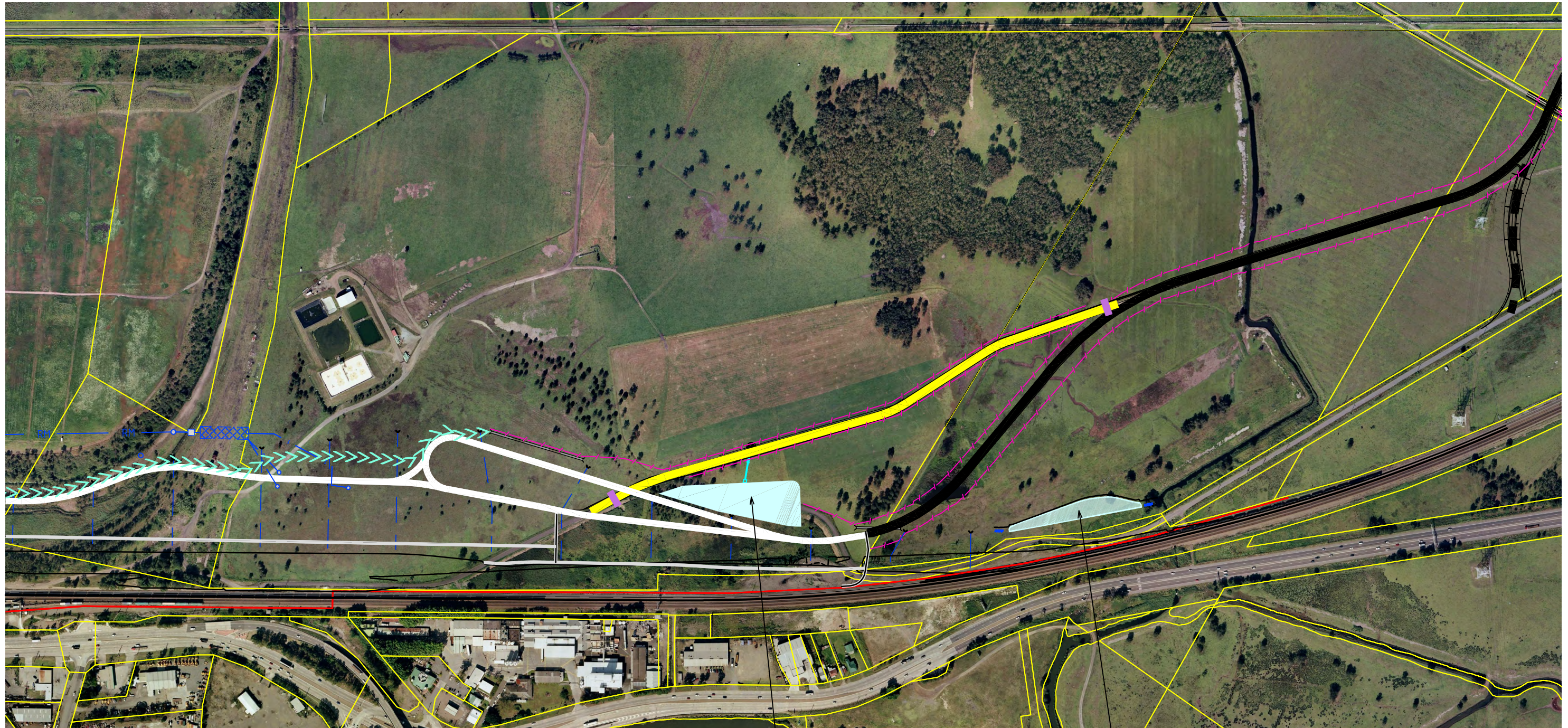
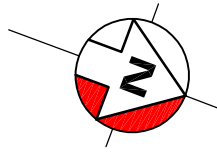




BASIN 2
(SEDIMENT BASIN)

BASIN 1
(SEDIMENT BASIN)

LEGEND



SEDIMENT BASIN



SEDIMENT FENCING



CATCH DRAIN
(USED TO DIRECT FLOWS TO SED. BASIN)



TRUCK SHAKE DOWN & WASH BAY



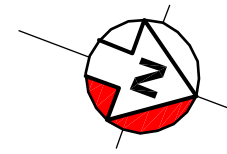
WorleyParsons

resources & energy



**STAGE 1 PRELIMINARY CONSTRUCTION
STORMWATER MANAGEMENT PLAN
TRAIN SUPPORT FACILITY
SHEET 2 OF 2**

FIGURE 5-3



BASIN 3

EFFLUENT
IRRIGATION AREAS

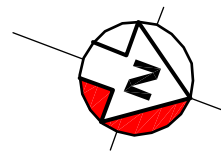
EFFLUENT
BUFFER TANK

PROVIDE TEMPORARY LOCALISED CONTROLS
AROUND BUILDING & ANY ASSOCIATED TRACK
WORKS AS REQUIRED, INCLUDING TEMPORARY
SEDIMENT PONDS

LEGEND

 SEDIMENT BASIN
 CATCH DRAIN

 SEDIMENT FENCING
 TRUCK SHAKE DOWN & WASH BAY



PROVIDE TEMPORARY LOCALISED CONTROLS
AROUND BUILDING & ANY ASSOCIATED TRACK
WORKS AS REQUIRED, INCLUDING TEMPORARY
SEDIMENT PONDS

BASIN 2

BASIN 1

LEGEND



WATER QUALITY POND



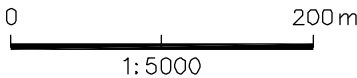
CATCH DRAIN



SEDIMENT FENCING

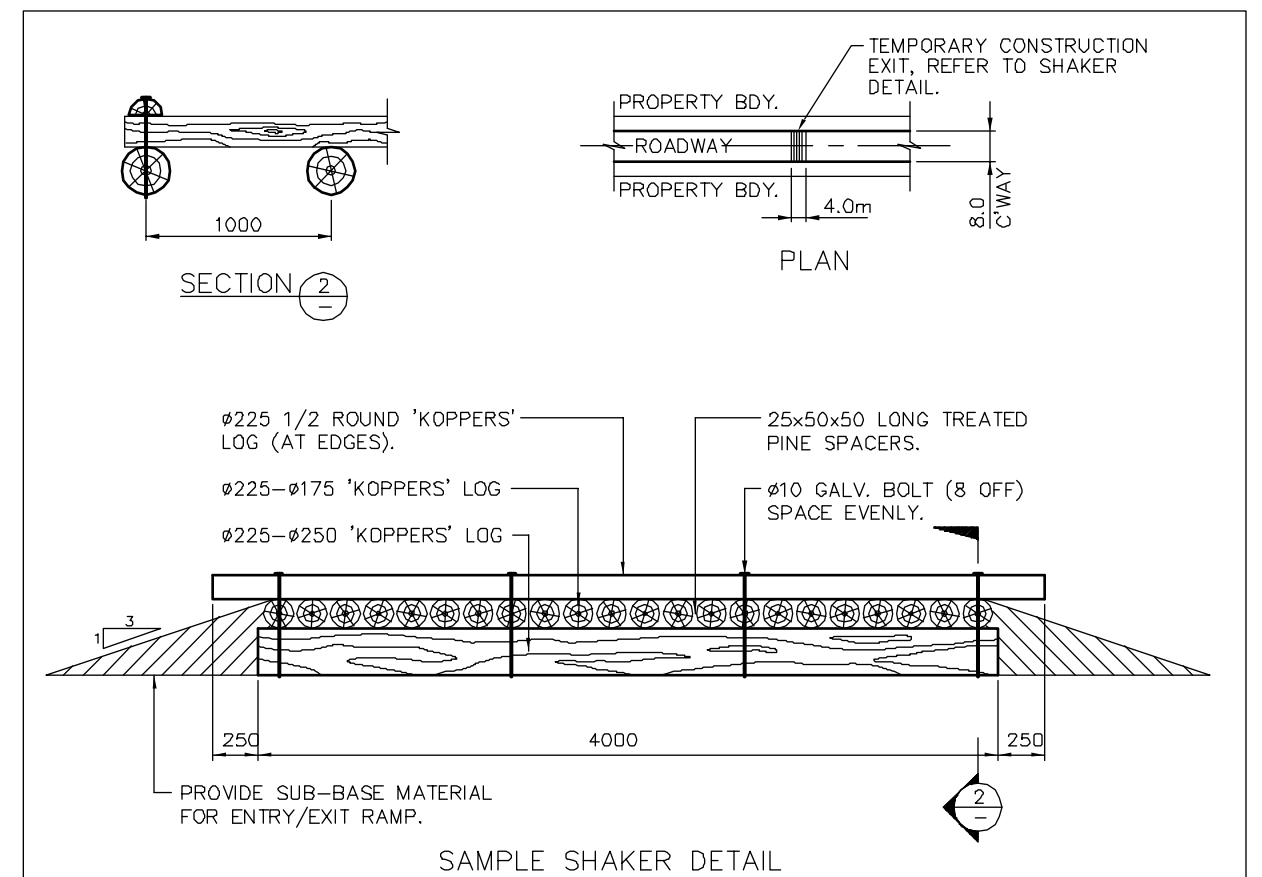
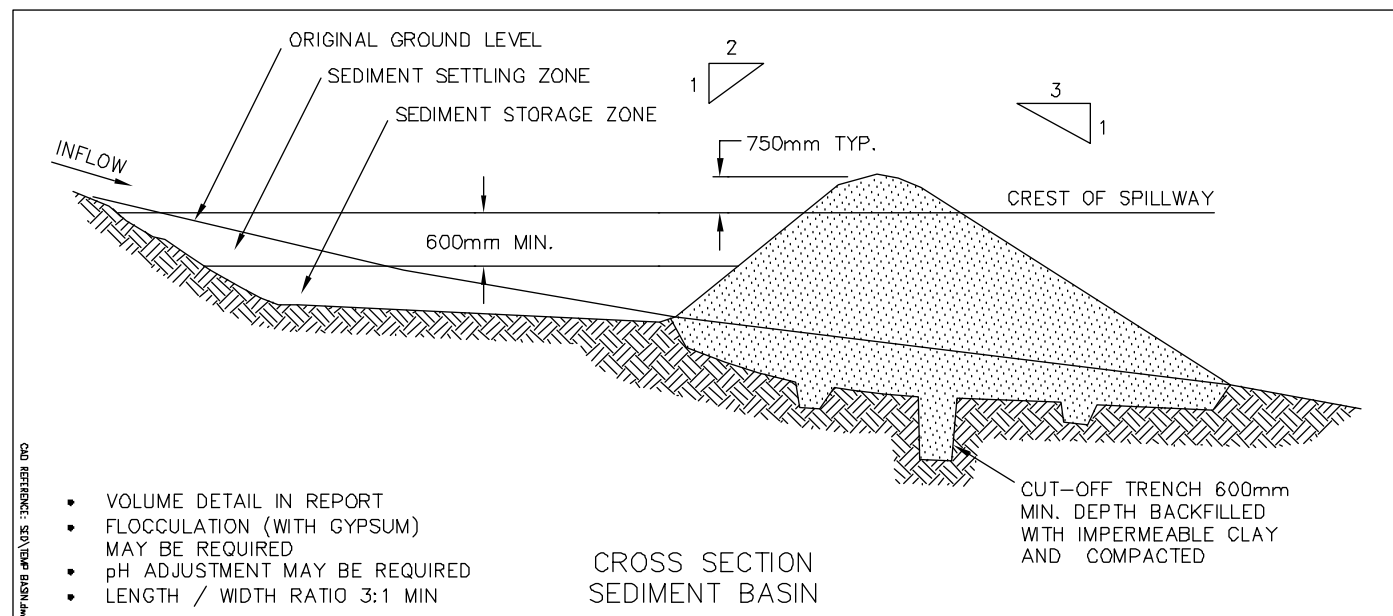
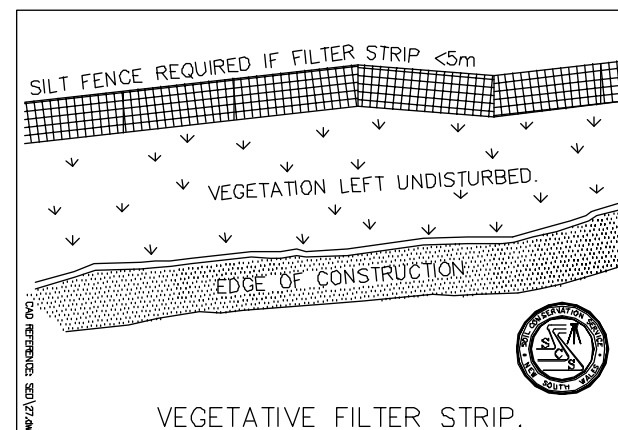
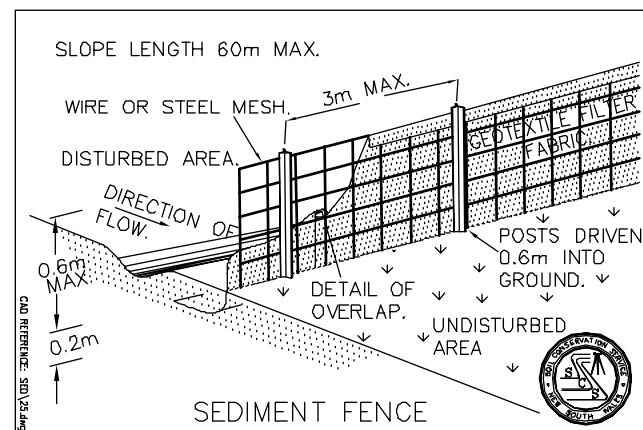
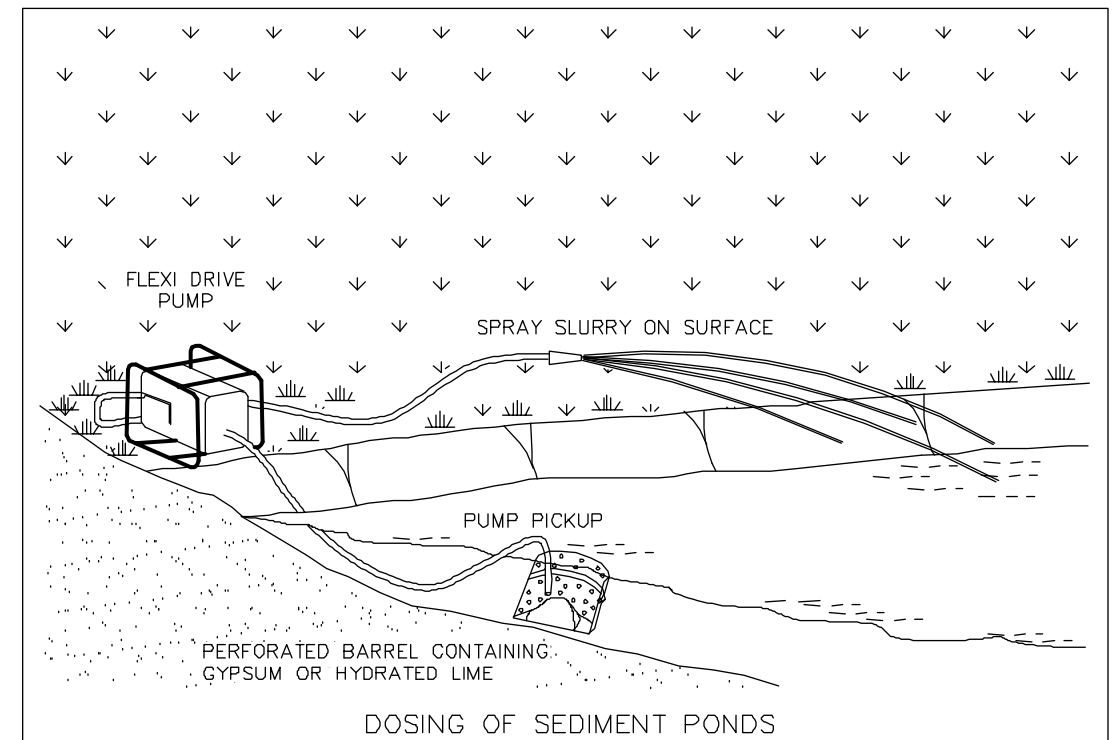
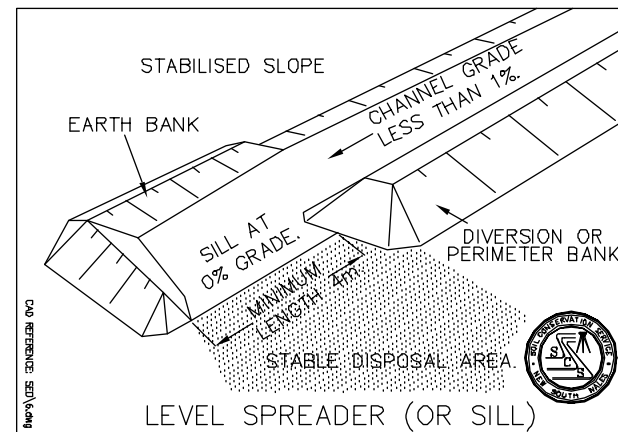
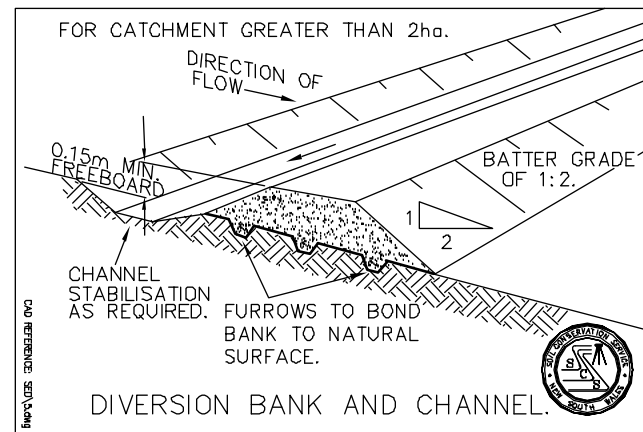


