T.D.O.T. Design Division Programs

The T.D.O.T. Design Division has developed several special programs or applications for use in MicroStation to perform a variety of functions including cell access, generating graphical elements or altering them and computing quantities or other needed information. These applications include Geopak 3 port criteria program files or 3PC files as they are commonly called, MicroStation Basic programs as well as MicroStation Visual Basic Applications.

All of them can be accessed from Geopak's Design & Computation Manager. When running the T.D.O.T. Design Division interface most of them can be accessed from the TDOT drop down menu. Many are available from short cuts provided on other associated program dialogs. The TDOT Design Division Toolbox program\dialog provides access to many of the tools, commands and functions used most often by TDOT Design Division personnel.

This document contains program descriptions and workflow for these special programs listed in the order as they appear in Geopak's Design & Computation Manager. From there the programs can be activated in two ways.

If you are running in the dialog mode with the expanded D&C Manager window then double click on the item with Design mode active.

If you are running D&C Manager window in the **toolbox** mode then just click on the **Execute Design Keyin** button

Drafting Standards

Tools

TDOT Design Division Toolbox

D&C location: Drafting Standards>Tools > Design Toolbox

MicroStation VBA Program: TDOTDesignDivToolbox.mvba

Description:

This program\dialog provides access to many of the tools, commands and functions used most often by TDOT Design Division personnel. It is an alternative to access of them through the TDOT interface drop down menu or Geopak's D&C Manager.

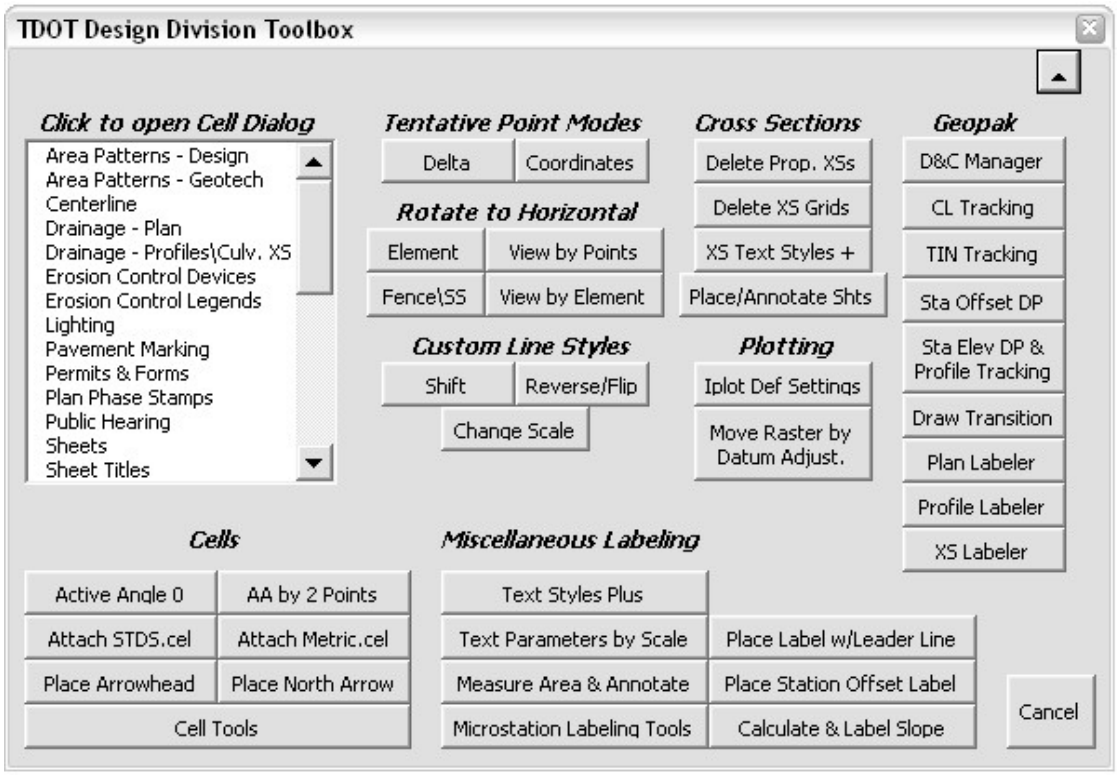
This program can also be activated from the MicroStation drop down menu
TDOT > Tools > Design Division Toolbox
or by using the keyin
vba run [TDOTDesignDivToolbox]DesignToolbox.Main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Design Toolbox**. The **TDOT Design Division Toolbox** dialog appears.



Step 2. Click on any command button to access the specified tool or any cell group description in the list provided to open that cell dialog.

TDOT Survey Project Workflow Toolbox

D&C location: Drafting Standards>Tools > Survey Toolbox

MicroStation VBA Program: SurveyProjectWorkFlowToolbox.mvba

Description:

This program\dialog provides access to many of the tools, commands and functions used most often by TDOT Survey personnel. It is an alternative to access of them through the Geopak Survey drop down menu and are presented in a work flow format as was shown on the Survey Operations dialog in Geopak 2001. The dialog includes the following categories: Project Control, Dataset Processing, Graphics Display, Coordinate Geometry & DTM Processing. When this vba program is started Geopak Survey is loaded and when the dialog is closed Geopak Survey and the vba is unloaded.

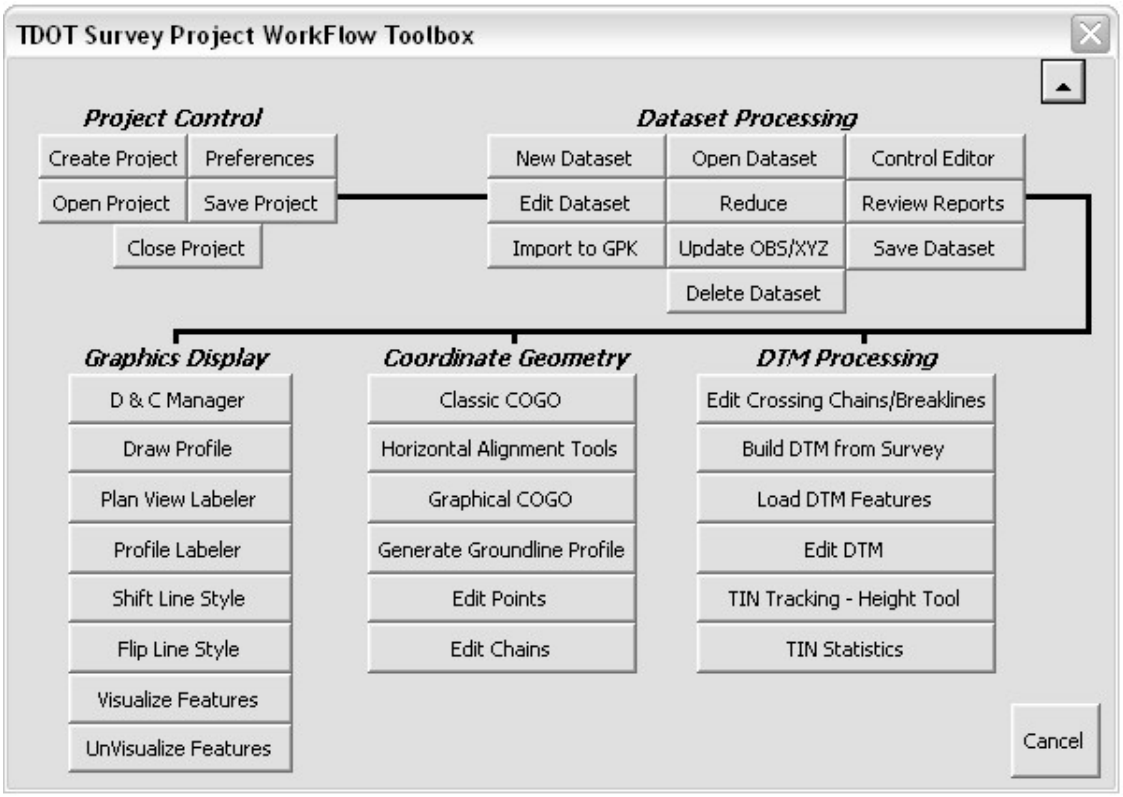
This program can also be activated from the MicroStation drop down menu
TDOT > Survey Project Workflow Toolbox
or by using the keyin
vba run [SurveyProjectWorkFlowToolbox]SurveyToolbox.main

Special Requirements:

Requires updated version of Geopak mdl program **survmain.ma** dated 2/1/2006 for use with Geopak version 08.05.02.35. Prior version of this mdl program created a vba interface error when Preferences were accessed from visual basic dialogs.

Usage:

Step 1. In D&C manager activate **Survey Toolbox**. The **TDOT Survey Project Workflow Toolbox** dialog appears.



Step 2. Click on any command button to access the specified tool.

Text Styles Plus

D&C location: Drafting Standards > Tools > Textstyles Plus

MicroStation VBA Program: TextstylesPlus.mvba

Description:

This program activates text styles and sets the active level, color and weight. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the text size in conjunction with the standard size associated with the text style. This includes all text styles except for those used on cross sections.

A command button is provided to access TDOT Design Division MicroStation Basic macro which is used to set any standard text size based on scale (command button: Alternate STD Text Size).

A command button is provided to access the Place Label with Leader Line vba program.

This program can also be activated from the MicroStation drop down menu
TDOT > Text Styles Plus…
or by using the keyin
vba run [TextstylesPlus]Textstyles.Main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Textstyles Plus**. The **Text Styles Plus** dialog appears.

Step 2. Check and reset the scale as needed. Click on any text style description in the dialog list to activate the text style and set the appropriate active level, color and weight.

Place Label with Leader Line

D&C location: Drafting Standards > Tools > LabelwithLeader

MicroStation VBA Program: PlaceLabel.mvba

Description:

This program places general labels with leader lines. Options include 1 or 2 lines of text, horizontal line and choice of terminators including arrowheads or a dot. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the terminator cell scale when included. Graphics are placed at the current active level, symbology & text parameters. All label graphics are combined in a graphic group for easy movement or deletion.

The most efficient use of this tool is in conjunction with the Text Style Plus vba program which will set the active level, symbology & text parameters. A command button is provided to access this program.

ALL options on the dialog can be adjusted on the fly as the label is placed.

This tool can be used without the placement of text to simply place a leader line. If a horizontal line is included without text then the length of the line is set at 10 character widths of the current text size.

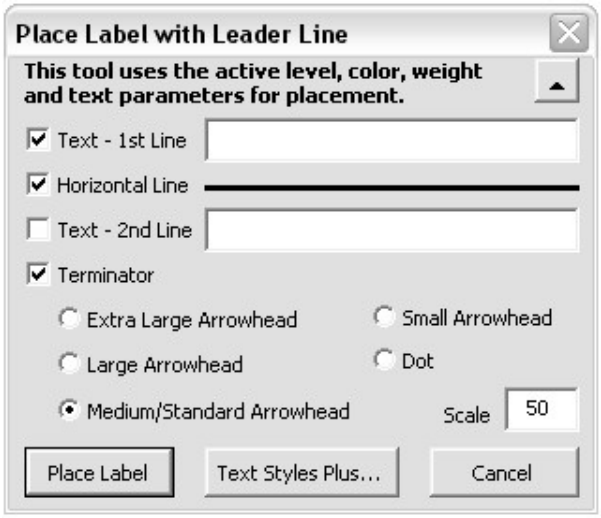
This program can also be activated from the MicroStation drop down menu
TDOT > Tools > Place Label with Leader
or by using the keyin
vba run [PlaceLabel]TDOTLabel.Main

Special Requirements:

None.

Usage:

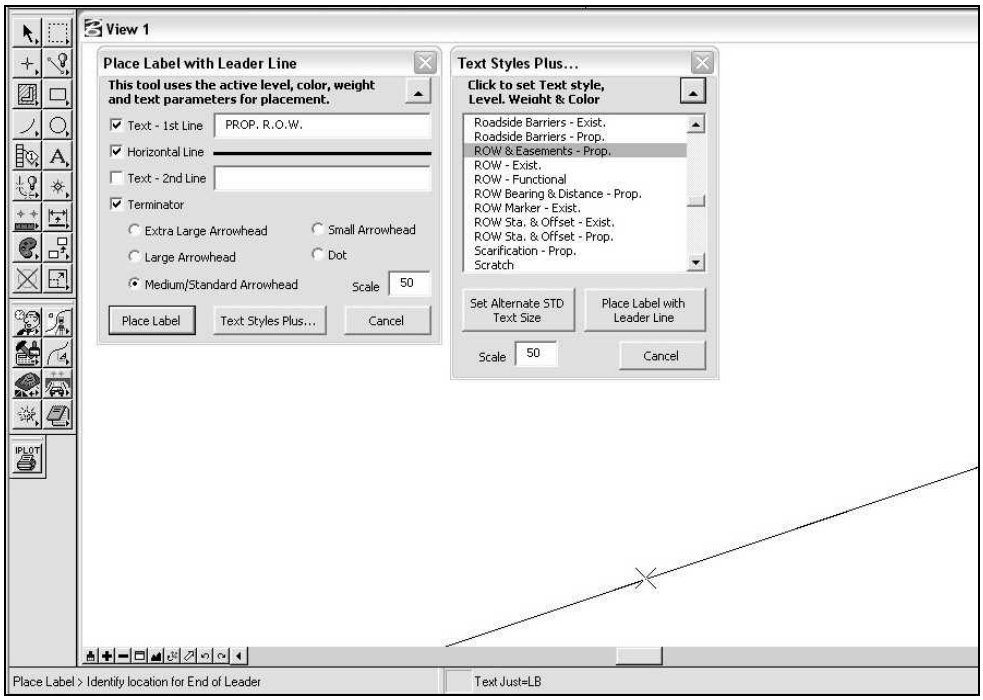
Step 1. In D&C manager activate **LabelwithLeader**. The **Place Label with Leader Line** dialog appears.



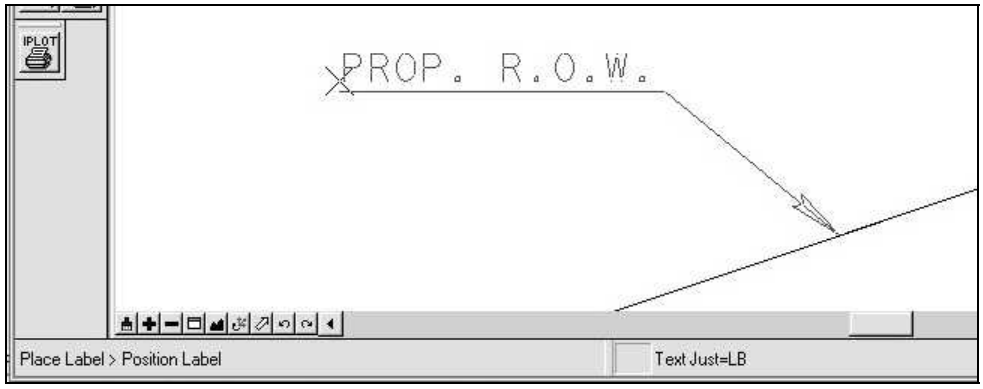
Step 2. In the Place Label with Leader Line dialog click on the desired options and keyin text for the label in the keyin fields provided. If a terminator is requested click on the desired type. Check and reset the scale as needed. Since this program uses the current active settings you may wish to start Text Styles Plus to control those.

When all settings are made click on the **Place Label** command button to start placement of the label.

Step 3. The user is first prompted to **Identify Location for End of Leader**.



Step 4. Once this point is given, a second point is required to position the label.



The label appears dynamically on the cursor as the user moves the mouse. If a horizontal line is included, the leader will jump to either end of the line. If no horizontal line is requested, the leader will jump to either end or above or below the text as the label is positioned. When a point is given the graphics are placed.

Label Station / Offset

D&C location: Drafting Standards > Tools> StaOffsetLabel

MicroStation VBA Program: StaOffLabel.mvba

Description:

This program places a station and offset label based on a data point, or a station and offset keyed in by the user. Options include title text, line separating station and offset, leader line and choice of terminator including arrowheads or a dot. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the terminator cell scale when included. Graphics are placed at the current active level, symbology & text parameters. All text and the divider line are combined in one graphic group and the leader and terminator combined in another. An ID button is provided for graphic selection of the chain to use.

The most efficient use of this tool is in conjunction with the Text Styles Plus vba program which will set the active level, symbology & text parameters. A command button is provided to access this program.

This tool can be used simply as a horizontal alignment tracking device with dynamic mode without placing labels.

After using this tool, the job number and chain name are remembered and will be used to populate those fields when the dialog is opened again as long as the previously defined job number is found in the current active folder.

Metric application includes both metric & English measurements.

This program can also be activated from the MicroStation drop down menu
TDOT > Tools> Place Station Offset Label
or by using the keyin
vba run [StaOffLabel]StationOffset.main

Special Requirements:

Chain that station and offset are measured from must be stored in a Geopak GPK file in the folder where the DGN file resides.

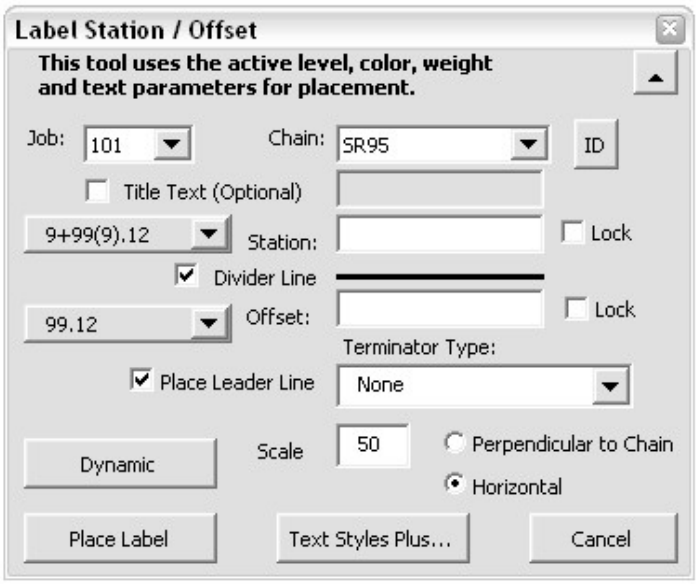
The **ID Chain** function uses a special VBA reference to program **GetCogoElement.mvba** which was provided by Bentley and must be present with the program for it to function.

Set level, symbology and text size for label using Text Styles Plus or manual methods prior to use.

Usage: User Key-In Method

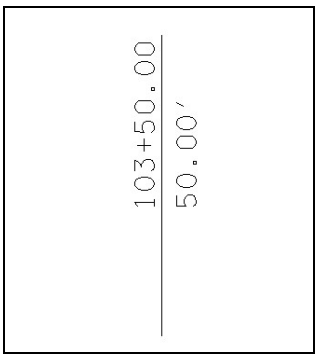
Step 1. In D&C manager activate **StaOffsetLabel**. The **Label Station/Offset** dialog appears.

All Geopak jobs found within the current active folder are listed in the Job drop down box. The dialog defaults to no title text or terminator, and placing the divider line.

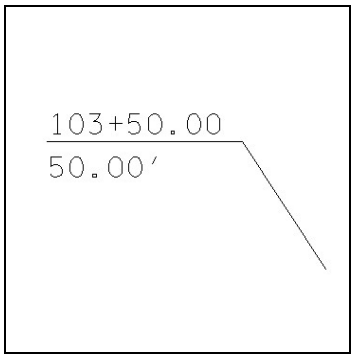


Step 2. After selecting the Geopak **Job** number, the **Chain** drop down is populated with all chains stored in the job. Select the chain to use for labeling. If you do not know the chain name but have chain graphics, the **ID** button can be used to select the chain.

Check the box next to title text and key in a title if desired. The title will only be placed if the Title Text box is checked. Uncheck the divider line or leader line if either is unneeded. Select whether you would like the label to be placed perpendicular to the chain or horizontal with the view. The diagrams below show how each will appear.



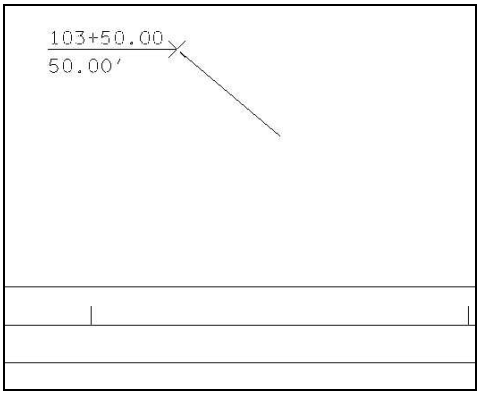
Perpendicular to Chain



Horizontal with View

Note: Any or all of the placement options can be changed on the fly, but changing the Job number or Chain name stops the labeling process.

Step 3. Key in a station value and offset value, use a negative offset value to indicate left of the centerline. Stations may be entered with or without a "+". After keying in the values, move the cursor off the dialog to identify the location of the label. If Place Leader is checked, the end of the line will be at the station and offset entered, and the label moves dynamically with the cursor. Data point to place the label in the desired location or reset to stop placement.

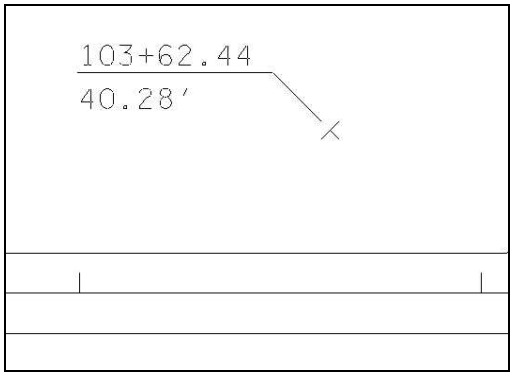


If at the time of placement you find it necessary to access other MicroStation commands, label placement can be re-started by clicking on the **Place Label** button.

Usage: Dynamic Method

Step 1. Set job number, chain name and placement options as described previously in Steps 1 and 2 under User Key-In Method

Step 2. Click the **Dynamic** button to initiate the dynamic placement mode. Move the cursor off the dialog and a temporary label will follow the cursor with the station and offset values changing dynamically on the screen and within the dialog's text boxes as the cursor moves along the specified chain.



Snapping to a point in the DGN file will pause the dynamic mode. Reset after a snap to resume the dynamic mode. After snapping to a point, edit the station and/or offset if desired in the dialog text boxes. Editing the text will lock the respective value. If the station is locked, but offset is not, the temporary label will then only move perpendicular to the chain at that station. If the offset is locked, and the station is not, the temporary label will only move along the chain at that offset.

Notes:

If either the station or offset are known prior to placement, set the value first and then start dynamic mode.

If the cursor moves to a point off the chain the label will disappear and the dialog text boxes will display the last available station and offset.

If both station and offset are locked the mode will switch to the place label mode as described in User Key-In Method Step 3.

Step 3. Once the station and offset are set in any of the ways described in the previous step, data point to initiate label placement. After the label is positioned correctly, data point again to place the label.

Data Point Profile Station Elevation

D&C location: Drafting Standards > Tools> DP Sta Elev

MicroStation VBA Program: DPprofile.mvba

Description:

'This program was primarily designed to issue a data point based on a station and elevation on the profile. Chain, reference datum, and other profile information are attained when the user selects the Geopak profile cell. The Geopak profile cell must be identified first before any tools are used. This program also includes options to dynamically track station and elevation values on the profile and to place labels for them.

Dynamic tracking options include dynamic graphic label, station lock and elevation lock. Locks allow dynamic tracking on just station or elevation.

Geopak accuracy format controls are provided for station and elevation. These control values placed with labels and when using the dynamic tracking function.

When placing labels, the current active element symbology and text settings are used to control all aspects of the labels which are placed. For this reason, a command button is provided to access the Text Styles Plus program to aide in making these settings. The length of the leader line which is placed with the labels is controlled dynamically by the user. Annotation may be placed above or below the profile point being labeled.

This tool stores the current location of the dialog in the file **C:\Temp\MVBA_FormStorage.log** when the dialog is closed. When opened later it uses this information to bring up the dialog on the screen where you last used it.

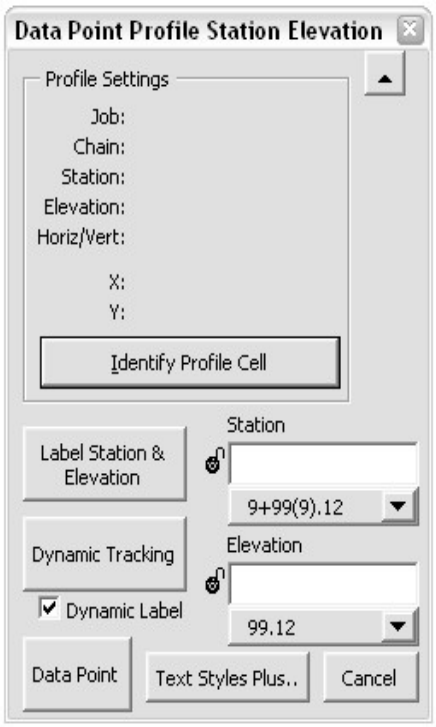
This program can also be activated from the MicroStation drop down menu
TDOT > Profiles> DP Profile Sta Elev w/Tracking
or by using the keyin
vba run [DPprofile]DataPointonProfile.main

Special Requirements:

A Geopak profile cell must be present.

Usage: Send Profile Data Point

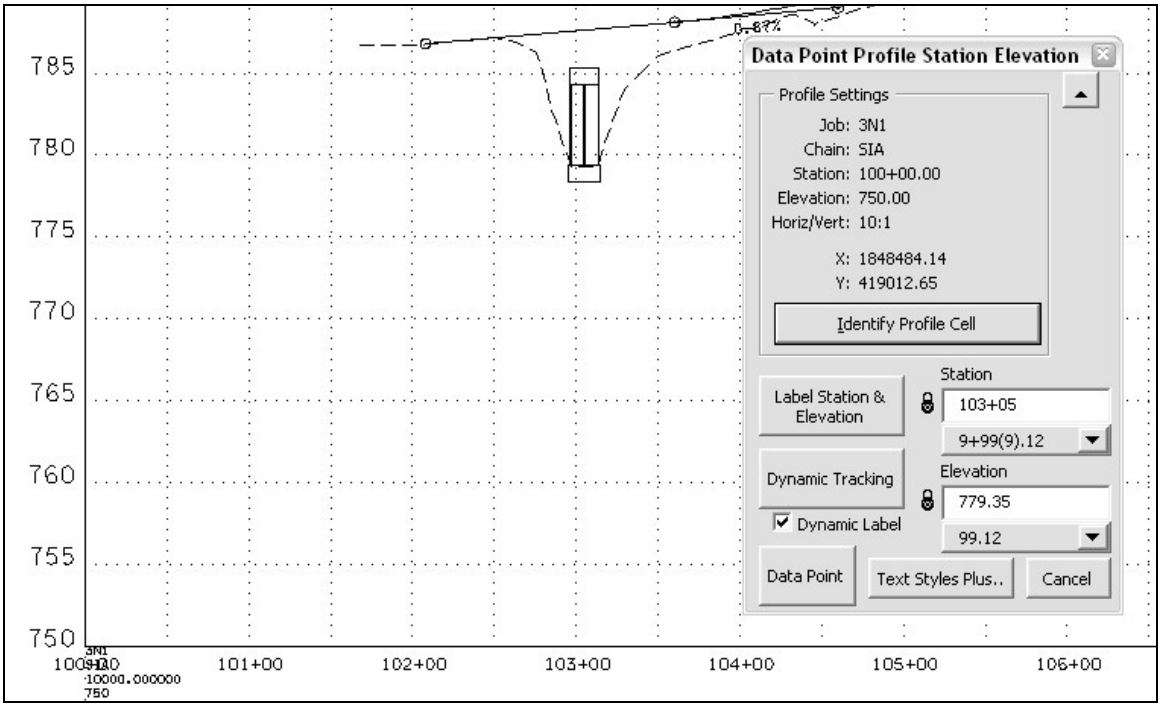
Step 1. In D&C manager activate **DP Sta Elev**. The **Data Point Profile Station Elevation** dialog appears.



Step 2. Click on the **Identify Profile Cell** command button and data point on the Geopak profile cell for the profile. The window shade button on the upper right of the dialog can be used to get the dialog out of the way as you identify the profile cell. Just click it again to re-expand the dialog after identifying the cell.

Step 3. Key in the **Station** and **Elevation** values where you wish for a data point to be sent. After keying in the values, click on the **Data Point** command button to send the point.

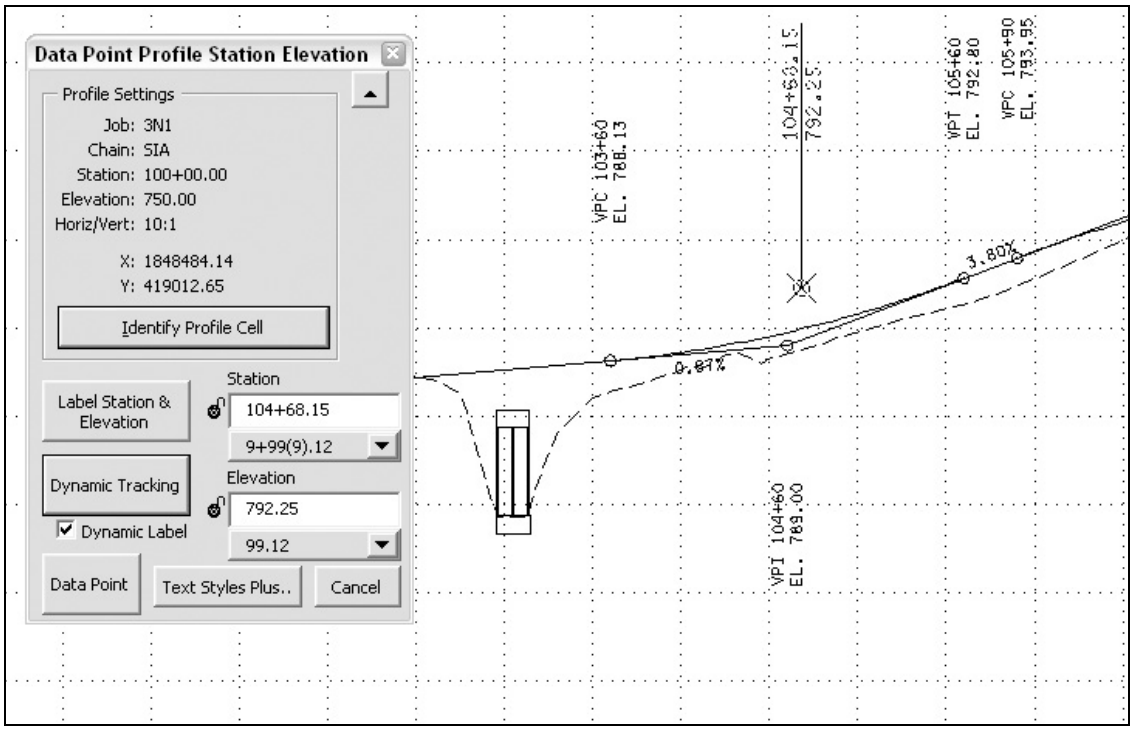
In the example shown below we needed to place a box culvert at station 103+05 and elevation 779.35. After making the desired settings in the box culvert tool, the user is prompted to "Identify Flow Line Location at Center". Rather than just data pointing or graphically locating this location, the **Data Point Profile Station Elevation** tool allows you to set the point by the known station and elevation at the centerline.



Usage: Dynamic Tracking

Step 1. Start the program and identify the Geopak profile cell as described previously in Steps 1 and 2 under Send Profile Data Point

Step 2. Click the **Dynamic Tracking** button to start the tracking mode. Move the cursor off the dialog and a temporary label will follow the cursor with the station and elevation values changing dynamically on the screen and within the dialog's text boxes as the cursor moves across the profile.



Snapping to a point in the DGN file will pause the dynamic mode. After snapping to a point, edit the station or elevation if desired in the dialog text boxes. Editing the text will lock the respective value. Click the **Dynamic Tracking** button to restart the tracking mode.

If either the station or elevation are known, set that value first and then start dynamic tracking.

Use the Geopak accuracy format controls below the station and elevation text fields on the dialog to control the decimal values which are shown.

The lock symbols can be clicked at any time to lock or un-lock the station or elevation values. If the station is locked, but elevation is not, the temporary label will then only move up & down on the profile at that station. If the elevation is locked, and the station is not, the temporary label will only move along the profile at that elevation

Usage: Placing Station & Elevation Labels

Step 1. Start the program and identify the Geopak profile cell as described previously in Steps 1 and 2 under Send Profile Data Point

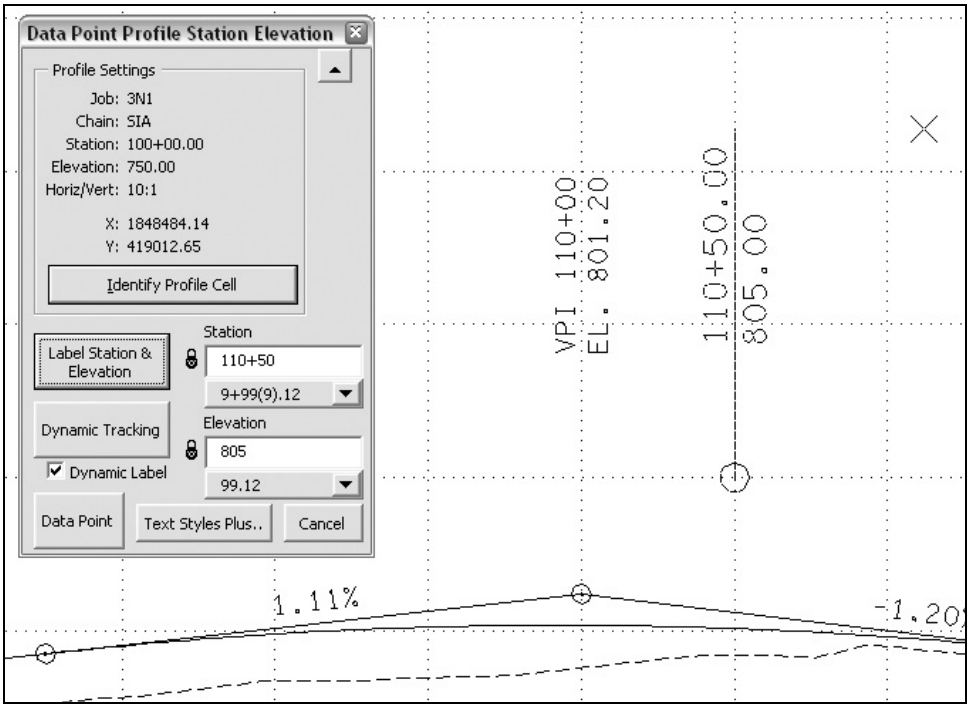
Step 2. Make MicroStation symbology and text settings, manually or by clicking the **Text Styles Plus…** command button to choose from the standard TDOT Design Division tezxt styles and set the appropriate level and weight as well.

Step 3. In the Data Point Profile Station Elevation dialog, either key in a known station and elevation or click the **Dynamic Tracking** button to start the tracking mode.

Step 4. If the station and elevation were keyed in click the **Label Station & Elevation** command button to start label placement.

If using the Dynamic Tracking mode, data point at any time while tracking to start label placement.

Step 5. The user is prompted to **Lidentify End for Leader**. Move the cursor up and down to set the length of the leader line and to place the label above or below the point being labeled. Data point to set and place the label.



The Geopak accuracy format controls below the station and elevation text fields on the dialog control the decimal values which are shown in labels.

Place Arrowhead

D&C location: Drafting Standards > Tools > Arrowheads

MicroStation VBA Program: PlaceArrowHead.mvba

Description:

This program places arrowhead cells. Option for small, medium(standard), large or extra large arrowhead is given. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of arrowhead cells.

The Place as Terminator command button can be used to place the chosen arrowhead as a terminator cell. Clicking this button starts MicroStation's Place Terminator command but note that when this command is used arrowheads are placed on the level and with the symbology as they were created (level 1, color 0).

A command button is provided to reset the active scale and the terminator scale. When a new scale value is entered in the scale keyin field that scale is automatically used for the cell placement with Place by 2 Points but does not automatically reset the files current active scales. If you wish to do so just click on the Set Scale button on the dialog. This was set up in this way so that users could adjust the scale of arrowheads on the fly without changing the current scales.

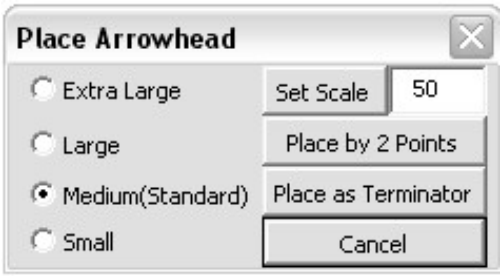
This program can also be activated from the MicroStation drop down menu
TDOT >Tools > Place Arrowhead
or by using the keyin
vba run [PlaceArrowHead]Arrowhead.main

Special Requirements:

None.

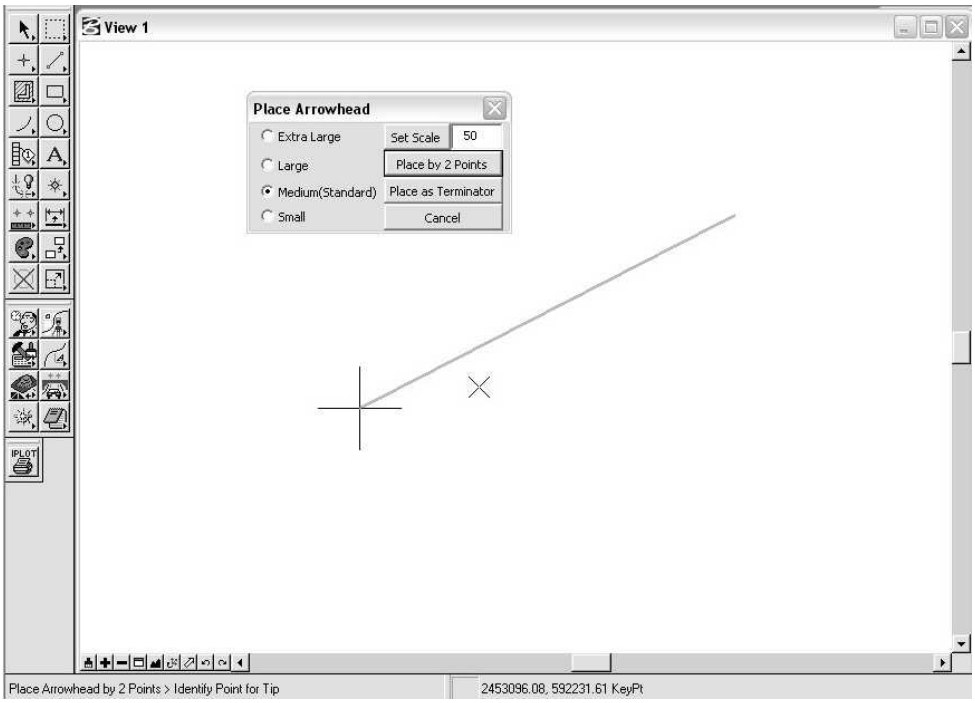
Usage:

Step 1. In D&C manager activate **Arrowheads**. The **Place Arrowhead** dialog appears.

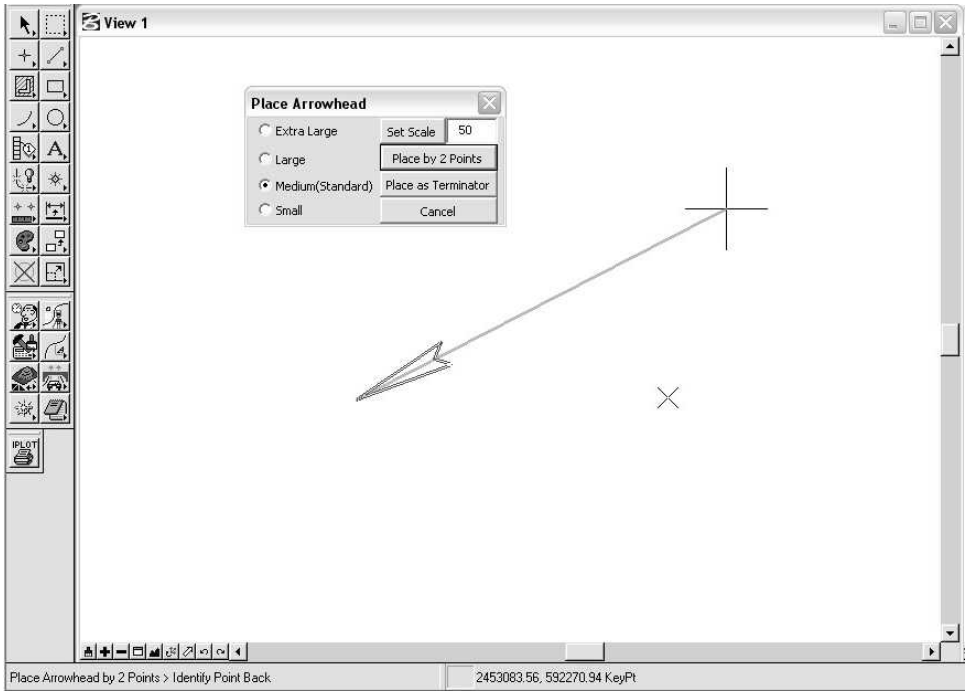


Step 2. Choose the type of arrowhead and check the scale. Then click on the **Place by 2 Points** command button to start placement of the arrowhead.

Step 3. The user is first prompted to **Identify Point for Tip**.



Step 4. Once this point is given, a point back is requested to set the angle of the arrowhead.



The cell is placed at the current active level & symbology. Scale or choice of arrowhead can be changed in the dialog during arrowhead placement. Level & symbology can be changed on the fly as well.

Rotate Element To Horizontal

D&C location: Drafting Standards > Tools > RotateToHoriz

MicroStation VBA Program: RotateElementHorizontal.mvba

Description:

This program rotates elements horizontal to the view. It is normally used for clean up of notes, labels etc. to appear horizontal on plan sheets.

This program supports the following element types: lines, line strings, shapes, text, text nodes, ellipses, arcs, cells, shared cells, shared cell definitions, tags, cones.

For line strings and shapes the nearest segment is used to control the angle. For these elements as well as lines the smallest angle of rotation is utilized.

If the chosen element is a in a graphic group and the graphic group lock is on then the rotation from the element chosen is applied to all members of the group.

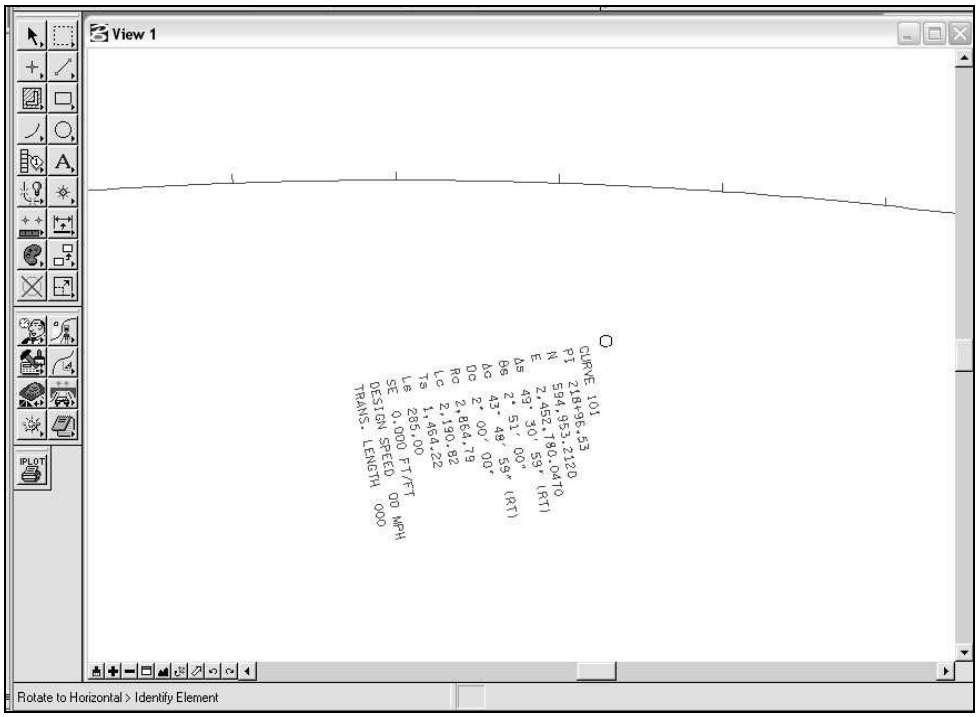
This program can also be activated from the MicroStation drop down menu
TDOT > Tools > Rotate Element To Horizontal
or by using the keyin
vba run [RotateElementHorizontal]RotateElementHoriz.Main

Special Requirements:

None.

