

## FLUG - Fall 2007 *Traffic Plans Session*

### **INTRODUCTION**

The Pavement Marking Tools section introduces several applications that help the user in the creation of a Pavement Marking set of plans.

Drawing the Pavement Markings in accordance with FDOT CADD Standards. The Traffic Plans SiteMenu provides tools with the active settings (Level and Symbology) used to create the markings. There are additional tools available to help in the efficient placement of directional arrows and message cells: the Pavement Marking Toolbox, GEOPAK's Pavement Marking program and the GEOPAK Draw Cell group by Feature tool.

Refer to chapter 23 in the *Plans Preparation Manual*, Volume II, for more detail on developing the Signing and Marking set of plans. Refer to the Design Standards indexes for design criteria.

The Labeling of the plan sheet items has been made easier with the use of GEOPAK's Plan Labeler, which allows you to create styles for the placement of repetitive labels.

To assure that you are adhering to the *Traffic Plans CADD Standards*, the Traffic Plans SiteMenu provides an easy way to check and fix symbology to match the CADD standards.

After the proposed Pavement Markings have been drawn, you are ready to clip the sheets. To aid in this task, you have two options available, the Traffic Plans SiteMenu Clipping program, commonly known as the FDOT clipping, and the GEOPAK's Sheet Clipping program.

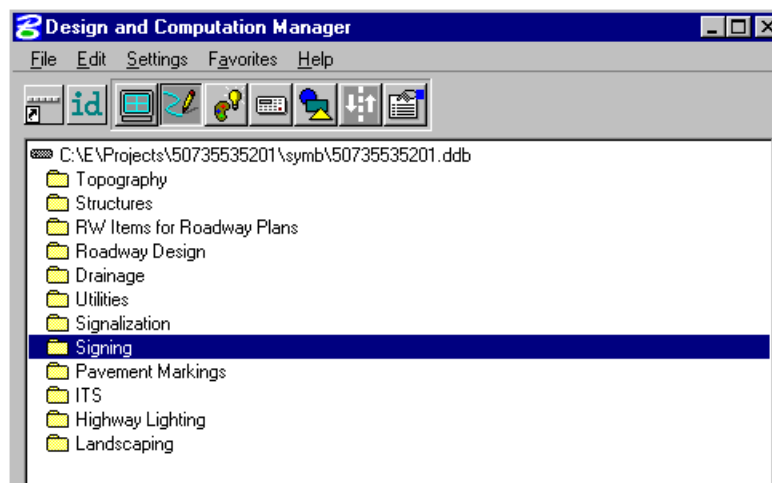
Finally, you must compute the pay items used and populate the Tabulation of Quantities Sheet. GEOPAK's Design and Computation Manager can count and report every "each" and "linear" item. Design and Computation Manager generates a report that can be polished in Microsoft Excel, which can then be imported into the MicroStation Tabulation of Quantities design file.

## EXPLORING DESIGN AND COMPUTATION MANAGER

The Design and Computation Manager or D&C Manager uses a proprietary database that is provided by FDOT. When the FDOT2004 software is installed the Design and Computation Manager database (DDB) is placed either on your server or on your local hard drive. It is recommended that you copy the DDB file from the FDOT2004 folder into your project SYMB folder and rename it to the eleven digit FIN number, example: the **fdot2007.ddb** would be renamed to **50735535201.ddb**. This allows you to modify the database for specific parameters, and protect it from being overwritten by any future maintenance updates. The FDOT **.ddb** file is in the **\FDOT2004\geopak\databases\** folder and is named **fdot2007.ddb**.

When D&C Manager is opened during a design session it should not be closed, just minimize the dialog. This tool loads slowly because of the number of items in the database.

It is highly recommended that every user that works on projects becomes very familiar with D&C Manager. D&C Manager should be the standard tool used by everyone whether they are drawing simple lines or designing major interchanges. Many other applications and processes rely on the features that D&C places on elements, if these features are not found then drawing cross sections, for example, would be nearly impossible.



This database has been set up specifically by FDOT to create elements with the correct level symbology according to FDOT CADD Standards. The **.ddb** file is set up with discipline folders called categories. Inside of each category are items.

- Categories - The basic component of the hierarchical tree is the Category, which is represented by a folder icon. The **fdot2007.ddb** database categories are divided by discipline. The figure above shows the Categories with a description relative to their discipline. Inside these Categories you have either subcategories or items. Items are represented by one of three icons as described below.

## FLUG - Fall 2007 *Traffic Plans Session*

- Items - The other database component is the item. An item could be a drafting item, a compute item or a default item. Items contain specific functions related to defined element symbology or quantity calculations. Items are represented by one of three icons:



**Default Icon** - These items are used to set drafting standards for MicroStation commands or to draw COGO elements without annotation. In many cases this is a 3PC routine.



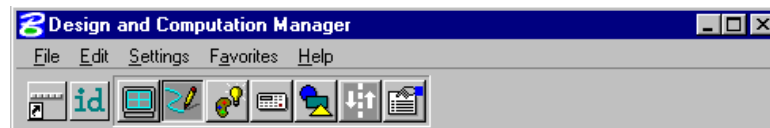
**Drafting Standards Icon** - These items are used to set drafting standards for MicroStation commands or to draw COGO elements with annotation.



**Calculator Icon** - These items are used to set drafting standards for MicroStation commands or to draw COGO elements. The graphics can be tagged with a pay item attribute for additional stratification of features when running computations. Computation parameters are defined for these items.

### DESIGN AND COMPUTATION MANAGER MENU BUTTONS

Design and Computation Manager has a toolbar to quickly access different modes. The function of each button is summarized below. The tools used to create pavement marking plans will be covered in more detail later in this chapter.



- Switch To Toolbox Mode. D&C Manager is set up to work in two different modes, as a dialog box or a toolbox. This button activates the toolbox mode. This toolbox can be resized and docked. To change the display back to the whole dialog box, click the Switch to Dialog Mode button. The Place Influence check box is at the left end of the toolbox.



- Identify Item. The **Identify Item** button is used to set the D&C Manager item to match a selected MicroStation element previously drawn by the D&C Manager or elements drawn with Graphical COGO and the SMD file. If the item you ID does not match an item in the active database, a message appears in the status bar saying: **No matching database item**. This is a very useful tool for new users learning the hierarchy of the database.



- Display. The **Display** button filters the display of MicroStation elements in the design file so only the selected features are displayed, highlighted or hidden. This button expands Design and Computation

## FLUG - Fall 2007 *Traffic Plans Session*

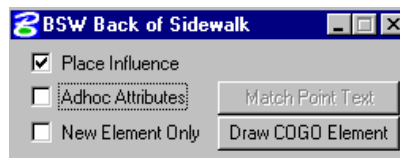
Manager to show a collection bin. This collection bin is for controlling the display of multiple items at one time. To add items to the collection bin, double-click the item. This tool also opens a second tool box with four buttons as seen in the figure below.



From left to right the buttons are: **Normal Display**, **Highlight Selection**, **Hide Selection** and **Display Only Selection**. We will cover all of these in the exercises.



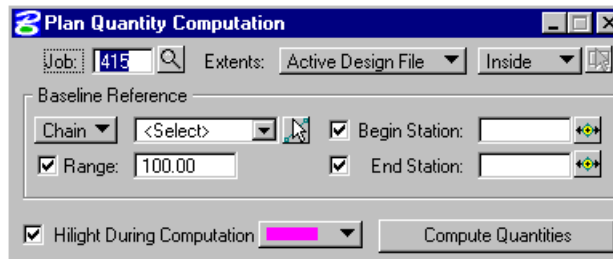
- Design. The **Design** button is used to plot COGO and MicroStation elements into MicroStation with the defined symbology by use of Draw Plan and Profile dialog or in conjunction with MicroStation commands when **Place Influence** is toggled on.



- Set. The Set button is used to set the symbology of previously drawn MicroStation graphic elements in accordance with the parameters of a selected item in the database. This is the tool you use if an element needs to be fixed to meet CADD standards.



- Compute. The Compute button is used for tabulating quantities of items that have been placed as a Pay Item by use of the Design or Set mode or have been drawn in MicroStation and they match the search criteria of the ddb file. This tool also expands D&C Manager to show the collection bin; this allows you to process multiple pay items at one time. A second toolbox containing the computation results is also opened. Computing is covered later in this course.



## FLUG - Fall 2007 *Traffic Plans Session*



- Shapes. The Shapes button uses plan view MicroStation graphics that defines an enclosed area to create a filled shape for computing area quantities. This tool will not be used in the creation of Pavement Marking Plans. However, this tool could be used to calculate Island Nose paint.



- Pavement Marking. This mode provides additional options for placing pavement striping and markings. This tool adds four additional tools to D&C Manager as shown in the figure below.



The four tools from left to right are:

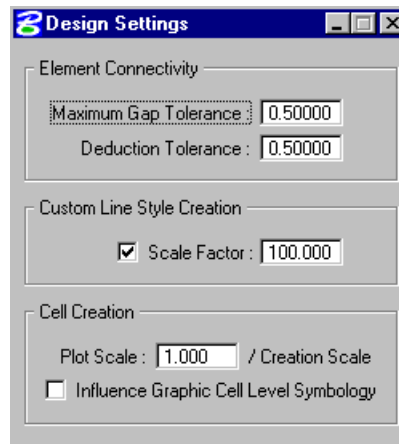
- Striping
- Separation
- Chevron Diverge
- Chevron Merge



- Preference. This expands the toolbar to include four additional buttons to configure D&C Manager. These tools are also accessible from the **Edit** menu.

### DESIGN SETTINGS

There are some settings that need to be addressed before using D&C Manager to draw or compute items. These are the Design Settings loaded from the **Settings > Design** menu in D&C Manager.



**Maximum GAP Tolerance** – If the distance between two specified elements in a MicroStation file is smaller than the **Max Gap Tolerance**, the software assumes the two elements intersect and act

## FLUG - Fall 2007 *Traffic Plans Session*

accordingly. If the distance is larger than the **Max Gap Tolerance**, GEOPAK assumes the two elements do not connect.

**Deduction tolerance** – The **Deduction Tolerance** is utilized in the Compute mode. For example, if the pay item is specified for a curb line, and for each manhole (drawn in as a cell), there is a deduction of six feet. The origin of the cell does not have to be on the curb line, but must be within the deduction tolerance in order for the cell to be recognized and the deduction to be made.

**Custom Line Style Creation** – The Custom Line Style **Scale Factor** utilized during the Draw Plan & Profile dialog. Note this scale is only for custom line styles. Text and other labeling are controlled by the Label Scale on the Draw Plan & Profile dialog.

**Cell Creation – Plot Scale** is utilized as a ratio with the Creation Scale within the setup of D&C Manager. If the Cell Creation Scale is 10 and the designer wants the cell twice as large as a cell placed with D&C Manager, utilize 20 as the Drawing Scale.

If a drawing scale is entered all subsequent cells that are placed from the D&C Manager are scaled accordingly if the item is set to use creation scale. When the user places a cell with place influence on, GEOPAK utilizes the drawing scale setting to compute an X & Y scale for use in the MicroStation place cell dialog. Why do this? Otherwise, the user has to key- the X & Y scale in the place cell dialog whenever you change the item to be placed in D&C Manager. This also allows you to use a metric ddb with English cells by using a different creation scale.

**Influence Graphic Cell Level Symbolology** – When active, GEOPAK utilizes the symbolology within the D&C Manager, ignoring the element symbolology defined in the cell.

### **DESIGN MODE**

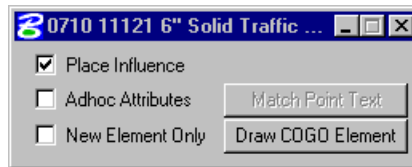
**Design Mode** is the default mode when the D&C Manager is opened. **Design Mode** is used for the following functions:

- Set Drafting Standards by use of the **Place Influence** command for the placement of MicroStation elements using MicroStation commands.
- Plot COGO elements into the design file according to the drafting standards set by the item's defined parameters.
- Place Adhoc Attributes on an element.

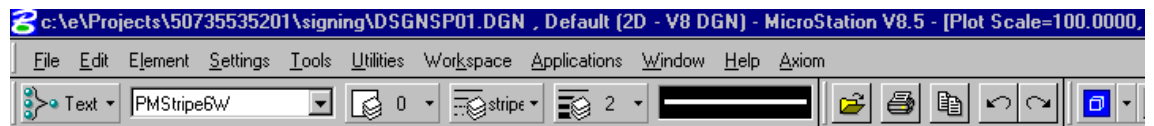
Whether an item is placed in the file by generic MicroStation commands or plotted from the COGO database, the items can be placed as pay items for future tabulation. The following sections will detail the procedure to set drafting standards for MicroStation commands and for the plotting of COGO elements.

## FLUG - Fall 2007 *Traffic Plans Session*

By selecting **Place Influence**, you can use MicroStation commands to place elements utilizing the element attributes established for the currently selected item in the GEOPAK D&C Manager database. With some items, a GEOPAK attribute is placed with the element for calculating quantities.



When **Place influence** is selected the MicroStation level symbology is set. Any MicroStation command to draw a line, copy a line or place a cell is set to this symbology.



When the user is finished placing the elements for a selected item it is important to remember to turn off **Place Influence**.

It cannot be stressed enough how important it is that all users working on projects become familiar with D&C Manager and use this tool for everything they do. D&C Manager should be the first tool opened when MicroStation is started and the last tool closed when the work day is done.

### **ADHOC ATTRIBUTES**

An Adhoc Attribute is additional information about a particular element. Look at it as just another property for the MicroStation element. Example, a line has this fundamental data associated to it:

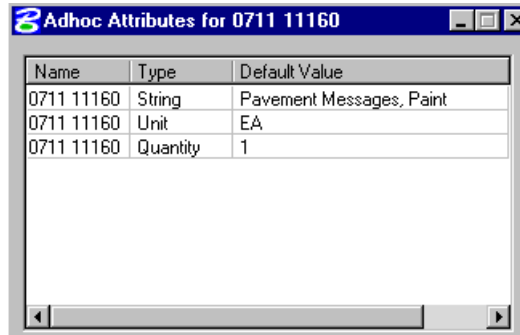
- Level
- Color
- Weight
- Style

By placing an Adhoc on the line you are giving that line additional information. That information could be a chain name, cross slope, profile name, thickness, etc. It is almost limitless as to what can be associated to an element with Adhocs. These Adhocs can be used by other applications down stream to generate quantities, draw cross sections or many other tasks.

Some Adhocs are placed in the background and the user has no interaction with them for, example when a pavement message is placed with D&C Manager there is an AdHoc placed on the pavement message for computing quantities.

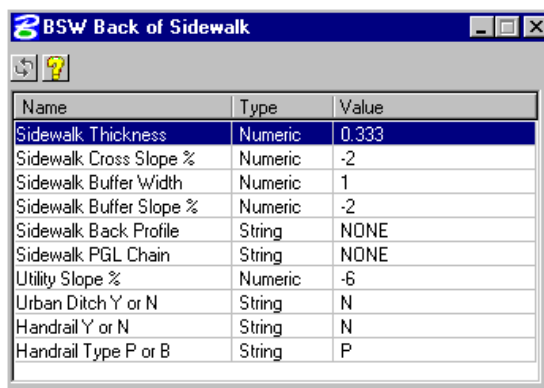
The figure below shows the Adhocs that are associated to an item from D&C Manager. These Adhocs are part of the item and are set by default. The user would never know these were set.

## FLUG - Fall 2007 *Traffic Plans Session*



Name	Type	Default Value
0711 11160	String	Pavement Messages, Paint
0711 11160	Unit	EA
0711 11160	Quantity	1

Other Adhocs are interactive meaning the user must fill in the parameters, an example of this would be when placing the back of sidewalk. There are several pieces of additional information that the user can add to the sidewalk line. This information is then used to draw the sidewalk in the cross sections.



Name	Type	Value
Sidewalk Thickness	Numeric	0.333
Sidewalk Cross Slope %	Numeric	-2
Sidewalk Buffer Width	Numeric	1
Sidewalk Buffer Slope %	Numeric	-2
Sidewalk Back Profile	String	NONE
Sidewalk PGL Chain	String	NONE
Utility Slope %	Numeric	-6
Urban Ditch Y or N	String	N
Handrail Y or N	String	N
Handrail Type P or B	String	P

AdHoc Attributes are comprised of three types of information that must be defined:

1. Name
2. Type
3. Value

The **Name** is an identifying term used when GEOPAK is searching for a specific Adhoc Attribute.