TRUCK SHAKE DOWN & WASH BAY



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FIGURE 6



Appendix A Drains Stormwater Modelling Results

INPUT DATA - EXISTING

PIT / NODE DETAILS

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	Part Full Shock Loss	Inflow Hydrograph
N59	Node					0.625		0		-18.896	-460.106		170	
N7	Node					0.2		0		-413.295	-221.642		196	
n1	Node					2		0		265.187	-115.888		182	
out-hunter	Node					1		0		611.893	198.884		193	
Out-smithy	Node					1.2		0		621.846	-1403.594		244	
N202	Node					0.6		0		649.218	-1786.795		247	
N134	Node					10		0		263.528	-609.82		485	
out-SWAM	Node					0.8		0		-453.108	-779.025		228	
n6	Node					2		0		936.868	-1195.072		575	

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Init Vol. (cu)	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Leng	id
n3	0.6	1000	0	Culvert		0.5				248.598	-507.798	No			156
	1	15000													
n2	0	1000	0	None						253.575	-291.315	No			198
	0.2	16000													
	1	16500													
Swale 4	1.2	786	0	Culvert		0.5				832.955	-654.012	No			546
	1.6	5145													
	1.7	6000													
Swale 5	1	3010	0	Culvert		0.5				230.981	-822.422	No			553
	1.6	13903													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%)	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)
c3	n3	30.5	6	94	0	0	0	0	0	10	300	0	0.5	0.5	0	0.02	0.1	0	0
c7	N7	280	0	100	0	0	0	0	0	0	1400	0	0	0.5	0	0.02	0.1	0	0
c1	n1	30.3	0	100	0	0	0	0	0	0	250	0	0	0.5	0	0.02	0.1	0	0
c2	n2	22.4	2	98	0	0	0	0	0	10	500	0	1	0.5	0	0.02	0.1	0	0
Cat163	Swale 4	45.75	6	94	0	0	0	0	0	0	250	0	1	3	0	0.013	0.1	0	0
C5	Swale 5	21.12	5	95	0	0	0	0	0	10	140	0	1	5	0	0.03	0.1	0	0
c6	n6	32	9	91	0	0	0	0	0	10	500	0	1	0.5	0	0.03	0.1	0	0

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	RI (m)	Chg (m)	RL (m)	etc (m)
p3.7	n3	N59	10	0.6	0.59	0.1	Concrete, r	900	900	0.013	NewFixed	2	n3		0				
culvert	n1	out-hunter	40	0.4	0	1	Box culvert 2.7W x 1.5H			0.013	Existing	1	n1		0				
p4-5	Swale 4	Swale 5	5	1.2	1.15	1	Concrete, r	900	900	0.013	NewFixed	2	Swale 4		0				
p3-out1	Swale 5	out-SWAM	10	1	0.8	2	Concrete, r	600	600	0.013	NewFixed	4	Swale 5		0				

DETAILS of SERVICES CROSSING PIPES

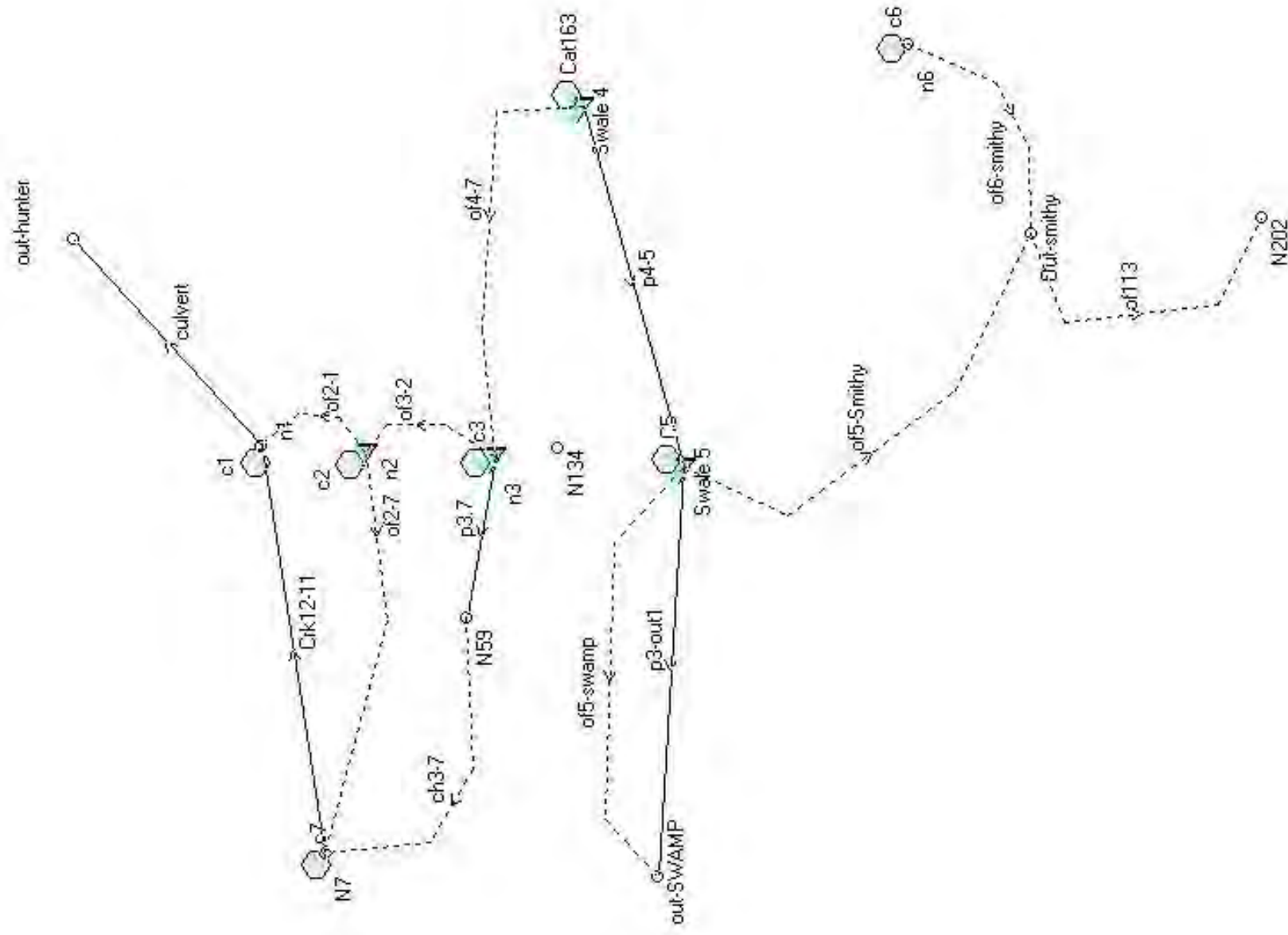
Pipe	Chg (m)	Bottom Elev (m)	Height of S Chg (m)	Bottom Elev (m)	Height of S Chg (m)	Bottom Elev (m)	Height of S etc (m)
------	------------	--------------------	------------------------	--------------------	------------------------	--------------------	------------------------

