

This document guides you through the use of the **Plan and Profile Generator** command in InRoads. The InRoads **Plan and Profile Generator** can be used for:

- Creating Roadway plan sheets depicting both plan and profile views on a single sheet.
- Full plan view sheets and double plan sheets (suitable for Roadway or Right-ofway plans)
- Full profile view sheets and double Profile Sheets

## **Required Resources:**

Before you begin, a number of resources are required for this command.

*Horizontal Alignment* - Plan view limits are defined relative to a horizontal alignment (length and right/left offsets). Therefore, a project specific Geometry Project must be loaded into memory.

*Digital Terrain Models* - Profile view limits are determined by the vertical relief of profiled DTM's. At least one project specific DTM must be loaded into memory.

*Cells* - Cells are used to place the Drawing's border and north arrows. The cell library *General.cel* must be attached for the Plan and Profile Generator to operate correctly.

**Border Sheet** - A Cell is used to generate the border sheet and is placed in each drawing created. *Source cell library:* 

#### C:\Wokspace\Workspace-CDOT\_XM\Standards-lobal\MicroStation\cells\General.cel

Cell Placed: SHEET\_Design-Sheet

*Scale* - Before the P&P command is run, the user needs to determine the final plot scale of the drawings being created. Current preferences exist for 20, 40, 50, 100, 200, and 500 scale plots. This is reflected on specific tabs within the command. See below for additional information.

Under Tools > Options > Factors the *Global Scale Factor* must be set to match the Plan & Profile Generator preference (horizontal scale) selected.

### **Dialog Settings:**

Project specific parameters need to be defined prior to command execution:

- Verification of Border Cell
- Location of MicroStation seed file
- Location for sheet output (project directory)
- Length along the alignment that will display in plan view
- Left and right offsets from a horizontal alignment for plan view display.

### **User Input:**

- 1. Select Drafting > Plan and Profile Generator. By default, the dialog will populate with the *CDOT* preference (100 horiontal scale by 1x vertical exageration Plan & Profile sheet).
- 2. **<D> Preferences** if a different scale or full plan sheet or double plan sheet or full profile sheet is desired:

Freferences	×
Preferences Name: 50 Scale Double Profile 2x 50 Scale Double Profile 5x 50 Scale Full Plan Sheet 50 Scale Full Profile 1x 50 Scale Full Profile 2x 50 Scale Full Profile 2x 50 Scale P&P (1x Vert) 500 Scale Double Plan 500 Scale Full Plan Sheet CDOT Default	Close Load Save Save As Delete Help
Active Preference: CDOT	

Developed Preferences are:

- 100 Scale Double Plan 100 scale (plot factor) double plan sheet
- 100 Scale Full Plan Sheet 100 scale (plot factor) plan sheet
- 100 Scale Full Profile 10x 100 scale (plot factor) full sheet profile with 10 times vertical exaggeration applied
- **100 Scale Double Profile 10x** 100 scale (plot factor) double profile sheet with 10 times vertical exaggeration applied
- **100 Scale Full Profile 1x** 100 scale (plot factor) full sheet profile with 1 times vertical exaggeration applied
- *100 Scale Full Profile 2x* 100 scale (plot factor) full sheet profile with 2 times vertical exaggeration applied

- *100 Scale P&P (1x Vert)* 100 scale (plot factor) plan & profile with 1 times vertical exaggeration applied
- *100 Scale P&P (2x Vert)* 100 scale (plot factor) plan & profile with 2 times vertical exaggeration applied
- **100** Scale P&P (5x Vert) 100 scale (plot factor) plan & profile with 5 times vertical exaggeration applied
- 100 Scale ROW Plan Sheet
- 3. Replicas of the above for 20, 40, 50, 200, and 500 scale as appropriate

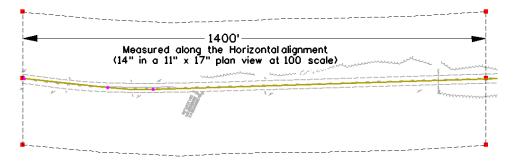
### **Main Tab**

 By default, the preference *CDOT* (which is the same as *CDOT 100 Scale P&P* (*1xVert*) ) will load & populate the dialog for generation of plan and profile sheets.

