

8226
Glynneath
SAway-R0



Designed by LKJ

Checked by

Source Control 2017.1.2

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.048	4 8	0.048	8 12	0.048

5-6 Deryn Court
Wharfedale Road
Pentwyn CF23 7HB

8226
Glynneath
SAway-R0

Date 12/01/2018

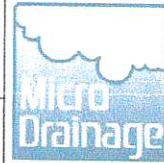
Designed by LKJ

File 8226-Calcs-SWS-SA-R0.SRCX

Checked by

XP Solutions

Source Control 2017.1.2

Model Details

Storage is Online Cover Level (m) 55.000

Cellular Storage Structure

Invert Level (m) 53.850 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.11880 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.11880

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	120.0	120.0	0.801	0.0	156.8
0.800	120.0	156.8			

C D Gray & Associates Ltd		Page 8
5-6 Deryn Court	8226	
Wharfedale Road	Glynneath	
Pentwyn CF23 7HB	SAway-R0	
Date 12/01/2018	Designed by LKJ	
File 8226-Calcs-SWS-SA-R0.SRCX	Checked by	
XP Solutions	Source Control 2017.1.2	

Summary of Results for 10 year Return Period

Half Drain Time : 125 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	53.949	0.099	2.1	11.3	O K
30 min Summer	53.989	0.139	2.1	15.8	O K
60 min Summer	54.031	0.181	2.1	20.6	O K
120 min Summer	54.066	0.216	2.1	24.7	O K
180 min Summer	54.082	0.232	2.2	26.5	O K
240 min Summer	54.092	0.242	2.2	27.5	O K
360 min Summer	54.099	0.249	2.2	28.4	O K
480 min Summer	54.099	0.249	2.2	28.4	O K
600 min Summer	54.096	0.246	2.2	28.1	O K
720 min Summer	54.091	0.241	2.2	27.5	O K
960 min Summer	54.078	0.228	2.2	26.0	O K
1440 min Summer	54.046	0.196	2.1	22.4	O K
2160 min Summer	54.001	0.151	2.1	17.2	O K
2880 min Summer	53.963	0.113	2.1	12.9	O K
4320 min Summer	53.914	0.064	2.0	7.3	O K
5760 min Summer	53.898	0.048	1.9	5.4	O K
7200 min Summer	53.892	0.042	1.7	4.8	O K
8640 min Summer	53.888	0.038	1.5	4.3	O K
10080 min Summer	53.885	0.035	1.4	3.9	O K
15 min Winter	53.962	0.112	2.1	12.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	48.273	0.0	23
30 min Summer	34.776	0.0	36
60 min Summer	24.244	0.0	62
120 min Summer	16.478	0.0	106
180 min Summer	13.023	0.0	140
240 min Summer	11.007	0.0	176
360 min Summer	8.665	0.0	246
480 min Summer	7.303	0.0	316
600 min Summer	6.392	0.0	386
720 min Summer	5.730	0.0	456
960 min Summer	4.818	0.0	588
1440 min Summer	3.772	0.0	850
2160 min Summer	2.954	0.0	1216
2880 min Summer	2.484	0.0	1568
4320 min Summer	1.950	0.0	2252
5760 min Summer	1.645	0.0	2936
7200 min Summer	1.443	0.0	3672
8640 min Summer	1.297	0.0	4408
10080 min Summer	1.184	0.0	5136
15 min Winter	48.273	0.0	23

C D Gray & Associates Ltd		Page 9
5-6 Deryn Court	8226	
Wharfedale Road	Glynneath	
Pentwyn CF23 7HB	SAway-R0	
Date 12/01/2018	Designed by LKJ	
File 8226-Calcs-SWS-SA-R0.SRCX	Checked by	
XP Solutions	Source Control 2017.1.2	

