

# CDOT InRoads Plan and Profile Generator



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-of-way 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.

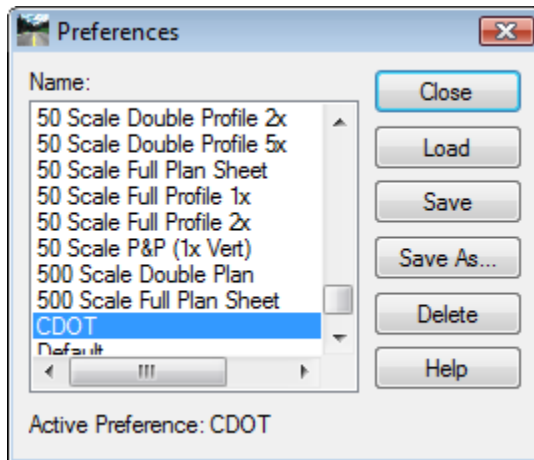
## Dialog Settings:

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 horizontal scale by 1x vertical exaggeration Plan & Profile sheet).
2. <D> **Preferences** if a different scale or full plan sheet or double plan sheet or full profile sheet is desired:



Developed Preferences are:

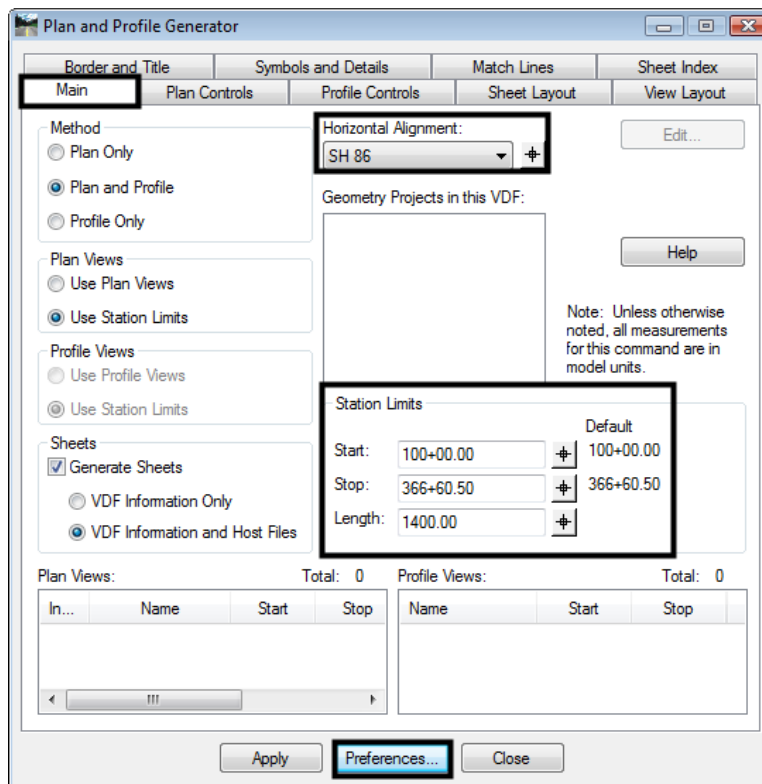
- **100 Scale Double Plan** – 100 scale (plot factor) double plan sheet
- **100 Scale Full Plan Sheet** – 100 scale (plot factor) plan sheet
- **100 Scale Full Profile 10x** – 100 scale (plot factor) full sheet profile with 10 times vertical exaggeration applied
- **100 Scale Double Profile 10x** – 100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

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- **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

