

Overview

FloodFlow is an advanced 2D analysis engine for calculating flow paths across a digital terrain model. Its advanced approach was recognised in the Pitt Review and it has been successfully used for Defra's Surface Water Management Plans.

FloodFlow requires the System 1, Simulation and APT modules to function.

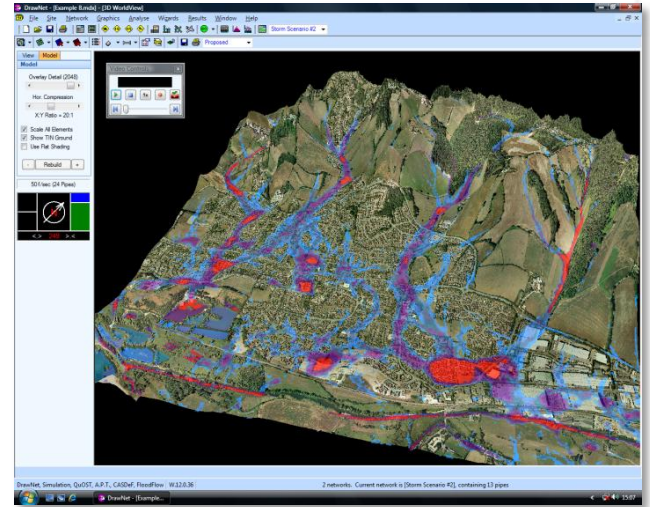
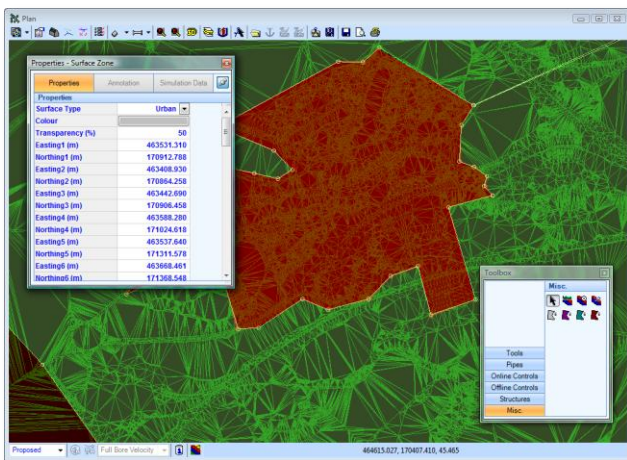
FloodFlow increases the functionality for both design and analysis of a system:

- ⊙ Within DrawNet with APT, FloodFlow becomes a powerful design tool, enabling detailed analysis of a sites ground profile at an early stage. This allows flood mitigation measures to be implemented within the outline design, rather than costly remediation measures at a later stage
- ⊙ Within Simulation with APT, FloodFlow brings superior capability to suit the emphasis of risk assessment within approval and regulatory systems. Flooding at nodes is only the first stage of any simulation. It is where the water goes (both on and off a site) that can determine the viability of proposed developments. FloodFlow has been designed to meet these requirements

Description Method

The program works by splitting the terrain into a uniform (user definable) grid.

- ⊙ Zones can be defined within DrawNet for different surface types and areas of the site can be excluded



- ⊙ Two calculation methods are available, Explicit or Alternate Direction Implicit (ADI)
- ⊙ Multiple analysis timesteps and surface types are supported
- ⊙ Flow and depth hydrographs can be defined on the terrain

