# Chapter 2

# Existing Ground Profiles

## 2.1 Objectives

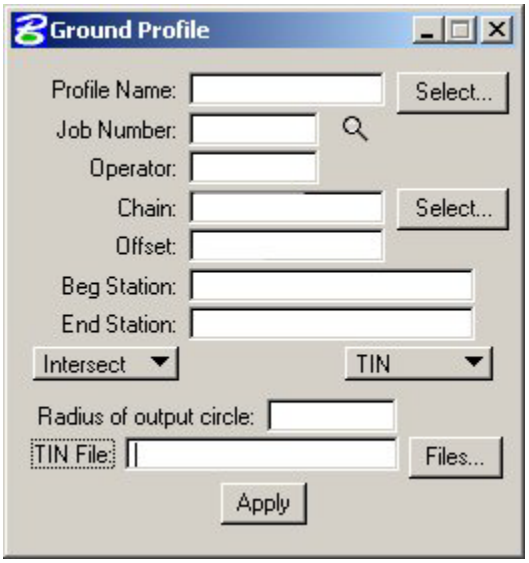
- Learn to calculate original ground profiles based on a DTM.

## 2.2 Definitions

GEOPAK will generate 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 .gpk file with the option to create an input (.inp) file.

## 2.3 Accessing


Existing ground profiles may be generated in either a 2D or 3D graphics file, both methods are similar except that an additional option is available with a 3D file. To access the **Existing Ground Profile** utility, click on **Project Manager >> Existing Ground Profile**. Once the run is chosen, the following dialog box will open.




## 2.4 Dialog

**Profile Name** - Name of the profile to be stored.

**Job Number and Operator** - .gpk job number and user's initials.

**Chain** - Name of stored chain used for profile stationing.

**Offset** - Produces a profile at a user specified 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

When in the **Increment, EVEN** or **POT** mode, an additional option box will provide two modes of operation for extracting data; **graphic** or **TIN**. (Only available in 3D file)

When using the **Intersect** or **POT** option *with* the graphic option, you will have an additional option for a circle to be drawn into the 3D file at the location of the intersection.

****Note:** It is recommended to use the **Intersect** option, as this will provide the most accurate existing ground profile.

## 2.5 Reviewing Profiles

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

1) Output viewed from the **COGO** dialog box: **Element >> Profile >> Print/List**

2) Profile drawn from the **D&C Manager**: By selecting the appropriate categories, for example:

**Drafting Standards >> Profile >> Existing Ground Profile >> Profile Scale**

Note: Always set an origin point for the profile display by drawing the Profile Cell.

