

CONTRACT Cowdale Quarry, Buxton

JOB NO P9362



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DESIGNED BY SDH

DATE 09/07/2010
OUTPUT

P1

Surface water calculations

1.1 Cowdale Quarry, Buxton

Total Site Area	=	17.8 ha	(100% greenfield)
Phase 1 site area	=	10.1 ha	
Phase 1 Impermeable Area	=	6.74 ha	
Hard Paved Impermeable area (excluding roofs)	=	5.22ha	
Roof Areas (Clean Water Only)	=	1.52ha	

1.2 Hydrological Characteristics (From the FEH / Wallingford maps)

M5-60	=	20.0
SAAR	=	1325mm
r	=	0.28
WRAP	=	1
SOIL	=	0.15
UCWI	=	138

1.3 IoH Report 124 Method for determining existing discharge rates

Development Site Area = 10.1 ha or 0.101 km

CWI = 125

SAAR = 1325 mm/year

SOIL = 0.15

1.3.1 QBAR estimation for small rural catchments

QBAR rural = $0.00108 \text{ AREA}^{0.89} \text{ SAAR}^{1.17} \text{ SOIL}^{2.17}$

QBAR rural = $0.00108 \times 0.101^{0.89} \times 1325^{1.17} \times 0.15^{2.17}$

QBAR rural = 0.0102 cumecs

QBAR rural = 10.2 l/s

1.3.2 Discharge rates

QBAR URBAN + 5% = $1.05 \times 10.2 = 10.71 \text{ l/s}$

Proposed rates: (minus 20%)

Q2= 10.7×0.8	=	8.5 l/s	Q2	=	6.8 l/s
Q5= 10.7×1.25	=	13 l/s	Q5	=	10.4 l/s
Q10= 10.7×1.4	=	15 l/s	Q10	=	12.0 l/s
Q25= 10.7×1.65	=	17.6 l/s	Q25	=	14.1 l/s
Q50= 10.7×1.8	=	19 l/s	Q50	=	15.2 l/s
Q100= 10.7×2.1	=	22.5 l/s	Q100	=	18 l/s
Q500= 10.7×2.7	=	29 l/s			
Q1000= 10.7×3.05	=	32.6 l/s			

(The multipliers are taken from R&D technical report W5-074/A/TR1/ Rev C -Figure 1.2, Peak growth curves of UK)

1.4 Storage Estimate

Using the impermeable area(excluding roof areas) contributing to the system (no infiltration)

Quick Storage Estimate

Variables Result Design Overview 2D Overview 3D Vt

Region: **England & Wales** Cv (Summer): **0.750**

Return Period (years): **100** Cv (Winter): **0.840**

Map: **M5-60 (mm)** Impermeable Area (ha): **5.22**

Ratio R: **0.28** Maximum Allowable Discharge (l/s): **18**

Infil Coefficient (m/hr): **0**

Safety Factor: **2**

Climate Change %: **20**

Apply

Done Help

Quick Storage Estimate

Variables Result Design Overview 2D Overview 3D Vt

Global Variables require approximate storage of between 3987 m³ and 6008 m³.

These values are estimates only and should not be used for design purposes.

Done Help

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Roof Areas contributing to soakaways (no offsite connection)

Quick Storage Estimate

Variables Result Design Overview 2D Overview 3D Vt

Region: **England & Wales**

Return Period (years): **100**

Map: **M5-60 (mm)**

Rainfall R: **0.28**

Cv (Summer): **0.750**

Cv (Winters): **0.840**

Impermeable Area (ha): **1.52**

Maximum Allowable Discharge (l/s): **18**

Infiltration Coefficient (m/hr): **0.5**

Safety Factor: **2**

Climate Change %: **20**

Apply

Done Help

Quick Storage Estimate

Variables Result Design Overview 2D Overview 3D Vt

Global Variables require approximate storage of between 727 m³ and 1149 m³.

With Infiltration storage is reduced to between 126 m³ and 613 m³.

These values are estimates only and should not be used for design purposes.

Done Help