
APPENDIX B – EXISTING CONDITIONS DRAINS RESULTS

Existing Conditions DRAINS - Catchment Data

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)
AJD2	JD2	1.13	96	4	0.82	0.793	0.032
AJD1	JD1	0.15	85	15	0.107	0.093	0.016
AJD	JD	2.46	92	8	1.772	1.655	0.141
AJC	JC	0.41	79	21	0.288	0.233	0.06
AJB	JB	0.2263	77	23	0.159	0.125	0.037
AOA1	OA1	0.98	95	5	0.71	0.681	0.035
AN	N	3.65	95	5	2.644	2.536	0.13
AL	L	4.13	23	77	2.9	0.688	2.247
AK	K	4.69	98	2	3.417	3.361	0.067
AOB1	OB1	0.08	100	0	0.059	0.059	0
AOB	OB	0.47	95	5	0.34	0.327	0.017
AJ24	J24	0.62	81	19	0.437	0.367	0.084
AJ21A	J21A	2.19	81	19	1.545	1.297	0.297
AJ19D	J19D	0.98	81	19	0.691	0.58	0.133
AJ19A	J19A	1.79	90	10	1.285	1.178	0.128
AJ18	J18	1.34	79	21	0.942	0.762	0.197
AJ17B	J17B	0.35	64	36	0.243	0.162	0.089
AJ17	J17	6.53	6	94	4.569	0.264	4.336
CSF5	SF5	0.2879	98	2	0.21	0.206	0.004
AJ40	J40	0.6	81	19	0.423	0.355	0.081
AJ35	J35	0.19	85	15	0.135	0.118	0.02
AJ33	J33	0.19	85	15	0.135	0.118	0.02
AJ32	J32	0.19	85	15	0.135	0.118	0.02
AJ31	J31	0.19	85	15	0.135	0.118	0.02
AJ30	J30	0.19	85	15	0.135	0.118	0.02
AJ26	J26	0.19	88	12	0.136	0.122	0.016
AJ13A	J13A	1.38	10	90	0.973	0.101	0.887
AJ12	J12	0.34	10	90	0.24	0.025	0.218
AJ11	J11	1.61	10	90	1.135	0.118	1.034
AJ37	J37	2.73	82	18	1.929	1.637	0.351
AJ36	J36	1.16	87	13	0.828	0.738	0.108
AJ38	J38	1.79	90	10	1.285	1.178	0.128
AJ29	J29	0.6	88	12	0.429	0.386	0.051
AOD	OD	5.57	90	10	3.629	3.342	0.391
AJ41	J41	0.44	81	19	0.31	0.261	0.06
AH1B	H1B	0.39	72	28	0.272	0.202	0.077
AH1A	H1A	0.48	69	31	0.333	0.238	0.104
AH1	H1	0.71	72	28	0.495	0.368	0.139
AZFB2	ZFB2	0.44	72	28	0.307	0.228	0.086
AZFB	ZFB	0.46	65	35	0.32	0.217	0.114
AZFA	ZFA	1	72	28	0.697	0.518	0.196
AZFA2	ZFA2	0.19	72	28	0.132	0.098	0.037
AZFD3	ZFD3	0.2	80	20	0.141	0.117	0.029
AZFD1	ZFD1	0.24	90	10	0.172	0.158	0.017
AZFD	ZFD	2.01	78	22	1.411	1.128	0.31
AZFC	ZFC	1.67	75	25	1.168	0.901	0.293
AZGB	ZGB	0.75	86	14	0.534	0.472	0.075
AZGA	ZGA	2.81	77	23	1.97	1.557	0.454
AZFC2	ZFC2	0.26	72	28	0.181	0.135	0.051
AZH	ZH	5.75	83	17	3.686	3.181	0.686
AY36	Y36	0.16	80	20	0.113	0.094	0.023
AY34	Y34	7.26	80	20	4.621	3.872	1.019
AY33	Y33	2.13	80	20	1.5	1.246	0.304
AY27	Y27	4.92	73	27	3.434	2.584	0.932
AY26	Y26	3.4	80	20	2.394	1.989	0.485

Existing Conditions DRAINS - Catchment Data

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)
AY25	Y25	0.18	80	20	0.127	0.105	0.026
AY24	Y24	0.31	75	25	0.217	0.167	0.054
AY32	Y32	4.91	85	15	3.49	3.052	0.526
AY30	Y30	1.35	85	15	0.96	0.839	0.145
AY29	Y29	4.5	80	20	3.168	2.632	0.643
AY28A	Y28A	0.21	75	25	0.147	0.113	0.037
AY28	Y28	0.52	72	28	0.363	0.269	0.102
CSG9	SG9	0.3227	98	2	0.236	0.231	0.005
CSG5	SG5	0.0641	98	2	0.047	0.046	0.001
CSG4	SG4	0.5453	98	2	0.399	0.391	0.008
CSG3	SG3	0.3405	98	2	0.249	0.244	0.005
CSG1	SG1	0.357	98	2	0.261	0.256	0.005
CSD5	SD5	0.0564	98	2	0.041	0.04	0.001
CSD2	SD2	0.1614	98	2	0.118	0.116	0.002
CSD1	SD1	0.1875	98	2	0.137	0.134	0.003
CS11	SI1	0.1491	98	2	0.109	0.107	0.002
CSA3	SA3	0.9036	98	2	0.66	0.648	0.013
CSA2	SA2	0.2842	98	2	0.208	0.204	0.004
CSA1	SA1	0.2052	98	2	0.15	0.147	0.003
CS	S	0.1963	98	2	0.143	0.141	0.003
CSE3	SE3	0.0569	98	2	0.042	0.041	0.001
CSE2	SE2	0.0344	98	2	0.025	0.025	0
CSC21	SC21A	0.1624	98	2	0.119	0.116	0.002
CSC23	SC23A	0.4866	98	2	0.356	0.349	0.007
CSC18	SC18A	0.4613	98	2	0.337	0.331	0.007
CSC3	SC3A	2.6387	98	2	1.929	1.891	0.038
CSC2	SC2A	0.2556	98	2	0.187	0.183	0.004
CSC1	SC1A	0.1087	98	2	0.079	0.078	0.002
CSB2A	SB2A	0.4791	98	2	0.35	0.343	0.007
CSB2B	SB2B	0.2731	98	2	0.2	0.196	0.004
CSB3	SB3A	1.0117	98	2	0.739	0.725	0.014
CSB4	SB4A	0.3014	98	2	0.22	0.216	0.004
CSB5	SB5A	0.0922	98	2	0.067	0.066	0.001
CSJ1	SI1	0.4732	98	2	0.346	0.339	0.007
CSK1	SK1	0.4265	98	2	0.312	0.306	0.006
CSB7B	SB7B	0.2552	98	2	0.187	0.183	0.004
CSB7A	SB7A	0.2515	98	2	0.184	0.18	0.004
CSM6	SM6	0.4416	98	2	0.323	0.316	0.006
CSH5	SH5	0.3128	98	2	0.229	0.224	0.004
CSH4	SH4	0.1414	98	2	0.103	0.101	0.002
CSH2	SH2	0.1613	98	2	0.118	0.116	0.002
CSG3A	SG3A	0.5194	98	2	0.38	0.372	0.007
CSM4A	SM4A	0.1292	98	2	0.094	0.093	0.002
CSM4B	SM4B	0.4031	98	2	0.295	0.289	0.006
CSM3A	SM3A	0.0922	98	2	0.067	0.066	0.001
CSM3B	SM3B	0.3389	98	2	0.248	0.243	0.005
CSM1A	SM1A	0.0671	98	2	0.049	0.048	0.001
CSM1B	SM1B	0.2252	98	2	0.165	0.161	0.003
CSC14	SC13A	0.134	98	2	0.098	0.096	0.002
CSL1	SL1	0.2552	98	2	0.187	0.183	0.004

Existing Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
JD2	OnGrade	Old Drains	SSQQS1		1.5	21.79		No	21.81		0.82		0.666
JD1	OnGrade	Old Drains	SSQQS1		1.5	16.9		No	17.16		0.771		0.789
JD	OnGrade	Old Drains	SSQQS1		1.5	15.25		No	16		9.015		9.91
JC	OnGrade	Old Drains	SSQQS1		1.5	15.21		No	15.25		0.288		0.355
JB	OnGrade	Old Drains	SSQQS1		1.5	15.36		No	14.56		0.159		0
SB8	OnGrade	Junction	JP		1.5	15		Yes	14.11		0		
SB7	OnGrade	Junction	JP		2	14.27		Yes	13.77		0		
SB6	OnGrade	Junction	JP		2	13.606		Yes	13.37		0		
SB5	OnGrade	Junction	JP		2	12.854		Yes	12.79		0		
SB4	OnGrade	Junction	JP		2	11.869		Yes	12.1		0		
SB3	OnGrade	Junction	JP		2	11.408		Yes	11.66		0		
H	OnGrade	Junction	JP		2	10.7		Yes	11.24		0		
SB2	OnGrade	Junction	JP		2	9.616		Yes	9.87		0		
SB1	OnGrade	Junction	JP		0.5	9.408		Yes	9.47		0		
S1	Node					9.347			9.35		5.921		
OA1	OnGrade	Old Drains	SSQQS1		1.5	26.28		No	26.66		0.71		1.183
OA	OnGrade	Old Drains	SSQQS1		1.5	26.2		Yes	25.07		0		
O	OnGrade	Old Drains	SSQQS1		1.5	23.81		Yes	23.01		0		
N	Sag	Old Drains	SSQQS 5	90	1.5	21.9	0.3	No	22.23	22.45	4.352	281.4	3.232
M	OnGrade	Old Drains	SSQQS1		1.5	21.5		Yes	19.44		0		
L	OnGrade	Old Drains	SSQQS1		1.5	18		No	18.1		5.976		3.967
K	OnGrade	Old Drains	SSQQS1		1.5	15.77		No	16.6		3.417		3.556
OB1	OnGrade	Old Drains	SSQQS1		1.5	26.31		No	26.62		0.059		0.483
OB	Sag	Old Drains	SSQQS 2	45	1.5	26.25	0.3	No	25.94	26.75	3.843	108.5	2.02
J24	OnGrade	Old Drains	SSQQS1		1.5	52.83		No	52.83		0.437		0.301
J23	OnGrade	Old Drains	SSQQS1		1.5	37.39		Yes	36.44		0		
J22	OnGrade	Old Drains	SSQQS1		1.5	36.35		Yes	35.11		0		
J21A	Sag	Old Drains	SSQQS 2	45	1.5	36.2	0.3	No	31.78	36.62	1.545	75.6	1.056
J21	Sag	Old Drains	SSQQS 4	75	1.5	32.93	0.3	No	31.47	33.24	1.056	55.2	0.022
J19D	Sag	Old Drains	SSQQS 2	45	1.5	31.39	0.3	No	30.36	31.73	0.691	45.3	0.181
J19C	OnGrade	Old Drains	SSQQS1		1.5	30.3		Yes	30		0		
J19B	OnGrade	Old Drains	SSQQS1		1.5	29.1		Yes	29.8		0		
J19A	Sag	Old Drains	SSQQS 2	45	1.5	29.43	0.3	No	29.68	29.86	1.829	77.3	1.088
J19	OnGrade	Old Drains	SSQQS1		1.5	29.92		Yes	28.99		0		
J18	Sag	Old Drains	SSQQS 3	53	1.5	27.11	0.3	No	28.13	27.69	2.484	195.4	2.633
J17B	OnGrade	Old Drains	SSQQS1		1.5	26.73		No	27.61		0.243		1.016
J17A	OnGrade	Old Drains	SSQQS1		1.5	25.26		Yes	27.31		0		
J17	OnGrade	Old Drains	SSQQS1		1.5	26		No	26.15		10.253		8.918
J16	OnGrade	Old Drains	SSQQS1		1.5	21.03		Yes	26.1		0		
J15	OnGrade	Old Drains	SSQQS1		1.5	25		Yes	22.51		0		
SF7	OnGrade	Junction	JP		1.5	21.072		Yes	20.4		0		
SF6	OnGrade	Junction	JP		0.5	21.152		Yes	19.74		0		
SF5	OnGrade	Fraser's	SCC-Double		0.5	19.716		No	19.18		0.246		0.101
SF4	OnGrade	Junction	JP		1.5	17.339		Yes	18.54		0		
SF3	OnGrade	Junction	JP		1.5	16.857		Yes	17.81		0		
SF2	OnGrade	Junction	JP		0.5	15.917		Yes	16.73		0		
SF1	OnGrade	Junction	JP		1.5	13.492		Yes	16.19		0		
SC4	OnGrade	Junction	JP		2	13.314		Yes	15.51		0		
SC3	OnGrade	Junction	JP		2	13.177		Yes	15.19		0		
SC2	OnGrade	Junction	JP		2	12.26		Yes	13.75		0		
SC1	OnGrade	Junction	JP		2	11.582		Yes	12.21		0		
J40	OnGrade	Old Drains	SSQQS1		1.5	32.42		No	32.44		0.71		0.562
J39	OnGrade	Old Drains	SSQQS1		1.5	31.45		Yes	30.43		0		
J35	OnGrade	Old Drains	SSQQS1		1.5	35.58		No	35.24		0.135		0
J34	OnGrade	Old Drains	SSQQS1		1.5	32.83		Yes	34.19		0		
J33	OnGrade	Old Drains	SSQQS1		1.5	33.83		No	33.82		0.135		0.037
J32	OnGrade	Old Drains	SSQQS1		1.5	33.48		No	33.45		0.135		0.002
J31	OnGrade	Old Drains	SSQQS1		1.5	33.56		No	32.26		0.135		0
J30	OnGrade	Old Drains	SSQQS1		1.5	31.5		No	31.5		0.135		0.062
J26	OnGrade	Old Drains	SSQQS1		1.5	32.87		No	30.96		0.136		0
J13A	OnGrade	Old Drains	SSQQS1		1.5	21.2		No	23.02		9.352		2.138
J13	OnGrade	Old Drains	SSQQS1		1.5	21.2		Yes	21.64		0		
J12	OnGrade	Old Drains	SSQQS1		1.5	21		No	21.03		2.243		0.425
J11	OnGrade	Old Drains	SSQQS1		1.5	20		No	20.69		1.135		3.332
SC23	OnGrade	Junction	JP		2	17.5		Yes	20.52		0		
SC22	OnGrade	Junction	JP		2	17.735		Yes	20.45		0		
SC21	OnGrade	Junction	JP		2	17.41		Yes	20.38		0		
SC20	OnGrade	Junction	JP		0	17.094		Yes	20.17		0		
SC19	OnGrade	Junction	JP		0	16.678		Yes	20.12		0		
SC18	OnGrade	Junction	JP		2	16.64		Yes	20.09		0		
SC17	OnGrade	Junction	JP		0	17.417		Yes	19.97		0		
SC16	OnGrade	Junction	JP		0	17.739		Yes	19.84		0		

Existing Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
SC15	OnGrade	Junction	JP		0	17.402		Yes	19.75		0		
SC14	OnGrade	Junction	JP		2	17.373		Yes	19.58		0		
SC13	OnGrade	Junction	JP		0	17.373		Yes	19.45		0		
SC12	OnGrade	Junction	JP		0	17.321		Yes	19.32		0		
SC11	OnGrade	Junction	JP		0	17.33		Yes	18.75		0		
SC10	OnGrade	Junction	JP		0	17.35		Yes	18.11		0		
SC9	OnGrade	Junction	JP		0	17.17		Yes	17.53		0		
SC8	OnGrade	Junction	JP		0	17.103		Yes	16.89		0		
SC7	OnGrade	Junction	JP		0	17.3		Yes	16.11		0		
SC6	OnGrade	Junction	JP		0	17.461		Yes	16.03		0		
SC5	OnGrade	Junction	JP		2	13.46		Yes	15.67		0		
J37	OnGrade	Old Drains	SSQQS1		1.5	31.7		No	32.42		1.929		1.711
J36	Sag	Old Drains	SSQQS 2	100	1.5	30.7	0.3	No	31.2	31.24	3.623	314.7	2.501
J38	OnGrade	Old Drains	SSQQS1		1.5	31.5		No	31.97		1.285		1.106
J29	OnGrade	Old Drains	SSQQS1		1.5	35.4		No	35.37		0.429		0
J28	OnGrade	Old Drains	SSQQS1		1.5	35.66		Yes	34.78		0		
J27	OnGrade	Old Drains	SSQQS1		1.5	35.14		Yes	33.59		0		
OD	OnGrade	Old Drains	SSQQS1		1.5	26.48		No	27.65		3.629		3.269
OC	OnGrade	Old Drains	SSQQS1		1.5	26.44		Yes	26.41		0		
J41	OnGrade	Old Drains	SSQQS1		1.5	29.5		No	29.93		0.31		0.531
N1083179015	Node					19			19		3.332		
H1B	OnGrade	Old Drains	SSQQS1		1.5	10		No	10.09		0.272		0.232
H1A	OnGrade	Old Drains	SSQQS1		1.5	9.85		No	9.87		0.552		0.421
H1	OnGrade	Old Drains	SSQQS1		1.5	9.47		No	9.81		0.495		1.282
ZFB2	OnGrade	Old Drains	SSQQS1		1.5	11.73		No	11.78		0.713		0.616
ZFB1	OnGrade	Old Drains	SSQQS1		1.5	11.71		Yes	11.44		0		
ZFB	OnGrade	Old Drains	SSQQS1		1.5	10.83		No	11.12		15.21		11.212
ZFA	OnGrade	Old Drains	SSQQS1		1.5	9.97		No	10.33		17.827		21.569
ZF	OnGrade	Old Drains	SSQQS1		1.5	9.55		Yes	9.68		0		
ZE	Node					8.91			8.9		22.856		
ZFA2	Sag	Old Drains	SSQQS 2	30	1.5	12.05	0.3	No	12.31	12.37	0.245	28	0.104
ZFA1	OnGrade	Old Drains	SSQQS1		1.5	11.5		Yes	11.85		0		
ZFD3	OnGrade	Old Drains	SSQQS1		1.5	18.6		No	14.51		0.141		0
ZFD2	OnGrade	Old Drains	SSQQS1		1.5	15.8		Yes	12.81		0		
ZFD1	OnGrade	Old Drains	SSQQS1		1.5	11.2		No	11.59		0.172		1.02
ZFD	OnGrade	Old Drains	SSQQS1		1.5	11.09		No	11.55		13.44		13.887
ZFC	OnGrade	Old Drains	SSQQS1		1.5	10.88		No	11.19		14.807		14.464
ZGB1	OnGrade	Old Drains	SSQQS1		1.5	11.5		No	11.64		0		
ZGB	OnGrade	Old Drains	SSQQS1		1.5	11.55		No	12.17		0.534		2.055
ZGA	OnGrade	Old Drains	SSQQS 3		1.5	11.68		No	12.09		1.97		1.732
ZG	OnGrade	Old Drains	SSQQS1		1.5	11.2		Yes	11.88		0		
ZFC2	OnGrade	Old Drains	SSQQS1		1.5	10.85		No	11.1		7.92		7.377
ZFC1	OnGrade	Old Drains	SSQQS1		1.5	11.25		Yes	11.15		0		
ZH	OnGrade	Old Drains	SSQQS1		1.5	13.7		No	13.06		3.686		0
ZGC	OnGrade	Old Drains	SSQQS1		1.5	13.01		Yes	12.75		0		
Y36	OnGrade	Old Drains	SSQQS1		1.5	20.41		No	19.99		0.113		0
Y35	OnGrade	Old Drains	SSQQS1		1.5	20.05		Yes	19.97		0		
Y34	OnGrade	Old Drains	SSQQS1		1.5	19.9		No	19.89		4.621		2.28
Y33	OnGrade	Old Drains	SSQQS 4		1.5	18.05		No	18.17		3.758		2.956
Y27	OnGrade	Old Drains	SSQQS1		1.5	16.68		No	17.45		8.335		10.792
Y26	OnGrade	Old Drains	SSQQS1		1.5	13.62		No	14.26		12.971		14.486
Y25	OnGrade	Old Drains	SSQQS1		1.5	13.56		No	13.95		14.596		11.733
Y24	OnGrade	Old Drains	SSQQS1		1.5	13.37		No	13.49		11.932		7.752
Y23A	Node					11.39			11.4		0		
Y32	OnGrade	Old Drains	SSQQS1		1.5	28.51		No	29.53		3.49		2.017
Y31	OnGrade	Old Drains	SSQQS1		1.5	25.72		Yes	25.78		0		
Y30	Sag	Old Drains	SSQQS 2	83	1.5	24.5	0.3	No	24.7	24.94	2.898	156.7	2.141
Y29	Sag	Old Drains	SSQQS 2	45	1.5	22.72	0.3	No	22.91	23.26	5.203	135.5	4.66
Y28A	OnGrade	Old Drains	SSQQS1		1.5	22.05		No	22.21		4.799		3.594
Y28	OnGrade	Old Drains	SSQQS1		1.5	21.04		No	21.04		3.942		2.259
SG9	OnGrade	Frasers	SCC-Single		4	19.334		No	19.43		0.507		0.458
SG8	OnGrade	Junction	JP		1.5	18.925		Yes	18.1		0		
SG7	OnGrade	Junction	JP		0.5	18.693		Yes	17.18		0		
SG6	OnGrade	Junction	JP		0.5	17.676		Yes	16.91		0		
SG5	OnGrade	Frasers	SCC-Single		0.5	16.548		No	16.64		0.502		0.497
SG4	Sag	Frasers	SCC-Triple	10	1.5	15.96	0.3	No	16.58	16.61	0.939	138.3	0.871
SG3	OnGrade	Frasers	SCC-Single		1.5	16.318		No	16.44		0.249		0.145
SG2	OnGrade	Junction	JP		0.5	15.261		Yes	15.03		0		
SG1	OnGrade	Frasers	SCC-Double		0.5	13.76		No	13.89		0.261		0.251
SD5	OnGrade	Frasers	SCC-Double		4	17.558		No	17.6		0.041		0.014
SD4	OnGrade	Junction	JP		1.5	17.306		Yes	17.75		0		
SD3	OnGrade	Junction	JP		0.5	17.648		Yes	17.76		0		

