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Chapter 19: Plan & Profile Sheet Clipping

Overview

This chapter will describe the methods used to create plan and profile sheets. The following workflows will show the user how to set up sheets using GEOPAK Plan and Profile Sheet Composition tool. This application has evolved over the years, allowing for profile stair stepping, ability to automatically clip the graphics with notches (Title block, project information, etc.), customized sheet numbering and station adjustment on sheets.



Note: CFLHD policy is to create one sheet per file. This will allow the use of plan and profile labelers when detailing the sheets.

Plan/profile sheet creation

GEOPAK will create single plans, double plans and plan/profile sheets. These sheets are generally created at 1000 scale Metric or 2000 scale Metric and 1:100 scale English and 1:200 scale English. Workflow 1 will describe the steps necessary to create a plan/profile sheet. Station range, drawing areas, and many other variables are contained in the sheet library files **English_sheets.psl** and **Metric_sheets.psl**. The sheet library file contains many values specific to CFLHD such as cell library names and locations, specific sheet cells to be used, drawing scales, and a variety of text parameters and cannot be modified by the user.

The sheet library files for CFLHD projects and are located on the CFLHD network at:
N:\Standards\V8_RESOURCE\X_30\Standards\Sheet_Layout\metric or English



For CFLHD employees, the unit correct .psl file will be automatically attached while opening a design file using the Project Configuration (*.pcf).

For consultants, CFLHD sheet library files are available through the **V8_Resource.zip** download. Download the file and extract the file to the server or local drive, keep the V8_Resource directory structure intact. The unit correct .psl file will be attached when opening a design file using the project configuration file.



Clip Sheets and Motif Files

Prior to using the GEOPAK Plan and Profile Sheet Composition tool, three files need to be created. **Clip.dgn**, **Plan_motif.dgn** and **Profile_motif.dgn** should be created to assure proper setup of plan and profile sheets. Outlined below are the uses and instructions for creating each file.

Clip.dgn

Creating a drawing to display the sheet boundaries will allow the user to always have a visual representation of how each sheet will layout in relation to the others. If the design changes, having this file will allow the user to move sheets around to better fit any design changes. To create this sheet, make a copy of the 2D seed file and reference the **chain** and **profile** into this new file. By referencing the overall design back into the **Clip.dgn** file, any future design changes will be displayed in this new file, instantly showing the designer which sheets, if any, will need to be adjusted. Sheet cell libraries **English_pnp_sheet_layout.cel** or **Metric_pnp_sheet_layout.cel** should be attached to the **Clip.dgn** file prior to clipping sheets, this will provide the ability to automatically clip the graphics with notches for project Information (state, project, sheet number) to be unobstructed.

Motif files

Motif files act as seed files for clipping plan and profile sheets. Motif file should be a blank file with the proper reference files attached, and the proper levels for each file turned on or off. The **Plan and Profile Sheet Composition tool** will then use these files when clipping each sheet and each clip sheet will have the correct files displayed with the correct levels on. For example, if the plan view in a final plan sheet needs to show overall design, mapping, raster images, ROW, etc., with specific levels on or off for each of these files, you would only need to setup this combination once in the motif file. This information would then be used to create each sheet. These sheets should be named **Plan_motif.dgn** and **Profile_motif.dgn**. To create **Plan_motif.dgn**, make a copy of the 2D seed file and attach each reference file that should be shown in the plan view, and turn on or off any levels to make the display look exactly like the final plan sheets in plan view. Repeat these steps for the **Profile_motif.dgn**, referencing the profile sheet into the 2D seed file.

The seed files for CFLHD projects are located on the CFLHD network at: *N:\Standards\W8_RESOURCE\X_30\Standards\seed\Metric or English*



Workflow 1: Plan/Profile sheets using GEOPAK

1. *Open the Clip.dgn and invoke Plan and Profile Sheet Composition tool from Project Manager by selecting the button for Plan & Profile Sheets. Select a Run or create a new Run.*

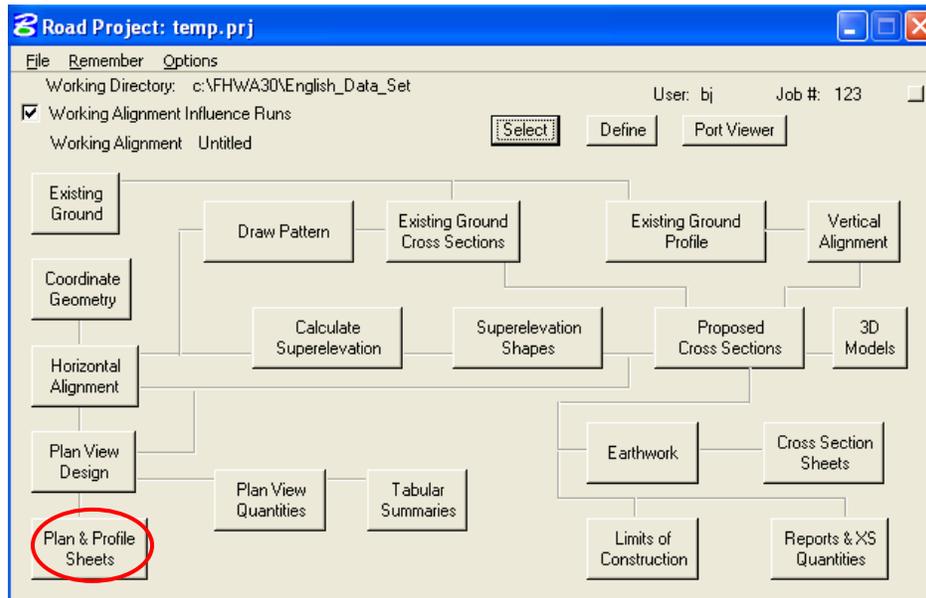


Figure 19-1: Project Manager

The example below is focused on clipping an English project using 100 Scale Plan/Profile sheets.

2. *The following Plan Sheet Layout dialog box appears. Select 100 Scale P_P using the drop down arrow, and select 2.0000 ft/in as shown below for Scale field.*

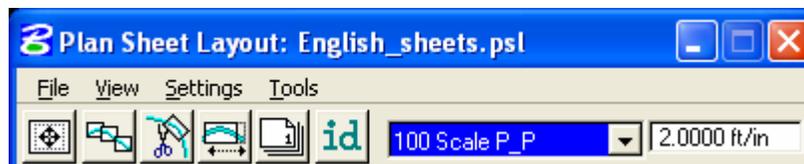


Figure 19-2: Plan Sheet Layout Dialog

3. *From the Plan Sheet Layout dialog box, select Settings > Sheet Layout, modify the Sheet Layout Settings as shown below and select OK:*

