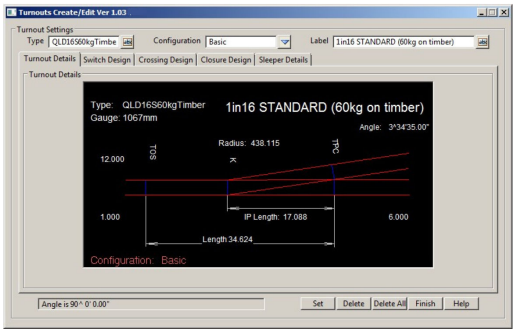
12d version 9 includes Track Design Tools to assist the rail designer in developing alignments and station yard designs.

Turnout Create/Edit

The "Turnout Create/Edit" panel allows the user to enter parameters for turnouts such as Lead Length, IP to Heel Length and Turnout Angle.

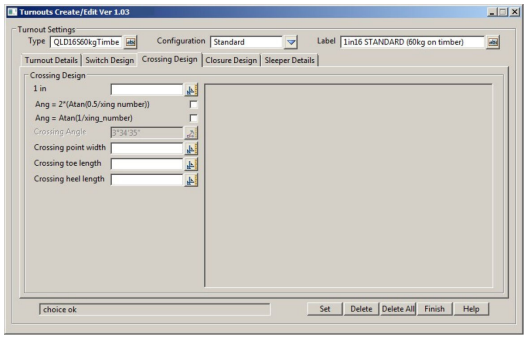
This tool will also be developed to include all special trackwork elements that may be required by a rail designer such as Similarflexure, Contraflexure, Tangential and Dual Gauge



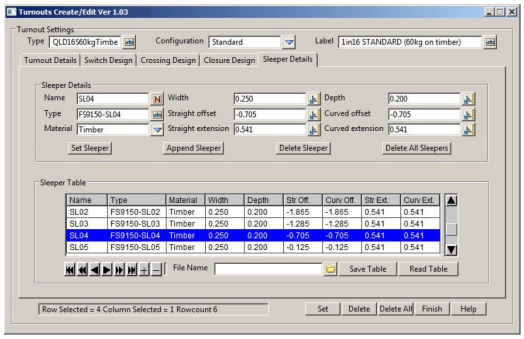
turnouts.

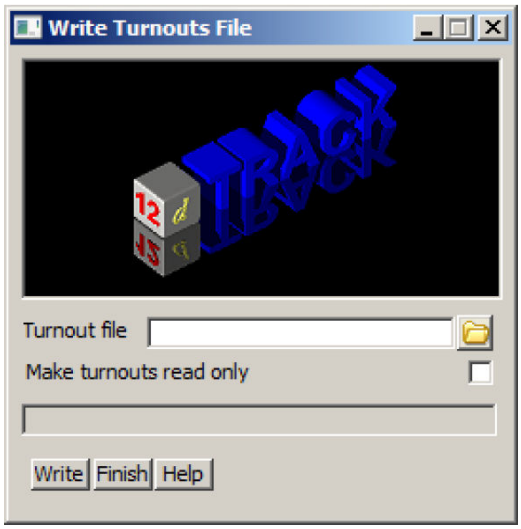
The **"Turnout Place"** panel to setout turnouts along an alignment will then use the parameters entered. The gauge and rail radii are also entered and these can be plotted for visualisation purposes.

Setout tables for sleeper sets can also be added to a turn-



out to allow sleepers to be plotted by setout distances along the stockrails and is useful for visualisation purposes.





Turnout Reader/Writer

Tools for writing turnout parameters to an ASCII file and reading them back in to another project are provided.

