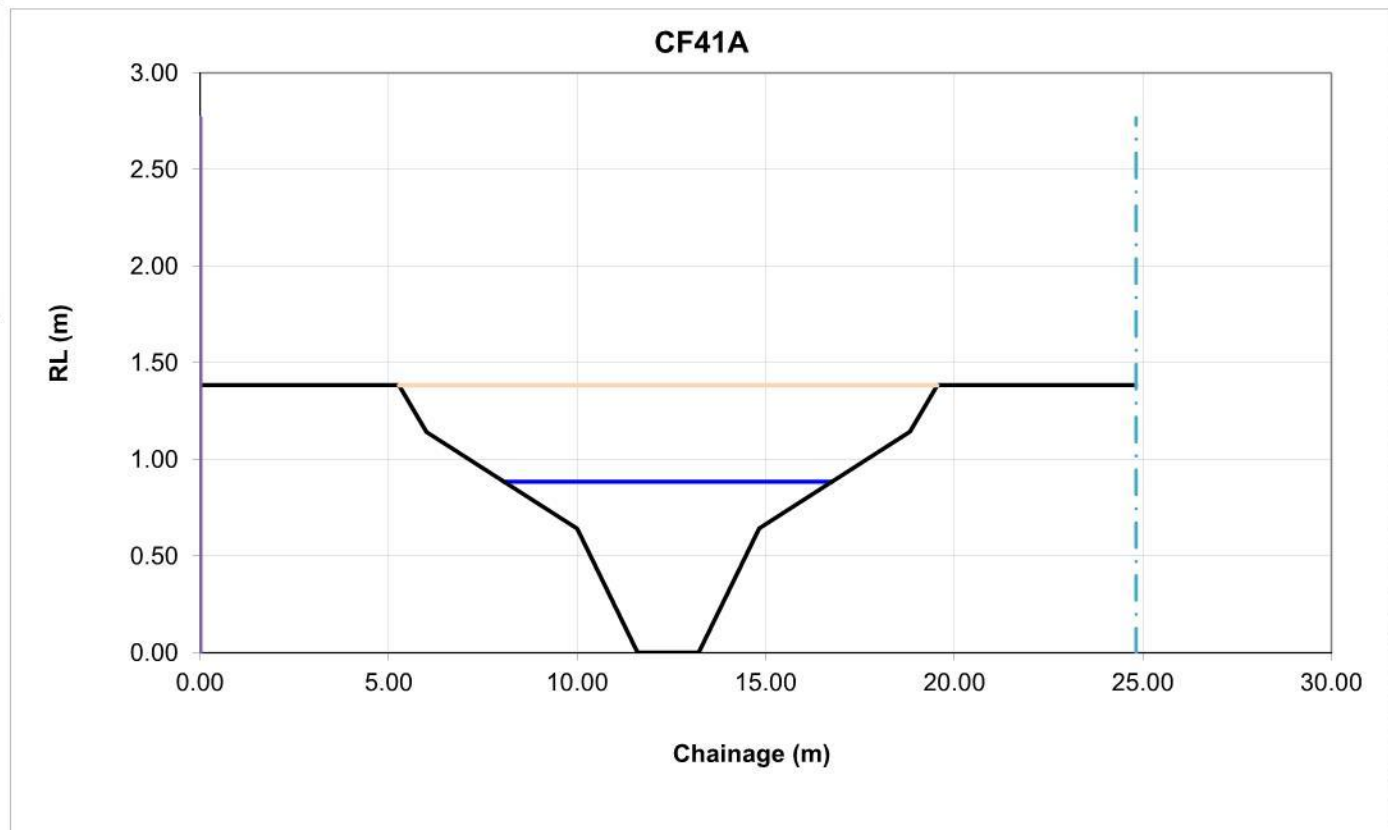


Geometry	
Main Channel (m)	7.21
Riparian (m)	27.21
Slope (m/m)	0.015
Water Level (m)	0.88

Channel Markers	
Left	10.00
Right	14.82

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.23	0.05	0.050	0.62915	0.08	0.33
Main Channel	3.23	0.58	0.050	45.0038	5.51	1.71
Right Overbank	0.23	0.12	0.050	1.1377	0.14	0.60
Total	3.70	0.31	0.037	46.7706	5.728	1.55

