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Textual Reporting with InRoads

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This presentation…

takes a look into various techniques for *creating textual reports* within InRoads. It focuses on getting InRoads data into textual format and workflows for geometry, legal descriptions, cross-sections, and volumes. In addition, you will become familiar with other workflows like survey, drainage and bridge.

What's generally available in InRoads?

- Reporting can be accomplished in several ways:
  - Review type reports
    - » Presentation / formatting controlled by the product
  - XML / XSL reports
    - » Presentation / formatting controlled by the user (as defined in a style sheet / XSL file)
    - » InRoads produces the XML data
    - » InRoads ***Report Browser*** utilizes XSL to transform the XML data to text or HTML
  - InRoads SDK, but it requires programming

Where have we come from?

- InRoads 8.2 Service Pack 5
  - Introduced ***XML Reports***
    - » Side by side with ***DBAccess Reporting***
- With InRoads 8.5, XML reporting was available for the following:
  - Surfaces
  - Geometry
  - Light Rail Manufacturing
  - Bridge
  - Survey Adjustments
- InRoads 8.7 completed the transition to XML / XSL
  - Cross sections
  - Volumes
  - Introduced ***Report Browser***

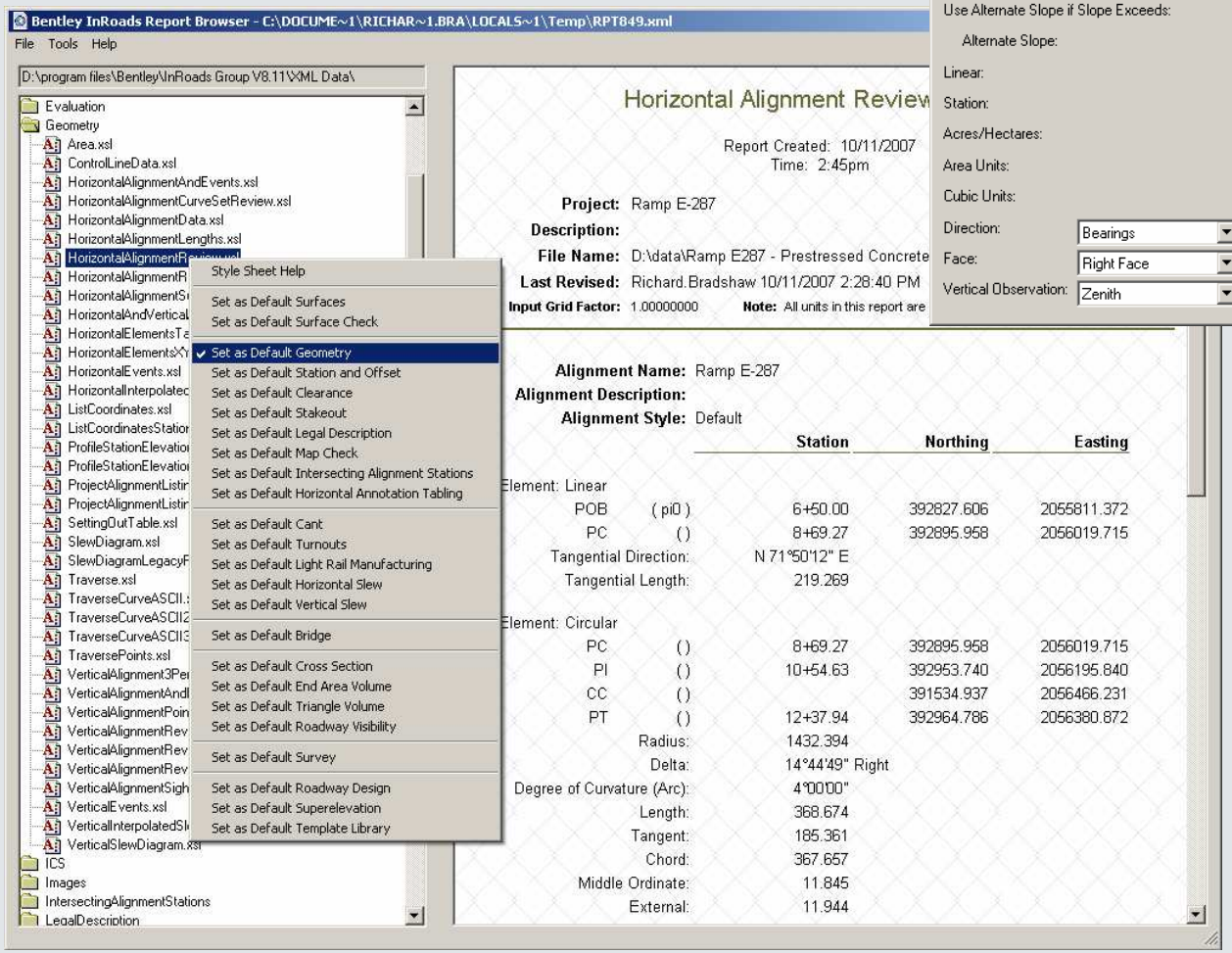
And within InRoads 8.9?

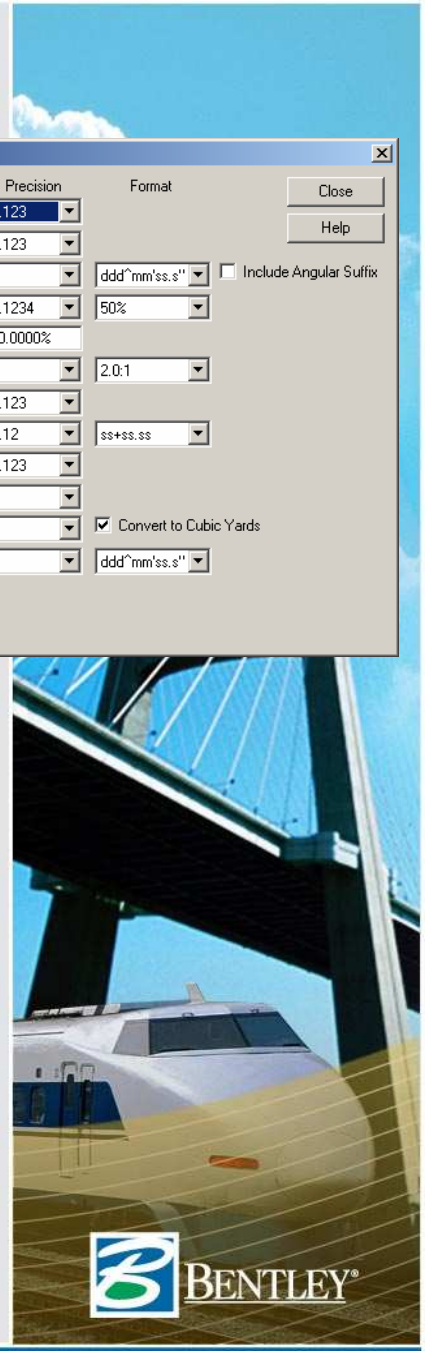
- Separated commands
- Added
  - ***Map Check***
  - ***Station Alignment Intersection***
  - ***Surface Check***
- Replaced some ***Reviews*** with ***XML***
  - ***Horizontal Slew***
  - ***Vertical Slew***
  - ***Cant***
- XML file is transient
  - Created in a temporary folder similar to *C:\Documents and Settings\Richard.Bradshaw\Local Settings\Temp*
- Report Browser
  - Style sheet help
  - Additional formatting options

Report Browser

- Manage “default” report style sheet for each type of report
- Style sheet “Help” documents what is required to use a specific style sheet
- Manage formatting with *Tools>Format Options*
  - Decimal precision
  - Formatting
    - » Stationing
    - » Angles
    - » Directions
    - » Slopes
- Allows *multiple* looks at the same data

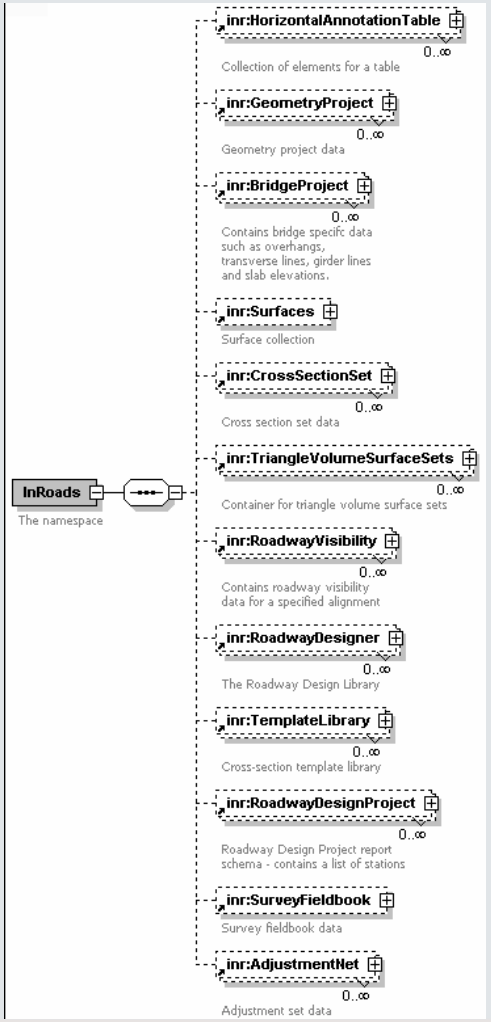
Report Browser





What's available in XML?

