Built-in CAD Capabilities
- Create and edit CAD elements
- Read, write, and reference DGN and DWG files
- Utilize unlimited number of reference files
- Integrate with design history
- Apply digital signatures using industry-standard encryption
- Secure digital rights definition for reviewing, printing, and editing
- Supports multiple raster formats
- Supports PostScript and HPGL2/RTL printing
- Use AccuDraw® and AccuSnap™ navigation tools

Integrated Mapping
- Provides data interoperability
- Browse and analyze data
- Map thematically
- Generate reports

Survey/Data Acquisition
- Read/write standard data formats automatically for:
  - Raw survey data from all major survey equipment
    - 2D/3D CAD graphics
    - ASCII/text data
    - LandXML
    - LiDAR data: ASCII and LAS
    - USGS Digital Elevation Model data
    - Photogrammetric data
    - Raster Files
    - Contour Maps
- Reduce survey data
- Support custom feature coding
- Attach multimedia files such as photo, movie, and audio to any point or linear feature
- Includes least squares adjustments
- Edit survey data graphically and dynamically
- Import and analyze point-cloud data
- Edit survey field book data graphically
- Change instrument setup with automatic updating
- Add, modify, or delete points and linear features
- Change codes and styles
- Upload to data collectors for construction stakeout
- Merge surfaces automatically
- Update surface data dynamically

Terrain Model Creation
- Create terrain model
- Create by graphical filter
- Import ASCII/text data
- Import 3D graphical data
- Import standard data formats automatically
- Import point-cloud data
- Import LandXML files
- Import LiDAR data: ASCII and LAS
- Import USGS Digital Elevation Model data
- Import aerial data
- Import raster files
- Maintain relationships to source data with complex terrain models
- Ensure intelligent models with terrain model stored as a DGN element
- Ensure correct entry with undo/redo capabilities
- Use across disciplines via reference files
- Customize and standardize displays via element templates

Terrain Model Analysis/Editing
- Create intelligent 3D models
- Model intelligent civil features for ditches, curbs, trees, culverts, etc.
- Pass survey intelligence to 3D model
- Edit context-sensitive intelligent features
- Extend, trim, and intersect features
- Insert, move, and delete vertices
- Delete, partially delete, break, or join features
- Support boundaries, voids, break lines, inferred break lines, and random points
- Manage large LiDAR datasets
- Exclude non-DTM features from triangulation

DTM Analysis
- Generate contours from data points accounting for breaks, random points, voids, edges, and other criteria
- Control maximum length of triangles
- Control density of points on linear features for optimal surface presentation
- Display cut-and-fill delineation
- View and edit feature properties
- Color code display by triangles, slopes, elevation, and aspect
- View slope vectors
- Analyze line of site
- View grided, profiled, and elevation models

Modeling
- Model multiple scenarios
- Edit design visually
- Create models automatically
- Generate material assignments automatically
- Updates of model are dynamic and automatic
- Preserve designer’s intent
- Ensure correct entry with undo/redo capabilities
- Utilize 2D/3D integration
- Use rule-based superlevation
- Use enhanced clipping and point controls
- Target graphical elements
- Utilize dynamic cross sections
- Create reports dynamically
- Generate plan-ready cross sections
- Control component display via rules
- Utilize WYSIWYG features – control display of complex terrain models
- Ensure intelligent models with terrain model stored as a DGN element
- Utilize dynamic cross sections
- Target graphical elements
- Use enhanced clipping and point controls
- Adhere to AASHTO and other regional standards

DGN-based Geometry and Models
- Integrate data with MicroStation and ProjectWise
- Works across references files
- Include other engineering data (e.g. drainage) as referencing it to the DGN model

Interactive Coordinate Geometry
- Use robust, interactive geometry tools
- Create, edit, move, and delete geometry dynamically
- Locate intersection: direction-direction, direction-distance, distance-distance, direction-alignment, distance-alignment, alignment-alignment, station-alignment
- Fit curve
- Traverse: angle, direction, and curve
- Angle resection
- Parallel by element or station range
- Display inverse
- Create right-of-way, lot layout, and cul-de-sac
- Generate geometric transformations
- Create horizontal geometry reports in variety of formats
- Monitor geometry errors and warnings in civil message center

Geometric Design
- Store rules and relationships between geometric elements
- Create horizontal/vertical by PI method or by elements
- Create circular and parabolic vertical curves
- Support complex geometry: SCSCS, SCSS, etc.
- Support tangential and non-tangential curves
- Edit elements associatively and dynamically
- Define curves by radius, degree of curvature, and pass-through points
- Edit, delete, and join elements
Support delta angles greater than 180°
Annotate alignments, stations, and COGO points
Review and report geometry
Annotate dynamically and automatically
Display 3D geometry
Adhere to AASHTO and other regional standards

