

APPENDIX I

Flood Study and Engineering Constraints Map

FLOOD STUDY

PROPOSED DEVELOPMENT

AT

**TALBINGO WEST
LOTS 35 & 36 DP878862**

FOR

KELE PROPERTY GROUP NSW

July 2006

1. INTRODUCTION

1.1 Study Brief

Site Plus has been commissioned by Kele Property group NSW to prepare a flood study for the above property to ascertain the likely flood levels pertaining to the property for the 1% event.

The site is located about 40Km south of Tumut, just off the Snowy Mountains Highway.

We understand that Tumut Shire Council considering a development application for the above site, and requires a flood assessment to determine the extent of storm water flows within the three (3) natural watercourses running through the subject site.

1.2 Location of Site

The site is a total 38ha in area and is undulating to grades of approximately 9% and varies in elevation from 405-700 meters AHD.

The slope of the surrounding area all falls to the low points of Murray Jackson Drive located north to the subject site and eventually to the Jounama Pondage.

2. BASIS OF ANALYSIS

2.1 Selection of Hydrological Model

Tumut Shire Council has provided Rainfall Data on Talbingo. An Orthophoto map 1:25000 of the subject site and the surrounding area was also utilized to carryout the flood study. The catchment area which includes the subject site was divided into three (3) Catchments: Appendix A.

Catchment 1 has an approximate area of 57ha.

Catchment 2 has an approximate area of 44ha.

Catchment 3 has an approximate area of 179ha.

The 100 Year flow was estimated by the Kinematic wave Rational Method ($Q=CIA/360$). The Methodology used to estimate the flow as outlined in Australian Rainfall and Runoff 1987. This is recommended for use in eastern New South Wales to catchment up to 250sqKm in area.

We calculated the time of Concentration by the following formula;

$$T_c = 0.76 A^{0.38}$$

2.2 MODEL

The existing surface of the property was modelled using the Orthophoto map 1:25000 of the subject site and the surrounding area. The surface model was used in HEC – RAS program, together with 100 year ARI flow obtained from the Rational Method and RARE drainage program.

3. EXISTING CATCHMENT HYDROLOGY

3.1 Natural Catchment Conditions

For the sake of this study, the total catchment upstream of the subject site will be considered. The existing surface of the subject site was modeled using the 1:25000 Orthophoto Map.

Catchment No	Area (ha)	N	C	Slope (mm)	Tc	Q out (cum)
1	57.5	0.04	0.50	0.13	22	7.83
2	44	0.04	0.50	0.15	20	6.34
3	179	0.04	0.50	0.20	33	19.374

TABLE 1
Catchments Details

4. DISCUSSION

The computer analysis determined the water levels at subject site, (lots 35 and 36). For the 1: 100 year flow event. Refer to HEC-RAS results in Appendix B.

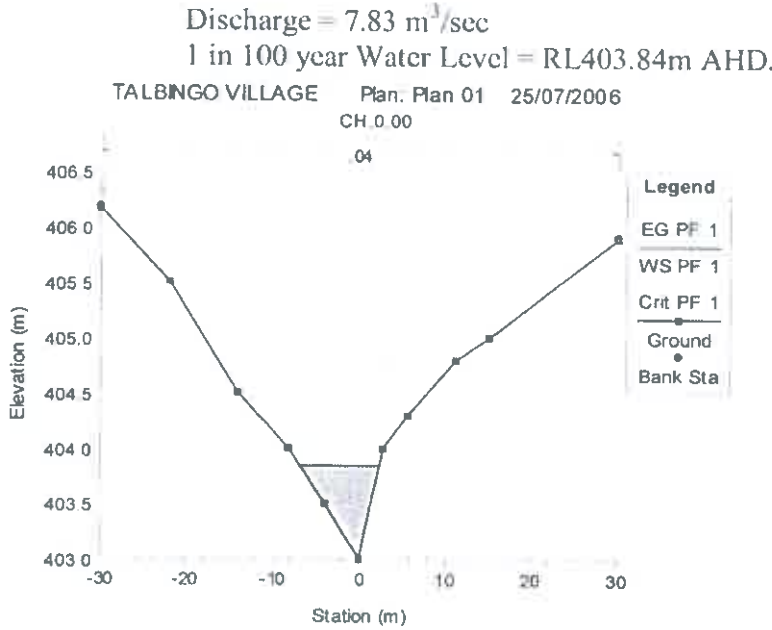
The catchment was divided initially into three (3) catchments. From these results we found the following:

- Catchment 1, the water level upstream (southern boundary), midway, and downstream (northern boundary) to be equal to 428.84m, 414.53m, and 403.84m respectively.
- Catchment 2, the water level upstream (southern boundary), midway, and downstream (northern boundary) to be equal to 461.33m, 436.78m, and 419.13m respectively.
- Catchment 3, the water level upstream (southern boundary), and downstream equal to 444.37m, and 441.65 respectively.

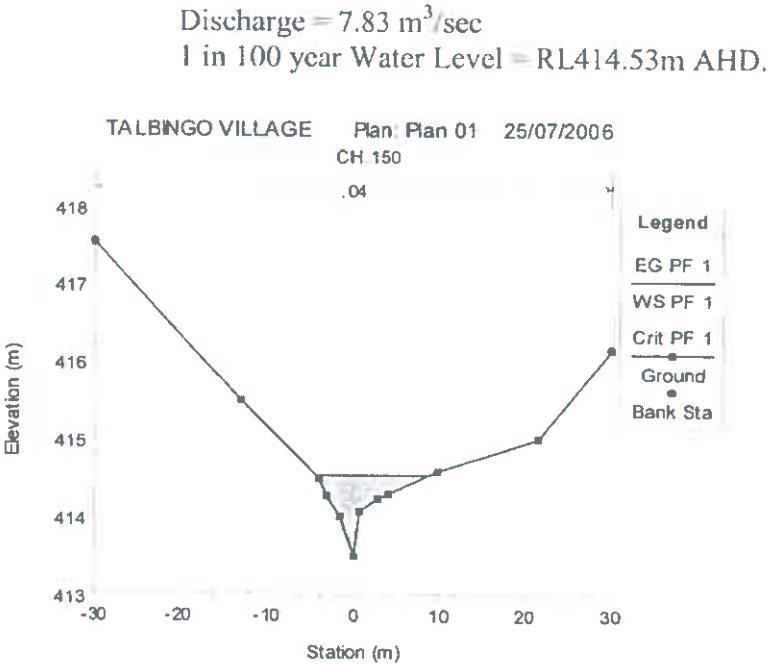
The cross-sections, (refer to Site Plan 05166-CO1 Appendix D), shown below allow the capacity of the subject site to be determined at a number of locations. The cross

sections have been located every 15m within the subject lot. This allows for the approximate flood levels to be given at these points and allow interpolation between these points.

