



Tunnel Design with Bentley InRoads Bentley Rail-Track

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Why use Rail Track in Tunnel design?

Bentley Rail Track provides specialized tools for rail geometry creation and data manipulation

- Turnouts and turnout connections
- Rail regression tools
- Rail Cant Editor
- Tunnel Surface commands
- 3D Modeling using the Roadway Designer



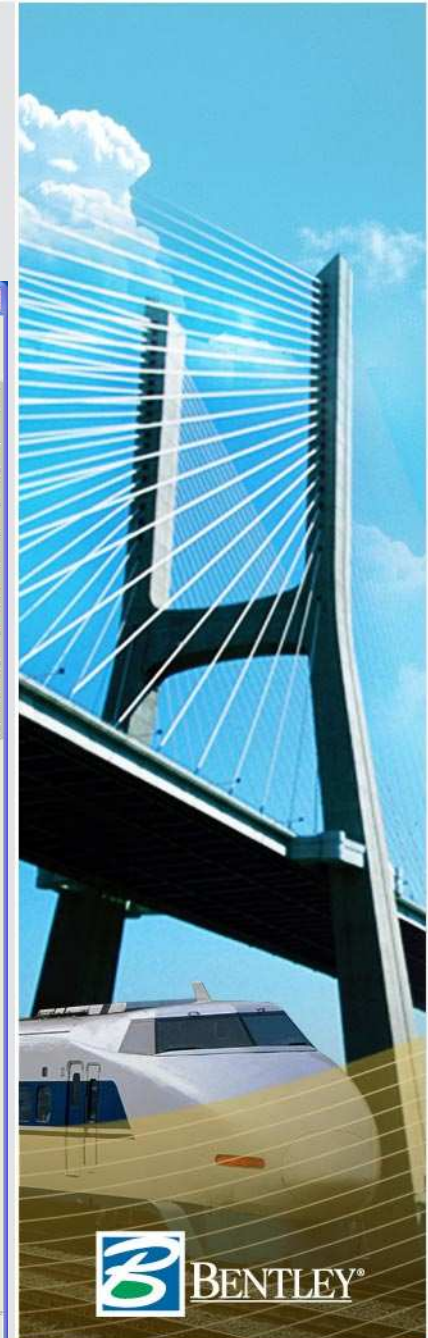
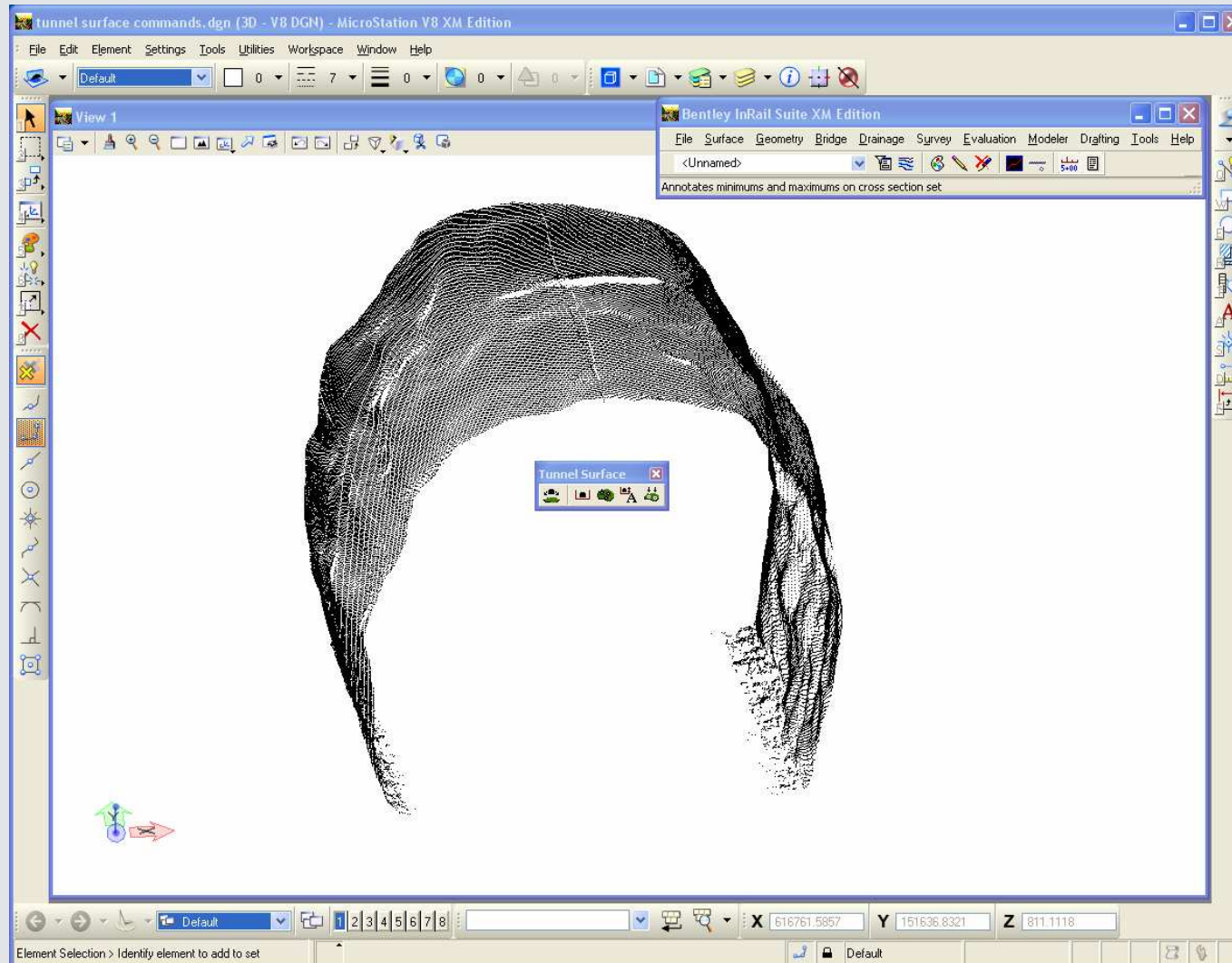
Rail Track Tunnel Surface commands

