



Pantanas House
Pantanas
Treharris
South Wales
CF46 5BN

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Email: roger.francis3@btinternet.com

Attenuation Calculations

Property Details:

New Club House
The Wern Sports Centre
Ynys Fach
Merthyr Tydfil

Client Details:

Merthyr Tydfil Rugby Club

Insruction:

To calculate the Attenuation Storage required to allow a discharge rate of 3lts/sec to a receiving surface water sewer from a building with an impermeabe area of 595m²

Attenuation Storage Required

Having regard to site specific rainfall data Attenuation Storage of 32m³ will be required.
A discharge orifice of 39.5mm will be required.

Attachments

Development Site Location Plan
Development Plan
Receiving Manhole Location
Attenuation Storage Calculations

Development Site Location Plan



Google

Penlan View

Penlan View

Penlan View

Penlan View

Caer Wern

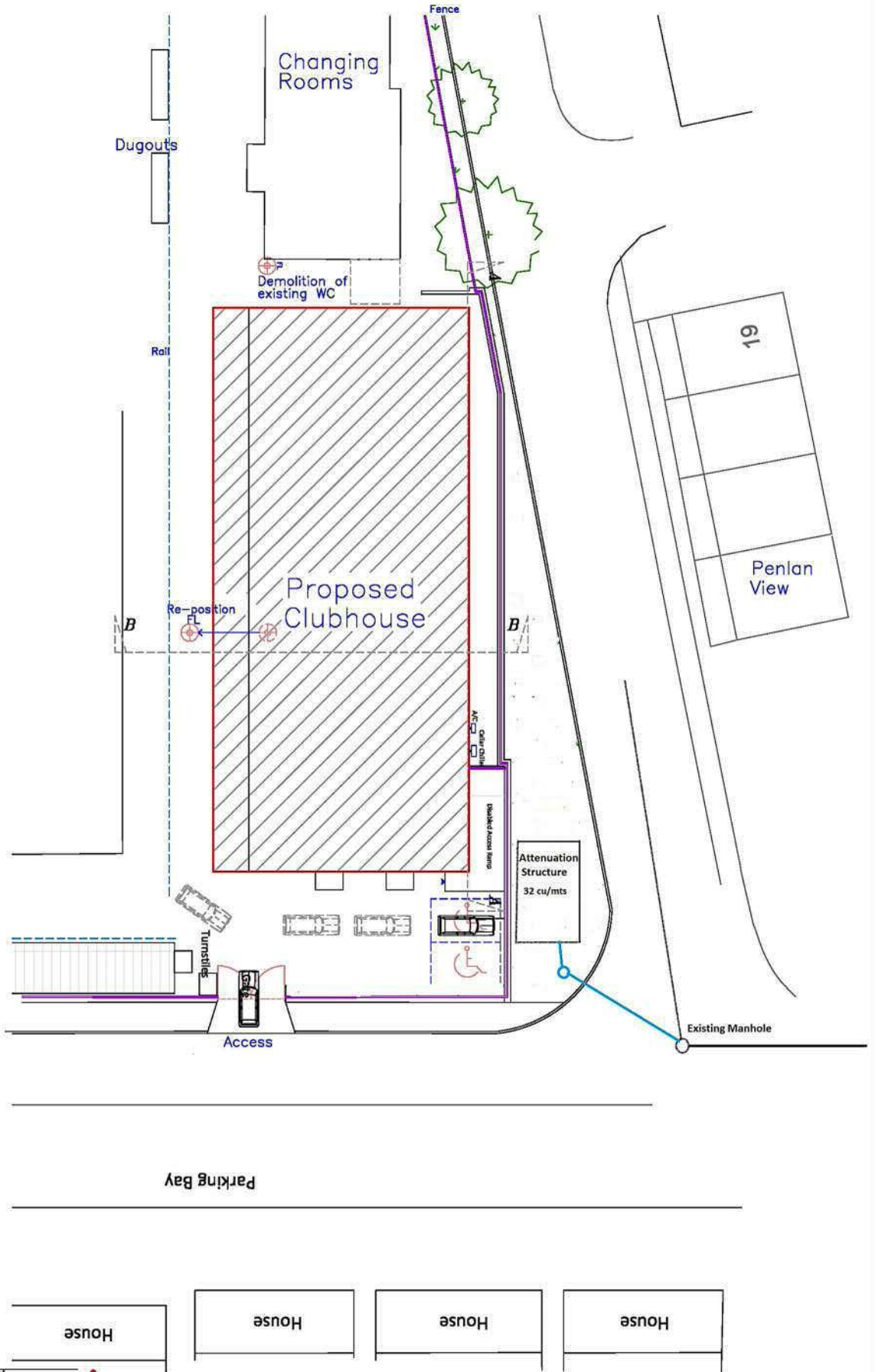
Caer Wern

Caer Wern

The Wern

Development Site

Development Plan



Proposed Block Plan
1:200



Utopia Design
Architectural Services
Building Planning Application Support
Paul Thomas 25c (Reno)
Tel: 01688 658250, Mob: 07008 712005
e-mail: utopiadesign@btinternet.com

Client: Mr Gary Thomas
Merthyr Rugby Club
Dyffryn Street
Merthyr Tydfil
CF46 1PA

Project: Proposed New Clubhouse
at
The Merthyr Rugby Ground
The Merthyr Tydfil
Merthyr Tydfil