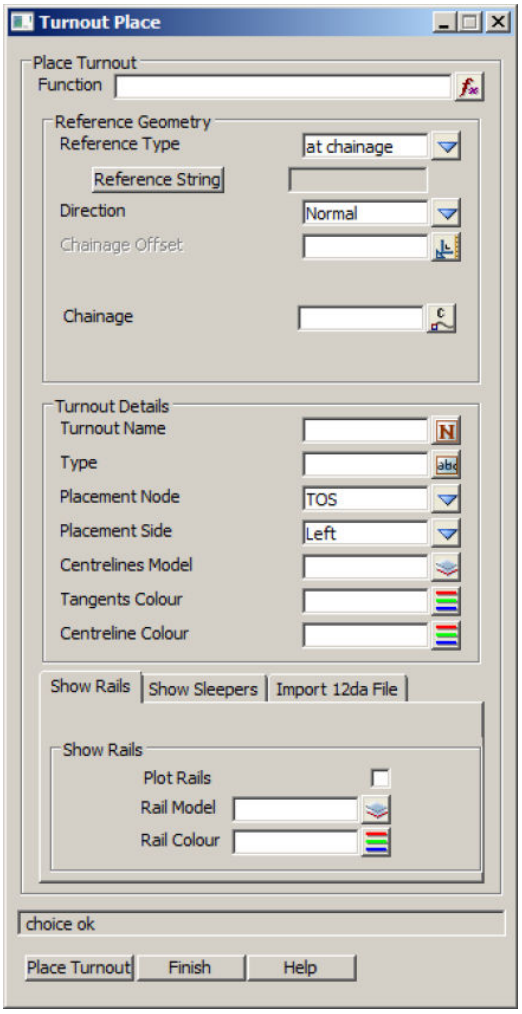
Place Turnouts

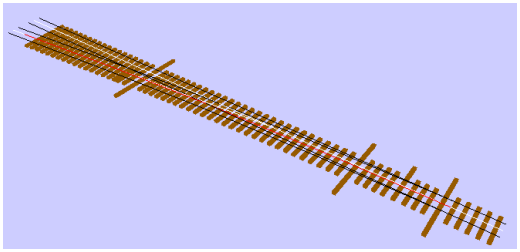
The "Place Turnouts" panel allows the rail designer to place a turnout into an alignment using a 12d function.

The positioning of the turnout is based on the chainage and direction of the turnout and the insertion point can be varied between the TOS, IP or one of the two APC points.

Turnouts can be places by various geometric "Reference" calculations relative to alignments such as "by chainage", "by vertex" and "by dropped point". The turnout is positioned according to the geometric data provided and should an alignment move the turnout will move also.

The "Place Turnouts" option is also able to plot the rails





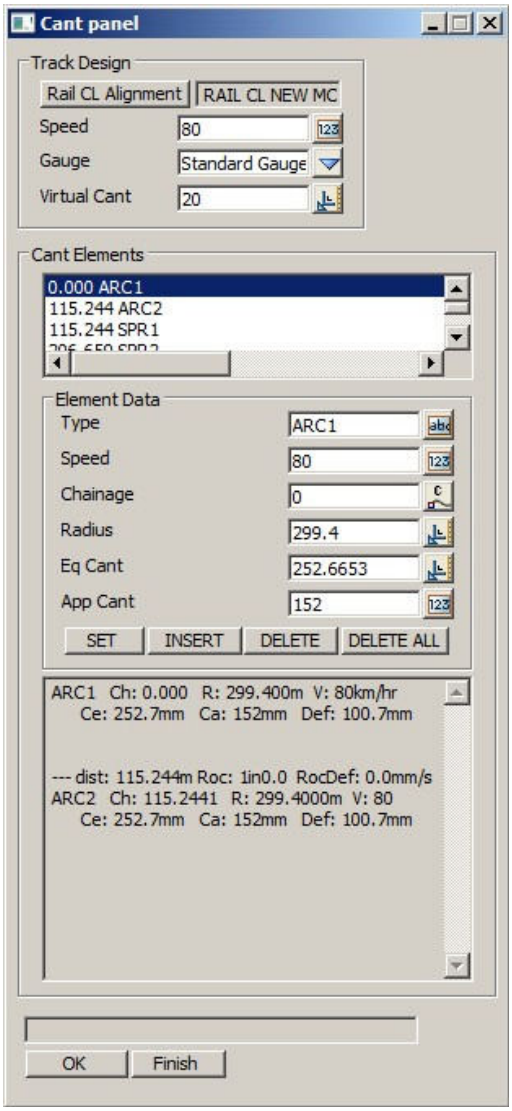
and sleepers for visualisation purposes.

