

*Info*Works™ SD

Simulation Engine

InfoWorks SD - Simulation Engine

"Fully dynamic, hydraulic modeling for stormwater professionals"

The InfoWorks SD simulation engine is world renowned for its speed, and for the unparalleled control it gives the user throughout the simulation process. We detail below the reasons why it is the industry-leading solution.

Benchmarks show it's the fastest

Benchmark speed testing against other simulation engines shows InfoWorks to be significantly faster than any other stormwater engine. The performance level is due to the unique way in which the simulation proceeds:

- Integration of Hydrological and Hydraulic simulation (i.e. one process).
- Automatic selection of the optimum simulation time-step, based on convergence tolerances for flow and depth at previous time-step (i.e. always uses the optimum time step).
- Automatic switching to a much larger simulation time-step for 'Dry Weather' conditions, giving very fast processing of these conditions without loss of accuracy.
- Option to switch between 'pressurized flow' and 'full solution' algorithms for manifolded pipes, rising mains, and any other pipes that are known to always be in a fully surcharged condition. This has the effect of dramatically increasing the simulation speed for the model as a whole.

Accurate "real world" modeling

Real world conditions are modeled right from the start of the simulation process. The initial conditions, both on the ground and in the pipes, are automatically re-set at the start of each simulation. The simulation then proceeds, maintaining the stability of the flows, depths and velocities throughout the system at each time step. This process is achieved by:

- Proper, initialisation of all hydraulic parameters before the start of the actual simulation (i.e. stable initial Flows, Depths and Velocities).
- Mathematical solution using the Priessmann 4-point scheme to approximate the Saint Venant equations.
- The stability of the calculations, particularly in the transition between pressurized and free surface flow, is ensured using the non-linear Newton-Raphson iteration and adaptive time-stepping algorithm.

Proven in thousands of projects

The engine has proved itself on thousands of network analysis projects world wide since its original development and is being continuously improved as new releases of InfoWorks SD are made. An increasing number of users are realising the productivity benefits of InfoWorks SD compared to 'standard' modeling engines.

In Summary

- InfoWorks SD engine comes from a long pedigree of development and improvement and is the leading edge simulation engine for stormwater modeling.
- The engine is a unique bespoke application for stormwater modeling, and does not suffer the inherent restrictions of modeling based on 'shareware'.
- Benchmark testing has shown the InfoWorks SD engine to be up to twice as fast as its closest competitor.
- Real world behaviour is modeled throughout the package rather than relying on simplified representations of hydraulic behaviour defined in terms of a head/discharge relationship.
- The modeler has far greater control of the Simulation's progress in terms of simulation tolerance, diagnostic feedback and general 'health' of the simulation.
- The engine is continuously being improved and developed in line with the InfoWorks SD release programme.

1982 Mainframe WASSP The first drainage modeling software which exclusively ran on an ICL mainframe

1984 MicroWASSP The next generation of drainage software which ran on an 8086 Sirius PC and had a limit of 300 manholes, and ran only small dendritic systems

1989 WALLRUS The next generation of drainage software which ran on an 80286 IBM XT and had a limit of 2,000 manholes. Included advanced ancillary structures and 'backwater effects'. (UNIX & DOS)

1992 SPIDA The first 'full solution' model for complex systems containing loops and accurately simulate large pipes at flat gradients. (DOS)

1993 MOSQUITO The first water quality model for dendritic systems

1994 HydroWorks PM The release of a single model that could analyse both steep and flat sewers or open channels. Also a much faster more stable 'full solution' numerical processor, which had a limit of 5,000 manholes (Windows)

1998 InfoWorks CS v1.0 Consists of a single environment that integrates hydraulic modeling with comprehensive data management and links to GIS systems, which included a new limit of 20,000 manholes. (Windows, NT)

2001 InfoWorks CS v4.0 Simulation limit increased to 50,000 manholes

2003 InfoWorks CS v5.5 Simulation limit increased to 100,000 manholes

2007 Launch of InfoWorks SD dedicated to stormwater modeling using the InfoWorks CS engine.
