Federal Lands Highway, Central Federal Lands Highway Division, Lakewood Colorado

CFLHD CADD Standards Manual
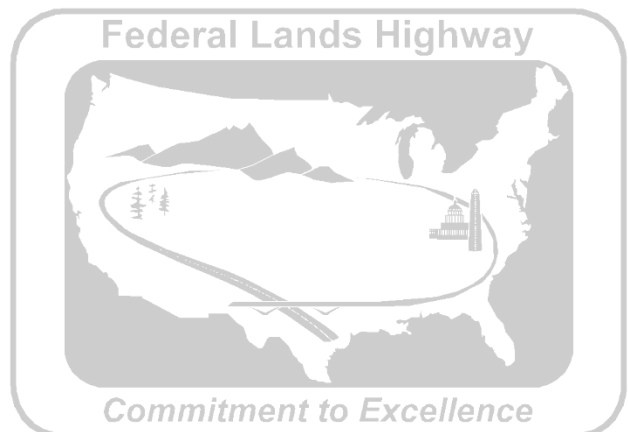
MicroStation V8i Edition

June 2012

U.S. Department of Transportation

Federal Highway Administration

Federal Lands Highway

Commitment to Excellence

Federal Highway Administration
Central Federal Lands Highway Division
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Software Versions

MicroStation V8i Edition

GEOPAK V8i Edition

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Chapter 1: Introduction

Purpose

This document is intended to outline the Federal Highway Administration's Central Federal Lands Highway Division's (CFLHD) use of Bentley's MicroStation V8i Edition and GEOPAK V8i Edition, 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 CFLHD internal designers and the A/E firms doing business with CFLHD.

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 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 V8i Edition, including topics such as:

- Chapter 1 - Introduction
- Chapter 2 - Directory structures
- Chapter 3 - File naming conventions
- Chapter 4 - Seed files
- Chapter 5 - Annotation
- Chapter 6 - Line styles
- Chapter 7 - Color Table
- Chapter 8 - Cell libraries
- Chapter 9 - Levels and Symbology
- Chapter 10 - Reference Files
- Chapter 11 – Plans and Packaging
- Chapter 12 – Printing
- Chapter 13 – PDF creation and Plan Delivery

STANDARDS FOR USE WITH MicroStation/GEOPAK V8i

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

- Chapter 1 - GEOPAK Introduction
- Chapter 2 - GEOPAK Preferences
- Chapter 3 - Project Manager
- Chapter 4 - Survey
- Chapter 5 - Digital Terrain Models
- Chapter 6 - Design and Computation Manager
- Chapter 7 - Horizontal and Vertical Design
- Chapter 8 - Cross-Sections
- Chapter 9 - Plan & Profile Sheet Clipping
- Chapter 10 - Quantities
- Chapter 11 - GEOPAK Reports
- Chapter 12 – Earthwork Calculations and Grading Summary

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

http://flh.fhwa.dot.gov/resources/cadd/cfl/

Terms and Abbreviations

Abbreviation	Description
CADD	Computer Aided Drafting and Design
CFLHD/CFL	Central 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's 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
WYSIWYG	What You See Is What You Get

Table 1-1: Terms and Abbreviations

Standard File Extensions

Extension	Description
. 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 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
. PLTFG	MicroStation Print Driver Configuration File
. RSC	MicroStation resource file

Table 1-2: File Extensions

CFLHD's use of MicroStation, V8i Edition

While there are many tools in MicroStation V8i edition that CFLHD will take advantage of, there are others that will not be endorsed by CFLHD 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 CFLHD project manager as to the acceptance of its use. The most important of these tools and the CFLHD use of these tools is outlined below. As CFLHD is currently testing some of these tools to determine the best use for CFLHD, comments on potential uses are welcome and should be sent to the above e-mail address.

New Generation of Standard Files

CFLHD 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 *Off-Site Configuration instructions.* Consultants working on CFLHD projects should download the **V8_Resource.zip** and configure their CADD environment with X30 Generation of Standard Files.

Download the V8i_resource.zip

View the Off-Site Configuration Instructions.pdf

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. CFLHD had discontinued the use of Batch Print and has made the use of Print Organizer the standard. A/E firms are recommended to do the same.

Models

The recommendations on the use of models have changed within CFLHD. When models were first available, they were perceived to have risks with the potential loss of data or design. Models are now standard within FLH Standard plans and CFLHD 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 firms may use or submit electronic files where multiple models have been created.

Models can be categorized by two types; design and sheet. CFLHD does not use or recommended the use of Sheet models. Design "type" models are commonly used as there are no significant differences in the feature between the two.

CFLHD will be plotting using the procedures established for MicroStation V8i. If multiple models are creating within a single file, it is imperative that each model is described and documented using a file tracking protocol.

Design History

CFLHD does not use or recommending the use of Design History. However, similar to models, AE firms may use design history if desired. CFLHD is currently evaluating the best uses for Design History, comments and suggestions may be submitted to the e-mail address listed above.

Support

Comments and suggestions for these CADD standards should be submitted to:

caddstandard@dot.gov

Additional Support

Guidance and CADD support on following and understanding these CFL CADD Standards Manuals is also provided by the CFL Senior Highway Design Enginner.

CADD Support Team Contact Information:

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