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed
Crk12-11	N7	n1	Irregular	600	0.061	0.01							

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major (m)	SafeDepth Minor (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id
of3-2	n3	n2	5	0.75	10	2	10m path	0.3	0.3	0.6	0.1	0	202
ch3-7	N59	N7	20				10m path	0.3	0.3	0.6	1	0	210
of2-7	n2	N7	1	0.2	4	2	4m path	0.3	0.3	0.6	1	0	212
of2-1	n2	n1	5	0.6	10	2	10m path	0.3	0.3	0.6	0.1	0	205
of113	Out-smithy	N202	1				4m path	0.3	0.3	0.6	1	0	254
of4-7	Swale 4	n3	10	1.55	10	2	10m path	0.3	0.3	0.6	1	0	548
of5-swamp	Swale 5	out-SWAM	1	2	100	2	HWC track	0.3	0.3	0.6	1	0	231
of5-Smithy	Swale 5	Out-smithy	1	1.3	10	2	10m path	0.3	0.3	0.6	1	0	252
of6-smithy	n6	Out-smithy	1				10m path	0.3	0.3	0.6	1	0	577



Existing 1yr ARI

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Version 8			Overflow (cu.m/s)	Constraint
			Max Surface Flow (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)		
N59	0.71			0			
N7	1.02		5.706				
n1	1.02		5.034				
out-hunter	1		0				
out-SWAM	0.93		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
c3	0.362	0.362	0.006	4.22	85.3		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c7	0.838	0	0.838	0	335.79		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
c1	0.254	0	0.254	0	119.44		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
c2	0.13	0.027	0.122	5.35	181.04		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat163	0.647	0.168	0.591	0	69.78		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
C5	0.427	0.065	0.404	6.83	42.27		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
c6	0.57	0.57	0.004	4.37	115.89		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1

Outflow Volumes for Total Catchment (8.96 impervious + 453 pervious = 462 total ha)

Storm	Total Rainf cu.m	Total Runoff cu.m (Runoff %)	Impervious Runoff cu.m (Runoff %)	Pervious Runoff cu.m (Runoff %)
AR&R 1 ye	116441.6	1988.89 (1.7%)	1988.89 (8.0%)	0.00 (0.0%)
AR&R 1 ye	152483.1	2708.12 (1.8%)	2687.69 (9.1%)	20.42 (0.0%)
AR&R 1 ye	177434.9	3171.62 (1.8%)	3171.62 (9.0%)	0.00 (0.0%)
AR&R 1 ye	230665.3	5940.81 (2.6%)	4203.50 (9.1%)	1737.32 (0.8%)
AR&R 1 ye	268647.5	17188.16 (4.9%)	4939.63 (9.1%)	12248.53 (4.6%)
AR&R 1 ye	299975.8	20791.27 (5.5%)	5549.29 (9.1%)	15241.98 (5.2%)
AR&R 1 ye	355147	16649.31 (4.7%)	6616.06 (9.1%)	10033.25 (2.9%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
p3.7	0.099	0.62	0.792	0.756	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
culvert	1.164	0.7	1.02	1	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
p4-5	0.338	1.79	1.386	1.336	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
p3-out1	0.372	2	1.133	0.933	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
Crk12-11	0.92	-1.8J	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1

OVERFLOW ROUTE DETAILS

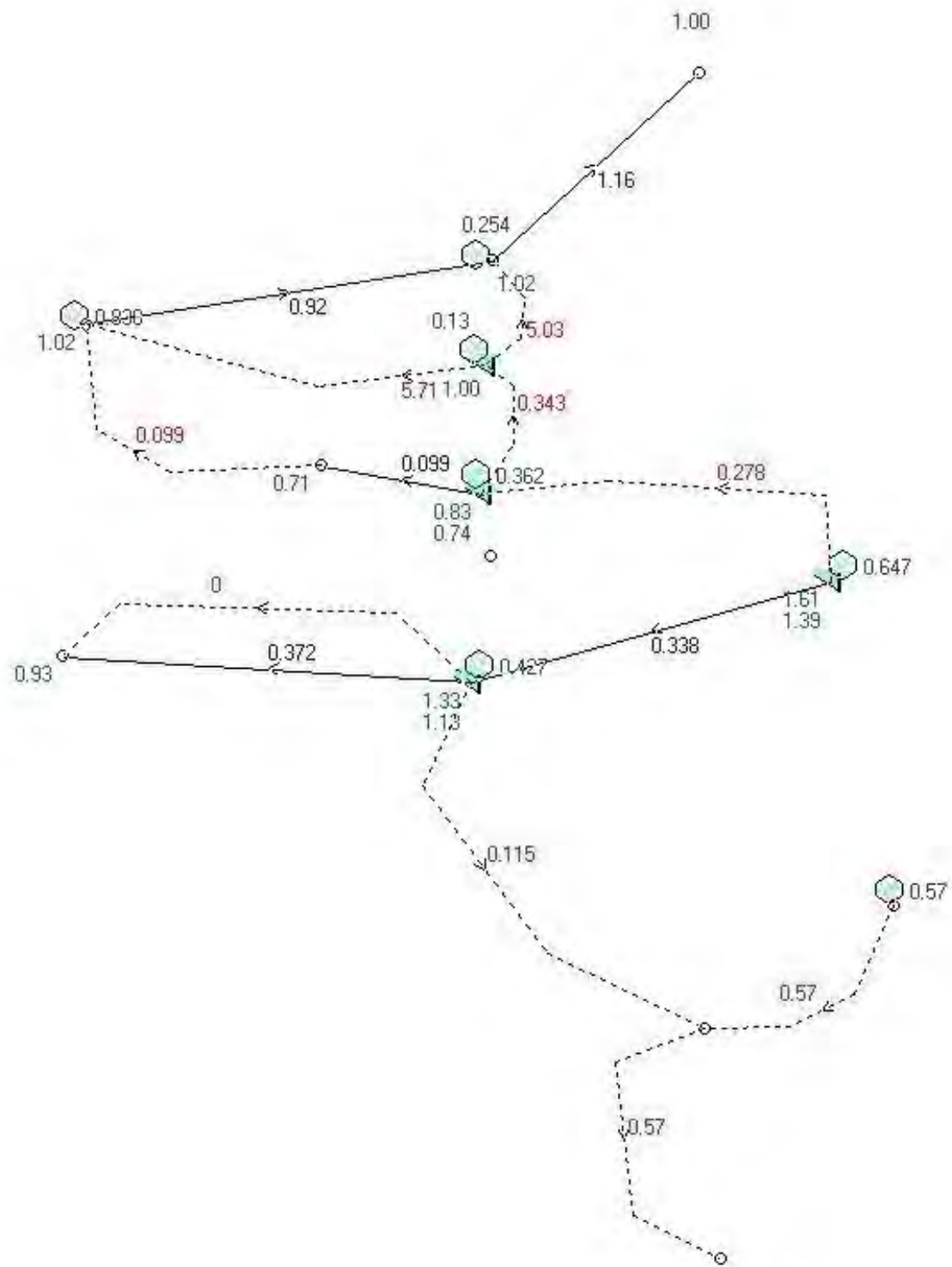
Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
of3-2	0.343	0.343	0.136	0.532	0.03	10	0.06	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
ch3-7	0.099	0.099	0.431	0.123	0.01	10	0.08	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
of2-7	5.706	5.706	0.163	1	1.43	4	1.43	AR&R 1 year, 1 hour storm, average 25.2 mm/h, Zone 1
of2-1	5.034	5.034	0.136	1	0.5	10	0.5	AR&R 1 year, 1 hour storm, average 25.2 mm/h, Zone 1
of113	0.57	0.57	0.163	0.675	0.14	4	0.21	AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
of4-7	0.278	0.278	0.431	0.229	0.03	10	0.12	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
of5-swamp	0	0	44.636	0	0	0	0	
of5-Smithy	0.115	0.115	0.431	0.134	0.01	10	0.09	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
of6-smithy	0.57	0.57	0.431	0.356	0.06	10	0.16	AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
n3	0.83	801.2	0.443	0.099	0.343
n2	1	14383.5	10.74	0	10.74
Swale 4	1.61	1099.2	0.616	0.338	0.278
Swale 5	1.33	1769.7	0.486	0.372	0.115

CONTINUITY CHECK for AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Ch (cu.m)	Difference %
n3	3261.33	3190.73	70.47	0
N59	1489.76	1489.76	0	0
N7	8958.39	8963.5	0	-0.1
n1	10580.8	10587.97	0	-0.1
out-hunter	10587.97	10587.97	0	0
n2	2866.48	1365.59	-12868.21	501.3
Out-smithy	3249.62	3249.46	0	0
N202	3249.46	3249.46	0	0
N134	0	0	0	0
Swale 4	4354.3	4326.47	28.21	0
Swale 5	5649.57	5491.91	157.81	0
out-SWAM	5203.69	5203.69	0	0
n6	2961.41	2961.41	0	0



Existing 10yr

PIT / NODE DETAILS

Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
N59	0.97		0				
N7	1.71		10.247				
n1	1.29		12.428				
out-hunter	0.89		0				
out-SWAM	1.02		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
c3	1.97	0.214	1.835	4.73	95.63		0 AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
c7	8.804	0	8.804	0	258.54		0 AR&R 10 year, 12 hours storm, average 10.4 mm/h, Zone 1
c1	2.18	0	2.18	0	59.26		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c2	1.173	0.052	1.158	3.84	129.92		0 AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
Cat163	4.856	1.028	4.633	0	34.62		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
C5	3.241	0.386	3.132	2.87	17.76		0 AR&R 10 year, 1 hour storm, average 47.3 mm/h, Zone 1
c6	1.684	1.053	1.248	2.87	76.05		0 AR&R 10 year, 1 hour storm, average 47.3 mm/h, Zone 1

Outflow Volumes for Total Catchment (8.96 impervious + 453 pervious = 462 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m	Impervious Runoff cu.m	Pervious Runoff cu.m	Runoff %
AR&R 10 y	288331.7	114716.17	5321.62	9109394.55	(38.7%)
AR&R 10 y	338235.3	142037.43	6288.85	9135748.58	(40.9%)
AR&R 10 y	395069.8	164284.83	7390.52	9156894.31	(40.5%)
AR&R 10 y	515670.1	202807.98	9729.85	9193078.13	(38.2%)
AR&R 10 y	576663.4	219793.92	10914.00	9208879.92	(36.9%)
AR&R 10 y	688669.2	244806.73	13086.87	9231719.86	(34.3%)
AR&R 10 y	218559.1	73297.33	3968.83	969328.50	(32.3%)
AR&R 10 y	778495.6	242097.34	14826.57	9227270.77	(29.8%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
p3.7	0.855	1.07	1.219	1.132	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
culvert	12.252	5.08	1.293	0.893	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
p4-5	1.164	2.17	1.595	1.566	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
p3-out1	0.964	2.63	1.216	1.017	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
Crk12-11	10.185	-1.8J	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
of3-2	1.94	1.94	0.136	1	0.19	10	0.19	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
ch3-7	0.855	0.855	0.431	0.457	0.09	10	0.19	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
of2-7	0.905	0.905	0.163	0.922	0.23	4	0.25	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
of2-1	1.891	1.891	0.136	1	0.19	10	0.19	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
of113	3.041	3.041	0.163	1	0.76	4	0.76	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
of4-7	2.422	2.422	0.431	0.881	0.24	10	0.27	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
of5-swamp	0	0	44.636	0	0	0	0	
of5-Smithy	1.436	1.436	0.431	0.632	0.14	10	0.23	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
of6-smithy	1.684	1.684	0.431	0.7	0.17	10	0.24	AR&R 10 year, 1 hour storm, average 47.3 mm/h, Zone 1