Cross-Section: Chainage 0.00 downstream of Watercourse 1:



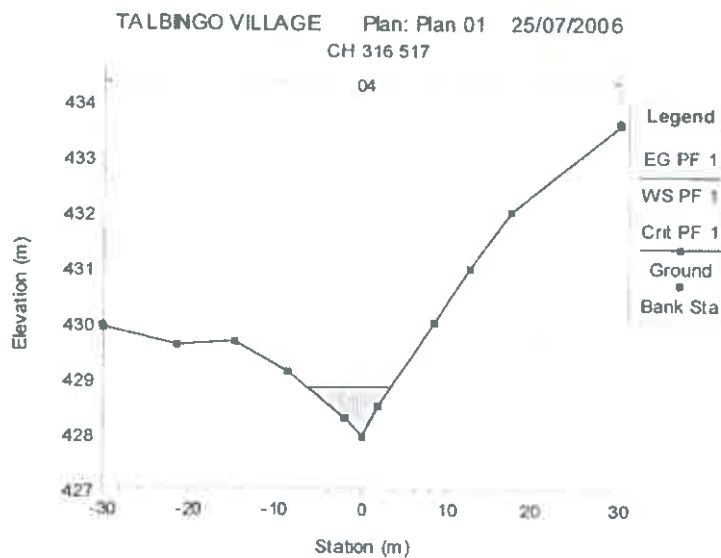
Cross-Section: Chainage 150 watercourse 1:



Cross-Section: Chainage 316.517 upstream watercourse 1:

Discharge = $7.83 \text{ m}^3/\text{sec}$

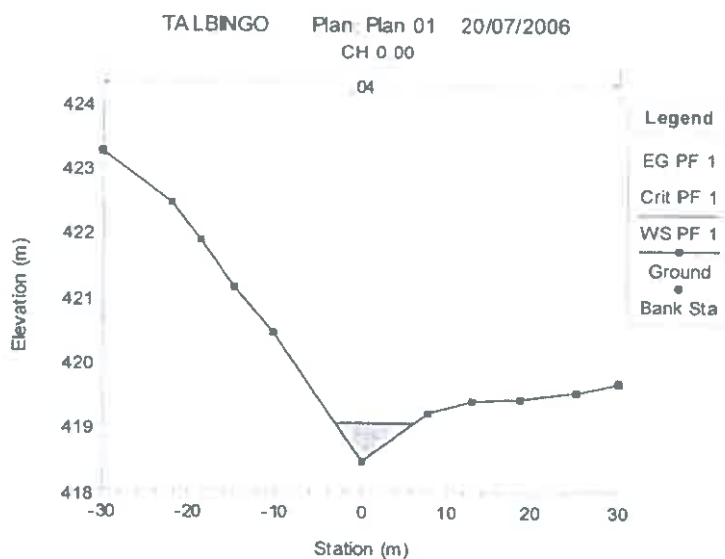
1 in 100 year Water Level = RL428.84m AHD.



Cross-Section: Chainage 0.00 downstream (southern boundary) watercourse 2:

Discharge = $6.34 \text{ m}^3/\text{sec}$

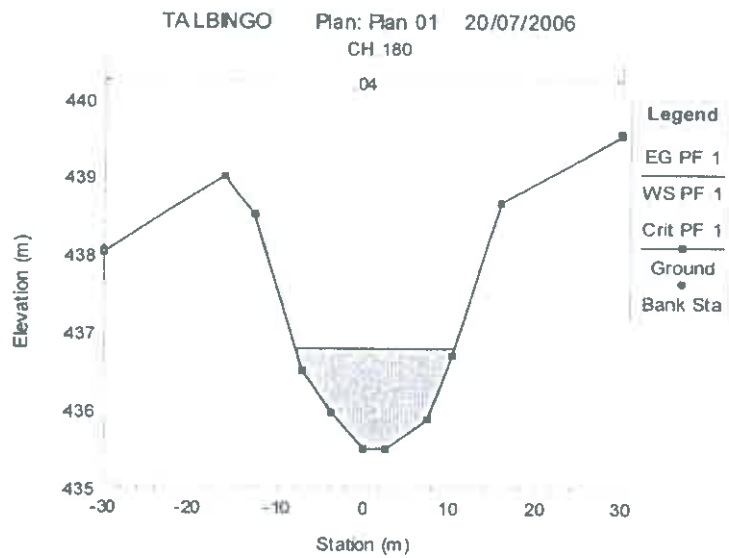
1 in 100 year Water Level = RL419.13m AHD.



Cross-Section: Chainage 180 watercourse 2:

Discharge = $6.34 \text{ m}^3/\text{sec}$

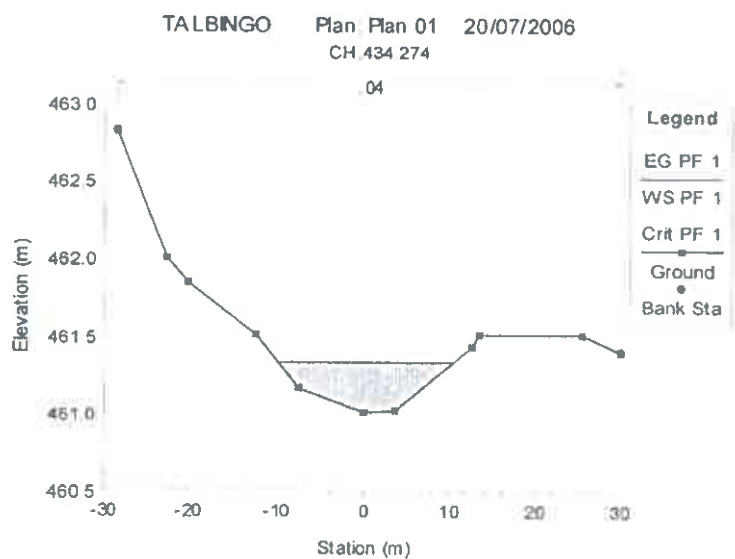
1 in 100 year Water Level = RL436.78m AHD.



Cross-Section: Chainage 180 watercourse 2:

Discharge = $6.34 \text{ m}^3/\text{sec}$

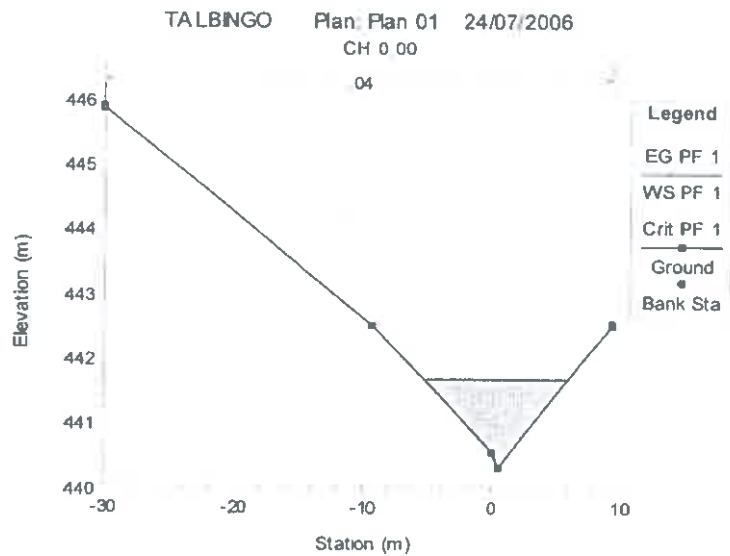
1 in 100 year Water Level = RL436.78m AHD.



