



Table of Contents

CHAPTER 6: D & C MANAGER	1
Overview	1
Database (.ddb) Files	1
WORKFLOW 1: ATTACHING A .DDB FILE	2
Using the D & C Manager	2
Chains and Profiles	2
WORKFLOW 2: DRAWING ELEMENTS STORED IN COORDINATE	
GEOMETRY DATABASE	2
Design Elements	2
WORKFLOW 3: DRAWING NEW DESIGN ELEMENTS	3
Changing AdHoc Attributes	3
Scale Factor for Custom Line Styles in D & C Manager	5
WORKFLOW 4: CHANGING EXISTING DESIGN ELEMENTS	6
WORKFLOW 5: DRAWING PAY ITEM ELEMENTS	6
Place Influence Command	6
MicroStation Visual Basic Application in D&C Manager	7
3PC Criteria in D&C Manager	12





Chapter 6: D & C Manager

Overview

The Design and Computation Manger (D & C Manager) has become a very integral part of the design process. Plan view elements such as edges of pavement, centerline, curb and gutter, walls, and guardrail must be drawn into a design file with the assigned attributes, conforming to agency drafting standards. Drawing plan view elements using D&C manager is vital for the use of FLH shape cluster criteria, automating quantities and plotting. GEOPAK's D & C manager is the tool that automates tasks through the use of a hierarchical database, **.ddb**, containing information about each element to be placed within a set of plans.

The FLH shape cluster criteria files use two FLH wide .ddb files. Both English and Metric versions (V8_ENGLISH.ddb & V8_METRIC.ddb) of the database is available for use with their respective projects. Each .ddb file is broken into 5 categories: CHAINS/PROFILES, MVBA Applications, 3PC, Pay_items, and Define_dgn. These five categories are then further broken down into the subcategories and into individual items.

M Design and Computation Manager
<u>Fi</u> le <u>E</u> dit <u>S</u> ettings F <u>a</u> vorites <u>H</u> elp
产 id 🔲 🚧 🧬 💷 🐂 👫 😭
N:\V8i_Resource\FLH_Common\GEOPAK\\V8_English.ddb CHAINS/PROFILES
MVBA Applications
Pay_items Define_dgn
1

Figure 6-1: Design and Computation Manager

Database (.ddb) Files

The .ddb files can be found on the CFLHD network at: *N:\V8i_ResourceFLH_Common\GEOPAK\DDBS*\English or Metric\



For CFLHD employees, the unit correct .ddb file will be automatically attached while opening a design file using the Project Configuration (*.pcf). Workflow 1, shown below, can be used to manually attach a .ddb file.





For consultants, .ddb files are available through the **V8i_Resource.zip** download. Download V8i_Resource.zip file and extract the files to the server or local drive, keep the V8i_Resource directory structure intact. The unit correct .ddb file will be attached when opening a design file using the project configuration file.

Workflow 1, shown below, can be used to manually attach a .ddb file to a design file.

Workflow 1: Attaching a .ddb File

To access this workflow, follow this link:

http://flh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow_6.1_v8i.pdf

Using the D & C Manager

As stated in Geopak Chapter 1, this manual is not intended to teach the use of GEOPAK to the novice user. However, the following workflows will outline the most important uses of the D & C Manager, and their importance to CFLHD. There are two types of information drawn by the D & C Manager; elements such as centerlines, which have been stored in the coordinate geometry database, and elements such as shoulder lines, which have not been stored.

Chains and Profiles

For CFLHD projects, the Design and Computation Manager is used to draw and display both horizontal chains and vertical profiles for design and drafting applications. Using the D&C manager ensures proper symbology, text and scales for display of Coordinate Geometry elements.

Workflow 2: Drawing Elements Stored in Coordinate Geometry Database

To access this workflow, follow this link:

http://flh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow_6.2_v8i.pdf

Design Elements

The D&C manager is used extensively when placing plan view elements into MicroStation design files. Using this tool helps standardize and automate CFLHD design processes and plan packages.

