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## Chapter 9: Levels and Symbology

### Overview

Symbology includes which level, color, line style, and weight is associated with each element to be drawn. Following the symbology outlined in this chapter is essential for several reasons, but perhaps the most important reason is the standardization of the final output. Following the standard symbology will ensure that each element, line work, text, etc., will appear and plot the same from drawing to drawing.

This chapter will detail the levels in use at CFLHD, the associated level symbology, the use of the CFLHD DGN library, and CFLHD level filters, including workflows for many of the MicroStation V8i Edition tools.

### Levels

Within MicroStation V8i Edition, a design file may contain an unlimited number of levels in which data may be displayed. There are two primary ways in which to assign symbology to each element: first, the color, weight, and line style of the graphic elements are set independently. Secondly, an addition first introduced in MicroStation V8, is **ByLevel** symbology. With ByLevel symbology each level may have a pre-assigned color, line style, and weight. By selecting the desired level, these attributes are automatically set.

As discussed above, the level symbology for any level may be set individually. This includes the ability to set some attributes of elements to ByLevel and other attributes independently.



While some manual drafting is necessary and expected, most design elements should be placed with the GEOPAK D&C manager, the **.ddb** file. This is the best way to insure that elements are placed with the proper symbology, for final output and for use at later stages for GEOPAK criteria files and for computing quantities.

### DGN Libraries

In MicroStation V8i, levels and the associated ByLevel symbology are stored in a DGN library (.dgnlib), and may be attached to any MicroStation file. In order to maintain the current and future versions of X30 criterion, the **FLH\_Combined.dgnlib** is controlled FLH wide. CFLHD designers and consultants will not be able to add new levels to the *FLH\_Combined.dgnlib* file.

DGN libraries may also contain information for text, dimension, level filters, and print styles. See the appropriate chapter for these tools. The workflow below outlines how to attach levels contained in the DGN library to the current file.



For CFLHD employees, the standard DGN Library will be automatically attached while opening a design file using the Project Configuration (\*.pcf). Workflow 1, shown below, can be used to manually attach the DGN Libraries to a design file.

## Workflow 1: Attaching a level library

To access this workflow, follow this link:

[http://flh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow\\_9.1m\\_v8i.pdf](http://flh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow_9.1m_v8i.pdf)

### Level Filters

Also included in MicroStation V8i are **level filters**. With an unlimited number of levels it could easily become very cumbersome to navigate to the desired level. Level filters are designed to group levels together creating a more manageable set of levels. For example the FLH levels have been broken down to: none, All, Civil\_All, Civil\_Bridge, Civil\_EC, Civil\_Hyd, Civil\_Road, Cross\_Sections, Drafting, Patterns, ROW, Survey\_Mapping, Unused, Used.

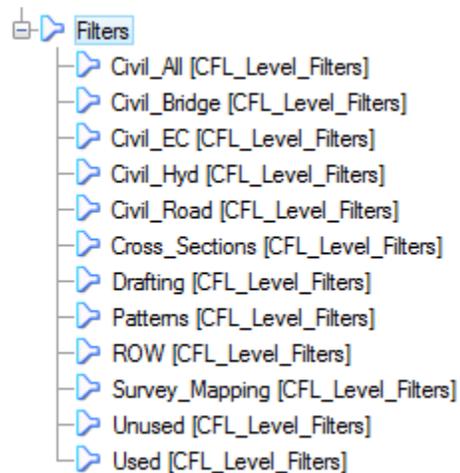


Figure 9.1: Level Filters

Selecting the appropriate filter will display only the desired levels. This does not turn the display of levels on or off, but simply allow the user to work with a smaller sub-set of levels.

### Level Overrides and Controlling Level Symbology

A user has the ability to change the properties and level symbology of a level using the Level Manager dialog box. Using overrides is a great way to view a level differently without modifying the default level properties.

- An asterisk (\*) appears in the Level Manager for a library level or an attachment level, when one or more attribute is modified so it is different from its source.
- ByLevel — When turned on, causes all elements with bylevel attributes to be displayed with the same element symbology.
- Overrides — View setting that, when turned on, causes all elements on a particular level to be displayed with an alternate set of element symbology than the default.
  - Level Overrides must be turned on in the View Attributes dialog for the override symbology to display.
  - Symbology overrides are disabled in DWG work mode. All elements are displayed with ByLevel element symbology.

Level overrides are used to change the display of level symbology. Using level overrides is not a standard practice for CFL plan sheets. However, there may be special needs for individual projects or plan sheets. Sometimes there becomes visual ambiguity with ByLevel attributes of elements and overlying color images. Or, it is possible that it is desirable to have specific elements stand out or be less visible than surrounding elements.

There are a few basic steps to set and view overrides:

1. From the Level Manager dialog box Level list, select the desired level or range of levels.
2. From the Symbology options menu, select Overrides.
3. Change the desired attributes.
4. If Level Symbology is toggled on (Settings > View Attributes) , each changed level attribute (color, line weight, or line style) displays in place of the elements' own attributes.  
If Level Symbology is toggled off (Settings > View Attributes) , the attributes return to their normal state when Symbology is changed back to ByLevel.
5. Click OK.



Note that it is possible to set individual overrides in multiple files using the Parent-Child “tree” in the Level Manager.

### Using Level Overrides on CFLHD Erosion and Sediment Control Plan Sheets

The level of detail and call-outs in CFLHD Erosion Control Plan Sheets has been reduced for simplicity. Since devices are placed schematically, the locations for devices are shown by symbols that are identified on the Conventional Plan Symbols and Abbreviations sheets in the front of plan sets. If necessary for plan clarity, it is recommended to use level symbology overrides to emphasize these devices on the plan sheets.

Workflow 2 demonstrates the process to use overrides on a sample plan sheet.



Note that using Level Symbology on Erosion Control sheets or any other type of plan sheet is not a required process. This Workflow is offered for user preference or when judged that additional clarity is needed.

## Workflow 2: Setting Level Symbology Overrides in Erosion Control Plan Sheets

To access this workflow, follow this link:

[http://filh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow\\_9.2m\\_v8i.pdf](http://filh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow_9.2m_v8i.pdf)