Cross-Section: Chainage 0.00 watercourse 3:

Discharge = $19.37 \text{ m}^3/\text{sec}$

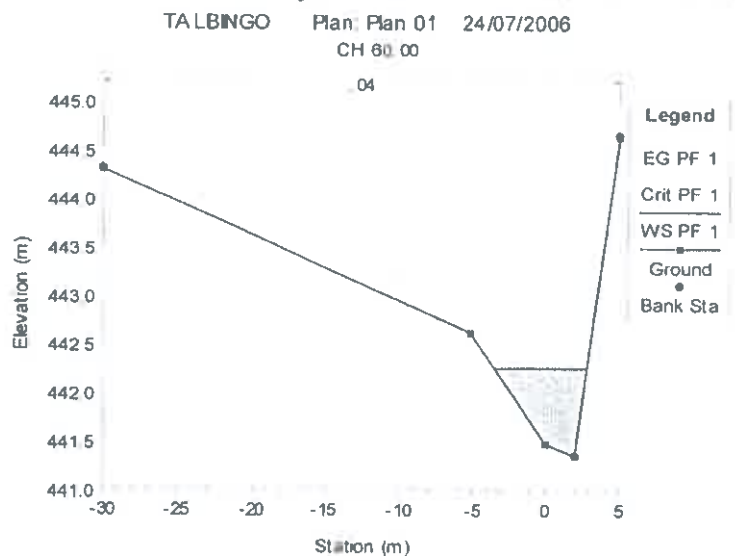
1 in 100 year Water Level = RL441.65m AHD.



Cross-Section: Chainage 60.0 watercourse 3:

Discharge = $19.37 \text{ m}^3/\text{sec}$

1 in 100 year Water Level = RL444.37m AHD.



5. CONCLUSION

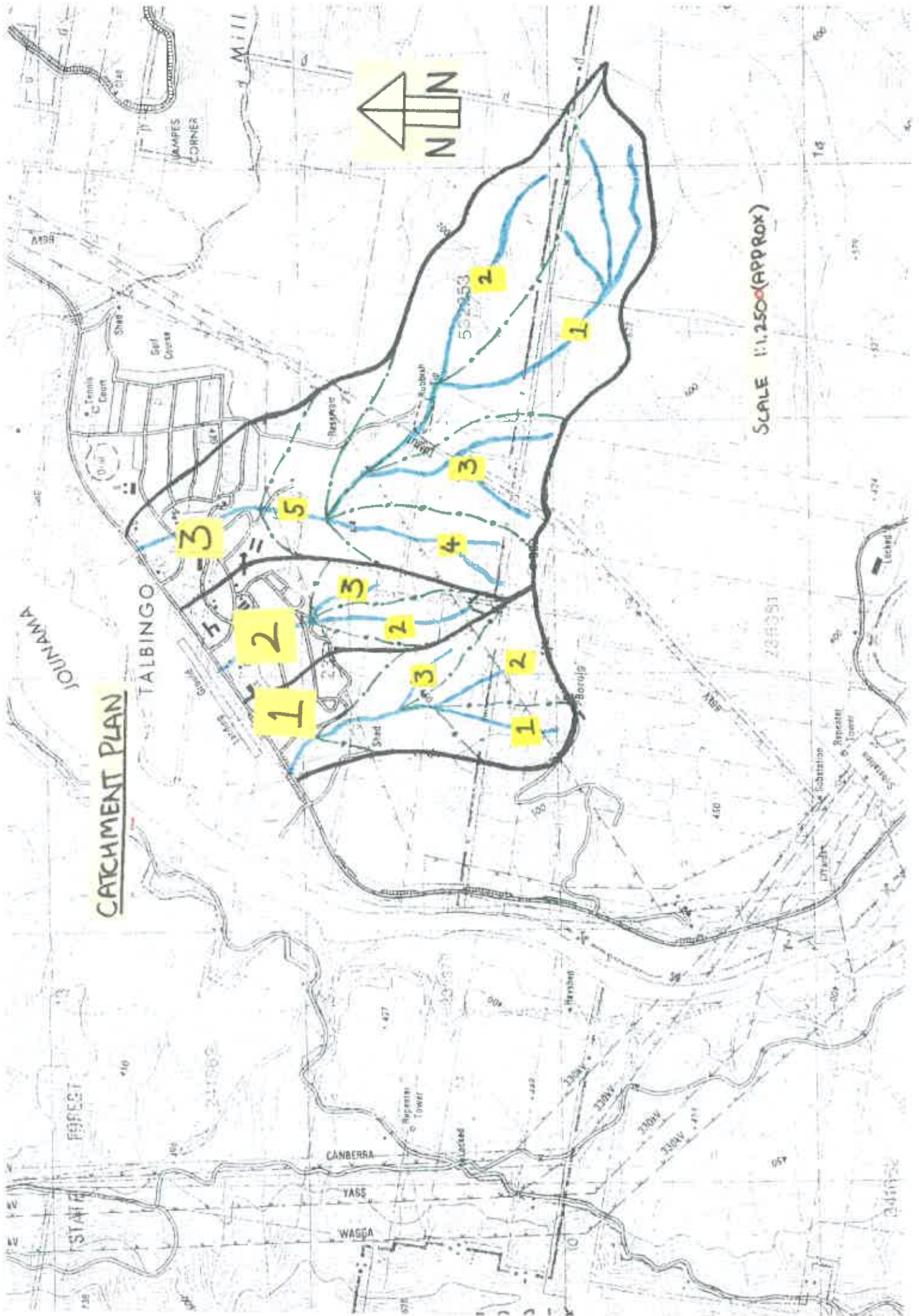
The calculations carried out in this report demonstrate that the flooding of the natural waterways within the subject site in the 1 in 100 year event has no significant impact on the proposed development.

The extent of flooding is mapped on the attached drawings (05166.CO1).

Once a final layout has been adopted the impacts of road crossings and watercourse channel alterations can be modeled.