Summary of Results for 10 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	54.008	0.158	2.1	18.0	O K
60 min Winter	54.057	0.207	2.1	23.6	O K
120 min Winter	54.100	0.250	2.2	28.5	O K
180 min Winter	54.117	0.267	2.2	30.4	O K
240 min Winter	54.126	0.276	2.2	31.5	O K
360 min Winter	54.131	0.281	2.2	32.0	O K
480 min Winter	54.126	0.276	2.2	31.5	O K
600 min Winter	54.117	0.267	2.2	30.4	O K
720 min Winter	54.105	0.255	2.2	29.1	O K
960 min Winter	54.078	0.228	2.2	26.0	O K
1440 min Winter	54.022	0.172	2.1	19.6	O K
2160 min Winter	53.951	0.101	2.1	11.5	O K
2880 min Winter	53.905	0.055	2.0	6.3	O K
4320 min Winter	53.891	0.041	1.7	4.7	O K
5760 min Winter	53.885	0.035	1.4	4.0	O K
7200 min Winter	53.881	0.031	1.2	3.5	O K
8640 min Winter	53.878	0.028	1.1	3.1	O K
10080 min Winter	53.875	0.025	1.0	2.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	34.776	0.0	36
60 min Winter	24.244	0.0	64
120 min Winter	16.478	0.0	116
180 min Winter	13.023	0.0	150
240 min Winter	11.007	0.0	188
360 min Winter	8.665	0.0	268
480 min Winter	7.303	0.0	344
600 min Winter	6.392	0.0	418
720 min Winter	5.730	0.0	492
960 min Winter	4.818	0.0	632
1440 min Winter	3.772	0.0	896
2160 min Winter	2.954	0.0	1252
2880 min Winter	2.484	0.0	1536
4320 min Winter	1.950	0.0	2204
5760 min Winter	1.645	0.0	2936
7200 min Winter	1.443	0.0	3664
8640 min Winter	1.297	0.0	4384
10080 min Winter	1.184	0.0	5040

5-6 Deryn Court

8226

Wharfedale Road

Glynneath

Pentwyn CF23 7HB

SAway-R0

Date 12/01/2018

Designed by LKJ

File 8226-Calcs-SWS-SA-R0.SRCX

Checked by

XP Solutions

Source Control 2017.1.2



Summary of Results for 30 year Return Period

Half Drain Time : 172 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	53.977	0.127	2.1	14.5	O K
30 min Summer	54.032	0.182	2.1	20.8	O K
60 min Summer	54.092	0.242	2.2	27.6	O K
120 min Summer	54.144	0.294	2.2	33.5	O K
180 min Summer	54.164	0.314	2.2	35.8	O K
240 min Summer	54.176	0.326	2.2	37.1	O K
360 min Summer	54.186	0.336	2.2	38.3	O K
480 min Summer	54.188	0.338	2.2	38.5	O K
600 min Summer	54.185	0.335	2.2	38.2	O K
720 min Summer	54.179	0.329	2.2	37.5	O K
960 min Summer	54.164	0.314	2.2	35.8	O K
1440 min Summer	54.127	0.277	2.2	31.5	O K
2160 min Summer	54.071	0.221	2.1	25.2	O K
2880 min Summer	54.022	0.172	2.1	19.6	O K
4320 min Summer	53.951	0.101	2.1	11.5	O K
5760 min Summer	53.911	0.061	2.0	6.9	O K
7200 min Summer	53.898	0.048	1.9	5.5	O K
8640 min Summer	53.893	0.043	1.7	4.9	O K
10080 min Summer	53.889	0.039	1.6	4.5	O K
15 min Winter	53.994	0.144	2.1	16.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	60.792	0.0	24
30 min Summer	44.325	0.0	37
60 min Summer	31.124	0.0	64
120 min Summer	21.055	0.0	120
180 min Summer	16.484	0.0	152
240 min Summer	13.839	0.0	186
360 min Summer	10.780	0.0	256
480 min Summer	9.009	0.0	326
600 min Summer	7.829	0.0	396
720 min Summer	6.975	0.0	466
960 min Summer	5.805	0.0	604
1440 min Summer	4.475	0.0	870
2160 min Summer	3.455	0.0	1252
2880 min Summer	2.879	0.0	1616
4320 min Summer	2.235	0.0	2300
5760 min Summer	1.876	0.0	2992
7200 min Summer	1.642	0.0	3672
8640 min Summer	1.473	0.0	4392
10080 min Summer	1.342	0.0	5136
15 min Winter	60.792	0.0	24

