Appendix D - Proposed Drainage Strategy

Reference	Title
C18299-HYD-XX-XX-DR-C-0500	Proposed Drainage Strategy

NOTE:
THE SITE HAS UNDERTAKEN SOAKAWAY TESTING WHICH HAS DETERMINED THAT THE DEVELOPMENT IS UNSUITABLE FOR INFILTRATION.

ATTENUATION SIZES ARE INDICATIVE ONLY, BASED UPON A GREENFIELD RUN-OFF OF 6.3 l/s TO ACCOMMODATE THE 1 IN 100 YEAR CRITICAL STORM EVENT WITH 30% ALLOWANCE FOR CLIMATE CHANGE.

FOUL FLOW RATES INDICATED ON THIS DRAWING ARE APPROXIMATE ONLY, AND WILL CHANGE FOLLOWING DETAILED DESIGN

Residential Plot 02
Total Units: 272
Peak Foul Flow Rate: 12.6 l/s

Residential Plot 02
Total Area: 6.886 Ha
Assumed 80% Impermeable Area: 5.509 Ha
100 Year Greenfield Run Off Rate: 34.71 l/s
Approximate Attenuation volume required: 3,527m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 01
Total Units: 132
Peak Foul Flow Rate: 6.1 l/s

Residential Plot 01
Total Area: 3.327 Ha
Assumed 80% Impermeable Area: 2.698 Ha
100 Year Greenfield Run Off Rate: 16.99 l/s
Approximate Attenuation volume required: 1,727m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 03
Total Units: 161
Peak Foul Flow Rate: 7.5 l/s

Residential Plot 04
Total Area: 3.529 Ha
Assumed 80% Impermeable Area: 2.823 Ha
100 Year Greenfield Run Off Rate: 17.79 l/s
Approximate Attenuation volume required: 1,807m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 04
Total Units: 140
Peak Foul Flow Rate: 6.5 l/s

Residential Plot 05
Total Area: 2.976 Ha
Assumed 80% Impermeable Area: 2.381 Ha
100 Year Greenfield Run Off Rate: 15.00 l/s
Approximate Attenuation volume required: 1,524m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 05
Total Units: 120
Peak Foul Flow Rate: 5.6 l/s

Community Use
Peak Foul Flow Rate: 3.33 l/s

Residential Plot 03 + Community Use
Total Area: 5.006 Ha
Assumed 80% Impermeable Area: 4.005 Ha
100 Year Greenfield Run Off Rate: 25.23 l/s
Approximate Attenuation volume required: 2,564m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 09
Total Units: 56
Peak Foul Flow Rate: 2.6 l/s

Residential Plot 09
Total Area: 1.591 Ha
Assumed 80% Impermeable Area: 1.273 Ha
100 Year Greenfield Run Off Rate: 8.02 l/s
Approximate Attenuation volume required: 816m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 06 + Primary School
Total Area: 4.149 Ha
Assumed 80% Impermeable Area: 3.319 Ha
100 Year Greenfield Run Off Rate: 20.91 l/s
Approximate Attenuation volume required: 2,125m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 08 + Mixed Use
Total Area: 3.946 Ha
Assumed 80% Impermeable Area: 3.157 Ha
100 Year Greenfield Run Off Rate: 19.89 l/s
Approximate Attenuation volume required : 2,021m3
Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 08
Total Units: 175
Peak Foul Flow Rate: 8.1 l/s

NC Plot 01
Total Units: 56
Peak Foul Flow Rate: 2.6 l/s

Residential Plot 10
Total Area: 1.509 Ha
Assumed 80% Impermeable Area: 1.207 Ha
100 Year Greenfield Run Off Rate: 7.61 l/s
Approximate Attenuation volume required: 773m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 07 + Mixed Use
Total Area: 2.201 Ha
Assumed 80% Impermeable Area: 1.761 Ha
100 Year Greenfield Run Off Rate: 11.09 l/s
Approximate Attenuation volume required: 1,127m3
(Approximate extent of attenuation pond at 1.0m depth)

Residential Plot 10
Total Units: 52
Peak Foul Flow Rate: 2.4 l/s

Residential Plot 06
Total Units: 130
Peak Foul Flow Rate: 6.0 l/s

NC Plot 02
Total Units: 32
Peak Foul Flow Rate: 1.5 l/s

Commercial Plot 02
Peak Foul Flow Rate: 8.3 l/s

Primary School
Occupancy of approximately 200 people
Peak Foul Flow Rate: 3.75 l/s

Commercial Plot 02
Total Area: 11.864 Ha
Assumed 80% Impermeable Area: 9.491 Ha
100 Year Greenfield Run Off Rate: 59.79 l/s
Approximate Attenuation volume required: 6,075m3
(Approximate extent of attenuation pond at 2.0m depth)

Residential Plot 07
Total Units: 75
Peak Foul Flow Rate: 3.5 l/s

675Ø

0701
Proposed foul drainage to connect to existing 675mm sewer within Clifton Road
Exact location, cover and invert levels to be confirmed on site

Commercial Plot 01
Peak Foul Flow Rate: 5.1 l/s

Commercial Plot 01
Total Area: 7,333 Ha
Assumed 80% Impermeable Area: 5.866 Ha
100 Year Greenfield Run Off Rate: 36.96 l/s
Approximate Attenuation volume required: 3,754m3
(Approximate extent of attenuation pond at 1.0m depth)

NOTES

1. THIS DRAWING IS NOT TO BE SCALED.
2. THE CONTRACTOR SHALL CHECK ALL DIMENSIONS AND LEVELS ON SITE.
3. ALL DIMENSIONS AND LEVELS ARE TO BE CHECKED ON SITE BEFORE THE COMMENCEMENT OF WORKS. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ARCHITECT AND ENGINEER FOR VERIFICATION. FIGURED DIMENSIONS ONLY ARE TO BE TAKEN FROM THIS DRAWING.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ENGINEERS' AND SERVICE ENGINEERS' DRAWINGS AND SPECIFICATIONS.
5. ALL LEVELS ARE IN METRES UNLESS NOTED OTHERWISE
6. PROPOSALS INDICATED ON THIS DRAWING ARE BASED UPON TOPOGRAPHICAL SURVEY "Whyndykee Farm Final.dwg" UNDERTAKEN BY CTESURVEYS DATED JULY 2010.
7. PROPOSED SITE LAYOUT BASED UPON DRAWING "SK02 LAND USE.dwg" REVISION A UNDERTAKEN BY CASSIDY & ASHTON.
8. INFORMATION SHOWN ON THIS DRAWING IS APPROXIMATE ONLY AND WILL CHANGE FOLLOWING FURTHER DETAILED DESIGN. ATTENUATION BASIN SIZES BASED UPON A GREENFIELD RUN-OFF OF 6.3 l/s/Ha TO ACCOMMODATE THE 1 IN 100 YEAH CRITICAL STORM EVENT WITH 30% ALLOWANCE FOR CLIMATE CHANGE.
9. PROPOSED FOUL DRAINAGE IS INDICATIVE ONLY. EXISTING DRAINAGE INFRASTRUCTURE IS TAKEN FROM UNITED UTILITIES SEWER RECORDS.

LEGEND

- PROPOSED DEVELOPMENT PLOT AREA
- EXISTING UNITED UTILITIES COMBINED PUBLIC SEWER
- APPROXIMATE ATTENUATION POND EXTENTS (BASED UPON A 1.0m DESIGN DEPTH UNLESS NOTED OTHERWISE) BELOW GROUND ATTENUATION TO BE PROVIDED WHERE PONDS ARE NOT SUITABLE
- PROPOSED SURFACE WATER HEADWALL
- PROPOSED SURFACE WATER FLOW CONTROL
- PROPOSED SURFACE WATER DRAINAGE
- PROPOSED FOUL DRAINAGE
- PROPOSED FOUL PUMPING STATION
- PROPOSED FOUL RISING MAIN
- EXISTING WATERCOURSE / POND

REV	REVISION NOTES/COMMENTS	DRAWN BY	DATE	CHECKED BY	DATE	APPROVED BY	DATE
P01	PRELIMINARY ISSUE	L. W. Pilsbury	12.03.21	R. Henshall	12.03.21	R. Henshall	12.03.21

Hydrock
North Assurance Buildings
9-21 Princess Street, St Alberts Square
Manchester
M2 4DN
t: +44(0)161 804 5550
e: manchester@hydrock.com

CLIENT
CASSIY & ASHTON

PROJECT
WHYNDYKE FARM,
BLACKPOOL

TITLE
PROPOSED DRAINAGE STRATEGY

DRAFT

HYDROCK PROJECT NO.	SCALE @ A1
C-18299	1:2500

STATUS DESCRIPTION	STATUS
PRELIMINARY	

DRAWING NO. (PROJECT CODE-ORGINATOR-ZONE-LEVEL-TYPE-ROLE-NUMBER)	REVISION
C18299-HYD-XX-XX-DR-C-0500	P01

Filepath: G:\Projects\01_LIVE\18299-GNMA Whyndyke Garden Village\01_WIP\DR_Drawing\C\C-18299-HYD-XX-XX-DR-C-0500_Drainage Strategy.dwg

