

Overview

APT (Advanced Productivity Tools) provides powerful additional capabilities across the WinDes suite, saving substantial time and money in the design and testing of a drainage network:

- ⊖ Additional network type and editing options
- ⊖ Check a design against multiple storms, return periods, varying climate change and test sensitivity to failure with Wizards
- ⊖ Complete a full Design Audit
- ⊖ Enhanced GIS resources

Description

Network Details

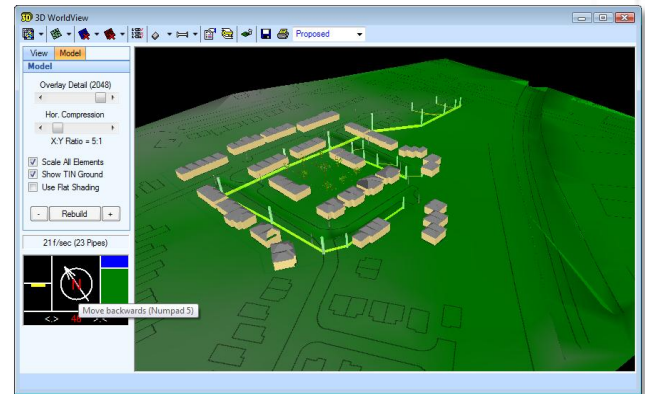
- ⊖ The Design Flow feature allows the downstream pipes to be sized based on flow control discharge, rather than the total upstream flow
- ⊖ Model Existing Networks enabling all invert levels, falls, diameters etc to be directly specified



- ⊖ Network Details Editor in Simulation with APT allows the user to lock a designed network and freely edit, to define rising mains, negative backdrops or throttle pipes
- ⊖ Import river models from Channel
- ⊖ Select FSR values from a map of the UK and Ireland to automatically populate M5-60, Ratio R, soil and others

Wizards

APT adds a range of Wizards to Simulation which fully analyse, audit and print a network.



Seasonal Return Period/Rainfall Wizard

- ⊖ Sites can be checked for seasonal rainfall profiles, for 15 minutes to 7 day storm durations and for multiple return periods (+ climate change). Finding the critical storm for the network is extremely time consuming when often over 100 events have been analysed, especially if attenuation is incorporated.
- ⊖ APT takes the laborious and time consuming data collection and analysis out of the equation. It can analyse all the storms in a single run and identify the critical storm at each node and for each return period based on user definable criteria, such as flow rate or water depth.

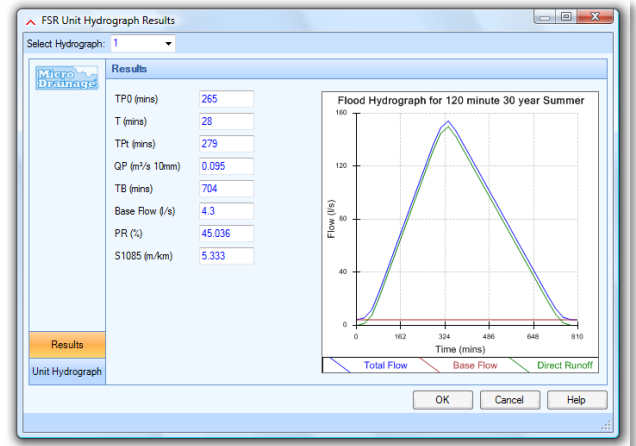
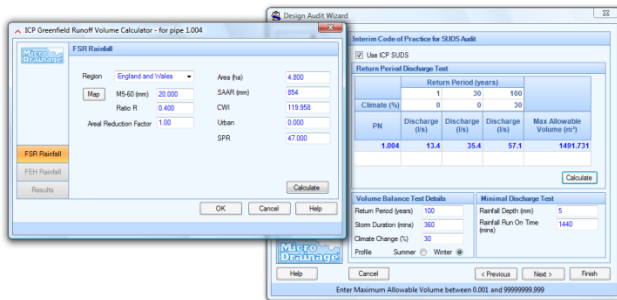
Pipe Number	USM# Name	Event	USCL (mm)	Water Level (m)	Surcharged Depth (m)	Flooded Volume (m³)	Flow Cap.	Overflow (l/s)	Pipe Flow (l/s)	Status
1.000.1		30 minute 20 year Summer 0%	103,000	101.736	-0.064	0.000	0.88		88.2	OK
1.001.2		30 minute 20 year Summer 0%	99,000	97.664	1.281	0.000	2.78		263.7	SURCHARGED
2.000.3		30 minute 20 year Summer 0%	102,000	100.727	-0.073	0.000	0.17		3.5	OK
3.000.4		30 minute 20 year Summer 0%	101,500	100.260	-0.050	0.000	0.59		7.0	OK
2.001.5		30 minute 20 year Summer 0%	99,500	98.255	-0.045	0.000	0.59		16.6	OK
1.002.6		60 minute 20 year Winter 0%	98				1.48		213.2	SURCHARGED
1.003.7		60 minute 20 year Winter 0%	98				0.88		200.8	SURCHARGED
1.004.8		60 minute 20 year Winter 0%	98				0.87		153.9	SURCHARGED