The **Type** identifies the nature of the information, and can be set to various options: Numeric, String, Unit, Quantity, and Remarks.

The **Value** is the actual information to be used by GEOPAK, and is determined by the Type. For example, if the Type is set to Numeric then the Value must be a number.

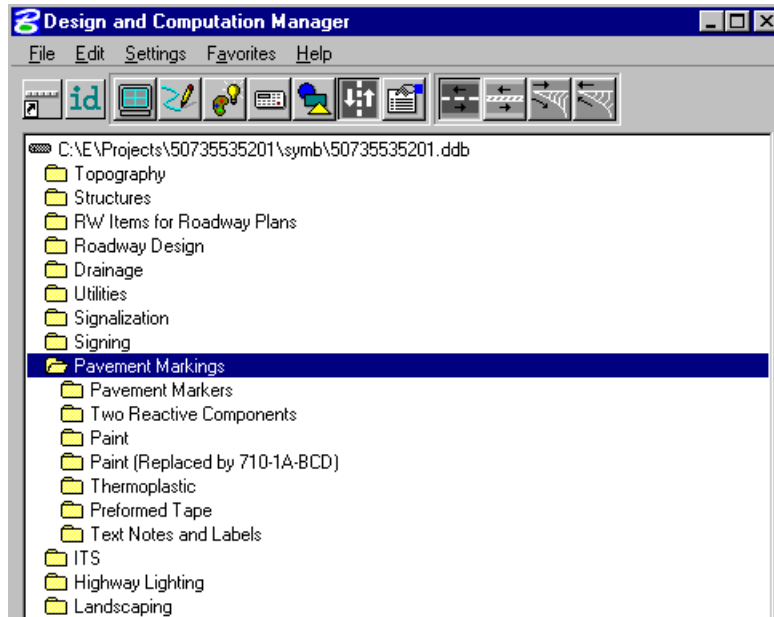
### **DRAWING PAVEMENT MARKINGS**

Many of the Traffic Plan items are simple cells or line styles that can be drawn and quantified using the D&C Manager. The Pavement Striping component of the D&C Manager facilitates the production of pavement striping plans as well as automates the quantities process. To draw pavement markings with the GEOPAK's Pavement Marking program, select the pay item then click on the **Pavement Marking**

## FLUG - Fall 2007 *Traffic Plans Session*

button from the D&C Manager dialog box. After selecting the **Pavement Marking** button, D&C Manager displays additional **Pavement Marking** options.

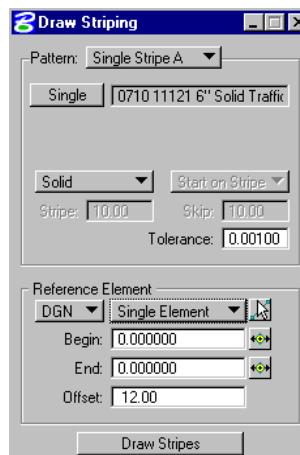
**Hint** As a best practice you should start the pavement marking design by placing one of the solid edge lines and build from that. This gives you a solid starting point to create the entire remaining pavement marking lines parallel to.



As mentioned earlier in this chapter, there are four additional tools in D&C Manager to aid in the design and layout of pavement marking.

### **DRAW STRIPING**

The Striping tool is the heart of this section in this training manual and will be the single most important tool used in the production of pavement marking plans. This is the tool used to draw all solid or skip pavement markings. The striping tool can reference a GEOPAK chain or an existing MicroStation linear element for length and offsets. The MicroStation elements can be in the active file or in a reference file.

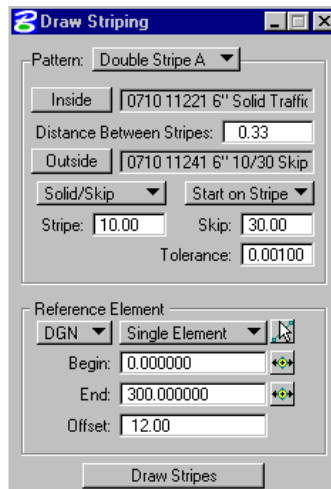


## FLUG - Fall 2007 *Traffic Plans Session*

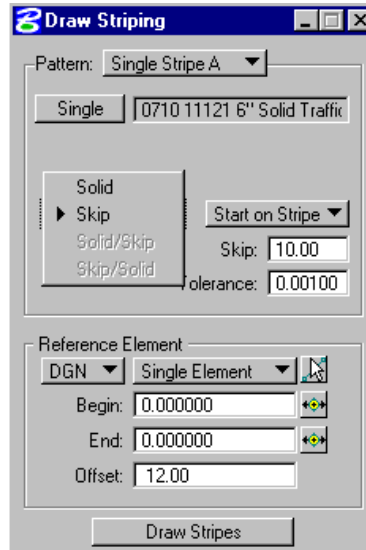
The Draw Striping tool is broken into two parts, Pattern and Reference Element, with several preferences for the user to set in each of the two parts. The following pages detail the **Draw Striping** tool.

**PATTERN** – The options are **Single Stripe** or **Double stripes**.

**Single Stripe A** or **Single Stripe B** options allow two different configurations to be stored in a resource file so the user can change the type of stripe being placed very easily. It is basically a way to set favorites, example; the user could set **Single Stripe A** to 6" solid white and set **Single Stripe B** to 6" solid yellow. To draw a 6" solid white line set the pattern to **Single Stripe A** or to draw a 6" solid yellow line set the pattern to **Single Stripe B**. In the case of **Double Stripe**, there are four possible configurations. **Double Stripe A, B, C** and **D**. The figure below shows the **Double Stripe A** Pattern, the example here is set up to draw a 6" solid yellow line on the Inside and a 6" 10/30 Skip line on the Outside with a 0.33' or 4" Distance Between Stripes.

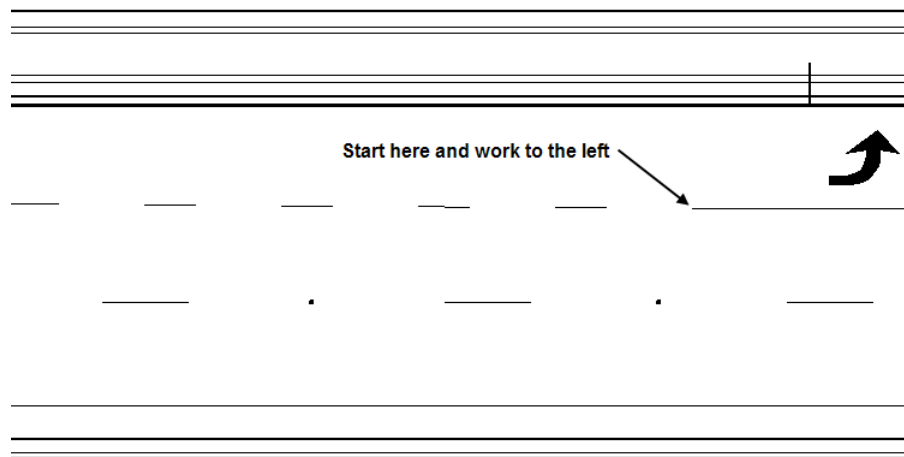


Below the **displayed item selection** is the **Skip/Solid** option. This defines whether to start on a stripe or a skip and the length parameters for both.

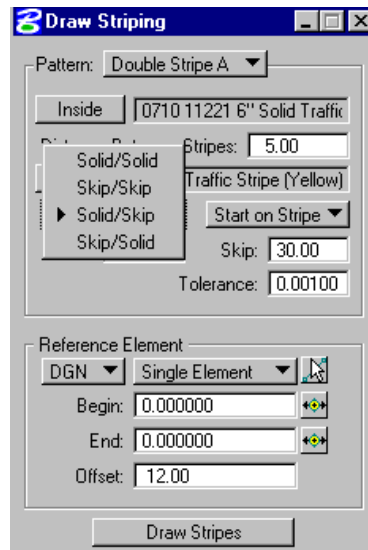


If **Single Stripe A** is selected there are two options for drawing the line, **Solid** or **Skip** as shown in the figure above. If the **Solid** option is selected the Stripe Length and Skip Length are not utilized. If **Skip** is selected then the Stripe Length and Skip Length must be defined.

**Note** When drawing skip lines it is easier to get the spacing correct by using the end point of the solid line that approaches the stop bar, starting on skip and placing the strip in reverse of the driving direction. The figure below shows this scenario.



If **Double Stripe A** is selected there are four options for drawing the lines, **Solid/Solid**, **Skip/Skip**, **Solid/Skip** and **Skip/Solid** as shown in the figure below. These four options work in conjunction with the **Inside** and **Outside** pay item options. If either of the Pay Item Specifications has one of the key words, "solid" or "skip", as part of the D&C Item the **Skip/Solid** option will be set to the appropriate option.



**Distance Between Stripes** – Simply put, it is the space between two striping lines. This distance is expressed in terms of master units. There will be times when you will need to use a larger distance between lines than what the design standards call for. Example, if the signing and marking plans are at 100 scale a 4” separation between two 6” lines would not be enough, the two lines would look like one thick line.

**Tolerance** – If the length of a segment of pavement marking is less than the **Tolerance**, the line will not be placed. It will only be utilized at the ending point, to determine where the final piece of marking is placed.

**REFERENCE ELEMENT** – The striping tool uses this as a reference for creating parallel lines and arcs. The options are, **DGN** or **Chain**.

**DGN** – This can be any MicroStation element like the edge of pavement line or another striping line.

When **DGN** is selected there are three options to choose when picking a MicroStation element:

**Single Element** – When selected, use the Identify DGN Element button to pick the element. The stationing begins at 0.00 and the end is based on the length of the element selected.

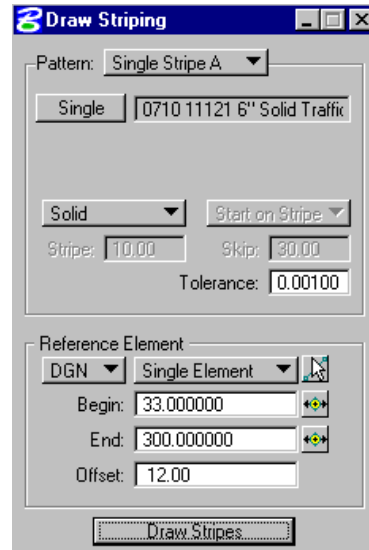
**Complex Chain** – Select the option, which invokes the MicroStation Create Automatic Complex chain tool to define the elements. Stationing begins at 0.00 and is based on the length of the selected element. This option does not work with elements in a reference file.

**Selection Set** – This option works with elements in the active file or in a reference file. Create the selection set, and then set the toggle to **Selection Set**. Click **Accept Selection Set** which computes the stationing for the selection set. MicroStation’s **PowerSelector** works very well for creating the selection set.

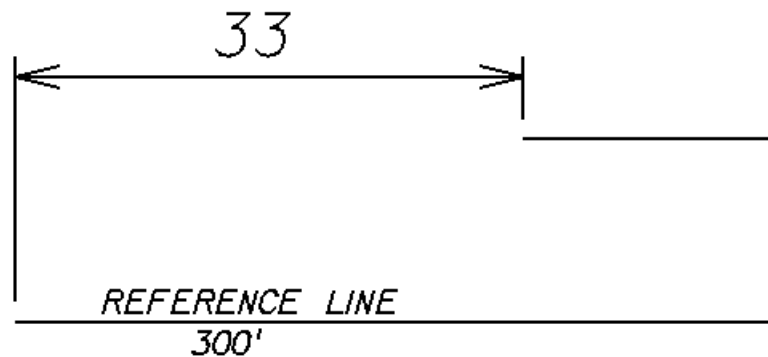
## FLUG - Fall 2007 *Traffic Plans Session*

**Chain** – This is a GEOPAK chain stored in the GPK. Select the chain from the list or graphically with Identify Chain. Stationing fields are automatically populated. The values may be changed manually or graphically using the Beg and End buttons.

**Begin** – Identifies the beginning of the striping. If using **DGN** element, this field will start at a value of 0.00 or the value of the length of the line selected depending on how the element was created. The user can enter a value in the field to start the striping at a point other than the beginning of the line. If **Station** is used the begin station of the chain will the value.



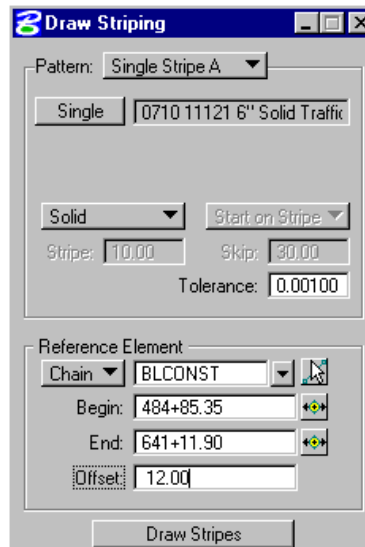
The figure below shows the reference line used which is 300' long and also the new line created 33' to the right of the beginning point. The reference line is just that, a reference, it does not have to control the length of the new striping line created.



**End** – Identifies the end of the striping. If using **DGN** element, this field will start at a value equal to the length of the line or 0.00 depending on how the element was created. The user can enter a value in the field to end the striping at a point other than the end of the line. If **Station** is used the end station of the chain will the value.

## FLUG - Fall 2007 *Traffic Plans Session*

The figure below shows the Chain option. Notice the **Begin** and **End** values are populated with the beginning and ending station values of the selected chain.



**Offset** – This is the offset from the selected element, either the **Chain** or **DGN** element, to the new striping line. It is not necessary to use plus or minus values, as the user graphically indicates the side by moving the cursor to the left or right.

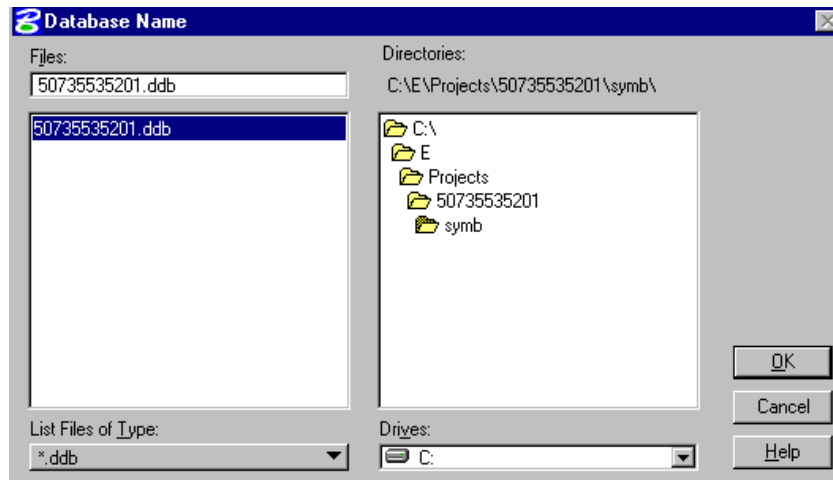
**Draw Stripes** – This attaches the new striping to the cursor at the defined offset. The user can move the striping to the desired side of the **DGN** or **Chain**. Issuing a data point places the new striping in the design file. The new striping elements are placed in a graphic group for easy deletion.