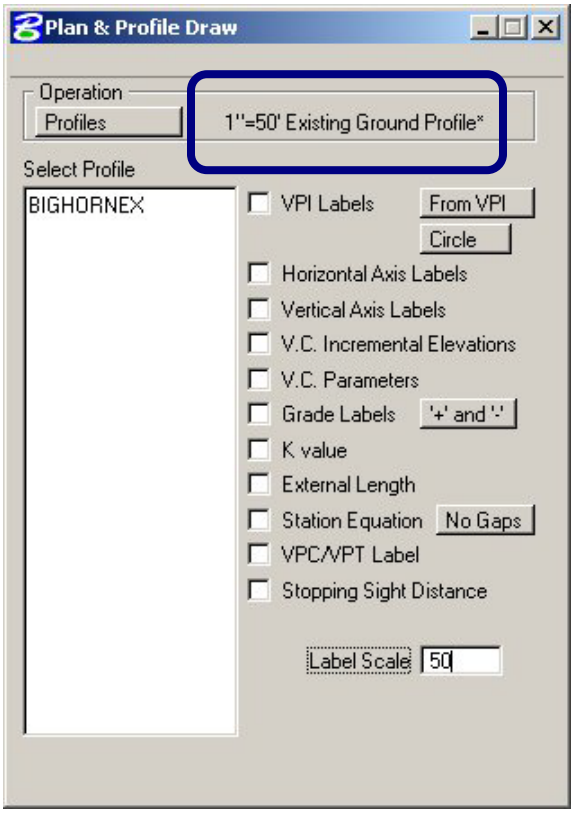
## 2.6 Plotting Profiles

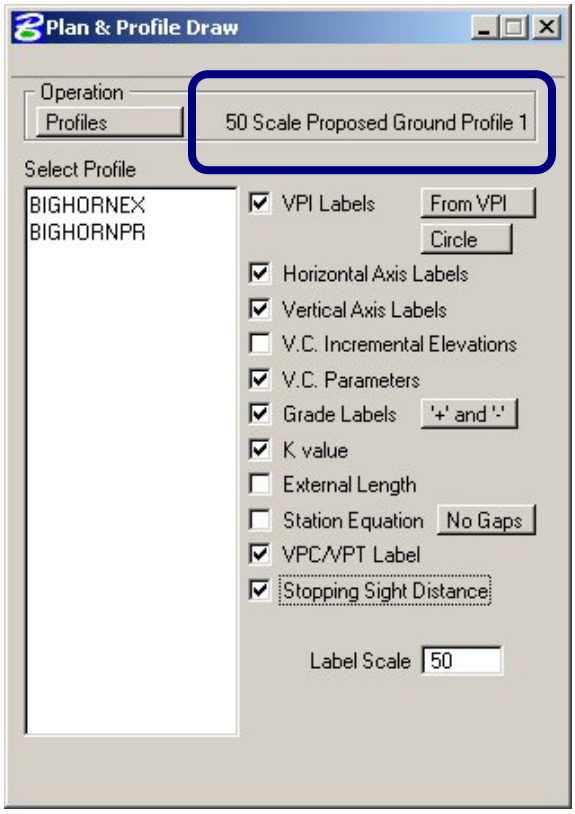
1) Draw a diagonal line to serve as a reference point.

2) Start D&C Manager.

3) From D&C Manager, choose the appropriate scale from the category **Drafting Standards>>Profile>>Existing Ground Profiles** or **Drafting Standards>>Profiles>>Proposed Ground Profiles**.
4) Choose the **Draw Plan & Profile** button.

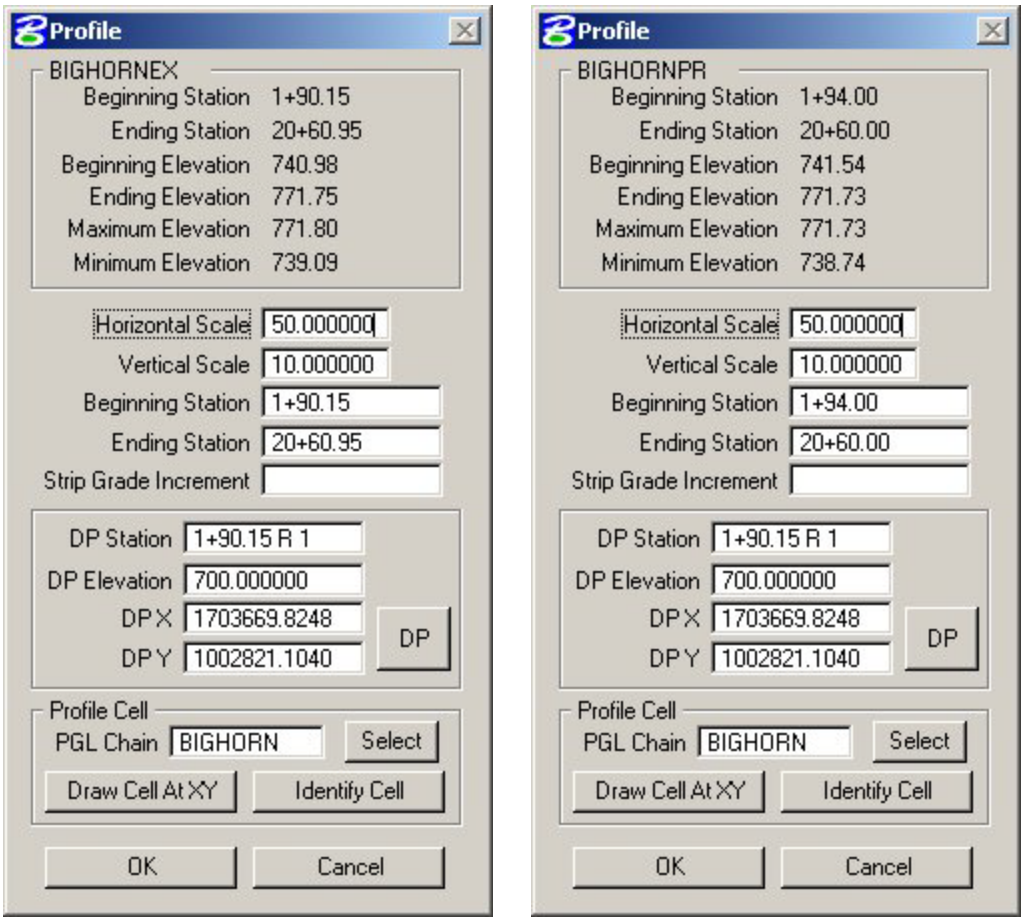
5) Set the options to be shown on the plotted profile.