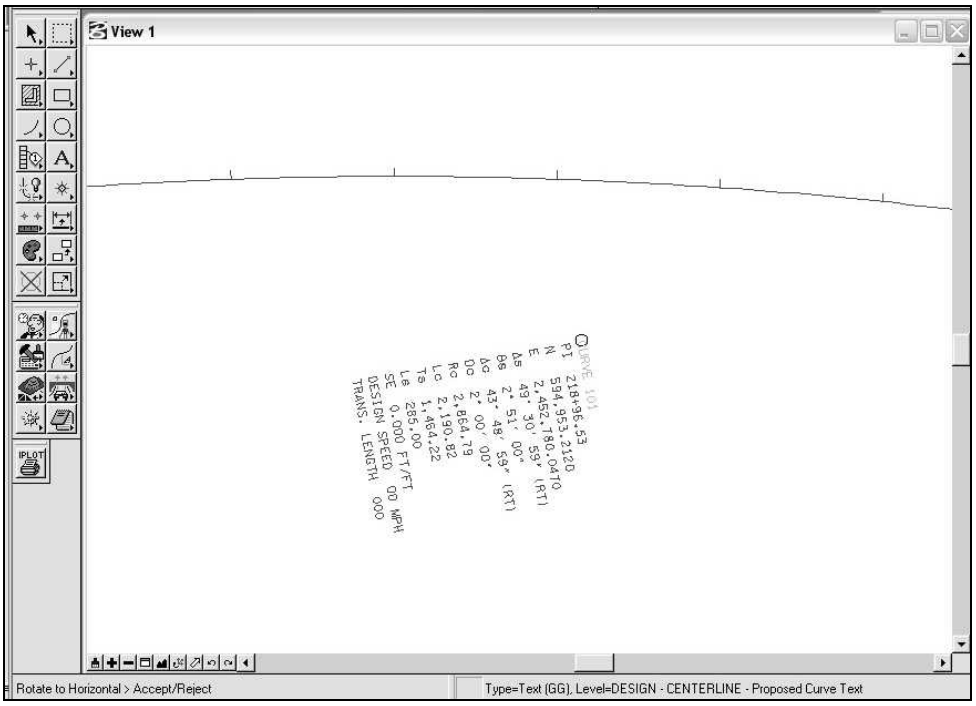
Usage:

Step 1. In D&C manager activate **RotateToHoriz**. When the command is started the user is prompted to **Identify Element**.

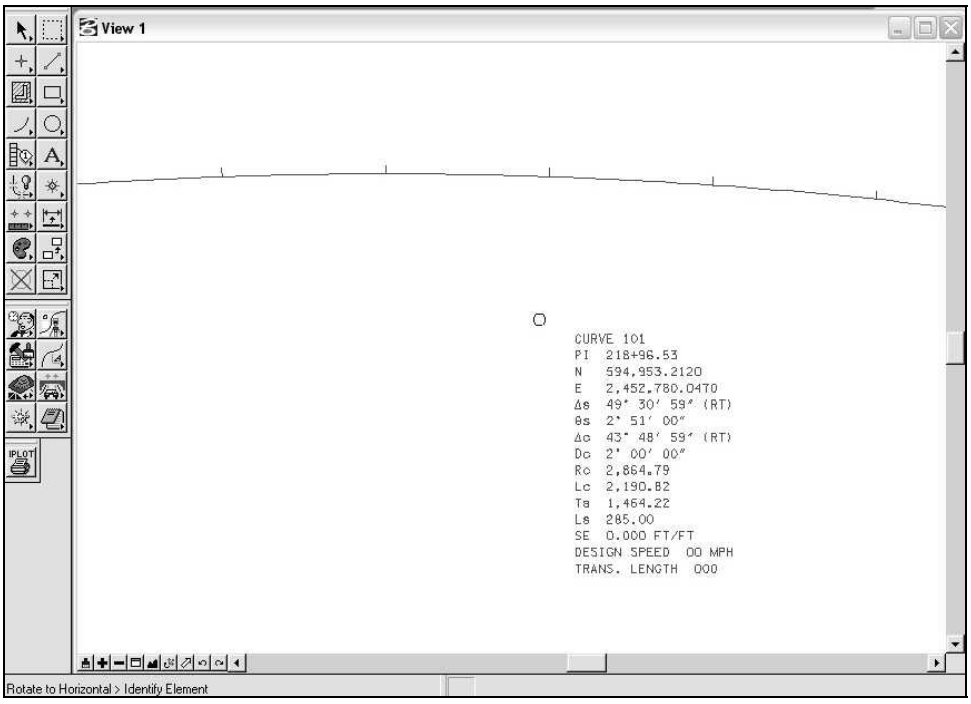


In this example we will use the tool to rotate a set of cure data to be horizontal on the plan sheet. To rotate all of the text at once the graphic group lock is turned on. This lock setting can be changed while using the command.

Step 2. When the top line of text is identified with a data point you are prompted to **Accept\Reject**.



Step 3. When the accept data point is given the curve data is rotated to horizontal.



Rotate Fence\Selection Set Horizontal

D&C location: Drafting Standards > Tools > RotateFencHoriz

MicroStation VBA Program: RotateFenceContentsHorizontal.mvba

Description:

This program rotates the contents of a fence or selection set horizontal to the view based on 2 points which define the desired horizontal. It is normally used to rotate groups of elements to appear horizontal on plan sheets.

This is an alternative to the Rotate Element to Horizontal vba program for groups of un-associated elements as well as for element types not supported by that command.

This program can also be activated from the MicroStation drop down menu
TDOT > Tools > Rotate Fence\SS Horizontal
or by using the keyin
vba run [RotateFenceContentsHorizontal]RotateFenceContentsHoriz.Main

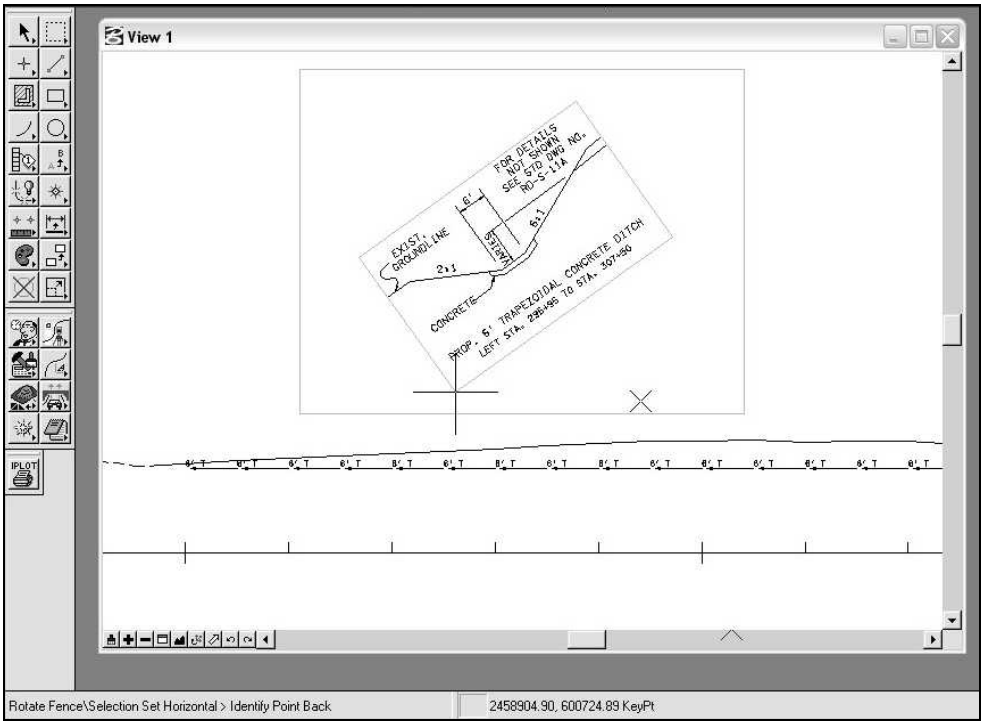
Special Requirements:

A fence or selection set must be active at the time the command is accessed. If both are present then the fence is processed.

Usage:

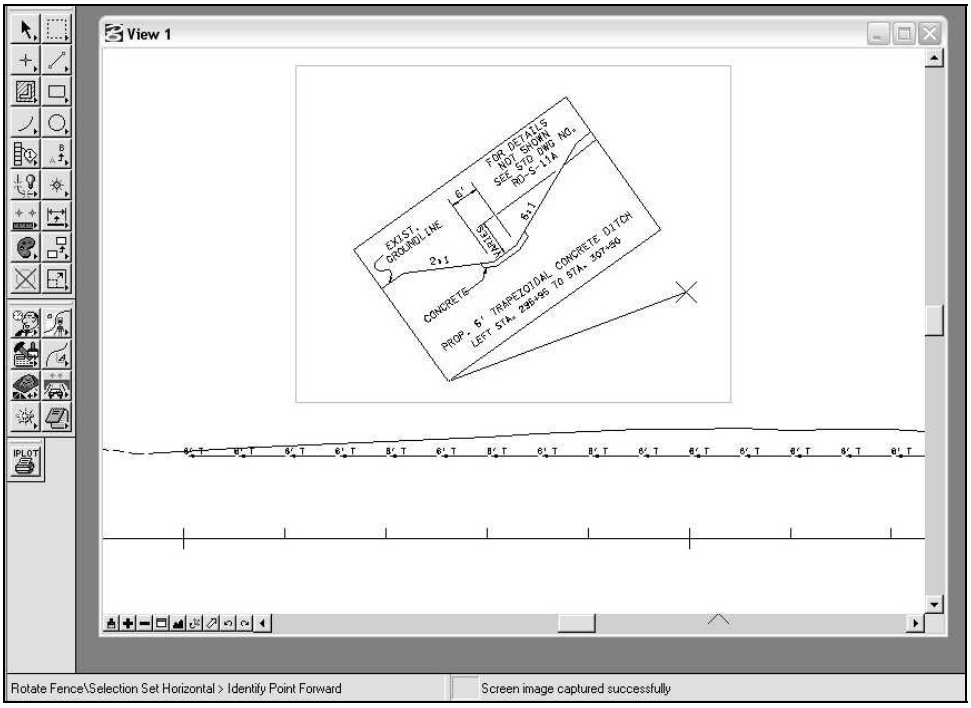
Step 1. Place a fence around the elements to be rotated or add them to a selection set. Current fence settings such as inside, overlap, etc. are used so set as needed.

Step 2. In D&C manager activate **RotateFencHoriz**. When the command is started the user is first prompted to **Identify Point Back**. This point will define the left end of an imaginary line you desire to be horizontal when the rotation is complete.

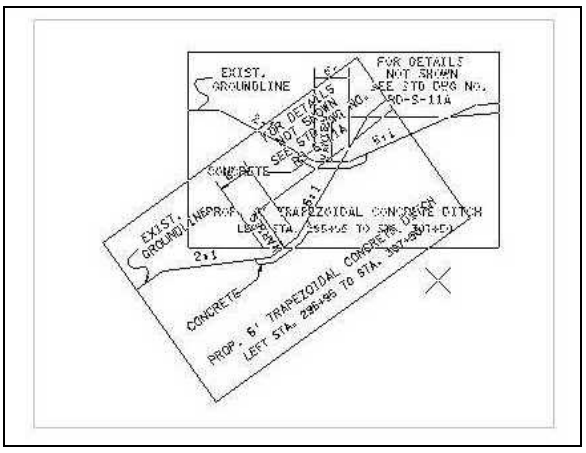


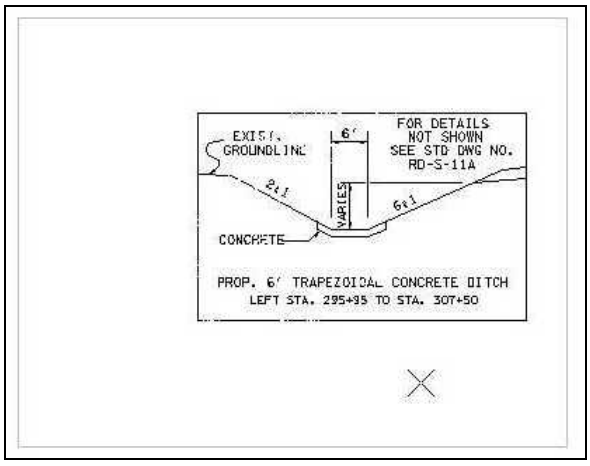
In this example we are rotating a special ditch detail originally set up on another sheet.

Step 2. After giving the point back you are prompted to **Identify Point Forward**. A temporary line is dynamically shown to aide in setting this final point of your desired horizontal.



Step 3. Once the desired horizontal is set you are prompted to **Identify Rotation Point**. Graphics are dynamically shown rotated so this final point can be used to position graphics. After the final point is given, graphics are rotated.





Calculate & Label Slope

D&C location: Drafting Standards > Tools > Slope Tool

MicroStation VBA Program: SlopeCalculater.mvba

Description:

Calculates slopes based on 2 points and if desired will place a label for the slope. Slope is shown in the dialog in the 3 standard formats: cross slope, percent grade & side slope. Slope label graphics are placed at the current active level, symbology & text parameters.

The Label Type option controls the format which is used when the Place Label command button is clicked. Includes an entry field for Profile Exaggeration to control how slopes are calculated when used on profiles. Command buttons are provided to access the Text Styles Plus & XS Text Styles Plus vba programs which will set the active level, symbology & text parameters. .

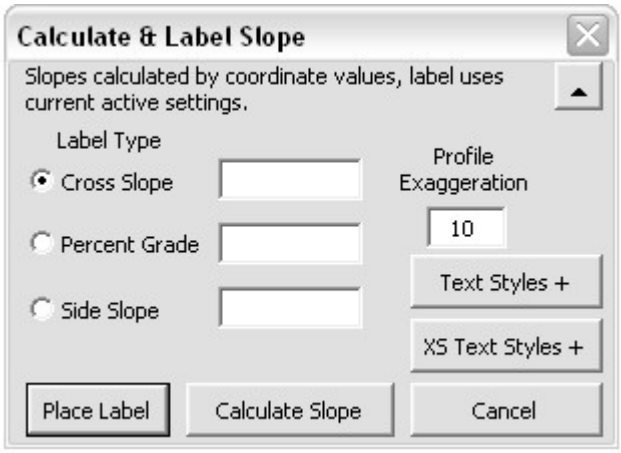
This program can also be activated from the MicroStation drop down menu
TDOT >Tools > Calculate & Label Slope
or by using the keyin
vba run [SlopeCalculater]SlopeToolStart.main

Special Requirements:

Set level, symbology and text size for label using Text Styles Plus, XS Text Styles Plus or manual methods.

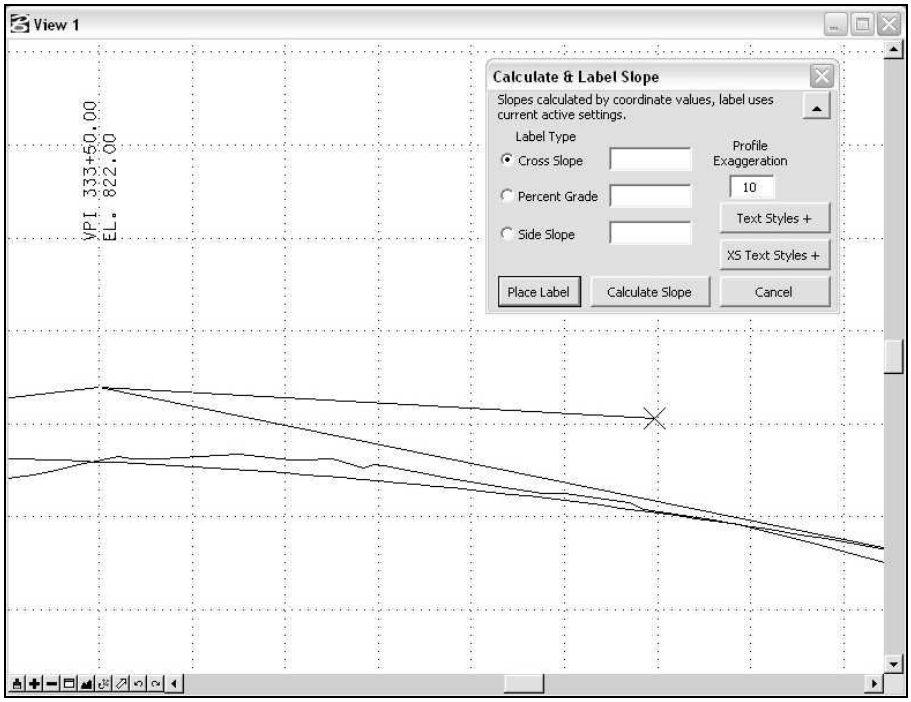
Usage:

Step 1. In D&C manager activate **Slope Tool**. The **Calculate & Label Slope** dialog appears.

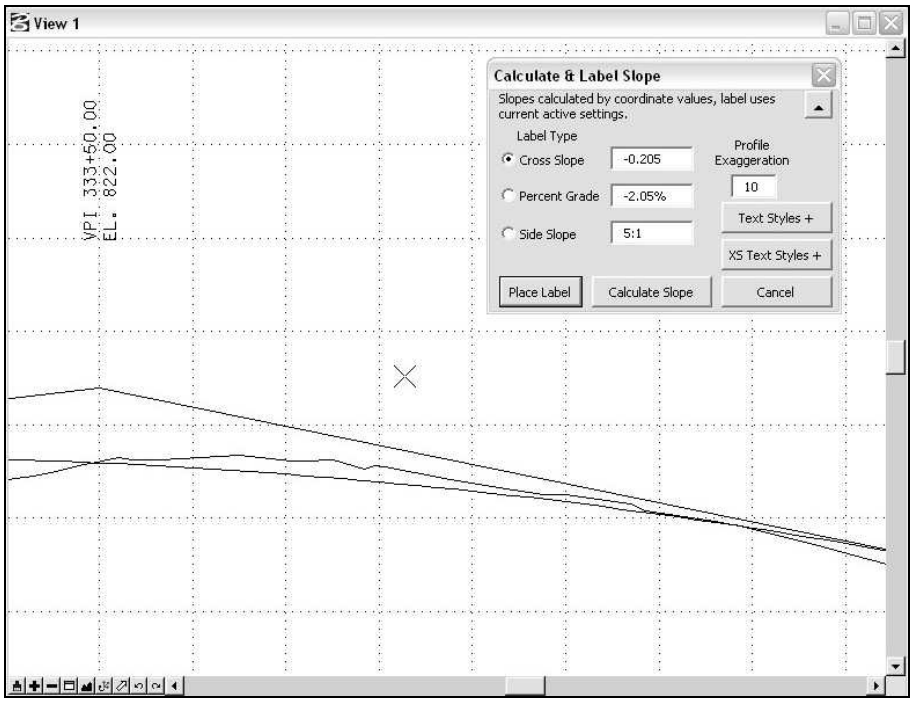


Step 2. As soon as the dialog opens the slope calculator starts and the user is prompted to **Identify Begin Point**. Data point or snap and data point on the end of an element as needed to mark the beginning of the slope you wish to calculate. If you are calculating on a profile, make sure the **Profile Exaggeration** is set correctly. The normal exaggeration of 10 is specified by default.

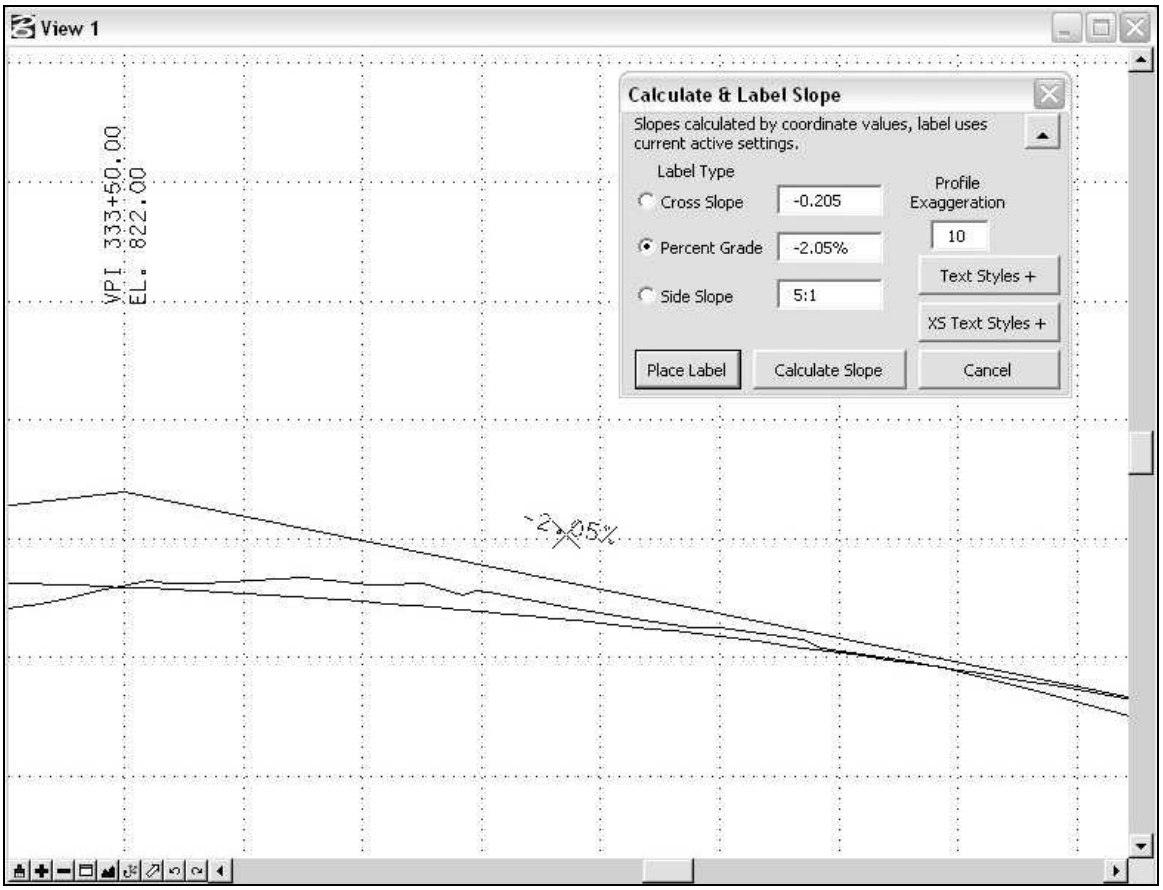
Step 3. After giving the beginning point the user is then prompted to **Identify End Point**. A temporary line is shown dynamically to indicate the slope that is being measured.



Step 4. After the end point is given the dialog is populated with the slope in its different formats and the calculator again prompts the user for a new begin point to continue calculating slopes.



Step 5. To label the slope, click on the desired **Label Type** option and click the **Place Label** command button. The text appears on the cursor point and the user is prompted to **Identify location for text**.



After the text location point is given, the text remains available for additional placements as needed. A reset will stop text placement and restart the slope calculator.

When other tools are accessed, the **Calculate Slope** command button can be clicked to restart the slope calculator.

DGN Batch Text Editor

D&C location: Drafting Standards > Tools > Batch Text Edit

MicroStation VBA Program: BatchTextEditor.mvba

Description:

This program looks for the specified text string in the selected DGN files and changes it to the new text string given. It uses the MicroStation Find/Replace text tool to make the changes. Match Case and Edit Text in Cells is enabled. No confirmation is offered and all changes are automatically done so it is critical that a full example of the text string is provided to avoid changing the wrong text. This tool was specifically created to edit project numbers when they change but can be used to edit any text string in multiple DGN files.

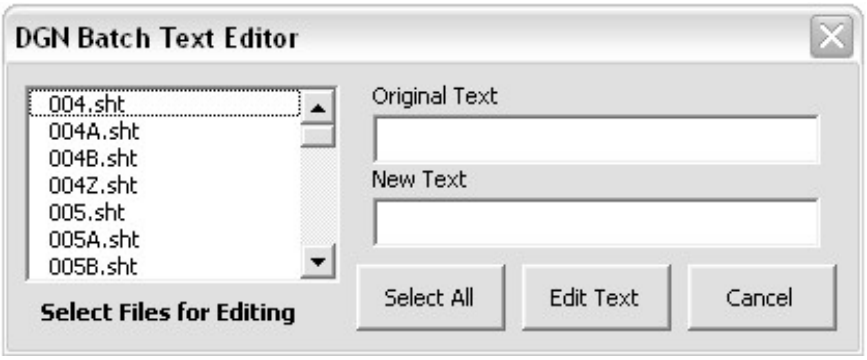
This program can also be activated from the MicroStation drop down menu
TDOT >DGN Batch Text Editor
or by using the keyin
vba run [BatchTextEditor]EditTexttStart.main

Special Requirements:

None.

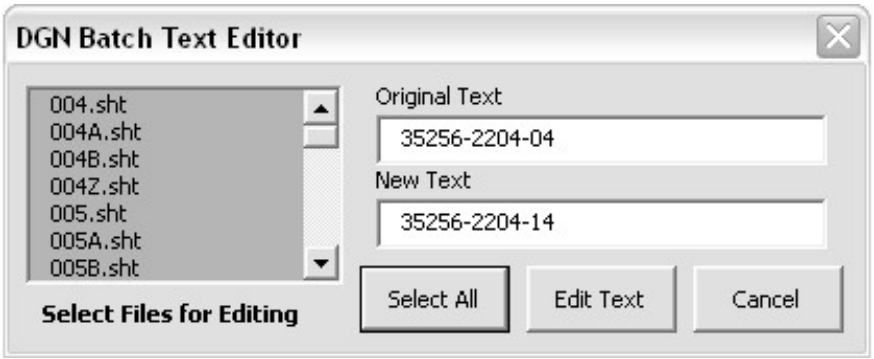
Usage:

Step 1. In D&C manager activate **Batch Text Edit**. The **DGN Batch Text Editor** dialog appears.



Step 2. In the keyin fields provided, enter the **Original Text** and the **New Text**.

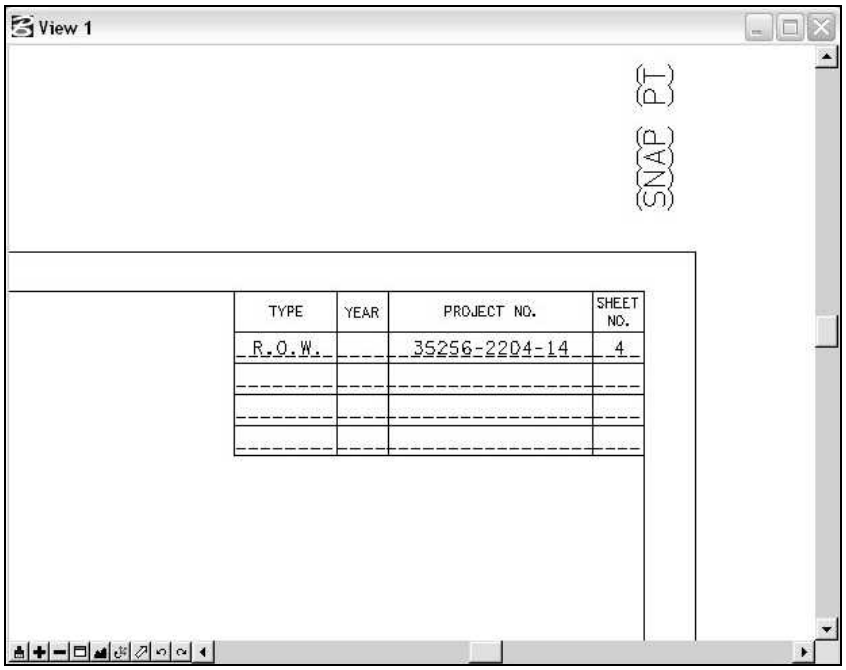
Step 3. Using standard Windows selection techniques select the files you wish to edit text in or just click the **Select All** command button to select all files.



Step 4. Click on the **Edit Text** command button to start edits. Each file is opened and MicroStation's Find/Replace Text tool is used to make the changes.

When the last file is processed a completion message is displayed. Click **OK** to dismiss the message.

A review of the files will show that the text has been changed.



Place North Arrow

D&C location: Drafting Standards > Tools > North Arrow

MicroStation VBA Program: PlaceNorthArrow.mvba

Description:

This program places the standard north arrow cell at true north.

Current active angle and view rotation are ignored by program to maintain true north orientation of cell.

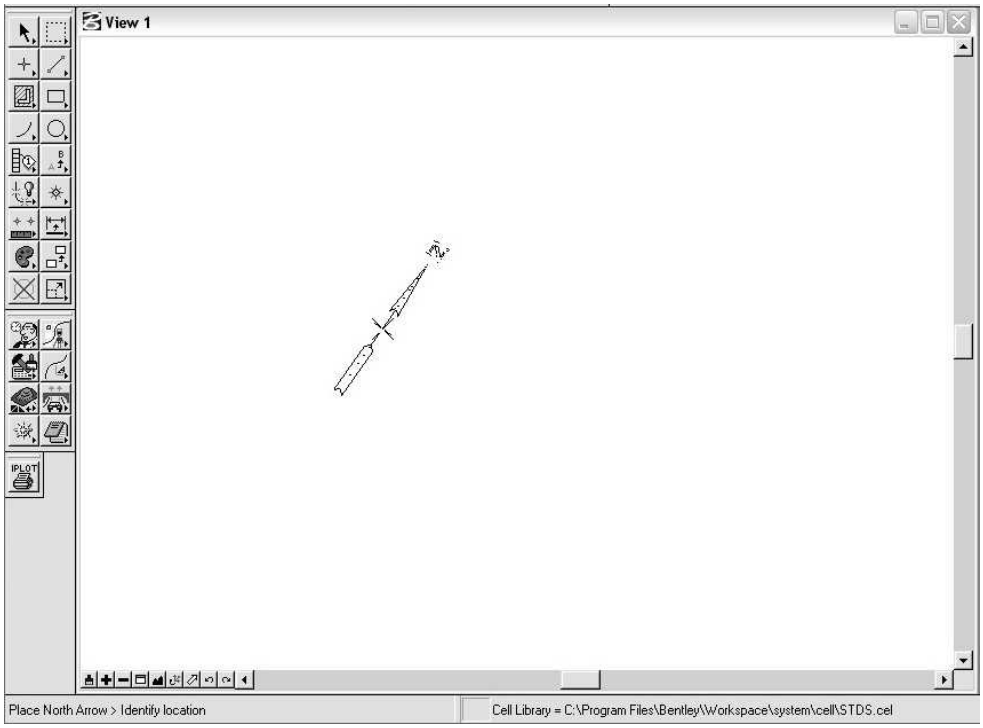
This program can also be activated from the MicroStation drop down menu
TDOT > Tools > Place North Arrow
or by using the keyin
vba run [PlaceNorthArrow]NorthArrow.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **North Arrow**. After starting the command the north arrow cell is activated and the user is prompted to **Identify Location**.



Step 2. A data point places the cell in the location given and the cell remains active for additional placements as needed. A reset will de-activate the cell and end exit the program.

Set Text Parameters by Active Scale

D&C location: Drafting Standards > Tools > Set Text

MicroStation VBA Program: SetTextParametersAS.mvba

Description:

This program sets active text size, weight, and line spacing based on the active scale and the text size desired when plotted. The user given plot scale is used to set the active scale.

To avoid problems when placing text, the text node lock is turned off and line length is set to 255. This program can be utilized at any time during text placement.

This tool is best used after picking a standard text style from the program, Text Styles Plus, which will set the appropriate level and color for the text.

Program is set up for use on English or Metric projects

This macro can also be activated from the MicroStation drop down menu
TDOT > Text Parameters by Active Scale
or by using the keyin
vba run [SetTextParametersAS]Settext.main

Special Requirements:

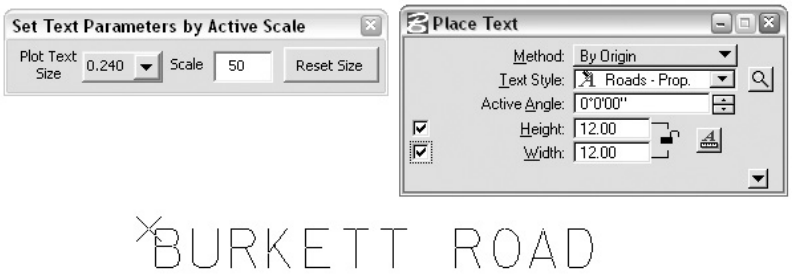
Make MicroStation element symbology settings manually or with pprogram, **Text Styles Plus**, which will set the appropriate level and color for the text.

Usage:

Step 1. In D&C manager activate **Set Text**. The **Set Text Parameters by Active Scale** dialog appears. The Scale value is read from the active scale currently set in the design file.

Step 2. Set **Scale** to an alternate value if needed. If changed this will reset the active scale in the file. **This should be set to the scale at which the text graphics are to be plotted.**

Step 3. Choose the **Plot Text Size** desired from the standard text size list. Text parameters are immediately set in the file based on the dialog settings. Any MicroStation text command can now be used to place text.



When text parameters are manually altered, the **Reset Size** command button can be clicked to reset all text parameters for the current selection on the dialog.

Measure Area & Annotate

D&C location: Drafting Standards > Tools > AnnotateArea

MicroStation VBA Program: MeasureAreaandAnnotate.mvba

Description:

This program places text reflecting the most recent values generated by the measure area command. Area text is given in square feet & acres for English files and in metric files it is given in square meters, square feet, hectares & acres. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the text size.

For the user's convenience, a command button is provided for MicroStation's Measure Area command. If other commands are used after the initial start of this program the user can use this command button to go back to measuring areas.

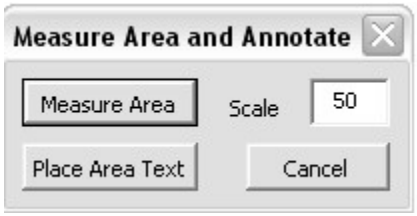
This program can also be activated from the MicroStation drop down menu
TDOT > Tools > Measure Area & Annotate
or by using the keyin
vba run [MeasureAreaandAnnotate]AnnotateArea.main

Special Requirements:

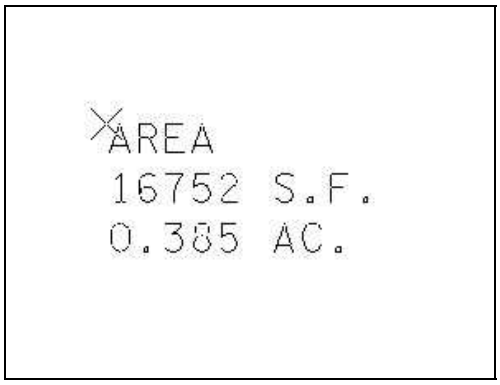
None.

Usage:

Step 1. In D&C manager activate **AnnotateArea**. When the command is first started MicroStation's Measure Area command is invoked and the **Measure Area & Annotate** dialog is displayed. Measure any area as needed.



Step 2. In the Measure Area & Annotate dialog check the scale and then click on the **Place Area Text** command button. The area text will appear on your cursor and you are prompted to **Identify Location** to place the text.



After this point is given the Measure Area command is re-started so that the user can measure another area.

Move Raster by Datum Adjustment Factor

D&C location: Drafting Standards > Tools > Move Raster

MicroStation Basic Program: moveraster.ba

Description:
This application moves the active raster attachment by a user given datum adjustment factor.

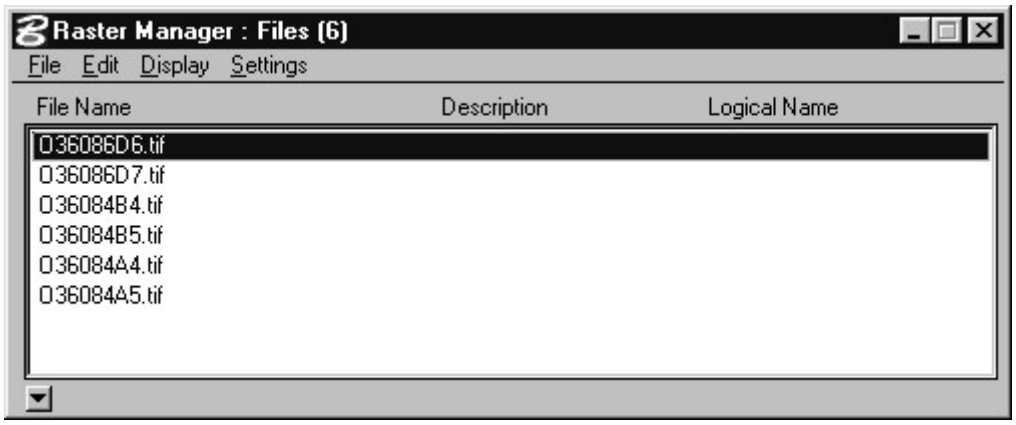
Raster images which are geo-referenced to the Tennessee state plane coordinates will come near our projects but due to the datum adjustment factor on coordinates they will usually be off some. This program will take that value and move the raster attachment to align properly with project data.

This macro can also be activated from the MicroStation drop down menu
TDOT > Raster – Move by Datum Adjust
or by using the keyin
macro moveraster.

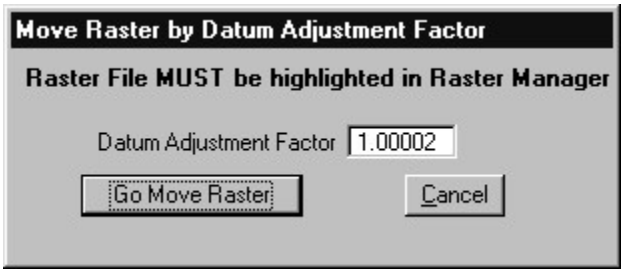
Special Requirements:
Raster Manager must be open with the raster image to be moved highlighted in the dialog.

Usage:

Step 1. In MicroStation activate **File>Raster Manager**. Highlight the attachment to be moved.

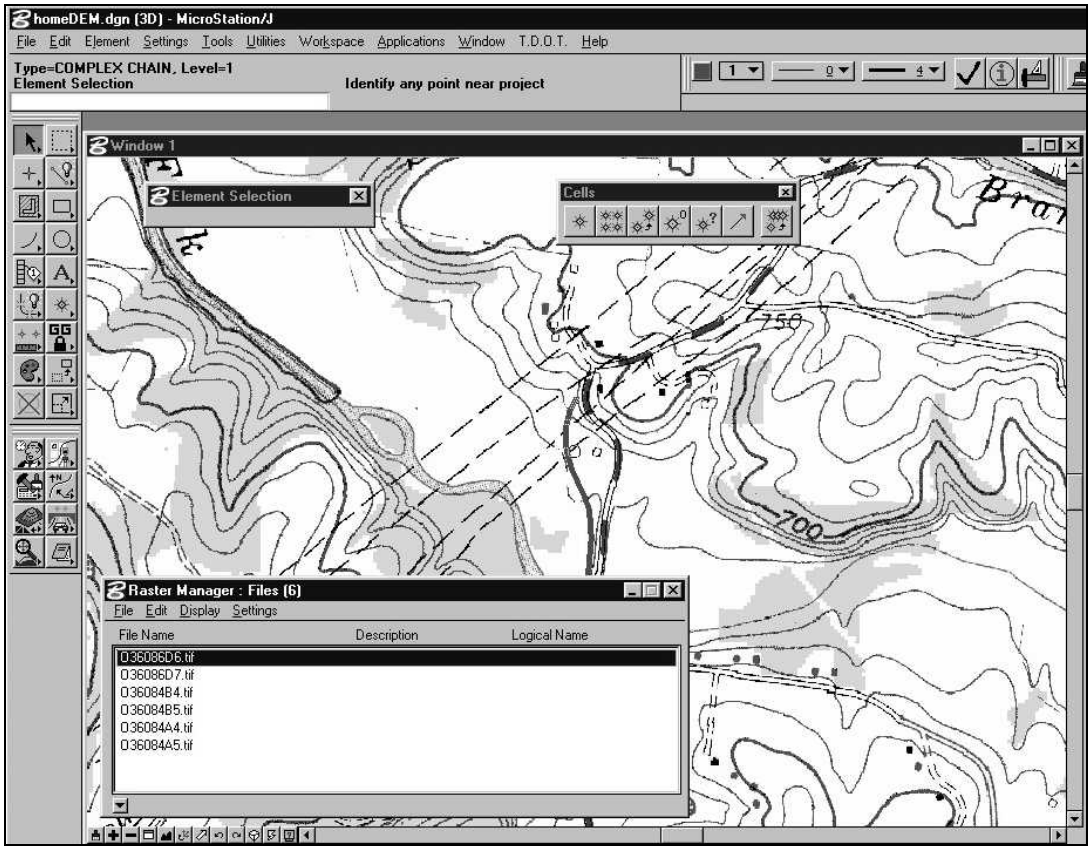


Step 2. In D&C manager activate **Move Raster**. Keyin the datum adjustment factor for the project area. Once that is set click on **Go Move Raster**.



Step 3. The user is then prompted to **Identify any point near project**.

Data point in the project area and the raster attachment is moved to overlay the project data correctly.



Change Line Style Scale

D&C location: Drafting Standards > Tools > Scale LineStyle

MicroStation VBA Program: ChangeLinestyleScale.mvba

Description:

This program is used to change the line style scale on existing lines that have a custom line style applied on them. The current active scale is read at program start up and is shown in a keyin field. This value which can be set as needed by the user is used to build the keyin to change the line style scale. After setting the scale desired the user can immediately apply by identifying an element or accepting the fence contents if a fence is active. Active selection sets are automatically updated to the new scale.

A command button is provided to restart the command with the current specified scale after using other MicroStation commands.

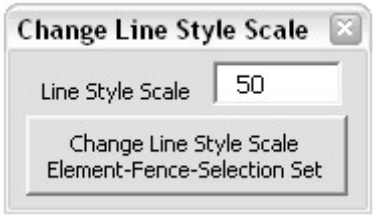
This program can also be activated from the MicroStation drop down menu
TDOT > Custom Line Styles > Change Line Style Scale
or by using the keyin
vba run [ChangeLinestyleScale]ChangeLSscale.Main

Special Requirements:

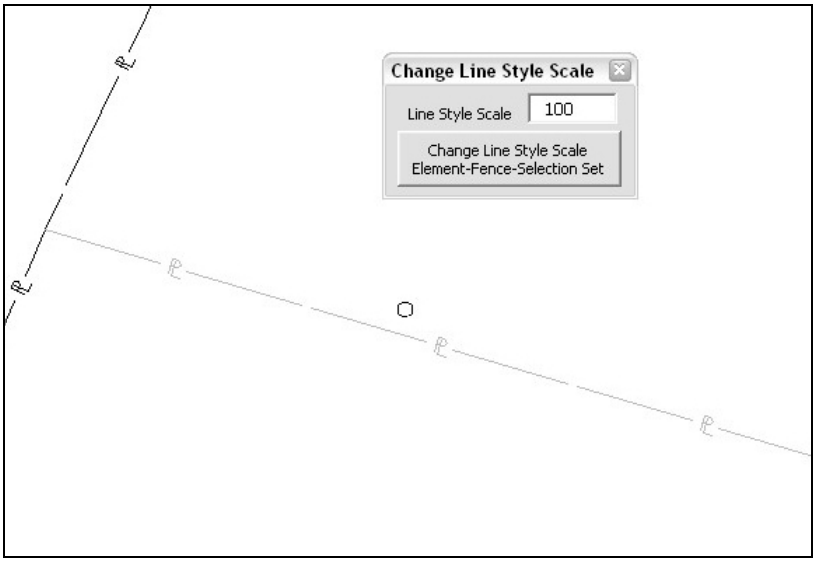
None.