### LAB EXERCISE: PLACING SOLID WHITE STRIPING

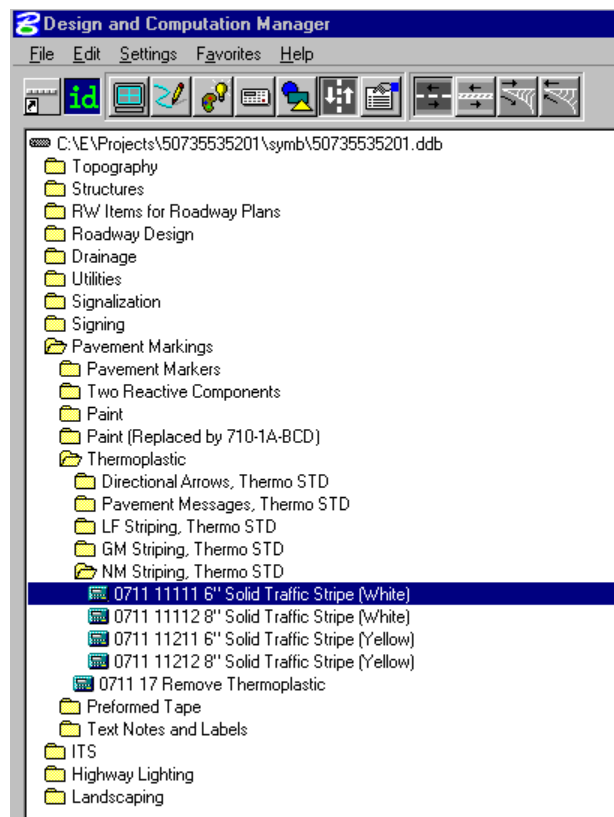
In this exercise **D&C Manager** will be used to draw the solid pavement markings. The process will start by placing the outside edge lines using the Baseline of Construction as the reference element then the inside edge lines. Thermoplastic items will be used in this exercise.

1. Open **Dsgnsp01.dgn**. This is the main design file for all signing and pavement marking elements.
2. From the Road toolbox, open **D&C Manger**. Next open the project ddb file.
3. From **D&C manager** select **File > Open**.
4. Navigate to the **symp** folder. This is where you should copy and rename the **FDOT2007.ddb**.
5. Select **50735535201.ddb** and click **OK**. It takes several seconds to load, be patient.

## FLUG - Fall 2007 *Traffic Plans Session*



6. Zoom to near **STA. 525+00**. This is basically where the edge lines will start.
7. From **D&C Manager** click the **Pavement Marking** button. This activates four additional pavement marking tools.
8. From **D&C Manager** navigate to the **Pavement Markings > Thermoplastic > NM Striping, Thermo STD** category.  
*Hint* From the Edit menu in D&C Manager there is a search tool to aid in finding a category or item within D&C Manager. To launch the search tool select **Edit > Find**.
9. Select the Item **0711 11111 6" Solid Traffic Stripe (White)**.

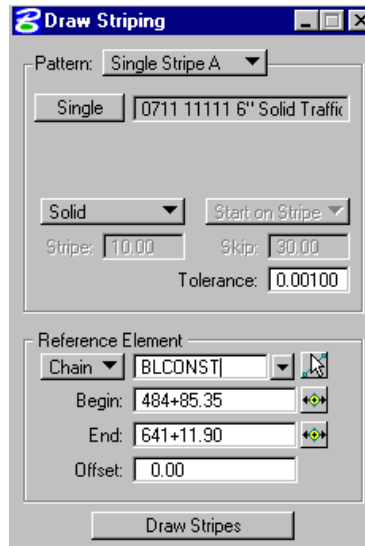


## FLUG - Fall 2007 *Traffic Plans Session*

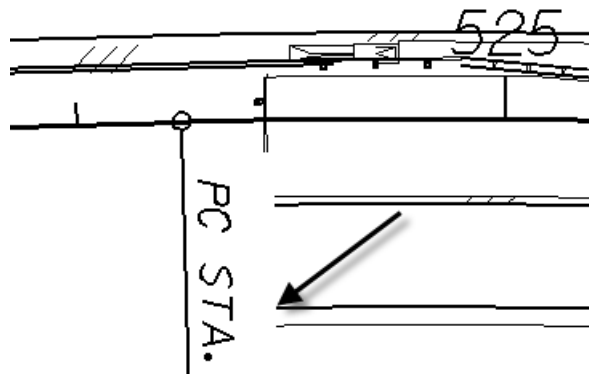
10. From **D&C Manager** click on the **Striping** button. This opens the **Draw Striping** tool.
11. Set the **Pattern** to **Single Stripe A**. Because the item was selected before starting this tool, the Single field is populated with the correct item.

**Note** It is not necessary to close the Draw Striping tool to select a different item, go back to D&C Manager and select a new item then click the Single button to make it active or double click on the new item in D&C Manager.

12. The type of line should be set to **Solid**. This is automatically set to solid because the item In **D&C Manager** was created with the key word **Solid** in the description.
13. Set the **Reference Element** to **Chain**.
14. From the drop down list select **BLCONST**. Selecting the chain will populate the Begin and End station values.



15. For the **Begin** station click on the VCR button **Begin Station** to the right of the station field.
16. Snap to the end of the edge of pavement line as shown in the figure below. This will populate the station with the value calculated from the chain.



17. For the **End** station key in **592+69**.
18. Set the **Offset** to **44.00**. It is not necessary to use a plus or minus with this tool.
19. Click the **Draw Stripes** button.

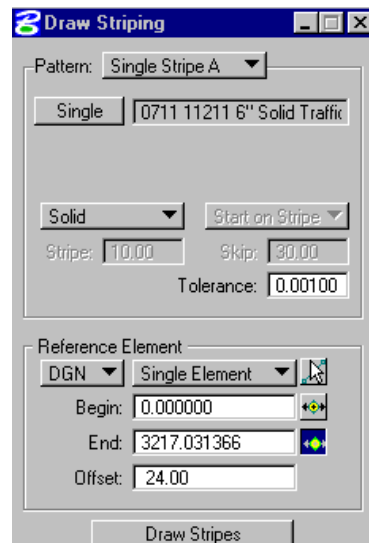
## FLUG - Fall 2007 *Traffic Plans Session*

20. Move your cursor to the right side of the Baseline and issue a **data point**.
21. Right mouse click to stop the command. Do not close the Draw Striping dialog.

### LAB EXERCISE: PLACING SOLID YELLOW STRIPING (PART 1)

In this part of the exercise you will draw the solid yellow edge line using the previously drawn white edge line as the reference element.

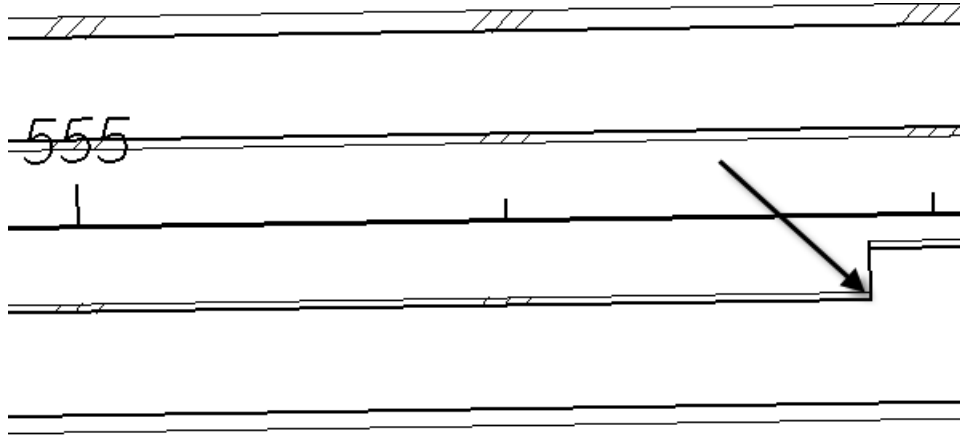
1. Continuing in **Dsgnsp01.dgn** select the **D&C Manger** item to **0711 11211 6" Solid Traffic Stripe (Yellow)**.
2. Leave the **Pattern** on **Single Stripe A**.
3. On the **Draw Striping** dialog box click the **Single** button. This will change the item to the 6" solid Yellow item.
4. For the **Reference Element** change the option to **DGN**.
5. Set the type of element to **Single Element**. The options are Single Element, Complex Chain or Selection Set.
6. Click the **Identify DGN Element** button.
7. Pick the previously drawn 6" White Edge Line and issue a data point to accept it.



The **Begin** field will be populated with 0.00 and the **End** will be the length of the element selected, this may need to be adjusted based on turn lanes and median openings. In this example there is a left turn lane that needs to be accounted for.

## FLUG - Fall 2007 *Traffic Plans Session*

8. **Zoom** to near station **556+85**. There is a left turn lane that we need to use for the end point, the figure below shows the location.



9. Click on the **End Distance** button and **Snap** to the beginning of the turn lane as seen in the figure above. This will adjust the End Distance.
10. Set the **Offset** to **24**. This is the roadway width based on the typical section.
11. Click the **Draw Stripes** button.
12. Move your cursor to the left side of the previously selected edge line and issue a **data point**.
13. Right mouse click to stop the command.
14. Open the **Reference** palette and turn off **Dsgnrd01**. This will better show the lines just drawn.

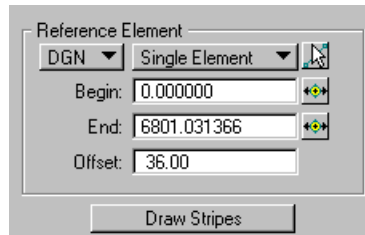
### **LAB EXERCISE: PLACING SOLID YELLOW STRIPING (PART 2)**

In this exercise the user will draw a 50' taper using a 6" solid yellow line. This taper occurs at a median opening where there is a left turn lane. Later in this chapter you will place turn arrows in this left turn lane.

1. Continuing in **Dsgnsp01.dgn** zoom to near **Sta. 557+00**. This is approximately where the turn lane starts.
2. Turn the **Dsgnrd01** reference file on.
3. Make sure item **0711 11211 6" Solid Traffic Stripe (Yellow)** is still selected.  
Next you will draw the yellow edge line starting 50' from the beginning of the turn lane up to the PC of the median nose. You will use the white edge line as the reference element and adjust the begin and end lengths using the Begin and End distance buttons on the Draw Striping tool along with AccuDraw. The alternative would be that you would have to draw construction lines that you would later have to delete.
4. On the **Draw Striping** tool click the **Identify DGN Element** button.
5. Pick the previously drawn 6" White Edge Line and issue a data point to accept it.

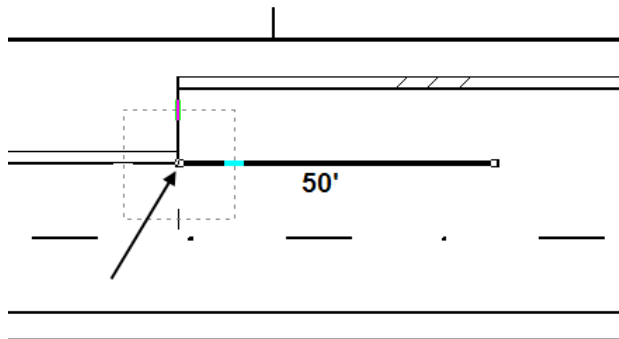
## FLUG - Fall 2007 *Traffic Plans Session*

The **Begin** distance will set to 0.0 and the **End** will be set to the length of the element selected.

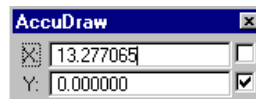


Next we will use **AccuDraw** and the **Draw Striping** tool to set the **Begin** distance **50'** to the right of the beginning of the turn lane.

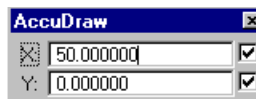
6. Activate **AccuDraw**.
7. Click the **Begin Distance** button and snap to the end point of the line at the beginning of the turn lane.



8. Push the letter **O** on the keyboard. This will move the **AccuDraw** compass to the location you just snapped to as shown in the figure above.
9. Move the cursor to the **right** and push the **Enter** key. This locks the **AccuDraw** origin.



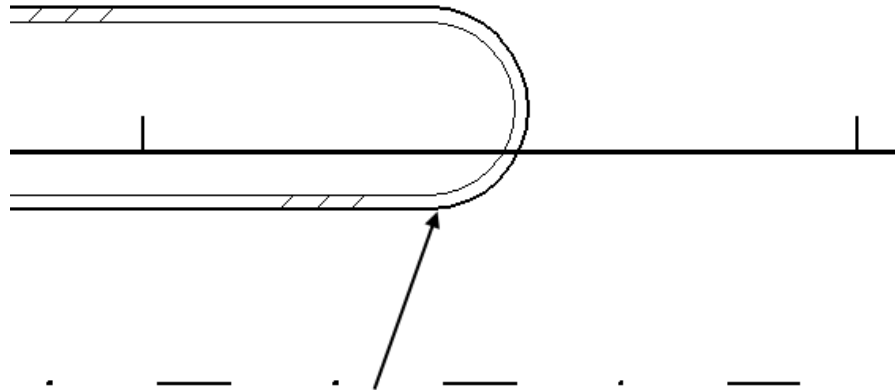
10. Key in **50**. This will set the **X** value to **50** in the **AccuDraw** dialog.  
As soon as you start entering a value the **X** origin will lock in as seen in the figure below.



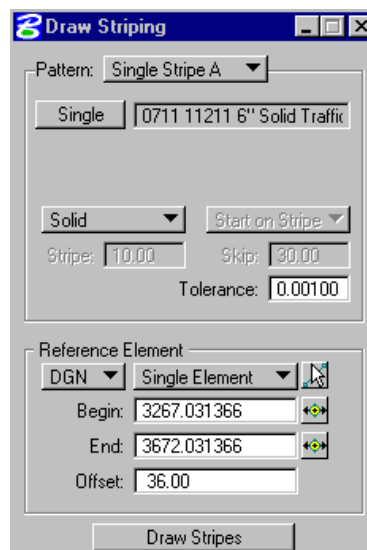
11. Issue a **Data Point** on the screen. This will move the **AccuDraw** compass over 50' and change the **Begin Distance** by 50' in the **Draw Striping** tool.
12. Zoom to the end of the turn lane.

## FLUG - Fall 2007 *Traffic Plans Session*

- Click the **End Distance** button and snap to the PC of the median nose.



- Set the **Offset** to **36.0**. This is the distance from the white edge line to the new inside yellow edge line.



- Click **Draw Stripes**.
- Move your cursor to the left side of the previously selected edge line and issue a **data point**.
- Reset** to cancel the command.

### LAB EXERCISE: PLACING SOLID YELLOW STRIPING (PART 3)

In this exercise you will draw the 6" yellow edge line representing the 50' taper from the begin turn lane to the end of the line placed in the previous exercise.

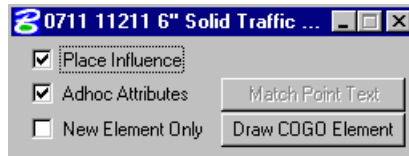
- Continuing in **Dsgnsp01.dgn** turn off the reference file **Dsgnrd01**. You need to be able to see the endpoints of the yellow edge lines.
- Zoom to the beginning of the turn lane.

## FLUG - Fall 2007 *Traffic Plans Session*

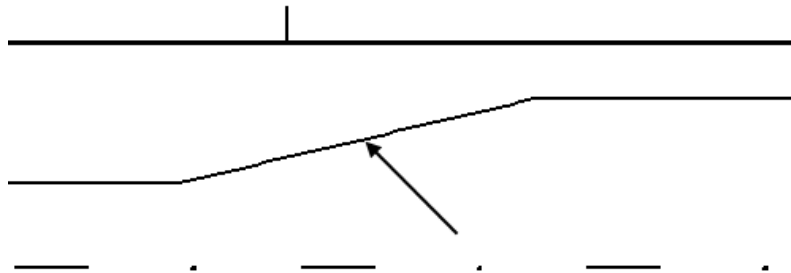
3. In **D&C Manger** click the **Design** button.



4. Make sure item **0711 11211 6" Solid Traffic Stripe (Yellow)** is still selected. It should be the current item as it was just used in the previous exercise.
5. Check on **Place Influence** and **AdHoc Attributes**.



6. Using MicroStation's **Place Line**, draw a line from end point to end point to finish the taper.

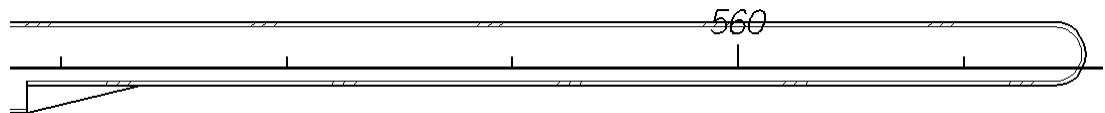


7. **Reset** to cancel the **Place Line** command.
8. Turn off **Place Influence**.
9. Turn on the reference file **Dsgnrd01**.