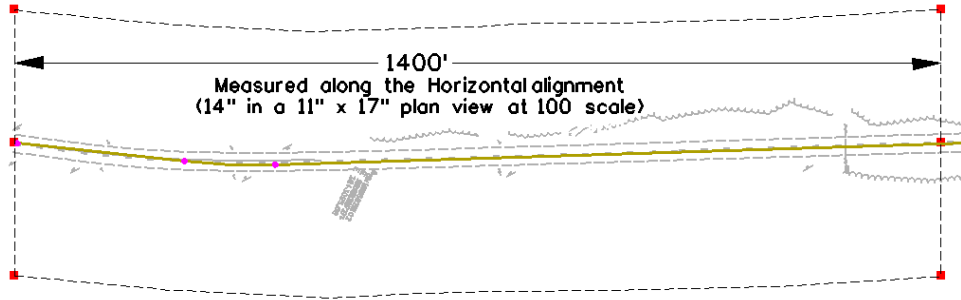
1. By default, the preference **CDOT** (which is the same as **CDOT 100 Scale P&P (1xVert)**) will load & populate the dialog for generation of plan and profile sheets.



## 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.

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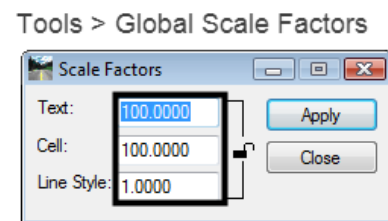
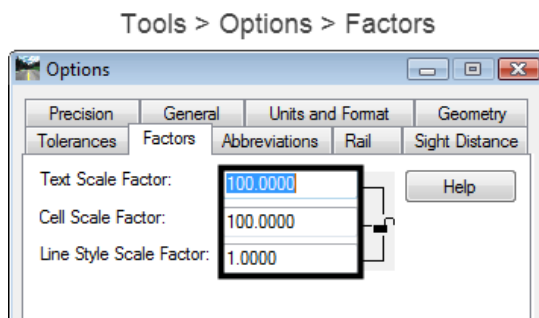


### Changing Scale:

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

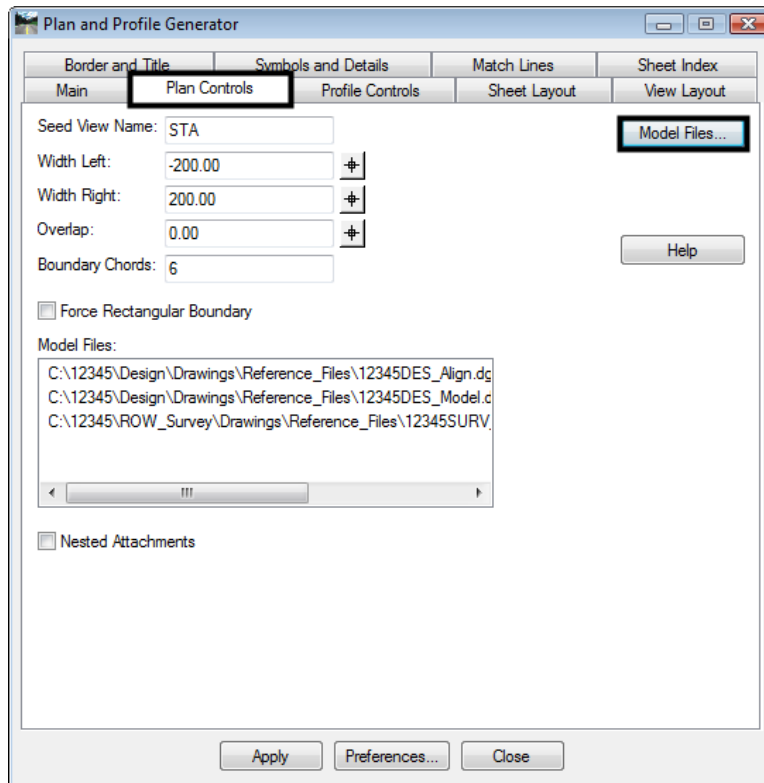
If something other than 100 scale is desired, the different scaled preferences are created to proportionally change the following:

