



APPENDIX B: Site Photos



Figure 2 - Test pit 1 during digging



Figure 3 - Test pit 6 after filling



Figure 4 – TP2 after filling



Figure 5 - TP5 after excavation



GibbsGeoTechnical



Figure 6 - Test pit remediation

APPENDIX C: BGS Records

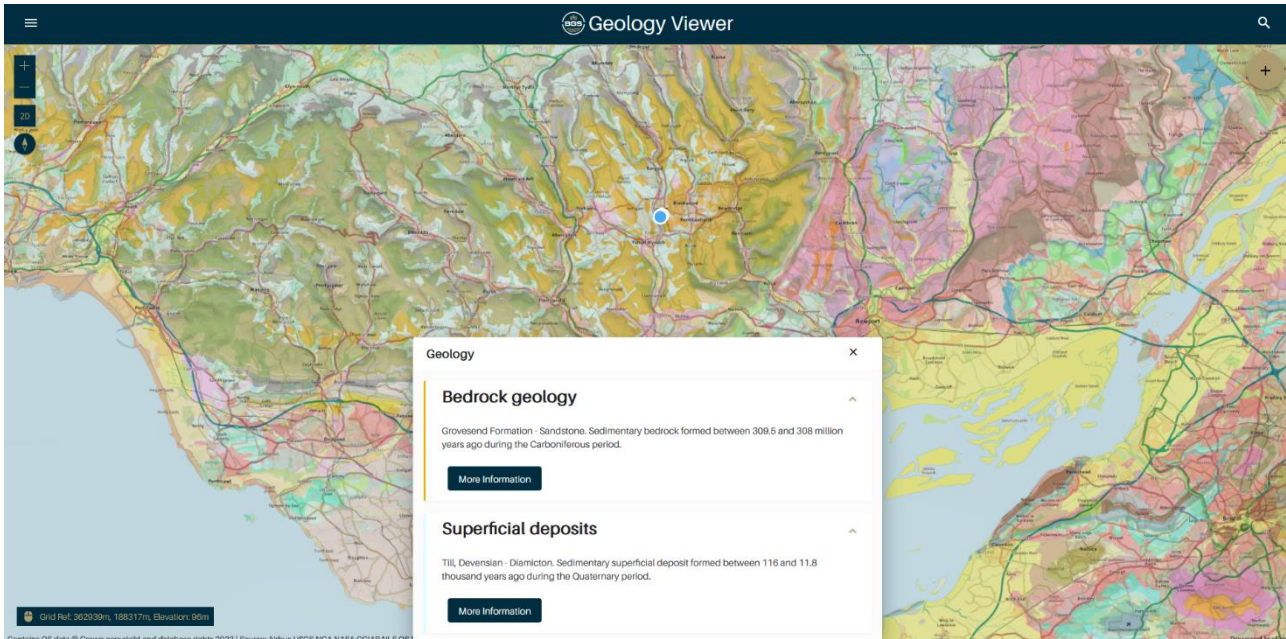


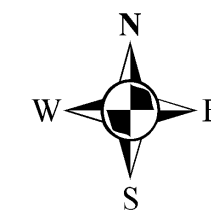
Figure 7 - British Geological Survey records of the site

APPENDIX D: DCWW Asset Plans



**Dŵr Cymru
Welsh Water**

40 Victoria Road Fleur-de-lis Blackwood
NP12 3UG



LEGEND (Representative of most common features)

- Waste network:**
- Foul chamber
 - Surface water chamber
 - Combined chamber
 - Combined sewer overflow
 - Special purpose chamber
 - ⊞ Treatment works
 - △ Pumping station
 - Outfall
 - Lighthouse
 - Storm overflow
 - Rising main
 - Gravity sewer
 - Private sewer
 - S 104 Private sewer subject to Sect. 104 adoption agreement
 - Private Sewer Transfer
 - Lateral Drain
 - Inspection Chamber
- NB: Sewer symbol colour indicates the type.
 RED - Combined
 GREEN - Surface Water
 BROWN - Foul
 Purple - Former S24 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases pipe material (other than Asbestos Cement or Pitch Fibre) may be found to be asbestos cement (AC) or Pitch Fibre (PF). It is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation.