- Geometry
  - Horizontal
  - Vertical
- Surfaces
- Cross sections
- Volumes
- Survey
- Others



Geometry

- Alignments
  - Horizontal
  - Vertical
  - Cant
  - Events
    - » Including regression points
    - » Including computed events
  - Cogo points
- Turnouts
- Light rail manufacturing

Geometry Report

Horizontal and Vertical Alignment Review Report

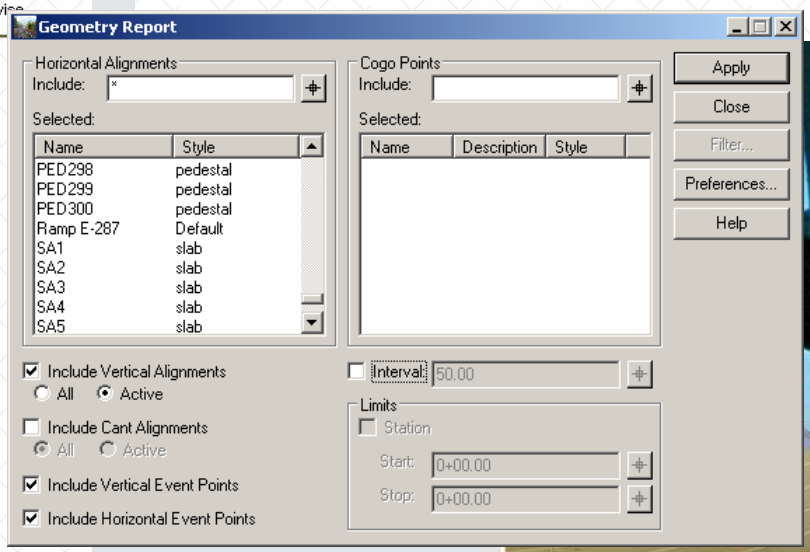
Report Created: 10/11/2007
Time: 2:52pm

Project: Ramp E-287
Description:
File Name: D:\data\Ramp E287 - Prestressed Concrete\Ramp E-287.alg
Last Revised: Richard.Bradshaw 10/11/2007 2:43:19 PM
Input Grid Factor: 1.00000000 **Note:** All units in this report are in feet unless specified otherwise.

Horizontal Alignment: Ramp E-287
Horizontal Description:
Horizontal Style: Default

		Station	Northing	Easting
Element: Linear				
POB	(pi0)	6+50.00	392827.606	2055811.372
PC	( )	8+69.27	392895.958	2056019.715
Tangential Direction:		N 71°50'12" E		
Tangential Length:		219.269		
Element: Circular				
PC	( )	8+69.27	392895.958	2056019.715
PI	( )	10+54.63	392953.740	2056195.840
CC	( )		391534.937	2056466.231
PT	( )	12+37.94	392964.786	2056380.872
Radius:		1432.394		
Delta:		14°44'49" Right		
Degree of Curvature (Arc):		4°00'00"		
Length:		368.674		

	Station	Elevation	Northing	Easting
Element: Linear				
POB	6+50.00	628.140	392827.606	2055811.372
PVC	6+74.00	627.545	392835.087	2055834.176
Tangent Grade:	-2.4800%			
Tangent Length:	24.000			
Element: Symmetrical Parabola				
PVC	6+74.00	627.545	392835.087	2055834.176
PVI	8+48.00	623.230	392889.328	2055999.506
PVT	10+22.00	625.293	392935.749	2056167.097
VLOW	9+09.44	624.626		
Length:	348.000			
Entrance Grade:	-2.4800%			
Exit Grade:	1.1856%			

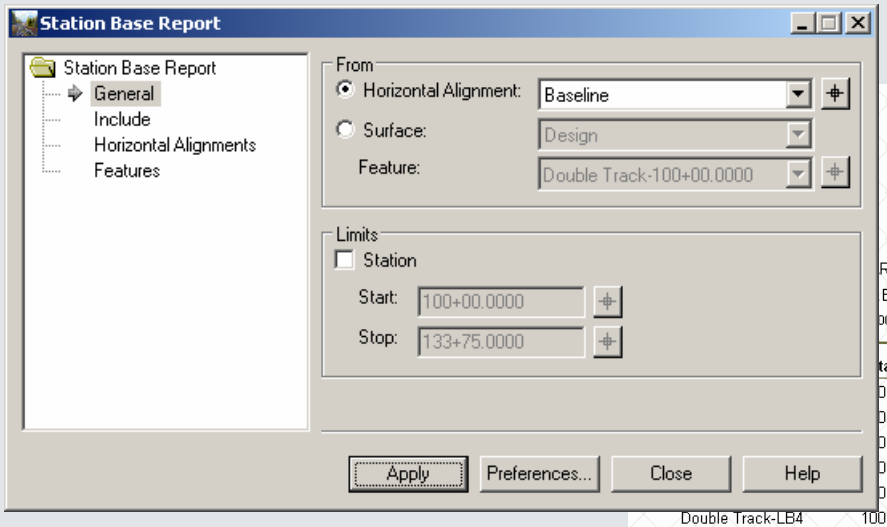


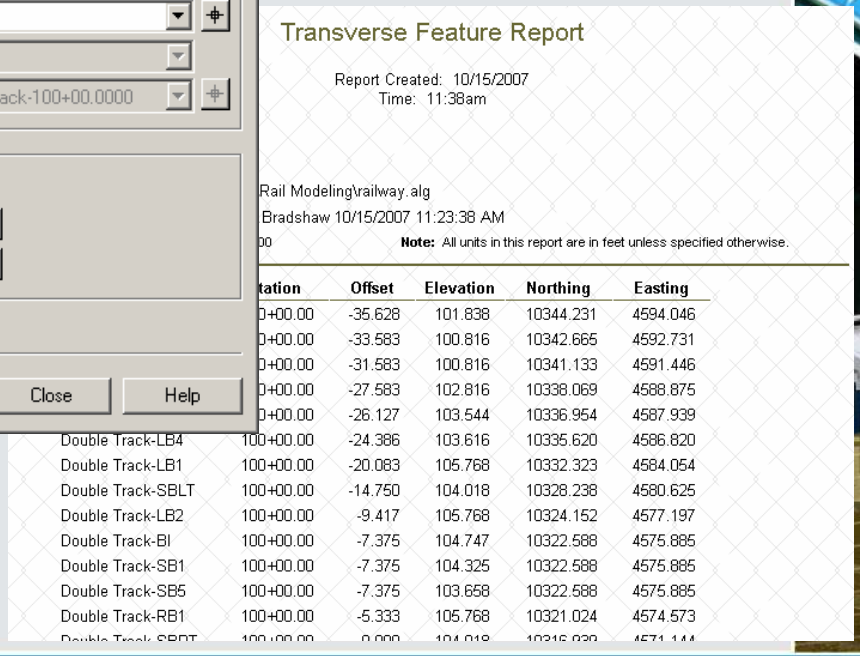
Station and Offset

- Why two commands ***Station Base*** and ***Station Offset***?
- What's the difference?
  - Primarily it has to do with whether you increment along the active alignment / feature or the selected alignments / features

Station Base Report

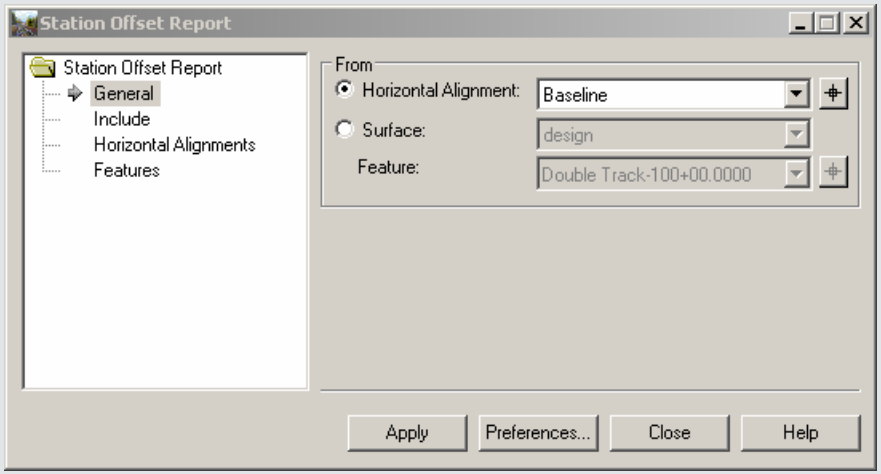
- Increments along the *From* object
- Allows you to define station limits