Usage:

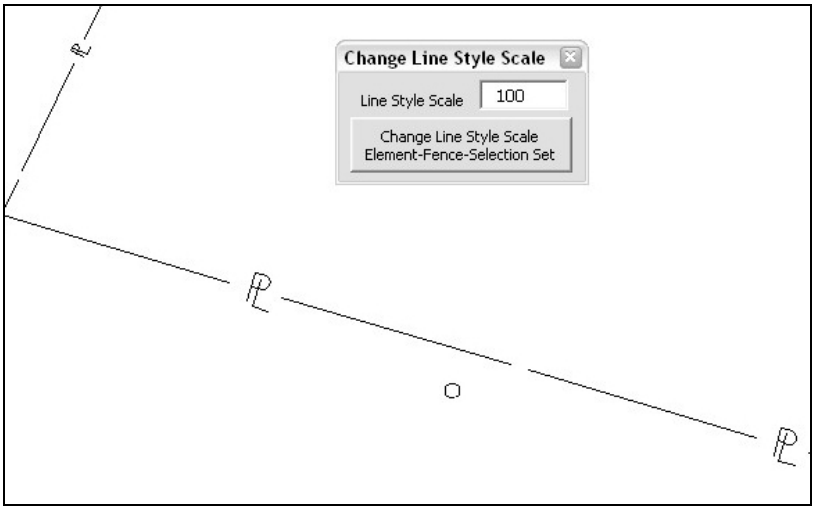
Step 1. In D&C manager activate **Scale LineStyle**. The **Change Line Style Scale** dialog appears. The current active scale is applied in the dialog.



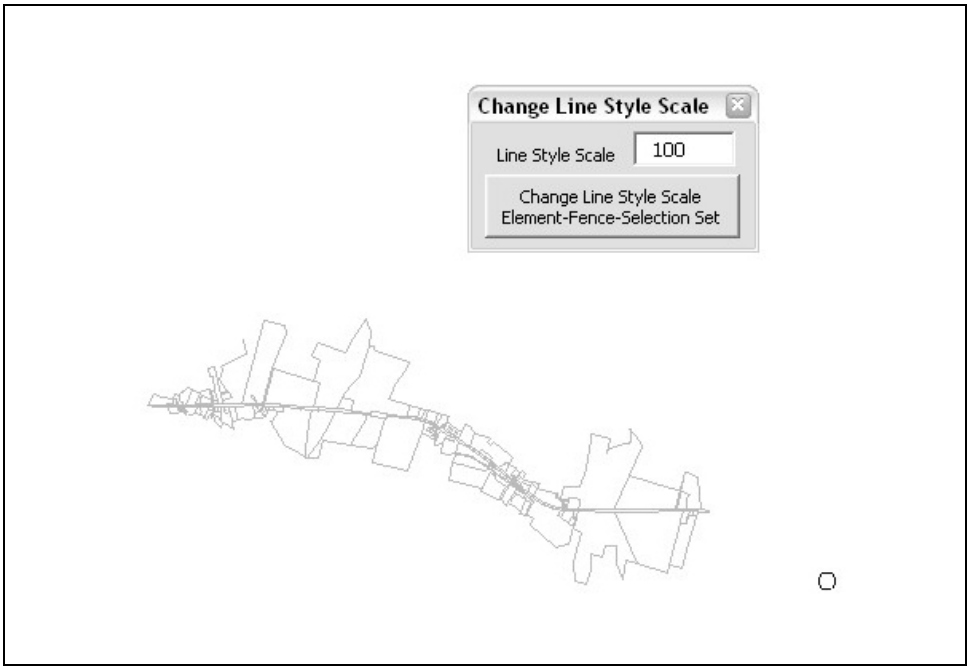
Step 2. Check and reset the scale as needed. Data Point on any element to reset its scale.



Step 3. Data point to accept the element and it is scaled to the given value.



Step 4. To process multiple elements, place a fence around them or add them to a selection set. Click on the **Change Line Style Scale** command button. Selection sets are immediately processed. If using a fence, the user is prompted to accept the fence contents, data point to start fence processing.



After changing the scale on custom line styles, it may be necessary to use the **Shift Line Style Pattern** tool to improve appearance of the line work.

Draw Plot Border

D&C location: Drafting Standards > Tools > Plot Border

MicroStation VBA Program: DrawPlotBorder.mvba

Description:

This program sets symbology, etc. and provides a tool for users to draw plot border shapes on plans sheets. This is intended for use on older jobs where sheets were used that did not include plot shapes as they do now. These plot shapes make it possible to use batch plotting without having to open the individual files to plot the sheets. A Plot Border Type option is provided to place either standard or PDF plot border shapes.

An Open DGN command button is provided to go to the File Open dialog so that the user can jump to the next sheet file.

This tool is **not** intended for use on cross sections. Instead, use the **Place & Annotate XS Sheets** tool to place cross section plot borders in a batch mode.

This program can also be activated from the MicroStation drop down menu
TDOT > Tools > Draw Plot Border
or by using the keyin
vba run [DrawPlotBorder]PlotBorder.Main

Special Requirements:

Old non-cross section DGN sheet files that need plot borders so that batch plotting can be used.

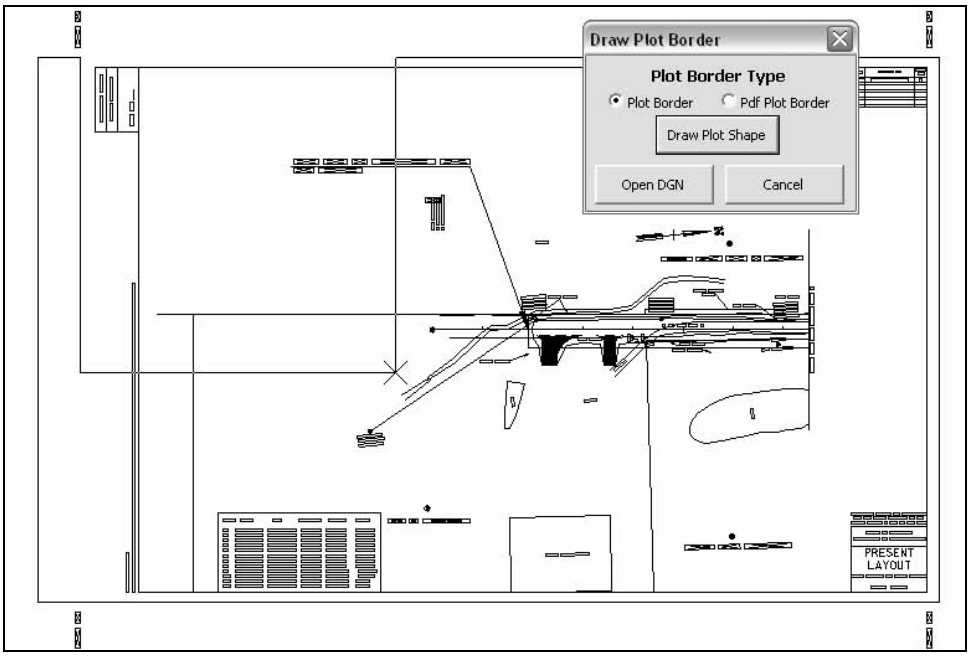
Usage:

Step 1. In D&C manager activate **Plot Border**. The **Draw Plot Border** dialog appears.

Step 2. Check and reset the **Plot Border Type** option as needed to place either a standard or PDF plot border shape.

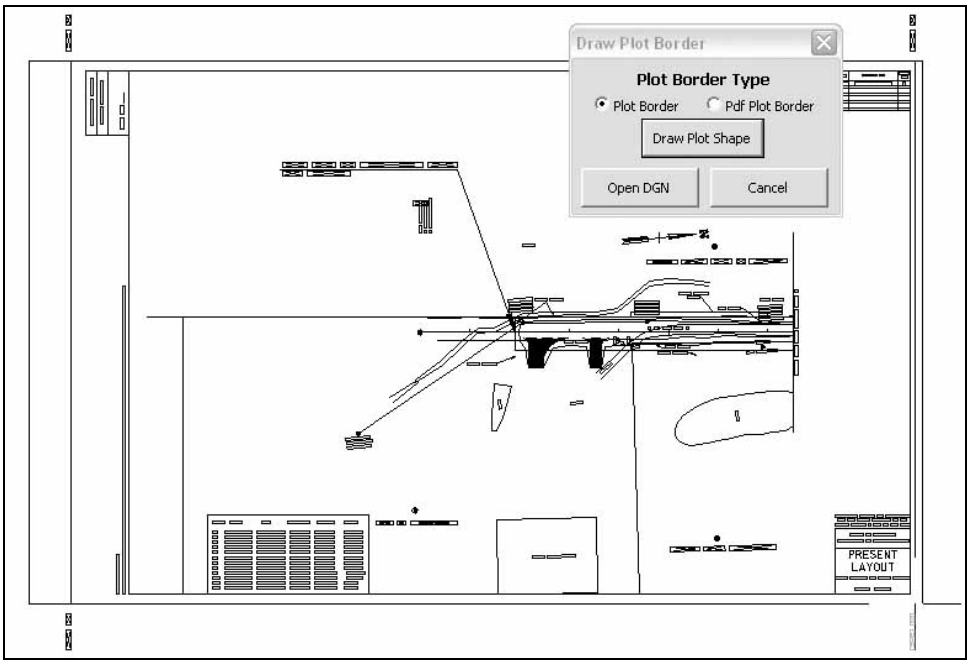
Step 3. Click on the **Draw Plot Shape** command button to start placement. The user is prompted to **Identify 1st Corner**

For standard plot shapes, snap and data point at one of the plot area snap points. .



Step 4. The shape is displayed dynamically and the user is then prompted to **Identify Opposite Corner**.

For standard plot shapes, snap and data point at the plot area snap point at the opposite corner of the sheet. The plot shape is drawn into the file.

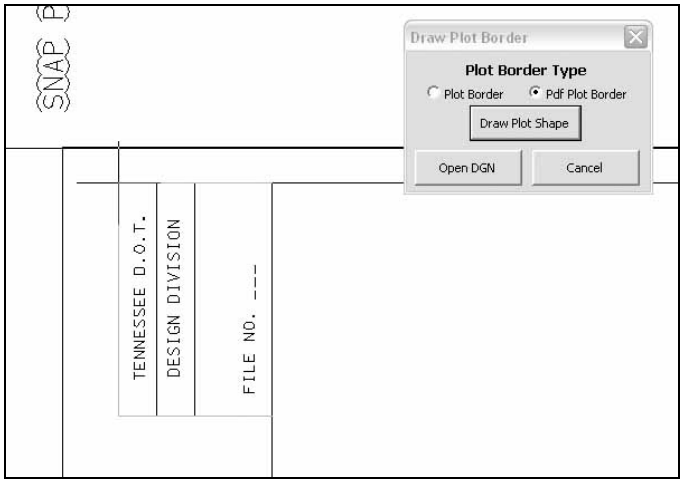


The plot shapes go on level **DESIGN - SHEET - Plot Shape** so that level must be on to see them after placement. This level **does not** need to be turned on to be recognized for batch plotting.

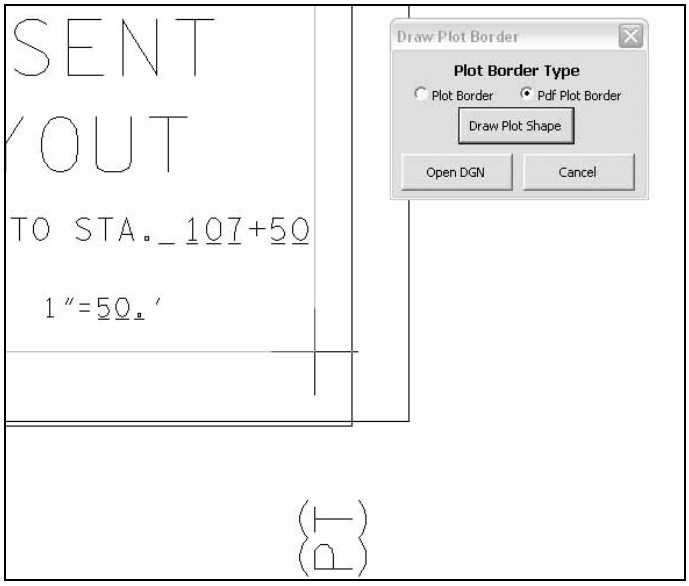
Step 5. Click the **Open DGN** command button to jump to the next sheet file.

PDF Plot Borders

The only difference when placing PDF plot borders is where you snap to. For the first point you should snap to the upper left corner of the File Room data block as shown below.



When prompted for the second point, snap to the lower right corner of the inside sheet border.



Note:
Use the **Place & Annotate XS Sheets** tool to place plot borders on cross section sheets.

Import Additional V8 Settings

D&C location: Drafting Standards > Tools > V8 Import

MicroStation VBA Program: V8_Import.mvba

Description:

This tool can be used in 2 workflows, for updating any V8 DGN file to current standards or to complete the conversion of V7 DGN files. After using MicroStation's Batch Converter for the initial conversion of V7 DGN files with levels 1-63 to V8, several additional settings need to made in order to make the files fully functional in V8.

This program deletes all existing level filters, imports current levels & level filters, text styles, attaches the current color table and will update English working units to use Survey Feet in multiple DGN files in a batch mode.

All levels, level filters & text styles are applied from TDOTmain.dgnlib.

All files with DGN, MFC, 2D, 3D or SHT extensions from the open DGN file's folder are included in the file list.

When processing metric DGN files, the option to update English working units to use Survey Feet is ignored even if this option is clicked on since it is not required in those files.

This macro can also be activated from the MicroStation drop down menu
TDOT > V8 – Import Additional Settings
or by using the keyin
vba run [V8_Import]V8_ImportStart.main

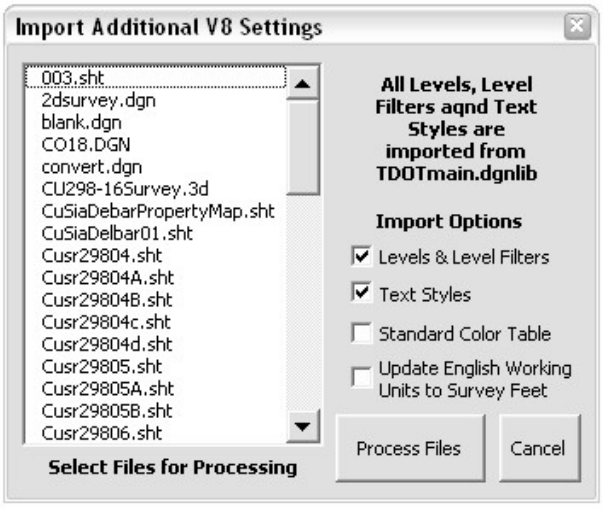
Special Requirements:

MicroStation DGN file opened from the folder in which files which need to be updated reside.

Usage:

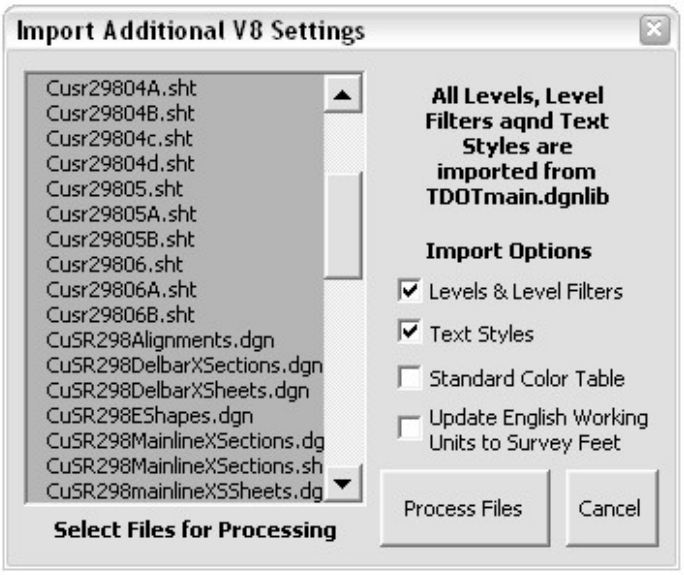
Step 1. Open a DGN file from the folder where files are to be processed. This can be one of the files to which you wish to import additional V8 settings.

Step 2. In D&C manager activate **V8 Import**. When the command is first started the **Import Additional V8 Settings** dialog is displayed.



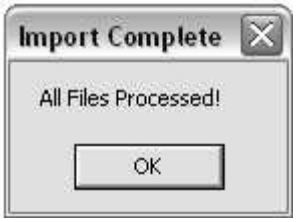
Step 3. Under **Import Options**, choose which of the V8 additional settings are desired for import. By default levels, level filters & text styles are turned on.

Step 4. Use standard selection methods to highlight the DGN files to be processed. Single click for one file, shift key with clicks at each end for groups of files or the control key with clicks to pick various files. To un-select a file hold the control key down and select it again.



Step 5. When files to be processed have been selected, click on the **Process Files** command button to start the import of additional settings. Each file is opened and processed.

Step 6. When finished a completion message is given. Click **OK** to dismiss the message.



Step 7. Click on the **Cancel** button to dismiss the dialog.

Cross Sections

Delete ALL Prop. XS Graphics

D&C location: Drafting Standards >Cross Sections > Delete XSs

MicroStation VBA Program: DeletePropXSectionGraphics.mvba

Description:
This program deletes all proposed cross section graphics by level name. When the program is executed, it records all levels currently shown in view 1, turns all levels off and then turns all proposed cross section levels on using their names. It then sets up a temporary fence and does a void delete on all graphics. Finally it restores the levels originally displayed in view 1.

It does not matter if view 1 is on or not for this program to function. The file must contain standard TDOT Design Division cross section level names or it will fail.

This macro can also be activated from the MicroStation drop down menu
TDOT > Cross Sections > Delete ALL Prop. XS Graphics
or by using the keyin
vba run [DeletePropXSectionGraphics]CleanXS.main

Special Requirements:
MicroStation DGN file must contain standard TDOT Design Division cross section level names.

Usage:

Step 1. In D&C manager activate **Delete XSs**. Program immediately deletes all graphics from proposed cross section levels and then refreshes the view 1 display.

Delete ALL XS Grids

D&C location: Drafting Standards > Cross Sections > Delete XS Grids

MicroStation VBA Program: DeleteAllXSectionGrids.mvba

Description:

This program deletes all working cross section grids by level name. When the program is executed, it records all levels currently shown in view 1, turns all levels off and then turns all working cross section grid levels on using their names. It then sets up a temporary fence and does a void delete on all graphics. Finally it restores the levels originally displayed in view 1.

It does not matter if view 1 is on or not for this program to function. The file must contain standard TDOT Design Division cross section level names or it will fail.

This macro can also be activated from the MicroStation drop down menu
TDOT > Cross Sections > Delete ALL XS Grids
or by using the keyin
vba run [DeleteAllXSectionGrids]CleanXSGrids.main

Special Requirements:

MicroStation DGN file must contain standard TDOT Design Division cross section level names.

Usage:

Step 1. In D&C manager activate **Delete XS Grids**. Program immediately deletes all graphics from working cross section grid levels and then refreshes the view 1 display.

Delete Earthwork Shapes

D&C location: Drafting Standards > Cross Sections > Delete EW Shape

MicroStation VBA Program: DeleteEarthworkShapes.mvba

Description:

This program deletes all earthwork shape graphics by level name. When the program is executed, it records all levels currently shown in view 1, turns all levels off and then turns the earthwork shape level on using its name. It then sets up a temporary fence and does a void delete on all graphics. Finally it restores the levels originally displayed in view 1.

It does not matter if view 1 is on or not for this program to function. The file must contain standard TDOT Design Division cross section level names or it will fail.

This macro can also be activated from the MicroStation drop down menu
TDOT > Cross Sections > Delete Earthwork Shapes
or by using the keyin
vba run [DeleteEarthWorkShapes]CleanEarthWorkShapes.main

Special Requirements:

MicroStation DGN file must contain standard TDOT Design Division cross section level names.

Usage:

Step 1. In D&C manager activate **Delete EW Shape**. Program immediately deletes all graphics from level DESIGN - EARTHWORK – Shapes and then refreshes the view 1 display.

Calculate & Label Slope

D&C location: Drafting Standards > Cross Sections >Slope Tool

MicroStation VBA Program: SlopeCalculater.mvba

Description:

Calculates slopes based on 2 points and if desired will place a label for the slope. Slope is shown in the dialog in the 3 standard formats: cross slope, percent grade & side slope. Slope label graphics are placed at the current active level, symbology & text parameters.

The Label Type option controls the format which is used when the Place Label command button is clicked. Includes an entry field for Profile Exaggeration to control how slopes are calculated when used on profiles. Command buttons are provided to access the Text Styles Plus & XS Text Styles Plus vba programs which will set the active level, symbology & text parameters. .

This program can also be activated from the MicroStation drop down menu
TDOT >Cross Sections > Calculate & Label Slope
or by using the keyin
vba run [SlopeCalculater]SlopeToolStart.main

Special Requirements:

Set level, symbology and text size for label using Text Styles Plus, XS Text Styles Plus or manual methods.

Usage:

This tool has been described previously under **Drafting Standards > Tools**. See the description of usage at that location.

XS Text Styles Plus

D&C location: Drafting Standards > Cross Sections > XS Textstyles+

MicroStation VBA Program: XSTextstylesPlus.mvba

Description:

This program activates cross section text styles and sets the active level, color and weight. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the text size in conjunction with the standard size associated with the text style.

Command buttons are provided to access vba programs to Set Alternate STD Text Size (Set Text Parameters by Active Scale) and Place Label with Leader Line.

This program can also be activated from the MicroStation drop down menu
TDOT > Cross Sections > XS Text Styles Plus
or by using the keyin
vba run [XSTextstylesPlus]Textstyles.Main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **XS Textstyles+**. The **XS Text Styles Plus** dialog appears.

Step 2. Check and reset the scale as needed. Click on any text style description in the dialog list to activate the text style and set the appropriate active level, color and weight.

Update Project XS Criteria Files

D&C location: Drafting Standards > Cross Sections > Update Criteria

MicroStation VBA Program: UpdateProjectCriteriaFiles.mvba

Description:

This program is for use when new versions of cross section criteria files are downloaded from the web and project criteria files need to be updated. After downloading the new files to the standard criteria folder this program is used to copy the new versions to your project folder to replace/update individual criteria files or all as needed.

The default criteria folder is determined by the setting for the MicroStation configuration variable GPK_MY_CRITERIADIR.

This macro can also be activated from the MicroStation drop down menu
TDOT > Cross Sections > Update Project XS Criteria Files
or by using the keyin
vba run [UpdateProjectCriteriaFiles]UpdatetStart.main.

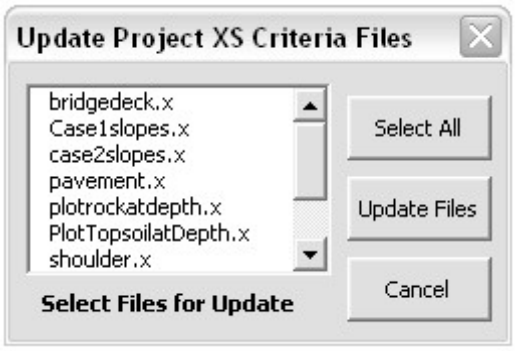
Special Requirements:

MicroStation DGN file opened from the folder in which criteria files which need to be updated reside. .

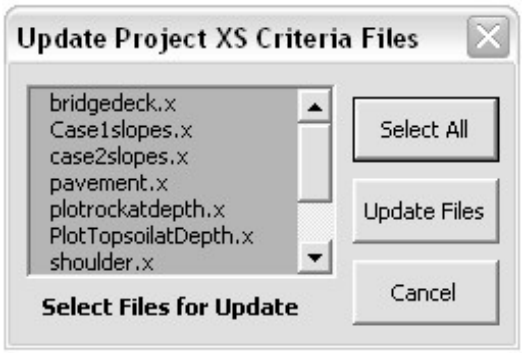
Usage:

Step 1. Open a DGN file from the folder where criteria files are to be updated.

Step 2. In D&C manager activate **Update Criteria**. When the command is first started the **Update Project XS Criteria Files** dialog is displayed.



Step 3. Use standard selection methods to highlight the criteria files to be processed. Single click for one file, shift key with clicks at each end for groups of files or the control key with clicks to pick various files. To unselect a file hold the control key down and select it again. To update all criteria files click on the **Select All** command button.



Step 4. When files to be updated have been selected, click on the **Update Files** command button. A file named **UpdateCriteriaFiles.bat** is created in the project folder with commands to copy the selected files from the default criteria folder to the project folder and then this batch file is processed. A DOS command window is briefly displayed during this process.

Step 5. Click **Cancel** to dismiss the dialog.

Place & Annotate XS Sheets

D&C location: Drafting Standards > Cross Sections > XS Sheets

MicroStation VBA Program: PlaceandAnnotateXSsheets.mvba

Description:

This program places shared cross section sheet cells, plot borders and annotation as requested by the user on cross section sheets set up by Geopak. All graphics are optional.

Graphics and annotation can be placed for either roadway or culvert cross section sheets. Individual parts of Project Data annotation are optional as well as placement on either line 1 or 2 in the project data block. A title for roadway cross sections sheets can be keyed in or for culvert cross section sheets the standard sheet title cell can be placed. Plot scale defaults to current active scale and controls cell & text sizes.

Separate graphic groups are set up for sheets, plot borders, project data annotation & title annotation to allow easy deletion and replacement as needed.

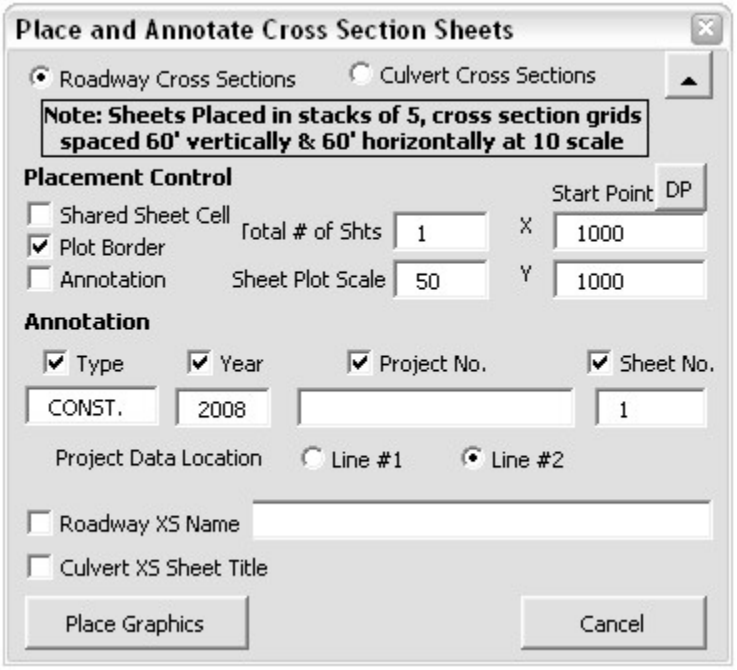
This program can also be activated from the MicroStation drop down menu
TDOT > Cross Sections > Place and Annotate XS Sheets
or by using the keyin
vba run [PlaceandAnnotateXSsheets]XSsheets.main

Special Requirements:

Program is specifically set up to place graphics on cross section sheets set up by Geopak in stacks of 5 sheets with cross section grids spaced 60' vertically and 60' horizontally at a 10 scale.

Usage:

Step 1. In D&C manager activate **XS Sheets**. The **Place & Annotate XS Sheets** dialog appears.



Step 2. Fill in dialog:

Pick type of cross sections, roadway or culvert

Keyin the total number of sheets

Adjust the plot scale if needed

Set Start Point X & Y, either keyin the X & Y coordinates or set them graphically with the DP button (first cross section sheet's origin point at lower left corner of inside border, same point given as the Sheet Placement Point in Geopak's Cross Section Sheet dialog.)

Under Placement Control click on the graphics required: shared sheet cell, plot border and/or annotation.

If annotation is requested…

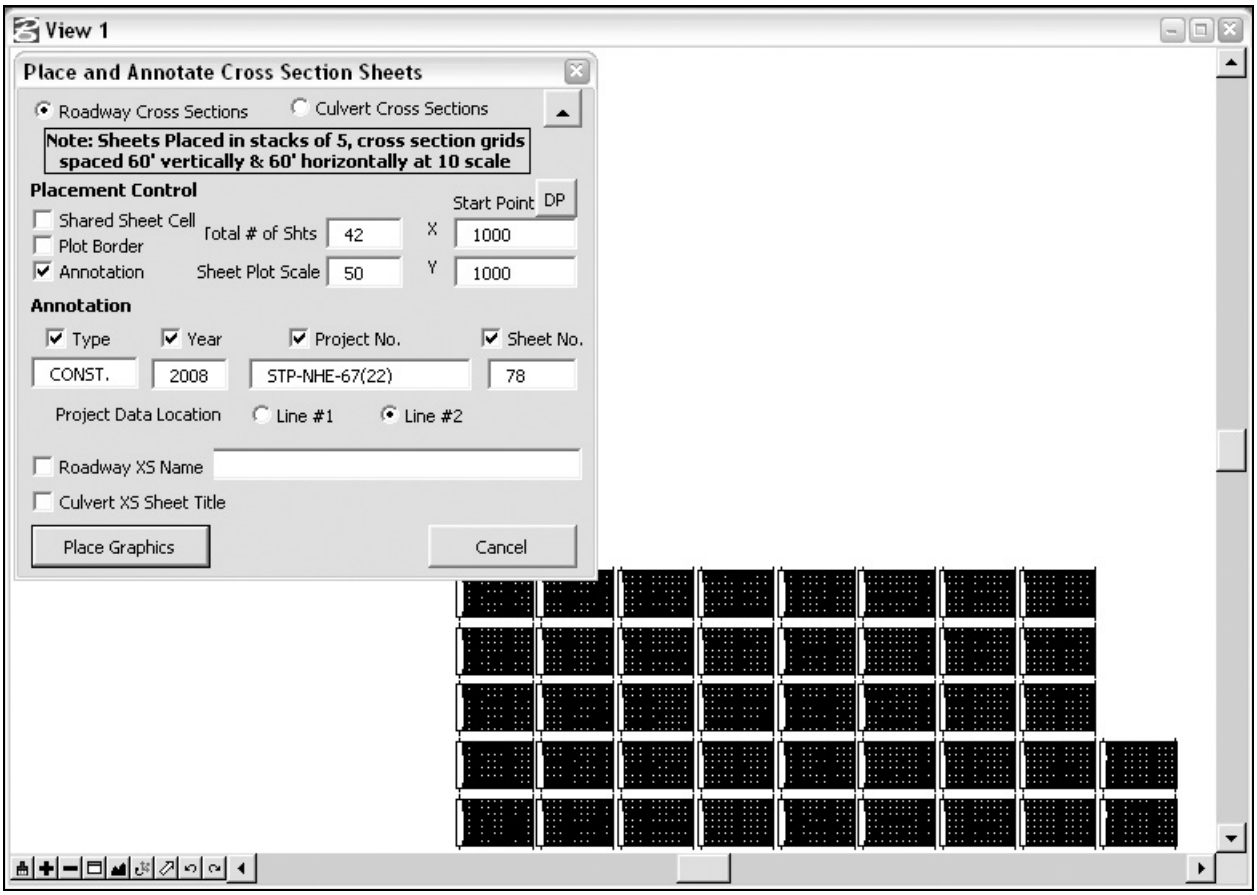
Click on the desired project data fields

Keyin project data field values, sheet no. value is beginning sheet number

Pick option for project data location, line 1 or 2.

If title annotation is desired on lower right of sheet, click on the appropriate option and if annotating roadway cross sections key in a name in the field provided.

Step 1. Once all control settings have been made, click on the **Place Graphics** command button and all requested graphics are placed.



Often when cross section sheets are first set up the project number is not yet known. This additional text annotation can easily be added later with this program

Roadway Horizontal Alignments

Place Horizontal Alignment Points

D&C location: Drafting Standards > Roadway Horizontal Alignments > HA Points

MicroStation VBA Program: HApoints.mvba

Description:

This program places the required point text symbols for all keypoints of any horizontal alignment/chain stored in the project GPK file in the plan view. The PI symbol (triangle) with short sub tangents are placed for all spiral-curve combinations or simple curves. The point on chain symbol (circle) is placed at the begin & end and at all on chain curve points. The PI symbol (triangle) by itself is placed at any break in tangent direction without a curve along the horizontal alignment. This is applicable to the following horizontal alignment types: Proposed Roadway Centerline, Preliminary Roadway Centerline, Existing Roadway Centerline, Proposed Special Ditch Centerline, Existing Stream Baseline, Functional Roadway Centerline, Proposed Private Drive Centerline.

All graphics are placed in a single graphic group for easy deletion as needed.

This tool stores the current location of the dialog, GPK job number, chain name and horizontal alignment type in the file **C:\Temp\MVBA_FormStorage.log** when the dialog is closed. When opened later it uses this information if applicable to bring up the dialog as you last used it.

This program can also be activated from the MicroStation drop down menu at
TDOT > Centerlines > Place Horizontal Alignment Points
or by using the keyin
vba run [HApoints]HApointsStart.main

Special Requirements:

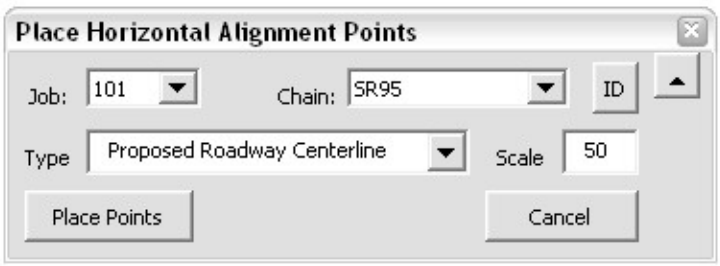
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

The **ID Chain** function uses a special VBA reference to program **GetCogoElement.mvba** which was provided by Bentley and must be present with the program for it to function.

Usage:

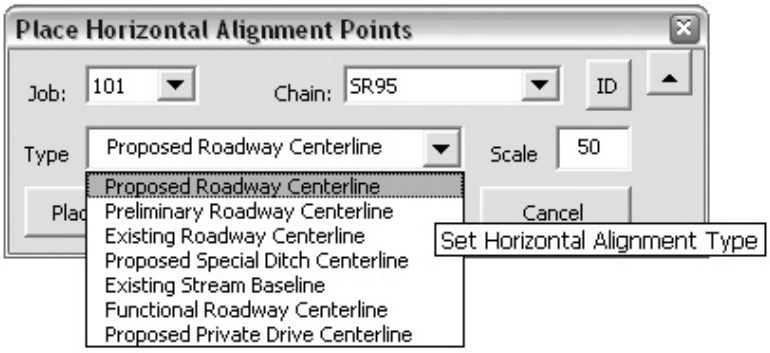
Step 1. In D&C manager activate **HA Points**. The **Place Horizontal Alignment Points** dialog is displayed.

All Geopak jobs found within the current active folder are listed in the Job drop down box. If this tool was used previously for that job, the last chain processed is set as well as the last horizontal alignment type which was used. Scale defaults to active scale set in the MicroStation DGN file.



Step 2. After selecting the Geopak **Job** number as needed, the **Chain** drop down is populated with all chains stored in the job. Select the chain to place point symbols for. If you do not know the chain name but have chain graphics, the **ID** button can be used to select the chain.

Step 3. Set the **Type** by clicking on one of the **Roadway Centerline** options in the drop down list provided**.** This setting controls the level, symbology, etc. for the point symbols which are to be placed.



If this tool was used previously, the last horizontal alignment type which was used is set automatically when the tool is activated.

Step 4. Reset the **Scale** if needed and click the **Place Points** command button. Point symbols are displayed for the specified chain.

Step 5. If you need to place point symbols for other chains, reset the chain name and click the **Place Points** command button for each one.

Centerline Cells

D&C location: Drafting Standards > Roadway Horizontal Alignments > CL Cells

MicroStation VBA Program: CenterlineCells.mvba

Description:

This program provides access to TDOT Design Division centerline cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

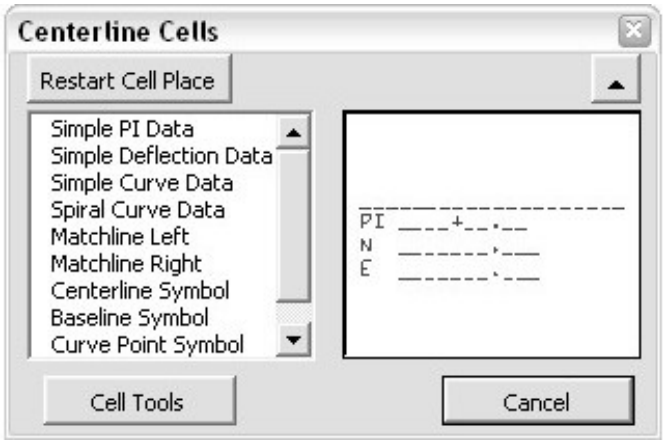
This program can also be activated from the MicroStation drop down menu
TDOT > Centerlines > Cells
or by using the keyin
vba run [CenterlineCells]CLcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **CL Cells**. The **Centerline Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Label Horizontal Alignment Intersections or Ends

D&C location: Drafting Standards > Roadway Horizontal Alignments > HA Intersection

MicroStation VBA Program: HA_IntersectLabel.mvba

Description:

This program labels horizontal alignment (chain) intersections in the plan view and includes an alternate dialog for labeling chain ends with station and coordinate values. It includes a Type option which sets the graphics attributes & text sizes based on selection which include: Proposed Centerline, Preliminary Centerline, Existing Drainage, Existing Centerline & Scratch. . Terminator option sets the type of terminator to be displayed at end of leader line if desired. Also includes a coordinate decimals control to adjust the displayed accuracy of the coordinate values. The default is 4. The dialog has a preview window so that you can see how the label will appear when placed.

For the Label Intersections dialog view, the mainline chain and intersecting chain drop-downs are populated based on chains stored in the GPK file. Text boxes display chain name and intersecting station for each chain and can be modified within each text box. If multiple intersections are found a Select Intersection Number control is displayed so that the user can pick the correct one to be labeled.

For the Label Chain Ends dialog view, all visible controls described above behave the same. The option buttons indicate which end of the chain is to be used to generate text displayed in the label and it's location

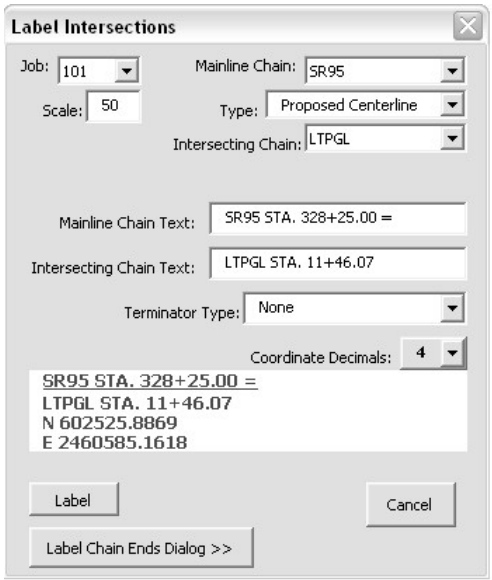
This program can also be activated from the MicroStation drop down menu
TDOT > Centerlines > HA Intersection Labeler
or by using the keyin
vba run [HA_IntersectLabel]modMain.main

Special Requirements:

None.

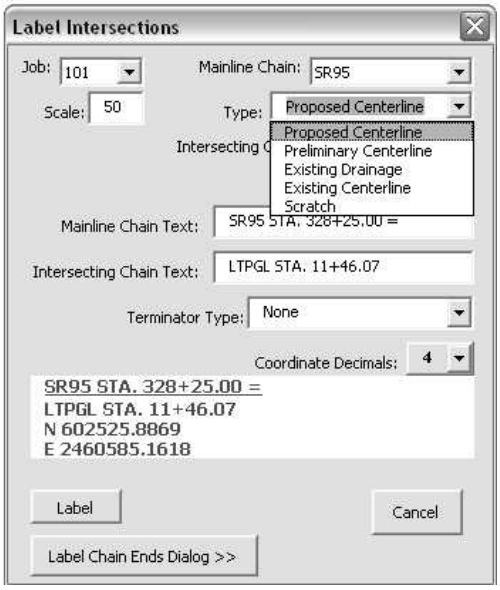
Label Intersections Usage:

Step 1. In D&C manager activate **HA Intersection**. The **Label Intersections** dialog appears.

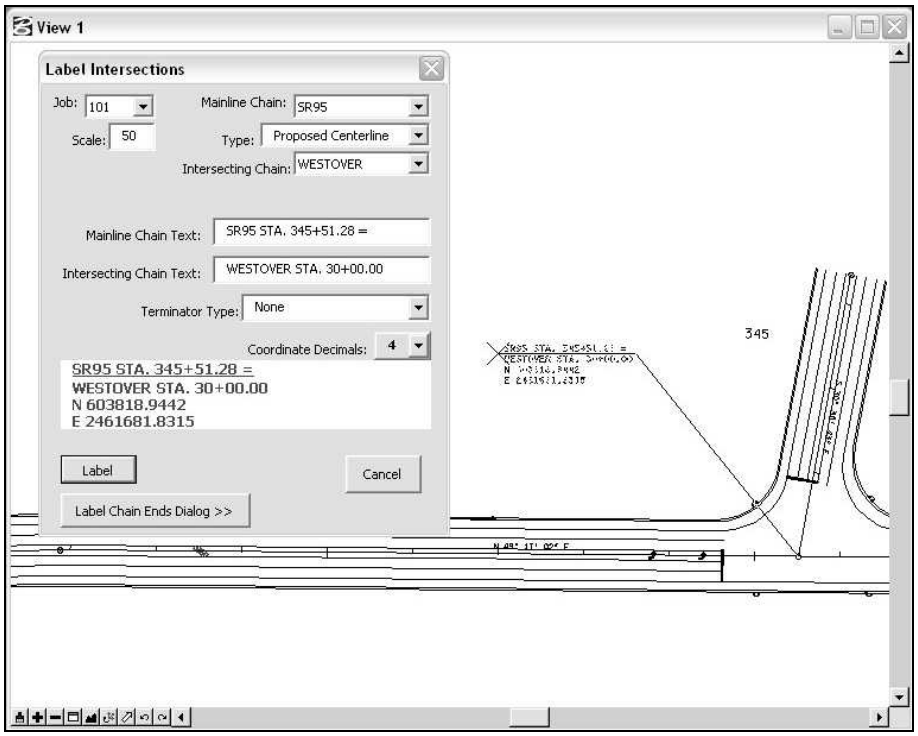


Set the GPK **Job** and **Mainline Chain** you wish to label an intersection on.

Step 2. Set **Scale** and choose the **Type** of alignment being labeled. These settings control level, symbology and text sizes used for the label.



Step 2. Set the **Intersecting Chain** for the label. Chain names are used by default in the label text but these can be edited as desired in the Text fields provided. Click the **Label** command button and the user is prompted to **Data Point to Accept/Reset to Exit**. Data point to place the label at the desired location.

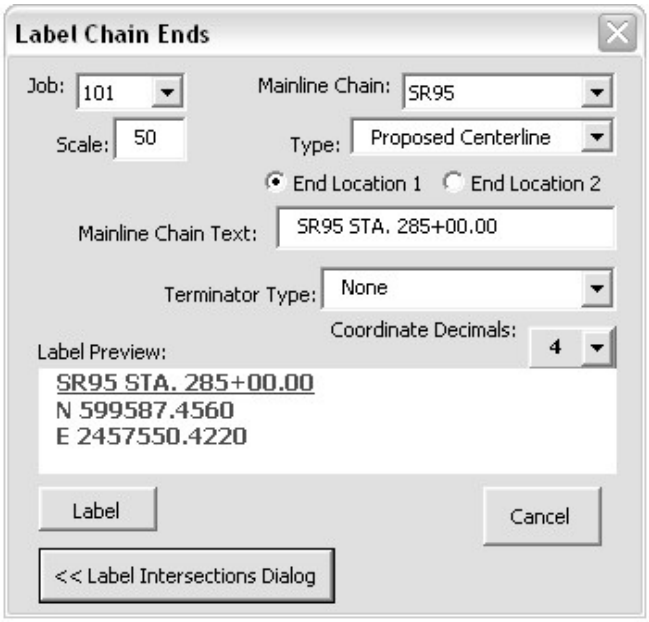


If more than one intersection is found for the chain then an option is provided to **Select Intersection Number**. Pick the intersection number from the option box provided.