By using the Place Influence tool within D&C manager, the user can set the level, symbology and attribute tags (or AdHocs) of MicroStation draw and manipulation functions. These level symbology and attribute tags are defined in the database.



In order to draw proposed cross sections using the shape cluster criteria or use the D&C manager to calculate quantities, it is essential to design elements from the .ddb file and to use the Place Influence tool.





Workflow 3: Drawing New Design Elements

To access this workflow, follow this link:

http://flh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow_6.3_v8i.pdf

Changing AdHoc Attributes

Once an element has been drawn to the plan view using D & C Manager, it may be desirable to revise certain adhoc values. Adhoc values can be changed using the GEOPAK 3PC ADHOC Attribute Manager.

 From the MicroStation Menu Select Applications > GEOPAK > ROAD > GEOPAK 3PC Adhoc Attribute Manager. The following dialog box will appear. Select the Identify Element icon to identify the plan element that contains the adhoc(s) to be revised.

📕 AdHoc Attribute Manager 💷 💷	23
File	
■ <mark>⊘</mark> ** * *	
Name Identify Element pe Value	
	"⊐ ★
	$ \times $
۰ ۲	

Figure 6-2: Adhoc Attribute Manager

 Select the plan element with a left mouse click to populate the dialog with the current adhoc attributes of the element. For example an MSE Wall plan element is selected. The dialog will be populated with adhoc attributes as shown below:

File			
🗖 🐼 🕉 🕇	• •		
Name	Туре	Value	
Wall Foreslope	String	-1:3	
Wall Batter	String	-24:1	2
Leveling Pad Depth	Numeric	0.000000	×
Wall Lift Height	Numeric	1.500000	
Set Back Width	Numeric	4.000000	
Wall Width Factor	Numeric	0.700000	
Additional Exc Width	Numeric	1.500000	
Min Reinforce Length	Numeric	0.000000	
Wall Excavation Slope	String	1:1	
Embedment Depth	Numeric	2.000000	
BottomFootingProfName	String	none	
WallChainName	String	none	
UNLOCK Wall Foreslope	String	N	
Foundation Depth	Numeric	0.000000	
Wall Backfill Depth	Numeric	2.000000	
MSE Wall Facing Width	Numeric	0.000000	

Figure 6-3: MSE Wall Adhoc Attributes





 Revise the value of the adhoc(s) in the dialog to the new desired value by clicking on the current adhoc setting and type in a new value and press enter or tab to accept the change. Select the icon entitled "Set Attributes" and then left mouse click on the plan element(s) that require the change.

File			
🔲 që <mark><table-cell> qa 🗧</table-cell></mark>	• •		
Name Set Attribu	tes ورز	Value	
Wall Foreslope	String	-1:3	<u></u>
Wall Batter	String	-24:1	2
Leveling Pad Depth	Numeric	0.000000	×
Wall Lift Height	Numeric	1.500000	
Set Back Width	Numeric	4.000000	
Wall Width Factor	Numeric	0.700000	
Additional Exc Width	Numeric	1.500000	
Min Reinforce Length	Numeric	0.000000	
Wall Excavation Slope	String	1:1	
Embedment Depth	Numeric	2.000000	
BottomFootingProfName	String	none	
WallChainName	String	none	
UNLOCK Wall Foreslope	String	Y	
Foundation Depth	Numeric	0.000000	
Wall Backfill Depth	Numeric	2.000000	
MSE Wall Facing Width Numeric 0.000000			

Figure 6-4: Edit MSE Wall Adhoc Values



The ability to change the value of an adhoc attribute as shown above will NOT work if D & C Manager is opened and Place Influence is turned on. Make sure before changing adhoc value(s) on previously drawn elements that the place influence is turned OFF.





Scale Factor for Custom Line Styles in D & C Manager

If the design element (ddb item) selected from the D & C Manager has custom line styles associated with the element, then a scale factor must be set prior to drawing the design element.