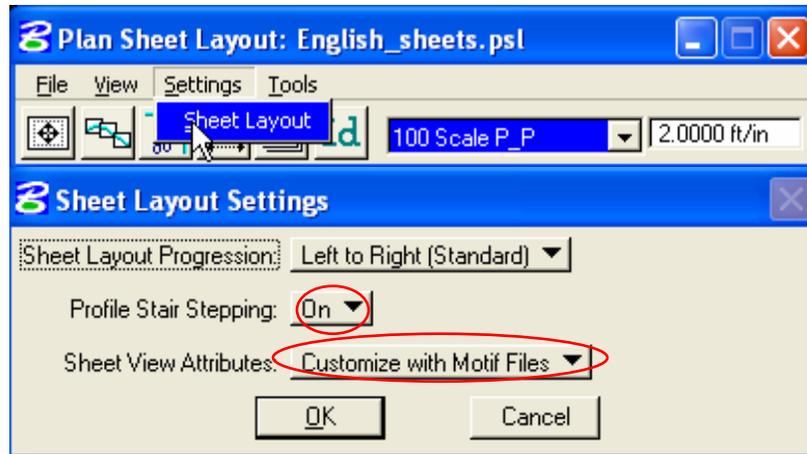


Figure 19-3: Sheet Layout Settings

4. Invoke the Sheet Composition dialog by clicking on the Sheet Composition icon from the Plan Sheet Layout dialog as shown below:

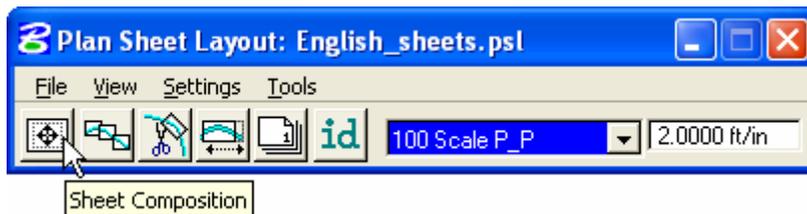


Figure 19-4: Plan Sheet Layout Dialog

5. Modify the Sheet Composition dialog box as shown below:

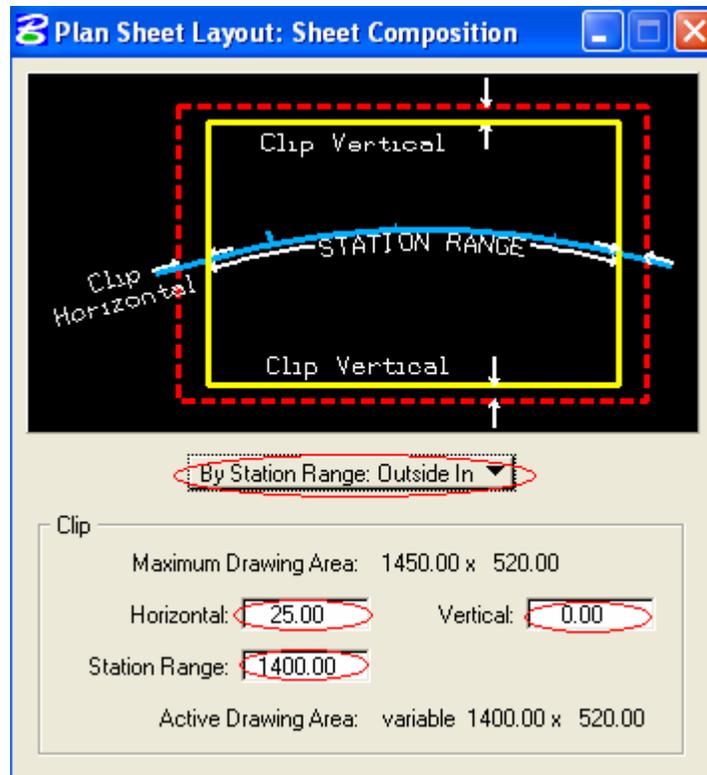


Figure 19-5: Sheet Composition

The above sheet composition dialog setting shows "sheet style" for 100 Scale P_P Sheet. Sheet styles have been created for English and Metric projects. Click [HERE](#) for other sheet style settings located at the end of this documentation.

6. Invoke the Layout Sheets tools by selecting the Layout Sheets icon from the Plan Sheet Layout dialog as shown below:

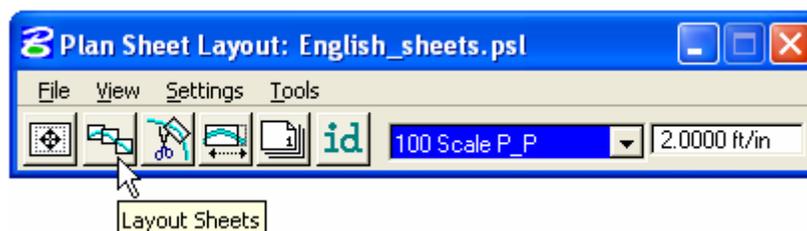


Figure 19-6: Plan Sheet Layout Dialog

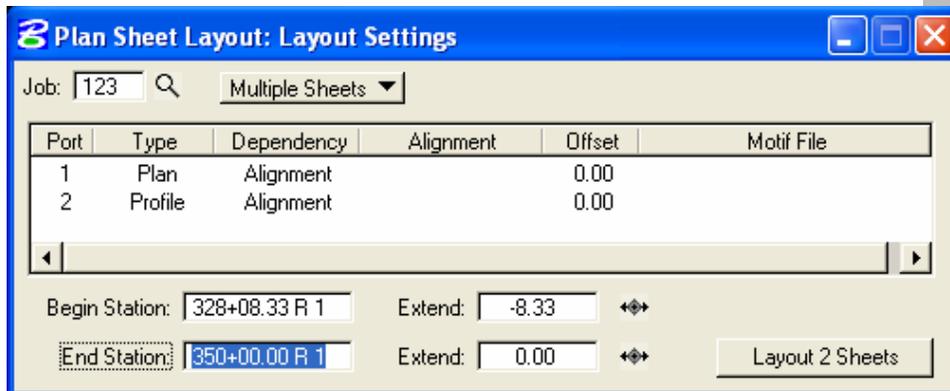


Figure 19-7: Layout Settings

7. Select *Multiple Sheets* from the dialog box and Select the GPK file by keying it into the "Job:" box, or by browsing using the file open icon.
8. To populate the *Plan Port Data* dialog box, double click along the row for Port 1 in the *Layout Settings* dialog box and the following dialog box will be invoked.

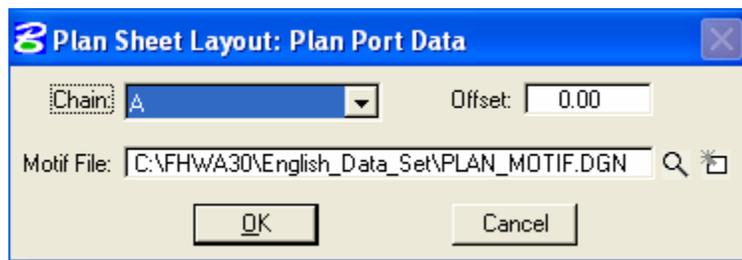


Figure 19-8: Plan Port Data

9. Select the correct Chain and the appropriate Plan Motif file. Select OK. If the Motif File has not been created, create Motif files using the *Create Motif File* icon as shown below:

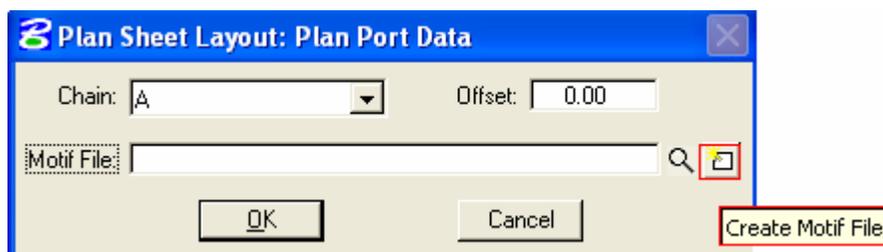


Figure 19-9: Plan Port Data - Create Motif File



Motif file should be created from a 2D seed file. After creating the Motif file, make sure to attach the required reference files.

