

# **GEOPAK – Vertical Geometry**

General	1
Existing Ground Profiles	2
Creating a Profile Cell	2
Creating Existing Profile (On Alignment)	5
Displaying Existing Profile (On Alignment)	8
Existing Offset Profiles (Lt & Rt)	11
Existing Ground Points (Lt & Rt)	14
Proposed Profiles	16
Displaying Proposed Profiles	16
High/Low point & Sta Equation Labels	19
Updating Displayed Profiles	21
Reviewing Profile Information	22
Print / Describe a Profile	22
Profile Elevation Analysis	24
Technical Support	25

# **General**

This workflow will demonstrate how to create, store, display and review existing ground profiles in GEOPAK. The project TIN file will provide the surface information needed for the existing ground profiles. In order to create an existing ground profile, a horizontal alignment, or chain, must be stored in COGO and used as a reference alignment for the profile.

Existing ground profiles are created along the alignment and on left and right offsets from the alignment. Existing offset ground profile information is created at an offset that is approximately the ditch location and existing ground point information is sampled at an offset that is approximately the Right of Way line location.

The existing ground profile on the alignment is created through the **Existing Ground Profile** tool in the Project Manager while the offset ground profiles are extracted using the **Draw Profiles** tool. The ground point information is created using a MDOT specific profile application.

Information on displaying proposed profiles, for plan preparation purposes, will be described in this workflow utilizing the **Draw Profiles** tool. Please refer to the OpenRoads Basics training for further information regarding development of proposed profiles.



## **Existing Ground Profiles**

#### **Creating a Profile Cell**

The profile cell stores data so that GEOPAK knows where to display the profile information in the MicroStation design file. The profile cell stores a reference station and elevation along with the horizontal and vertical scale and is the basis for profile plan production.

- Open Project Manager for the desired project to ensure the correct GPK file is referenced. Refer to <u>Workflow – GEOPAK\_1 – Project Manager</u> for information on setting up a project through Project Manager.
- Open the Draw Profiles tool in a desired MicroStation file (GEOPAK → ROAD → Plans Preparation → Draw Profiles). This tool cannot be opened from Project Manager dialog.

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Ta <u>b</u> les			Plan/Profile Sheet Composition
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3. In the **Draw Profile** dialog box, select the **Dialog Profile Cell Control** button.

🎬 Draw Profile	_		×
File Edit Update Options			
Job Number: 456  Chain: SALIL Surfaces COGO Projection	Label Scale:	80.000	00
Name Display Settings		Draw	
Details			
Profile:     MXX_EX     Station       Vertical Offset:     0.0000     Be	1 Limits :gin: 903+26 End: 903+26	.43 .43	+⊕+ +⊕+
Display Settings			
By Feature 🔻	Justom Line St	yle	
Feature: Prf_ExG Ex Ground 🔻 🏭	Scale facto	r: 0.000	)0
Options General VPI Labels From VPI VC Grade Labels '+' ar	VPI 🔻		

4. In **the Profile Cell Control** dialog, set the **Active Chain** to the desired chain (alignment). Then select the **Place Profile Cell** icon to place the profile cell in the file.

🖥 Profile Cell Control					-		×
Active Chain: SALIL							
Microstation File	Station	K	Elevation	H. Scale	V. Scale	Gap	
							2
							<b>X</b>
							×



- 5. The **Place Profile Cell** dialog lets the user define the characteristics of the cell.
  - **Station:** Start station for the cell. This will auto populate based on the Active Chain selected.
  - Elevation: Starting Elevation for the cell. This must be manually entered by the user based on the elevation characteristics of the project.
  - Horizontal Scale: Defines the horizontal scale.
  - Vertical Scale: Defines the vertical scale.
  - Gap/No Gap: If the selected chain has a station equation, this selection allows a gap to be placed at the location of the station equation. MDOT Recommends Profile Cells are created without a gap.
  - **Cell Range:** defines the cell range from the starting elevation defined in the Elevation cell. If the selections are changed to Top/Bottom Elevation allows the user to define the desired elevations.