5-6 Deryn Court

8226

Wharfedale Road

Glynneath

Pentwyn CF23 7HB

SAway-R0

Date 12/01/2018

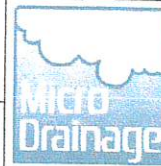
Designed by LKJ

File 8226-Calcs-SWS-SA-R0.SRCX

Checked by

XP Solutions

Source Control 2017.1.2



Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	54.057	0.207	2.1	23.6	O K
60 min Winter	54.127	0.277	2.2	31.6	O K
120 min Winter	54.190	0.340	2.2	38.8	O K
180 min Winter	54.214	0.364	2.3	41.5	O K
240 min Winter	54.226	0.376	2.3	42.9	O K
360 min Winter	54.236	0.386	2.3	44.0	O K
480 min Winter	54.233	0.383	2.3	43.7	O K
600 min Winter	54.224	0.374	2.3	42.7	O K
720 min Winter	54.212	0.362	2.3	41.2	O K
960 min Winter	54.181	0.331	2.2	37.8	O K
1440 min Winter	54.116	0.266	2.2	30.3	O K
2160 min Winter	54.026	0.176	2.1	20.0	O K
2880 min Winter	53.955	0.105	2.1	12.0	O K
4320 min Winter	53.897	0.047	1.9	5.4	O K
5760 min Winter	53.890	0.040	1.6	4.5	O K
7200 min Winter	53.885	0.035	1.4	4.0	O K
8640 min Winter	53.881	0.031	1.3	3.5	O K
10080 min Winter	53.879	0.029	1.2	3.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	44.325	0.0	37
60 min Winter	31.124	0.0	64
120 min Winter	21.055	0.0	120
180 min Winter	16.484	0.0	172
240 min Winter	13.839	0.0	198
360 min Winter	10.780	0.0	276
480 min Winter	9.009	0.0	354
600 min Winter	7.829	0.0	432
720 min Winter	6.975	0.0	506
960 min Winter	5.805	0.0	652
1440 min Winter	4.475	0.0	926
2160 min Winter	3.455	0.0	1304
2880 min Winter	2.879	0.0	1648
4320 min Winter	2.235	0.0	2204
5760 min Winter	1.876	0.0	2936
7200 min Winter	1.642	0.0	3672
8640 min Winter	1.473	0.0	4376
10080 min Winter	1.342	0.0	5152

5-6 Deryn Court

8226

Wharfedale Road

Glynneath

Pentwyn CF23 7HB

SAway-R0

Date 12/01/2018

Designed by LKJ

File 8226-Calcs-SWS-SA-R0.SRCX

Checked by

XP Solutions

Source Control 2017.1.2



Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	54.217	0.367	2.3	41.9	O K
60 min Winter	54.354	0.504	2.4	57.5	O K
120 min Winter	54.488	0.638	2.5	72.8	O K
180 min Winter	54.549	0.699	2.5	79.6	O K
240 min Winter	54.583	0.733	2.5	83.6	O K
360 min Winter	54.611	0.761	2.6	86.7	O K
480 min Winter	54.619	0.769	2.6	87.7	O K
600 min Winter	54.618	0.768	2.6	87.5	O K
720 min Winter	54.610	0.760	2.6	86.6	O K
960 min Winter	54.582	0.732	2.5	83.4	O K
1440 min Winter	54.508	0.658	2.5	75.0	O K
2160 min Winter	54.394	0.544	2.4	62.0	O K
2880 min Winter	54.287	0.437	2.3	49.8	O K
4320 min Winter	54.111	0.261	2.2	29.8	O K
5760 min Winter	53.987	0.137	2.1	15.6	O K
7200 min Winter	53.911	0.061	2.0	6.9	O K
8640 min Winter	53.897	0.047	1.9	5.3	O K
10080 min Winter	53.893	0.043	1.7	4.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	75.172	0.0	39
60 min Winter	53.203	0.0	66
120 min Winter	35.806	0.0	122
180 min Winter	27.743	0.0	180
240 min Winter	23.121	0.0	234
360 min Winter	17.802	0.0	336
480 min Winter	14.741	0.0	382
600 min Winter	12.711	0.0	460
720 min Winter	11.249	0.0	540
960 min Winter	9.256	0.0	694
1440 min Winter	7.018	0.0	990
2160 min Winter	5.335	0.0	1412
2880 min Winter	4.399	0.0	1816
4320 min Winter	3.374	0.0	2556
5760 min Winter	2.818	0.0	3232
7200 min Winter	2.460	0.0	3816
8640 min Winter	2.200	0.0	4384
10080 min Winter	2.002	0.0	5136

C D Gray & Associates Ltd		Page 13
5-6 Deryn Court	8226	
Wharfedale Road	Glynneath	
Pentwyn CF23 7HB	SAway-R0	
Date 12/01/2018	Designed by LKJ	
File 8226-Calcs-SWS-SA-R0.SRCX	Checked by	
XP Solutions	Source Control 2017.1.2	