Climate Change/Sensitivity Wizard

- ⊖ As regulations and specifications move towards a risk based approach, testing the robustness of a network becomes increasingly important. The Climate Change/Sensitivity Wizard enables a return period and the required storm durations to be tested for up to 30 variations (both + and -) of climate change/sensitivity.
- ⊖ Results can be sorted by critical storm per sensitivity percentage for a range of criteria

Design Audit

- ⊙ The Design Audit Wizard assesses the network against 14 individual tests for good engineering practice and produces a full audit trail. Checks include manhole headlosses, minimum pipe diameters, crossings/clashes as well as runoff rates and volume balance, as required by the Code for Sustainable Homes.



With Other Modules

APT cannot be used by itself, it extends across other WinDes modules, predominantly Simulation but also System1, DrawNet and Source Control.

It is a required addition to DrawNet or Simulation before FloodFlow can be used, and is also a required addition to Source Control or Simulation for CASDeF.

Additional Features in WinDes W.12.6

To assist engineers and hydrologists a huge increase in functionality has been provided within the APT module. Here is a brief summary;

Real Time Controls (RTC) are now available. A RTC allows the flow of water to be controlled for the duration of the storm. It is a dynamic control and during the storm it will vary the amount that it is open, depending upon the water levels in the specified governing manhole.

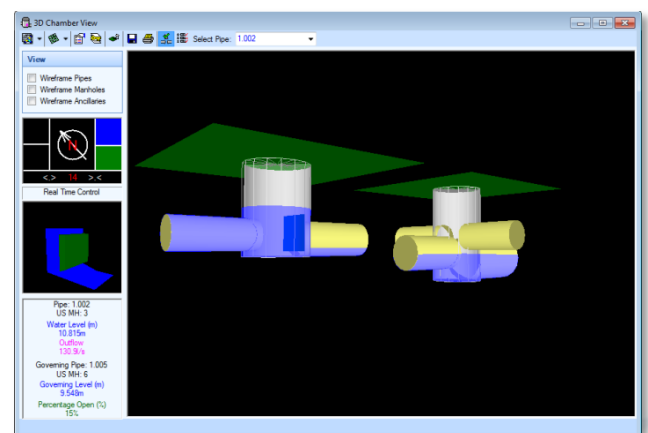
GIS

APT allows pipe design to move from 2D to 3D across all Network modules.

- ⊙ Define terrain information to include spot z levels and breaklines to produce a full triangulated surface model
- ⊙ The TIN Optimiser can optimise a terrain surface to a maximum number of points or a maximum vertical error, providing vast time savings when viewing and analysing the terrain
- ⊙ Digital Terrain Models (DTM) can be imported from a range of file formats including: .xml, .pwf, .csv, .txt and .asc, or with DrawNet as a layer within a .dwg or .dxf format. With a DTM in place the software will automatically assign cover levels at manhole positions.
- ⊙ Define water table, rock strata and landscape features such as trees, houses and other buildings which can be viewed in Plan and 3D Worldview
- ⊙ Maps, CAD and photographic images can be positioned as background overlays in both Plan and 3D Worldview

Unit Hydrographs

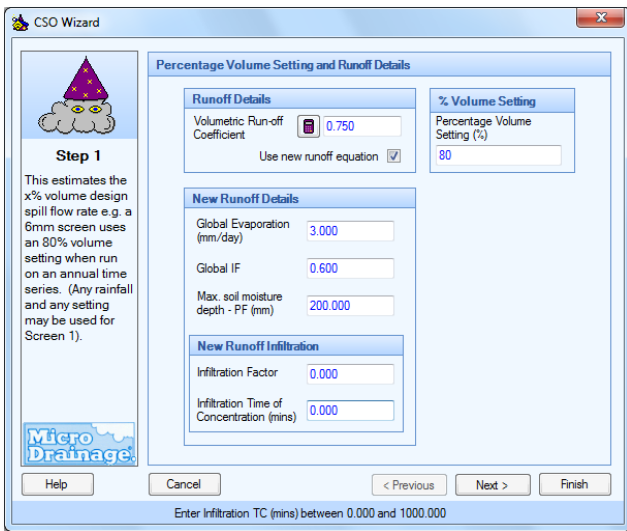
- ⊙ Define FSR, FEH and ReFH Unit Hydrographs in Simulation and Source Control. This allows combined urban and rural catchments, including water courses, to be analysed.