🖗 Place Profi 🗕	
Station:	903+26.43
Elevation:	700.0000
Horizontal Scale:	10.000000
Vertical Scale:	1.000000
	No Gap 🔻
Cell Range	
Top Delta 🔻	200.0000
Bottom Delta 🔹	0.0000

6. Place the cell in the file by left clicking in the file. No stationing or elevations will be shown on the cell at this point, only the cell characteristics. The stationing and elevation information will be added when the existing and proposed profiles are drawn on the cell.

450	
80326 430000	
700	
10	
1	
NOGAP	

**Note:** If the text labeling in the lower left-hand corner of the cell is very large or very small, open the place text tool and ensure the text style is set to Pr\_Mask and that the annotation scale of the sheet is on and set to the desired scale. Delete and re-place the cell.





# **Creating Existing Profile (On Alignment)**

The existing ground profile on alignment will be created from the project TIN file and stored in the GPK. To extract a TIN file from the survey terrain, refer to <u>Workflow – GEOPAK 2 – Digital Terrain Model Analysis</u>.

- Open Project Manager for the desired project to ensure the correct GPK file is referenced. Refer to <u>Workflow – GEOPAK\_1 – Project Manager</u> for information on setting up a project through Project Manager.
- 2. In the **Project Manager** dialog, select **Existing Ground Profile**.

,					1111	$\sim$
le <u>R</u> emember <u>O</u> j	otions					
Working Directory:	pw:\Statewide Group	s\Engineering Sup	port Services	User: John	Job # 456	1
Working Alignment	Influence Runs					-
Working Alignment	Untitled		Select	Define Port View	wer	
Existing						
Ground	Draw Pattern	Existing Gi Cross Sec	round tions	Existing Ground Profile	Vertical Alignment	
Coordinate Geometry	Calcula	ta	Superalevation	Pmppes	d 20	
Horizontal Alignment	Superelev	vation	Shapes	Cross Sec	ions Models	s
Place Manue				E al al	Cross Section	
Design				Earthwork	Sheets	
	Plan View Quantities	Tabular Summaries				
Plan & Profile				Limits of	Reports & XS	

3. In the Select Run dialog, select Run  $\rightarrow$  New.

08/03/2017 09:58:58	

NOTE: Do not select or edit the default Untitled run. Create a new run for this process.



4. Enter a **Run Name** in the dialog with no spaces. If desired, enter a description for the run then select **OK**.

🛉 New Run I	lame	×
Run Name:	MXX_Ex	
Description	M-XX Existing Ground	
	<u>Q</u> K Cancel	

5. In the Select Run dialog, select the new run, then select OK.

Select Kun		×
<u>R</u> un		
Name	Time	
MXX_Ex	08/11/2017 11:02:32	
Untitled	08/03/2017 09:58:58	
Description		
Description M-XX Existing Groun	d	

- 6. In the Ground Profile dialog enter the following information, then select Apply.
  - Profile Name: Enter the desired profile name for the existing ground profile on alignment. (11 characters or less with no spaces or special characters, underbars are allowed)
  - Job Number: Ensure the correct GPK file is selected for the desired project.
  - **Operator:** Enter the user's initials.
  - **Chain:** Select the desired alignment or chain to run the existing ground profile.
  - Offset: Ensure the offset is set to 0.000
  - Beg Station: Enter desired start station.
  - End Station: Enter desired end station.
  - Sample Type Drop Down: Set Option to Even
  - Sample Spacing: MDOT recommends 5
  - Data Type Drop Down select TIN
  - **TIN File:** Select the appropriate TIN file for the desired project.

Profile Name:	MXX_Ex		¥.
Job Number:	456	Q	
Operator:	JS		
Chain:	SALIL		1
Offset:	0.000		
Beg Station:	903+26.4	3	
End Station:	1128+82.	56	
Even 🔻	5.000	TIN	•
Radius of outpu	t circle: 1	0.0	1
		ata\123456 tin	Q

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7. Select **OK** on the dialog below to continue.

🖬 Gro —		×
456oJS.inp		Select
<u>O</u> K	Cance	el

8. The existing ground on the alignment will be sampled from the TIN file at the specified increment. When complete, the user will be prompted to **Store** the profile. Select **Yes** to store the profile in the GPK.