DETENTION BASIN DETAILS

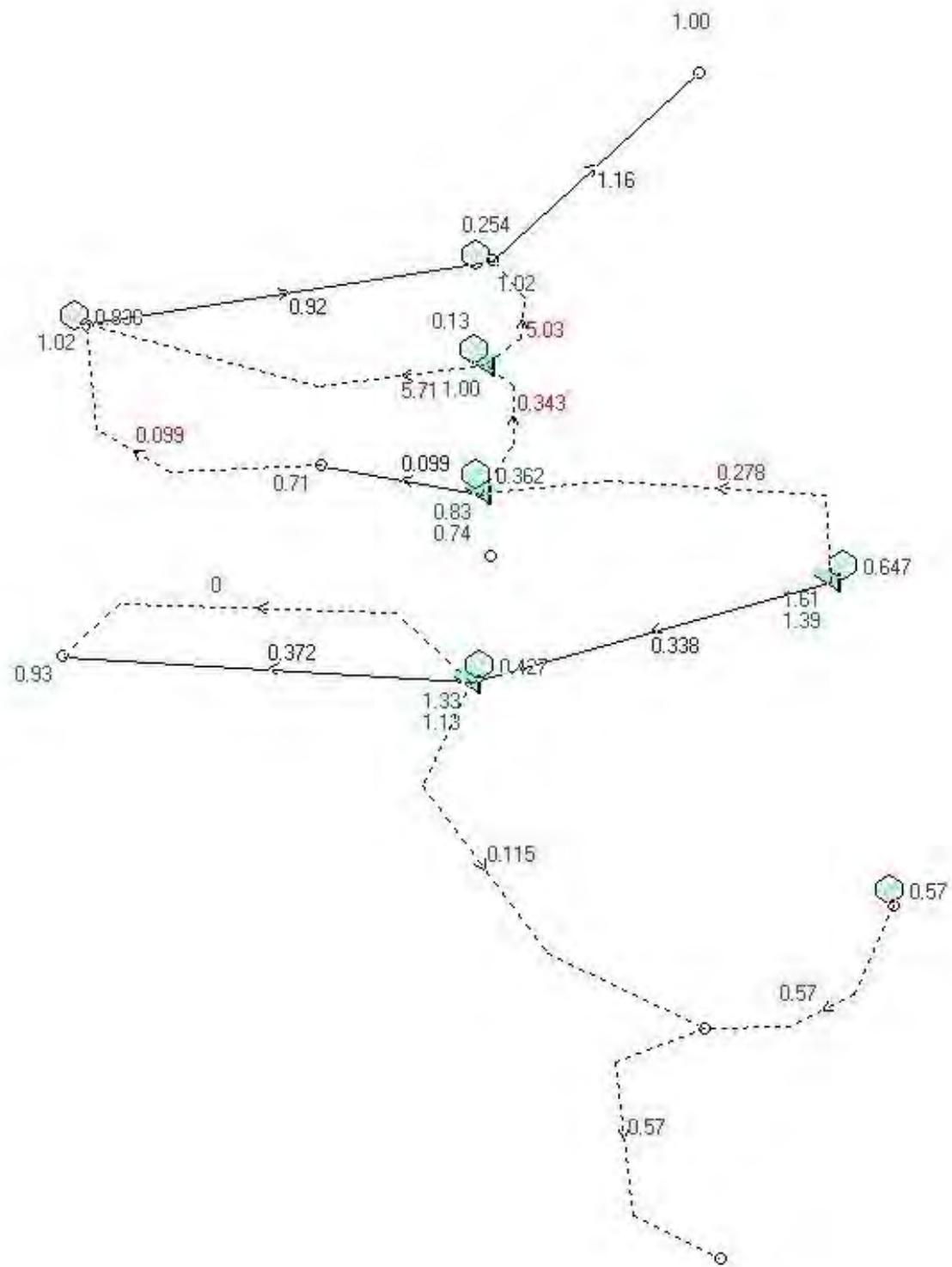
Name	Max WL	Max Vol	Max Q Total	Max Q Low Level	Max Q High Level
n3	1.31	0	2.796	0.855	1.94
n2	0.81	0	2.796	0	2.796
Swale 4	2	0	3.586	1.164	2.422
Swale 5	1.57	0	2.399	0.964	1.436

CONTINUITY CHECK for AR&R 10 year, 1 hour storm, average 47.3 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage C _t (cu.m)	Difference %
n3	11522.33	10332.71	1190.01	0
N59	2858.23	2858.01	0	0
N7	43647.85	34781.63	0	20.3
n1	40362.72	32368.92	0	19.8
out-hunter	32368.92	32368.92	0	0
n2	11245.08	3118.01	8127.16	0
Out-smithy	9341.71	9341.7	0	0
N202	9341.7	9341.7	0	0
N134	0	0	0	0
Swale 4	9369.62	9101.85	267.76	0
Swale 5	7854.07	6673.92	1180.17	0
out-SWAM	3538.5	3538.5	0	0
n6	6206.3	6206.3	0	0

Run Log for QR Hexham A run at 12:09:02 on 30/5/2012

The maximum flow exceeded the safe value in the following overflow routes: of6-smithy, of4-7, of113, of5-Smithy, of2-7, ch3-7, of2-1, of3-2



PIT / NODE DETAILS						Version 10														
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Shock	Full Lost	Inflow Hydrograph				
n102.5	Node					1.25		0		2048.483	-640.509						1			
n102.4	Node					1.24		0		1834.902	-640.509						2			
n102.3	Node					1.2		0		1642.058	-642.582						3			
n102.2	Node					1.23		0		1420.182	-636.362						7			
n102.1	Node					1.22		0		1192.086	-632.214						8			
n102	Node					1.21		0		974.358	-632.214						9			
N59	Node					0.625		0		-18.896	-460.106						170			
n101.5	Node					1.2		0		2067.146	-883.12						41			
n101.4	Node					1.2		0		1870.154	-887.267						49			
n101.3	Node					1.2		0		1662.794	-872.752						50			
n101.2	Node					1.2		0		1453.36	-876.899						51			
n101.1	Node					1.2		0		1202.454	-881.046						52			
n101.0	Node					1.2		0		980.579	-866.531						53			
N258	Node					1.2		0		920.445	-1438.43						258			
N7	Node					0.2		0		-413.295	-221.642						196			
n1	Node					2		0		265.187	-115.888						182			
out-hunter	Node					1		0		611.893	198.884						193			
n6	Node					2		0		233.668	-1134.86						241			
out-SWAM	Node					0.8		0		-453.108	-779.025						228			
Out-smithy	Node					1.2		0		621.846	-1403.59						244			
N202	Node					0.6		0		649.218	-1786.8						247			
N267	Node					0.6		0		679.078	-2075.44						250			
N103	Node					2		0		969.116	141.454						276			
N100	Node					4.8		0		728.844	-871.093						320			
N101	Node					5		0		1243.926	-1072.65						328			
N107	Node					6.8		0		1495.247	-1119.93						340			
N110	Node					11.4		0		1761.497	-1147.3						354			
N113	Node					11.4		0		1980.469	-1132.37						361			
N115	Node					5		0		2137.233	-1114.95						385			
N122	Node					10.2		0		2101.401	-277.778						420			
N125	Node					10.2		0		1864.632	-290.248						430			
N128	Node					10.2		0		1627.128	-301.268						438			
N147	Node					2		0												

[illegible]

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope(%)	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough
c102.5	n102.5	2.39	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c102.4	n102.4	3.25	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c102.3	n102.3	3.45	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c102.2	n102.2	3.18	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c102.1	n102.1	3.53	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c102	n102	3.01	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c3	n3	30.5	6	94	0	0	0	0	10	300	0	0.5	0.5	0	0.02	0.1
c101.5	n101.5	1.96	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c101.4	n101.4	1.74	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c101.3	n101.3	1.8	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c101.2	n101.2	1.66	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c101.1	n101.1	1.7	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c101	n101.0	4.27	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
c7	N7	280	0	100	0	0	0	0	0	1400	0	0	0.5	0	0.02	0.1
c1	n1	30.3	0	100	0	0	0	0	0	250	0	0	0.5	0	0.02	0.1
c2	n2	22.4	2	98	0	0	0	0	10	500	0	1	0.5	0	0.02	0.1
c5	wetland 2	18.05	6	94	0	0	0	0	178	261	0	0.5	2	0	0.02	0.1
c103	N103	7.7	50	50	0	0	0	0	50	50	0	0.5	0.5	0	0.02	0.1
Cat73	N100	5.58	4	96	0	0	0	0	47	25	0	1	1	0	0.02	0.1
Cat82	N101	1.98	4	96	0	0	0	0	20	234	0	1	1	0	0.02	0.1
Cat88	N107	2.31	4	96	0	0	0	0	25	240	0	1.58	1.58	0	0.02	0.1
Cat91	N110	2.93	4	96	0	0	0	0	25	330	0	2.18	2.18	0	0.02	0.1
Cat93	N113	3.59	4	96	0	0	0	0	25	346	0	2.1	2.1	0	0.02	0.1
Cat97	N115	6.7	4	96	0	0	0	0	20	414	0	2.27	2.27	0	0.02	0.1
Cat117	N122	3.44	4	96	0	0	0	0	20	414	0	2.27	2.27	0	0.02	0.1
Cat119	N125	4.094	4	96	0	0	0	0	20	414	0	2.27	2.27	0	0.02	0.1
Cat124	N128	7.56	4	96	0	0	0	0	20	336	0	2.38	2.38	0	0.02	0.1
C6	N147	18.6	9	91	0	0	0	0	25	360	0	1	1	0	0.02	0.1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	RI (m)
p2.3	Basin2	n3	5	1.01	0.6	8.2	Concrete, 1	600	600	0.013	NewFixed	4	Basin2		0	
p3.7	n3	N59	10	0.6	0.59	0.1	Concrete, 1	900	900	0.013	NewFixed	2	n3		0	
p3-out	basin3	N258	5	1.01	0.6	8.2	Concrete, 1	600	600	0.013	NewFixed	4	basin3		0	
culvert	n1	out-hunter	40	0.4	0	1	Box culvert 2.7W x 1.5H			0.013	Existing	1	n1		0	
P5-out	wetland 2	n6	10	1.8	0.9	9	Concrete, 1	600	600	0.013	NewFixed	4	wetland 2		0	
p3-1	Basin1	n1	5	1.01	0.6	8.2	Concrete, 1	600	600	0.013	NewFixed	4	Basin1		0	