To create Double Plan Sheets (plan/plan), attach Plan Motif File to Port 1 and 2.

10. To populate the Profile Port Data dialog box, double click along the row for Port 2 in the Layout Settings dialog box and the following dialog box will be invoked.

Plan Sheet Layout: Profile (VERT)

Profile Data

Profile: VERT

Chain: A

Station: 328+08.33 R 1

Elevation: 7300.00

Horizontal Scale: 100.00

Vertical Scale: 10.00

By DP X: 530185.12
Y: 1833037.11

Equation Treatment: No Gap

Profile Cell

Draw Cell at X,Y Identify Cell Identify Profile Port

Motif File

C:\FHWA30\English_Data_Set\PROFILE_MOTIF.DG

OK Cancel

Figure 19-10: Profile Layout

11. If a profile cell exists for the file that is referenced to the Clip.dgn file, then select on Identify cell, place data point on the profile cell and accept. Profile Data dialog fields can be populated using this method, or manually enter in the required information.

12. Select the appropriate Profile Motif file. Select OK. If the Motif file has not been created, create Motif files using a 2D seed file as outlined in step 9.



13. *GEOPAK will calculate the number of sheets to layout. Number of sheets calculated will be placed on the button at the bottom right of the Layout Settings dialog box. Use the extend distance field to shift the clipping shapes ahead or back a given distance from begin and end stations. If the number of sheets is acceptable, press the Layout 8 Sheets button and GEOPAK will draw clipping shapes into the drawing.*

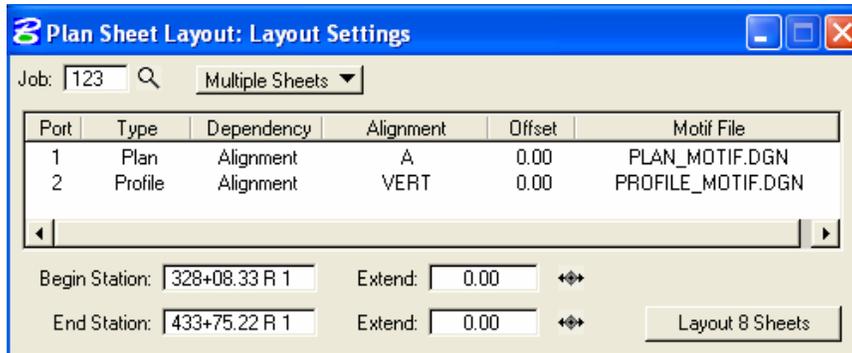


Figure 19-11: Layout Settings

In order for the data to be clipped correctly, use the Sheet Layout Modify Tools. Two most common types of modification supported are sliding the sheets and modifying the drawing area. The drawing area cannot be increased in Length (Horizontal) or Height (Vertical) to exceed the drawing area setup in the sheet library.

14. *Once the clipping shapes are placed, for extremely curved chains and steep vertical curves it may be necessary to modify the clipping shapes. To invoke the Modify tools, use the Modify Sheets icon from the Plan Sheet Layout dialog as shown below:*

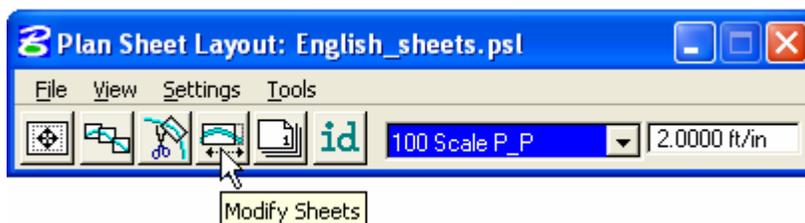


Figure 19-12: Plan Sheet Layout Dialog

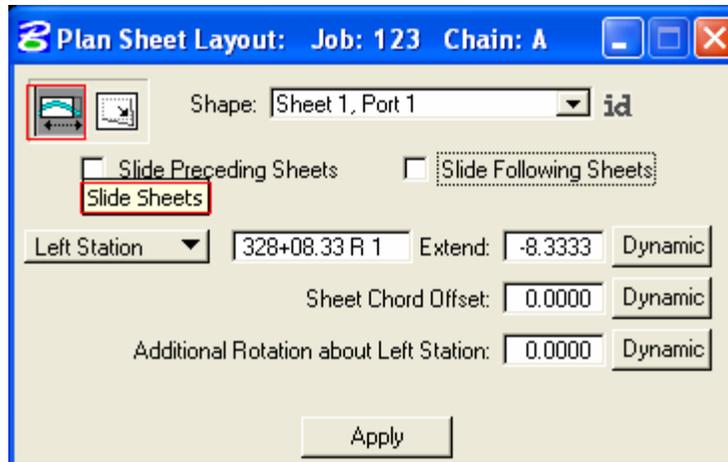


Figure 19-13: Modify Sheet Layout-Plan

15. Use the drop down arrow to select the clipping shape to be modified from the list or Identify the clipping shape by clicking on the ID button and then data pointing the clipping shape.

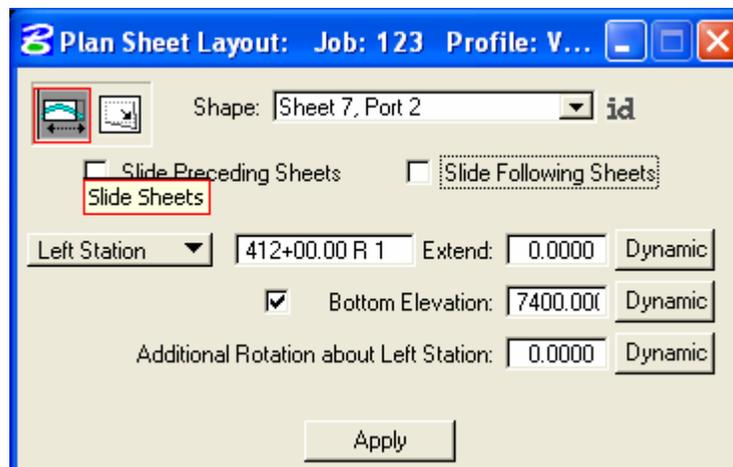


Figure 19-14: Modify Sheet Layout-Profile



NOTE: The application is intelligent enough to know whether a Plan clipping shape or Profile clipping shape has been identified. When a Profile clipping shape is identified, the "Sheet Chord Offset" field changes to "Bottom Elevation", (as shown above). When modifying the vertical position of a Profile clipping shape, toggle "Bottom Elevation" ON, type in the desired "bottom of the shape" elevation, or press **Dynamic** and move the shape up or down.