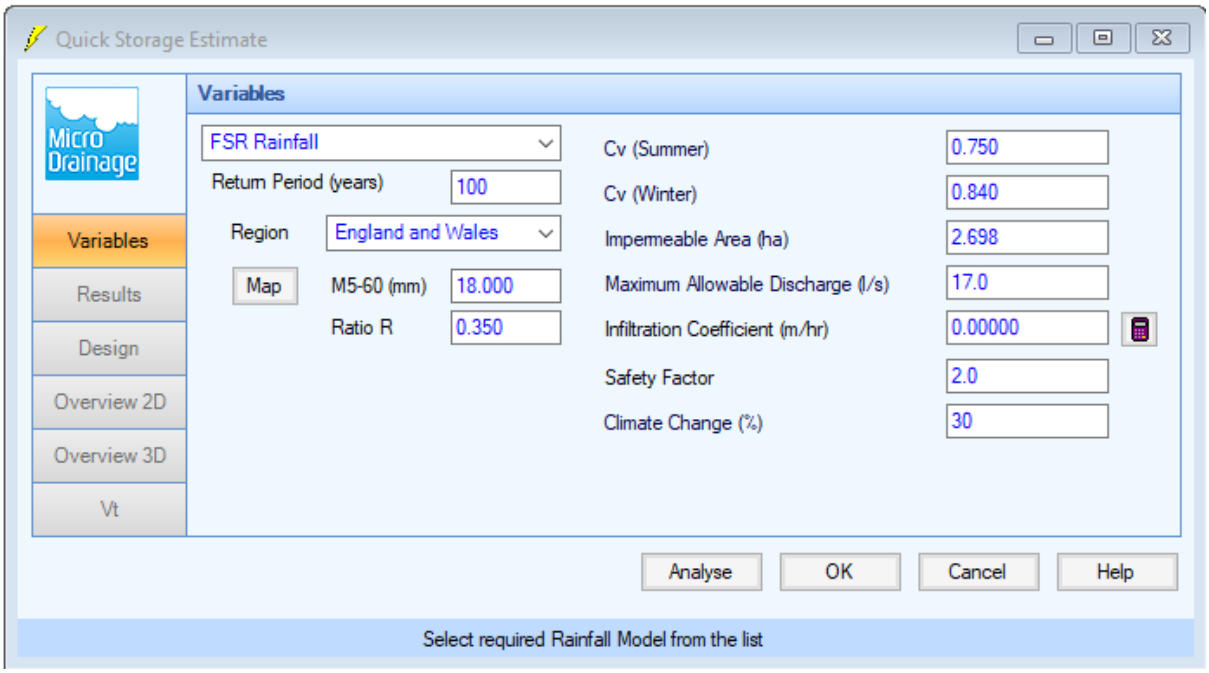
Date Plotted: Apr 23, 2021 - 11:59am Plotted By: LUKEPILSBURY

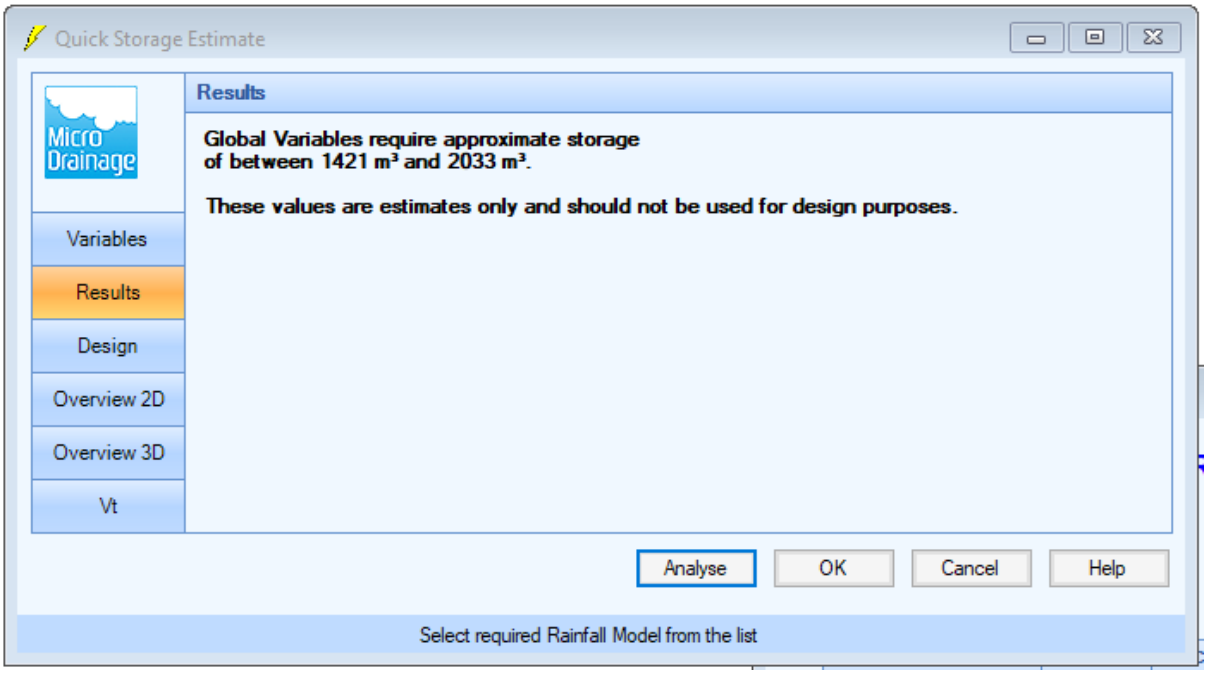
Appendix E - MicroDrainage Quick Storage Estimate