Drawn by: Paul Thomas
Date: 01/06/19

Scale: 1:200

Page: 42

Drawn by: WEN CHEN/05082017

Receiving Manhole Details



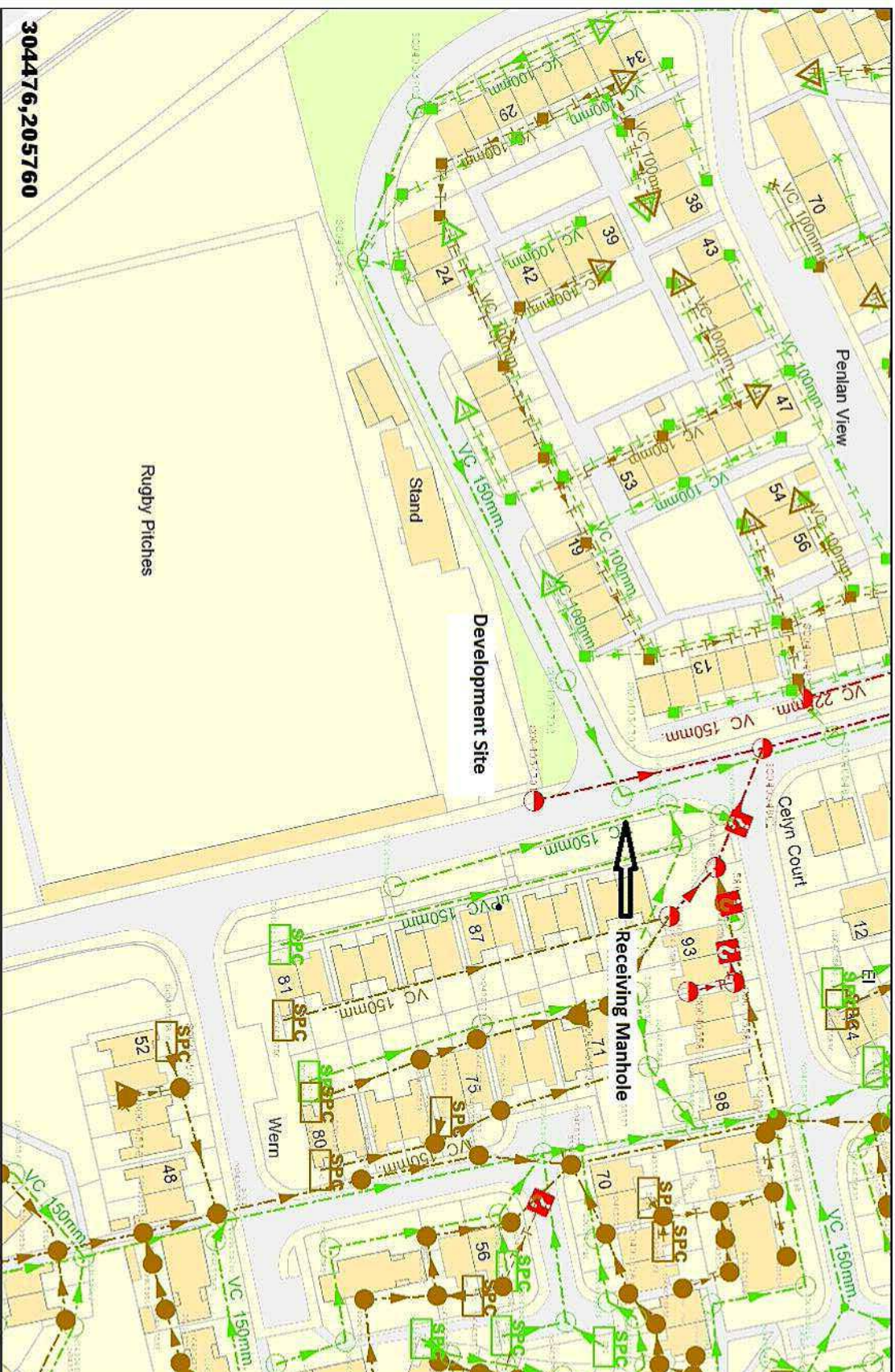
Dŵr Cymru
Welsh Water

Wern Rugby Club



Scale: 1: 1250

01/07/2020



304476,205760

**EXACT LOCATION OF
ALL APPARATUS TO
BE DETERMINED ON
SITE**

- LEGEND**
- Clean Water
 - Sluice Val
 - Air Val, SINGLE
 - Tap
 - Pressure Reducing Valve
 - Meter
 - BULK Meter
 - FH
 - Cap
 - Existing Main
 - NON COMPANY
 - Sewerage External
 - Foul
 - Surface Water
 - Combined
 - Rising Main
 - Private
 - Treatment Works
 - Pumping Station
 - Special Purpose
 - Unknown End
 - Change, Combined Overflow
 - Outfall, FOUL
 - Lamp Hole, Foul
 - Private Sewer Transfer
 - Lateral Drain
 - Inspection Chamber

Dŵr Cymru Cyllyngedig (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.

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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

Attenuation Storage Calculations



MasterDrain
SW

GWP Property Services

www.gwpropertyservices.com

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Job No. Storage		
Sheet no. 1		
Date 12/07/20		
By	Checked	Reviewed
RAF		

Project	The Wern Clubhouse
Title	Hydrograph storage analysis (Winter profile) for MERTHYR TYDFIL

Data:-

Location = MERTHYR TYDFIL Grid reference = SO0406
M5-60 (mm) = 20 r = 0.22
Soil index = 0.50 SAAR (mm/yr) = 1600
Return period = 100 WRAP = 5
UCWI = 0.0 Climate change = +30%

Soils of wet uplands -

- i) with peaty or humose surface horizons and impermeable layers at shallow depth;
- ii) deep raw peat associated with gentle upland slopes or basin sites;
- iii) bare rock cliffs and screes;
- iv) shallow, permeable rocky soils on steep slopes.