- Laser scan random point cloud data input
- Flatten Surface Transformation
- Tunnel Cross Sections
- Surface Depression Check
- Cross Section Minimums and Maximums
- Locate Critical Points



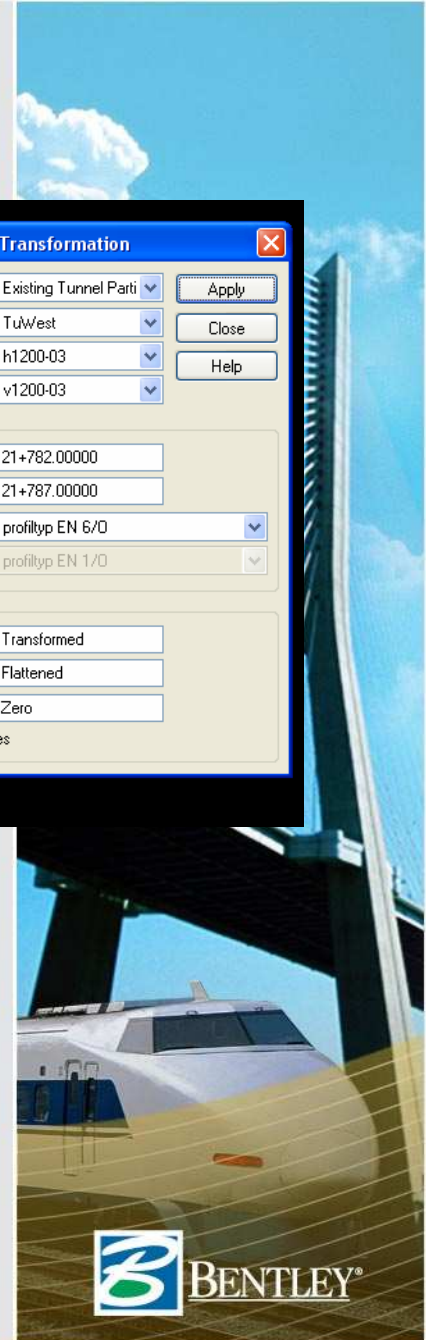
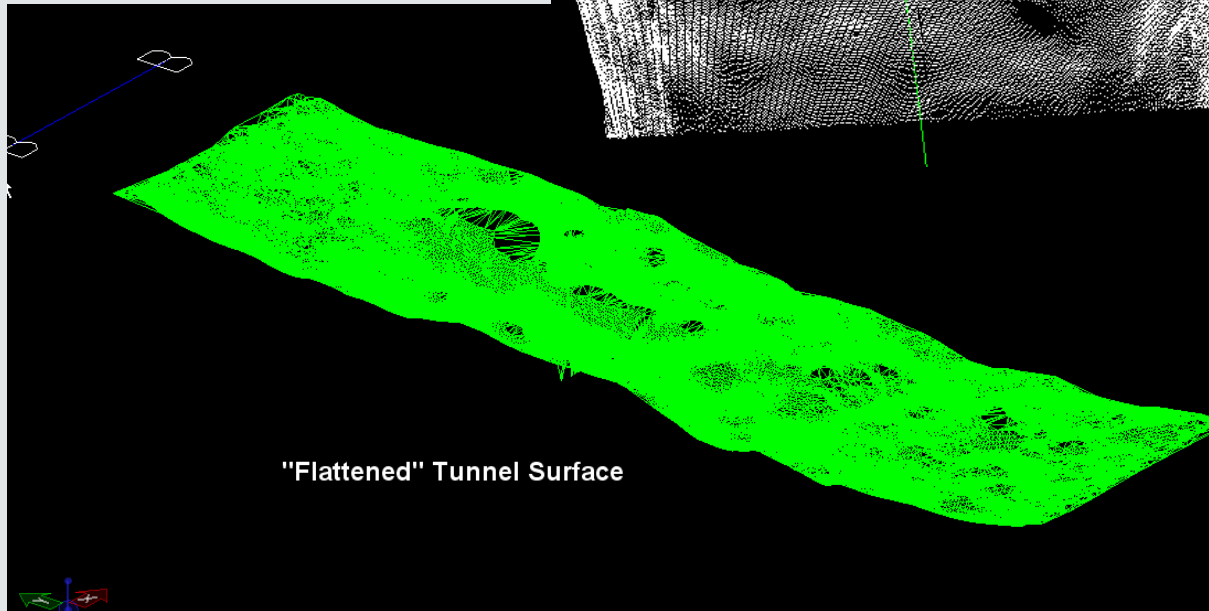
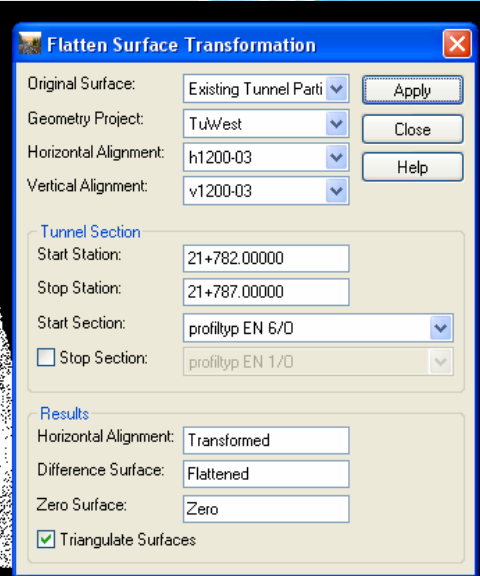
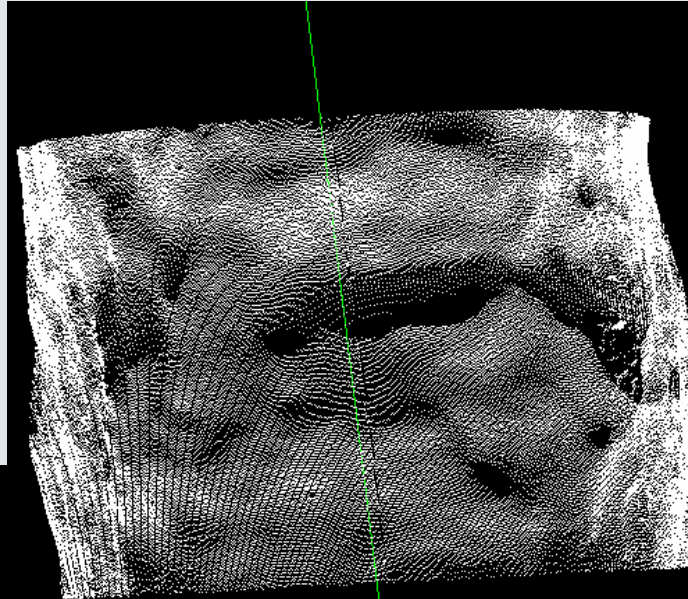
Point Cloud Data

