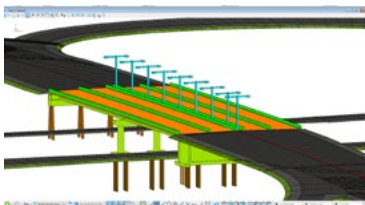
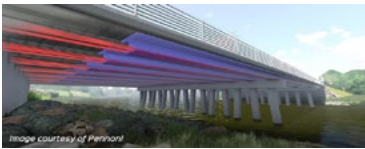


# BETTER BRIDGES BY DESIGN

## OpenBridge Modeler OpenBridge Designer



### OpenBridge Designer

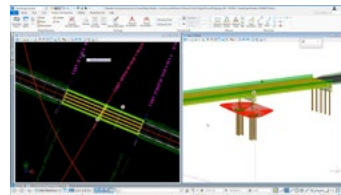


OpenBridge Designer combines modeling, analysis, and design into one dynamic, iterative, and parametrically enabled environment. OpenBridge Designer is the industry leading solution for serious bridge engineers, with the fully integrated

capabilities of Bentley's OpenBridge Modeler, LEAP Bridge Concrete, LEAP Bridge Steel, and RM Bridge. Removing the need to work with a host of independent applications, reduces the time required for data translations, the inevitable lack of interoperability, and the risk of error. Create a true BIM model (physical and analytical models) at the beginning of a bridge project and improve design workflows, project efficiencies, design time, and risk analysis. For any bridge design project, steel or concrete, OpenBridge Designer is the only solution you need.

- Better bridges with true BrIM models
- Accelerate bridge performance using one application
- Create intelligent models, mitigate risks, and perform construction sequence inspections

### OpenBridge Modeler



OpenBridge Modeler is intelligent 3D parametric bridge modeling software. Now, in one program, you can create a true 3D model of a bridge with enhanced visualization not possible with generic 2D CAD programs. 3D modeling removes tedious, repeatable drafting work as it automates workflows

and updates changes throughout the model – saving you time and money. OpenBridge Modeler also includes intelligent bridge objects. Gone is the need to custom code specific bridge objects, simply select what you need from the OpenBridge Modeler library. Integrate with other civil design applications, and unify roadway engineers, bridge engineers, and contractors from the earliest stages of a bridge project through design revisions and beyond. The result: an innovative, collaborative, and efficient project.

- Create intelligent models and easily manage project changes
- Integrate with civil design applications
- Enhance visualization of your bridge project

*“Bentley software guarantees an excellent structural performance in operation and reduces unforeseen adjustments during construction, especially relevant due to the geometrical complexity of segmental bridges.”* – Rui Afonso Tavares, LCW Consult, S.A.

# BRIDGE DESIGN PRODUCT FEATURES

Types of Bridges	OpenBridge Designer	OpenBridge Modeler
Prestressed girder bridge	✓	✓
Steel I-girder bridge - built up and rolled up sections	✓	✓
Steel boxes or tubs	✓	
Cast-in-place postensioned boxes	✓	✓
Integral abutment bridges	✓	✓
Integral abutment and integral piers	✓	✓
Segmental bridge Balanced Cantilever Construction	✓	✓
Segmental bridge Incremental Launched Bridge	✓	
Segmental bridge Span by Span Construction	✓	✓
Cable Stayed Bridge	✓	✓
Suspension Bridge	✓	✓
Spliced girder bridges	✓	✓
Reinforced Concrete Slab and Box Bridges	✓	✓
Truss bridges	✓	
Arch bridges	✓	
Design Codes		
US AASHTO LRFD and LFD codes for design	✓	
US AASHTO LFR and LRFR codes for load rating	✓	
Canadian CHBDC code	✓	
Indian WSD and LSD codes	✓	
U.S. customary units	✓	✓
Metric (SI) units	✓	✓
Additional Design Codes: Eurocode, China, South Korea, Australia (AS5100), Brazil (NBR7187-88), Austria (ON 4700), Malaysia (NS EN), Hong Kong Std, Japan (JIS), New Zealand (NZS), Russia (SNiP), S.Africa (TMH7)	✓	

	OpenBridge Designer	OpenBridge Modeler
<b>Interoperability</b>		
3D BIM model creation	✓	✓
MicroStation platform based	✓	✓
Interoperability between 3D Parametric Physical Model & Analytical Model	✓	✓
Interoperability between Highway Design Software - OpenRoads and others	✓	✓
Interoperability between Steel and Reinforcement Software - ProStructures	✓	✓
Interoperability between Rendering/Visualization Software - LumenRT	✓	✓
Interoperability between Construction planning software: Synchro	✓	✓
3D Analytical models	✓	
Import of roadway geometry	✓	✓
Create custom structural elements for BIM Modeling	✓	✓
Create custom structural elements for analytical modeling	✓	✓
File formats: DGN, DWG, XML and LandXML	✓	✓
ProjectWise compatible	✓	✓
AASHTO BRIDGEWare database	✓	
CONNECT Advisor features	✓	✓
<b>Design</b>		
Prestressed Concrete Design (AASHTO, Eurocode)	✓	
Steel Frame (AASHTO, India, AISC, Taiwan)	✓	
Plate Girder (Eurocode)	✓	
Concrete Frame (AASHTO, Eurocode, BS, Taiwan)	✓	
Design Optimization for steel plates for Steel bridges	✓	
Design Optimization for Field Splices for Steel Bridges	✓	
Irregular Section Design (Eurocode, AASHTO)	✓	
Moving Load (AASHTO LRFD, Standard, PENDOT, Canada, BS, Eurocode, India, Taiwan, China)	✓	
Creep / Shrinkage (CEG-FIP, ACI, PCA, AASHTO, IRC, Eurocode)	✓	
Strut-tie modeling	✓	
Seismic design - Response Spectrum	✓	
Seismic design - Pushover analysis	✓	
Bridge Load Rating (AASHTO)	✓	