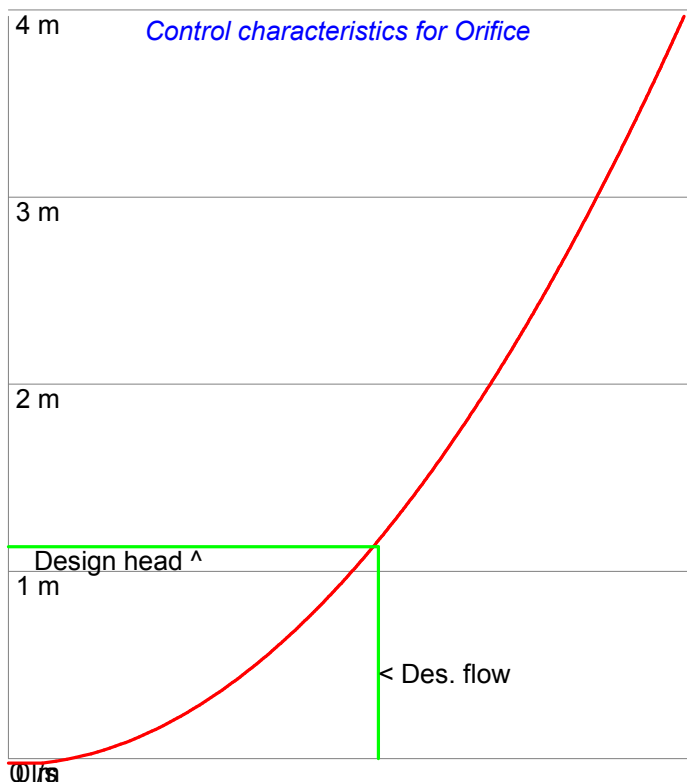
Percentage runoff = 100.0% (manual setting)

Imperv. area = 595 m² Pervious area = 0 m²
Total area = 595 m² Equiv area = 595 m² (Tot. area x % runoff).
Total runoff = 48.0 m³ Discharge rate = 3.000 l/s

Design Head = 1.2m Peak flow = 3.00 l/s
Control device = Orifice Orifice diam = 35.9 mm
Max. calc. depth = 1.2 m Available depth = 0.0 m³

Available system storage = 0.00 m³ under a system plane at the design head level.

Offline storage = 0.0 m³ Peak input flow = 11.11 l/s
Total storage = 32.0 m³



Head (m)	Flow (l/s)	Head (m)	Flow (l/s)
0.01	0.27	2.01	3.88
0.05	0.61	2.05	3.92
0.10	0.87	2.10	3.97
0.15	1.06	2.15	4.02
0.20	1.22	2.20	4.06
0.25	1.37	2.25	4.11
0.30	1.50	2.30	4.15
0.35	1.62	2.35	4.20
0.40	1.73	2.40	4.24
0.45	1.84	2.45	4.29
0.50	1.94	2.50	4.33
0.55	2.03	2.55	4.37
0.60	2.12	2.60	4.42
0.65	2.21	2.65	4.46
0.70	2.29	2.70	4.50
0.75	2.37	2.75	4.54
0.80	2.45	2.80	4.58
0.85	2.52	2.85	4.62
0.90	2.60	2.90	4.66
0.95	2.67	2.95	4.70
1.00	2.74	3.00	4.74
1.05	2.81	3.05	4.78
1.10	2.87	3.10	4.82
1.15	2.94	3.15	4.86
1.20	3.00	3.20	4.90
1.25	3.06	3.25	4.94
1.30	3.12	3.30	4.97
1.35	3.18	3.35	5.01
1.40	3.24	3.40	5.05
1.45	3.30	3.45	5.09
1.50	3.35	3.50	5.12
1.55	3.41	3.55	5.16
1.60	3.46	3.60	5.20
1.65	3.52	3.65	5.23
1.70	3.57	3.70	5.27
1.75	3.62	3.75	5.30
1.80	3.67	3.80	5.34
1.85	3.72	3.85	5.37
1.90	3.77	3.90	5.41
1.95	3.82	3.95	5.44
2.00	3.87	4.00	5.48