- Import as DTM random Do Not Triangulate



Data Transformation

- “Flattens” and transforms point data relative to H&V alignment and a tunnel typical section

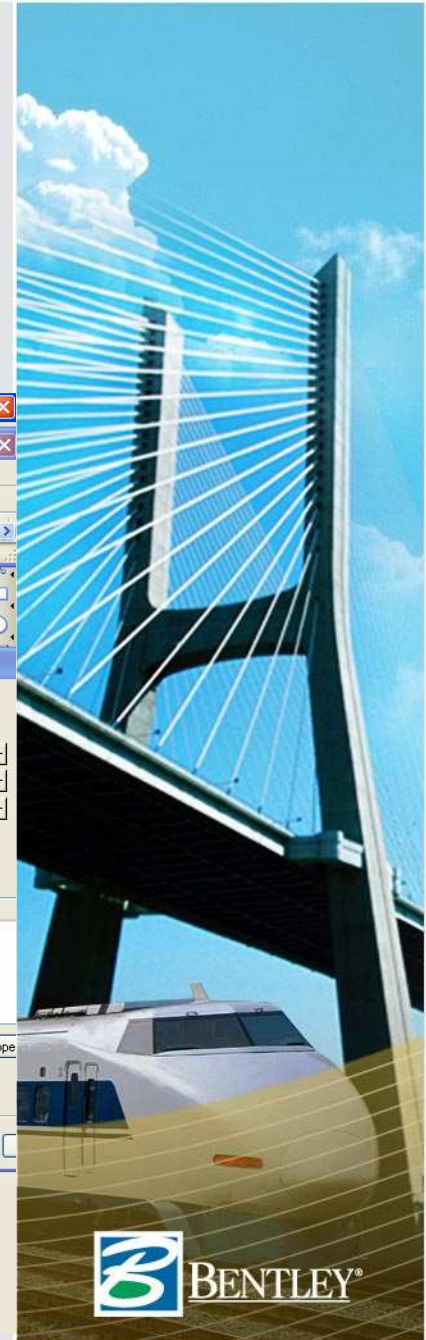


Tunnel Cross Sections

- Specialized Cross Sections for computing overcut and undercut volumes.