Store	- 🗆 X
	File
	j456oJS.inp
con	aining store profile
comma	nds has been created.
Do you	want to store profile?
Do you	want to store profile?
Yes	No

9. In the following dialog, select **Yes** to delete the 3D profile string.

-	<u> 27 – 78</u>		×
Wo	uld you like to a	delete	
th	e 3D profile stri	ing ?	
Yes	No		

10. The existing ground profile on alignment is now stored in the GPK. To review, go to COGO and access the profile portion in Navigator.

Mavigator(456)	- 🗆 X
Select Tools	
' × ⊡ id 📥 🖹 № Element : Profile -	
Name MXX_EX	Feature



# **Displaying Existing Profile (On Alignment)**

Once the existing profile on alignment has been created and stored in the GPK file, it must be displayed on the profile cell. In addition to the existing profile, the horizontal and vertical axis labels (Stations, Elevations & Strip Grades) are added as part of the process.

- Open Project Manager for the desired project to ensure the correct GPK file is referenced. Refer to <u>Workflow – GEOPAK\_1 – Project Manager</u> for information on setting up a project through Project Manager.
- 2. Open the **Draw Profiles** tool (GEOPAK → ROAD → Plans Preparation → Draw Profiles) in the DGN file that contains the Profile Cell for the project.
- 3. In the **Draw Profile** dialog, ensure the **Job Number** shown is the correct GPK number, select the desired alignment for the **Chain** and set the **Label Scale** to the desired annotation scale.
- 4. Select the **COGO** tab.

🚔 Draw Profile		¢ <u>-</u>		×
File Edit Update Options				
Job Number: 456 Chain: SALIL Surfaces COGO Projectio		Label Scale:	80.0000	0
Name C	iisplay Settings		Draw	N II N

5. In the **Details** portion of the **Draw Profile** dialog, select the desired profile. The **Station Limits** will default to the beginning and end station of the selected chain.

Details	Station Limits
Profile: MXX_EX Vertical Offset: 0.0000	Begin: 903+26.43 ↔

6. In the **Display Settings** portion of the **Draw Profile** dialog, set the line style option to **By Feature.** Set the feature to **Prf\_ExG Ex Ground**. If the option doesn't appear in the dropdown, select the **paintbrush** icon.





 Selecting the paintbrush icon opens the Design & Computation manager. Navigate to the Vertical Alignment folder under Geometry – Design and select Prf\_ExG Ex Ground at PGL. Select OK to return to the Draw Profile dialog.



- 8. In the **Options** portion of the **Draw Profile** dialog, there are three menu selections: General, VPI and VC. Select **General**.
  - The **Strip Grade increment** determines the increment that the existing ground strip grades are displayed on the horizontal axis. Enter 50.
  - Ensure that the Horizontal and Vertical Axis labels are checked. These will display the stations and elevations on the profile cell.



9. In the **VPI** and **VC** options, ensure none of the options are selected. These options will be utilized when the proposed profile is displayed on the profile cell.

General	VPI Labels	From VPI -			
VC	Grade Labels	Lircle ▼ '+' and '-' ▼			
		_	Options General VPI VC	V.C. Parameters	/PC/VPT Label
			1.0	K Value	External Length

10. Once the **Draw Profiles** dialog has been populated for the existing profile, select the **Add COGO Profile Settings** icon to add the existing ground profile on alignment, as well as the horizontal and vertical axis labels to the Profile Cell.









# Existing Offset Profiles (Lt & Rt)

Existing offset profiles are developed directly from the **Draw Profile** dialog and are typically shown on the profile cell but are not stored in the GPK file. The offsets used are approximately the ditch location to the left and right of the alignment or just beyond the back of curb when there is no ditch on the project.

