Baseline geometry

Added by Ondrej, last edited by Ondrej on Apr 27, 2010

Tutorial

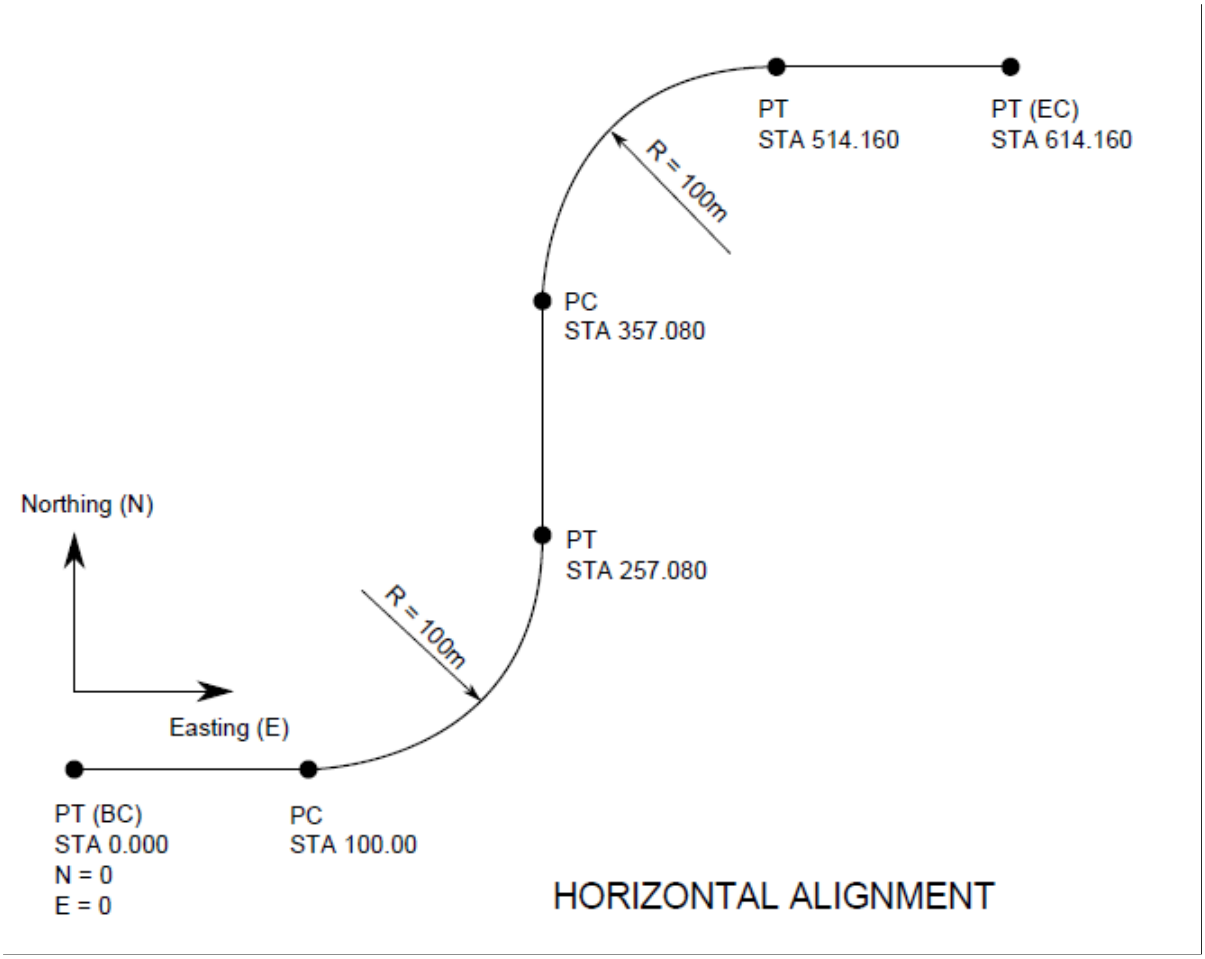
Name:	Baseline geometry
Description:	Guidelines for defining baseline vertical and horizontal geometry.
Program:	SAP2000
Version:	all
Status:	Finalize
Id:	ok/test_problems/baseline

This tutorial explains how horizontal and vertical layout line geometry can be defined in SAP2000. The layout line is broken into a numbe between the transition points (PT - point of tangent, PC - point for curvature, PVT - point of vertical tangent, PVC - point of vertical cur segment is defined using the parameters available in the relevant SAP2000 form.