### LAB EXERCISE: PLACING SOLID WHITE TURN LANE STRIPE

In this exercise you will draw the 6" solid white line in the left turn lane. The user will use the yellow edge line placed in the previous exercise as the reference element. Refer to index 301 for turn lane design criteria and index 17346 for special markings in turn lanes.

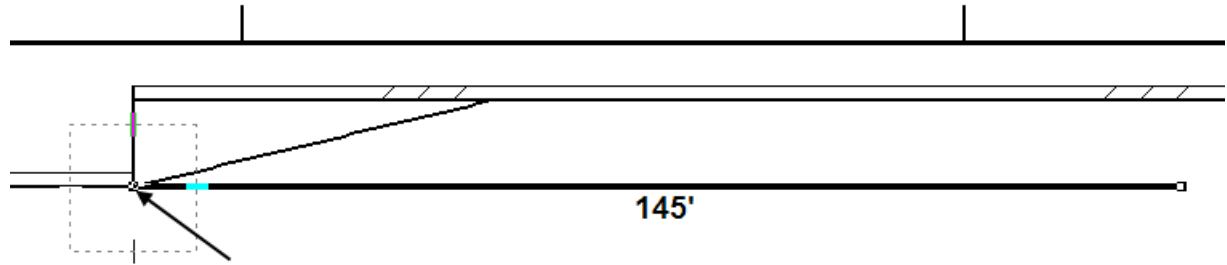
1. Continuing in **Dsgnsp01.dgn** zoom so you can see the entire turn lane.



2. In D&C Manager select Item **0711 11111 6" Solid Traffic Stripe (White)**.
3. If you closed the **draw Striping** tool, open it again.
4. Set the **Pattern** to **Single Stripe B**.
5. Click the **Single** button. This will set the item from D&C Manager.
6. Set the **Reference Element** to **DGN** and **Single Element**.
7. Click the **Identify DGN Element** button.
8. Identify the 6" yellow edge line drawn earlier.
9. Click the **Begin Distance** button. Next you will use **AccuDraw** to set the **Begin** distance.

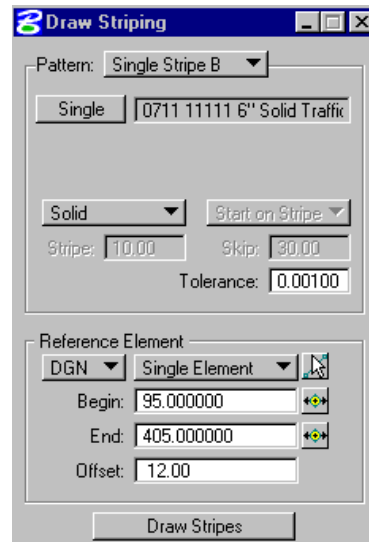
## FLUG - Fall 2007 *Traffic Plans Session*

10. Snap to the end point of the line at the beginning of the turn lane. This is where the 50' taper begins.



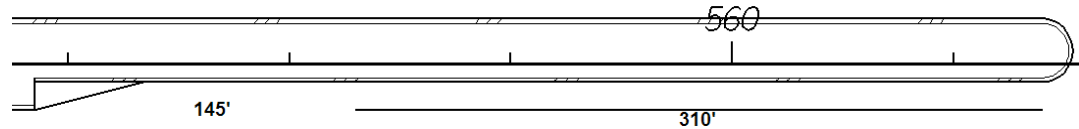
11. Push the letter **O** on the keyboard. This will move the **AccuDraw** compass to the location you just snapped to as shown in the figure above.
12. Move the cursor to the **right** and push the **Enter** key. This locks the **AccuDraw** origin.
13. Key in **145**. This will set the **X** value to **145** in the **AccuDraw** dialog.
14. Issue a **Data Point** on the screen. This will move the **AccuDraw** compass over 145'.

**Note** 145' is distance L1 from the table on index 17346 based on a 60 (mph) design speed. This gives you a 310' lane line. The length 310' is derived from L2 which is 260' plus the Queue length. The Queue length is based on the number of vehicles making the turning movement, this exercise uses a Queue length of 50'.



11. **End** distance, leave as is.
12. Set the **Offset** to **12.0**. This is the lane width.
13. Click **Draw Stripes**.
14. Move your cursor to the right side of the previously selected edge line and issue a **data point**.
15. **Reset** to cancel the command.
16. Take a moment to review the pavement markings.

The figure below shows the finished product, 145' Clearance Distance and 310' lane line.



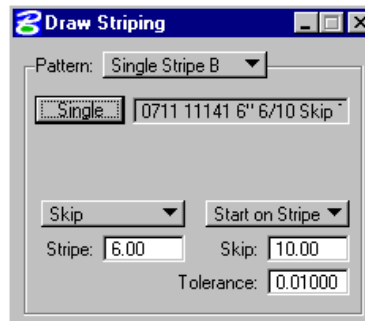
### LAB EXERCISE: PLACING 6/10 WHITE SKIP STRIPE

In this exercise you will complete the turn lane striping by placing a 6" white 6/10 skip line from the beginning of the turn lane to the 6" solid lane line. You will use the 6" white edge line as the reference element.

1. Continuing in **Dsgnsp01.dgn** zoom to the beginning of the turn lane.
2. In D&C Manager select Item **0711 11141 6" 6/10 Skip Traffic Stripe (White)**. This is located in the category **Pavement Markings > Thermoplastic > LF Striping, Thermo STD > Skip Traffic Stripe (White)**.
3. In the **Draw Striping** dialog set the **Pattern** to **Single Stripe B**.
4. Click the **Single** button. This sets the pay item and sets the line to **Skip**.
5. Set to **Start on Stripe**.

**Note** When starting a skip line from a solid lane line and using a dgn element the user would set this to start on skip.

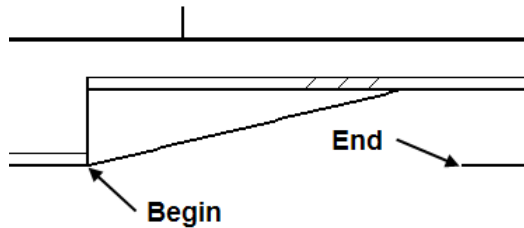
6. Set the **Stripe** length to **6.0** and the **Skip** length to **10.0**.



7. Set the **Reference Element** to **DGN** and **Single Element**.
8. Click the **Identify DGN Element** button.
9. Identify the outside 6" white edge line drawn earlier.

## FLUG - Fall 2007 *Traffic Plans Session*

- Click the **Begin Distance** button and snap to beginning of the turn lane as shown in the figure below.

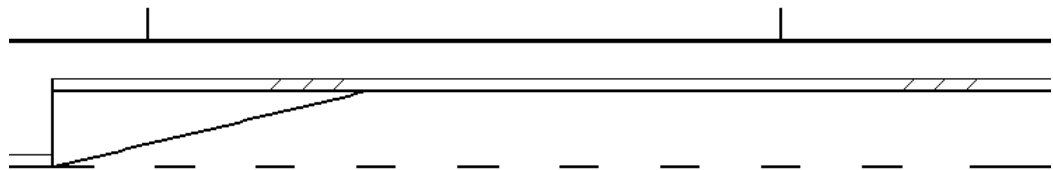


- Click the **End Distance** button and snap to the beginning of the turn lane as shown in the figure above.
- Set the **Offset** to 24.0.

Reference Element	
DGN	Single Element
Begin:	3217.031366
End:	3362.031366
Offset:	24.00
Draw Stripes	

- Click **Draw Stripes**.
  - Move your cursor to the left side of the previously selected edge line and issue a **data point**.
- Note** The user can adjust the begin and end points by using the vcr buttons to achieve the desired first stripe line.
- Reset** to cancel the command.

The figure below shows the finished skip stripes. Later in this chapter you will place left turn arrows in this turn lane.



**LAB EXERCISE: PLACING 10/30 SKIP STRIPING**

In this exercise the user will add the 10/30 Skip Striping between the two edge lines previously placed.

1. Continuing in **Dsgnsp01.dgn** in **D&C Manger** navigate to the **GM Striping** category and select item **0711 11131 6" 10/30 Skip Traffic Stripe (White)**.

**Note** GROSS MILE ITEMS: The gross mile quantity shall be used to pay for all 3/9 or 10/30 skip traffic stripes, as indicated in the plans. Measurement will be taken as the distance from the beginning of the first painted stripe to the end of the last painted stripe, and shall include the unpainted intervals, refer to the Basis of Estimates manual for more information.

2. On the **Draw Striping** dialog box set the **Pattern** to **Single Stripe B**.
3. On the **Draw Striping** dialog box click the **Single** button. This will change the item to the 6" 10/30 Skip Traffic Stripe.

Notice that the option for the type of line to draw switched to **Skip**; this is because the key word Skip is in the description of the item name in D&C Manager.

4. Set to **Start on Stripe**.
5. Set the **Stripe** length to **10.0**.
6. Set the **Skip** length to **30.0**.

Next you will need to set the Reference Element and Begin and End stations.

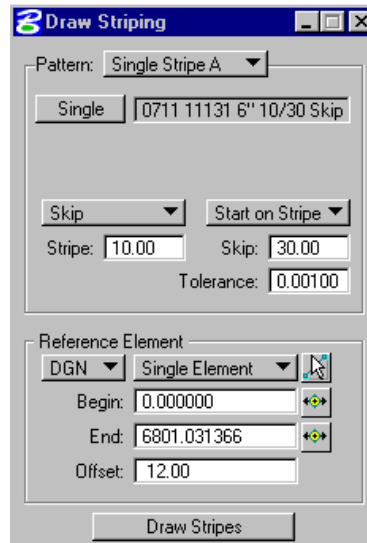
7. Set the **Reference Element** to **DGN**.
8. Set to **Single Element**.
9. Click on the **Identify DGN Element** button.
10. Pick the previously drawn 6" White Edge Line and issue a data point to accept it.

The Begin and End distances are set based on the length of the DGN element selected. These values can be adjusted with key-ins or by clicking on the Begin Distance or End Distance buttons to the right of the distance fields.

11. Leave the **Begin** and **End** distances as they are.

## FLUG - Fall 2007 *Traffic Plans Session*

12. Set the **Offset** to **12.0**.



13. Click the **Draw Stripes** button.
14. Move your cursor in between the edge lines and issue a **data point**.
15. Right mouse click to stop the command.
16. Take a moment to review the striping lines, turn the reference files off to better see the line work.

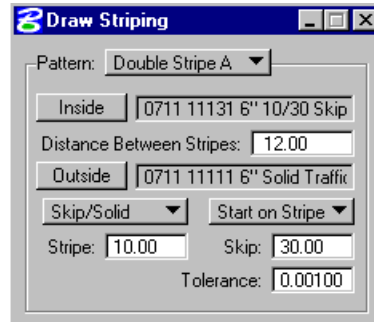
### **LAB EXERCISE: PLACING SOLID WHITE AND 10/30 SKIP STRIPING AT THE SAME TIME**

In this exercise you will use the **Double Stripe A** option on the **Draw Striping** tool to place a Solid White edge line and the White 10/30 skip line at the same time. This exercise will work on the left side of the Baseline.

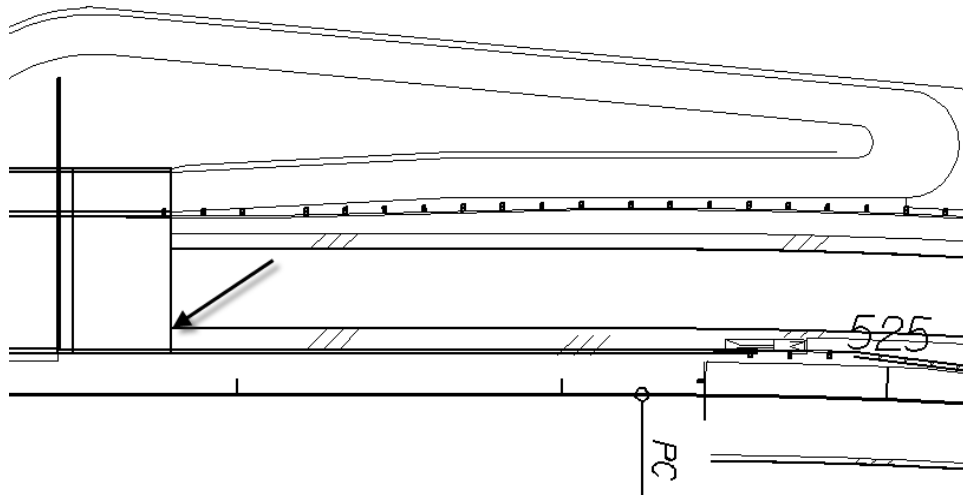
1. Continuing in **Dsgnsp01.dgn** zoom to near Sta **523+80**. You will be working on the left side of the Baseline.
2. Set the **Pattern** to **Double Stripe A**. This is in the **Draw Striping** tool.
3. In **D&C Manger** navigate to the **GM Striping** category and select item **0711 11131 6" 10/30 Skip Traffic Stripe (White)**.
4. On the **Draw Striping** tool click the **Inside** button. This will set the Pay Item for the inside line.
5. In **D&C Manager** navigate to the **NM Striping** category and select the Item **0711 11111 6" Solid Traffic Stripe (White)**.
6. Set the **Distance Between Stripes** to **12.00**.
7. On the **Draw Striping** tool click the **Outside** button. This will set the Pay Item for the outside line.
8. Set the option to **Skip/Solid**. Skip goes with the inside and Solid goes with the outside.

## FLUG - Fall 2007 *Traffic Plans Session*

- Set to **Start on Stripe**. This is a project specific setting not a default.



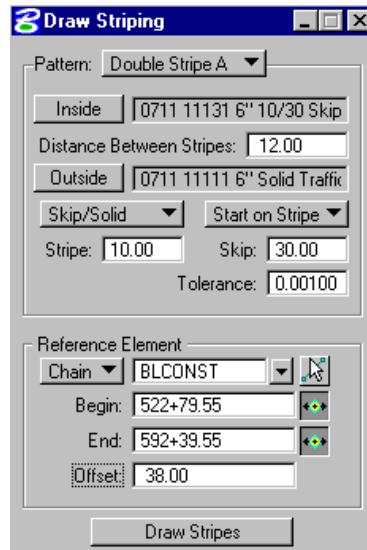
- Set the **Reference Element** to **Chain**.
- Click the **Begin Station** button.
- Snap to the end of the edge of pavement line as shown in the figure below. This will populate the station with the value calculated from the chain.



- For the **End Station** key in **592+39.55**.

## FLUG - Fall 2007 *Traffic Plans Session*

14. Set the **Offset** to **38.00**.



The **Offset** in this example is  $44' - 6' = 38'$  where  $44'$  is the distance from the BLCONST to the outside edge line and  $6'$  is half of the  $12'$  distance between stripes.

14. Click the **Draw Stripes** button.
15. Move your cursor in between the edge lines on the left side of the Baseline and issue a **data point**.
16. Right mouse click to stop the command.

### **LAB EXERCISE: PLACING SOLID YELLOW STRIPING (PART 4)**

In this exercise you will finish the left side of the Baseline with a single 6" solid yellow line.

1. Continuing in **Dsgnsp01.dgn** zoom to near Sta **523+80**.
2. On the **Draw Striping** tool set the **Pattern** to **Single Stripe A**. The pay item data should be set already. This was set for the first yellow stripe, **0711 11211 6" Solid Traffic Stripe (Yellow)**.
3. Set the **Reference Element** to **Chain**.
4. Select the chain **BLCONST**.
5. Snap to the same end of the edge of pavement line as in the last exercise. Sta **522+79.55**.
6. For the **End Station** key in **561+40.00**. This is at a median opening.
7. Set the **Offset** to **20.00**.
8. Click the **Draw Stripes** button.
9. Move your cursor to the left side of the Baseline and issue a **data point**.
10. Right mouse click to stop the command.
11. Take a moment to review the striping lines just draws. Turn the reference files off to better see the lines.

