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Chapter 19: Cut Sheets

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 either automatically using GEOPAK or manually. The first method described will be the automatic method, using plan and profile sheet generator. This method works the best on projects that are relatively straight and flat. For projects that have sharp curves or switchbacks, the sheets will need to be set up manually. The third method for setting up sheets will use Descartes to set up sheets for 3R projects.



Notice, for ease of labeling, CFLHD policy is to create one sheet per file. This will allow the use of plan and profile labelers when detailing the sheets. For Descartes projects where geometrics are not controlled, multiple plan sheets can be in one drawing.

Automatic plan/profile sheet creation

GEOPAK will create plan, profile and plan/profile sheets. These sheets are generally created at 1000 scale metric and 1:100 scale English. This rule could change depending on the size of the project. Workflow 1 will describe the steps necessary to create a plan/profile sheet. Station range, drawing areas, and many other variables are contained in a file called cflhd.psl. This file, the sheet library, contains many values specific to CFLHD and cannot be modified by the user. For A/E firms, download this sheet library from:

(Sheet Library will be available soon. Please check back.)

Save the file to a project directory for attachment in workflow 1 below.

Cut Sheet Key Map and Motif Files

When using the GEOPAK automatic plan and profile sheet generator, two files need to be created. Outlined below are the names, uses, and instructions for creating each file.



Cutsheet.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 to better fit around to fit any design changes. To create this sheet, make a copy of the overall design file, delete all of the elements in this new file, and reference the overall design file into this new file. By referencing the overall design back into the cutsheet.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.

Motif files

Motif files act as seed files for cutting plan and profile sheets. A motif file must have the proper reference files attached, and the proper levels for each file turned on or off. The plan and sheet generator will then use these files when cutting each sheet and each cut sheet will have the correct files displayed with the correct levels on. For example, if the plan view in a cut sheet needs to show overall design, mapping, 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 the plan motif file, copy the overall design file and delete all of the elements in this new file. Attach each reference file that should be shown in the cut sheet, and turn on or off any levels to make the display look exactly like the final cut sheets should. Repeat these steps for the profile motif file copying the overall profile sheet as a base.

Workflow 1: Plan/Profile sheets using GEOPAK

1. *Invoke the GEOPAK User Preferences dialog box and make sure the Plan & Profile Sheets Compatibility is set to GEOPAK 2001+.*

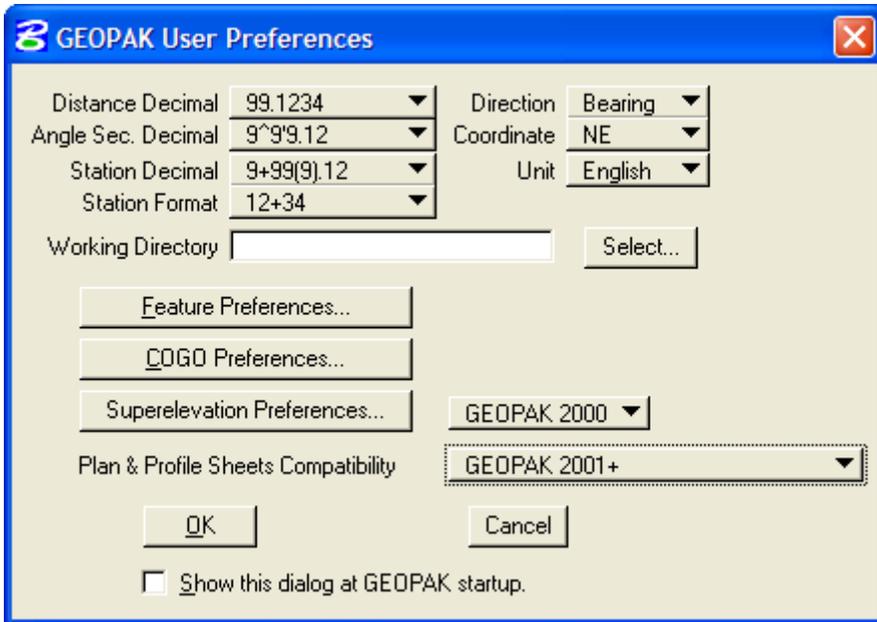


Figure 19-2: User Preferences

2. Load *cutsheets.dgn* and invoke *Plan and Profile Sheets* through one of following three methods.
 - Select *Applications>GEOPAK Road>Plans Preparation>Plan and Profile Sheets*.
 - From *Project Manager* select the button on the bottom left