Border and Title	Symbols	and Details		Match Lines	S	heet Index
Main Plan Contro	ols	Profile Con	trols	Sheet Layo	ut \	/iew Layout
Method			Alignment:			Edit
Plan Only		SH 86		- +		
Plan and Profile		Geometry I	Projects in th	is VDF:		
Profile Only						
Plan Views						Help
Use Plan Views						
Use Station Limits					Note: Unles	
Profile Views					for this com	nand are in
Use Profile Views					model units.	_
Ose Station Limits		-Station L	imits			
Sheets Generate Sheets		Start:	100+00.00	_		
VDF Information Only		Stop:	366+60.50	-4	→ 366+60.5	50
VDF Information and H	lost Files	Length:	1400.00	-4	+	
lan Views:	Т	otal: 0	Profile View	s:		Total: 0
In Name	Start	Stop	Name		Start	Stop
•						

#### User input – Main Tab

- 1. Load the appropriate Preference (if necessary)
- 2. Select the *Horizontal Alignment* to be centered in the plan view
- 3. Define *Start* and *Stop* stations to define limits of sheet generation
- 4. *Length* defines the length along the alignment that will fit in a plan view. 1400 feet is the default for a 100 scale 11" x 17" plotted sheet. See graphic below.



#### **Changing Scale:**

A 50 scale plot will display 700 feet along the alignment in plan view, a 200 scale plot will display 2800 feet.

If something other than 100 scale is desired, the different scaled preferences are created to proportionally change the following:

- *Main* tab modifies *Length* along Alignment
- *Plan Controls* tab modifies *Width Left* and *Width Right* of reference line (alignment)
- Profile Controls tab modifies Profile Height
- *View Layout* tab modifies *Scale*
- *Symbols and Details* tab modifies *Scale*
- 5. One item that is not set by the preferences and that needs to be set by the user is the overall InRoads scale which is set by selecting the command:
  Tools>Options>Factors or Tools > Global Scale Factor set *Text*, *Cell*, *LineStyle* to the desired plot scale

10013 -	options	1 aou	013
Magnetions			
Precision General	Units and	d Format	Geometry
Tolerances Factors	Abbreviations	Rail	Sight Distance
Text Scale Factor:	100.0000		Help
Cell Scale Factor:	100.0000	─┟╺	
Line Style Scale Factor:	1.0000		
· · · · · · · · · · · · · · · · · · ·			

Tools > Options > Factors

Tools > Global Scale Factors

🐂 Scale F	actors		- • 💌
Text:	100.0000	h	Apply
Cell:	100.0000	۱÷۱	Close
Line Style:	1.0000		

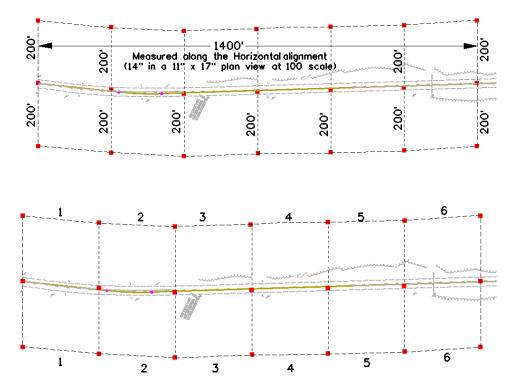
## **Plan Controls Tab**

1. **<D> Model Files** to pick the Drawing files (references) for display in plan view.

