



Pantanas House
Pantanas
Treharris
South Wales
CF46 5BN

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Pant Road Surface Water Run Off Calculations

Property Details:

Land Adj to:
22 Pant Road
Merthyr Tydfil
CF48 3SP

Client Details:

Dean Davis

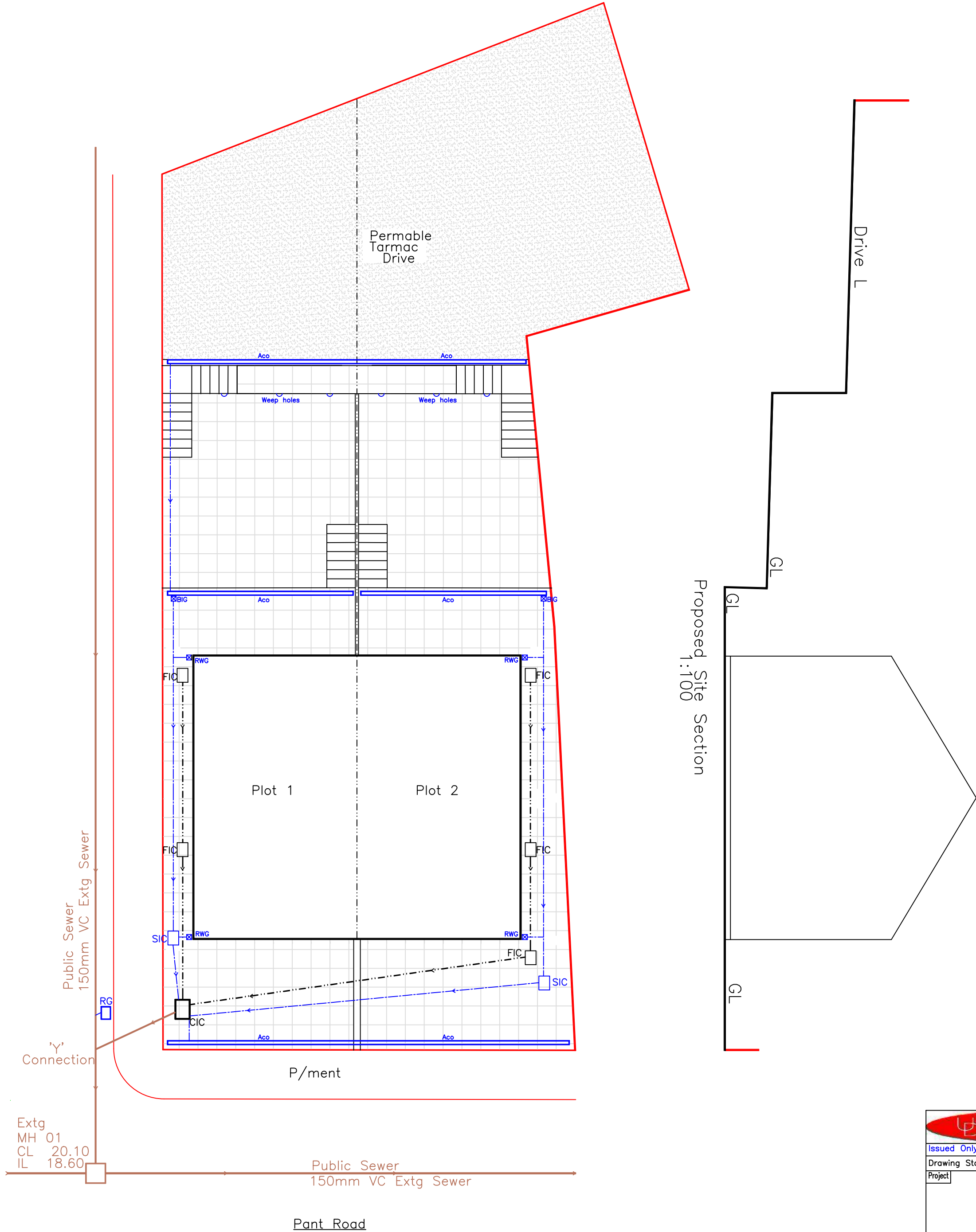
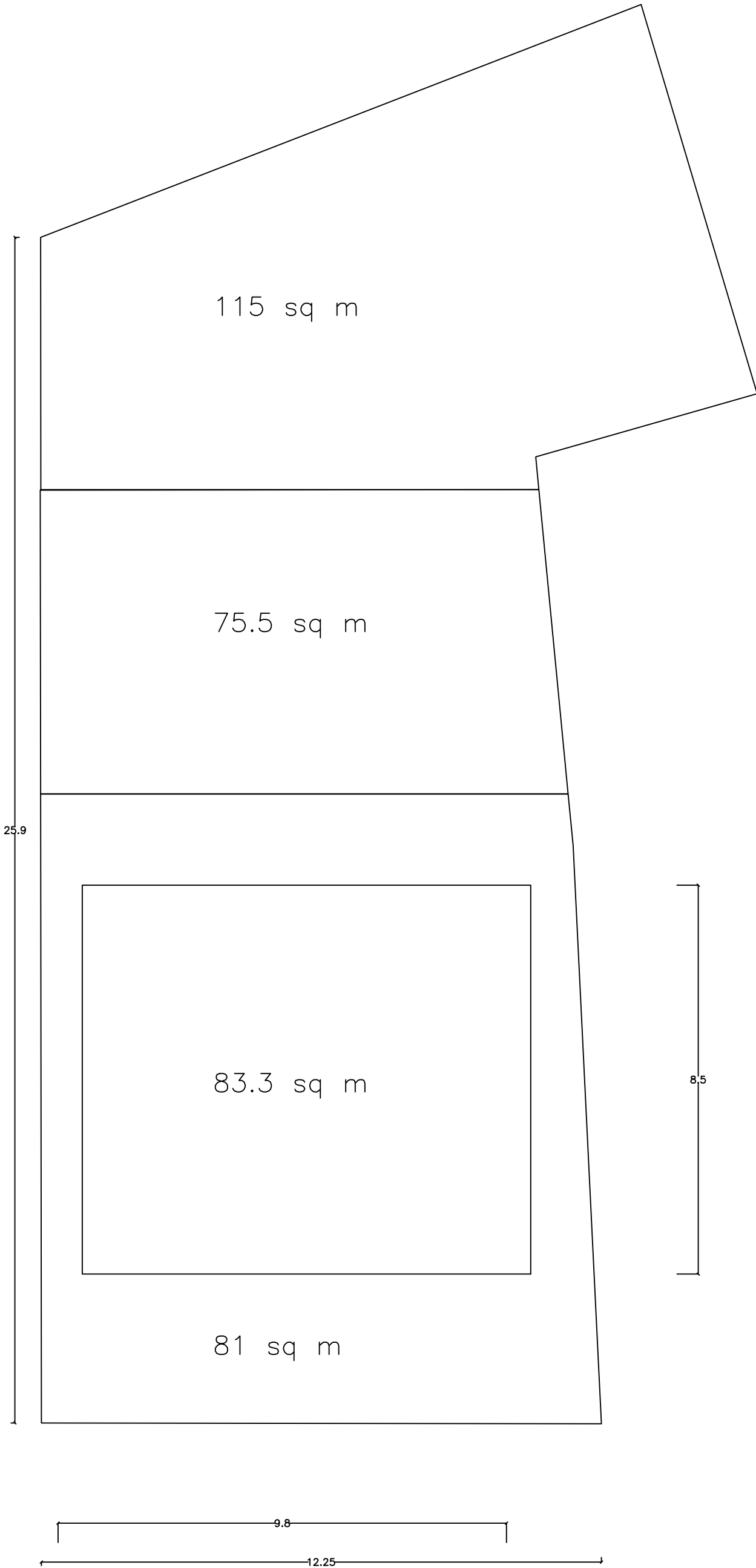
Surface Water Run off Calculations

