Horizontal Alignments

The purpose of horizontal alignments is to control the horizontal geometry of a line.

Which files do we need from InRoads to translate into the GSI format for use with our total station instruments? The first and most used are horizontal alignment files. There are two types of InRoads horizontal alignment reports that we use. Either use the condensed version which does not contain station equation information or a detailed report which does contain equation information. If no equations exist, either type will do. When equations are present RPI requires the detailed type of InRoads report in order to create the necessary station equation file.

Refer to the ROADPLUS Interface User's Guide, pages 17 and 18 for instruction on creating these InRoads reports.

The report shown on this page is an example of the condensed Report from InRoads.

```
* INTERGRAPH HORIZONTAL ALIGNMENT TO ASCII
*
* Alignment name: L1
* Alignment description: alt1
* Alignment preference: default
*
{ TYPE STATION RADIUS X_CRD Y_CRD DIRECTION SPI_LENGTH
LIN   0+000.000      0.0000   2299517.9122 160263.0134 320^03'23.5393"  0.0000
SPI   0+025.455      0.0000   2299501.5693 160282.5292 320^03'23.5393" 25.0000
CIR   0+050.455    -40.0000   2299483.6919 160299.8495 302^09'05.7873"  0.0000
SPI   0+090.052      0.0000   2299445.7747 160302.3626 245^25'56.3948"  25.0000
LIN   0+115.052      0.0000   2299425.7678 160287.5532 227^31'38.6429"  0.0000
CIR   0+139.727     60.0000   2299407.5675 160270.8918 227^31'38.6429"  0.0000
LIN   0+206.006      0.0000   2299345.7282 160259.0654 290^49'08.8378"  0.0000
SPI   0+217.793      0.0000   2299334.7113 160263.2545 290^49'08.8378"  20.0000
CIR   0+237.793     -5.0000   2299315.5846 160268.9480 278^05'12.2142"  0.0000
SPI   0+265.317      0.0000   2299288.8537 160264.5055 243^02'29.0797"  20.0000
LIN   0+285.317      0.0000   2299272.5967 160252.9315 230^18'32.4561"  0.0000
EOP   0+319.254      0.0000   2299246.4821 160231.2576 230^18'32.4561"  0.0000
```

The report shown on this page is an example of a detailed InRoads horizontal alignment output. As you can see it contains much more detail compared to the condensed report.

Consider that horizontal and vertical alignments need not be limited to the roadway centerline. In construction, many lines may be appropriate for alignments. For example, curbs, pipes, fences, ditches and canals, just to mention a few, can be made into alignments for stakeout.

```
Project Name: wilmis4
        Description: willamette pk alignment
Horizontal Alignment Name: L1
        Description: alt1
         Preference: default

                              Station    Northing    Easting
Element:LINEAR
                       POB    0+000.000  160263.013  2299517.912
                        TS    0+025.455  160282.529  2299501.569
  Tangent Dir.:     N 39^56'36" W
 Tangent Length:    25.455

Element:SPIRAL
      Length:       25.000     TS   0+025.455  160282.529  2299501.569
       Angle:    17^54'18"L    SPI             160295.373  2299490.814
    Constant:       31.623     SC   0+050.455  160299.849  2299483.692
 Long Tangent:      16.753
Short Tangent:       8.412
  Long Chord:       24.892
           X:       24.757
           Y:        2.586
           P:        0.649
          KS:       12.459
  Tangent Dir.:     N 39^56'36" W
  Tangent Dir.:     N 57^50'54" W
```

Vertical Alignments

The purpose of a vertical alignment is to control the vertical geometry of a line.

Using a vertical alignment with a horizontal alignment allows us to control both horizontal and vertical geometry of a line simultaneously.

For example, we need to stake a run of pipe. On our total station we can select both the horizontal and vertical alignment. We can then stake an offset line to the center of the pipe using the horizontal component and at the same time see the cut to the flow line of the pipe.
Creation of the vertical alignment reports is much the same as creating horizontal alignment reports in InRoads. Refer to the ROADPLUS Interface manual, pages 19 and 20 for detailed instruction on the creation of these reports.

Note: ROADPLUS Interface will **only** use the **condensed** vertical alignment report to translate to the GSI format.

Cross Sections

Cross section files are used to define and control the roadway typical section perpendicular to the horizontal alignment. Three options exist for creating cross section files in InRoads. Station, offset and elevation (SOE), cross section binary, and roadway modeler binary are the three options.

To translate The InRoads files in RPI the same three options exist.

The first is cross section from ascii. This option is also known as a station, offset and elevation (SOE). Use RPI the following example is an example of an SOE file.

```
0+040.00      5.81      33.39
0+040.00      5.82      33.49
0+040.00      6.42      33.50
0+040.00      8.00      33.10
0+060.00    -11.44      32.98
0+060.00    -10.41      32.96
0+060.00     -8.07      32.85
```

The second is cross section from binary. Use this option if the designer used roadway modeler to create a rough draft of the roadbed and then developed the final design by modifying the cross sections. Do not use this option if the designer used roadway modeler to perform the entire design.