Profiles and Cross Sections
Create/generate cross sections and profiles along alignments, graphics, or between points
Include drainage structures and utilities in cross sections
Include vertical alignments and existing and proposed surfaces
Apply user-defined annotation of points and segments
Cut cross sections orthogonally or at skew
Create custom cross sections
Update cross sections and profiles
Generate earthwork volumes from cross sections

Typical Sections and Template Libraries
Include components, end conditions, and features
Create components as roadway elements such as lanes, curbs, walls, ditches, barriers
Define parametric components graphically
Apply constraints to components
Place component points as free, partially constrained, or fully constrained
Set constraints as horizontal, vertical, sloped, projected, vectors, offsets, elevations, etc.
Constrain end conditions partially or fully
Set end conditions to trace existing surfaces such as rock
Drag-and-drop assembly of templates from components and end conditions
Perform graphical tests to verify design

Corridor Modeling
Blend horizontal and vertical geometry with 3D topography and typical sections
Assign component control points to existing or designed features and geometry, controlling horizontal and/or vertical location
Assign automatic overrides
View plan, profile, and cross section interactively
Provides heads-up dynamic, interactive parametric design
Manage one or multiple corridors for designs
Transition between disparate templates
Apply superelevation through text tables, customizable standards, or AASHTO standards
Allows dynamic editing of superelevation
Apply exceptions for bridges, voids, and special end conditions
Assists problem resolution through intelligent color coding of transitions, super runout, etc.
Edit stations dynamically
Reflect edits automatically in quantities and volumes

Storm Drainage and Sanitary Sewer Layout and Design
3D modeling
Create 3D drainage model relative to topography and alignments
Place multiple drainage structures along alignments by spacing and offsets
Supports pipes, channels, culverts, manholes, catch basins, and inlets
Creates associative and dynamic model-based designs
Build drainage networks from survey data
Apply any material and coefficient of roughness
Identify graphics as utilities and drape relative to DTM
Display all network and utility objects in sections and profiles
Label all attributions in any view or include in user-defined reports

Design and analysis
Analyze and design using industry-standard theorems such as Mannings, Colebrook-White, Bernouli, and continuity equations
Compute Tc from 3D model or specify
Analyze and design based upon HEC 22, FHWA, HDS 5, 10, 13, and Rational Method
Compute drainage flows using Rational Method or SCS Unit Hydrograph Method
Compute Tc via FAA, Kirpich, or Overland Flow methods
Use demand and demographic tables
Supports infiltration, population, peaking factors and land usage
Compute or specify flows
Generate reports for inclusion in project notebook Define custom intensity-duration frequency tables
Generate drainage queries and reports

Pond routing
Calculate pond volumes
Create input and output hydrographs
Design inlet and outlet control structures

Quantity Management
Automate quantity takeoffs for estimating
Link design to a master pay item list
Report quantities by entire project or delineate by sheets, stations, area, or phase
Access more than 60 formulas
Report on design features and graphic elements
Generate linear, area, and volume quantities
Integrate non-graphic (mobilization, etc.) quantities
Does not require design application or CAD expertise since reporting interface is executed outside of CAD
Apply funding splits and payer rules to quantities
Choose from more than 30 sample reports delivered (includes CSV, HTML, TST, and PDF)
Modify sample reports or create custom reports through XML style sheets

Contract Deliverables
Automate project delivery process with drafting and plan preparation tools
Extract sections, drawings, and reports directly from completed 3D model

Publishing
Export to machine guidance
Support industry standards, such as LandXML
Export alignments, surfaces and other pertinent design information to other systems via XML
Generate PDFs and 3D PDFs
Plot directly from Power GEOPAK
Integrate with Google Earth™
Supports i-model creation (includes 2D and 3D geometry and business data)

Integration with Bentley Content Management and Publishing Solutions
Component-level integration with Bentley™ ProjectWise® for collaborative design and engineering project management
Integration with ProjectWise® InterPlot® for automated plot set generation and web-based access to plot archives
Integration with Bentley® Navigator for design review, construction simulation, or automated clash detection

Visualization
Walk through interactively or along a defined path
Design process produces dynamic 3D models as a by-product
Visualize paths through the project relative to design control by offsets and vehicle speeds
Predefine materials for standard components enabling realistic rendering
Position sun for geographically defined locations to ensure realistic shadow patterns
Animate vehicles in traffic lanes without additional software
Populate 3D objects along linear paths and within designated areas
Apply traffic paint striping plans to the 3D model
Use sample vehicle library and plantings