Reference	Title
Quick Storage Estimate	MicroDrainage Quick Storage Estimate

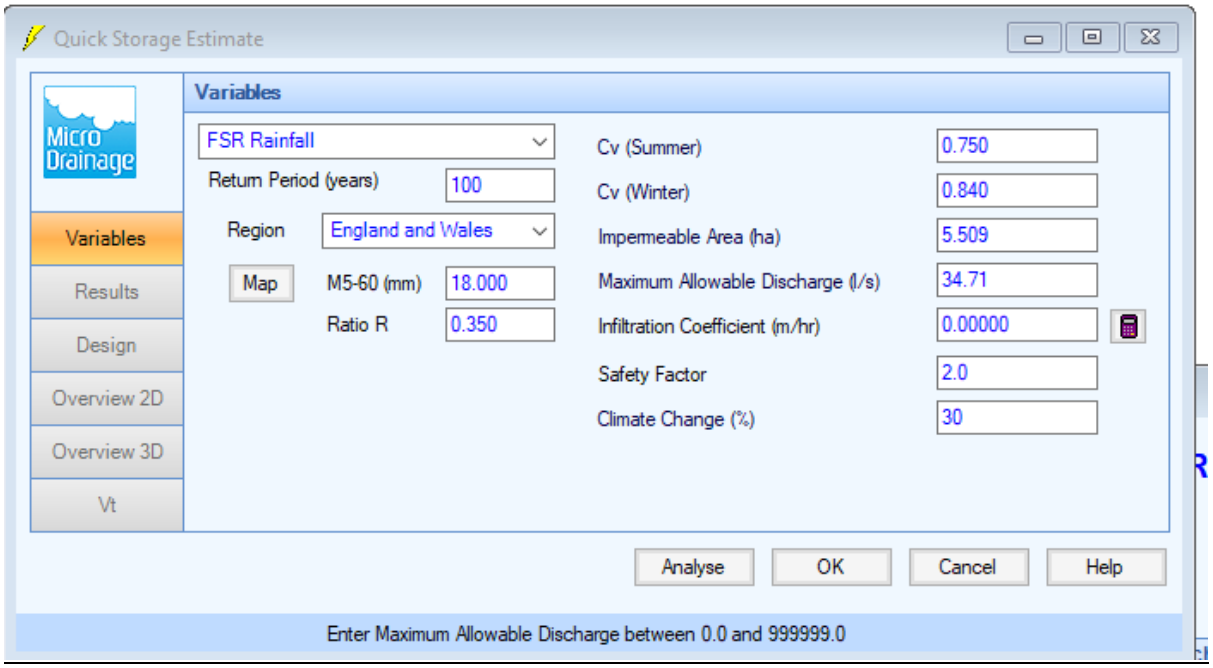
Quick Storage Estimate

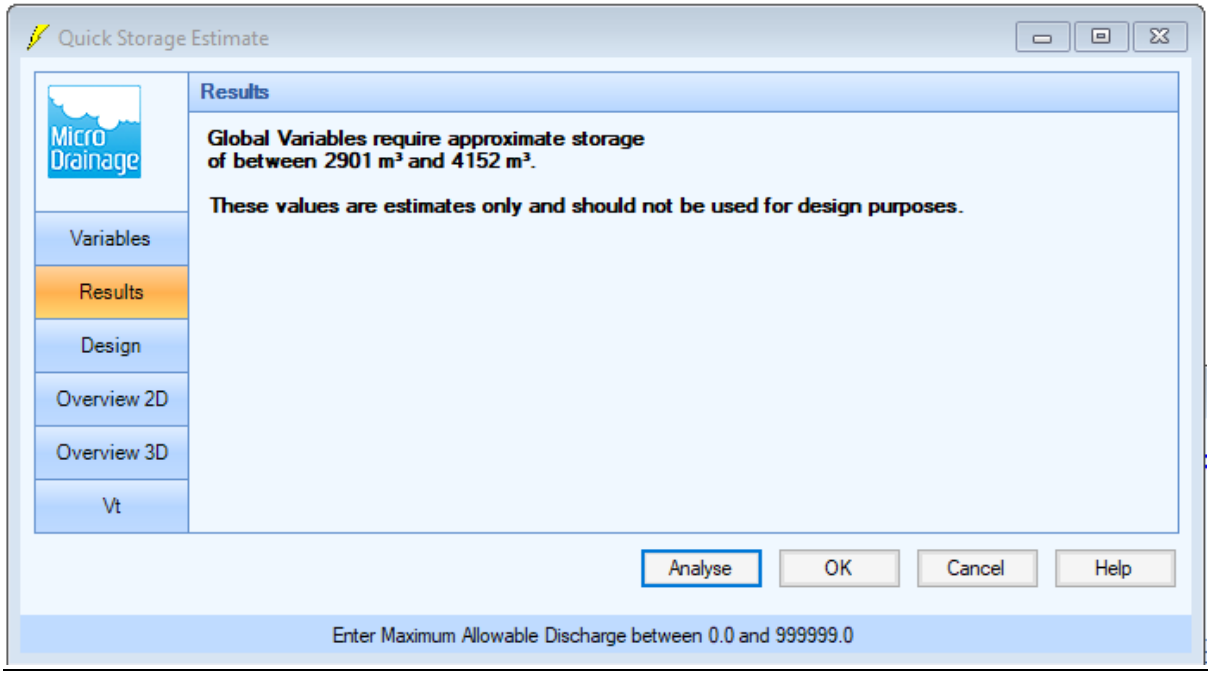
Plot 01



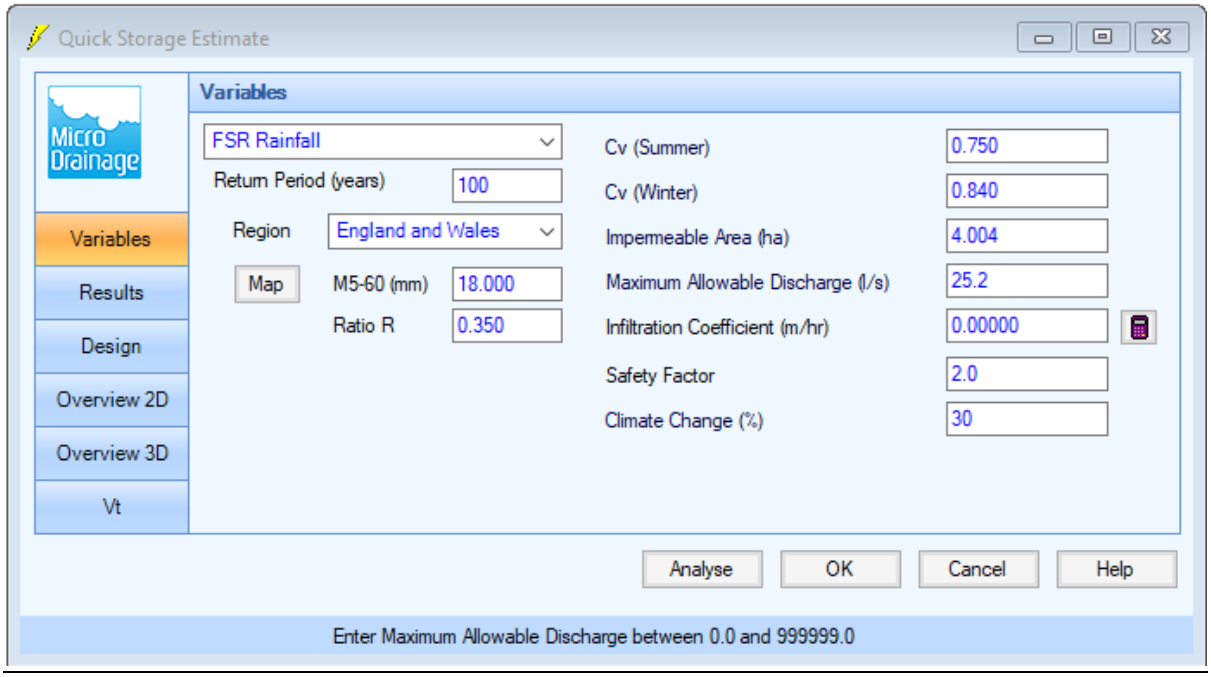


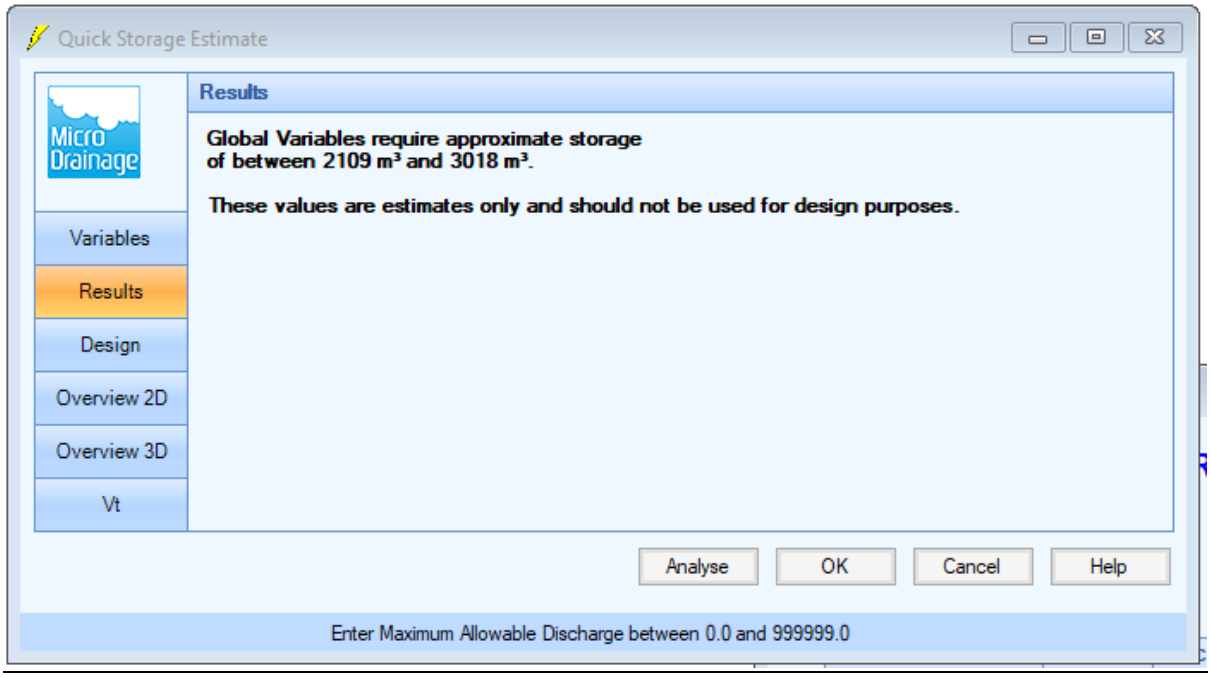
Plot 02


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map
M5-60 (mm) 18.000
Ratio R 0.350
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 5.509
Maximum Allowable Discharge (l/s) 34.71
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