Existing Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
SD2	OnGrade	Frasers	SCC-Double		0.5	17.285		No	17.78		0.118		4.788
SD1	OnGrade	Frasers	SCC-Double		0.5	16.864		No	17.91		4.788		11.216
SI1	OnGrade	Frasers	SCC-Single		4	17.468		No	17.78		0.161		1.819
SA3	OnGrade	Frasers	SCC-Single		4	16.165		No	16.28		0.661		0.597
SA2	OnGrade	Frasers	SCC-Single		0.5	14.909		No	14.96		0.799		0.635
SA1	OnGrade	Frasers	SCC-Single		0.5	12.809		No	12.86		0.15		0.138
S	OnGrade	Frasers	SCC-Single		2	9.347		No	10.02		0.279		0.371
SE3	OnGrade	Frasers	SCC-Single		4	16.161		No	16.23		0.44		0.313
SE2	OnGrade	Frasers	SCC-Single		1.5	15.78		No	15.84		1.194		1.077
SE1	OnGrade	Junction	JP		1.5	15.508		Yes	15.78		0		
SC21A	Sag	Frasers	SCC-Single	163	4	17.41	0.6	No	18.07	18.04	0.766	159.3	0.145
SC23A	Sag	Frasers	SCC-Single	10.4	4	17.5	0.3	No	18.12	18.09	0.707	63.5	0.674
SC18A	Sag	Frasers	SCC-Double	134	4	16.64	1	No	17.81	17.82	12.027	162.7	0.259
SC3A	OnGrade	Frasers	SCC-Triple		4	13.177		No	13.54		3.517		3.61
SC2A	OnGrade	Frasers	SCC-Single		4	12.26		No	12.54		3.79		3.836
SC1A	OnGrade	Frasers	SCC-Single		4	11.582		No	11.8		1.107		1.09
SB2A	OnGrade	Frasers	SCC-Single		4	9.17		No	9.4		0.35		0.359
SB2B	OnGrade	Frasers	SCC-Single		4	9.68		No	9.73		5.631		5.562
N1065521803	Node					9.07			9.07		0.359		
SB3A	OnGrade	Frasers	SCC-Single		4	11.13		No	11.51		5.487		5.452
SB4A	OnGrade	Frasers	SCC-Double		4	11.869		No	12.07		0.22		0.21
N1065521826	Node					11.769			11.77		0.21		
SB5A	OnGrade	Frasers	SCC-Single		4	12.854		No	12.99		0.78		0.74
SJ1	OnGrade	Frasers	SCC-Double		4	12.76		No	12.86		0.346		0.314
SK1	OnGrade	Frasers	SCC-Double		4	14.4		No	14.42		0.312		0.246
SB7B	OnGrade	Frasers	SCC-Single		4	14.49		No	14.55		0.311		0.238
SB7A	OnGrade	Frasers	SCC-Single		4	14.44		No	14.42		0.184		0.115
SM6	OnGrade	Frasers	SCC-Single		4	23.97		No	23.99		0.323		0.28
SM5	OnGrade	Junction	JP		1.5	23.88		Yes	23.28		0		
SM4	OnGrade	Junction	JP		2	22.04		Yes	21.22		0		
SM3	OnGrade	Junction	JP		2	19.26		Yes	18.26		0		
SM2	OnGrade	Junction	JP		0.5	17		Yes	15.93		0		
SM1	OnGrade	Junction	JP		2	15.98		Yes	15.43		0		
SH5	OnGrade	Frasers	SCC-Single		4	22.41		No	22.44		0.229		0.154
SH4	OnGrade	Frasers	SCC-Single		0.5	20.634		No	20.69		0.256		0.243
SH3	OnGrade	Junction	JP		1.5	20.128		Yes	20.47		0		
SH2	OnGrade	Frasers	SCC-Single		0.5	18.414		No	19.63		0.355		0.38
SH1	OnGrade	Junction	JP		1.5	17.672		Yes	19.96		0		
SG3A	OnGrade	Frasers	SCC-Single		4	17.23		No	17.27		0.4		0.305
SM4A	OnGrade	Frasers	SCC-Single		4	22.06		No	21.6		0.094		0.037
SM4B	OnGrade	Frasers	SCC-Double		4	22.05		No	22.04		0.295		0.219
SM3A	OnGrade	Frasers	SCC-Single		4	19.39		No	19.17		0.067		0.022
SM3B	OnGrade	Frasers	SCC-Double		4	19.49		No	19.46		0.463		0.323
SM1A	OnGrade	Frasers	SCC-Single		4	15.69		No	15.5		0.049		0.012
SM1B	OnGrade	Frasers	SCC-Double		4	16.05		No	16.05		0.481		0.413
N1	Node					12.75			12.89		1.04		
N2	Node					16.15			16.29		1.17		
N3	Node					14.38			14.5		0.483		
N4	Node					13.74			13.87		0.722		
SC13A	OnGrade	Frasers	SCC-Single		4	17.31		No	17.39		0.098		0.17
SL1	OnGrade	Frasers	SCC-Double		1.5	15.05		No	15.04		0.187		0.114
N5	Node					11.533			11.79		4.778		

Existing Conditions DRAINS - Pipe Data

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	No of Pipes	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)
PJD2	JD2	JD1	80	21.19	16.39	6	RCP	300	1	0.145	4.1	21.341	17.162
PJD1	JD1	JD	70	16.36	12.51	5.5	RCP	300	1	0.154	2.2	16.731	16.001
PJD	JD	JC	68.54	12.51	11.04	2.14	RectChannel	0.915W x 1.37H	1	4.806	3.8	15.832	15.254
PJC	JC	JB	73.3	11.04	9.77	1.73	RectChannel	0.915W x 1.37H	1	4.668	3.7	15.142	14.562
PJB	JB	SB8	35	9.77	9.179	1.69	RectChannel	0.9W x 1.35H	1	5.08	4.2	14.462	14.108
PSB8	SB8	SB7	23	9.179	8.8	1.65	RectChannel	0.9W x 1.35H	1	5.101	4.2	14.012	13.767
PSB7	SB7	SB6	24.678	8.8	8.53	1.09	RectChannel	0.9W x 1.35H	1	5.288	4.4	13.634	13.369
PSB6	SB6	SB5	35.633	8.53	8.13	1.12	RectChannel	0.9W x 1.35H	1	5.62	4.6	13.211	12.791
PSB5	SB5	SB4	45.778	8.13	7.41	1.57	RectChannel	0.9W x 1.35H	1	5.74	4.7	12.613	12.104
PSB4	SB4	SB3	20.47	7.41	6.96	2.2	RectChannel	0.9W x 1.35H	1	5.858	4.8	11.944	11.665
PSB3	SB3	H	14.962	6.96	6.77	1.27	RectChannel	1.8W x 1.225H	1	12.819	5.8	11.452	11.244
PH	H	SB2	100.419	6.77	5.94	0.83	RectChannel	1.8W x 1.225H	1	11.144	5.1	10.984	9.871
PSB2	SB2	SB1	10.541	5.94	5.85	0.85	RectChannel	1.8W x 1.225H	1	11.055	5	9.587	9.472
PSB1	SB1	S1	2.888	5.85	5.76	3.12	RectChannel	1.8W x 1.225H	1	11.244	5.1	9.416	9.347
POA1	OA1	OA	8.9	25.05	23.88	13.15	RCP	300	1	0.331	4.7	25.615	25.068
POA	OA	O	71.82	23.51	21.21	3.2	RCP	900	1	1.89	6.1	23.947	23.011
PO	O	N	30.2	21.21	18.99	7.35	RectChannel	0.61W x 0.915H	1	1.879	3.4	22.61	22.233
PN	N	M	16.51	18.99	16.72	13.75	RCP	750	1	2.632	7.8	19.522	19.44
PM	M	L	62.4	16.72	15.35	2.2	RCP	1200	1	3.03	2.6	18.457	18.098
PL	L	K	167.76	15.22	12.56	1.59	RectChannel	0.915W x 1.37H	1	5.154	4.1	17.869	16.601
PK	K	JD	25.1	12.56	12.51	0.2	RectChannel	0.915W x 1.37H	1	6.344	5.1	16.372	16.001
POB1	OB1	OB	6.8	24.92	24.56	5.29	RCP	300	1	0.265	3.7	26.081	25.937
POB	OB	OA	30.62	24.56	23.56	3.27	RCP	900	1	1.628	3.5	25.179	25.068
PJ24	J24	J23	154.55	51.82	35.64	10.47	RCP	225	1	0.127	4.8	51.962	36.438
PJ23	J23	J22	49.67	35.64	34.65	1.99	RCP	300	1	0.137	2.6	35.854	35.106
PJ22	J22	J21A	7.96	34.65	34.02	7.91	RCP	525	1	0.176	5	34.776	34.134
PJ21A	J21A	J21	34	31.09	30.07	3	RectChannel	0.9W x 0.6H	1	0.624	1.8	31.465	31.467
PJ21	J21	J19D	49.43	30.07	27.83	4.53	RectChannel	0.61W x 0.915H	1	1.343	3.9	30.636	30.36
PJ19D	J19D	J19C	20.36	27.83	27.35	2.36	RCP	1050	1	1.794	2	30.056	30.002
PJ19C	J19C	J19B	8.89	27.35	27.17	2.02	RectChannel	0.61W x 0.915H	1	1.794	3.2	29.901	29.799
PJ19B	J19B	J19A	1.51	27.17	27.15	1.32	RectChannel	0.61W x 0.915H	1	1.814	3.3	29.694	29.676
PJ19A	J19A	J19	31	27.15	26.3	2.74	RectChannel	0.61W x 0.915H	1	2.26	4	29.501	28.99
PJ19	J19	J18	43.68	26.3	25.32	2.24	RectChannel	0.61W x 0.915H	1	2.21	4	28.843	28.13
PJ18	J18	J17B	48	25.32	23.58	3.62	RectChannel	0.61W x 0.915H	1	2.162	3.9	28.058	27.615
PJ17B	J17B	J17A	89.04	23.58	20.82	3.1	RectChannel	0.61W x 0.915H	1	2.079	3.7	27.603	27.309
PJ17A	J17A	J17	95.78	20.82	19.23	1.66	RectChannel	0.61W x 0.915H	1	2.19	3.9	27.292	26.146
PJ17	J17	J16	20.13	19.23	18.08	5.71	RectChannel	1.22W x 1.195H	1	4.533	3.1	26.125	26.103
PJ16	J16	J15	20.13	18.08	15.14	14.61	RCP	750	1	3.261	7.2	23.514	22.514
PJ15	J15	SF7	212.07	15.14	13.13	0.95	RCP	1050	1	2.89	3.2	21.873	20.399
PSF7	SF7	SF6	3.579	13.13	12.83	8.38	RCP	1050	1	2.876	3.2	19.761	19.741
PSF6	SF6	SF5	63.64	12.83	12.24	0.93	RCP	1050	1	2.892	3.2	19.528	19.178
PSF5	SF5	SF4	73.21	12.24	11.53	0.97	RCP	1050	1	2.938	3.3	18.956	18.538
PSF4	SF4	SF3	13.219	11.53	11.42	0.83	RCP	1050	1	2.977	3.3	17.882	17.807
PSF3	SF3	SF2	74.965	11.42	10.71	0.95	RCP	1050	1	3.049	3.4	17.156	16.732
PSF2	SF2	SF1	57.179	10.71	10.16	0.96	RCP	1050	1	3.154	3.5	16.516	16.193
PSF1	SF1	SC4	7.97	10.16	10.11	0.63	RCP	1050	1	3.21	3.6	15.559	15.515
PSC4	SC4	SC3	4.091	10.11	9.99	2.93	RectChannel	0.9W x 1.35H	1	7.133	5.9	15.278	15.186
PSC3	SC3	SC2	54.319	9.99	8.61	2.54	RectChannel	0.9W x 1.35H	1	7.091	5.8	14.936	13.751
PSC2	SC2	SC1	59.962	8.61	7.07	2.57	RectChannel	0.9W x 1.35H	1	7.125	5.9	13.499	12.209
PSC1	SC1	SB3	13.813	7.07	6.96	0.8	RectChannel	0.9W x 1.35H	1	7.143	5.9	11.965	11.665
PJ40	J40	J39	27.02	29.72	29.28	1.63	RCP	225	1	0.139	3.5	31.73	30.426
PJ39	J39	J19A	50.13	29.28	27.15	4.25	RCP	300	1	0.163	2.3	30.201	29.676
PJ35	J35	J34	55.29	34.07	31.31	4.99	RCP	300	1	0.13	1.8	34.696	34.185
PJ34	J34	J33	17.1	31.31	30.07	7.25	RCP	300	1	0.154	2.2	33.982	33.819
PJ33	J33	J32	24.29	30.07	29.17	3.71	RCP	375	1	0.246	2.2	33.625	33.454
PJ32	J32	J31	36.45	29.17	28.82	0.96	RCP	375	1	0.345	3.1	32.917	32.26
PJ31	J31	J30	20.45	28.82	28.62	0.98	RCP	450	1	0.466	2.9	31.774	31.497
PJ30	J30	J26	36	28.62	28.27	0.97	RCP	525	1	0.606	2.7	31.202	30.956
PJ26	J26	J17A	177.21	28.27	20.82	4.2	RCP	600	1	0.984	3.4	29.779	27.309
PJ13A	J13A	J13	58.9	17.57	17.09	0.81	RectChannel	1.22W x 1.195H	1	8.849	6.1	22.84	21.644
PJ13	J13	J12	8.11	17.09	17.01	0.99	RectChannel	0.94W x 1.4H	1	8.837	6.7	21.258	21.028
PJ12	J12	J11	14.66	16.97	16.53	3	RectChannel	1.83W x 0.865H	1	9.164	5.8	20.921	20.691
PJ11	J11	SC23	38.79	16.53	15.28	3.22	RectChannel	1.83W x 1.065H	1	8.831	4.5	20.65	20.519
PSC23	SC23	SC22	8.212	15.28	15.21	0.85	RectChannel	1.8W x 0.975H	1	8.108	4.6	20.485	20.45
PSC22	SC22	SC21	10.564	15.21	15.11	0.95	RectChannel	1.8W x 0.975H	1	7.802	4.4	20.418	20.375
PSC21	SC21	SC20	44.32	15.11	14.65	1.04	RectChannel	1.8W x 0.975H	1	7.19	4.1	20.344	20.169
PSC20	SC20	SC19	10.031	14.65	14.52	1.3	RectChannel	1.8W x 0.975H	1	6.459	3.7	20.163	20.124
PSC19	SC19	SC18	7.456	14.52	14.43	1.21	RectChannel	1.8W x 0.975H	1	6.207	3.5	20.12	20.09
PSC18	SC18	SC17	21.256	14.43	14.15	1.32	RectChannel	1.8W x 0.9H	1	5.577	3.4	20.068	19.974
PSC17	SC17	SC16	13.496	14.15	14.11	0.3	RectChannel	0.92W x 1.35H	1	5.225	4.2	19.958	19.837

Existing Conditions DRAINS - Pipe Data

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	No of Pipes	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)
PSC16	SC16	SC15	7.479	14.11	14.05	0.8	RectChannel	0.92W x 1.35H	1	5.072	4.1	19.821	19.754
PSC15	SC15	SC14	17.681	14.05	13.92	0.74	RectChannel	0.92W x 1.35H	1	4.894	3.9	19.737	19.579
PSC14	SC14	SC13	5.449	13.92	13.84	1.47	RectChannel	0.92W x 1.35H	1	4.588	3.7	19.499	19.453
PSC13	SC13	SC12	14.278	13.84	13.7	0.98	RectChannel	0.92W x 1.35H	1	4.561	3.7	19.437	19.317
PSC12	SC12	SC11	2.79	13.7	13.7	0	RCP	1050	1	4.543	5.1	18.8	18.754
PSC11	SC11	SC10	7.684	13.7	13.62	1.04	RCP	1050	1	4.541	5	18.238	18.11
PSC10	SC10	SC9	3.573	13.62	13.58	1.12	RCP	1050	1	4.538	5	17.594	17.534
PSC9	SC9	SC8	7.877	13.58	13.51	0.89	RCP	1050	1	4.534	5	17.022	16.893
PSC8	SC8	SC7	16.337	13.51	13.39	0.73	RCP	1050	1	4.53	5	16.384	16.114
PSC7	SC7	SC6	16.756	11.68	11.09	3.52	RectChannel	1.1W x 1.5H	1	4.518	2.7	16.097	16.035
PSC6	SC6	SC5	39.966	11.09	10.16	2.33	RectChannel	0.9W x 1.35H	1	4.501	3.7	16.014	15.671
PSC5	SC5	SC4	7.586	10.16	10.11	0.66	RectChannel	0.9W x 1.35H	1	4.585	3.8	15.584	15.515
PJ37	J37	J36	85.63	25.45	24.59	1	RCP	300	1	0.162	2.3	31.776	31.197
PJ36	J36	J17B	100.69	24.59	23.58	1	RCP	300	1	0.293	4.1	30.529	27.615
PJ38	J38	J36	78	25.37	24.59	1	RCP	300	1	0.151	2.1	31.56	31.197
PJ29	J29	J28	6.4	33.54	33.41	2.03	RCP	450	1	0.418	2.6	34.863	34.776
PJ28	J28	J27	45.75	33.41	32.52	1.95	RCP	450	1	0.418	2.6	34.235	33.593
PJ27	J27	J26	58.09	32.52	28.27	7.32	RCP	450	1	0.424	5.7	32.732	30.956
POD	OD	OC	4.45	25.31	25.17	3.15	RCP	600	1	1.2	4.1	26.213	26.408
POC	OC	OB	6.31	25.17	24.56	9.67	RCP	900	1	1.092	1.9	25.919	25.937
PJ41	J41	J19B	17.1	27.27	27.17	0.58	RCP	225	1	0.131	3.3	29.827	29.799
PH1B	H1B	H1A	75.02	9.27	8.43	1.12	RCP	225	1	0.04	1	10.016	9.873
PH1A	H1A	H1	98.5	8.43	7.5	0.94	RCP	450	1	0.176	1.1	9.871	9.809
PH1	H1	H	135.35	7.5	6.77	0.54	RectChannel	0.915W x 1.37H	1	1.104	0.9	11.211	11.244
PZFB2	ZFB2	ZFB1	12.22	9.02	8.83	1.55	RCP	225	1	0.095	2.4	11.554	11.444
PZFB1	ZFB1	ZFB	56.13	8.83	8.22	1.09	RCP	300	1	0.093	1.3	11.253	11.117
PZFB	ZFB	ZFA	72.75	8.22	8.14	0.11	RectChannel	0.915W x 1.37H	1	4.314	3.4	10.835	10.332
PZFA	ZFA	ZF	35	8.14	7.8	0.97	RectChannel	0.915W x 1.37H	1	4.331	3.5	9.794	9.678
PZF1	ZF	ZE	77.12	6.54	6.02	0.67	RCP	1500	1	4.484	2.5	9.34	8.9
PZF	ZF	H1	37.3	7.8	7.5	0.8	RectChannel	0.915W x 1.37H	1	0.823	0.7	9.796	9.809
PZFA2	ZFA2	ZFA1	15.97	10.24	9.74	3.13	RCP	225	1	0.08	2	12.087	11.853
PZFA1	ZFA1	ZFA	94.41	9.74	8.14	1.69	RCP	225	1	0.086	2.2	11.634	10.332
PZFD3	ZFD3	ZFD2	35.18	13.9	12.14	5	RCP	300	1	0.141	3.8	14.056	12.809
PZFD2	ZFD2	ZFD1	105.14	12.14	9.51	2.5	RCP	400	1	0.141	2.8	12.309	11.59
PZFD1	ZFD1	ZFD	40.57	9.51	8.5	2.49	RCP	450	1	0.171	1.1	11.584	11.549
PZFD	ZFD	ZFC	80.17	8.5	8.26	0.3	RectChannel	0.915W x 1.37H	1	2.876	2.3	11.462	11.194
PZFC	ZFC	ZFB	11.38	8.26	8.22	0.35	RectChannel	0.915W x 1.37H	1	3.634	2.9	11.097	11.117
PZGB1	ZGB1	ZGB	10.67	9.74	9.1	6	RCP	300	1	0.113	1.6	12.165	12.169
PZGB	ZGB	ZGA	7.73	9.1	9.03	0.91	RectChannel	0.915W x 1.37H	1	2.448	2	12.117	12.088
PZGA	ZGA	ZG	22.41	9.03	8.76	1.2	RectChannel	0.915W x 1.37H	1	3.525	2.8	11.965	11.878
PZG	ZG	ZFD	36.8	8.76	8.5	0.71	RectChannel	0.915W x 1.37H	1	3.519	2.8	11.759	11.549
PZFC2	ZFC2	ZFC1	43.58	9.69	9.07	1.42	RCP	300	1	0.102	1.4	11.144	11.15
PZFC1	ZFC1	ZFC	40.02	9.07	8.5	1.42	RCP	400	1	0.094	0.7	11.187	11.194
PZH	ZH	ZGC	42.14	9.4	9.3	0.24	RectChannel	0.915W x 1.37H	1	3.71	3	12.963	12.747
PZGC	ZGC	ZGB	65.18	9.3	9.1	0.31	RectChannel	0.915W x 1.37H	1	3.856	3.1	12.623	12.169
PY36	Y36	Y35	3.19	17.66	17.26	12.54	RCP	900	1	0.297	0.5	19.987	19.969
PY35	Y35	Y34	9.68	17.26	17.08	1.86	RectChannel	0.915W x 0.915H	1	0.591	0.7	19.969	19.892
PY34	Y34	Y33	57.54	17.08	15.94	1.98	RCP	900	1	2.539	3.9	18.817	18.173
PY33	Y33	Y27	90.53	15.94	14.95	1.09	RCP	1200	1	3.517	3	17.728	17.454
PY27	Y27	Y26	236.86	14.95	9.73	2.2	RCP	1350	1	5.471	5.5	15.821	14.26
PY26	Y26	Y25	33.11	9.45	9.04	1.24	RCP	1500	1	6.451	3.5	13.988	13.952
PY25	Y25	Y24	71.74	8.72	8.39	0.46	RCP	1800	1	7.793	3	13.589	13.486
PY24	Y24	Y23A	211.66	8.39	7.01	0.65	RCP	1800	1	9.969	3.8	12.475	11.4
PY32	Y32	Y31	70.29	26.92	24.28	3.76	RCP	600	1	1.259	5.2	27.394	25.783
PY31	Y31	Y30	43.57	24.28	22.94	3.08	RCP	750	1	1.347	3.4	24.898	24.698
PY30	Y30	Y29	92.96	22.92	20.84	2.24	RCP	900	1	1.793	4.2	23.484	22.912
PY29	Y29	Y28A	60.36	20.84	19.87	1.61	RCP	1050	1	2.358	2.6	22.536	22.213
PY28A	Y28A	Y28	77.03	19.87	17.51	3.06	RCP	1050	1	3.564	4	21.572	21.035
PY28	Y28	Y27	126.33	17.51	15.15	1.87	RCP	1050	1	4.344	4.8	19.34	17.454
PSG9	SG9	SG8	7.211	16.53	16.41	1.66	RCP	150	1	0.043	2.4	18.416	18.098
PSG8	SG8	SG7	12.019	16.41	16.24	1.41	RCP	150	1	0.042	2.4	17.72	17.185
PSG7	SG7	SG6	48.828	16.24	15.55	1.41	RCP	225	1	0.047	1.2	17.16	16.909
PSG6	SG6	SG5	48.593	15.55	14.94	1.26	RCP	225	1	0.057	1.4	16.884	16.639
PSG5	SG5	SG4	48.882	14.94	14.37	1.17	RCP	300	1	0.087	1.2	16.63	16.575
PSG4	SG4	SG3	14.673	14.37	14.06	2.11	RCP	300	1	0.245	3.5	16.493	16.437
P SG3	SG3	SG2	52.427	14.06	12.98	2.06	RCP	400	1	0.342	2.7	15.908	15.027
PSG2	SG2	SG1	58.092	12.98	11.66	2.27	RCP	400	1	0.341	2.7	14.854	13.894
PSG1	SG1	SB6	10.531	11.66	8.96	25.64	RCP	400	1	0.433	3.4	13.725	13.369
PSD5	SD5	SD4	8.096	16.12	16.04	0.99	RCP	225	1	0.047	1.2	17.745	17.746
PSD4	SD4	SD3	51.941	16.04	15.64	0.77	RCP	300	1	0.058	0.8	17.763	17.764

