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Chapter 6 - Plotting and Postscript Image Files

CADD Production Criteria Handbook

6.1 PLOTS

The FDOT CADD Manual requires all Postscript images used as electronic plans sheets to be generated from the native MicroStation design files. To assist users in producing paper plots of the images, FDOT developed utilities that complement MicroStation plotting and are included with the FDOT CADD software (The Electronic Delivery Indexer). This utility supports the production of the required PostScript images. In addition, it facilitates the creation of the plot files in accordance with the file name standards.

All sheet images produced shall be to scale. Standard FDOT sheet borders, as defined for each discipline, along with sample plot drivers, are provided to generate “drawn to scale” sheet images. In addition, the Postscript sheet images shall reflect, at the side of the sheet image, the file name, directory path and the date and time of the plot. These standard sheet borders comply with the FDOT sheet formats as defined in the Plans Preparation Manual and other controlling documents. Documents such as the Design Standard Indexes, Plans Preparation Manual, and the Right-of-Way Mapping CADD Handbook are just some of the references that apply.

6.2 PLOT BORDERS

The FDOT standard sheets have a plot border embedded in the each sheet cell. The plot border symbology and element type differ in the cells according to the discipline and the software version. The FDOT Standard plot drivers, Sheet Navigator program and Electronic Delivery software, are predefined to search for these various border definitions and sizes. The FDOT predefined search criteria is illustrated in the table below.

NOTE: PlotBorder_dp and **ShtPlotBorder_c** are the current plot border level symbologies used in the FDOT2004 Software.

	Border 1	Border 2	Border 3	Border 4	Border 5
Type	Shape	Shape			Shape
Level	PlotBorder_ dp	PlotBorderSht	PlotShape	ShtPlotBorder_c	51
Color	3	3	BYLEVEL	BYLEVEL	3

English plot border size for 11x17: 16.5” x 10.6”
Metric plot border size for 11x17: 0.42mm x 0.269mm

6.3 POSTSCRIPT IMAGE FILES

The Department’s policy states that all construction plans prepared by and for the Department, either by in-house staff or by consultants, shall be totally prepared utilizing CADD techniques. This involves the delivery of an “image” of the plan sheet in electronic format.

PostScript was selected as the format for the electronic version of the plan sheet image. Postscript is the most widely used, open standard in the publishing and reprographics industry. In addition, MicroStation, at no additional cost, does an excellent job of producing a PostScript file to scale, with grayscales,

halftones and color. The PostScript plan sheet images can be plotted at any scale while maintaining adequate resolution.

There are “freeware” PostScript file viewers available. GSView, a free postscript viewer, is distributed on the FDOT CADD Software CD, and is available as a download on the Internet. The PostScript image files for the plan sheets are produced the same way a paper plot is generated, except a MicroStation PostScript plot driver is used. See also section 6.4 below. If the Engineer of Record signs and seals these files with the Professional’s Electronic Data Delivery System (PEDDS), then those files will be the official record document and any paper plots (if desired) will be considered only copies of the official legal record.

For those sheets that are electronically signed and sealed by a Professional Engineer, the following note shall be placed legibly on the sheet. See the Plans Preparation Manual, Volume 1, Chapter 19, section 19.2.2, for further information.

“NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.” *

> ***Note: The Rule number referenced is determined by the discipline of the professional that is signing and sealing (i.e. for Surveyors, this Rule is 61G17-7.0025, F.A.C.; for Geologists, this Rule is 61G16-2.005, F.A.C. and for Landscape Architects the rule is 61G10-11.011, F.A.C.).**

6.4 INCLUSION OF SCANNED PLAN SHEETS ELECTRONICALLY

In some cases, users have no choice but to scan hardcopy plan sheets to create electronic sheet files.

For example: Some plan sheets may already exist as hardcopies, and signed & sealed traditionally. This can occur when either pre-existing plans are incorporated into the electronic delivery, or a professional discipline does not have legal authority to sign and seal their plans electronically. In such cases, those plans should be scanned at a 300 DPI resolution (or higher if warranted), to Postscript, PDF, or Group-4 TIFF format.

If a PDF is produced, the user must ensure that no encryption or other PDF security is embedded in the PDF. Each sheet should be scanned to its own single file that is one sheet per file, however some Districts prefer scanned documents included as a multi-page PDF or Postscript (multiple sheets per scanned file), so check with your Project Manager.

File naming of the scanned sheet files are also alphanumeric, and shall contain no spaces or special characters, with the exception of the underscore “_” or dash “-“ characters.

If scanning hardcopy plans that bear a raised seal, then the raised seal should be shaded with a pencil or by other means before scanning so the seal appears clearly in the scanned image. Scanned existing plan sheets that are already signed and sealed on paper will not be also signed and sealed electronically, however they may be signed-only (not sealed) electronically by a responsible party to take accountability for their inclusion in the electronic plans set.

The user must also ensure that the result of the scan bears a legible image when viewed on the computer screen, and that the image can be re-printed to a legible print hardcopy.

6.5 FDOT MICROSTATION PLOT DRIVERS

The plot drivers and the sheet cells provided with the FDOT software are used to generate plots to scale. All plot drivers now have raster plotting enabled. These drivers are called “examples,” due to the various site-specific configurations and types of plotters that may be encountered. The plot drivers have been tested and work with the plotters for which they were developed. Each printer/plotter has its own “drawable” area defined for a paper size and it may differ slightly.

See the CPCH Chapter 3, Section 3.5, Plot Driver Descriptions, for a list of the FDOT delivered plot drivers.

6.5.1 Half-Toning

The color 20 is used to define half-toning in the plot driver files supplied by FDOT. Half-toning of the minor grid lines on the cross section sheets, the profile portion of the plan/profile sheet and the profile sheet has been approved by FDOT as shown in the *Plans Preparation Manual, Volume II* exhibits. The FDOT Project Manager must approve half-toning of any other element in the design file.

Some districts have specified the half-toning of certain reference files from one discipline to another. For example, the topography file could be half-toned when referenced to the proposed design. This must be approved on a per district basis.

A pen table can be set up to equate any referenced file to color 20, thus half-toning the entire reference file at plot time.

6.5.2 Quality and Reproduction

Printed output from the design files and postscript image files must be legible and of a quality to be reproducible on 2nd generation copies. Line Weights as defined in CPCH Chapter 3.4 are default settings in the Plot drivers, but may need to be adjusted, depending on hardware, to product the required quality of printed documents.