

# Memo

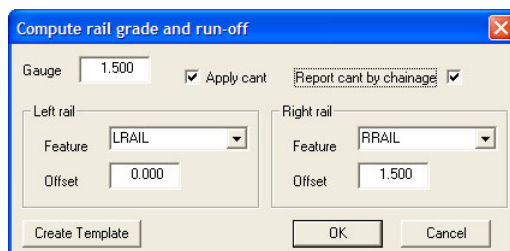
**Date:** 20/08/2010

**Re:** Rail cant computations in SCC 9.10.0

SCC 9.10.0 now includes separate design sheet views for road super elevation and rail cant, and includes low rail cant calculations based on curve directions. This can be demonstrated using the a LandXML file including rail cant, such as **readings.pax.land.xml**. To process this file and check the results, do the following;

- Create a new SCC project
- File / Import / LandXML and pick **readings.pax.land.xml** as the input file.
- To view the cant stations, select **View / Rail Cant**, which will show the following, which agrees with the LandXML values.
- To check the gauge and cant, select **Design / Enter Gauge and compute Cant**. The gauge will have been read in from the LandXML file in this case, so you simply enter the feature names and offsets for left and right rails, as shown in the dialog below.

	Chainage	Cant	Rot
1	9857.035	10.669	CC
2	9864.255	8.661	CC
3	9871.057	8.010	CC
4	9884.879	0.508	CW
5	9892.152	9.086	CW
6	9898.901	19.766	CW
7	9905.943	12.978	CW
8	9912.923	19.845	CW
9	9926.657	19.614	CW
10	9933.803	21.776	CW
11	9940.840	21.292	CW
12	9954.909	16.788	CW
13	9961.805	23.564	CW
14	9968.853	22.139	CW
15	9975.754	29.744	CW
16	9982.833	31.809	CW
17	9989.718	34.964	CW
18	9996.593	31.754	CW
19	9999.818	33.451	CW
20	10004.996	34.120	CW



This option will also produce a report listing the cant stations, and applied cant values on either rail at a regular chainage interval. The chainage interval can be specified using **Design / Interface and export parameters**.

Rail cant check report  
Date: Wed Aug 11 11:54:32 2010

Alignment: base readings.pax

Gauge: 1.500 Left Rail:LRAIL Offset 0.000 Right Rail:RRAIL Offset 1.500

Chainage	CL Height	L.Cant	R.Cant	L.Height	R.Height	Direction
9860.000	99.169	+0.000	+9.844	99.169	99.178	Left (CCW)
9870.000	99.126	+0.000	+8.111	99.126	99.134	Left (CCW)
9880.000	99.077	+0.000	+3.156	99.077	99.080	Left (CCW)
9890.000	99.013	+6.547	+0.000	99.020	99.013	Right (CW)
9900.000	98.938	+18.707	+0.000	98.957	98.938	Right (CW)
9910.000	98.873	+16.969	+0.000	98.890	98.873	Right (CW)
9920.000	98.828	+19.726	+0.000	98.848	98.828	Right (CW)
9930.000	98.778	+20.626	+0.000	98.799	98.778	Right (CW)
9940.000	98.707	+21.350	+0.000	98.728	98.707	Right (CW)
9950.000	98.642	+18.360	+0.000	98.660	98.642	Right (CW)
9960.000	98.598	+21.790	+0.000	98.620	98.598	Right (CW)
9970.000	98.532	+23.403	+0.000	98.556	98.532	Right (CW)
9980.000	98.500	+30.983	+0.000	98.531	98.500	Right (CW)
9990.000	98.482	+34.832	+0.000	98.517	98.482	Right (CW)
10000.000	98.438	+33.475	+0.000	98.472	98.438	Right (CW)