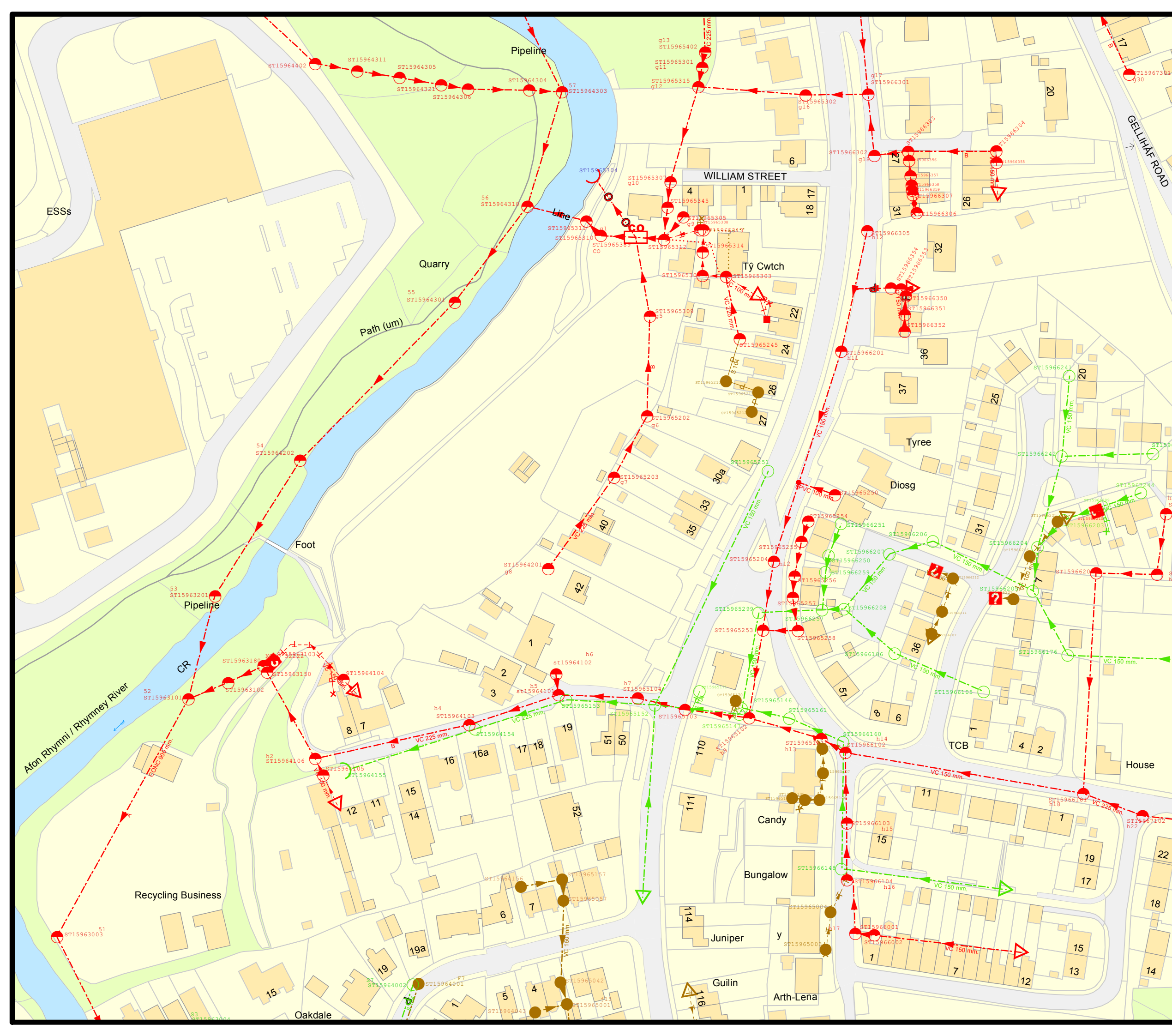
Dŵr Cymru Cylfyngedig (the Company) gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and no warranty as to its correctness is relied upon in the event of excavations or other works made in the vicinity of the company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company, is done so in accordance with statutory requirements of sections 198 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of the foregoing, it should be noted that the records that are available to the Company may not disclose the existence of a water main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to its apparatus.

Service pipes are not generally shown but their presence should be anticipated.


**EXACT LOCATIONS OF ALL APPARATUS
TO BE DETERMINED ON SITE.**

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Map Ref: 315514,196234
 Map scale: 1:1250
 Printed by: Zara Howells
 Printed on: 27 Apr 2023



APPENDIX E: Calculations

Vale Consultancy		Page 1
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 26/05/2023 16:03 File	Designed by Paul.Graham Checked by	
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ICP SUDS Mean Annual Flood

Input


Return Period (years) 1 SAAR (mm) 1547 Urban 0.000
Area (ha) 7.313 Soil 0.400 Region Number Region 9

Results 1/s

QBAR Rural 62.9
QBAR Urban 62.9

Q1 year 55.4

Q1 year 55.4
Q30 years 110.9
Q100 years 137.2

Vale Consultancy		Page 1
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 19/09/2023 13:50 File CATCHMENT 1 STORAGE.SRCX	Designed by Paul.Graham Checked by	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 473 minutes.


Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	92.797	0.547	0.3	6.9	O K
30 min Summer	93.029	0.779	0.3	9.8	O K
60 min Summer	93.301	1.051	0.3	13.2	O K
120 min Summer	93.522	1.272	0.4	16.0	O K
180 min Summer	93.655	1.405	0.4	17.7	Flood Risk
240 min Summer	93.740	1.490	0.4	18.8	Flood Risk
360 min Summer	93.827	1.577	0.4	19.9	Flood Risk
480 min Summer	93.869	1.619	0.4	20.4	Flood Risk
600 min Summer	93.890	1.640	0.4	20.7	Flood Risk
720 min Summer	93.897	1.647	0.4	20.7	Flood Risk
960 min Summer	93.883	1.633	0.4	20.6	Flood Risk
1440 min Summer	93.814	1.564	0.4	19.7	Flood Risk
2160 min Summer	93.708	1.458	0.4	18.4	Flood Risk
2880 min Summer	93.619	1.369	0.4	17.3	Flood Risk
4320 min Summer	93.480	1.230	0.4	15.5	O K
5760 min Summer	93.375	1.125	0.4	14.2	O K
7200 min Summer	93.300	1.050	0.3	13.2	O K
8640 min Summer	93.243	0.993	0.3	12.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.633	0.0	26
30 min Summer	85.944	0.0	40
60 min Summer	59.299	0.0	68
120 min Summer	37.556	0.0	126
180 min Summer	28.869	0.0	184
240 min Summer	23.938	0.0	242
360 min Summer	18.284	0.0	344
480 min Summer	15.035	0.0	402
600 min Summer	12.876	0.0	464
720 min Summer	11.319	0.0	528
960 min Summer	9.191	0.0	666
1440 min Summer	6.809	0.0	944
2160 min Summer	5.050	0.0	1364
2880 min Summer	4.109	0.0	1764
4320 min Summer	3.117	0.0	2556
5760 min Summer	2.597	0.0	3344
7200 min Summer	2.283	0.0	4104
8640 min Summer	2.072	0.0	4848