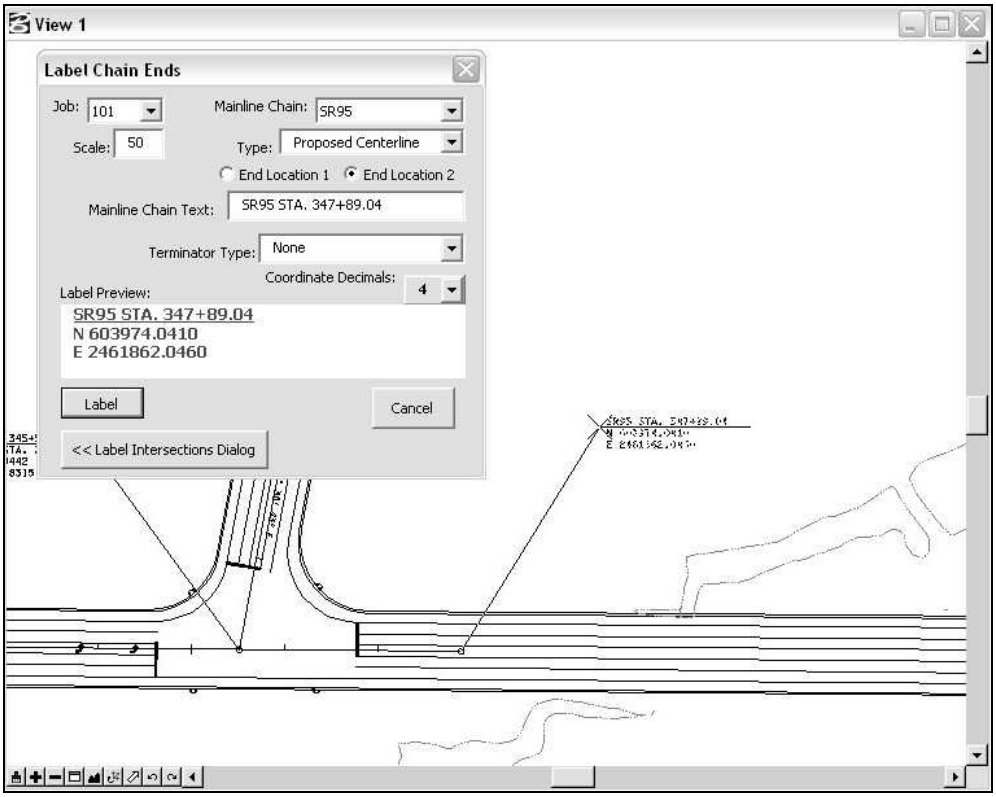
label Ends Usage:

Step 1. At the bottom left of the **Label Intersections** dialog, click the **Chain Ends Dialog** command button and the dialog switches to **Label Chain Ends**.

Set **Mainline Chain** and **Type** as needed and choose **End Location 1** or **2**.



Step 2. Click the **Label** command button and the user is prompted to **Data Point to Accept/Reset to Exit**. Data point to place the label at the desired location.



Roadway Vertical Alignments

Label Vertical Alignment

D&C location: Drafting Standards > Roadway Vertical Alignments > VA Labeler

MicroStation/Geopak VBA Program: VA_Labeler.mvba

Description:

This program was designed to label pertinent vertical alignment information on the profile. The user has the ability to choose the options they would like to label by selecting the check box corresponding to the label. Chain, reference datum, and scale information is attained when the user selects the Geopak profile cell.

Only profiles applicable to the identified Geopak profile cell are offered for labeling.

Type option allows for application for roadways, private drives or special ditches. The type controls text sizes, orientation and symbology.

A Maximum Speed Label keyin field is provided. When set, all curves exceeding the given speed are labeled with the speed and a "+". Any vertical curves where the speed is less than this value will also display a warning message as well.

Program is set up for use on English or Metric projects

This program can also be activated from the MicroStation drop down menu
TDOT > Profiles > Vertical Alignment Labeler
or by using the keyin
vba run [VA_Labeler]modStartUp.label_VApts

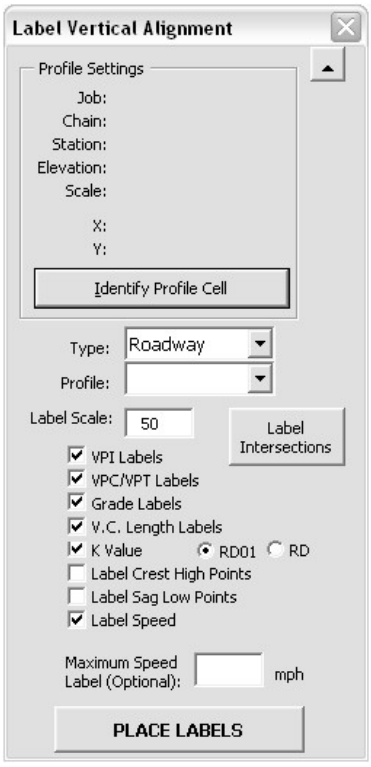
Special Requirements:

A Geopak profile cell must be present.

K value text file, **VALabel_Speed_kvl.txt** must be present in TDOT Design Division's GeopakStandards folder at C:\Program Files\GeopakStandards\.

Usage:

Step 1. In D&C manager activate **VA Labeler**. The **Label Vertical Alignment** dialog is opened. By default the type is set to Roadway.



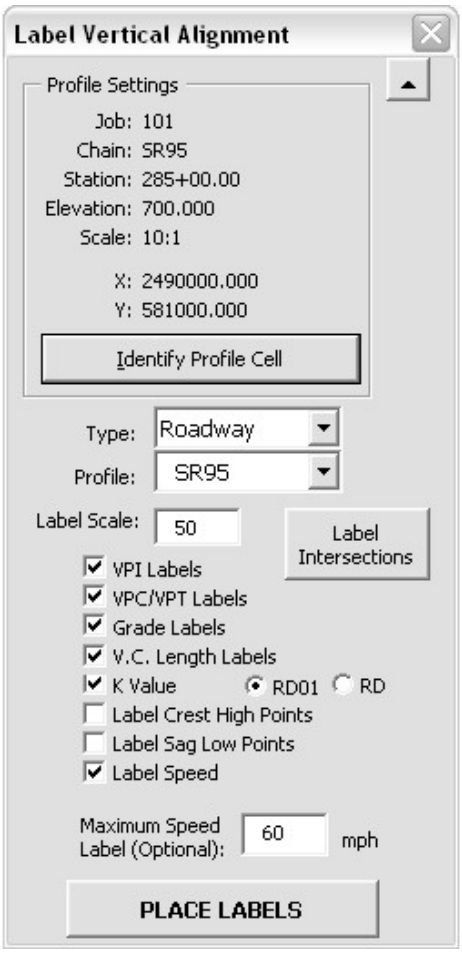
Step 2. Click on the **Identify Profile Cell** command button and data point on the Geopak profile cell for the profile. The window shade button on the upper right of the dialog can be used to get the dialog out of the way as you identify the profile cell. Just click it again to re-expand the dialog after identifying the cell.

Note:
After reading the profile cell and populating the Profile Settings at the top of the dialog, the GPK file is read for all profiles/vertical alignments applicable for display on this profile and fills the profile list box

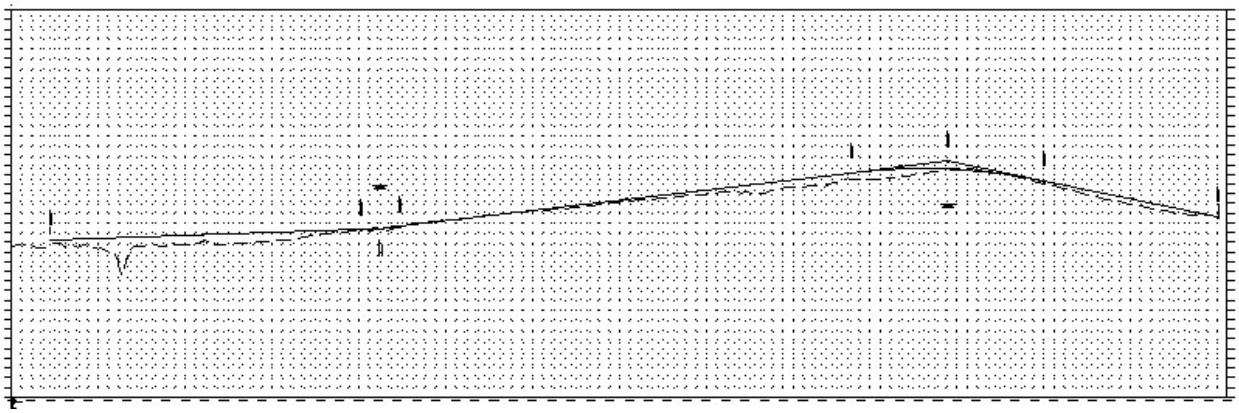
Step 3. Scroll through the **Profile** list and choose the vertical alignment that you wish to annotate.

Step 4. Set the **Scale** value as needed. The current active scale is read when the program is started to fill in this field automatically. Scale controls text sizes & label offsets.

Step 5. Finally the label options can be adjusted as needed. The type of profile to be labeled determines which default options are turned on. Key in a Maximum Speed value in the keyin field which is provided to control speed labels placed with vertical curve information.

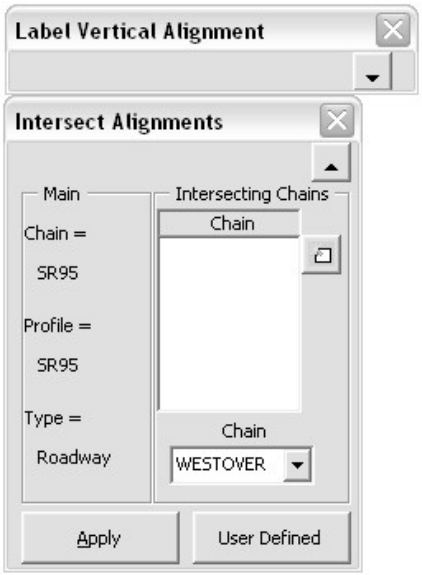


Step 5. Now that all control values are set, click on the **Place Labels** command button and the vertical alignment is annotated. Review the annotation graphics and click the red X to close the dialog.



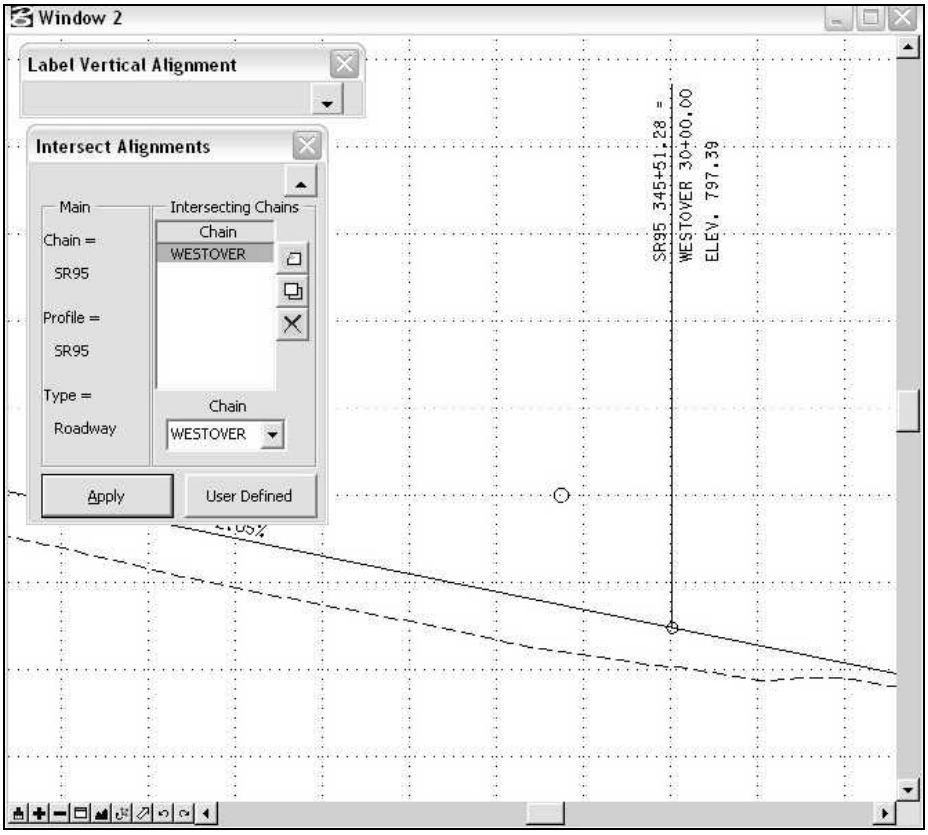
Label Intersections Usage:

Step 1. In the Label Vertical Alignment dialog, click on the **Label Intersections** command button. The Label Vertical Alignment dialog is minimized and the **Intersect Alignments** dialog is opened.

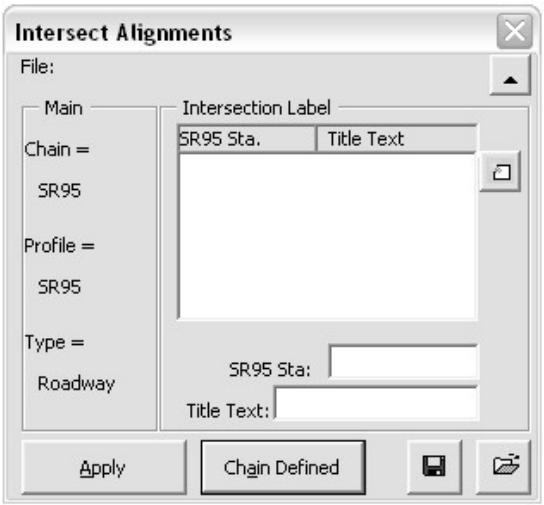


The drop down chain selection list is automatically populated with all chains that intersect the mainline chain whose profile is being annotated.

Step 2. Select the desired chain from the drop down list and then click the **Add** button on the right side of the dialog. Add additional chains as needed and then click **Apply** to annotate the intersection on the profile.



By clicking the **User Defined** command button at the bottom you can add your own station locations with titles for intersections to be labeled. The **Save** & **Open** buttons at the bottom can be used to save these custom locations and recall them later.



Calculate & Label Slope

D&C location: Drafting Standards > Roadway Vertical Alignments >Slope Tool

MicroStation VBA Program: SlopeCalculater.mvba

Description:

Calculates slopes based on 2 points and if desired will place a label for the slope. Slope is shown in the dialog in the 3 standard formats: cross slope, percent grade & side slope. Slope label graphics are placed at the current active level, symbology & text parameters.

The Label Type option controls the format which is used when the Place Label command button is clicked. Includes an entry field for Profile Exaggeration to control how slopes are calculated when used on profiles. Command buttons are provided to access the Text Styles Plus & XS Text Styles Plus vba programs which will set the active level, symbology & text parameters. .

This program can also be activated from the MicroStation drop down menu
TDOT >Tools > Calculate & Label Slope
or by using the keyin
vba run [SlopeCalculater]SlopeToolStart.main

Special Requirements:

Set level, symbology and text size for label using Text Styles Plus, XS Text Styles Plus or manual methods.

Usage:

This tool has been described previously under **Drafting Standards > Tools**. See the description of usage at that location.

Vertical Curve Design Tool

D&C location: Drafting Standards > Roadway Vertical Alignments > VC Design Tool

MicroStation/Geopak VBA Program: VerticalCurveDesign.mvba

Description:

This program is set up to be used to design or check vertical curves for roadways. Entrance and exit grades for the vertical curve can be keyed in or identified graphically. They must be identified graphically for visual vertical curve displays. Command buttons are provided to identify these lines together or individually as needed. After the grades are set, one of 3 Design Controls must be set, length, K value or design speed. Then click on the Calculate Curve command button and the unknown design values are computed, shown in the dialog and the curve is temporarily visualized in graphics.

If desired, the curve can be drawn in permanently by clicking the Draw Curve command button. Curve graphics include the curve and circle point text symbols at the VPC, VPI & VPT. All graphics are joined as a graphic group. Current active level and element symbology are used for permanent curve displays. The current active scale controls the size of the point symbols.

Options are provided for the use of either RD or RD01 vertical curve design standards which are read from the text file VALabel_Speed_kvl.txt.

A key in field is provided to enter the profile vertical exaggeration factor. This value defaults to the standard 10 times exaggeration but can be reset as needed. This controls grade values that are computed from graphics and how the vertical curve will appear on the profile.

Program is set up for use on English or Metric projects

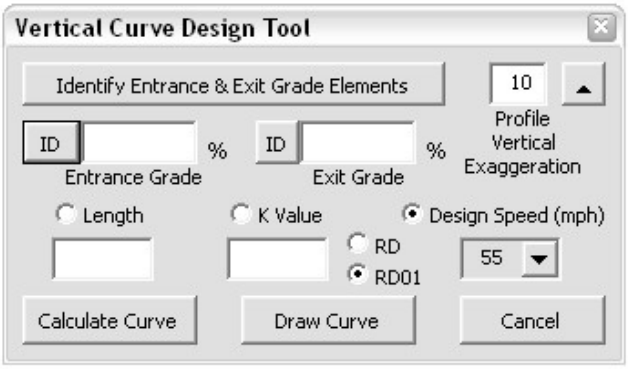
This program can also be activated from the MicroStation drop down menu
TDOT > Profiles > Vertical Curve Design Tool
or by using the keyin
vba run [VerticalCurveDesign]VCDesign.main

Special Requirements:

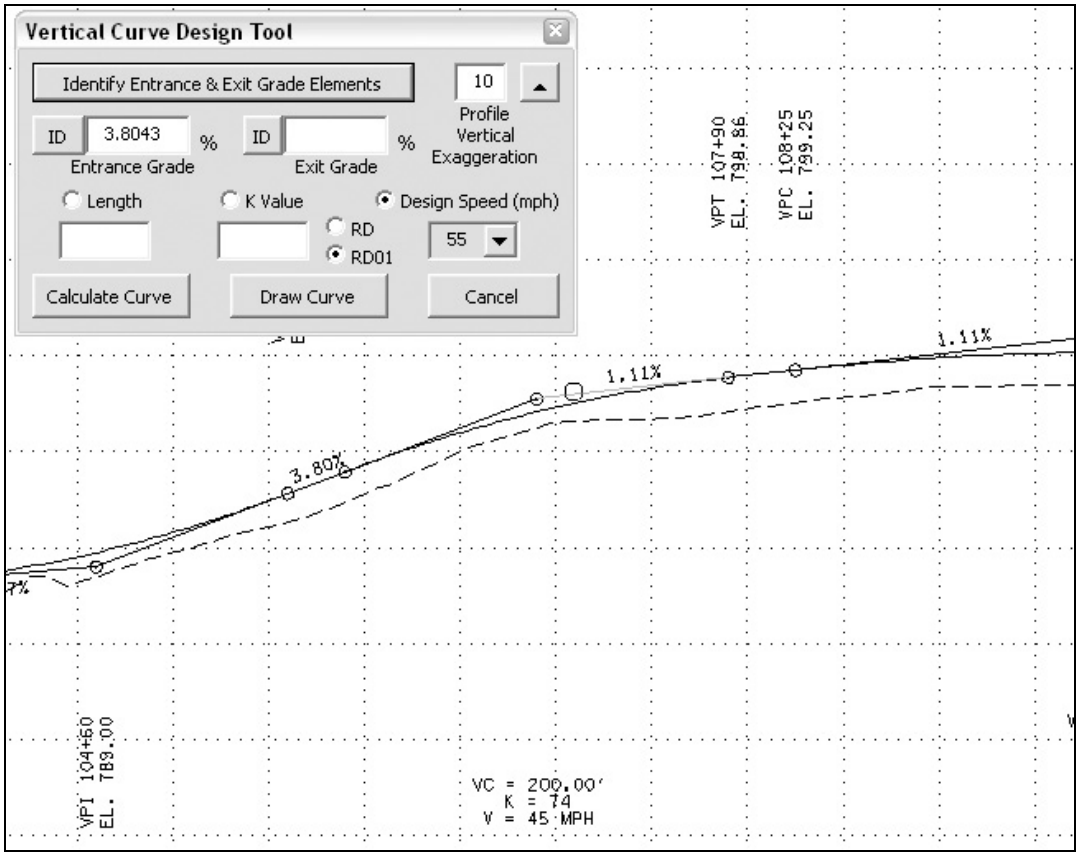
K value text file, **VALabel_Speed_kvl.txt** must be present in TDOT Design Division's GeopakStandards folder at C:\Program Files\GeopakStandards\.

Usage:

Step 1. In D&C manager activate **VC Design Tool**. The **Vertical Curve Design Tool** dialog is opened.



Step 2. Click the **Identify Entrance & Exit Grade Elements** button and you are prompted to **Identify Entrance Element**. Data point on the line or line string segment for the entrance grade. When the entrance element is highlighted, data point to accept. The entrance grade is calculated from the element and is shown in the dialog. The user is then prompted to **Identify Exit Element**. Repeat these actions to set the exit grade.



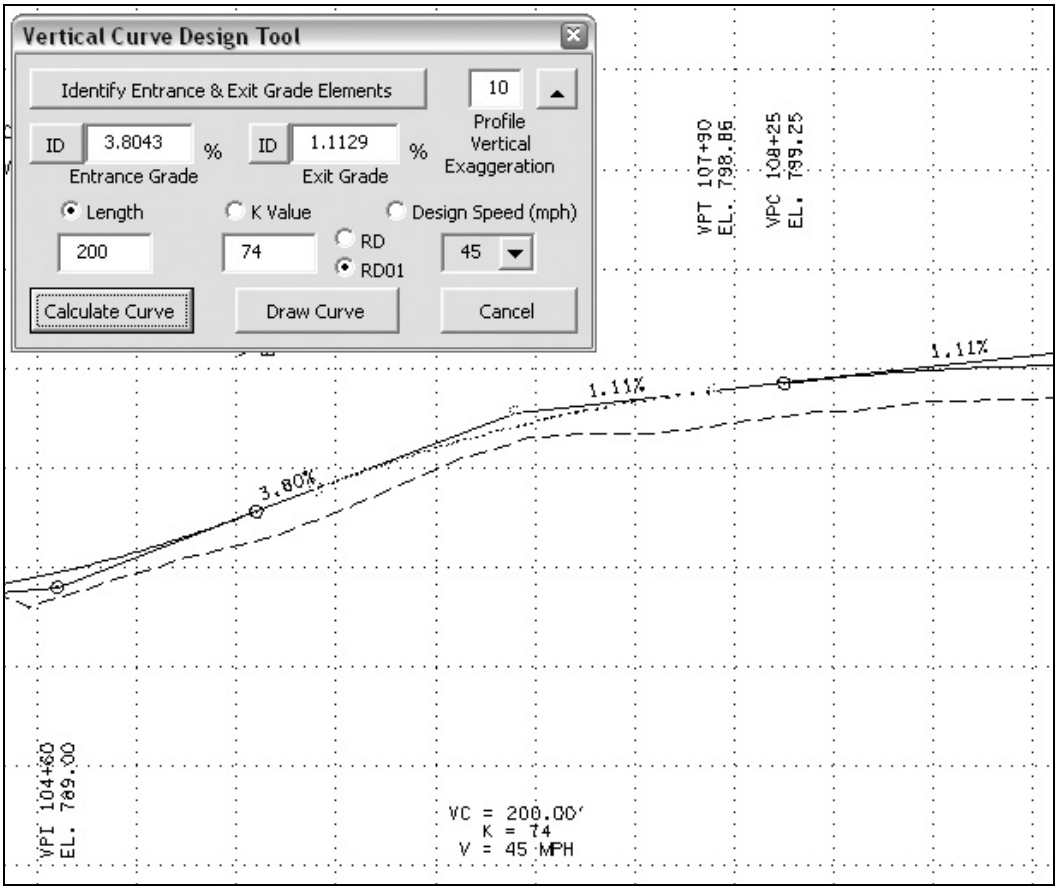
Individual **ID** buttons are provided so that you can reset either the entrance or exit grades separately.

The entrance and exit grades can be keyed in manually but no visualization of the designed vertical curve is possible when the tool is used in this way.

Step 3. If your profile uses an alternate **Profile Vertical Exaggeration** than the default 10 value (1"=50' Horiz./1"=5' Vert.) , then reset that value at the upper right of the dialog.

Step 4. Set the desired design control value, **Length**, **K Value** or **Design Speed**. If you are designing a vertical curve for the first time you may wish to start with the Design Speed. In this example we are checking a vertical curve design so we will just key in the Length of the vertical curve which has been proposed.

Step 5. Click the **Calculate Curve** button. The grades and the design control value are used to calculate the other vertical curve design values which are filled in on the dialog. If the grades were entered by identifying graphical elements the curve is temporarily visualized.



If your project uses the older RD design standards then click the **RD** option between the K Value & Design Speed controls prior to calculating the vertical curve. By default the RD01 standards are used.

Step 6. If desired, the curve can be drawn in permanently by clicking the **Draw Curve** button. Curve graphics include the curve and circle point text symbols at the VPC, VPI & VPT. Current active level and element symbology are used for permanent curve displays. The current active scale controls the size of the point symbols.

Exist. Profiles

Draw Profile Grid

D&C location: Drafting Standards > Exist. Profiles > Profile Grid

MicroStation VBA Program: DrawProfileGrid.mvba

Description:

This program draws a profile grid for any profile area, based on control values provided by the user. A dialog is provided for entry of Horizontal & Vertical Scale, Minimum & Maximum Elevation and Beginning & Ending Station.

All graphics for the profile grid are combined in a graphic group for easy movement or deletion as needed.

Program is set up for use on English or Metric projects

This program can also be activated from the MicroStation drop down menu
TDOT > Profiles > Draw Profile Grid
or by using the keyin
vba run [DrawProfileGrid]DrawGrid.main

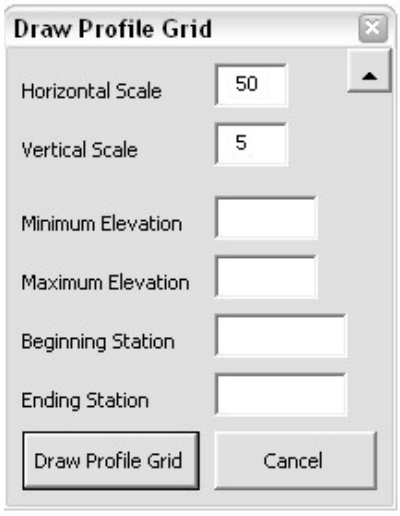
Special Requirements:

Profile's lower left reference origin location must be visible. This is the location which corresponds to the minimum elevation and beginning station of the desired profile grid.

Usage:

Step 1. Set your view so that the lower left reference origin location of the profile area is visible.

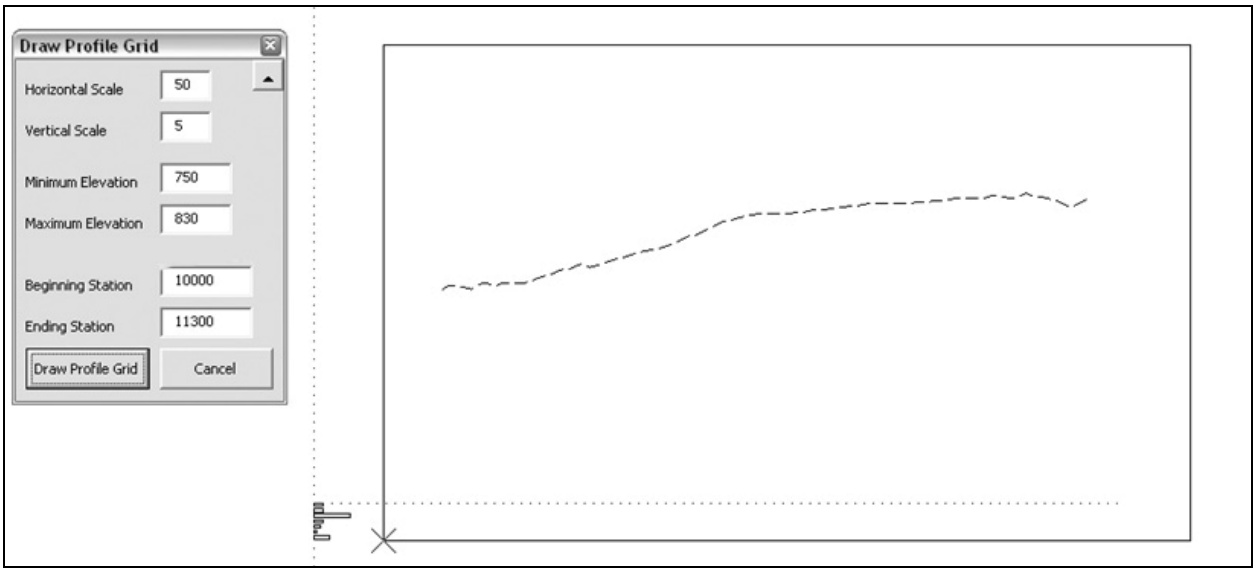
Step 2. In D&C manager activate **Profile Grid**. The **Draw Profile Grid** dialog opens. The current active scale is read from the DGN file to set the **Horizontal Scale** & **Vertical Scale.**



Adjust the scale values if needed, enter **Minimum** and **Maximum Elevation** and **Beginning** & **Ending Station.**

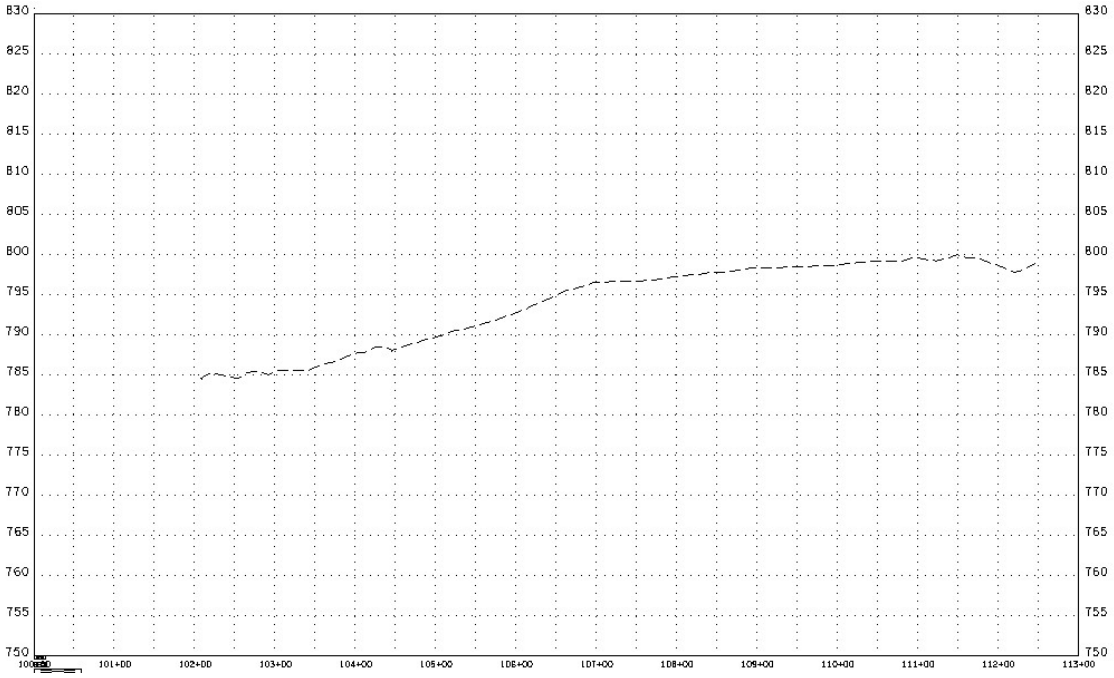
Step 3. When all control values have been set, click on the **Draw Profile Grid** command button**.**

You are prompted to **Data Point at Profile Origin**. The profile grid range is shown dynamically. If the profile coverage is not acceptable, you may give a Reset to stop and adjust the control values.



Step 4. Data point at the lower left reference origin location of the profile area.

The program generates the profile grid based on your given control values on level DESIGN - SHEET - Light Grid. Annotation is placed on level DESIGN - SHEET - Corner Text.



Draw Benchmark on Profile

D&C location: Drafting Standards > Exist. Profiles > BMonPro

Geopak 3PC Program: bmonpro.x

Description:
Draws and labels benchmarks and control points with annotation from plan view on to profile. Used by Survey personnel.

Special Requirements:
All graphics must be in a MicroStation selection set prior to running the program and a Geopak profile cell must be present. This must be a 3D MicroStation DGN file since the tool reads the graphics for elevation values.

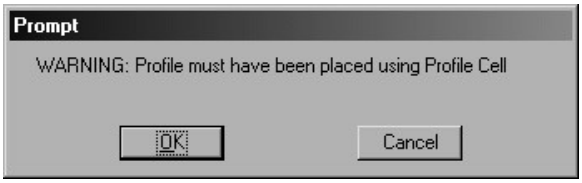
If a benchmark or control point is not within the limit of the horizontal alignment the program will generate an error file noting those.

After running the program check the elevation on the profile text. At this time remove any points from the profile that you do not want shown there.

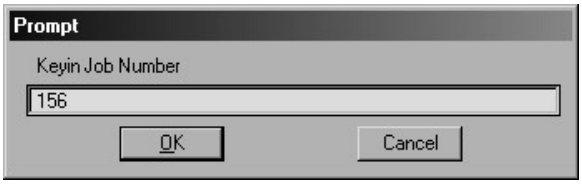
Usage:

Step 1. Using MicroStation's Selection Set tool add all plan view graphics to a selection set.

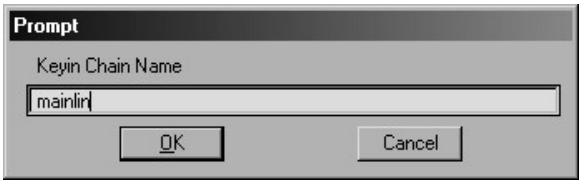
Step 2. In D&C manager activate **BMonPro**. The initial warning message is displayed, Click **OK** to go on.



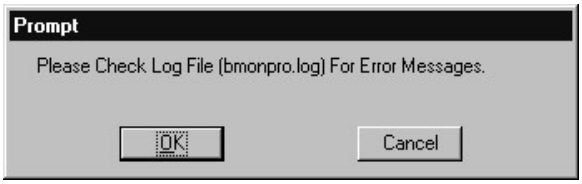
Step 3. You are then prompted for a **job no.** Key that in and click **OK**.



Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.



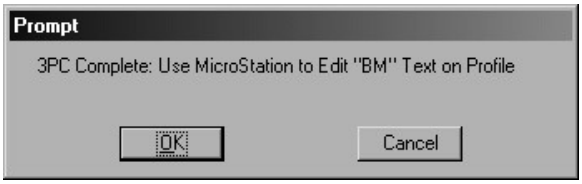
Step 5. If errors are encountered then an error log file named **bmonpro.log** is created and the user is notified with a message prompt**.** Click on **OK** to dismiss this message.



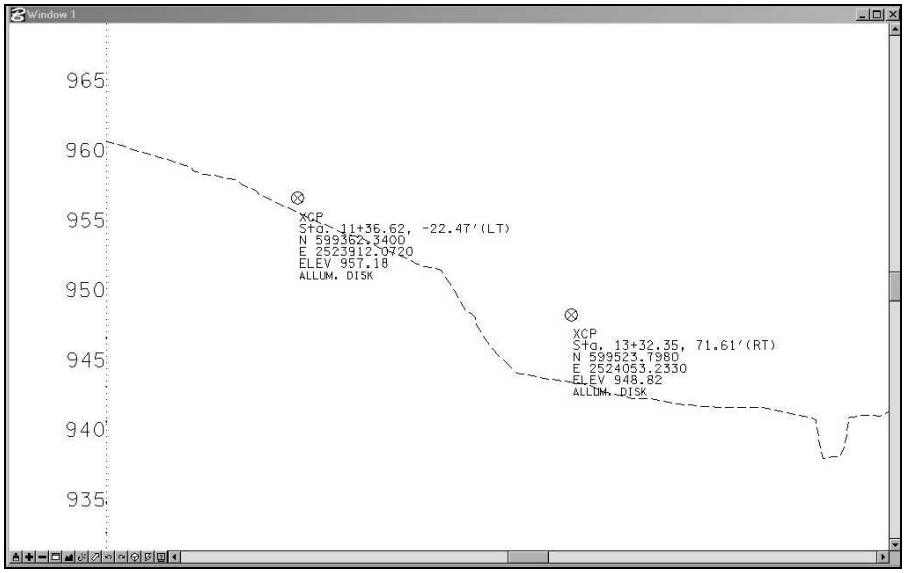
Step 6. If an error log was generated use any ASCII text editor to review errors. Make corrections in plan view graphics as needed and reprocess.

You do not have to re-do the entire project. This can be done on localized areas by limiting the plan view graphics which are placed in the selection set prior to activating the 3PC program.

Step 7. If no benchmarks are found then a message is given indicating that situation otherwise the final completion message is given. Click on **OK** to dismiss this message.



Step 8. Edit/check text on profile as needed to indicate the correct elevation. Any points which are not desired on the profile should be deleted.



Draw Exist. SA/ST System on Profile

D&C location: Drafting Standards > Exist. Profiles > Utilities > Ex SA/ST System

Geopak 3PC Program: draw_cb.x

Description:
Draws existing storm and sanitary sewer catch basins, drop inlets & manholes as well as connecting pipes on profile using plan view graphics. Includes annotation of structures and pipes. Produces error log for missing data, etc. Used by Survey personnel.

Special Requirements:
All graphics must be in a MicroStation selection set prior to running the program and a Geopak profile cell must be present. This must be a 3D MicroStation DGN file since the tool reads the graphics for elevation values.

The use of this application requires that field data be collected in a certain manner. Please note that some data can be added or corrected in the office if the field crew does not take all shots required for the 3PC program to run.

When a point is set in the field and coded: **XCB**, **XDI**, **XMHSTS** or **XMHSAS** this sets the top invert of the structure. At this time another point is set using **XBOT** code and the elevation is adjusted to the bottom invert of the structure.

For pipe coding all pipes need a **FROM / TO** field shot, using **?STS** or **?SAS.** Doing this will place the correct custom line style for the existing pipe and place an **XINV** cell at each end of all runs of pipe.

If there is a run of pipe that begins or ends outside the limits of the horizontal alignment this run of pipe needs to be adjusted in the office by placing a **XINV** cell on the pipe run within the limit of the alignment and setting a break in the existing pipe line at that location. To get this done:

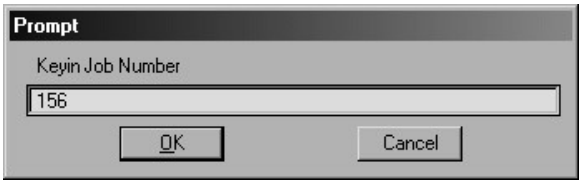
1. On level DESIGN - SCRATCH - User 1 draw a MicroStation line crossing the existing run of pipe within the alignment.
2. Draw another MicroStation line from exist. invert to exist. invert on the existing pipe.
3. Temporarily turn off the level of the existing pipe.
4. Using MicroStation extend to intersection the second line drawn with the first line placed.
5. Place a **XINV** cell at the new end of this line.
6. Delete the two lines that you placed to locate the new XINV cell.
7. Turn the level of the existing pipe back on
8. Add a break in the existing pipe line at the location of the new XINV cell just placed using MicroStation partial delete snapping to the cell location each time to make a zero length break in the pipe line.

Usage:

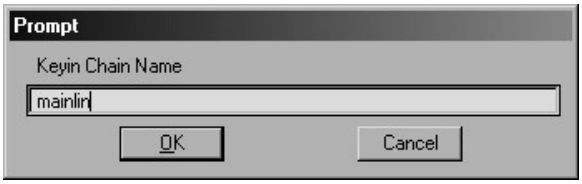
Step 1. Using MicroStation's Selection Set tool add all plan view graphics to a selection set.

Step 2. In D&C manager activate **Ex SA/ST System**. The initial warning message is displayed, Click **OK** to go on.

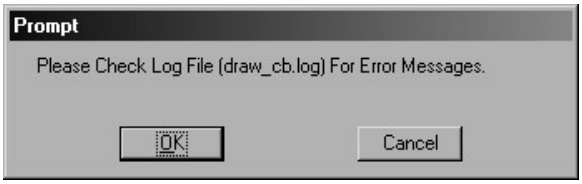
Step 3. You are then prompted for a **job no.** Key that in and click **OK**.



Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.



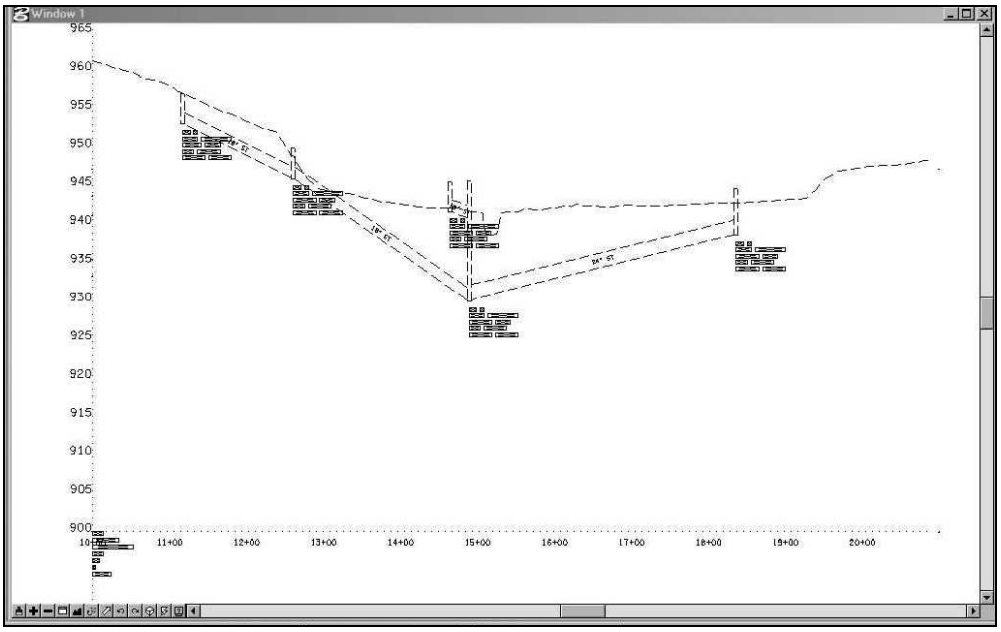
Step 5. If errors are encountered then an error log file named **draw_cb.log** is created and the user is notified with a message prompt**.** Click on **OK** to dismiss this message.



Step 6. If an error log was generated use any ASCII text editor to review errors. Make corrections in plan view graphics as needed, delete any invalid graphics placed previously on the profile and reprocess.

You do not have to re-do the entire project. This can be done on localized areas by limiting the plan view graphics which are placed in the selection set prior to activating the 3PC program.

Step 7. Edit or move text on profile as required. Add CB, MH and DI numbers if a table is used.



Draw OH Wire Crossings on Profile

D&C location: Drafting Standards > Exist. Profiles > Utilities > OHonPro

Geopak 3PC Program: ohonpro.x

Description:
Draws and labels low wire crossings with annotation from plan view on to profile. Used by Survey personnel.

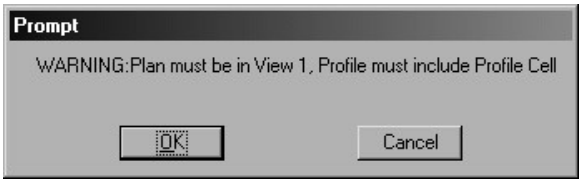
Special Requirements:
All graphics must be in a MicroStation selection set prior to running the program and a Geopak profile cell must be present. This must be a 3D MicroStation DGN file since the tool reads the graphics for elevation values.