1. Baseline Geometry

A sample baseline to be entered into SAP2000 is described in the following two sections.

1.1. Horizontal Profile

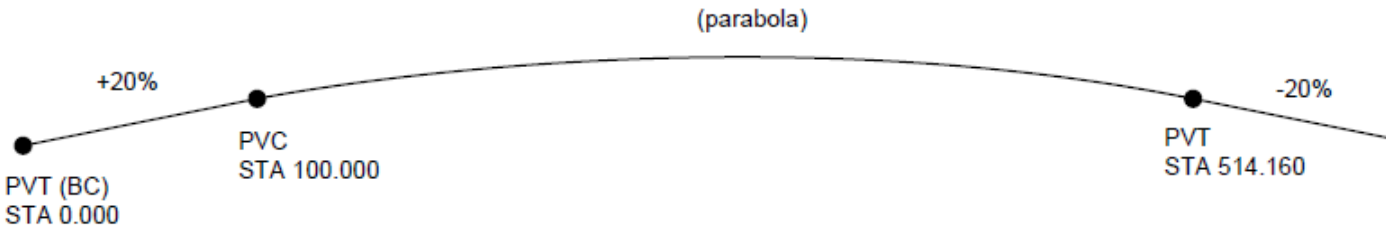


Horizontal Alignment
(all dimensions are in [m] units)

Point No.	Point Type	Station	Northing (N)	Easting (E)
1	PT	0.000	0	0
2	PC	100.000	0	100
3	PT	257.080	100	200
4	PC	357.080	200	200
5	PT	514.160	300	300
6	PT	614.160	300	400