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Summer	93.197	0.947	0.3	11.9	O K
15 min Winter	92.797	0.547	0.3	6.9	O K
30 min Winter	93.030	0.780	0.3	9.8	O K
60 min Winter	93.303	1.053	0.3	13.3	O K
120 min Winter	93.527	1.277	0.4	16.1	O K
180 min Winter	93.663	1.413	0.4	17.8	Flood Risk
240 min Winter	93.752	1.502	0.4	18.9	Flood Risk
360 min Winter	93.845	1.595	0.4	20.1	Flood Risk
480 min Winter	93.878	1.628	0.4	20.5	Flood Risk
600 min Winter	93.895	1.645	0.4	20.7	Flood Risk
720 min Winter	93.898	1.648	0.4	20.8	Flood Risk
960 min Winter	93.871	1.621	0.4	20.4	Flood Risk
1440 min Winter	93.765	1.515	0.4	19.1	Flood Risk
2160 min Winter	93.607	1.357	0.4	17.1	Flood Risk
2880 min Winter	93.475	1.225	0.4	15.4	O K
4320 min Winter	93.269	1.019	0.3	12.8	O K
5760 min Winter	93.117	0.867	0.3	10.9	O K
7200 min Winter	93.006	0.756	0.3	9.5	O K
8640 min Winter	92.920	0.670	0.3	8.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Summer	1.922	0.0	5560
15 min Winter	119.633	0.0	26
30 min Winter	85.944	0.0	40
60 min Winter	59.299	0.0	68
120 min Winter	37.556	0.0	124
180 min Winter	28.869	0.0	180
240 min Winter	23.938	0.0	238
360 min Winter	18.284	0.0	346
480 min Winter	15.035	0.0	442
600 min Winter	12.876	0.0	478
720 min Winter	11.319	0.0	554
960 min Winter	9.191	0.0	710
1440 min Winter	6.809	0.0	1014
2160 min Winter	5.050	0.0	1452
2880 min Winter	4.109	0.0	1876
4320 min Winter	3.117	0.0	2688
5760 min Winter	2.597	0.0	3464
7200 min Winter	2.283	0.0	4256
8640 min Winter	2.072	0.0	5016

Vale Consultancy		Page 3
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 19/09/2023 13:50 File CATCHMENT 1 STORAGE.SRCX	Designed by Paul.Graham Checked by	
Innovyze	Source Control 2020.1	

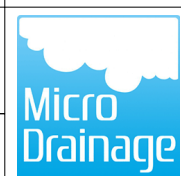
Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	92.852	0.602	0.3	7.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Winter	1.922	0.0	5752

29 Bocam Park
 Old Field Road, Pencoed
 Bridgend, Glamorgan, CF35 5LJ

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Innovyze Source Control 2020.1


Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 315494 196239 ST 15494 96239
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.024

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0 4	0.008	4 8	0.008	8 12	0.008

Vale Consultancy		Page 5
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 19/09/2023 13:50 File CATCHMENT 1 STORAGE.SRCX	Designed by Paul.Graham Checked by	
Innovyze	Source Control 2020.1	

Model Details

Storage is Online Cover Level (m) 93.900

Cellular Storage Structure

Invert Level (m) 92.250 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.06840 Porosity 0.70
 Infiltration Coefficient Side (m/hr) 0.06840

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	18.0	18.0	1.651	0.0	46.1
1.650	18.0	46.1			

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 411 minutes.


Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	93.492	0.542	0.4	9.4	O K
30 min Summer	93.721	0.771	0.5	13.4	O K
60 min Summer	93.988	1.038	0.5	18.0	O K
120 min Summer	94.199	1.249	0.6	21.7	O K
180 min Summer	94.322	1.372	0.6	23.8	Flood Risk
240 min Summer	94.398	1.448	0.6	25.1	Flood Risk
360 min Summer	94.471	1.521	0.6	26.4	Flood Risk
480 min Summer	94.506	1.556	0.6	27.0	Flood Risk
600 min Summer	94.519	1.569	0.6	27.2	Flood Risk
720 min Summer	94.519	1.569	0.6	27.2	Flood Risk
960 min Summer	94.493	1.543	0.6	26.8	Flood Risk
1440 min Summer	94.412	1.462	0.6	25.4	Flood Risk
2160 min Summer	94.297	1.347	0.6	23.4	O K
2880 min Summer	94.199	1.249	0.6	21.7	O K
4320 min Summer	94.045	1.095	0.5	19.0	O K
5760 min Summer	93.928	0.978	0.5	17.0	O K
7200 min Summer	93.844	0.894	0.5	15.5	O K
8640 min Summer	93.778	0.828	0.5	14.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.633	0.0	26
30 min Summer	85.944	0.0	40
60 min Summer	59.299	0.0	68
120 min Summer	37.556	0.0	126
180 min Summer	28.869	0.0	184
240 min Summer	23.938	0.0	242
360 min Summer	18.284	0.0	324
480 min Summer	15.035	0.0	388
600 min Summer	12.876	0.0	452
720 min Summer	11.319	0.0	518
960 min Summer	9.191	0.0	658
1440 min Summer	6.809	0.0	934
2160 min Summer	5.050	0.0	1348
2880 min Summer	4.109	0.0	1756
4320 min Summer	3.117	0.0	2548
5760 min Summer	2.597	0.0	3296
7200 min Summer	2.283	0.0	4040
8640 min Summer	2.072	0.0	4832