Existing Conditions DRAINS - Pipe Data

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	No of Pipes	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)
PSD3	SD3	SD2	38.898	15.64	15.34	0.77	RCP	300	1	0.082	1.2	17.769	17.778
PSD2	SD2	SD1	52.179	15.34	15.01	0.63	RCP	300	1	0.171	2.4	17.891	17.913
PSD1	SD1	SC18	20.364	14.94	14.43	2.5	RCP	450	1	0.464	2.9	20.017	20.09
PSI1	SI1	SD1	32.44	15.72	14.98	2.28	RCP	300	1	0.147	2.1	17.908	17.913
PSA3	SA3	SA2	71.381	15.08	13.52	2.19	RCP	225	1	0.085	2.1	15.813	14.955
PSA2	SA2	SA1	60.542	13.52	11.48	3.37	RCP	300	1	0.208	2.9	14.733	12.861
PSA1	SA1	S	76.038	11.48	8.84	3.47	RCP	300	1	0.218	3.1	12.61	10.023
PS	S	SB1	17	8.84	6.47	13.94	RCP	300	1	0.12	1.7	9.746	9.472
PSE3	SE3	SE2	40.131	15.03	13.93	2.74	RCP	300	1	0.143	2	15.976	15.841
PSE2	SE2	SE1	11.305	13.93	13.23	6.19	RCP	400	1	0.257	2	15.796	15.78
PSE1	SE1	SC5	49.305	13.23	10.67	5.19	RCP	400	1	0.249	2	15.735	15.671
PSC21A	SC21A	SC21	1	15.12	15.11	1	RCP	300	1	0.387	5.5	20.374	20.375
PSC23A	SC23A	SC23	1	15.29	15.28	1	RCP	300	1	0.341	4.8	20.519	20.519
PSC18A	SC18A	SC18	1	14.44	14.43	1	RCP	300	2	0.768	5.4	20.09	20.09
PSC3A	SC3A	SC3	1	10	9.99	1	RCP	300	2	0.79	5.6	15.186	15.186
PSC2A	SC2A	SC2	1	8.62	8.61	1	RCP	300	1	0.373	5.3	13.751	13.751
PSC1A	SC1A	SC1	1	7.08	7.07	1	RCP	300	1	0.208	2.9	12.206	12.209
PSB2A	SB2A	SB2	5	5.99	5.94	1	RCP	225	1	0.028	0.7	9.865	9.871
PSB2B	SB2B	SB1	18	5.99	5.85	0.78	RCP	300	1	0.099	1.4	9.681	9.472
PSB3A	SB3A	SB3	5	7.01	6.96	1	RCP	225	1	0.115	2.9	11.619	11.665
PSB4A	SB4A	SB4	5	7.46	7.41	1	RCP	225	1	0.114	2.9	12.097	12.104
PSB5A	SB5A	SB5	5	8.18	8.13	1	RCP	225	1	0.095	2.4	12.814	12.791
PSJ1	SJ1	SB5	12	11.695	8.13	29.71	RCP	225	1	0.08	2	12.803	12.791
PSK1	SK1	SB7	10	9.3	8.8	5	RCP	225	1	0.117	2.9	13.915	13.767
PSB7B	SB7B	SB7	10	9.3	8.8	5	RCP	225	1	0.094	2.4	13.923	13.767
PSB7A	SB7A	SB7	10	9.3	8.8	5	RCP	225	1	0.093	2.3	13.88	13.767
PSM6	SM6	SM5	5	23.59	23.4	3.8	RCP	225	1	0.037	2.4	23.688	23.495
PSM5	SM5	SM4	70	22.82	20.44	3.4	RCP	300	1	0.049	2.3	22.921	21.221
PSM4	SM4	SM3	74	20.44	17.25	4.31	RCP	375	1	0.177	3.5	20.616	18.26
PSM3	SM3	SM2	53	17.25	15.35	3.58	RCP	450	1	0.357	3.8	17.505	15.927
PSM2	SM2	SM1	33	15.35	12.083	9.9	RCP	450	1	0.36	2.3	15.794	15.425
PSM1	SM1	JB	18	12.083	10.3	9.91	RCP	450	1	0.416	2.6	14.826	14.562
PSH5	SH5	SH4	44	20.952	19.65	2.96	RCP	225	1	0.074	1.9	21.691	20.688
PSH4	SH4	SH3	13.498	19.65	19.25	2.96	RCP	225	1	0.094	2.4	20.626	20.466
PSH3	SH3	SH2	57.508	19.25	17.48	3.08	RCP	225	1	0.086	2.2	20.293	19.63
PSH2	SH2	SH1	54.3	17.48	15.89	2.93	RCP	225	1	0.105	2.6	19.893	19.959
PSH1	SH1	SC22	17.47	15.89	15.53	2.06	RCP	300	1	0.133	1.9	20.442	20.45
PSG3A	SG3A	SG3	52	15.955	14.06	3.64	RCP	300	1	0.11	1.6	16.869	16.437
PSM4A	SM4A	SM4	5	21.19	20.68	10.2	RCP	300	1	0.056	3.5	21.274	21.221
PSM4B	SM4B	SM4	5	21.165	20.44	14.5	RCP	225	1	0.087	2.6	21.342	21.221
PSM3A	SM3A	SM3	5	18.685	18.53	3.1	RCP	225	1	0.045	2.3	18.801	18.641
PSM3B	SM3B	SM3	5	18.47	17.9	11.4	RCP	300	1	0.13	4.4	18.601	18.26
PSM1A	SM1A	JB	10	15.11	10.83	42.8	RCP	225	1	0.036	3.2	15.184	14.562
PSM1B	SM1B	SM1	5	15.34	14.84	10	RCP	225	1	0.066	2.1	15.505	15.425
PSC13A	SC13A	SC14	21	15.74	14.31	6.81	RCP	600	1	0.17	0.6	19.571	19.579
PSL1	SL1	SB8	12.5	14.185	10.35	30.68	RCP	225	1	0.113	2.8	14.815	14.108

Existing Conditions DRAINS - Overland Flow Data

Name	From	To	Travel Time (min)	Bed Slope (%)	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max V
OJD2	JD2	JD1	1.33	6.11	0.666	0.666	11.847	0.032	0.03	1.49
OJD1	JD1	JD	1.17	2.36	0.789	0.789	11.906	0.169	0.04	1.2
OJD	JD	ZFD	4	1.73	9.91	9.91	11.898	0.371	0.5	2.92
OJC	JC	ZFD	4.17	1.65	0.355	0.355	12.113	0.371	0.02	0.77
OJB	JB	ZFB	2.92	3.77	0	0	12.042	0	0	0
OOA1	OA1	OB	0.5	0.08	1.183	1.183	5.736	0.495	0.06	0.13
ON	N	L	4.44	5.25	3.232	3.232	12.021	0.101	0.16	2.69
OL	L	JD	3.5	1.43	3.967	3.967	11.98	0.169	0.2	1.96
OK	K	JD	0.42	2.08	3.556	3.556	11.964	0.169	0.18	2.07
OOB1	OB1	OB	0.1	0.86	0.483	0.483	12.004	0.495	0.02	0.05
OOB	OB	N	1.83	3.1	2.02	2.02	12.102	0.553	0.1	1.89
OJ24	J24	J40	4.08	8.5	0.301	0.301	11.874	0.023	0.02	1.19
OJ21A	J21A	J21	1.94	10.5	1.056	1.056	11.871	0.312	0.05	2.09
OJ21	J21	J19D	3.3	3.68	0.022	0.022	11.897	0.338	0	0.27
OJ19D	J19D	J19A	1.94	7.53	0.181	0.181	11.951	0.43	0.01	0.95
OJ19A	J19A	J18	2.22	3.54	1.088	1.088	11.98	0.576	0.05	1.53
OJ18	J18	J17	14.44	0.6	2.633	2.633	11.962	0.133	0.13	1.29
OJ17B	J17B	J17	10	0.39	1.016	1.016	11.94	0.133	0.05	0.77
OJ17	J17	J13A	5.56	3	8.918	8.918	11.905	0.133	0.45	3.4
OSF5	SF5	SE3	2	2.73	0.101	0.101	3.233	0.149	0.06	1.09
OJ40	J40	J18	1.67	4.08	0.562	0.562	11.87	0.576	0.03	1.24
OJ35	J35	J36	2.33	3.25	0	0	12.084	0	0	0
OJ33	J33	J36	2.53	4.82	0.037	0.037	11.859	0.537	0	0.37
OJ32	J32	J36	2.17	6.18	0.002	0.002	11.915	0.537	0	0.16
OJ31	J31	J36	3.25	9.53	0	0	12.146	0	0	0
OJ30	J30	J36	2.89	1.78	0.062	0.062	12.068	0.537	0	0.4
OJ26	J26	J36	1.33	3.1	0	0	12.102	0	0	0
OJ13A	J13A	J12	3.89	0.3	2.138	2.138	11.108	0.114	0.11	1.02
OJ12	J12	J11	0.83	7.14	0.425	0.425	12.022	0.05	0.02	1.31
OJ11	J11	N1083179015	0.1	10	3.332	3.332	12.01	0.051	0.17	3.3
OJ37	J37	J36	1.42	1.18	1.711	1.711	11.981	0.537	0.09	1.26
OJ36	J36	J17	15	1.92	2.501	2.501	12.01	0.133	0.13	1.76
OJ38	J38	J36	1.33	1.03	1.106	1.106	12.043	0.537	0.06	1.02
OJ29	J29	J26	1.83	2.3	0	0	12.027	0	0	0
OOD	OD	OB	0.17	2.3	3.269	3.269	12.027	0.495	0.16	0.58
OJ41	J41	J19A	0.25	0.41	0.531	0.531	12.079	0.43	0.03	0.07
OH1B	H1B	H1A	1.25	0.2	0.232	0.232	9.069	0.034	0.01	0.48
OH1A	H1A	ZE	1.83	0.78	0.421	0.421	12.019	0.032	0.02	0.66
OH1	H1	ZE	1	0.8	1.282	1.282	11.972	0.071	0.06	1.05
OZFB2	ZFB2	ZFB	1	1.32	0.616	0.616	11.97	0.219	0.03	0.89
OZFB	ZFB	ZFA	1.08	1.19	11.212	11.212	12.032	0.351	0.56	2.58
OZFA	ZFA	ZE	1.92	0.96	21.569	21.569	12.044	0.352	1.08	3.26
OZFA2	ZFA2	ZFA	1.75	1.89	0.104	0.104	11.916	0.351	0.01	0.42
OZFD3	ZFD3	ZFD1	2.33	5.29	0	0	12.067	0	0	0
OZFD1	ZFD1	ZFD	0.67	0.27	1.02	1.02	10.538	0.371	0.05	0.18
OZFD	ZFD	ZFC	1.78	0.26	13.887	13.887	10.341	0.372	0.69	1.93
OZFC	ZFC	ZFB	0.25	0.45	14.464	14.464	11.981	0.311	0.72	2.33
OZGB	ZGB	ZFD	1.17	0.84	2.055	2.055	12.065	0.371	0.1	1.22
OZGA	ZGA	ZFD	1.17	1.23	1.732	1.732	12.005	0.371	0.09	1.35
OZFC2	ZFC2	ZFA	2.67	0.52	7.377	7.377	11.995	0.351	0.37	1.48
OZH	ZH	ZGB1	1.67	2.06	0	0	11.907	0	0	0
OY36	Y36	Y34	0.17	11.09	0	0	12.2	0	0	0
OY34	Y34	Y33	0.92	3.25	2.28	2.28	12.084	0.087	0.11	1.99
OY33	Y33	Y27	1.42	1.52	2.956	2.956	12.108	0.188	0.15	1.7
OY27	Y27	Y26	3.92	1.3	10.792	10.792	12.11	0.402	0.54	2.86
OY26	Y26	Y25	0.58	0.18	14.486	14.486	8.604	0.402	0.72	1.91
OY25	Y25	Y24	1.17	0.26	11.733	11.733	10.341	0.379	0.59	1.81
OY24	Y24	ZFC2	1.1	3.15	7.752	7.752	11.896	0.248	0.39	3.18
OY32	Y32	Y30	1.92	3.55	2.017	2.017	11.997	0.442	0.1	1.92
OY30	Y30	Y29	1.33	1.91	2.141	2.141	11.979	0.538	0.11	1.68

Existing Conditions DRAINS - Overland Flow Data

Name	From	To	Travel Time (min)	Bed Slope (%)	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max V
OY29	Y29	Y28A	1.08	1.12	4.66	4.66	11.892	0.12	0.23	1.95
OY28A	Y28A	Y28	1.17	1.31	3.594	3.594	11.924	0.112	0.18	1.85
OY28	Y28	Y27	2.17	3.46	2.259	2.259	12.154	0.188	0.11	1.95
OSG9	SG9	SG5	2	2.23	0.458	0.458	1.971	0.135	0.22	1.65
OSG5	SG5	SG4	2	1.23	0.497	0.497	2.728	0.65	0.14	1.42
OSG4	SG4	N2	2	0.64	0.871	0.871	2.281	0.233	0.29	1.26
OSG3	SG3	SG4	2	2.39	0.145	0.145	1.256	0.65	0.06	0.2
OSG1	SG1	N4	2	0.4	0.251	0.251	2.169	0.13	0.09	0.74
OSD5	SD5	SA3	2	1.48	0.014	0.014	3.203	0.135	0.03	0.62
OSD2	SD2	SD1	2	0.81	4.788	4.788	3.651	0.94	0.65	0.74
OSD1	SD1	SC18A	2	0.07	11.216	11.216	1.437	1.135	1.25	1.29
OSI1	SI1	SC18A	2	1.49	1.819	1.819	2.124	1.139	0.43	1.3
OSA3	SA3	SA2	2	1.77	0.597	0.597	3.214	0.197	0.26	1.67
OSA2	SA2	SC3A	2	1.44	0.635	0.635	2.354	0.243	0.34	1.71
OSA1	SA1	S	2	4.56	0.138	0.138	1.988	0.078	0.12	1.75
OS	S	S1	2	0.23	0.371	0.371	3.676	0.078	0.04	0.6
OSE3	SE3	N2	2	0.06	0.313	0.313	1.176	0.149	0.08	0.55
OSE2	SE2	SC3A	2	5.21	1.077	1.077	3.422	0.243	0.27	2.53
OSC21	SC21A	SI1	2	0.46	0.145	0.145	2.137	0.334	0.07	0.7
OSC23	SC23A	SC21A	2	1.77	0.674	0.674	10.198	0.634	0.02	0.1
OSC18	SC18A	SA3	2	0.54	0.259	0.259	3.759	0.135	0.06	0.79
OSC3	SC3A	SC2A	2	1.7	3.61	3.61	2.89	0.282	0.7	2.72
OSC2	SC2A	N5	2	1.21	3.836	3.836	3.299	0.282	0.67	2.49
OSC1	SC1A	N5	2	0.61	1.09	1.09	3.128	0.257	0.25	1.14
OSB2A	SB2A	N1065521803	2	1	0.359	0.359	12.079	0.027	0.02	0.68
OSB2B	SB2B	S1	2	2.53	5.562	5.562	12.043	0.11	0.28	2.67
OSB3	SB3A	SB2B	2	1.26	5.452	5.452	5.07	0.274	0.63	2.33
OSB4	SB4A	N1065521826	2	1	0.21	0.21	12.079	0.019	0.01	0.55
OSB5	SB5A	N1	2	0.87	0.74	0.74	3.14	0.148	0.2	1.39
OSJ1	SJ1	N1	2	0.29	0.314	0.314	2.257	0.137	0.09	0.69
OSK1	SK1	N3	2	0.4	0.246	0.246	2.169	0.125	0.1	0.78
OSB7B	SB7B	N3	2	1.22	0.238	0.238	2.625	0.121	0.11	1.14
OSB7A	SB7A	ZFA2	2	4.78	0.115	0.115	12.152	0.321	0.01	0.68
OSM6	SM6	SG9	2	3.51	0.28	0.28	4.242	0.103	0.08	1.43
OSH5	SH5	SH4	2	4.04	0.154	0.154	2.494	0.069	0.1	1.59
OSH4	SH4	SH2	2	3.17	0.243	0.243	2.67	0.128	0.13	1.62
OSH2	SH2	SC23A	2	1.31	0.38	0.38	4.094	0.589	0.17	1.31
OSG3A	SG3A	SE3	2	1.84	0.305	0.305	2.395	0.149	0.17	1.49
OSM4A	SM4A	SF5	2	3.84	0.037	0.037	4.179	0.014	0.01	0.61
OSM4B	SM4B	SM3B	2	3.46	0.219	0.219	3.692	0.057	0.08	1.4
OSM3A	SM3A	SG3A	2	3.22	0.022	0.022	1.644	0.11	0.05	1.05
OSM3B	SM3B	SM1B	2	4	0.323	0.323	2.654	0.094	0.16	1.77
OSM1A	SM1A	SB7B	2	1.79	0.012	0.012	2.537	0.099	0.01	0.53
OSM1B	SM1B	ZFB2	2	3.32	0.413	0.413	11.906	0.034	0.02	1.02
OSB5/J1	N1	SC1A	2	2.6	1.032	1.032	2.594	0.214	0.3	2.21
OSG4/E3	N2	SE2	2	2.06	1.173	1.173	3.094	0.14	0.29	2.11
OSB7B/SK1	N3	N4	2	1.78	0.475	0.475	2.508	0.13	0.19	1.56
OSB7B/SK1/SG1	N4	SB5A	2	2.95	0.715	0.715	2.284	0.138	0.26	2.02
OSC14	SC13A	SC3A	2	2.95	0.17	0.17	12.101	0.243	0.01	0.7
OSL1	SL1	SB7B	2	2.67	0.114	0.114	2.327	0.099	0.06	1.29
OSC1/OSC2	N5	SB3A	2	3.71	4.835	4.835	2.27	0.271	0.99	3.85