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 307 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	54.072	0.222	2.1	25.3	O K
30 min Summer	54.175	0.325	2.2	37.0	O K
60 min Summer	54.294	0.444	2.3	50.6	O K
120 min Summer	54.407	0.557	2.4	63.5	O K
180 min Summer	54.454	0.604	2.4	68.8	O K
240 min Summer	54.479	0.629	2.5	71.7	O K
360 min Summer	54.503	0.653	2.5	74.4	O K
480 min Summer	54.512	0.662	2.5	75.4	O K
600 min Summer	54.513	0.663	2.5	75.6	O K
720 min Summer	54.510	0.660	2.5	75.2	O K
960 min Summer	54.496	0.646	2.5	73.6	O K
1440 min Summer	54.455	0.605	2.4	69.0	O K
2160 min Summer	54.388	0.538	2.4	61.3	O K
2880 min Summer	54.321	0.471	2.3	53.7	O K
4320 min Summer	54.205	0.355	2.2	40.5	O K
5760 min Summer	54.116	0.266	2.2	30.3	O K
7200 min Summer	54.046	0.196	2.1	22.3	O K
8640 min Summer	53.990	0.140	2.1	16.0	O K
10080 min Summer	53.948	0.098	2.1	11.1	O K
15 min Winter	54.101	0.251	2.2	28.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	101.752	0.0	25
30 min Summer	75.172	0.0	39
60 min Summer	53.203	0.0	66
120 min Summer	35.806	0.0	124
180 min Summer	27.743	0.0	182
240 min Summer	23.121	0.0	230
360 min Summer	17.802	0.0	294
480 min Summer	14.741	0.0	360
600 min Summer	12.711	0.0	428
720 min Summer	11.249	0.0	498
960 min Summer	9.256	0.0	638
1440 min Summer	7.018	0.0	914
2160 min Summer	5.335	0.0	1320
2880 min Summer	4.399	0.0	1708
4320 min Summer	3.374	0.0	2468
5760 min Summer	2.818	0.0	3176
7200 min Summer	2.460	0.0	3896
8640 min Summer	2.200	0.0	4584
10080 min Summer	2.002	0.0	5248
15 min Winter	101.752	0.0	25