DETAILS of SERVICES CROSSING PIPES

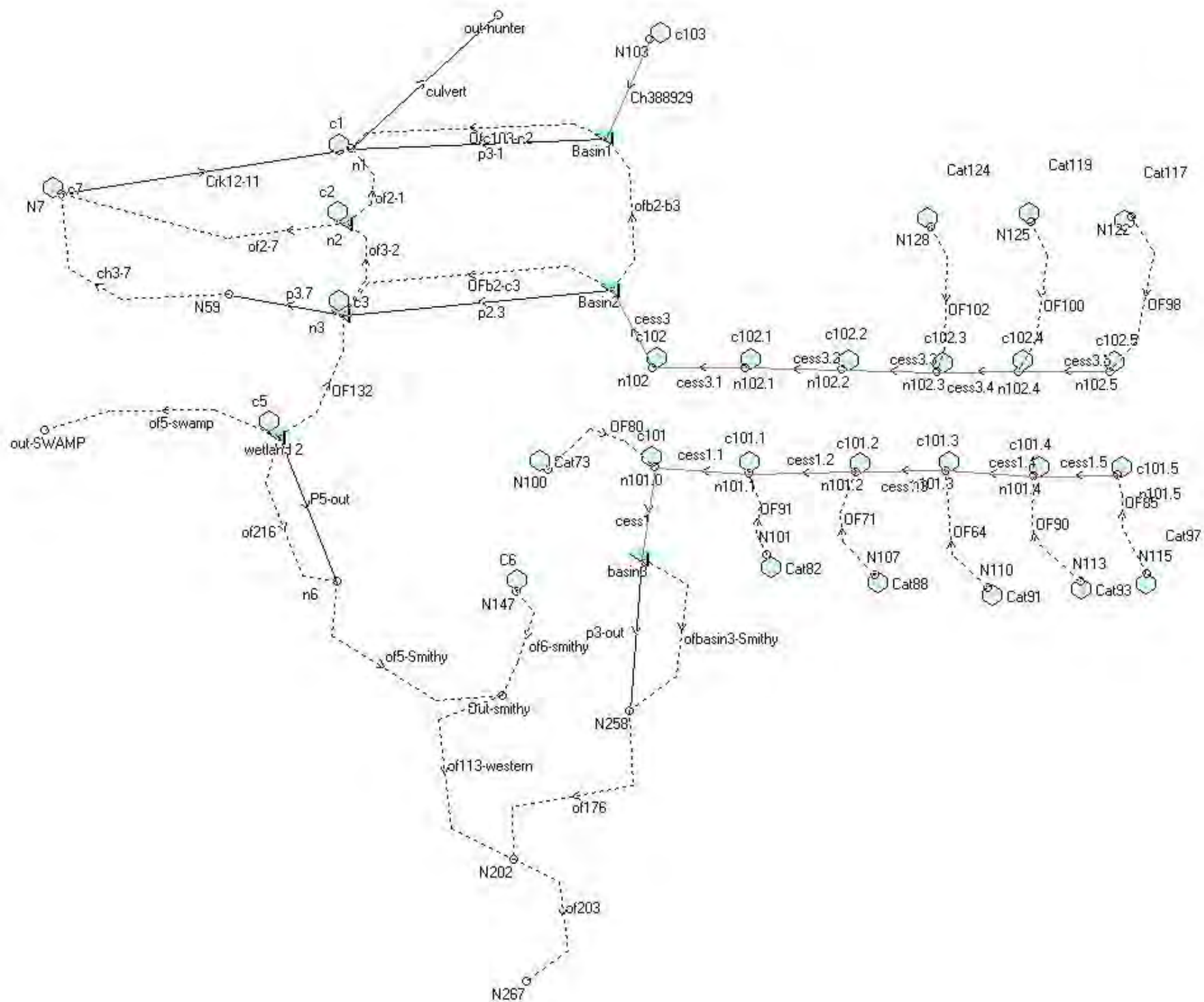
Pipe	Chg (m)	Bottom Elev (m)	Height of S Chg (m)	Bottom Elev (m)	Height of S Chg (m)	Bottom Elev (m)	Height of Setc (m)	etc
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CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed
cess3.5	n102.5	n102.4	Prismatic	170	1.3	1.25	0.03	2.5	2	2	0.05	1	No
cess3.4	n102.4	n102.3	Prismatic	170	1.25	1.2	0.03	2.5	2	2	0.05	1	No
cess3.3	n102.3	n102.2	Prismatic	170	1.2	1.15	0.03	2.5	2	2	0.05	1	No
cess3.2	n102.2	n102.1	Prismatic	170	1.1	1.15	-0.03	2.5	2	2	0.05	1	No
cess3.1	n102.1	n102	Prismatic	170	1.1	1.05	0.03	2.5	2	2	0.05	1	No
cess3	n102	Basin2	Prismatic	170	1.05	1	0.03	2.5	2	2	0.05	1	No
cess1.5	n101.5	n101.4	Prismatic	130	1.3	1.2	0.08	2.5	2	2	0.05	1	No
cess1.4	n101.4	n101.3	Prismatic	130	1.25	1.2	0.04	2.5	2	2	0.05	1	No
cess1.3	n101.3	n101.2	Prismatic	130	1.2	1.15	0.04	2.5	2	2	0.05	1	No
cess1.2	n101.2	n101.1	Prismatic	130	1.15	1.1	0.04	2.5	2	2	0.05	1	No
cess1.1	n101.1	n101.0	Prismatic	130	1.1	1.05	0.04	2.5	2	2	0.05	1	No
cess1	n101.0	basin3	Prismatic	130	1.05	1	0.04	2.5	2	2	0.05	1	No
Crk12-11	N7	n1	Irregular	600	0.061	0.01							
Ch388929	N103	Basin1	Prismatic	600	1.05	1	0.01	2.5	2	2	0.05	0.35	No

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Stori (m)	SafeDepth Minor Stori (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id
ofb2-b3	Basin2	Basin1	1	1.2	2.5		2 cess drain	0.3	0.3	0.6	0.5	0	177
OFb2-c3	Basin2	n3	10	1.19	20		2 20m spillw.	0.2	0.05	0.6	5	0	155
of3-2	n3	n2	5	0.75	10		2 10m path	0.3	0.3	0.6	0.1	0	202
ch3-7	N59	N7	20				10m path	0.3	0.3	0.6	1	0	210
ofbasin3-S	basin3	N258	5	1.2	20		2 20m spillw.	0.3	0.3	0.6	1	0	269
of176	N258	N202	5				Dummy us	0.3	0.3	0.6	1	0	261
of2-7	n2	N7	1	0.2	4		2 4m path	0.3	0.3	0.6	1	0	212
of2-1	n2	n1	5	0.6	10		2 10m path	0.3	0.3	0.6	0.1	0	205
OF132	wetland 2	n3	10	2	80		2 HWC track	0.3	0.3	0.6	1	0	545
of216	wetland 2	n6	1	1.9	40		2.2 20m spillw.	0.3	0.3	0.6	1	0	240
of5-swamp wetland 2	out-SWAM		1	1.9	100		2 HWC track	0.3	0.3	0.6	1	0	231
of5-Smith n6	Out-smithy		1				10m path	0.3	0.3	0.6	1	0	252
of113-west Out-smithy	N202		5				10m path	0.3	0.3	0.6	1	0	254
of203	N202	N267	1				HWC track	0.3	0.3	0.6	1	0	256
Ofc103-c2	Basin1	n1	10	1.19	20		2 20m spillw.	0.3	0.3	0.6	1	0	184
OF80	N100	n101.0	10				20m spillw.	0.3	0.3	0.6	1	0	372
OF91	N101	n101.1	10				20m spillw.	0.3	0.3	0.6	1	0	393
OF71	N107	n101.2	10				20m spillw.	0.3	0.3	0.6	1	0	356
OF64	N110	n101.3	10				20m spillw.	0.3	0.3	0.6	1	0	344
OF90	N113	n101.4	10				20m spillw.	0.3	0.3	0.6	1	0	389
OF85	N115	n101.5	10				20m spillw.	0.3	0.3	0.6	1	0	380
OF98	N122	n102.5	10				20m spillw.	0.3	0.3	0.6	1	0	424
OF100	N125	n102.4	10				20m spillw.	0.3	0.3	0.6	1	0	432
OF102	N128	n102.3	10				cess drain	0.3	0.3	0.6	1	0	440
of6-smithy	N147	Out-smithy	1				10m path	0.3	0.3	0.6	1	0	564



Developed 1yr ARI

PIT / NODE DETAILS			Version 8				
Name	Max HGL	Max Pond HGL	Max Surface Flow Arrivir (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
n102.5	1.68		0.207				
n102.4	1.68		0.362				
n102.3	1.66		0.399				
n102.2	1.62		0.353				
n102.1	1.57		0.349				
n102	1.48		0.399				
N59	0.72		0				
n101.5	1.61		0.2				
n101.4	1.6		0.27				
n101.3	1.57		0.26				
n101.2	1.54		0.226				
n101.1	1.5		0.262				
n101.0	1.46		0.455				
N258	0.69		0				
N7	0.61		1.01				
n1	0.55		0.799				
out-hunter	0.15		0				
n6	0.9		0				
N103	1.58		0.604				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
c102.5	0.187	0.187	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c102.4	0.255	0.255	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c102.3	0.271	0.271	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c102.2	0.249	0.249	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c102.1	0.277	0.277	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c102	0.236	0.236	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c3	0.362	0.362	0.006	4.22	85.3		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c101.5	0.154	0.154	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c101.4	0.136	0.136	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c101.3	0.141	0.141	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c101.2	0.13	0.13	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c101.1	0.133	0.133	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c101	0.335	0.335	0	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
c7	0.838	0	0.838	0	335.79		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
c1	0.254	0	0.254	0	119.44		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
c2	0.13	0.027	0.122	5.35	181.04		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
c5	0.229	0.061	0.204	37.09	80.86		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
c103	0.604	0.604	0.002	11.08	29.11		0 AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
Cat73	0.158	0.014	0.148	12.62	22.7		0 AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1
Cat82	0.022	0.005	0.02	8.12	93.24		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat88	0.028	0.006	0.026	8.09	82.53		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat91	0.033	0.007	0.031	7.34	90.71		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat93	0.039	0.009	0.036	7.43	94.38		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat97	0.067	0.016	0.062	6.35	102.68		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat117	0.034	0.008	0.032	6.35	102.68		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat119	0.041	0.01	0.038	6.35	102.68		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Cat124	0.086	0.019	0.08	6.26	89.31		0 AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
C6	0.326	0.326	0	5.01	65.25		0 AR&R 1 year, 1 hour storm, average 25.2 mm/h, Zone 1

Outflow Volumes for Total Catchment (26.4 impervious + 451 pervious = 478 total ha)

Storm	Total Rainfall cu.m	Total Runoff cu.m	Impervious Runoff cu.m	Pervious Runoff cu.m	Runoff %
AR&R 1 ye	120373.8	5537.49	(4 5537.49	(8 0.00	(0.0%)
AR&R 1 ye	157632.4	7613.71	(4 7595.34	(8 18.37	(0.0%)
AR&R 1 ye	183426.8	9020.12	(4 9020.12	(8 0.00	(0.0%)
AR&R 1 ye	238454.8	13697.43	(12057.85	(1639.58	(0.7%)
AR&R 1 ye	277719.7	25881.61	(14230.20	(11651.40	(4.4%)
AR&R 1 ye	310106	30413.18	(16020.23	(14392.94	(4.9%)
AR&R 1 ye	367140.2	28618.85	(19168.75	(9450.10	(2.7%)
AR&R 1 ye	412710.3	26956.14	(21703.77	(5252.37	(1.3%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
p2.3	0.313	3.13	1.096	0.844	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
p3.7	0.114	0.63	0.807	0.769	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
p3-out	0.32	3.16	1.097	0.687	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
culvert	0.784	1.99	0.546	0.146	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
P5-out	0	0	1.231	0.9	AR&R 1 year, 1 hour storm, average 25.2 mm/h, Zone 1
p3-1	0.171	2.62	1.074	0.668	AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
cess3.5	0.102	0.09	AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
cess3.4	0.165	0.13	AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
cess3.3	0.249	0.16	AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1
cess3.2	0.292	0.21	AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1
cess3.1	0.342	0.24	AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1
cess3	0.391	1.46	AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1
cess1.5	0.129	0.14	AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
cess1.4	0.155	0.15	AR&R 1 year, 2 hours storm, average 16.5 mm/h, Zone 1
cess1.3	0.184	0.15	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
cess1.2	0.226	0.18	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
cess1.1	0.264	0.21	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
cess1	0.421	1.68	AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1
Crk12-11	0.719	-1.#J	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Ch388929	0.309	0	AR&R 1 year, 1 hour storm, average 25.2 mm/h, Zone 1