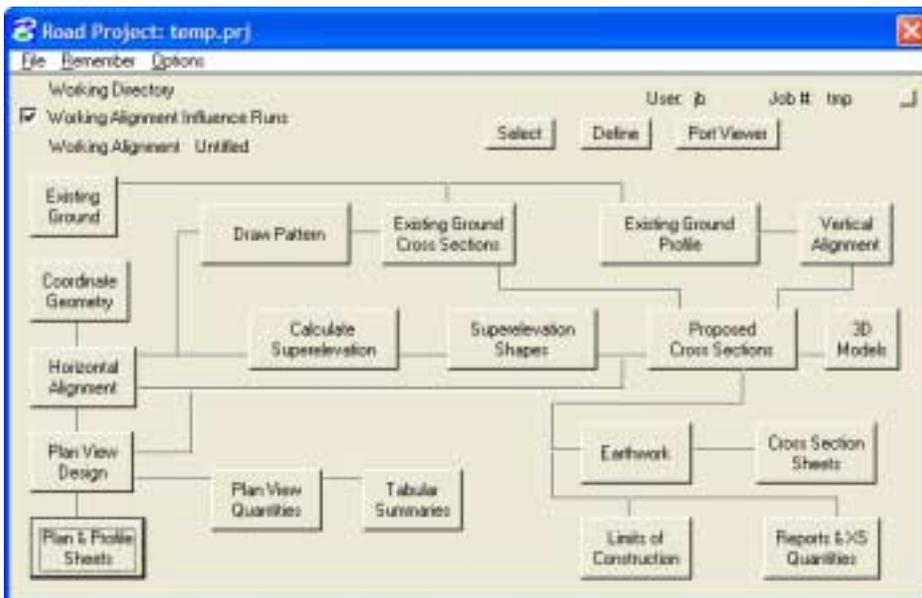


Figure 19-3: Project Manager

- Pick the *Plan and Profile Sheet Composition* button  in the main GEOPAK tool bar.

3. The following dialog box appears.



Figure 19-4: GEOPAK Sheet Layout Dialog

Select *Sheet>Library>Attach* from the menu and browse to the file.

4. Press the Sheet Composition button  to make sure the station range looks correct. The information for station range and drawing area will already have been setup in the cflhd.psl.