### DRAW CELL GROUP BY FEATURE

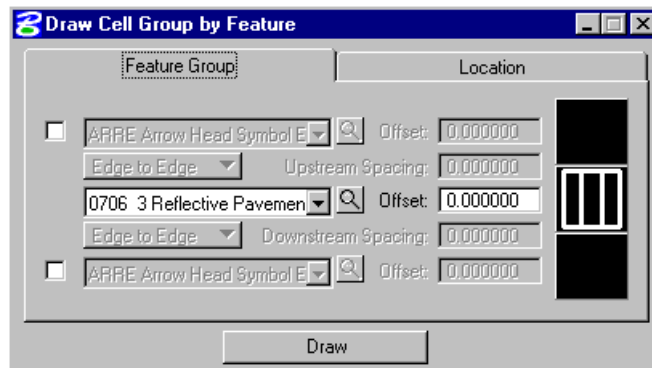
The **Draw Cell Group by Feature** tool can be used for placing Pavement Messages and Arrows, RPM's or any other cell you would like to group together. In this chapter the user will place RPM's and Turn Arrows. It is not required to use this tool when placing cells however this tool will make the task of drawing Arrows and RPM's much easier.

**Note** When using the Draw Cell Group by Feature and/or Draw Cell by Feature tools, always ensure to load the correct Geopak Database (\*.ddb) as the tool will 'reset' the Database to the \*.ddb specified in the resource file every time the tool is closed and reopened. This Geopak Database (\*.ddb) may not be the database intended for use with your active project.



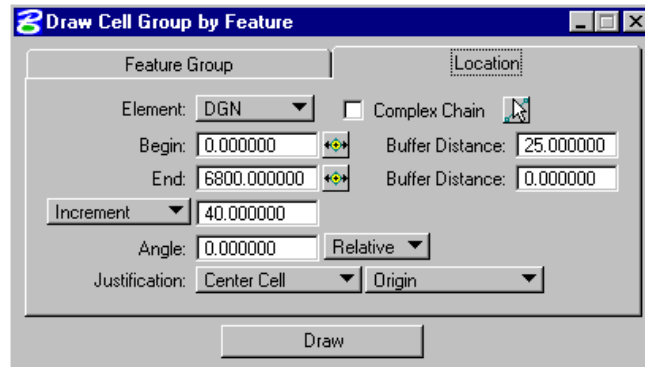
The dialog consists of two tabs:

- **Feature Group** – defines the D&C Manager item to use which in turn selects the cell to be placed and the Offset from the selected element to place the item.



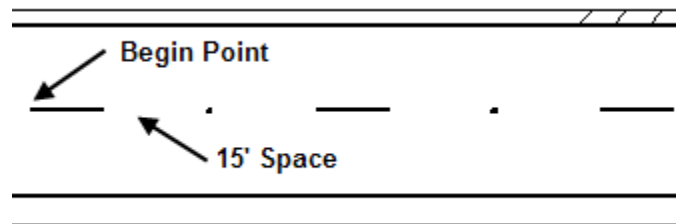
Based on the items that are checked you can place up to three different cells with this tool. The Magnifying glass next to each item allows the user to browse to D&C Manager and select the appropriate item which will attach the cell to be drawn. The Offset is the distance off of the selected DGN Element or Chain when drawing the cell.

- **Location** – defines whether you use a DGN element or Chain, Begin and End stations and Spacing.



**Element** – This is either a GEOPAK Chain or DGN element. This functions just like the Draw Striping tool. The Begin and End fields will be populated with the appropriate data based on the element selected. They can be modified using the buttons or by keying in the value.

**Buffer Distance** – This is for setting where to start the first cell and end the last cell. Example, placing RPM's on a 10/30 skip line, assuming you snapped to the beginning of the first painted stripe you would set the Begin Buffer Distance to 25.0. This accounts for the 10' stripe and 15' to get to between the first and second stripe, the figure below shows this.



**Spacing** – There are several options available to set the spacing between the cells, they are:

1. **Increment** – This is a set value between cells.
2. **Even** – Evenly spaces the cells at a user specified spacing, the buffer distances are ignored.
3. **Max Spacing** – The location of the beginning and ending cell are determined, than a sufficient number of cells are placed in between, so that the distance between them is no more than the specified Max Spacing.
4. **Once** – Only one set or cell is placed. The ending buffer distance is ghosted.
5. **Each Vertex** – The origin of the cell is placed at each vertex of the selected element. The Begin and End and buffer distances are ghosted.
6. **End Points** – The origin of the cell is placed at each end point of the selected element. The Begin and End and buffer distances are ghosted.

**Hint** When placing RPM's along a curved roadway this tool does not account for the curve geometry at an offset. The user will have to copy parallel one of the edge lines on top of the 10/30 skip line and use that line as the DGN element then delete the copied line. Using the Chain option does not work either; it must be an arc on top of the skip line.

## FLUG - Fall 2007 *Traffic Plans Session*

**Angle** – If set to **Absolute** the angle is based on 0 degrees as horizontal. If set to **Relative** the cell is placed relative to the element selected.

**Justification** - The justification can be based on the center cell (only option if only one row is placed), the upstream or downstream cell. Only those toggled on in the **Feature Group** are available for setting Justification.

### LAB EXERCISE: PLACING RPM'S USING DRAW CELL GROUP BY FEATURE (PART 1)

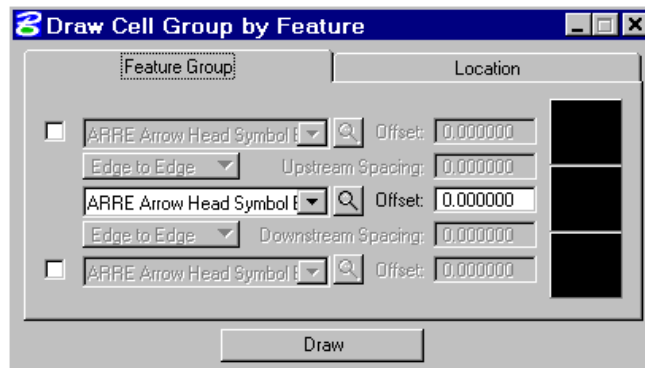
In this exercise the user will place RPM's along the 10/30 skip line drawn in a previous exercise.

Remember that a construction line must be drawn on top of the curved section of the skip line in order to get evenly spaced RPM's.

1. Continuing in **Dsgnsp01.dgn** open the **Draw Cell Group by Feature** tool. This tool can be opened from the **Road** tools palette or from the menu **Applications > GEOPAK ROAD > Plans Preparation > Draw Cell Group by Feature**.

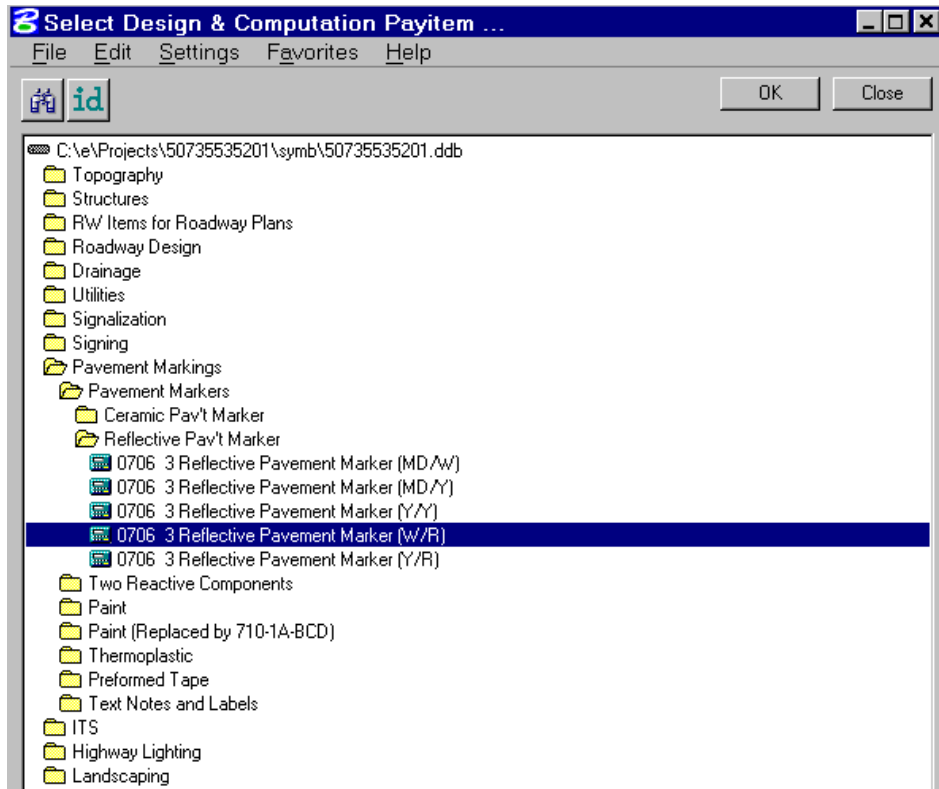


2. On the **Feature Group** tab click on the magnifying glass icon to open D&C Manager. Next we will pick one of the RPM items.

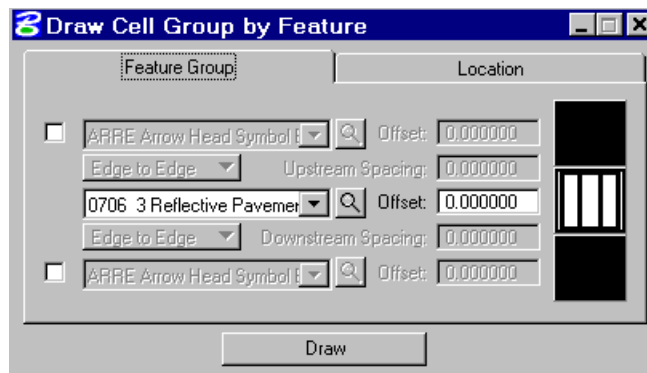


## FLUG - Fall 2007 *Traffic Plans Session*

3. In D&C Manager navigate to **Pavement Markings > Pavement Markers > Reflective Pav't Marker** and select the Item **0706 3 Reflective Pavement Marker (W/R)**.



4. Click the **OK** button or **double click** on the item in D&C Manager. This will close D&C Manager and push this item over to the **Feature Group** tab.  
You should also notice that the picture of the RPM is now visible in the dialog box. The items displayed in this tool are remembered in a .rsc file in the geopak\bin directory. If the .rsc files are deleted this tool will be clean with no items filled in.
5. Set the **Offset** to **0.0**. This is because the first skip line you are placing RPM's on is in a curve and the element you are using in the dgn file is a copy of the edge line on top of the 10/30 skip.

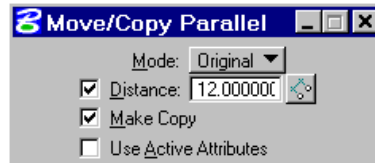


6. Click on the **Location** Tab.

**LAB EXERCISE: PLACING RPM'S USING DRAW CELL GROUP BY FEATURE (PART 2)**

In this part of the exercise you will copy the 6" white edge line over 12' and complete the Location tab of the **Draw Cell Group by Feature** tool.

1. Continuing in **Dsgnsp01.dgn** open the reference palette and turn the **dsgnrd01** file off. This will make selecting the edge line easier.
2. Zoom to near Sta. **525+00**. You will be working on the right roadway first.
3. Using the MicroStation **Move/Copy Parallel** tool copy the 6" white edge line **12'** left.

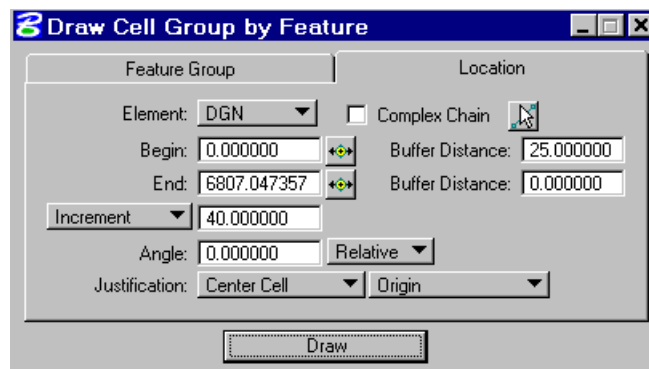


You should now have a solid line on top of the 10/30 skip line.

4. Continuing on the **Location** tab of the **Draw Cell Group by Feature** tool set the **Element** to **DGN**.
5. Click the **Identify DGN element** button. Next you will pick the line you copied earlier.
6. Select the line you copied on top of the skip line. Make sure you do not pick the short skip line.

The Begin field will be set to 0.00 and the End will be the value of the total length of the element selected, 6807.047 in this example.

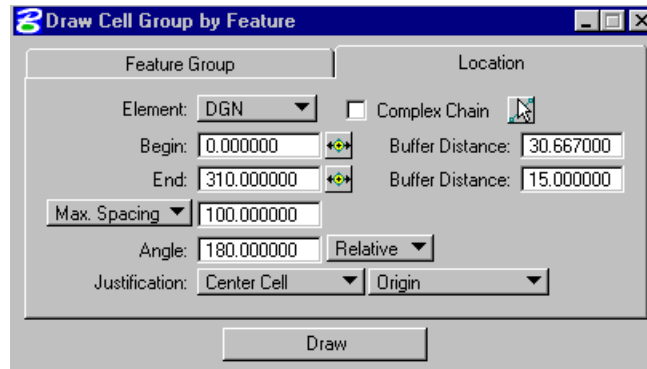
7. **Delete** the copied line. Once the line is selected it is no longer needed.
8. Set the Begin **Buffer Distance** to 25.0.
9. Set the End **Buffer Distance** to 0.00.
10. Set to **Increment** and enter **40.0**. This is the spacing between the RPM's.
11. **Angle** should be 0.00 and **Relative**.
12. Set the **Justification** to **Center Cell** and **Origin**.



13. Click **Draw** and move the pointer over the skip lines and issue a **data point**. You should now see RPM's centered between the skips.
14. Take a moment to review the pavement markings.
15. Do not close the **Draw Cell Group by Feature** dialog; it is needed for the next exercise.

### DIRECTIONAL ARROWS

Using the **Draw Cell Group by Feature** to draw directional arrows is very similar to how the RPM's were drawn. The **Feature Group** tab is the same just pick the correct item in D&C for the pavement arrow. In the **Location** tab there are some settings that need to be set based on the standard indexes and the size of the arrow cell being placed in order to get the required spacing.

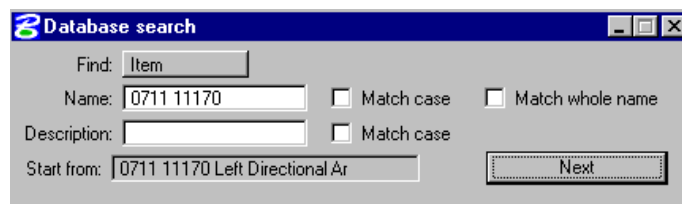


### LAB EXERCISE: PLACING TURN ARROWS USING DRAW CELL GROUP BY FEATURE

In this exercise the user will use the **Draw Cell Group by Feature** tool to draw turn arrows in the left turn lane worked on earlier in this chapter. When placing turn arrows and pavement messages refer to index 17346 for placement and spacing details. This exercise uses the 6" white lane line as the reference element to place the turn arrows.

1. Continuing in **Dsgnsp01.dgn** zoom to near **Sta. 558+00**.
2. Switch to the **Feature** tab on the **Draw Cell Group by Feature** tool.
3. Click the **Magnifying Glass** icon in the center field. This opens D&C Manager.
4. In D&C Manager navigate to **Pavement Markings > Thermoplastic > Directional Arrows, Thermo STD > 0711 11170 Left Directional Arrow**.

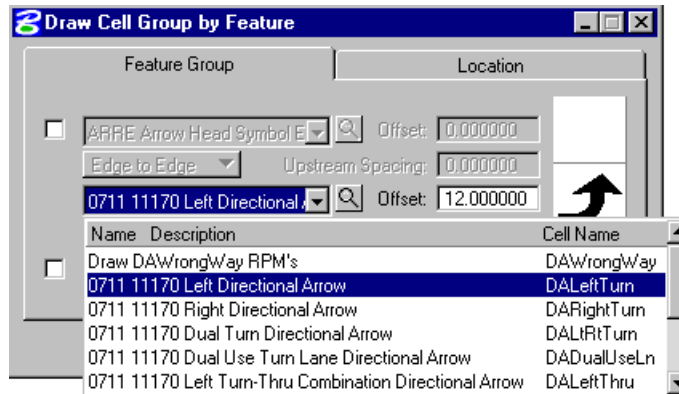
**Note** You can use the search function to locate items if you know the pat item number or description.