Chainage (m)	RL (m)	n
0.00	1.38	
5.27	1.38	0.05
6.00	1.14	0.05
10.00	0.64	0.05
11.61	0.00	0.05
12.41	0.00	0.05
13.21	0.00	0.05
14.82	0.64	0.05
18.82	1.14	0.05
19.54	1.38	0.05
24.82	1.38	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF41B

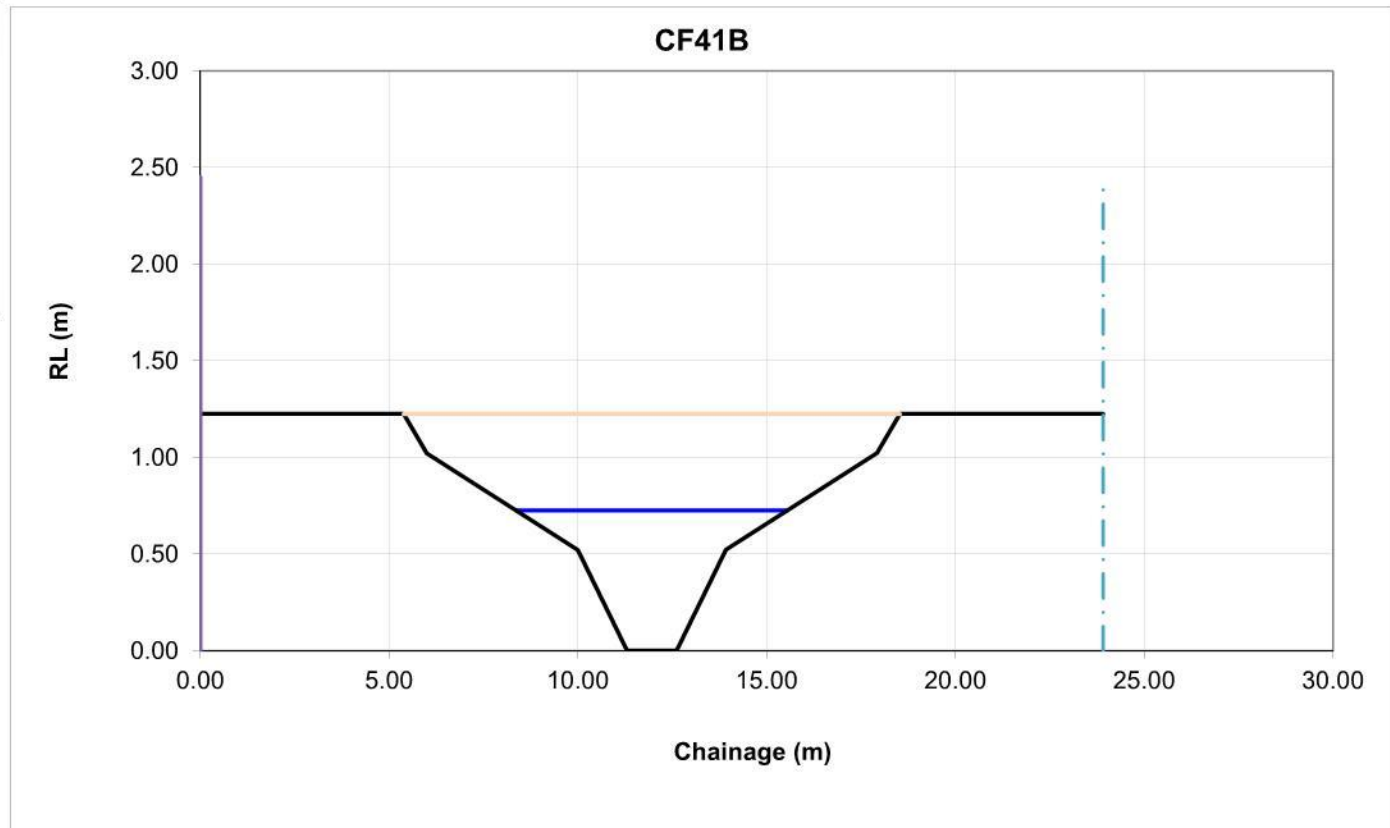


Geometry	
Main Channel (m)	6.61
Riparian (m)	26.61
Slope (m/m)	0.015
Water Level (m)	0.73