Turnouts placed with functions can be self-positioning using several insertion “nodes” such as “Toe of Switch”, “Intersection point” or on alignment opposite the “Theoretical Crossing point”.

Cant Calculation

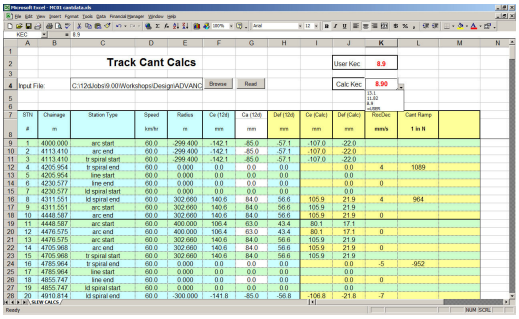
The “Cant Calculator” panel is used to calculate cants along an alignment.

Rate of change of Cant and Cant Deficiency are calculated based on the gauge constants entered into the panel.



Particular curve constants for any gauge can be entered into the panel or one of three typical gauges can be selected.

The data can also be exported to an excel spreadsheet.



Plot Rails

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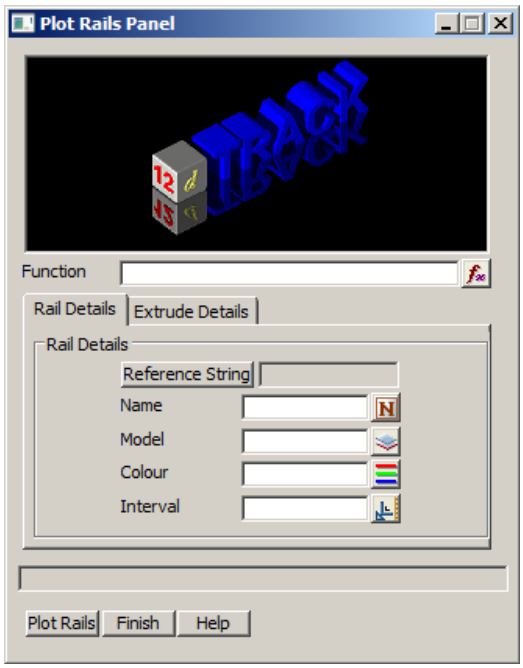
Rails can be plotted using the "Plot Rails" panel. This option uses the cant calculations and gauge to plot the rail levels at a regular interval along the alignment.

Rail extrusion techniques can be used in 12d to produce a visualisation of the project.

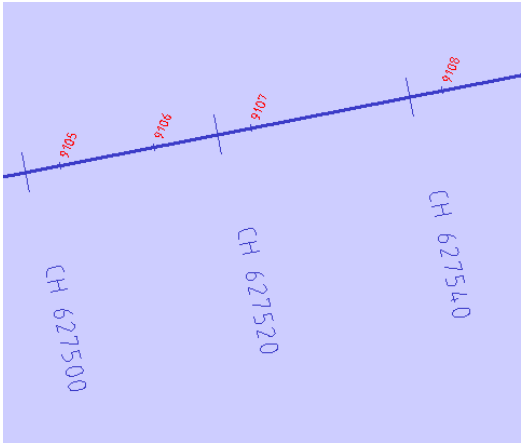
Advanced Rail Alignments



12d alignments also have the ability to be generated by joining elements that are fixed in position or can have various degrees of freedom to float into place relative to adjacent elements whose positions have been resolved based on their own location parameters.

