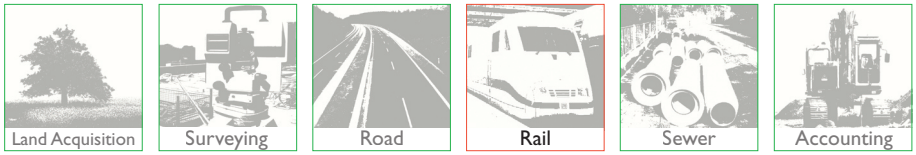
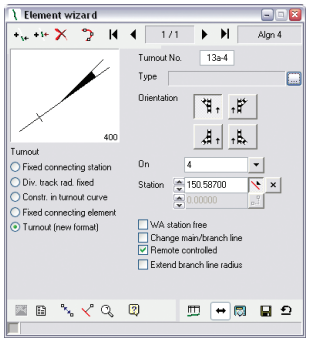
AKG Software Consulting GmbH

Rail



VESTRA®

Civil 3D – CAD – GIS



VESTRA Rail

Binary data compatibility with **Verm.esn** when importing and exporting line data for alignments, profiles, and superelevations

Alignment taking account of any planning constraints that arise

Automatic inclusion of **switches** and track connections in the calculation

Recalculation of all interdependent elements in case of **planning changes**

Calculation of the superelevation taking account of **dynamics parameters** (automatic calculation of standard values)

Modular **cross section design**

Automatic generation of **line and switch elevation plans**

Consideration of national standards, especially in **Germany**, **Austria**, and **Switzerland**

Integration of planning and management into **public transport**

VESTRA Rail, the modern system for track planning and track design, meets all possible railway design requirements – from exchanging data without loss and planning entire track systems to making data available for construction machines. The application takes account of the different national standards for alignment, switch calculation, dynamics, and the clearance gauge. Envelopes can be generated for almost every kind of vehicle. Line and switch elevation plans are drawn automatically as railway-specific documentation for Deutsche Bahn AG. Components from the integrated catalog support the creation of complex cross sections – including the pavement, subgrade, formation, and drainage. VESTRA Rail is the intelligent solution for railway design.

Alignment

The alignment function in VESTRA Rail is one of the most effective methods for defining alignments. Line and track alignments can be designed independently of one another. Incorrect stationings are taken into account. There is a large choice of transition curve forms. You can add switch definitions of your own to the switch libraries for standard switches (DB AG, BOStrab, industrial standard) at any time. You can construct profiles yourself or have them developed graphically/interactively from constraints. Do you need additional profiles for the top of the noise barrier or the drainage ditch? The profile construction function in VESTRA Rail will meet all your needs.

Envelope and clearance

Thanks to its sophisticated technology, the interactive envelope provides a realistic picture of line trafficability. Likewise, it is possible to check whether the required clearance is adhered to when calculating platform edges and planning structures close to the track systems.

Cross section

Simple functions can be used to create standard cross sections. The relevant cross sections can be developed by intelligently controlling station ranges, conditions (e.g. embankment/cutting), and alternatives.

Dynamics

In order to determine the speed-dependent superelevations, the values are calculated automatically in line with the selected set of rules and can then be adapted variably to the project-specific situation (superelevation values, ramp lengths, ramp type).

Visualization

The visualization function allows you to "try out" a line. In built-up areas, this means you can recognize important aspects relevant to the acceptance of a line (especially in public transport), the definition of signal locations, and clarity at junctions and platforms.

VESTRA Rail

designing your way

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Alignment

- Ultramodern element alignment for which, in addition to the straight line, circular arc, and transition curve elements (e.g. spirals, Bloss curves, sinusoids, or cosinusoids), constraints and dependencies are also recorded and changes taken into account automatically
- Comprehensive switch libraries in accordance with European standards such as Ril 800.0120 (defined by DB AG), BOStrab, and the industry standard (VDV)
- User defined switch libraries

Track connections

- Automatic inclusion of track connections in the ground plan and front view
- Track connections using the switches in the switch libraries

Envelope and clearance

- The clearance gauges from the individually extendible catalog allow all relevant calculations (platform edge, tunnel profile, collision controls, etc.).
- Using the envelope calculation for any rail vehicles it is possible to evaluate swept areas in the plan. The vehicles themselves can also be presented in the plan.

