



## WaterCAD®

### Water Distribution Modeling and Management

WaterCAD® is an easy-to-use hydraulic and water quality modeling solution for water distribution systems. Utilities, municipalities and engineering firms trust WaterCAD as a reliable, resource-saving, decision-support tool for their water infrastructure.

From fire flow and constituent concentration analyses, to energy consumption and capital cost management, WaterCAD helps engineers and utilities analyze, design, and optimize water distribution systems.

#### Model in Stand-Alone, or Within Your Favorite CAD Platform

Out of the box, WaterCAD® 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, WaterCAD maintains a single set of modeling files for true interoperability across platforms.

The stand-alone interface offers unparalleled versatility with 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 WaterCAD 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

The LoadBuilder™ and TRex™ geospatial modules – included with WaterCAD at no additional cost – help engineers allocate water demands and node elevations based on geospatial data found in shapefiles, DEMs, and even CAD drawings, avoiding potential manual-input mistakes and speeding up the model building process.

WaterCAD users can also use CAD drawings to directly create hydraulically connected models; import topology and data from GIS; and create persistent, bidirectional connections between shapefiles, databases, spreadsheets and the WaterCAD model.

#### Water Quality Modeling

The built-in water quality features help WaterCAD users perform constituent, water age, tank mixing, and source

trace analysis to develop comprehensive chlorination schedules, simulate emergency contamination events, visualize zones of influence for different water sources, and improve turbidity, taste, and odor by identifying water blending problems in the system.

#### Fire Flow Analysis

Using the Fire Flow Navigator, WaterCAD users can quickly and accurately establish the ability of their network to provide protection against fires. WaterCAD simultaneously models multiple fire flow events evaluating flows and pressures across the entire system.

#### Criticality Analysis and Operations Modeling

The Criticality Analysis Center is a comprehensive utility to identify critical assets in water distribution infrastructure, and evaluate the risk associated with their failure. Also, by using rule-based operational controls, variable-speed pumping (VSP), and pressure-dependent demands (PDD), engineers can find operational bottlenecks, minimize energy consumption, and model real-time operations to improve system performance.

#### Comprehensive Scenario Management

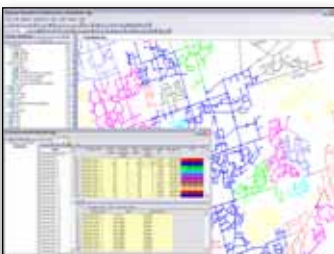
WaterCAD Scenario Management Center gives engineers full control to configure, run, evaluate, visualize, and compare an unlimited number of whatif scenarios within a single file. Engineers can easily make decisions by comparing unlimited scenarios, analyzing rehabilitation alternatives for multiple planning horizons, evaluating pump operation strategies, or flushing alternatives for emergency contamination events.



*WaterCAD runs in its stand-alone platform, but also MicroStation. The WaterCAD For AutoCAD option also runs in AutoCAD*



*Use the built-in manual calibration or leverage the available Darwin Calibrator module.*



*The Pressure Zone Manager automates the process of identifying the multiple pressure zones of a water distribution system and their characteristics.*

## System Requirements

Refer to the 'Installation Requirements' section of the WaterCAD's ReadMe file:

[www.bentley.com/WaterCAD-Spec](http://www.bentley.com/WaterCAD-Spec)

### Platform pre-requirements:

WaterCAD runs without platform restrictions as a stand-alone application. It can also run from within AutoCAD and MicroStation. The requirements are also available in the WaterCAD's ReadMe file.

## Find out about Bentley at: [www.bentley.com](http://www.bentley.com)

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### Global Office Listings

[www.bentley.com/contact](http://www.bentley.com/contact)

## WaterCAD At-A-Glance

### Interoperability, Interface, and Graphical Editing

- Runs in three platforms, with one set of files:
  - » Stand-alone Windows
  - » MicroStation
  - » AutoCAD (available in WaterCAD For AutoCAD)
  - » Consider WaterGEMS to run in ArcGIS
- Seamless compatibility with WaterGEMS
- Unlimited undo and redo
- Element morphing, splitting, and reconnection
- Merge nodes in close proximity tool
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Element prototypes
- Aerial view and dynamic zooming
- Named views library
- Multiple background-layer support
- Image, CAD, and GIS background support

### Hydraulics, Operations, and Water Quality

- Steady-state simulation
- Extended-period simulation
- Constituent-concentration analysis
- Criticality analysis
- Source tracing
- Tank-mixing analysis
- Water-age analysis
- Water quality batch run
- Fire-flow analysis
- Rule-based or logical controls
- Variable-speed pumping, with
- Option to use APEX® (Automatic Parameter Estimation eXtension)
- Leakage and sprinkler modeling
- Pressure-dependent demands
- Valve modeling
- System head curve for closed system supported
- Scenario modeling-based unidirectional flushing
- Air release valve element
- Top Fill Tank element
- Combination pump curves
- Carbon emission calculation
- Optimization of pipe renewal with Pipe Renewal Planner (available)

### Model Building and Data Connection

- Spreadsheet, database, and ODBC connections
- Polyline-to-pipe conversion from DXF files
- Shapefile, Geodatabase, Geometric Network and SDE
- Oracle spatial support
- GIS-ID property to maintain associations between records in the source file and elements in the model
- SCADAConnect® available for live data connections
- Automatic demand allocation from geospatial data
- Geospatial demand allocation from customer meters
- Demand allocation from lump-sum geospatial data
- Geospatial-based water consumption projection
- Daily, weekly, monthly, and superimposed patterns
- Unaccounted-for water and leakage estimation
- Composite demands global edition
- Area, count, discharge, and population-based loading
- Pipe length-based demand loading
- Elevation extraction from DEM, TIN, and shapefiles
- Elevation extraction from CAD drawings and surfaces
- Series-pipes skeletonization (available)
- Parallel-pipes skeletonization (available)
- Branch-trimming skeletonization (available)
- Multi-criteria automated skeletonization (available)
- Skeletonization support for isolation valves (available)
- User-data extension, including formula-based

### Model Management

- Unlimited scenarios and alternatives
- Comprehensive scenario management
- Tree-based scenario and alternative management
- Global attribute tabular edition

- Scenario and alternative inheritance properties
- Pressure zone management
- Sorting and persistent filtering on tabular reports
- Statistical analysis from tabular reports
- Personalizable engineering libraries
- i-model support
- Dynamic and static selection sets
- Local and global engineering-units management
- Sub-model management
- Drawing review tools for connectivity consistency
- Automatic topology review
- Orphaned nodes and dead-end pipes queries
- Support of ProjectWise® / ProjectWise® Geospatial Management

### Results Presentation

- Thematic mapping
- Dynamic, multi-parameter, and multi-scenario graphing
- Scenario and element comparison
- Shapefile contouring
- Advance profiling
- Advanced tabular reporting with FlexTables®
- Property-based annotation, color coding and symbology
- Creation of Google Earth (KML) files

### Optimization (using Genetic Algorithm)

- Automated model calibration with Darwin Calibrator (available)
- Optimized design and rehabilitation with Darwin® Designer (available)
- Optimized pump scheduling with Darwin Scheduler (available)

### Energy and Capital-Cost Management

- Energy cost analysis
- Capital cost analysis
- Automatic design and rehabilitation (available)
- Automated pump scheduling (available)