SPR Hooper

Consulting Civil & Structural Engineers
7 Coychurch Road
Bridgend
CF31 3AR

Tel: 07977555746

Proj: 4913.016

Ref : Highway Soakaway

Date: 17/10/19

Page: 14

Residential Development Glynneath
General components

STORAGE VOLUME REQUIRED

1 IN 10 STORM - 32m^3

1 IN 30 STORM - 44m^3

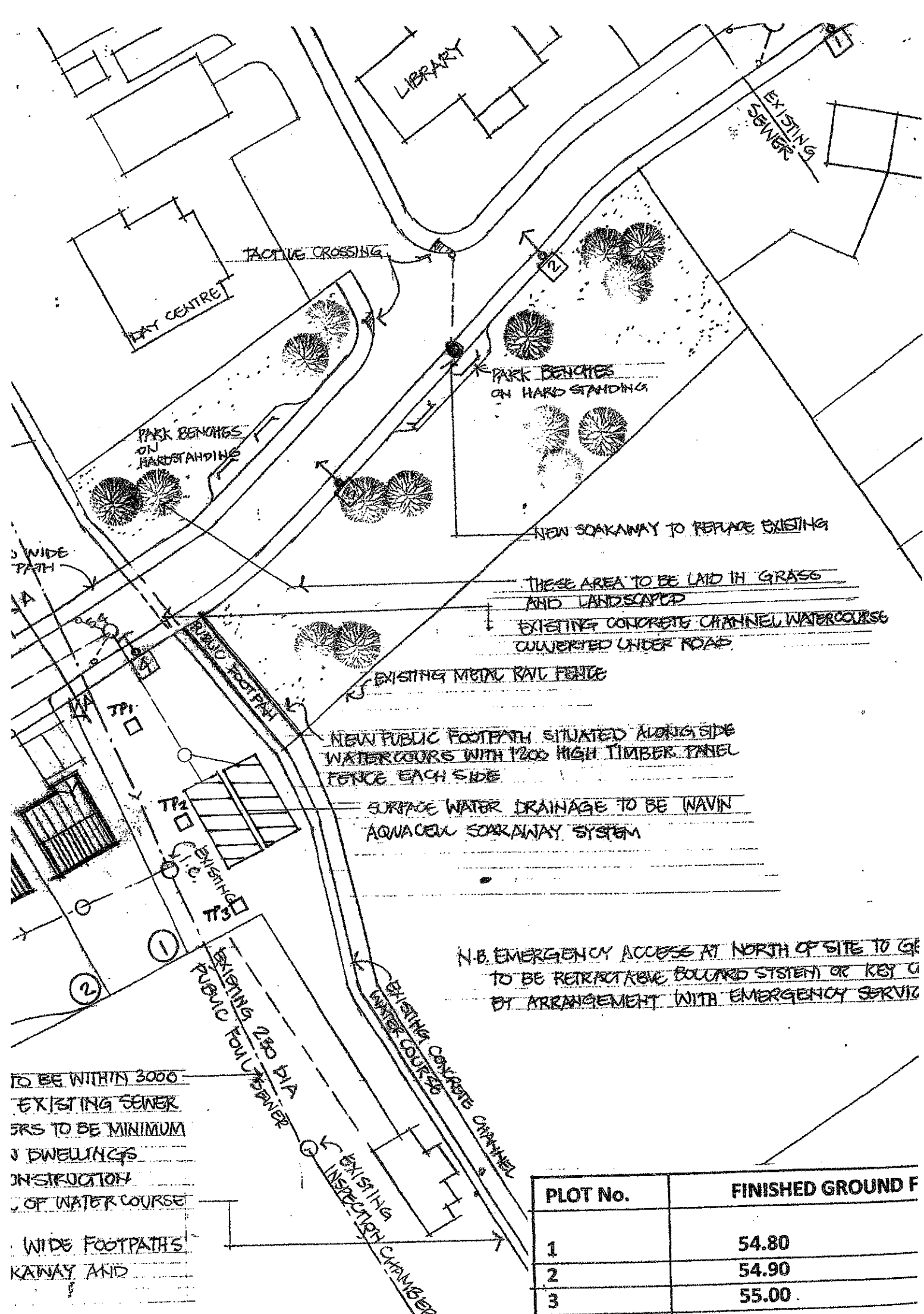
1 IN 100 STORM + 30% = 87.7m^3

USING 2 NO SOAKAWAYS

STORAGE VOLUME PER SOAKAWAY = 44m^3

∴ MAKE SOAKAWAYS - $15 \times 4.0 \times 0.8\text{M}$ DEEP - 2 NO.

USING WAVIN BLUE AQUA CRATES.



SPR HOOPER

CONSULTING CIVIL AND STRUCTURAL ENGINEERS

**HYDRAULIC CALCULATIONS FOR
PROPOSED HIGHWAY SOAKAWAY
OLD WELFARE HALL SITE
GLYNNEATH
NEATH PORT TALBOT**

SPR Hooper

Consulting Civil & Structural Engineers
7 Coychurch Road
Bridgend
CF31 3AR

Tel:07977555746

Proj: 4913.016

Ref : Trial Pit 1

Date: 17/10/19

Page: 1

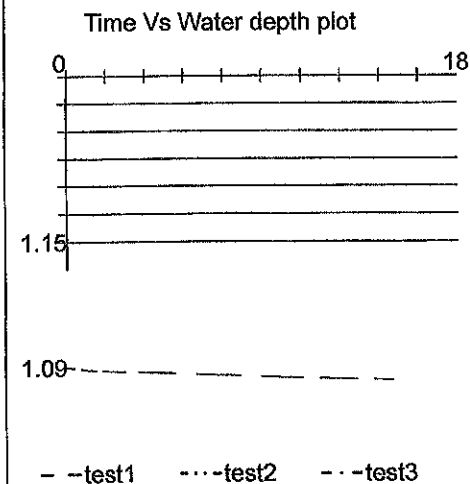
Residential Development Glynneath
General components

Soakaway design - Soil infiltration rate calculation to BRE Digest 365

Test pit details

Reference = TP01; Length = 0.83m; Breadth = 0.85m ; Dept h = 1.15m
Depth of water at start = 1.09 m

Test data



Step	Test 1	
	Time (minutes)	Water depth (m)
1	0	1.09
2	1	1.1
3	2	1.11
4	4	1.11
5	7	1.12
6	10	1.13
7	15	1.14