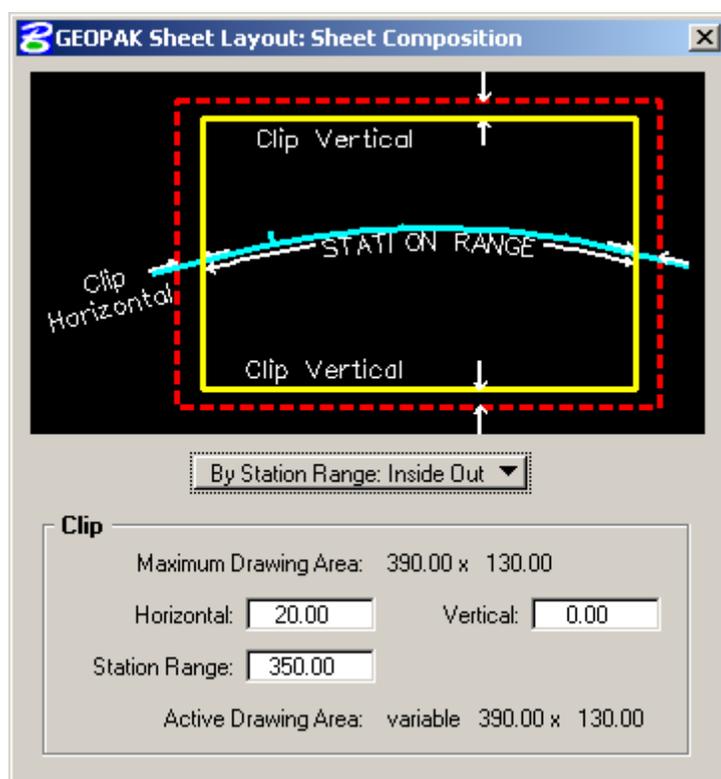


Figure 19-5: Sheet Composition

5. Press the layout sheets button  and the following dialog box will appear.

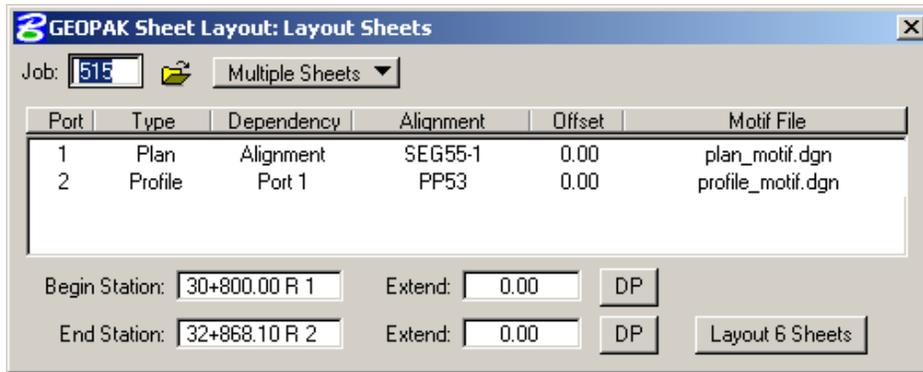


Figure 19-6: Layout Sheets

6. Select the gpk file by keying it into the “Job:” box, or by browsing using the file open icon. To populate the Alignment and Motif File portions of the dialog box, double click on the word “Plan”. The following dialog box will be invoked.

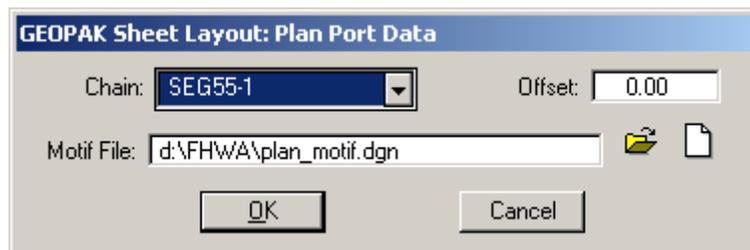


Figure 19-7: Plan Port Data

7. Select the correct chain and the appropriate motif file. Press OK.
8. To populate the Profile information, double click on the word “Profile” and the following dialog box will be invoked.

Profile Data

Profile: PP53
 Chain: SEG55-1
 Station: 30+800.00 R 1
 Elevation: 2770.00
 Horizontal Scale: 1000.00
 Vertical Scale: 100.00
 By DP X: 816355.18
 Y: 411317.00
 Equation Treatment: No Gap

Profile Cell

Draw Cell at X,Y Identify Cell Identify Profile Port

Motif File

d:\FH\WA\profile_motif.dgn

OK Cancel

Figure 19-8: Profile Layout

9. Go to the dgn that has your profile cell, pick the Identify Cell button and select the correct profile cell. Select the appropriate motif file and hit OK.
10. GEOPAK will calculate the number of sheets to layout and will provide that information on the button at the bottom right of the Layout Sheets dialog box. If this number of sheets makes sense, press the Layout 6 Sheets button and GEOPAK will draw shapes into the drawing, where the sheets will be cut.

