Image courtesy of Pennoni

OpenBridge® Designer CCK CONNECT Edition
Integrated Modeling, Analysis, and Design of Bridges

OpenBridge Designer CCK is a unique and complete BIM solution for all bridge types from conceptual design to the end of the asset's lifecycle. OpenBridge Designer CCK provides intuitive capabilities for 3D parametric bridge modeling with intelligent objects through a fully integrated modeling, analysis, and design application that produces deliverables derived directly from the models – optimizing bridge constructability and ensuring smooth project delivery. The application integrates the modeling capabilities of OpenBridge Modeler and the analysis and design features of RM Bridge to meet the design and construction needs. OpenBridge Designer CCK provides a unique single data environment, which unifies roadway engineers, bridge engineers, and contractors from the outset of a bridge project through design revisions and beyond. Using this application, engineers can easily relate the up-to-date physical model with the analytical of the bridge. This multi discipline and consolidated view of a bridge project makes evaluating design decisions faster, optimizes analytical solutions, and facilitates identifying constructability issues or conflicts earlier in the workflow.

The CONNECT Edition

The SELECT® CONNECT Edition includes SELECT CONNECT *services,* new Azure-based services that provide comprehensive **learning, mobility,** and **collaboration** benefits to every Bentley application subscriber. *Adaptive Learning Services* helps users master use of Bentley applications through CONNECT Advisor, a new in-application service that provides contextual and personalized learning. *Personal Mobility Services* provides unlimited access to Bentley apps, ensuring users have access to the right project information when and where they need it. *ProjectWise® Connection Services* allow users to securely share application and project information, to manage and resolve issues, and to create, send, and receive transmittals, submittals, and RFIs.

Produce Intelligent Models

OpenBridge Designer CCK produces intelligent, parametric BIM 3D and 4D models rich in engineering content properties for various bridge components. These include concrete compressive strength, structural steel grade, standard beam designations, and more. The application reuses data from various stakeholders thus maintaining relevant and up-to-date geometry and analytical results within a single model. OpenBridge Designer CCK users can also specify the construction sequence and schedule (4D), and view a time-lapse construction animation, as well as perform clash detection with other structures, objects, and underground utilities to eliminate problems before they occur.

Accelerate Performance with All-in-one Bridge Application

Integrated analysis, design, and load-rating functionality come together to provide a unique one-data advanced environment in OpenBridge Designer CCK. It introduces a new and highly productive approach, which every aspect of a bridge design, construction or maintenance project initiates from a physical model, for example the digital twin of the constructed bridge. Using OpenBridge Designer CCK, the analytical model is automatically created from the physical model to perform analysis and design of the bridge, at any time during the design process of the bridge. Any changes made in the physical model are reflected in the analytical model automatically, or vice versa. This direct exchange of project information – including bridge geometry, materials, loads, pre-stressing strand pattern, tendon layout, shear reinforcement, cross-frames, diaphragms, stiffeners, and so on – helps users improve decision making for design and construction while eliminating duplicate data entry during the workflow processes. The resulting information provides a rich BIM data asset for as-built documentation, maintenance, and operations. When combined with Bentley software for user collaboration and project data management, OpenBridge Designer CCK is the ideal solution for professional bridge organizations, construction teams, and bridge owner-operators.

Improve Collaboration

OpenBridge Designer CCK brings various disciplines together for analysis, design, detailing, documentation, construction engineering, and load-rating. The software allows direct referencing of DGN models for highway alignments, profiles, and ground information created with Bentley's OpenRoads and OpenRail applications, as well as LandXML files. If the reference data changes, the parametric and intelligent rule-based bridge model responds to those changes automatically. Engineers can also include within the BIM model geotechnical data with Bentley's gINT®, and store digital information (photos, PDFs, AVIs). OpenBridge Designer CCK also works seamlessly with ProjectWise®, Bentley's platform for connecting people and information across project teams. By using OpenBridge Designer CCK with ProjectWise and Navigator, project team members can continuously share, reuse, and repurpose data, gaining the benefits of real-time collaboration – working across multiple locations and time zones, among numerous contributors, companies, and stakeholders.

