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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.
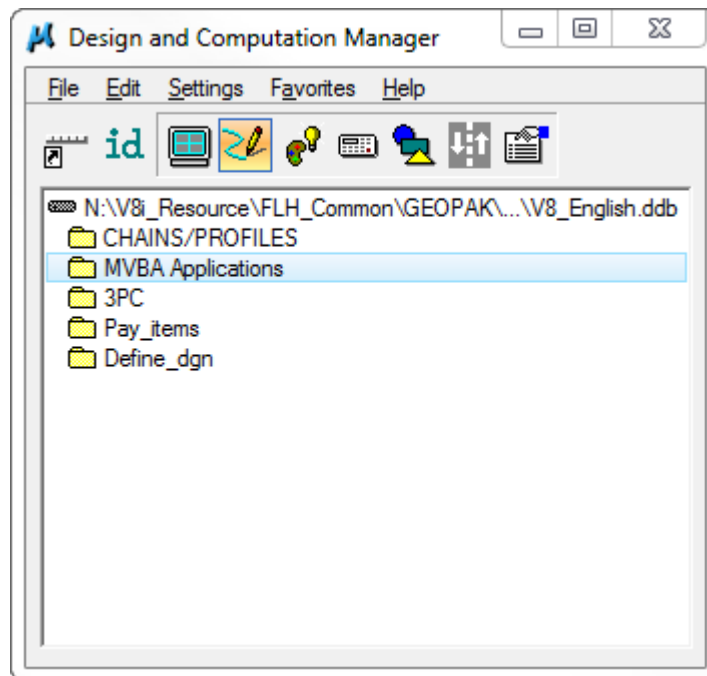

Figure 6-1: Design and Computation Manager

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.

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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.

1. 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.
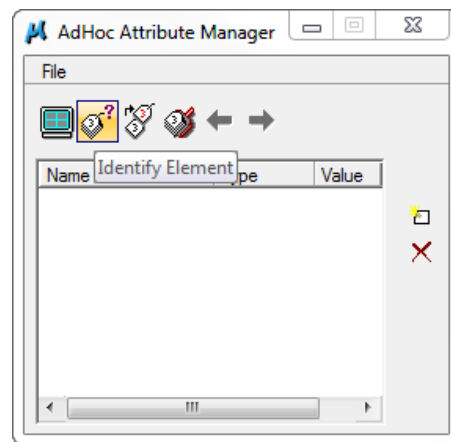

Figure 6-2: Adhoc Attribute Manager

2. 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:
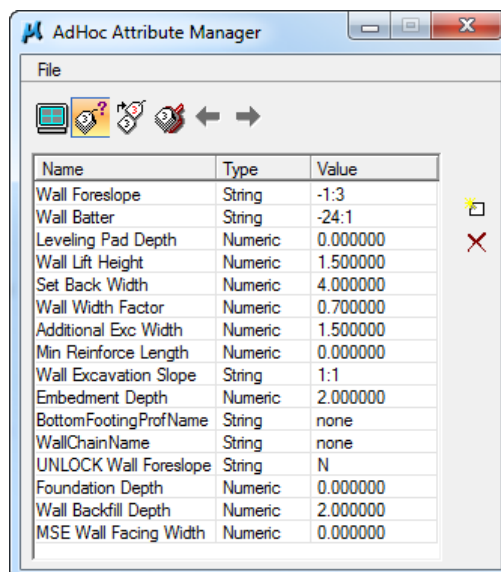