- **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



## Plan Controls Tab

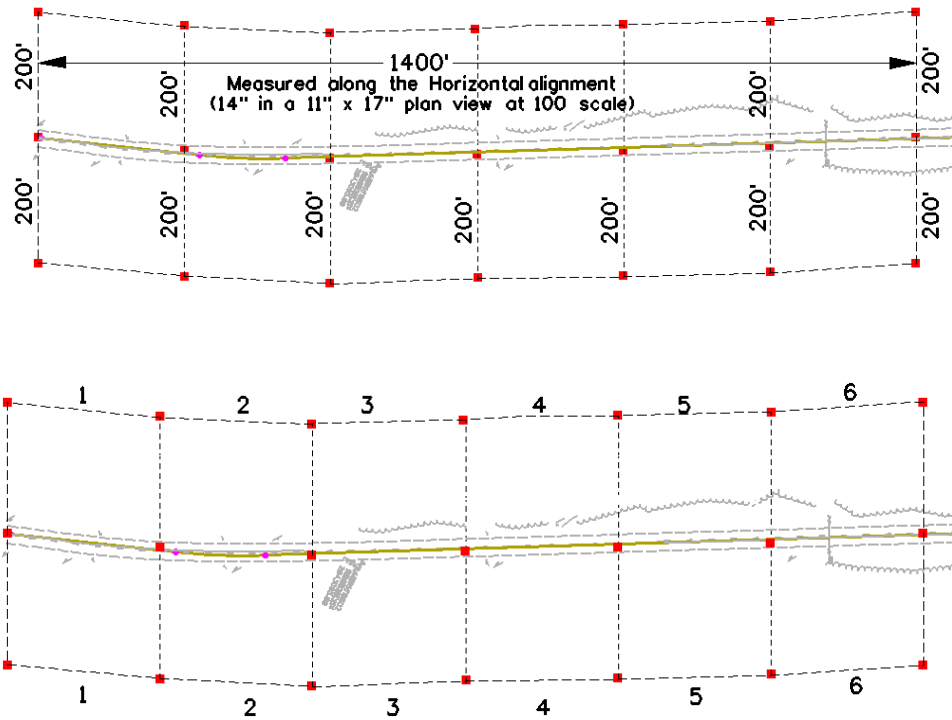
1. <D> Model Files to pick the Drawing files (references) for display in plan view.



**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.

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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.

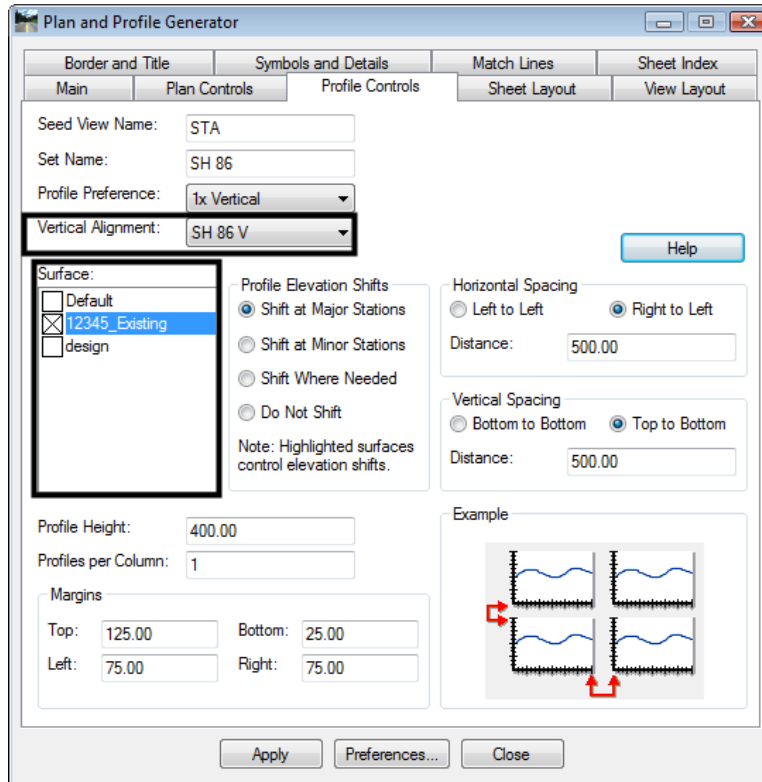
## Model Files & Levels

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.