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Summer	93.728	0.778	0.5	13.5	O K
15 min Winter	93.493	0.543	0.4	9.4	O K
30 min Winter	93.722	0.772	0.5	13.4	O K
60 min Winter	93.991	1.041	0.5	18.1	O K
120 min Winter	94.205	1.255	0.6	21.8	O K
180 min Winter	94.331	1.381	0.6	24.0	Flood Risk
240 min Winter	94.411	1.461	0.6	25.4	Flood Risk
360 min Winter	94.488	1.538	0.6	26.7	Flood Risk
480 min Winter	94.513	1.563	0.6	27.1	Flood Risk
600 min Winter	94.523	1.573	0.6	27.3	Flood Risk
720 min Winter	94.517	1.567	0.6	27.2	Flood Risk
960 min Winter	94.474	1.524	0.6	26.5	Flood Risk
1440 min Winter	94.350	1.400	0.6	24.3	Flood Risk
2160 min Winter	94.180	1.230	0.6	21.4	O K
2880 min Winter	94.035	1.085	0.5	18.8	O K
4320 min Winter	93.811	0.861	0.5	15.0	O K
5760 min Winter	93.648	0.698	0.4	12.1	O K
7200 min Winter	93.529	0.579	0.4	10.1	O K
8640 min Winter	93.438	0.488	0.4	8.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Summer	1.922	0.0	5552
15 min Winter	119.633	0.0	26
30 min Winter	85.944	0.0	39
60 min Winter	59.299	0.0	68
120 min Winter	37.556	0.0	124
180 min Winter	28.869	0.0	180
240 min Winter	23.938	0.0	236
360 min Winter	18.284	0.0	344
480 min Winter	15.035	0.0	396
600 min Winter	12.876	0.0	470
720 min Winter	11.319	0.0	548
960 min Winter	9.191	0.0	702
1440 min Winter	6.809	0.0	1004
2160 min Winter	5.050	0.0	1436
2880 min Winter	4.109	0.0	1852
4320 min Winter	3.117	0.0	2648
5760 min Winter	2.597	0.0	3456
7200 min Winter	2.283	0.0	4184
8640 min Winter	2.072	0.0	4936

Vale Consultancy		Page 3
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 19/09/2023 14:00 File CATCHMENT 2 STORAGE.SRCX	Designed by Paul.Graham Checked by	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Winter	93.366	0.416	0.4	7.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Winter	1.922	0.0	5664

29 Bocam Park
 Old Field Road, Pencoed
 Bridgend, Glamorgan, CF35 5LJ

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Date 19/09/2023 14:00
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Innovyze Source Control 2020.1


Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 315494 196239 ST 15494 96239
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.033

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0	4 0.011	4	8 0.011	8	12 0.011

Vale Consultancy		Page 5
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 19/09/2023 14:00 File CATCHMENT 2 STORAGE.SRCX	Designed by Paul.Graham Checked by	
Innovyze	Source Control 2020.1	


Model Details

Storage is Online Cover Level (m) 94.600

Cellular Storage Structure

Invert Level (m) 92.950 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.08316 Porosity 0.70
 Infiltration Coefficient Side (m/hr) 0.08316

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	24.8	24.8	1.651	0.1	57.3
1.650	24.8	57.3			

Vale Consultancy		Page 1
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 26/10/2023 09:04 File Catchment 3 Storage.SRCX	Designed by Paul.Graham Checked by	
Innovyze	Source Control 2020.1	

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 138 minutes.


Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	94.668	0.718	0.8	7.5	O K
30 min Summer	94.954	1.004	1.0	10.5	O K
60 min Summer	95.250	1.300	1.1	13.7	O K
120 min Summer	95.395	1.445	1.2	15.2	Flood Risk
180 min Summer	95.462	1.512	1.2	15.9	Flood Risk
240 min Summer	95.496	1.546	1.2	16.2	Flood Risk
360 min Summer	95.501	1.551	1.2	16.3	Flood Risk
480 min Summer	95.472	1.522	1.2	16.0	Flood Risk
600 min Summer	95.429	1.479	1.2	15.5	Flood Risk
720 min Summer	95.381	1.431	1.2	15.0	Flood Risk
960 min Summer	95.278	1.328	1.1	13.9	O K
1440 min Summer	95.083	1.133	1.0	11.9	O K
2160 min Summer	94.855	0.905	0.9	9.5	O K
2880 min Summer	94.687	0.737	0.8	7.7	O K
4320 min Summer	94.458	0.508	0.7	5.3	O K
5760 min Summer	94.313	0.363	0.6	3.8	O K
7200 min Summer	94.216	0.266	0.6	2.8	O K
8640 min Summer	94.148	0.198	0.6	2.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.633	0.0	24
30 min Summer	85.944	0.0	37
60 min Summer	59.299	0.0	64
120 min Summer	37.556	0.0	108
180 min Summer	28.869	0.0	140
240 min Summer	23.938	0.0	174
360 min Summer	18.284	0.0	244
480 min Summer	15.035	0.0	314
600 min Summer	12.876	0.0	382
720 min Summer	11.319	0.0	450
960 min Summer	9.191	0.0	584
1440 min Summer	6.809	0.0	844
2160 min Summer	5.050	0.0	1220
2880 min Summer	4.109	0.0	1592
4320 min Summer	3.117	0.0	2336
5760 min Summer	2.597	0.0	3056
7200 min Summer	2.283	0.0	3752
8640 min Summer	2.072	0.0	4496

