

APPENDIX A **DRAINAGE DISCHARGE CALCULATIONS (Rev B)**

1. Infiltration Calculations (Required Total Volume of Soakaway)

r for St Bees = 30
Impermiable Area 190.8

f= 0.000027

Storm Duration D (min)	Z1	M5-Dmin 20mmxZ1	M5-Dmin (m)	I (m3)	Z2 (M10)	M10-D R (m)	I (m3)	Z2 (M100)	M100-D R (m)	I (m3)
10	0.49	9.8	0.0098	1.870	1.22	0.01196	2.281	1.91	0.0187	3.571
15	0.59	11.8	0.0118	2.251	1.23	0.01451	2.769	1.95	0.0230	4.390
30	0.77	15.4	0.0154	2.938	1.24	0.01910	3.644	2.00	0.0308	5.877
60	1	20	0.0200	3.816	1.24	0.02480	4.732	2.03	0.0406	7.746
120	1.25	25	0.0250	4.770	1.24	0.03100	5.915	2.01	0.0503	9.588
240	1.53	30.6	0.0306	5.838	1.22	0.03733	7.123	1.97	0.0603	11.502
360	1.78	35.6	0.0356	6.792	1.21	0.04308	8.219	1.94	0.0691	13.177
600	2.12	42.4	0.0424	8.090	1.19	0.05046	9.627	1.90	0.0806	15.371

O (m3)
0.2689
0.4034
0.8068
1.6135
3.2270
6.4541
9.6811
16.1352

S (m3)		
M5	M10	M100
1.6009	2.0123	3.30247
1.8481	2.3659	3.98693
2.1316	2.8368	5.06988
2.2025	3.1183	6.13296
1.5430	2.6878	6.36066
-0.6156	0.6689	5.04773
-2.8886	-1.4622	3.49629
-8.0453	-6.5082	-0.76435

SOAKAWAY REQUIREMENTS	
Width (W)	1 m
Length (L)	1 m
Effective Depth	8.3 m
as50 =	16.6 m2
Effective Volume	8.30 m3
Required Volume	8.27 m3

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

r for St Bees = 30
Impermiable Area 265.8

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)	M10-D R (m)	I (m3)	Z2 (M100)	M100-D R (m)	I (m3)
10	0.49	9.8	0.0098	2.605	1.22	0.01196	3.178	1.91	0.0187	4.975
15	0.59	11.8	0.0118	3.136	1.23	0.01451	3.858	1.95	0.0230	6.116
30	0.77	15.4	0.0154	4.093	1.24	0.01910	5.076	2.00	0.0308	8.187
60	1	20	0.0200	5.316	1.24	0.02480	6.592	2.03	0.0406	10.791
120	1.25	25	0.0250	6.645	1.24	0.03100	8.240	2.01	0.0503	13.356
240	1.53	30.6	0.0306	8.133	1.22	0.03733	9.923	1.97	0.0603	16.023
360	1.78	35.6	0.0356	9.462	1.21	0.04308	11.450	1.94	0.0691	18.357
600	2.12	42.4	0.0424	11.270	1.19	0.05046	13.411	1.90	0.0806	21.413

O (m3)
6.0000
9.0000
18.0000
36.0000
72.0000
144.0000
216.0000
360.0000

S		
M5	M10	M100
-3.3952	-2.8221	-1.0248
-5.8636	-5.1422	-2.8839
-13.9067	-12.9243	-9.8134
-30.6840	-29.4082	-25.2085
-65.3550	-63.7602	-58.6436
-135.8665	-134.0772	-127.9770
-206.5375	-204.5504	-197.6428
-348.7301	-346.5888	-338.5872

2b Plot 1 Discharge to Shared SW Pipe

r for St Bees = 30
SW Drain Area = 140.8
Land drainage area = 50

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)	M10-D R (m)	I (m3)	Z2 (M100)	M100-D R (m)	I (m3)
10	0.49	9.8	0.0098	1.380	1.22	0.01196	1.683	1.91	0.0187	2.635
15	0.59	11.8	0.0118	1.661	1.23	0.01451	2.044	1.95	0.0230	3.240
30	0.77	15.4	0.0154	2.168	1.24	0.01910	2.689	2.00	0.0308	4.337
60	1	20	0.0200	2.816	1.24	0.02480	3.492	2.03	0.0406	5.716
120	1.25	25	0.0250	3.520	1.24	0.03100	4.365	2.01	0.0503	7.075
240	1.53	30.6	0.0306	4.308	1.22	0.03733	5.256	1.97	0.0603	8.488
360	1.78	35.6	0.0356	5.012	1.21	0.04308	6.065	1.94	0.0691	9.724
600	2.12	42.4	0.0424	5.970	1.19	0.05046	7.104	1.90	0.0806	11.343

O (m3)
6.0000
9.0000
18.0000
36.0000
72.0000
144.0000
216.0000
360.0000

S		
M5	M10	M100
-4.6202	-4.3166	-3.3645
-7.3386	-6.9564	-5.7602
-15.8317	-15.3113	-13.6634
-33.1840	-32.5082	-30.2835
-68.4800	-67.6352	-64.9248
-139.6915	-138.7437	-135.5123
-210.9875	-209.9349	-206.2758
-354.0301	-352.8958	-348.6572

Max Discharge Rate		
M5	M10	M100
2.30	2.81	4.39
1.85	2.27	3.60
1.20	1.49	2.41
0.78	0.97	1.59
0.49	0.61	0.98
0.30	0.37	0.59
0.23	0.28	0.45
0.17	0.20	0.32