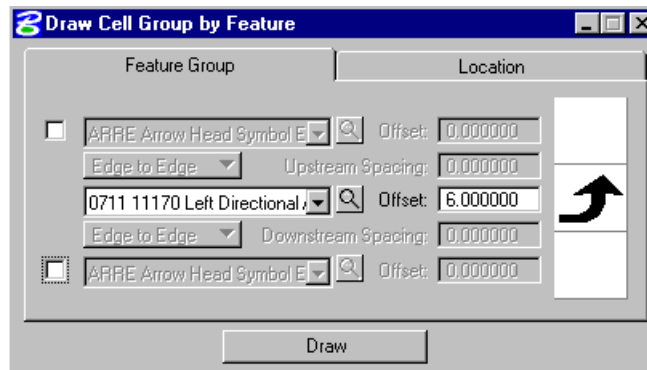
5. Either **Double Click** on the item in D&C Manager or click the **OK** button. This loads all of the items from that category into the drop down menu on the **Feature Group** tab, next you need to select the correct item.

## FLUG - Fall 2007 *Traffic Plans Session*

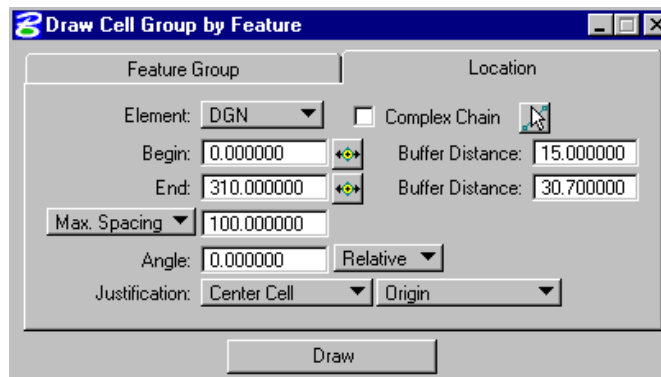
- Next to the **Magnifying Glass** click the Drop Down menu and select the **Left Directional Arrow**. This will load the appropriate cell.



- Set the **Offset** to **6.0**. This is the distance from the reference element used to place the turn arrows; you must also take into account the cell origin if it is not in the center of the cell.



- On the **Location** tab set **Element** to **DGN**. Use the 6" white lane line as the reference element.
- Click the **Identify DGN element** button and pick the 6" white lane line. Make sure and pick the line near the entrance of the turn lane, the left side.

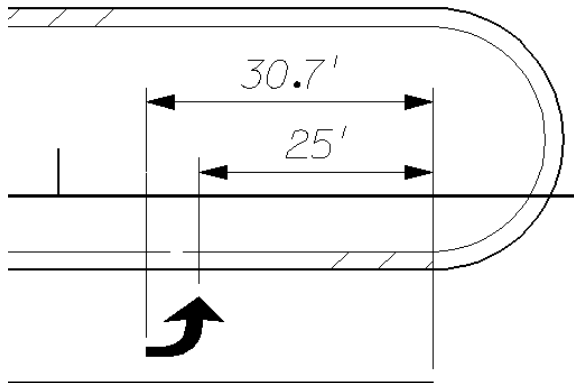


Notice the **End** distance value is 310', based on the details on Index 17346 any turn lane longer than 200' the designer is to add one arrow for each additional 100'. This means the turn lane in this exercise requires four arrows total.

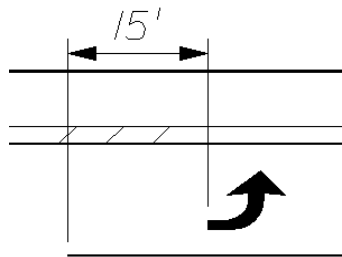
## FLUG - Fall 2007 *Traffic Plans Session*

In this exercise the white edge line starts at the right that is the Begin and the end is to the left. This is important to know before filling in the Buffer Distances. If you use Chain as the element then the Begin would be on the left and End would be to the right.

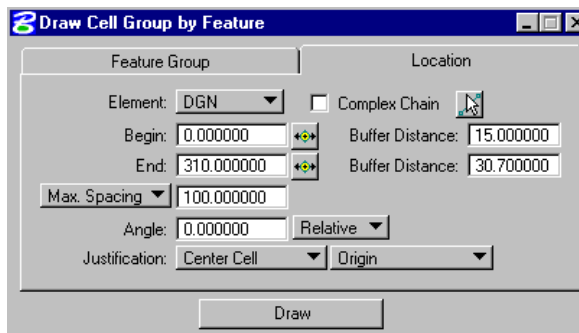
10. Set the End **Buffer Distance** to **30.7**. This is the distance from the end of the white edge line or stop bar to the origin of the turn arrow cell to get the required 25' distance from the end of the lane line or stop bar to the point of the arrow.



11. Set the Begin **Buffer Distance** to **15.00**.



12. Set the Spacing to **Max Spacing**.
13. Set the Spacing distance to **100.0**.
14. Set the **Angle** to **0.0**.
15. Set rotation to **Relative**.
16. Set **Justification** to **Center Cell** and **Origin**.



## FLUG - Fall 2007 *Traffic Plans Session*

17. Click **Draw** and move the pointer into the turn lane and issue a **data point**.
18. Close the **Draw Cell Group by Feature** tool.

The figure below shows the completed turn lane.



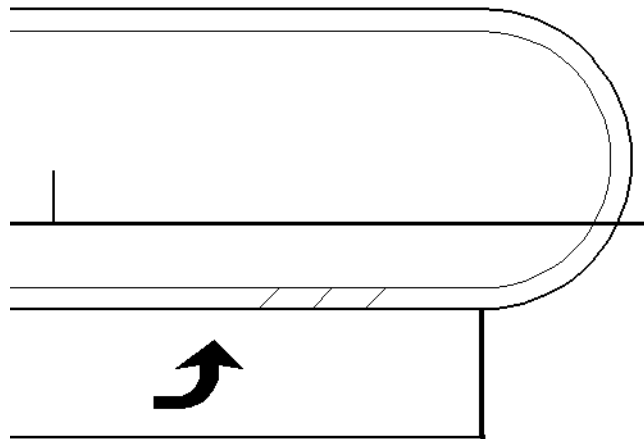
### LAB EXERCISE: PLACING STOP BAR USING D&C MANAGER

In this exercise you will use D&C Manager to place a stop bar. The Stop Bar item in D&C Manager has the Construct Perpendicular command built into it. When using items from D&C, always read the status line in MicroStation for hints.

1. Continuing in **Dsgnsp01.dgn** zoom to near **Sta. 561+00**. This is the end of the turn lane you just placed the turn arrows in.
2. Open **D&C Manager**.
3. Navigate to the category **Pavement Markings > Thermoplastic > LF Striping, Thermo STD > Solid Traf. Stripe (White)**.
4. Double click on item **0711 11125 24" Solid Traffic Stripe (White)**. Read the message field in MicroStation.



5. Snap to the end of the Yellow edge line for the start point.
6. Snap to the white lane line for the end point.
7. Turn Off **Place Influence**. The figure below shows the stop bar placed.



## Quantities


In this section we will cover:

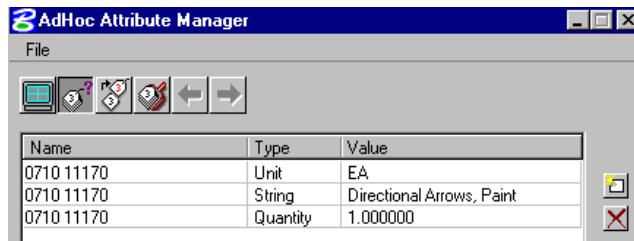
- AdHocs
- Quantities.

### DEFINING ADHOCs FOR QUANTITIES


AdHocs are additional information that can be used to better define an element or associate a quantity to an element. Several of the items in the FDOT ddb file have AdHocs associated to them. It is very important to become familiar with the items in the ddb that have AdHocs, understand how they operate and how they affect quantities. GEOPAK provides tools that allow the user to select elements and view what attributes and AdHocs are associated to those elements. The user can also review an item in D&C Manager to determine if there is an AdHoc associated to it. Review chapter 4 of this training manual for more information on AdHocs.

### ADHOC ATTRIBUTE MANAGER

This tool can be used to view AdHocs or Set AdHocs. It can be opened from the **Road** tools palette  or from **Applications>GEOPAK ROAD>GEOPAK 3PC AdHoc Attribute Manager**.



### IDENTIFY ELEMENT

Using this tool is as simple as clicking on the  icon and picking a MicroStation element. If it was drawn with AdHocs associated to the element they all display as shown above. If there are no AdHocs then the display will be blank. The figure above is showing the AdHocs of a Left Turn Arrow. The information displayed is purely for quantities.

### SET ATTRIBUTES

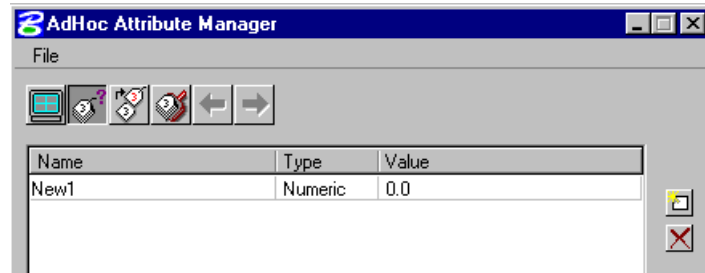
This is used to set AdHocs on an item, for example: The Nose Paint quantity on traffic separators or median openings. There is currently a limit of 48 attributes that can be associated to an element. If the user wants to create their own AdHoc for a scenario as shown above, it is a multiple step process.

## FLUG - Fall 2007 *Traffic Plans Session*

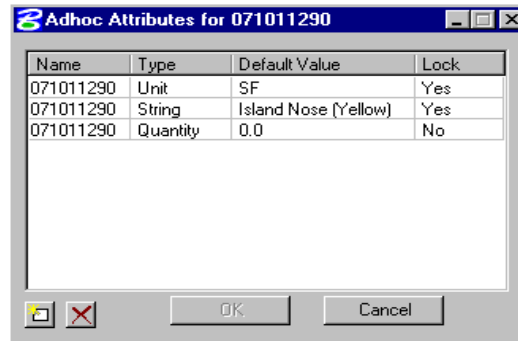
You need to create three new rows for the AdHoc, it needs:

- Unit
- Description/String
- Value

1. Starting with a blank dialog, click the  Add New Row icon on the right side of the dialog.



2. The **Name**, in this example, would be the pay item number in D&C Manager, example **071011290**.
3. The **Type** would be **Unit**.
4. The **Value** would be **SF**. The value SF must be all caps.
5. Repeat the process two more times using the same **Name** but create two new **Types** and **Values** as shown below.



6. The Quantity Value is the area the user measured in MicroStation.
7. Then click the Set Attributes icon and pick the element to add the AdHoc to. The element set in this example would be a line drawn in MicroStation in the area of the nose paint. The length of the line is not important.

## FLUG - Fall 2007 *Traffic Plans Session*

- Next you need to make sure that the item in D&C Manager is set to compute by AdHoc. Use the Modify Item option to check the **Compute Parameters**. The user can right click on the Item in D&C to Modify the item.

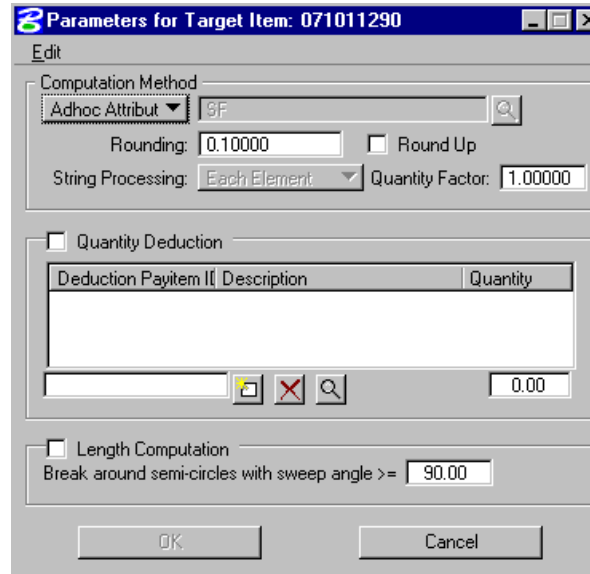
The screenshot shows the 'Item Modify' dialog box with the following fields and values:

- Item ID: 071011290
- Compute Parameter: (dropdown menu)
- Description: Island Nose (Yellow)
- Placement: (yellow bar)
- Attribute: 710-11-290
- Class: Construction
- Cell Name: (empty)
- Use Active Sc: (dropdown menu)
- Supplemental Search Criteria:
  - Levels: 20
  - Colors: 4
  - Styles: 0
  - Weights: 3
- Key-in Commands:
  - Design: Acbook Influence;Place Smartline Arc
  - Set: On=RefIPaintYel;mdl silentload SELECTB\*
  - Display: On=RefIPaintYel
- Adhoc Attributes:
- Compute Parameters:

Buttons: OK, Cancel

Notice in the Figure below that the **Computation Method** is NOT set to **Adhoc Attribute**. The item must be set to use Adhoc Attribute as the computation method, if D&C Manager is to use the Adhoc quantity attached to an element for computation.

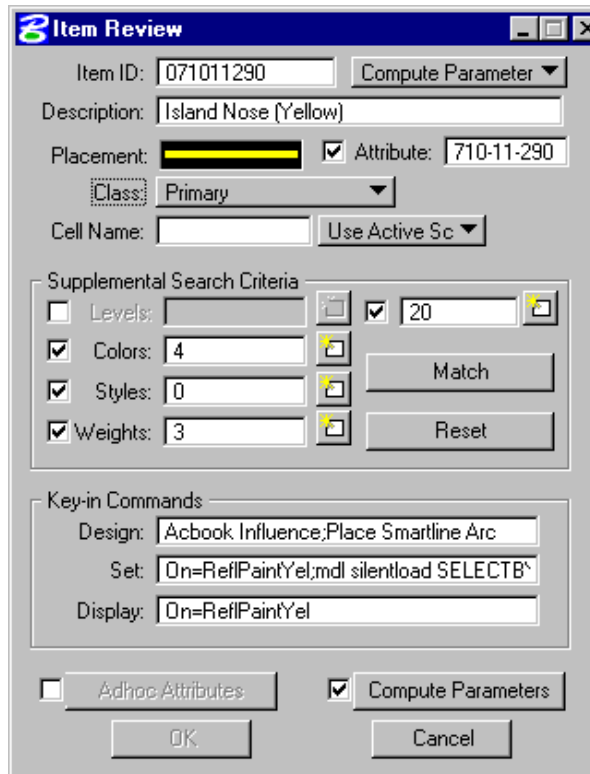
## FLUG - Fall 2007 *Traffic Plans Session*

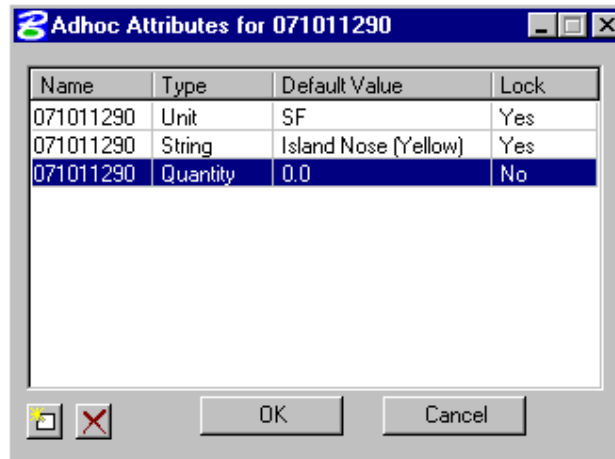


### D&C MANAGER – MODIFY ITEM

In this section the user will learn how to Modify an Item to add an AdHoc. By doing this the AdHoc is added as the item is drawn. The process is similar to how the AdHoc was created in the last example.

In D&C Manager you right click on the item you want to add the AdHoc to, example: Item **071011290** is yellow reflective nose paint. Notice in the figure below that the **AdHoc Attributes** option is toggled off.





