



StormCAD®

Storm Sewer Design and Modeling

StormCAD is a comprehensive modeling software program for the design and analysis of storm sewer systems. StormCAD provides calculations for catchment runoff, inlet capacity, and gutters and pipe network flow.

Model in Stand-Alone Mode, MicroStation, or AutoCAD

Out of the box, StormCAD users can work within stand-alone and MicroStation® platforms, while optional AutoCAD integration means that users can model within their favorite CAD environment. Regardless of the platform used, StormCAD maintains a single set of modeling files for true interoperability across platforms.



Users can employ StormCAD as stand-alone application, within MicroStation, or, with optional integration, within AutoCAD.

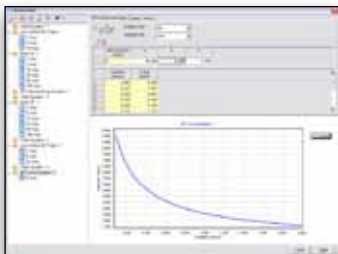
The stand-alone interface offers easy-to-use model layout tools, multiple background support, conversion utilities from CAD, GIS, and databases, and unlimited undo and redo layout.

The MicroStation interface, included at no additional cost with all StormCAD versions, provides a geospatial and engineering design environment with unrivaled visualization and publishing tools.

AutoCAD users can add AutoCAD integration features to build, lay out, and plot models with engineering precision within an environment they are already comfortable with.

Enhanced Workflow with Stormwater-Civil Integration

StormCAD can now import and export drainage data directly from InRoads, GEOPAK, and PowerCivil for North America, providing engineers and designers with a way to achieve an optimized workflow and better coordination between engineering teams.



Intensity-Duration-Frequency (IDF) data can be defined using equations or tables, and saved for later use.

Inlet and Network Hydraulics

StormCAD determines intercepted flow at network inlets, and routes bypass flow to selected bypass targets. Inlets can be computed using the U.S. Federal Highway Administration (FHWA) HEC-22 methodology and users can choose from grate, curb, slot, ditch, and combination inlet types. Engineers can use a variety of methods to compute headloss, including HEC-22 Energy and AASHTO.

StormCAD solves for subcritical, critical, and supercritical conditions with its robust gradually varied, standard-step algorithm. StormCAD calculates friction losses using Manning, Kutter, Darcy-Weisbach, and Hazen-Williams, and users can

choose circular, box, arch, or elliptical pipe section shapes or irregular, trapezoidal, or triangular channel sections.

Hydrology and Loads Allocation

StormCAD uses the Rational Method to calculate peak flows in the storm sewer design, or accepts direct input of known flows for inlet inflows.

StormCAD allows users to specify Intensity-Duration-Frequency data using equations or tables. Modelers can then plot the IDF curves, and reuse their data for other projects in that region. Engineers can work with an unlimited number of sub-watershed areas and C coefficients for each inlet watershed.

StormCAD allows the input of external contributing areas, additional flows, and carryover flows to model non-local runoff contributing to the discharge at any inlet. StormCAD provides several methods for computing travel time, including full pipe velocity, normal velocity, average end velocity, and weighted average velocity.

Automatic Design

The constraint-based design features in StormCAD allow modelers to automatically design gravity piping and structures. The design is flexible enough to allow users to specify the elements to be designed, from a single pipe size to the entire system, by simply entering the appropriate design conditions: minimum/maximum velocities, covers, and slopes; pipe elevation offsets (including whether or not to allow drop structures), maximum spread and depth for inlets in sag; and minimum efficiency for inlets on grade.

StormCAD will automatically determine cost-effective pipe sizes and invert elevations while minimizing pipe cover to avoid unnecessary pipe trench excavation.

Comprehensive Scenario Management

With StormCAD scenario management center, engineers can evaluate, visualize, and compare an unlimited number of what-if scenarios within a single file. They can easily make decisions by comparing design approaches with varying velocity, slope and cover restrictions, evaluating system capacity for multiple storm events, or analyzing outlet flow using different estimations for the catchment Rational Coefficients.

ID	Label	Inlet Type	Inlet Capacity	Inlet Elevation
11	11-12-4	Grate	100.0	8.0
12	12-12-4	Grate	100.0	8.0
13	13-12-4	Grate	100.0	8.0
14	14-12-4	Grate	100.0	8.0
15	15-12-4	Grate	100.0	8.0
16	16-12-4	Grate	100.0	8.0
17	17-12-4	Grate	100.0	8.0
18	18-12-4	Grate	100.0	8.0
19	19-12-4	Grate	100.0	8.0
20	20-12-4	Grate	100.0	8.0

StormCAD's constraint-based design automatically determines diameters and invert elevations.