APPENDIX A

CATCHMENT PLAN



APPENDIX B

HEC-RAS RESULTS

HEC-RAS Plan: Plan 01 River River-1 Reach: A Profile: PF 1

Reach	River Sta	Q Total (m3/s)	Min Ch El (m)	W.S Elev (m)	Crit W.S. (m)	E.G Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
A	316 517	7.83	3.3	427.95	428.84	428.84	0.021762	2.01	3.89	9.48	1.00
A	300	7.83	3.5	426.50	427.58	427.58	0.021617	2.20	3.55	7.30	1.01
A	285.963	7.83	3.7	425.49	426.21	426.21	0.021179	2.15	3.64	7.81	1.00
A	270.00	7.83	3.6	424.00	424.52	424.52	0.023349	1.82	4.30	13.02	1.01
A	253.243	7.83	3.2	422.33	422.89	422.89	0.022516	1.92	4.07	11.03	1.01
A	240	7.83	3.4	421.00	421.42	421.42	0.023799	1.76	4.44	14.31	1.01
A	225	7.83	3.3	419.50	420.35	420.35	0.023294	2.08	3.76	8.76	1.01
A	207 751	7.83	3.6	418.00	418.53	418.53	0.022563	1.93	4.06	10.96	1.01
A	195	7.83	4.4	417.00	417.64	417.64	0.023907	1.81	4.31	13.18	1.01
A	180	7.83	4.2	415.94	416.51	416.51	0.023325	1.83	4.27	12.78	1.01
A	165	7.83	2.4	414.79	415.46	415.46	0.023179	1.86	4.20	12.15	1.01
A	150	7.83	3.8	413.50	414.53	414.53	0.024877	1.84	4.25	12.96	1.03
A	135	7.83	6.5	412.50	413.29	413.29	0.022120	2.02	3.87	9.47	1.01
A	120	7.83	5.2	411.99	412.52	412.52	0.022630	1.90	4.13	11.44	1.01
A	105	7.83	4.4	410.50	411.26	411.26	0.022599	1.96	4.00	10.46	1.01
A	90	7.83	10.1	409.13	410.04	410.04	0.023252	1.83	4.29	12.76	1.01
A	75	7.83	13.5	408.00	408.67	408.67	0.023495	1.77	4.43	13.97	1.00
A	60	7.83	12.3	406.45	407.28	407.28	0.023640	1.81	4.33	13.12	1.00
A	45	7.83	3.4	404.95	406.24	406.24	0.000177	0.28	27.52	33.45	0.10
A	43 656	7.83	2.3	405.50	406.07	406.07	0.013802	1.74	4.50	9.61	0.81
A	30	7.83	7.1	405.00	405.80	405.80	0.022999	1.91	4.10	11.38	1.01
A	15.233	7.83	8.9	404.28	405.13	405.13	0.003710	0.93	8.43	17.56	0.43
A	15.00	7.83	8.1	404.50	405.00	405.00	0.023609	1.78	4.41	13.99	1.01
A	0.00	7.83	2.5	403.00	403.84	403.84	0.021710	2.01	3.88	9.41	1.00

HEC-RAS Plan: Plan 01 River: River-1 Reach: A Profile: PF 1

Reach	River Sta	Q Total m3/s	Min Ch El m	W S Elev m	Crit W S m	E G Elev m	E G Slope m/m	Vel Chnl m/s	Flow Area m2	Top Width m	Froude # Ch
A	316.517	7.83	427.95	428.84	428.84	429.04	0.021726	2.01	3.89	9.49	1.00
A	300	7.83	426.50	427.27	427.58	428.26	0.120279	4.41	1.77	4.61	2.27
A	285.963	7.83	425.49	425.98	426.20	426.69	0.093618	3.73	2.10	6.02	2.01
A	270.00	7.83	424.00	424.35	424.52	424.92	0.126275	3.36	2.33	9.99	2.22
A	253.243	7.83	422.33	422.75	422.89	423.20	0.081961	3.00	2.61	9.54	1.83
A	240	7.83	421.00	421.28	421.42	421.79	0.144386	3.14	2.49	13.03	2.30
A	225	7.83	419.50	420.24	420.35	420.62	0.046227	2.71	2.89	7.56	1.40
A	207.751	7.83	418.00	418.33	418.53	419.13	0.194183	3.97	1.97	9.07	2.72
A	195	7.83	417.00	417.56	417.64	417.85	0.050406	2.37	3.30	11.82	1.43
A	180	7.83	415.94	416.36	416.51	416.83	0.090952	3.06	2.56	9.80	1.91
A	165	7.83	414.79	415.34	415.46	415.71	0.059565	2.67	2.93	9.99	1.58
A	150	7.83	413.50	414.42	414.54	414.79	0.063477	2.69	2.91	10.09	1.60
A	135	7.83	412.50	413.10	413.29	413.69	0.081752	3.39	2.31	6.96	1.88
A	120	7.83	411.99	412.44	412.52	412.74	0.042569	2.40	3.27	10.24	1.35
A	105	7.83	410.50	411.02	411.26	411.76	0.100492	3.79	2.06	6.11	2.08
A	90	7.83	409.13	409.88	410.04	410.35	0.078225	3.03	2.58	8.89	1.80
A	75	7.83	408.00	408.54	408.67	408.98	0.106868	2.94	2.66	12.13	2.01
A	60	7.83	406.45	407.16	407.27	407.54	0.084779	2.74	2.86	12.12	1.80
A	45	7.83	404.95	405.36	405.49	405.81	0.165084	2.96	2.65	16.42	2.35
A	43.656	7.83	405.50	405.99	405.99	406.21	0.021809	2.08	3.77	8.71	1.01
A	30	7.83	405.00	405.80	405.80	405.98	0.022397	1.89	4.15	11.45	1.00
A	15.233	7.83	404.28	404.67	404.84	405.26	0.142938	3.41	2.30	10.55	2.33
A	15.00	7.83	404.50	404.97	405.00	405.16	0.029390	1.92	4.07	13.47	1.12
A	0.00	7.83	403.00	403.62	403.84	404.34	0.112933	3.76	2.08	6.82	2.17

