

**Bentley**<sup>®</sup>  
Advancing Infrastructure

 CONNECT Edition



## OpenRail™ Overhead Line Designer CONNECT Edition

BIM-enabled Rail Electrification Design

Designing rail overhead line infrastructure projects presents unique opportunities and challenges for rail designers and engineers. OpenRail Overhead Line Designer CONNECT Edition combines OpenRail Designer's proven technology with Siemens Sicat Master enabling you to quickly identify the optimum design choice while ensuring you have the necessary data to generate more detailed modeling later in the design stage.

The application's BIM enabled design workflows simplify preliminary and detailed design saving time and money for rail overhead line infrastructure projects of all sizes.

### The CONNECT Edition

The SELECT<sup>®</sup> 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<sup>®</sup> 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.

### Address Industry BIM Requirements

Combining the capabilities of Bentley OpenRail Designer with advanced Siemens Sicat Master overhead line tools, the software handles a wide variety of overhead line electrification design cases, such as long-track segments and

complex yard/station areas and tunnels. Adapting to virtually any rail design and maintenance workflow it is suitable for light rail, metros (transit), heavy rail, and high-speed rail.

Powered by a BIM-enabled MicroStation<sup>®</sup>-based platform, the created models adhere to contemporary asset-centric information management requirements. Underlying CONNECT technology, supporting a connected data environment ensures close collaboration across multidiscipline teams.

### Better Deliverables Faster

OpenRail Overhead Line Designer helps you produce more accurate project deliverables faster. Sophisticated algorithms quickly calculate accurate optimal longitudinal span length for detailed analysis of wire geometry and its interaction with the pantograph range.

It also allows you to select components with precision using static load calculations on poles together with their built-on parts. Moreover, with productivity capabilities like reusable catenary installation blocks, efficient project planning and engineering is ensured.

### A Complete Rail Design Solution

OpenRail Overhead Line Designer contains all the capabilities from OpenRail Designer including detailed railway design, roadway design, site development, sanitary and stormwater network design, subsurface utilities, and construction drawing production.

With built-in Siemens Sicat libraries, OpenRail Overhead Line Designer enables you to effectively manage your project compliance or create your own standards and user-defined libraries with easy-to-use editing functions.



Improve design efficiency and change management with OpenRail Overhead Line Designer to mitigate design automation.



OpenRail Overhead Line Designer addresses BIM project requirements and meets on-time delivery with design standardization.

## Designing in Reality Context

OpenRail Overhead Line Designer excels at data acquisition, enabling users to consume multiple data types to effectively understand site and existing conditions. From photogrammetry and total station surveys to GPS LiDAR, point clouds, and reality meshes, the application can upload, analyze, and manipulate field data, while preserving the source of the original data. The software allows you to rapidly capture the as-built condition of an existing site or asset using Bentley's ContextCapture to quickly produce 3D models from photographs.

## Rapidly Model Design Intent

OpenRail Overhead Line Designer's design intent capabilities help you build associations and relationships among civil elements to ensure the design project is reflective of engineering intent to improve design efficiency.

Rule-based association of overhead line elements assure model consistency. Relationships between components are checked and updates of the affected parts take place automatically, saving time and reducing risk of error. For example, a change in wire location will automatically change the design of the related cantilever assembly.

OpenRail Overhead Line Designer lets you increase productivity by creating and grouping commonly used design elements including catenary block capabilities. Once a detailed overhead line design has been created for one section, it can be saved as a catenary block and applied to different segments of the track.

For track design, civil cells provide a similar functionality. Preconfigured commonly used 2D and 3D geometric layouts, such as siding or yard layouts, can be used repeatedly in designs ensuring standards are implemented, while accelerating design production.

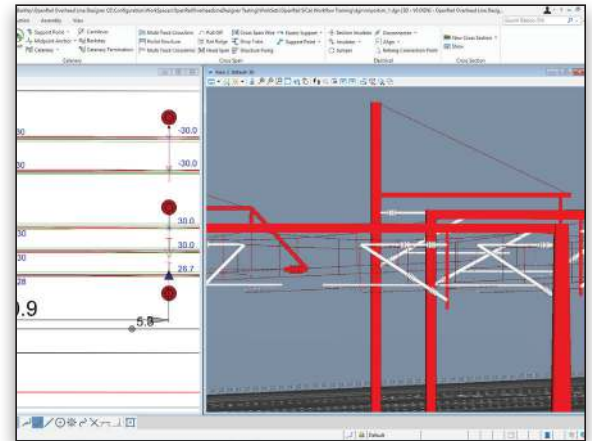
## Integrate Multiple Disciplines

OpenRail Overhead Line Designer provides a comprehensive modeling environment for the project delivery of rail and road networks, unifying design and construction. Users can easily integrate data from different disciplines to improve collaboration and ensure the latest model is used in all phases of the design.