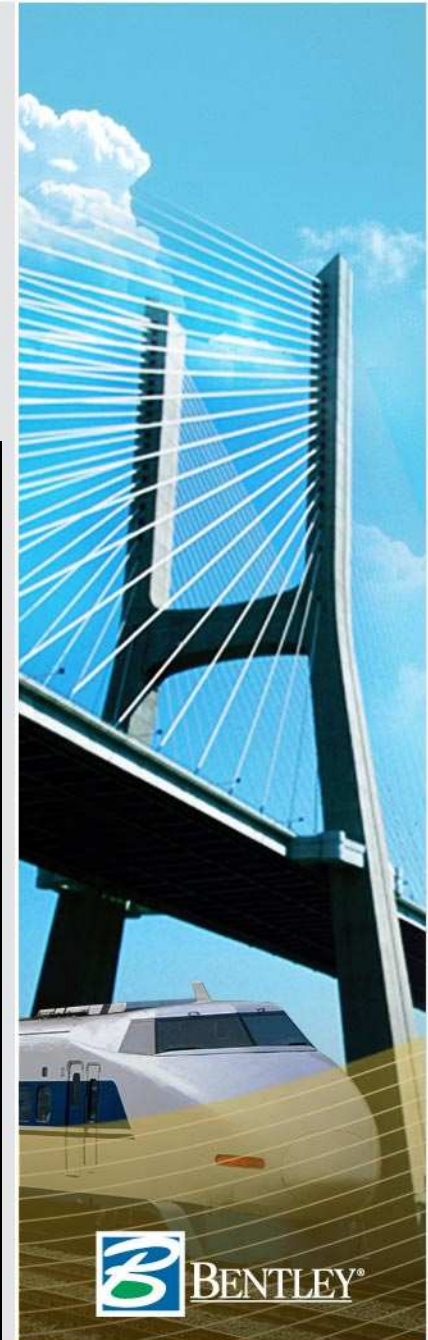
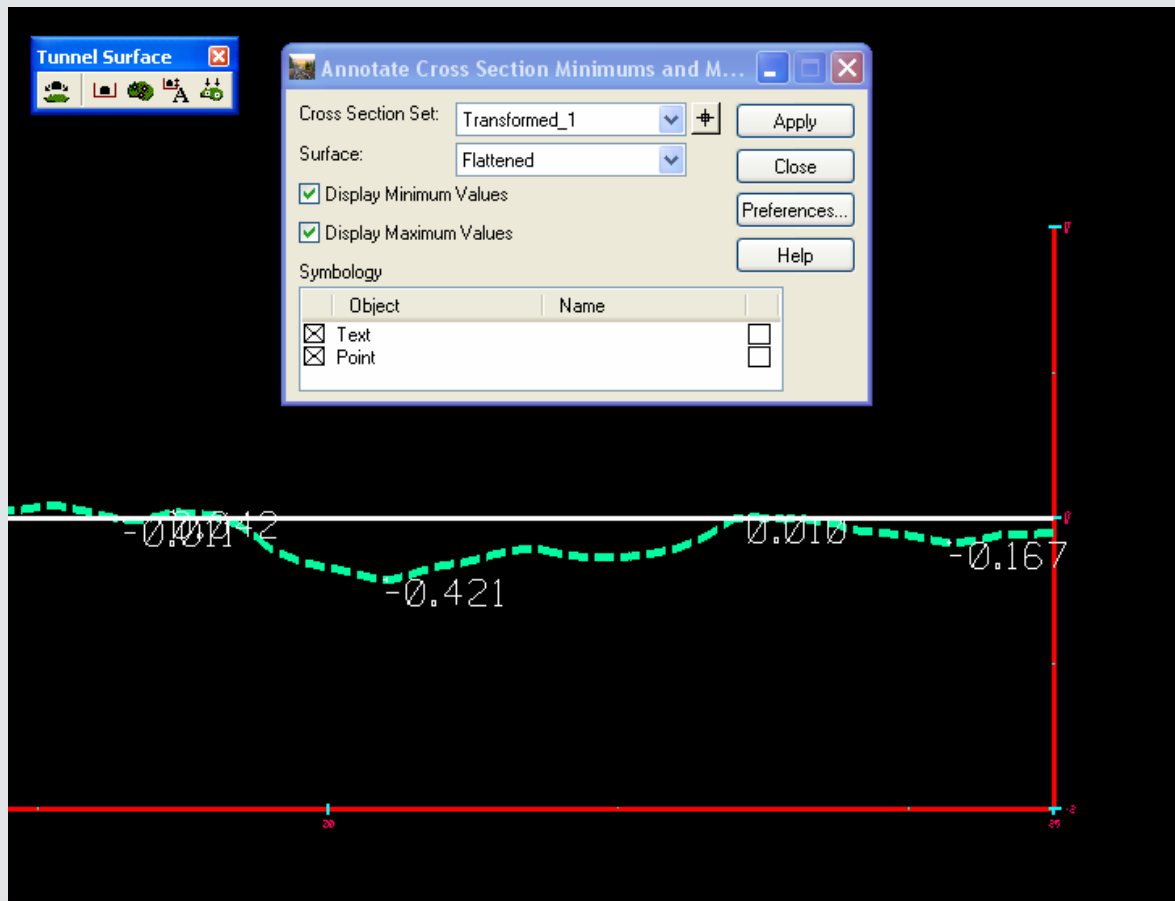
The screenshot shows the Bentley InRoads Suite software interface. The main window displays a 3D model of a tunnel cross-section with a yellow and green outline. A dialog box titled 'Create Tunnel Cross Sections' is open, showing settings for 'Set Name' (Transformed), 'Create' (Window and Data), 'Interval' (1.00000), 'Left Offset' (-10.00000), 'Right Offset' (25.00000), and 'Vertical Exaggeration' (1.0000). The 'Surfaces' section is checked for 'Flattened' and 'Zero'. A 'Results' window is also open, displaying a table of undercut and overcut volumes for various stations.

