



PondPack®

Detention Pond Design and Urban Hydrology Modeling

PondPack is a versatile software program to model any project from basic site designs to complex drainage studies. Users can model rainfall and runoff from urban and rural watersheds to design detention and retention facilities, outlet structures, and channels.

Complete System Analysis and Interconnected Pond Modeling

The robust PondPack analysis engine computes outlet rating curves with tailwater effects, accounts for pond infiltration, calculates pond detention times, analyzes channels, and performs interconnected pond routing with divergent (multiple) outfalls.

In many scenarios, downstream conditions cause backwater effects that influence the performance of detention pond outlet structures. A pond may discharge to another pond that is close in elevation, or to a location influenced by downstream tidal effects or flooding. With the advanced PondPack Interconnected Pond Modeling (ICPM) capabilities, these complex scenarios can be modeled with confidence.

For catchment runoff computations, users can choose from the SCS Runoff CN method, the Santa Barbara unit hydrograph, user defined unit hydrograph, the Modified Rational Method or Rational Q/Qp templates. Users can also add an unlimited number of user defined hydrographs throughout the watershed.

Catchment infiltration losses can be computed using the SCS Method, the Green-Ampt equation, the Horton equation, or by entering a constant infiltration rate. PondPack also calculates the time of concentration quickly and accurately, even when there are several possible flow paths to consider. PondPack offers engineers the choice of modeling infiltration from a pond to the surrounding soil using a constant flow rate, or rates that vary depending on the depth of water in the pond.

New Interface and CAD Interoperability

PondPack's new graphical user interface streamlines network layout, data entry, and output viewing. PondPack users have the option to add DXF, Shapefiles or raster background layers (e.g. aerial photos), and trace catchments, ponds and channels over the top to scale.

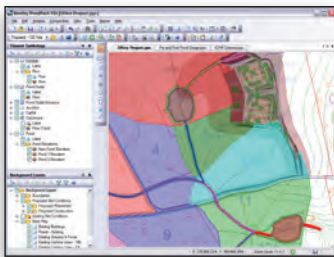
Both PondPack stand-alone and PondPack for AutoCAD versions include a stand-alone interface and can run in MicroStation® or PowerCivil for enhanced stormwater-civil workflows. PondPack for AutoCAD can also be run in AutoCAD.

Simple Step-by-Step Pond and Outlet Design

PondPack® PondMaker® guides users through the pond design process by providing an easy step-by-step interface that gives them constant feedback on how the design is progressing. Engineers can explicitly set the allowable pond outflow rate, or let PondMaker automatically apply pre-developed conditions for multiple storm events. PondMaker also assists by keeping track of information such as target outflows, pond volume estimates, outlet structure design trials, peak pond outflows, and maximum water surface elevations for multiple storm events and/or multiple ponds.

Comprehensive Scenario Management

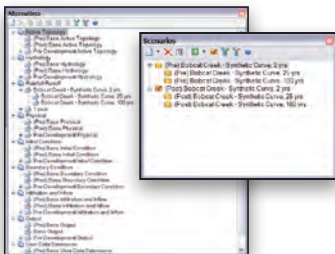
The Scenario Management Center in PondPack gives engineers full control to configure, run, evaluate, visualize, and compare an unlimited number of scenarios within a single file. Engineers can easily make decisions by comparing alternative designs for a variety of storm events and system conditions (including pre- and post-development).



PondPack's new graphical user interface provides the option to model your systems in a scaled environment.



PondPack can run on any of 4 different platforms: Stand-Alone, MicroStation, PowerCivil, and AutoCAD.



Store all of your different "what-if" scenarios in one PondPack file using the new Scenario Management feature.

Hydrology

PondPack handles an unlimited number of synthetic or real storm events of any duration or distribution. Choose from a number of standard and regionalized methods such as: SCS 24-hour Type I, IA, II, and III rainfall distributions, Bulletin 70 and 71 rainfall distribution data for the Midwest U.S., gauged rainfall data, rainfall curves created from I-D-F data, I-D-F curves, and more.

SYSTEM REQUIREMENTS

Processor: Per minimum operating system requirements

Operating System: Windows Vista, Windows Vista x64, Windows XP (SP2 or later), Windows XP x64, Windows Server 2003 (SP1 or later), Windows Server 2003 x64, Windows Server 2008, Windows Server 2008 x64

Memory: Per minimum operating system requirements

Hard Disk: 300 MB of free storage space, with additional room for data files

Display: 800 x 600 resolution, 256 colors

Software pre-requisite: Microsoft .NET Framework (Installer will attempt to download and install this prerequisite if it is not present during installation)

Platform pre-requirements: PondPack runs without platform restrictions using the stand-alone interface. If integration with CAD platforms is desired, these are the requirements: MicroStation V8i, AutoCAD 2009 and 2010, PowerCivil V8i.