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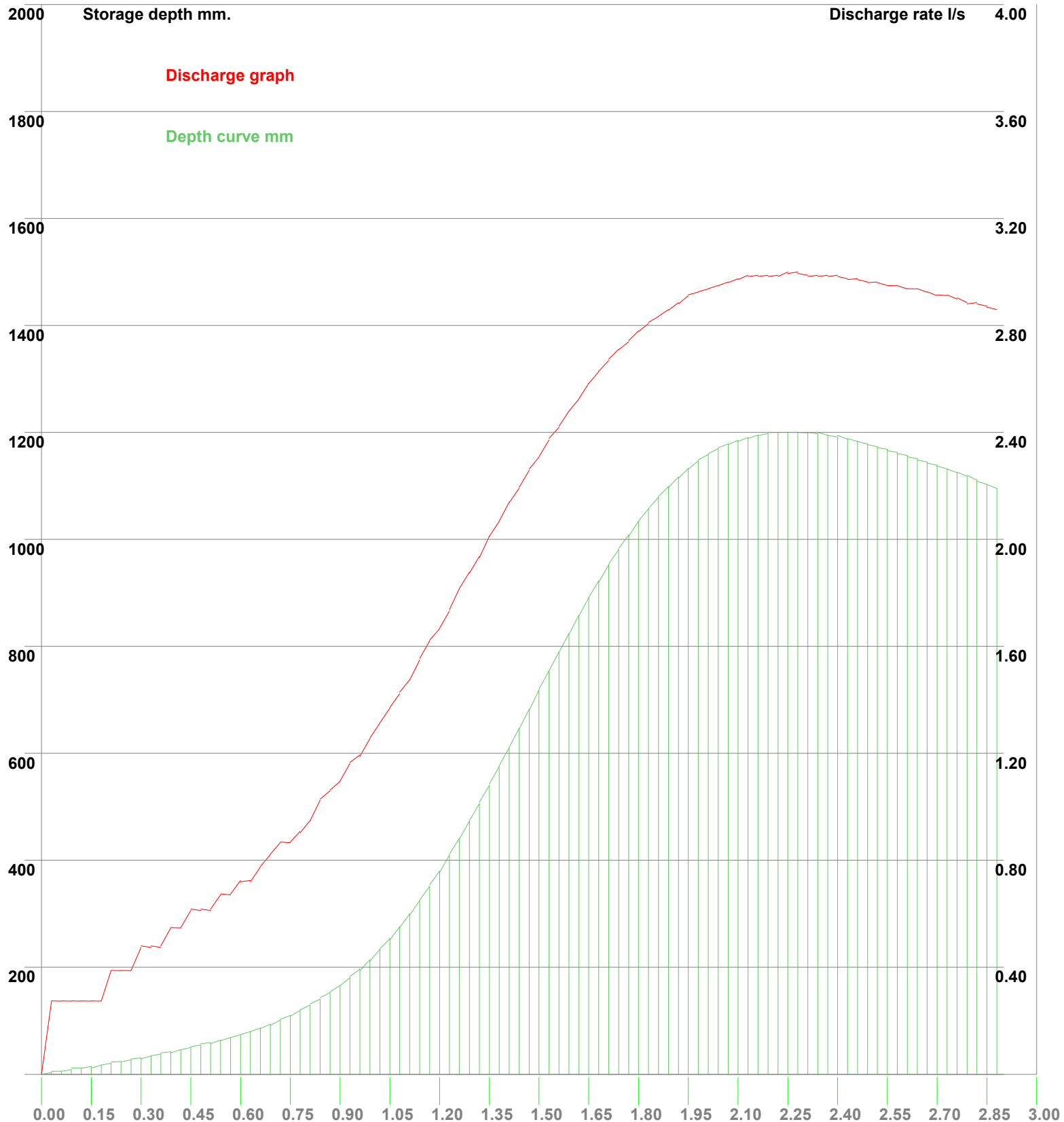
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Job No. Storage		
Sheet no. 2		
Date 12/07/20		
By RAF	Checked	Reviewed

Project The Wern Clubhouse	
Title Hydrograph storage analysis (Winter profile) for MERTHYR TYDFIL	

Storage curves for a 3 hours storm.





Job No.	Storage		
Sheet no.	3		
Date	12/07/20		
By	RAF	Checked	Reviewed
Title			

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Project	The Wern Clubhouse
Title	Hydrograph storage analysis (Winter profile) for MERTHYR TYDFIL

Incremental rainfall figures.

