An underground Peg Calculation using the Double Set-Up Method

Underground Peg Calculation using the "Double Set Up" Method

- This application is designed to solve the common underground Mine Survey problem of determining and checking the [Y, X, Z] (or [E, N, Z]) ordinates a new Peg.

- The [Y, X, Z] (or [E, N, Z]) ordinates of both the Set Up Peg and the Back Sight peg must be known, and exist in the current Co-ordinate File.

- This technique provides a better overall check on the position of the New Peg than does the "Double Button" technique described below. The "Double Set Up' technique provides a full check on the distance between the two Pegs, and their relative elevations. However, until the Peg's position is verified by means of a closed traverse at some future date, its absolute position can not be assured.

- The required method of Survey is a Set up at the Set Up (or Fixing) Peg, plus a Setup at the New (or Fore-Sight) Peg.

- At the Set Up Peg , the following quantities should be measured or observed :-

  - Back Check Vertical Angles and Distance to the Back Sight Peg in order to verify the relative positions of these two Pegs, with respect to their theoretical values,

  - Face Left and Face Right Vertical Angles to the Fore Sight Peg,

  - One, or two, full Arcs (Face Left and Face Right) Horizontal Angles to the Fore Sight Peg

and the Back Sight Peg,

- The Slope Distance to the Fore Sight Peg, measured from the Height of Collimation of the Instrument to the Bob at the Fore Sight Peg,

- The Height of Instrument (Collimation). If this value is measured from a Roof Peg, then the value must be entered as negative, and

- The Height of the Bob at the Fore Sight Peg. If this value is measured from a Roof Peg, then the value must be entered as positive.

- At the Fore Sight Peg , the following quantities should be measured or observed :-

  - Face Left and Face Right Vertical Angles to the Set Up Peg,

  - The Slope Distance to the Fixing Peg, measured from the Height of Collimation of the Instrument to the Bob at the Set Up Peg,

  - The Height of Instrument (Collimation). If this value is measured from a Roof Peg, then the value must be entered as negative,

  - The Height of the Bob at the Set Up Peg. If this value is measured from a Roof Peg, then the value must be entered as positive, and

  - If required, the Roof to Floor Height value may be measured.

- The application allows for data entry by :-

  - Manual (keyboard) entry of Observations,

  - From a pre-generated ASCII File (type ***.pg1), or

  - Automatic loading of the observations from a General Observation File.

- Calculation will only take place if none of the angular and/or linear measurements exceeds the User specified limits. These limits are compared to the calculated differences for Vertical Angles, Horizontal Angles, Horizontal Distances and Vertical Height Differences. They also provide the option of forcing the User to carry out a Back Check before the new Fore Sight Peg can be calculated. The ability to modify these limits is limited to Users having the necessary Security Code. This Security Code prevents un-authorized Users from changing the limits, or resetting the Back Check option.

- Before the New Peg calculation takes place, a Back Check calculation may be carried out to verify the relative positions of the Back Sight Peg and the Set Up Peg against the theoretical values.

- After calculation takes place, the Co-ordinates, Peg Elevation and Floor Elevation of the Fore Sight Peg (New Peg) will be stored in the current Co-ordinate File.

- The results of the Peg calculation will also be stored in the Multi-Polar/Peg File of the current Co-ordinate File. This file will hold and display up to 4 determinations of a Peg, over and above the actual co-ordinates (current values) stored in the Co-ordinate File. Running the Edit a Multi-Polar/Peg File (found under the General main Menu) programme will generate a display of a summary of all determinations of existing Pegs in the Co-ordinate File. The stored ASCII Peg File (type ***.pg1) can then be called, for any the Point/Peg determinations, which will in turn generate a full display of all the observational and derived data for the New Peg calculation.

- After calculating the New Peg, an ASCII Peg File (type ***.pg1) of all observed and derived data my be created. This ASCII Peg File has four main uses :-

  - The results of the New Point just calculated can easily be imported back into the application at any future time, preventing the time wasting and possible errors of re-

entering these data manually. Even if the observational data originally came from an Observation file, the ASCII file contains extended information relative to the Peg calculation.

- When doing a Right Button Click on a Point displayed in the Co-ordinate File, for example, it is possible to display the contents of any ASCII Peg file relative to a required Peg and to re-calculate the Peg.

- If the User requires an output format different from the one used by SURPAC, the data from the ASCII Peg File can be easily imported into a User generated application.

- It provides a backup for all observational data used to fix the Peg.

- The application also allows for the calculation of a Chain length at the New Peg. The Chain length is the height difference between the Peg elevation of the New Peg and a computed Grade Elevation, based on User input information.

- The option to Print the results is available, after the on screen entries have been made and checked and the New Peg calculated. The results of both the Back Check calculation and the Chain Length calculation may also be printed.