Station	Undercut (sq. m.)	Overcut (sq. m.)	Undercut (cu. m.)	Overcut (cu. m.)
21+781.00005	3.37	2.38		
21+782.00000	3.15	1.27	3.26	1.83
21+783.00000	2.19	2.15	2.67	1.71
21+784.00000	1.20	3.39	1.69	2.77
21+785.00000	1.37	2.99	1.29	3.19
21+785.99995	2.33	1.37	1.85	2.18
			10.76	11.68



Cross Section Minimum and Maximum

- Uses standard Cross Sections relative to the transformed alignment and surfaces for annotation

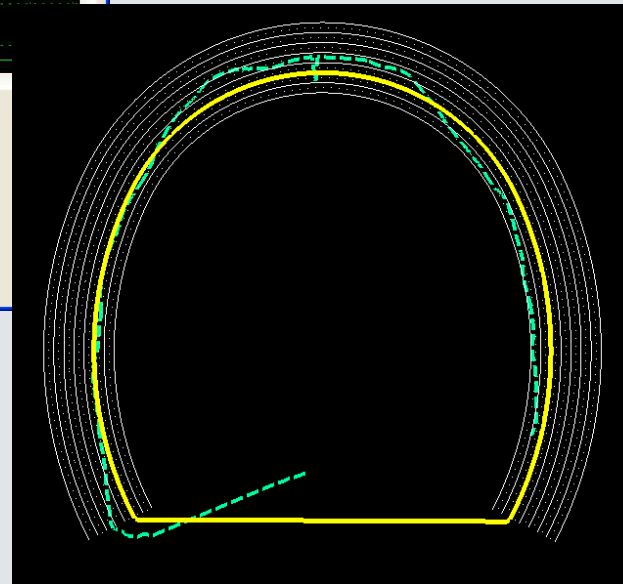
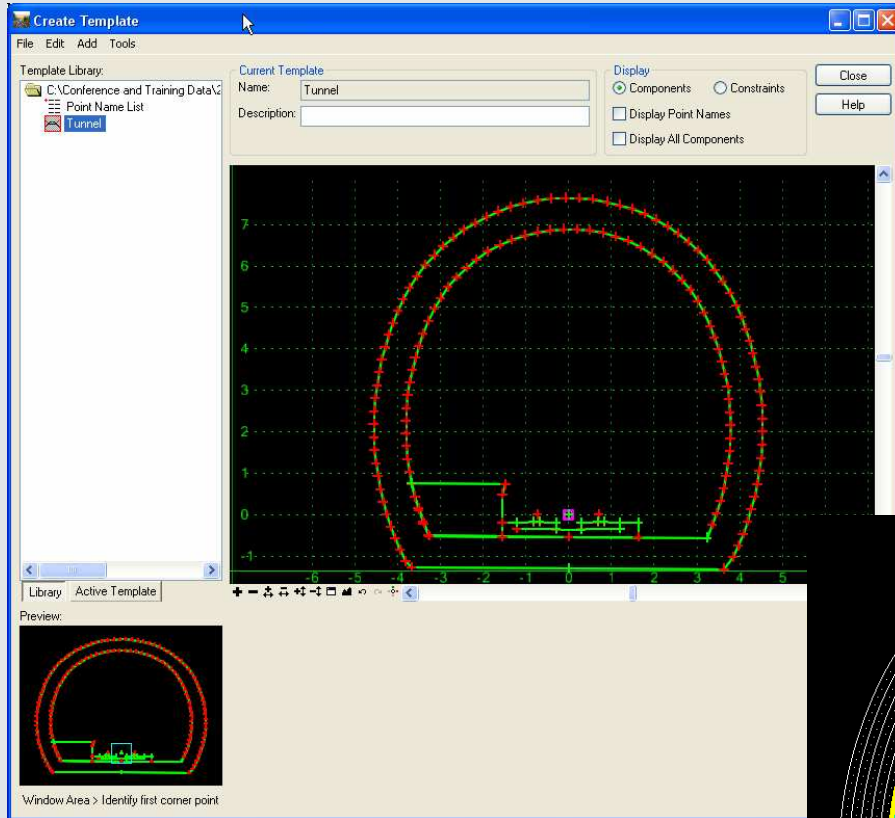