OVERFLOW ROUTE DETAILS

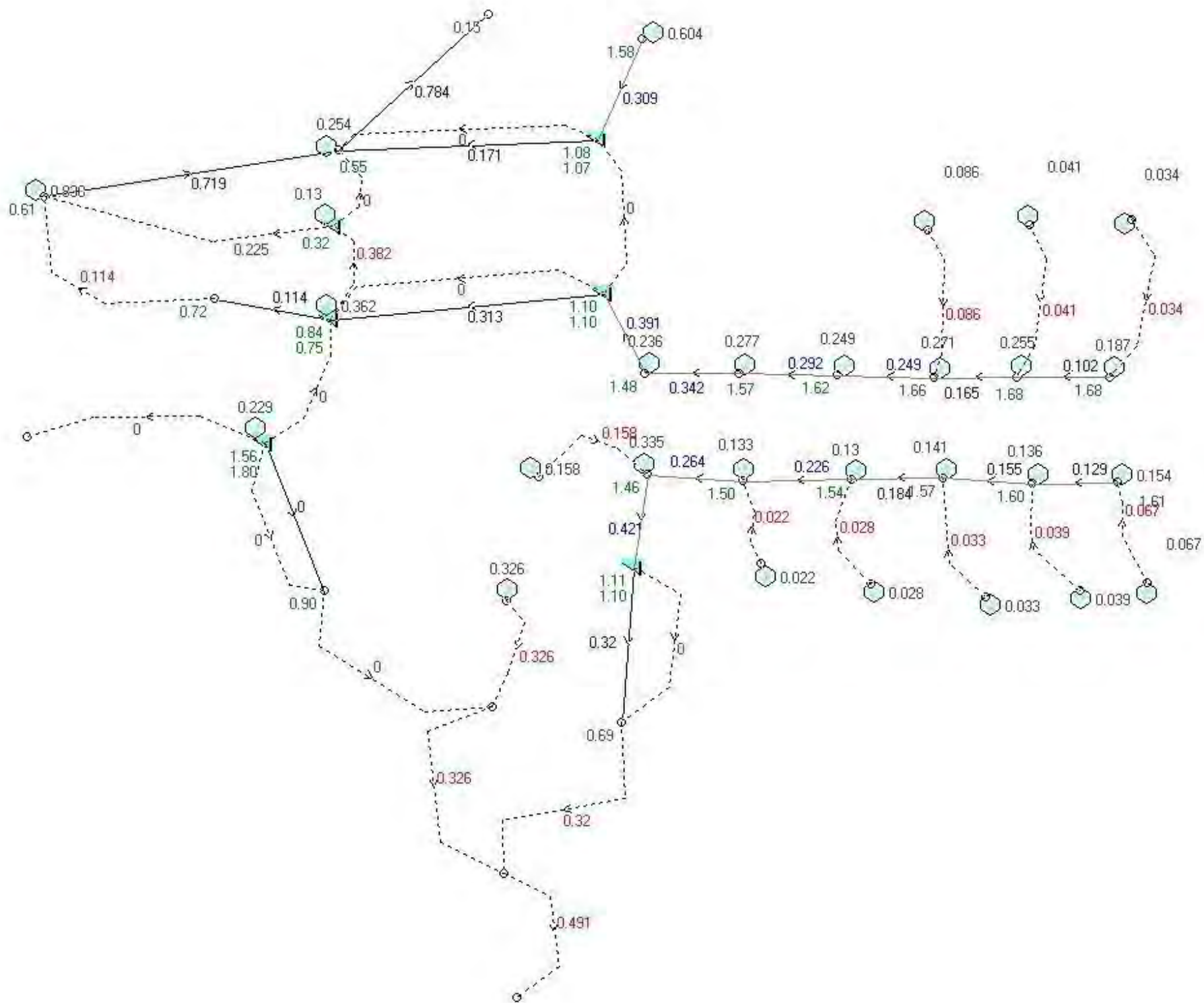
Name	Max Q	U/S Max Q	D/S Safe Q	Max D	Max D x V	Max Width	Max V	Due to Storm
ofb2-b3	0	0	0.085	0	0	0	0	
Ofb2-c3	0	0	0.101	0	0	0	0	
of3-2	0.382	0.382	0.136	0.568	0.04	10	0.07	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
ch3-7	0.114	0.114	0.431	0.133	0.01	10	0.09	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
ofbasin3-S	0	0	0.879	0	0	0	0	
of176	0.32	0.32	21.732	0.048	0.03	20.15	0.62	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
of2-7	0.225	0.225	0.163	0.368	0.06	4	0.15	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
of2-1	0	0	0.136	0	0	0	0	
OF132	0	0	44.636	0	0	0	0	
of216	0	0	0.879	0	0	0	0	
of5-swamp	0	0	44.636	0	0	0	0	
of5-Smithy	0	0	0.431	0	0	0	0	
of113-west	0.326	0.326	0.431	0.252	0.03	10	0.13	AR&R 1 year, 1 hour storm, average 25.2 mm/h, Zone 1
of203	0.491	0.491	44.636	0.02	0	100	0.25	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
Ofc103-c2	0	0	0.879	0	0	0	0	
OF80	0.158	0.158	0.879	0.106	0.01	20	0.07	AR&R 1 year, 9 hours storm, average 6.46 mm/h, Zone 1
OF91	0.022	0.022	0.879	0.032	0	20	0.03	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
OF71	0.028	0.028	0.879	0.037	0	20	0.04	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
OF64	0.033	0.033	0.879	0.041	0	20	0.04	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
OF90	0.039	0.039	0.879	0.045	0	20	0.04	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
OF85	0.067	0.067	0.879	0.064	0	20	0.05	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
OF98	0.034	0.034	0.879	0.043	0	20	0.04	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
OF100	0.041	0.041	0.879	0.047	0	20	0.04	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
OF102	0.086	0.086	0.12	0.247	0.03	3.49	0.12	AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1
of6-smithy	0.326	0.326	0.431	0.252	0.03	10	0.13	AR&R 1 year, 1 hour storm, average 25.2 mm/h, Zone 1

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin2	1.1	3288.7	0.313	0.313	0
n3	0.84	923.7	0.496	0.114	0.382
basin3	1.11	3155	0.32	0.32	0
n2	0.32	3255.8	0.225	0	0.225
wetland 2	1.56	1687.3	0	0	0
Basin1	1.08	963.4	0.171	0.171	0

CONTINUITY CHECK for AR&R 1 year, 12 hours storm, average 5.41 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage Ct (cu.m)	Difference %
n102.5	986.14	976.79	0	0.9
n102.4	2271.81	2245.96	0	1.1
n102.3	3890.66	3855.53	0	0.9
n102.2	4808.23	4751.19	0	1.2
n102.1	5808.74	5758.64	0	0.9
n102	6661	6608.17	0	0.8
Basin2	6608.17	3835.81	2739.69	0.5
n3	6412.92	6227.46	184.95	0
N59	2457.32	2457.3	0	0
n101.5	1113.26	1110.6	0	0.2
n101.4	1919.09	1902.37	0	0.9
n101.3	2677.72	2662	0	0.6
n101.2	3348.41	3328.74	0	0.6
n101.1	3996.94	3975.18	0	0.5
n101.0	5773.11	5754.26	0	0.3
basin3	5754.26	3132.03	2596.68	0.4
N258	3132.03	3132.02	0	0
N7	11892.23	8901.05	0	25.2
n1	12207.87	9012.03	0	26.2
out-hunter	9012.03	9012.03	0	0
n2	4935.61	3331.1	1604.51	0
wetland 2	1687.31	0	1687.31	0
n6	0	0	0	0
out-SWAM	0	0	0	0
Out-smithy	1927.6	1927.6	0	0
N202	5058.47	5058.39	0	0
N267	5058.16	5058.16	0	0
N103	2640.45	2608.42	0	1.2
Basin1	2608.42	1704.63	835.53	2.6
N100	518.64	518.64	0	0
N101	158.8	158.8	0	0
N107	189.46	189.46	0	0
N110	236.27	236.27	0	0
N113	287.2	287.2	0	0
N115	526.04	526.04	0	0
N122	270.09	270.09	0	0
N125	321.43	321.43	0	0
N128	611.43	611.43	0	0
N147	1927.6	1927.6	0	0



Developed 10 yr ARI

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Version 8		Min Freeboard (m)	Overflow (cu.m/s)	Constraint
			Max Surf Flow (cu.m/s)	Max Pond Volume (cu.m)			
n102.5	2.3			0.56			
n102.4	2.29			0.928			
n102.3	2.27			1.662			
n102.2	2.2			1.757			
n102.1	2.1			1.914			
n102	1.94			2.045			
N59	0.96			0			
n101.5	2.22			0.671			
n101.4	2.21			1.004			
n101.3	2.18			1.286			
n101.2	2.13			1.524			
n101.1	2.06			1.77			
n101.0	1.94			2.363			
N258	0.78			1.045			
N7	1.47			10.236			
n1	1.24			11.893			
out-hunter	0.84			0			
n6	1.01			0.356			
N103	1.94			1.609			

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
c102.5	0.389	0.389	0.061	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c102.4	0.529	0.529	0.084	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c102.3	0.562	0.562	0.089	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c102.2	0.518	0.518	0.082	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c102.1	0.575	0.575	0.091	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c102	0.49	0.49	0.077	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c3	1.97	0.214	1.835	4.73	95.63		0 AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
c101.5	0.319	0.319	0.05	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c101.4	0.283	0.283	0.045	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c101.3	0.293	0.293	0.046	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c101.2	0.27	0.27	0.043	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c101.1	0.277	0.277	0.044	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c101	0.695	0.695	0.11	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c7	8.804	0	8.804	0	258.54		0 AR&R 10 year, 12 hours storm, average 10.4 mm/h, Zone 1
c1	2.18	0	2.18	0	59.26		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c2	1.173	0.052	1.158	3.84	129.92		0 AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
c5	1.698	0.258	1.621	18.4	40.12		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
c103	1.609	1.254	0.523	8.59	22.56		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat73	1.21	0.077	1.167	6.72	12.09		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat82	0.17	0.03	0.166	4.03	46.26		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat88	0.213	0.035	0.209	4.01	40.95		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat91	0.254	0.044	0.248	3.64	45.01		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat93	0.308	0.054	0.298	3.68	46.82		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat97	0.544	0.1	0.529	3.15	50.94		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat117	0.279	0.052	0.272	3.15	50.94		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat119	0.332	0.061	0.323	3.15	50.94		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
Cat124	0.659	0.113	0.644	3.1	44.31		0 AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
C6	1.293	0.196	1.15	6.66	86.65		0 AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1

Outflow Volumes for Total Catchment (26.4 impervious + 451 pervious = 478 total ha)

Storm	Total Rainf. cu.m	Total Runoff cu.m	Impervious Runoff cu.m	Pervious Runoff cu.m	Runoff %
AR&R 10 y	298068.6	122054.21	15351.71	106702.50	(37.9%)
AR&R 10 y	349657.4	151156.64	18199.93	132956.70	(40.2%)
AR&R 10 y	408411.3	175433.89	21445.93	153987.97	(39.9%)
AR&R 10 y	533084.1	218291.67	28330.32	189961.34	(37.7%)
AR&R 10 y	596137.2	237566.56	31813.67	205752.89	(36.5%)
AR&R 10 y	711925.4	266499.00	38214.43	228284.58	(33.9%)
AR&R 10 y	804785.3	267240.06	43375.01	223865.05	(29.4%)

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
p2.3	1.154	2.15	1.298	1.298	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
p3.7	0.837	1.06	1.212	1.126	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
p3-out	1.31	4.76	1.185	0.775	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
culvert	11.343	4.97	1.245	0.845	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
P5-out	0.528	3.78	1.909	1.009	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
p3-1	0.703	1.72	1.245	1.245	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm
cess3.5	0.37	0.08	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess3.4	0.843	0.19	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
cess3.3	1.591	0.33	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess3.2	1.735	0.41	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess3.1	1.894	0.5	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess3	2.029	2.2	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess1.5	0.624	0.16	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
cess1.4	0.96	0.24	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1
cess1.3	1.277	0.29	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess1.2	1.547	0.37	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess1.1	1.799	0.47	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
cess1	2.382	2.69	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
Crk12-11	9.882	-1.#J	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1
Ch388929	1.105	2.58	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1

OVERFLOW ROUTE DETAILS

Name	Max Q	U/S	Max Q	D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
ofb2-b3	0.153	0.153	0.085	0.417	0.05	4.17	0.11	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
OFb2-c3	1.415	1.415	1.006	0.246	0.07	20	0.29	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
of3-2	1.906	1.906	0.136	1	0.19	10	0.19	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
ch3-7	0.837	0.837	0.431	0.452	0.08	10	0.19	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
ofbasin3-Si	1.045	1.045	0.879	0.333	0.05	20	0.16	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
of176	2.351	2.351	21.732	0.104	0.12	33.91	1.11	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
of2-7	0.896	0.896	0.163	0.916	0.22	4	0.24	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
of2-1	1.817	1.817	0.136	1	0.18	10	0.18	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
OF132	0	0	44.636	0	0	0	0			
of216	0.356	0.356	0.879	0.173	0.02	20	0.1	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
of5-swamp	0.81	0.81	44.636	0.027	0.01	100	0.3	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
of5-Smithy	0.882	0.882	0.431	0.467	0.09	10	0.19	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
of113-west	2.118	2.118	0.431	0.809	0.21	10	0.26	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
of203	4.252	4.252	44.636	0.073	0.04	100	0.58	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
Ofc103-c2	0.266	0.266	0.879	0.145	0.01	20	0.09	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		
OF80	1.21	1.21	0.879	0.365	0.06	20	0.17	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF91	0.17	0.17	0.879	0.111	0.01	20	0.08	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF71	0.213	0.213	0.879	0.127	0.01	20	0.08	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF64	0.254	0.254	0.879	0.141	0.01	20	0.09	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF90	0.308	0.308	0.879	0.159	0.02	20	0.1	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF85	0.544	0.544	0.879	0.225	0.03	20	0.12	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF98	0.279	0.279	0.879	0.15	0.01	20	0.09	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF100	0.332	0.332	0.879	0.166	0.02	20	0.1	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
OF102	0.659	0.659	0.12	0.761	0.16	5.54	0.22	AR&R 10 year, 2 hours storm, average 31.2 mm/h, Zone 1		
of6-smithy	1.293	1.293	0.431	0.592	0.13	10	0.22	AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1		