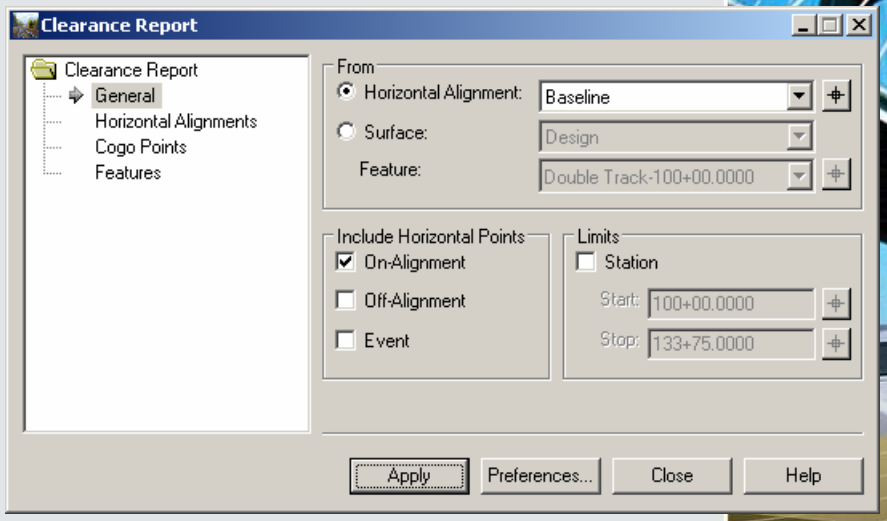
Station Offset Report

- Increments along the *Selected* object

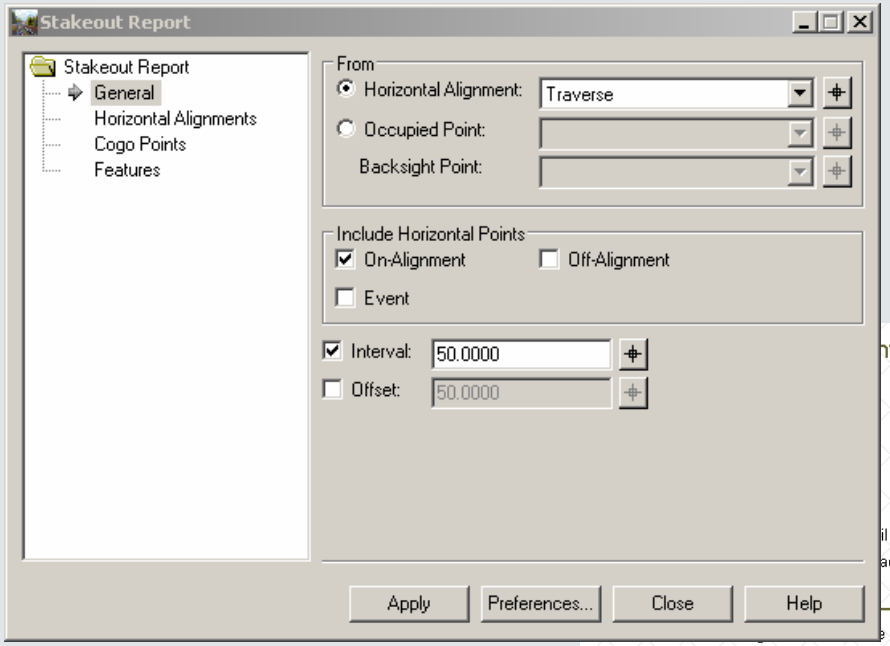


Clearance Report

- Computes station and offset from actual data
  - Horizontal cardinal points
  - Cogo points
  - Features



Stakeout Report



nterline Stakeout Report

Report Created: 10/15/2007
Time: 12:25pm

il Modeling\railway.alg
adshaw 10/15/2007 12:24:09 PM

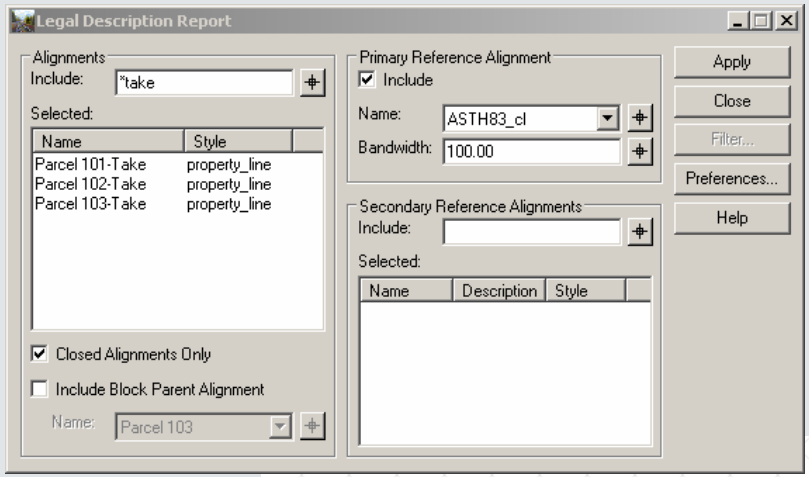
Note: All units in this report are in feet unless specified otherwise.

Offset From Centerline	BS	OC	FS Station	Angle Right	Distance
0.000	trv102	trv101	100+00.00	325°25'42"	133.880
0.000	trv102	trv101	102+00.00	359°20'37"	296.628
0.000	trv102	trv101	103+50.00	6°20'19"	439.986
0.000	trv101	trv102	111+75.00	194°34'32"	293.204
0.000	trv102	trv103	113+25.00	26°24'24"	270.616
0.000	trv103	trv104	120+25.00	30°37'32"	218.664
0.000	trv103	trv104	121+75.00	60°55'08"	87.178
0.000	trv104	trv105	127+75.00	301°11'14"	114.603
0.000	trv104	trv105	129+25.00	247°49'12"	186.858
0.000	trv105	trv106	133+75.00	32°23'50"	115.544
0.000	trv102	trv101	100+00.00	325°25'42"	133.880

Legal Description Report

- Simple boundary
  - Includes typical distances, bearings and curve data
  - Includes areas
  - Includes closures
- Right-of-way takes & easements
  - Include references (i.e. station & offsets) to multiple alignments

Legal Description Report



Alignment Name: Parcel 101-Take

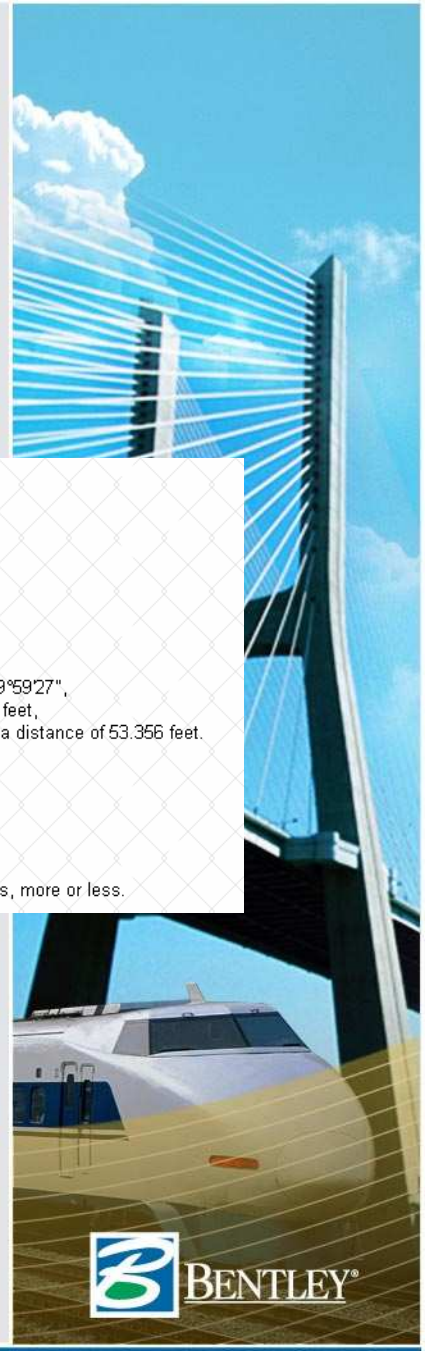
Alignment Description:

Commencing at 32,
said point being the POINT OF BEGINNING;
thence S 90°00'00" E, 53.772 feet,
thence S 0°00'00" W, 92.202 feet,
to a point on a curve 36,
having a radius of 153.700 feet and a central angle of 19°59'27",
thence along the arc of said curve a distance of 53.627 feet,
said arc subtended by a chord bearing N 37°36'54" W, a distance of 53.356 feet.
thence N 31°23'27" W, 10.154 feet,
thence N 29°31'47" W, 8.044 feet,
thence N 25°54'20" W, 8.726 feet,
thence N 19°45'19" W, 13.052 feet,
thence N 16°27'56" W, 10.638 feet,
thence N 10°17'00" W, 4.001 feet.
and the POINT OF BEGINNING; Containing 0.069 acres, more or less.

Alignment Description:

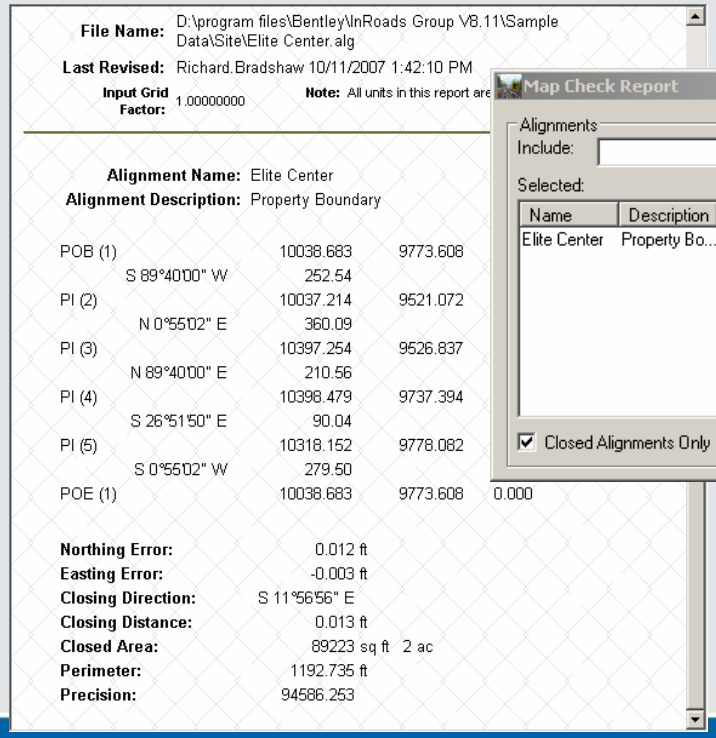
Beginning at a point 16.129 feet left of ASTH83_cl at Station 14+90.29 thence S 90°00'00" E a distance of 53.772 feet to a point 36.910 feet right of ASTH83_cl at Station 14+80.54 thence S 0°00'00" W a distance of 92.202 feet to a point 11.000 feet left of ASTH83_cl at Station 13+90.92 thence along an arc 53.627 feet to the right, having a radius of 153.700 feet, the chord of which is N 37°36'54" W for a distance of 53.356 feet, to a point 11.000 feet left of ASTH83_cl at Station 14+40.71 thence N 31°23'27" W a distance of 10.154 feet to a point 12.000 feet left of ASTH83_cl at Station 14+50.06 thence N 29°31'47" W a distance of 8.044 feet to a point 13.000 feet left of ASTH83_cl at Station 14+57.40 thence N 25° 54'20" W a distance of 8.726 feet to a point 14.000 feet left of ASTH83_cl at Station 14+65.32 thence N 19°45'19" W a distance of 13.052 feet to a point 15.000 feet left of ASTH83_cl at Station 14+77.14 thence N 16°27'56" W a distance of 10.638 feet to a point 16.000 feet left of ASTH83_cl at Station 14+86.69 thence N 10°17'00" W a distance of 4.001 feet to a point 16.129 feet left of ASTH83_cl at Station 14+90.29 and the POINT OF BEGINNING.