Curve Name	Radius	Northing of Center	Easting Center
C1	100	100	
C2	100	200	

1.2. Vertical Profile



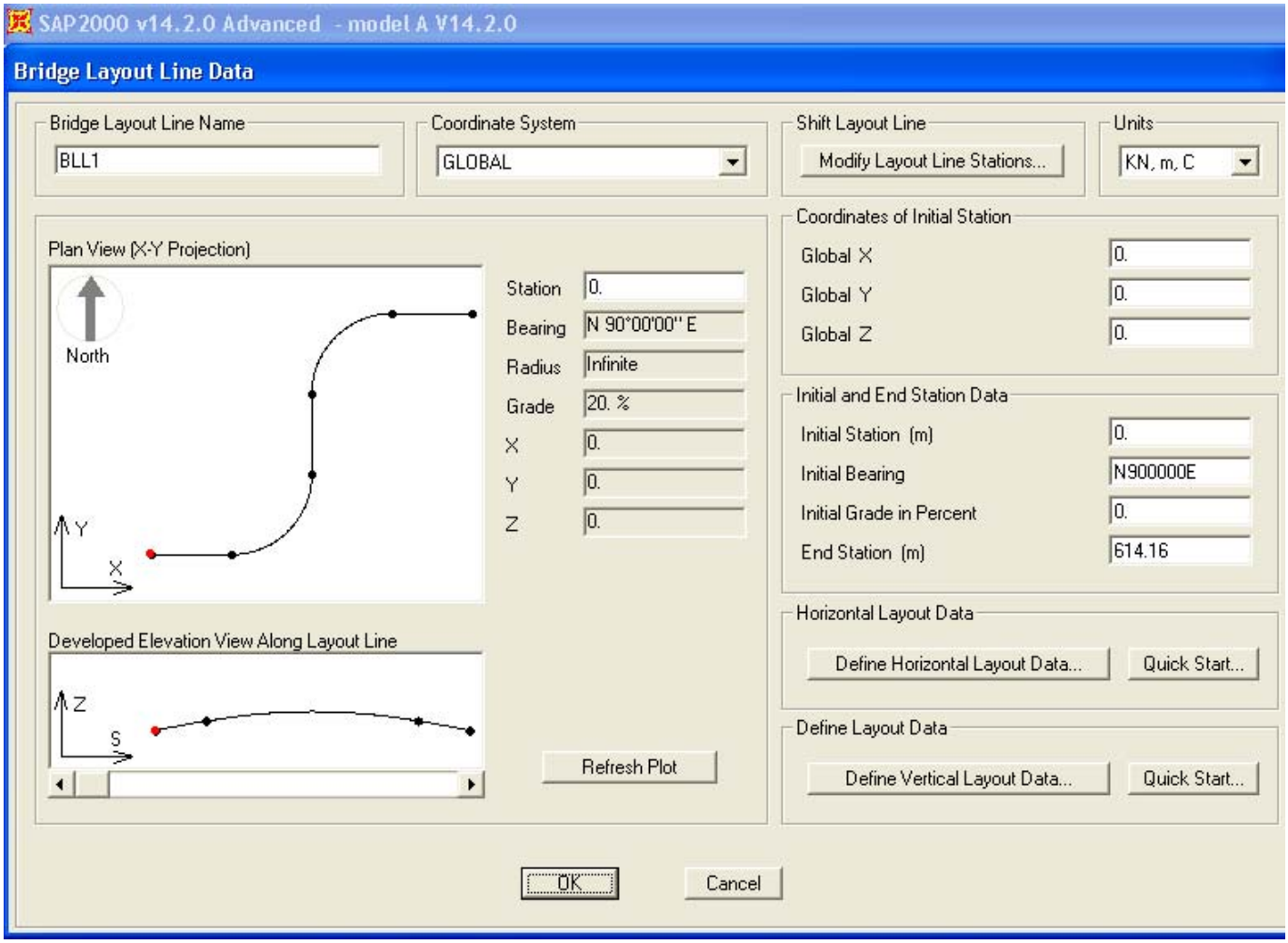
VERTICAL ALIGNMENT

Vertical Profile

(all dimensions are in [m] units)