Channel Markers	
Left	10.00
Right	13.91

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.17	0.04	0.050	0.36144	0.04	0.27
Main Channel	2.16	0.48	0.050	26.3837	3.23	1.50
Right Overbank	0.17	0.10	0.050	0.72059	0.09	0.53
Total	2.49	0.24	0.035	27.4657	3.364	1.35

Chainage (m)	RL (m)	n
0.00	1.23	
5.39	1.23	0.05
6.00	1.02	0.05
10.00	0.52	0.05
11.30	0.00	0.05
11.96	0.00	0.05
12.61	0.00	0.05
13.91	0.52	0.05
17.91	1.02	0.05
18.53	1.23	0.05
23.91	1.23	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: [CF49](#)

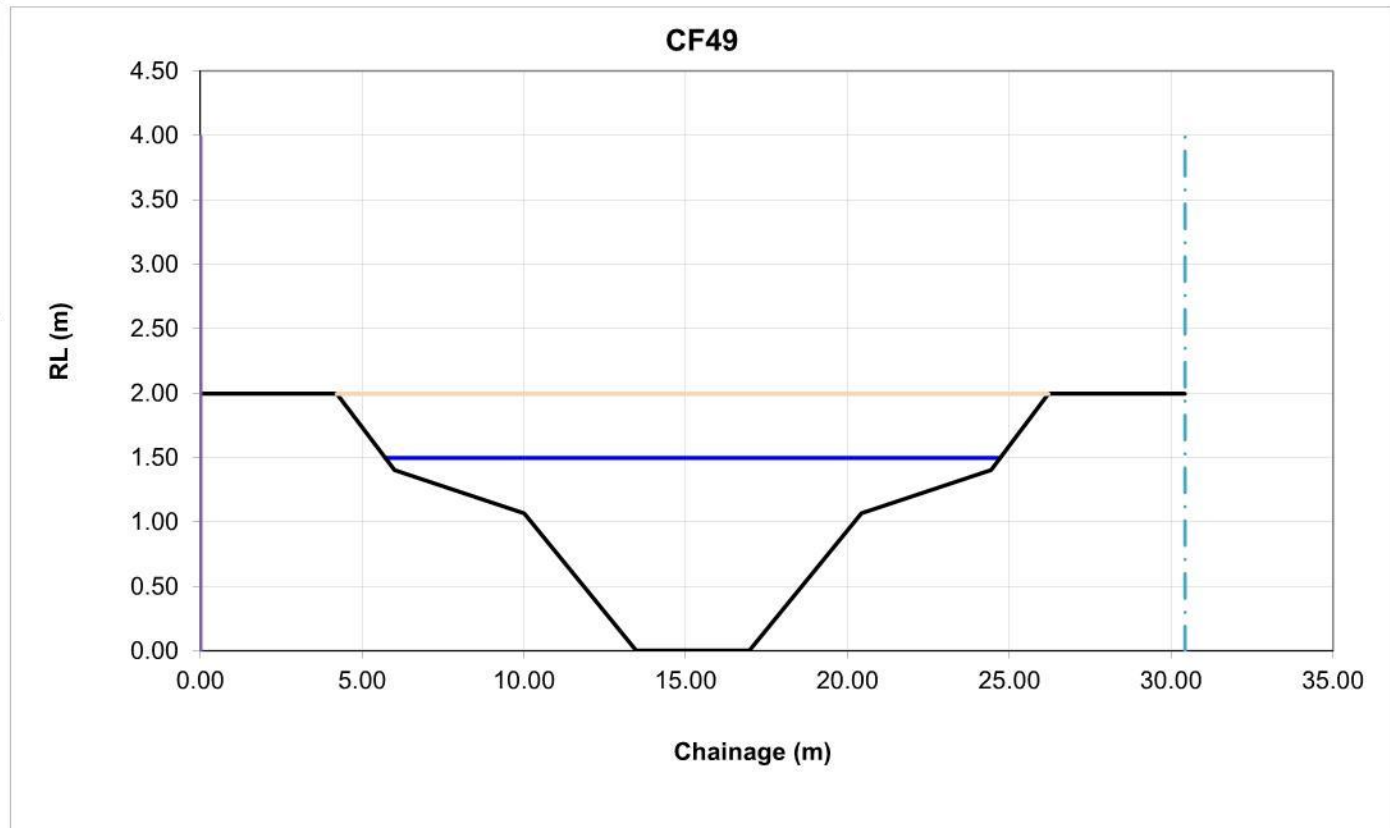


Geometry	
Main Channel (m)	10.95
Riparian (m)	30.95
Slope (m/m)	0.0088
Water Level (m)	1.50

Channel Markers	
Left	10.00
Right	20.43

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	1.05	0.10	0.050	4.66972	0.44	0.42
Main Channel	11.88	1.02	0.050	241.279	22.63	1.91
Right Overbank	1.05	0.24	0.050	8.20342	0.77	0.73
Total	13.98	0.56	0.037	254.152	23.842	1.71

Chainage (m)	RL (m)	n
0.00	2.00	
4.22	2.00	0.05
6.00	1.40	0.05
10.00	1.07	0.05
13.48	0.00	0.05
15.21	0.00	0.05
16.95	0.00	0.05
20.43	1.07	0.05
24.43	1.40	0.05
26.20	2.00	0.05
30.43	2.00	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF50