HEC-RAS Plan: Plan 01 River River-1 Reach: A Profile: PF 1

Reach	River Sta	Q Total (m3/s)	Min Ch El (m)	W S Elev (m)	Crit W S (m)	E G Elev (m)	E G Slope (m/m)	Ve Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
A	316.517	7.83	427.95	428.84	428.84	429.04	0.021762	2.01	3.89	9.48	1.00
A	300	7.83	426.50	427.27	427.58	428.26	0.120124	4.41	1.77	4.61	2.27
A	285.963	7.83	425.49	425.98	426.21	426.69	0.093753	3.73	2.10	6.02	2.02
A	270.00	7.83	424.00	424.35	424.52	424.92	0.125775	3.35	2.33	9.99	2.22
A	253.243	7.83	422.33	422.75	422.89	423.21	0.082125	3.00	2.61	9.54	1.83
A	240	7.83	421.00	421.28	421.42	421.78	0.144209	3.14	2.49	13.03	2.29
A	225	7.83	419.50	420.24	420.35	420.62	0.046238	2.71	2.89	7.56	1.40
A	207.751	7.83	418.00	418.33	418.53	419.13	0.194086	3.97	1.97	9.07	2.72
A	195	7.83	417.00	417.56	417.64	417.85	0.050406	2.37	3.30	11.82	1.43
A	180	7.83	415.94	416.36	416.51	416.83	0.090952	3.06	2.56	9.80	1.91
A	165	7.83	414.79	415.34	415.46	415.71	0.059565	2.67	2.93	9.99	1.58
A	150	7.83	413.50	414.42	414.54	414.79	0.063477	2.69	2.91	10.09	1.60
A	135	7.83	412.50	413.10	413.29	413.69	0.081775	3.39	2.31	6.96	1.88
A	120	7.83	411.99	412.44	412.52	412.74	0.042569	2.40	3.27	10.24	1.35
A	105	7.83	410.50	411.02	411.26	411.76	0.100492	3.79	2.06	6.11	2.08
A	90	7.83	409.13	409.88	410.04	410.35	0.078225	3.03	2.58	8.89	1.80
A	75	7.83	408.00	408.54	408.67	408.98	0.106868	2.94	2.66	12.13	2.01
A	60	7.83	406.45	407.16	407.28	407.54	0.084779	2.74	2.86	12.12	1.80
A	45	7.83	404.95	406.24	405.49	406.24	0.000177	0.28	27.52	33.45	0.10
A	43.656	7.83	405.50	406.07		406.22	0.013802	1.74	4.50	9.61	0.81
A	30	7.83	405.00	405.80	405.80	405.98	0.022999	1.91	4.10	11.38	1.01
A	15.233	7.83	404.28	405.13	404.84	405.17	0.003710	0.93	8.43	17.56	0.43
A	15.00	7.83	404.50	405.00	405.00	405.16	0.023609	1.78	4.41	13.99	1.01
A	0.00	7.83	403.00	403.60	403.84	404.40	0.129865	3.96	1.98	6.64	2.32

HEC-RAS Plan: Plan 01 River: TALBINGO Reach: B Profile: PF 1

Reach	River Sta	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crtl W.S (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
B	434.274	6.34	461.00	461.33	461.33	461.44	0.026855	1.46	4.34	20.38	1.01
B	420	6.34	460.45	447.89	447.89	444.71	9.865384	7.90	0.80	0.13	1.01
B	405	6.34	457.34	457.68	457.68	457.78	0.027218	1.43	4.42	21.61	1.01
B	390	6.34	455.16	455.49	455.49	455.59	0.027518	1.42	4.46	22.19	1.01
B	375	6.34	452.85	453.20	453.20	453.30	0.028518	1.38	4.58	24.43	1.02
B	360	6.34	450.73	451.03	451.03	451.14	0.028566	1.46	4.34	20.27	1.01
B	345	6.34	448.92	449.25	449.25	449.34	0.027781	1.35	4.68	25.23	1.00
B	330	6.34	446.71	447.02	447.02	447.14	0.026228	1.51	4.21	18.53	1.01
B	315	6.34	445.50	446.09	446.09	446.11	0.002945	0.60	10.56	35.82	0.35
B	300	6.34	445.50	445.92	445.92	446.00	0.028525	1.23	5.14	32.53	0.99
B	285	6.34	444.12	444.56	444.56	444.63	0.029163	1.21	5.26	35.03	0.99
B	270	6.34	442.44	442.89	442.89	443.06	0.023556	1.79	3.54	11.04	1.01
B	255	6.34	441.20	441.61	441.61	441.74	0.025338	1.59	4.00	15.87	1.01
B	240	6.34	440.29	440.61	440.61	440.72	0.026449	1.49	4.26	19.27	1.01
B	225	6.34	439.20	439.57	439.57	439.67	0.028667	1.37	4.62	25.04	1.02
B	210	6.34	437.44	438.37	438.37	438.40	0.002259	0.70	9.08	20.07	0.33
B	195	6.34	437.39	438.21	438.21	438.31	0.030585	1.36	4.67	26.70	1.04
B	180	6.34	435.50	436.78	436.78	436.79	0.000313	0.40	15.96	18.52	0.14
B	165	6.34	435.98	436.61	436.61	436.76	0.025819	1.69	3.74	13.43	1.02
B	150	6.34	434.98	435.63	435.63	435.79	0.023808	1.80	3.52	10.95	1.01
B	144.925	6.34	434.51	435.12	435.12	435.21	0.027794	1.32	4.82	27.04	1.00
B	135	6.34	431.50	432.43	432.43	432.65	0.021901	2.07	3.07	7.09	1.00
B	120	6.34	429.93	430.59	430.59	430.80	0.021883	2.07	3.06	7.13	1.01
B	105	6.34	427.86	428.49	428.49	428.70	0.021961	2.06	3.07	7.19	1.01
B	90	6.34	426.00	426.68	426.68	426.91	0.022238	2.10	3.02	6.84	1.01
B	75	6.34	423.96	424.55	424.55	424.77	0.021985	2.08	3.04	7.01	1.01
B	60	6.34	422.05	422.76	422.76	422.99	0.021683	2.15	2.94	6.36	1.01
B	45	6.34	420.80	421.43	421.43	421.66	0.021553	2.13	2.97	6.49	1.01
B	38.822	6.34	420.50	421.05	421.05	421.23	0.022836	1.88	3.37	9.46	1.01
B	30	6.34	420.09	420.81	420.81	420.97	0.023304	1.78	3.57	11.14	1.00
B	15	6.34	419.22	419.98	419.98	420.14	0.024155	1.80	3.51	10.97	1.02
B	0.00	6.34	418.46	419.13	419.13	419.30	0.023194	1.82	3.47	10.38	1.01