From the D & C Manager Dialog Box, Select Settings>Design

📕 Design and Computation Manager						
<u>F</u> ile	<u>E</u> dit	<u>S</u> ettings F <u>a</u> vorites <u>H</u> elp				
	id	Display				
2	IU	Design				
	CHAI	Compute				
	D MVB/ 3PC	Computation Units				
	Defin	Dialog				
	Pro 🗁					
	Plan View Overrides					
	🛅 Widening					
	Curbs & Paved Ditches					
	🗁 Guardrail & Concrete Barriers					
	Bystem G1					
	C Steel Posts					
	617010050 Guardrail system G1, type 1, class A					
	📾 617010051 Guardrail system G1, type 1, class A					
	6	Wood Posts				

Figure 6-5: Design Settings

Modify the Custom Line Style Creation Scale Factor based on the scale of your plan drawing. For CFLHD projects, use scale factors shown below. After the Scale Factor has been modified, all the custom line styles drawn using the D & C Manager will have the new scale until changed by the user. Custom Line Style Creation Scale Factor can be changed in the Design Mode as well as in the Set Mode in the D&C Manager.

📕 Design Settings 📃 🗆 🐹
Element Connectivity
Maximum Gap Tolerance : 0.50000
Deduction Tolerance : 0.50000
Custom Line Style Creation
Scale Factor : 5.00000
Cell Creation
Plot Scale : 1.000 / Creation Scale
Influence Graphic Cell Level Symbology
·

Figure 6-6: Custom Line Style Scale Factor







For CFLHD projects, Use the following Scale Factors: 1"=100' English Plans Scale Factor =5 (Exception: Concrete Barrier =2.5) 1:1000 Metric Plans Scale Factor =2 (Exception: Concrete Barrier =1) For different scale plans, adjust scale factor accordingly.

Workflow 4: Changing Existing Design Elements

To access this workflow, follow this link:

http://flh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow_6.4_v8i.pdf

Workflow 5: Drawing Pay Item Elements

To access this workflow, follow this link:

http://flh.fhwa.dot.gov/resources/cadd/cfl/documents/Workflow_6.5_v8i.pdf

Place Influence Command

Simply setting the active level, color, weight, and style or toggling on the Use Active Attributes button is not the same as using the GEOPAK Place Influence command. To verify that Place Influence was used to place a line, open the D&C manager and click on the ID button.

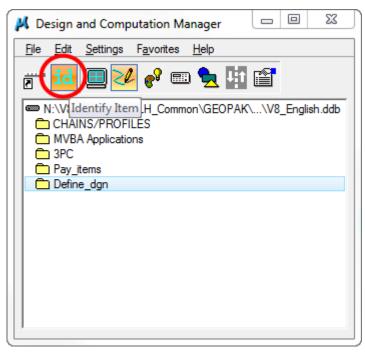


Figure 6-7: D&C Manager ID Button





Click on the graphical element in the dgn file that is in question, and data point to accept. If the line was placed with Place Influence toggled on, then the line type will automatically be highlighted in the D&C Manager.

📕 Design and Computation Manager 🛛 😐	23
<u>Fi</u> le <u>E</u> dit <u>S</u> ettings F <u>a</u> vorites <u>H</u> elp	
ē'' 💶 🔜 🍫 🕬 💷 🚰	
C 3PC	•
Pay_items	
🗁 Define_dgn	
Proposed	=
🛱 Plan View Overrides	
💼 Widening	
Curbs & Paved Ditches	
Guardrail & Concrete Barriers	
🗁 Walls	
misc 🔁	
Prop. MSE Wall <	-

Figure 6-8: Element Identified with D&C Manager

As shown above, the element created with place influence has user data linkage attributed to the element. The element created without place influence does not. This extra data is read by GEOPAK for things such as automated quantities, etc.

MicroStation Visual Basic Application in D&C Manager

Several MicroStation Visual Basic Application (MVBA) applications can be launched through the D & C Manager.