APPENDIX C – PROPOSED DEVELOPMENT DRAINS RESULTS

Proposed Conditions DRAINS - Catchment Data

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)
AJD2	JD2	1.13	96	4	0.82	0.793	0.032
AJD1	JD1	0.15	85	15	0.107	0.093	0.016
AJD	JD	2.46	92	8	1.772	1.655	0.141
AJC	JC	0.41	79	21	0.288	0.233	0.06
AJB	JB	0.2263	77	23	0.159	0.125	0.037
AOA1	OA1	0.98	95	5	0.71	0.681	0.035
AN	N	3.65	95	5	2.644	2.536	0.13
AL	L	4.13	23	77	2.9	0.688	2.247
AK	K	4.69	98	2	3.417	3.361	0.067
AOB1	OB1	0.08	100	0	0.059	0.059	0
AOB	OB	0.47	95	5	0.34	0.327	0.017
AJ24	J24	0.62	81	19	0.437	0.367	0.084
AJ21A	J21A	2.19	81	19	1.545	1.297	0.297
AJ19D	J19D	0.98	81	19	0.691	0.58	0.133
AJ19A	J19A	1.79	90	10	1.285	1.178	0.128
AJ18	J18	1.34	79	21	0.942	0.762	0.197
AJ17B	J17B	0.35	64	36	0.243	0.162	0.089
AJ17	J17	6.53	6	94	4.569	0.264	4.336
CSF5	SF5	0.2879	98	2	0.21	0.206	0.004
AJ40	J40	0.6	81	19	0.423	0.355	0.081
AJ35	J35	0.19	85	15	0.135	0.118	0.02
AJ33	J33	0.19	85	15	0.135	0.118	0.02
AJ32	J32	0.19	85	15	0.135	0.118	0.02
AJ31	J31	0.19	85	15	0.135	0.118	0.02
AJ30	J30	0.19	85	15	0.135	0.118	0.02
AJ26	J26	0.19	88	12	0.136	0.122	0.016
AJ13A	J13A	1.38	10	90	0.973	0.101	0.887
AJ12	J12	0.34	10	90	0.24	0.025	0.218
AJ11	J11	1.61	10	90	1.135	0.118	1.034
AJ37	J37	2.73	82	18	1.929	1.637	0.351
AJ36	J36	1.16	87	13	0.828	0.738	0.108
AJ38	J38	1.79	90	10	1.285	1.178	0.128
AJ29	J29	0.6	88	12	0.429	0.386	0.051
AOD	OD	5.57	90	10	3.629	3.342	0.391
AJ41	J41	0.44	81	19	0.31	0.261	0.06
AH1B	H1B	0.39	72	28	0.272	0.202	0.077
AH1A	H1A	0.48	69	31	0.333	0.238	0.104
AH1	H1	0.71	72	28	0.495	0.368	0.139
AZFB2	ZFB2	0.44	72	28	0.307	0.228	0.086
AZFB	ZFB	0.46	65	35	0.32	0.217	0.114
AZFA	ZFA	1	72	28	0.697	0.518	0.196
AZFA2	ZFA2	0.19	72	28	0.132	0.098	0.037
AZFD3	ZFD3	0.2	80	20	0.141	0.117	0.029
AZFD1	ZFD1	0.24	90	10	0.172	0.158	0.017
AZFD	ZFD	2.01	78	22	1.411	1.128	0.31
AZFC	ZFC	1.67	75	25	1.168	0.901	0.293
AZGB	ZGB	0.75	86	14	0.534	0.472	0.075
AZGA	ZGA	2.81	77	23	1.97	1.557	0.454
AZFC2	ZFC2	0.26	72	28	0.181	0.135	0.051
AZH	ZH	5.75	83	17	3.686	3.181	0.686
AY36	Y36	0.16	80	20	0.113	0.094	0.023
AY34	Y34	7.26	80	20	4.621	3.872	1.019
AY33	Y33	2.13	80	20	1.5	1.246	0.304
AY27	Y27	4.92	73	27	3.434	2.584	0.932
AY26	Y26	3.4	80	20	2.394	1.989	0.485

Proposed Conditions DRAINS - Catchment Data

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)
AY25	Y25	0.18	80	20	0.127	0.105	0.026
AY24	Y24	0.31	75	25	0.217	0.167	0.054
AY32	Y32	4.91	85	15	3.49	3.052	0.526
AY30	Y30	1.35	85	15	0.96	0.839	0.145
AY29	Y29	4.5	80	20	3.168	2.632	0.643
AY28A	Y28A	0.21	75	25	0.147	0.113	0.037
AY28	Y28	0.52	72	28	0.363	0.269	0.102
CSG9	SG9	0.3227	98	2	0.236	0.231	0.005
CSG5	SG5	0.0583	98	2	0.043	0.042	0.001
CSG4	SG4	0.3827	98	2	0.28	0.274	0.005
CSG3	SG3	0.3405	98	2	0.249	0.244	0.005
CSG1	SG1	0.357	98	2	0.261	0.256	0.005
CSI1	SI1	0.1494	98	2	0.109	0.107	0.002
CSE3	SE3	0.0569	98	2	0.042	0.041	0.001
CSE2A	SE2A	0.0202	98	2	0.015	0.014	0
CSC21	SC21A	0.1624	98	2	0.119	0.116	0.002
CSC23	SC23A	0.4866	98	2	0.356	0.349	0.007
CSC1	SC1A	0.0835	98	2	0.061	0.06	0.001
CSB2A	SB2A	0.4791	98	2	0.35	0.343	0.007
CSB2B	SB2B	0.107	98	2	0.078	0.077	0.002
CSB3	SB3A	0.0261	98	2	0.019	0.019	0
CSB4	SB4A	0.3014	98	2	0.22	0.216	0.004
CSB5	SB5A	0.0922	98	2	0.067	0.066	0.001
CSK1	SK1	0.4265	98	2	0.312	0.306	0.006
CSB7B	SB7B	0.2552	98	2	0.187	0.183	0.004
CSB7A	SB7A	0.2515	98	2	0.184	0.18	0.004
CSM6	SM6	0.4416	98	2	0.323	0.316	0.006
CSH5	SH5	0.3128	98	2	0.229	0.224	0.004
CSH4	SH4	0.1414	98	2	0.103	0.101	0.002
CSH2	SH2	0.1613	98	2	0.118	0.116	0.002
CSG3A	SG3A	0.5194	98	2	0.38	0.372	0.007
CSM4A	SM4A	0.1292	98	2	0.094	0.093	0.002
CSM4B	SM4B	0.4031	98	2	0.295	0.289	0.006
CSM3A	SM3A	0.0922	98	2	0.067	0.066	0.001
CSM3B	SM3B	0.3389	98	2	0.248	0.243	0.005
CSM1A	SM1A	0.0671	98	2	0.049	0.048	0.001
CSM1B	SM1B	0.2252	98	2	0.165	0.161	0.003
CSL1	SL1	0.2552	98	2	0.187	0.183	0.004
Block 8	B5A	0.1755	100	0	0.128	0.128	0
CB5	B5	0.0333	98	2	0.024	0.024	0
CB6	B6	0.0095	98	2	0.007	0.007	0
CG2	G2	0.4908	98	2	0.357	0.352	0.007
CG1	G1	0.2784	98	2	0.203	0.2	0.004
CD2	D2	0.1441	98	2	0.105	0.103	0.002
CD6A	D6A	0.2112	98	2	0.154	0.151	0.003
CD6	D6	0.0701	98	2	0.051	0.05	0.001
CD5	D5	0.061	98	2	0.044	0.044	0.001
CD4	D4	0.0533	98	2	0.039	0.038	0.001
CD3	D3	0.0272	98	2	0.02	0.019	0
CA2A2	A2A2	0.1902	98	2	0.138	0.136	0.003
CA2/A2A	A2/A2A	0.1319	98	2	0.096	0.095	0.002
CA1	A1	0.0638	98	2	0.046	0.046	0.001
Block 6	A8A	0.0454	100	0	0.033	0.033	0
CA8	A8	0.0688	98	2	0.05	0.049	0.001
CA7	A7	0.1045	98	2	0.076	0.075	0.001

Proposed Conditions DRAINS - Catchment Data

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)
CA6	A6	0.062	98	2	0.045	0.044	0.001
CA5	A5	0.1191	98	2	0.087	0.085	0.002
CA4/A4A	A4/A4A	0.0876	98	2	0.064	0.063	0.001
CA3	A3	0.0217	98	2	0.016	0.016	0
Block 7	A7A	0.0148	100	0	0.011	0.011	0
Block 10	A6A	0.0521	100	0	0.038	0.038	0
Block 3a	D10A	0.1325	100	0	0.097	0.097	0
CD10	D10	0.0333	98	2	0.024	0.024	0
CD8	D8	0.0315	98	2	0.023	0.023	0
Block 3b+3c	A4E1	0.1247	100	0	0.091	0.091	0
CA4E	A4E	0.0423	98	2	0.031	0.03	0.001
CA4D	A4D	0.0849	98	2	0.062	0.061	0.001
Block 9	A2B1	0.1625	100	0	0.119	0.119	0
CA2B	A2B	0.1047	98	2	0.076	0.075	0.001
Block 11b	A2A3	0.1463	100	0	0.107	0.107	0
Block 11a	A1A1	0.2688	100	0	0.197	0.197	0
CA1A	A1A	0.1371	98	2	0.1	0.098	0.002
Block 5b	D7A2	0.1491	100	0	0.109	0.109	0
CD7A	D7A	0.0574	98	2	0.042	0.041	0.001
Block 5a	D7A1	0.2119	100	0	0.155	0.155	0
Block 2	D6B	0.4874	100	0	0.356	0.356	0
Block 4b	D2B	0.1487	100	0	0.109	0.109	0
Block 1	D5C1	0.309	100	0	0.226	0.226	0
CD5C	D5C	0.0082	98	2	0.006	0.006	0
CD5A	D5A	0.0242	98	2	0.018	0.017	0
Block 4a	D3A	0.6272	100	0	0.459	0.459	0
CA10	A10	0.0548	98	2	0.04	0.039	0.001
CA9	A9	0.0322	98	2	0.023	0.023	0
CA11	A11	0.0074	98	2	0.005	0.005	0
CE3	E3	0.0211	98	2	0.015	0.015	0
CE1	E1	0.1026	98	2	0.075	0.074	0.001
CSA3	SA3	0.0483	98	2	0.035	0.035	0.001
CSA2	SA2	0.1137	98	2	0.083	0.081	0.002
CSA1	SA1	0.1674	98	2	0.122	0.12	0.002
CS	S	0.1101	98	2	0.08	0.079	0.002
CE1B	E1B	0.0266	98	2	0.019	0.019	0
CE1A	E1A	0.0256	98	2	0.019	0.018	0
CA4C	A4C	0.1873	98	2	0.136	0.134	0.003
CA4B	A4B	0.1254	98	2	0.091	0.09	0.002
CD2A	D2A	0.006	98	2	0.004	0.004	0
CD5B	D5B	0.0282	98	2	0.021	0.02	0
CD9A	D9A	0.0121	98	2	0.009	0.009	0
CB1	B1	0.0564	98	2	0.041	0.04	0.001
CB3	B3	0.0569	98	2	0.041	0.041	0.001
CF2	F2	0.0751	98	2	0.055	0.054	0.001
CF1	F1	0.0187	98	2	0.014	0.013	0
CC2	C2	0.1372	98	2	0.1	0.098	0.002
CC1	C1	0.0413	98	2	0.03	0.03	0.001
CC4	C4	0.0337	98	2	0.025	0.024	0
CC3	FC3	0.0123	98	2	0.009	0.009	0
CB8	B8	0.0044	98	2	0.003	0.003	0

Proposed Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
JD2	OnGrade	Old Drains	SSQQS1		1.5	21.79		No	21.99		0.82		0.666
JD1	OnGrade	Old Drains	SSQQS1		1.5	16.9		No	17.15		0.771		0.799
JD	OnGrade	Old Drains	SSQQS1		1.5	15.25		No	15.91		9.157		10.105
JC	OnGrade	Old Drains	SSQQS1		1.5	15.21		No	15.21		0.288		0.154
JB	OnGrade	Old Drains	SSQQS1		1.5	15.36		No	14.53		0.159		0
SB8	OnGrade	Junction	JP		1.5	15		Yes	14.09		0		
SB7	OnGrade	Junction	JP		2	14.27		Yes	13.75		0		
SB6	OnGrade	Junction	JP		2	13.606		Yes	13.35		0		
SB5	OnGrade	Junction	JP		2	12.854		Yes	12.78		0		
SB4	OnGrade	Junction	JP		2	11.869		Yes	12.11		0		
SB3	OnGrade	Junction	JP		2	11.408		Yes	11.66		0		
H	OnGrade	Junction	JP		2	10.7		Yes	11.26		0		
SB2	OnGrade	Junction	JP		2	9.616		Yes	9.93		0		
SB1	OnGrade	Junction	JP		0.5	9.408		Yes	9.49		0		
S1	Node					9.347			9.35		2.276		
OA1	OnGrade	Old Drains	SSQQS1		1.5	26.28		No	26.72		0.71		1.142
OA	OnGrade	Old Drains	SSQQS1		1.5	26.2		Yes	24.94		0		
O	OnGrade	Old Drains	SSQQS1		1.5	23.81		Yes	23.02		0		
N	Sag	Old Drains	SSQQS 5	90	1.5	21.9	0.3	No	21.43	22.47	4.481	0	3.657
M	OnGrade	Old Drains	SSQQS1		1.5	21.5		Yes	19.34		0		
L	OnGrade	Old Drains	SSQQS1		1.5	18		No	18.1		6.417		3.672
K	OnGrade	Old Drains	SSQQS1		1.5	15.77		No	16.48		3.417		4.255
OB1	OnGrade	Old Drains	SSQQS1		1.5	26.31		No	26.6		0.059		0.431
OB	Sag	Old Drains	SSQQS 2	45	1.5	26.25	0.3	No	25.79	26.75	3.835	0	2.118
J24	OnGrade	Old Drains	SSQQS1		1.5	52.83		No	52.83		0.437		0.301
J23	OnGrade	Old Drains	SSQQS1		1.5	37.39		Yes	36.43		0		
J22	OnGrade	Old Drains	SSQQS1		1.5	36.35		Yes	35.1		0		
J21A	Sag	Old Drains	SSQQS 2	45	1.5	36.2	0.3	No	31.63	36.63	1.545	0	1.282
J21	Sag	Old Drains	SSQQS 4	75	1.5	32.93	0.3	No	30.98	33.34	1.282	0	0.795
J19D	Sag	Old Drains	SSQQS 2	45	1.5	31.39	0.3	No	29	31.81	1.394	0	1.124
J19C	OnGrade	Old Drains	SSQQS1		1.5	30.3		Yes	28.9		0		
J19B	OnGrade	Old Drains	SSQQS1		1.5	29.1		Yes	28.79		0		
J19A	Sag	Old Drains	SSQQS 2	45	1.5	29.43	0.3	No	28.68	29.93	2.661	0	2.047
J19	OnGrade	Old Drains	SSQQS1		1.5	29.92		Yes	28.21		0		
J18	Sag	Old Drains	SSQQS 3	53	1.5	27.11	0.3	No	27.77	27.71	3.352	0	2.998
J17B	OnGrade	Old Drains	SSQQS1		1.5	26.73		No	27.4		0.243		0.906
J17A	OnGrade	Old Drains	SSQQS1		1.5	25.26		Yes	27.17		0		
J17	OnGrade	Old Drains	SSQQS1		1.5	26		No	26.15		10.535		8.412
J16	OnGrade	Old Drains	SSQQS1		1.5	21.03		Yes	26.1		0		
J15	OnGrade	Old Drains	SSQQS1		1.5	25		Yes	22.49		0		
SF7	OnGrade	Junction	JP		1.5	21.072		Yes	20.37		0		
SF6	OnGrade	Junction	JP		0.5	21.152		Yes	19.71		0		
SF5	OnGrade	Fraser's	SCC-Double		0.5	19.716		No	19.14		0.251		0.132
SF4	OnGrade	Junction	JP		1.5	17.339		Yes	18.5		0		
SF3	OnGrade	Junction	JP		1.5	16.857		Yes	17.75		0		
SF2	OnGrade	Junction	JP		0.5	15.917		Yes	16.67		0		
SF1	OnGrade	Junction	JP		1.5	13.492		Yes	16.14		0		
SC4	OnGrade	Junction	JP		2	13.314		Yes	15.46		0		
SC3	OnGrade	Junction	JP		2	13.177		Yes	15.13		0		
SC2	OnGrade	Junction	JP		2	12.26		Yes	13.7		0		
SC1	OnGrade	Junction	JP		2	11.582		Yes	12.19		0		
J40	OnGrade	Old Drains	SSQQS1		1.5	32.42		No	32.44		0.71		0.561
J39	OnGrade	Old Drains	SSQQS1		1.5	31.45		Yes	29.99		0		
J35	OnGrade	Old Drains	SSQQS1		1.5	35.58		No	35.13		0.135		0

Proposed Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
J34	OnGrade	Old Drains	SSQQS1		1.5	32.83		Yes	34.17		0		
J33	OnGrade	Old Drains	SSQQS1		1.5	33.83		No	33.82		0.135		0.031
J32	OnGrade	Old Drains	SSQQS1		1.5	33.48		No	33.45		0.135		0
J31	OnGrade	Old Drains	SSQQS1		1.5	33.56		No	32.25		0.135		0
J30	OnGrade	Old Drains	SSQQS1		1.5	31.5		No	31.5		0.135		0.052
J26	OnGrade	Old Drains	SSQQS1		1.5	32.87		No	30.96		0.136		0
J13A	OnGrade	Old Drains	SSQQS1		1.5	21.2		No	22.74		8.966		1.311
J13	OnGrade	Old Drains	SSQQS1		1.5	21.2		Yes	21.5		0		
J12	OnGrade	Old Drains	SSQQS1		1.5	21		No	20.93		1.471		0
J11	OnGrade	Old Drains	SSQQS1		1.5	20		No	20.6		1.135		2.743
SC23	OnGrade	Junction	JP		2	17.5		Yes	20.42		0		
SC22	OnGrade	Junction	JP		2	17.735		Yes	20.36		0		
SC21	OnGrade	Junction	JP		2	17.41		Yes	20.29		0		
SC20	OnGrade	Junction	JP		0	17.094		Yes	20.1		0		
SC19	OnGrade	Junction	JP		0	16.678		Yes	20.06		0		
SC18	OnGrade	Junction	JP		2	16.64		Yes	20.03		0		
SC17	OnGrade	Junction	JP		0	17.417		Yes	19.92		0		
SC16	OnGrade	Junction	JP		0	17.739		Yes	19.78		0		
SC15	OnGrade	Junction	JP		0	17.402		Yes	19.7		0		
SC14	OnGrade	Junction	JP		0	17.373		Yes	19.54		0		
SC13	OnGrade	Junction	JP		0	17.373		Yes	19.47		0		
SC12	OnGrade	Junction	JP		0	17.321		Yes	19.33		0		
SC11	OnGrade	Junction	JP		0	17.33		Yes	18.76		0		
SC10	OnGrade	Junction	JP		0	17.35		Yes	18.1		0		
SC9	OnGrade	Junction	JP		0	17.17		Yes	17.51		0		
SC8	OnGrade	Junction	JP		0	17.103		Yes	16.86		0		
SC7	OnGrade	Junction	JP		0	17.3		Yes	16.07		0		
SC6	OnGrade	Junction	JP		0	17.461		Yes	15.99		0		
SC5	OnGrade	Junction	JP		2	13.46		Yes	15.62		0		
J37	OnGrade	Old Drains	SSQQS1		1.5	31.7		No	32.56		1.929		1.717
J36	Sag	Old Drains	SSQQS 2	100	1.5	30.7	0.3	No	31.17	31.24	3.629	0	2.492
J38	OnGrade	Old Drains	SSQQS1		1.5	31.5		No	32.07		1.285		1.104
J29	OnGrade	Old Drains	SSQQS1		1.5	35.4		No	35.35		0.429		0
J28	OnGrade	Old Drains	SSQQS1		1.5	35.66		Yes	34.72		0		
J27	OnGrade	Old Drains	SSQQS1		1.5	35.14		Yes	33.62		0		
OD	OnGrade	Old Drains	SSQQS1		1.5	26.48		No	27.88		3.629		2.983
OC	OnGrade	Old Drains	SSQQS1		1.5	26.44		Yes	26.18		0		
J41	OnGrade	Old Drains	SSQQS1		1.5	29.5		No	29.84		0.31		0.61
N1083179015	Node					19			19		2.743		
H1B	OnGrade	Old Drains	SSQQS1		1.5	10		No	10.12		0.272		0.233
H1A	OnGrade	Old Drains	SSQQS1		1.5	9.85		No	9.87		0.553		0.42
H1	OnGrade	Old Drains	SSQQS1		1.5	9.47		No	9.79		0.495		1.266
ZFB2	OnGrade	Old Drains	SSQQS1		1.5	11.73		No	11.79		0.732		0.604
ZFB1	OnGrade	Old Drains	SSQQS1		1.5	11.71		Yes	11.43		0		
ZFB	OnGrade	Old Drains	SSQQS1		1.5	10.83		No	11.19		15.575		12.016
ZFA	OnGrade	Old Drains	SSQQS1		1.5	9.97		No	10.32		18.578		20.71
ZF	OnGrade	Old Drains	SSQQS1		1.5	9.55		Yes	9.65		0		
ZE	Node					8.91			8.9		22.182		
ZFA2	Sag	Old Drains	SSQQS 2	30	1.5	12.05	0.3	No	12.27	12.38	0.255	0	0.153
ZFA1	OnGrade	Old Drains	SSQQS1		1.5	11.5		Yes	11.83		0		
ZFD3	OnGrade	Old Drains	SSQQS1		1.5	18.6		No	14.51		0.141		0
ZFD2	OnGrade	Old Drains	SSQQS1		1.5	15.8		Yes	12.79		0		
ZFD1	OnGrade	Old Drains	SSQQS1		1.5	11.2		No	11.61		0.172		1.049
ZFD	OnGrade	Old Drains	SSQQS1		1.5	11.09		No	11.58		13.794		13.886

