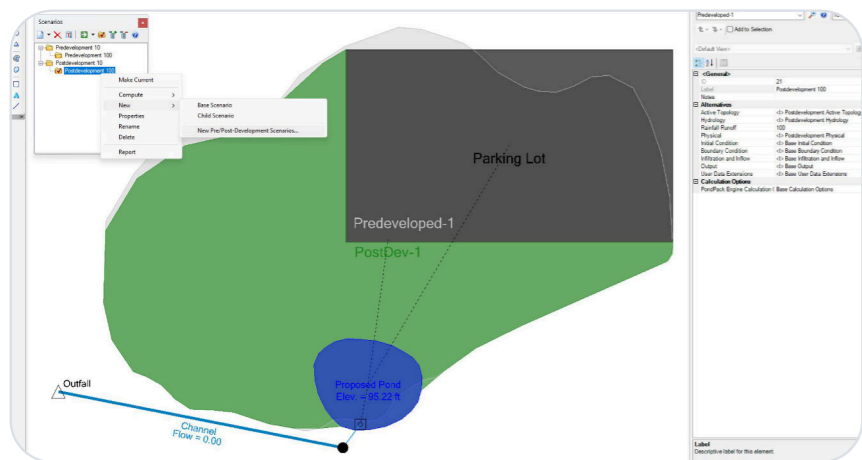
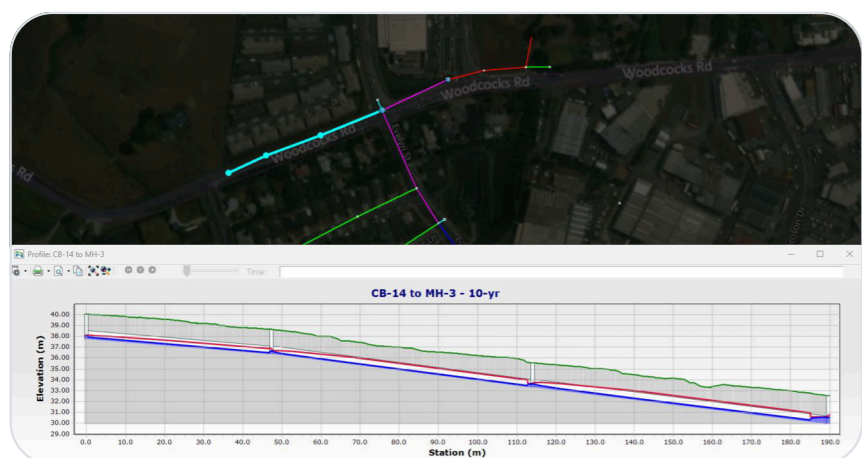


OpenFlows™ Storm

Stormwater systems modeling and management



Model complex pond outlets for a variety of tailwater conditions.



Build hydraulic models using synchronized network data from standard formats, such as GIS and CAD files, databases and spreadsheets.

Plan, design, and analyze stormwater systems

OpenFlows Storm is a multiplatform hydraulic and hydrologic modeling application for engineers to analyze, design, and plan complex stormwater systems. Optimize network designs and master plans to improve capacity, limit flooding, and minimize capital investment.

Its comprehensive environment allows you to model your entire storm system, from rainfall and 2D surface runoff to integrated pipe and channel networks, low-impact development controls, and complex detention ponds.

Advance analysis and scenario management

Configure, run, evaluate, visualize, and compare unlimited scenarios within a single file. Easily make decisions by comparing alternative designs or proposed rehabilitation methods for a variety of system conditions. Visualize and present comparisons of different simulation results directly on your model with multiple scenario annotation.

AI-powered insights

Work faster and more efficiently with Bentley Copilot, an AI assistant integrated in OpenFlows Storm. Use natural language to interrogate model data, launch ribbon commands, perform edits, and query uploaded documents such as city codes without navigating complex menus.

Integrated modeling and interoperability

Streamline model creation by synchronizing data from GIS, CAD, spreadsheets, and SCADA, enhanced by automatic coordinate system reprojection to simplify workflows. Projects can be extended into digital twin workflows, enabling storm models to be viewed in 3D and collaboratively reviewed alongside other infrastructure data in Bentley Infrastructure Cloud™.

Multiple 1D hydraulic solver options

Use the GVF-Rational solver to evaluate peak flow conditions or automatically design storm sewers, including sizing pipes and setting elevations. For complex unsteady flow, storage, and overflows, the Implicit and Explicit (SWMM) dynamic solvers apply the full 1D Saint-Venant equations. Level pool routing and interconnected pond modeling calculation methods are also available for stormwater detention design.

1D/2D hydraulic analysis

Better understand surface flooding depth and velocity, flood hazards, and inundation times by connecting 1D network elements with 2D surface flows. Use enhanced 2D results visualization, such as reporting transects and instant graphing, for deeper analysis of flood extents and to communicate important information to stakeholders with versatile mapping and reporting capabilities.