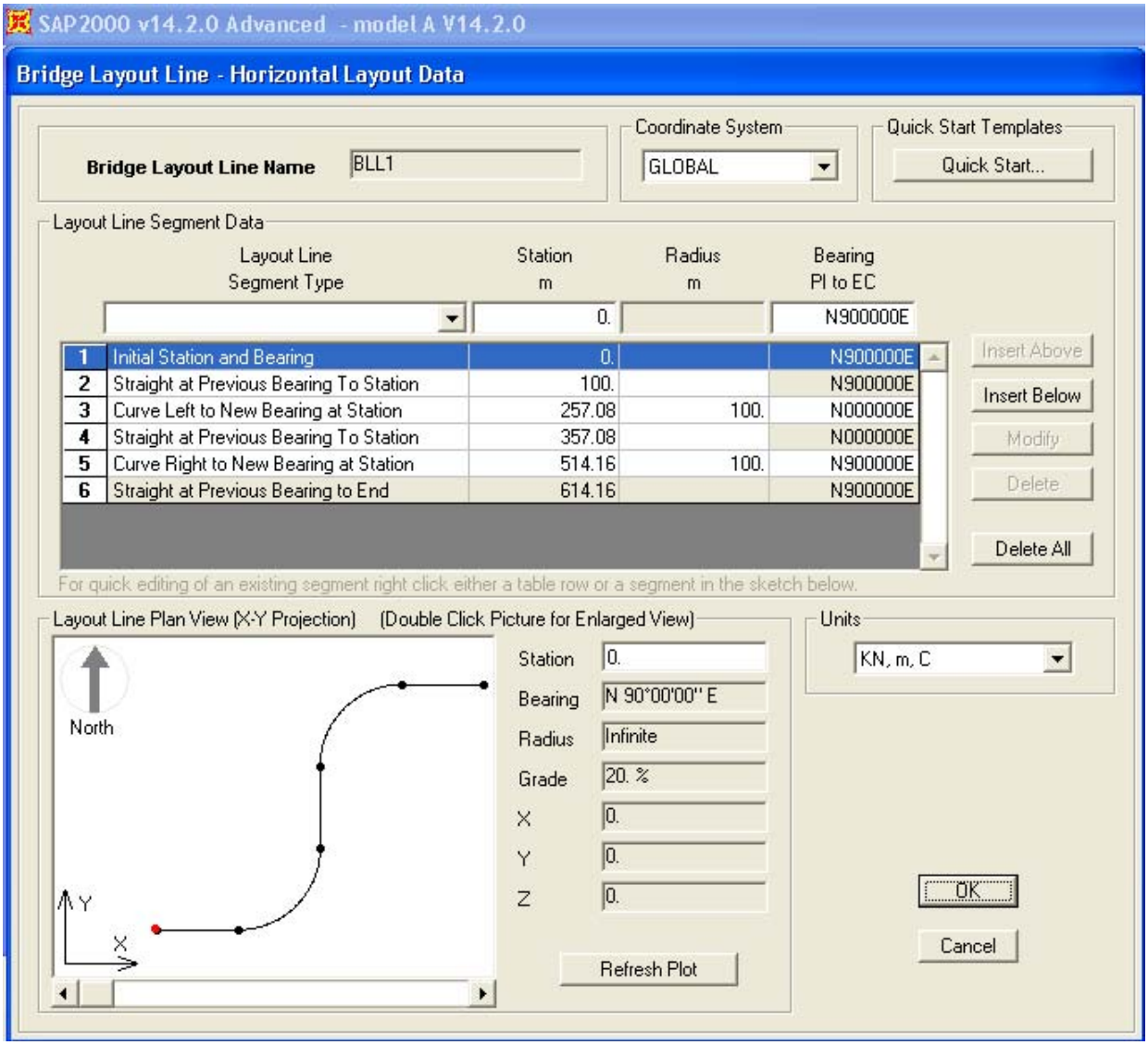
Point No.	Point Type	Station	Elevation	Comment
1	PVT	0	0	
2	PVC	100	20	
3	PVI	307.08	61.42	Elevation of PVI, not point on the curve
4	PVT	514.16	20	
5	PVT	614.16	0	