The above described parcel contains ± 0.069 acres (3022 sq. ft.)



Map Check Report

- Multiple parcels at one time
- Curvilinear & angular data is rounded

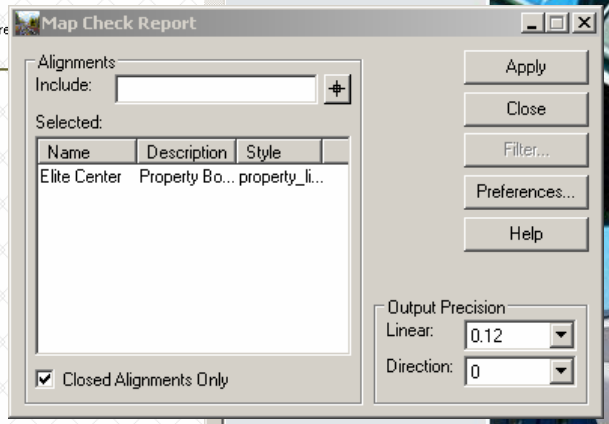


File Name: D:\program files\Bentley\InRoads Group V8.11\Sample Data\Site\Elite Center.alg
Last Revised: Richard.Bradshaw 10/11/2007 1:42:10 PM
Input Grid Factor: 1.00000000 Note: All units in this report are

Alignment Name: Elite Center
Alignment Description: Property Boundary

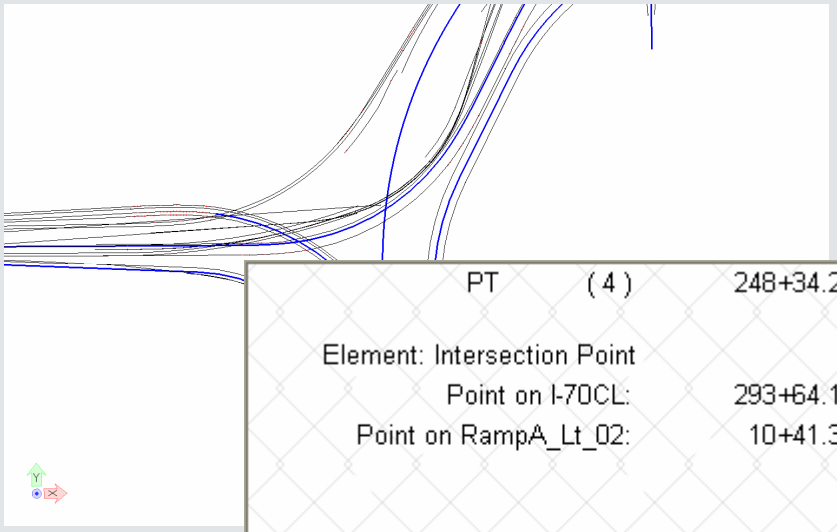
POB (1)	10038.683	9773.608	
S 89°40'00" W	252.54		
PI (2)	10037.214	9521.072	
N 0°55'02" E	360.09		
PI (3)	10397.254	9526.837	
N 89°40'00" E	210.56		
PI (4)	10398.479	9737.394	
S 26°51'50" E	90.04		
PI (5)	10318.152	9778.082	
S 0°55'02" W	279.50		
POE (1)	10038.683	9773.608	0.000

Northing Error: 0.012 ft
Easting Error: -0.003 ft
Closing Direction: S 11°56'56" E
Closing Distance: 0.013 ft
Closed Area: 89223 sq ft 2 ac
Perimeter: 1192.735 ft
Precision: 94586.253



Intersecting Alignment Stations Report

- Complements ***Drafting > Intersecting Alignment Note***

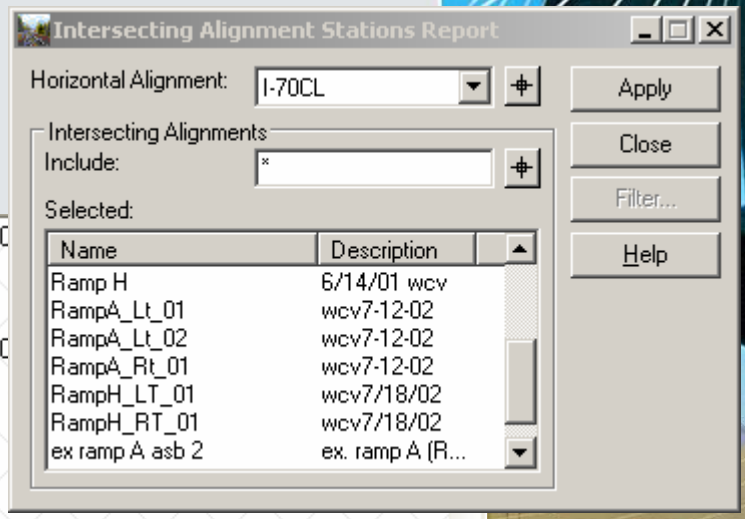


PT (4) 248+34.2718 170

Element: Intersection Point
Point on I-70CL: 293+64.1663 170
Point on RampA_Lt_02: 10+41.3649

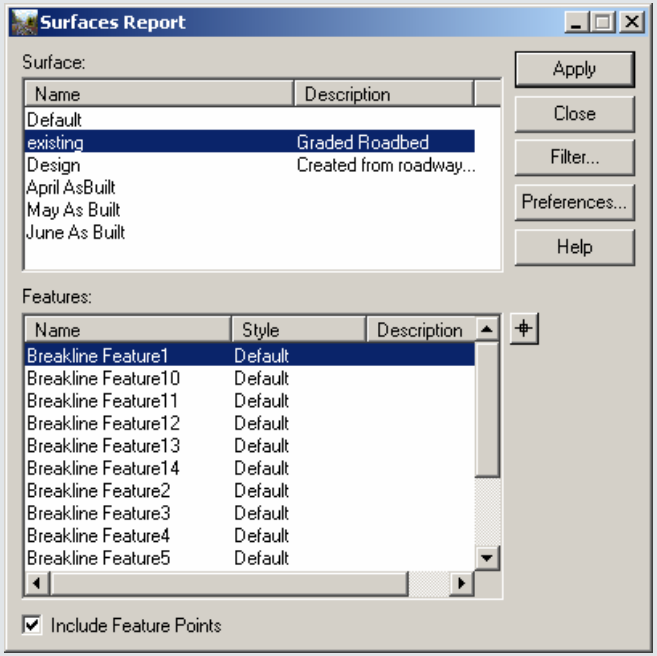
Element: Intersection Point
Point on I-70CL: 293+89.4762 1707576.3922 3101050.6055
Point on RampA_Lt_01: 15+26.7274

TS (25) 293+97.2929 1707584.2083 3101050.5062



Surfaces Report

- Pretty basic reporting, since most surface data is related to cross-sections, volumes, etc.