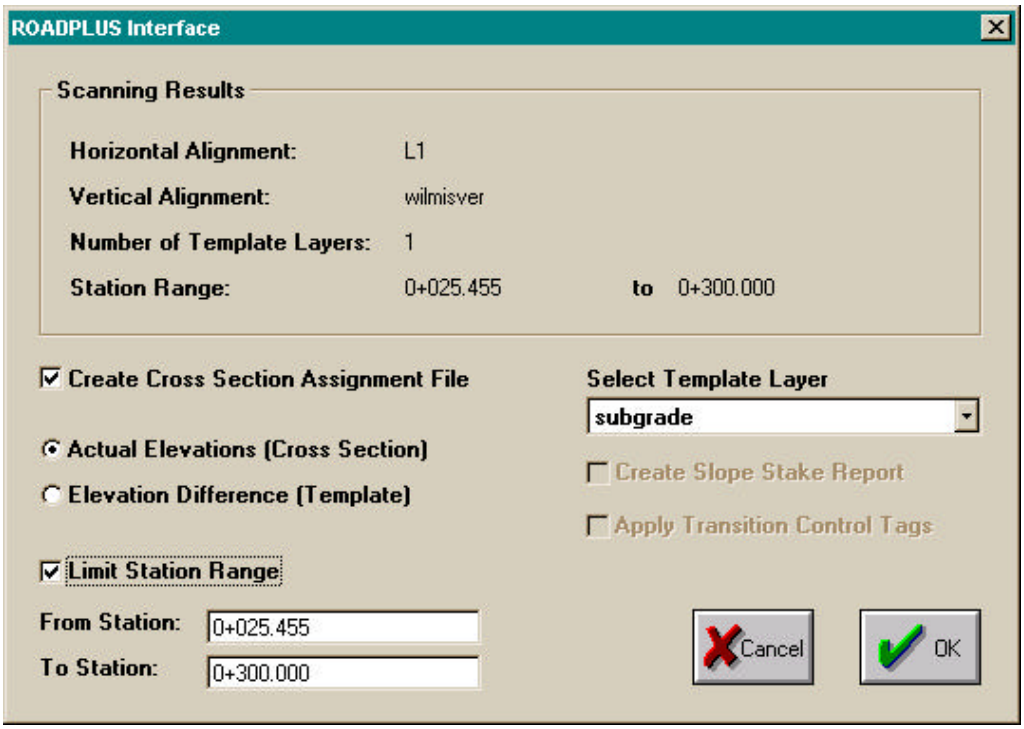
The third is the roadway modeler binary file. Use this option if the entire design is done using the InRoads roadway modeler. This option should be the most common.

The file produced by the designer will have a name similar to 12345.bin, where 12345 is the key number and .bin is the file extension associated with binary files.

Note: It is not possible to know if the binary file is a cross section or a roadway modeler file with out communication with the designer. It is however important to know which type it is. RPI recognizes the difference and will not translate unless the correct type of binary file is used.

Refer to the ROADPLUS Interface User's Guide pages 21-26 for detailed instructions on the creation of the InRoads source files and translation to GSI format.

File size is important when translating to GSI format. Size should be limited to about 200 data blocks. Larger files tend to slow the search process on the total station. RPI has the functionality to specify the file size by checking "Limit Station Range" as shown in the dialog box below. Keep in mind that each cross section station has several lines, each line constitutes a data block.



The following is an example of a GSI cross section file. Notice that station 0+025.455 contains 15 data blocks.

```
41....+000000L1 42....+TEMPLATE
11....+0+025455 35..10+00000000 36..10+00033126
11....+0+025455 35..10-00005200  36..10+00033095
11....+0+025455 35..10-00005870  36..10+00032760
11....+0+025455 35..10-00006870  36..10+00032760
11....+0+025455 35..10-00007540  36..10+00033095
11....+0+025455 35..10+00004750 36..10+00033098
11....+0+025455 35..10+00004760 36..10+00033548
11....+0+025455 35..10+00005810 36..10+00033554
11....+0+025455 35..10+00005820 36..10+00033654
11....+0+025455 35..10+00006420 36..10+00033658
11....+0+025455 35..10+00007090 36..10+00033323
11....+0+025455 35..10+00008090 36..10+00033323
11....+0+025455 35..10+00008760 36..10+00033658
11....+0+025455 35..10-00008978  36..10+00033455
11....+0+025455 35..10+00009150 36..10+00033560
```

Cross section assignment files are supporting files that are created by default when translating from an InRoads .bin file to GSI. This file allows the total station to search for and assign the proper cross section to the station that you have selected. Below is an example of a Cross Section Assignment File.

```
41....+000000L1 42..10+ASSIGNMT 43....+CRS12345
11....+0+025455 71....+00025455
11....+0+040000 71....+00040000
11....+0+050455 71....+00050455
11....+0+060000 71....+00060000
11....+0+080000 71....+00080000
11....+0+090052 71....+00090052
11....+0+100000 71....+00100000
11....+0+115052 71....+00115052
11....+0+120000 71....+00120000
```