	OpenBridge Designer	OpenBridge Modeler
<b>Analysis</b>		
<b>Static Analysis</b>		
Line girder analysis	✓	
Grillage analysis	✓	
Finite Element Analysis	✓	
<b>Dynamic Analysis</b>		
Eigen ( Lanczos) and Ritz vector Analyses	✓	
Response Spectrum Analysis	✓	
Time History Analysis	✓	
Inelastic Time History Analysis	✓	
Beam Element	✓	
Lumped hinge & Distributed hinge	✓	
Automatic calculation of yield strength	✓	
Axial load – biaxial moment interaction	✓	
Fiber model Analysis	✓	
Boundary Nonlinear Dynamic Analysis using Gap, Hook, Damper, Isolator, Hysteretic System	✓	
Pushover Analysis	✓	
Auto Plastic Hinge Definition	✓	
Auto PM Interaction curve for hinge formation	✓	
Obtain Performance point as per FEMA	✓	
Definition of live load vehicles	✓	
Live load distribution factors	✓	
Moving Load Analysis	✓	
Load combinations	✓	
<b>Soil Structure Interaction Analysis</b>		
Settlement Analysis	✓	
<b>Section Definitions</b>		
Section Property Calculator for irregular sections	✓	
Import section drawing from CADD software	✓	
Create composite section with more than 2 parts	✓	
Buckling Analysis	✓	
Wind in Time Domain Analysis	✓	
Wind CFD Analysis	✓	
Hydrodynamic Analysis	✓	
Hybrid Finite Element Analysis	✓	

	OpenBridge Designer	OpenBridge Modeler
<b>Analysis continued</b>		
<b>Heat of Hydration Analysis for Mass Concrete</b>		
Heat of Hydration Analysis for mass concrete	✓	
Convection, Heat Source, Pipe cooling, etc.	✓	
Thermal Stress Analysis	✓	
<b>Material Nonlinear Analysis</b>		
Truss, Plate, Plane stress, Plane strain, Axisymmetric and Solid	✓	
Tresca, von Mises, Mohr Coulomb and Drucker Prager	✓	
Isotropic, kinematic and mixed hardening	✓	
Composite Bridge Analysis	✓	
<b>Construction Stage Analysis</b>		
Unlimited Stages	✓	
Creep, Shrinkage & Modulus of Elasticity	✓	
Tension losses in tendons	✓	
<b>Higher Order Analysis</b>		
P Delta Analysis	✓	
Geometric Nonlinear Analysis	✓	
Large Displacement (Forward / Backward ) Analysis	✓	
Suspension Bridge	✓	
Cable Stayed Bridge	✓	
Floating Bridge	✓	
Cable Tuning	✓	
<b>Rail Track Analysis</b>		
Auto generation wizard of rail track analysis model	✓	
Temperature, acceleration and braking loads	✓	
Rail track structure interaction	✓	
<b>Finite Element Library</b>		
General Beam	✓	
Tapered Beam	✓	
Truss	✓	
Compression Only	✓	
Gap	✓	
Hook	✓	

	OpenBridge Designer	OpenBridge Modeler
<b>Analysis continued</b>		
<b>Finite Element Library</b>		
Mass / Spring / Damper	✓	
Plane Stress	✓	
Plane Strain	✓	
Plate (Thick / Thin, In-plane / Out of plane Thickness & Orthotropic materials)	✓	
Stiffened Plate	✓	
Solid (Hexahedron, Pentahedron, Tetrahedron)	✓	
Rigid Link	✓	
Cable (Equivalent Truss Type)	✓	
Cable (Elastic Catenary Type )	✓	
<b>Reports</b>		
Deck Elevations Report	✓	✓
Beam-Seat Elevations Report	✓	✓
Material Quantities Report	✓	✓
Cost Estimate Report	✓	✓
Camber Diagrams for steel bridges	✓	
Analysis reports: forces, stresses, displacements	✓	
Design code checks reports	✓	
Excavation quantities	✓	✓
Report Customization	✓	
<b>Drawing Generation</b>		
Plan View	✓	✓
Elevation View	✓	✓
Sections	✓	✓
Customization according to CADD Standards	✓	✓
Steel and Rebar Detailing Drawings (interoperability with ProStructures)	✓	✓
Plans and profile sheets generation	✓	✓
DGN and DWG deliverables	✓	✓

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