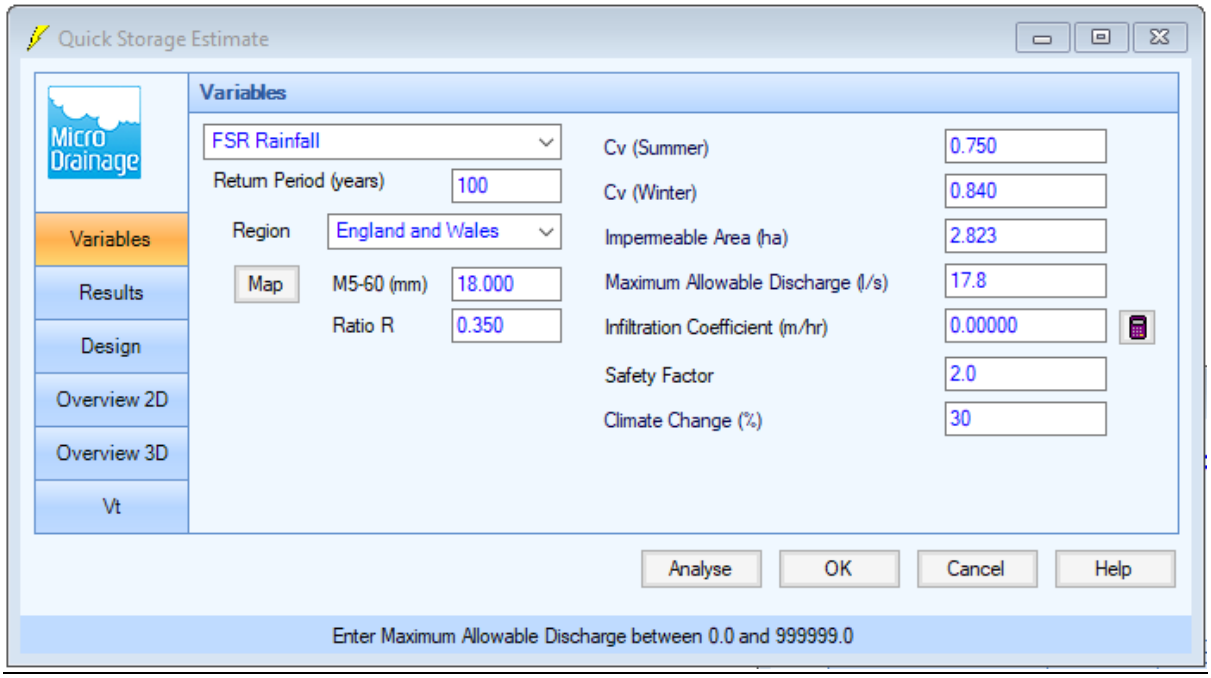

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage
of between 2901 m³ and 4152 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Maximum Allowable Discharge between 0.0 and 999999.0