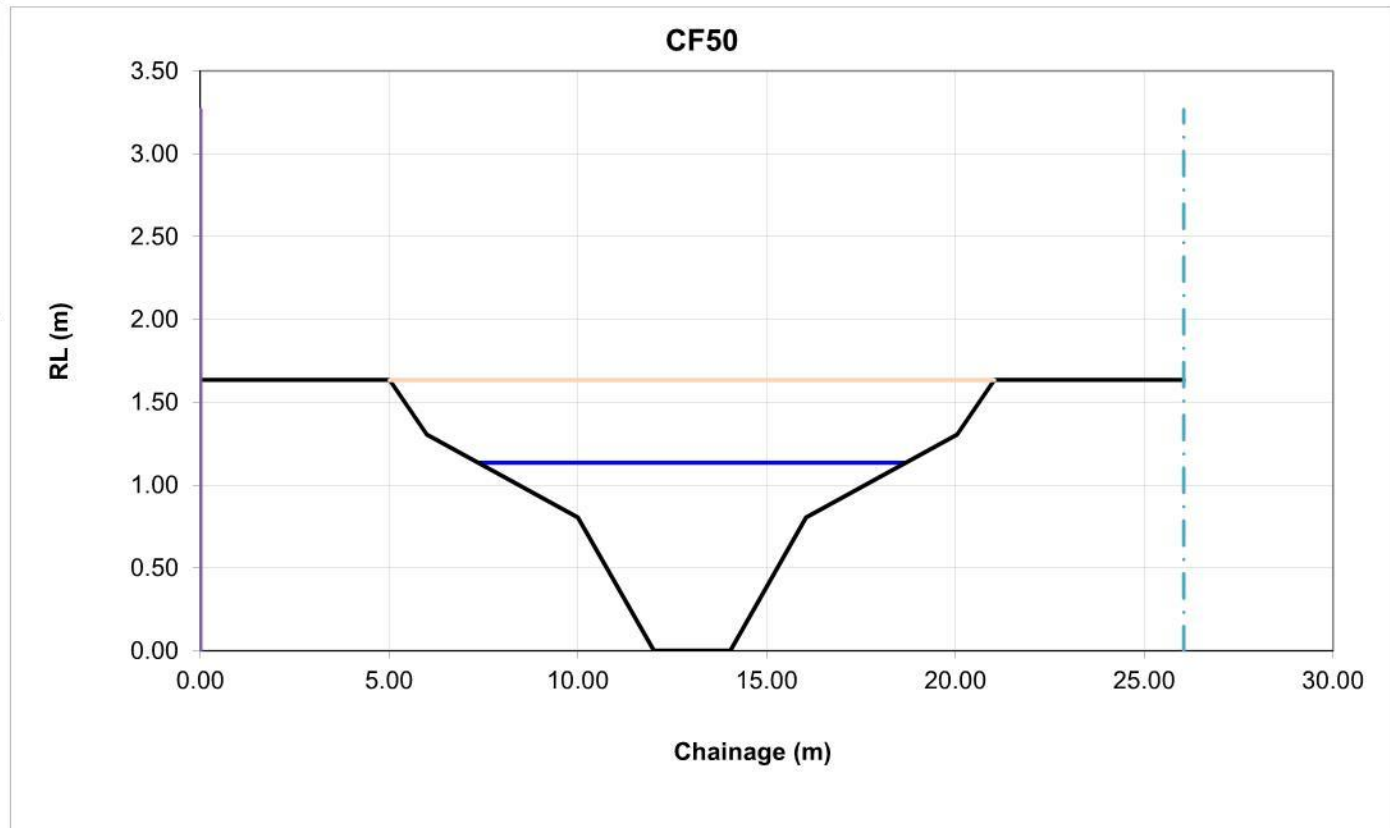


Geometry	
Main Channel (m)	8.03
Riparian (m)	28.03
Slope (m/m)	0.015
Water Level (m)	1.13

Channel Markers	
Left	10.00
Right	16.04

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.43	0.09	0.050	1.67365	0.20	0.48
Main Channel	5.23	0.75	0.050	86.0025	10.53	2.01
Right Overbank	0.43	0.16	0.050	2.56143	0.31	0.73
Total	6.09	0.43	0.039	90.2376	11.052	1.82

Chainage (m)	RL (m)	n
0.00	1.63	
5.02	1.63	0.05
6.00	1.31	0.05
10.00	0.81	0.05
12.01	0.00	0.05
13.02	0.00	0.05
14.03	0.00	0.05
16.04	0.81	0.05
20.04	1.31	0.05
21.03	1.63	0.05
26.04	1.63	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: CF51