Proposed Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
ZFC	OnGrade	Old Drains	SSQQS1		1.5	10.88		No	11.2		14.829		14.799
ZGB1	OnGrade	Old Drains	SSQQS1		1.5	11.5		No	11.64		0		
ZGB	OnGrade	Old Drains	SSQQS1		1.5	11.55		No	12.24		0.534		2.173
ZGA	OnGrade	Old Drains	SSQQS 3		1.5	11.68		No	12.18		1.97		1.712
ZG	OnGrade	Old Drains	SSQQS1		1.5	11.2		Yes	11.92		0		
ZFC2	OnGrade	Old Drains	SSQQS1		1.5	10.85		No	11.14		6.527		6.909
ZFC1	OnGrade	Old Drains	SSQQS1		1.5	11.25		Yes	11.16		0		
ZH	OnGrade	Old Drains	SSQQS1		1.5	13.7		No	13.08		3.686		0
ZGC	OnGrade	Old Drains	SSQQS1		1.5	13.01		Yes	12.75		0		
Y36	OnGrade	Old Drains	SSQQS1		1.5	20.41		No	19.99		0.113		0
Y35	OnGrade	Old Drains	SSQQS1		1.5	20.05		Yes	19.97		0		
Y34	OnGrade	Old Drains	SSQQS1		1.5	19.9		No	19.89		4.621		2.283
Y33	OnGrade	Old Drains	SSQQS 4		1.5	18.05		No	18.21		3.757		2.944
Y27	OnGrade	Old Drains	SSQQS1		1.5	16.68		No	17.45		8.83		11.215
Y26	OnGrade	Old Drains	SSQQS1		1.5	13.62		No	14.27		13.426		14.552
Y25	OnGrade	Old Drains	SSQQS1		1.5	13.56		No	14		14.666		10.691
Y24	OnGrade	Old Drains	SSQQS1		1.5	13.37		No	13.47		10.887		6.346
Y23A	Node					11.39			11.4		0		
Y32	OnGrade	Old Drains	SSQQS1		1.5	28.51		No	29.61		3.49		1.772
Y31	OnGrade	Old Drains	SSQQS1		1.5	25.72		Yes	25.79		0		
Y30	Sag	Old Drains	SSQQS 2	83	1.5	24.5	0.3	No	24.76	24.95	2.702	0	2.289
Y29	Sag	Old Drains	SSQQS 2	45	1.5	22.72	0.3	No	22.98	23.27	5.312	0	4.981
Y28A	OnGrade	Old Drains	SSQQS1		1.5	22.05		No	22.27		5.12		4.431
Y28	OnGrade	Old Drains	SSQQS1		1.5	21.04		No	21.11		4.765		3.216
SG9	OnGrade	Frasers	SCC-Single		4	19.334		No	19.43		0.507		0.455
SG8	OnGrade	Junction	JP		1.5	18.925		Yes	18.09		0		
SG7	OnGrade	Junction	JP		0.5	18.693		Yes	17.18		0		
SG6	OnGrade	Junction	JP		0.5	17.676		Yes	16.9		0		
SG5	OnGrade	Frasers	SCC-Single		0.5	16.548		No	16.64		0.495		0.475
SG4	Sag	Frasers	SCC-Triple	10	1.5	15.96	0.3	No	16.53	16.59	0.793	0	0.731
SG3	OnGrade	Frasers	SCC-Single		1.5	16.318		No	16.36		0.249		0.162
SG2	OnGrade	Junction	JP		0.5	15.261		Yes	14.99		0		
SG1	OnGrade	Frasers	SCC-Double		0.5	13.76		No	13.88		0.261		0.239
SI1	OnGrade	Frasers	SCC-Single		4	17.468		No	17.61		0.201		0.218
SD1	OnGrade	Junction	JP		0.5	16.864		Yes	19.97		0		
SE3	OnGrade	Frasers	SCC-Single		4	16.161		No	16.23		0.472		0.374
SE2A	OnGrade	Frasers	SCC-Single		0.5	15.78		No	15.94		1.105		0.995
SE2	OnGrade	Frasers	SCC-Single		1.5	15.78		No	15.77		0		
SE1	OnGrade	Junction	JP		1.5	15.508		Yes	15.72		0		
SC21A	Sag	Frasers	SCC-Single	163	4	17.41	0.6	No	18.09	18.05	0.748	0	0.184
SC23A	Sag	Frasers	SCC-Single	10.4	4	17.5	0.3	No	18.14	18.1	0.697	0	0.65
SC1A	OnGrade	Frasers	SCC-Single		4	11.582		No	11.72		0.806		0.794
SB2A	OnGrade	Frasers	SCC-Single		4	9.17		No	9.41		0.35		0.359
SB2B	OnGrade	Frasers	SCC-Single		4	9.68		No	9.68		2.128		2.074
N1065521803	Node					9.07			9.07		0.359		
SB3A	OnGrade	Frasers	SCC-Single		4	11.13		No	11.4		0.906		0.906
SB4A	OnGrade	Frasers	SCC-Double		4	11.869		No	12.04		0.22		0.204
N1065521826	Node					11.769			11.77		0.204		
SB5A	OnGrade	Frasers	SCC-Single		4	12.854		No	12.98		0.769		0.726
SK1	OnGrade	Frasers	SCC-Double		4	14.4		No	14.42		0.312		0.244
SB7B	OnGrade	Frasers	SCC-Single		4	14.49		No	14.52		0.313		0.239
SB7A	OnGrade	Frasers	SCC-Single		4	14.44		No	14.25		0.184		0.125
SM6	OnGrade	Frasers	SCC-Single		4	23.97		No	23.99		0.323		0.28
SM5	OnGrade	Junction	JP		1.5	23.88		Yes	23.27		0		

Proposed Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
SM4	OnGrade	Junction	JP		2	22.04		Yes	21.21		0		
SM3	OnGrade	Junction	JP		2	19.26		Yes	18.23		0		
SM2	OnGrade	Junction	JP		0.5	17		Yes	15.88		0		
SM1	OnGrade	Junction	JP		2	15.98		Yes	15.29		0		
SH5	OnGrade	Frasers	SCC-Single		4	22.41		No	22.11		0.229		0.159
SH4	OnGrade	Frasers	SCC-Single		0.5	20.634		No	20.69		0.262		0.238
SH3	OnGrade	Junction	JP		1.5	20.128		Yes	20.46		0		
SH2	OnGrade	Frasers	SCC-Single		0.5	18.414		No	19.6		0.35		0.365
SH1	OnGrade	Junction	JP		1.5	17.672		Yes	19.88		0		
SG3A	OnGrade	Frasers	SCC-Single		4	17.23		No	17.25		0.403		0.307
SM4A	OnGrade	Frasers	SCC-Single		4	22.06		No	21.57		0.094		0.042
SM4B	OnGrade	Frasers	SCC-Double		4	22.05		No	22.04		0.295		0.219
SM3A	OnGrade	Frasers	SCC-Single		4	19.39		No	19.14		0.067		0.024
SM3B	OnGrade	Frasers	SCC-Double		4	19.49		No	19.28		0.463		0.342
SM1A	OnGrade	Frasers	SCC-Single		4	15.69		No	15.48		0.049		0.015
SM1B	OnGrade	Frasers	SCC-Double		4	16.05		No	16.04		0.5		0.432
N1	Node					12.75			12.87		0.765		
N2	Node					16.15			16.28		1.095		
N3	Node					14.38			14.5		0.484		
N4	Node					13.74			13.87		0.712		
SL1	OnGrade	Frasers	SCC-Double		1.5	15.05		No	15.04		0.187		0.114
N283	Node					17.12			17.15		0.011		
N279	Node					12.061			12.06		0		
B5A	OnGrade	Dummy	UNLIMITED		4	12.661		No	12.34		0.128		0
B5	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	12.511		No	12.03		0.024		0
B6	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	12.753		No	11.86		0.007		0
Det 1	OnGrade	Junction	JP		0.5	11.927		Yes	10.86		0		
Det 2	OnGrade	Junction	JP		2	11.72		Yes	10.76		0		
Det 3	OnGrade	Junction	JP		0.5	11.38		Yes	10.53		0		
Det 4	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		0.5	10.079		No	10.36		0.906		1.225
Det 5	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		0.5	10.02		No	10.2		1.225		1.424
Det 6	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		0.5	9.82		No	10.09		1.424		1.791
Det 7	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	9.78		No	10.02		1.791		2.099
G2	OnGrade	Dummy	UNLIMITED		4	13.5		No	13.49		0.357		0.116
G1	OnGrade	Dummy	UNLIMITED		0.5	12.5		No	12.44		0.299		0.538
D2	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		2	12.439		No	12.27		0.746		0.144
D6A	OnGrade	Dummy	UNLIMITED		4	15.36		No	15.38		0.154		0.03
D6	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		2	15.257		No	15.12		0.154		0.034
D5	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		2	14.139		No	14.1		0.076		0.008
D4	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	13.419		No	13.24		0.044		0.001
D3	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	12.951		No	12.53		0.83		0.167
A2A2	OnGrade	Dummy	UNLIMITED		4	17.22		No	16.05		0.138		0
A2/A2A	OnGrade	Frasers	RM10 Inlet 1.8m Lintel Double		2	15.965		No	14.77		0.11		0
A1	Sag	Frasers	O Connor St Sag 4 x 0.6m x 0.9m	350	2	15.371	0.48	No	13.9	15.58	0.808	0	0
A8A	OnGrade	Dummy	UNLIMITED		4	17.51		No	16.21		0.033		0
A8	OnGrade	Dish Drain Grate	AWY DDG		0.5	17.41		No	16.16		0.05		0.021
A7	OnGrade	Dish Drain Grate	AWY DDG		2	17.41		No	15.93		0.076		0.027
A6	OnGrade	Dish Drain Grate	AWY DDG		2	17.01		No	15.76		0.071		0.031
A5	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	16.791		No	15.55		0.232		0.13
A4/A4A	OnGrade	Frasers	RM10 Inlet 1.8m Lintel Double		2	16.565		No	15.35		0.288		0.064
A3	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		0.5	16.379		No	14.99		0.016		0.001
A7A	OnGrade	Dummy	UNLIMITED		4	17.51		No	15.93		0.011		0
A6A	OnGrade	Dummy	UNLIMITED		4	17.11		No	15.78		0.038		0
D10A	OnGrade	Dummy	UNLIMITED		4	17.34		No	16.97		0.097		0

Proposed Conditions DRAINS - Pit and Node Data

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Bolt-down lid	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Overflow (cu.m/s)
D10	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		0.5	17.24		No	16.65		0.024		0
D9	OnGrade	Junction	JP		2	17.036		Yes	16.59		0		
D8	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		0.5	16.688		No	16.09		0.023		0
D7	OnGrade	Junction	JP		2	16.223		Yes	15.56		0		
A4E1	OnGrade	Dummy	UNLIMITED		4	16.909		No	16.08		0.091		0
A4E	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	16.809		No	15.93		0.031		0
A4D	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	16.812		No	15.81		0.062		0.007
A2B1	OnGrade	Dummy	UNLIMITED		4	16.39		No	15.85		0.119		0
A2B	OnGrade	Dish Drain Grate	AWY DDG		2	16.29		No	15.58		0.076		0.014
A2A3	OnGrade	Dummy	UNLIMITED		4	16.471		No	15.63		0.107		0
A1A1	OnGrade	Dummy	UNLIMITED		4	15.471		No	15.51		0.197		0.043
A1A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	15.371		No	14.51		0.099		0.027
D7A2	OnGrade	Dummy	UNLIMITED		4	16.666		No	16.66		0.109		0.004
D7A	OnGrade	Dish Drain Grate	AWY DDG		2	16.566		No	15.99		0.07		0.013
D7A1	OnGrade	Dummy	UNLIMITED		4	16.666		No	16.67		0.155		0.027
D6B	OnGrade	Dummy	UNLIMITED		4	15.36		No	15.47		0.356		0.096
D2B	OnGrade	Dummy	UNLIMITED		4	12.5		No	12.54		0.109		0.239
D5C1	OnGrade	Dummy	UNLIMITED		4	15.2		No	15.19		0.226		0.071
D5C	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	15.163		No	14.89		0.077		0.012
D5A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	14.834		No	14.56		0.028		0
D3A	OnGrade	Dummy	UNLIMITED		4	12.99		No	13.17		0.459		0.813
A10	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	17.575		No	16.44		0.04		0
A9	OnGrade	Dish Drain Grate	AWY DDG		2	17.202		No	16.21		0.044		0.011
A11	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	17.513		No	16.28		0.005		0
E3	OnGrade	Dish Drain Grate	AWY DDG		4	16.989		No	16.69		0.021		0.004
E2	OnGrade	Junction	JP		2	16.809		Yes	16.63		0		
E1	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		2	16.476		No	16.57		0.086		0.083
SA3	OnGrade	Frasers	SCC-Single		4	16.165		No	16.2		0.117		0.082
SA2	OnGrade	Frasers	SCC-Single		0.5	14.909		No	13.89		0.159		0.097
SA1	OnGrade	Frasers	SCC-Single		0.5	12.809		No	12.17		0.215		0.144
S	OnGrade	Frasers	SCC-Single		2	9.347		No	9.9		0.22		0.302
E1B	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	16.747		No	16.72		0.019		0
E1A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	16.632		No	16.64		0.019		0.008
A4C	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	16.646		No	15.77		0.136		0.051
A4B	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	16.633		No	15.62		0.091		0.022
D2A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	12.183		No	12.35		0.004		0.015
D5B	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	14.63		No	14.59		0.021		0
D9A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	17.289		No	16.59		0.009		0
B1	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	11.471		No	11.57		0.041		0.052
B3	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	11.4		No	11.59		0.041		0.078
F2	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	14.973		No	13.83		0.055		0.004
F1	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		0.5	14.973		No	13.63		0.014		0
C2	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	12.778		No	12.86		0.1		0.073
C1	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		2	12.797		No	12.81		0.03		0.003
C4	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	13.875		No	12.83		0.028		0
FC3	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		1.5	13.875		No	12.81		0.009		0
N5	Node					11.395			11.54		0.905		
N9	Node					12.1			12.21		0.21		
N10	Node					16.226			16.27		0.013		
N11	Node					16.37			16.45		0.058		
SC2A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	12.26		No	12.38		0		0.041
SC3A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	13.177		No	13.24		0		0.097
SC18A	OnGrade	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)		4	16.64		No	16.86		0		0.165
B8	Sag	NSW Dept. of Housing RM10 Inlet, 3% crossfall-all grades	1.8 m lintel (all grades)	220	1.5	12.394	0.4	No	11.15	12.4	0.003	0	0

Proposed Conditions DRAINS - Pipe Data

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	No of Pipes	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)
PJD2	JD2	JD1	80	21.19	16.39	6	RCP	300	1	0.161	4.2	21.35	17.147
PJD1	JD1	JD	70	16.36	12.51	5.5	RCP	300	1	0.154	2.2	16.704	15.911
PJD	JD	JC	68.54	12.51	11.04	2.14	RectChannel	0.915W x 1.37H	1	4.816	3.8	15.744	15.209
PJC	JC	JB	73.3	11.04	9.77	1.73	RectChannel	0.915W x 1.37H	1	4.769	3.8	15.104	14.534
PJB	JB	SB8	35	9.77	9.179	1.69	RectChannel	0.9W x 1.35H	1	5.146	4.2	14.434	14.085
PSB8	SB8	SB7	23	9.179	8.8	1.65	RectChannel	0.9W x 1.35H	1	5.15	4.2	13.99	13.75
PSB7	SB7	SB6	24.678	8.8	8.53	1.09	RectChannel	0.9W x 1.35H	1	5.291	4.4	13.617	13.354
PSB6	SB6	SB5	35.633	8.53	8.13	1.12	RectChannel	0.9W x 1.35H	1	5.582	4.6	13.196	12.78
PSB5	SB5	SB4	45.778	8.13	7.41	1.57	RectChannel	0.9W x 1.35H	1	5.773	4.8	12.607	12.105
PSB4	SB4	SB3	20.47	7.41	6.96	2.2	RectChannel	0.9W x 1.35H	1	5.892	4.8	11.946	11.664
PSB3	SB3	H	14.962	6.96	6.77	1.27	RectChannel	1.8W x 1.225H	1	12.59	5.7	11.456	11.258
PH	H	SB2	100.419	6.77	5.94	0.83	RectChannel	1.8W x 1.225H	1	10.956	5	11.016	9.934
PSB2	SB2	SB1	10.541	5.94	5.85	0.85	RectChannel	1.8W x 1.225H	1	11.798	5.4	9.613	9.486
PSB1	SB1	S1	2.888	5.85	5.76	3.12	RectChannel	1.8W x 1.225H	1	11.912	5.4	9.392	9.347
POA1	OA1	OA	8.9	25.05	23.88	13.15	RCP	300	1	0.284	4	25.549	24.945
POA	OA	O	71.82	23.51	21.21	3.2	RCP	900	1	1.692	5.8	23.929	23.019
PO	O	N	30.2	21.21	18.99	7.35	RectChannel	0.61W x 0.915H	1	1.677	4.9	21.77	21.428
PN	N	M	16.51	18.99	16.72	13.75	RCP	750	1	2.125	8.1	19.419	19.345
PM	M	L	62.4	16.72	15.35	2.2	RCP	1200	1	2.853	2.4	18.555	18.1
PL	L	K	167.76	15.22	12.56	1.59	RectChannel	0.915W x 1.37H	1	5.173	4.1	17.843	16.476
PK	K	JD	25.1	12.56	12.51	0.2	RectChannel	0.915W x 1.37H	1	6.243	5	16.253	15.911
POB1	OB1	OB	6.8	24.92	24.56	5.29	RCP	300	1	0.254	3.6	25.972	25.794
POB	OB	OA	30.62	24.56	23.56	3.27	RCP	900	1	1.446	5.7	24.938	24.945
PJ24	J24	J23	154.55	51.82	35.64	10.47	RCP	225	1	0.127	4.8	51.962	36.433
PJ23	J23	J22	49.67	35.64	34.65	1.99	RCP	300	1	0.137	2.6	35.852	35.104
PJ22	J22	J21A	7.96	34.65	34.02	7.91	RCP	525	1	0.174	5	34.775	34.133
PJ21A	J21A	J21	34	31.09	30.07	3	RectChannel	0.9W x 0.6H	1	0.401	3.5	31.218	30.976
PJ21	J21	J19D	49.43	30.07	27.83	4.53	RectChannel	0.61W x 0.915H	1	0.73	5.1	30.303	29.002
PJ19D	J19D	J19C	20.36	27.83	27.35	2.36	RCP	1050	1	1.349	1.5	28.916	28.901
PJ19C	J19C	J19B	8.89	27.35	27.17	2.02	RectChannel	0.61W x 0.915H	1	1.007	1.8	28.814	28.786
PJ19B	J19B	J19A	1.51	27.17	27.15	1.32	RectChannel	0.61W x 0.915H	1	1.097	2	28.687	28.681
PJ19A	J19A	J19	31	27.15	26.3	2.74	RectChannel	0.61W x 0.915H	1	1.508	2.7	28.432	28.212
PJ19	J19	J18	43.68	26.3	25.32	2.24	RectChannel	0.61W x 0.915H	1	1.539	2.8	28.083	27.774
PJ18	J18	J17B	48	25.32	23.58	3.62	RectChannel	0.61W x 0.915H	1	1.753	3.1	27.708	27.396
PJ17B	J17B	J17A	89.04	23.58	20.82	3.1	RectChannel	0.61W x 0.915H	1	1.779	3.2	27.386	27.167
PJ17A	J17A	J17	95.78	20.82	19.23	1.66	RectChannel	0.61W x 0.915H	1	2.291	4.1	27.151	26.154
PJ17	J17	J16	20.13	19.23	18.08	5.71	RectChannel	1.22W x 1.195H	1	4.224	2.9	26.124	26.103
PJ16	J16	J15	20.13	18.08	15.14	14.61	RCP	750	1	3.222	7.1	23.5	22.494
PJ15	J15	SF7	212.07	15.14	13.13	0.95	RCP	1050	1	2.886	3.2	21.849	20.367
PSF7	SF7	SF6	3.579	13.13	12.83	8.38	RCP	1050	1	2.92	3.2	19.725	19.705
PSF6	SF6	SF5	63.64	12.83	12.24	0.93	RCP	1050	1	2.963	3.3	19.492	19.139
PSF5	SF5	SF4	73.21	12.24	11.53	0.97	RCP	1050	1	3.039	3.4	18.917	18.495
PSF4	SF4	SF3	13.219	11.53	11.42	0.83	RCP	1050	1	3.088	3.4	17.828	17.752
PSF3	SF3	SF2	74.965	11.42	10.71	0.95	RCP	1050	1	3.165	3.5	17.098	16.674
PSF2	SF2	SF1	57.179	10.71	10.16	0.96	RCP	1050	1	3.303	3.7	16.459	16.137
PSF1	SF1	SC4	7.97	10.16	10.11	0.63	RCP	1050	1	3.38	3.8	15.508	15.464
PSC4	SC4	SC3	4.091	10.11	9.99	2.93	RectChannel	0.9W x 1.35H	1	7.134	5.9	15.222	15.129
PSC3	SC3	SC2	54.319	9.99	8.61	2.54	RectChannel	0.9W x 1.35H	1	7.052	5.8	14.873	13.698
PSC2	SC2	SC1	59.962	8.61	7.07	2.57	RectChannel	0.9W x 1.35H	1	7.06	5.8	13.442	12.192
PSC1	SC1	SB3	13.813	7.07	6.96	0.8	RectChannel	0.9W x 1.35H	1	7	5.8	11.956	11.664
PJ40	J40	J39	27.02	29.72	29.28	1.63	RCP	225	1	0.138	3.5	31.551	29.992
PJ39	J39	J19A	50.13	29.28	27.15	4.25	RCP	300	1	0.143	3.6	29.445	28.681
PJ35	J35	J34	55.29	34.07	31.31	4.99	RCP	300	1	0.13	1.8	34.664	34.169
PJ34	J34	J33	17.1	31.31	30.07	7.25	RCP	300	1	0.155	2.2	33.973	33.818
PJ33	J33	J32	24.29	30.07	29.17	3.71	RCP	375	1	0.248	2.2	33.623	33.452
PJ32	J32	J31	36.45	29.17	28.82	0.96	RCP	375	1	0.35	3.2	32.909	32.248
PJ31	J31	J30	20.45	28.82	28.62	0.98	RCP	450	1	0.472	3	31.77	31.497
PJ30	J30	J26	36	28.62	28.27	0.97	RCP	525	1	0.614	2.7	31.208	30.955
PJ26	J26	J17A	177.21	28.27	20.82	4.2	RCP	600	1	1.015	3.5	29.68	27.167
PJ13A	J13A	J13	58.9	17.57	17.09	0.81	RectChannel	1.22W x 1.195H	1	8.561	5.9	22.585	21.499
PJ13	J13	J12	8.11	17.09	17.01	0.99	RectChannel	0.94W x 1.4H	1	8.428	6.4	21.13	20.933
PJ12	J12	J11	14.66	16.97	16.53	3	RectChannel	1.83W x 0.865H	1	8.558	5.4	20.823	20.601
PJ11	J11	SC23	38.79	16.53	15.28	3.22	RectChannel	1.83W x 1.065H	1	7.963	4.1	20.553	20.422
PSC23	SC23	SC22	8.212	15.28	15.21	0.85	RectChannel	1.8W x 0.975H	1	7.484	4.3	20.389	20.356
PSC22	SC22	SC21	10.564	15.21	15.11	0.95	RectChannel	1.8W x 0.975H	1	7.229	4.1	20.324	20.286
PSC21	SC21	SC20	44.32	15.11	14.65	1.04	RectChannel	1.8W x 0.975H	1	6.636	3.8	20.256	20.101
PSC20	SC20	SC19	10.031	14.65	14.52	1.3	RectChannel	1.8W x 0.975H	1	5.992	3.4	20.096	20.06
PSC19	SC19	SC18	7.456	14.52	14.43	1.21	RectChannel	1.8W x 0.975H	1	5.779	3.3	20.055	20.028
PSC18	SC18	SC17	21.256	14.43	14.15	1.32	RectChannel	1.8W x 0.9H	1	5.212	3.2	20.006	19.915
PSC17	SC17	SC16	13.496	14.15	14.11	0.3	RectChannel	0.92W x 1.35H	1	4.957	4	19.9	19.785
PSC16	SC16	SC15	7.479	14.11	14.05	0.8	RectChannel	0.92W x 1.35H	1	4.851	3.9	19.769	19.705
PSC15	SC15	SC14	17.681	14.05	13.92	0.74	RectChannel	0.92W x 1.35H	1	4.726	3.8	19.689	19.536
PSC14	SC14	SC13	5.449	13.92	13.84	1.47	RectChannel	0.92W x 1.35H	1	4.656	3.7	19.519	19.472
PSC13	SC13	SC12	14.278	13.84	13.7	0.98	RectChannel	0.92W x 1.35H	1	4.62	3.7	19.456	19.332
PSC12	SC12	SC11	2.79	13.7	13.7	0	RCP	1050	1	4.601	5.1	18.803	18.756
PSC11	SC11	SC10	7.684	13.7	13.62	1.04	RCP	1050	1	4.593	5.1	18.23	18.099
PSC10	SC10	SC9	3.573	13.62	13.58	1.12	RCP	1050	1	4.59	5.1	17.574	17.513
PSC9	SC9	SC8	7.877	13.58	13.51	0.89	RCP	1050	1	4.587	5.1	16.989	16.858
PSC8	SC8	SC7	16.337	13.51	13.39	0.73	RCP	1050	1	4.582	5.1	16.342	16.073
PSC7	SC7	SC6	16.756	11.68	11.09	3.52	RectChannel	1.1W x 1.5H	1	4.566	2.8	16.055	15.99
PSC6	SC6	SC5	39.966	11.09	10.16	2.33	RectChannel	0.9W x 1.35H	1	4.539	3.7	15.969	15.624
PSC5	SC5	SC4	7.586	10.16	10.11	0.66	RectChannel	0.9W x 1.35H	1	4.604	3.8	15.534	15.464
PJ37	J37	J36	85.63	25.45	24.59	1	RCP	300	1	0.163	2.3	31.785	31.172
PJ36	J36	J17B	100.69	24.59	23.58	1	RCP	300	1	0.288	4.1	30.474	27.396
PJ38	J38	J36	78	25.37	24.59	1	RCP	300	1	0.153	2.2	31.563	31.172
PJ29	J29	J28	6.4	33.54	33.41	2.03	RCP	450	1	0.418	2.6	34.815	34.722
PJ28	J28	J27	45.75	33.41	32.52	1.95	RCP	450	1	0.418	2.6	34.212	33.624
PJ27	J27	J26	58.09	32.52	28.27	7.32	RCP	450	1	0.423	5.8	32.731	30.955