Job: 515 Multiple Sheets

Port	Type	Dependency	Alignment	Offset	Motif File
1	Plan	Alignment	SEG55-1	0.00	Current
2	Profile	Port 1	APPR	0.00	Current

Begin Station: 308+00.00 R 1 Extend: 0.00 DP

End Station: 328+68.10 R 2 Extend: 0.00 DP **Layout 6 Sheets**

Figure 19-9: Layout Sheets

11. Press the *Clip Sheets* button  and the following dialog box will be invoked.

Figure 19-10: Clip Sheets

12. Make sure the button in the *Output File* box is set to *Rotate View* and the sheet name prefix is to the naming convention set in the CADD standards and press *Process Sheets*.
13. GEOPAK will create the sheets automatically. The user will need to review each sheet to make sure it has been placed properly. If slight adjustments are needed, get into *cutsheets.dgn* and pick the *Modify Sheets*  button. The following dialog box will be invoked.

Figure 19-11: Modify Sheet Layout



14. Make any necessary corrections using this box and rerun Clip Sheets.

Manual Plan/Profile Sheet Generation

When the alignment has sharp curves or switchbacks, the creation of sheets automatically will not work properly, so the user will need to set the sheets up manually. There are a few guidelines to remember while setting up the sheets

- The station range for the plan view should be centered as much as possible.
- The plan view should be set such the stationing is as close to directly above the corresponding station in the profile as possible.
- Refer to chapter 5 Table 5-2 for the correct number of stations for each sheet.



When creating cut sheets manually, always reference the border rotated to the alignment, then rotate the view back to correct. **Always rotate the view, never the actual files.**

Descartes

Descartes is usually used on 3R type of projects when no profile is needed and the geometry is minimal. The horizontal alignment is developed using either As-Built data or laid out on the photo itself, which is delivered at a 1:1 scale and at the correct coordinates. The photo will be delivered either in **.tiff** or **.hmr** format. Descartes requires the photo to be in **.hmr** format, so the following workflow will include the process for converting from **.tiff** to **.hmr** also. 3R projects usually use double plan sheets. The following workflow will describe the process for creating these double plan sheets.

Workflow 2: Descartes

- 1. If the As-Builts for the alignment are available, create the alignment and draw it in a design file. If As-Builts are not available skip to step two.*
- 2. Load the Descartes MDL by picking Utilities>MDL Applications. Pick the Browse button and select the Descartes mdl application. Press OK. The following Image Manager dialog box will come up.*

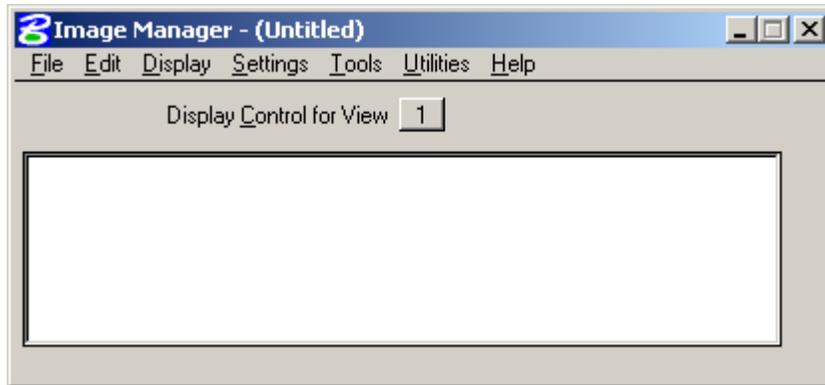


Figure 19-12: Image Manager

3. If the photo is in HMR format, proceed to step 5. Otherwise, from the Image Manager menu bar pick File>Batch Conversion. The following dialog box will come up.