Subsequent calculations

- The shunting limit signals of the switches can be calculated, as can intermediate points and alignment intersection points.
- Assignment of the stationing of up lines to a route distance marking line
- Calculation of alignment stakeouts directly from the database
- Constraints analyses for one or more points on an alignment

Alignment annotations

- Alignment presentation and annotation (e.g. alignment main points or switches)
- Output of the PIs of profiles in the plan, the high/low points, and the cross sections in the plan

Profile construction

Graphical/interactive construction of profiles in the long section based on PIs and constraints. In addition to the main profile, other profiles are also possible for the height references in the track, as well as for structures, edge ways, drainage systems, and slopes.

- Calculation of the height differences between two profiles, specifying the maximum deviation and outputting a list

Profile view

- Automatic creation of a profile view. The display and annotation are controlled in a user-friendly manner. Any number of description strings and horizons from all sorts of sources can be output with the data.

Horizon Manager

- Horizons that are important for construction and calculating quantities can be defined as required both in the long section and in the cross section (e.g. soil replacement, good bearing building soil, groundwater level, etc.).

Import and export

- Loss-free data exchange using DB AG's bidirectional binary Verm.esn interface
- CARD/1 interface
- Output interface for direct data forwarding (STRATIS track) to new track trains and tamping machines (ALC)
- Data transfer to the digital field book

Platform edge calculation

- VESTRA Rail allows you to calculate platforms.
- Platforms can also be calculated in curves and transition curves with the aid of the platform profile.

Checks

- Standard values have been defined in VESTRA for the alignment, superelevation, speed, lane widths, track spacing, and clearance.

Track

- Spatial planning of the cross sections by defining the position of the tracks, their lane width, the superelevation, and the respective valid profile, which can be selected separately for each track.
- Definition of the superelevation ramps in a clear graphical interface

Standard cross section

- A wizard develops a standard cross section quickly and easily based on the planning circumstances
- A quantity estimate thus already exists.
- The drainage facilities can be planned immediately.

Cross section construction

- Detailed plans are controlled using catalogs. They range from the integration of platform edges and special slope types to formation design and drainage.
- From the extensive component catalog, the necessary constructions can be selected by mouse-click and special parameters such as the slope grade or ditch width can be set individually.
- Component catalog individually extendible
- Within a cross section it is possible to refer to profiles belonging to your own or other alignments.

Cross section plan

- Output of one or more profiles on a plan
- Individual output of dimensioning strings and annotations
- Optional output of symbols and constraints
- Assignment of structures or drainage lines

Horizon comparison

- Comparison of two horizons or cross section areas and calculation of the deviation (e.g. constructed line/planned line)

Volume calculation

- Quantity calculation in the cross section directly from the database, optionally taking account of the alignment curvature. The result can be output in a list or exported to a spreadsheet analysis.
- Total earth quantity cut and fill based on the cross sections. This mass-haul diagram can be used to optimize the transfer of extension and integration quantities.
- If changes are later made to alignments, profiles, terrain profiles, or the track book, subsequent calculations such as the quantity calculation are updated automatically.

Line plan (track marking plan)

- Automatic creation of line plans in accordance with European standards and user-friendly structure assignment options
- Automatic determination of cross-span suspensions and calculation of long chords followed by transfer to the line plan
- Creation of analyses in the list format of Deutsche Bahn AG

Switch elevation plan

- Automatic calculation of the switch elevation plan in compliance with Deutsche Bahn AG, using the diverging track profile calculated by the program
- User-friendly design and modification of the created plans

System requirements

- **VESTRA Civil 3D** – civil engineering on Autodesk® Civil 3D® (Autodesk)
  or
- **VESTRA CAD** – civil engineering on AutoCAD® / Autodesk Map® 3D (Autodesk)
  or
- **VESTRA GIS** – civil engineering on GeoMedia (Intergraph)

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