Figure 6-3: MSE Wall Adhoc Attributes

3. 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.
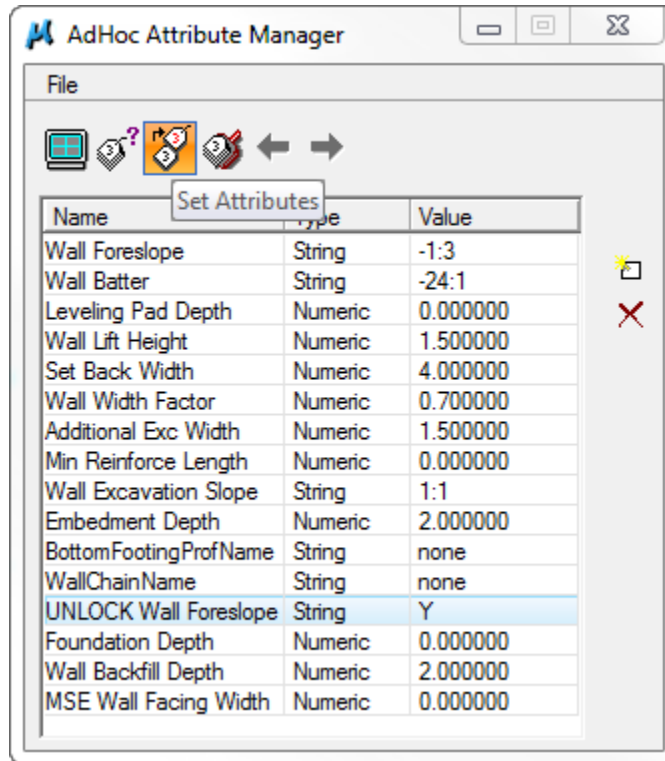

Figure 6-4: Edit MSE Wall Adhoc Values

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.

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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.

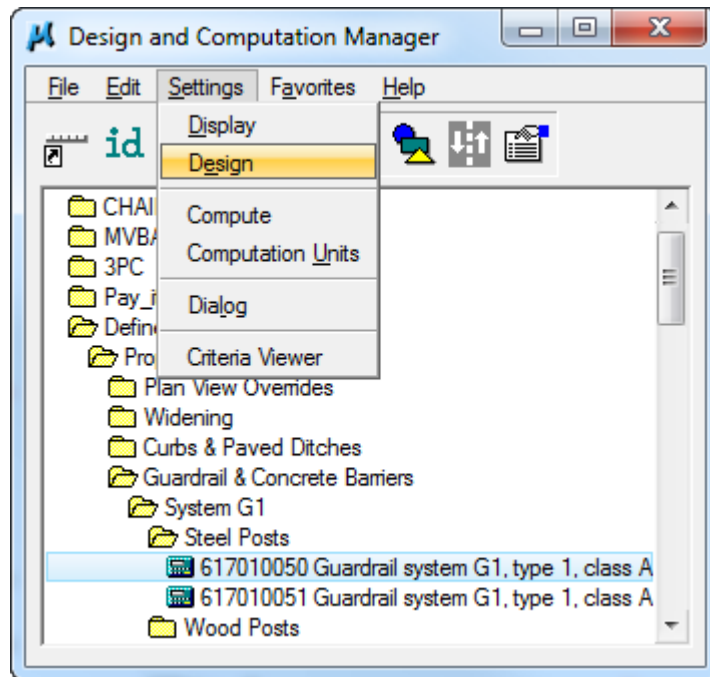From the D & C Manager Dialog Box, Select *Settings>Design*

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.
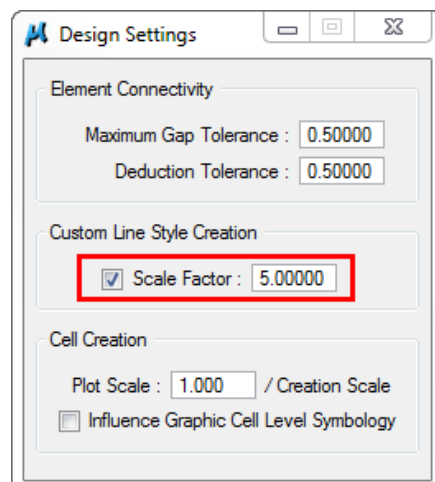

