

This Guide has been written for:
Federal Highway Administration
Eastern Federal Lands Highway Division
21400 Ridgetop Circle
Sterling, Virginia 20166

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Software Versions

MicroStation V8i Edition
GEOPAK V8i Edition

1. MICROSTATION V8i Edition

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Chapter 1: INTRODUCTION

1.1 – Purpose

This document is intended to outline the Federal Highway Administration (FHWA), Eastern Federal Lands Highway Division's (EFLHD) use of Bentley's MicroStation V8i Edition and GEOPAK V8i Edition, as well as internally developed tools and procedures. The V8i CADD (Computer Aided Design and Drafting) Procedures Guide (V8i CPG) 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 V8i CADD Procedures Guide (V8i CPG) 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:

- Standardization of design and plan production
- Increased efficiency and productivity
- Re-usability of data
- Increased ability to share resources

The V8i CPG is intended to be as complete as possible. However, there will be circumstances, 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 guide as possible.

1.2 - Outline of Guide

The V8i CPG covers the use of both MicroStation and GEOPAK. The first section of Chapters covers the use of **MicroStation V8i** Edition, including topics such as:

- Chapter 1 - Introduction
- Chapter 2 - Directory structures and File naming conventions
- Chapter 3 – MicroStation V8i Basics
- Chapter 4 – Annotation
- Chapter 5 - Line styles
- Chapter 6 - Color Table
- Chapter 7 - Cell libraries
- Chapter 8 - Levels and Symbology
- Chapter 9 - Reference Files
- Chapter 10 – Printing
- Chapter 11 – PDF creation and Plan Delivery
- Chapter 12 –EFLHD Standard CADD Procedures

The second section of Chapters covers the use of **GEOPAK V8i Edition**, including topics such as:

- Chapter 1 - GEOPAK V8i Basic
 - Chapter 1.1 - Introduction
 - Chapter 1.2 - Geopak Files Name
 - Chapter 1.3 - User Preferences
 - Chapter 1.4 - Setting Up Project Manager (Geopak)
 - Chapter 1.5 - Create Horizontal Alignment (Geopak)
 - Chapter 1.6 - Display the Horizontal Alignment
 - Chapter 1.7 - Create/Draw Existing Ground Profile (Geopak)
 - Chapter 1.8 - Create Proposed Vertical Alignment (Geopak)
 - Chapter 1.9 - Existing Ground Cross Sections (Geopak)
 - Chapter 1.10 - Developing the "Superelevation" Shape
 - Chapter 1.11 - Proposed Cross Section (Geopak)
 - Chapter 1.12 - Draw Construction Limits (Geopak)
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- Chapter 2 - GEOPAK V8i – EFLHD Procedures
 - Chapter 2.1 - GEOPAK Plan & Profile Sheet Clipping
 - Chapter 2.2 - Cross Section Sheets
 - Chapter 2.3 - Draw Graphics Elements Using D&C Manager

1.2.1 – 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.

Hyperlinking

Throughout the guide 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.eflhd.gov/>

1.3 - Terms and Abbreviations

CADD	Computer Aided Drafting and Design
CFLHD / CFL	Central Federal Lands Highway Division
CPG	CADD Procedures Guide
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.
MU	Master Units, part of MicroStation unit system
PS&E	Plans, Specifications, & Estimates
PU	Positional Units, part of MicroStation's unit system
Symbology	Color, weight, and style of graphical elements
SU	Sub-units, part of MicroStation's unit system
UOR	Units of Resolution
WFLHD / WFL	Western Federal Lands Highway Division

1.3.1 - Standard File Extensions

. CEL	MicroStation cell or cell library
. CON	MicroStation design file containing contours
. DDB	GEOPAK D&C Manager database file
. DGN	MicroStation graphics design file
. DGNLIB	MicroStation V8 library containing level definitions, text styles, and dimension styles
. DTM	MicroStation design file containing 3D graphics used to create the GEOPAK .TIN file
. DWG	AutoCAD graphics drawing file
. MAP	MicroStation design file containing mapping planimetrics
. MVBA	MicroStation Visual Basic Application
. PCF	MicroStation Project Configuration File
. PLTCFG	MicroStation Print Driver Configuration File
. RSC	MicroStation resource file

1.4 - EFLHD's use of MicroStation, V8i Edition

1.4.1 - New Generation of Standard Files

EFLHD has implemented a new generation of MicroStation/GEOPAK standard files. This new generation is known as the V8i Edition of standard files. All files are located within a folder structure named **V8i_resource**. Listed below are links to *MicroStation & GEOPAK V8i Edition Standard Files* and *A/E Configuration instructions*. Consultants working on EFLHD projects should download the **CADD_Resource_V8i.zip** and configure their CADD environment with X30 Generation of Standard Files.

[Download the V8i_resource.zip](#)

[View the AE Offsite Configuration Instructions](#)

1.4.2 - Print Organizer

Print Organizer is a new utility in V8i that is used for creating, managing, and publishing project plan sheets. This new utility replaces the Batch Print utility used in MicroStation V8. Batch Print will no longer be supported in future versions of MicroStation. EFLHD is discontinuing the use of Batch Print and is making the use of Print Organizer the standard. A/E's are recommended to do the same. See Chapter 10.6.

1.4.3 - Models

Models are now standard within FLH Standard plans and EFLHD Detail drawings. All cells and cell libraries are done with the use of models. See Chapter 8, Cell Libraries, for more information about models within cell libraries. Both internal users and AE's may use or submit electronic files where multiple models have been created.

Models can be categorized by two types; Design and Sheet. EFLHD does not recommend the use of Sheet models. "Design" models are commonly used as there are no significant differences in the feature between the two.

1.4.4 - Support

Comments and suggestions for these CADD procedures should be forwarded to the EFL CADD Coordinator.

Additional Support

Guidance and CADD support on following and understanding the V8i CPG is also provided by the EFL CADD Coordinator.

CADD support contact information:

Spencer Beale

EFL Highway Design CADD Coordinator

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