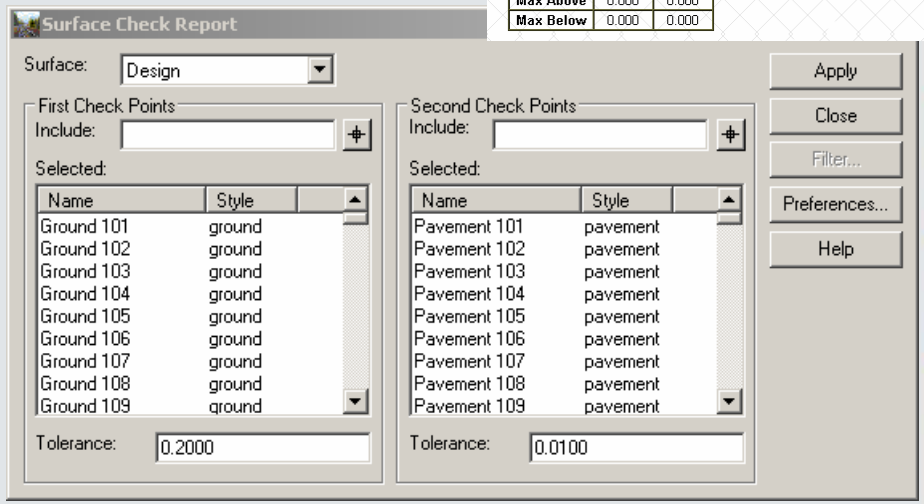
Surface Check Report

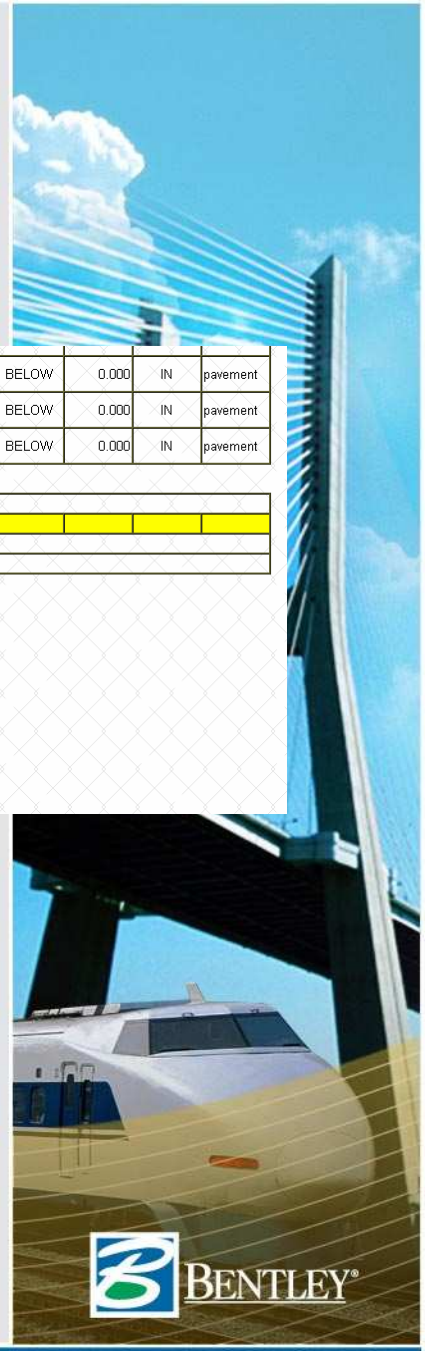
- Quality checking of a surface to allowable tolerances
- Similar to ***Compare Surface***

Pavement 234	7648.007	9341.183	130.705	130.705	0.000	BELOW	0.000	IN	pavement
Pavement 235	7669.436	9328.307	130.893	130.893	0.000	BELOW	0.000	IN	pavement
Pavement 236	7690.866	9315.431	131.080	131.080	0.000	BELOW	0.000	IN	pavement

Points Outside of DTM	
Total Points Outside	0

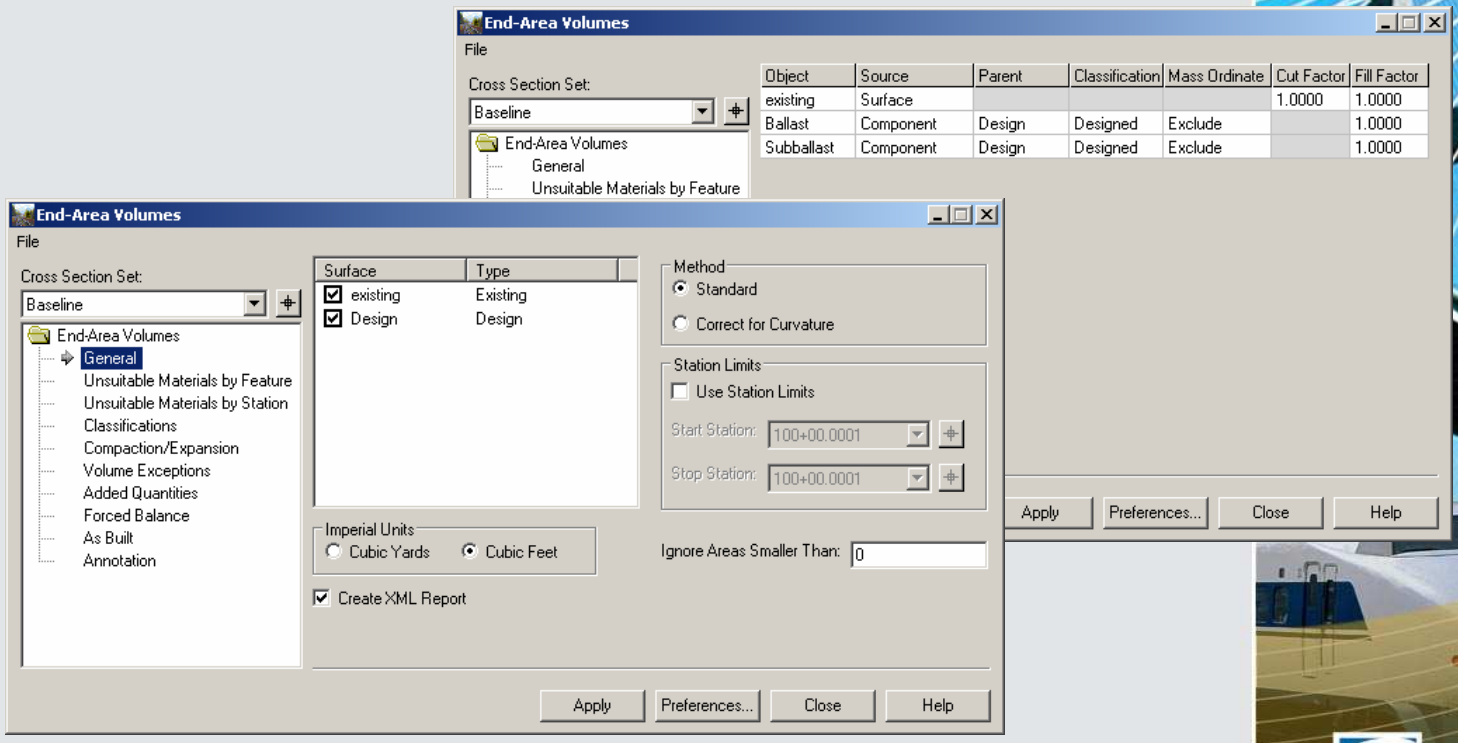
Summary		
	Group 1	Group 2
Points	170	136
In Tol	170	136
Out of Tol	0	0
% In Tol	100%	100%
% Out Tol	0%	0%
Max Above	0.000	0.000
Max Below	0.000	0.000

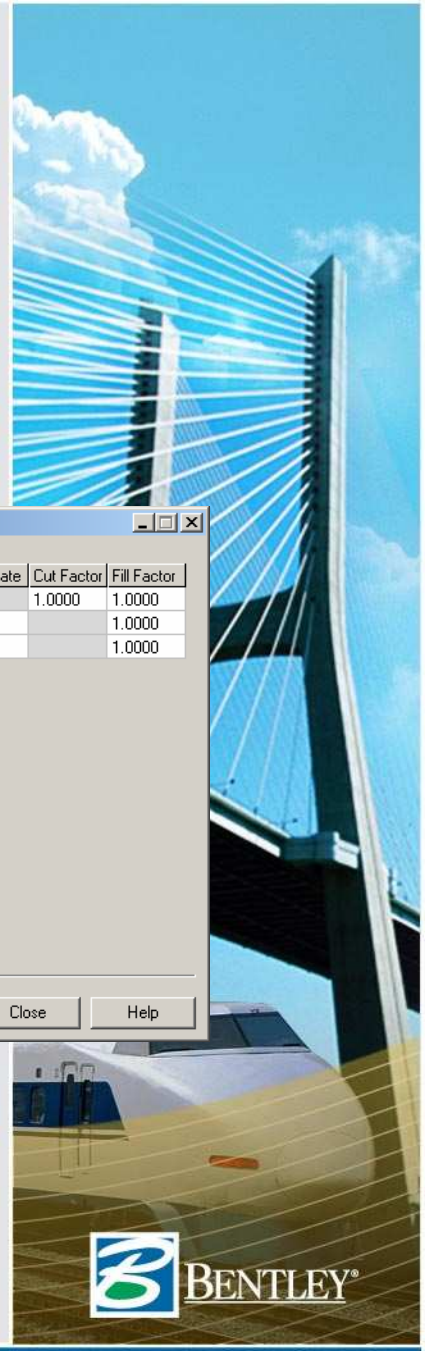




End-Area Volumes

- Volumes from cross-section sets





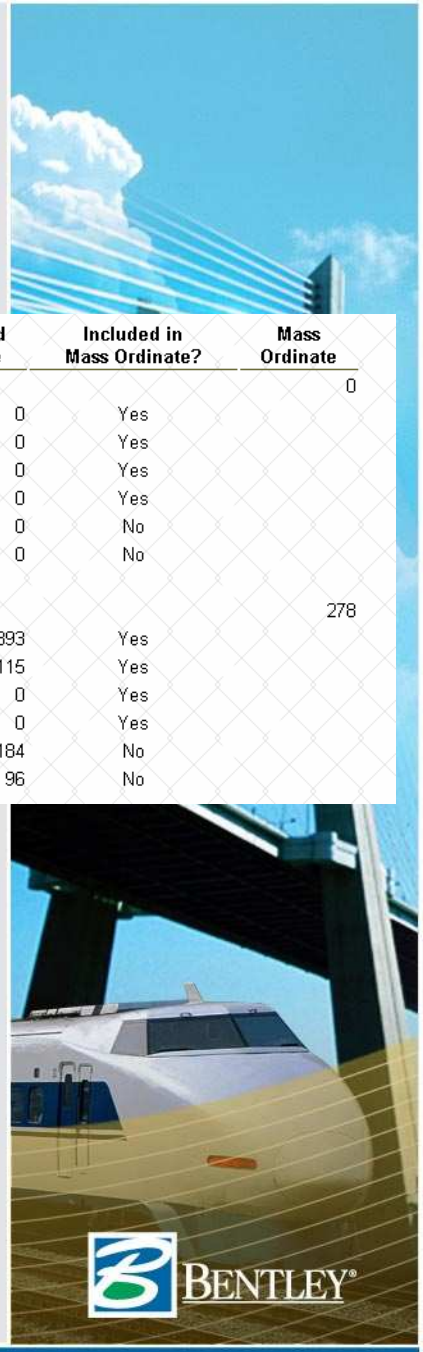
Multiple *looks* at the data

- Volumes
- Grade book
- Many style sheets!

