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CIVILSTORM®

COMPREHENSIVE STORMWATER MODELING AND ANALYSIS

CivilStorm is a fully-dynamic, multi-platform, hydraulic modeling solution developed for the analysis of complex stormwater systems. Engineers can analyze these systems using built-in hydraulic and hydrology tools and a variety of wet-weather calibration methods. From stormwater master plan development, to water quality studies, CivilStorm provides an easy-to-use environment for engineers to analyze, design, and operate stormwater systems.

One Solution for all Stormwater System Modeling Needs

CivilStorm performs comprehensive analysis of all aspects of your system: rainfall, runoff, inlet capture and bypass, gravity and pressure piping, ponds, outlet structures, open channels, culverts and more.

Engineers can analyze pressure and free surface flow conditions for networks of channels and closed conduits; model complex pond outlets for a variety of tailwater conditions; and use weirs, orifices, culverts, risers, and inlet boxes in their design, all within a single product.

Two Dynamic Engines

CivilStorm includes two dynamic engines that account for storage effects within structures and quantify overflows should they occur. The flexibility of choosing between the EPA-SWMM engine as well as an extremely stable implicit engine to solve the complete set of wave components behind the Saint Venant equations, gives added comfort to those modelers that are accustomed to modeling with SWMM and familiar with its capabilities and limitations. On the other hand, the implicit engine can deliver numerically stable results for any model size, without users having to trick the model with unrealistic physical properties and calculation intervals.

Engineers can also use the SWMM water quality features to comply with NPDES water quality regulations.

Three engineering platforms. One product. One model file.

Out of the box, CivilStorm users can work within stand-alone and MicroStation® platforms, with available AutoCAD integration to model within their favorite CAD environment. Regardless of the platform used, CivilStorm maintains a single set of modeling files for true interoperability across platforms support for multiple background

layers, conversion utilities from CAD, GIS, and databases, and unlimited undo and redo.

The MicroStation interface, included at no additional cost with all CivilStorm versions, provides a geospatial and engineering design environment with unrivaled visualization and publishing tools. AutoCAD users can also add AutoCAD integration features to build and lay out models with engineering precision within an environment they are already comfortable with.

Streamlined Model-building

Engineers can leverage geospatial data, CAD drawings, databases, and spreadsheets to jumpstart the model building process. CivilStorm provides synchronized database connections, geospatial links, and advanced model-building modules that connect with virtually any digital data format. In addition, modelers can import SWMM files as well as StormCAD® files into CivilStorm.

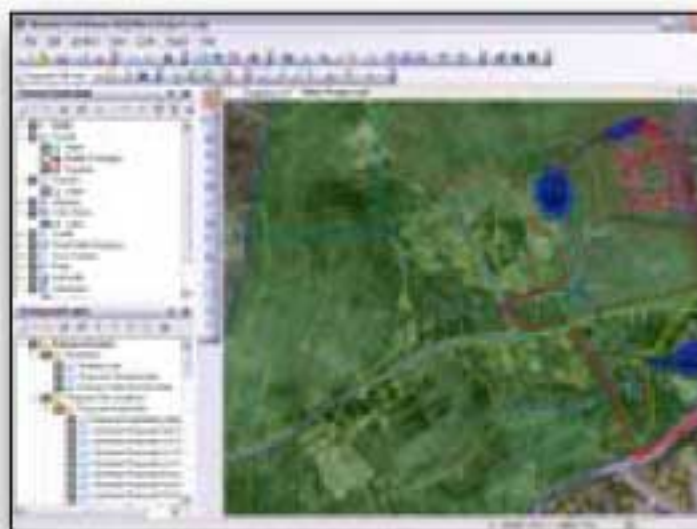
CivilStorm also provides drawing and connectivity review tools to guarantee a hydraulically coherent model.

Comprehensive Scenario Management

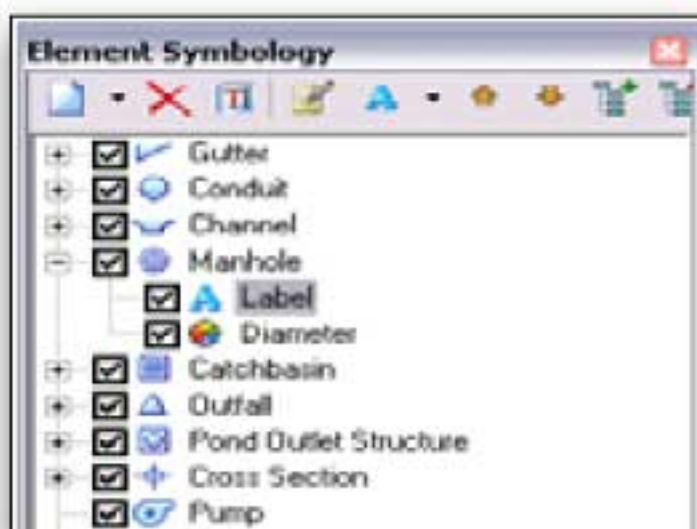
The Scenario Management Center in CivilStorm gives engineers full control to configure, run, evaluate, visualize, and compare an unlimited number of scenarios within a single file. Engineers can easily make decisions by comparing alternative designs or proposed rehabilitation methods for a variety of system conditions (including pre- and post- development).