Drawing area cannot be increased horizontally or vertically to exceed the drawing area setup in the Sheet Library.



16. Use the Sheet Number Manager tool to number sheet to CFL standards. To invoke the Sheet Number Manager tool, use the Sheet Number Manager icon from the Plan Sheet Layout dialog as shown below:

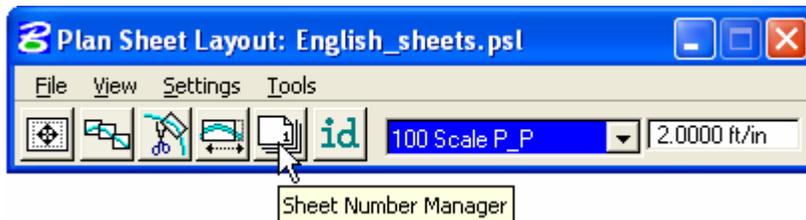


Figure 19-15: Plan Sheet Layout Dialog

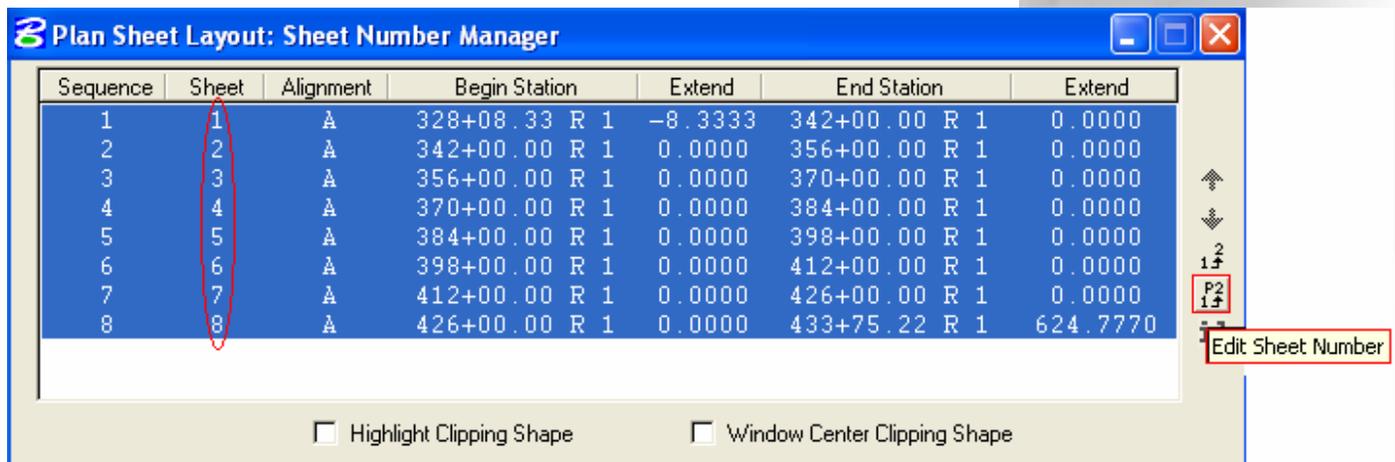


Figure 19-16: Sheet Number Manager

17. To select all rows, click anywhere on row one, hold down the shift key and click a second time anywhere on the last row. Once rows are selected, select the Edit Sheet Number icon as shown above.
18. The Edit Sheet Number dialog box will appear, complete as shown below and select OK. Dialog box values correspond to CFL specific sheet numbering scheme where the sheets are numbered in sequence beginning with D1.

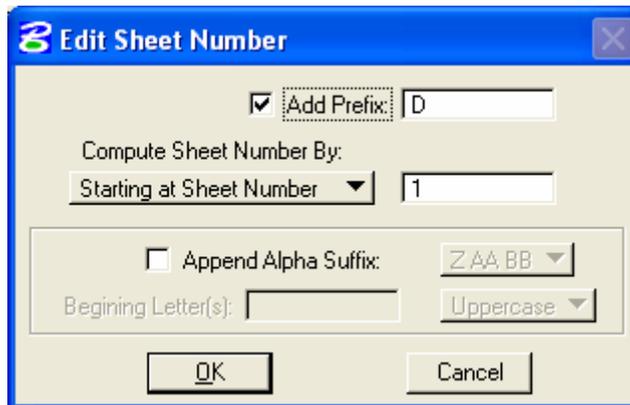


Figure 19-17: Edit Sheet Number

19. Upon Selecting OK, Sheet numbers will change from 1 to D1 in the Sheet Number Manager dialog box.

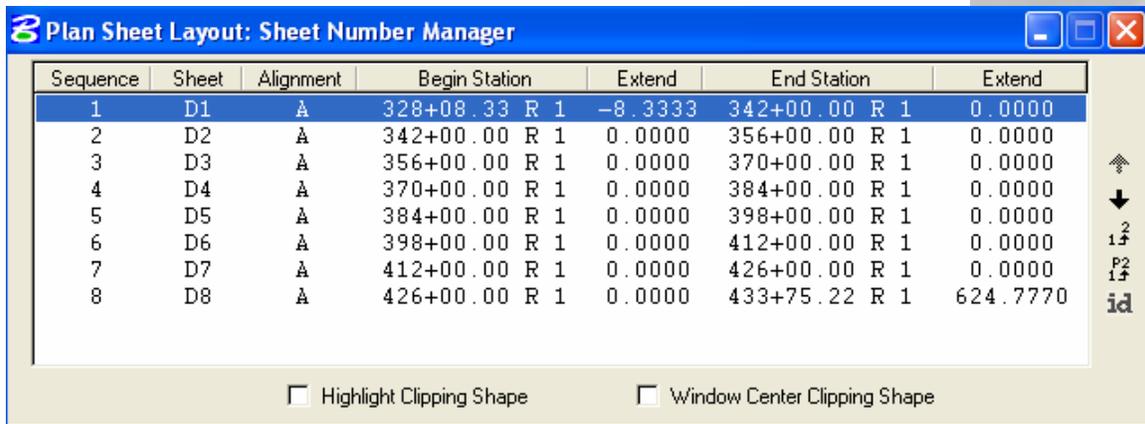


Figure 19-18: Sheet Number Manager

20. To Invoke the Clip Sheets tool, Select the Clip Sheets icon from the Plan Sheet Layout dialog as shown below:

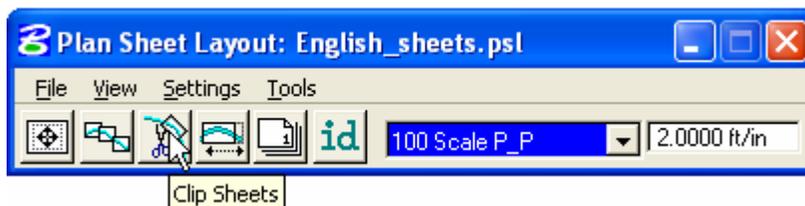


Figure 19-19: Plan Sheet Layout Dialog



Figure 19-20: Clip Sheets

21. In the *Clip Sheets* dialog box, select the directory for the output file and type in the *Sheet Name Prefix*. Sheet name prefix should follow the naming convention set in Chapter 3 of the *CFL CADD standards Manual*.



