



SewerCAD®

A Powerful Tool for Effortless Sewer Design and Rehabilitation

SewerCAD is an easy-to-use sanitary sewer modeling and design software product that thousands of municipalities, utilities, and engineering firms around the world trust to design, analyze, and plan wastewater collection systems. Engineers can model both pressurized force mains and gravity hydraulics with ease, using steady-state analysis with various standard peaking factors, and extended-period simulations.

Interoperability

Out of the box, SewerCAD users can employ this product as a stand-alone application or work directly from within MicroStation®, while an additional integration option lets them model within AutoCAD. Regardless of the platform used, SewerCAD maintains a single set of modeling files for true interoperability across platforms.

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.

SewerCAD can open SewerGEMS® models seamlessly, including those created within ArcGIS.

When modeling from MicroStation, users can enjoy a geospatial and engineering design environment with unrivaled visualization and publishing tools. AutoCAD users can also add the ability to run SewerCAD models from AutoCAD to build, lay out, and plot models with engineering precision in an environment with which they are already comfortable.

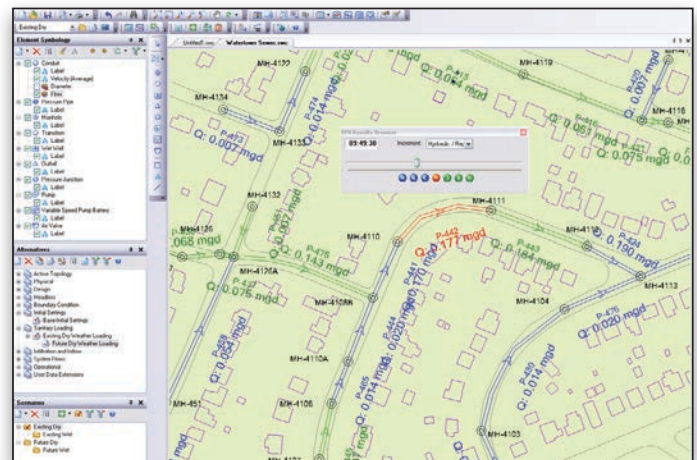
Gravity and Pressure Hydraulics

Engineers can analyze pressure or free surface flow conditions using a robust gradually varied, standard-step algorithm in SewerCAD for solving subcritical, critical, and supercritical conditions, and complex composite profiles.

The steady-state simulation analyzes the system under extreme flow conditions. Automated design features are available with a steady-state analysis type to find cost-effective sewer designs. The extended period simulations (EPS) allow modelers to visualize how the system behaves over time. Results can be animated through time to locate hydraulic jumps and surcharging sections.

Wastewater Loading Allocation and Estimation, and Infiltration and Inflow

The LoadBuilder™ module included in SewerCAD helps engineers allocate sewer loads based on a variety of GIS-based sources such as consumer water use billing data, area-wide flow measurement, or polygons with known population or land use. Sewer loading in SewerCAD also can be applied as user-defined hydrographs, pattern-based loads, and unit loads. Modelers can use totally customizable unit load libraries to estimate sanitary flows based on contributing population, service area, total dry weather discharge, or their own customized loading types.



Benefit from platform freedom and versatility with the ability to run SewerCAD as a stand-alone application, or from within MicroStation and AutoCAD.

SewerCAD also includes numerous pre-defined extreme flow factor formulas and tables, including Babbitt, Harmon, Ten State, and Federov's – or lets users enter their own formulas and tables. SewerCAD determines infiltration in gravity pipes, based on pipe length, length diameter, surface area, count value, or user-defined data. SewerCAD can also use multiple flow patterns or flow hydrographs for EPS. The sanitary load control center and inflow control center make it easy to globally edit or edit a filtered set of elements.

Automatic Design of New Systems and Rehabilitation of Existing Sanitary Sewers

The constraint-based design features in SewerCAD 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, or anything in between, by simply entering their design restrictions: minimum and maximum velocities, covers and slopes; pipe and manhole matching offsets; and allow (or not) drop structures. SewerCAD will automatically determine cost-effective pipe sizes and invert elevations, avoiding unnecessary pipe trench excavation.

Comprehensive Scenario Management

The SewerCAD Scenario Management Center gives engineers full control to configure, run, evaluate, visualize, and compare an unlimited number of what-if scenarios within a single file. Engineers can easily make decisions by comparing unlimited scenarios, analyzing rehabilitation alternatives for multiple planning horizons, and evaluating pump operation strategies, or overflow scenarios with varying future wastewater flows.