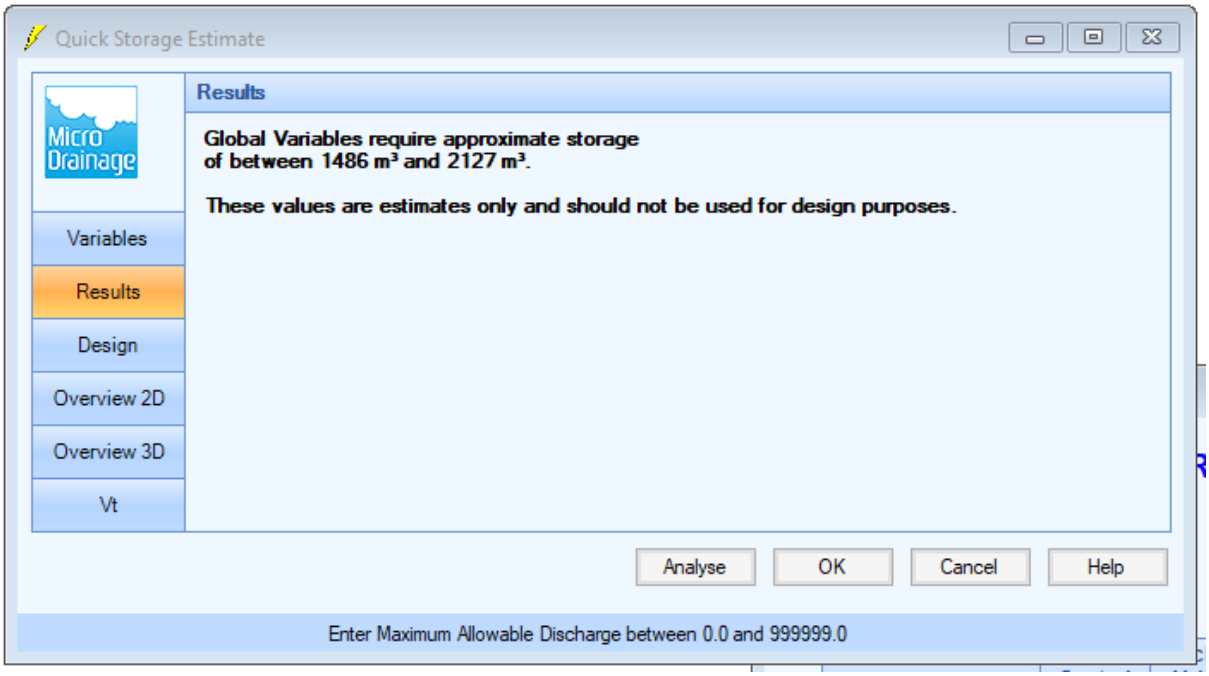
Plot 03 + Community Use



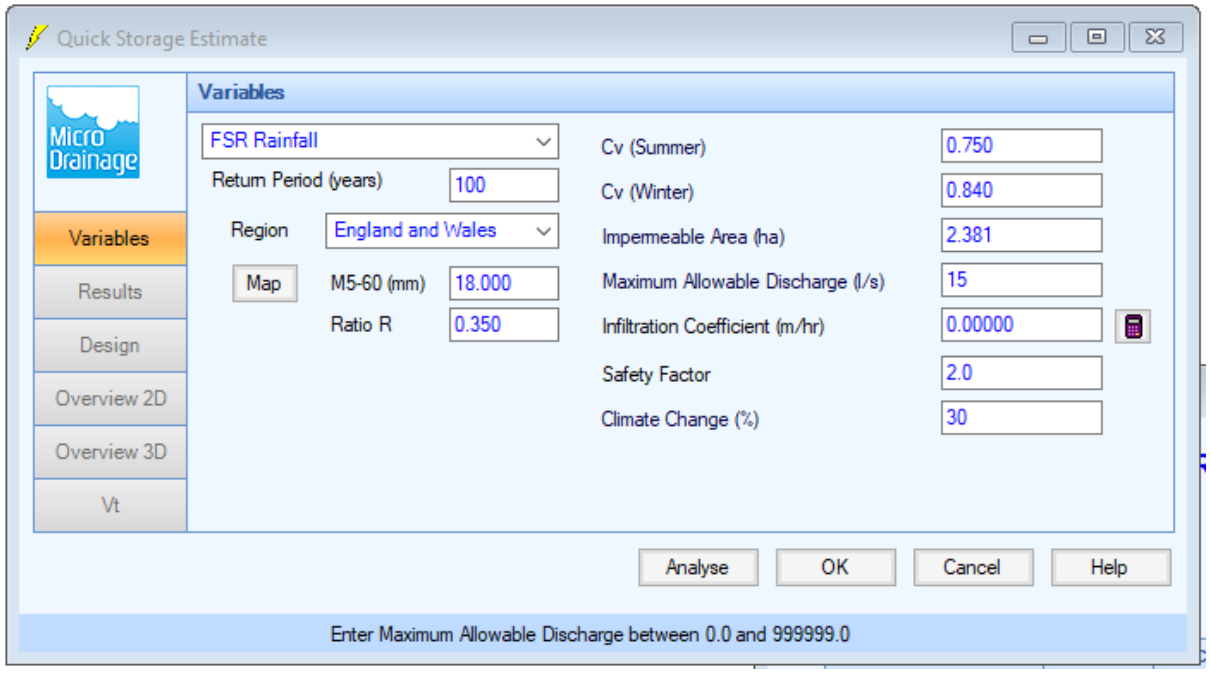


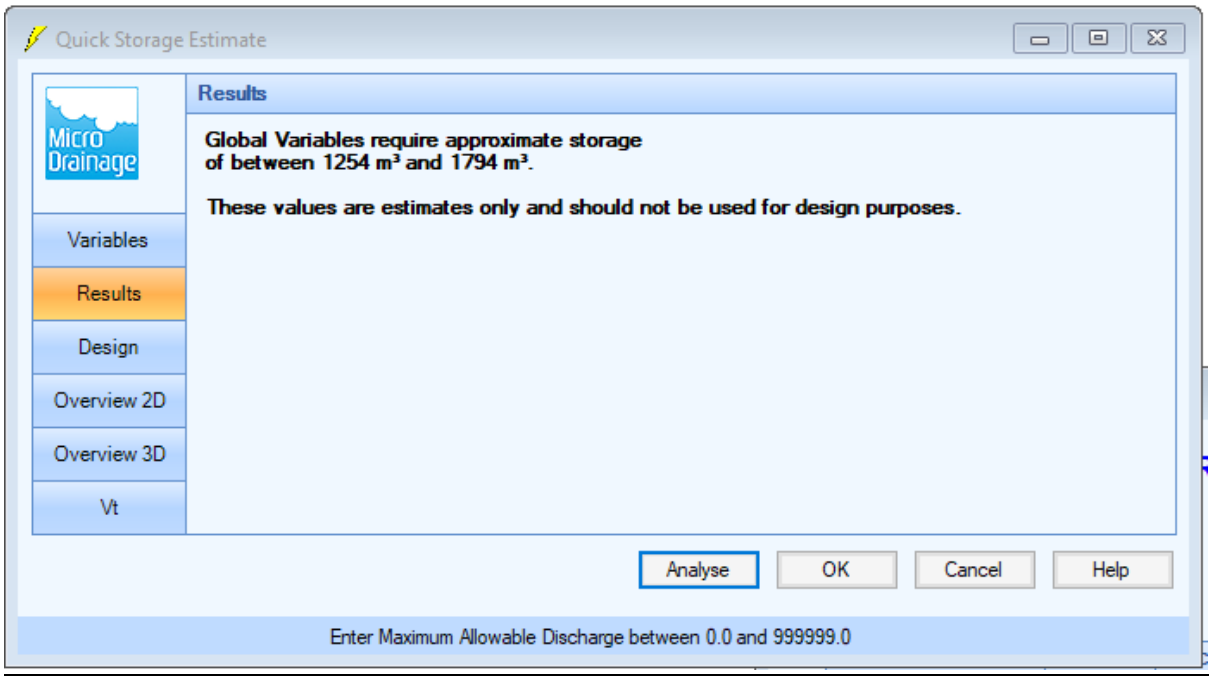
Plot 04


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map
M5-60 (mm) 18.000
Ratio R 0.350
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 2.823
Maximum Allowable Discharge (l/s) 17.8
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

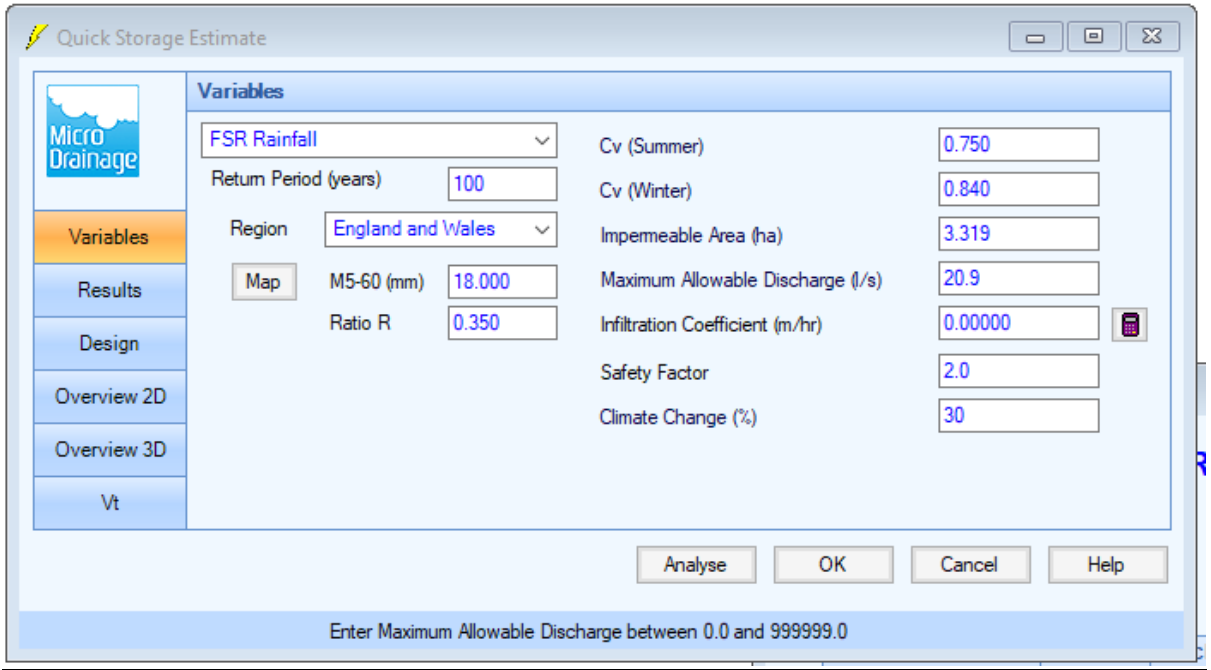

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage
of between 1486 m³ and 2127 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Maximum Allowable Discharge between 0.0 and 999999.0