DrawNet APT – Geometric TIN Analysis

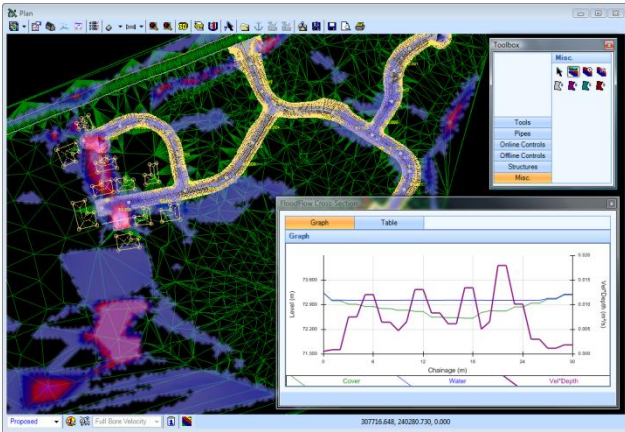
- ⊙ Lines of steepest gradient are displayed on each grid
- ⊙ Flat areas are identified along with ridge lines and sink points. This analysis helps to locate optimum gully, swale and pond locations based on the TIN

DrawNet APT - Fixed Depth

- ⊙ A fixed depth of rainfall is applied to the entire terrain and then allowed to flow for a user definable time
- ⊙ The program shows maximum depths and velocities reached. This allows the user to identify the natural catchments, channels and areas of existing ponding on the site, saving time and money by considering them during design phase

Simulation APT - Static

- ⊙ Only available after a Simulation run, flood volume leaving a manhole is routed across the terrain to identify the overland flow paths
- ⊙ Analysis is volume aware. Water must fill surface depressions before flowing on
- ⊙ FloodFlow volume cannot re-enter the drainage network when analysing in this mode



Simulation APT – Dynamic

- FloodFlow and Simulation analysis are completed together
- Flood Volume can leave the 1D model at a manhole position or across the sides of an open channel
- Volume is maintained. Water that floods onto the 2D model 'overland' is removed from the 1D model 'below ground'
- Water can flow back into the 1D model via manholes or open sections
- If an open section or manhole is fully surcharged water will flow across the top

Simulation APT – Apply Rainfall

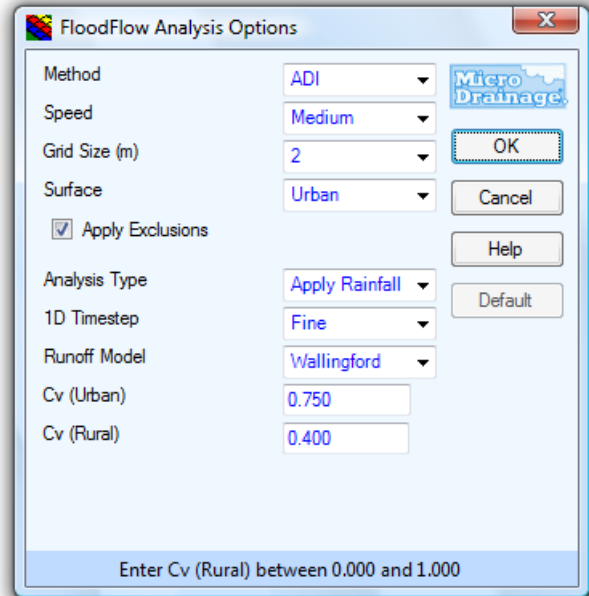
- Water is allowed to find its own way into the 1D system via 2D overland flow
- This approach allows the modelling of rural catchments that may runoff onto urban areas or can be used to model extreme rainfall
- Apply rainfall uses the same approach as 'Dynamic', but, rather than using the specified impermeable areas at each node, the rainfall is applied directly to the terrain

Results

Graphical results are available on both the Plan and 3D WorldView.

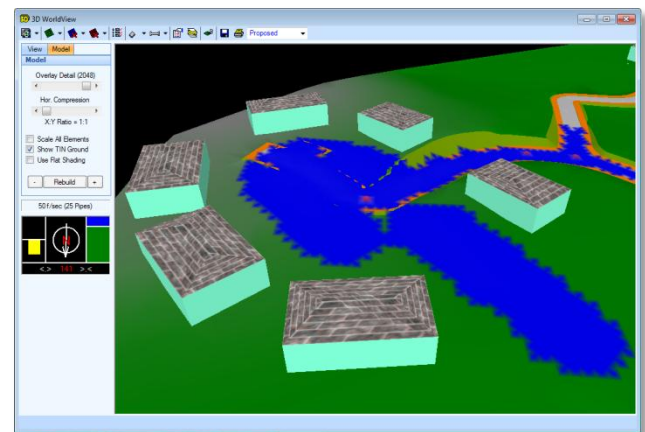
- Depths and Velocities for each grid cell are displayed at critical levels and can be animated throughout the storm
- All FloodFlow colours, depth and velocity-depth ranges are user definable
- Produce a contour map with user defined depth bands
- Display Hazard Rating based on Defra's *Flood Risk to People* Methodology
- FloodFlow gauges on Plan display the maximum water depth and depth-velocity against time