System Requirements

Processor:

Pentium III at 1 GHz. As per minimum operating system requirements

Operating System:

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

Memory:

256 MB or more. As per minimum operating system requirements.

Hard Disk:

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

Display:

1024 x 768 resolution, High Color (16 Bit)

Video:

800 x 600 resolution, 256 colors

Platform pre-requirements:

StormCAD runs without platform restrictions using the stand-alone interface. If integration with CAD platforms is desired, these are the requirements: MicroStation V8i, AutoCAD 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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Global Office Listings

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StormCAD At-A-Glance

Interface and Graphical Editing

- Ability to run within PowerCivil for North America
- Stand-alone Windows interface
- Ability to run within AutoCAD
- Ability to run within MicroStation
- InRoads®/GEOPAK®/PowerCivil™ drainage file import/export
- Unlimited undo/redo of layout and editing
- Element morphing, splitting, and reconnection
- Nodes in close proximity merging tool
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Scaled catchment and gutter elements
- Element prototypes
- Aerial view and dynamic zooming
- Named views library
- Multiple background-layer support
- Image, CAD, and GIS background support
- Element Prototypes (one-click setup)

Interoperability and Model Building

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

Model Management

- Unlimited scenarios and alternatives
- Comprehensive scenario management
- Active topology (to activate or deactivate network elements)
- Scenario comparison
- Tabular reports with global editing
- Tabular report sorting and persistent filtering
- 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
- Hyperlink for network elements
- Custom data fields (with user-assigned or formula-based values)
- ProjectWise® / ProjectWise® Geospatial Management support

Hydraulics

- Steady-state simulations
- Flow profile methods: capacity and backwater analysis
- Headloss methods: AASHTO, HEC-22, standard, absolute, generic, and headloss-flow curve
- Diversion simulation

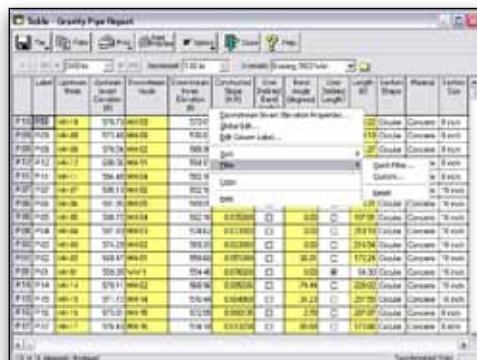
- Automatic constraint-based design
- Friction loss methods: Manning, Kutter, Darcy-Weisbach, and Hazen-Williams
- Curb, grate, ditch, slot, generic, combination, and user-defined capture curve inlet types
- Open channel and closed conduit hydraulics

Hydrology and Load Allocation

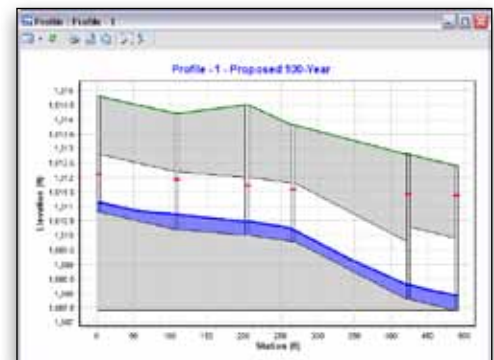
- Rational Method
- Rainfall data input: user-defined Intensity-Duration-Frequency (IDF) table, Hydro-35, IDF table equation, IDF curve equation, IDF polynomial log equation
- Time of concentration methods: User-Defined, Carter, Eagleson, Espey/Winslow, Federal Aviation Agency, Kerby/Hathaway, Kirpich (PA and TN), Length and Velocity, SCS Lag, TR-55 Sheet Flow, TR-55 Shallow Concentrated Flow, and TR-55 Channel Flow
- External load assignment

Results Presentation

- Thematic mapping
- Dynamic, multi parameter, and multi scenario graphing
- Advanced profiling
- Advanced tabular reporting with FlexTables®
- Property-based color coding and symbology
- Property-based annotation
- Contouring with Shapefile and DXF export



Use FlexTables to sort, filter, manage units, and globally edit your data.



Locate bottlenecks quickly using thematic mapping, FlexTables, and profiles.