Cant Stations

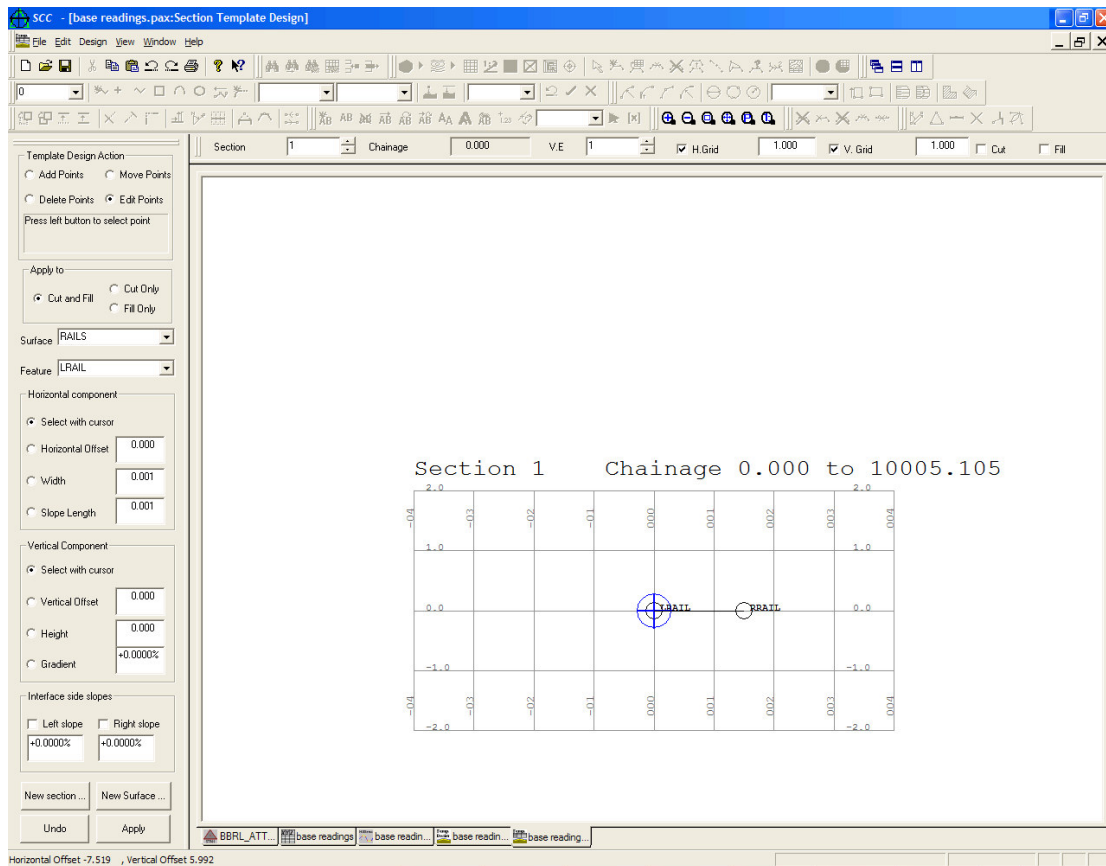
Chainage	Cant	Direction
9857.035	+10.669	Left (CCW)
9864.255	+8.661	Left (CCW)
9871.057	+8.010	Left (CCW)
9884.879	+0.508	Right (CW)
9892.152	+9.086	Right (CW)
9898.901	+19.766	Right (CW)
9905.943	+12.978	Right (CW)
9912.923	+19.845	Right (CW)
9926.657	+19.614	Right (CW)
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9996.593	+31.754	Right (CW)
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10004.996	+34.120	Right (CW)