Figure 6-6: Custom Line Style Scale Factor

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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,
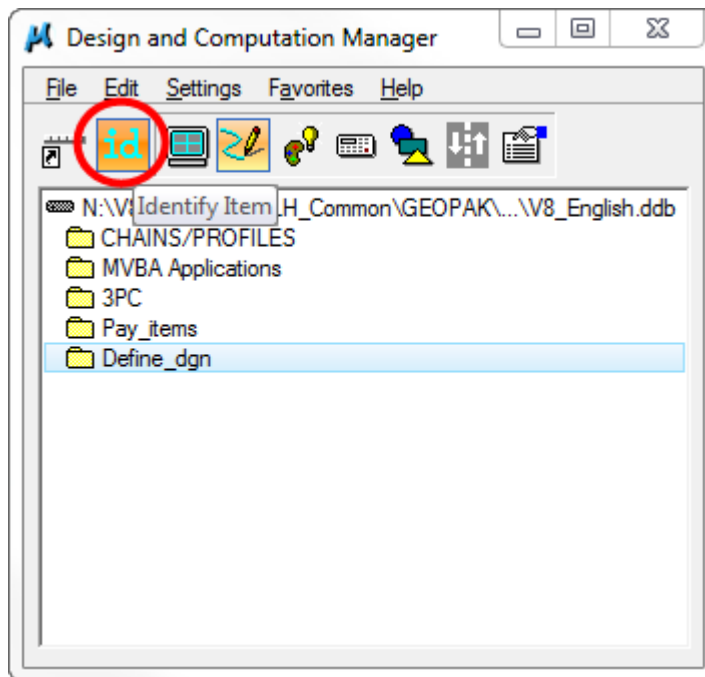open the D&C manager and click on the ID button.

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.
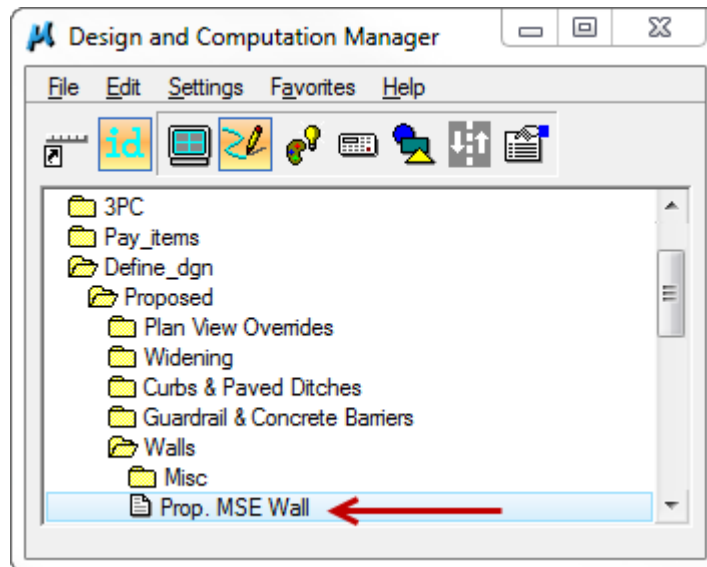

Figure 6-8: Element Identified with D&C Manager

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.
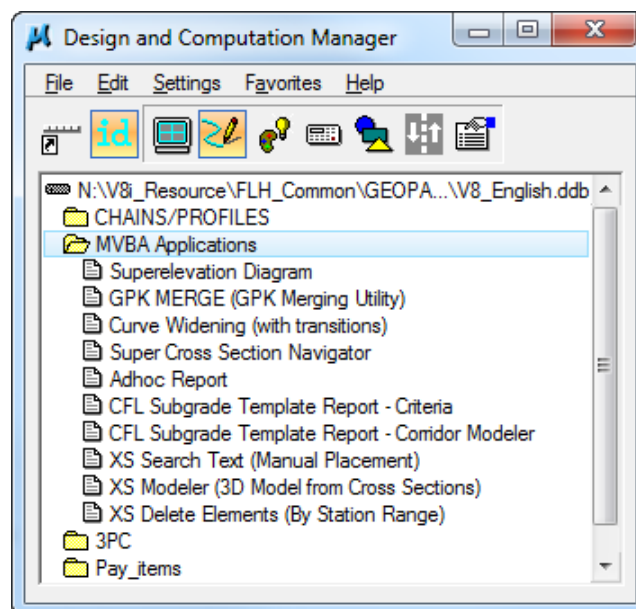