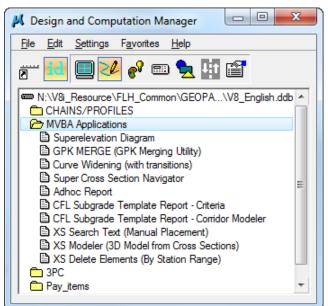


Figure 6-9: MVBA Applications





Listed below are the MVBA available through the D & C Manager and their use.

Superelevation Diagram - This MVBA draws the Superelevation Diagram using a valid autoshape input file. The MVBA will draw the diagram into a dgn file containing the profile cell that matches the Job and Chain that is specified in the shape input file.

Superelevation Diagram - C:\CADD\SuperDiagramSettings.sds					
Superelevation Input File	2:	٩			
Labeling Options	Draw Grid				
Axis of Rotation 🔽 Transition Point Symbol	Superelevation	Station			
✓ Curve Information ✓ Transition Point Station	Interval: 5	Interval: 50			
Honor Vertical Exaggeration of Profile Cell	Draw Superelevation	on Diagram			

Figure 6-10: Superelevation Diagram

GPK Merge - This MVBA is GPK Merging Utility that can merge two GPK files, by the categories defined on the left side of the dialog box.

Merge GPK Elements			×
Source			Target
Job: 001 💌		₩ ₽ ₩ ₽	Job: 001 💌
Points	300		Options
Lines	4000 4001		Ask Before
Curves	4002		 Redefining Elements
Spirals	4003 4004		al
Chains	4005 4006		Always C Redefine
Profiles	4007		Elements
Parcels	4008		Add Prefix
Survey Chains	4010		
	4011 4012		
	4013		
	4014		Merge Elements

Figure 6-11: GPK Merge





Curve Widening - This MVBA is to assist the user in drawing curve widening lines in Accordance with the AASHTO guidelines. A valid autoshape input file is required for this MVBA.

Draw Curve Widening	×
Shape Input File:	۹
Job:	Chain:
Roadway Width: [Design Speed: eMax:
Apply Widening: Only Along the Insi	de Edge of Traveled Way
✓ Disregard Widening < 2.0'	Vehicle Type: WB-50
Display Only Generate Report	Draw Curve Widening

Figure 6-12: Curve Widening

More information on the curve widening MVBA can be found by selecting <u>Curve Widening (Automatic Method)</u>

Super Cross Section Navigator -This MVBA is an alternative application for reviewing cross sections. User can drive through the cross sections or review cross section one at a time. Setting the profile keeps the cross sections from moving up and down.

Cross Section Movie				
Job: 123 💌				
XS Chain: MAIN 💌				
Profile EXMAIN				
Station: 100+00.00 💌 🖬				
I44 I4 M MI				
<u>▲</u> 2 ↓ ■				

Figure 6-13: Cross Section Movie





Adhoc Report - This MVBA will provide a listing of all the adhocs and their attributes based on the selection Method. Report can be printed using a screen capture program (SnagIt) or saved as a .csv file.

Report Adhoc A	Attributes		
Job:	123 💌		
Chain:	MAIN		
Method:	Selection Set		
Report Title	Active Model View 1		
Line 1:	Fence Selection Set		
Line 2:			
Line 3:			
R	eport on Adhocs		

Figure 6-14: Adhoc Report

CFL Subgrade Template Report - This MVBA will produce new CFLHD standard Subgrade Template XS Reports. The Subgrade Template XS Report will replace CFLHD's previous Redtop Report and Detail Staking Report. More information on the Adhoc Report MVBA will be available on CFLHD Website.