- Open Project Manager for the desired project to ensure the correct GPK file is referenced. Refer to <u>Workflow – GEOPAK\_1 – Project Manager</u> for information on setting up a project through Project Manager.
- 2. Open the **Draw Profiles** tool (GEOPAK → ROAD → Plans Preparation → Draw Profiles) in the DGN file that contains the Profile Cell for the project.
- 3. In the **Draw Profile** dialog, ensure the correct project **Job Number** (GPK) is selected and the **Chain** is set to the desired alignment.
- 4. Select the **Surfaces** tab.

File       Edit       Update Options         Job Number:       456       Image: Comparison of the second	ibel Scale: 80.00000
Job Number: 456  Chain: SALIL Surfaces COGO Projection Typ Name Display Settings	abel Scale: 80.00000
Surfaces COGO Projection           Typ         Name         Display Settings	
Typ Name Display Settings	
Type Mane Display Settings	Draw
	<b>D</b>
	×
	<u>2</u> +

5. In the **Details** portion of the **Draw Profile** dialog, select the project TIN file. Set the **Method** to **Triangles**.

ìn File		Manual\Data\123456.tin	Q
	Method:	Triangles 🔻	

6. In the **Display Settings** portion of the **Draw Profile** dialog, set the line style option to **By Feature.** Set the Feature to **Slope\_Ex\_Lt** or **Slope\_Ex\_Rt**. If the option doesn't appear in the dropdown, select the **paintbrush** icon.

1.7.5	Second and the second s	nonzontal.	0.3000
lope_Ex_Lt	- 4	Variance:	0.1000
	lope_Ex_Lt	lope_Ex_Lt 👻 🐣	lope_Ex_Lt 👻 🛃 Variance:



 Selecting the **paintbrush** icon opens the Design & Computation manager. Navigate to the Slope – Side Ground folder under Profiles (Offset) and select Slope\_Ex\_Lt or Slope\_Ex\_Rt. Select OK to return to the Draw Profile dialog.

File	Edit	Settings	Favorites	Help			
ñ	id				ок	Clo	se
	A:\MD ) Geon > Profile Bar Cur Dra Dra Mis Slo 2 Slo	OT_02 We netry - Des netry - Sun es (Offset) mer - Noise bGut - Top ain - Culver ain - Storm scellaneou pe - Ditch pe - Side (	orkspace\Pr ign yey 5 5 t Sewer s Ground	ojects \M \Fe	atures_CivilCla	Inic_MDOT.	dd ^
(	String String String String String	lope_Ex_l lope_Ex_f uc - Retain f - Bike Pa	t Ex. Profi Rt Ex. Prof hing Wall hith	le - Ground Lef ile - Ground Rig	t (All Scales) ght (All Scales	)	

8. In the **Station Limits** and **Offsets** portion of the **Draw Profile** dialog, enter the desired horizontal offset for the side profile. Negative values are to the left of the alignment up-station. Leaving the Station Limits portion un-selected will display the side profiles for the entire alignment.

Begin:	903+26.43	***	Horizontal:	-30.0000
End:	1128+82.56	+0+	Vertical	0.0000



9. When the Draw Profile dialog has been populated for one of the side profiles, select the **Add Surface Settings** icon to add the side profile to the profile cell.

e Edit Upda	te Options						
Job Num	ber: 456	•		Label	Scale:	80.000	00
nain: SALIL		•	_				
faces COGO	Projectio	n					
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10. Once complete, repeat Steps 5 through 9 to display the remaining offset profile, updating the feature and horizontal offset to the applicable side of the alignment.