- Generate cross-sections to show ground level, water depth and velocity in graphical and tabular format
- Depths and velocities can be output to SMS or ESRI ASC grid format
- With DrawNet export results to .dxf and .dwg



Additional Features in WinDes W.12.6

Save the **Hazard Rating** into an .asc format. This enables the export of the FloodFlow Hazard Ratings into an ESRI ASC file.

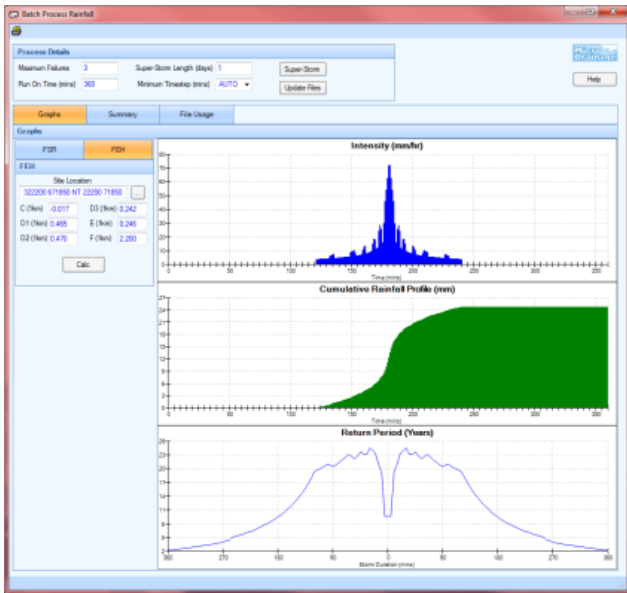


Batch Process Rainfall enables the user to automatically set a batch of rainfall files.

Compress Rainfall/Hydrographs allows the user to load in large sets of data and break them up into individual files in order to remove any values below a set threshold e.g. X mm of rainfall or X l/s of flow.

Additional Features in WinDes W.12.6 (cont'd)

Super-Storm creates a single all encompassing 'Super-Storm' from a set of rainfall files so that the key criteria of both Peak Intensity and Total Volume are preserved.



It is possible to view the resulting storm to see which aspects were taken from each file and compare this with either Flood Studies Report (FSR) or Flood Estimation Handbook (FEH) rainfall data to view the equivalent Return Period.

WinDes can now support larger pipe numbers, from 1.000 to 9999.999 in a single network.

WinDes will now detect if a file is already in use, to prevent file locking issues and avoid any errors when saving.

Support Material

WinDes is supplied with a hard-copy manual which includes worked examples. All the modules benefit from extensive online help including 'How Do I' tutorials for frequently asked questions.

All Micro Drainage software is backed up by a comprehensive support and maintenance program.

With other modules

FloodFlow cannot be used by itself, it requires APT and adds functionality to DrawNet and Simulation .

Training

Training Course C covers Graphical & Advanced Design.

Training Course G covers Greenfield Runoff, Unit Hydrographs and Flood Risk Management Tools.

Training Course H covers Checking and Auditing WinDes Submissions.

Contact Details

For further information about WinDes, training and workshops, visit www.microdrainage.co.uk, email info@microdrainage.co.uk or call +44 (0)1635 582555.

If you have been struggling to keep abreast of the latest guidance, rules and regulations visit the Micro Drainage Blog at <http://pipedup.wordpress.com>



WinDes W.12.6, keeping you up to date and industry compliant.