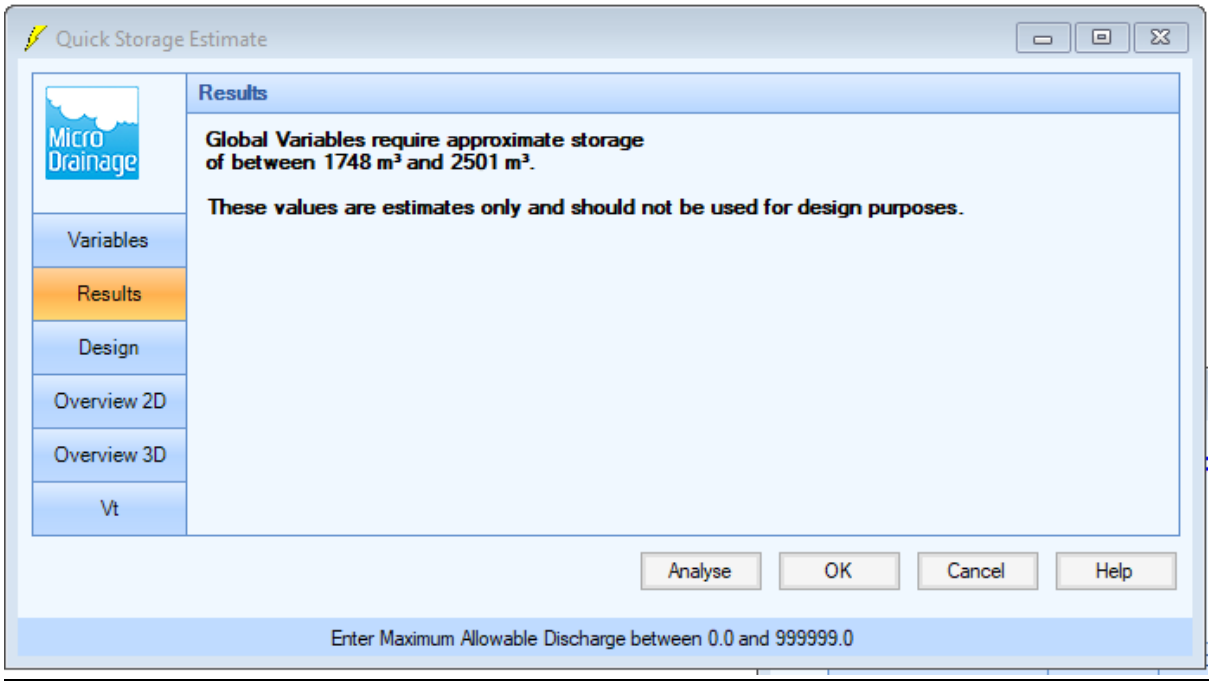
Plot 05


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map
M5-60 (mm) 18.000
Ratio R 0.350
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 2.381
Maximum Allowable Discharge (l/s) 15
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

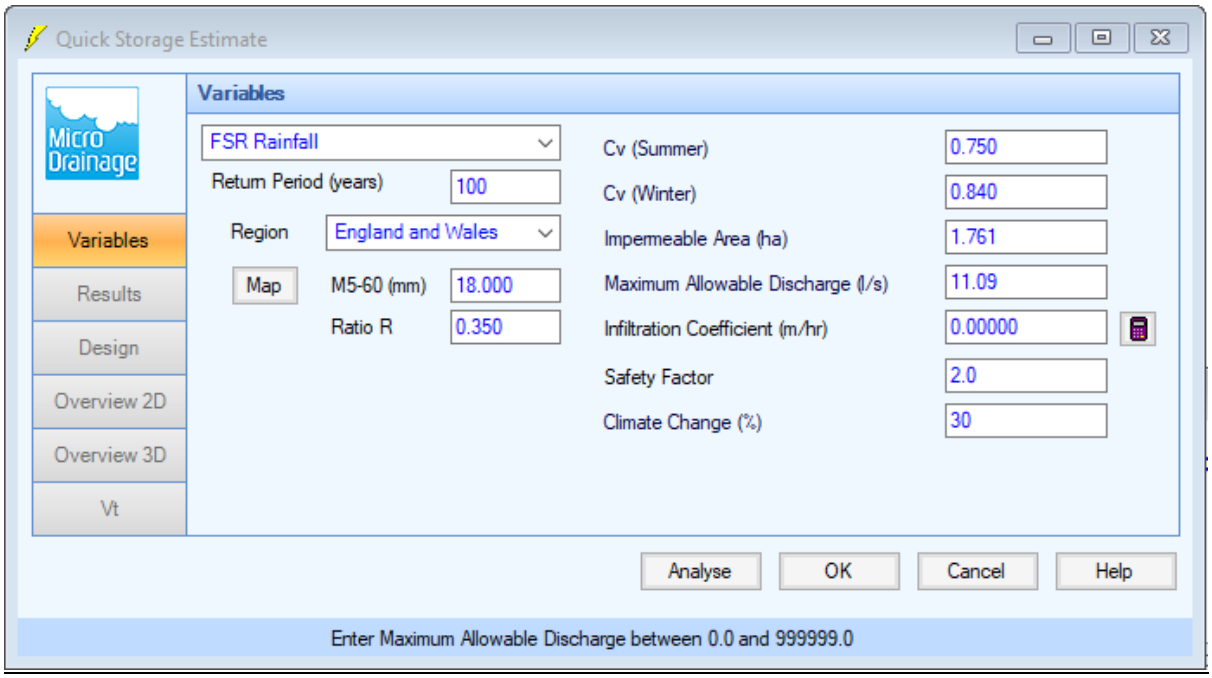

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage
of between 1254 m³ and 1794 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Maximum Allowable Discharge between 0.0 and 999999.0