Proposed Conditions DRAINS - Pipe Data

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	No of Pipes	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)
POD	OD	OC	4.45	25.31	25.17	3.15	RCP	600	1	1.024	3.5	26.253	26.177
POC	OC	OB	6.31	25.17	24.56	9.67	RCP	900	1	1.027	2.6	25.7	25.794
PJ41	J41	J19B	17.1	27.27	27.17	0.58	RCP	225	1	0.129	3.2	29.345	28.786
PH1B	H1B	H1A	75.02	9.27	8.43	1.12	RCP	225	1	0.041	1	10.023	9.87
PH1A	H1A	H1	98.5	8.43	7.5	0.94	RCP	450	1	0.176	1.1	9.868	9.793
PH1	H1	H	135.35	7.5	6.77	0.54	RectChannel	0.915W x 1.37H	1	1.076	0.9	11.231	11.258
PZFB2	ZFB2	ZFB1	12.22	9.02	8.83	1.55	RCP	225	1	0.095	2.4	11.548	11.431
PZFB1	ZFB1	ZFB	56.13	8.83	8.22	1.09	RCP	300	1	0.094	1.3	11.276	11.186
PZFB	ZFB	ZFA	72.75	8.22	8.14	0.11	RectChannel	0.915W x 1.37H	1	4.312	3.4	10.844	10.315
PZFA	ZFA	ZF	35	8.14	7.8	0.97	RectChannel	0.915W x 1.37H	1	4.275	3.4	9.785	9.654
PZF1	ZF	ZE	77.12	6.54	6.02	0.67	RCP	1500	1	4.467	2.4	9.32	8.9
PZF	ZF	H1	37.3	7.8	7.5	0.8	RectChannel	0.915W x 1.37H	1	0.784	0.6	9.783	9.793
PZFA2	ZFA2	ZFA1	15.97	10.24	9.74	3.13	RCP	225	1	0.08	2	12.057	11.827
PZFA1	ZFA1	ZFA	94.41	9.74	8.14	1.69	RCP	225	1	0.086	2.2	11.612	10.315
PZFD3	ZFD3	ZFD2	35.18	13.9	12.14	5	RCP	300	1	0.141	3.8	14.056	12.793
PZFD2	ZFD2	ZFD1	105.14	12.14	9.51	2.5	RCP	400	1	0.141	2.8	12.308	11.614
PZFD1	ZFD1	ZFD	40.57	9.51	8.5	2.49	RCP	450	1	0.17	1.1	11.611	11.58
PZFD	ZFD	ZFC	80.17	8.5	8.26	0.3	RectChannel	0.915W x 1.37H	1	2.984	2.4	11.488	11.205
PZFC	ZFC	ZFB	11.38	8.26	8.22	0.35	RectChannel	0.915W x 1.37H	1	3.607	2.9	11.127	11.186
PZGB1	ZGB1	ZGB	10.67	9.74	9.1	6	RCP	300	1	0.101	1.4	12.237	12.241
PZGB	ZGB	ZGA	7.73	9.1	9.03	0.91	RectChannel	0.915W x 1.37H	1	2.456	2	12.209	12.182
PZGA	ZGA	ZG	22.41	9.03	8.76	1.2	RectChannel	0.915W x 1.37H	1	3.712	3	12.047	11.921
PZG	ZG	ZFD	36.8	8.76	8.5	0.71	RectChannel	0.915W x 1.37H	1	3.715	3	11.784	11.58
PZFC2	ZFC2	ZFC1	43.58	9.69	9.07	1.42	RCP	300	1	0.103	1.5	11.154	11.156
PZFC1	ZFC1	ZFC	40.02	9.07	8.5	1.42	RCP	400	1	0.094	0.8	11.195	11.205
PZH	ZH	ZGC	42.14	9.4	9.3	0.24	RectChannel	0.915W x 1.37H	1	3.733	3	12.982	12.754
PZGC	ZGC	ZGB	65.18	9.3	9.1	0.31	RectChannel	0.915W x 1.37H	1	3.838	3.1	12.645	12.241
PY36	Y36	Y35	3.19	17.66	17.26	12.54	RCP	900	1	0.274	0.4	19.989	19.973
PY35	Y35	Y34	9.68	17.26	17.08	1.86	RectChannel	0.915W x 0.915H	1	0.513	0.6	19.971	19.893
PY34	Y34	Y33	57.54	17.08	15.94	1.98	RCP	900	1	2.538	3.9	18.815	18.21
PY33	Y33	Y27	90.53	15.94	14.95	1.09	RCP	1200	1	3.581	3.1	17.728	17.454
PY27	Y27	Y26	236.86	14.95	9.73	2.2	RCP	1350	1	5.484	5.5	15.829	14.268
PY26	Y26	Y25	33.11	9.45	9.04	1.24	RCP	1500	1	6.312	3.5	13.957	14.003
PY25	Y25	Y24	71.74	8.72	8.39	0.46	RCP	1800	1	7.792	3	13.577	13.47
PY24	Y24	Y23A	211.66	8.39	7.01	0.65	RCP	1800	1	9.941	3.8	12.474	11.4
PY32	Y32	Y31	70.29	26.92	24.28	3.76	RCP	600	1	1.291	4.5	27.497	25.786
PY31	Y31	Y30	43.57	24.28	22.94	3.08	RCP	750	1	1.302	4.8	24.716	24.763
PY30	Y30	Y29	92.96	22.94	20.84	2.24	RCP	900	1	1.669	4.9	23.394	22.984
PY29	Y29	Y28A	60.36	20.84	19.87	1.61	RCP	1050	1	1.967	2.2	22.504	22.268
PY28A	Y28A	Y28	77.03	19.87	17.51	3.06	RCP	1050	1	3.551	3.9	21.585	21.109
PY28	Y28	Y27	126.33	17.51	15.15	1.87	RCP	1050	1	4.375	4.9	19.339	17.454
PSG9	SG9	SG8	7.211	16.53	16.41	1.66	RCP	150	1	0.044	2.5	18.41	18.092
PSG8	SG8	SG7	12.019	16.41	16.24	1.41	RCP	150	1	0.045	2.5	17.712	17.175
PSG7	SG7	SG6	48.828	16.24	15.55	1.41	RCP	225	1	0.05	1.3	17.15	16.898
PSG6	SG6	SG5	48.593	15.55	14.94	1.26	RCP	225	1	0.066	1.7	16.873	16.637
PSG5	SG5	SG4	48.882	14.94	14.37	1.17	RCP	300	1	0.096	1.4	16.621	16.527
PSG4	SG4	SG3	14.673	14.37	14.06	2.11	RCP	300	1	0.22	3.1	16.43	16.364
P SG3	SG3	SG2	52.427	14.06	12.98	2.06	RCP	400	1	0.327	2.6	15.844	14.989
PSG2	SG2	SG1	58.092	12.98	11.66	2.27	RCP	400	1	0.33	2.6	14.819	13.878
PSG1	SG1	SB6	10.531	11.66	8.96	25.64	RCP	400	1	0.394	3.1	13.714	13.354
PSI1	SI1	SD1	32.44	15.72	14.98	2.28	RCP	300	1	0.083	1.2	19.944	19.969
PSD1	SD1	SC18	20.364	14.94	14.43	2.5	RCP	450	1	0.149	0.9	19.999	20.028
PSE3	SE3	SE2A	18.391	15.03	14.53	2.72	RCP	300	1	0.1	1.4	15.988	15.935
PSE2A	SE2A	SE2	21.74	14.53	13.93	2.76	RCP	300	1	0.239	3.4	15.894	15.771
PSE2	SE2	SE1	11.305	13.93	13.23	6.19	RCP	400	1	0.239	1.9	15.732	15.718
PSE1	SE1	SC5	49.305	13.23	10.67	5.19	RCP	400	1	0.235	1.9	15.679	15.624
PSC21A	SC21A	SC21	1	15.12	15.11	1	RCP	300	1	0.397	5.6	20.285	20.286
PSC23A	SC23A	SC23	1	15.29	15.28	1	RCP	300	1	0.329	4.6	20.422	20.422
PSC1A	SC1A	SC1	1	7.08	7.07	1	RCP	300	1	0.223	3.2	12.192	12.192
PSB2A	SB2A	SB2	5	5.99	5.94	1	RCP	225	1	0.028	0.7	9.931	9.934
PSB2B	SB2B	SB1	18	5.99	5.85	0.78	RCP	300	1	0.093	1.3	9.682	9.486
PSB3A	SB3A	SB3	5	7.01	6.96	1	RCP	225	1	0.093	2.3	11.631	11.664
PSB4A	SB4A	SB4	5	7.46	7.41	1	RCP	225	1	0.113	2.8	12.103	12.105
PSB5A	SB5A	SB5	5	8.18	8.13	1	RCP	225	1	0.086	2.2	12.805	12.78
PSK1	SK1	SB7	10	9.3	8.8	5	RCP	225	1	0.125	3.1	13.903	13.75
PSB7B	SB7B	SB7	10	9.3	8.8	5	RCP	225	1	0.107	2.7	13.888	13.75
PSB7A	SB7A	SB7	10	9.3	8.8	5	RCP	225	1	0.107	2.7	13.824	13.75
PSM6	SM6	SM5	5	23.59	23.4	3.8	RCP	225	1	0.037	2.3	23.688	23.494
PSM5	SM5	SM4	70	22.82	20.44	3.4	RCP	300	1	0.048	2.3	22.921	21.21
PSM4	SM4	SM3	74	20.44	17.25	4.31	RCP	375	1	0.175	3.5	20.614	18.226
PSM3	SM3	SM2	53	17.25	15.35	3.58	RCP	450	1	0.341	3.8	17.497	15.877
PSM2	SM2	SM1	33	15.35	12.083	9.9	RCP	450	1	0.342	3.2	15.637	15.289
PSM1	SM1	JB	18	12.083	10.3	9.91	RCP	450	1	0.399	2.5	14.757	14.534
PSH5	SH5	SH4	44	20.952	19.65	2.96	RCP	225	1	0.064	1.6	21.447	20.687
PSH4	SH4	SH3	13.498	19.65	19.25	2.96	RCP	225	1	0.094	2.4	20.622	20.457
PSH3	SH3	SH2	57.508	19.25	17.48	3.08	RCP	225	1	0.085	2.1	20.284	19.603
PSH2	SH2	SH1	54.3	17.48	15.89	2.93	RCP	225	1	0.107	2.7	19.832	19.884
PSH1	SH1	SC22	17.47	15.89	15.53	2.06	RCP	300	1	0.132	1.9	20.35	20.356
PSG3A	SG3A	SG3	52	15.955	14.06	3.64	RCP	300	1	0.097	1.4	16.779	16.364
PSM4A	SM4A	SM4	5	21.19	20.68	10.2	RCP	300	1	0.05	3.4	21.269	21.21
PSM4B	SM4B	SM4	5	21.165	20.44	14.5	RCP	225	1	0.087	2.7	21.335	21.21
PSM3A	SM3A	SM3	5	18.685	18.53	3.1	RCP	225	1	0.042	2.3	18.797	18.637
PSM3B	SM3B	SM3	5	18.47	17.9	11.4	RCP	300	1	0.112	4.2	18.591	18.226
PSM1A	SM1A	JB	10	15.11	10.83	42.8	RCP	225	1	0.033	3.1	15.181	14.534
PSM1B	SM1B	SM1	5	15.34	14.84	10	RCP	225	1	0.061	3.6	15.438	15.289
PSL1	SL1	SB8	12.5	14.185	10.35	30.68	RCP	225	1	0.112	2.8	14.808	14.085
PB5A	B5A	B5	10	11.25	11.15	1	RCP	375	1	0.128	1.2	12.054	12.028
P B5	B5	B6	6.377	11.15	11.086	1	RCP	375	1	0.152	1.4	11.886	11.86

Proposed Conditions DRAINS - Pipe Data

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	No of Pipes	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)
P B6	B6	Det Bas	2.845	11.086	11.046	1.41	RCP	375	1	0.154	2.5	11.298	11.252
P Det	Det Bas	Det 1	16.48	9.596	9.431	1	RCP	1500	1	2.674	1.5	11.001	10.861
P Det 1	Det 1	Det 2	48.85	9.431	8.943	1	RCP	1500	1	2.674	1.5	10.8	10.757
P Det 2	Det 2	Det 3	9.67	8.943	8.846	1	RCP	1500	1	2.676	1.5	10.54	10.529
P Det 3	Det 3	Det 4	95.5	8.846	6.506	2.45	RCP	1500	1	2.676	1.5	10.474	10.365
P Det 4	Det 4	Det 5	5	6.506	6.384	2.44	RCP	1050	1	2.108	2.3	10.225	10.202
P Det 5	Det 5	Det 6	5	6.384	6.261	2.46	RCP	1050	1	1.798	2	10.102	10.086
P Det 6	Det 6	Det 7	5	6.261	6.139	2.44	RCP	1050	1	1.431	1.6	10.03	10.021
PB3A	Det 7	SB2	7.787	6.139	5.94	2.56	RCP	1050	1	1.379	1.5	9.939	9.934
P G2	G2	G1	50	11.127	10.627	1	RCP	400	1	0.329	2.6	12.723	12.44
P G1	G1	D2	3	10.627	10.597	1	RCP	600	1	0.801	2.7	12.394	12.275
P D2	D2	Det Bas	12.771	10.597	10.447	1.17	RCP	1200	1	2.433	3.5	11.482	11.143
P D6A	D6A	D6	10	13.99	13.89	1	RCP	400	1	0.267	2.1	15.12	15.119
P D6	D6	D5	41.736	13.89	12.693	2.87	RCP	750	1	0.982	4.8	14.241	14.105
P D5	D5	D4	41.736	12.693	11.973	1.73	RCP	825	1	1.293	2.6	13.408	13.244
P D4	D4	D3	13.643	11.973	11.055	6.73	RCP	825	1	1.432	4.5	12.441	12.528
P D3	D3	D2	46.061	11.055	10.597	0.99	RCP	1200	1	2.258	2	12.227	12.275
PA2A2	A2A2	A2/A2A	75	15.296	14.546	1	RCP	375	1	0.14	2.1	15.519	14.767
P A2	A2/A2A	A1	68.266	12.441	12.152	0.42	RCP	825	1	1.267	2.3	14.226	13.901
P A1	A1	Det Bas	16.11	12.152	12.085	0.42	RCP	1050	1	2.375	3	13.071	12.956
PA8A	A8A	A8	10	15.62	15.52	1	RCP	375	1	0.099	0.9	16.166	16.163
P A8	A8	A7	71.098	15.52	14.809	1	RCP	375	1	0.148	1.3	16.13	15.929
P A7	A7	A6	40	14.809	14.409	1	RCP	450	1	0.217	1.4	15.838	15.757
P A6	A6	A5	13.161	14.409	14.277	1	RCP	450	1	0.289	1.8	15.591	15.55
P A5	A5	A4/A4A	26.618	14.277	14.011	1	RCP	525	1	0.371	1.7	15.435	15.355
P A4	A4/A4A	A3	20.867	14.011	13.802	1	RCP	750	1	0.8	1.8	15.058	14.995
P A3	A3	A2/A2A	45.426	12.637	12.441	0.43	RCP	750	1	0.865	1.9	14.918	14.767
PA7A	A7A	A7	10	14.909	14.809	1	RCP	375	1	0.046	0.4	15.932	15.929
PA6A	A6A	A6	10	14.509	14.409	1	RCP	375	1	0.115	1	15.762	15.757
PD10A	D10A	D10	10	16.425	16.325	1	RCP	375	1	0.099	1.4	16.648	16.649
P D10	D10	D9	13.058	16.325	16.091	1.79	RCP	375	1	0.123	1.5	16.588	16.594
P D9	D9	D8	15.695	16.091	15.743	2.22	RCP	375	1	0.128	2.7	16.257	16.085
P D8	D8	D7	19.8	15.743	14.856	4.48	RCP	375	1	0.149	3.7	15.891	15.56
P D7	D7	D6	41.736	14.856	13.89	2.31	RCP	750	1	0.443	3.7	15.091	15.119
PA4E1	A4E1	A4E	10	15.434	15.334	1	RCP	375	1	0.106	1	15.932	15.926
P A4E	A4E	A4D	6.405	15.334	15.27	1	RCP	375	1	0.155	1.4	15.825	15.812
P A4D	A4D	A4/A4A	10.357	15.25	15.09	1.54	RCP	375	1	0.174	2.5	15.473	15.355
PA2B1	A2B1	A2B	10	15.034	14.934	1	RCP	375	1	0.145	1.3	15.607	15.579
P A2B	A2B	A2/A2A	10.188	14.934	14.611	3.17	RCP	375	1	0.18	3.4	15.117	14.791
PA2A3	A2A3	A2/A2A	45	14.996	14.546	1	RCP	375	1	0.107	1.9	15.186	14.767
PA1A1	A1A1	A1A	10	13.871	13.771	1	RCP	375	1	0.237	2.1	14.626	14.51
P A1A	A1A	A1	6.4	13.771	13.707	1	RCP	600	1	0.453	2.8	14.106	14.038
PD7A2	D7A2	D7A	10	15.191	15.091	1	RCP	375	1	0.236	2.1	16.157	15.985
P D7A	D7A	D7	10.196	15.091	14.856	2.3	RCP	450	1	0.294	1.8	15.632	15.56
PD7A1	D7A1	D7A	10	15.191	15.091	1	RCP	375	1	0.262	2.4	16.146	15.985
P D6B	D6B	D6	10	13.99	13.89	1	RCP	600	1	0.637	2.2	15.157	15.119
PD2B	D2B	D2	10	10.697	10.597	1	RCP	375	1	0.322	2.9	12.431	12.275
PD5C1	D5C1	D5C	10	13.321	13.221	1	RCP	400	1	0.203	1.6	14.915	14.894
P D5C	D5C	D5A	22.271	13.221	13.096	0.56	RCP	400	1	0.231	1.8	14.68	14.563
P D5A	D5A	D5	15.472	13.096	12.693	2.6	RCP	400	1	0.293	2.3	14.245	14.105
PD3A	D3A	D3	10	11.155	11.055	1	RCP	450	1	0.564	3.5	12.794	12.528
P A10	A10	A9	8.3	15.81	15.727	1	RCP	375	1	0.13	1.2	16.277	16.208
P A9	A9	A8	20.62	15.727	15.52	1	RCP	375	1	0.106	1	16.155	16.163
P A11	A11	A9	8.682	15.814	15.727	1	RCP	375	1	0.082	0.7	16.283	16.208
P E3	E3	E2	10.579	15.781	15.675	1	RCP	225	1	0.02	0.5	16.644	16.63
P E2	E2	E1	30.646	15.675	15.369	1	RCP	225	1	0.025	0.6	16.61	16.566
P E1	E1	SA3	28.916	15.369	15.08	1	RCP	225	1	0.064	1.6	16.439	16.204
PSA3	SA3	SA2	71.381	15.08	13.52	2.19	RCP	225	1	0.081	2	15.368	13.894
PSA2	SA2	SA1	60.542	13.52	11.48	3.37	RCP	300	1	0.136	3.2	13.693	12.17
PSA1	SA1	S	76.038	11.48	8.84	3.47	RCP	300	1	0.194	2.7	11.963	9.899
PS	S	SB1	17	8.84	6.47	13.94	RCP	300	1	0.104	1.5	9.685	9.486
P E1B	E1B	E1A	7.072	15.536	15.465	1	RCP	225	1	0.021	0.5	16.655	16.645
P E1A	E1A	E1	9.559	15.465	15.369	1	RCP	225	1	0.033	0.8	16.601	16.566
P A4C	A4C	A4B	7.508	15.171	15.096	1	RCP	375	1	0.14	1.3	15.607	15.622
P A4B	A4B	A4/A4A	10.671	15.076	14.969	1	RCP	375	1	0.15	1.6	15.379	15.355
P D2A	D2A	D2	6.225	10.651	10.597	0.87	RCP	375	1	0.231	2.1	12.286	12.275
P D5B	D5B	D5A	7.341	13.155	13.116	0.53	RCP	375	1	0.059	0.5	14.564	14.563
P D9A	D9A	D9	9.869	16.19	16.091	1	RCP	375	1	0.021	0.2	16.586	16.594
PB1	B1	SC1	5.245	9.918	9.864	1.03	RCP	375	1	0.127	1.2	12.156	12.192
PB3	B3	SC1	4.459	8.683	8.638	1.01	RCP	375	2	0.245	1.1	12.171	12.192
P F2	F2	F1	6.4	13.498	13.434	1	RCP	375	1	0.05	1.4	13.634	13.631
P F1	F1	Det Bas	4	13.414	13.374	1	RCP	375	1	0.065	1.7	13.557	13.516
P C2	C2	C1	6.425	11.303	11.238	1.01	RCP	375	1	0.185	1.7	12.817	12.806
P C1	C1	SB5	10	11.238	10.988	2.5	RCP	375	1	0.153	1.4	12.799	12.78
P C4	C4	FC3	6.4	12.4	12.336	1	RCP	375	1	0.088	0.8	12.81	12.811
P C3	FC3	C1	31.829	12.316	11.322	3.12	RCP	375	1	0.045	0.4	12.801	12.806
PSC2A	SC2A	SC2	1	8.62	8.61	1	RCP	375	1	0.307	2.8	13.696	13.698
PSC3A	SC3A	SC3	1	10	9.99	1	RCP	525	1	0.973	4.3	15.129	15.129
PSC18A	SC18A	SC18	1	14.44	14.43	1	RCP	600	1	0.74	2.5	20.024	20.028
P B8	B8	Det Bas	4.112	10.919	10.883	0.88	RCP	375	1	0.008	0.1	11.147	11.143

