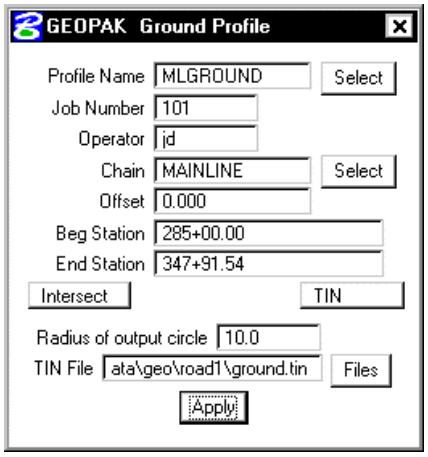
Existing Ground Profiles

6.1 Introduction

Objectives	Learn to calculate existing ground profiles extracted from a surface model.
Tools	
Menu Bar Application	GEOPAK Road > Geometry > Ground Profile

GEOPAK generates an existing ground profile based on a stored chain from either a 3D graphic file or from a triangulation file (TIN). The profile information is stored in the coordinate geometry database file and an input file is created.

Existing ground profiles may be generated in either 2D or 3D graphics file. If the tool is accessed via Project Manager, a run must be defined. The dialog is shown below.



Profile Name - Name of the profile to be stored.

Job Number and Operator - *.GPK file job number and user's initials. For more explanation, refer to the Introduction chapter.

Chain - Name of stored chain used for profile stationing.

Offset - Produces a profile at a user specified horizontal offset to the selected chain.

Beg Station and End Station - By clearing each field and hitting the Enter key the stationing will default to the beginning and ending station limits of the selected chain. The user may also key-in a station range within the limits of the chain.

There are four options that control the frequency of elevation calculations along the base chain.

- **Increment -** based on the beginning station of the alignment, incremented by a user specified value.

- **Intersect -** an elevation is calculated at every intersection of the alignment with a triangle side.
- **Even -** will compute elevations at even stations rather than an incremented distance along the alignment. This is best used for alignments with station equations.
- **POT -** calculates an elevation at each POT along the alignment.

After clicking **Apply**, the resulting profile will be stored in the designated GPK file in addition to creating an ASCII text file containing the store profile commands.

6.2 Reviewing

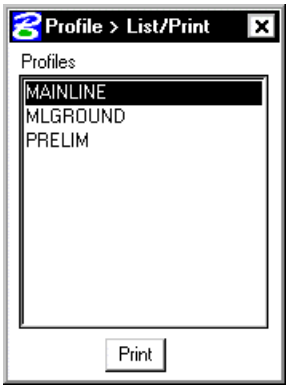
Once a profile has been created, it may be reviewed in two ways:

- Textual output viewed from the COGO dialog box. Select **Element > Profile > Print/List** from the COGO menu bar.
- Profile drawn via the D&C Manager. Select an appropriate category, for example, **Drafting Standards > Imperial > Ground Profiles > Existing**

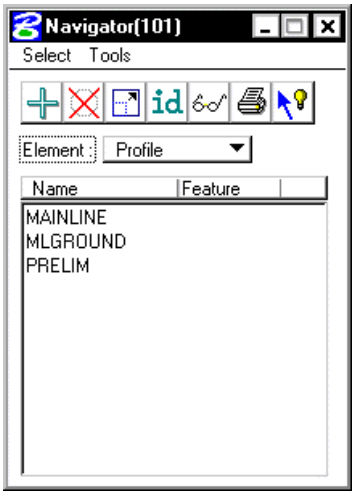
6.2.1 Profile Report

To review a textual report listing stations and elevations of a ground profile, open the GEOPAK Coordinate Geometry dialog. A couple of different methods can be used to create this listing for any profile.

By selecting **Element > Profile > List/Print** then highlighting a specific profile name and clicking **Print**. The results of this command will be displayed in the Command Output window of the Coordinate Geometry dialog. To obtain a hardcopy of this information, create an output file using the **File > Output** command and supply a filename of 1-5 characters. Then use the **File > Print > Output File** command to print this to the default system printer.

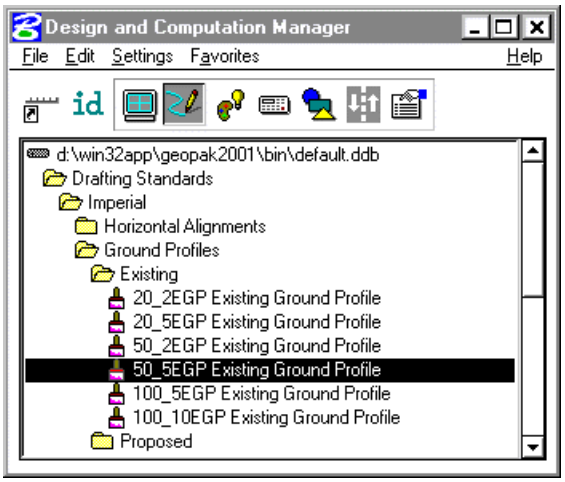


The second method utilizes the COGO Navigator tool to create the **Print Profile** command. The advantage to this method is that multiple profiles can be identified at once and printed to the Command Output window. Start the COGO Navigator by clicking **Tools > Navigator** or selecting the icon from the COGO dialog. Change the **Element** to **Profile** then highlight the desired profile(s). Once selected, click the printer icon on the Navigator to process the profile(s).