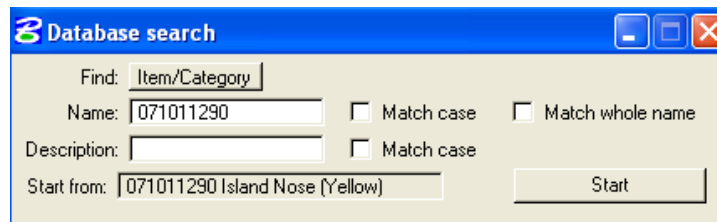
**LAB EXERCISE: ADD AN ADHOC TO D&C MANAGER ITEM**

> **MODIFY ITEM 071011290 ADD AN ADHOC**

1. Open **Dsgnsp01.dgn** in the Signing folder.
2. Start **D&C Manager**. Make sure the correct ddb file is loaded.

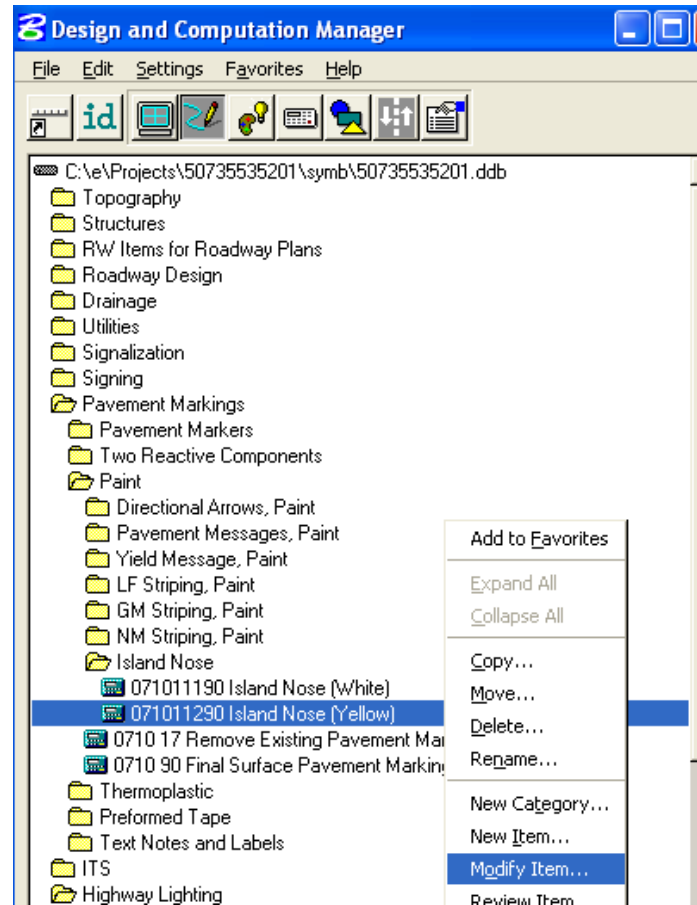
*Note* It is recommended that the FDOT delivered ddb file be copied into the project Symb folder and renamed to the eleven digit fin number. This allows the user to modify the ddb file without fear of overwriting it when updates are released.

3. Use the **Edit > Find** option in **D&C Manager** to search for item **071011290**. This is for Reflective Island Nose Paint (White).



## FLUG - Fall 2007 *Traffic Plans Session*

4. Right click on Item **071011290** and select **Modify Item** from the menu. This opens **Item Modify**.



## FLUG - Fall 2007 *Traffic Plans Session*

5. This opens **Item Modify**, make sure that the **Attribute** option is toggled ON. This located in the top right side of the dialog.

Item ID: 071011290 Compute Parameter

Description: Island Nose (Yellow)

Placement: Attribute:  710-11-290

Class: Construction

Cell Name: Use Active Sc

Supplemental Search Criteria

Levels:    20

Colors: 4

Styles: 0

Weights: 3

Match

Reset

Key-in Commands

Design: Acbook Influence;Place Smartline Arc

Set: On=RefIPaintYel;mdl silentload SELECTB^

Display: On=RefIPaintYel

Adhoc Attributes  Compute Parameters

OK Cancel

6. On **Item Modify** toggle on **AdHoc Attributes**. By default this will be off if there are no AdHocs assigned to the item.
7. Click the **AdHoc Attributes** button. This opens **AdHoc Attributes**.

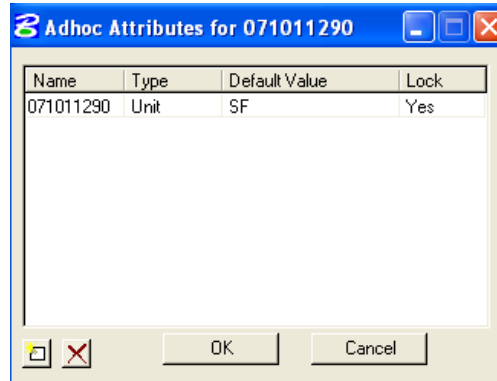
Name	Type	Default Value	Lock
------	------	---------------	------

OK Cancel

8. Click the **Add New Row** icon. This is the same process as used earlier; you need a name a type and a default value.
9. For the Name click on **New1** and Key in **071011290**. This is the pay item and must match the D&C Item name.
10. For the **Type** select **Unit**.
11. For the **Default Value**, key in **SF**. Must be upper case.

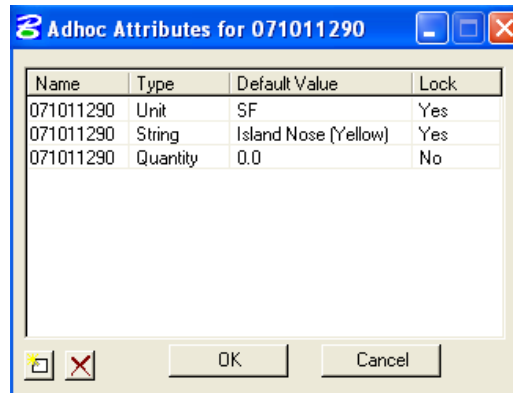
## FLUG - Fall 2007 *Traffic Plans Session*

- Toggle the Lock to **Yes**. Toggling this on locks the item so when an element is drawn the user cannot change it.



> **ADD NEW ROW FOR DESCRIPTION AND QUANTITY**

- Click **Add New Row** again. It is necessary to create three rows for the AdHoc.
- For the Name click on **New1** and Key in **071011290**. You can copy and paste from the first entry.
- For Type select **String**. This is a description of the item.
- For the **Default Value**, key in **Nose Paint Yellow**. This will show up on the quantity reports.
- Toggle the Lock to **Yes**.
- Click **Add New Row** again.
- For the Name click on **New1** and Key in **071011290**.
- For Type select **Quantity**.
- For the **Default Value** leave it at **0.0**. The user will edit this as the elements are drawn.
- Toggle the Lock to **No**. You will fill this in with the area calculated.



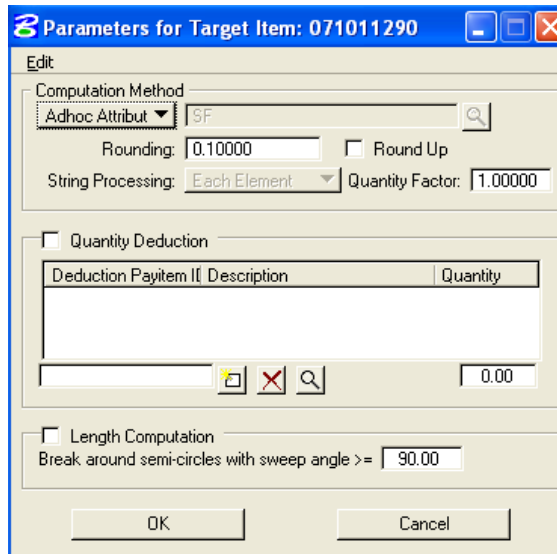
- Click **OK**. This takes you back to the **Item Modify** dialog.

> **SET COMPUTE PARAMETERS**

- On **Item Modify** click **Compute Parameters**. This opens **Parameters for Target Item**.

## FLUG - Fall 2007 *Traffic Plans Session*

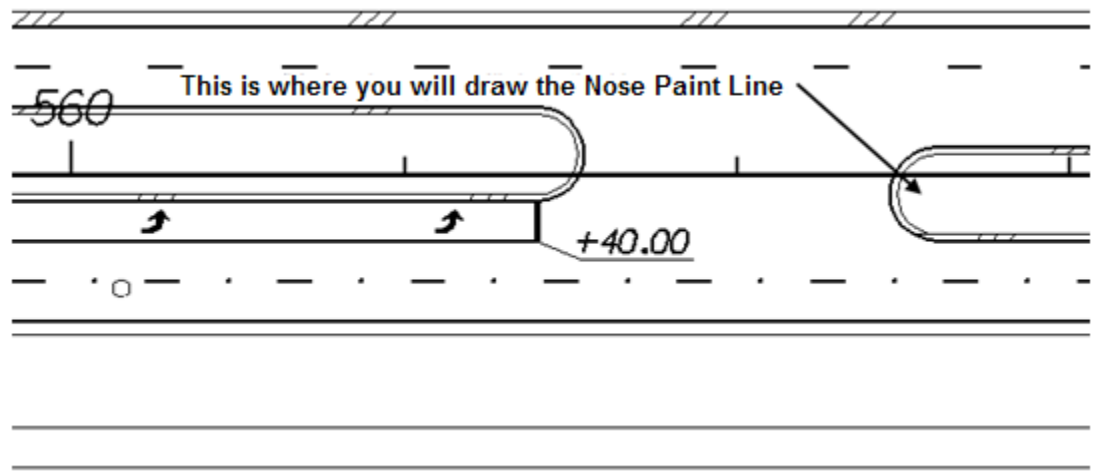
2. Under **Computation Method** select **AdHoc Attribute**. If this is already set than ignore this step.




3. Click **OK** to close and save changes in the **Parameters for Target Item** dialog.
4. Click **OK** on the **Item Modify** dialog.
5. In **D&C Manager** select **File > Save**. This will save this change to the DDB file.

### > **PLACE A LINE WITH AN ADHOC**

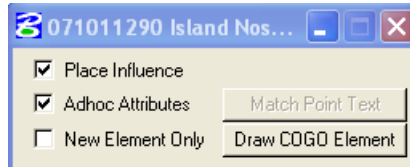
1. Continuing in **Dsgnsp01.dgn** zoom to near Sta **562+50**. The figure below shows where you will be working.



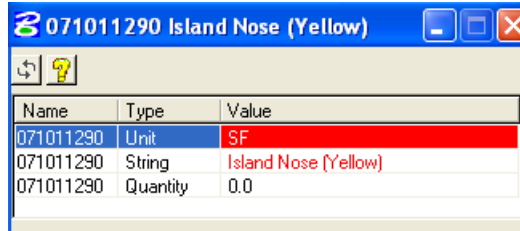
2. If item **071011290** is not selected, select it. This is the item just modified.
3. In **D&C Manager** select **Design mode** .

## FLUG - Fall 2007 *Traffic Plans Session*

- In **Design** mode toggle on **Place Influence** and **AdHoc Attributes**.

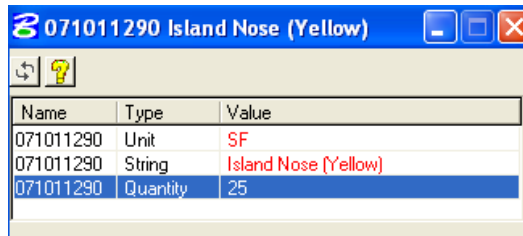


Notice when AdHoc is toggled on that AdHoc editor opens. Also notice that two of the rows values are red, this is because when you created the AdHoc earlier the two options were locked.



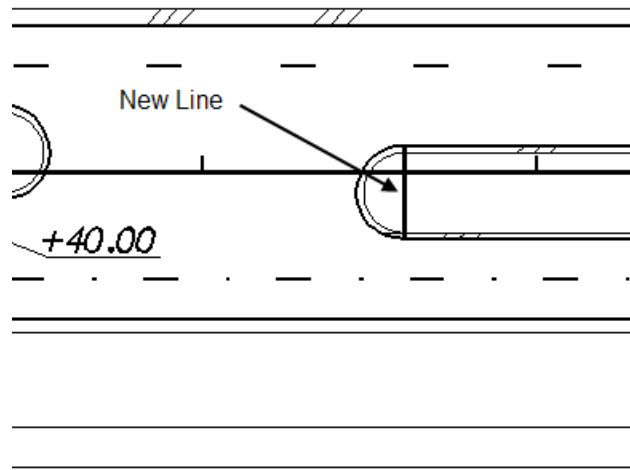
Name	Type	Value
071011290	Unit	SF
071011290	String	Island Nose (Yellow)
071011290	Quantity	0.0

- Next to **Quantity** click on the value **0.0** field and enter **25.0**. This would be the area measured in MicroStation. This is an arbitrary number for this exercise.



Name	Type	Value
071011290	Unit	SF
071011290	String	Island Nose (Yellow)
071011290	Quantity	25

- Select MicroStation's **Place Line** tool.
- Draw a line from one end of the radius of the median to the other end.





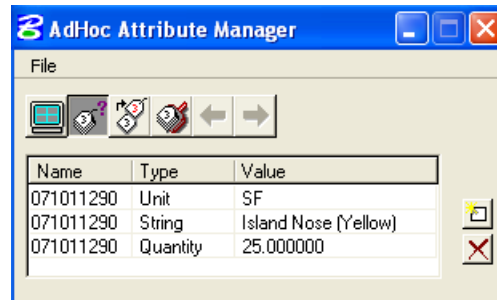
**Note** The length of the line makes no difference, it could be one inch and the item will quantify. The AdHoc is only additional information about an item.

- Toggle Off **Place Influence**.

## FLUG - Fall 2007 *Traffic Plans Session*

### > **USE 3PC ADHOC ATTRIBUTE MANAGER TO CHECK ELEMENT**

1. From the **Road Tools** palette open **3PC AdHoc Attribute Manager** .
2. In **AdHoc Attribute Manager** click **Identify Element** .
3. Pick the line drawn in the previous exercise and issue a data point to except it.




The AdHoc information will populate the dialog, this is what will show up when quantities are run.

4. Close **AdHoc Attribute Manager**.


## GENERATING QUANTITIES


### **REVIEW ITEMS PRIOR TO COMPUTING QUANTITIES**


Prior to computing any quantities it is important to review the items that are about to be computed.


D&C Managers **Display** tool will aid in this task. To activate the **Display** tool, click on the  icon.



 **Normal Display** – the items of interest change back to their original element symbology.

 **Highlight Selection** – the desired elements are displayed in the current MicroStation highlight color, while any other elements remain unchanged.

 **Hide Selection** – the desired items are not displayed in the view, however all other elements are displayed. This is the reverse of the **Display Only Selection** tool.

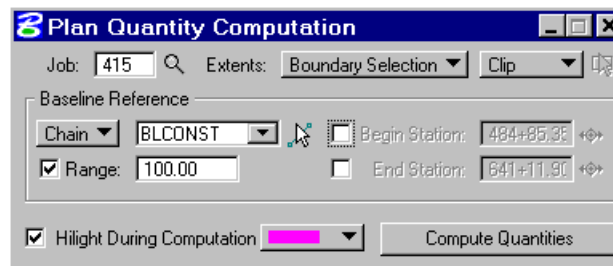
 **Display Only Selection** – only the items in the collection box appear, while the rest are not displayed in the view.

Using the **Highlight Selection** the user would zoom in close to the project elements and make sure that whatever is placed in the collection bin for computing quantities highlights.

*Note* Always set the option back to Normal Display before closing the tool.

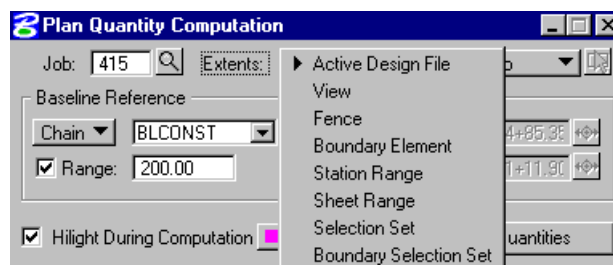
**COMPUTING QUANTITIES**

Plan Quantity Computation opens when the Compute is selected.