NOTE: The software appends the **beginning sheet number** to the "**Sheet Name Prefix**". You most likely will have to rename this (or these) file(s) later.

22. Select *Orientation to Rotate View* for *Plan & Profile sheets* and *Single Plan sheets*. Select *Orientation to Rotate Reference* for *Double Plans sheets* and *Profile sheets*. *Sheet Cell* is rotated and moved into correct position with plan reference file data when orientation is set to *Rotate View*. Reference file data is rotated and moved into correct position with each of the sheet cells when orientation is set to *Rotate Reference*.

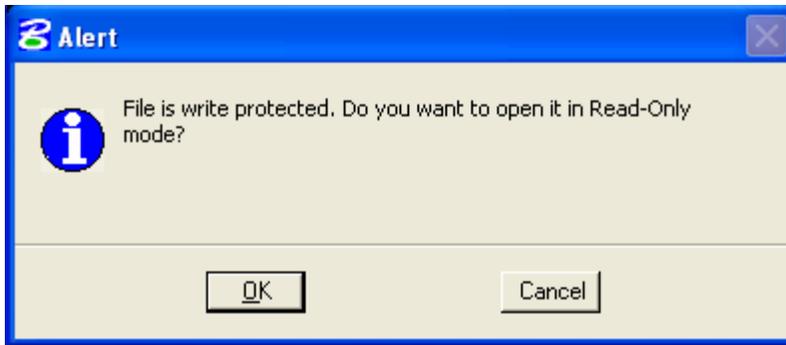


23. Select Sheet per File to 1. CFLHD policy is to create one sheet per file.
24. Select the Sheet Range required from the pick list, using the drop down arrows. Use the Sheet Number Manager Tool to renumber sheets to CFL specific sheet numbering (such as D1, D2, D3, etc.), if not already done so.
25. Enter Labels and Annotation. Complete Clip Sheets dialog as shown below. Select Process Sheets.

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
16	ST	KEYS VIEW ROAD PRA JOTR 13(1)	D1	

Figure 19-21: Clip Sheets

Since the CFL reference sheet cell drawing is write protected. The following dialog box below will appear. Just click **OK**.



Click on a Sheet Style link (below) for recommended CFL Sheet Composition Dialog Settings:

METRIC Sheet Styles:

[1000 Scale PLAN & PROFILE](#)

[1000 Scale DOUBLE PLAN](#)

[2000 Scale PLAN & PROFILE](#)

[2000 Scale DOUBLE PLAN](#)

[2000 Scale SINGLE PLAN](#)

[2000 Scale SINGLE PROFILE](#)

[500 Scale PLAN & PROFILE](#)

ENGLISH Sheet Styles:

[100 Scale PLAN & PROFILE](#)

[100 Scale DOUBLE PLAN](#)

[200 Scale PLAN & PROFILE](#)

[200 Scale DOUBLE PLAN](#)

[200 Scale SINGLE PLAN](#)

[200 Scale SINGLE PROFILE](#)

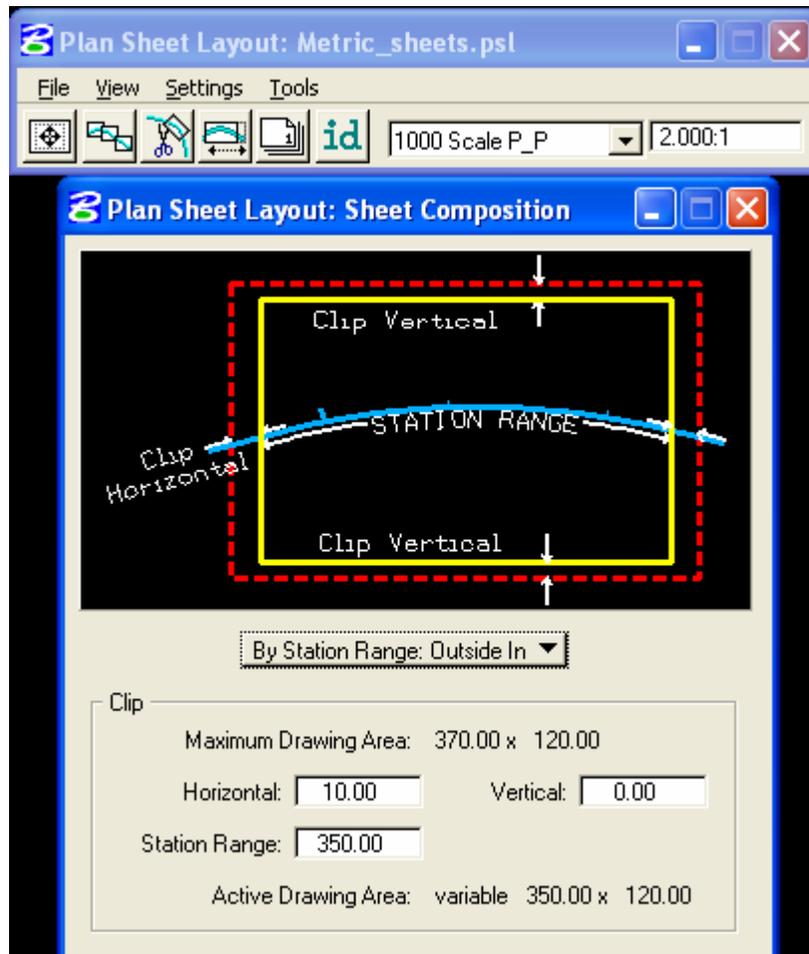
[50 Scale PLAN & PROFILE](#)

