

# GEOPAK® CIVIL ENGINEERING SUITE

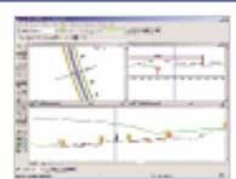
The **v8** Generation



The suite handles transportation projects of any scope.



Project Manager steps you through the roadway design workflow.



A 3-Port Viewer allows you to work simultaneously in plan, profile and cross section files.

## A comprehensive civil engineering solution

Bentley's GEOPAK® Civil Engineering Suite offers a powerful and flexible suite of integrated tools for field-to-finish design of transportation and civil infrastructure projects. The suite comprises interactive modules for surveying and design of roads, sites, drainage networks, water and sewer systems, as well as for bridge design and analysis. Supporting true interdisciplinary design, the software enables a distributed team to work interactively in real time on a central road or site plan.

Seamless exchange of data, from survey crews to the designer and project manager, translates to a better, more accurate deliverable for the client and the public. GEOPAK Civil Engineering Suite can handle virtually any design circumstance. Using the suite's flexible, customizable options, you can evaluate design alternatives – even during conceptual phases – to arrive at a better, more cost-effective design in less time.

### Easily Managed Workflow

The suite gives you the technology to easily manage your entire project workflow. The Project Manager interface assists you with tracking project files, recording project histories and saving design project settings. Project Manager virtually steps you through the design process and populates repetitive design data for you automatically. Organized in a real-world project workflow, the interface lets you retrieve tools at the appropriate step in the design process. From a single dialog, you can manage existing ground sections and profiles, proposed alignments, cross sections, earthworks and reporting. By saving an exact history of the project, Project Manager enables engineers to share work and quickly recall projects at any time.

A unique 3-Port Viewer interactively synchronizes your work in three separate files or views: plan, profile and cross section. This eliminates the need to switch between files for review of the design results in multiple drawings. For example, you can preview the right-of-way impacts from the cut and fill slopes in plan view, while assessing the earthwork impact in cross section view.

### Integrated Plans Production

GEOPAK Civil Engineering Suite includes an extensive set of plans production tools for annotating, labeling, sheet composition and tabular arrangements for plan, profile and cross section sheets. These tools are common to all modules included in the suite to eliminate inconsistencies between discipline-specific activities. Accurate information is extracted from a common geometry database that can be accessed from all modules by multiple users. To ensure consistency and conform to design standards, the software draws design features according to user-defined symbology used by the entire project team. Additionally, you can generate construction quantities from these graphics and transfer the quantities to programs such as AASHTO Trans\*port software for a comprehensive project estimate.

### Design Standardization

You can choose from multiple options for standardizing your production results. Each module utilizes a discipline-specific database and preference files for customizing your design output. Customizable

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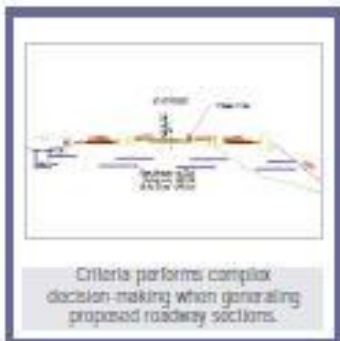
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feature management ensures field surveys are consistent with each deliverable as your company determines the method for representing existing conditions. This takes the guesswork out of recognizing features such as waterlines or utility structures when reviewing data delivered from the field.

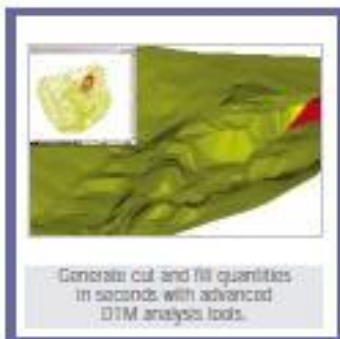
The Design and Computation Manager ensures that your implementation of consistent drafting standards will result in accurate project quantity calculations, improving the quality of your project deliverable. You can place design features using custom-defined symbology and automatically compute an accurate estimate of construction costs at any phase of the project. You have the flexibility to define methods for computing pavement quantities and customize the inclusion of tabular data on plan sheets. The suite delivers a set of sample files to assist you in a quick startup; all are completely modifiable.

