



The Cross Section Plotting Programme, showing both Ground and Design Sections



## **Cross Section Creation/Editing/Plotting**

- Cross Sectional data may be generated through a variety of different methods, namely :-
  - By Manual (keyboard) entry,
  - By Interpolation when combining a Horizontal Alignment (Centre Line) File and a Tacheometric File.
    - *The use of a Horizontal Alignment File infers that the centre line points are at regular intervals, and will lie along mathematically correct geometric entities such as straight lines, circular curves and transition (clothoid) curves.*
    - *The two defined files must have a common area of overlap. Further information such the required Section chainage range, the Section widths and interpolation distances along the Sections may be entered.*
    - *This method provides a technique of creating Cross Sections without having to stake the Centre Line, or physically measuring the Sectional data. This method is not suitable, however, for terrain that contains man made features such as drains, existii roads etc.*
  - By Interpolation when combining a Co-ordinate File and a Tacheometric File.
    - *The use of a Co-ordinate File makes allowance for "centre line points" that need not*

*at regular intervals, and may not necessarily lie along mathematically correct geometric entities.*

- *The two defined files must have a common area of overlap. Further information such as the required Section chainage range, the Section widths and interpolation distances along the Sections may be entered. Interpolation is carried out via a least squares plane fitting technique.*
- *As for the previous method, this method also provides a technique of creating Cross Sections without having to stake the Centre Line, or physically measuring the Sectional data. This method is not suitable, however, for terrain that contains man made features such as drains, existing roads etc.*
- **By using a a Horizontal Alignment ( Centre Line) File plus extraction of BreakLine Data from a Tacheometric File.**
  - *This option searches through a user defined Tacheometric File for all BreakLine information, and then combines this information with centre line information taken from a user defined Horizontal Alignment File .*
  - *The two defined files must have a common area of overlap.*
  - *Only those points that represent intersections between a BreakLine and defined cross sections will be added to the cross section file. Hence, by manipulating BreakLines in a Tacheometric File it is possible to pre-select features that will be reflected on the cross sections. No interpolation will take place using this Option.*
  - *This method provides a technique of creating Cross Section information on discreet topographical features without having to stake the Centre Line, or physically measuring the Sectional data, and is suitable for both natural terrain and terrain that contains man made features such as drains, existing roads etc.*
- **Generate Cross Sections using both Interpolation and BreakLine Data from a Tacheometric File**
  - *This option uses the Centre Line data taken from a user defined Horizontal Alignment File to position and orientate the cross sections. It then searches the defined Tacheometric File for all BreakLine Information, and combines this information with least squares interpolated heights to supply the most complete cross section information of all the options.*
  - *The resulting Sections are more comprehensive than those of the previous options, and hence take somewhat longer to generate.*
  - *This method provides a technique of creating Cross Section information on discreet topographical features, plus interpolated heights, without having to stake the Centre Line, or physically measuring the Sectional data, and is suitable for both natural terrain and terrain that contains man made features such as drains, existing roads etc.*
- **Load Cross Section Information held in a Tacheometric File.**
  - *This option combines information held in a user defined Horizontal Alignment File and surveyed Sectional information held in a user defined Tacheometric File . The two files must have a common area of overlap.*
  - *Further information such as required section widths and acceptable Off-line tolerances along the sections must be entered.*
  - *This method provides a technique for generating Cross Sections that have been Surveyed using polar techniques and stored in, and then transferred from, an electron*

*logger or Total Station. This method requires that the centre line is staked and the Sections are measured in the field and is, therefore, suitable for terrain that contains man made features.*

- *Load Cross Section Data from a Handi-Data "LEVELS" format ASCII File .*
- *Using this option the Cross Section data are read from an ASCII File, set in the "HANDI-DATA SYSTEMS SURPAC" format. This method provides direct reading and loading of data as measured in the field. For further information on the ASCII file format, refer to the "LEVELS" User's Guide for the PSION Organiser, or for the PSION Workabout "DISK Transfer".*
- **The total number of points per cross section is 51 . The centre line point plus 25 points left and right from the centre line.**
- **Cross Sections may be Displayed on the Screen, Plotted directly to a Printer/Plotter, or stored in an HPGL file format.**
- **Cross Sections may be combined with a Vertical Curve Alignment File data created through the Vertical Curve Alignment programme. If Design File information is included, then the programme allows for the inclusion of user information related to the construction of batter slopes, drainage channels etc. This combination is used both for the plotting of Cross Sections, and the generation of Sectional Volumes.**