STANDARDS FOR USE WITH X30 CRITERIA



METRIC SHEET STYLE

1000 Scale Plan/Profile





METRIC SHEET STYLE

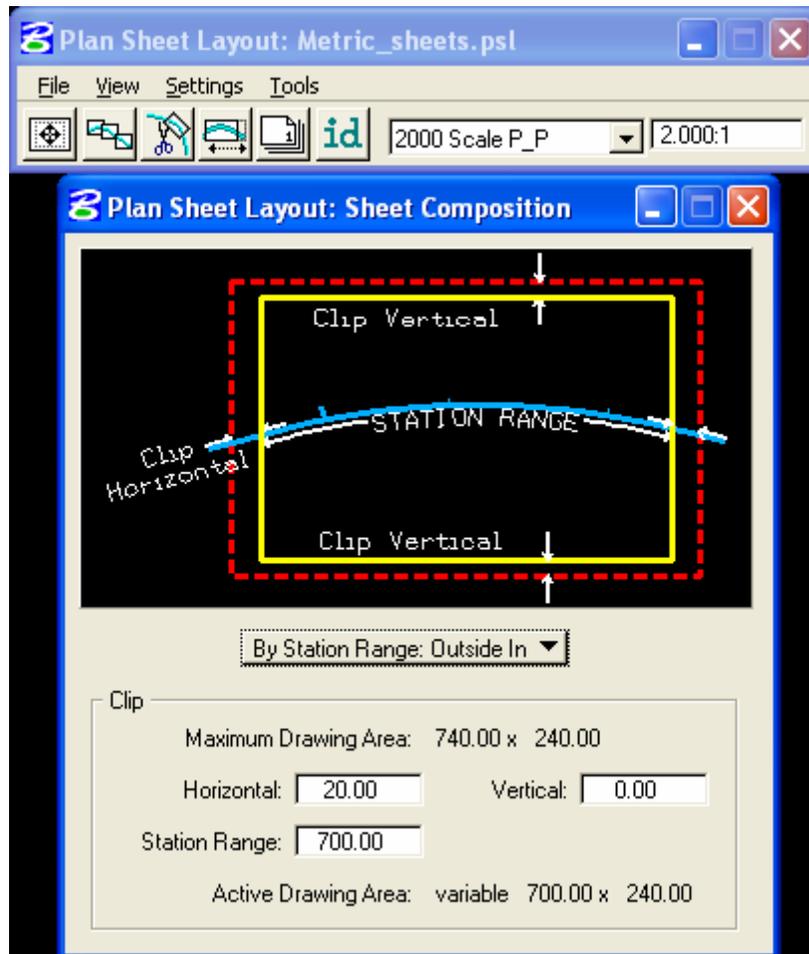
1000 Scale Double Plan

The screenshot displays the 'Plan Sheet Layout: Sheet Composition' dialog box. The main window title is 'Plan Sheet Layout: Metric_sheets.psl'. The menu bar includes 'File', 'View', 'Settings', and 'Tools'. The toolbar shows various icons, including a red 'id' icon. The current drawing is '1000 Scale D_PLAN' with a scale of '2,000:1'. The dialog box shows a diagram of a drawing area with a yellow border and a red dashed border. Labels include 'Clip Horizontal', 'Clip Vertical', 'DRAWING SHOWN', and 'OVERLAP'. Below the diagram is a dropdown menu set to 'By BeginStation/OverLap'. The 'Clip' section has the following settings: Maximum Drawing Area: 390.00 x 132.50; Horizontal: 0.00; Vertical: 0.00; Drawing Shown: 390.00; Active Drawing Area: 390.00 x 132.50. The 'Overlap' section has 'Overlap: 20.00' and a dropdown set to 'Fixed Distance'.