The low wire crossing shot needs to be on the proposed centerline if it is not the program will not run. After running the program the user must edit text annotation on the profile to list the temperature, crossing wire types and numbers located at each location. The elevation shown is for the lowest wire only.

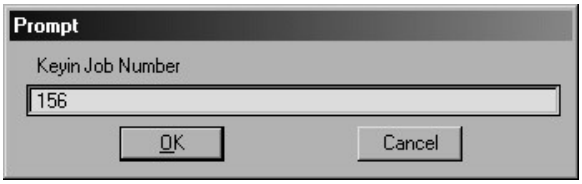
Usage:

Step 1. Using MicroStation's Selection Set tool add all plan view graphics in View #1 to a selection set.

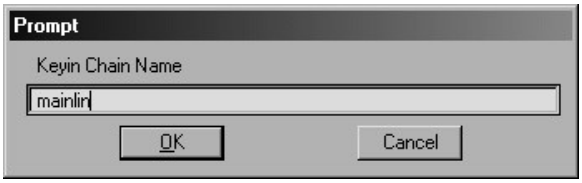
Step 2. In D&C manager activate **OHonPro**. The initial warning message is displayed, Click **OK** to go on.



Step 3. You are then prompted for a **job no.** Key that in and click **OK**.



Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

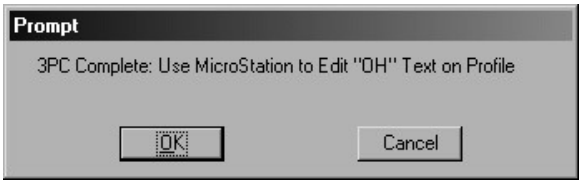


Step 5. If errors are encountered then an error log file named **OHonPRO.log** is created and the user is notified with a message prompt**.** Click on **OK** to dismiss this message.

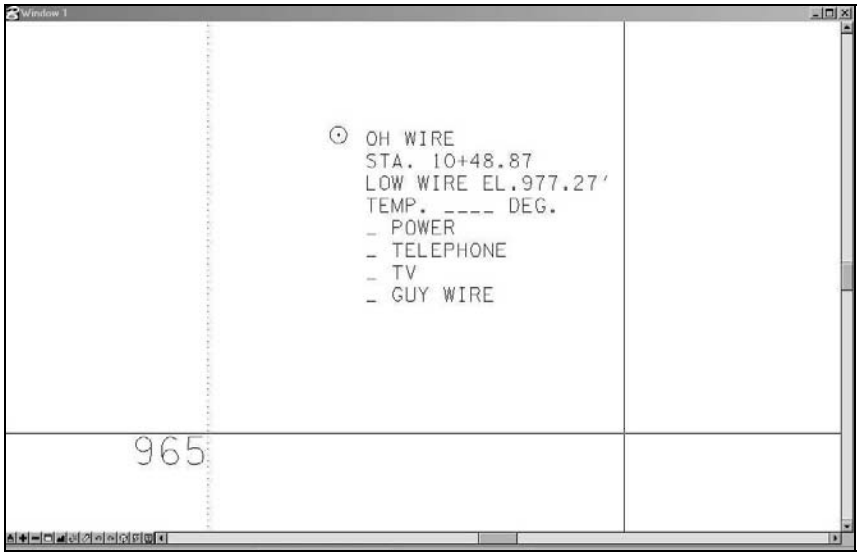
Step 6. If an error log was generated use any ASCII text editor to review errors. Make corrections in plan view graphics as needed, delete any invalid graphics placed previously on the profile and reprocess.

You do not have to re-do the entire project. This can be done on localized areas by limiting the plan view graphics which are placed in the selection set prior to activating the 3PC program.

Step 7. If no overhead wire crossings are found then a message is given indicating that situation otherwise the final completion message is given. Click on **OK** to dismiss this message.



Step 8. Edit text on profile as needed to indicate the temperature, crossing wire types and numbers at each crossing location.



Draw & Label Existing Pipes from GPK

D&C location: Drafting Standards > Exist. Profiles > Drainage> Profile ExPipes

MicroStation VBA Program: ExistingPipeProfileLabeler.mvba

Description:

Draws and labels existing pipes on the profile. Chain, reference datum, and scale information is attained when the user selects the Geopak profile cell. Scale controls text sizes that are used. When the Apply command button is clicked the GPK file is scanned for all existing pipe features and any that intersect the specified chain are drawn and labeled on the profile based on the information found in the GPK file.

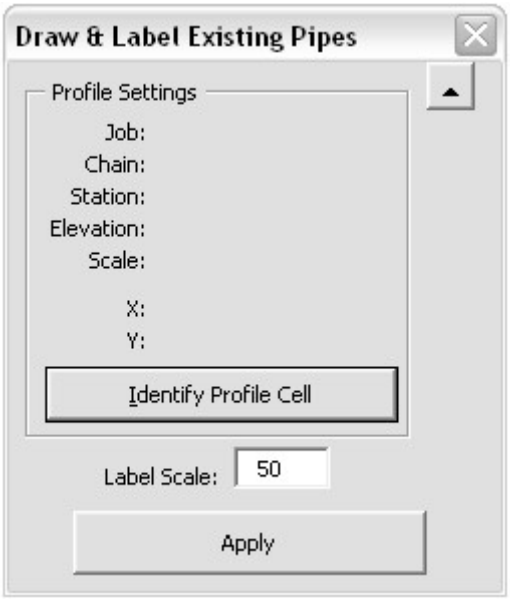
This program can also be activated by using the keyin
vba run [ExistingPipeProfileLabeler]modMain.Exist_ProfileLabelMain

Special Requirements:

None.

Usage:

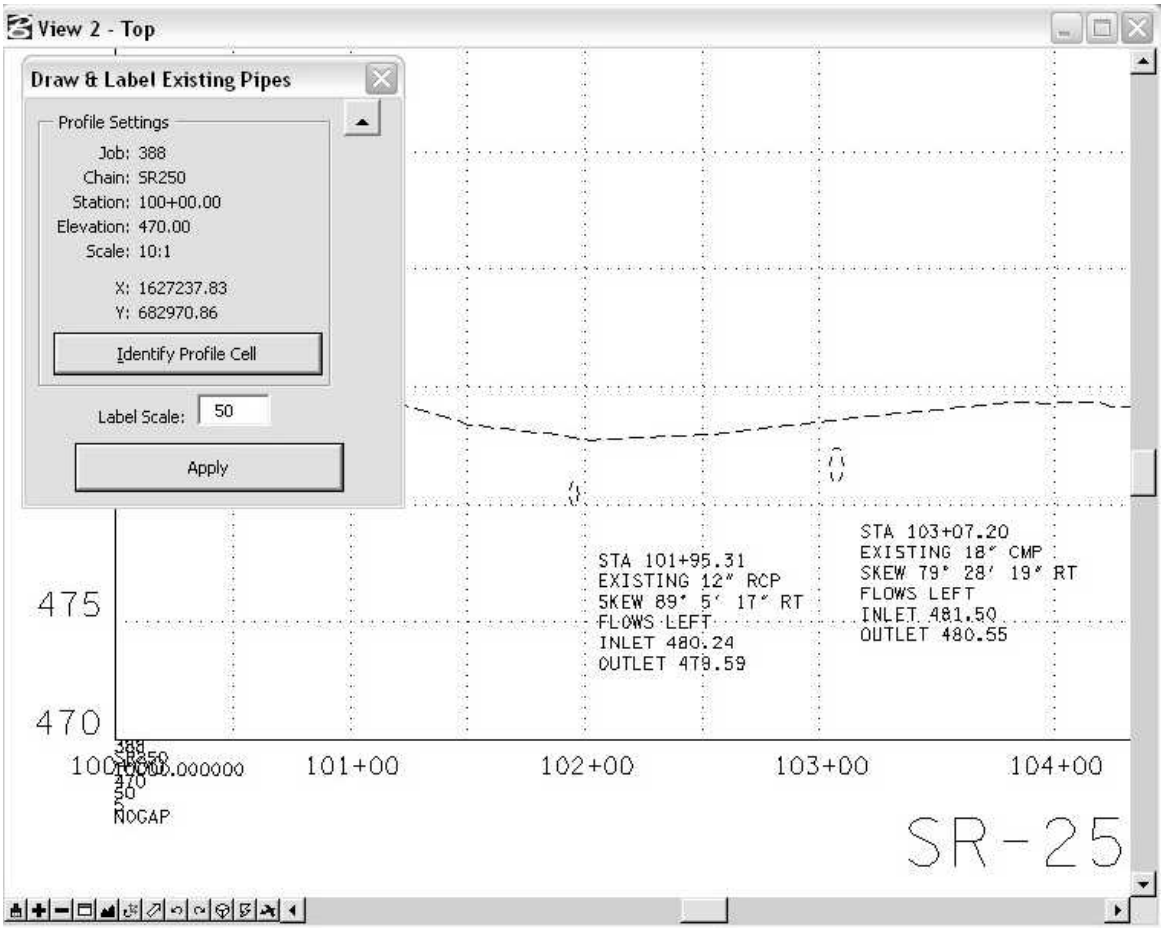
Step 1. In D&C manager activate **Profile ExPipes**. The **Draw & Label Existing Pipes** dialog appears.



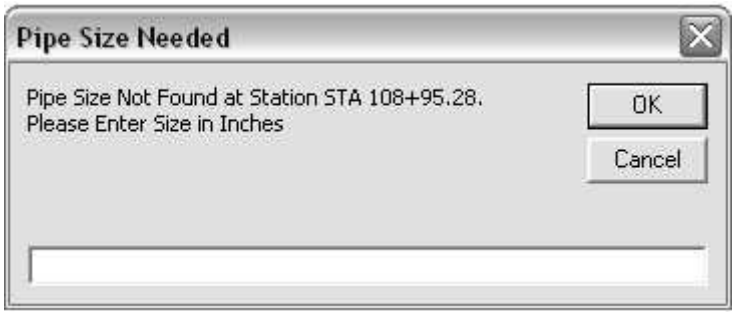
Step 2. Click on the **Identify Profile Cell** command button and data point on the Geopak profile cell for the profile. The window shade button on the upper right of the dialog can be used to get the dialog out of the way as you identify the profile cell. Just click it again to re-expand the dialog after identifying the cell.

Step 3. Adjust scale if needed in the **Label Scale** text entry field. Click on the **Apply** command button.

The GPK file is read and all PIPE features which cross the chain are located, plotted and annotated on the profile.



If a pipe is found that does not include the size in its description then the user is prompted for the size.



Draw Exist. SA/ST System on Profile

D&C location: Drafting Standards > Exist. Profiles > Drainage> Ex SA/ST System

Geopak 3PC Program: draw_cb.x

Description:
Draws existing storm and sanitary sewer catch basins, drop inlets & manholes as well as connecting pipes on profile using plan view graphics. Includes annotation of structures and pipes. Produces error log for missing data, etc. Used by Survey personnel.

Special Requirements:
All graphics must be in a MicroStation selection set prior to running the program and a Geopak profile cell must be present. This must be a 3D MicroStation DGN file since the tool reads the graphics for elevation values.

The use of this application requires that field data be collected in a certain manner. Please note that some data can be added or corrected in the office if the field crew does not take all shots required for the 3PC program to run.

When a point is set in the field and coded: **XCB**, **XDI**, **XMHSTS** or **XMHSAS** this sets the top invert of the structure. At this time another point is set using **XBOT** code and the elevation is adjusted to the bottom invert of the structure.

For pipe coding all pipes need a **FROM / TO** field shot, using **?STS** or **?SAS.** Doing this will place the correct custom line style for the existing pipe and place an **XINV** cell at each end of all runs of pipe.

If there is a run of pipe that begins or ends outside the limits of the horizontal alignment this run of pipe needs to be adjusted in the office by placing a **XINV** cell on the pipe run within the limit of the alignment and setting a break in the existing pipe line at that location. To get this done:

1. On level DESIGN - SCRATCH - User 1 draw a MicroStation line crossing the existing run of pipe within the alignment.
2. Draw another MicroStation line from exist. invert to exist. invert on the existing pipe.
3. Temporarily turn off the level of the existing pipe.
4. Using MicroStation extend to intersection the second line drawn with the first line placed.
5. Place a **XINV** cell at the new end of this line.
6. Delete the two lines that you placed to locate the new XINV cell.
7. Turn the level of the existing pipe back on
8. Add a break in the existing pipe line at the location of the new XINV cell just placed using MicroStation partial delete snapping to the cell location each time to make a zero length break in the pipe line.

Usage:

This tool has been described previously under **Drafting Standards > Exist. Profiles > Utilities**. See the description of usage at that location.

Draw Exist. Pipe(s) on Profile by Center Flow Point

D&C location: Drafting Standards > Exist. Profiles > Drainage> Profile Pipe Ex

MicroStation Basic Program: drawEXpipeprofile.ba

Description:
This application is used to draw a existing pipe(s) on a profile. Drainage structure graphics and annotation are added to 2 separate graphic groups to aide in moving or deleting.

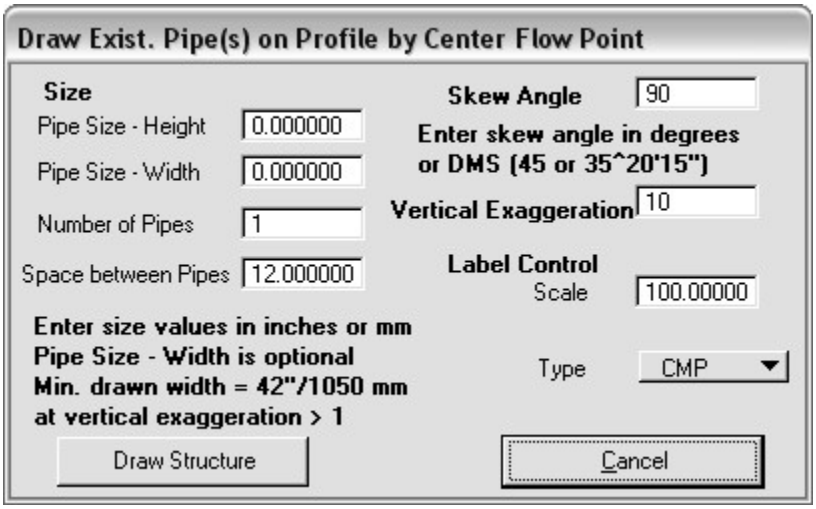
This program can also be activated by using the keyin
macro drawEXpipeprofile

Special Requirements:
The center flow line point of the pipe(s) must be located in graphics prior to running the application.

Usage:

Step 1. Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Geopak's **Vertical Alignment Generator** and it's **Issue Data Point** tool.

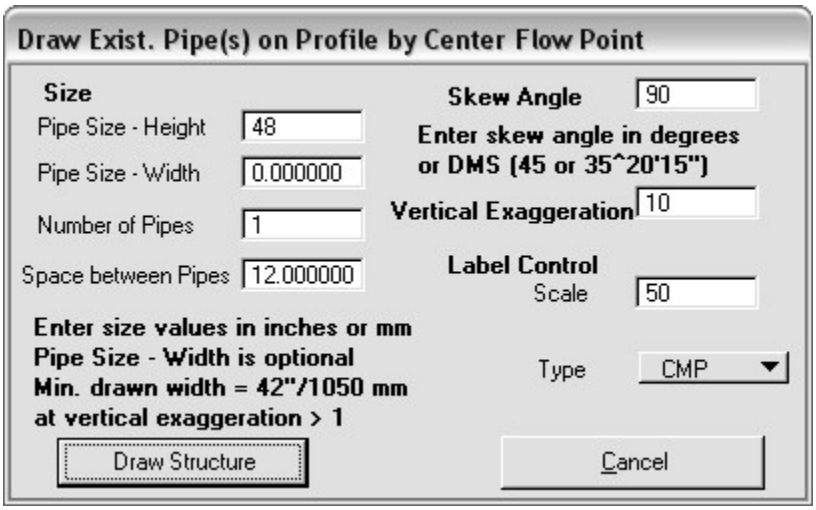
Step 2. In D&C manager activate **Profile Pipe Ex**. The **Draw Exist. Pipe(s) on Profile by Center Flow Point** dialog opens**.** Defaults which are displayed . .**Number of Pipes 1, Space between Pipes 12 inches, Skew Angle 90, Vertical Exaggeration 10, Label Control - Scale (Current Active Scale) & Label Control - Type CMP.** Note that skew angles in degrees minutes & seconds are supported.



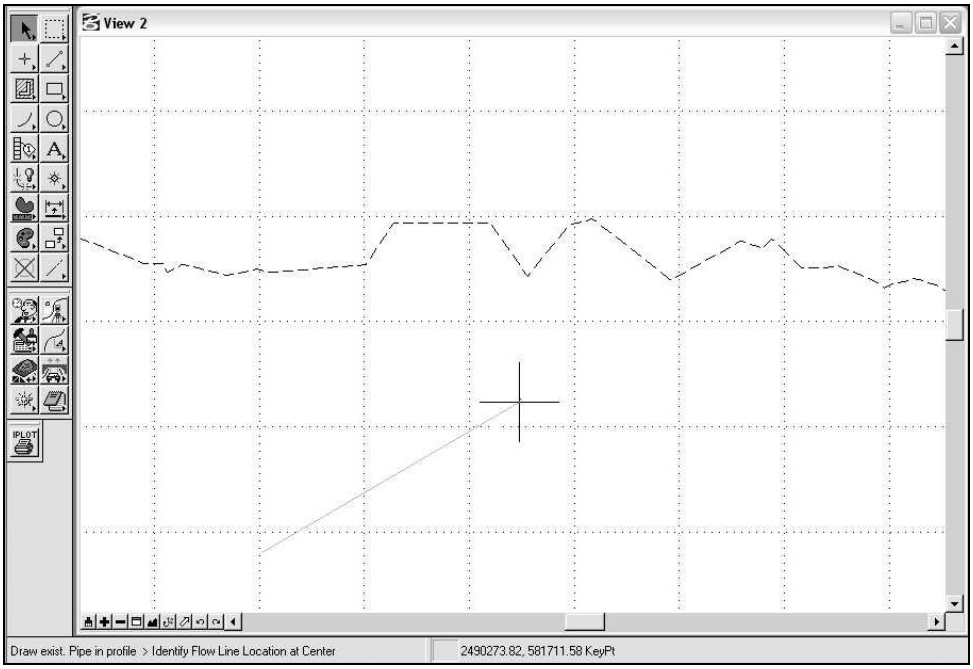
Pipe Size - Width is optional and is provided so that horizontal & vertical oval pipes can be drawn as needed.

Vertical Exaggeration should usually be 10 for profiles …
(Example: 50 scale horiz. / 5 scale vert. = 10)
It is provided for special profile cases and for the occasional need to draw on culvert sections which would use an exaggeration value of 1.

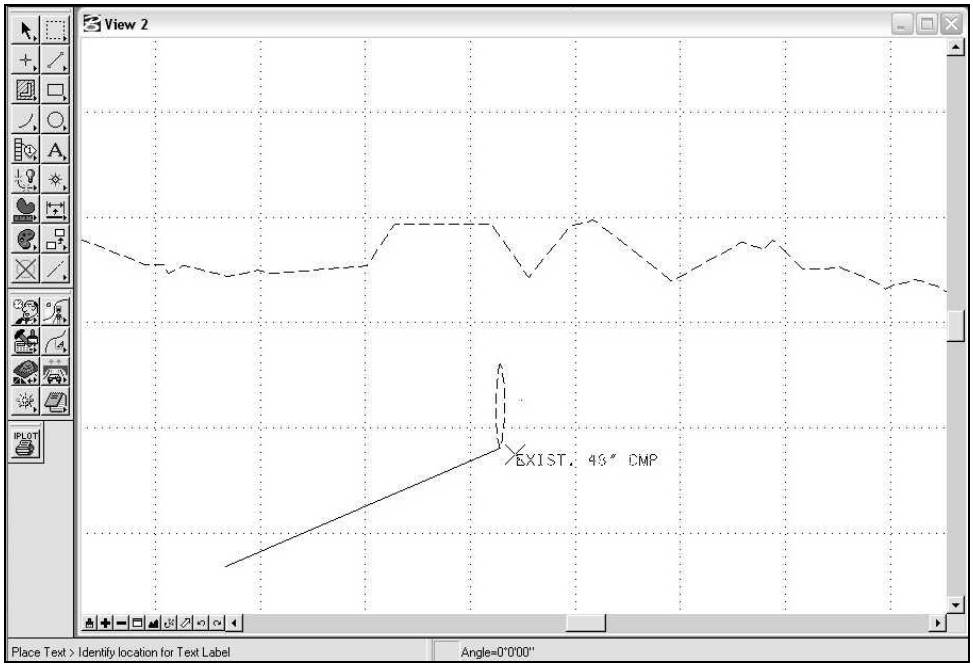
Step 3. Make settings in the dialog as needed for the pipe(s) you need to draw. In our example we are placing a 48" CMP at a 90 degree skew. Once settings are made click on the **Draw Structure** button.



Step 4. You are then prompted to **Identify Flow Line Location at Center**. **Snap** and **Data point** at the flow line point.

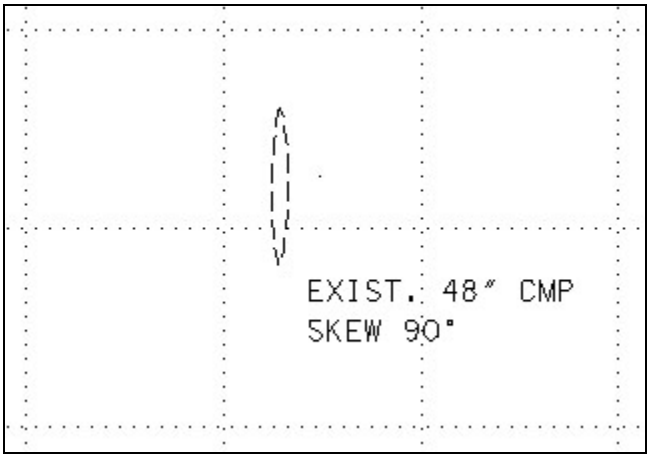


Step 6. The pipe is drawn and the user is prompted to **Identify location for Text Label.** A **Reset** can be given to skip placement or **Data point** at location for the text to be placed.



Since it is difficult to see small pipes on profiles when drawn at actual size, this program plots pipes at a **minimum width of 42"(3.5')** when the Vertical Exaggeration is greater than 1. The pipe height is always shown at actual size times the Vertical Exaggeration value.

When text annotation is placed, **size, type & skew** information is included.



Draw Exist. Box Culvert on Profile by Flow Point

D&C location: Drafting Standards > Exist. Profiles > Drainage> Profile Box Ex

MicroStation Basic Program: drawEXboxprofile.ba

Description:
This application is used to draw a existing box culvert or bridge on a profile. Drainage structure graphics and annotation are added to 2 separate graphic groups to aide in moving or deleting.

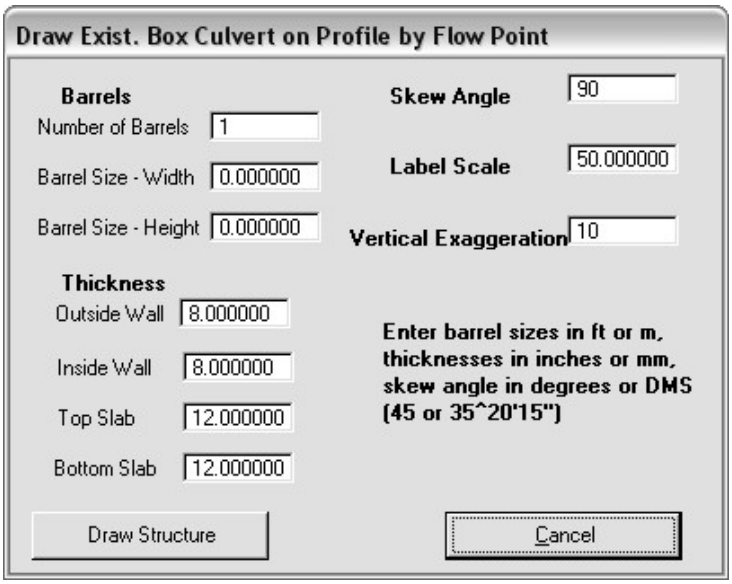
This program can also be activated by using the keyin
macro drawEXboxprofile

Special Requirements:
The center flow line point of the structure must be located in graphics prior to running the application.

Usage:

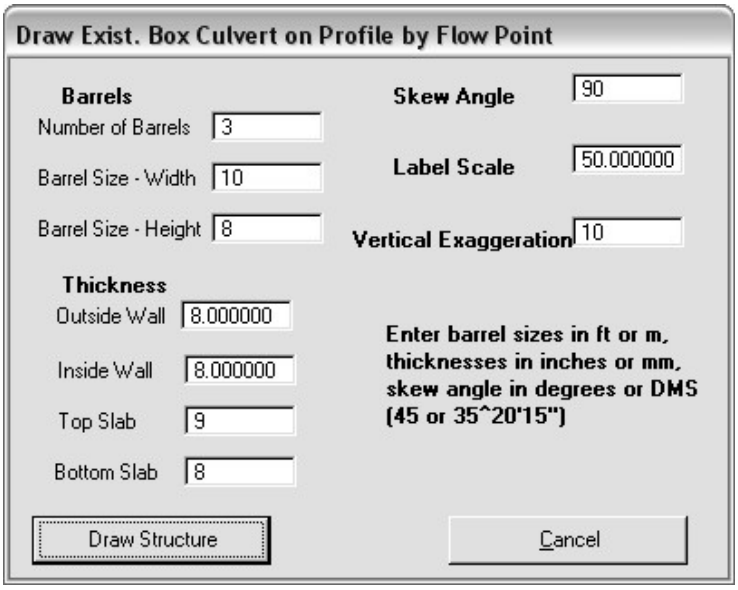
Step 1. Establish the center flow line point of the structure. This may be located with MicroStation tools or with Geopak's **Vertical Alignment Generator** and it's **Issue Data Point** tool.

Step 2. In D&C manager activate **Profile Box Ex**. The **Draw Exist. Box Culvert on Profile by Flow Point** dialog opens**.** Defaults which are displayed . . . **Number of Barrels 1, Outside Wall 8 inches, Inside Wall 8 inches, Top Slab 12 inches, Bottom slab 12 inches, Skew Angle 90, Label Scale (Current Active Scale)** & **Vertical Exaggeration 10.** Note that skew angles in degrees minutes & seconds are supported.

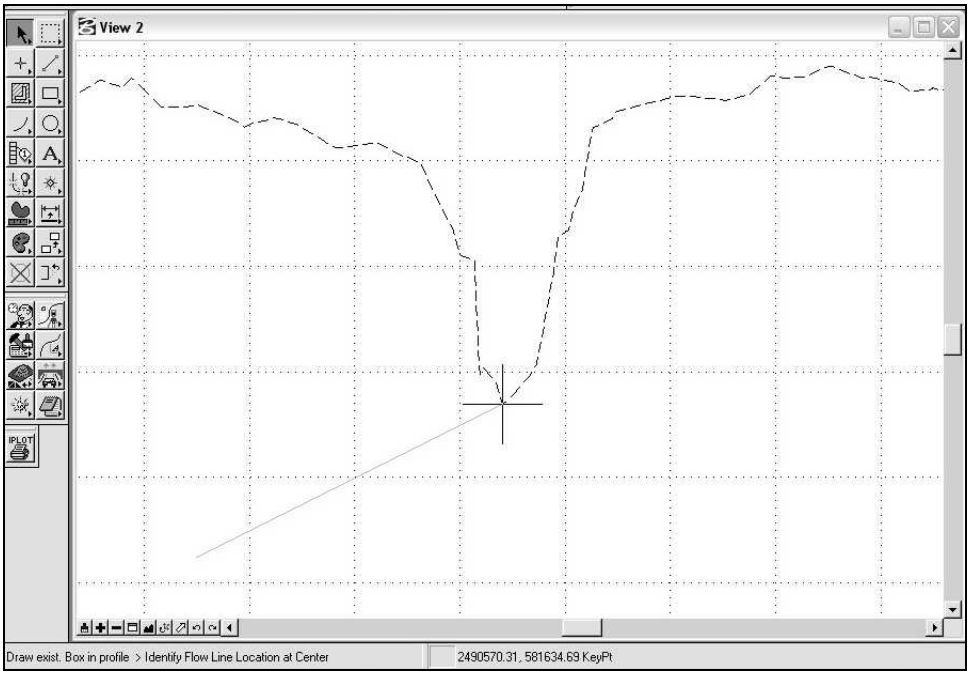


Vertical Exaggeration should usually be 10 for profiles …
(Example: 50 scale horiz. / 5 scale vert. = 10)
It is provided for special profile cases and for the occasional need to draw on culvert sections which would use an exaggeration value of 1.

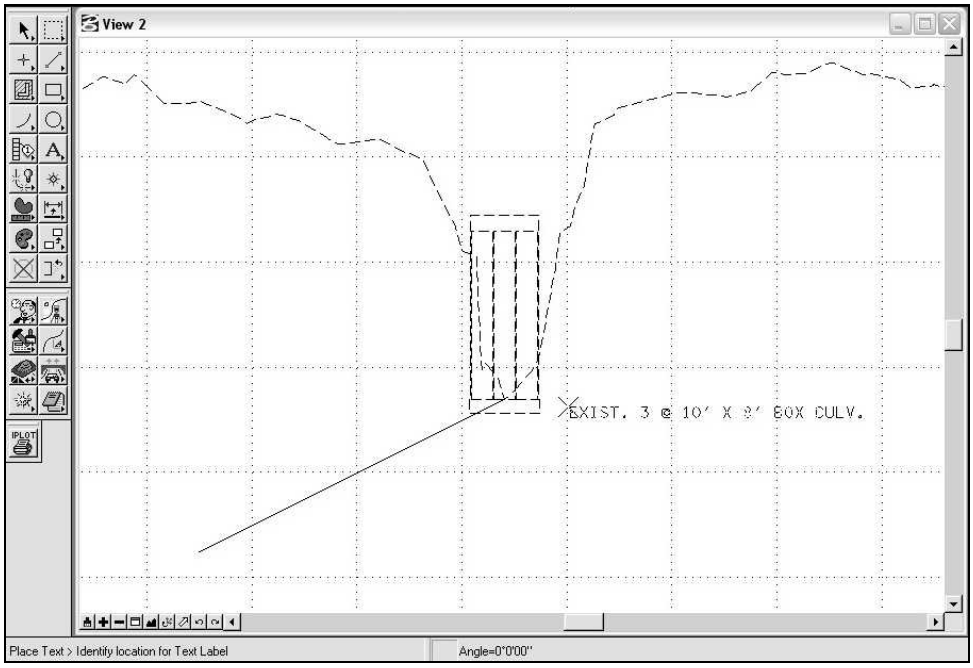
Step 3. Make settings in the dialog as needed for the structure you need to draw. In our example we are placing a 3 @ 10X8 structure at a 90 degree skew. It has an outside wall thickness of 8" and an inside wall thickness of 8" so we can use the defaults. The top slab thickness is 9" and the bottom slab thickness is 8" so we enter those. Once settings are made click on the **Draw Structure** button.



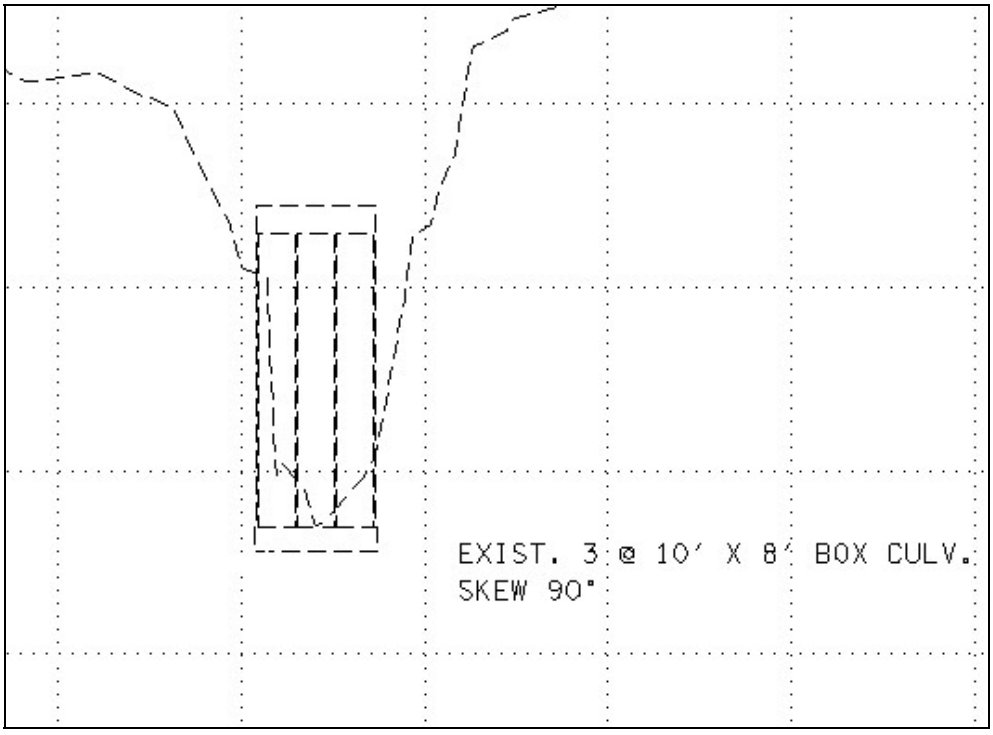
Step 4. You are then prompted to **Identify Flow Line Location at Center**. **Snap** and **Data point** at the flow line point.



Step 6. The structure is drawn and the user is prompted to **Identify location for Text Label.** A **Reset** can be given to skip placement or **Data point** at location for the text to be placed.



When text annotation is placed, **size, type & skew** information is included.



Draw Exist. Slab Culvert on Profile by Flow Point

D&C location: Drafting Standards > Exist. Profiles > Profile Slab Ex

MicroStation Basic Program: drawEXslabprofile.ba

Description:
This application is used to draw a existing slab culvert or bridge on a profile. Drainage structure graphics and annotation are added to 2 separate graphic groups to aide in moving or deleting.

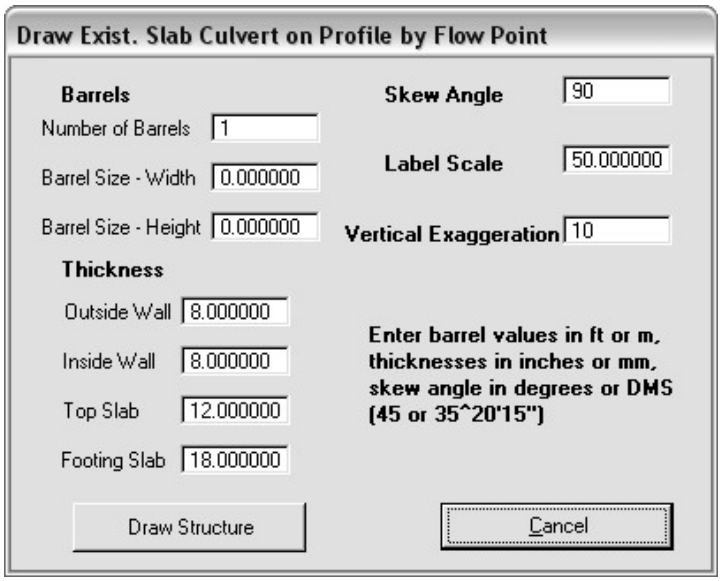
This program can also be activated by using the keyin
macro drawEXslabprofile

Special Requirements:
The center flow line point of the structure must be located in graphics prior to running the application.

Usage:

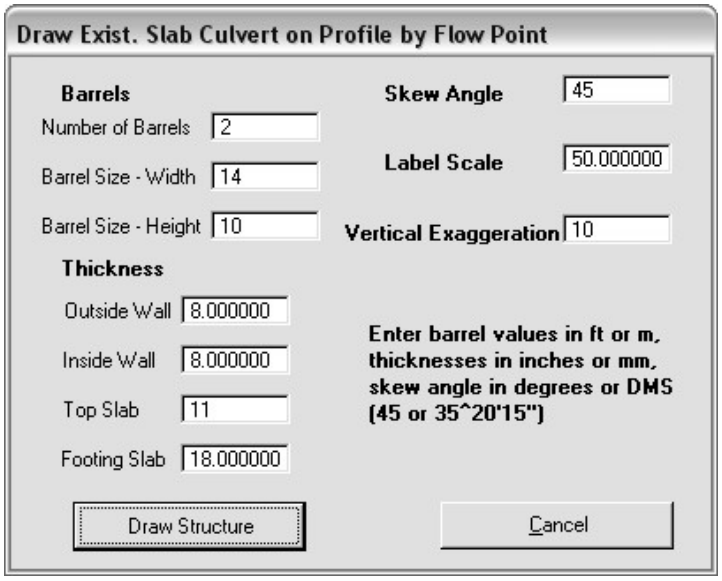
Step 1. Establish the center flow line point of the structure. This may be located with MicroStation tools or with Geopak's **Vertical Alignment Generator** and it's **Issue Data Point** tool.

Step 2. In D&C manager activate **Profile Slab Ex**. The **Draw Exist. Slab Culvert on Profile by Flow Point** dialog opens**.** Defaults which are displayed . . . **Number of Barrels 1, Outside Wall 8 inches, Inside Wall 8 inches, Top Slab 12 inches, Footing slab 18 inches, Skew Angle 90, Label Scale (Current Active Scale)** & **Vertical Exaggeration 10.** Note that skew angles in degrees minutes & seconds are supported.

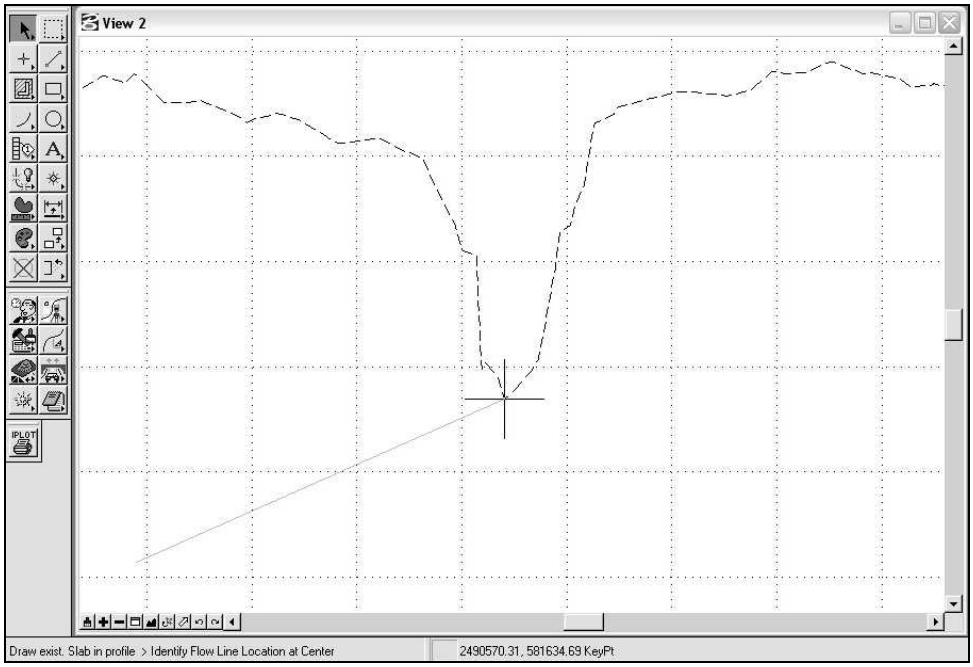


Vertical Exaggeration should usually be 10 for profiles …
(Example: 50 scale horiz. / 5 scale vert. = 10)
It is provided for special profile cases and for the occasional need to draw on culvert sections which would use an exaggeration value of 1.

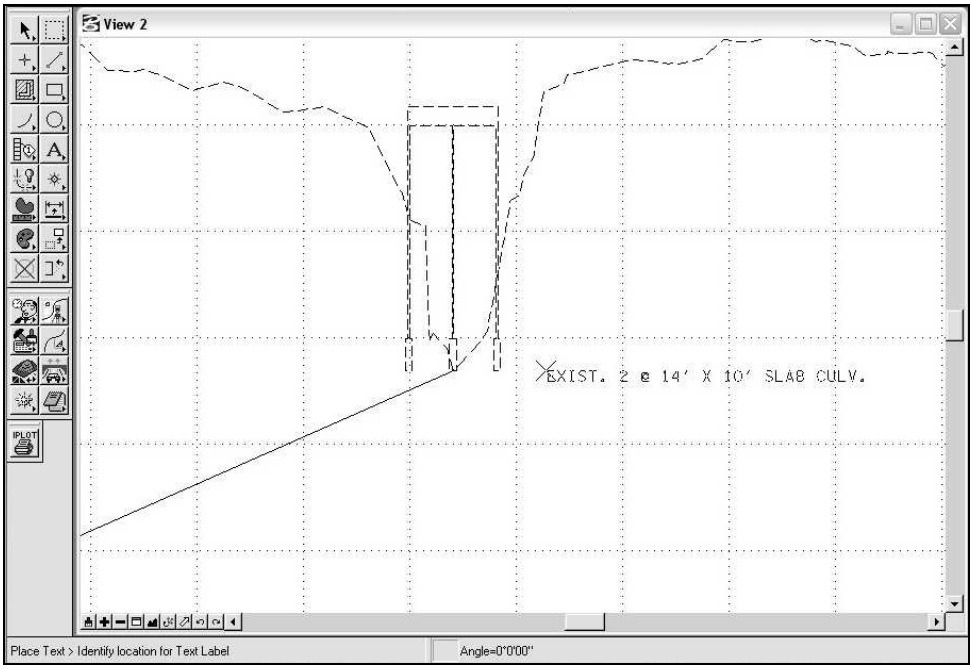
Step 3. Make settings in the dialog as needed for the structure you need to draw. In our example we are placing a 2 @ 14X10 structure at a 45 degree skew. The outside wall thickness is 8", inside wall thickness is 8" and the footing slab thickness is 18" so we can use the defaults. The top slab thickness is 11" so we enter that. Once settings are made click on the **Draw Structure** button.



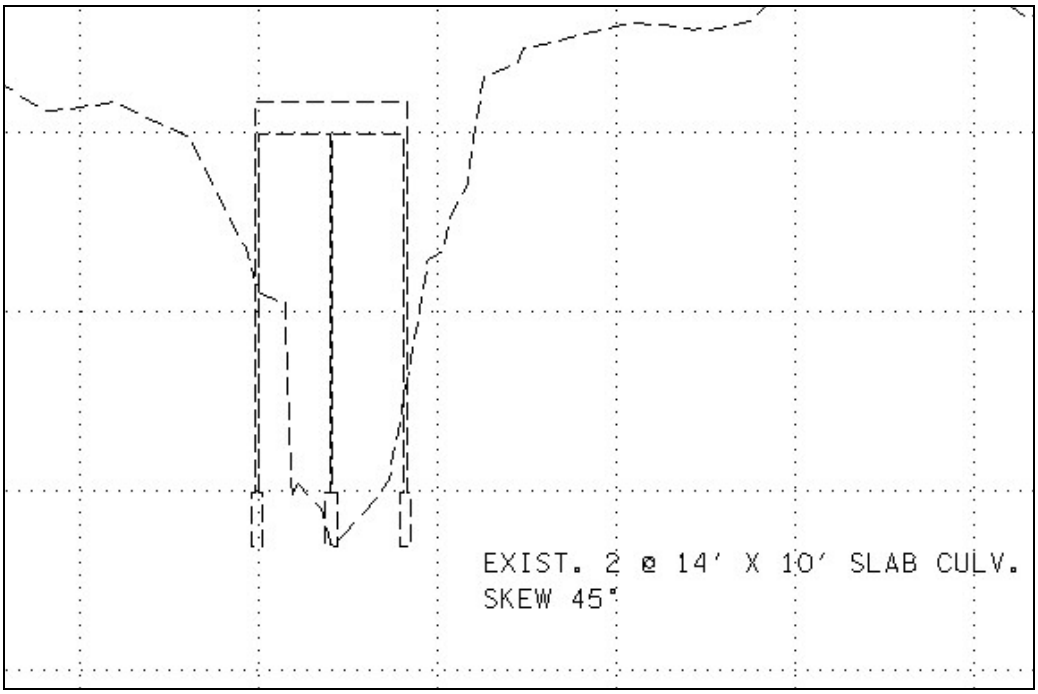
Step 4. You are then prompted to **Identify Flow Line Location at Center**. **Snap** and **Data point** at the flow line point.