### Intelligent Roadway Design



GEOPAK Civil Engineering Suite offers powerful tools for developing any roadway design, from the most complex interchange designs to basic subdivision roads. You can develop corridor studies, as well as simple roadway designs, with the composite section tool in the software's Site™ module. Intersections and roundabouts are designed with minimal effort as well, as you can interactively develop edges of pavements, quickly determine the impacts and validate your design decisions in real time. The software produces highly accurate results when generating slope limits, balancing earthworks and calculating project quantities.

Advanced Criteria routines allow for complex decision-making to be accomplished in a single process while producing proposed cross sections. The user-customizable routines enable you to address a limitless array of practical uses, from controlling standard placement of design features—such as curbs, guardrails and retaining walls—to analyzing existing conditions and automatically making design decisions. Criteria can draw complex roadways and adjoining structures according to your predefined standards—greatly improving productivity and accuracy of design.



A 3-Port Criteria application extends the traditional design process into a threefold approach. As you create your proposed design in plan, profile or cross section files, the design feature automatically draws in all three files. For example, a ditch grade can be generated in profile view from the proposed cross section as it is being created and, simultaneously slope limits are drawn into plan view. All impacts of a proposed roadway section are viewed at one time in the 3-Port Viewer mode.

### Field-to-Finish Integration

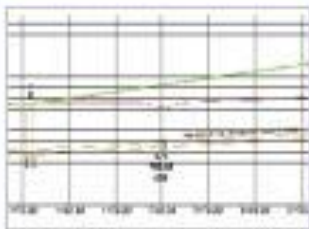
The suite allows for complete field-to-finish project integration. With survey data management, site development tools, complex roadway design capability, bridge design and analysis functions and more, all modules communicate with one another seamlessly. An all-inclusive package of design tools allows you to handle any design circumstance without translating data, adjusting your preferred workflows, or modifying your current deliverables. You control all output whether it is topo display, plan sheet appearance, quantity calculation methods or construction stakeout format. Intelligent associativity between design disciplines removes risk of error and ensures consistent, accurate plan production—actually improving constructability of your project.



A full set of plans production tools enables you to create construction-ready plan sets with ease.



The suite includes tools for producing proposed models of your design.



Perform conflict checking between storm sewer and wastewater designs during layout.

## GEOPAK CIVIL ENGINEERING SUITE AT-A-GLANCE

### Digital Terrain Modelling

- Generated from survey data, ASCII files, MicroStation® 2D/3D graphics and digital elevation maps
- Creates triangles, lattices, building pads
- Dynamic, visual editing tools
- Extensive analysis tools include slope and elevations, drainage tools, visibility and a new surface navigation camera
- Export DTM to construction support for Trimble DTX, Trimble TTM and Leica GSI

### Geometry

- Coordinate geometry module supports command-line and graphical tools
- Graphical and element-based Horizontal Alignment Generator
- Unlimited storage of geometric elements
- Automated Subdivision Wizard for lot layout
- Advanced legal description editing functions

### Cross Sections

- Generation of existing sections from surfaces, tabular data or station-offset-elevation (SOE)
- Generation of sections at user defined intervals, offsets and skews
- Computation of superelevation by methods including AASHTO Method 5, user equation, or radius tables
- Development of proposed pavement surfaces with intelligent superelevated shape elements
- Use of criteria to generate extensive proposed design of cross section features
- 3-Port Criteria functionality for designing in plan, profile and cross section view simultaneously
- Extensive reporting capabilities and analysis tools

### Earthworks

- Generated directly from graphical cross section elements for end-area calculations
- Support of surface-to-surface and surface-to-plane computations from existing and proposed models is included
- Generation of multiple material types in a single process
- Balance points and centroid adjustments
- Generation of mass diagrams, as well as overhaul calculations
- Support of calculations for project phasing

