



U.S. Department
of Transportation

**Federal Highway
Administration**

EFLHD CADD Standards Manual
For Microstation & Geopak



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This document has been prepared for:
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Software Versions

Microstation Version 8.5.02.55

GEOPAK Version 8.8.02.40



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Chapter 1 Introduction

Purpose

This document is intended to outline the Federal Highway Administration's Eastern Federal Lands Highway Division's (EFLHD) use of Bentley's MicroStation V8 Version 8.5.02.55 and GEOPAK Version 8.8.02.40, as well as internally developed tools and procedures. The CADD (Computer Aided Design and Drafting) Standards Manual will address issues such as: software, tools, techniques, standards, and procedures, which will aid the user in the efficient production of PS&E plans.

The CADD Standards Manual and the associated electronic files are to be used in the generation of electronic plans by both EFLHD internal designers and the A/E firms doing business with EFLHD.

The proper use of CADD Standards can produce many desirable results, including:

- Increased efficiency and productivity
- Re-usability of data
- Increased ability to share resources

The CADD Standards Manual is intended to be as all encompassing as possible. However, there will be circumstances, such as with various scales of drawings, where there is no one correct answer. In these cases the engineer or designer must use his or her judgment to stay as close to the original intent of this manual as possible.



Outline of Manual

The CADD Standards Manual covers the use of both MicroStation and GEOPAK. The first section of Chapters covers the use of MicroStation V8, Version 8.5.02.55, including topics such as:

- Directory structures
- File naming conventions and locations
- Seed files
- Annotation
- Line styles
- Color Table
- Cell libraries
- Levels and Symbology
- Batch Printing

The second section of Chapters covers the use of GEOPAK Version 8.8.02.40, including topics such as:

- User Preferences
- Project Manager
- Survey
- DTM creation
- Design and Computation Manager
- Horizontal and Vertical Design
- Cross-Sections
- Plan & Profile Sheet Clipping
- Quantities
- Reports
- File exchange procedures
- Models



Conventions

The CADD Standards Manual contains special features designed to help the users find information quickly and easily. Below is a description of the conventions used throughout this manual.

Use of Bold and (>) Greater-Than Symbol

Bold letters are used to identify program commands, menus, and file names. The greater-than symbol (>) is used to divide a series of commands.

For example:

Open the file **TTL.dgn** using the **File>Open** command. If it is not in the expected folder, click the **Cancel** button.



Caution is to be shown when the reader should take particular note of the information being discussed.



Information is used to provide helpful information about a particular item when it is being discussed, or to provide general information about the standards as needed.

Hyper linking

Throughout the manual there will be references to information found on the EFLHD website, along with the accompanying web link to this information. Links will be as shown below:

<http://www.efl.fhwa.dot.gov/>



Terms and Abbreviations

Abbreviation	Description
CADD	Computer Aided Drafting and Design
EFLHD/EFL	Eastern Federal Lands Highway Division
Excel	Spreadsheet software from Microsoft
FHWA	Federal Highway Administration
GEOPAK	Civil Engineering highway design software from Bentley Systems, Inc.
MicroStation	Drafting Software from Bentley Systems, Inc.
PS&E	Plans, Specifications, & Estimates
Symbology	Color, weight, and style of graphical elements
Working units	MicroStation's system of precision including MU, SU, and UOR
MU	Master Units, part of MicroStation's unit system
SU	Sub-units, part of MicroStation's unit system
UOR	Units of Resolution

Table 1-1: Terms and Abbreviations

Standard File Extensions

Extension	Description
. DGN	MicroStation graphics design file
. DWG	AutoCAD graphics design file
. DDB	GEOPAK D&C Manager database file
. RSC	MicroStation resource file
.X30	GEOPAK Criteria files version
.DTM	Microstation design file containing 3D graphics used to create GEOPAK .TIN file
.TIN	GEOPAK digital terrain model
.DAT	Hydraulic model file (ASCII file containing Northing, Easting, Elevation).
.SMD	Survey manager database
.GPK	GEOPAK coordinate geometry database
.TXT	Final ASCII survey control file
.DGNLIB	MicroStation library containing levels, text styles and dimension styles

Table 1-2: File Extensions



Support

CADD Support help using this manual, comments, and suggestions for these CADD standards should be submitted using the standard change form, which can be downloaded [here](#), and e-mailed to:

Richard.McDaniel@fhwa.dot.gov

Shoukat.nawaz@fhwa.dot.gov

FLHD's use of MicroStation V8, 2004 Edition

While there are many new tools in MicroStation V8 Version 8.5.02.55 that EFLHD will take advantage of, there are others that will not be endorsed by EFLHD at this time. If the use of a particular tool is not outlined in this section, or in its appropriate place in the CADD Standards Manual, check with the EFLHD project manager as to the acceptance of its use. The most important of these tools and the EFLHD use of these tools is outlined below. As EFLHD is currently testing some of these tools to determine the best use for EFLHD, comments on potential uses are welcome and should be sent to the above e-mail address.

New Generation of Standard Files

EFLHD is implementing a new generation of MicroStation/GEOPAK standard files. This new generation is known as the X30 Generation of standard files. Listed below are links to *MicroStation V8/GEOPAK 2004 – X30 Generation of Standard Files* and *Off-Site Configuration instructions*. Consultants working on EFLHD projects should download the **CADD_Resource_V8.zip** and configure their CADD environment with X30 Generation of Standard Files.

[MicroStation V8 / GEOPAK 2004 - X30 Generation of Standard Files](#)

[Off-Site Configuration Instructions](#)

Design History

At this time EFLHD will not be using Design History. However, AE firms may use design history if desired. EFLHD is currently evaluating the best uses for Design History, comments and suggestions may be submitted to the e-mail address listed above.

Macros

MicroStation Basic Macros and MicroStation Visual Basic Applications (MVBA) help the user to streamline processes, check geometry, and enhance overall efficiency. Currently EFL does not use macros or MVBA but may in the future. Please check back to see what has been added.



The Macros for MicroStation 2004 are in the process of being updated or being converted to MVBA. Please check back often as they will be added to the website as completed. A list of macros and descriptions will also be available at a later date.