Built-in stormwater hydrology

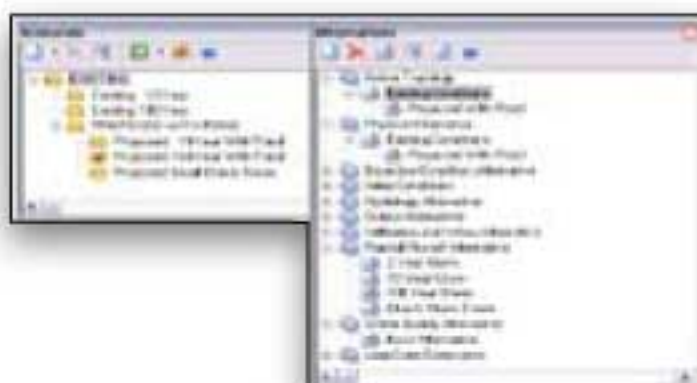
Engineers can load models with wet weather runoff flows derived from precipitation using the CivilStorm built-in rainfall distributions, or user defined rainfall events. Runoff flows are modeled using a choice of hydrograph methods, including RTK, SCS, Modified Rational, EPA-SWMM, or user-defined generic unit hydrographs.



Map and model your systems in a scaled environment whether you work in the stand-alone, MicroStation, or AutoCAD interface



CivilStorm models every aspect of your stormwater conveyance system



Organize an unlimited number of physical, design, hydrology, network topology, and operational scenarios with a single CivilStorm file.

CIVILSTORM SYSTEM REQUIREMENTS

Processor:

Pentium III at 1 GHz
(Recommended: Pentium 4 at 1.2 GHz)

Operating System:

Windows Vista, Windows XP,
and Windows Server 2003

Memory:

256 Mb
(1 GB recommended for large networks)

Hard Disk:

500 MB of free storage space, with
additional room for data files

Display:

1024 x 768 resolution, 256 colors

Platform pre-requirements:

CivilStorm runs without platform restrictions using the standalone interface. If integration with CAD platforms is desired, these are the requirements:

- MicroStation V8i
- AutoCAD 2009

Support for older platform software versions is available if required. Contact your Bentley representative for details.

ABOUT BENTLEY

Bentley Systems, Incorporated is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Architects, engineers, constructors, and owner-operators are indispensable in improving our world and our quality of life; the company's mission is to improve the performance of their projects and of the assets they design, build, and operate. Bentley sustains the infrastructure professions by helping to leverage information technology, learning, best practices, and global collaboration – and by promoting careers devoted to this crucial work.

About Harken-Reidar

Harken-Reidar, Inc. is a Bentley Channel Partner for the Mid-Atlantic VA, MD, DC & PA. Our sales and training staff are Registered Professional engineers who understand Civil design and plans preparation. We have 20 years of experience using GeoPak, InRoads, MicroStation and Haestad Methods software for over 20 years.

Contact Harken-Reidar, your local Bentley dealer, integration and training center.

Corporate office: 1105 N. Royal Avenue
Front Royal, VA 22630

Offices: Pittsburgh, 130 Venango Ct.
New Kensington, PA 15068
Houston, 2201 Fountain View #F38
Houston, TX 77057
T: 540-635-6742 F: 540-635-6752
info@harken-reidar.com



CIVILSTORM AT-A-GLANCE

Interface and graphical editing

- Stand-alone Windows interface included
- MicroStation-based interface included
- AutoCAD-based interface available
- Unlimited undo and redo
- Element morphing, splitting, and reconnection
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Element prototypes
- Dynamic zooming
- Named view
- Aerial view
- Multiple background file support
- Image, CAD, and GIS background layer support
- Statistical analysis from tabular reports
- Customizable engineering libraries
- Dynamic and static selection sets
- Element selection by polygon
- Element selection inversion
- Table opening on selection
- Global engineering-units management
- Drawing review tools for connectivity consistency
- Automatic topology review
- Drawing navigator
- Orphaned node and dead-end pipe queries
- Support of ProjectWise® XM / ProjectWise® Geospatial Management