Proposed Conditions DRAINS - Overland Flow Data

Name	From	To	Travel Time (min)	Bed Slope (%)	U/S IL	D/S IL	Length (m)	Max Q U/S	Max Q D/S	Safe Q	Max D	Max Dx/V	Max V
OJD2	JD2	JD1	1.33	6.11	21.79	16.9	80	0.666	0	11.847	0.022	0.03	1.52
OJD1	JD1	JD	1.17	2.36	16.9	15.25	70	0.799	0	11.906	0.033	0.04	1.22
OJD	JD	ZFD	4	1.73	15.25	11.09	240	10.105	0	11.898	0.166	0.51	3.03
OJC	JC	ZFD	4.17	1.65	15.21	11.09	250	0.154	0	12.113	0.013	0.01	0.58
OJB	JB	ZFB	2.92	3.77	15.36	10.83	120	0	0	12.042	0	0	0
OOA1	OA1	OB	0.5	0.08	26.28	26.25	40	1.142	0	5.736	0.113	0.06	0.51
ON	N	L	4.44	5.25	22.2	18	80	3.657	0	12.021	0.065	0.18	2.82
OL	L	JD	3.5	1.43	18	15.25	192	3.672	0	11.98	0.096	0.18	1.91
OK	K	JD	0.42	2.08	15.77	15.25	25	4.255	0	11.964	0.093	0.21	2.28
OOB1	OB1	OB	0.1	0.86	26.31	26.25	7	0.431	0	12.004	0.031	0.02	0.7
OOB	OB	N	1.83	3.1	26.55	21.9	150	2.118	0	12.102	0.054	0.11	1.95
OJ24	J24	J40	4.08	8.5	52.83	32.42	240	0.301	0	11.874	0.012	0.02	1.23
OJ21A	J21A	J21	1.94	10.5	36.5	32.93	34	1.282	0	11.871	0.028	0.06	2.3
OJ21	J21	J19D	3.3	3.68	33.23	31.39	50	0.795	0	11.897	0.029	0.04	1.38
OJ19D	J19D	J19A	1.94	7.53	31.69	29.43	30	1.124	0	11.951	0.029	0.06	1.95
OJ19A	J19A	J18	2.22	3.54	29.73	27.11	74	2.047	0	11.98	0.051	0.1	2
OJ18	J18	J17	14.44	0.6	27.41	26	236	2.998	0	11.962	0.11	0.15	1.36
OJ17B	J17B	J17	10	0.39	26.73	26	188	0.906	0	11.94	0.061	0.05	0.74
OJ17	J17	J13A	5.56	3	26	23	100	8.412	0	11.905	0.126	0.42	3.33
OSF5	SF5	SE3	2	2.73	19.716	16.161	130	0.132	0	3.233	0.064	0.08	1.17
OJ40	J40	J18	1.67	4.08	32.42	27.11	130	0.561	0	11.87	0.023	0.03	1.22
OJ35	J35	J36	2.33	3.25	35.58	30.7	150	0	0	12.084	0	0	0
OJ33	J33	J36	2.53	4.62	33.83	30.7	65	0.031	0	11.859	0.003	0	0.45
OJ32	J32	J36	2.17	6.18	33.48	30.7	45	0	0	11.915	0	0	0
OJ31	J31	J36	3.25	9.53	33.56	30.7	30	0	0	12.146	0	0	0
OJ30	J30	J36	2.89	1.78	31.5	30.7	45	0.052	0	12.068	0.007	0	0.35
OJ26	J26	J36	1.33	3.1	32.87	30.7	70	0	0	12.102	0	0	0
OJ13A	J13A	J12	3.89	0.3	21.2	21	66	1.311	0	11.108	0.083	0.07	0.79
OJ12	J12	J11	0.83	7.14	21	20	14	0	0	12.022	0	0	0
OJ11	J11	N1083179015	0.1	10	20	19	10	2.743	0	12.01	0.044	0.14	3.09
OJ37	J37	J36	1.42	1.18	31.7	30.7	85	1.717	0	11.981	0.064	0.09	1.34
OJ36	J36	J17	15	1.92	31	26	260	2.492	0	12.01	0.07	0.12	1.78
OJ38	J38	J36	1.33	1.03	31.5	30.7	78	1.104	0	12.043	0.051	0.06	1.08
OJ29	J29	J26	1.83	2.3	35.4	32.87	110	0	0	12.027	0	0	0
OOD	OD	OB	0.17	2.3	26.48	26.25	10	2.983	0	12.027	0.074	0.15	2.02
OJ41	J41	J19A	0.25	0.41	29.5	29.43	17	0.61	0	12.079	0.047	0.03	0.64
OH1B	H1B	H1A	1.25	0.2	10	9.85	75	0.233	0	9.069	0.033	0.01	0.36
OH1A	H1A	ZE	1.83	0.78	9.85	8.91	120	0.42	0	12.019	0.031	0.02	0.68
OH1	H1	ZE	1	0.8	9.47	8.91	70	1.266	0	11.972	0.06	0.06	1.05
OZFB2	ZFB2	ZFB	1	1.32	11.73	10.83	68	0.604	0	11.97	0.033	0.03	0.92
OZFB	ZFB	ZFA	1.08	1.19	10.83	9.97	72	12.016	0	12.032	0.207	0.6	2.9
OZFA	ZFA	ZE	1.92	0.96	9.97	8.91	110	20.71	0	12.044	0.308	1.04	3.36
OZFA2	ZFA2	ZFA	1.75	1.89	12.05	9.97	110	0.153	0	11.916	0.013	0.01	0.58
OZFD3	ZFD3	ZFD1	2.33	5.29	18.6	11.2	140	0	0	12.067	0	0	0
OZFD1	ZFD1	ZFD	0.67	0.27	11.2	11.09	40	1.049	0	10.538	0.075	0.05	0.7
OZFD	ZFD	ZFC	1.78	0.26	11.09	10.88	80	13.886	0	10.341	0.359	0.69	1.93
OZFC	ZFC	ZFB	0.25	0.45	10.88	10.83	11	14.799	0	11.981	0.316	0.74	2.34
OZGB	ZGB	ZFD	1.17	0.84	11.55	11.09	55	2.173	0	12.065	0.083	0.11	1.32
OZGA	ZGA	ZFD	1.17	1.23	11.68	11.09	48	1.712	0	12.005	0.063	0.09	1.36
OZFC2	ZFC2	ZFA	2.67	0.52	10.85	9.97	170	6.909	0	11.995	0.191	0.35	1.81
OZH	ZH	ZGB1	1.67	2.06	13.7	11.5	107	0	0	11.907	0	0	0
OY36	Y36	Y34	0.17	11.09	20.41	19.9	4.6	0	0	12.2	0	0	0
OY34	Y34	Y33	0.92	3.25	19.9	18.05	57	2.283	0	12.084	0.056	0.11	2.03
OY33	Y33	Y27	1.42	1.52	18.05	16.68	90	2.944	0	12.108	0.083	0.15	1.78
OY27	Y27	Y26	3.92	1.3	16.68	13.62	236	11.215	0	12.11	0.194	0.56	2.89
OY26	Y26	Y25	0.58	0.18	13.62	13.56	33	14.552	0	8.604	0.413	0.73	1.76
OY25	Y25	Y24	1.17	0.26	13.56	13.37	72	10.691	0	10.341	0.306	0.53	1.75
OY24	Y24	ZFC2	1.1	3.15	13.37	10.85	80	6.346	0	11.896	0.105	0.32	3.02
OY32	Y32	Y30	1.92	3.55	28.51	24.5	113	1.772	0	11.997	0.047	0.09	1.87
OY30	Y30	Y29	1.33	1.91	24.5	22.72	93	2.289	0	11.979	0.066	0.11	1.74
OY29	Y29	Y28A	1.08	1.12	22.72	22.05	60	4.981	0	11.892	0.124	0.25	2
OY28A	Y28A	Y28	1.17	1.31	22.05	21.04	77	4.431	0	11.924	0.11	0.22	2.02
OY28	Y28	Y27	2.17	3.46	21.04	16.68	126	3.216	0	12.154	0.068	0.16	2.37
OSG9	SG9	SG5	2	2.23	19.334	16.548	125	0.455	0	1.971	0.134	0.22	1.65
OSG5	SG5	SG4	2	1.23	16.548	15.96	48	0.475	0	2.728	0.098	0.14	1.4
OSG4	SG4	N2	2	0.64	16.33	16.15	28	0.731	0	2.281	0.215	0.26	1.22
OSG3	SG3	SG4	2	2.39	16.318	15.96	15	0.162	0	1.256	0.088	0.13	1.52
OSG1	SG1	N4	2	0.4	13.76	13.74	5	0.239	0	2.169	0.124	0.09	0.75
OSI1	SI1	A5	2	1.41	17.468	16.719	53	0.218	0	2.176	0.094	0.11	1.19
OSE3	SE3	N2	2	0.06	16.161	16.15	18	0.374	0	1.176	0.177	0.08	0.46
OSE2	SE2A	A1	2	1.4	15.78	15.371	29.311	0.995	0	2.321	0.23	0.43	1.86
OSC21	SC21A	SI1	2	0.46	17.8	17.468	72	0.184	0	2.137	0.108	0.08	0.78
OSC23	SC23A	SC21A	2	1.77	17.8	17.41	22	0.65	0	10.198	0.065	0.07	1.04
OSC1	SC1A	N5	2	1.87	11.582	11.395	10	0.794	0	2.69	0.143	0.26	1.8
OSB2A	SB2A	N1065521803	2	1	9.17	9.07	10	0.359	0	12.079	0.027	0.02	0.67
OSB2B	SB2B	S1	2	2.53	9.68	9.3	15	2.074	0	12.043	0.057	0.1	1.82
OSB3	SB3A	Det 4	2	1.11	11.13	10.079	95	0.906	0	5.137	0.161	0.2	1.26
OSB4	SB4A	N1065521826	2	1	11.869	11.769	10	0.204	0	12.079	0.019	0.01	0.53
OSB5	SB5A	N1	2	0.87	12.854	12.75	12	0.726	0	3.14	0.146	0.2	1.38
OSK1	SK1	N3	2	0.4	14.4	14.38	5	0.244	0	2.169	0.125	0.09	0.76
OSB7B	SB7B	N3	2	1.22	14.49	14.38	9	0.239	0	2.625	0.1	0.11	1.14
OSB7A	SB7A	ZFA2	2	4.78	14.44	12.05	50	0.125	0	12.152	0.008	0.01	0.75
OSM6	SM6	SG9	2	3.51	23.97	19.334	132	0.28	0	4.242	0.057	0.08	1.34
OSH5	SH5	SH4	2	4.04	22.41	20.634	44	0.159	0	2.494	0.067	0.11	1.6
OSH4	SH4	SH2	2	3.17	20.634	18.414	70	0.238	0	2.67	0.081	0.13	1.61
OSH2	SH2	SC23A	2	1.31	18.414	17.5	70	0.365	0	4.094	0.127	0.17	1.31
OSG3A	SG3A	SE3	2	1.84	17.23	16.161	58	0.307	0	2.395	0.114	0.16	1.42
OSM4A	SM4A	SF5	2	3.84	22.06	19.716	61	0.042	0	4.179	0.009	0.01	0.65
OSM4B	SM4B	SM3B	2	3.46	22.05	19.49	74	0.219	0	3.692	0.057	0.07	1.23
OSM3A	SM3A	SG3A	2	3.22	19.39	17.23	67	0.024	0	1.644	0.046	0.05	1.07
OSM3B	SM3B	SM1B	2	4	19.49	16.05	86	0.342	0	2.654	0.096	0.16	1.66
OSM1A	SM1A	SB7B	2	1.79	15.69	14.49	67	0.015	0	2.537	0.016	0.01	0.55
OSM1B	SM1B	ZFB2	2	3.32	16.05	11.73	130	0.432	0	11.906	0.021	0.02	1.03
OB5/OC1/OC2	N1	SC1A	2	2.92	12.75	11.582	40	0.751	0	2.536	0.121	0.24	2.02