Figure 6-9: MVBA Applications

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.
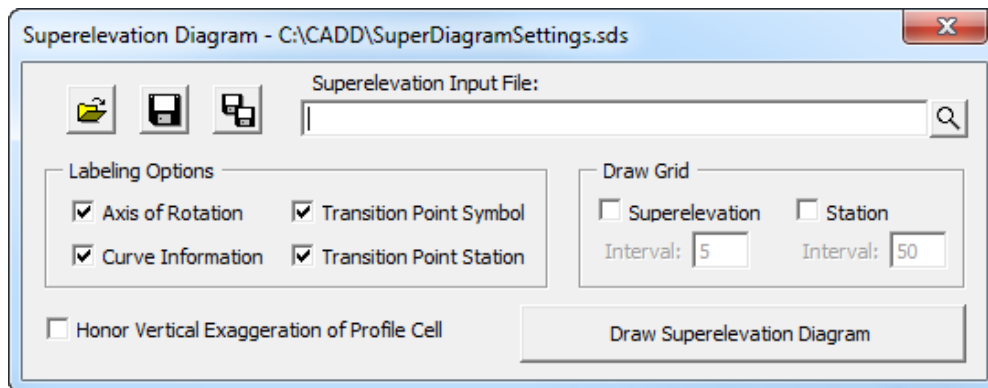

Figure 6-10: Superelevation Diagram

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.
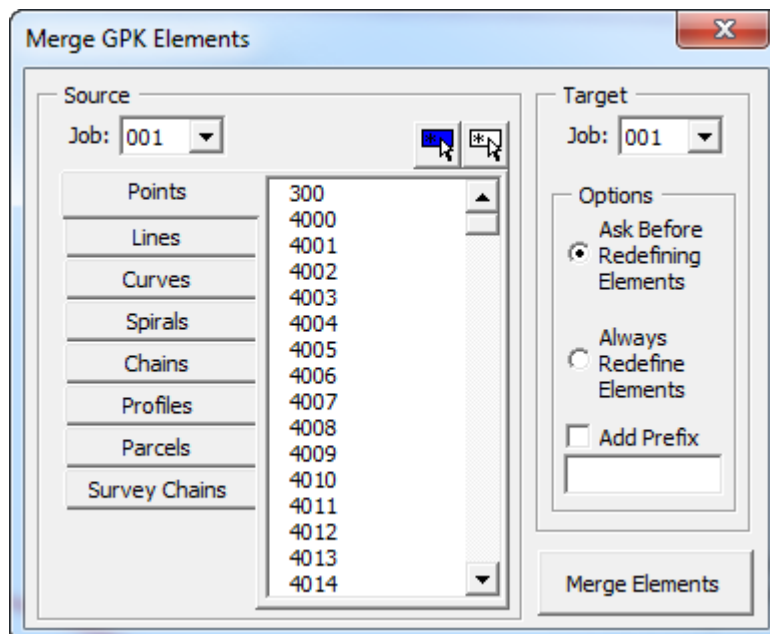

Figure 6-11: GPK Merge

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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.

Figure 6-12: Curve Widening

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

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.