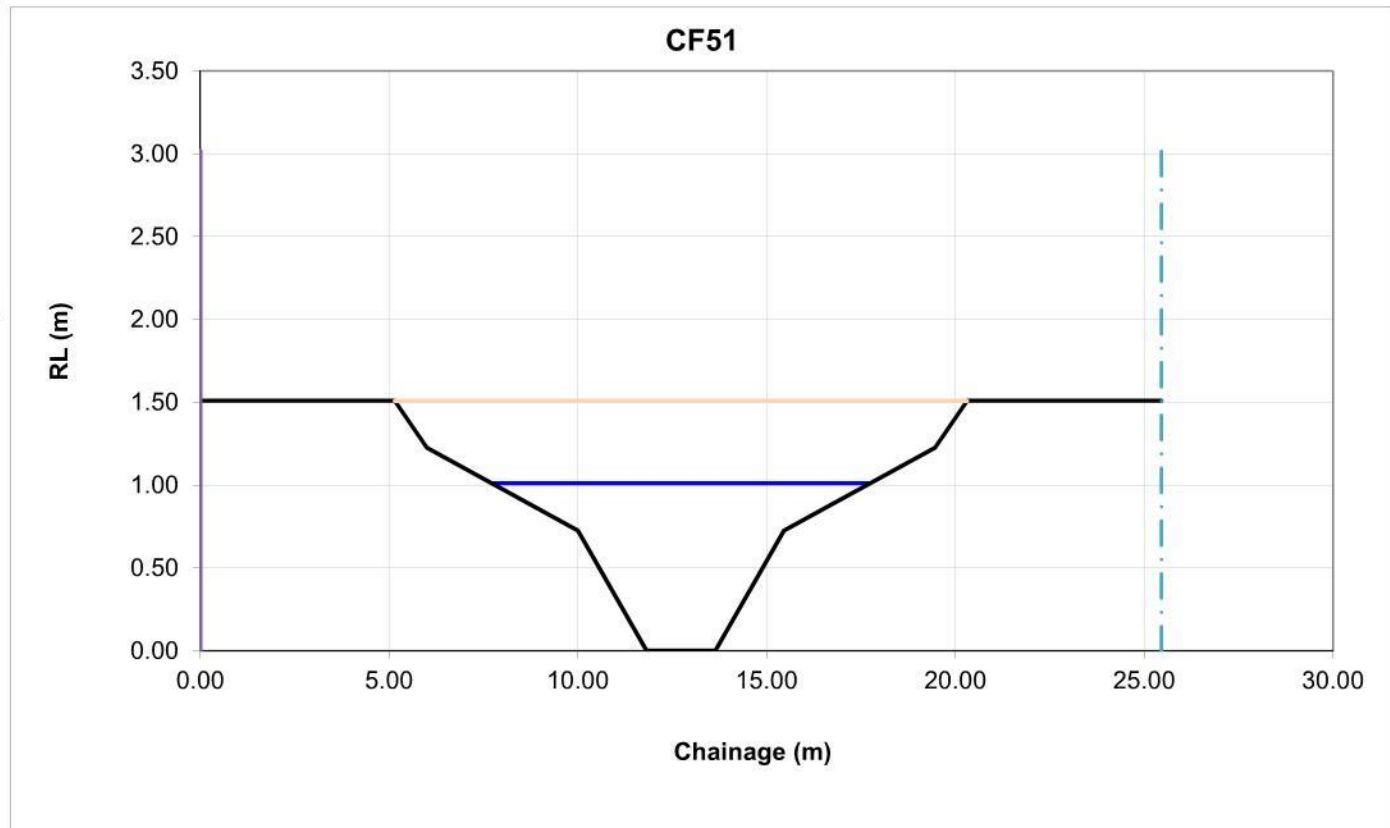


Geometry	
Main Channel (m)	7.64
Riparian (m)	27.64
Slope (m/m)	0.015
Water Level (m)	1.01

Channel Markers	
Left	10.00
Right	15.46

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.32	0.07	0.050	1.0371	0.13	0.40
Main Channel	4.19	0.66	0.050	63.7668	7.81	1.87
Right Overbank	0.32	0.14	0.050	1.72058	0.21	0.66
Total	4.82	0.37	0.038	66.5244	8.148	1.69

Chainage (m)	RL (m)	n
0.00	1.51	
5.15	1.51	0.05
6.00	1.23	0.05
10.00	0.73	0.05
11.82	0.00	0.05
12.73	0.00	0.05
13.64	0.00	0.05
15.46	0.73	0.05
19.46	1.23	0.05
20.30	1.51	0.05
25.46	1.51	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: [CF52A](#)

