

APPENDIX A
DRAINAGE DISCHARGE CALCULATIONS

1. Infiltration Calculations (Required Total Volume of Soakaway)

r for St Bees = 30
Impermeable Area 190.8

f = 0.000027

Storm Duration D (min)	Z1	M5-Dmin 20mmxZ1	M5-Dmin (m)	I (m3)	Z2 (M10) R (m)	M10-D R (m)	I (m3)	Z2 (M100) R (m)	M100-D R (m)	I (m3)	O (m3)	S (m3)			SOAKAWAY REQUIREMENTS			
10	0.49	9.8	0.0098	1.870	1.22	0.01196	2.281	1.91	0.0187	3.571	0.2689	M5	M10	M100	Width (W)	1 m		
15	0.59	11.8	0.0118	2.251	1.23	0.01451	2.769	1.95	0.0230	4.390	0.4034	1.6009	2.0123	3.30247	Length (L)	1 m		
30	0.77	15.4	0.0154	2.938	1.24	0.01910	3.644	2.00	0.0308	5.877	0.8068	1.8481	2.3659	3.98693	Effective Depth	8.3 m		
60	1	20	0.0200	3.816	1.24	0.02480	4.732	2.03	0.0406	7.746	1.6135	2.2025	3.1183	6.13296	as50 =	16.6 m2		
120	1.25	25	0.0250	4.770	1.24	0.03100	5.915	2.01	0.0503	9.588	3.2270	1.5430	2.6878	6.36066	Effective Volume	8.30 m3		
240	1.53	30.6	0.0306	5.838	1.22	0.03733	7.123	1.97	0.0603	11.502	6.4541	-0.6156	0.6689	5.04773	Required Volume	8.27 m3		
360	1.78	35.6	0.0356	6.792	1.21	0.04308	8.219	1.94	0.0691	13.177	9.6811	-2.8886	-1.4622	3.49629				
600	2.12	42.4	0.0424	8.090	1.19	0.05046	9.627	1.90	0.0806	15.371	16.1352	-8.0453	-6.5082	-0.76435				

2a Total Discharge to Combined Sewer (Confirmation of Sufficient Flow in Existing SW Drain)

r for St Bees = 30
Impermeable Area 315.8

Max Flow Rate for 110mm pipe @ 1 in 40 gradient =

0.010 m³/s

Storm Duration D (min)	Z1	M5-Dmin 20mmxZ1	M5-Dmin (m)	I (m3)	Z2 (M10) R (m)	M10-D R (m)	I (m3)	Z2 (M100) R (m)	M100-D R (m)	I (m3)	O (m3)	S		
												M5	M10	M100
10	0.49	9.8	0.0098	3.095	1.22	0.01196	3.776	1.91	0.0187	5.911	6.0000	-2.9052	-2.2243	-0.0889
15	0.59	11.8	0.0118	3.726	1.23	0.01451	4.584	1.95	0.0230	7.267	9.0000	-5.2736	-4.4165	-1.7334
30	0.77	15.4	0.0154	4.863	1.24	0.01910	6.031	2.00	0.0308	9.727	18.0000	-13.1367	-11.9695	-8.2734
60	1	20	0.0200	6.316	1.24	0.02480	7.832	2.03	0.0406	12.821	36.0000	-29.6840	-28.1682	-23.1785
120	1.25	25	0.0250	7.895	1.24	0.03100	9.790	2.01	0.0503	15.869	72.0000	-64.1050	-62.2102	-56.1311
240	1.53	30.6	0.0306	9.663	1.22	0.03733	11.789	1.97	0.0603	19.037	144.0000	-134.3365	-132.2106	-124.9629
360	1.78	35.6	0.0356	11.242	1.21	0.04308	13.603	1.94	0.0691	21.810	216.0000	-204.7575	-202.3966	-194.1896
600	2.12	42.4	0.0424	13.390	1.19	0.05046	15.934	1.90	0.0806	25.441	360.0000	-346.6101	-344.0660	-334.5592

2b Plot 1 Discharge to Shared SW Pipe

r for St Bees = 30
Impermeable Area 190.8

Max Flow Rate for 110mm pipe @ 1 in 40 gradient =

0.010 m³/s

Storm Duration D (min)	Z1	M5-Dmin 20mmxZ1	M5-Dmin (m)	I (m3)	Z2 (M10) R (m)	M10-D R (m)	I (m3)	Z2 (M100) R (m)	M100-D R (m)	I (m3)	O (m3)	S			Max Discharge Rate			
10	0.49	9.8	0.0098	1.870	1.22	0.01196	2.281	1.91	0.0187	3.571	6.0000	M5	M10	M100	M5	M10	M100	
15	0.59	11.8	0.0118	2.251	1.23	0.01451	2.769	1.95	0.0230	4.390	9.0000	-4.1302	-3.7188	-2.4286	3.12	3.80	5.95	
30	0.77	15.4	0.0154	2.938	1.24	0.01910	3.644	2.00	0.0308	5.877	18.0000	-6.7486	-6.2307	-4.6097	2.50	3.08	4.88	
60	1	20	0.0200	3.816	1.24	0.02480	4.732	2.03	0.0406	7.746	36.0000	-15.0617	-14.3565	-12.1234	1.63	2.02	3.26	
120	1.25	25	0.0250	4.770	1.24	0.03100	5.915	2.01	0.0503	9.588	72.0000	-32.1840	-31.2682	-28.2535	1.06	1.31	2.15	
240	1.53	30.6	0.0306	5.838	1.22	0.03733	7.123	1.97	0.0603	11.502	144.0000	-67.2300	-66.0852	-62.4123	0.66	0.82	1.33	
360	1.78	35.6	0.0356	6.792	1.21	0.04308	8.219	1.94	0.0691	13.177	216.0000	-138.1615	-136.8771	-132.4982	0.41	0.49	0.80	
600	2.12	42.4	0.0424	8.090	1.19	0.05046	9.627	1.90	0.0806	15.371	360.0000	-209.2075	-207.7811	-202.8226	0.31	0.38	0.61	
												-351.9101	-350.3730	-344.6292	0.22	0.27	0.43	