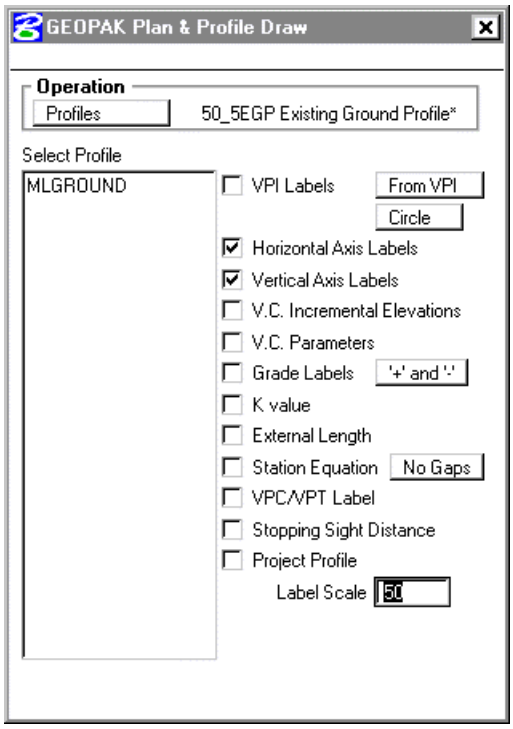


6.2.2 Drawing Profiles with D&C Manager

As with other COGO elements, Design and Computation Manager will be utilized to draw any type of profile into a MicroStation file: existing roadway, proposed roadway, utility, special ditch, etc. To get started, open D&C Manager then navigate to the desired item for plotting of the profile. Upon selecting an item, click on the **Draw Plan & Profile** button on the supplemental D&C dialog.



The next dialog that appears is the **GEOPAK Draw Plan & Profile** window, as depicted below.



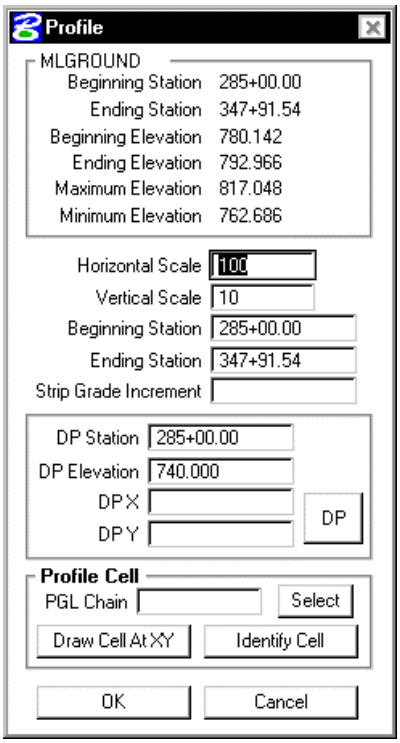
If it is not already selected, change the **Operation** to **Profiles**. Displayed in the window is a list of profiles currently stored in the GPK file. Along the right side of the window are labeling options for the profile that is to be plotted. Configure these as desired before selecting a profile to plot.

- **VPI Labels** – Labels the station and elevation of the VPI – typically turned off for plotting of existing profiles.
- **Horizontal Axis** – Places stations along the bottom of the profile.
- **Vertical Axis** – Places elevations along the left side of the profile.

- **VC Parameters** – Labels the length of the vertical curve if applicable.
- **VPC/VPT Labels** – Annotates the station and elevation of a vertical curves control points.
- **Stopping Sight Distance** – Places text for crest vertical curves representing the curves stopping sight distance as defined by AASHTO.

After selecting a profile to plot, the dialog below opens. Since a profile does not have XY coordinates, the user must specify a location in the MicroStation file to place the profile and a scale at which to plot the profile. When using a ratio other than 1:1, the horizontal dimensions of the profile remain true and the vertical is exaggerated.

The location can be selected by clicking on the **DP** button then specifying a location in the file by issuing a data point in the view. The coordinates can also be keyed in to the dialog. A **Profile Cell** can be drawn into the file to represent the location of the data point and associated information. This cell can be used in any other GEOPAK tool that needs to know the location of the profile. A PGL Chain must be selected before drawing the profile cell. This chain will be the chain that the profile is stationed along.

If a value is specified for the **Strip Grade Increment**, elevations will be calculated at the desired interval along the profile and placed just above the **Horizontal Axis Labels** (stations).

Click **OK** to draw the profile.