METRIC SHEET STYLE

2000 Scale Plan/Profile





METRIC SHEET STYLE

2000 Scale Double Plan

Plan Sheet Layout: Metric_sheets.psl

File View Settings Tools

id 2000 Scale D_PLAN 2,000:1

Plan Sheet Layout: Sheet Composition

Clip Vertical

Clip Horizontal

DRAWING SHOWN

OVERLAP

Clip Vertical

By BeginStation/OverLap

Clip

Maximum Drawing Area: 780.00 x 265.00

Horizontal: 0.00 Vertical: 0.00

Drawing Shown: 780.00

Active Drawing Area: 780.00 x 265.00

Overlap: 20.00 Fixed Distance



METRIC SHEET STYLE

2000 Scale Single Plan

Plan Sheet Layout: Metric_sheets.psl

File View Settings Tools

id 2000 Scale S_PLAN 2.000:1

Plan Sheet Layout: Sheet Composition

Clip Vertical

Clip Horizontal

DRAWING SHOWN

OVERLAP

Clip Vertical

By BeginStation/OverLap

Clip

Maximum Drawing Area: 780.00 x 530.00

Horizontal: 0.00 Vertical: 0.00

Drawing Shown: 780.00

Active Drawing Area: 780.00 x 530.00

Overlap: 20.00 Fixed Distance



METRIC SHEET STYLE

2000 Scale Single Profile

Plan Sheet Layout: Metric_sheets.psl

File View Settings Tools

id 2000 Scale S_PROFIL 2.000:1

Plan Sheet Layout: Sheet Composition

Clip Vertical

Clip Horizontal

STATION RANGE

By Station Range: Outside In

Clip

Maximum Drawing Area: 740.00 x 480.00

Horizontal: 20.00 Vertical: 0.00

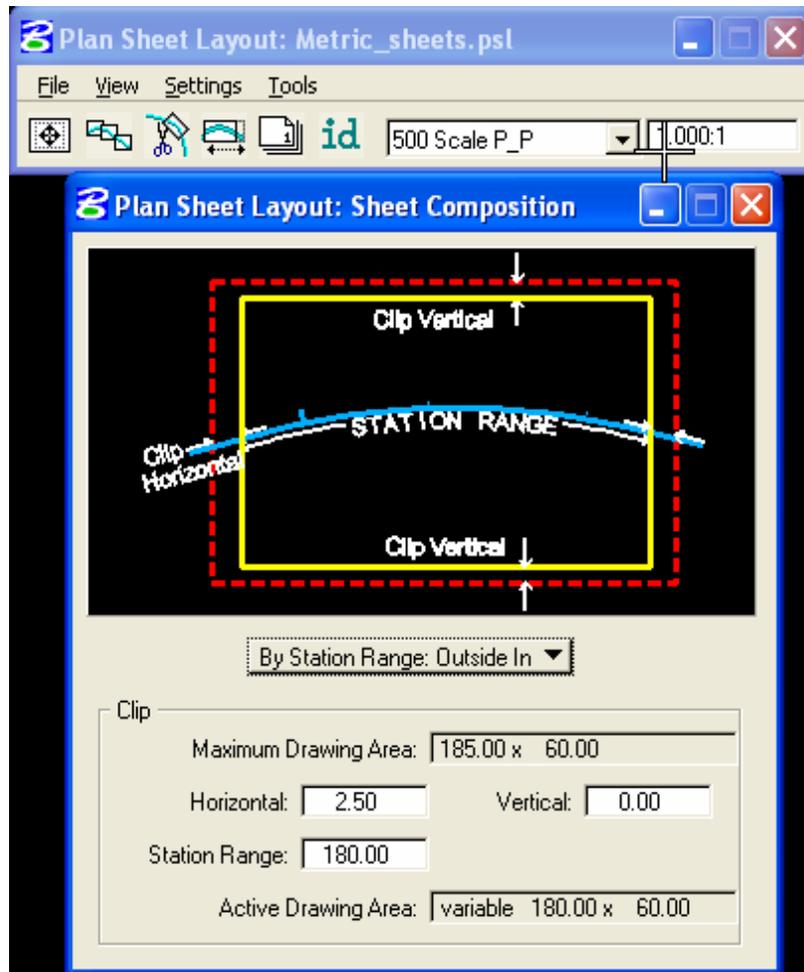
Station Range: 700.00