Step 6. The structure is drawn and the user is prompted to **Identify location for Text Label.** A **Reset** can be given to skip placement or **Data point** at location for the text to be placed. Due to the 45 degree skew, structure widths are adjusted.



When text annotation is placed, **size, type & skew** information is included.



Survey Control

Draw Control Point Table

D&C location: Drafting Standards > Survey Control > Cntrl Pt Table

Geopak 3PC Program: draw_contrl_pt_table.x

Description:
Builds control point table for placement in plan view. Used by Survey personnel.

Special Requirements:
All graphics must be in a MicroStation selection set prior to running the program. This must be a 3D MicroStation DGN file since the tool reads the graphics for elevation values.

If a benchmark or control point is not within the limit of the horizontal alignment the program will generate an error file noting those.

After building the control point table with this program it is necessary to edit the data to show point numbers.

Usage:

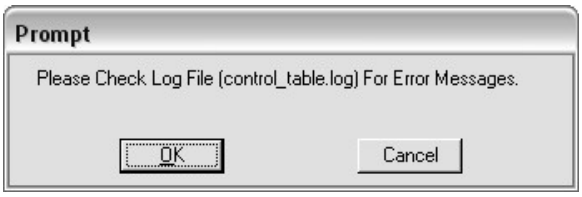
Step 1. Using MicroStation's Selection Set tool add all plan view graphics to a selection set.

Step 2. In D&C manager activate **Cntrl Pt Table**. You are prompted for a **job no.** Key that in and click **OK**.

Step 3. You are then prompted for the **chain name.** Key that in and click **OK**.

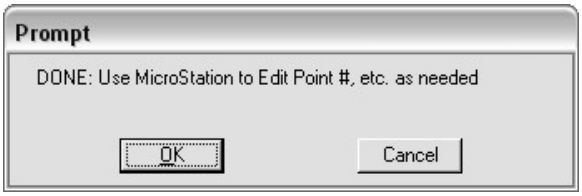
Step 4. You are then prompted for a **Data point** for the table location in the plan view area**.**

Step 5. If errors are encountered then an error log file named **control_table.log** is created and the user is notified with a message prompt**.** Click on **OK** to dismiss this message.



Step 6. If an error log was generated use any ASCII text editor to review errors. Make corrections in plan view graphics as needed and reprocess.

Step 7. If no control points are found then a message is given indicating that situation otherwise the final completion message is given. Click on **OK** to dismiss this message.



Step 8. Edit the control point data in the table to show point numbers.

CONTROL POINTS

POINT	NORTH	EAST	ELEV.	STATION	OFFSET
S____	687351.1555	1629244.6846	484.72	104+34.83	38.81' (RT)
S____	687492.8911	1629339.3204	485.87	105+98.97	19.08' (RT)
S____	687220.7578	1629026.5631	481.61	101+88.37	14.46' (RT)

Place Coordinate Grid Tick

D&C location: Drafting Standards > Survey Control > Coor Grid Tick

MicroStation VBA Program: PlaceCoorGridTick.mvba

Description:

This program places a single coordinate grid tick with northing and easting coordinate annotation. All graphics are combined in a graphic group.

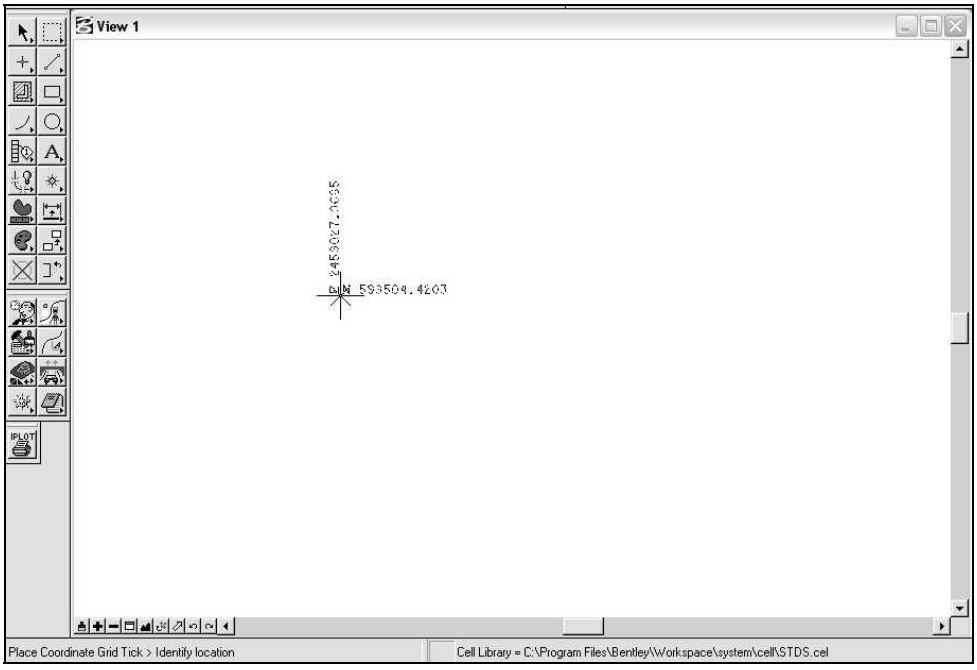
This program can also be activated from the MicroStation drop down menu
TDOT > Topographic > Place Coordinate Grid Tick
or by using the keyin
vba run [PlaceCoorGridTick]GridTick.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Coor Grid Tick**. When started the program goes immediately into a dynamic mode with the tick on the user's cursor. As the mouse is moved, coordinate information updates with tracking.



Step 2. When the user gives a data point by mouse or via keyin, tick and annotation are placed at the location. Additional placements can then be made. Command remains active until another command is chosen.

Place Coordinate Grid Ticks by Range

D&C location: Drafting Standards > Survey Control > Grid Tick Range

MicroStation VBA Program: PlaceCoorGridTick.mvba

Description:

This program places coordinate grid ticks with northing and easting coordinate annotation based on a range and increment given by the user. All graphics are combined in a graphic group. Scale controls size of grid tick cells and text.

Each placement of graphics are in a separate graphic group so the user can easily delete and replace as needed.

For the user's convenience, the command button Place Grid Ticks is provided on the dialog to restart the command after the initial start of the program.

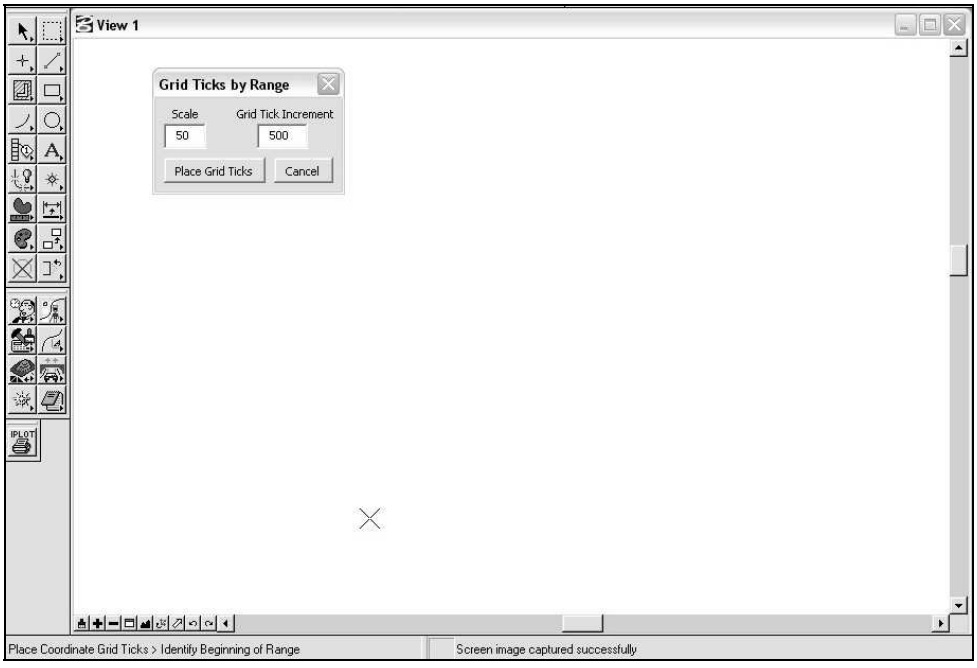
This program can also be activated from the MicroStation drop down menu
TDOT > Topographic > Place Grid Ticks by Range
or by using the keyin
vba run [PlaceCoorGridTick]GridTickRange.main

Special Requirements:

None.

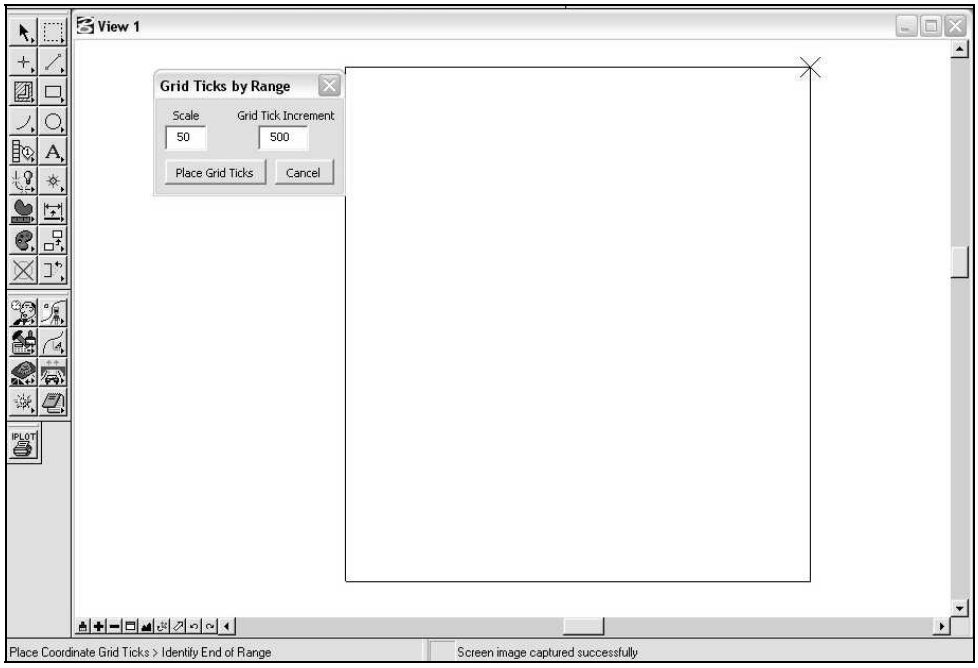
Usage:

Step 1. In D&C manager activate **Grid Tick Range**. The **Grid Ticks by Range** dialog appears. When started program immediately prompts user **to Identify Beginning of Range** for placing coordinate grid ticks. User should check scale & grid tick increment given in Grid Ticks by Range dialog and adjust as needed.

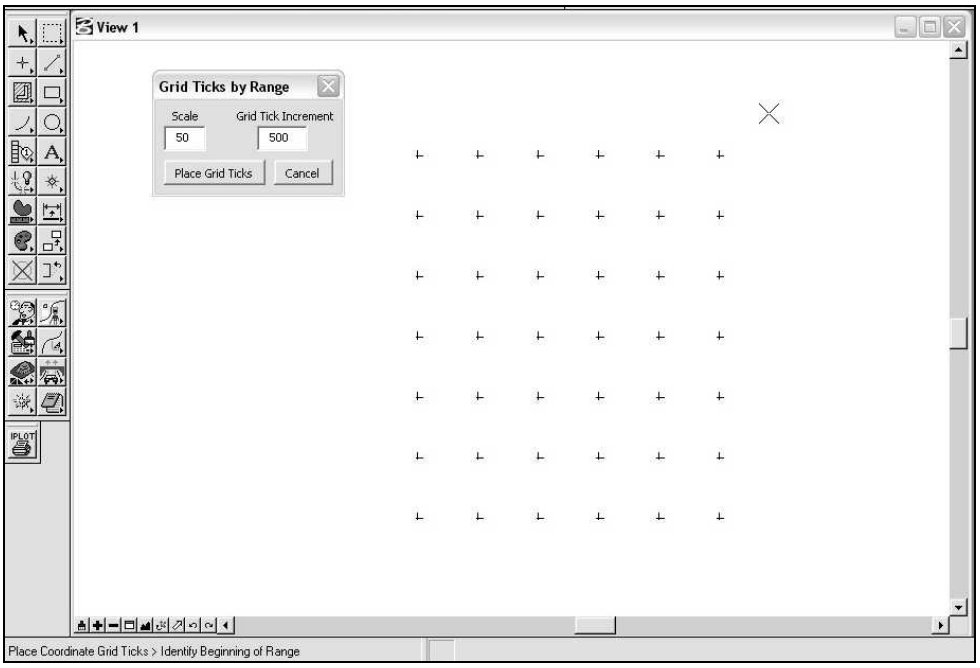


Once settings are made, enter a data point at any corner of the range to which you wish apply coordinate grid ticks.

Step 3. The user is then prompted to **Identify End of Range**. A rectangle is shown dynamically to illustrate the limits of the desired range.



Step 4. After entering the second point, coordinate grid ticks and annotation are placed for the range. The user is again prompted for a beginning point for range in order to place additional graphics.



Prop. R.O.W.

Pattern Loss of Access Area

D&C location: Drafting Standards > Prop. R.O.W. > Loss of Access

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a loss of access area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]LossOfAccess.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

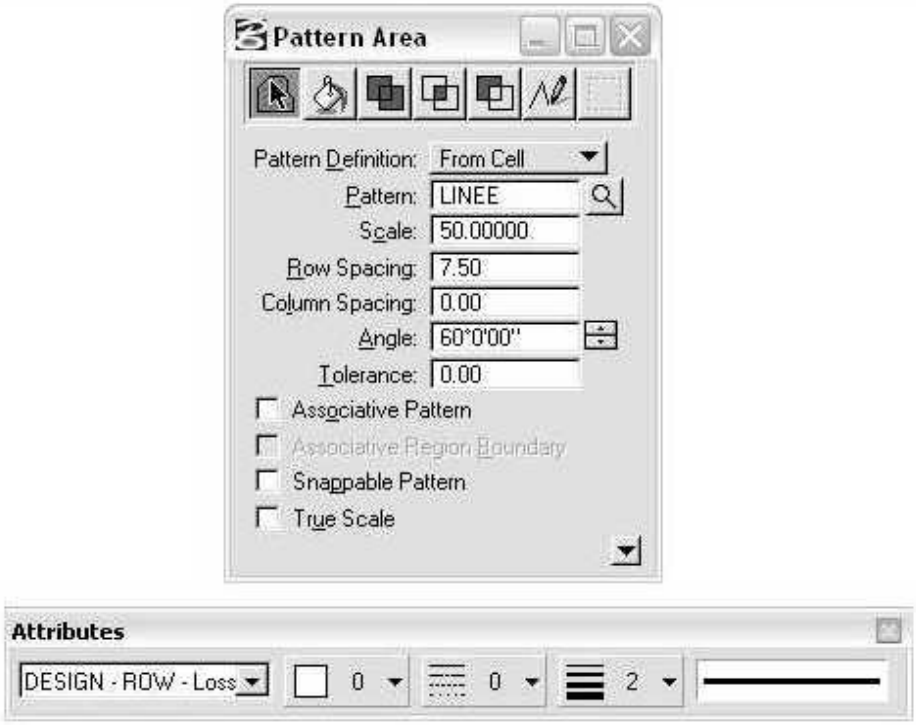
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

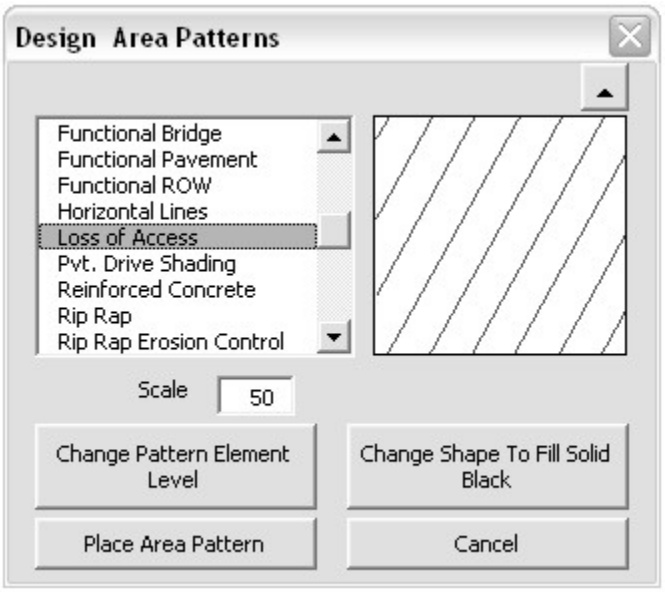
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Loss of Access**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

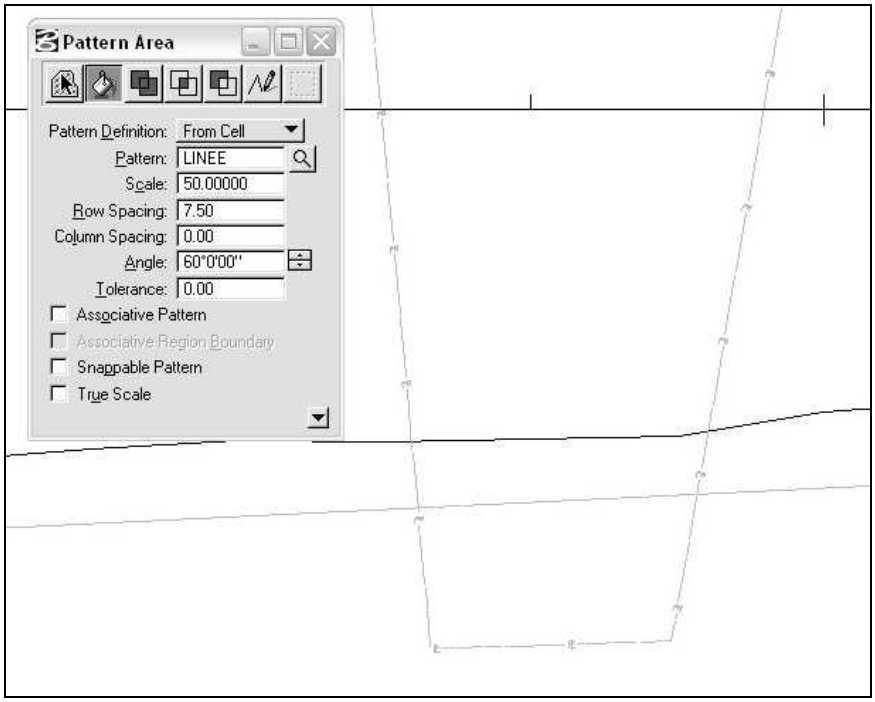


Or from the drop down menu in the **Design Area Patterns** dialog …

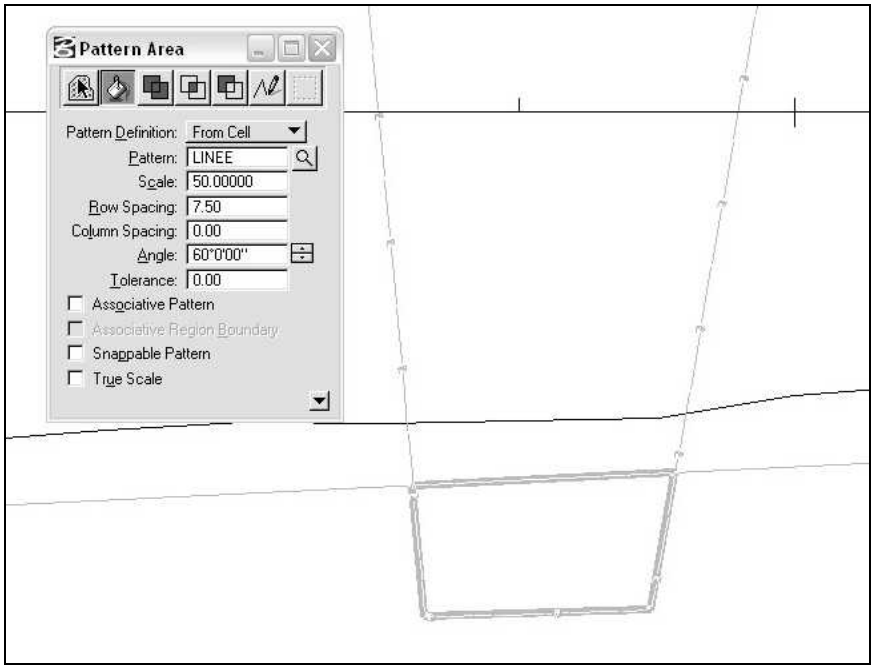


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

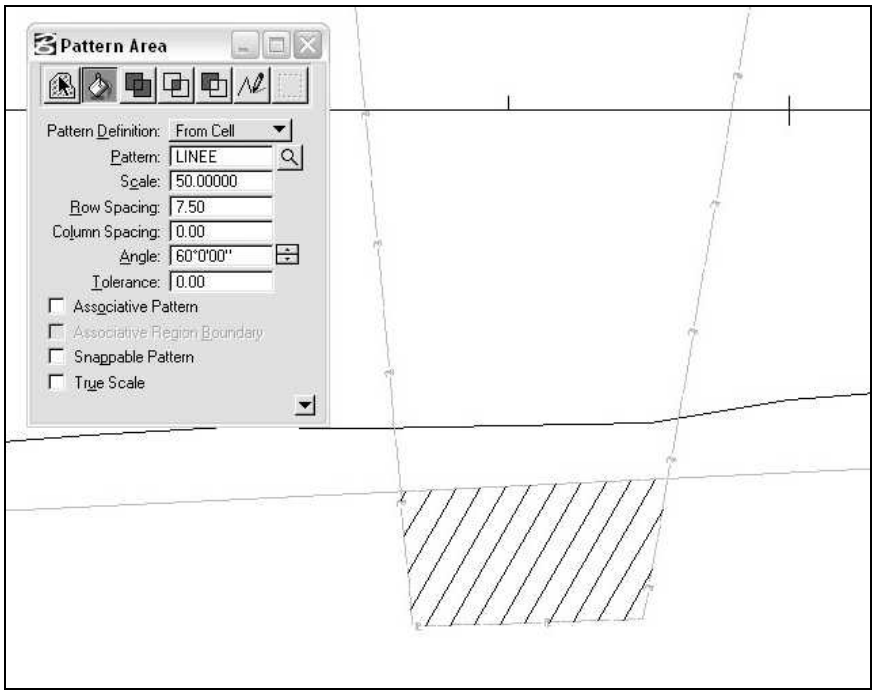
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Wetlands Mitigation Area

D&C location: Drafting Standards > Prop. Easements > Wetlands Mit A

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a prop. wetlands mitigation ROW acquisition area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]WetlandsMitigationArea.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

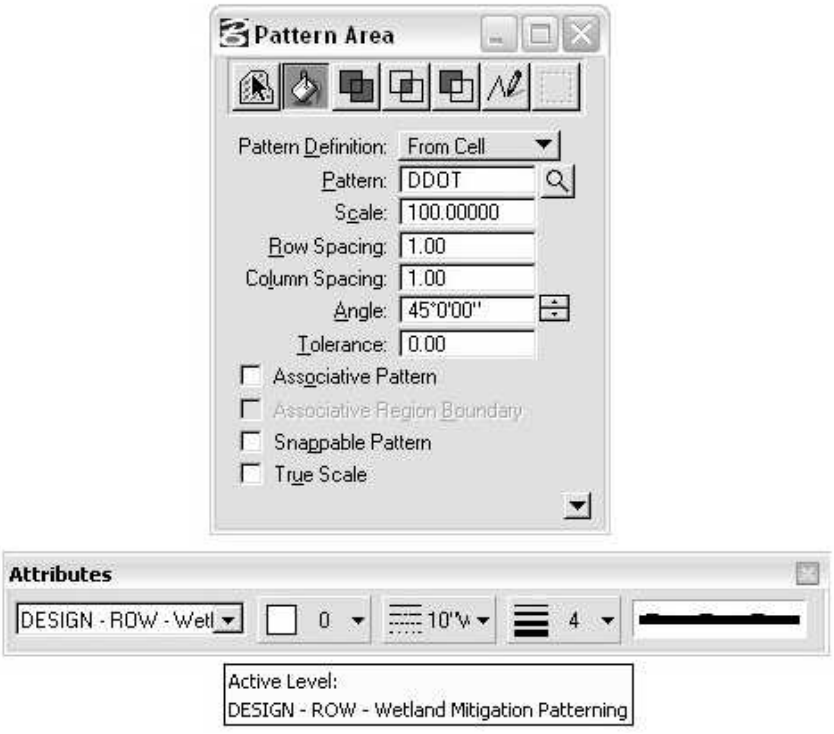
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

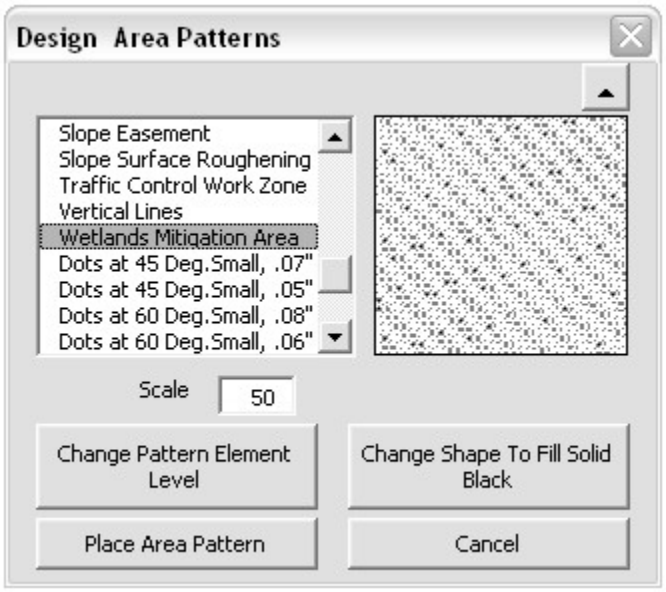
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Wetlands Mit A**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

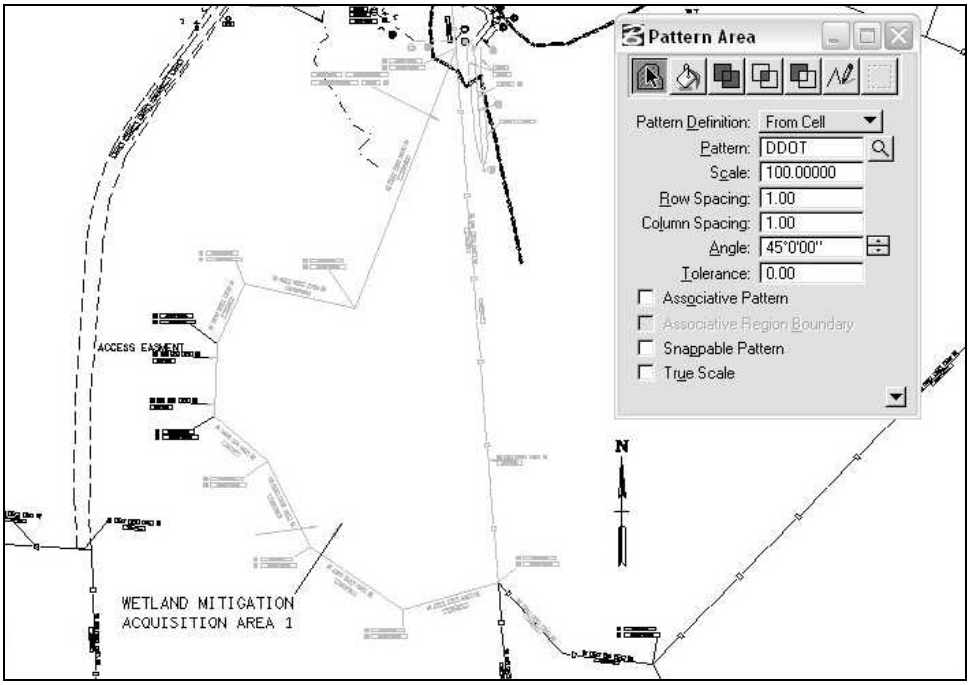


Or from the drop down menu in the **Design Area Patterns** dialog …

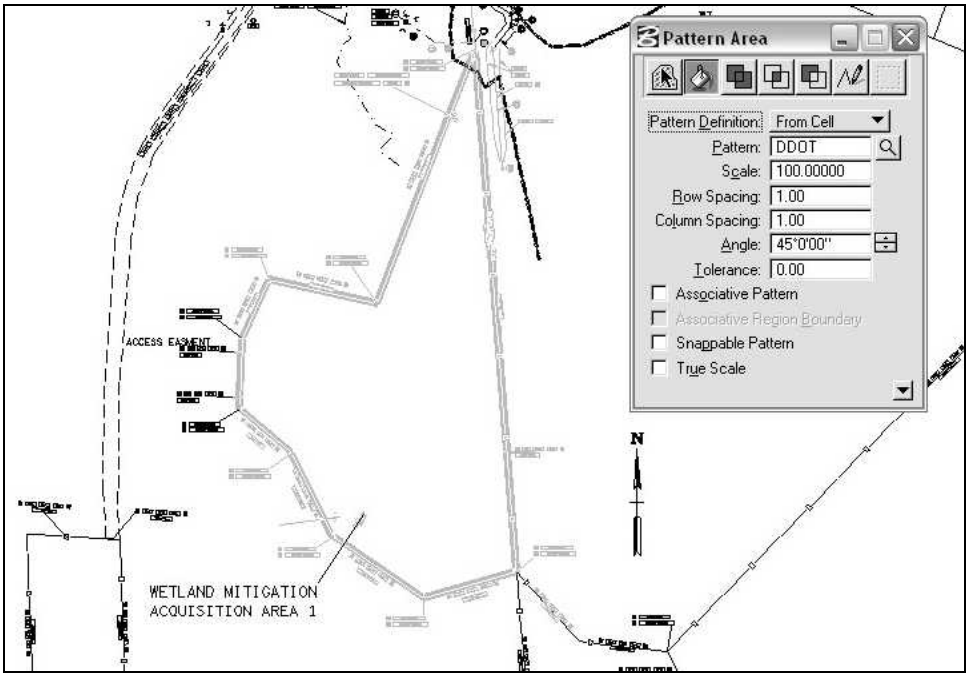


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

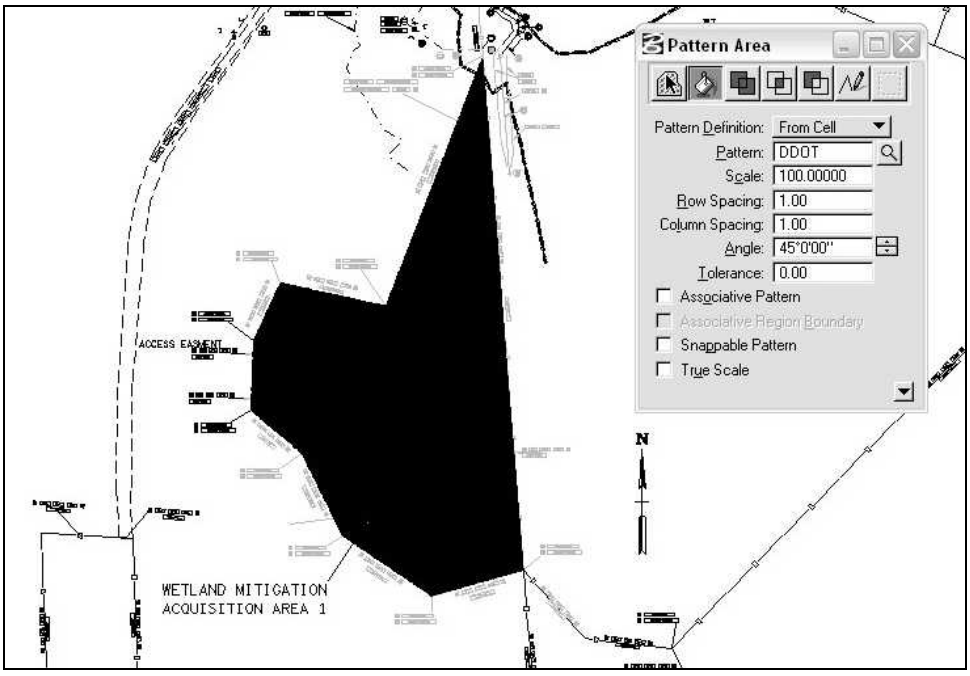
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned. This pattern is one of our most dense dot patterns but due to the size of the example area, it appears solid black when zoomed out.



Place Proposed ROW Flags

D&C location: Drafting Standards > Prop. R.O.W. > ROW Flags

Geopak 3PC Program: place_row_flags.x

Description:
This application reads a selection set of proposed R.O.W. lines and calculates & then places station and offset flags at each break and if desired R.O.W. markers are placed as well.

The prop. R.O.W. flags are placed at the alignment angle. To aide in the clean up of flag locations the text information and it's horizontal line form a single graphic group allowing them to be easily relocated with a single move command. The leader can then be modified to the new location of the horizontal line. MicroStation's Fence Stretch may be used to re-position flags in some cases where flag graphics can be fenced.

Proposed R.O.W. marker types are determined based on the 45 degree rule. Any turn out greater than 45 degrees requires a C marker, any turn in greater than 45 degrees requires a B marker and all others are to be type A markers. The type is labeled with the marker. No marker is placed if there is no change in direction between R.O.W. lines. This is done to prevent placement at R.O.W. and property line intersections.

A ROW marker and it's text label form a single graphic group to aide in clean-up if the marker is to be removed totally. Be sure to turn off graphic group lock prior to repositioning it's text label to avoid moving the marker.

Complete documentation of all prop. R.O.W. procedures can be found in **ProposedROW.pdf.**

Special Requirements:
Proposed R.O.W. lines must be previously displayed using D&C manager and added to a MicroStation selection set.

Selection set should contain any **connected** group of prop. R.O.W. lines that are referenced to a specified chain.

Use of line strings or complex chains are not supported.

Usage:

Step 1. Display proposed R.O.W. lines using D&C manager.

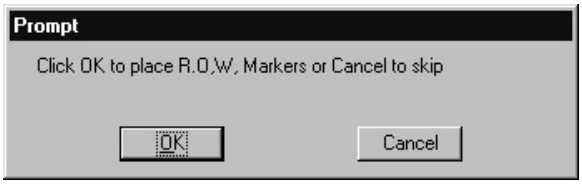
Step 2. Add a connected group of proposed R.O.W. lines to a MicroStation selection set.

Step 3. In D&C manager activate **ROW Flags**.

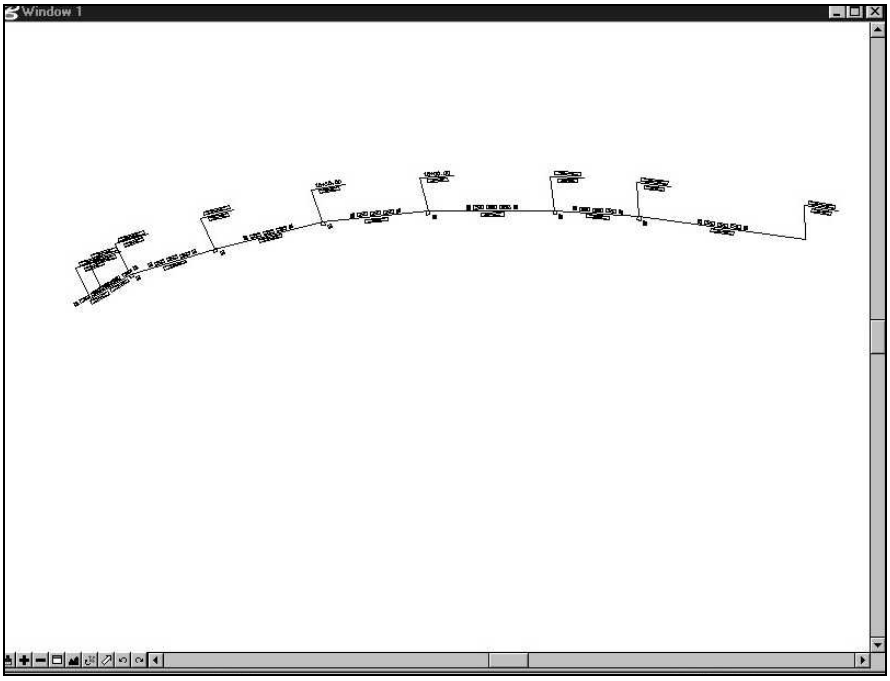
Step 4. You are prompted for a **job no.** Key that in and click **OK**.

Step 5. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 6. Finally you are given an option to place prop. R.O.W. markers. Click **OK** to place them or **Cancel** to skip placement.



Step 7. Station/Offset flags are placed at all locations along the prop. R.O.W. lines in the selection set. If requested prop. R.O.W. markers and their text labels are placed everywhere except at the beginning and end or at any location where there is no change in direction. Use MicroStation to re-position labels as needed for clarity in the plans.



Place ROW Marker

D&C location: Drafting Standards > Prop. R.O.W. > ROW Marker

Geopak 3PC Program: place_row_marker.x

Description:
This application reads a selection set of 2 adjoining proposed R.O.W. lines, calculates the angles between them & then places the appropriate R.O.W. marker and labels it.

Proposed R.O.W. marker types are determined based on the 45 degree rule. Any turn out greater than 45 degrees requires a C marker, any turn in greater than 45 degrees requires a B marker and all others are to be type A markers. The type is labeled with the marker.

A ROW marker and it's text label form a single graphic group to aide in clean-up if the marker is to be removed totally. Be sure to turn off graphic group lock prior to repositioning it's text label to avoid moving the marker.

Complete documentation of all prop. R.O.W. procedures can be found in **ProposedROW.pdf.**

Special Requirements:
Two adjoining proposed R.O.W. lines must be previously displayed using D&C manager and added to a MicroStation selection set.

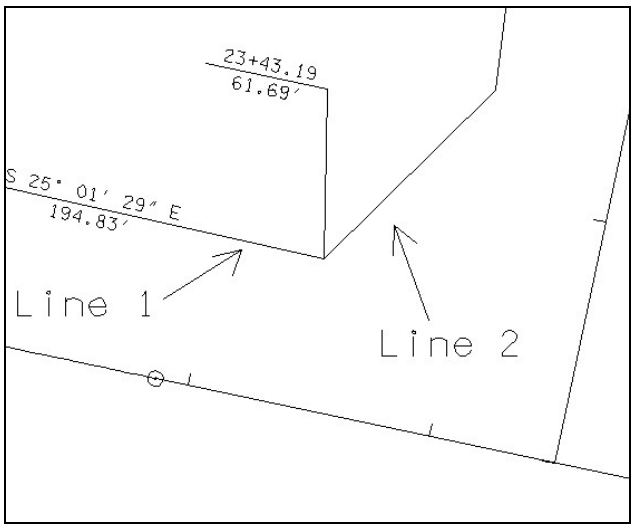
Use of line strings or complex chains are not supported.

Usage:

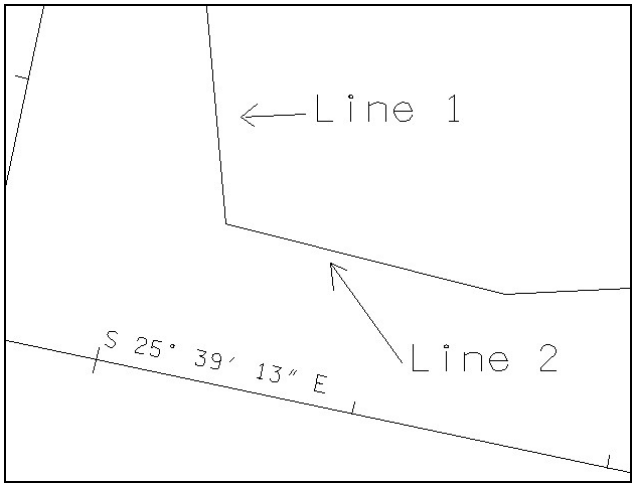
Step 1. Display proposed R.O.W. lines using D&C manager if needed.

Step 2. Create a MicroStation selection set of the two adjoining R.O.W. lines. They should be **selected in a forward direction** along the main roadway. Hold **Ctrl** down on the keyboard and **data point** on the lines in order as shown below.

On the first intersection of the side road prop. R.O.W.



or on the other side

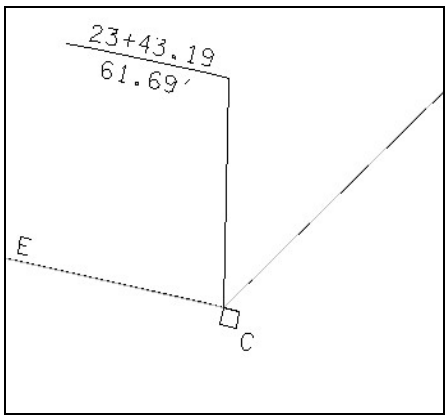


Step 3. In D&C manager activate **ROW Marker**.

Step 4. You are prompted for a **job no.** Key that in and click **OK**.

Step 5. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 6. Angles between prop. R.O.W. lines are measured and the marker is placed. Use MicroStation to re-position label as needed for clarity in the plans.



Label Station / Offset

D&C location: Drafting Standards > Prop. R.O.W. > StaOffsetLabel

MicroStation VBA Program: StaOffLabel.mvba

Description:

This program places a station and offset label based on a data point, or a station and offset keyed in by the user. Options include title text, line separating station and offset, leader line and choice of terminator including arrowheads or a dot. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the terminator cell scale when included. Graphics are placed at the current active level, symbology & text parameters. All text and the divider line are combined in one graphic group and the leader and terminator combined in another. An ID button is provided for graphic selection of the chain to use.

The most efficient use of this tool is in conjunction with the Text Styles Plus vba program which will set the active level, symbology & text parameters. A command button is provided to access this program.

This tool can be used simply as a horizontal alignment tracking device with dynamic mode without placing labels.

After using this tool, the job number and chain name are remembered and will be used to populate those fields when the dialog is opened again as long as the previously defined job number is found in the current active folder.

Metric application includes both metric & English measurements.

This program can also be activated from the MicroStation drop down menu
TDOT > R.O.W.> Label Station Offset
or by using the keyin
vba run [StaOffLabel]StationOffset.main

Special Requirements:

The **ID Chain** function uses a special VBA reference to program **GetCogoElement.mvba** which was provided by Bentley and must be present with the program for it to function.

Chain that station and offset are measured from must be stored in a Geopak GPK file in the folder where the DGN file resides.

Set level, symbology and text size for label using Text Styles Plus or manual methods prior to use.

Usage:

This tool has been described previously under **Drafting Standards > Tools**. See the description of usage at that location.

Place Bearing & Distance Label

D&C location: Drafting Standards > Prop. R.O.W. > BearingDistance

MicroStation VBA Program: DistanceBearingLabel.mvba

Description:

Calculates the bearing angle and distance from a line or line string segment and sets it up for placement as a label. Text can be placed at the angle of the line or it can be placed horizontal to the view with a leader line as a flag. Program will process line or line strings in complex strings. Graphics are placed at the current active level, symbology & text parameters.

The most efficient use of this tool is in conjunction with the Text Styles Plus vba program which will set the active level, symbology & text parameters. A command button is provided to access this program.

A command button is provided to Identify Element on the dialog to restart the command after the initial start of the program. The Place Label command button is provided so that the user can restart the label placement sequence when it is necessary to use alternate MicroStation commands prior to actual placement, such as going to Text Styles Plus to set symbologies.

Metric application includes both metric & English measurements.