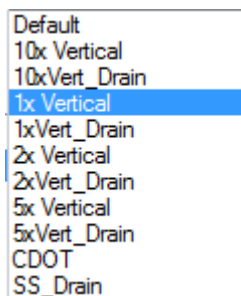
Additionally, the files referenced will have the design file ‘CDOT Default’ model attached. It is CDOT policy that only the model titled ‘CDOT Default’ should be used in any MicroStation file.

## Profile Controls Tab

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



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



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.)

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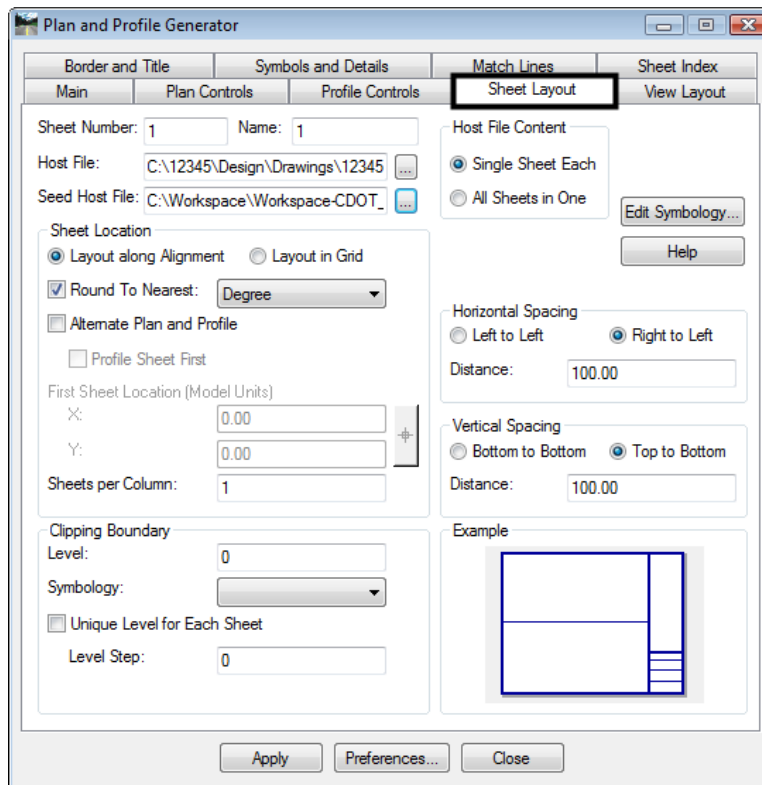
4. Check on (X) any **Surface** that you wish to display in the profile window as it is created (you can always display additional data after the profiles have been constructed).
5. Hold down the CTRL key and select any **Surface** that should be considered when establishing the elevation range position 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



1. <D>  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



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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*

2. 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’

The screenshot shows the 'Plan and Profile Generator' dialog box with the 'View Layout' tab selected. The dialog has a title bar and a menu bar with 'Border and Title', 'Symbols and Details', 'Match Lines', and 'Sheet Index'. Below the menu bar are four sub-tabs: 'Main', 'Plan Controls', 'Profile Controls', and 'Sheet Layout'. The 'View Layout' sub-tab is active and highlighted with a black border. The 'View Layout' sub-tab contains the following fields and controls:

- Views** section:
  - Number: 1
  - Distance between Plans: 0.00
  - Distance between Profiles: 0.00
- Location (Paper Units)** section:
  - X: Plan: 1.75, Profile: 1.75
  - Y: 8.50, 1.75
- Scale** section: 1.00 = 100.00
- A 'Help' button is located to the right of the 'Views' section.

At the bottom of the dialog are three buttons: 'Apply', 'Preferences...', and 'Close'.

**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 ½ of the

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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*

Plan and Profile Generator

Main Plan Controls Profile Controls Sheet Layout View Layout

Border and Title Symbols and Details Match Lines Sheet Index

Border:

Cell  
Name: SHEET\_Design-?