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Summer	94.096	0.146	0.5	1.5	O K
15 min Winter	94.668	0.718	0.8	7.5	O K
30 min Winter	94.956	1.006	1.0	10.6	O K
60 min Winter	95.257	1.307	1.1	13.7	O K
120 min Winter	95.406	1.456	1.2	15.3	Flood Risk
180 min Winter	95.465	1.515	1.2	15.9	Flood Risk
240 min Winter	95.488	1.538	1.2	16.2	Flood Risk
360 min Winter	95.467	1.517	1.2	15.9	Flood Risk
480 min Winter	95.405	1.455	1.2	15.3	Flood Risk
600 min Winter	95.333	1.383	1.2	14.5	Flood Risk
720 min Winter	95.260	1.310	1.1	13.8	O K
960 min Winter	95.113	1.163	1.0	12.2	O K
1440 min Winter	94.858	0.908	0.9	9.5	O K
2160 min Winter	94.579	0.629	0.8	6.6	O K
2880 min Winter	94.387	0.437	0.7	4.6	O K
4320 min Winter	94.147	0.197	0.6	2.1	O K
5760 min Winter	94.016	0.066	0.5	0.7	O K
7200 min Winter	93.996	0.046	0.4	0.5	O K
8640 min Winter	93.992	0.042	0.4	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Summer	1.922	0.0	5160
15 min Winter	119.633	0.0	24
30 min Winter	85.944	0.0	37
60 min Winter	59.299	0.0	64
120 min Winter	37.556	0.0	116
180 min Winter	28.869	0.0	146
240 min Winter	23.938	0.0	184
360 min Winter	18.284	0.0	262
480 min Winter	15.035	0.0	336
600 min Winter	12.876	0.0	408
720 min Winter	11.319	0.0	480
960 min Winter	9.191	0.0	618
1440 min Winter	6.809	0.0	884
2160 min Winter	5.050	0.0	1264
2880 min Winter	4.109	0.0	1644
4320 min Winter	3.117	0.0	2344
5760 min Winter	2.597	0.0	3000
7200 min Winter	2.283	0.0	3672
8640 min Winter	2.072	0.0	4408

Vale Consultancy		Page 3
29 Bocam Park Old Field Road, Pencoed Bridgend, Glamorgan, CF35 5LJ		
Date 26/10/2023 09:04 File Catchment 3 Storage.SRCX	Designed by Paul.Graham Checked by	
Innovyze	Source Control 2020.1	

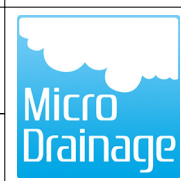
Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	93.989	0.039	0.4	0.4	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Winter	1.922	0.0	5144

29 Bocam Park
 Old Field Road, Pencoed
 Bridgend, Glamorgan, CF35 5LJ

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 315494 196239 ST 15494 96239
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.028

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From: To:	(ha)	From: To:	(ha)	From: To:	(ha)
0	4 0.009	4	8 0.009	8	12 0.009

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Model Details

Storage is Online Cover Level (m) 95.600

Cellular Storage Structure

Invert Level (m) 93.950 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.22356 Porosity 0.70
 Infiltration Coefficient Side (m/hr) 0.22356

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	15.0	15.0	1.651	0.1	41.4
1.650	15.0	41.4			


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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 654 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	95.178	0.428	0.2	6.4	O K
30 min Summer	95.360	0.610	0.2	9.1	O K
60 min Summer	95.578	0.828	0.2	12.4	O K
120 min Summer	95.764	1.014	0.3	15.1	O K
180 min Summer	95.882	1.132	0.3	16.9	O K
240 min Summer	95.964	1.214	0.3	18.1	O K
360 min Summer	96.060	1.310	0.3	19.5	O K
480 min Summer	96.106	1.356	0.3	20.2	Flood Risk
600 min Summer	96.130	1.380	0.3	20.6	Flood Risk
720 min Summer	96.143	1.393	0.3	20.8	Flood Risk
960 min Summer	96.148	1.398	0.3	20.8	Flood Risk
1440 min Summer	96.119	1.369	0.3	20.4	Flood Risk
2160 min Summer	96.055	1.305	0.3	19.5	O K
2880 min Summer	96.000	1.250	0.3	18.6	O K
4320 min Summer	95.915	1.165	0.3	17.4	O K
5760 min Summer	95.850	1.100	0.3	16.4	O K
7200 min Summer	95.804	1.054	0.3	15.7	O K
8640 min Summer	95.769	1.019	0.3	15.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.633	0.0	26
30 min Summer	85.944	0.0	41
60 min Summer	59.299	0.0	70
120 min Summer	37.556	0.0	128
180 min Summer	28.869	0.0	186
240 min Summer	23.938	0.0	244
360 min Summer	18.284	0.0	362
480 min Summer	15.035	0.0	472
600 min Summer	12.876	0.0	522
720 min Summer	11.319	0.0	586
960 min Summer	9.191	0.0	714
1440 min Summer	6.809	0.0	986
2160 min Summer	5.050	0.0	1408
2880 min Summer	4.109	0.0	1820
4320 min Summer	3.117	0.0	2640
5760 min Summer	2.597	0.0	3416
7200 min Summer	2.283	0.0	4192
8640 min Summer	2.072	0.0	5008