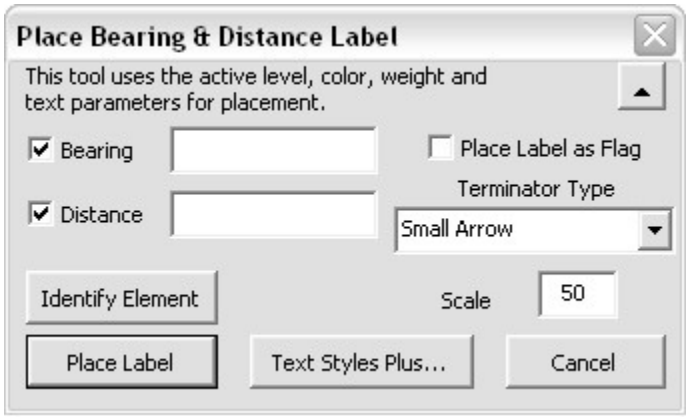
This program can also be activated from the MicroStation drop down menu
TDOT > R.O.W.> Label Bearing & Distance
or by using the keyin
vba run [DistanceBearingLabel]DistanceBearing.Main

Special Requirements:

Set level, symbology and text size for label using Text Styles Plus or manual methods.

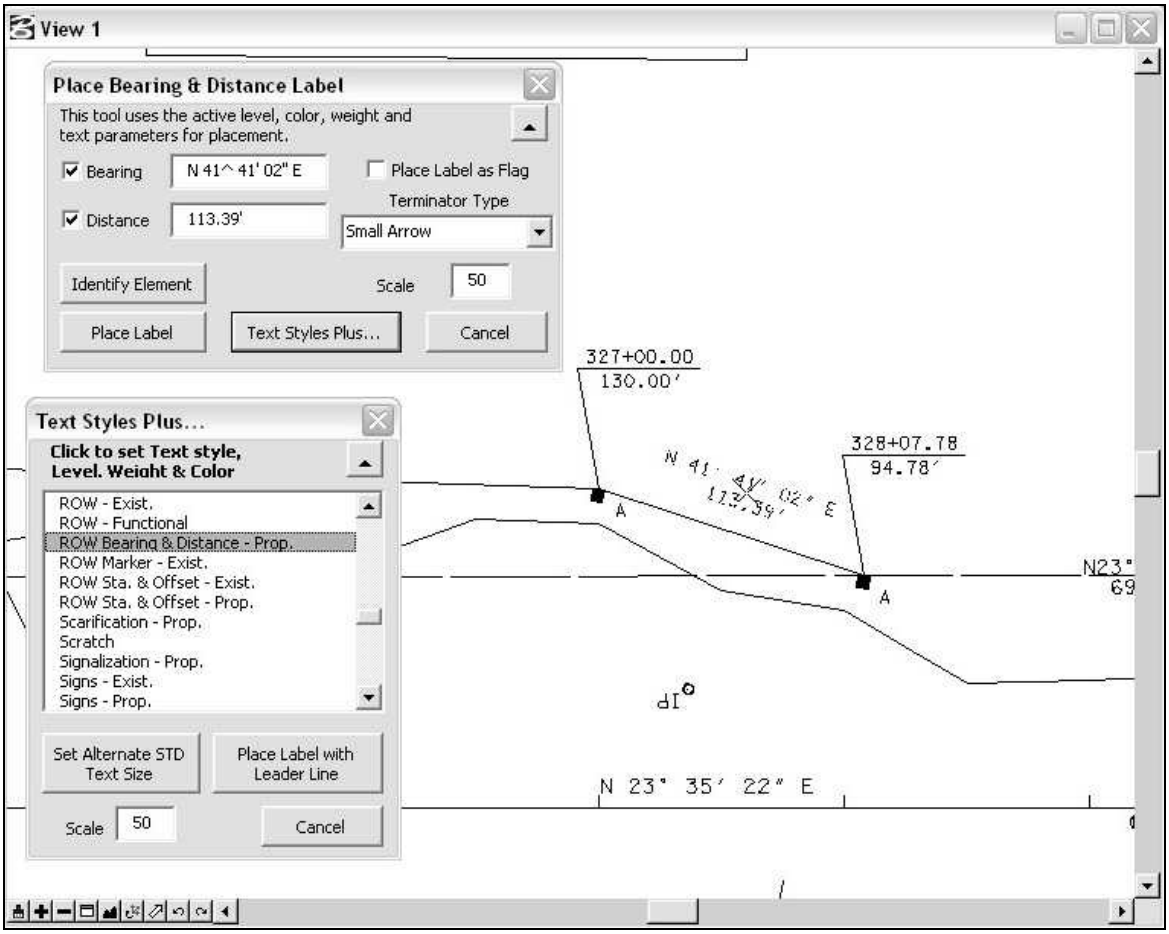
Usage:

Step 1. In D&C manager activate **BearingDistance**. The **Place Bearing & Distance Label** dialog appears. When started program immediately prompts user to **Identify Element** for annotation.



Step 2. Data point on the line element or segment of a line string or complex string that you wish to annotate with bearing & distance.

Step 3. After giving a point to accept the element selected, the dialog is populated with label information and the label text appears on the cursor. The user is prompted to **Identify location for text**.



After the text location point is given, the text remains available for additional placements as needed. A reset will stop text placement and restart the tool.

If the dialog is populated with label information but the user does something else such as setting symbologies, the **Place Label** command button can be used to go on and place that label afterwards.

When other tools are accessed, the **Identify Element** command button can be clicked to restart the tool.

Click option buttons on or off to place bearing or distance labels only.

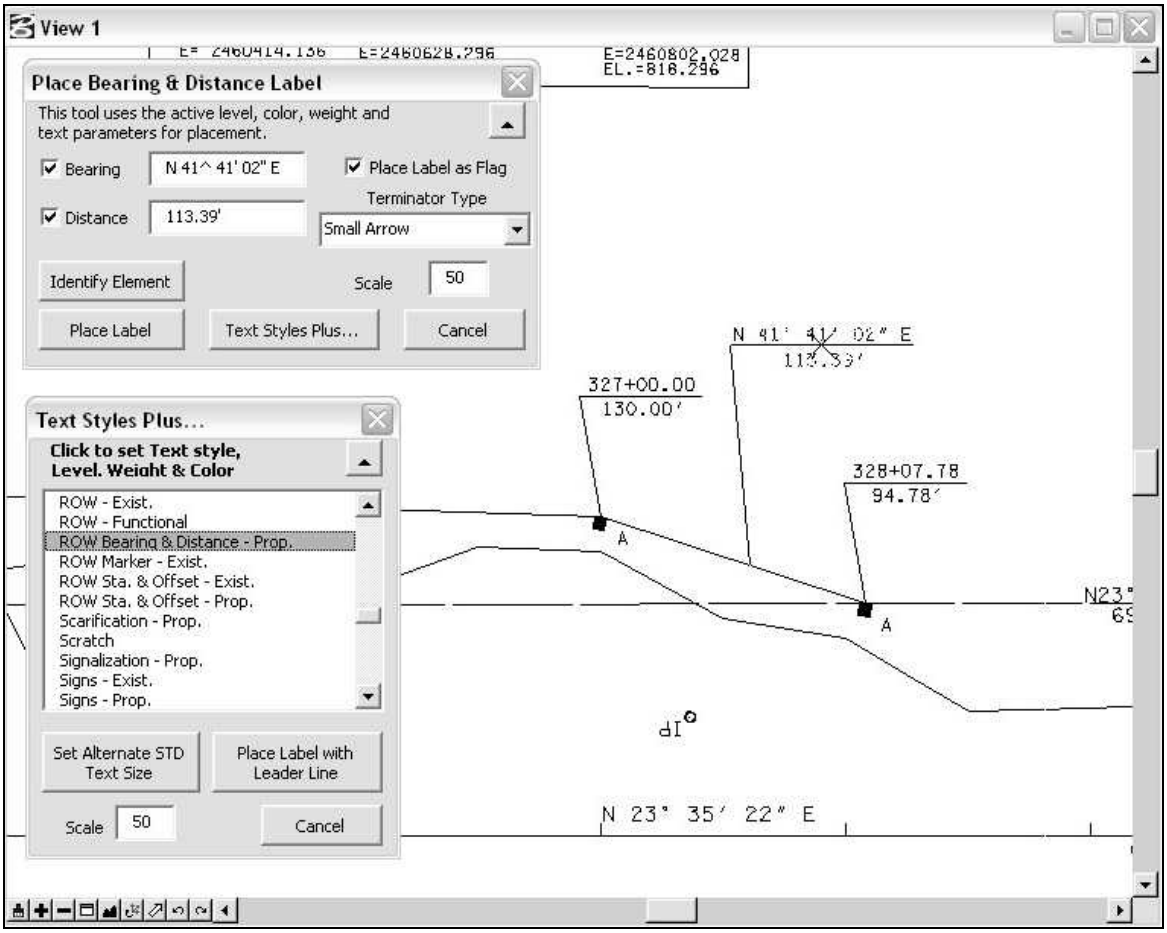
Label placement with Leader line as a Flag:

Step 1. With the **Place Bearing & Distance Label** dialog open, click on the option to **Place Label as Flag** and choose the **Terminator Type** (defaults to small arrow). Following prompts, **Identify Element** for annotation.

This option is most often used when in tight places or when labeling short elements.

Step 2. After giving a point to accept the element selected, the dialog is populated with label information and the user is prompted to **Identify location for End of Leader**.

Data point on or near the element being labeled and you are prompted to **Position Label** . Movement of the cursor allows dynamic control of the leader line to the label text.



After the label location point is given, the user is again prompted for the end of the leader point allowing for additional placements as needed. A reset will stop label placement and restart the tool.

Place Arc Radius & Length Label

D&C location: Drafting Standards > Prop. R.O.W. > RadiusLength

MicroStation VBA Program: ArcRadiusLengthLabel.mvba

Description:

Calculates the radius and length from an arc element and sets it up for placement as a label. Text can be placed at the angle of the tangent line at the point of identification or it can be placed horizontal to the view with a leader line as a flag. Program will process arcs in complex strings. Graphics are placed at the current active level, symbology & text parameters.

The most efficient use of this tool is in conjunction with the Text Styles Plus vba program which will set the active level, symbology & text parameters. A command button is provided to access this program.

A command button is provided to Identify Element on the dialog to restart the command after the initial start of the program. The Place Label command button is provided so that the user can restart the label placement sequence when it is necessary to use alternate MicroStation commands prior to actual placement, such as going to Text Styles Plus to set symbologies.

Metric application includes both metric & English measurements.

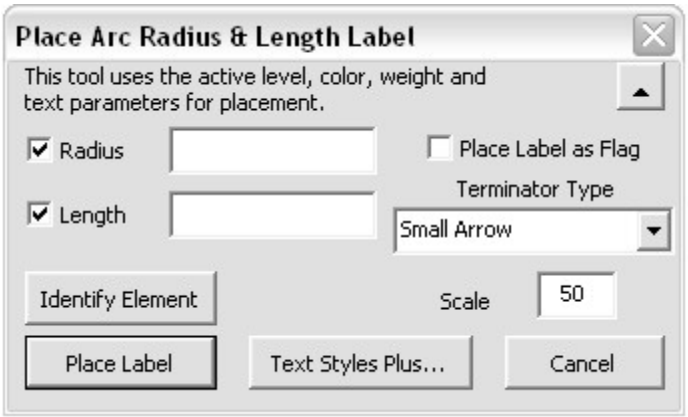
This program can also be activated from the MicroStation drop down menu
TDOT > R.O.W.> Label Arc Radius & Length
or by using the keyin
vba run [ArcRadiusLengthLabel]LabelArc.Main

Special Requirements:

Set level, symbology and text size for label using Text Styles Plus or manual methods.

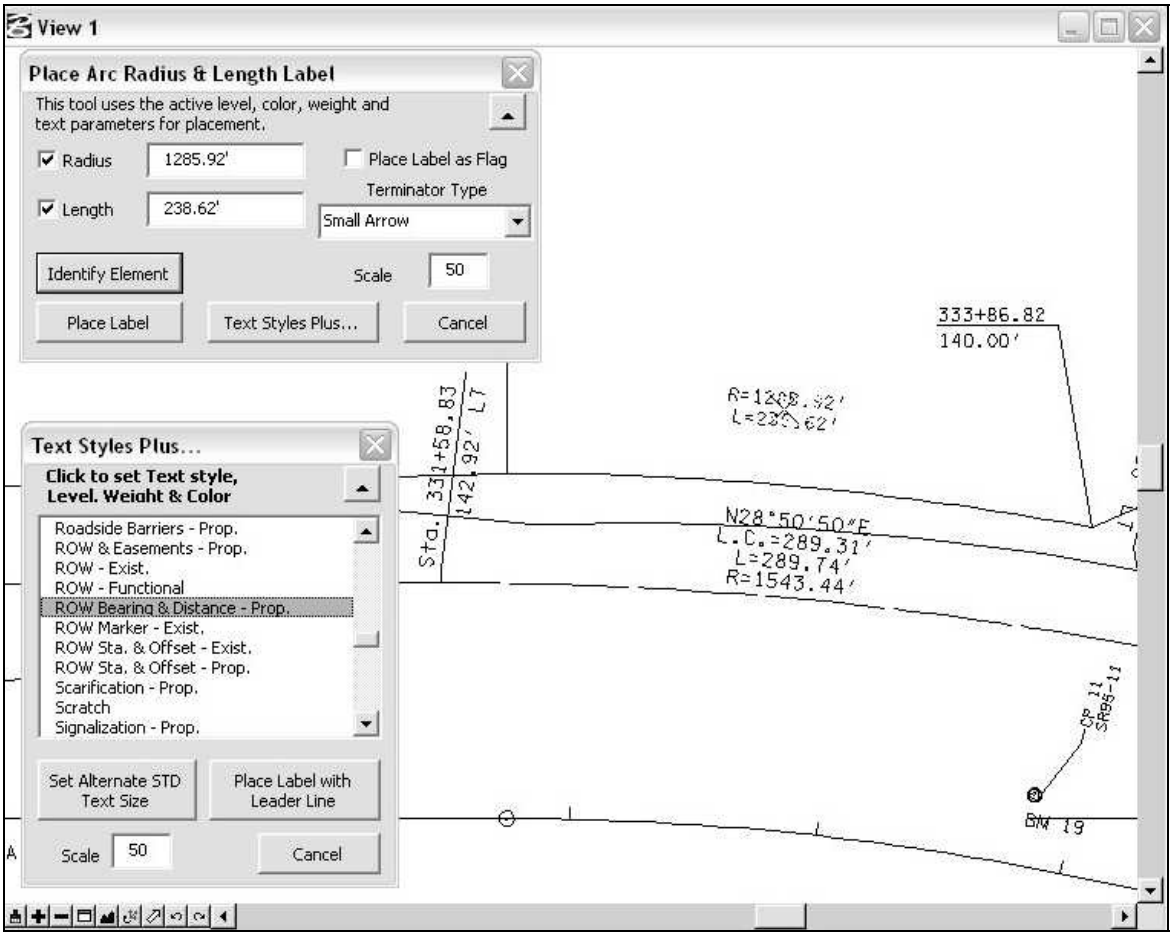
Usage:

Step 1. In D&C manager activate **RadiusLength**. The **Place Arc Radius & Length Label** dialog appears. When started program immediately prompts user **to Identify Element** for annotation.



Step 2. Data point on the arc element or arc segment of a complex chain that you wish to annotate with radius & length.

Step 3. After giving a point to accept the element selected, the dialog is populated with label information and the label text appears on the cursor. The user is prompted to **Identify location for text**.



After the text location point is given, the text remains available for additional placements as needed. A reset will stop text placement and restart the tool.

If the dialog is populated with label information but the user does something else such as setting symbologies, the **Place Label** command button can be used to go on and place that label afterwards.

When other tools are accessed, the **Identify Element** command button can be clicked to restart the tool.

Click option buttons on or off to place radius or length labels only.

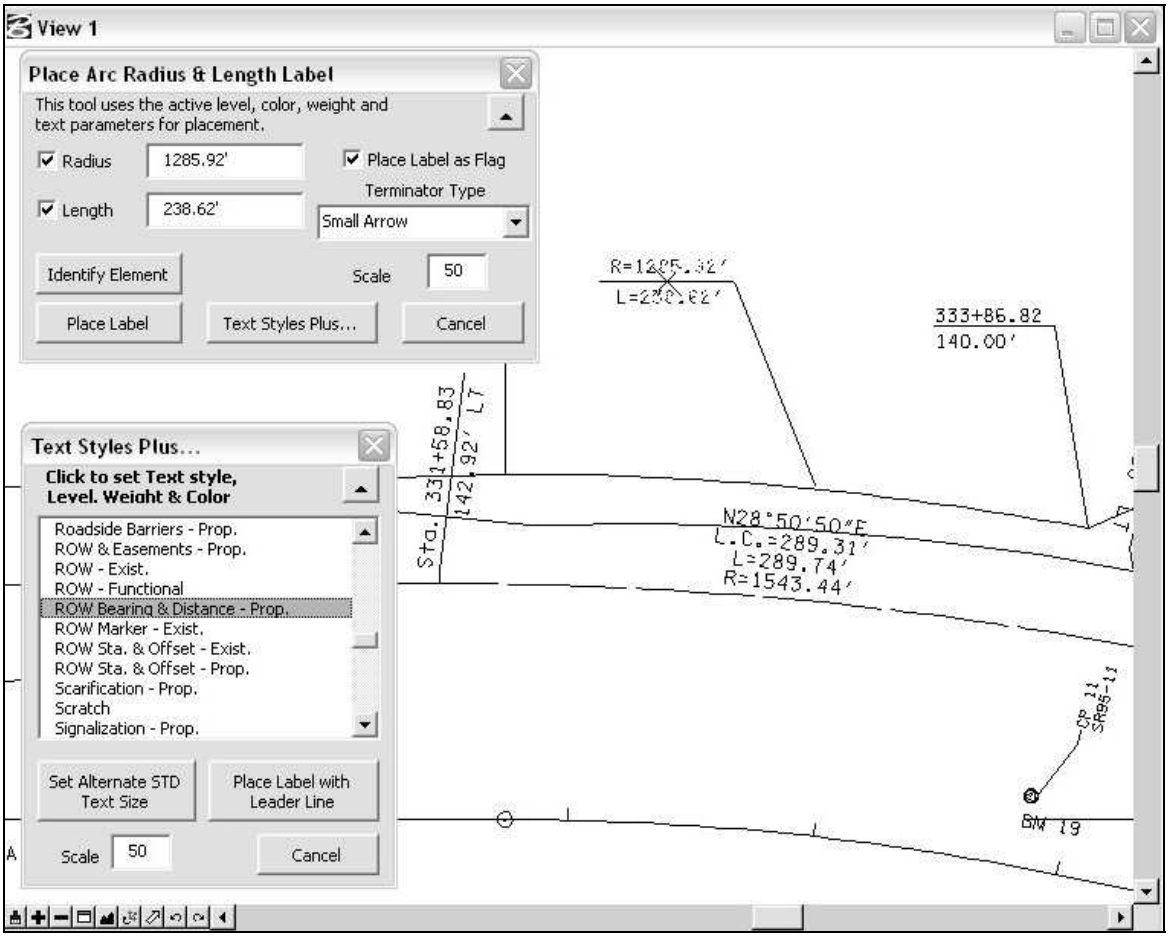
Label placement with Leader line as a Flag:

Step 1. With the **Place Arc Radius & Length Label** dialog open, click on the option to **Place Label as Flag** and choose the **Terminator Type** (defaults to small arrow). Following prompts, **Identify Element** for annotation.

This option is most often used when in tight places or when labeling short elements.

Step 2. After giving a point to accept the element selected, the dialog is populated with label information and the user is prompted to **Identify location for End of Leader**.

Data point on or near the element being labeled and you are prompted to **Position Label** . Movement of the cursor allows dynamic control of the leader line to the label text.



After the label location point is given, the user is again prompted for the end of the leader point allowing for additional placements as needed. A reset will stop label placement and restart the tool.

Prop. Easements

Pattern Slope Esmt. Area

D&C location: Drafting Standards > Prop. Easements > Slope Esmt Area

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a prop. slope easement area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]SlopeEasement.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

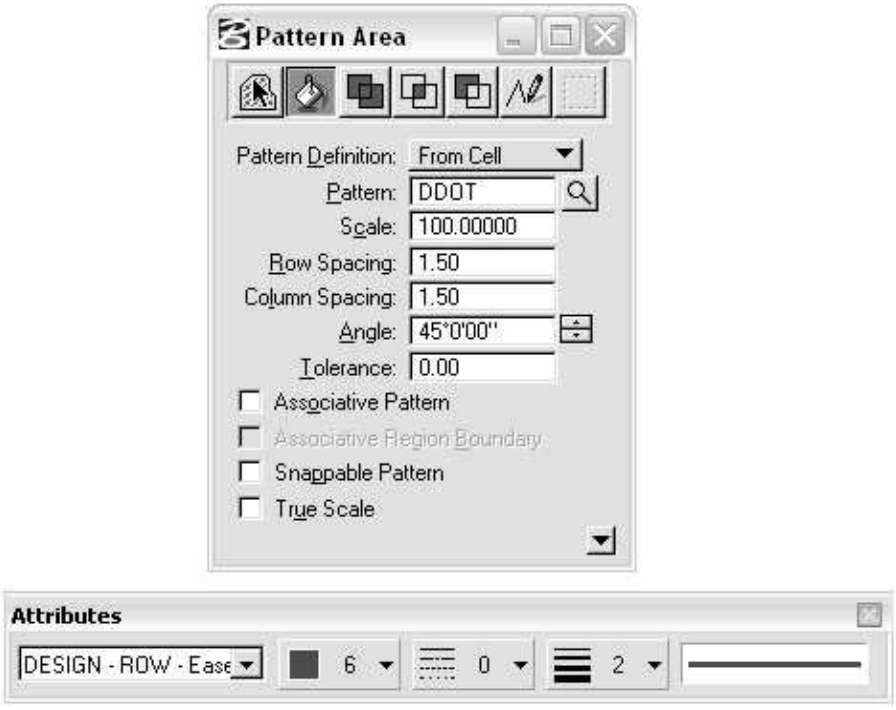
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

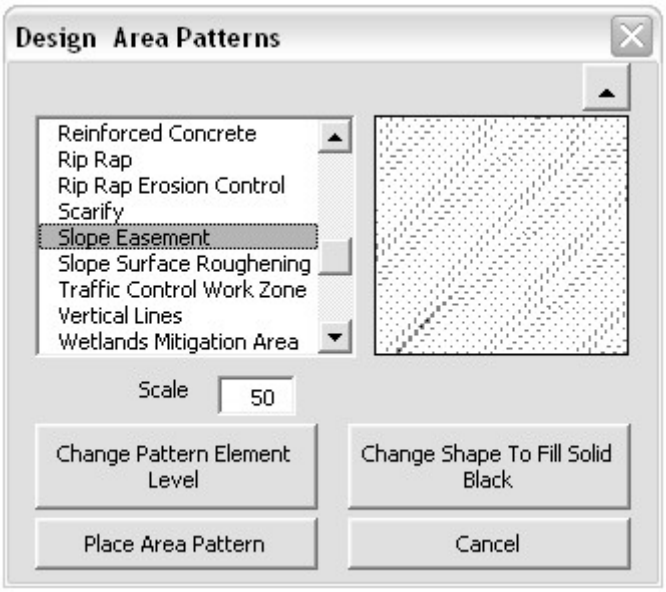
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Slope Esmt Area**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

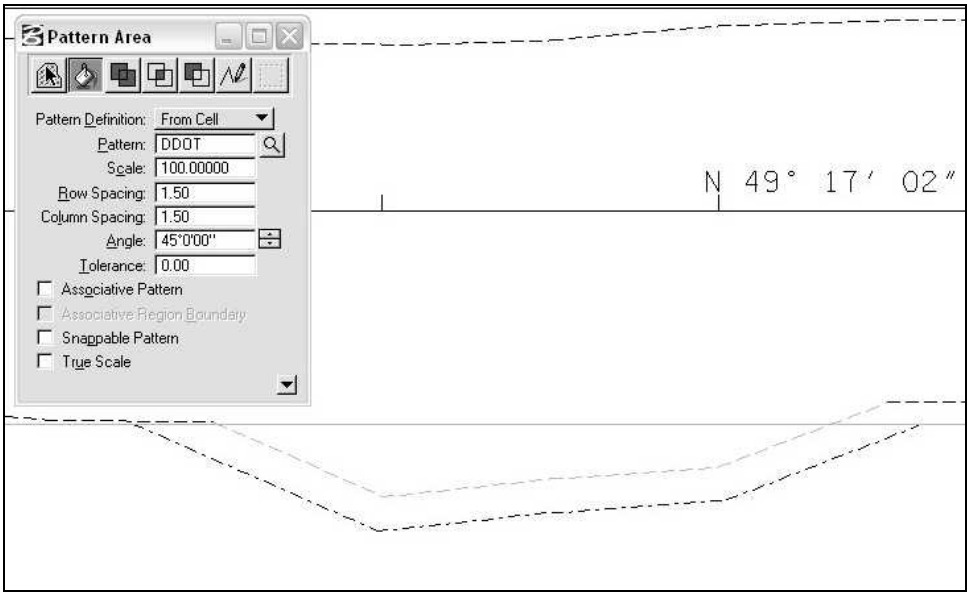


Or from the drop down menu in the **Design Area Patterns** dialog …

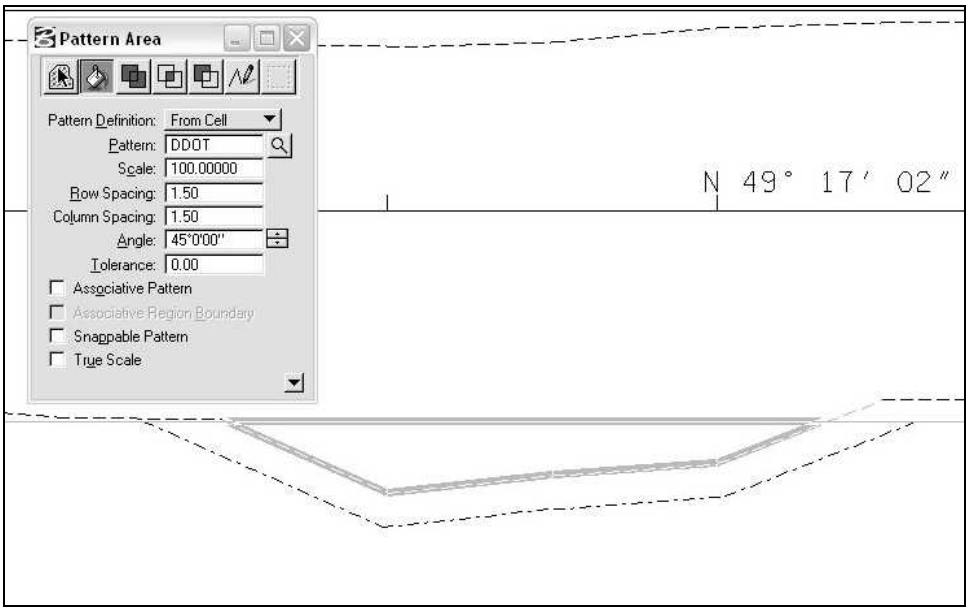


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

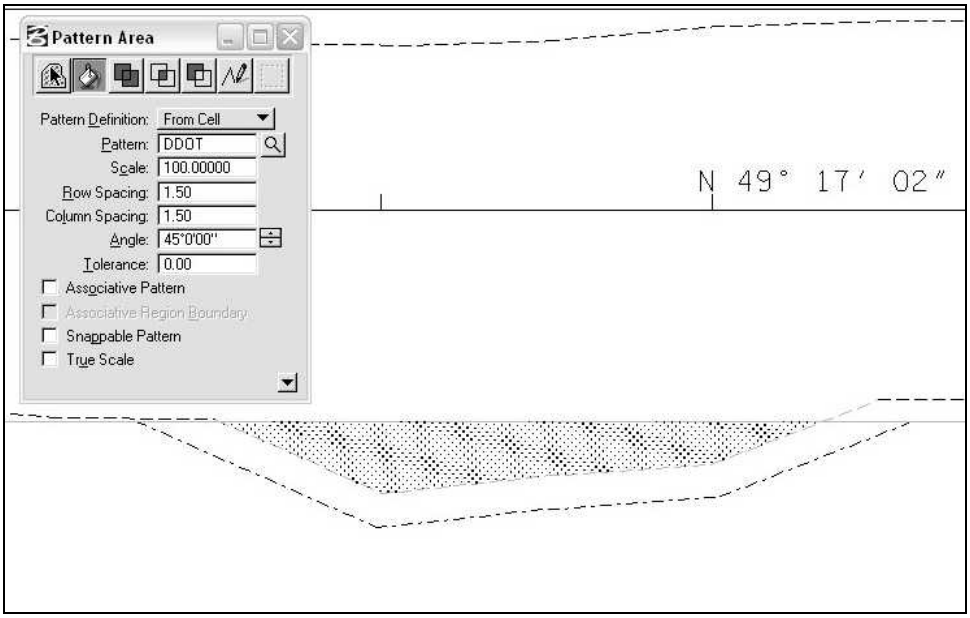
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Drainage Esmt. Area

D&C location: Drafting Standards > Prop. Easements > Drain Esmt Area

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a prop. drainage easement area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]DrainEasement.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

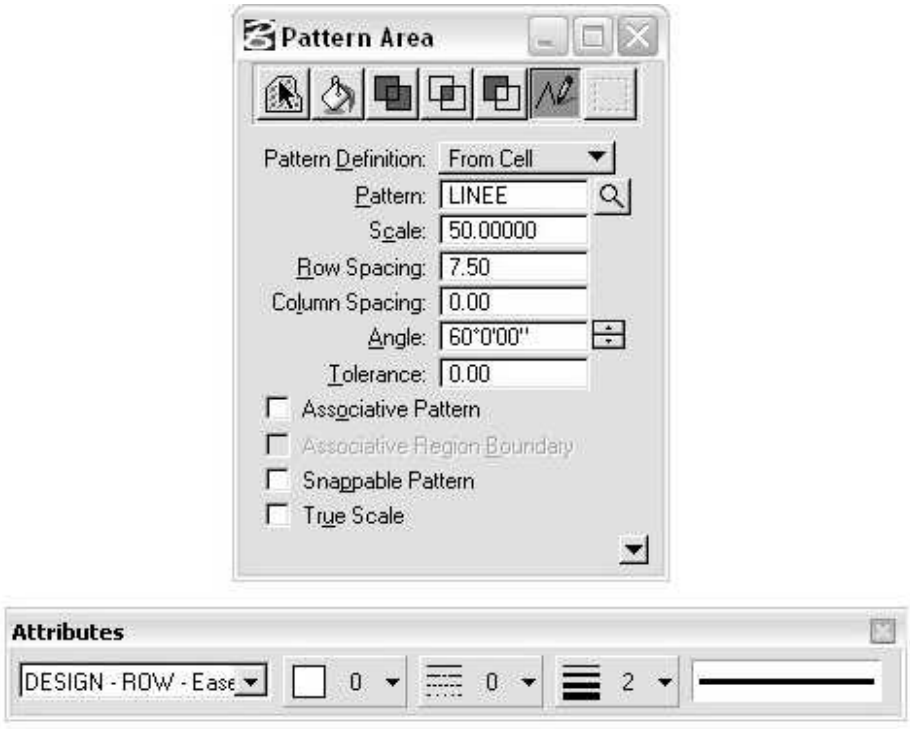
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

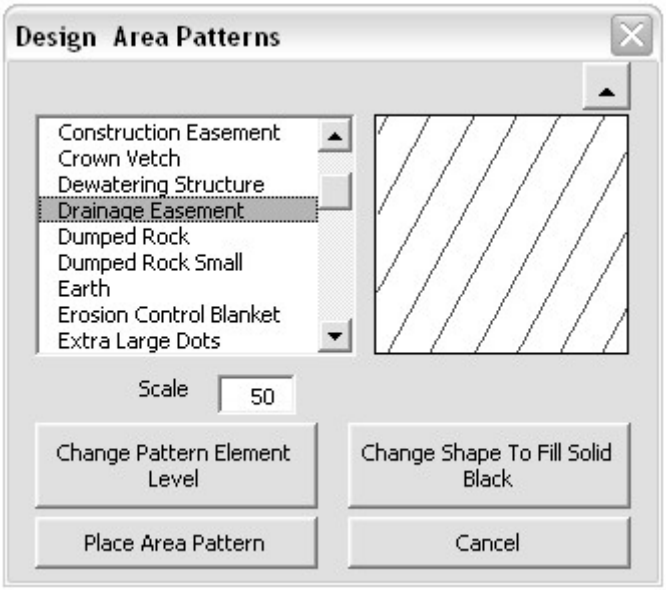
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Drain Esmt Area**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

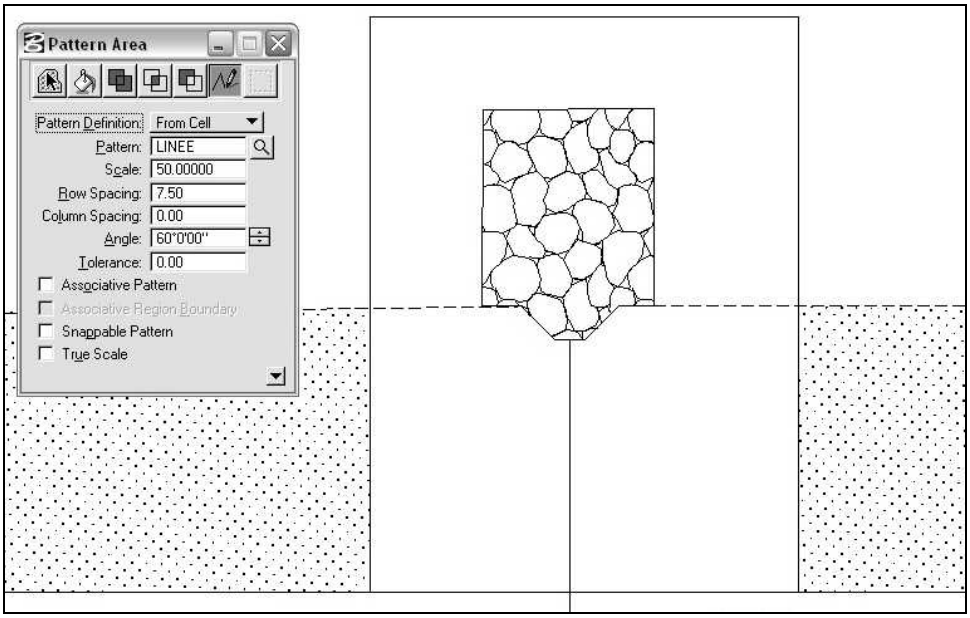


Or from the drop down menu in the **Design Area Patterns** dialog …

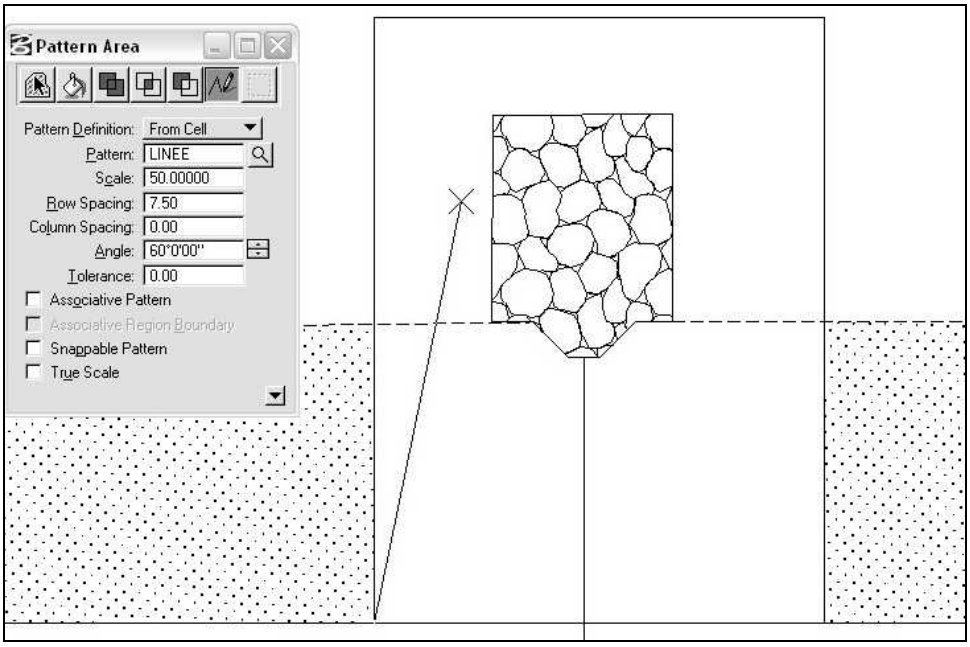


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Points**.

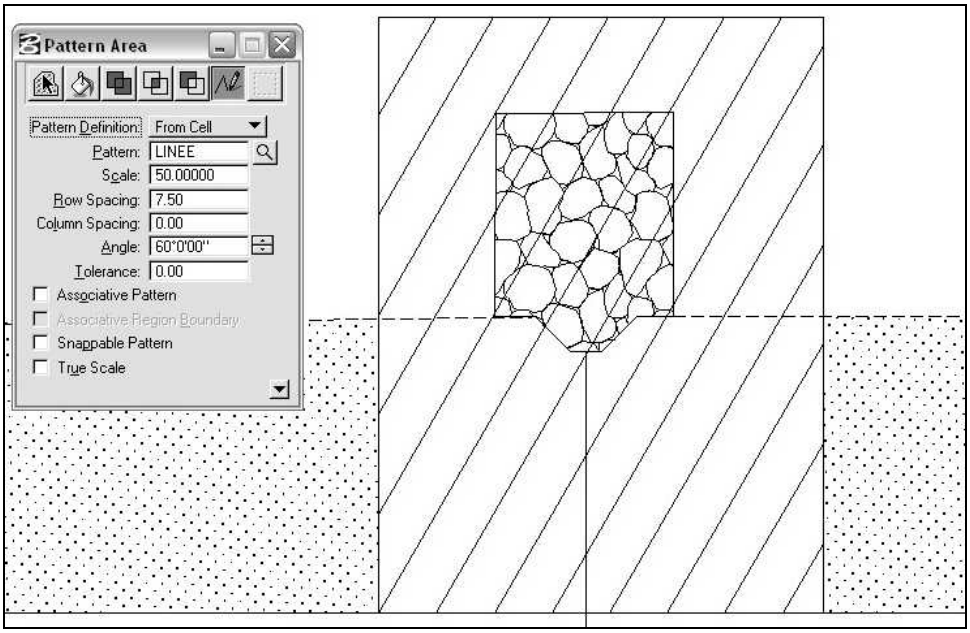
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Points, the user is prompted to **Enter shape vertex**.



Step 4. The user continues to be prompted to **Enter shape vertex** until the minimum of 3 points have been given. After that, you are prompted to **Enter point or RESET to complete**.



After giving the reset to complete, the area is patterned.



Pattern Construction Esmt. Area

D&C location: Drafting Standards > Prop. Easements > Const Esmt Area

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a prop. construction easement area and starts MicroStation's Pattern Area tool.

This patterning is not required for construction easement for the purpose of slope construction.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]ConstructionEasement.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

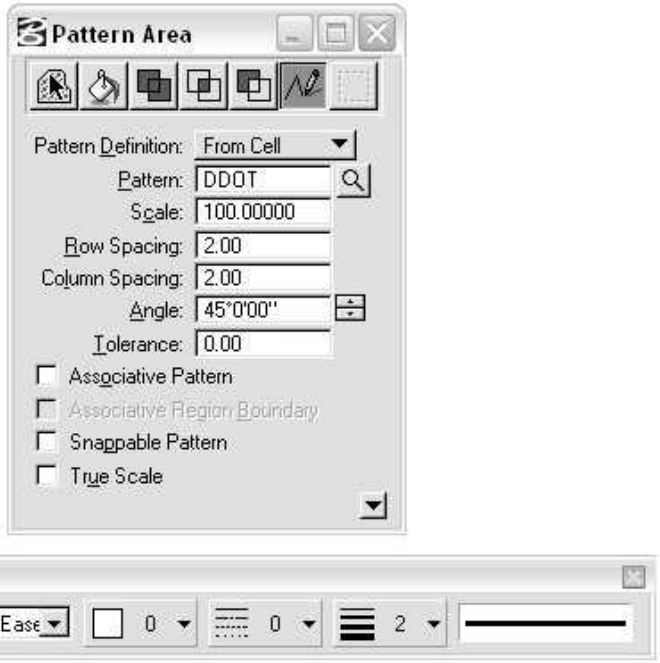
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

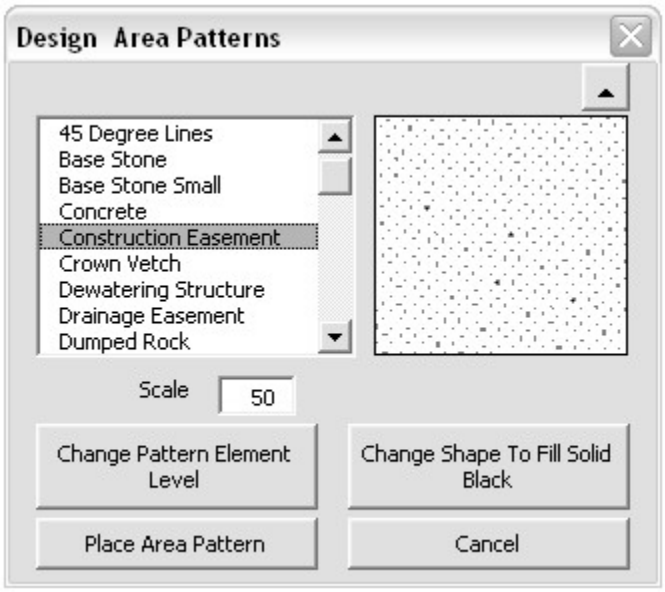
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Const Esmt Area**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

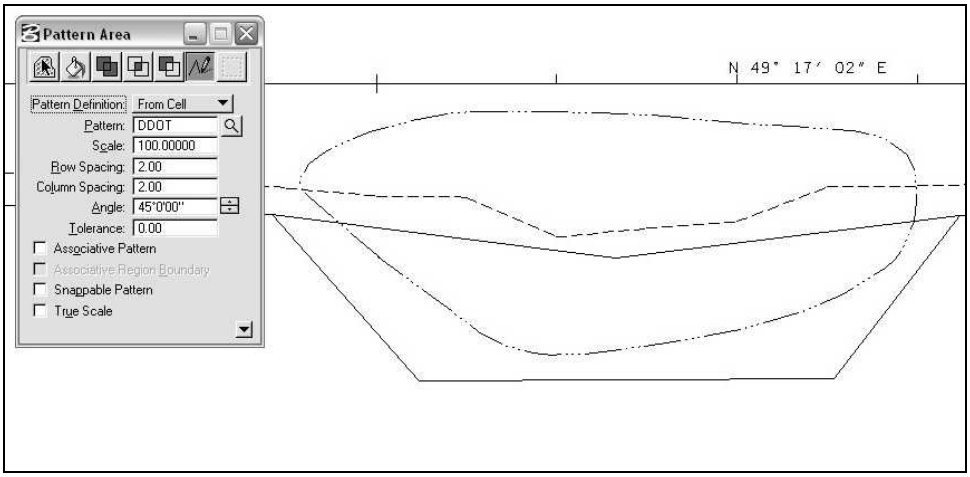


Or from the drop down menu in the **Design Area Patterns** dialog …

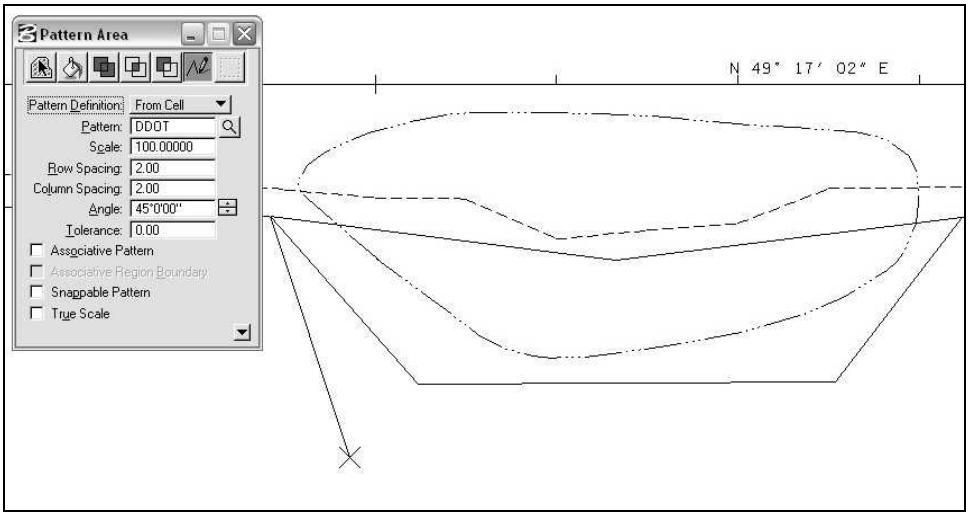


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Points**.