Draw Profile			The second	×
ile Edit Update Op	otions			
Job Number:	456 🔻 🔊	Eabel S	cale: 80.0	0000
Chain: SALIL	*			
urfaces COGO Pr	ojection			
Type Name	Display Setting	s	Draw	v
TIN pw:\\12345	6.tin Slope_Ex_Lt			
				<b>*</b> *
Details* Tin File ▼	Manual\Data\1234	56.tin Q		<u>8</u> 4
Details* 	Manual\Data\1234 Triangles 💌	56.tin Q		<b>*</b>
Details* Tin File ▼ Method: Display Settings	Manual\Data\1234 Triangles ▼	56.tin Q Filter 1	olerances	<b>*</b> *
Details* Tin File ▼ Method: Display Settings By Feature	Manual\Data\1234 Triangles	56.tin Q Filter T Horiz	olerances	<b>*</b> *
Details* Tin File ▼ Method: Display Settings By Feature Feature: Slope_	Manual\Data\1234 Triangles Ex_Rt	56.tin Q Filter T Horiz Varia	olerances ontal: 0.30 ance: 0.10	₽¢
Details* Tin File Method: Display Settings By Feature Feature: Slope_ Station Limits	Manual\Data\1234 Triangles Ex_Rt	56.tin Q Filter T Horiz Varia Offsets	olerances ontal: 0.30 ance: 0.10	<b>₽</b> *
Details* Tin File Method: Display Settings By Feature Feature: Slope_ Station Limits Begin: 903+	Manual\Data\1234 Triangles Ex_Rt 26.43	56.tin Q Filter T Horiz Varia Offsets Horizontal:	olerances           ontal:         0.30           ance:         0.10           30.0000         1	₿* 100
Details* Tin File Method: Display Settings By Feature Feature: Slope Station Limits Begin: 903+ End: 1128	Manual\Data \1234 Triangles ▼ Ex_Rt 26.43 +\$+ +82.56 +\$+	56.tin Q Filter T Horiz Varia Offsets Horizontal: Vertical	olerances           ontal:         0.30           ance:         0.10           30.0000         0.0000	<u>8</u> *



### Existing Ground Points (Lt & Rt)

Existing ground points are left and right offset profiles that are displayed as dashes every 50 feet with an offset that is approximately equal to the average Right of Way location. They are added to the Profile Cell utilizing an MDOT specific tool called **Ground Point Profiles**.

Open the Ground Point Profiles tool (MDOT Tools → Road → Profile Apps → Ground Point Profiles).

MDOT Tools MDOT I	evel Filters MDOT View Set Subsurface	e Utility <u>H</u> elp
Cell Selector Place Quantity Text Slope Labeler Set Active Angle		
Printing	•	
Bridge	•	
Drainage	•	
Real Estate	<u>•</u>	
Road	Create Superelevation CSV File	
Survey	Grades	
Sheet Tools	Typical	
File Tools	Delete Civil Classic Resource Files	
Uala	Plan Apps 🕨	
нер	Profile Apps	Drainage Structures
Development	•	Ground Point Profiles
		High/Low Pt & Sta Eqn Labels
		Horizontal VPI Labels

- Select the TIN file for the project by selecting the folder with a magnifying glass next to TIN File:
- Select Identify Profile Cell in the Profile Settings portion of the tool and select the previously placed profile cell in the DGN file.
- Left click within the window to accept the selection. The project information in the Profile Settings should match the profile cell selected.

**NOTE:** If no information is shown the profile cell is not recognized. This tool will not function if the profile cell information is not displayed and the cell will have to be recreated to complete this process.





- In the Grid and Plot Information portion of the tool, enter the desired interval to place the ground points (50 ft) and the applicable drawing scale.
- 6. In the **Profile To Extract** portion of the tool, enter the desired Left and Right offsets. The start and stop stations are automatically populate based on the selected profile cell. Multiple Regions apply if there are station equations. To note regions in the selected chain, review the chain through COGO Navigator.

**NOTE:** Do not enter negative values for the Left Chain Offset. The tool will automatically select the correct side of the alignment based on the inputs.

**NOTE:** Ensure that the offsets from the alignment entered are within the limits of the terrain. If no information is identified at a given interval, the ground point will not be displayed.

Grid and Plot Information		
Even Station Intevals:	50	
Plot Scale:	80	

Left Chain	Offset:	60		
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tart Station/Region:	903+2	6. <mark>4</mark> 3	R	1
Exampl	le> 1+0	0	R :	1
top Station/Region:	1128+	82.5	R	1
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7. Once the tool is populated, select **OK** to draw the exiting Ground Points on the selected profile cell. Both the left and right ground points will be drawn at the same time.

ound Point Profiles		;
		Version: 2.3.5
		HELP
TIN File: 123456.ti	n 🙆	Grid and Plot Information
Profile Settings		
Identify Pr	ofile Cell	Plot Scale: 80
		Profile To Extract
Job: 456 Chain: SALIL		Left Chain Offset: 60
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Vert Scale: 1 X: 893903	3.0190	Example> 1+00 R 1
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## **Proposed Profiles**

This workflow is limited to describing how to display proposed profiles for plan production purposes that have been stored in the GPK. For further information regarding the creation of profiles, refer to OpenRoads Basics training.