Retain Cell Levels for Each Sheet

Same Level for Each Sheet

Unique Level for Each Sheet

Sheet Level: 1

Level Step: 1

Scale: 100.00

Reference File Name:  
C:\Program Files\Workspace-CDOT

Sheet Size: B (11 x 17)

Custom Width: 16.00

Custom Height: 10.50

Title Block Data File Name:  
Edit...

Browse... Help

Symbology:

Object	Name
<input type="checkbox"/> Horizontal Alignment	
<input type="checkbox"/> Start Station	
<input type="checkbox"/> Stop Station	
<input type="checkbox"/> Sheet Number	
<input type="checkbox"/> Total Sheets	
<input type="checkbox"/> Scale	
<input type="checkbox"/> View Name	
<input type="checkbox"/> Rotation	

Location in Paper Units:  
X: 0.00  
Y: 0.00

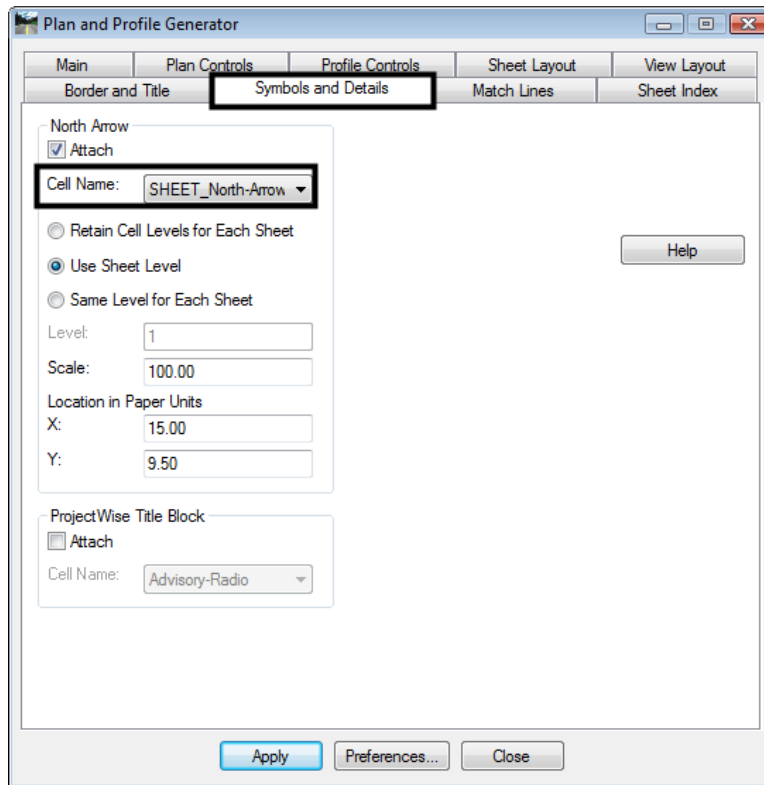
User Text:  
Station Format:  
s+sss.ss

Use Sheet Level