Storm Mins	Storage Depth mm	Control Flow l/s	Storm Mins	Storage Depth mm	Control Flow l/s
1.8	3.6	0.27	91.8	754.1	2.37
3.6	6.1	0.27	93.6	789.4	2.42
5.4	8.8	0.27	95.4	824.2	2.48
7.2	11.4	0.27	97.2	858.1	2.52
9.0	14.3	0.27	99.0	890.9	2.58
10.8	17.3	0.27	100.8	922.4	2.63
12.6	20.5	0.39	102.6	952.4	2.67
14.4	23.6	0.39	104.4	981.0	2.71
16.2	26.9	0.39	106.2	1008.2	2.74
18.0	30.6	0.47	108.0	1033.8	2.78
19.8	34.2	0.47	109.8	1057.5	2.81
21.6	38.1	0.47	111.6	1079.1	2.83
23.4	42.1	0.55	113.4	1098.7	2.86
25.2	46.0	0.55	115.2	1116.7	2.89
27.0	50.3	0.61	117.0	1132.7	2.91
28.8	54.6	0.61	118.8	1146.6	2.92
30.6	59.2	0.61	120.6	1159.1	2.94
32.4	63.9	0.67	122.4	1169.7	2.95
34.2	68.7	0.67	124.2	1178.3	2.96
36.0	74.1	0.72	126.0	1185.2	2.97
37.8	80.0	0.72	127.8	1190.8	2.99
39.6	86.6	0.77	129.6	1195.1	2.99
41.4	93.7	0.82	131.4	1198.1	2.99
43.2	101.6	0.87	133.2	1199.8	2.99
45.0	109.9	0.87	135.0	1200.5	3.00
46.8	119.2	0.91	136.8	1200.3	3.00
48.6	129.4	0.95	138.6	1199.3	2.99
50.4	140.7	1.02	140.4	1197.4	2.99
52.2	152.9	1.06	142.2	1194.9	2.99
54.0	166.2	1.10	144.0	1191.6	2.99
55.8	180.7	1.16	145.8	1187.6	2.97
57.6	196.5	1.19	147.6	1183.1	2.97
59.4	214.2	1.25	149.4	1178.2	2.96
61.2	233.4	1.31	151.2	1173.3	2.96
63.0	253.8	1.37	153.0	1168.1	2.95
64.8	276.0	1.42	154.8	1162.6	2.95
66.6	299.7	1.47	156.6	1156.8	2.94
68.4	324.9	1.55	158.4	1150.9	2.94
70.2	351.6	1.62	160.2	1144.7	2.92
72.0	379.9	1.67	162.0	1138.5	2.91
73.8	409.9	1.73	163.8	1131.9	2.91
75.6	441.1	1.82	165.6	1125.0	2.90
77.4	473.1	1.88	167.4	1117.9	2.89
79.2	506.2	1.94	169.2	1110.5	2.89
81.0	540.3	2.01	171.0	1103.0	2.87
82.8	575.2	2.07	172.8	1095.3	2.86
84.6	610.7	2.14	174.6	1087.5	2.85
86.4	646.7	2.19	176.4	1079.8	2.83
88.2	682.6	2.26	178.2	1071.9	2.83
90.0	718.5	2.31	180.0	1064.0	2.82

Using the Get Max button causes the program to step through a series of storm durations until a maximum volume is obtained.

Each duration is sampled 600 times and the results recorded. The storm durations (hrs) are:-

0.25, 0.5, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 18, 20, 24, 30, 36, 42, 48, 54, 60, 66, 72, 84, 96, 120, 150, 175, 200, 250, 300, 375, 500, 750, 1000, 1250, 1500, 1570, 2000, 2500, 3000, 3500, 4000

It should be noted that the six hour storm frequently requested rarely demonstrates the worst case for storage.



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Sheet no. 4	
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Sequential storage volume at specific storm durations.

m³