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Innovyze	Source Control 2020.1	

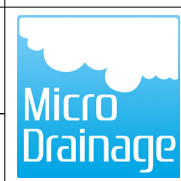
Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Summer	95.744	0.994	0.3	14.8	O K
15 min Winter	95.178	0.428	0.2	6.4	O K
30 min Winter	95.361	0.611	0.2	9.1	O K
60 min Winter	95.580	0.830	0.2	12.4	O K
120 min Winter	95.766	1.016	0.3	15.2	O K
180 min Winter	95.887	1.137	0.3	16.9	O K
240 min Winter	95.970	1.220	0.3	18.2	O K
360 min Winter	96.071	1.321	0.3	19.7	O K
480 min Winter	96.121	1.371	0.3	20.4	Flood Risk
600 min Winter	96.143	1.393	0.3	20.8	Flood Risk
720 min Winter	96.149	1.399	0.3	20.9	Flood Risk
960 min Winter	96.150	1.400	0.3	20.9	Flood Risk
1440 min Winter	96.104	1.354	0.3	20.2	Flood Risk
2160 min Winter	96.006	1.256	0.3	18.7	O K
2880 min Winter	95.920	1.170	0.3	17.4	O K
4320 min Winter	95.781	1.031	0.3	15.4	O K
5760 min Winter	95.672	0.922	0.2	13.8	O K
7200 min Winter	95.592	0.842	0.2	12.5	O K
8640 min Winter	95.528	0.778	0.2	11.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Summer	1.922	0.0	5752
15 min Winter	119.633	0.0	26
30 min Winter	85.944	0.0	40
60 min Winter	59.299	0.0	68
120 min Winter	37.556	0.0	126
180 min Winter	28.869	0.0	182
240 min Winter	23.938	0.0	240
360 min Winter	18.284	0.0	352
480 min Winter	15.035	0.0	462
600 min Winter	12.876	0.0	566
720 min Winter	11.319	0.0	600
960 min Winter	9.191	0.0	744
1440 min Winter	6.809	0.0	1054
2160 min Winter	5.050	0.0	1512
2880 min Winter	4.109	0.0	1940
4320 min Winter	3.117	0.0	2808
5760 min Winter	2.597	0.0	3624
7200 min Winter	2.283	0.0	4400
8640 min Winter	2.072	0.0	5192

29 Bocam Park
 Old Field Road, Pencoed
 Bridgend, Glamorgan, CF35 5LJ

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Winter	95.477	0.727	0.2	10.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Winter	1.922	0.0	5960

29 Bocam Park
 Old Field Road, Pencoed
 Bridgend, Glamorgan, CF35 5LJ

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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 315494 196239 ST 15494 96239
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.022

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)	From:	To: (ha)
0	4 0.007	4	8 0.007	8	12 0.007

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Model Details

Storage is Online Cover Level (m) 96.400

Cellular Storage Structure

Invert Level (m) 94.750 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.04320 Porosity 0.70
 Infiltration Coefficient Side (m/hr) 0.04320

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	21.3	21.3	1.651	0.1	57.6
1.650	21.3	57.6			

Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 528 minutes.


Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
15 min Summer	94.575	0.525	0.5	13.2	O K
30 min Summer	94.799	0.749	0.5	18.9	O K
60 min Summer	95.062	1.012	0.6	25.5	O K
120 min Summer	95.279	1.229	0.7	31.0	O K
180 min Summer	95.413	1.363	0.7	34.4	Flood Risk
240 min Summer	95.502	1.452	0.7	36.6	Flood Risk
360 min Summer	95.597	1.547	0.7	39.0	Flood Risk
480 min Summer	95.639	1.589	0.8	40.0	Flood Risk
600 min Summer	95.661	1.611	0.8	40.6	Flood Risk
720 min Summer	95.670	1.620	0.8	40.8	Flood Risk
960 min Summer	95.662	1.612	0.8	40.6	Flood Risk
1440 min Summer	95.602	1.552	0.7	39.1	Flood Risk
2160 min Summer	95.507	1.457	0.7	36.7	Flood Risk
2880 min Summer	95.427	1.377	0.7	34.7	Flood Risk
4320 min Summer	95.301	1.251	0.7	31.5	O K
5760 min Summer	95.204	1.154	0.6	29.1	O K
7200 min Summer	95.134	1.084	0.6	27.3	O K
8640 min Summer	95.080	1.030	0.6	26.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
15 min Summer	119.633	0.0	26
30 min Summer	85.944	0.0	40
60 min Summer	59.299	0.0	70
120 min Summer	37.556	0.0	128
180 min Summer	28.869	0.0	186
240 min Summer	23.938	0.0	244
360 min Summer	18.284	0.0	360
480 min Summer	15.035	0.0	420
600 min Summer	12.876	0.0	484
720 min Summer	11.319	0.0	548
960 min Summer	9.191	0.0	682
1440 min Summer	6.809	0.0	960
2160 min Summer	5.050	0.0	1372
2880 min Summer	4.109	0.0	1788
4320 min Summer	3.117	0.0	2596
5760 min Summer	2.597	0.0	3352
7200 min Summer	2.283	0.0	4112
8640 min Summer	2.072	0.0	4920

Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Summer	95.039	0.989	0.6	24.9	O K
15 min Winter	94.576	0.526	0.5	13.2	O K
30 min Winter	94.799	0.749	0.5	18.9	O K
60 min Winter	95.064	1.014	0.6	25.6	O K
120 min Winter	95.284	1.234	0.7	31.1	O K
180 min Winter	95.421	1.371	0.7	34.5	Flood Risk
240 min Winter	95.512	1.462	0.7	36.8	Flood Risk
360 min Winter	95.613	1.563	0.7	39.4	Flood Risk
480 min Winter	95.655	1.605	0.8	40.4	Flood Risk
600 min Winter	95.669	1.619	0.8	40.8	Flood Risk
720 min Winter	95.676	1.626	0.8	41.0	Flood Risk
960 min Winter	95.657	1.607	0.8	40.5	Flood Risk
1440 min Winter	95.567	1.517	0.7	38.2	Flood Risk
2160 min Winter	95.423	1.373	0.7	34.6	Flood Risk
2880 min Winter	95.301	1.251	0.7	31.5	O K
4320 min Winter	95.106	1.056	0.6	26.6	O K
5760 min Winter	94.958	0.908	0.6	22.9	O K
7200 min Winter	94.849	0.799	0.5	20.1	O K
8640 min Winter	94.764	0.714	0.5	18.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Summer	1.922	0.0	5648
15 min Winter	119.633	0.0	26
30 min Winter	85.944	0.0	40
60 min Winter	59.299	0.0	68
120 min Winter	37.556	0.0	124
180 min Winter	28.869	0.0	182
240 min Winter	23.938	0.0	238
360 min Winter	18.284	0.0	350
480 min Winter	15.035	0.0	454
600 min Winter	12.876	0.0	494
720 min Winter	11.319	0.0	566
960 min Winter	9.191	0.0	722
1440 min Winter	6.809	0.0	1030
2160 min Winter	5.050	0.0	1476
2880 min Winter	4.109	0.0	1904
4320 min Winter	3.117	0.0	2728
5760 min Winter	2.597	0.0	3520
7200 min Winter	2.283	0.0	4320
8640 min Winter	2.072	0.0	5096

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Innovyze	Source Control 2020.1	

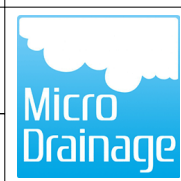
Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m ³)	Status
10080 min Winter	94.696	0.646	0.5	16.3	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Time-Peak (mins)
10080 min Winter	1.922	0.0	5848

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 Old Field Road, Pencoed
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Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 315494 196239 ST 15494 96239
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	1.000
Cv (Winter)	1.000
Shortest Storm (mins)	15
Longest Storm (mins)	10080
Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.046

Time (mins)	Area	Time (mins)	Area	Time (mins)	Area
From:	To: (ha)	From:	To: (ha)	From:	To: (ha)
0	4 0.015	4	8 0.015	8	12 0.015

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Model Details

Storage is Online Cover Level (m) 95.700

Cellular Storage Structure

Invert Level (m) 94.050 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.06480 Porosity 0.70
 Infiltration Coefficient Side (m/hr) 0.06480

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	36.0	36.0	1.651	0.1	85.5
1.650	36.0	85.5			

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Innovyze	Network 2020.1	

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model	
Return Period (years)	100
FEH Rainfall Version	2013
Site Location GB 315494 196239 ST 15494 96239	
Data Type	Point
Maximum Rainfall (mm/hr)	50
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	0.011	4-8	0.029

Total Area Contributing (ha) = 0.040


Total Pipe Volume (m³) = 1.899

Network Design Table for Storm

« - Indicates pipe capacity < flow


PN (m)	Length (m)	Fall (1:X)	Slope (ha)	I.Area (mins)	T.E. (Flow)	Base (l/s)	k (mm)	HYD SECT (mm)	DIA (mm)	Section Type	Auto Design
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Network Results Table







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Network Design Table for Storm

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	6.890	0.430	16.0	0.040	5.00	0.0	0.600	o	225	Pipe/Conduit	
1.001	12.902	0.000	0.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.002	8.030	0.650	12.4	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	
1.003	29.848	0.900	33.2	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	3.739	0.160	23.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.005	5.000	0.001	5000.0	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.03	96.930	0.040	0.0	0.0	0.0	3.29	130.6	5.4
1.001	50.00	6.79	96.500	0.040	0.0	0.0	0.0	0.12	4.9<	5.4
1.002	50.00	6.82	96.500	0.040	0.0	0.0	0.0	3.74	148.8	5.4
1.003	50.00	7.11	95.850	0.040	0.0	0.0	0.0	1.75	31.0	5.4
1.004	50.00	7.14	94.950	0.040	0.0	0.0	0.0	2.09	37.0	5.4
1.005	50.00	7.61	94.750	0.040	0.0	0.0	0.0	0.18	7.0	5.4

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Innovyze		Network 2020.1

Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	PN	Pipe Out		Pipes In			Backdrop (mm)
						Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
Mh01	97.850	0.920	Open Manhole	600	1.000	96.930	225				
HW01	97.000	0.500	Open Manhole	1200	1.001	96.500	225	1.000	96.500	225	
HW02	97.000	0.500	Open Manhole	1200	1.002	96.500	225	1.001	96.500	225	
HB	97.000	1.150	Open Manhole	1800	1.003	95.850	150	1.002	95.850	225	
CP	96.400	1.450	Open Manhole	600	1.004	94.950	150	1.003	94.950	150	
Soakaway	96.400	1.650	Open Manhole	600	1.005	94.750	225	1.004	94.790	150	
	96.000	1.251	Open Manhole	0		OUTFALL		1.005	94.749	225	

No coordinates have been specified, layout information cannot be produced.