Station	Type	Area	Volume	Factor	Adjusted Volume	Included in Mass Ordinate?	Mass Ordinate
100+00.00							0
	Normal Cut:	133	0	1.000	0	Yes	
	Normal Fill:	6	0	1.000	0	Yes	
	Added Cut:		0	1.000	0	Yes	
	Added Fill:		0	1.000	0	Yes	
	Ballast:	50	0	1.000	0	No	
	Subballast:	26	0	1.000	0	No	
101+00.00							278
	Normal Cut:	79	393	1.000	393	Yes	
	Normal Fill:	56	115	1.000	115	Yes	
	Added Cut:		0	1.000	0	Yes	
			0	1.000	0	Yes	
			184	1.000	184	No	
			96	1.000	96	No	

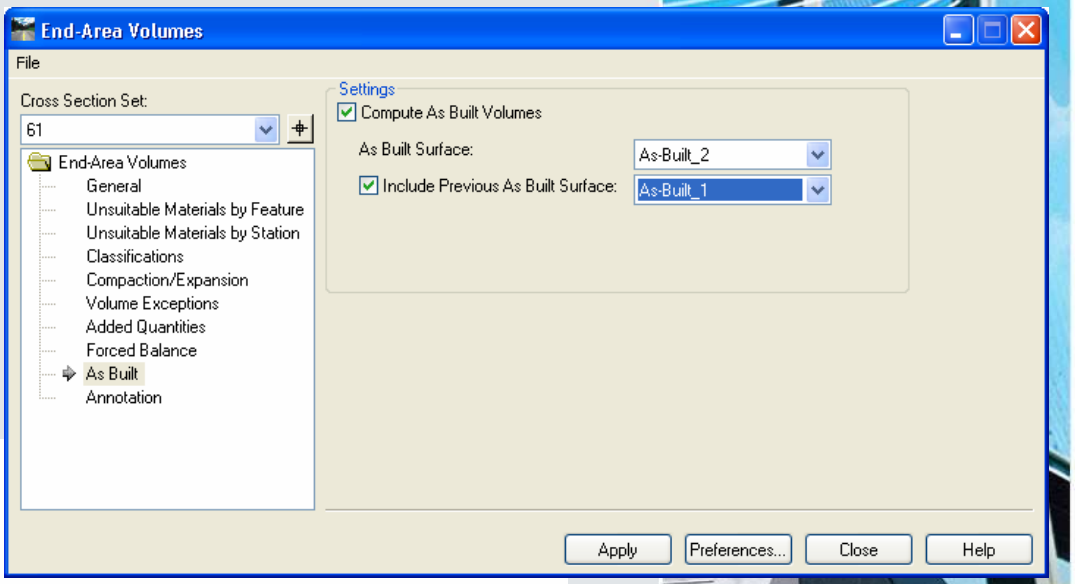
Station Quantities

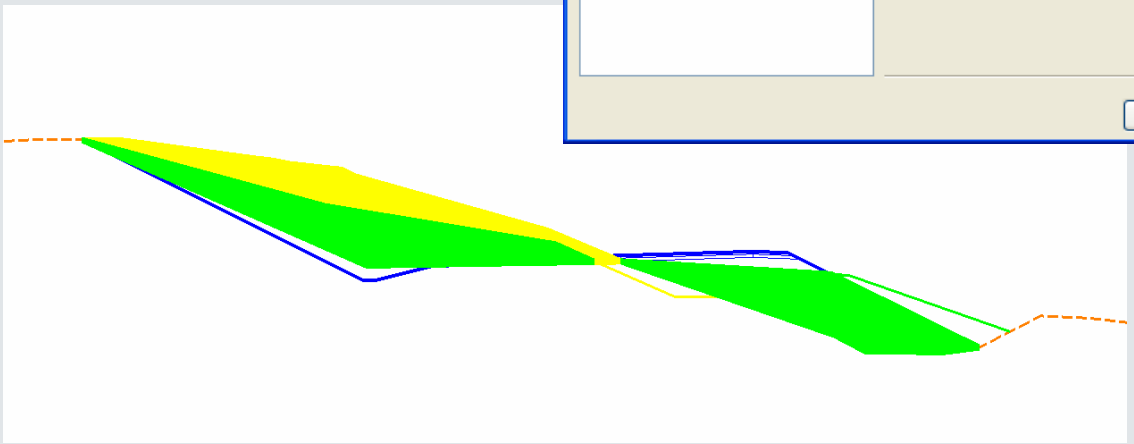
Baseline Station	Cut Factor	Cut Area	Cut Volume	Cut Adjusted	Fill Factor	Fill Area	Fill Volume	Fill Adjusted	Mass Ordinate
100+00.00	1.000	133	0	0	1.000	6	0	0	0
101+00.00	1.000	79	393	393	1.000	56	115	115	278
101+96.05	1.000		166	166	1.000		444	444	0
102+00.00	1.000	14	173	173	1.000	193	462	462	-11
103+00.00	1.000	6	37	37	1.000	141	618	618	-592
103+50.00	1.000	43	46	46	1.000	51	177	177	-724
104+00.00	1.000	67	102	102	1.000	34	78	78	-700
105+00.00	1.000	133	370	370	1.000	0	62	62	-393
105+77.91	1.000		393	393	1.000		0	0	0
106+00.00	1.000	140	504	504	1.000	0	0	0	111
107+00.00	1.000	23	301	301	1.000	29	54	54	359
107+64.53	1.000		27	27	1.000		386	386	0
108+00.00	1.000	0	43	43	1.000	294	598	598	-197
109+00.00	1.000	0	0	0	1.000	607	1669	1669	-1866
110+00.00	1.000	0	0	0	1.000	963	2907	2907	-4773
111+00.00	1.000	0	0	0	1.000	1044	3717	3717	-8490
111+75.00	1.000	0	0	0	1.000	800	2561	2561	-11051
112+00.00	1.000	0	0	0	1.000	688	689	689	-11740



End-Area Volumes & As Builts

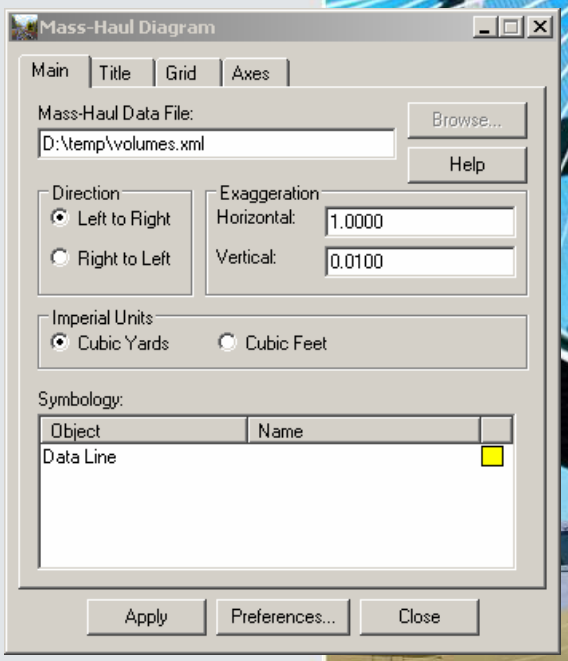
- 1st month (yellow)
- 2nd month (green)
  - Computed to design lines not over-constructed lines!