## **Displaying Proposed Profiles**

To display a proposed profile, a profile must be stored in the GPK file for the project. In addition to displaying the proposed profile, the vertical curve information and proposed strip grades will be displayed.

- Open Project Manager for the desired project to ensure the correct GPK file is referenced. Refer to <u>Workflow – GEOPAK\_1 – Project Manager</u> for information on setting up a project through Project Manager.
- 2. Open the **Draw Profiles** tool (GEOPAK → ROAD → Plans Preparation → Draw Profiles) in the DGN file that contains the Profile Cell for the project.
- 3. In the **Draw Profile** dialog, ensure the **Job Number** displays the correct GPK number, the **Chain** is set to the desired alignment and the **Label Scale** is set to the desired annotation scale. Select the **COGO** tab.

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MXX_EX	Prf_ExG Ex Ground	at		
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4. In the **Details** portion of the **Draw Profile** dialog, select the desired profile. The **Station Limits** will default to the beginning and end station of the selected chain.

Profile	MXX PR	Station Lim	its	
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	Ventical Offset.	End:	1060+00.00	+++++

5. In the **Display Settings** portion of the **Draw Profile** dialog, set the line style option to **By Feature.** Set the feature to **Prf\_PGL\_XXX** that corresponds to the desired scale. If the desired option doesn't appear in the dropdown, select the **paintbrush** icon.

y Feature	•		Custom Line Style
Feature:	Prf_PGL_080	-	Scale factor: 0.0000
outorer [			1.000



- 6. Selecting the **paintbrush** icon opens the Design & Computation manager. Navigate to the Vertical Alignment folder under Geometry Design and select appropriate feature based on the desired drawing scale.
- 7. Select **OK** to apply the feature style selection and return to the Draw Profile dialog.



- 8. In the **Options** portion of the **Draw Profile** dialog, there are three menu selections: General, VPI and VC. Select **General**.
  - Enter 50 in the **Strip Grade Increment**. This determines the spacing of the ground strip grades that are displayed on the horizontal axis.
  - Ensure the remaining options are Unchecked. The horizontal and vertical axis labels were displayed with the Existing Profile.



9. Select **VPI** and ensure that the VPI Labels and Grade Labels options are selected. The dropdown information is default based on the selected feature.





10. Select VC and ensure that the V.C. Parameters and K Value are selected.



11. Once the **Draw Profiles** dialog has been populated for the proposed profile, select the **Add COGO Profile Setting** icon. The proposed profile, as well as the vertical curve information and strip grades are displayed on the Profile Cell.

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# High/Low point & Sta Equation Labels

High and low points, as well as station equation labels, can added to the proposed profile using the MDOT specific tool called **High/Low Pt & Sta Eqn Labels**.

 Open the High/Low Pt & Sta Eqn Labels tool (MDOT Tools → Road → Profile Apps → High/Low Pt & Sta Eqn Labels).

MDOT Tools MDOT Le	vel Filters MDOT View Set Subsurfa	ce Utility <u>H</u> elp
Cell Selector Place Quantity Text Slope Labeler Set Active Angle		
Printing •		
Bridge  Drainage  Real Estate		
Road	Create Superelevation CSV File	
Survey •	Grades	
Sheet Tools	Typical Delete Civil Classic Resource Files Plan Apps	•
Help •	Profile Apps	Drainage Structures
Development		Ground Point Profiles
		High/Low Pt & Sta Eqn Labels
		Horizontal VPI Labels

2. Select **Identify Profile Cell** in the **Profile Settings** portion of the tool. Once selected, click on the profile cell in the DGN file. Left click within a window to accept the selection and add the profile cell information to the **Profile Settings**.