Maximum effective storage depth	= 0.06 m
Volume outflow, V_{p75-25}	= 0.021 m ³
Mean outflow surface area, a_{p50}	= 0.81 m ²
Time taken for mean outflow, t_{p75-25}	= 10.5 ; min.
Soil infiltration rate	= 0.000042 ; m/s

SPR Hooper

Consulting Civil & Structural Engineers
7 Coychurch Road
Bridgend
CF31 3AR

Tel:07977555746

Proj: 4913.016

Ref : Trial Pit 2

Date: 17/10/19

Page: 2

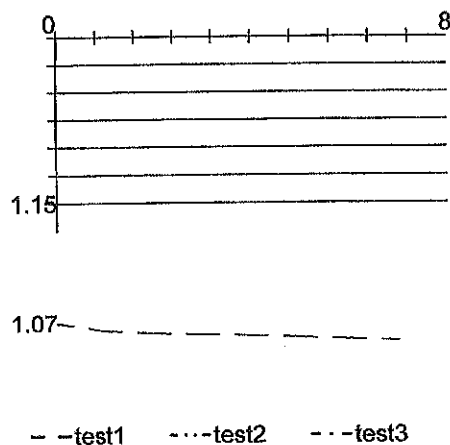
Residential Development Glynneath
General components

Soakaway design - Soil infiltration rate calculation to BRE Digest 365*Test pit details*

Reference = TP02; Length = 0.76m; Breadth = 0.82m ; Dept h = 1.15m
Depth of water at start = 1.07 m

Test data

Time Vs Water depth plot



Step	Test 1	
	Time (minutes)	Water depth (m)
1	0	1.07
2	1	1.1
3	2	1.11
4	4	1.12
5	7	1.14

Maximum effective storage depth	= 0.08 m
Volume outflow, V_{p75-25}	= 0.025 m ³
Mean outflow surface area, a_{p50}	= 0.75 m ²
Time taken for mean outflow, t_{p75-25}	= 4.83 ; min.
Soil infiltration rate	= 0.00011 ; m/s

SPR Hooper

Consulting Civil & Structural Engineers
7 Coychurch Road
Bridgend
CF31 3AR

Tel:07977555746

Proj: 4913.016

Ref : Trial Pit 3

Date: 17/10/19

Page: 3

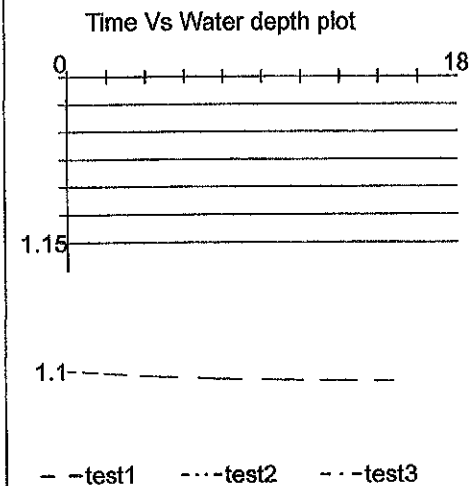
Residential Development Glynneath
General components

Soakaway design - Soil infiltration rate calculation to BRE Digest 365

Test pit details

Reference = TP013; Length = 0.82m ; Breadth = 0.83 m; Depth = 1.15m
Depth of water at start = 1.1 m

Test data



Step	Test 1	
	Time (minutes)	Water depth (m)
1	0	1.1
2	1	1.11
3	2	1.11
4	4	1.12
5	7	1.13
6	10	1.14
7	15	1.14

Maximum effective storage depth	= 0.05 m
Volume outflow, V_{p75-25}	= 0.017 m ³
Mean outflow surface area, a_{p50}	= 0.76 m ²
Time taken for mean outflow, t_{p75-25}	= 10 ; min.
Soil infiltration rate	= 0.000037 ; m/s

SPR Hooper Consulting Civil & Structural Engineers 7 Coychurch Road Bridgend CF31 3AR Tel:07977555746	Proj: 4913.016	Ref : Highway Soakaway
	Date: 17/10/19	Page: 4
	Residential Development Glynneath General components	

SOIL INFILTRATION RATES

TRIAL PIT 1 - 0.000042 m/sec

TRIAL PIT 2 - 0.000110 m/sec

TRIAL PIT 3 - 0.000037 m/sec

AVERAGE INFILTRATION RATE = 0.000063 m/sec