🐂 Plan and Profile	Generator			
Border and Titl Main	e Svmb Plan Controls	ols and Details Profile Controls	Match Lines Sheet Layout	Sheet Index View Layout
Seed View Name:	STA			Model Files
Width Left:	-200.00	<del>.</del>		
Width Right:	200.00	-+-		
Overlap:	0.00	+		
Boundary Chords:	6			Help
C:\12345\Design	1\Drawings\Referen 1\Drawings\Referen 2Survey\Drawings\ 111	nce_Files\12345DES_A nce_Files\12345DES_N Reference_Files\12345:	lodel.d	

**Note:** *Nested Attachments* can be checked, but you will only be able to manipulate levels (on or off) through Level Display and not in the Level Manager. Also, you can switch to live nesting in the actual P&P sheets by changing the reference file attachment settings.

The inputs *Width Left* and *Width Right* define plan view limits perpendicular from the reference line (left is negative).



The *Boundary Chords* setting will create a clipping limit that will fit the extents of the upper plan window area. This reference file clipping edge should be considered a "first pass limit" and may have to be edited on curved portions of the corridor path in locations where the cut / fill limits extend outside this "calculated" clipping limit. This plan limit editing, along with any shifting of the plan window position, is accomplished on the *Sheet Index* tab after the sheets have been created.

#### Model Files & Levels

The Model files selected (along with the profile generated) will be attached as reference files. The attached files will have the levels turned on that contain data. If additional data (levels) are added to the referenced files after the sheets are created, the user is required to turn on the appropriate levels through the use of the level display dialog box.

Additionally, the files referenced will have the design file 'CDOT Default' model attached. It is CDOT policy that only the model titled 'CDOT Default' should be used in any MicroStation file.

### **Profile Controls Tab**

1. Select the design *Vertical Alignment*. The alignment specified determines window clearance (top/bottom profile grid clearance.

🕌 Plan and Profile Ge	nerator		
Border and Title Main Pla	Symbols and Details In Controls Profile Controls	Match Lines Sheet Layout	Sheet Index View Layout
Seed View Name: Set Name: Profile Preference: Vertical Alignment:	STA SH 86 1x Vertical ▼ SH 86 V ▼		Help
Surface: Default 12345_Existing design	Profile Elevation Shifts Shift at Major Stations Shift at Minor Stations Shift Where Needed Do Not Shift Note: Highlighted surfaces control elevation shifts.	Horizontal Spacing Left to Left Distance: 500.0 Vertical Spacing Bottom to Bottom Distance: 500.0	Right to Left
Profile Height: Profiles per Column: Margins Top: 125.00 Left: 75.00	400.00 1 Bottom: 25.00 Right: 75.00	Example	
	Apply Preferences.	Close	

*Profile Preference* defines profile grid settings (ticks, annotation, grid/tick spacing etc.) as stored as a preference in Evaluation > Profile >Generate Profile

Default
10x Vertical
10xVert_Drain
1x Vertical
1xVert_Drain
2x Vertical
2xVert_Drain
5x Vertical
5xVert_Drain
CDOT
SS_Drain

- 2. Enter an appropriate profile *Set Name*. For better tracking and locating, this field will default to the name of the *Horizontal Alignment* from the *Main* tab.
- 3. Select the *Vertical Alignment* from the drop-down list. (This tells InRoads to create a profile window with an elevation range compatible with the vertical design.)

- 4. Check on (X) any *Surface* that you wish to display in the profile window as it is created (you can always display additional data after the profiles have been constructed).
- 5. Hold down the CTRL key and select any *Surface* that should be considered when establishing the elevation range position of the profile window. These selected surfaces affect the *Profile Elevation Shifts* locations.
  - **Note:** The Margin on the Top has additional space provided in case a superelevation diagram is shown in combination with the profile window.

From the InRoads help menu:

When a profile is shifted (vertically), the starting elevation will always be a multiple of the Spacing value for the ticks on the left axis in the Create Profile command. To set this parameter, go to the Axes tab on the Create Profile dialog box, set Axis to Left, set Annotation to Ticks, and key in the Spacing value in the Major Ticks group box. Therefore, if you get a message stating that the profile will not fit in the given profile height, you have two choices: (1) increase the profile height or (2) specify a smaller spacing value for the left axis.