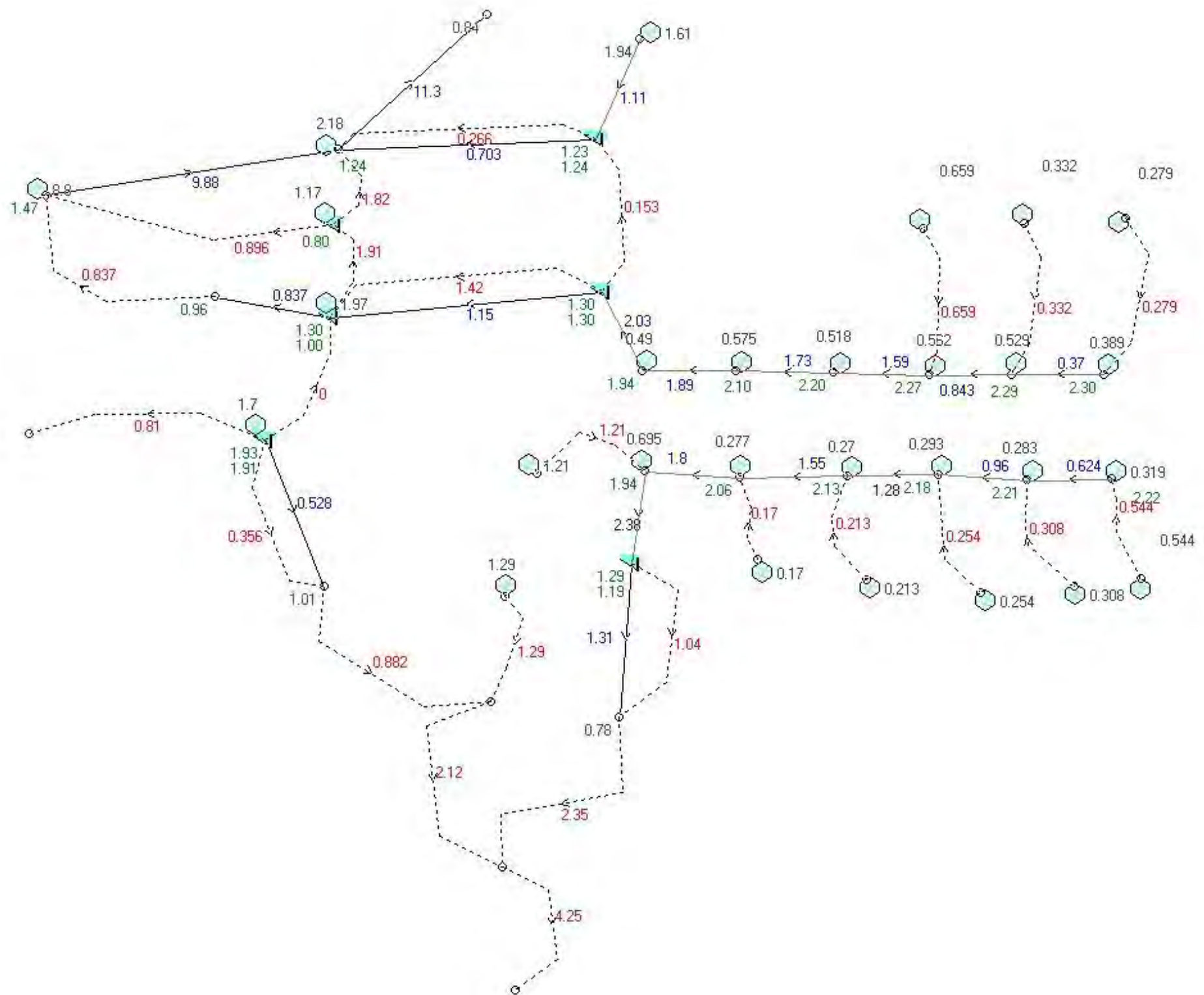
DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q	Max Q	Max Q
			Total	Low Level	High Level
Basin2	1.3	4637.4	2.722	1.154	1.568
n3	1.3	7116.2	2.743	0.837	1.906
basin3	1.29	4365.9	2.355	1.31	1.045
n2	0.8	11145.8	2.713	0	2.713
wetland 2	1.93	2776.2	1.694	0.528	1.166
Basin1	1.23	1286	0.969	0.703	0.266

CONTINUITY CHECK for AR&R 10 year, 9 hours storm, average 12.4 mm/h, Zone 1

Node	Inflow (cu.m)	Outflow (cu.m)	Storage (cu.m)	ChDifference %
n102.5	3225.02	3191.96	0	1
n102.4	7305.95	7229.52	0	1
n102.3	13096.45	13007.93	0	0.7
n102.2	15165.24	15054.73	0	0.7
n102.1	17451.53	17350.1	0	0.6
n102	19394.54	19294.82	0	0.5
Basin2	19294.82	16453.1	2771.43	0.4
n3	30318.91	30061.28	256.64	0
N59	9234.04	9234.01	0	0
n101.5	4450.75	4434.31	0	0.4
n101.4	7288.96	7241.85	0	0.6
n101.3	9830.27	9784.16	0	0.5
n101.2	11988.57	11938.21	0	0.4
n101.1	14014.2	13963.53	0	0.4
n101.0	19478.51	19433.09	0	0.2
basin3	19433.09	16762.97	2619.38	0.3
N258	16762.96	16762.98	0	0
N7	143418.8	136126.7	0	5.1
n1	166322.9	159416.6	0	4.2
out-hunter	159416.6	159416.6	0	0
n2	30879.43	28408.4	2469.15	0
wetland 2	8654.56	6248.01	2406.54	0
n6	4266.66	4266.66	0	0
out-SWAM	1981.36	1981.36	0	0
Out-smithy	13518.67	13518.73	0	0
N202	30279.25	30279.63	0	0
N267	30279.23	30279.23	0	0
N103	5883.17	5834.71	0	0.8
Basin1	6535.63	5597.28	841.66	1.5
N100	2614.53	2614.53	0	0
N101	922.81	922.81	0	0
N107	1077.64	1077.64	0	0
N110	1365.94	1365.94	0	0
N113	1673.12	1673.12	0	0
N115	3120.28	3120.28	0	0
N122	1602.24	1602.24	0	0
N125	1906.77	1906.77	0	0
N128	3524.54	3524.54	0	0
N147	9252	9252	0	0

Run Log for QR Hexham A developed1.drm run at 11:36:04 on 30/5/2012



Appendix B MUSIC Modelling Result Files

Existing Site: Source Nodes

Node Type	AgriculturalSourceNode	AgriculturalSourceNode	AgriculturalSourceNode	ForestSourceNode
Node Name	C101	102	103 surrounding catchments:	7
Node ID	5	8	9	
Coordinates				
General - Location	C101	102	103 surrounding catchments:	
General - Notes			C5, C6(partial),c7	
General - Fluxes - Daily				
General - Fluxes - Sub-Daily				
Areas - Total Area (ha)	40.84	83.2	23.09	310.13
Areas - Impervious (%)	4	4	4	4
Areas - Pervious (%)	96	96	96	96
Rainfall-Runoff - Impervious Area - Rainfall Threshold (mm/day)	1	1	1	1.5
Rainfall-Runoff - Pervious Area - Soil Storage Capacity (mm)	120	120	120	100
Rainfall-Runoff - Pervious Area - Initial Storage (% of Capacity)	36	36	36	30
Rainfall-Runoff - Pervious Area - Field Capacity (mm)	80	80	80	30
Rainfall-Runoff - Pervious Area - Infiltration Capacity Coefficient - a	200	200	200	400
Rainfall-Runoff - Pervious Area - Infiltration Capacity Exponent - b	1	1	1	1
Rainfall-Runoff - Groundwater Properties - Initial Depth (mm)	10	10	10	0
Rainfall-Runoff - Groundwater Properties - Daily Recharge Rate (%)	25	25	25	25
Rainfall-Runoff - Groundwater Properties - Daily Baseflow Rate (%)	5	5	5	50
Rainfall-Runoff - Groundwater Properties - Daily Deep Seepage Rate (%)	0	0	0	0
Total Suspended Solids - Base Flow Concentration - Mean (log mg/L)	1.74	1.74	1.74	1.74
Total Suspended Solids - Base Flow Concentration - Std Dev (log mg/L)	0.13	0.32	0.13	0.32
Total Suspended Solids - Base Flow Concentration - Estimation Method	0	0	0	0
Total Suspended Solids - Base Flow Concentration - Serial Correlation (R squared)	0	0	0	0
Total Suspended Solids - Storm Flow Concentration - Mean (log mg/L)	2.279	2.279	2.279	2.004
Total Suspended Solids - Storm Flow Concentration - Std Dev (log mg/L)	0.46	0.46	0.46	0.598
Total Suspended Solids - Storm Flow Concentration - Estimation Method	0	0	0	0
Total Suspended Solids - Storm Flow Concentration - Serial Correlation (R squared)	0	0	0	0
Total Phosphorus - Base Flow Concentration - Mean (log mg/L)	-0.14	-0.14	-0.14	-0.14
Total Phosphorus - Base Flow Concentration - Std Dev (log mg/L)	1.368	1.368	1.368	1.368
Total Phosphorus - Base Flow Concentration - Estimation Method	0	0	0	0
Total Phosphorus - Base Flow Concentration - Serial Correlation (R squared)	0	0	0	0
Total Phosphorus - Storm Flow Concentration - Mean (log mg/L)	-0.14	-0.267	-0.14	-0.658
Total Phosphorus - Storm Flow Concentration - Std Dev (log mg/L)	0.47	0.47	0.47	0.503
Total Phosphorus - Storm Flow Concentration - Estimation Method	0	0	0	0
Total Phosphorus - Storm Flow Concentration - Serial Correlation (R squared)	0	0	0	0
Total Nitrogen - Base Flow Concentration - Mean (log mg/L)	0.24	0.24	0.24	0.24
Total Nitrogen - Base Flow Concentration - Std Dev (log mg/L)	0.339	0.339	0.339	0.339
Total Nitrogen - Base Flow Concentration - Estimation Method	0	0	0	0
Total Nitrogen - Base Flow Concentration - Serial Correlation (R squared)	0	0	0	0
Total Nitrogen - Storm Flow Concentration - Mean (log mg/L)	0.6	0.602	0.6	0.322
Total Nitrogen - Storm Flow Concentration - Std Dev (log mg/L)	0.376	0.376	0.376	0.418
Total Nitrogen - Storm Flow Concentration - Estimation Method	0	0	0	0
Total Nitrogen - Storm Flow Concentration - Serial Correlation (R squared)	0	0	0	0