### Plans Production

- Plan and profile sheet composition capability
- Cross section sheet composition functionality
- Support for raster images in final construction plan sheets
- Extensive plan/profile and cross section labeling tools
- Profile generation for single and multiple surfaces and with tabular data

### Design & Computation Manager

- User-definable graphic display of design features
- Instantaneous generation of quantities from design graphics
- Support for variable computational units within single project
- Pavement marking functionality
- Construction quantity export to AASHTO Trans\*port software

### Geotechnical

- Import support for CSV and Microsoft® Access database file types
- Display borehole data in plan, profile, cross section and 3D views
- Subsurface determination of material types
- User-definable preferences for graphic representation of boring data

### 3D Modeling

- Model proposed designs from cross sections and surface models
- Drive through functionality at user-defined settings
- Passing site distance calculations allowed with ability to draw striping, create reports and draw or display sight lines

### Drainage

- Storm sewer design
- Culvert design
- Routing capabilities
- Complete user-definable drainage library for localized design
- Global editing capabilities
- Reporting and computation functionality



Bentley's image manager tools offer a visual approach to evaluating design alternatives.



Automate parcel layout with the Subdivision Wizard and generate legal descriptions.

### Water & Sewer Layout and Analysis

- Water system layout and design tools
- Sewer system layout and design tools
- Seamless integration with drainage module for conflict finding and labeling
- Functionality for inclusion of miscellaneous utilities

### GEOPAK® Site™ \*

- Completely integrated with all suite modules
- Site design with advanced modeling capabilities
- Simple geometry referencing for establishing roadway models
- Composite section generation of roadway features – curbing, sidewalk, etc.
- Dynamic modifications adjust throughout the model
- Accurate roadway models suitable for construction stakeout

### GEOPAK® Bridge™ \*

- Seamless transfer of coordinate geometry elements from all suite modules for bridge design
- Modeling of solid elements via Bentley's SmartSolid® with b-spline curves generated using Parasolid® modeling
- Support of five different deflection methods for deflection analysis
- Generation of surfaces from roadway design integrated seamlessly into the bridge design process
- GEOPAK Bridge report output options include a variety of text file formats, including ASCII and CSV file format

### GEOPAK® Survey™ \*

- Communication with all major data collectors
- Processing of virtually all data sources: Raw, ASCII Station/Offset/Elevation, ASCII XYZ, AASHTO SDMS, Florida EFB
- Adjustment routines include network least squares, transit rule and compass rule
- Extensive feature database support for feature mapping
- Powerful map and chain editing tools
- Support for HPGN, NAD83, NAD27, Lat/Long (all zones)
- Universal Transverse Mercator support for all zones and southern and northern hemisphere

### Integration with Bentley Content Management and Publishing Solutions

- Tight integration with Bentley content management and publishing solutions to bring collaborative design data to the entire project team in a secure environment
- Integration of Digital InterPlot at the production end, enabling automated plot set generation and Web-based access to plot archives

\* For additional feature information, see the *GEOPAK Bridge, GEOPAK Site and GEOPAK Survey brochures*

## GEOPAK CIVIL ENGINEERING SUITE SYSTEM REQUIREMENTS

- Prerequisites: MicroStation® v8.1 or higher
- Processor: Intel® Pentium® 400 Mhz minimum, 500 Mhz recommended
- Operating System: Microsoft® Windows® XP Professional, Microsoft Windows 2000, Microsoft Windows NT® (SP6 recommended)
- Memory: 128 Mb minimum, 256 Mb recommended
- Disk Space: 300 Mb minimum, 500 Mb or more recommended
- Input Device: Mouse

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 Our sales & training staff are Registered Engineers who understand Civil design and plans preparation. We have 20 years of experience using GeoPak, InRoads, MicroStation and Haestad Methods software.  
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