Active Drawing Area: variable 700.00 x 480.00



METRIC SHEET STYLE

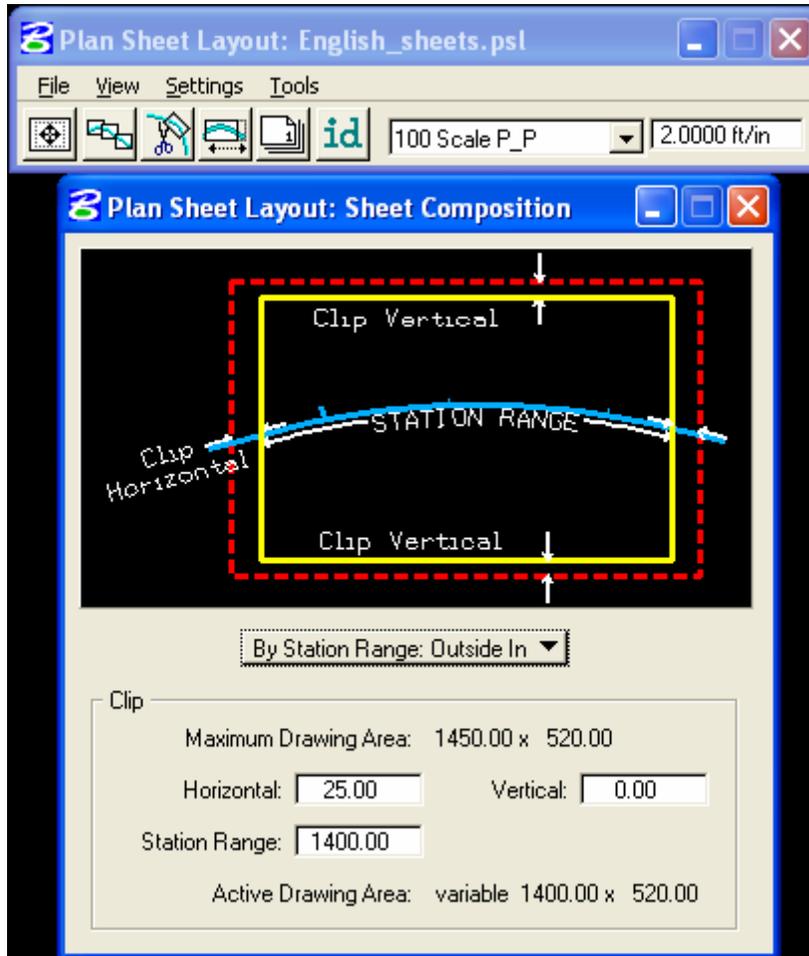
500 Scale Plan/Profile





ENGLISH SHEET STYLE

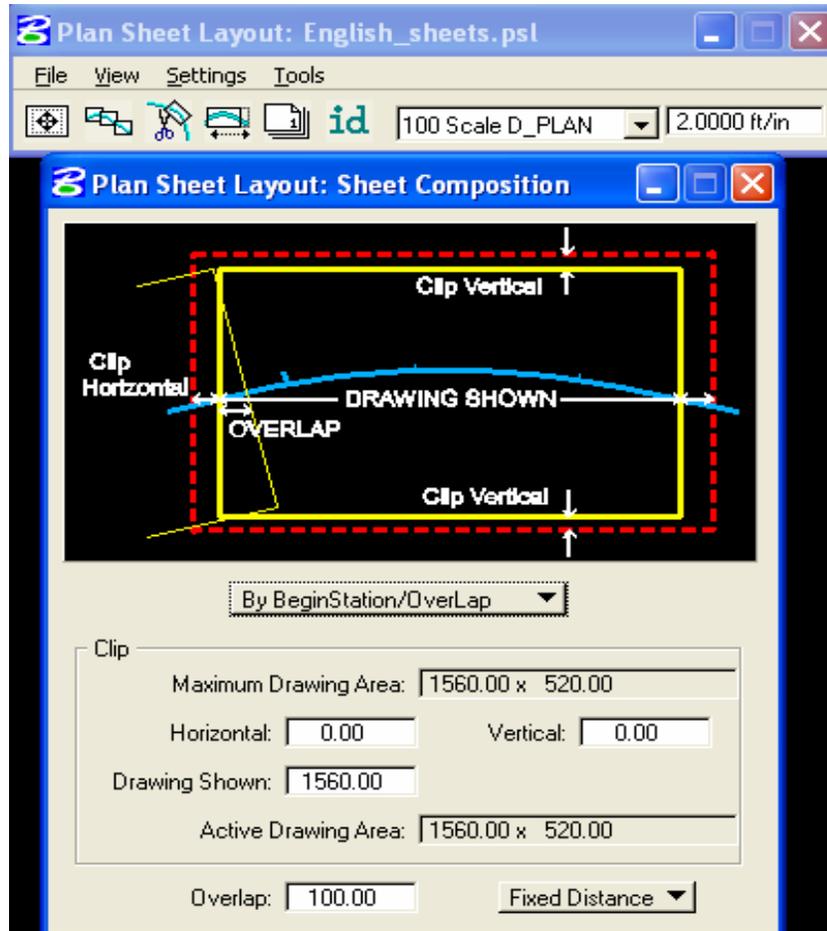
100 Scale Plan/Profile





ENGLISH SHEET STYLE

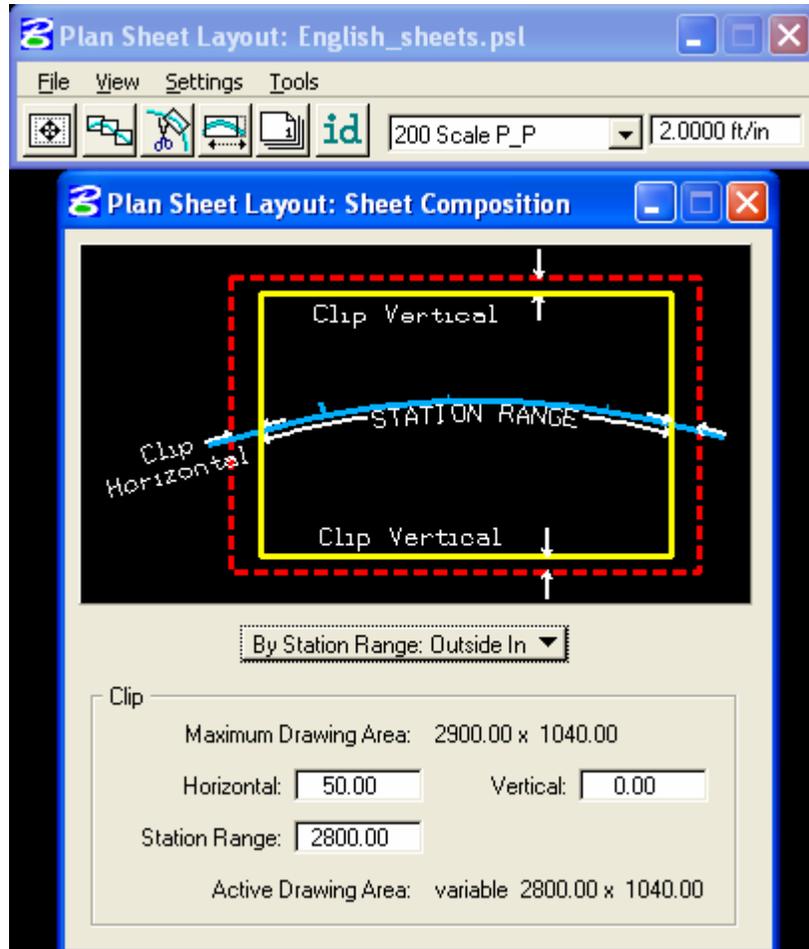
100 Scale Double Plan





ENGLISH SHEET STYLE

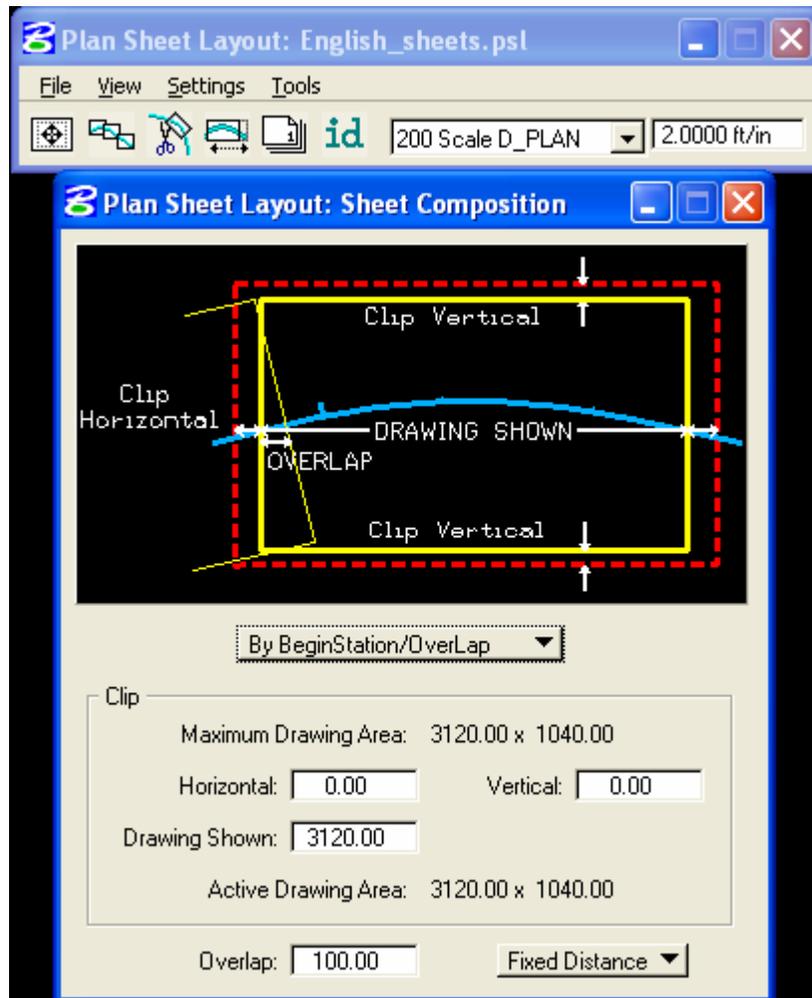
200 Scale Plan/Profile





ENGLISH SHEET STYLE

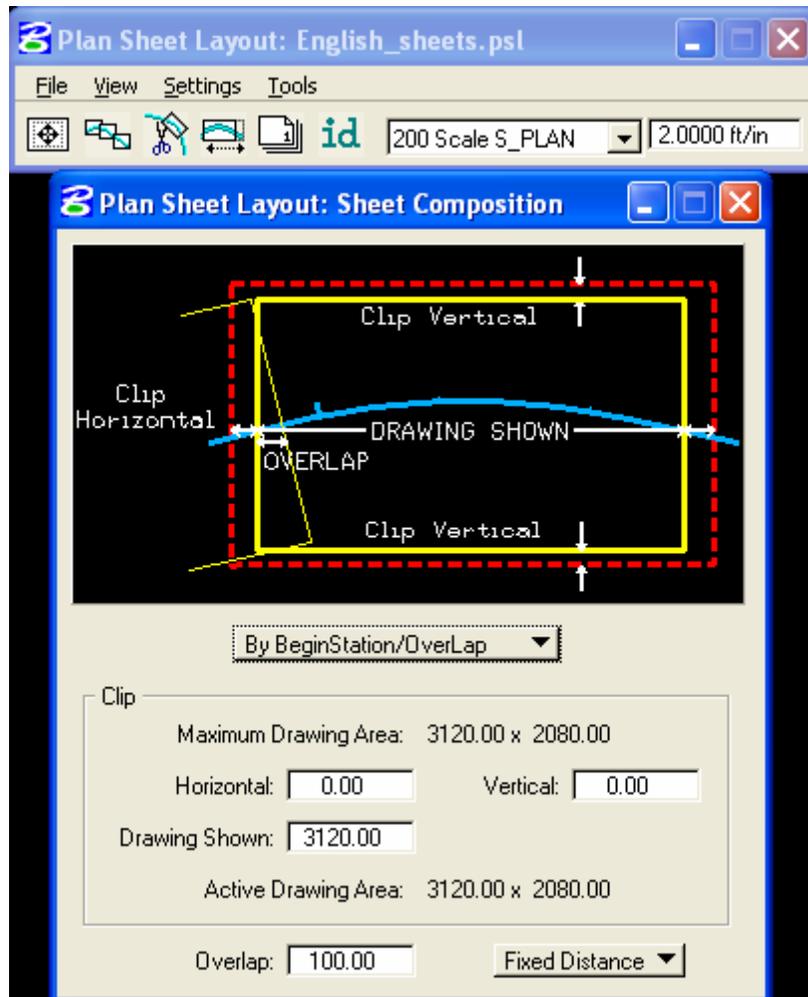
200 Scale Double Plan





ENGLISH SHEET STYLE

200 Scale Single Plan





ENGLISH SHEET STYLE

200 Scale Single Profile

Plan Sheet Layout: English_sheets.psl

File View Settings Tools

id 200 Scale S_PROFILE 2.0000 ft/in

Plan Sheet Layout: Sheet Composition

Clip Vertical

Clip Horizontal

STATION RANGE

By Station Range: Outside In

Clip

Maximum Drawing Area: 2900.00 x 1900.00

Horizontal: 50.00 Vertical: 0.00

Station Range: 2800.00

Active Drawing Area: variable 2800.00 x 1900.00



ENGLISH SHEET STYLE

50 Scale Plan/Profile

Plan Sheet Layout: English_sheets.psl

File View Settings Tools

id 50 SCALE P_P 1.0000 ft/in

Plan Sheet Layout: Sheet Composition

Clip Vertical

Clip Horizontal

STATION RANGE

By Station Range: Outside In

Clip

Maximum Drawing Area: 725.00 x 260.00

Horizontal: 12.50 Vertical: 0.00

Station Range: 700.00

Active Drawing Area: variable 700.00 x 260.00