System requirements

Minimum: Windows 10 or higher, 8 GB RAM, 720 × 480 resolution. Stand-alone application or runs within MicroStation®, AutoCAD, OpenRoads™, OpenSite®, or OpenRail™ Designer
Recommended: 16 GB RAM, 1,920 × 1,080 resolution

OpenFlows Storm at-a-glance capabilities

Interoperability

- Operates as a stand-alone application or integrated within MicroStation, AutoCAD, and Bentley civil design applications (e.g., OpenRoads Designer, OpenSite, or OpenRail Designer)
- Manages project data and files with ProjectWise® integration
- Connects storm models to Bentley Infrastructure Cloud for 3D visualization and collaboration

Model building and management

- Automated catchment delineation and elevation assignment from terrain
- Automated CN and rational “c” weighting from land use polygons
- Seed files for new model templates
- Supports shapefiles, geodatabases, geometric networks, SDE, spreadsheets, databases, Oracle Spatial, and ODBC connections
- Creation of model elements from CAD drawings
- Import/export of LandXML, MX Drainage, SWMM, and MicroDrainage model files
- Time-series data import
- Storm events scenario wizard
- Unlimited scenarios and comparisons
- Active topology to activate or deactivate network elements
- Tabular reports with global editing, sorting, filtering, and statistics
- Custom data fields with user-assigned or formula-based values
- Drawing review capabilities with queries to ensure network connectivity
- Customizable engineering libraries
- Automatic topology review
- Automatic coordinate system detection and reprojection for external data sources
- Optimized graphical display for smooth navigation of large-scale models
- Improved catchment delineation for headwalls and cross-sections
- Support for text string output from user data extensions for custom reporting
- Background display of Google Maps, image files, CAD drawings, and GIS data

AI assistance – Bentley Copilot

- Natural language model interrogation (e.g., “How many ponds are in the system?”)
- Launch ribbon commands via text prompts
- Perform basic model editing and scenario creation
- Query uploaded external documents (e.g., city codes) against the model

Hydraulics

- 1D/2D hydraulic analysis for surface flood modeling
- Two solvers for the full set of 1D Saint-Venant equations: implicit dynamic and explicit dynamic (EPA-SWMM)
- Steady-state, peak flow, and gradual varied flow rational solver engine
- Automatic constraint-based design of gravity storm sewers
- Surface flow path tracing from terrain
- Long-term simulations with statistical reports
- HEC-22 inlet capacity and node head-loss calculations
- V-shaped and parabolic gutters
- Regular and irregular surface channel shapes
- Detention/retention ponds and storage chamber systems
- Simple and multistage detention pond outlet structures (weirs, orifices, culverts, inlet boxes, standpipes, vortex valves)
- PondMaker® application for detention pond design, flow and volume estimates, and data tracking
- Pre-development and post-development peak flow and volume comparison
- Level pool routing and interconnected pond modeling
- Low-impact development controls
- Evaporation definition
- Aquifer simulation
- Pollutant and treatment analysis
- HDS-5 and SWMM culverts
- Tractive stress calculation
- Critical storm analysis
- Rule-based controls
- Inline control structures and diversions (weirs, orifices, depth-flow curves)
- Enhanced 2D results reporting (reporting transects and grid cell graphing)
- Flow meter tool for measuring flow in gravity and pressure pipes

- New calculation option to assume all inlets are full capture
- Channel rational method attributes exposed in properties

Stormwater load allocation and estimation

- Support for synthetic design storms and gauged rainfall events
- Intensity-duration-frequency curve input in tabular or equation format
- Time of concentration methods: User-defined, Carter, Eagleson, Espey/Winslow, Federal Aviation Agency, Kerby/Hathaway, Kirpich (PA and TN), Length/Velocity, SCS Lag, TR-55 Sheet Flow, TR-55 Shallow Concentrated Flow, TR-55 Channel Flow, Friend, Kinematic Wave, Bransby-Williams, and UK standard
- Runoff methods (all levels): Rational Method peak flow calculation, SCS Unit Hydrograph, Modified Rational Method, generic unit hydrograph, Santa Barbara Urban Hydrograph, and user-defined hydrograph
- Additional runoff methods: EPA SWMM, RTK Unit Hydrograph, Time-Area Method, and ILSAX
- Loss methods (all levels): Constant loss rate, Green and Ampt, Horton, SCS CN
- Flood Estimation Handbook Rainfall (U.K.)
- Australian rainfall and runoff
- Inflow control center
- Additional loss methods: Green and Ampt (modified), Horton (modified), and Initial Loss and Constant Fraction or Constant Loss Rate

Results presentation

- Thematic mapping with color coding
- Scenario and element comparison
- Engineering profile with annotation table
- Multiple scenario annotation for side-by-side visual comparison of different scenarios
- Direct export of reports and tables to Microsoft Office formats
- Grid browser and graphing tools for visualizing 2D results (depth, WSE, velocity over time)
- Create reporting transects for detailed 2D flow analysis over time

Find out more at Bentley.com
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Global office listings: [bentley.com/contact](https://www.bentley.com/contact)

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