Proposed Conditions DRAINS - Overland Flow Data

Name	From	To	Travel Time (min)	Bed Slope (%)	U/S IL	D/S IL	Length (m)	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max V
OSG4/E3	N2	SE2A	2	2.06	16.15	15.78	18	1.092	0	3.094	0.133	0.27	2.06
OSB7B/SK1	N3	N4	2	1.78	14.38	13.74	36	0.475	0	2.508	0.121	0.19	1.55
OSB7B/SK1/SG1	N4	SB5A	2	2.95	13.74	12.854	30	0.705	0	2.284	0.127	0.27	2.09
OSL1	SL1	SB7B	2	2.67	15.05	14.49	21	0.114	0	2.327	0.043	0.06	1.28
OA9/OA10/OA11	N283	E3	2	1.06	17.12	16.989	12.338	0.008	0	3.596	0.027	0.01	0.34
OB5/OB6	N279	B3	2	1.23	12.061	11.403	53.319	0	0	2.375	0	0	0
OB5A	B5A	B5	2	1.5	12.651	12.561	10	0	0	12.028	0	0	0
OB5	B5	N279	2	3.55	12.561	12.061	12.693	0	0	1.825	0	0	0
OB6	B6	N279	2	3.93	12.625	12.061	17.6	0	0	1.835	0	0	0
O Det Bas	Det Bas	N9	2	1.73	12.5	12.2	17.364	0	0	10.082	0	0	0
O Det 4	Det 4	Det 5	2	1.18	10.079	10.02	5	1.225	0	5.166	0.176	0.24	1.37
O Det 5	Det 5	Det 6	2	4	10.02	9.82	5	1.424	0	3.758	0.151	0.35	2.35
O Det 6	Det 6	Det 7	2	0.8	9.82	9.78	5	1.791	0	5.626	0.206	0.28	1.35
O Det 7	Det 7	SB2B	2	2	9.78	9.68	5	2.099	0	4.538	0.191	0.36	1.9
OG2	G2	G1	2	2	13.5	12.5	50	0.116	0	11.994	0.011	0.01	0.52
OG1	G1	D2	2	2.03	12.5	12.307	3	0.538	0	12.083	0.027	0.03	1
OD2	D2	N9	2	1.54	12.307	12.1	22	0.144	0	3.335	0.11	0.12	1.1
OD6A	D6A	D6	2	1.03	15.36	15.26	10	0.03	0	12.043	0.005	0	0.28
OD6	D6	D5	2	2.68	15.26	14.139	41.736	0.034	0	2.419	0.072	0.06	0.84
OD5	D5	D4	2	1.73	14.139	13.419	41.736	0.008	0	2.654	0.049	0.03	0.54
OD4	D4	D3	2	2.43	13.419	12.81	19.266	0.001	0	2.376	0.023	0.01	0.45
OD3	D3	D2	2	1.12	12.81	12.307	45.801	0.167	0	2.519	0.131	0.12	0.88
OA2A2	A2A2	A2/A2A	2	1.6	17.22	16.021	75	0	0	11.928	0	0	0
OA2	A2/A2A	A1	2	0.87	15.965	15.371	68.266	0	0	3.853	0	0	0
OA1	A1	F1	2	0.66	15.371	14.973	60	0	0	1.94	0	0	0
OA8A	A8A	A8	2	1	17.51	17.41	10	0	0	12.079	0	0	0
OA8	A8	A9	2	1.04	17.41	17.202	20.07	0.021	0	3.562	0.039	0.02	0.43
OA7	A7	A6	2	1	17.41	17.01	40	0.027	0	4.129	0.042	0.02	0.45
OA6	A6	A4/A4A	2	1.3	17.01	16.565	34.342	0.031	0	8.74	0.021	0.01	0.41
OA5	A5	A4/A4A	2	0.85	16.791	16.565	26.618	0.13	0	7.067	0.04	0.02	0.5
OA4/OA4A	A4/A4A	N11	2	0.89	16.565	16.37	21.867	0.064	0	3.81	0.079	0.05	0.67
OA3	A3	N11	2	0.9	16.379	16.37	1	0.001	0	1.94	0.022	0.01	0.35
OA7A	A7A	A7	2	1	17.51	17.41	10	0	0	12.079	0	0	0
OA6A	A6A	A6	2	1	17.11	17.01	10	0	0	12.079	0	0	0
OD10A	D10A	D10	2	1	17.34	17.24	10	0	0	12.079	0	0	0
OD10	D10	D8	2	1.92	17.24	16.688	28.754	0	0	2.583	0	0	0
OD8	D8	N10	2	2.33	16.688	16.226	19.8	0	0	2.471	0	0	0
OA4E1	A4E1	A4E	2	1	16.909	16.809	10	0	0	12.079	0	0	0
OA4E	A4E	A4/A4A	2	1.41	16.809	16.565	17.348	0	0	1.817	0	0	0
OA4D	A4D	A4/A4A	2	1.7	16.812	16.565	14.516	0.007	0	1.738	0.043	0.03	0.68
OA2B1	A2B1	A2B	2	1	16.39	16.29	10	0	0	12.079	0	0	0
OA2B	A2B	A2/A2A	2	2.41	16.29	15.965	13.47	0.014	0	1.712	0.052	0.04	0.84
OA2A3	A2A3	A2/A2A	2	1	16.471	16.021	45	0	0	12.079	0	0	0
OA1A1	A1A1	A1A	2	1	15.471	15.371	10	0.043	0	12.079	0.007	0	0.29
OA1A	A1A	A1	2	0	15.371	15.371	6.4	0.027	0	0	0.23	0	0
OD7A2	D7A2	D7A	2	1	16.666	16.566	10	0.004	0	12.079	0.001	0	0.14
OD7A	D7A	N10	2	2.85	16.566	16.226	11.941	0.013	0	2.341	0.054	0.04	0.72
OD7A1	D7A1	D7A	2	1	16.666	16.566	10	0.027	0	12.079	0.005	0	0.25
OD6B	D6B	D6	2	1.03	15.36	15.26	10	0.096	0	12.043	0.012	0	0.39
OD2B	D2B	D2	2	0.61	12.407	12.307	10	0.239	0	12.061	0.024	0.01	0.5
OD5C1	D5C1	D5C	2	0.37	15.1	15	10	0.071	0	11.941	0.013	0	0.27
OD5C	D5C	D5A	2	1.32	15	14.631	15.766	0.012	0	1.242	0.054	0.03	0.64
OD5A	D5A	D5	2	3.9	14.631	14.139	17.839	0	0	13.71	0	0	0
OD3A	D3A	D3	2	0.39	12.91	12.81	10	0.813	0	11.94	0.057	0.04	0.71
OA10	A10	N283	2	1.85	17.575	17.12	24.554	0	0	3.456	0	0	0
OA9	A9	N283	2	0.42	17.202	17.12	19.385	0.011	0	2.639	0.036	0.01	0.26
OA11	A11	N283	2	2.03	17.513	17.12	19.34	0	0	3.398	0	0	0
OE3	E3	E1	2	1.24	16.989	16.476	41.225	0.004	0	3.647	0.026	0.01	0.47
OE1	E1	SA3	2	1.08	16.476	16.165	28.916	0.083	0	3.644	0.086	0.08	0.88
OSA3	SA3	SA2	2	1.77	16.165	14.909	71	0.082	0	3.214	0.078	0.08	1.07
OSA2	SA2	SA1	2	3.47	14.909	12.809	60.54	0.097	0	2.724	0.063	0.09	1.42
OSA1	SA1	S	2	4.56	12.809	9.347	76	0.144	0	1.988	0.072	0.13	1.75
OS	S	S1	2	0.23	9.347	9.3	20	0.302	0	3.676	0.072	0.03	0.4
OE1B	E1B	E1	2	1.63	16.747	16.476	16.631	0	0	9.786	0	0	0
OE1A	E1A	E1	2	1.63	16.632	16.476	9.559	0.008	0	3.29	0.033	0.02	0.62
OA4C	A4C	A4/A4A	2	0.26	16.646	16.589	22.291	0.051	0	1.262	0.106	0.05	0.46
OA4B	A4B	A4/A4A	2	0.3	16.633	16.589	14.877	0.022	0	1.356	0.081	0.03	0.41
OD2A	D2A	N9	2	0.5	12.216	12.1	16.6	0.015	0	2.89	0.067	0.03	0.45
OD5B	D5B	D5	2	2.13	14.63	14.139	23	0	0	11.187	0	0	0
OD9A	D9A	D8	2	2.11	17.289	16.688	28.489	0	0	2.563	0	0	0
OFB1	B1	N5	2	1.52	11.474	11.395	5	0.052	0	3.408	0.082	0.07	0.89
OB3	B3	N5	2	0.1	11.403	11.395	5	0.078	0	0.965	0.139	0.05	0.36
OF2	F2	C4	2	3.39	14.973	13.875	32.4	0.004	0	1.529	0.03	0.03	0.84
OF1	F1	FC3	2	3.39	14.973	13.875	32.4	0	0	1.481	0	0	0
OC2	C2	N1	2	2.8	12.778	12.75	1	0.073	0	1.606	0.082	0.1	1.24
OC1	C1	N1	2	4.7	12.797	12.75	1	0.003	0	1.364	0.026	0.02	0.9
OC4	C4	C2	2	3.45	13.875	12.778	31.829	0	0	1.542	0	0	0
OC3	FC3	C1	2	3.39	13.875	12.797	31.829	0	0	1.481	0	0	0
OSC1/OB1/OB3	N5	SB3A	2	2.65	11.395	11.13	10	0.89	0	2.48	0.14	0.3	2.11
O Irving 1	N9	N5	2	1.42	12.1	11.395	49.526	0.131	0	3.398	0.109	0.11	1.05
O7A/O8	N10	D6	2	2.32	16.226	15.26	41.736	0.008	0	2.465	0.047	0.03	0.62
OA4/OA4A/OA3	N11	A2/A2A	2	0.92	16.37	15.965	43.896	0.031	0	3.785	0.064	0.04	0.58
OSC2	SC2A	N9	2	1.23	12.26	12.1	12.962	0.041	0	3.58	0.079	0.06	0.79
OSC3	SC3A	N9	2	1.89	13.177	12.1	57.014	0.097	0	11.916	0.01	0	0.47
OSC18	SC18A	A4/A4A	2	0.27	16.64	16.589	19	0.165	0	2.672	0.126	0.07	0.52
OB8	B8	N9	2	2.94	12.394	12.1	10	0.0294	0	13.143	0	0	0

Proposed Conditions DRAINS - Detention Basin Data

Name	Elev	Surf. Area	Init Vol. (cu.m)	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Det Bas	9.596 10.269 12.5	0 2250 2250	0	11.14	2502.401	2.674	2.674	0

APPENDIX D – AUTHORITY CORRESPONDENCE

Telephone: 9350 4473
Fax: 9350 4228
Officer: Jeya Jeyadevan
Our Ref.: 2006/11094F

23 June 2008

Hughes Trueman
PO Box 151
St Leonards NSW 1590

Attention: Mr Glen Sullivan

Dear Sir,

ON SITE DETENTION REQUIREMENTS
Carlton Breweries, 26 Broadway Chippendale

With reference to your email dated 30 June 2008 regarding the above subject

The requirements are to apply for a year from the date of this letter after which the requirements will be updated on reapplication.

1. An application fee of \$345.45 is payable to Sydney Water. If the payment is to be made after 30 June 2008, you are required to contact Sydney Water for the revised application fee.
2. On-Site Detention of stormwater will be required for stormwater discharge. A maximum permitted site discharge (P.S.D.) of 1552 litres/sec and a minimum on-site storage of 1730 cubic meters is required for storage of the excess flow from a 100 year A.R.I. design storm (Total Site Area 60,000 square meter).
3. Hydraulic calculations and plans showing on-site storage are to be submitted for final approval prior to commencement of any drainage works.
4. All costs associated with the proposal are at the applicant's expense.
5. Applicant should approach Council for their stormwater requirements including any floodway requirements.
6. No filling should be carried out within 3m from the outside edge of the channel without Sydney Water prior approval.

7. Any structure within the zone of influence of stormwater channel require Sydney Water approval and should comply with “General Requirements for Building Adjacent to Stormwater Channel”.
8. Any landscaping work within the zone of influence of the channel should consider the structural condition of the stormwater channel. If the stormwater channel is damaged as part of your proposed development work or landscaping work, then it is your responsible to repair the channel at your cost.
9. No machinery should be used within the zone of influence of stormwater channel which could affect the structural integrity of the stormwater channel.

Note: Upon completion of the work, the applicant is to submit a certified report from an appropriately qualified engineer or registered surveyor indicating that the OSD structure has been installed as per submitted plan.

Water Sensitive Urban Design (WSUD)

Development of the above site presents an excellent opportunity to integrate the passage and treatment of stormwater using Water Sensitive Urban Design (WSUD). WSUD links water infrastructure, landscape design and the urban built form and is more attuned to natural hydrological and ecological process than conventional stormwater design.

Sydney Water is developing Stormwater Quality Policies and Guidelines and in the interim encourages all developers to implement best practice urban stormwater management using WSUD as summarised below:

1. Treat stormwater runoff to NSW EPA draft best practice treatment objectives:
 - 80% reduction in Total Suspended Solids
 - 45% reduction in Total Phosphorus
 - 45% reduction in Total Nitrogen
2. Maximise stormwater reuse through integrated water cycle management, which can reduce potable water demand and assist in achieving the above pollutant load reduction objectives.

To encourage WSUD, Sydney Water allows 50% of the required On-Site Detention volume to be offset by installing rainwater tanks. Up to 50% of the total rainwater tank volume can be used as an offset. To obtain the offset the rainwater tanks must be connected to toilets in addition to external use such as garden watering and washing cars.

The following link provides further detail on the NSW EPA’s best practice treatment objectives in Table 8.1 (attached) of the draft Managing Urban Stormwater: Council Handbook –

<http://www.epa.nsw.gov.au/resources/chbody.pdf>

Further information on WSUD in the Sydney Region can be obtained by visiting the following website –

<http://www.wsud.org/>

If you have any questions about this Notice, you may contact the officer specified at the top of this notice.

Yours sincerely

A handwritten signature in cursive script, appearing to read "Jeyadevan", written in black ink.

Jeya Jeyadevan

DRAFT

Table 8.1 – Potential Stormwater Treatment Objectives

Pollutant:	Goal/Vision:	ESD Treatment Objective:
Post construction phase:		
Suspended solids (SS)	Suspended solids loads equal to that which would have been exported from the equivalent forested catchment	80% retention of the average annual load**
Total phosphorus (TP)	The load of phosphorus from the catchment that results in the attainment of the ambient water quality concentration objective	45% retention of the average annual load**
Total nitrogen (TN)	The load of nitrogen from the catchment that results in the attainment of the ambient water quality concentration objective	45% retention of the average annual load**
Litter	No anthropogenic litter in waterbodies. Input of organic litter equal to that which would have occurred from the equivalent forested catchment	Retention of litter greater than 50 mm for flows up to 25% of the 1 year ARI peak flow
Coarse sediment	Coarse sediment loads equal to those which would have been exported from the equivalent forested catchment	Retention of sediment coarser than 0.125 mm* for flows up to 25% of the 1 year ARI peak flow
Oil and grease (hydrocarbons)	No visible oil and grease (anthropogenic hydrocarbons) in waterbodies	In areas with concentrated hydrocarbon deposition, no visible oils for flows up to 25% of the 1 year ARI peak flow
Construction phase:		
Suspended solids	Suspended solids loads equal to those which would have been exported from the equivalent forested catchment	Maximum SS concentration of 50 mg/L for all 5 day rainfalls up to the 75 th percentile depth. All practical measures to reduce pollution are to be taken beyond this event.
Other pollutants	No export of toxicants (eg pesticides, petroleum products, construction chemicals) from the site	Limit the application, generation and migration of toxic substances to the maximum extent practicable

* based on idealised settling characteristics

** a design storm of 25% of the 1 year ARI flow is to be adopted for the design of certain elements of some stormwater treatment measures which can be used to meet this objective

Sean Reilly

From: Myl Senthilvasan [msenthilvasan@cityofsydney.nsw.gov.au]
Sent: Thursday, 5 June 2008 2:52 PM
To: gsullivan@hughestrueman.com.au
Subject: RE: Frasers Broadway - Freeboard Requirements

Glen

Yes, the freeboard that you mentioned would be acceptable. Generally 1 in 100 year flood level plus 500mm. Please ring me if you need any further information.

Regards

Myl Senthilvasan
Senior Engineer Drainage & Environment
City of Sydney
456 Kent Street, Sydney NSW 2000
Phone: 02 9246 7223; Fax: 02 9246 7712; Mobile: 0401 628 726

From: Glen Sullivan [mailto:gsullivan@hughestrueman.com.au]
Sent: Thursday, 5 June 2008 8:35 AM
To: Myl Senthilvasan
Subject: Frasers Broadway - Freeboard Requirements

Myl,

In May we met with yourself and other council staff to discuss the proposed development of the Frasers Broadway site. Hughes Trueman have been engaged to provide infrastructure advice and design. We are currently working on the site grading and advancing the flood study for the proposed development.

I would like to discuss with you the free board requirements for both regional and local overland flows. Hughes Trueman has been involved with the proposed Green Square development and are familiar with the free board requirements contained in the Development Control Plan 1997 Amendment Part H: Green Square Town Centre, Table 7.1 - Flood Planning Levels for the Town Core Precinct (see attached). We are proposing to adopt these guidelines and apply them to the Frasers Broadway site.

Could you please advise if this approach is acceptable to council. In the absence of specific guidelines for this location we believe it is the most sensible solution.

Kind Regards

Glen Sullivan
MEM, BE, MIEAUST
SENIOR PROJECT MANAGER

Hughes Trueman
Level 2, 60 Pacific Highway, St Leonards NSW 2065
PO Box 151, St Leonards NSW 1590
Ph: 02 9439 2633
Fax: 02 9438 4505

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07S628-080605 - Table 7.1 Flood Planning Levels Green Square.pdf

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To: All councils in New South Wales

GUIDELINE ON DEVELOPMENT CONTROLS ON LOW FLOOD RISK AREAS— FLOODPLAIN DEVELOPMENT MANUAL

This Guideline provides advice to councils on appropriate flood related controls for residential and non-residential development in areas of flood prone land above the FPL for residential development (sometimes known as low risk areas) and associated advice on section 149 certificate notifications.

Introduction

The NSW Government's Flood Prone Land Policy and Floodplain Development Manual support the wise and rational development of flood prone land, the area inundated by the probable maximum flood (PMF).

This is achieved by the strategic consideration of a number of key issues relating to protecting existing and future occupants of flood prone land from the ramifications of flooding. These key issues are:

- safety of people;
- management of the potential damage to property and infrastructure; and
- management of the cumulative impacts of development.

Local councils are responsible for managing the flood risk in their local government areas. The Manual outlines the floodplain risk management (FRM) process which assists councils in making informed decisions on managing flood risk to existing and future development through the development and implementation of FRM plans.

The Policy acknowledges that flood prone land is a valuable resource that should not be sterilised by unnecessarily precluding its development and that development should be treated on its merits rather than through the imposition of rigid and prescriptive criteria.

This Guideline should be read as part of the Floodplain Development Manual.

Categories of Flood Prone Land

To balance protection of existing and future inhabitants from flood hazard and the potential danger and damage associated with use of the flood prone land, the Manual promotes the appropriate use of flood prone land by breaking it down into areas dependant upon frequency of inundation, their hydraulic function (floodways in which floodwaters are conveyed, flood storage areas where flood waters are temporarily stored during flood events, and flood fringe areas) and flood hazard (a minimum of two categories, high and low). These categories assist councils in determining appropriate development limits and controls to reflect the variation in flood risk across flood prone land and the associated consequences on residents and their property. Key categories are:

1. **Floodways:** Floodways are the areas of the floodplain which are essential to convey flood waters. Development of these areas would have significant adverse impacts upon flood behaviour which in turn may result in adverse affects on other development and the community. Development of floodways would also expose occupants and their property to significant levels of flood danger and damage.
2. **Below the residential FPL:** The area of the floodplain where residential development is subject to flood related development controls, i.e. below the residential FPL (as determined in accordance with the Floodplain Development Manual). These are the areas of the floodplain where development limits and controls are used to reduce the frequency of exposure of people and property to flood risk and the associated danger and damage. Development controls in this area need may limit the area that can be developed and may include minimum fill levels, minimum floor levels, the requirement to use flood compatible building materials and need to address emergency management issues as outlined in (3) below.
3. **Above the residential FPL:** The area of flood prone land above the residential FPL and therefore these are areas where residential development is not subject to flood related development controls. These areas generally have a low risk of flooding and are sometimes known as low flood risk areas. As such, they are areas where no development controls should apply for residential development but the safety of people and associated emergency response management needs to be considered and may result in:
 - Restrictions on types of development which are particularly vulnerable to emergency response, for example developments for aged care.
 - Restrictions on critical emergency response and recovery facilities and infrastructure. These aim to ensure that these facilities and the infrastructure can fulfil their emergency response and recovery functions during and after a flood event. Examples include evacuation centres and routes, hospitals and major utility facilities.

Standards for Flood Controls for Residential Development

Councils are responsible for determining the appropriate flood planning levels for land within their local government area. Whilst the flood used to determine the residential FPL is a decision of the local council, the Manual highlights that FPLs for typical residential development would generally be based around the 100 year flood plus an appropriate freeboard (typically 0.5m).

This Guideline confirms that, unless there are exceptional circumstances, councils should adopt the 100 year flood as the FPL for residential development. In proposing a case for exceptional circumstances, a Council would need to demonstrate that a different FPL was required for the management of residential development due to local flood behaviour, flood history, associated flood hazards or a particular historic flood.

Unless there are exceptional circumstances, councils should not impose flood related development controls on residential development on land with a low probability of flooding, that is, land above the residential FPL (low flood risk areas).

Justification for variations to the above should be provided in writing to, and agreed by, the Department of Natural Resources and the Department of Planning prior to exhibition of a draft local environmental plan or a draft development control plan that proposes to introduce flood related development controls on residential development.

Advice on Section 149 Certificates

Schedule 4 of the Environmental Planning and Assessment Regulation 2000 (the Regulation) has been amended in relation to flooding by the Environmental Planning and Assessment Amendment (Flood Related Development Controls Information) Regulation 2006. The amendment will require councils to distinguish between the situation where there are flood related development controls on nominated types of 'residential development' and all other development. The nominated types of residential development are dwelling houses, dual occupancies, multi dwelling housing and residential flat buildings (but not group homes or seniors living).

For ease of reference, words and expressions used in the new provision have the same meaning as in the Standard Instrument which councils are required to adopt as part of the NSW Planning Reform process.

Flood related development controls are not defined but would include any development standards relating to flooding applying to land, that are a matter for consideration under section 79C of the *Environmental Planning and Assessment Act 1979* (the EP&A Act).

Clause 7A(1) of the Regulation means that councils should not include a notation for residential development on section 149 certificates in low risk areas if no flood related development controls apply to the land. However, a notation for all residential development below the flood planning level would be appropriate if council has adopted flood related development controls for this area. Under clause 7A(2) councils could include a notation for critical infrastructure or vulnerable development on section 149 certificates in low risk areas but only if flood related development controls apply to such development.

Section 149(5) of the EP&A Act also provides that council can include 'such other relevant factors affecting the land that the council may be aware'. Therefore a council may include additional information in a section 149 certificate it believes is relevant to the land.

Section 117 Ministerial Direction No. 15—Flood Prone Land

Draft local environmental plans (LEPs) are required to be consistent with directions issued under section 117 of the EP&A Act. Direction No.15—Flood Prone Land requires draft plans to be consistent with the principles of the Manual. Direction No. 15 has been amended to make it clear that consistency with this Guideline will also be required when Councils are preparing draft LEPs. The amended Direction will apply to draft local environmental plans that have not yet been issued with a section 65 certificate under the EP&A Act.

Legal Responsibility and Indemnities

Section 733 of the *Local Government Act 1993* (LG Act) protects councils from liability if they have followed the requirements of the Manual. Under section 733 (4) and (5), the

Minister has given notification that this Guideline should be considered in conjunction with the Manual.

Further Information

Please contact the relevant regional offices of the Department of Natural Resources (www.dnr.nsw.gov.au) or the Department of Planning (www.planning.nsw.gov.au).

Item	Flood Planning Level
Residential Properties	
<i>Habitable Room Floor Level:</i>	
• inundated by mainstream flooding,	1% AEP + 0.5 m.
• inundated by local drainage flooding,	1% AEP + 0.5 m or if the depth of flow in the 1% AEP is <0.25 m then 2 x the depth of flow with a minimum of 0.3 m above the surrounding surface.
• all other properties.	0.3 m above surrounding ground
<i>Non-Habitable Floor Level such as a garage (excluding underground garages) or laundry for which development approval is required:</i>	
• inundated by mainstream or local drainage flooding.	1% AEP
Underground Garage or Car Park	
For this purpose an underground garage or car park is where the floor of the car park is more than 1 m below the surrounding natural ground.	
<i>Single property owner with not more than 2 car spaces:</i>	
• inundated by mainstream or local overland flooding,	1% AEP + 0.5 m
• car park outside floodplain.	0.3 m above the surrounding surface
<i>All others:</i>	
• inundated by mainstream or local overland flooding,	1% AEP + 0.5 m (as a minimum) or a level that is determined based on a review of the PMF, whichever is the higher.
• car park outside floodplain.	0.3 m above the surrounding surface
Industrial/Commercial Properties	
It is assumed that all properties will be advised of the flood risk, either from existing studies or investigations by the proponent.	
• floor level of a small business,	1% AEP
• floor level of a large business,	merits approach presented by the applicant
• floor level of schools and child care facilities,	merits approach presented by the applicant
• residential floors within tourist establishments,	1% AEP + 0.5 m
• housing for older people or people with disabilities,	1% AEP + 0.5 m (as a minimum) or a level that is determined based on a review of the PMF, whichever is the higher.
• above ground car park.	1% AEP
Critical Facilities	
These include: hospitals and ancillary service; communication centres; police, fire and SES stations; major transport facilities, sewerage and electricity plants; any installations containing infrastructure control equipment, any operational centres for use in a flood.	
• floor level,	1% AEP + 0.5 m (as a minimum) or a level that is determined based on a review of the PMF, whichever is the higher.
• access to and from.	1% AEP + 0.5 m (as a minimum) or a level that is determined based on a review of the PMF, whichever is the higher.

Note

The Flood Planning Level (FPL) refers to the minimum building floor levels. For underground parking or other forms of underground development, the FPL refers to the minimum level at each access point. The higher of any FPL will prevail.

Table 7.1 - Flood Planning Levels for the Town Core Precinct