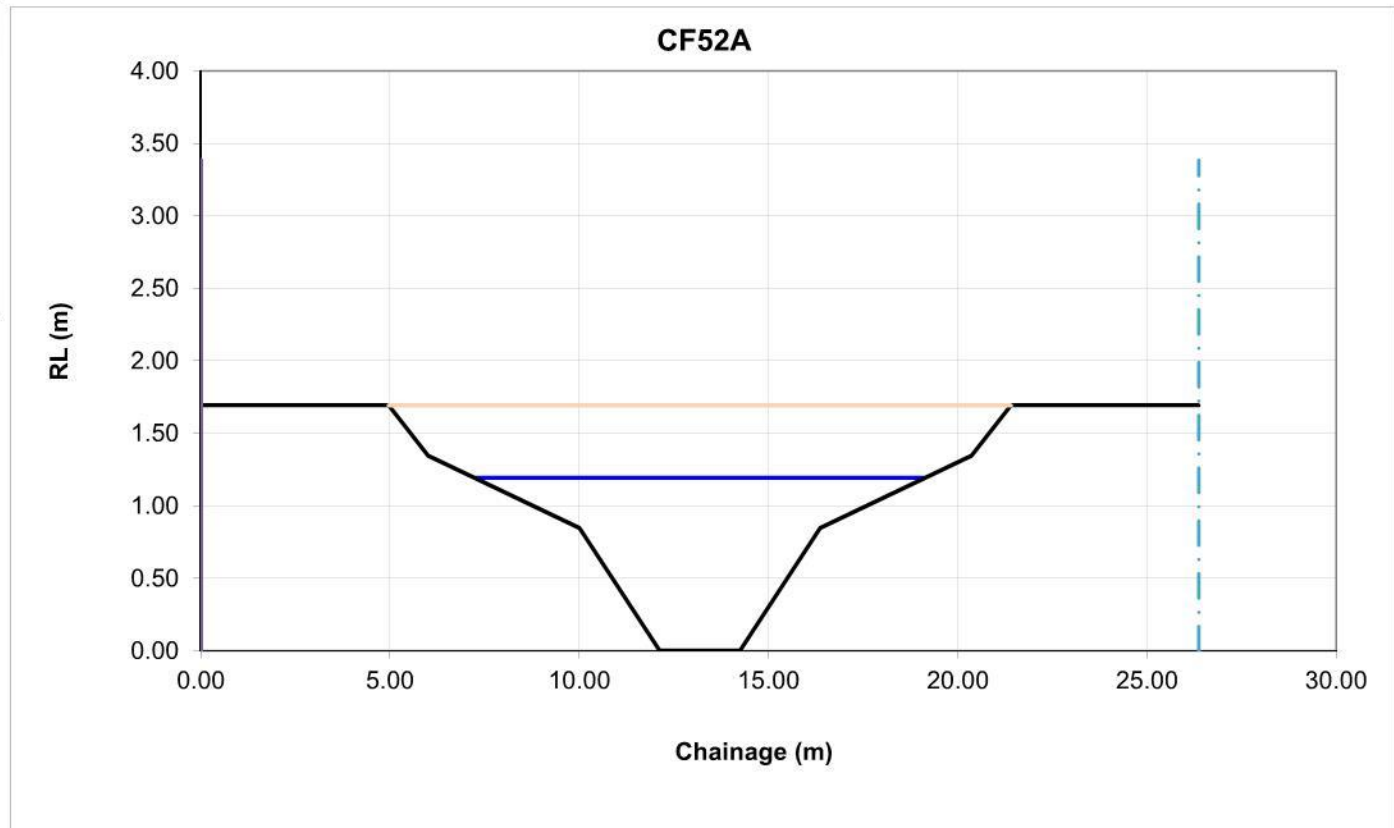


Geometry	
Main Channel (m)	8.24
Riparian (m)	28.24
Slope (m/m)	0.015
Water Level (m)	1.19

Channel Markers	
Left	10.00
Right	16.36

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.48	0.09	0.050	1.96371	0.24	0.51
Main Channel	5.79	0.78	0.050	98.5197	12.07	2.08
Right Overbank	0.48	0.17	0.050	2.92673	0.36	0.75
Total	6.74	0.46	0.039	103.41	12.665	1.88

Chainage (m)	RL (m)	n
0.00	1.69	
4.97	1.69	0.05
6.00	1.35	0.05
10.00	0.85	0.05
12.12	0.00	0.05
13.18	0.00	0.05
14.24	0.00	0.05
16.36	0.85	0.05
20.36	1.35	0.05
21.40	1.69	0.05
26.36	1.69	0.05



Riverstone East - Channel Calculations
CROSS-SECTION ANALYSIS

100-YR

X-section: [CF52B](#)



Geometry	
Main Channel (m)	7.65
Riparian (m)	27.65
Slope (m/m)	0.015
Water Level (m)	1.01

Channel Markers	
Left	10.00
Right	15.48

Channel Properties						
	Area (m ²)	R	n	K	Flow (m ³ /s)	Velocity (m/s)
Left Overbank	0.31	0.06	0.050	0.97459	0.12	0.39
Main Channel	4.19	0.66	0.050	63.7006	7.80	1.86
Right Overbank	0.31	0.14	0.050	1.63413	0.20	0.65
Total	4.80	0.37	0.038	66.3094	8.121	1.69

Chainage (m)	RL (m)	n
0.00	1.51	
5.17	1.51	0.05
6.00	1.23	0.05
10.00	0.73	0.05
11.83	0.00	0.05
12.74	0.00	0.05
13.65	0.00	0.05
15.48	0.73	0.05
19.48	1.23	0.05
20.31	1.51	0.05
25.48	1.51	0.05