Having regard to a new site impermeable area of some 234m² the surface water run off rate into the reciving infrastruccture for the 1 in 30 year 1.47 l/s.

Attachments:

Site Plan

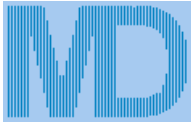
Surface Run Off Calculations



Proposed Site Plan
1:100

The developer must self-vet and certify that the design criteria, material standards and workmanship specifications for the proposed adoptable sewers are in accordance with Sewers for Adoption 7th edition, the requirements of DCWW as the Statutory Sewerage Undertaker and the Welsh Ministers Build Standards

			
Issued Only for Purpose Indicated			
Drawing Status: FOR CONSTRUCTION PURPOSES ONLY			
Project			
Land Adjacent to 22, Pant Road Merthyr Tydfil CF48 3SP			
Drawn by	Date	Paper	
PT	23.03.23		A3
Title	Scale		
Proposed Plan & Section		Drwg No	1:100
Pant Road 22 AS BUILT 02B			



MasterDrain
HY 11.0

GWP Property Services

www.gwpropertyservices.com

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Job No. Pant Road		
Sheet no. 1		
Date 22/04/23		
By RAF	Checked	Reviewed

Project
Adj 22 Pant Road

Title
IoH 124 (Qbar(urban))Runoff calcs for MERTHYR TYDFIL

Hydrological Data:-

FSR Hydrology:-

Location	= MERTHYR TYDFIL	Grid reference	= SO0406
M5-60 (mm)	= 20	r	= 0.22
Soil runoff	= 0.50	SAAR (mm/yr)	= 1600
WRAP	= 5	Area	= England & Wales
Hydrological area	= 9	Hydrological zone	= 6

Soil classification for WRAP type 5

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.

Design data:-

Area = 0.000234 Km² - 0.023 Ha - 234 m² % Urbanisation = 100.00%

Calculation method:-

Runoff is calculated from:-

$$Q_{BAR(urban)} = Q_{BAR(rural)} (1 + URBAN)^{2NC} [1 + URBAN \{ (21/CIND) - 0.3 \}]$$

where:-

NC varies with the value of SAAR:-

for 500<SAAR<1100 mm then NC = 0.92 - 0.00024SAAR

for 1100<SAAR<3000 mm then NC = 0.74 - 0.000082SAAR

CIND = 102.4SOIL + 0.28(CWI - 125) CWI = Catchment Wetness Index

so

CIND = 57.908

CWI = 148.956

NC = 0.609

For areas less than 50Ha, a modified calculation which multiplies the 50Ha runoff value by the ratio of the site area to 50Ha is used
Reducing factor used for these calculations is 0.000

$$Q_{BAR(rural)} = 0.340 \text{ (l/s)}$$

$$Q_{BAR(urban)} = 0.840 \text{ (l/s)}$$

$Q_{BAR(urban)}$ is then multiplied by a growth factor - GC(T) - for different storm return periods derived from EA publication W5-074/A.



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Calculated data:-

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Job No. Pant Road		
Sheet no. 2		
Date 22/04/23		
By RAF	Checked	Reviewed

Project
Adj 22 Pant Road

Title
IoH 124 (Qbar(urban))Runoff calcs for MERTHYR TYDFIL

Mean Annual Peak Flow $Q_{BAR(urban)} = 0.84 \text{ l/s}$

Values for $Q_{BAR(urban)}$

Ret. per.	m ³ /hr	l/s	l/s/ha	Ret. per.	m ³ /hr	l/s	l/s/ha
1yr	2.570	0.714	30.512	100yr+20%	7.910	2.197	93.904
2yr	2.812	0.781	33.383	100yr+30%	8.570	2.380	101.729
5yr	3.689	1.025	43.793	100yr+40%	9.229	2.564	109.554
10yr	4.294	1.193	50.972	200yr	7.560	2.100	89.740
30yr	5.292	1.470	62.818	200yr + 30%	9.828	2.730	116.662
50yr	5.866	1.630	69.638	500yr	8.648	2.402	102.662
100yr	6.592	1.831	78.253	1000yr	9.646	2.679	114.508

Growth factors -

1yr	2yr	5yr	10yr	30yr	50yr	100yr	200yr	500yr	1000yr
0.85	0.93	1.22	1.42	1.75	1.94	2.18	2.50	2.86	3.19

The above is based on the Institute of Hydrology Report 124 to which you are referred for further details (see Sect 7). Note that the 200 year growth curve was taken from W5-074/A.

For WRAP type 1 soils, CIND can become negative for lower values of SAAR. In this case the CIND value is multiplied by -1 to return a positive value (CIND is very small at this point).