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.
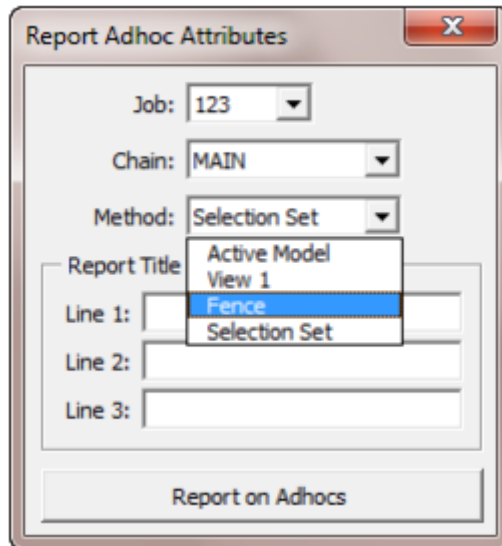

Figure 6-14: Adhoc Report

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.
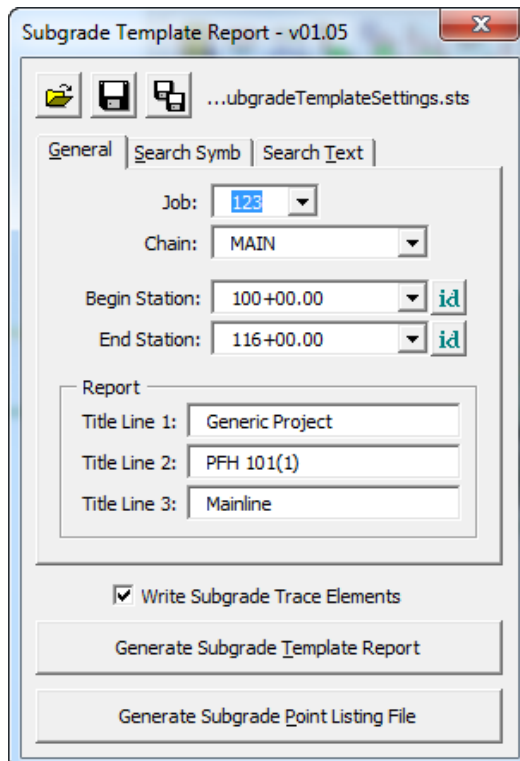

Figure 6-15: Adhoc Report

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.
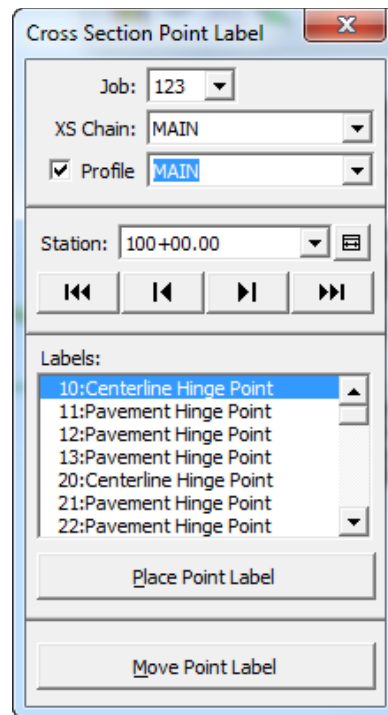

Figure 6-16: XS Search Text

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.
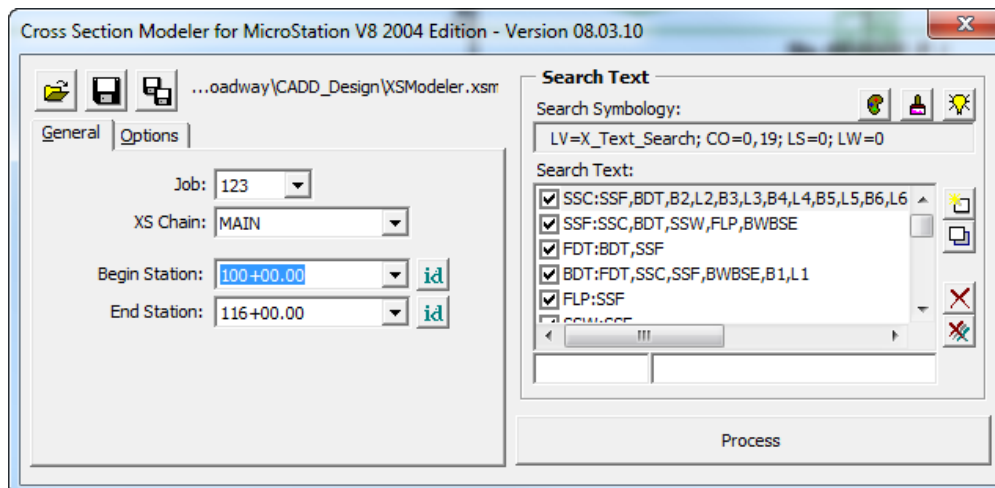