HEC-RAS Plan View 01 River: TALBINGO Reach: B Profile: PF 1

Reach	River Sta	Q Total (m3/s)	Min Ch E (m)	W S Elev (m)	Crit W.S (m)	E G Elev (m)	E G Slope (m/m)	Vel Chn (m/s)	Flow Area (m2)	Top Width (m)	Froude # Ch
B	434.274	6.34	461.00	461.33	461.33	461.44	0.026975	1.46	4.33	20.37	1.01
B	420	6.34	-460.45	-457.33	-447.89	376.54	16543.590000	127.94	0.05	0.03	32.69
B	405	6.34	457.34	457.68	457.68	457.78	0.027075	1.43	4.43	21.62	1.01
B	390	6.34	455.16	455.32	455.49	456.50	0.869551	4.81	1.32	14.06	5.01
B	375	6.34	452.85	453.15	453.20	453.34	0.081369	1.97	3.21	22.04	1.65
B	360	6.34	450.73	450.90	451.03	451.38	0.235014	3.06	2.07	16.34	2.74
B	345	6.34	448.92	449.19	449.25	449.38	0.079883	1.92	3.29	23.18	1.63
B	330	6.34	446.71	446.89	447.02	447.40	0.248578	3.14	2.02	15.93	2.82
B	315	6.34	445.50	445.79	445.83	445.96	0.045343	1.83	3.46	17.06	1.30
B	300	6.34	445.50	445.92	445.92	446.00	0.030509	1.26	5.02	32.32	1.02
B	285	6.34	444.12	444.42	444.56	444.97	0.224635	3.30	1.92	13.10	2.74
B	270	6.34	442.44	442.78	442.89	443.14	0.072848	2.66	2.38	9.55	1.70
B	255	6.34	441.20	441.51	441.61	441.84	0.103715	2.58	2.46	13.51	1.93
B	240	6.34	440.29	440.56	440.61	440.74	0.050872	1.84	3.44	18.42	1.36
B	225	6.34	439.20	439.51	439.57	439.72	0.093596	2.06	3.07	21.89	1.76
B	210	6.34	437.44	437.90	438.03	438.31	0.091806	2.84	2.23	9.63	1.89
B	195	6.34	437.39	438.21	438.21	438.31	0.033300	1.39	4.54	26.56	1.08
B	180	6.34	435.50	435.75	435.98	436.98	0.427195	4.91	1.29	7.81	3.86
B	165	6.34	435.98	436.62	436.62	436.76	0.024571	1.67	3.80	13.45	1.00
B	150	6.34	434.98	435.46	435.63	436.02	0.120793	3.31	1.91	8.07	2.17
B	144.925	6.34	434.51	435.05	435.12	435.28	0.131855	2.16	2.94	25.22	2.02
B	135	6.34	431.50	432.10	432.43	433.46	0.236096	5.16	1.23	4.27	3.07
B	120	6.34	429.93	430.38	430.59	431.04	0.100469	3.61	1.75	5.57	2.06
B	105	6.34	427.86	428.24	428.49	429.13	0.162895	4.16	1.52	5.63	2.56
B	90	6.34	426.00	426.49	426.68	427.13	0.104002	3.53	1.80	6.00	2.06
B	75	6.34	423.96	424.32	424.55	425.17	0.164680	4.08	1.55	5.98	2.55
B	60	6.34	422.05	422.55	422.76	423.23	0.099170	3.66	1.73	5.33	2.05
B	45	6.34	420.80	421.24	421.43	421.84	0.084183	3.41	1.86	5.61	1.89
B	38.822	6.34	420.50	420.90	421.05	421.33	0.066293	2.89	2.19	7.17	1.67
B	30	6.34	420.09	420.81	420.81	420.97	0.023648	1.79	3.55	11.11	1.01
B	15	6.34	419.22	419.83	419.98	420.31	0.095716	3.07	2.06	8.15	1.95
B	0.00	6.34	418.46	419.05	419.12	419.32	0.042670	2.29	2.76	9.26	1.34

HEC-RAS Plan View 01 River TALBINGO Reach: B Profile: PF 1

Reach	River Sta	Q Total (m3/s)	Min Ch El (m)	W S Elev (m)	Crit W S (m)	E G Elev (m)	E G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
S	434.274	6.34	461.00	461.33	461.33	461.44	0.026855	1.46	4.34	20.38	1.01
B	420	6.34	-460.45	-457.33	-447.89	376.54	16543.590000	127.94	0.05	0.03	32.69
B	405	6.34	457.34	457.68	457.68	457.78	0.027218	1.43	4.42	21.61	1.01
B	390	6.34	455.16	455.32	455.49	456.50	0.085627	4.80	1.32	14.07	5.00
B	375	6.34	452.85	453.15	453.20	453.34	0.081369	1.97	3.21	22.04	1.65
S	360	6.34	450.73	450.90	451.03	451.38	0.235014	3.06	2.07	16.34	2.74
B	345	6.34	448.92	449.19	449.25	449.38	0.079883	1.92	3.29	23.18	1.63
B	330	6.34	446.71	446.89	447.02	447.40	0.248578	3.14	2.02	15.93	2.82
B	315	6.34	445.50	446.09	445.83	446.11	0.002945	0.60	10.56	35.82	0.35
B	300	6.34	445.50	445.92	445.92	446.00	0.028525	1.23	5.14	32.53	0.99
B	285	6.34	444.12	444.42	444.56	445.00	0.241019	3.38	1.87	12.91	2.84
B	270	6.34	442.44	442.78	442.89	443.14	0.071309	2.64	2.40	9.58	1.68
B	255	6.34	441.20	441.50	441.61	441.85	0.105348	2.59	2.44	13.49	1.95
B	240	6.34	440.29	440.57	440.61	440.74	0.050493	1.84	3.45	18.43	1.36
B	225	6.34	439.20	439.51	439.57	439.72	0.094179	2.07	3.06	21.88	1.76
B	210	6.34	437.44	438.37	438.03	438.40	0.002259	0.70	9.08	20.07	0.33
B	195	6.34	437.39	438.21	438.21	438.31	0.030585	1.36	4.67	26.70	1.04
B	180	6.34	435.50	436.78	435.98	436.79	0.000313	0.40	15.96	18.52	0.14
B	165	6.34	435.98	436.61	436.61	436.76	0.025819	1.69	3.74	13.43	1.02
B	150	6.34	434.98	435.46	435.63	436.00	0.115620	3.26	1.94	8.14	2.13
B	144.925	6.34	434.51	435.05	435.12	435.28	0.133475	2.17	2.92	25.21	2.03
B	135	6.34	431.50	432.10	432.43	433.45	0.234773	5.15	1.23	4.27	3.06
B	120	6.34	429.93	430.38	430.59	431.04	0.100536	3.61	1.75	5.57	2.06
B	105	6.34	427.86	428.24	428.49	429.13	0.162830	4.16	1.52	5.63	2.56
B	90	6.34	426.00	426.49	426.68	427.13	0.104002	3.53	1.80	6.00	2.06
B	75	6.34	423.96	424.32	424.55	425.17	0.164680	4.08	1.55	5.98	2.55
B	60	6.34	422.05	422.55	422.76	423.23	0.099170	3.66	1.73	5.33	2.05
B	45	6.34	420.80	421.24	421.43	421.84	0.084183	3.41	1.86	5.61	1.89
B	38.822	6.34	420.50	420.90	421.05	421.33	0.066293	2.89	2.19	7.17	1.67
B	30	6.34	420.09	420.81	420.81	420.97	0.023304	1.78	3.57	11.14	1.00
B	15	6.34	419.22	419.83	419.98	420.31	0.096842	3.08	2.06	8.13	1.96
B	0.00	6.34	418.46	419.06	419.13	419.32	0.042331	2.29	2.77	9.27	1.33

HEC-RAS Plan:

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	Wb El (m)	Cnt W S (m)	E G Elev (m)	E G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
C	72.564	PF 1	19.37	443.55	444.37	444.37	444.55	0.023560	1.86	10.43	30.03	1.01
C	60	PF 1	19.37	441.34	442.25	442.74	443.84	0.123308	5.57	3.48	6.37	2.41
C	45	PF 1	19.37	441.00	442.33	441.67	442.34	0.000516	0.54	35.60	37.01	0.18
C	30	PF 1	19.37	440.00	442.31		442.33	0.000507	0.64	30.09	22.98	0.18
C	15	PF 1	19.37	440.29	441.94	441.90	442.28	0.016714	2.60	7.45	9.75	0.95
C	0.00	PF 1	19.37	440.29	441.67	441.67	442.01	0.014096	2.57	7.54	11.41	1.01