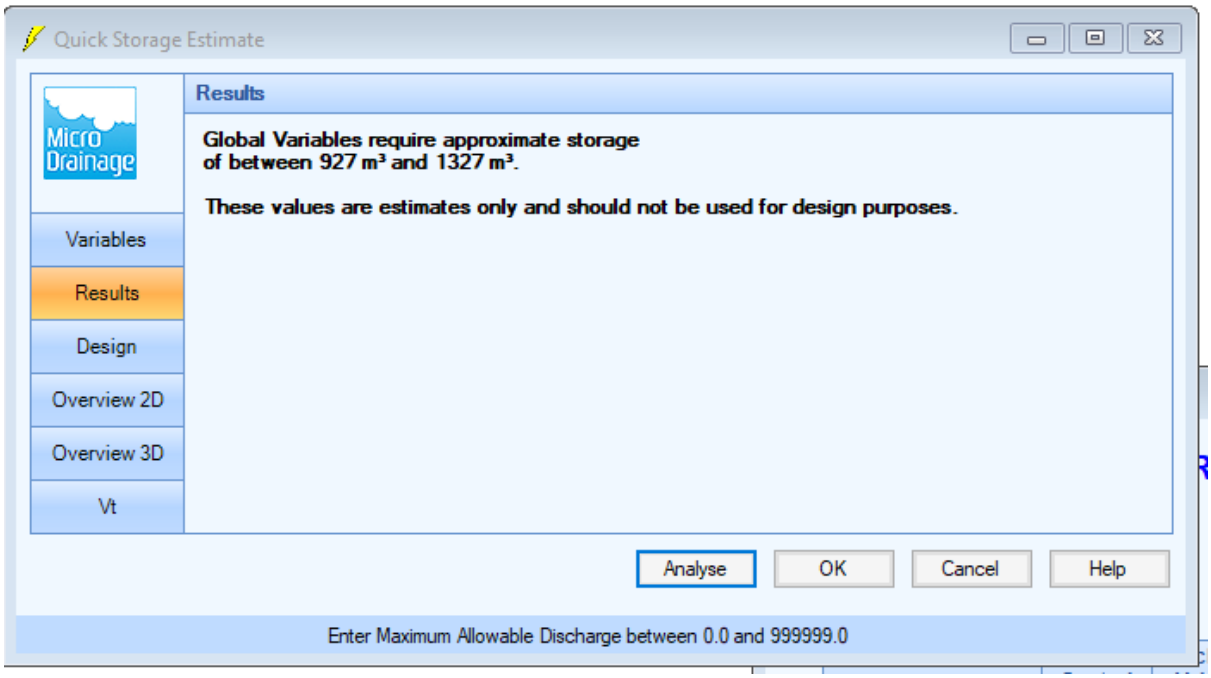
Plot 06 + Primary School



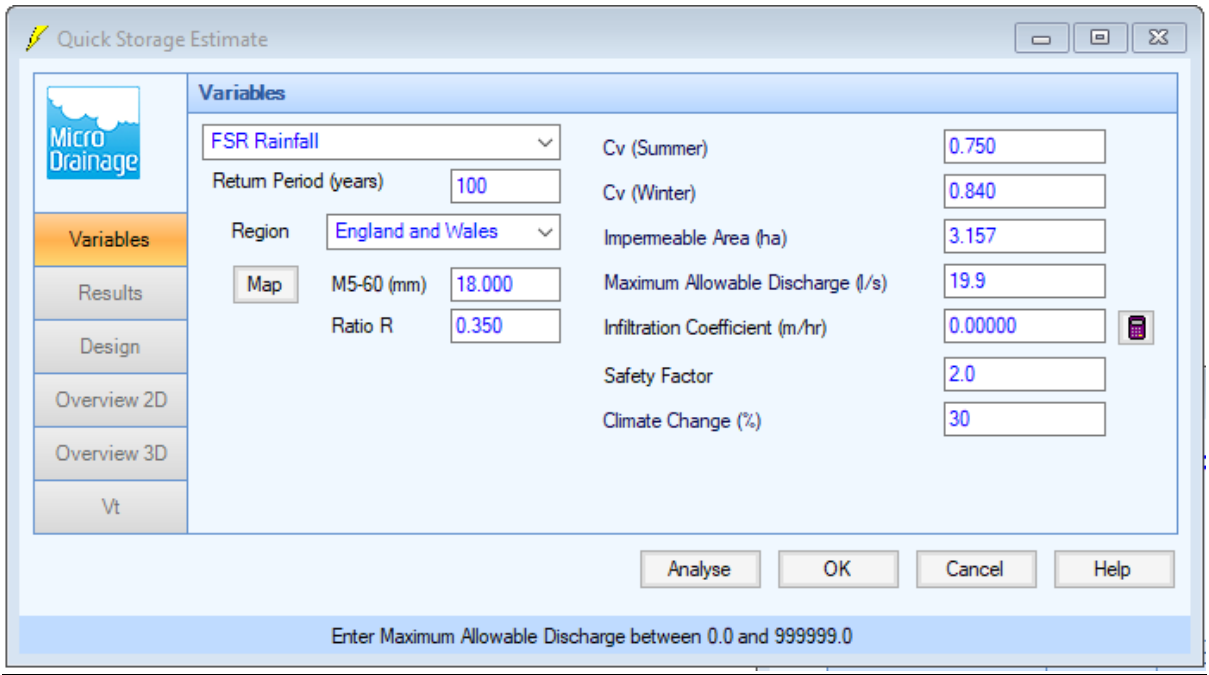


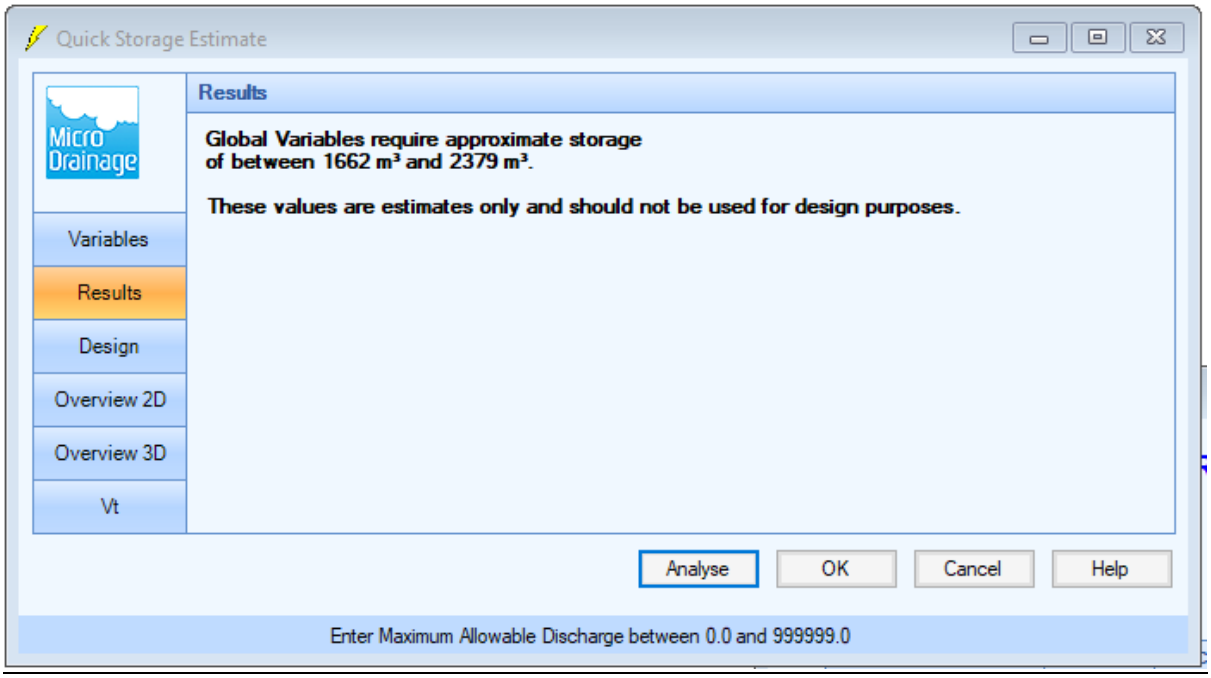
Plot 07 + Mixed Use



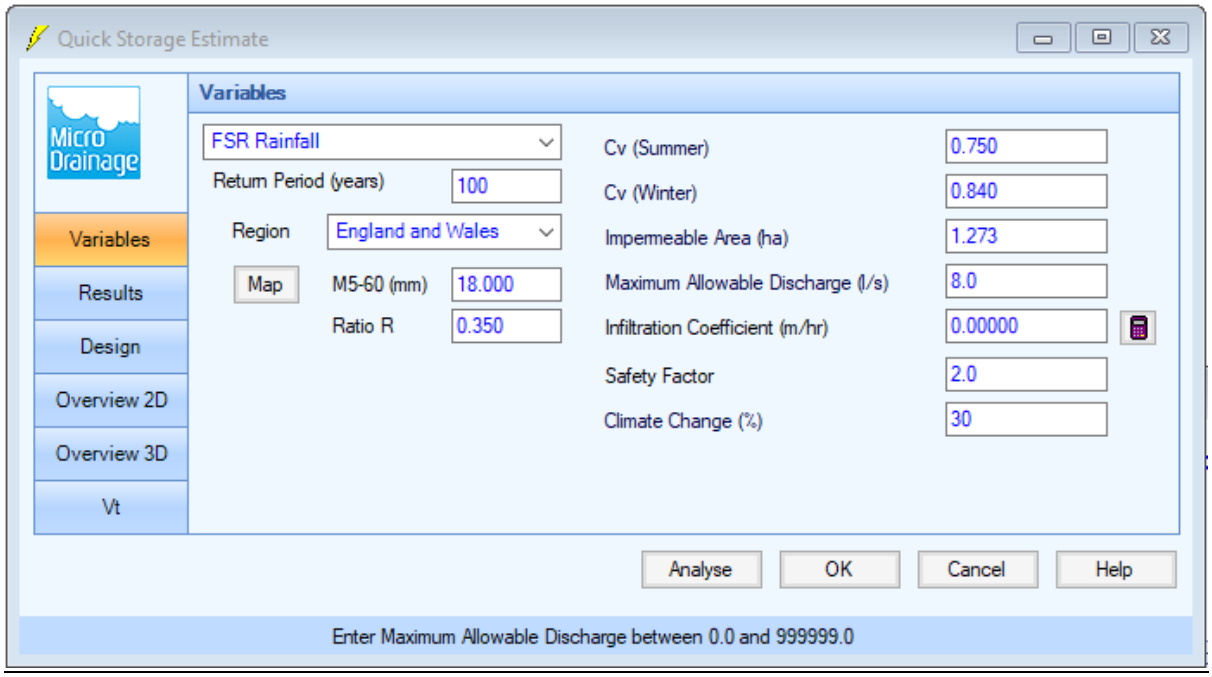


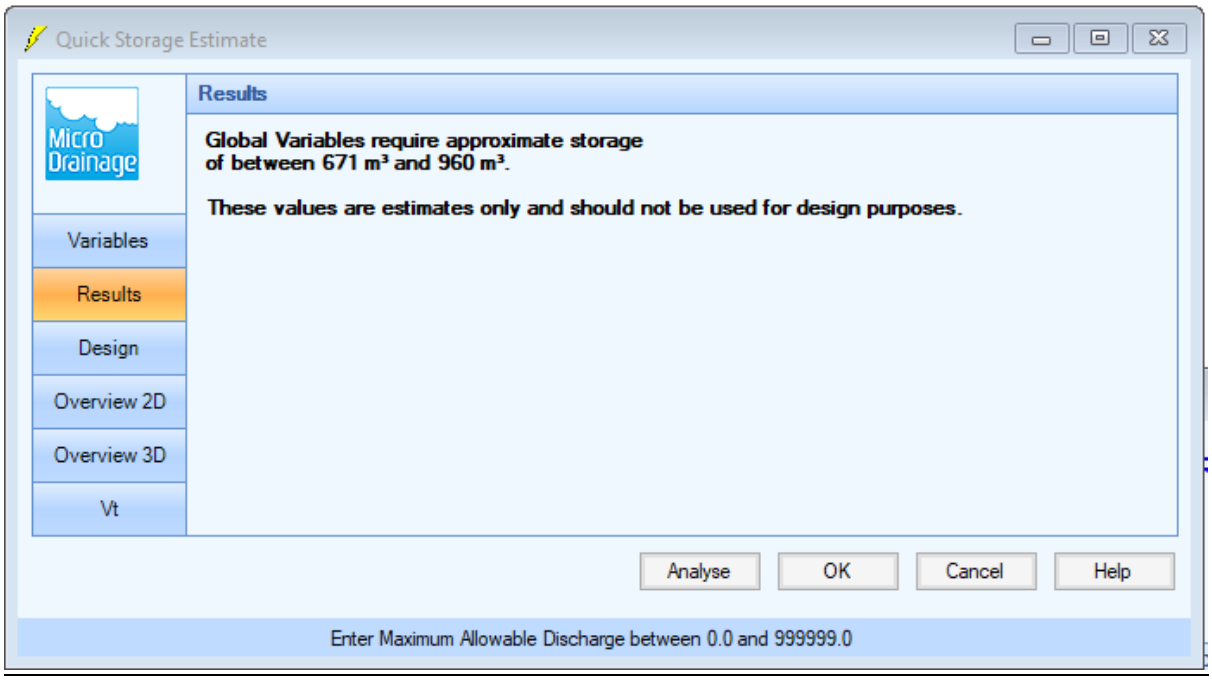
Plot 08 + Mixed Use



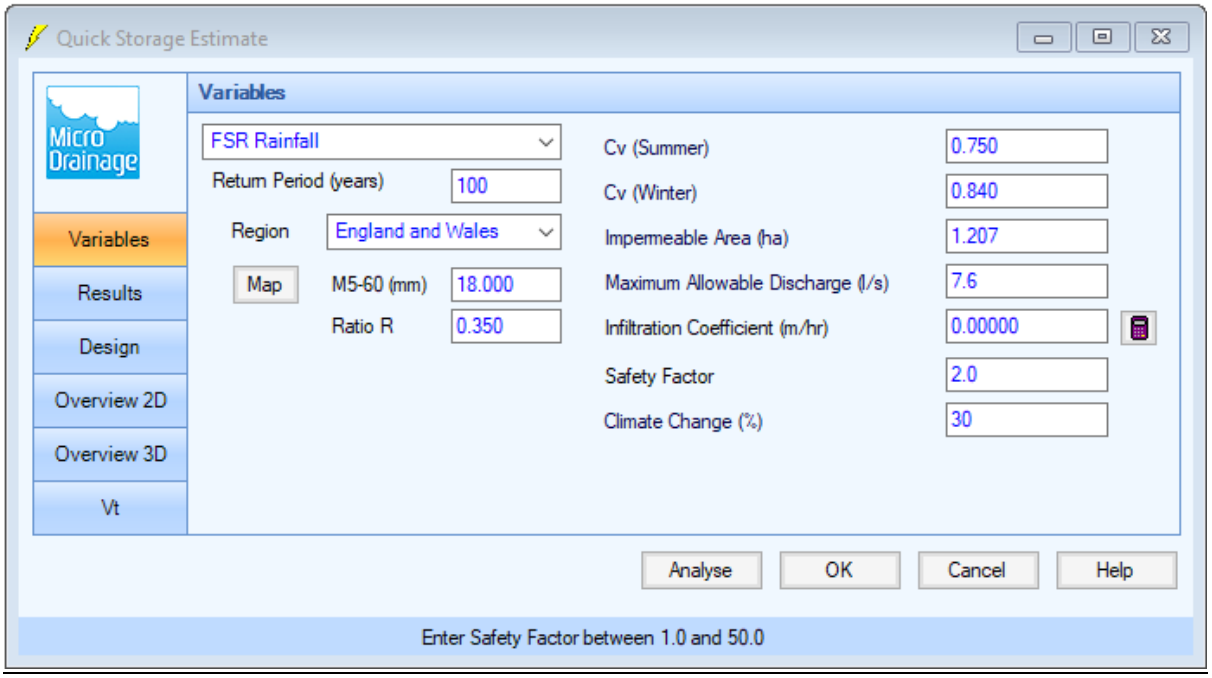


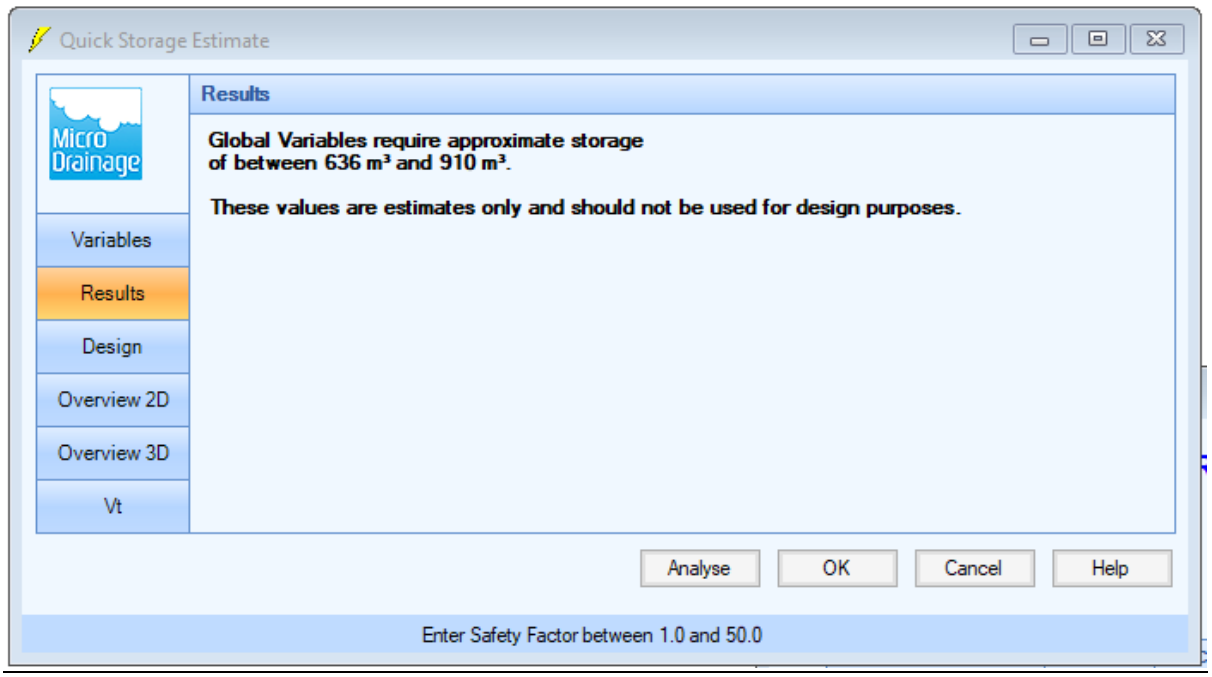
Plot 09


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map
M5-60 (mm) 18.000
Ratio R 0.350
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 1.273
Maximum Allowable Discharge (l/s) 8.0
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

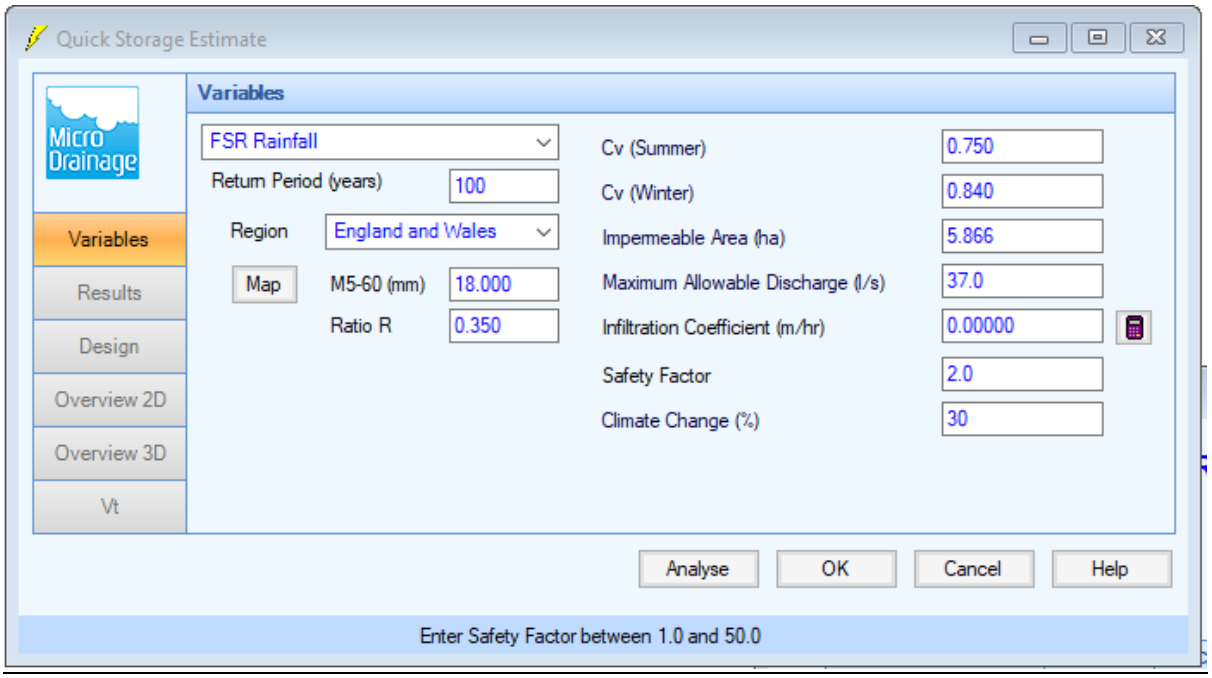

Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage of between 671 m³ and 960 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Maximum Allowable Discharge between 0.0 and 999999.0

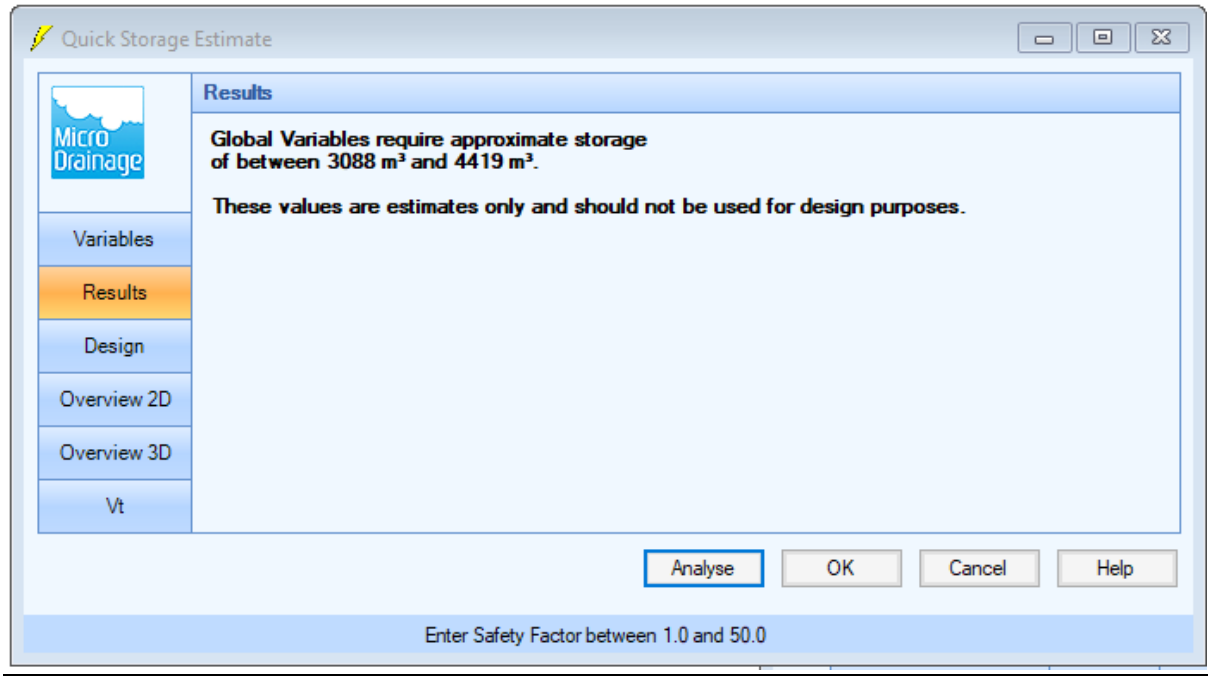
Plot 10


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map
M5-60 (mm) 18.000
Ratio R 0.350
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 1.207
Maximum Allowable Discharge (l/s) 7.6
Infiltration Coefficient (m/hr) 0.00000
Safety Factor 2.0
Climate Change (%) 30
Analyse
OK
Cancel
Help
Enter Safety Factor between 1.0 and 50.0


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage
of between 636 m³ and 910 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Safety Factor between 1.0 and 50.0

Commercial Plot 01





Commercial Plot 02