



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 stormwater systems: 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 ability to choose 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, affords flexibility to those modelers that are accustomed to 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 AutoCAD integration also available. 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 an environment with which they are already comfortable.

Streamlined Model Building

Engineers can leverage geospatial data, CAD drawings, databases, and spreadsheets to jump-start 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.

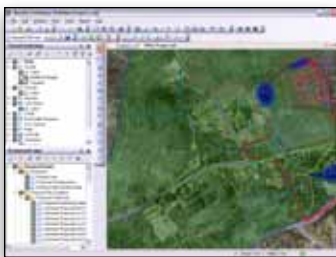
CivilStorm also provides drawing and connectivity review tools to guarantee a hydraulically coherent model.

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

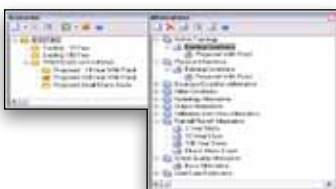
Engineers can load models with wet weather runoff flows derived from precipitation using the CivilStorm built-in rainfall distributions, or user defined rainfall events. Runoff flows are modeled using a choice of hydrograph methods, including RTK, SCS, Modified Rational, EPA -SWMM, or user-defined generic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



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



Load rainfall, infiltration, time of concentration, and runoff hydrograph data using built-in hydrology calculations and engineering libraries



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

System Requirements

Processor:

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

Operating System:

Windows 7, Windows Vista, Windows XP,
Windows Server 2008, and Windows
Server 2003

Memory:

Per minimum operating system
requirements

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 stand alone
interface. If integration with CAD
platforms is desired, these are the
requirements:

- MicroStation V8i
- AutoCAD 2011, 2010
- PowerCivil for North America V8i

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

Find out about Bentley at: www.bentley.com

Contact Bentley

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Outside the US +1 610-458-5000

Global Office Listings

www.bentley.com/contact

CivilStorm At-A-Glance

Interface and Graphical Editing

- Stand-alone Windows interface included
- Ability to run within MicroStation
- Ability to run within PowerCivil for North America
- Ability to run within AutoCAD (add-on option)
- InRoads® Storm and Sanitary file import/export
- Unlimited undo and redo
- Element morphing, splitting, and reconnection
- Nodes in close proximity merging tool
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Inference tool (to interpolate missing data)
- Element prototypes (one-click setup)
- Dynamic zooming
- Named view
- Aerial view
- Multiple background file support
- Image, CAD, and GIS background layer support
- Comprehensive scenario management
- Scenario comparison
- Active topology (to activate or deactivate network elements)
- Tabular reports with global editing
- Sorting and persistent filtering on tabular reports
- Statistical analysis from tabular reports
- Customizable engineering libraries
- Dynamic (query based) 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
- Custom data fields (with user-assigned or formula-based values)
- Hyperlinks for network elements
- Support of ProjectWise®/ProjectWise® Geospatial Management

Interoperability and Data Connections

- Single set of model files for four compatible interfaces
- GIS-ID property (to maintain associations between records in source file and elements in model)
- Polyline-to-pipe conversion from DXF and DWG files
- Spreadsheet, database, Shapefile, and OleDB connections
- Oracle spatial import/export
- LandXML data import/export
- StormCAD files import
- SWMM files import
- Observed data import
- Time series data import

Model Management

- Unlimited scenarios and alternatives

- 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, Loss, 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

Presentation of Results

- Thematic mapping
- Dynamic multiparameter, and multisenario 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

Unit Hydrograph Methods

- Generic unit hydrograph, RTK, SCS

Hydraulics and Operations

- Ability to switch readily between two engines for solving the full set of St. Venant equations
- Implicit dynamic engine included
- Explicit dynamic engine included (EPA-SWMM)
- Long-term simulations with statistical reports
- Inlet capacity calculations
- Evaporation definition
- Aquifer simulation
- Pollution analysis with optional definition of land use categories and land surface characteristics
- Treatment analysis