HEC-RAS Plan:

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W/S Elev (m)	Cnt W/S (m)	E/G Elev (m)	E/G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
C	72.5+4	PF 1	19.37	443.55	444.37	444.37	444.55	0.023560	1.86	10.43	30.03	1.01
C	60	PF 1	19.37	441.34	442.25	442.74	443.84	0.123301	5.57	3.48	6.37	2.41
C	45	PF 1	19.37	441.00	442.33	441.62	442.34	0.000516	0.54	35.60	37.01	0.18
C	30	PF 1	19.37	440.00	442.31		442.33	0.000507	0.64	30.09	22.98	0.18
C	15	PF 1	19.37	440.29	441.04	441.90	442.28	0.016714	2.60	7.45	9.75	0.95
C	0.00	PF 1	19.37	440.29	441.67	441.67	442.01	0.019096	2.57	7.54	11.41	1.01

HEC-RAS Plan:

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	WS Elev (m)	Cnt WS (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vet Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Cht
C	72.564	PF 1	19.37	443.55	444.37	444.37	444.55	0.023576	1.60	10.43	30.02	1.01
C	60	PF 1	19.37	441.34	442.33	442.74	443.64	0.123285	5.57	3.48	6.37	2.41
C	45	PF 1	19.37	441.00	441.52	441.82	441.89	0.091292	2.71	7.14	33.12	1.86
C	30	PF 1	19.37	440.00	441.27	441.27	441.52	0.020839	2.20	8.82	18.0	1.00
C	15	PF 1	19.37	440.29	441.90	441.90	442.28	0.018816	2.72	7.13	9.53	1.00
C	0.00	PF 1	19.37	440.29	441.85	441.68	442.01	0.020941	2.66	7.28	11.22	1.05

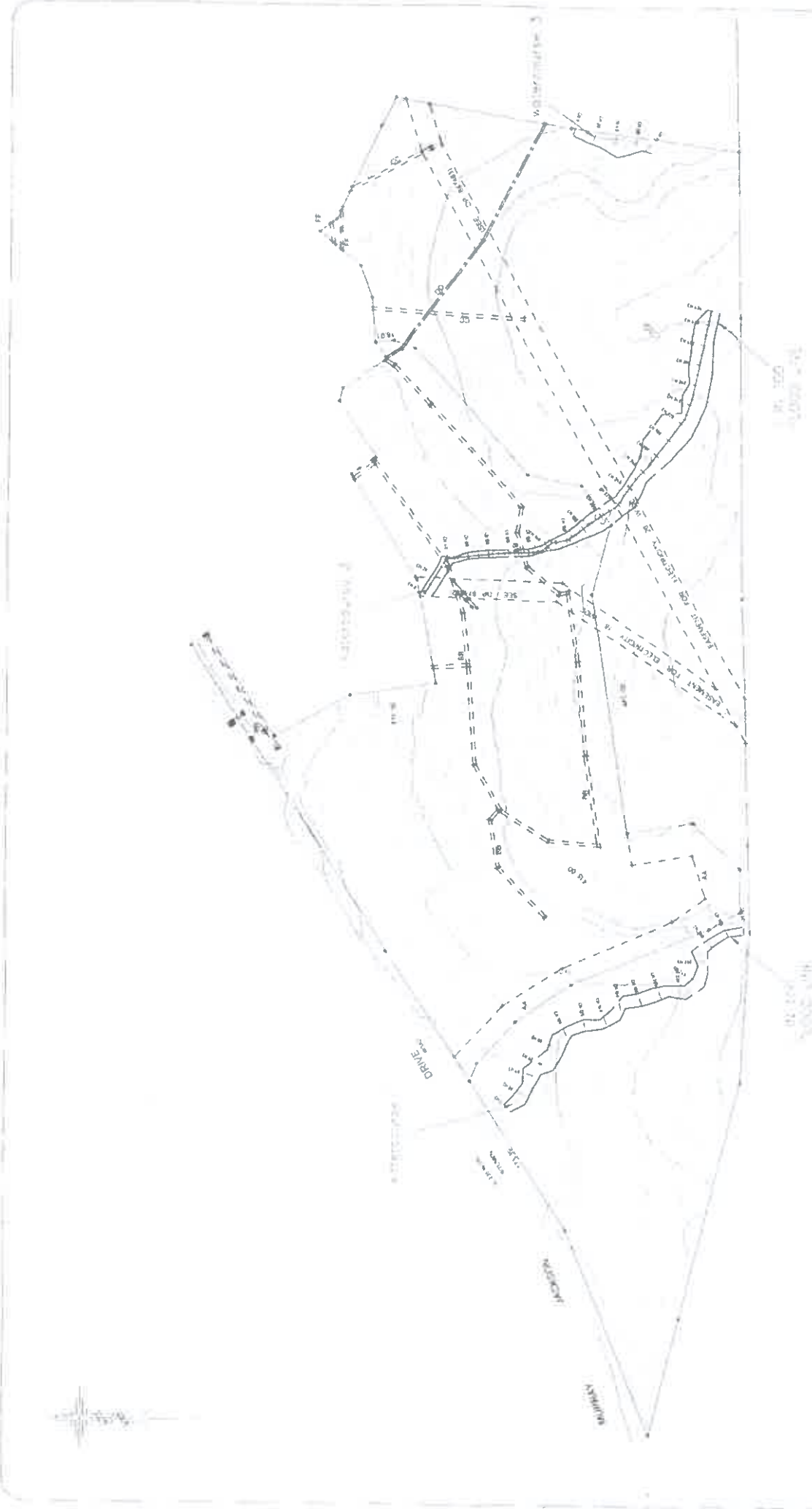
Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	WS Elev (m)	Chl W S (m)	E G Elev (m)	E G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Cht
C	72.564	PF 1	19.37	443.55	444.31	444.37	444.55	0.023560	1.86	10.43	30.03	1.01
C	60	PF 1	19.37	441.34	442.25	442.74	443.84	0.123306	5.57	3.48	6.37	2.41
C	45	PF 1	19.37	441.00	442.33	441.62	442.34	0.000516	0.54	35.60	37.01	0.10
C	30	PF 1	19.37	440.00	442.31		442.33	0.000507	0.64	30.09	22.98	0.18
C	15	PF 1	19.37	440.29	441.94	441.90	442.28	0.016714	2.60	7.45	9.75	0.95
C	0.00	PF 1	19.37	440.20	441.81	441.67	442.01	0.018096	2.57	7.54	11.41	1.01

HEC-RAS Plan.