Roadway Designer for Tunnel Modeling

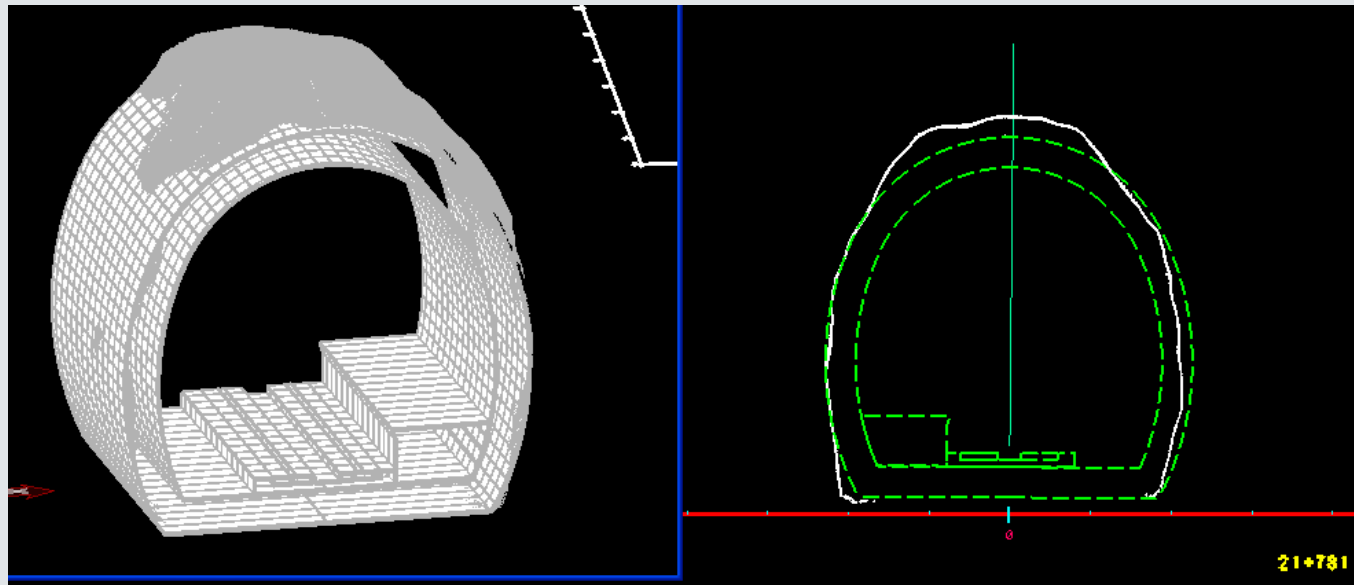
- Uses standard Typical Section and Components for modeling.
- Specialized Template Point Constraints for “rigid body rotation”
- Cant is applied via point controls



Roadway Designer for Tunnel Modeling



Demonstration



Conclusion

- Bentley Rail Track is used to create and analyze accurate 3D model content.
- Roadway Designer is used to create the proposed tunnel and displayed in cross section.



Questions?