Unit hydrograph methods

- Generic unit hydrograph, RTK, SCS

Hydraulics and operations

- Switch readily between two engines for solving the full set of St. Venant equations.
- Implicit dynamic engine included
- Explicit dynamic engine included (EPA-SWMM)
- Evaporation definition
- Aquifer simulation
- Pollution analysis with optional definition of land use categories and land surface characteristics
- Treatment analysis
- Pond infiltration
- Culvert roadway overtopping
- Rule-based controls
- Variable-speed pumping

Rainfall data

- Synthetic design storms or gauged events, including SCS Types (I, IA, II,

or III), Bulletin 71 rainfall, cumulative depth dimensionless depth (and depth and time), incremental depth, and intensity hyetograph

Runoff and loss methods

- SCS runoff with automatic CN weighting, fLoss, Green and Ampt, Horton, user-defined hydrograph, EPA SWMM runoff, Modified Rational

Time of concentration methods

- User-Defined, Carter, Eagleson, Espey/Winslow, Federal Aviation Agency, Kerby/Hathaway, Kirpich (PA and TN), Length and Velocity, SCS Lag, TR-55 Sheet Flow, TR-55 Shallow Concentrated Flow, and TR-55 Channel Flow

Inflow

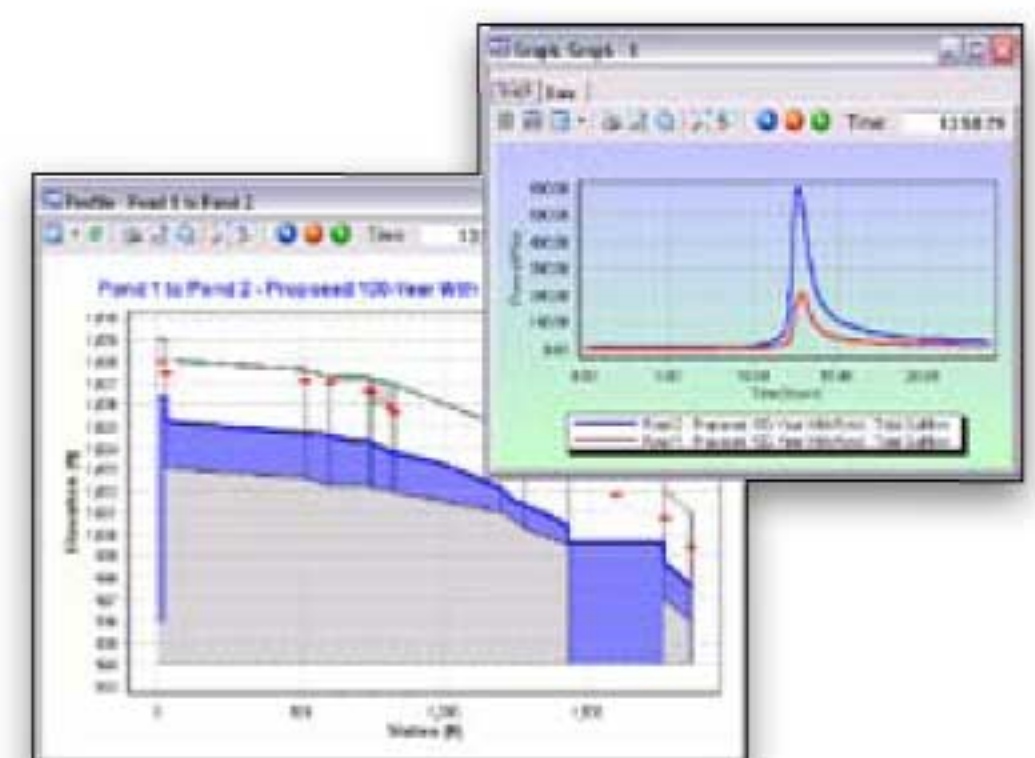
- Inflow control center
- Inflow collection defining a hydrograph table, fixed load, and base inflow

Results presentation

- Thematic mapping
- Dynamic, multi-parameter, and multi-scenario graphing
- Advanced dynamic profiling
- Advanced tabular reporting with FlexTables®
- Property-based color coding and symbology
- Property-based annotation
- Contouring with Shapefile and DXF export
- EQT (Elevation vs. Flow) curve to outfall elements



CivilStorm includes built-in hydrology and engineering libraries to load and estimate rainfall, infiltration, time of concentration, and runoff hydrographs



Use tables, maps, dynamic graphs and profiles, with system master plans or studies and plan sets