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W S (m)	E G Elev (m)	E G Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
C	72.564	PF 1	19.37	443.55	444.31	444.37	444.55	0.023560	1.86	10.43	30.03	1.01
C	80	PF 1	19.37	441.34	442.74	442.74	443.10	0.019579	2.63	7.38	10.51	1.00
C	45	PF 1	19.37	441.00	442.77		442.34	0.000510	0.54	35.60	37.01	0.11
C	30	PF 1	19.37	440.00	442.31		442.33	0.000507	0.64	30.09	22.98	0.11
C	15	PF 1	19.37	440.29	441.84	441.90	442.28	0.016714	2.60	7.45	9.75	0.95
C	0.00	PF 1	19.37	440.29	441.67	441.67	442.01	0.019090	2.57	7.54	11.41	1.01

APPENDIX C

DRAWINGS 05166.CO1



- AA - RIGHT OF CARRIAGEWAY VARIABLE WIDTH (SEE DP 878862)
- BB - EASEMENT FOR WATER SUPPLY 3 WIDE (SEE DP 878862)
- CC - EASEMENT FOR ELECTRICITY 3 WIDE (SEE DP 847483)
- DD - EASEMENT FOR WATER SUPPLY 2 WIDE (SEE DP 847483)
- EE - EASEMENT TO DRAIN SEWAGE 3 WIDE (SEE DP 847483)
- FF - EASEMENT FOR WATER SUPPLY 2 WIDE (SEE DP 847483)

REV	DESCRIPTION	DEN	APP	DATE



Head Office:
 18-12 New Street
 Sydney NSW 1500
 PO Box 415
 Tel: (02) 9550 2770
 Fax: (02) 9550 2771
 Email: info@siteplus.com.au

Local Office:
 18-12 New Street
 Sydney NSW 1500
 PO Box 415
 Tel: (02) 9550 2770
 Fax: (02) 9550 2771
 Email: info@siteplus.com.au

DATE: 28/08/20
 DRAWN: [Signature]
 CHECKED: [Signature]
 APPROVED: [Signature]
 SCALE: 1:500

**PROPOSED TALBINGO WEST
 RESIDENTIAL ESTATE, TALBINGO
 LOTS 35 & 36 DP878862
 1 IN 100 YEAR FLOOD LINES**

REV: 05166.C01
 SHEET 1 OF 1
 A3

ENGINEERING CONSTRAINTS MAP

TALBINGO WEST
RESIDENTIAL ESTATE MASTER PLAN



Create Water Quality ponds
Area shown is indicative
only

Access to these lots impossible
unless extensive filling occurs.

Split level road will not
help Reservoir deletion

Create Water Quality pond
off-stream.

Delete 5 lots west
of road.

Difficult accesses

Road embankment protection
required from flooding

NOTE: All services
to be considered redundant.
All new servicing infrastructure is required.
2 Hard copy of geotechnical report.

Difficult access. Gain
access from roads to
east and west of lot

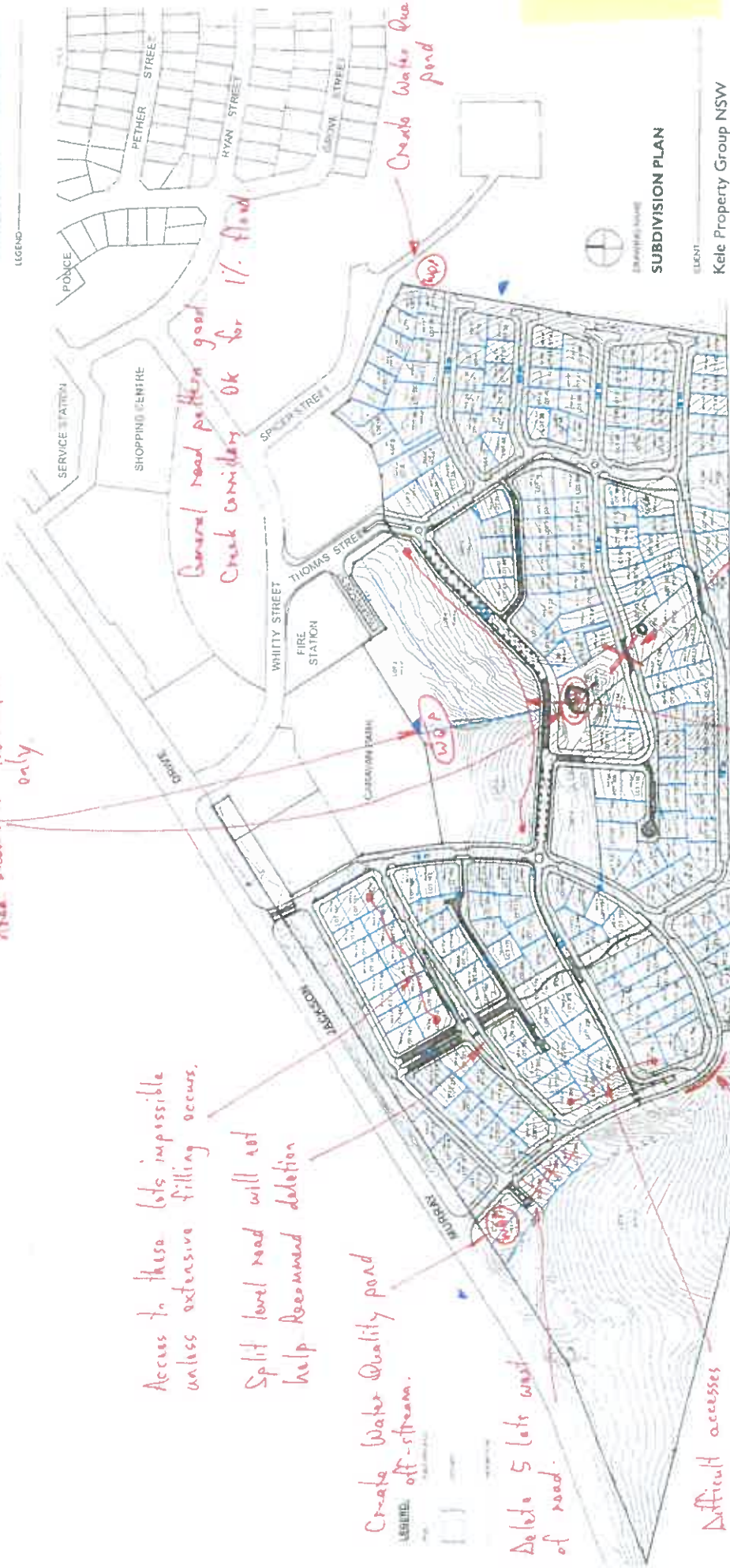
Roadways to have
swales where possible. Seek
greater width in Road Reserve
to say 20 metres (or even 22m)

Assume No On Site Detention necessary

Eliminate creek crossing

General road pattern good
Creek corridors OK for 1% flood

Create Water Quality
pond



SUBDIVISION PLAN

CLIENT
Kele Property Group NSW

DEVELOPMENT MANAGER
Urban Link P/L

ARCHITECT
Prescott Architects P/L

PROJECT
Talbingo Masterplan

DRAWN	CHECKED	DATE
TJ/SG	RP	04/07/2021
SCALE	DRAWING NUMBER	
1:1000 (1/13)	04071-17	