### **Sheet Layout Tab**

Border and	Title	Symb	ols and Details		ch Lines	Sheet Index
Main	Plan Co	ontrols	Profile Controls	Sł	neet Layout	View Layout
Sheet Number:	1	Name:	1	Host Fil	e Content -	
Host File:	C:\12345	\Design\Dr	awings\12345	Sing	le Sheet Ea	ch
Seed Host File:	C:\Works	pace\Work	space-CDOT_ 🛄	) Al S	heets in One	e Edit Symbology
<ul> <li>Sheet Location</li> <li>Layout alo</li> </ul>		nt 🔘 La	yout in Grid			Help
	Nearest: Plan and Pro Sheet First	Degree	T	Horizon	tal Spacing to Left	Right to Left
First Sheet Lo		del Units)		Distanc	e: 1	00.00
X:		0.00		Vertical	Spacing	
Y:		0.00	- <del>4</del> -	Botte	om to Botton	n (     Top to Bottom
Sheets per Co	olumn:	1		Distanc	e: 1	00.00
Clipping Bour	ndary			Exampl	e	
Level:		0				
Symbology:			•			
🔲 Unique Le	vel for Eacl	n Sheet				
Level Step	):	0				

1. <D> an next to the *Host File* field to identify the path and initial sheet name for the new drawing set. The *Host File* refers to the new MicroStation plan

and profile drawings that will be created by this tool. The last number, "1", will be automatically incremented as each new sheet is created. This should be set to the project directory, i.e.

C:\Projects\12345\ Design\Drawings\12345DES\_PnP01.dgn

- The Seed Host File is the 'prototype' file used to create the Host files. Verify the path is set to: C:\Workspace\Workspace-CDOT\_XM\Standards-Global\MicroStation\ seed\3D-Seed\_CDOT.dgn
- 3. The *Symbology* for the *Clipping Boundary* will be blank since the Level specified will determine the clipping boundary symbology.

## View Layout Tab

This tab sets location (origin) for the profile and plan views relative to the border sheet. No user input is required in this dialog unless creating sheets at a scale other than 1"=100'

Border an	d Title	Symbols	and Details	Match Lines	Sheet Index
Main	Plan Cont	rols	Profile Controls	Sheet Layout	View Layout
Views					
Number:		1			
Distance be	tween Plans:	0.00			
Distance be	tween Profiles:	0.00			
					Help
- Location (Pa	aper Units) X	Y			
Plan: 1.7	5	8.50			
Profile: 1.7	5	1.75			
Scale: 1.0	) =	100.00			

- **Note:** The *Location* of the *Profile Y* position was determined by 1.50" of outside title block border plus 0.25" of clear space for the station text at that bottom of the profile window. (1.50+0.25 = 1.75)
- **Note:** The *Location* of the *Plan Y* position was determined by 1.50" of outside title block border plus 0.25" clear space for the station text below the profile window plus 4.5" of space required for 45' of profile elevation plus 0.25" of clear space above the profile window plus  $\frac{1}{2}$  of the

```
remaining 4" width of the plan window. (1.50+0.25+4.50+0.25+2.00 = 8.50)
```

## **Border and Title Tab**

The only user input on this tab is to ensure the correct cell is specified for the border sheet. Cell Placed: *SHEET\_Design-Sheet* 

Main	Plan Con	role	Profile Controls	Sheet Layout	View Layout
Border and T			ols and Details	Match Lines	Sheet Index
Dorder and 1	ille.	Symbo	is and Details	Match Lines	Sheet Index
Border			7		Browse
Cell			Reference File		
Name:	SHEET_D	esian-( 🔻	C:\Program File	es\Workspace-CDOT\	
C Retain C	ell Levels fo	-	Sheet Size:	B (11 x 17) 🔹	
0			Custom Width:	16.00	Help
Same Le			Custom Height:	10.50	
🔘 Unique L	evel for Ead	ch Sheet	- Title Block Data		
Sheet Level:	1			a rile ivame:	
Level Step:	1		í L		
Scale:	<u> </u>		1	Edit	
Scale.	100.00				
Sankalaan					
Symbology:				Location in Paper Ur	nits:
Object		Name	, ,	X: 0.00	
Horizontal A	-				_
Start Station					
Stop Station				User Text:	
Total Sheet					
Scale	5		H	Station Format:	
View Name			H		
Rotation			H,	S+SSS.SS	<b>*</b>
<			•	Use Sheet Level	

## Symbols and Details Tab

No user input is required in this dialog unless modifications to the stored preference are required.