Apply Preferences... Close

## Symbols and Details Tab

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

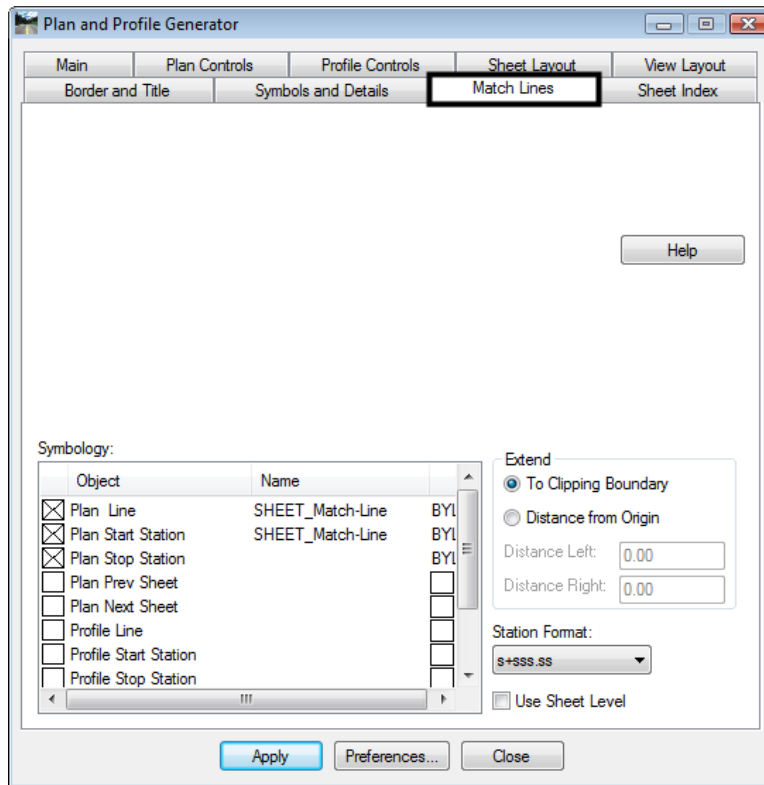


The **North Arrow** position is specified by the **Location in Paper Units** input and is set to the upper right corner of the sheet. This is a rough placement and will likely have to be moved for clarity and conflicts on many sheets. Once the sheets are constructed each sheet should be checked for optimum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



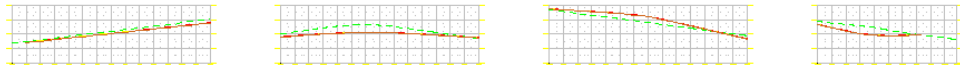
## Executing the Command

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.

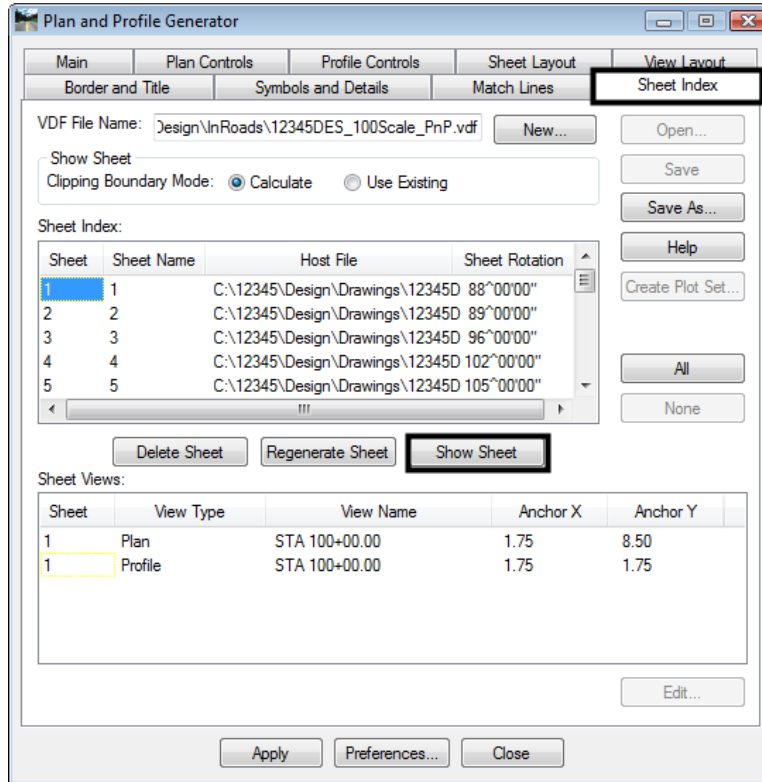
**Note:** Because new profiles will be generated, you should execute the command in a drawing specific for this use. For example:

