
Appendix C Development Masterplan

Appendix D Concept Drainage Calculations

Project OLD MILL LANE, BARNSELEY			Status Final			
Date JUNE 2012 By CJS Checked TXM		Job no. 1117 1504	Section DEVELOPMENT	Sheet no.		Rev A
Rev A	Date 21/06/12	Details INITIAL ISSUE				Tel 0113 395 6200 Fax 0113 395 6201
Part SURFACE WATER DRAINAGE CALCULATIONS						

Strategy:

Surface water drainage is required to manage and control run-off from the proposed development.

The principle is to restrict flows and provide attenuation storage for up to the 1 in 100 year plus climate change event.

The discharge rate for the proposed development will be restricted to the existing discharge rate minus 30%.

Design Assumptions:

- Existing site impermeable areas are based on the topographical survey, drawing no. 11806/1, produced by Malcolm Hughes Land Surveyors in August 2008.
- Proposed site impermeable areas are based on drawing no. MH403-SK43, produced by Bate & Taylor Architects in May 2011.
- It is assumed at this stage that no infiltration is possible due to the made ground at the site.
- All drainage calculations are based on FSR rainfall data

Allowable Discharge Calculations:

1. Determine the existing discharge rate;

Based on the topographical survey, the existing impermeable areas total 3.02ha for the southern portion of the site. Using the modified rational method, assuming an intensity of 50mm/hour, the existing discharge rate is as follows;

$$\begin{aligned}
 \text{Existing Discharge Rate} &= 50\text{mm/hour} \times 2.78 \times 3.02\text{ha} \\
 &= \mathbf{420 \text{ l/s}}
 \end{aligned}$$

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2. Calculate the proposed discharge rate;

The proposed discharge rate will be restricted to the existing discharge rate minus 30%;

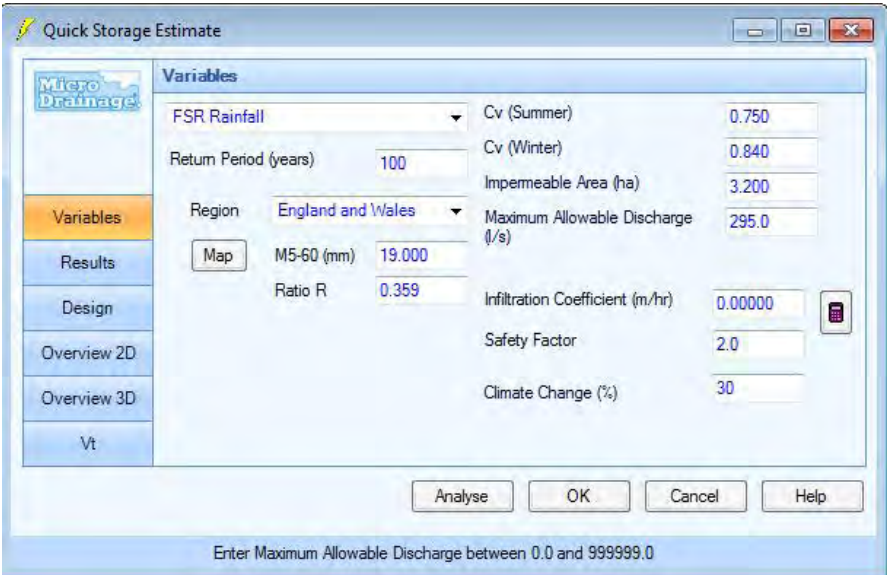
$$\begin{aligned}\text{Proposed Discharge Rate} &= 420 \text{ l/s} - (0.3 \times 420 \text{ l/s}) \\ &= \mathbf{295 \text{ l/s}}\end{aligned}$$

Attenuation Storage Calculations:

The WinDes "Quick Storage Estimate" function was used to calculate the approximate attenuation volume needed to be stored for the southern proportion for the site. Based on the proposed masterplan, the proposed impermeable areas total 3.20ha. The following are the variables used for the volume estimates as well as the results obtained.

Quick Storage Estimate Variables

M5-60 = 19.0mm
 Ratio R = 0.359
 Cv (Summer) = 0.75
 Cv (Winter) = 0.84
 Area = 3.20ha



Quick Storage Estimate

Variables

FSR Rainfall

Return Period (years) 100

Region England and Wales

Map

M5-60 (mm) 19.000

Ratio R 0.359

Cv (Summer) 0.750

Cv (Winter) 0.840

Impermeable Area (ha) 3.200

Maximum Allowable Discharge (l/s) 295.0

Infiltration Coefficient (m/hr) 0.00000

Safety Factor 2.0

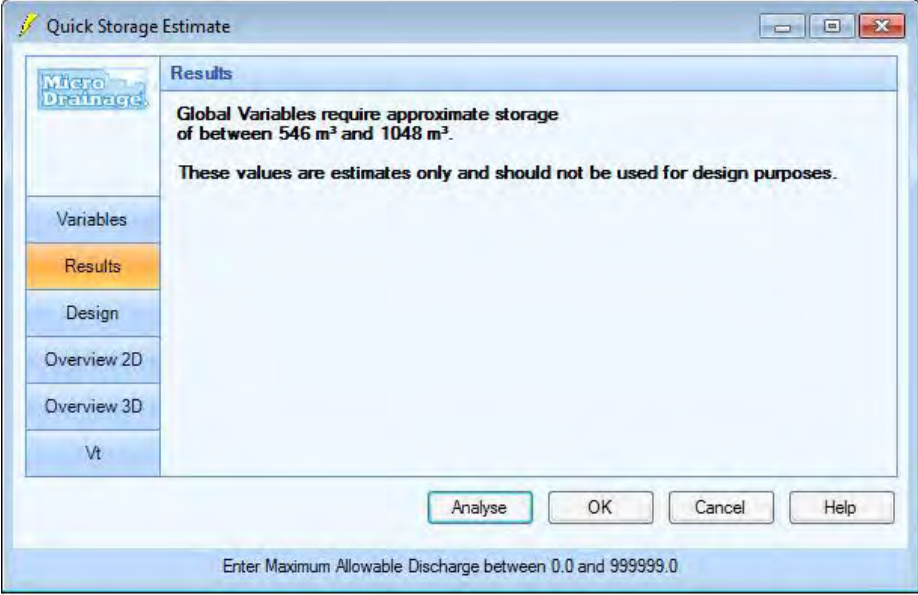
Climate Change (%) 30

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

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Quick Storage Estimate Results



Quick Storage Estimate

Results

Global Variables require approximate storage of between 546 m³ and 1048 m³.

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

Variables
Results
Design
Overview 2D
Overview 3D
Vt

Analyse OK Cancel Help

Enter Maximum Allowable Discharge between 0.0 and 999999.0