Computated rail alignments are alignments that are positioned relative to other rail alignments.

These alignments have the ability to reposition automatically should the reference alignments move.



In conjunction with the turnout placement tool a group of rail alignments can be generated that are self-calculating based on the choices of turnouts made.

Chainage Equalities

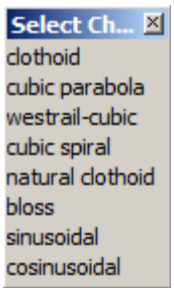
Chainage equalities can be placed at any point along an alignment using several methods of definition.

These can be point equalities at any chainage or offsets calculated from Kilometre posts.

- K-post coord
- K-post chainage
- K-post relative
- Internal equality

Rail Transitions

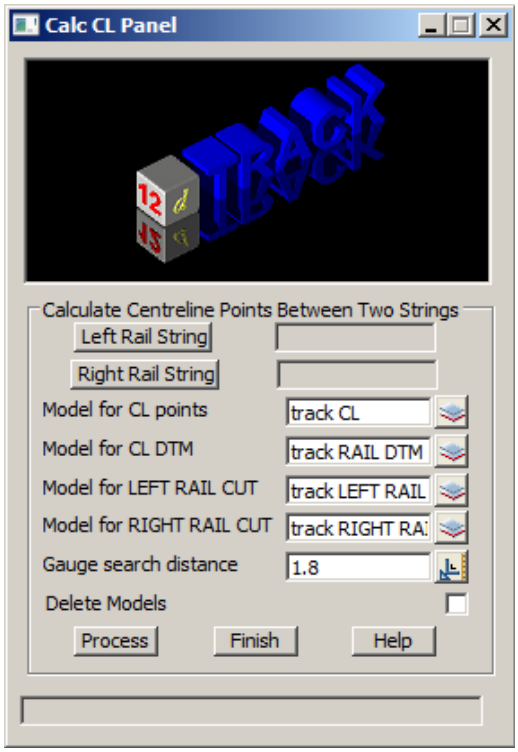
12d calculates various Rail Transition types such as Clothoid, Cubic spiral and Cubic Parabola.



Calculate Centre from Rails

The "Calculate centreline points from rails" panel generates a sequence of points between two surveyed rail strings.

These points can be used to check slew and best fit between alignments generated by 12d and the original surveyed rail alignment.



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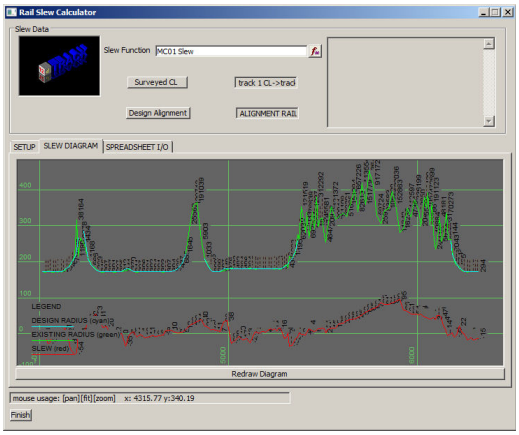
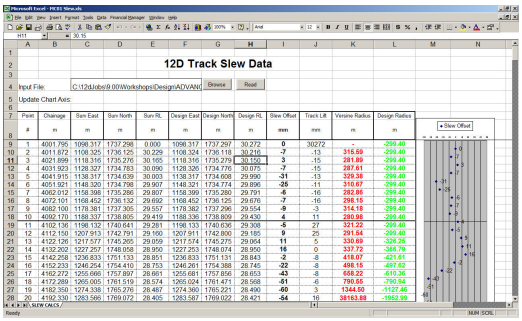
The tool also develops strings across the rails representing the “Low Rail Height”.

These can be viewed in a long section of an alignment to determine the track lift and lower along the alignment.

The “Slew-Calculation” panel also plots the radius at each point based on the versine of surrounding points.





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