6) Choose the profile from the list.

7) Set the horizontal and vertical scales and the station range to be plotted.




8) Determine the station and elevation of the origin point. (Usually the station will be the beginning of the chain, and the elevation will be a rounded value below the minimum elevation of the profile.

9) Select the **By DP** button and snap to the end of the diagonal line plotted in step 1 and accept the location. The coordinates for that location will be filled out.

10) If a profile cell has not been previously plotted, and is desired, set the PGL Chain and choose **Draw Cell at XY**. If a cell has been previously drawn, selecting the **Identify Cell** button and choosing the appropriate cell will fill in the scale, station and DP information.

11) Select the **OK** button.

## 2.7 Example 2-1

1. Using ProjectWise open the following MicroStation file:

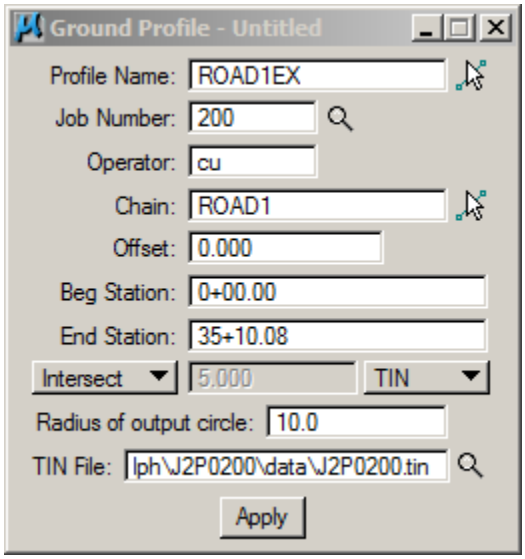
   **District CADD\Design\Randolph\J2P0200\data\plan.dgn**

2. Choose the **Road1** Working Alignment in the **J2P0200** project.

3. Choose **Existing Ground Profile** from the **Project Manager** dialog. Copy the **MoDOT** run and name the new run **Road1**.


4. Create an original ground profile for the project based on the following.

| | | | |
|---|---|---|---|
| Profile Name: | **ROAD1EX** | Job Number: | **200** |
| Operator: | **CU** | Chain: | **ROAD1** |
| Offset: | **0** | | |
| Beg. Station: | *Will be filled in when chain is chosen.* | | |
| End Station: | *Will be filled in when chain is chosen.* | | |
| Mode: | **Intersect** **TIN** | TIN File: | **J2P0200.tin** |



5. Using ProjectWise open the MicroStation file:

   **District CADD\Design\Randolph\J2P0200\data\Profile.dgn**

6. Attach as references the files **Plan.dgn** and fit the screen. Move to a blank area of the drawing.

7. Plot the existing ground profile using **Design and Computation Manager** item **Drafting Standards\ Profile\Existing Ground Profiles\1"=50' Existing Ground Profile**.

   Be sure all options are turned off, and the **Labeling Scale** is set to **50**.

   Choose the profile **ROAD1EX**.

   Set the following parameters:

   | | | | |
   |---|---|---|---|
   | Horizontal Scale: | **50** | Vertical Scale: | **10** |
   | DP Station: | **0+00** | DP Elevation: | **800** |
   | DP X and Y: | *Data point on the screen in an open area* | PGL Chain: | **ROAD1** |

   Draw the profile cell with the **Draw Cell at XY** button.

   Draw the profile by selecting **OK**.

   Save changes to the MicroStation drawing and update the Working Alignment Definition.