2. Data to be entered to SAP2000



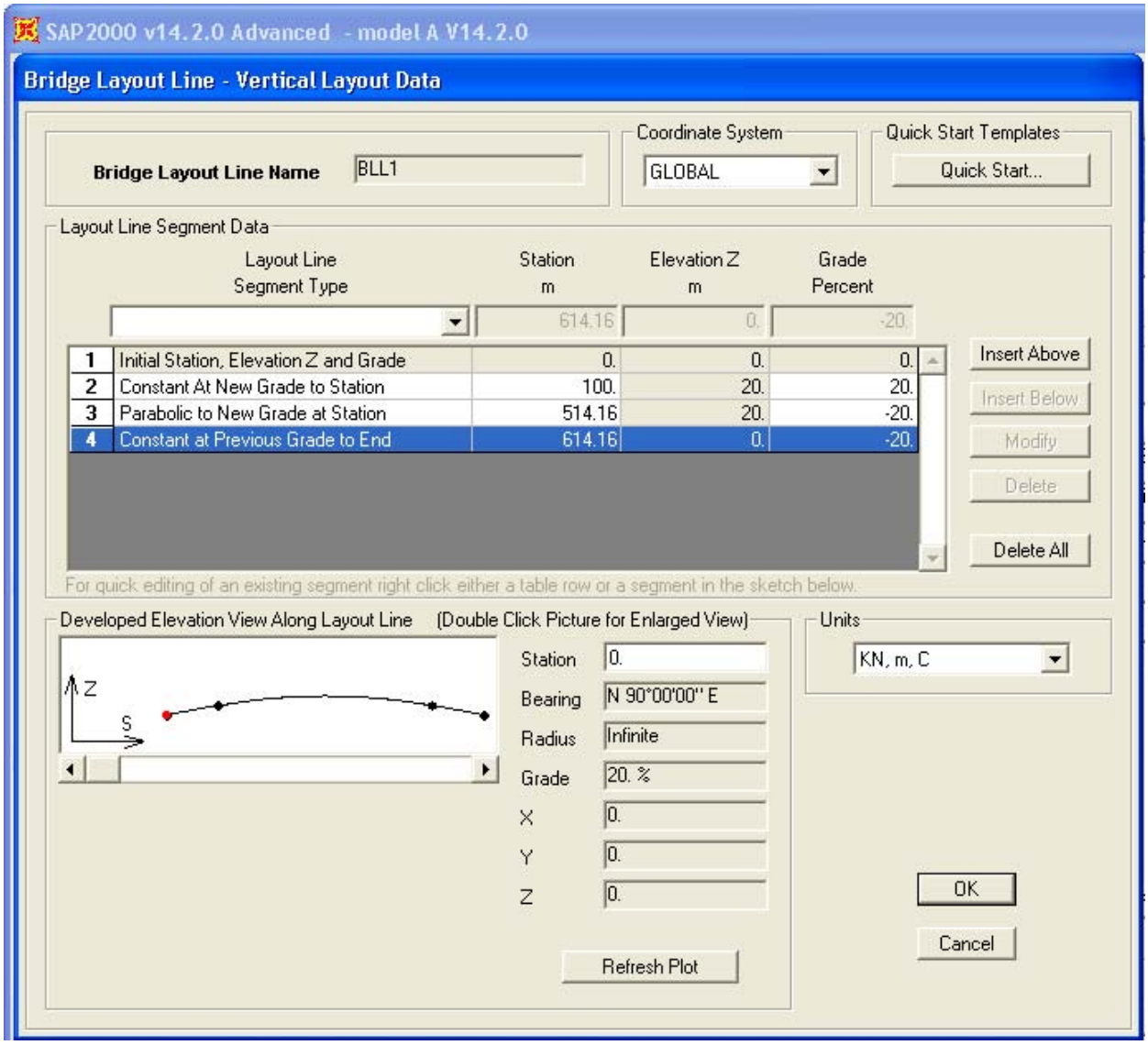
Each row in the SAP2000 table below is used to define one segment of the horizontal alignment as follows:

- The first row indicates that the initial bearing is N 90° 0′ 0″ E.
- The 2nd row defines straight segment, 100m long at the previous bearing, ie. N 90° 0′ 0″ E.
- The 3rd row defines the first curved segment. For our alignment, there are no transition curves as the entire second segment ha 100m. Therefore, we need to enter the end bearing such that it exactly corresponds to the final station for the segment. In gene or the end bearing is sufficient to define a circular curve with constant radius. **If you specify radius and end bearing that do n circular segment with constant curvature, then an arc of the specified constant is centered within the specified statior length is less than the difference in stations, transitions are created of where the curvature varies linearly from 1/R at to zero at the corresponding station end point.**
- The description of the next three rows is similar to the previous rows.



Each row in the SAP2000 table below is used to define one segment of the vertical alignment as follows:

- The first row lists initial elevation and initial grade as entered on the "Bridge Layout Line Data" form.
- The 2nd row defines constant slope (20% segment) up to station 100.
- The 3rd row defines parabolic segment with initial slope +20% and end slope -20%.
- Finally, the 4th row defines constant slope (-20% segment) up to station 614.16.



Labels

layout-line bridge-modeler status-ready-for-review

Printed by Atlassian Confluence 3.1, the Enterprise Wiki.