3. Select the desired proposed profile and enter the annotation scale for the text.



4. The Label High/Low Points and Station Equations prefixes are populated with the default MDOT naming conventions. The user can customize what is shown by modifying the selections or changing the Prefix or Suffix on each option.



5. When the dialog has been populated, select **apply** to label the High/Low points and Station Equations for the selected proposed profile.

ligh/Low Point & Station Equation	n Labeling × Version 3.0.0
Profile Settings Identify Profile Cell Job: 456 Chain: SALIL Station: 903+26.43 Elevation: 700.0000 Scale Ratio: 10:1 X: 893903.0190 Y: 377063.5610	HELP         Label High/Low Points         I Label Points         I Label Points         I Station         Prefix:         Station         Prefix:         Elevation         Prefix:         Elevation         For HP/LP Prefix         Horizontal         Station Equations         I Label Station Equations         Prefix:       Suffix:         Back:       BK         Ahead:       AH
Profile: MXX_PR   Annotation Scale: 80	Include Regions in the Label



### **Updating Displayed Profiles**

Profiles that are displayed utilizing the Draw Profiles tool are not dynamically linked to the GPK. If any updates are made and stored in the GPK after it has been displayed on the profile cell, it must be updated to account for the changes.

1. Select the profile to be modified from the **Draw Profile** dialog. If desired, make changes to the Details, Display Settings and Options portions of the dialog.

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2. Select the **Modify COGO Profile Settings** icon to update the selected profile from the project GPK.

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#### **Reviewing Profile Information**

## Print / Describe a Profile

The Print/Describe function for a profile stored in the GPK allows the complete description of a profile to be displayed in text format in the COGO window. Information includes all grade and vertical curve data.

1. To describe a desired profile that is stored in the project GPK file, open COGO by selecting **Coordinate Geometry** in the **Road Project** dialog.



2. Open Navigator by selecting the Navigator icon on the COGO dialog.





3. Once in the **Navigator** dialog, select **Profile** from the Element dropdown. Select the desired profile to describe.



Note: This tool works best with proposed profiles. Existing profiles are developed from the project terrain file and do not include any curve information.

4. Select the **Print/Describe** icon. The profile data will be shown in the COGO display window. To obtain a hardcopy print of the data displayed in the COGO window, first highlight the desired data to be printed, then right click and select Print from the menu.

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#### **Profile Elevation Analysis**

Elevations along the proposed profile can be identified at any single station, or range of stations using the Profile Element tool through COGO for a proposed profile that is stored in the project GPK.

- 1. Open the COGO window from the Project manager.
- 2. To obtain Elevation Information at specific station or at a range of stations, in the COGO window box select **Element → Profile → Elevation**.



- 3. In the dialog that opens, select the desired profile from the dropdown
- 4. Under the **Station** dropdown select the desired analysis limits.
  - Station: Analysis at a single station
  - Even Station: Analysis at even stations
  - Increment Stations: Analysis at an entered increment
- 5. Enter the desired stationing limits based on the analysis limits selected.
- 6. Select **Compute Elevation**
- 7. The Elevation and location information will be displayed in the COGO window.

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MXX_PR 🗸
Station 🔻
Begin: 941+00.00
End: 1060+00.00
Even: 100
Compute Elevation



# **Technical Support**

Please email any questions, issues or problems associated with this document to:

MDOT-EngineeringSupportTraining@Michigan.gov

Additional Design Services Help and Support can also be obtained through the following email resources:

<u>MDOT-BridgeDesignSupport@Michigan.gov</u> – For help with bridge design software, cells, levels, and workspace tools.

<u>MDOT-Drainage-Utility@Michigan.gov</u> – For help with GEOPAK Drainage, drainage cells and other subsurface utility modeling tools.

<u>MDOT-CaddSupport@Michigan.gov</u> – For help with cells, levels, line styles, dimensions, and other CADD and workspace tools.

<u>MDOT-RoadwayModelingSupport@Michigan.gov</u> – For help with roadway modeling, modeling templates, civil cells and workspace tools.

<u>MDOT-Survey\_Support@Michigan.gov</u> – For help with survey data, workflows and processes.