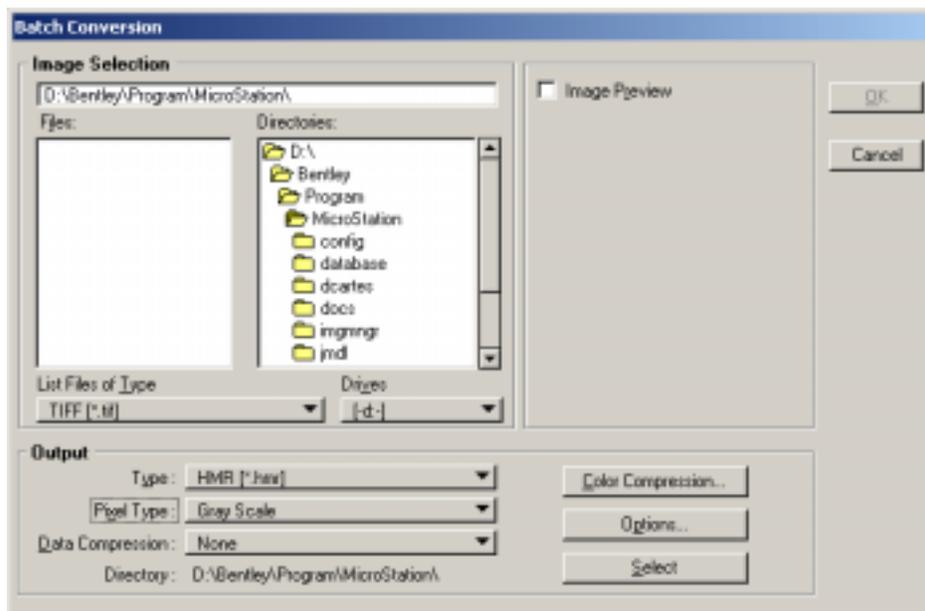


Figure 19-13: Batch Conversion

4. Highlight the tiff you want to convert and set the Output Type to HMR, Pixel Type to Grey Scale and Data Compression to None. Pick the Select button to the right of Directory to select the destination of the HMR. Press OK.
5. From the Image Manager menu bar pick File>Open and select the HMR. If there are more than one HMR, repeat this process for each.
6. Your photo should line up with the As-Built alignment. If there was no As-Built information available, lay out your alignment using any of the GEOPAK methods for alignment generation and follow the striped centerline.

7. Once the alignment is set, use the GEOPAK draw pattern command to draw lines at the sheet match lines. Draw these patterns on level 62. Since these sheets are usually at 1000 or 1:100 scale draw the pattern lines at 350 m or 1400' intervals.
8. Use cells *<insert cell names here>* to set the first two views. Shift and rotate the cell to make sure to center the alignment in each view. Once the cells are in the proper location, drop them using the MicroStation Drop Element command. This will drop the cells into shapes.
9. Layout the sheets along the rest of the alignment making sure to alternate the top and bottom shapes.
10. Zoom out so the hmr does not fill the view. At the bottom of the view, place the top shape without any rotation and directly under it place the bottom shape. Do this for as many sheets that will be needed. Make sure there is enough space between the sheets to allow for the referenced borders.

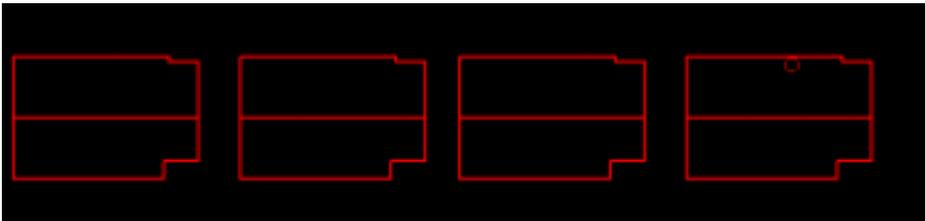


Figure 19-14: Layout

11. In the Image Manager dialog box pick Tools>Image Transform. The following button bar will appear.

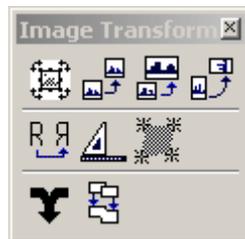


Figure 19-15: Image Tools

12. Pick the Corridor Image button . Descartes will prompt the user to Identify a source closed element. Pick the first shape on the alignment and accept. Then pick the first top sheet in the row. Descartes will create a new HMR and place it in the proper location on the row. Repeat this process for both the top and bottom of every sheet.
13. Make a saved view around each shape along the alignment.
14. Use these saved views to reference the alignment into the sheets at the bottom of the drawing.



15. Reference the border around each sheet.