Figure 6-17: XS Modeler

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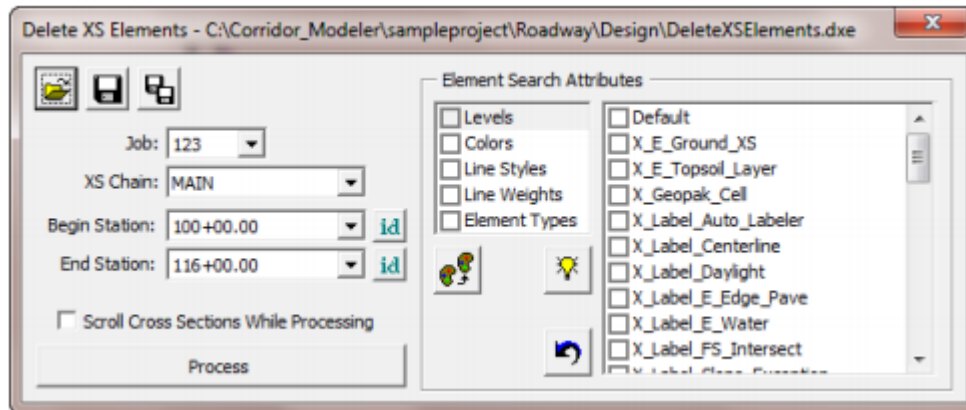

Figure 6-18: XS Delete Elements (By Station Range)

3PC Criteria in D&C Manager

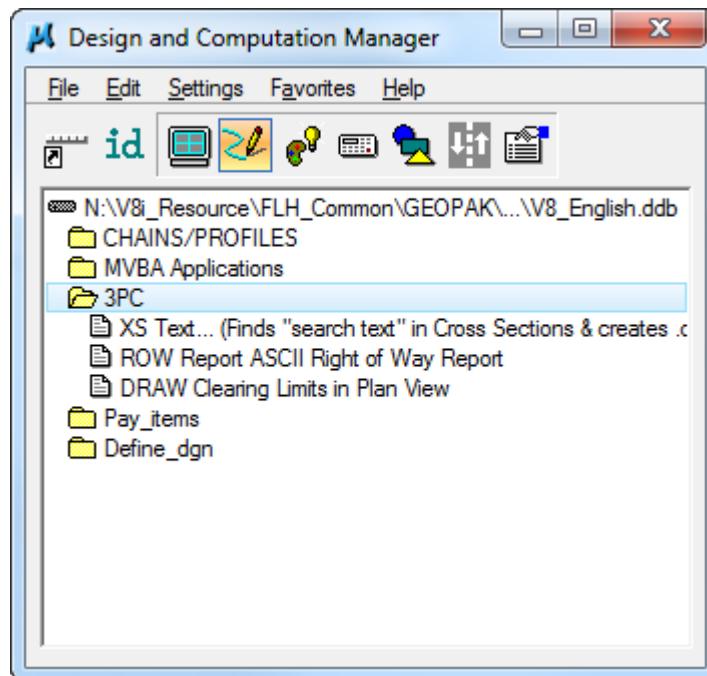Several 3PC applications can be launched through the D & C Manager.

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 ROW STAKING NOTES ..via 3PC

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.