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.005		96.000	94.749	0.000	0	0


Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	100
FEH Rainfall Version	2013
Site Location	GB 315494 196239 ST 15494 96239
Data Type	Point
Summer Storms	Yes

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Synthetic Rainfall Details

Winter Storms Yes
 Cv (Summer) 0.750
 Cv (Winter) 0.840
 Storm Duration (mins) 30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: HB, DS/PN: 1.003, Volume (m³): 3.2

Unit Reference MD-SHE-0024-3000-1150-3000
 Design Head (m) 1.150
 Design Flow (l/s) 0.3
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 24
 Invert Level (m) 95.850
 Minimum Outlet Pipe Diameter (mm) 75
 Suggested Manhole Diameter (mm) 1200


Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.150	0.3	Kick-Flo®	0.213	0.1
Flush-Flo™	0.104	0.2	Mean Flow over Head Range	-	0.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	0.2	1.200	0.3	3.000	0.5	7.000	0.7
0.200	0.2	1.400	0.3	3.500	0.5	7.500	0.7
0.300	0.2	1.600	0.3	4.000	0.5	8.000	0.7
0.400	0.2	1.800	0.4	4.500	0.5	8.500	0.7
0.500	0.2	2.000	0.4	5.000	0.6	9.000	0.7
0.600	0.2	2.200	0.4	5.500	0.6	9.500	0.8
0.800	0.3	2.400	0.4	6.000	0.6		
1.000	0.3	2.600	0.4	6.500	0.6		

Weir Manhole: Soakaway, DS/PN: 1.005, Volume (m³): 0.5

Discharge Coef 0.544 Width (m) 0.001 Invert Level (m) 96.400

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Storage Structures for Storm

Cellular Storage Manhole: HW02, DS/PN: 1.002


Invert Level (m) 96.400 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 1.00
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	72.5	0.0	0.601	0.1	0.0
0.600	151.0	0.0			

Cellular Storage Manhole: Soakaway, DS/PN: 1.005

Invert Level (m) 94.750 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.04320 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.04320

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	20.0	20.0	0.801	0.1	34.4
0.800	20.0	34.4			

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 315494 196239 ST 15494 96239
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	Mh01	15 Summer	2	+0%					96.972
1.001	HW01	15 Summer	2	+0%	30/15 Summer				96.627
1.002	HW02	1440 Summer	2	+0%	100/240 Summer				96.588
1.003	HB	1440 Summer	2	+0%	2/120 Summer				96.591
1.004	CP	1440 Summer	2	+0%	2/1440 Summer				95.154
1.005	Soakaway	1440 Summer	2	+0%	2/480 Summer				95.153

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged		Flooded Volume (m ³)	Flow / Overflow Cap. (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Flow						
1.000	Mh01	-0.183	0.000	0.00			7.1	OK	
1.001	HW01	-0.098	0.000	0.60			7.1	OK	
1.002	HW02	-0.137	0.000	0.01		968	0.9	OK	
1.003	HB	0.591	0.000	0.01			0.2	SURCHARGED	
1.004	CP	0.054	0.000	0.01			0.2	SURCHARGED	
1.005	Soakaway	0.178	0.000	0.00		518	0.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 315494 196239 ST 15494 96239
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF


Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	Mh01	15 Summer	30	+0%					96.992
1.001	HW01	15 Summer	30	+0%	30/15 Summer				96.740
1.002	HW02	1440 Summer	30	+0%	100/240 Summer				96.682
1.003	HB	1440 Summer	30	+0%	2/120 Summer				96.684
1.004	CP	1440 Summer	30	+0%	2/1440 Summer				95.356
1.005	Soakaway	1440 Summer	30	+0%	2/480 Summer				95.356

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m ³)						
1.000	Mh01	-0.163	0.000	0.17			15.7	OK	
1.001	HW01	0.015	0.000	1.31			15.6	FLOOD RISK	
1.002	HW02	-0.043	0.000	0.01		1188	0.9	OK	
1.003	HB	0.684	0.000	0.01			0.3	SURCHARGED	
1.004	CP	0.256	0.000	0.01			0.3	SURCHARGED	
1.005	Soakaway	0.381	0.000	0.00		700	0.0	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coeffiecient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 2 Number of Storage Structures 2 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FEH
FEH Rainfall Version 2013
Site Location GB 315494 196239 ST 15494 96239
Data Type Point
Cv (Summer) 1.000
Cv (Winter) 1.000

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status ON
DVD Status OFF
Inertia Status OFF

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surchage	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	Mh01	15 Summer	100	+40%					97.014
1.001	HW01	1440 Winter	100	+40%	30/15 Summer				96.861
1.002	HW02	1440 Winter	100	+40%	100/240 Summer				96.860
1.003	HB	1440 Winter	100	+40%	2/120 Summer				96.893
1.004	CP	1440 Summer	100	+40%	2/1440 Summer				96.129
1.005	Soakaway	1440 Summer	100	+40%	2/480 Summer				96.129

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
		Depth (m)	Volume (m ³)						
1.000	Mh01	-0.141	0.000	0.30			27.4	OK	
1.001	HW01	0.136	0.000	0.16			1.9	FLOOD RISK	
1.002	HW02	0.135	0.000	0.04		1562	5.0	FLOOD RISK	
1.003	HB	0.893	0.000	0.01			0.3	FLOOD RISK	
1.004	CP	1.029	0.000	0.01			0.3	FLOOD RISK	
1.005	Soakaway	1.154	0.000	0.00		1879	0.0	FLOOD RISK	

APPENDIX F: Proposed Drainage Strategy