Development Site With Treatment

Node Type	AgriculturalSourceN	AgriculturalSource	UserDefinedSour	UserDefinedSourc	UserDefinedSour	UserDefinedSourc
Node Name	C4	C6 (partial) cess drain	C101-A	C102	c103	C101-B
Node ID	23	24	1	2	3	22
Coordinates						
General - Location	C4	C6 (partial) cess drain	C101-A	C102	c103	C101-B
General - Notes						
General - Fluxes - Daily						
General - Fluxes - Sub-Daily						
Areas - Total Area (ha)	30.62	7.56	7.571	24.146	3.014	6.108
Areas - Impervious (%)	4	4	50	50	50	50
Areas - Pervious (%)	96	96	50	50	50	50
Rainfall-Runoff - Impervious Area - Rainfall Threshold (mm/day)	1	1	1.5	1.5	1.5	1.5
Rainfall-Runoff - Pervious Area - Soil Storage Capacity (mm)	120	120	100	100	100	100
Rainfall-Runoff - Pervious Area - Initial Storage (% of Capacity)	36	36	30	30	30	30
Rainfall-Runoff - Pervious Area - Field Capacity (mm)	80	80	30	30	30	30
Rainfall-Runoff - Pervious Area - Infiltration Capacity Coefficient - a	200	200	400	400	400	400
Rainfall-Runoff - Pervious Area - Infiltration Capacity Exponent - b	1	1	1	1	1	1
Rainfall-Runoff - Groundwater Properties - Initial Depth (mm)	10	10	0	0	0	0
Rainfall-Runoff - Groundwater Properties - Daily Recharge Rate (%)	25	25	25	25	25	25
Rainfall-Runoff - Groundwater Properties - Daily Baseflow Rate (%)	5	5	50	50	50	50
Rainfall-Runoff - Groundwater Properties - Daily Deep Seepage Rate (%)	0	0	0	0	0	0
Total Suspended Solids - Base Flow Concentration - Mean (log mg/L)	1.74	1.74	1.74	1.74	1.74	1.74
Total Suspended Solids - Base Flow Concentration - Std Dev (log mg/L)	0.13	0.13	0.497	0.5	0.497	0.497
Total Suspended Solids - Base Flow Concentration - Estimation Method	0	0	0	0	0	0
Total Suspended Solids - Base Flow Concentration - Serial Correlation (R squared)	0	0	0	0	0	0
Total Suspended Solids - Storm Flow Concentration - Mean (log mg/L)	2.279	2.279	2.6	2.6	2.6	2.6
Total Suspended Solids - Storm Flow Concentration - Std Dev (log mg/L)	0.46	0.46	0.495	0.495	0.495	0.495
Total Suspended Solids - Storm Flow Concentration - Estimation Method	0	0	0	0	0	0
Total Suspended Solids - Storm Flow Concentration - Serial Correlation (R squared)	0	0	0	0	0	0
Total Phosphorus - Base Flow Concentration - Mean (log mg/L)	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14
Total Phosphorus - Base Flow Concentration - Std Dev (log mg/L)	1.368	1.368	0.533	0.533	0.533	0.533
Total Phosphorus - Base Flow Concentration - Estimation Method	0	0	0	0	0	0
Total Phosphorus - Base Flow Concentration - Serial Correlation (R squared)	0	0	0	0	0	0
Total Phosphorus - Storm Flow Concentration - Mean (log mg/L)	-0.14	-0.14	-0.523	-0.523	-0.523	-0.523
Total Phosphorus - Storm Flow Concentration - Std Dev (log mg/L)	0.47	0.47	0.27	0.271	0.271	0.271
Total Phosphorus - Storm Flow Concentration - Estimation Method	0	0	0	0	0	0
Total Phosphorus - Storm Flow Concentration - Serial Correlation (R squared)	0	0	0	0	0	0
Total Nitrogen - Base Flow Concentration - Mean (log mg/L)	0.24	0.24	0.24	0.24	0.24	0.24
Total Nitrogen - Base Flow Concentration - Std Dev (log mg/L)	0.339	0.339	0.258	0.258	0.258	0.258
Total Nitrogen - Base Flow Concentration - Estimation Method	0	0	0	0	0	0
Total Nitrogen - Base Flow Concentration - Serial Correlation (R squared)	0	0	0	0	0	0
Total Nitrogen - Storm Flow Concentration - Mean (log mg/L)	0.6	0.6	0.398	0.398	0.398	0.398
Total Nitrogen - Storm Flow Concentration - Std Dev (log mg/L)	0.376	0.376	0.3	0.3	0.3	0.3
Total Nitrogen - Storm Flow Concentration - Estimation Method	0	0	0	0	0	0
Total Nitrogen - Storm Flow Concentration - Serial Correlation (R squared)	0	0	0	0	0	0

Treatment Nodes - Wetlands

Node Type	WetlandNode	WetlandNode	WetlandNode
Node Name	Basin 3	Basin 2	Basin 1
Node ID	7	8	12
Coordinates			
General - Location	Basin 3	Basin 2	Basin 1
General - Notes			
General - Fluxes			
Stormwater Re-use - Use stored water for irrigation or other purpose	1	1	1
Stormwater Re-use - Annual Demand (kL/yr) Scaled by Daily: PET	-9999	-9999	-9999
Stormwater Re-use - Annual Demand (kk/yr) Scaled by Daily: PET - Rain	-9999	-9999	-9999
Stormwater Re-use - Daily Demand (kL/day)	-9999000	-9999000	-9999000
Stormwater Re-use - User-defined distribution of Annual Demand (ML/yr)	-9999	-9999	-9999
Stormwater Re-use - User-defined time series			
Inlet Properties - Low Flow By-pass (cubic metres per sec)	0	0	0
Inlet Properties - High Flow By-pass (cubic metres per sec)	100	100	100
Inlet Properties - Inlet Pond Volume (cubic metres)	0	0	0
Storage Properties - Surface Area (square metres)	6562	6675	2187
Storage Properties - Extended Detention Depth (metres)	0.6	0.6	0.6
Storage Properties - Permanent Pool Volume (cubic metres)	2500	2404	793
Storage Properties - Exfiltration Rate (mm/hr)	3.6	3.6	3.6
Storage Properties - Evaporative Loss as % of PET	125	125	125
Outlet Properties - Equivalent Pipe Diameter (mm)	300	300	300
Outlet Properties - Overflow Weir Width (metres)	4	4	4
Outlet Properties - Notional Detention Time (hrs)	6.733035744	6.848981041	2.244003226
Advanced Properties - Orifice Discharge Coefficient	0.6	0.6	0.6
Advanced Properties - Weir Coefficient	1.7	1.7	1.7
Advanced Properties - Number of CSTR Cells	5	5	5
Advanced Properties - Total Suspended Solids - k (m/yr)	1500	1500	1500
Advanced Properties - Total Suspended Solids - C* (mg/L)	6	6	6
Advanced Properties - Total Suspended Solids - C** (mg/L)	6	6	6
Advanced Properties - Total Phosphorus - k (m/yr)	1000	1000	1000
Advanced Properties - Total Phosphorus - C* (mg/L)	0.06	0.06	0.06
Advanced Properties - Total Phosphorus - C** (mg/L)	0.06	0.06	0.06
Advanced Properties - Total Nitrogen - k (m/yr)	150	150	150
Advanced Properties - Total Nitrogen - C* (mg/L)	1	1	1
Advanced Properties - Total Nitrogen - C** (mg/L)	1	1	1
Advanced Properties - Threshold Hydraulic Loading for C** (m/yr)	3500	3500	3500
Advanced Properties - User Defined Storage-Discharge-Height			

Swale Treatment Nodes

Node Type	SwaleNode	SwaleNode	SwaleNode	SwaleNode
Node Name	Swale 101-A	Swale 101-B	Swale 102	Swale 103
Node ID	4	5	10	11
Coordinates				
General - Location	Swale 101-A	Swale 101-B	Swale 102	Swale 103
General - Notes				
General - Fluxes				
Inlet Properties - Low Flow By-pass (cubic metres per sec)	0	0	0	0
Storage Properties - Length (metres)	524	258	981.8	256
Storage Properties - Bed Slope (%)	0.01	0.01	0.05	0.05
Storage Properties - Base Width (metres)	2.5	2.5	2.5	5
Storage Properties - Top Width (metres)	4.9	4.9	4.9	12.8
Storage Properties - Depth (metres)	0.6	0.6	0.6	0.6
Storage Properties - Vegetation Height (metres)	0.1	0.1	0.1	0.1
Storage Properties - Exfiltration Rate (mm/hr)	0	0	0	0
Advanced Properties - Number of CSTR Cells	10	10	10	10
Advanced Properties - Total Suspended Solids - k (m/yr)	8000	8000	8000	8000
Advanced Properties - Total Suspended Solids - C* (mg/L)	20	20	20	20
Advanced Properties - Total Suspended Solids - C** (mg/L)	14	14	14	14
Advanced Properties - Total Phosphorus - k (m/yr)	6000	6000	6000	6000
Advanced Properties - Total Phosphorus - C* (mg/L)	0.13	0.13	0.13	0.13
Advanced Properties - Total Phosphorus - C** (mg/L)	0.13	0.13	0.13	0.13
Advanced Properties - Total Nitrogen - k (m/yr)	500	500	500	500
Advanced Properties - Total Nitrogen - C* (mg/L)	1.4	1.4	1.4	1.4
Advanced Properties - Total Nitrogen - C** (mg/L)	1.4	1.4	1.4	1.4
Advanced Properties - Threshold Hydraulic Loading for C** (m/yr)	3500	3500	3500	3500

GPT Treatment Node

Node Type	GPTNode
Node Name	Gross Pollutant Trap
Node ID	Gross Pollutant Trap
Coordinates	
Lo-flow bypass rate (cum/sec)	0
High Flow By-pass (cubic metres per sec)	0.1
Flow Transfer Function - Input #2	10
Flow Transfer Function - Output #2	10
GP Transfer Function - Input #2	15
GP Transfer Function - Output #2	15
TN Transfer Function - Input #2	50
TN Transfer Function - Output #2	50
TP Transfer Function - Input #2	50
TP Transfer Function - Output #2	50
TSS Transfer Function - Input #2	1000
TSS Transfer Function - Output #2	300

Appendix C Inspection and Test Plans

Issue	SEDIMENT AND EROSION CONTROLS – ESTABLISHMENT AND MAINTENANCE
Purpose	Monitor and maintain Sediment and Erosion controls to minimise pollutant export from the site.
Responsibility	Site Foreman
Criteria	• Sediment traps, check dams – clean out when 30% of design capacity • Basins – remove sediment within 1 week of reaching 100% of design capacity • Truck shakedown – clean out when 90% of design capacity • All controls to be cleaned when construction stops for periods >2 weeks.
Monitoring	Inspect controls: • Daily for first week; • Fortnightly thereafter; • after rainfall events >25mm/day • Prior to shut downs >2 weeks.
Corrective Actions	• Increase frequency of maintenance; • Improve sediment and erosion controls • Modify site practices
Reporting	• Record inspect results; • Store 1 copy on site for inspection by authorities; • Provide monthly copies to Superintendent
Notification	For Breach of Criteria; • Notify Superintendent by phone and Fax on same day, or within 12 hours. Detail rectification measures undertaken/proposed.

Issue	BASIN WATER QUALITY AND LEVELS
Purpose	Monitor water quality in basins to maintain within an acceptable range in case of overflow. Maintain adequate buffer in the basin in the event of wet weather.
Responsibility	Site Foreman
Criteria	- pH – 6 to 8.5 (or ± 0.5 of receiving waters) - Suspended Solids - <50mg/L¹ - Water level <90%
Monitoring	Inspect: - Daily for first week; - Weekly thereafter; - Prior to rainfall, if possible - After rainfall events >25mm/day - Prior to shut downs >2 weeks.
Corrective Actions	- pH – add Hydrated Lime or Acid to modify pH accordingly; - Suspended Solids – add Gypsum. Other flocculants require approval due to possibly impacts on aquatic species. - Modify site practices; - Pump water from pond, clear out discharge pipes.
Reporting	- Record inspect results; - Store 1 copy on site for inspection by authorities; - Provide monthly copies to Superintendent
Notification	For Breach of Criteria and discharge from site; - Notify Superintendent by phone and Fax on same day, or within 12 hours. Detail rectification measures undertaken/proposed. When water quality is unsatisfactory for > 2weeks; - Notify Superintendent to determine rectification measures.

Issue	DUST CONTROL
Purpose	Control dust on the site to prevent adverse impacts on adjacent properties.
Responsibility	Site Foreman

¹ If a relationship can be established between Turbidity and TSS then turbidity readings may be adopted for the monitoring criteria.

Criteria	• Less than 1 complaint per week, and less than 3 in total
Monitoring	Inspect: • Continuously monitor site conditions and weather; • If >3 complaints are received set up dust monitoring stations with data loggers.
Corrective Actions	• Water cart; • Install wind breaks in accordance with Blue Book. • Stop work on windy days. • Revegetate exposed areas (e.g. hydro-mulch); • Install dust monitoring;
Reporting	• Record wind speed and direction, water truck usage (number, times) and wind breaks (install date, details); • Review dust monitoring results and collate weekly, or upon receipt of complaints. • Store 1 copy on site for inspection by authorities; • Provide monthly summaries to Superintendent.
Notification	For Breach of Criteria; • Notify Superintendent by phone and Fax on same day, or within 12 hours. Detail rectification measures undertaken/proposed.

Issue	WATER RELEASES
Purpose	Protect receiving waters during planned discharges.
Responsibility	Site Foreman
Criteria	• pH – 6 to 8.5 (or ± 0.5 of receiving waters) • Suspended Solids - <50mg/L
Monitoring	• Record pH and TSS in receiving waters daily and following rainfall events >25mm/day • Record pH and TSS in receiving waters prior to release; • Record pH and TSS in pond water.
Corrective Actions	• pH – add Hydrated Lime or Acid to modify pH accordingly; • Suspended Solids – add Gypsum. Other flocculants require approval due to possibly impacts on aquatic species. • Modify site practices;
Reporting	• Report all monitoring results. • Store 1 copy on site for inspection by authorities; • Provide monthly summaries to Superintendent.
Notification	For Breach of Criteria; • Notify Superintendent by phone and Fax on same day, or within 12 hours. Detail rectification measures undertaken/proposed.