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



## Sheet Index Tab

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

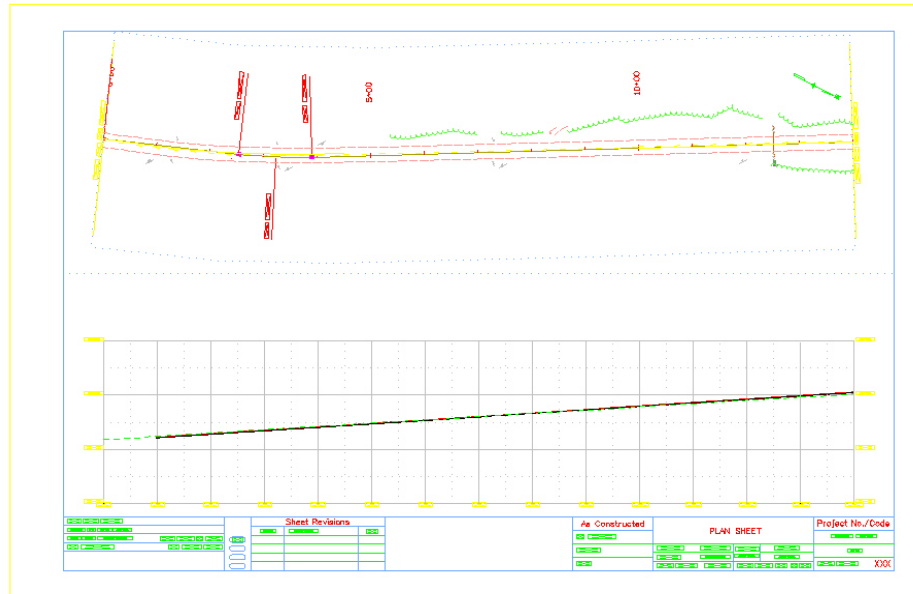


1. After the **Plan and Profile Generator** has been run, each sheet should be reviewed for:
  - North Arrow position (Manually move the Cell if necessary)
  - Plan view Clipping limits (Using MicroStation Modify, edit the clipping shape). This level is set to be on a no plot level.
  - Plan View Position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

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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.

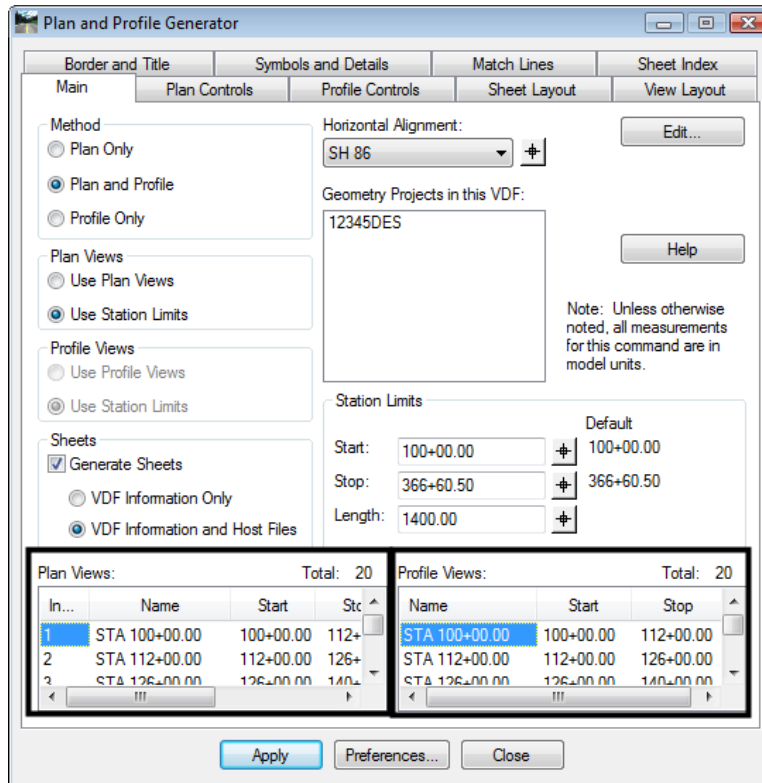
By highlighting a specific sheet and <D> **Show Sheet**, MicroStation will open the selected drawing.



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## 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.



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.