Subgrade Template Report - v01.05				
🗃 🖬 🖳ubgradeTemplateSettings.sts				
General Search Symb Search Text				
Job: 123 💌				
Chain: MAIN 💌				
Begin Station: 100+00.00 💌 id				
End Station: 116+00.00 💌 id				
Report				
Title Line 1: Generic Project				
Title Line 2: PFH 101(1)				
Title Line 3: Mainline				
✓ Write Subgrade Trace Elements				
Generate Subgrade Template Report				
Generate Subgrade Point Listing File				

Figure 6-15: Adhoc Report





XS Search Text (Manual Placement) - This MVBA allows the user to drive through cross sections and place or move cross section search text, while updating the Adhocs associated with each piece of search text.

Cross Section Point Label
Job: 123 XS Chain: MAIN Profile MAIN
Station: 100+00.00 Image: Baseline and the second
Labels: 10:Centerline Hinge Point 11:Pavement Hinge Point 12:Pavement Hinge Point 13:Pavement Hinge Point 20:Centerline Hinge Point 21:Pavement Hinge Point 22:Pavement Hinge Point Place Point Label
Move Point Label

Figure 6-16: XS Search Text

XS Modeler (3D Model from Cross Sections) - This MVBA allows the user to create a three dimensional model of the subgrade, aggregate and finished surfaces from cross sections.

Cross Section Modeler for MicroStation V8 2004 Edition -	Version 08.03.10
Image: Second system Image: Second system Image: Second	Search Text Search Symbology: LV=X_Text_Search; CO=0, 19; LS=0; LW=0 Search Text: SSC:SSF,BDT,B2,L2,B3,L3,B4,L4,B5,L5,B6,L6 SSF:SSC,BDT,SSW,FLP,BWBSE FDT:BDT,SSF BDT:FDT,SSC,SSF,BWBSE,B1,L1 FLP:SSF C EDT:FDT,SSC,SSF,BWBSE,B1,L1 Process

Figure 6-17: XS Modeler





XS Delete Elements (By Station Range) - This MVBA allows the user to delete cross section elements by search attributes for specific station ranges.

ጅ 🖬 🗣	Element Search Attributes	
	Levels Default	*
Job: 123 💌	Colors X_E_Ground_XS	=
XS Chain: MAIN	Line Styles X_E_Topsoil_Layer	
	Line Weights X_Geopak_Cell	
Begin Station: 100+00.00 💌 id	Element Types X_Label_Auto_Labeler	
End Station: 116+00.00 🔹 id	€ X_Label_Daylight	
	X_Label_E_Edge_Pave	
Scroll Cross Sections While Processing	X_Label_E_Water	
Process	X_Label_FS_Intersect	-

Figure 6-18: XS Delete Elements (By Station Range)

3PC Criteria in D&C Manager

Several 3PC applications can be launched through the D & C Manager.

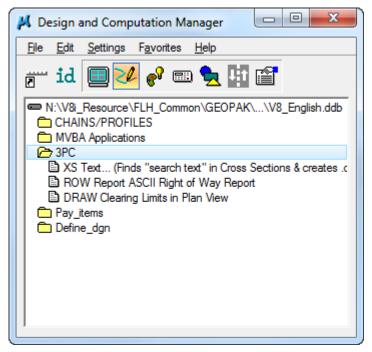


Figure 6-19: 3PC Applications

Listed below are the 3PC's available through the D & C Manager and their use.

XS Text (Finds "search text" in Cross Sections & creates .csv report) - This 3PC will find all the "search text" elements in a cross section file and create a .csv report. GEOPAK notifies the user when the report is completed. The report will be called output.csv and will be located in the working directory defined in the User Preferences dialog box.





ROW Report - This 3PC will provide an electronic file for staking variety of Right of Way types. This 3PC was developed for WFLHD. More information on the ROW Report can be found by selecting <u>ROW STAKING NOTES ...via</u> <u>3PC</u>

Draw Clearing Limits in Plan View - This 3PC draws clearing limit lines into a plan view dgn file based on the information from a standard Geopak Clearing Report. The file path to the clearing report may be too long for this 3PC to run. Temporarily copy the clearing report to the Roadway directory if this 3PC does not work.