The **Job** is the GEOPAK gpk file, if the user is using Project Manager than this will be set.

**Extents** is a list of options for limiting the area and elements included in the quantity calculations. The figure below shows the options available.



- Active Design File** – All elements in the Active Design File are candidates for computation.
- View** – Only the selected items that are displayed in MicroStation view one are computed. If the view includes area outside of the **Range**, the **Range** will override.
- Fence** – A MicroStation fence must be placed, and all specified graphical features which satisfy both the fence and the **Range** will be tabulated.
- Boundary Element** – A previously drawn closed shape is used to determine quantities. When selected, the user is prompted to select the closed shape. This mode is sensitive to the MicroStation Inside, Overlap and Clip modes.
- Station Range** – A Baseline Reference (chain or dgn) must be defined for this option. The range fields default to the extent of the chain. The user can key in a station or by clicking Begin or End Station icons graphically define the station range. Perpendicular projections to the station(s) define the extent of the computations. This option is not ideal for sheet quantities.
- Sheet Range** – Sheets placed with the Plan Profile Sheet Composition tool can be utilized. Select the option which displays the sheet range. This option will work in our scenario.
- Selection Set** – A MicroStation selection set of the candidate compute elements must be created prior to computing.
- Boundary Selection Set** – A MicroStation selection set of the Boundary (not the actual candidate compute elements) must be created prior to computing. This option will work in our scenario. When this option is used it uses the element ID number in Quantity Manager to organize the data for each individual sheet.

**Baseline Reference** allows the user to define a Chain or DGN element for offsets and station values for reports. In addition the **Range**, if set, is measured from the selected Chain or DGN element to search for

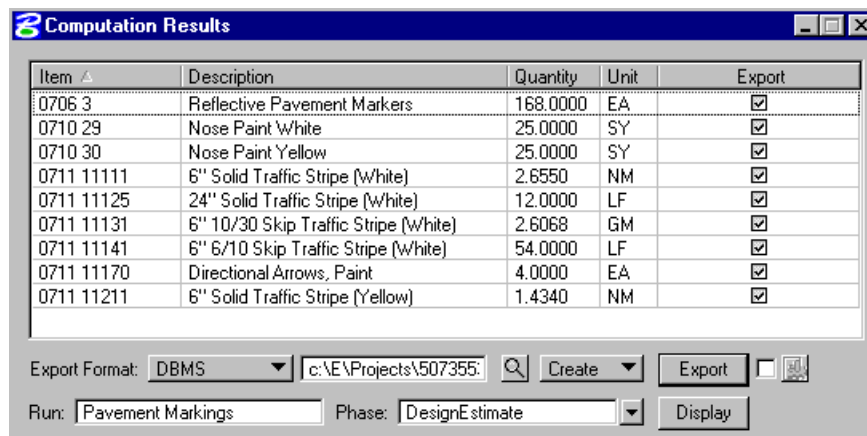
## FLUG - Fall 2007 *Traffic Plans Session*

candidate items. Setting the **Baseline Reference** to **None** limits the type of output that can be generated as no station / offset values can be computed.

When using **Sheet Range** or **Boundary Elements** it is not necessary to toggle on Begin and End Station limits.

**Highlight During Computation** when toggled on, all MicroStation elements computed are highlighted in the selected highlight color.

**Compute Quantities** starts the computation process and when completed opens the **Computation Results** dialog box.



Item	Description	Quantity	Unit	Export
0706 3	Reflective Pavement Markers	168.0000	EA	<input checked="" type="checkbox"/>
0710 29	Nose Paint White	25.0000	SY	<input checked="" type="checkbox"/>
0710 30	Nose Paint Yellow	25.0000	SY	<input checked="" type="checkbox"/>
0711 11111	6" Solid Traffic Stripe (White)	2.6550	NM	<input checked="" type="checkbox"/>
0711 11125	24" Solid Traffic Stripe (White)	12.0000	LF	<input checked="" type="checkbox"/>
0711 11131	6" 10/30 Skip Traffic Stripe (White)	2.6068	GM	<input checked="" type="checkbox"/>
0711 11141	6" 6/10 Skip Traffic Stripe (White)	54.0000	LF	<input checked="" type="checkbox"/>
0711 11170	Directional Arrows, Paint	4.0000	EA	<input checked="" type="checkbox"/>
0711 11211	6" Solid Traffic Stripe (Yellow)	1.4340	NM	<input checked="" type="checkbox"/>

Export Format: DBMS | c:\E\Projects\507355: | Create | Export | Run: Pavement Markings | Phase: DesignEstimate | Display

It is imperative that you review these results before going any further. If there are any errors or omissions now is the time to fix or add them.

**Export Format** sets the type of output the user wants to generate from the reported quantities. There are several formats to choose from.

**Comp Book** – A more detailed report that lists not only quantity summaries, but also geometric properties such as plan view coordinates and station/offsets for located elements. File is in ASCII format.

**Item report** – Quantities Summary listing pay items, descriptions, units and total quantities for located elements. File is in ASCII format.

**Item Table** – Contains the same information as the Item Report, but formatted in tabular form.

**DBMS** – Very detailed information including calculated and rounded quantities, geometric properties, pay item numbers, descriptions, station / offset values, etc. The format is the selected database (i.e., Microsoft Access, Oracle, SQL Server, and dbase is set in the Compute Settings tool. This option is required when taking the quantities into Quantity Manager. This is the option used in this training guide.

**CSV By Item** – Summary listing pay items, descriptions, units and total quantities for located elements. Format is CSV (coma separated values).

## FLUG - Fall 2007 *Traffic Plans Session*

**CSV By Element** – A more detailed report that lists not only quantity summaries, but also geometric properties such as plan view coordinates and station/offsets for located elements. Format is CSV (coma separated values).

**Table** – User defined table column properties. A column for designating the appropriate symbol is also included, as well as adhoc attribute data. This option is used to generate legends such as for landscape plans.

Next to the **Export Format** is a field for entering the file name of the output file, using the hourglass allows you to browse to a specific folder.

When exporting the quantities there are two options to choose from, **Create** or **Append**. This will place the quantities into a new file or append them to a previously created file.

**Run** and **Phase** are only used for the DBMS export format to Quantity Manager. The **Run** is a user key in and any logical description, like Pavement Marking or Preliminary, can be used. This description will be passed to Quantity Manager. There are several default **Phases** included in the drop down menu, however, you are only concerned with **DesignEstimate**. This is the recommended **Phase** when exporting to Quantity Manager, as this is the only phase that can be passed to Trnsport.

**Export** commences the output file process and creates the quantity file. In this training you will be exporting to DBMS which will create an MDB file that can then be opened with Quantity Manager.

### LAB EXERCISE: REVIEW THE QUANTITY ITEMS

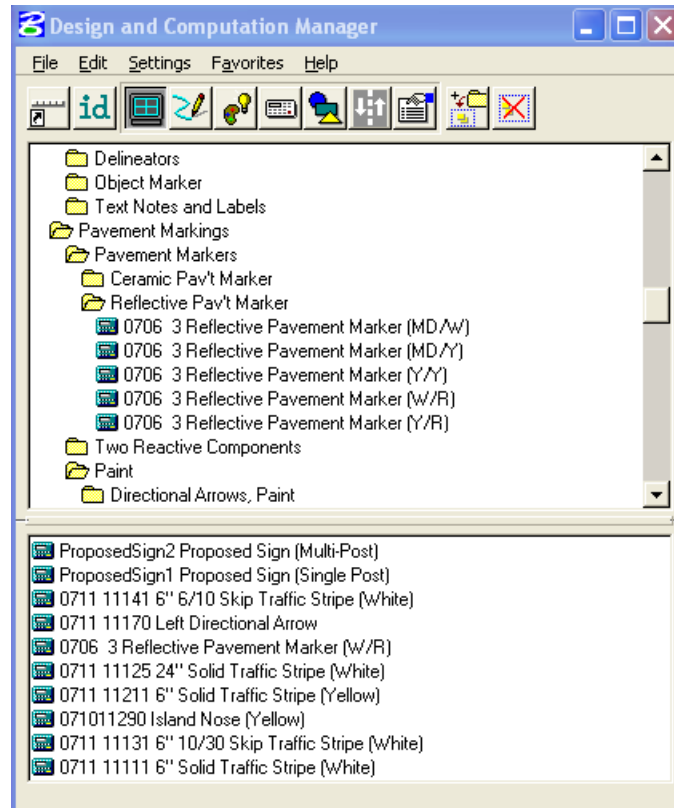
> **USE THE DISPLAY TOOL TO REVIEW ITEMS**

1. Continuing in **Dsgnsp01.dgn** zoom in near Sta 560+00.
2. click the **Display** tool on D&C Manager.



3. If there are items in the collection bin of D&C Manager, right click in the collection area and select **Clear Collection**.
4. Click the **ID** icon in D&C Manager.
5. Pick the white edge line and accept it. This will take you to the item **0711 11111 6" Solid Traffic Stripe (White)**.
6. Right click on the item and select **Add to Collection**. This will place the item in the collection bin.
7. Click the **ID** icon and pick the 10/30 skip line and accept it.
8. Right click on the item and select **Add to Collection**.
9. Repeat this process to add the rest of the Pavement Marking items used into the collection bin.

## FLUG - Fall 2007 *Traffic Plans Session*

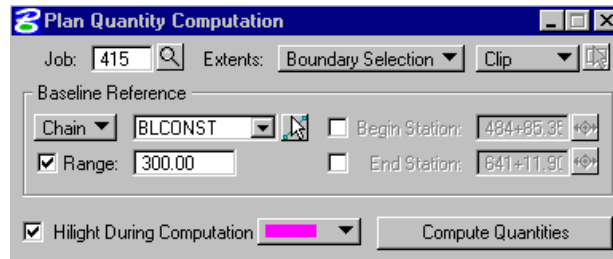


10. On the **Display** tool click the **Highlight** icon. This will highlight all of the items in the collection.
11. Take a moment to review the design file.
12. Set the display option to **Normal**.
13. Close the **Display** tool.

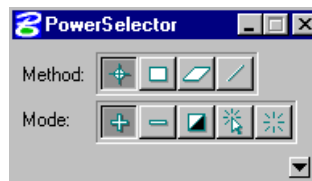
**LAB EXERCISE: GENERATE QUANTITIES FOR QUANTITY MANAGER**

> **COMPUTE QUANTITIES**

1. Continuing in **Dsgnsp01.dgn** reference in **Clipsp01.dgn** from the Signing folder.
2. Zoom out so you can see the first five clip borders.
3. On D&C Manager click the **Compute** icon. This opens **Plan Quantity Computation**.



4. The **Job** number is **415**. This will be set if you use Project Manager.
5. Set the **Extents** to **Boundary Selection**.
6. Set to method **Clip**.
7. Set the **Baseline Reference** to **Chain**.
8. Pick the Chain **BLCONST**.
9. Toggle on **Range**.
10. Set the **Range** value to **300.00**. This is how far from the chain the software will look for items to compute.
11. Toggle on **Highlight During Computation**.
12. In MicroStation use **Power Selector** to pick the first five clip borders.



13. Click **Compute Quantities**. This opens **Computation Results**.

Item #	Description	Quantity	Unit	Export
0700-20-11	Single Post, Ground Mount	1.0000	AS	<input checked="" type="checkbox"/>
0706 3	Reflective Pavement Markers (W/R)	168.0000	EA	<input checked="" type="checkbox"/>
071011290	Island Nose (Yellow)	25.0000	SF	<input checked="" type="checkbox"/>
0711 11111	6" Solid Traffic Stripe (White)	2.6560	NM	<input checked="" type="checkbox"/>
0711 11125	24" Solid Traffic Stripe (White)	12.0000	LF	<input checked="" type="checkbox"/>
0711 11131	6" 10/30 Skip Traffic Stripe (White)	2.5985	GM	<input checked="" type="checkbox"/>
0711 11141	6" 6/10 Skip Traffic Stripe (White)	54.0000	LF	<input checked="" type="checkbox"/>
0711 11170	Left Directional Arrow	4.0000	EA	<input checked="" type="checkbox"/>
0711 11211	6" Solid Traffic Stripe (Yellow)	1.4340	NM	<input checked="" type="checkbox"/>

Export Format: DBMS | c:\E\Projects\507355 | Create | Export

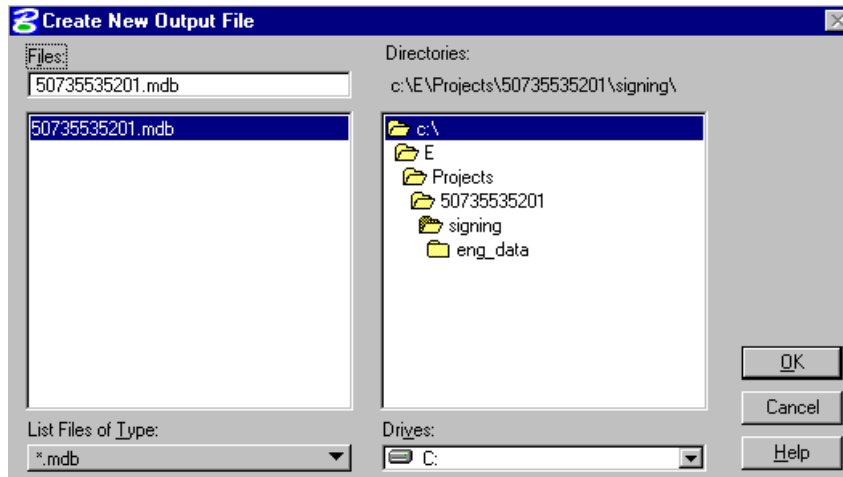
Run: Pavement Markings | Phase: DesignEstimate | Display

## FLUG - Fall 2007 *Traffic Plans Session*

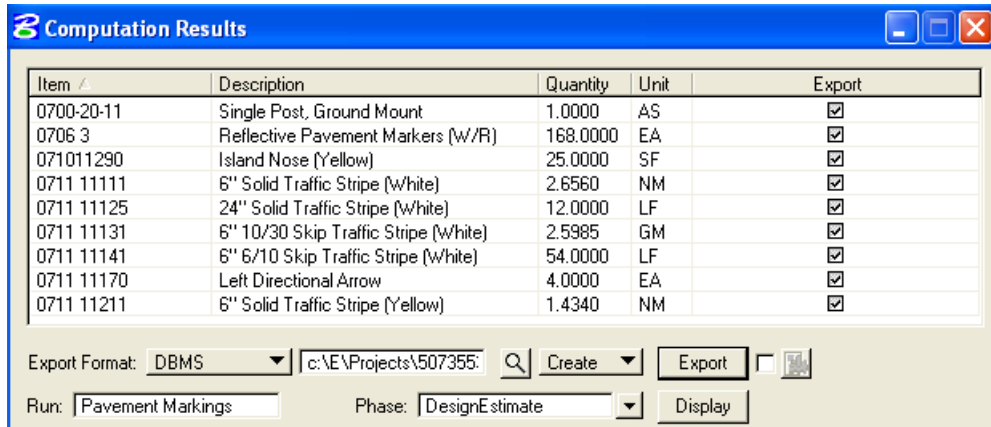
Note there is a known issue with GEOPAK crashing when computing quantities with reference files attached. If MicroStation crashes while running quantities, make sure locate is turned off on all reference files and copy the clip borders into the active design file.

### > **EXPORT QUANTITIES TO DBMS FOR QUANTITY MANAGER**

1. Set the **Export Format** to **DBMS**. This is the required format for Quantity Manager.
2. Using the Magnifying Glass icon browse to the Signing folder.



3. Enter a file name, I recommend using the fin number. The MDB file extension will be added automatically.
4. Click **OK**.
5. Set to **Create**. The options are **Create** or **Append**.
6. For **Run** enter **Pavement Markings**.
7. For **Phase** select **DesignEstimate**. This option must be selected.



8. Click **Export**. This creates the MDB file.
9. Close **Computation Results**. Next open **Windows Explorer** and make sure the file was created.
10. From **SiteMenu** select **Standards > Explore Current Working Directory**.
11. You should see the **MDB** file in the **Signing** folder.
12. Close **Windows Explorer**.