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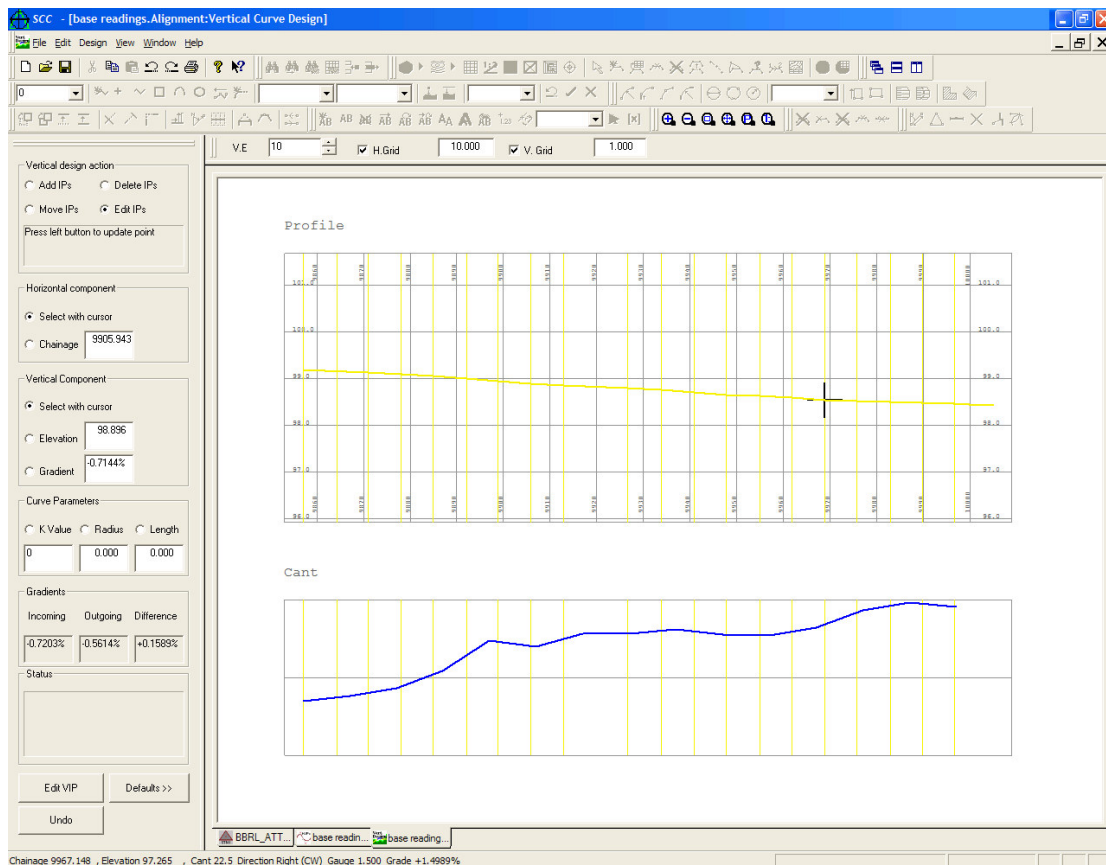
Pressing the create template, will create a simple design template consisting of just the two rails. This can be viewed as a spreadsheet using **View / Section template points**

	Sect	Chainage 1	Chainage 2	Surface	Feature	Str	Hz.Offset	Vt.Offset	Type	Cut	Fill
1	1	0.000	10005.105	RAILS	LRAIL	1	0.000	0.000	Fixed - Both	+0.0000%	+0.0000%
2	1	0.000	10005.105	RAILS	RRAIL	1	1.500	0.000	Fixed - Both	+0.0000%	+0.0000%

or graphically via **Design / Section templates**.



A cant graph can also be viewed with the profile using Design / Vertical design. N.b. use the V/E controls to change the vertical exaggeration.



On the vertical design view, the status bar shows instantaneous cant at the cursor position, along with chainage, profile height, gradient and curve direction.

The cant at a given chainage is linearly interpolated based on the surrounding cant stations. For a given chainage and horizontal offset, if the cant direction is right / clockwise, the cant is given as

$$G = \text{Interpolated cant / gauge}$$
$$C = (\text{Right rail offset} - \text{horizontal offset}) * G$$

If the cant direction is left / ant-clockwise, the cant is given as

$$G = \text{Interpolated cant / gauge}$$
$$C = (\text{horizontal offset} - \text{Left rail offset}) * G$$

The design height for that chainage and offset is calculated as sum of the profile height at that chainage, the vertical offset in the template string point (e.g. 0 for the rails), and the cant as computed above. This is the same for all surfaces in the alignment.