ABOUT BENTLEY

Bentley Systems, Incorporated is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Architects, engineers, constructors, and owner-operators are indispensable in improving our world and our quality of life; the company's mission is to improve the performance of their projects and of the assets they design, build, and operate. Bentley sustains the infrastructure professions by helping to leverage information technology, learning, best practices, and global collaboration – and by promoting careers devoted to this crucial work.

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PONDPACK AT-A-GLANCE

Interface and Graphical Editing

- Stand-alone Windows interface
- Runs in MicroStation (MicroStation license required)
- Runs in PowerCivil (PowerCivil license required)
- Runs in AutoCAD (AutoCAD and PondPack for AutoCAD required)
- Unlimited undo and redo
- Element morphing, splitting, and reconnection
- Automatic element labeling
- Scaled, schematic, and hybrid environments
- Element prototypes
- Dynamic zooming
- Aerial and Named view
- Image, CAD, and GIS background layer support

Model Building

- Single set of model files for four compatible platforms
- Bidirectional synchronized Shapefile, database, spreadsheet, and ODBC connections
- Polyline-to-pipe connections from DXF and DWG files
- Oracle Locator/Spatial data connections
- InRoads/PowerCivil import/export (pond elevation-volume data)
- GIS-ID property (maintain associations between records in source file and elements in a model)

Model Management

- Unlimited scenarios and alternatives
- Scenario management
- Active topology (activate or deactivate network elements)
- Tabular reports with global editing, sorting, and filtering
- Dynamic (query based) and static selection sets
- Element selection by polygon
- Element selection inversion
- Table opening on selection
- Engineering-units management
- Drawing review tools
- Automatic topology review
- Network navigator
- Orphaned node and dead-end pipe queries
- Hyperlinks for network elements
- User-data extensions
- ProjectWise® integration (including engineering libraries)

- Customized engineering libraries for: conduit, curve number (CN), culvert inlet coefficient, rainfall curve, material, Q/Qp template, unit hydrograph, storage chamber, storm event, vortex valve, weir depth coefficient, weir submergence
- Import of PondPack V8 engineering library data (*.plb) files
- Import of PondPack V9 and V10 engineering library data (*.plb) files
- Import of PondPack V10 data management center (*.plb) files
- Submodel import/export

Presentation of Results

- Report Builder: per element, all elements, index, summary
- Thematic mapping
- Dynamic, multi-parameter, and multi-scenario graphing
- Advanced tabular reporting with FlexTables®
- Property-based color coding, annotation, and symbology
- DXF export
- Scaled print of network view

PondMaker: Pond Outlet Design

- Automatic update of worksheet containing design data for multiple design trials of a single pond
- Multiple pond designs possible
- Establishment of maximum outflow rates (pre-development or user-defined flows)
- Post-development pond inflows computation
- Pond size requirements estimation
- Pond geometry design (grading plan or underground storage).
- Outlet structure design
- Pre- and post-development peak flow and volume comparison
- Hydrograph routing through ponds

Hydraulics and calculators

- Underground detention chambers (including data from CULTEC)
- Vortex valves (including data from Hydro International)
- Calculators: first flush, estimated storage (overlay hydrographs), minimum drain time, estimate storage (rational method QPeak), estimated storage (peak flows), TR-55 tabular method, TR-55 graphical peak and storage, SCS CN volume
- Channel types: circular, rectangular, trapezoidal, parabolic, irregular

- Routing methods – *For channels:* modified Puls, Muskingum, translation. *For ponds:* level pond routing, interconnected ponds
- Outlet types: user-defined rating, culvert (box, circular), stand pipe, inlet box, circular orifice, orifice area, weir (rectangular, V-notched, irregular), vortex valve
- Water quality: first flush volume, minimum drain time, detention time estimation

Hydrology

- Unlimited number of return events, using SCS 24-hour Type I, IA, II, & III rainfall distributions, Bulletin 70 and 71 rainfall distribution data for the Midwest U.S., Gauged rainfall data, I-D-F curves
- Rainfall data input: dimensionless curves with total depth, time-depth curves, user-defined Intensity-Duration-Frequency (IDF) table, IDF curve equation
- Time of concentration methods: user-defined, Carter, Eagleson, Espey/Winslow, Federal Aviation Agency, Kerby/Hathaway, Kirpich (PA), Kirpich (TN), length and velocity, SCS lag, TR-55 sheet flow, TR-55 shallow concentrated flow, TR-55 channel flow
- Peak flow & hydrograph methods: SCS graphical peak discharge method, rational method, SCS unit hydrograph method, modified rational method, Santa Barbara urban hydrograph, user-defined unit hydrograph, user-defined hydrograph.