Mass-Haul Diagram

- Save the results of ***End Area Volumes*** in the **Report Browser** (as a .xml file)
- Load the XML file in ***Mass-Haul Diagram*** to display the diagram

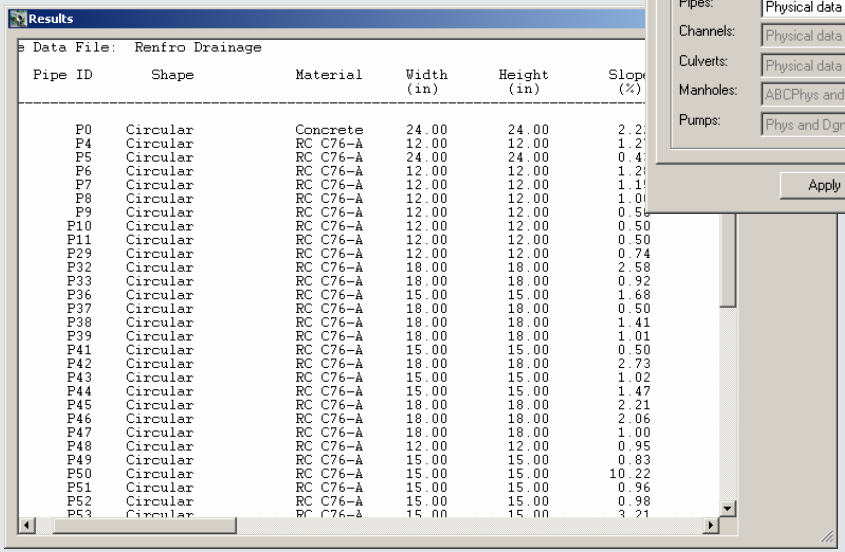


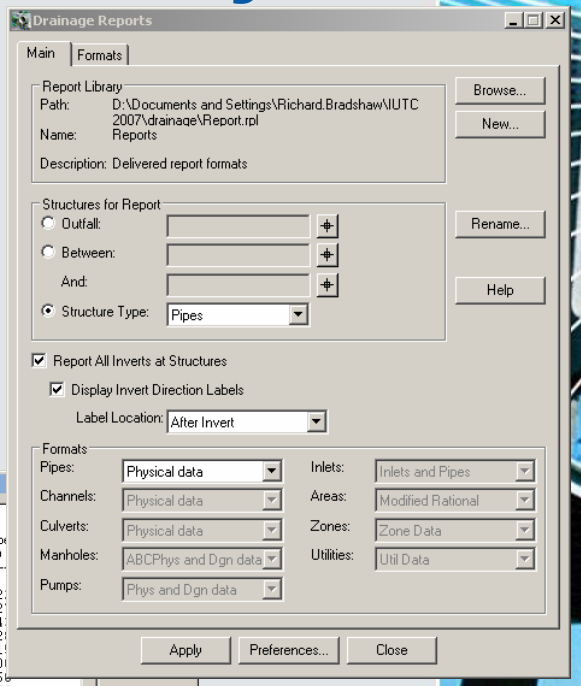
InRoads Survey

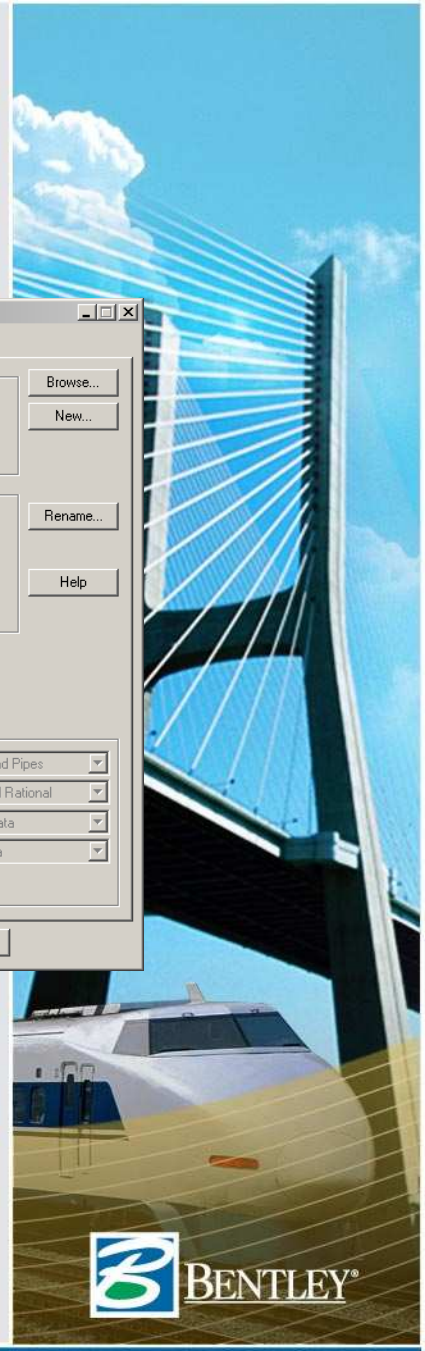
- Complements ***Text Export Wizard***
- Adjustments

InRoads Storm & Sanitary

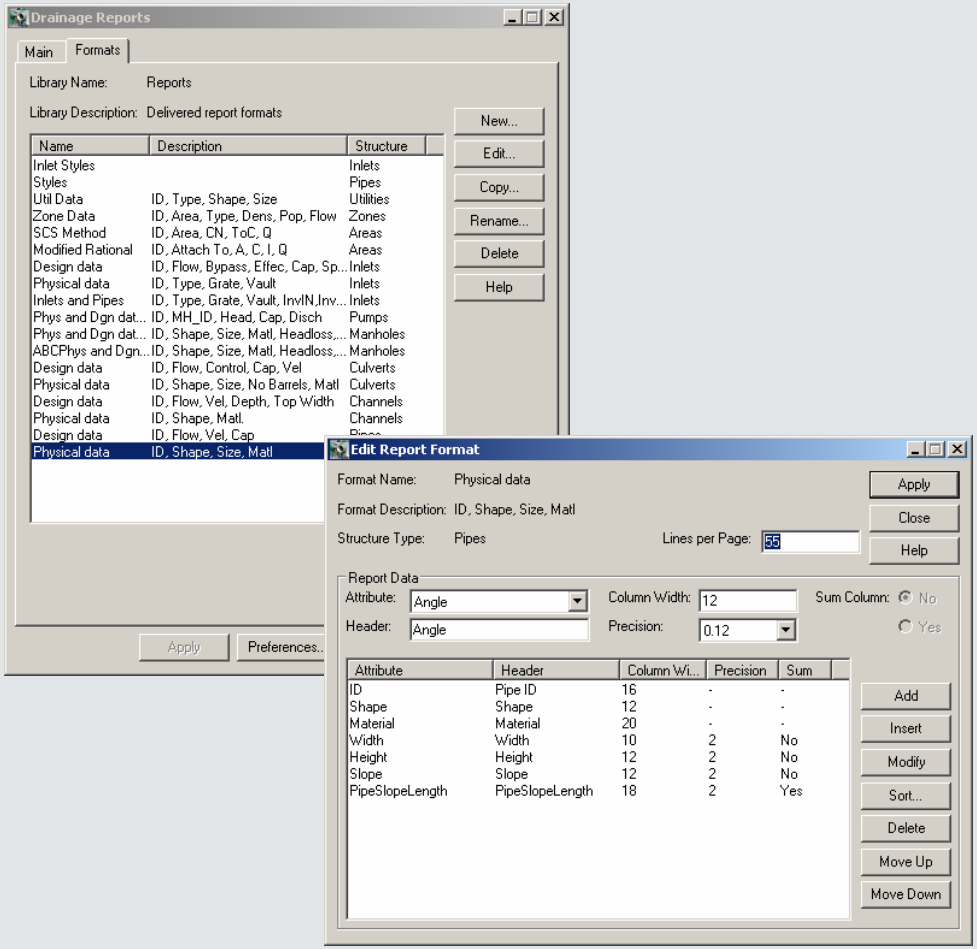
- Currently does not use XML but you can still create user definable reports







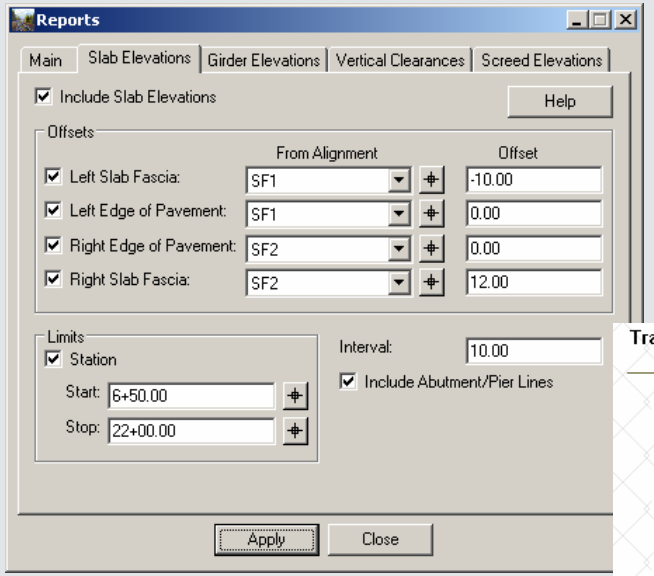
Drainage Reports



InRoads Bridge

- Create the geometric model
  - Abutment / Pier / Bearing Lines
  - Girders
  - Define the girder's type
    - » Eliminates a lot of geometric calculations
- Compute clearances between the existing surface (under the bridge) and the superstructure.
- Display girders in sections and plan views

InRoads Bridge Reports



Point	Relative Station (Distance Along)	Top of Slab	Top of Girder	Bottom of Girder	Slab Thickness	Haunch Thickness	Girder Depth
Girder 1 (G1)							
1	0.708	627.839	626.923	622.423	0.667	0.250	4.500
2	10.523	627.606	626.690	622.190	0.667	0.250	4.500
3	20.337	627.383	626.467	621.967	0.667	0.250	4.500
4	30.152	627.170	626.254	621.754	0.667	0.250	4.500
5	39.966	626.968	626.051	621.551	0.667	0.250	4.500
6	49.781	626.775	625.858	621.358	0.667	0.250	4.500
7	59.595	626.592	625.676	621.176	0.667	0.250	4.500
						0.250	4.500
						0.250	4.500
						0.250	4.500

Transverse Line	Station	Offset	Elevation	Northing	Easting	Longitudinal Line	Offset From Long. Line
BT1	6+82.42	-29.000	626.528	392865.266	2055833.133	SF1	-10.000
BT1	6+79.21	-19.000	627.911	392854.766	2055833.207	SF1	0.000
BT1	6+73.13	0.000	627.567	392834.816	2055833.349	Ramp E-287	0.000
BT1	6+70.89	7.000	627.440	392827.466	2055833.402	SF2	0.000
BT2	7+68.00	-29.000	624.861	392891.945	2055914.452	SF1	-10.000
BT2	7+68.00	-19.000	626.173	392882.443	2055917.569	SF1	0.000
				54.390	2055923.492	Ramp E-287	0.000
				57.739	2055925.674	SF2	0.000
				46.336	2055929.415	SF2	12.000