*Save time and reduce tedious manual work. Automate the production of a complete array of design deliverables.*

Working in the live model reduces risk by utilizing the data interactively and working among rail, road, bridge, drainage, subsurface utilities, geotechnical, and other design teams. The interaction among these multidiscipline teams helps identify conflicts earlier and eliminates construction errors and delays. Employing a comprehensive modeling environment allows users to share data that is relevant to the project and to enrich project understanding, identify potential risk, and make more-informed engineering decisions in the design phase.



*Integrate data from a variety of disciplines to improve collaboration in all phases of the design.*

## Adapt to Change

Bentley understands the demands on engineers and designers to produce models that provide information beyond documentation and construction, into operations, maintenance, and rehabilitation and back to design if necessary. Using a model-centric approach, designs are dynamically updated throughout the model, guaranteeing that the current design is readily available for all team members. A federated modeling approach helps you make more-informed decisions earlier in the design process with more complete conceptual designs, while eliminating errors and omissions in the documentation process by having fully synchronized documentation from the model. With OpenRail Overhead Line Designer you can explore and analyze many options to maximize the performance of the asset in the real world, and reuse information to improve construction and operations of the asset.

## Improve Project Deliverables

OpenRail Overhead Line Designer automates the production of a complete array of design deliverables. Flexible, symbolic representation of overhead contact line elements provides detailed 2D layout plans with annotation. Corresponding 3D representation of the structures lets you create high-quality models for your BIM workflows. Detailed cross-section drawings with material lists and dimensions together with material reports can also be obtained directly from the modeled elements. Since all deliverables adhere to the same project standards and come from the same model, you can be confident of your deliverables. OpenRail Overhead Line Designer provides design, volume, and cross-section data in XML industry-standard format for data exchange and reporting. Project data can be used in multiple formats, including Excel spreadsheets, HTML or text files, PDFs, printable documents, and other output. Reporting capabilities automate the production of a variety of standard reports, including horizontal and vertical alignments, quantity takeoffs, clearance reports, stakeout, legal descriptions, surfaces, and more.

## System Requirements

### Processor

Intel® or AMD® processor 1.0 GHz or greater

### Operating System

Windows 10 (64-bit)  
Windows 8 and 8.1 (64-bit)

### Memory

8 GB minimum 16 GB recommended.  
(More memory typically results in better performance)

### Disk Space

9 GB free disk space (which includes the 5.6 GB install footprint for a complete installation)

### Video

See the graphics card manufacturer for latest information on DirectX drivers. 1024 MB of video RAM or higher is recommended

### Screen Resolution

1600 x 1200 or higher

**Find out about Bentley at: [www.bentley.com](http://www.bentley.com)**

### Contact Bentley

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### Global Office Listings

[www.bentley.com/contact](http://www.bentley.com/contact)

## Visualizing Designs

OpenRail Overhead Line Designer lets you experience designs in real time with the software's constraint-driven templates, context sensitive, intuitive interface, and dynamic 3D modeling. Additionally, you can virtually drive through the 3D corridor model.

You can also visually evaluate overhead line structures, rail and sleeper placement, signal sighting, station

designs as well as try out multiple aesthetic treatments to reach the desired result. OpenRail Overhead Line Designer seamlessly integrates with LumenRT to create models and high-impact visuals and animations to effectively communicate the project to stakeholders for project approvals.



*Produce consistent project deliverables from visualizations to drawings.*

## OpenRail Overhead Line Designer At-A-Glance

### Process Data Module

- Material data
  - » Elasticity module
  - » Maximum tensile strength
- Environmental data
  - » Wind velocity
  - » Ice loads
  - » Assembly loads
- Operating conditions
  - » System height
  - » Stagger
  - » Valid pantograph range
  - » Maximum tensile force

### Catenary Design Module

- Pole positioning
- Drawing of catenaries
- Functions for creating, editing, and deleting of overhead contact line elements
  - » Catenary
  - » Attachment points
  - » Poles
  - » Cantilevers, multiple track cantilevers
  - » Tunnel supports
  - » Cross spans and yokes

- » Switches, insulators, connectors, section insulators
- » Traction power lines
- Calculation and check of run of catenaries in dips
- Insertion of section insulations and tension assemblies from an extensive library
- Functions for automatic dimensioning and labeling
- Check of wind deflection
- Rule-based automatic and manual determination of material quantities
- Comfortable track layout-based copy-and-paste function of complex groups of overhead contact line objects

### Plan, Profiles, and Cross Sections

- Flexible, symbolic view of overhead contact line elements (symbol size, customer specific adaption of symbols)
- View of cross sections
  - » Visualization for each pole position
  - » Calculation of structure height and dimensioning
  - » Visualization of structure gauges and standard sections
- Longitudinal profiles
  - » Graphical view of catenary dip
  - » Graphical view of vertical run of feeder and reinforcement lines
- Create plans, profiles, and cross section directly from the 3D model and support federated multidiscipline models
- Automatic user-defined annotation of points and segments
- Additional annotation tools available for one-offs