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

A CSO Wizard has been incorporated that includes water quality and CSO efficiencies;

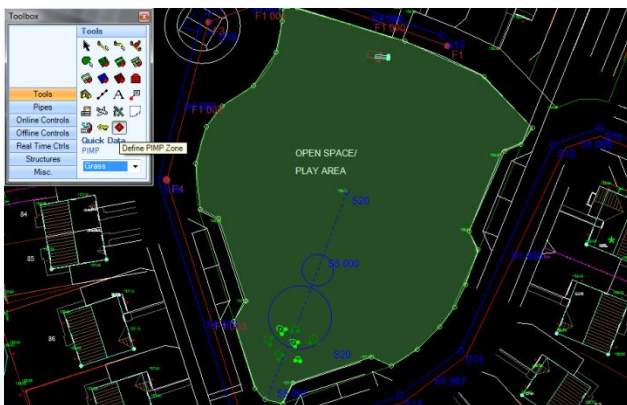
- ⊕ Saul-Gupta pollution analysis, also available on hydrograph tables
- ⊕ Water quality & flow splits
- ⊕ Event Mean Spill (EMS) concentrations
- ⊕ CSO efficiency matrix to analyse screen efficiencies
- ⊕ CSO design graphic
- ⊕ CSO summations



Diurnal Flows and Formula A including population and industrial flow per pipe.

Roughness or Manning's n values at 1/3 & 2/3 pipe depth can be specified, to produce an average value per pipe when analysed in Simulation.

The PIMP/Cv value can be set up globally and adjusted locally on a pipe by pipe basis.

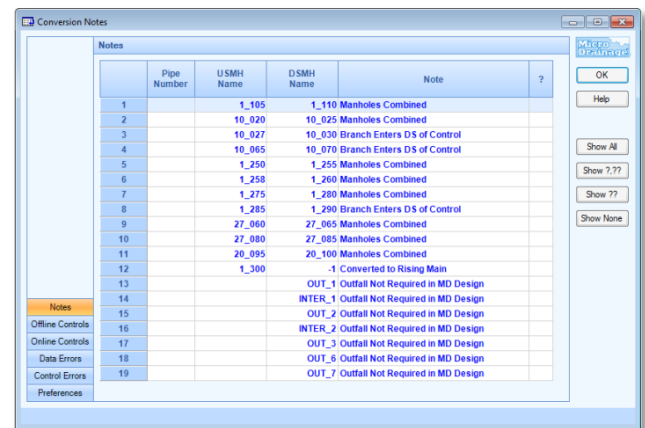


When rainfall profiles are specified a soil index per pipe can be applied and used in the calculation of Cv for each pipe.

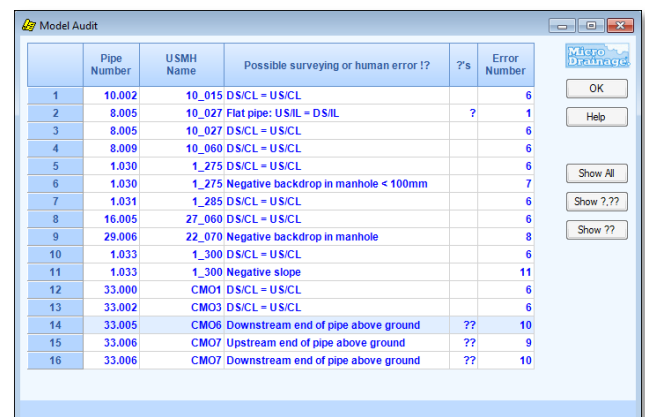
Pipe Labels provide an annotated link to enable unique pipe descriptors to be used.

Model Calibration is a tool to compare 'Observed' with 'Predicted' flows and depths for an existing drainage system to calibrate a simulated drainage model.

To facilitate the importing of existing drainage system data the .DSD file format is now supported. This includes the ability to 'Model Audit' and provides 'Conversion Notes'.



Model Audit shows the possible surveying or human errors (from data entry) found in the network and will report on 14 potential sources of error.



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.

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.