Span 1

Girder	Bearing Line	Station	Offset	Northing	Easting	Bearing Depth	Beam Seat Elevation
G1	Back	6+78.96	-16.000	392851.837	2055833.903	0.083	622.339
G1	Ahead	7+67.29	-16.000	392879.372	2055917.832	0.083	620.606
G2	Back	6+76.83	-9.333	392844.837	2055833.953	0.083	622.218
G2	Ahead	7+67.29	-9.333	392873.037	2055919.910	0.083	620.433
G3	Back	6+74.69	-2.667	392837.837	2055834.003	0.083	622.097
G3	Ahead	7+67.29	-2.667	392866.703	2055921.988	0.083	620.259
G4	Back	6+72.56	4.000	392830.837	2055834.053	0.083	621.977
G4	Ahead	7+67.29	4.000	392860.368	2055924.066	0.083	620.086

Other XML files

- XIN
- ITL
- IRD
  - Which can be loaded into the Report Browser for QC

Report Browser & .XIN

Missing Named Symbologies Report

Report Created: 10/15/2007
Time: 9:43am

Missing Named Symbology	Used By	Type
	Lane line	FeatureStyle

Named Symbologies Use Report

Report Created: 10/15/2007
Time: 9:44am

Named Symbology	Used By	Type
abutment		
	abutment	Geometry Line Feature Style
Aggregate		
	Aggregate	Surface Feature Style
Annotation-Plan		
	Default	ViewSurfaceElevations Preference
	Default	ViewSurfaceElevations Preference
	Default	ViewClosedArea Preference
	Default	StationBaseClearanceAnnotation Preference
	Default	StationBaseClearanceAnnotation Preference
	Default	GeneralTracking Preference
	Default	GeneralTracking Preference
Annotation-Profile		
Annotation-XCS		
Ballast		
	Ballast	Surface Feature Style
Base		
	Base	Surface Feature Style
BB		
	BB	Surface Feature Style
	BB	Survey Feature Style
BBERM		
	BBERM	Survey Feature Style
BBOARD		
	BBOARD	Survey Feature Style
BC		
	BC	Survey Feature Style

Report Browser & .IRD

File Name: D:\data\Rail Modeling\railway.ird

Corridor: Single Track

Template: Single Track - Tangent - Ballasted
Start Station: 100+00.00 **Interval:** 10.000000

Component: Ballast
Description:

Point Name	X	Y	Type	Constraints Value	Constraints Parent	Slope	Width	Delta Y
B2	-5.250	-0.583	Horizontal	-5.250	PGL			
			Vector	-5.250	Left Rail			
						50.0000%	-4.296	-2.148
B3	-9.546	-2.731	Slope	50.0000%	B2			
			Slope	4.1667%	SB1			
						4.1667%	9.546	0.398
SB1	0.000	-2.333	None					
			None					
						-4.1667%	9.546	-0.398
B4	9.546	-2.731	Slope	-4.1667%	SB1			
			Slope	-50.0000%	B5			
						-50.0000%	-4.296	2.148
B5	5.250	-0.583	Horizontal	5.250	PGL			
			Vector	5.250	Left Rail			
						0.0000%	-10.500	0.000

Component: Subballast
Description:

Point Name	X	Y	Type	Constraints Value	Constraints Parent	Slope	Width	Delta Y
SB1	0.000	-2.333	None					
			None					
						4.1667%	-11.545	-0.481
SB2	-11.545	-2.814	Slope	50.0000%	SB3			
			Slope	4.1667%	SB1			

Tips and Tricks

- "At one time I could do annotation with reports" Can I still do that?
- Simple answer is no! Instead use ***Geometry > Utilities > Inverse Direction***
  - Inverse point to point
  - Radial inverse
  - Tangent offset
    - » Check on Annotation
- Or
  - ***Horizontal Annotation***
  - ***View Station Base / Clearance Annotation***
  - ***Drafting Tools***

Editing alignments via text…

- *Export* data to text, edit and *import* with ***Text Import Wizard***
  - Horizontal Curve Set
  - Vertical Curve Set
  - Cant

Horizontal Tabling

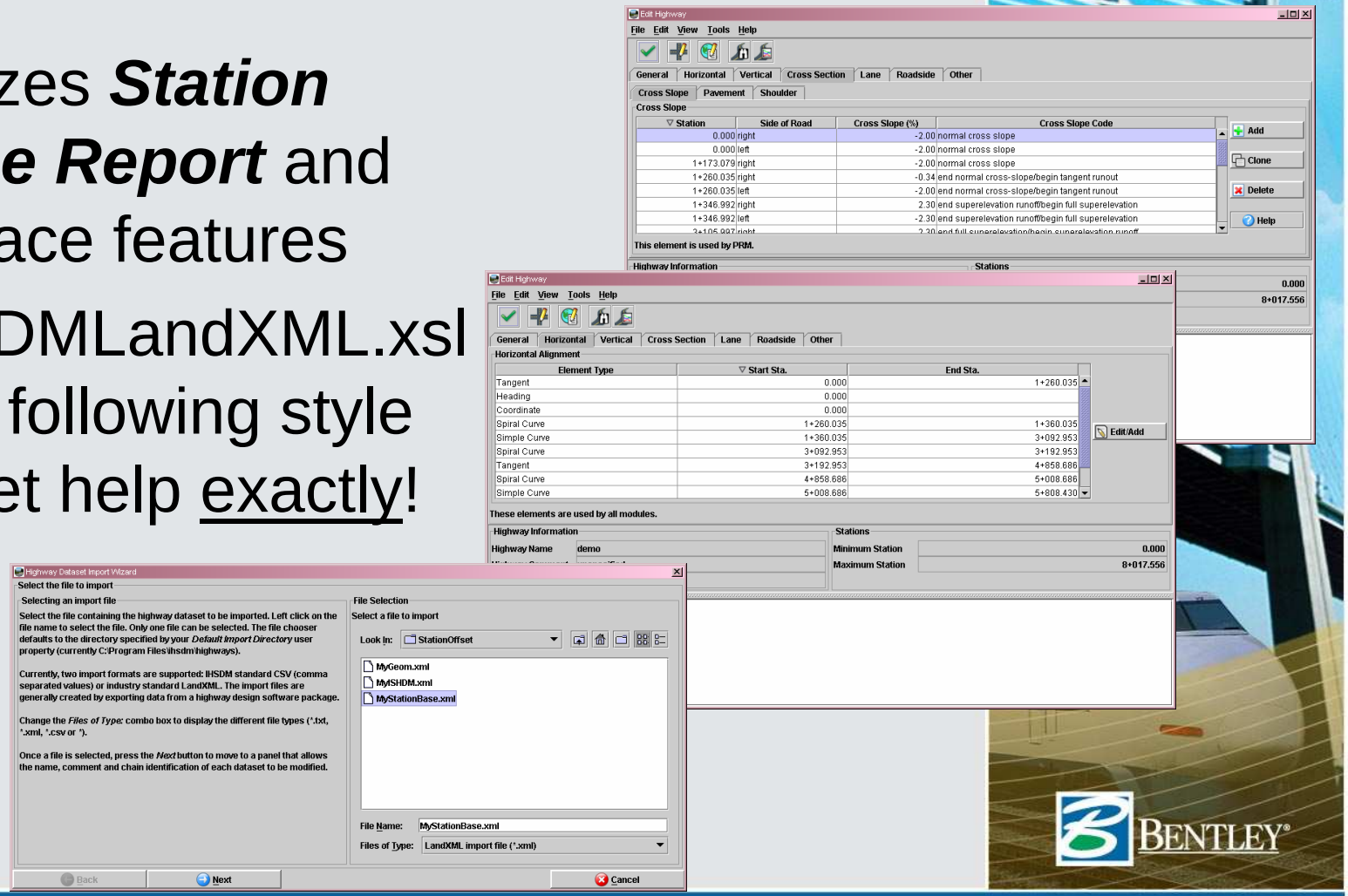
- What is the relationship between styles and alternate styles and tabling?
  - Table everything
  - If the annotation does not fit then table some:
    - » Typical line / curve table
    - » Insertion of text into a symbol
    - » Point names as the line / curve table entry

How to get it into a graphics file?

- Cut and paste the ASCII version of the data into the design file
  - From the ***Report Browser*** cut into the cut / paste buffer (i.e. <Ctrl> C)
  - In **MicroStation** paste the cut / paste buffer (i.e. <Ctrl> V)

Export XML to IHSDM

- Utilizes ***Station Base Report*** and surface features
- IHSDMLandXML.xsl and following style sheet help exactly!



Text Only Style Sheets

- Look at *\Program Files\Bentley\InRoads Group V8.9\XML Data\Creating ASCII Output Style Sheets.pdf*
- Look at *\Program Files\Bentley\InRoads Group V8.9\XML Data\Creating XML Lookup Table Style Sheets.pdf*

Style Sheet Modifications

- Look at style sheets that are close to what you want!
  - It is always easier to start from something than nothing!
- Look at the schema
  - *\Program Files\Bentley\InRoads Group V8.9\XML Data\Schemas\Documentation\InRoads Schema.chm*
- If all else fails contact us!

Questions?