Plan and Pro	ofile Generator			
Main	Plan Controls	Profile Controls	Sheet Layout	View Layout
Border and	d Title Syn	nbols and Details	Match Lines	Sheet Index
North Arrow				
🔽 Attach				
Cell Name:	SHEET_North-Arro	w 💌		
🔘 Retain Ce	ell Levels for Each She	eet		
Use Sheet	et Level			Help
Same Le	vel for Each Sheet			
Level:	1			
Scale:	100.00			
Location in F	aper Units			
X:	15.00			
Y:	9.50			
ProjectWise	Title Block Advisory-Radio	•		
	Арр	Preferences	Close	

The *North Arrow* position is specified by the *Location in Paper Units* input and is set to the upper right corner of the sheet. This is a rough placement and will likely have to be moved for clarity and conflicts on many sheets. Once the sheets are constructed each sheet should be checked for optimum cell position.

The North Arrow and matchline information are not being placed on the correct level. A workflow document has been created to assist you in moving the North Arrow and matchline information to the correct level through a batch process. If these elements are not moved to the correct level, they will not plot. InRoads places these elements on a no plot level. See the CDOT Batch Processing workflow document for more information on this process.

## **Match Lines Tab**

No user input is required in this dialog.

Main	Plan Co	ntrols	Profile Controls		Sheet Layout	View Layout
Border and	Title	Symb	ools and Details	Μ	atch Lines	Sheet Index
						Help
Symbology:						
Symbology: Object		Nam	ne	*	Extend To Clipping B	oundary
Object Object Plan Line Plan Start Plan Stop Plan Prev	Station	SHE	ne ET_Match-Line ET_Match-Line	BYI BYI BYI	<ul> <li>To Clipping Bi</li> <li>Distance from</li> <li>Distance Left:</li> </ul>	0.00
Object Object Plan Line Plan Start Plan Stop Plan Prev Plan Next Profile Line Profile Star	Station Sheet Sheet Sheet	SHE	ET_Match-Line	BYI_	<ul> <li>To Clipping B</li> <li>Distance from</li> </ul>	ı Origin
Object Object Plan Line Plan Start Plan Stop Plan Prev Plan Next Plan Next	Station Sheet Sheet Sheet	SHE	ET_Match-Line	BYI_	<ul> <li>To Clipping Bit</li> <li>Distance from</li> <li>Distance Left:</li> <li>Distance Right:</li> </ul> Station Format:	Origin 0.00 0.00

### **Executing the Command**

The workflow process for this command follows the sequence:

- New profiles are generated for referencing to individual sheets
- Plan view reference limits are established
- New drawing files are created based on the host file name
- Each new drawing file has 3 items generated
  - Plan views or Plan and Profile views
  - Profile views
  - Border sheet placed as a cell in each generated drawing
- North arrows are placed in all sheets
- The Plan and Profile dialog (sheet index tab) will populate with sheets created and sheet limits.
  - **Note:** Because new profiles will be generated, you should execute the command in a drawing specific for this use. For example:

#### C:\Projects\12345\Design\Drawings\Reference\_Files\12345DES\_Prof. dgn



## **Sheet Index Tab**

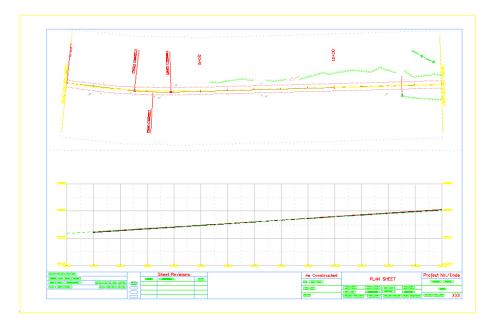
Main	Plan (	Controls	Profile Controls	Sheet Layout	View Layout
	er and Title			Match Lines	Sheet Index
Borde	erand little	Sym	ools and Details	Match Lines	Sheet Index
VDF File	Open				
- Show S Clipping	Save				
Sheet Ind	lex:				Save As
Sheet	Sheet Name		Host File	Sheet Rotation	Help
1	1	C:\12345\	Design\Drawings\1234	5D 88^00'00''	Create Plot Set
2	2	C:\12345\	Design\Drawings\1234	5D 89^00'00"	
3	3	C:\12345\	Design\Drawings\1234	5D 96^00'00"	
4	4	C:\12345\	Design\Drawings\1234	5D 102^00'00''	All
5	5	C:\12345\	Design\Drawings\1234	5D 105^00'00'' 🛛 👻	
•		None			
	Delete She	et Re	generate Sheet	how Sheet	
Sheet Vie	ws.				
Sheet Vie Sheet	View Ty	pe	View Name	Anchor X	Anchor Y
			View Name TA 100+00.00	Anchor X 1.75	Anchor Y 8.50
Sheet	View Ty	S			
Sheet 1	View Ty Plan	S	TA 100+00.00	1.75	8.50
Sheet 1	View Ty Plan	S	TA 100+00.00	1.75	8.50 1.75

Nothing is required by the user on this tab prior to Plan & Profile sheet creation.

- 1. After the **Plan and Profile Generator** has been run, each sheet should be reviewed for:
- North Arrow position (Manually move the Cell if necessary)
- Plan view Clipping limits (Using MicroStation Modify, edit the clipping shape). This level is set to be on a no plot level.
- Plan View Position (Select the sheet on the Sheet Index tab, modify the Anchors as necessary, and Regenerate Sheet to reconstruct)

2. Save a project specific View Definition File (VDF) so that sheet definitions can be recalled and modified if necessary. This file should be saved to your InRoads project folder location, not within the CDOT Workspace.

By highlighting a specific sheet and <D> Show Sheet, MicroStation will open the selected drawing.



#### Main Tab

Once the command has been run the *Geometry Projects in this VDF* list box will populate and the *Plan View* and *Profile View* limits display.

🐂 Plan and Pro	file Genera	tor					
Border and Main	Title Plan Co	-	and Details Profile Controls		Match Lines Sheet Layout		Sheet Index View Layout
	y Views in Limits is Views in Limits Sheets formation Or	nly nd Host Files	Horizontal SH 86 Geometry 12345DE Station L Start: Stop: Length:	Projects in S	• <u>•</u>	noted, for this model Def	
2 STA 1 3 STA 1	Name 00+00.00 12+00.00 26±00.00	Start 100+00.00 112+00.00 126±00.00	126+	STA 11	0+00.00 2+00.00 £+00.00	Start 100+00.0 112+00.0 126±00.0 III	0 126+00.00
Apply Preferences Close							

1. <D> <D> on a Plan or Profile View in the list to open an *Edit Plan (or Profile) View* dialog. Sheet limits can be modified and reference files can be added or removed from this location.

🚼 Edit Plan View 💽						
View Name:	Apply					
Start:	100+00.00	Stop:	112+00.00	Close		
Rotation:	88^00'00''	Overlap:	0.00	Model Files		
Width Left	-200.00	Width Right:	200.00	< Previous		
Force Re	Force Rectangular Boundary Boundary Chords: 6					
Model Files:	Next >					
C:\12345\Design\Drawings\Reference_Files\12345DES_Align.dgn C:\12345\Design\Drawings\Reference_Files\12345DES_Model.dgn C:\12345\ROW_Survey\Drawings\Reference_Files\12345SURV_Topo.dgn						
<	III		Þ			
Nested A	ttachments					