Enhance Visualization

Modeling in a 3D environment allows users to rapidly create all the bridge geometry. The bridge can also be viewed in 2D plan, elevation, and cross-section views. Solid and transparent viewing options aid in the exploration of areas with complex geometry. Using the Dynamic View feature allows the creation 2D views of superstructure and substructure components, with annotated dimensions, as preliminary drawings. Users can also specify the construction sequence and schedule and view a time-lapse construction animation and help users rapidly verify vertical and horizontal clearances. OpenBridge Designer CCK offers a companion installation of LumenRT so that users can easily create stunning visualizations.

Improve Deliverables Production

OpenBridge Designer CCK can create annotated 2D plans, elevations, and sections using MicroStation's® Dynamic View feature; generate a variety of deliverables, such as complete bridge geometry reports with deck elevations, beam-seat elevations, material quantities, and cost estimates, which can be used in the evaluation of multiple bridge alternatives. OpenBridge Designer CCK also includes an input Echo report that facilitates the verification of the 3D model, construction sequences, camber diagrams, and well-organized analysis and design reports. OpenBridge Designer CCK, with its seamless interoperability with ProStructures, can be used for detailed rebar designs, including bar marks, schedules, quantities, and drawings.

OpenBridge Designer CCK System At-A-Glance

Ease of Use

- Intelligent graphical user interface
- U.S. customary and metric (SI) units
- Comprehensive 3D physical bridge modeling
- 2D views, with dimensions using Dynamic Views
- User customizable libraries
- Variety of reporting formats
- Intuitive dialogue-driven workflows
- Cross-section template for complex geometry
- Catalog of appurtenances
- Automated bridge creation (ABC wizard)

Intelligent Analysis and Design

- All bridge types, including suspension, cable-stayed and post-tensioned segmental box bridges
- Time-dependent analysis (creep, shrinkage, steel relaxation) and soil-structure interaction analysis
- Advanced geometric and material non-linear analysis
- Construction staging analysis
- Advanced seismic and dynamic analysis — response spectrum, pushover and time-history analysis
- Seismic isolator models
- High-speed rail bridge analysis - rolling stock analysis
- Cable optimization for suspension and cable-stayed bridges
- Erection control and incremental launching features for special construction techniques
- Advanced wind analysis — CFD calculations to simulate wind tunnel tests and sophisticated wind buffeting analysis

Modeling and Visualization Capabilities

- Superstructure and substructure modeling
- All bridge types, including suspension, cable-stayed and post-tensioned segmental box bridge
- Bridge Components:
  » Deck Slab
  » Girders; steel — rolled, built up I-girder or tub-girder, concrete — precast I-girder, box, T-beam
  » Tendons
  » Cables
  » Pylons
  » Abutments
  » Piers: cap, column, footing, piles
  » Variable columns and caps
  » Wing walls
  » Bearings and beam seats
  » Light poles
  » Crash barriers
  » Medians
- Parametric, intelligent bridge components
- Intuitive, dialogue-driven workflows
- Rule-based and constraint-driven modeling
- Clash detection and clearances
- Solid and transparent views
- Lifelike rendering
- Reference roadway information and ground data
- Construction scheduling and animation using Navigator

Versatile Reporting Options

- Deck elevations report
- Beam-seat elevations report
- Material quantities report
- Cost estimate report
- Camber diagram
- Input Echo report
- Formats:
  » PDF
  » HTML
  » Microsoft Word
  » Microsoft Excel

Automated Drawing Generation

- DGN and DWG drawings
- Plan and elevation drawings
- Bridge framing plans
- Precast, prestressed concrete girders
- Piers

Integration with Other Software

- Direct data exchange with MicroStation®, OpenRoads, OpenRail, InspectTech, ProStructures, gINT, and more
- AASHTO BRIDGEWare database
- File formats: DGN, DXF, XML, and LandXML