System Requirements

Refer to the 'Installation Requirements' section of the SewerCAD ReadMe file:

www.bentley.com/SewerCAD-Spec

Platform pre-requirements:

SewerCAD runs without platform restrictions as a stand-alone application.

It can also run from within AutoCAD and MicroStation. The requirements are also available in SewerCAD's ReadMe file.

Find out about Bentley at: www.bentley.com

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SewerCAD At-A-Glance

Editing

- Stand-alone Windows interface
- Ability to run within AutoCAD (AutoCAD license required)
- Ability to run within MicroStation (MicroStation license required)
- Unlimited undo and redo
- Element morphing, splitting, and reconnection
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Element prototypes
- Aerial view and dynamic zooming
- Named view library
- Multiple background-layer support
- Image, CAD, and GIS background support
- Inferencing tool (to interpolate missing elevation data)
- Automatic calculation of elevations on pipe split operation
- Automatic input and result fields filtering (based on solver used)

Hydraulics and Operations

- Steady-state simulations
- Extended period simulations
- Flow profile methods: capacity and backwater analysis
- Automatic constraint-based design
- Diversion simulation
- Rule-based or logical controls
- Tractive stress calculations
- Accurate variable-speed pumping
- Pump batteries element
- System head curves
- Totalizing flow meters
- Air valves for high points in force mains
- Control structures (culvert inlet, weirs, orifices, depth-flow curve)
- HEC-22 node headloss calculations
- Complex manifolded pump stations/force mains
- Pond outlet structure calculations
- Support for catchment elements
- Support for culvert headwalls and endwalls
- Low impact development control analysis

Interoperability and Model Building

- Single set of model files for three compatible interfaces
- Import of MX Drainage files
- LandXML data import and export
- Polyline-to-pipe conversion from DXF and DWG files
- Spreadsheet, database, Shapefile, and OLE DB connections
- Elevation extraction from contours, points, and Shapefiles
- Elevation extraction from CAD drawings and surfaces
- Interpolating elevations between elements
- Interpolating elevations at split
- GIS-ID property (to maintain associations between records in source file and elements in model)
- Seed files (new models template)
- Oracle Locator/spatial data connection
- Automated assignment of elevation data to manhole elements
- Unified file format with StormCAD, CivilStorm, and SewerGEMS

Sanitary Load Allocation and Estimation

- Automatic sanitary load allocation from geospatial data
- Geospatial load allocation from billing meters
- Load allocation using flow monitoring distribution
- Land-use based load distribution
- Sewer load assignment based on phased land-use

projections and population projections

- Dry-weather load assignment using hydrographs, unit loads, and pattern-based loads
- Customizable area-, count-, discharge-, and population-based unit sanitary loading library
- Pipe length-, diameter-, surface area-, length-diameter-, or user-defined infiltration load type

Model Management

- Unlimited scenarios and alternatives
- Comprehensive scenario management
- Scenario comparison
- Diversions displayed as links
- Active topology (to activate or deactivate network elements)
- Tabular reports with global editing
- Tabular report sorting and persistent filtering
- Table opening on selection
- Customizable engineering libraries for extreme flow factors, section size, material properties, minor losses, and unit-sanitary (dry-weather) loads
- Dynamic (query-based) and static selection sets
- Element selection by polygon
- Element selection inversion
- Statistical analysis from tabular reports
- Global engineering-units management
- Drawing review tools for consistent connectivity
- Automatic topology review
- Network navigator with dozens of useful predefined queries
- Orphaned node and dead-end pipe queries
- Hyperlink for network elements
- Custom data fields (with user-assigned or formula-based values)
- Surface water flow direction displayed across any terrain
- ProjectWise and ProjectWise Geospatial Management support

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
- Project inventory report
- Scenario summary report
- Element report and graphs
- Hydrograph graphs
- Contouring with export to Shapefile, DXF, and native CAD format
- Publishing of i-models in 2D or 3D, including to Bentley Map Mobile

Stormwater Load Allocation and Estimation

- Runoff methods: SCS Unit Hydrograph, Modified Rational Method, EPA SWMM, RTK Unit Hydrograph, generic Unit Hydrograph, Time-Area Method, ILSAX and user-defined hydrograph
- 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, Friend, Kinematic Wave, Bransby-Williams and UK standard
- Loss Methods: Constant loss rate, Green and Ampt, Horton, Initial Loss and Constant Fraction, Initial Loss and Constant Loss Rate, SCS Curve Number.