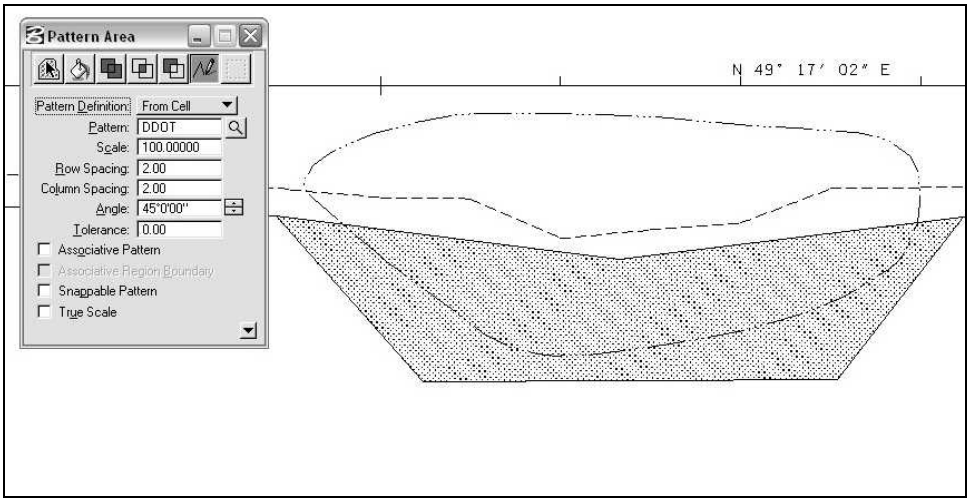
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Points, the user is prompted to **Enter shape vertex**.



Step 4. The user continues to be prompted to **Enter shape vertex** until the minimum of 3 points have been given. After that, you are prompted to **Enter point or RESET to complete**.



After giving the reset to complete, the area is patterned.



Roadway Linework

Draw Handicap Ramp

D&C location: Drafting Standards > Roadway Linework > HC Ramp

MicroStation VBA Program: DrawHandicapRamp.mvba

Description:

This program draws proposed handicap ramps in the plan view based on standard roadway drawings RP-H-3 to RP-H-9 and RP-R-2. Options in the dialog for type, location, ramp width, landing length, sidewalk width, grass separator width and roadway curb width are given to determine the handicap ramp dimensions. Additional check box controls are offered to match parallel ramps to the sidewalk width when greater than minimum, set perpendicular ramp landing beginning to the sidewalk when the grass separator width plus the curb width is greater than minimum of 8 feet and to place a leader line with text labels. As different types and locations are chosen, the default values and information on the dialog face are changed. If a control is not used for a given type or location then it is specified as N/A or non-applicable.

The outer limits of all ramps are created as a shape using the handicap ramp line style so that later area calculations can be done with Geopak's D&C Manger quantity calculation tools. All handicap ramp graphics are combined into a graphic group.

All English values have been converted so that this tool can also be used on metric projects.

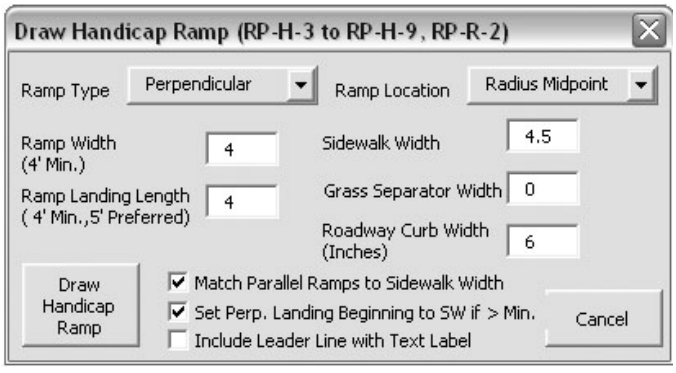
This program can also be activated from the MicroStation drop down menu
TDOT > Handicap Ramps
or by using the keyin
vba run [DrawHandicapRamp]HCRamp.main

Special Requirements:

Curb lines must be present in the DGN file. The center of the handicap ramp at the curb line must be located and marked for any locations that cannot be snapped to on the curb line. These locations would be such as within the radius but not at the radius midpoint or ends, along the roadway, concrete islands, concrete medians, splitter islands or bicycle ramps.

Usage: General Start

Step 1. In D&C manager activate **HC Ramp**. The **Draw Handicap Ramp** dialog appears.



Step 2. Adjust the values for **Sidewalk Width**, **Grass Separator Width** and **Roadway Curb Width** to match what is proposed in the area where you plan to place the proposed handicap ramp. The Sidewalk Width & Grass Separator Width **should not** include the

width of the curb. The Sidewalk Width & Grass Separator Width values are **not** used with concrete islands, concrete medians, splitter islands or bicycle ramps.

By default, the option to **Match Parallel Ramps to Sidewalk Width** is turned on. If you are placing a parallel ramp and your sidewalk is 9' wide or greater then you may wish to turn off this option. This will let the ramp be placed at the minimum distance of 5' across the sidewalk.

By default, the option to **Set Perp. Landing Beginning to SW if > Min.** is turned on. If you are placing a perpendicular ramp where the grass separator width plus the curb width is greater than the minimum of 8 feet for the slope up the ramp, this option will force the ramp landing beginning to start at the edge of the sidewalk.

If it is crowded in the area where you will be placing the ramp's type text label then you may wish to turn on the **Include Leader Line with Text Label** option.

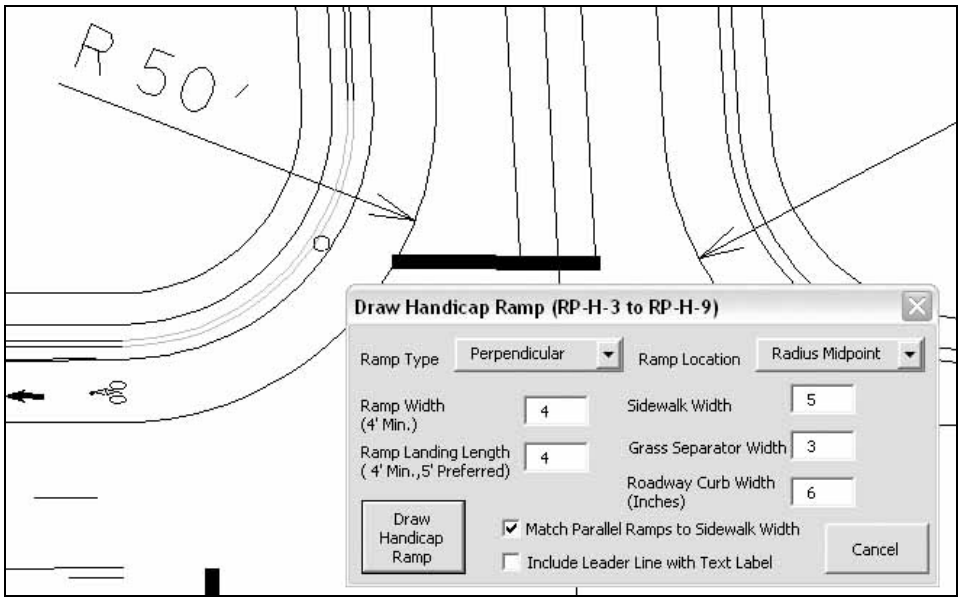
Depending on the handicap ramp type and location, the default values for **Ramp Width** & **Ramp Landing Width** as well as the steps required for placement will vary. Listed below are the additional steps the user goes through to place the various types\locations of proposed handicap ramps.

Usage: Perpendicular or Parallel at radius midpoint

Step 3. Make your final settings on the dialog. Set the Ramp Type to **Perpendicular** or **Parallel** and the Ramp Location to **Radius Midpoint**.

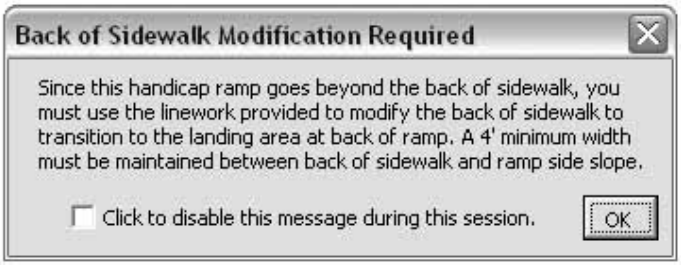
Adjust the values for **Ramp Width** & **Ramp Landing Length** as needed. Minimum values from the standard roadway drawings are specified by default. A notation of **N/A** indicates that the value is non-applicable for that ramp type.

Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **Identify curb arc**. Data point anywhere on the radius curb arc. Once identified, data point to accept.

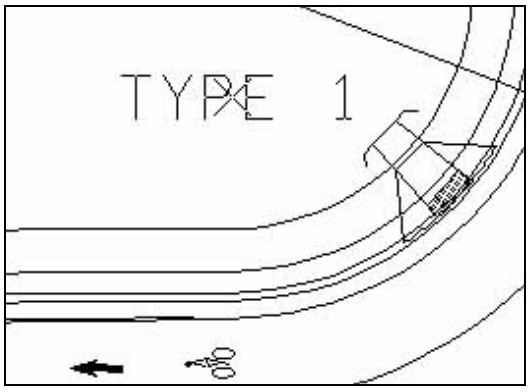


When placing a handicap ramp at the radius midpoint, the program gets everything it needs for placement from the arc which was identified and the ramp is immediately drawn in.

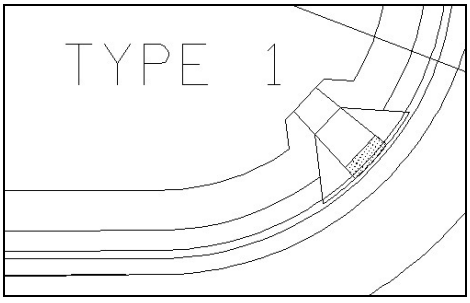
If a perpendicular handicap ramp is placed which goes beyond the back edge of the sidewalk then the following warning message is given. When this situation occurs, the program adds sidewalk lines at the back of the ramp for use in adjusting the sidewalk. To prevent this message from coming up every time you place a ramp, click on the option to disable it during the current session.



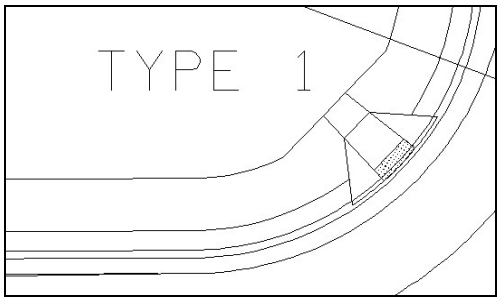
Step 5. The user is then prompted to **Identify Location** for placement of the handicap ramp type text label. Data point to place the label. If the option for a leader line was turned on then the user is also prompted to identify the begin and end locations for the leader.



Step 6. The final step for perpendicular handicap ramps would be to clean up the sidewalk lines on the inside if a grass separator is specified and on the outside if the ramp extends past the back of sidewalk. Use regular MicroStation graphics commands to make these adjustments.



Narrow Sidewalk Example



Wide Sidewalk Example

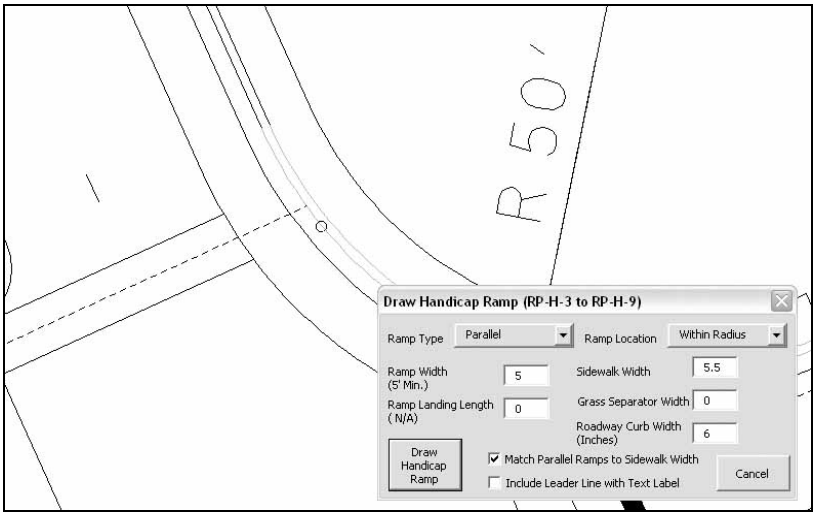
Usage: Perpendicular or Parallel within radius

Step 3. Make your final settings on the dialog. Set the Ramp Type to **Perpendicular** or **Parallel** and the Ramp Location to **Within Radius**.

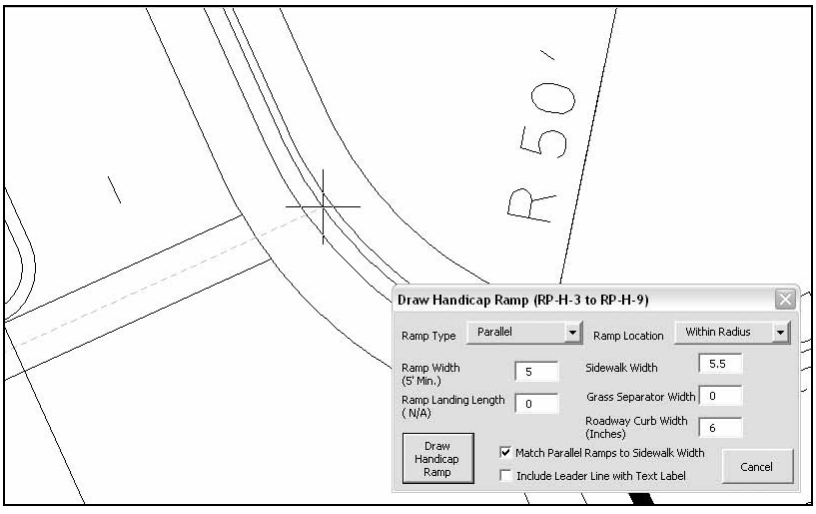
This location option is for use on any radius where the preferred midpoint or radius end locations are not workable. **You will need to locate the handicap ramp's center point at the curb line prior to placing the ramp.**

Adjust the values for **Ramp Width** & **Ramp Landing Length** as needed. Minimum values from the standard roadway drawings are specified by default. A notation of **N/A** indicates that the value is non-applicable for that ramp type.

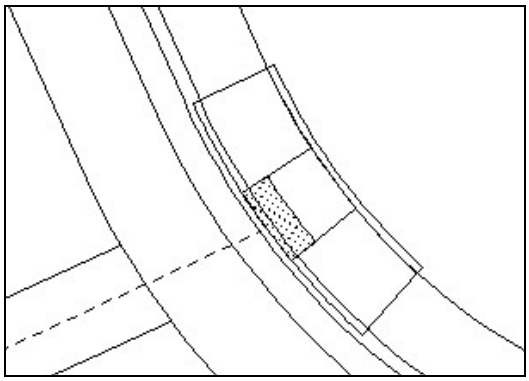
Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **Identify curb arc**. Data point anywhere on the radius curb arc. Once identified, data point to accept.



Step 5. The user is then prompted to **Identify Point at Curb for Ramp Center**. Snap and data point at the center location for the handicap ramp.

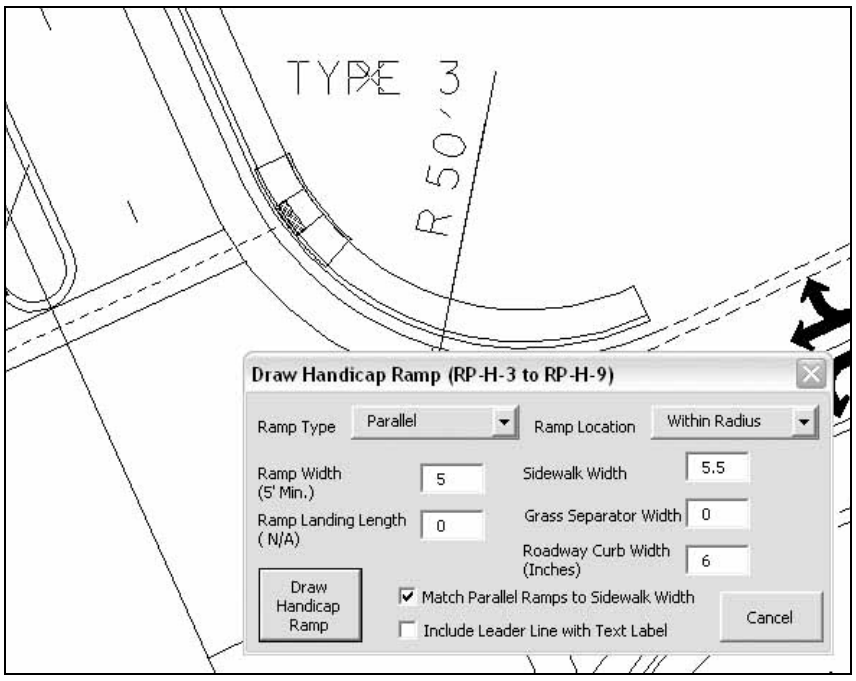


When the ramp center point is given, the handicap ramp is drawn in.



If a perpendicular handicap ramp is placed which goes beyond the back edge of the sidewalk then a warning message is given. When this situation occurs, the program adds sidewalk lines at the back of the ramp for use in adjusting the sidewalk. To prevent this message from coming up every time you place a ramp, click on the option to disable it during the current session.

Step 6. The user is then prompted to **Identify Location** for placement of the handicap ramp type text label. Data point to place the label. If the option for a leader line was turned on then the user is also prompted to identify the begin and end locations for the leader.



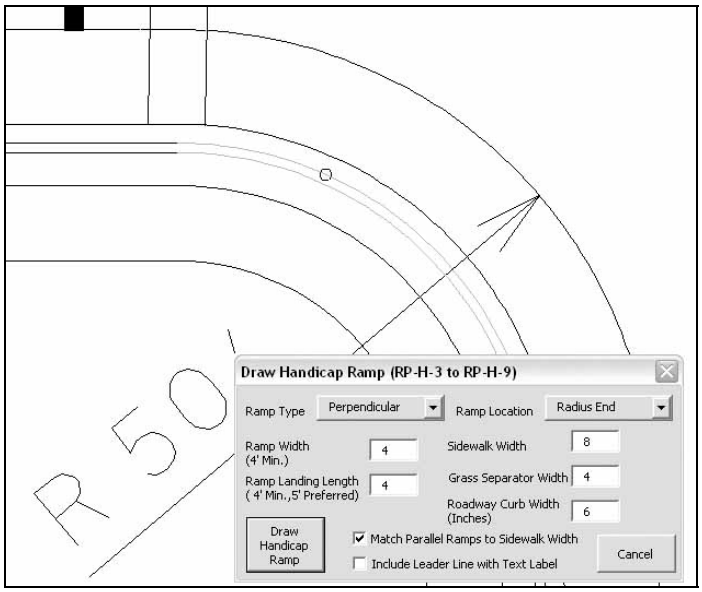
Step 7. The final step for perpendicular handicap ramps would be to clean up the sidewalk lines on the inside if a grass separator is specified and on the outside if the ramp extends past the back of sidewalk. Use regular MicroStation graphics commands to make these adjustments.

Usage: Perpendicular or Parallel at radius end

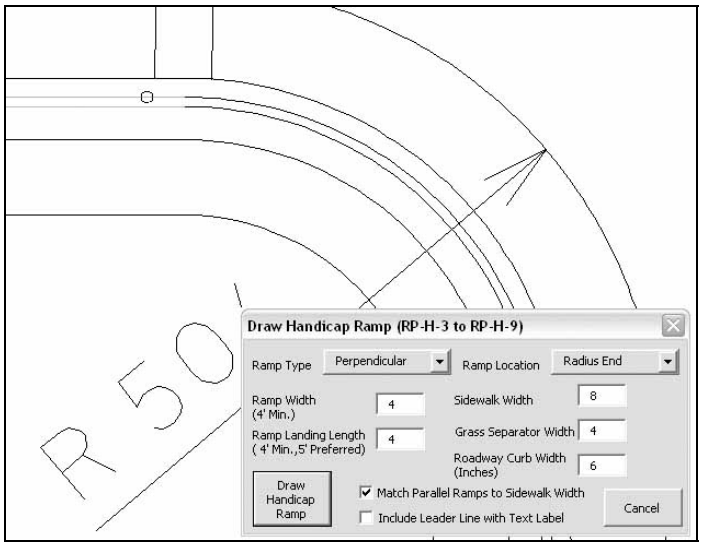
Step 3. Make your final settings on the dialog. Set the Ramp Type to **Perpendicular** or **Parallel** and the Ramp Location to **Radius End**.

Adjust the values for **Ramp Width** & **Ramp Landing Length** as needed. Minimum values from the standard roadway drawings are specified by default. A notation of **N/A** indicates that the value is non-applicable for that ramp type.

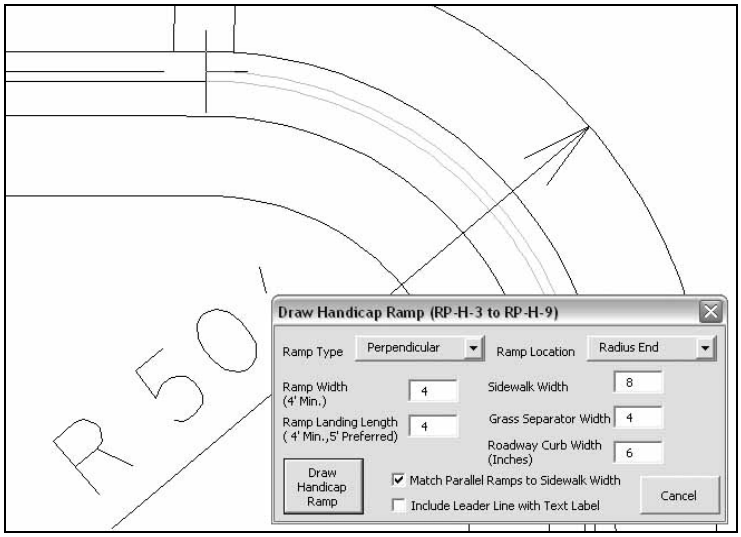
Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **Identify curb arc**. Data point anywhere on the radius curb arc. Once identified, data point to accept.



Step 5. The user is then prompted to **Identify curb element outside radius**. Data point on the curb past the end of the radius arc. Once identified, data point to accept.



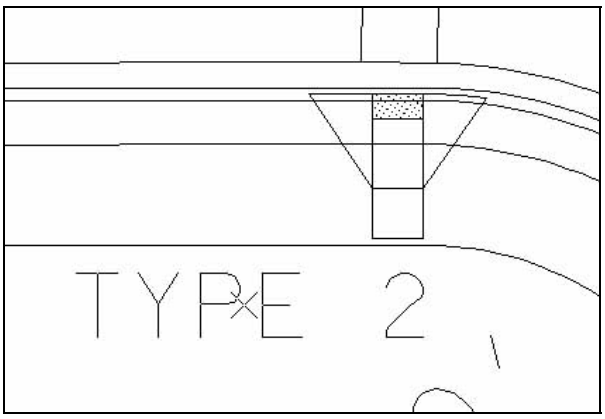
Step 6. After identifying the curbs, the user is prompted to **Snap to end of curb radius**. Snap and data point at the radius end location for the handicap ramp.



When the radius end point is given, the handicap ramp is drawn in.

If a perpendicular handicap ramp is placed which goes beyond the back edge of the sidewalk then a warning message is given. When this situation occurs, the program adds sidewalk lines at the back of the ramp for use in adjusting the sidewalk. To prevent this message from coming up every time you place a ramp, click on the option to disable it during the current session.

Step 7. The user is then prompted to **Identify Location** for placement of the handicap ramp type text label. Data point to place the label. If the option for a leader line was turned on then the user is also prompted to identify the begin and end locations for the leader.



Step 8. The final step for perpendicular handicap ramps would be to clean up the sidewalk lines on the inside if a grass separator is specified and on the outside if the ramp extends past the back of sidewalk. Use regular MicroStation graphics commands to make these adjustments.

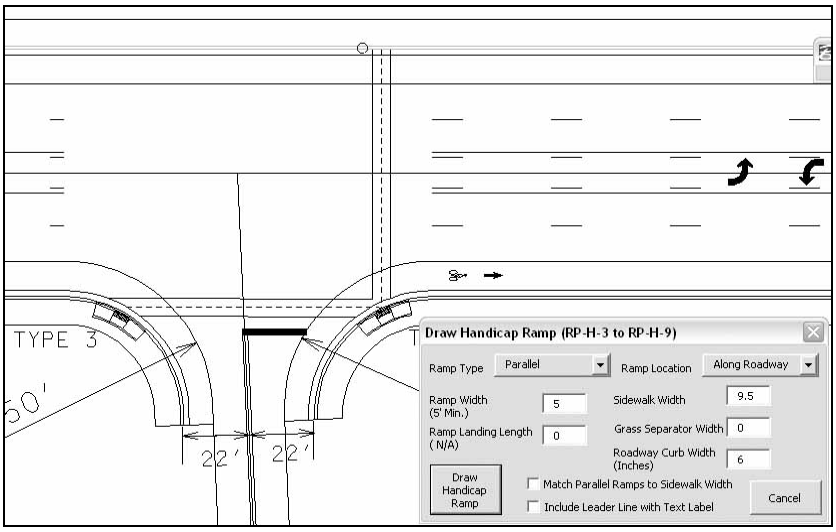
Usage: Perpendicular or Parallel along roadway

Step 3. Make your final settings on the dialog. Set the Ramp Type to **Perpendicular** or **Parallel** and the Ramp Location to **Along Roadway**.

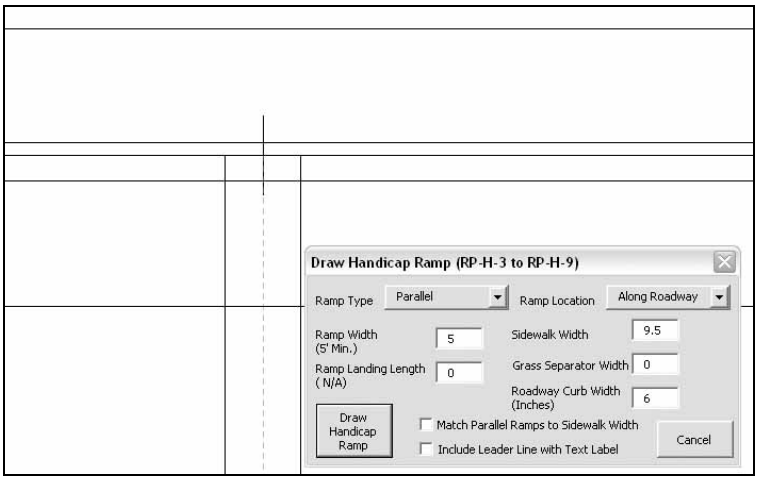
This location option is for use at places such as "T" intersections where a handicap ramp needs to be placed along the roadway where no radius is present. **You will need to locate the handicap ramp's center point at the curb line prior to placing the ramp.**

Adjust the values for **Ramp Width** & **Ramp Landing Length** as needed. Minimum values from the standard roadway drawings are specified by default. A notation of **N/A** indicates that the value is non-applicable for that ramp type.

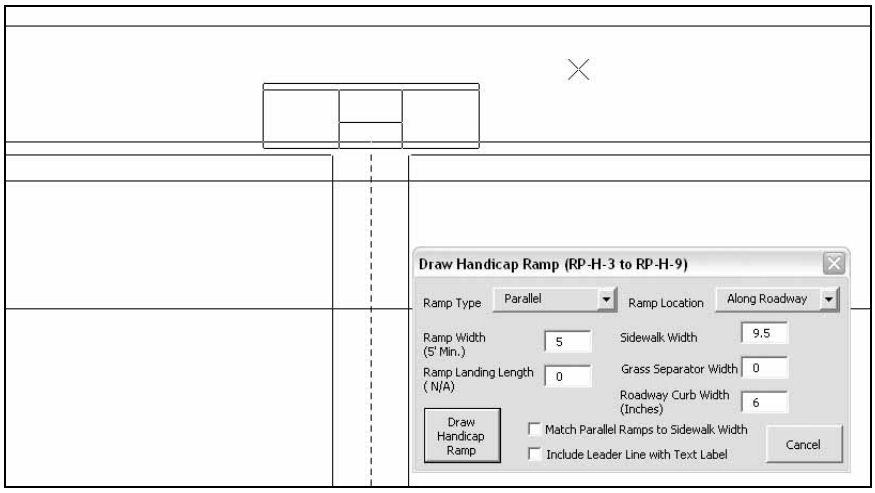
Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **Identify curb element**. Data point on the curb element near the location for the handicap ramp. Once identified, data point to accept.



Step 5. The user is then prompted to **Identify Point at Curb for Ramp Center**. Snap and data point at the center location for the handicap ramp.



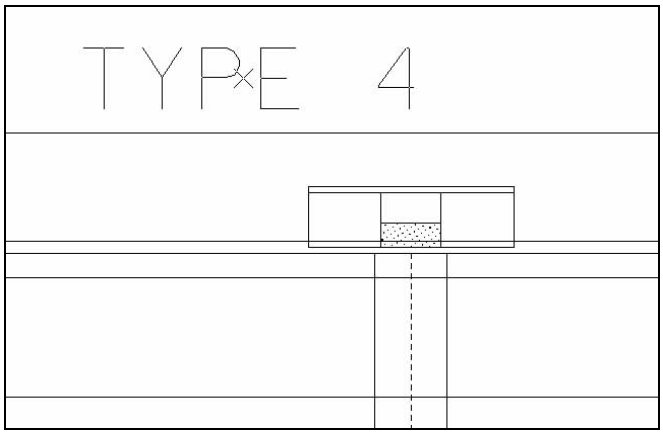
Step 6. After identifying the center point, the user is prompted to **Identify side for placement**. The handicap ramp is shown dynamically to help the user set the side where it should be placed. Data point to set the location.



When the side point is given, the handicap ramp is drawn in.

If a perpendicular handicap ramp is placed which goes beyond the back edge of the sidewalk then a warning message is given. When this situation occurs, the program adds sidewalk lines at the back of the ramp for use in adjusting the sidewalk. To prevent this message from coming up every time you place a ramp, click on the option to disable it during the current session.

Step 7. The user is then prompted to **Identify Location** for placement of the handicap ramp type text label. Data point to place the label. If the option for a leader line was turned on then the user is also prompted to identify the begin and end locations for the leader.



Step 8. The final step for perpendicular handicap ramps would be to clean up the sidewalk lines on the inside if a grass separator is specified and on the outside if the ramp extends past the back of sidewalk. Use regular MicroStation graphics commands to make these adjustments.

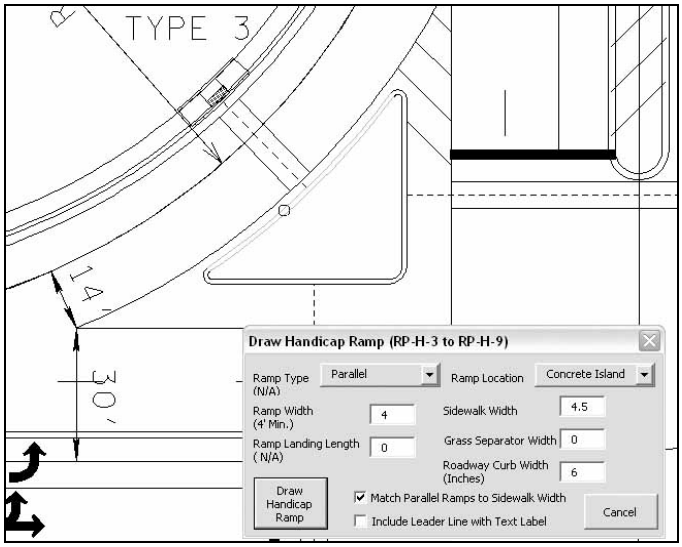
Usage: Concrete Island

Step 3. Make your final settings on the dialog. Set the Ramp Location to **Concrete Island**. The Ramp Type setting is not applicable for this kind of handicap ramp and is noted as N/A.

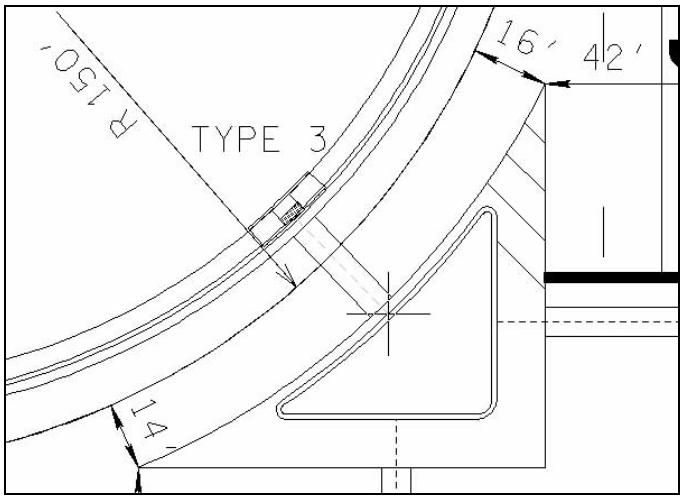
You will need to locate the handicap ramp's center point at the curb line prior to placing the ramp.

Adjust the value for **Ramp Width** as needed. Minimum values from the standard roadway drawings are specified by default.

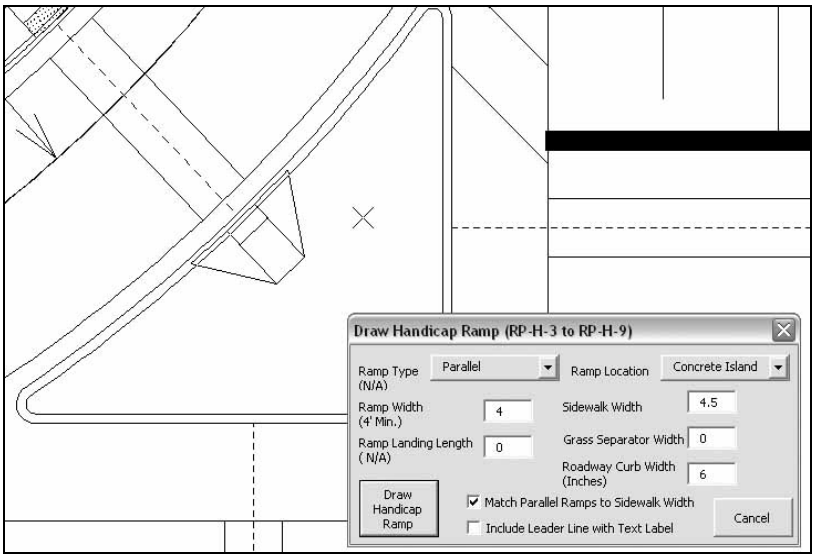
Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **Identify curb element**. Data point on the curb element near the location for the handicap ramp. Once identified, data point to accept.



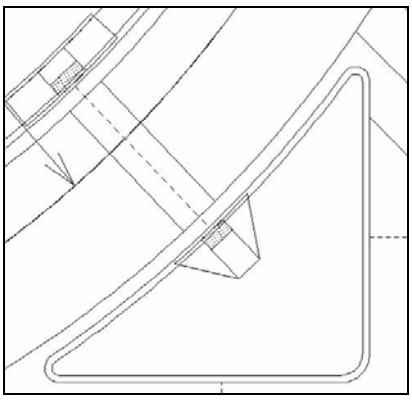
Step 5. The user is then prompted to **Identify Point at Curb for Ramp Center**. Snap and data point at the center location for the handicap ramp.



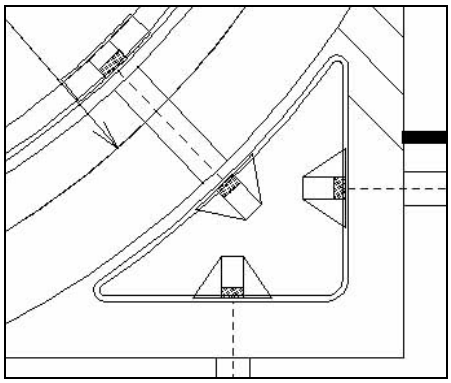
Step 6. After identifying the center point, the user is prompted to **Identify side for placement**. The handicap ramp is shown dynamically to help the user set the side where it should be placed. Data point to set the location.



When the side point is given, the handicap ramp is drawn in.



This handicap ramp does not have a defined type number so no text labeling is needed. The image below shows the concrete island completed with all needed handicap ramps.



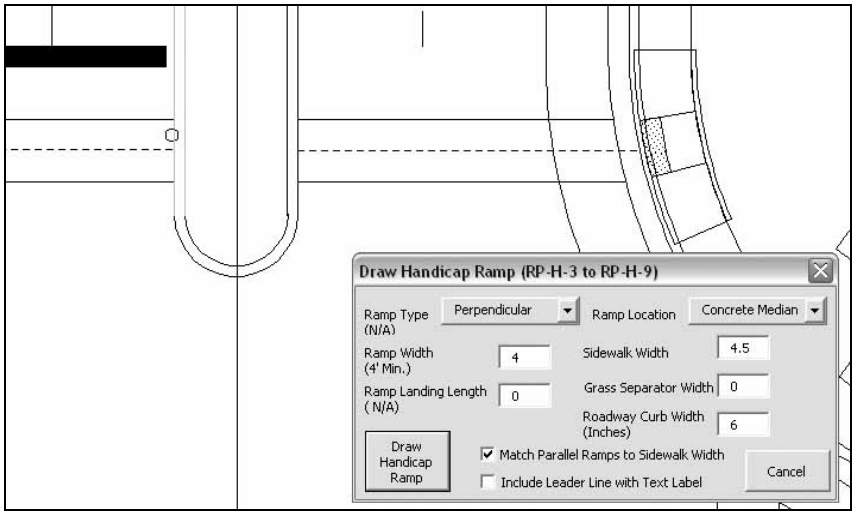
Usage: Concrete Median

Step 3. Make your final settings on the dialog. Set the Ramp Location to **Concrete Median**. The Ramp Type setting is not applicable for this kind of handicap ramp and is noted as N/A.

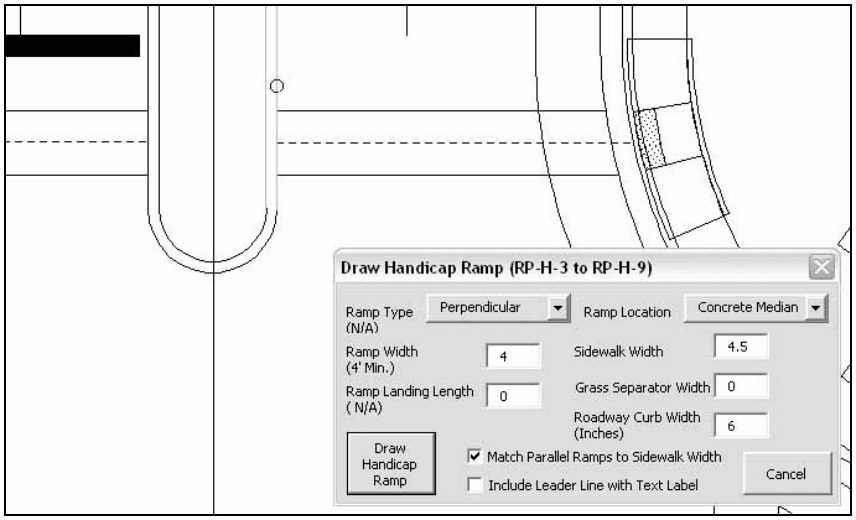
You will need to locate the handicap ramp's center points at the median curb lines prior to placing the ramp.

Adjust the value for **Ramp Width** as needed. Minimum values from the standard roadway drawings are specified by default.

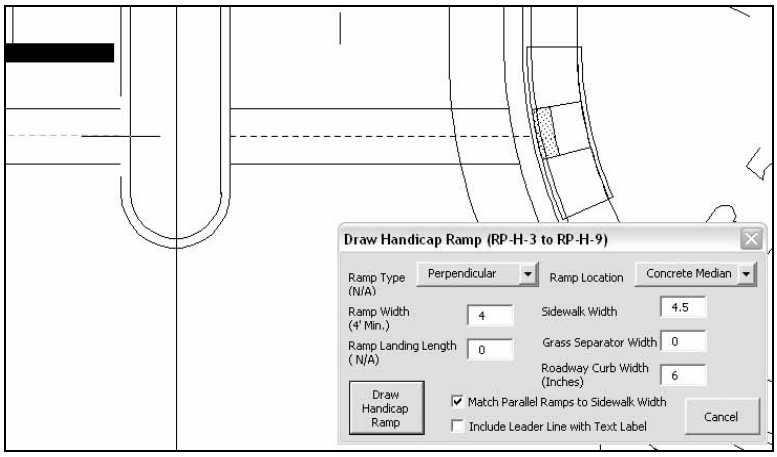
Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **Identify median curb on one side**. Data point on the median curb at either side of the median. Once identified, data point to accept.



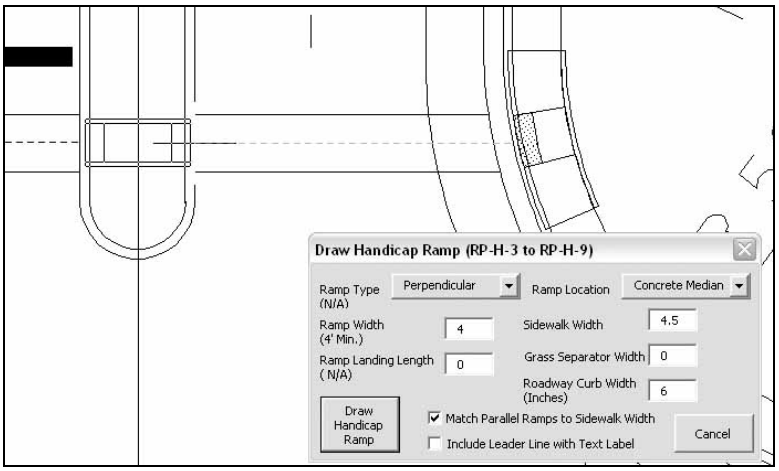
Step 5. The user is then prompted to **Identify median curb on other side**. Data point on the median curb on the other side of the median. Once identified, data point to accept.



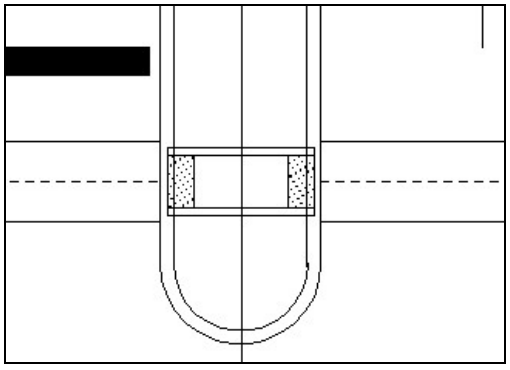
Step 6. After identifying the curbs, the user is prompted to **Identify Point at Curb for Ramp Begin**. Snap and data point at the center location for the handicap ramp on the beginning side.



Step 7. The user is then prompted to **Identify Point at Curb for Ramp End**. Snap and data point at the center location for the handicap ramp on the ending side. The handicap ramp is shown dynamically to aide in placement.



When the end center point is given, the handicap ramp is drawn in. This handicap ramp does not have a defined type number so no text labeling is needed.



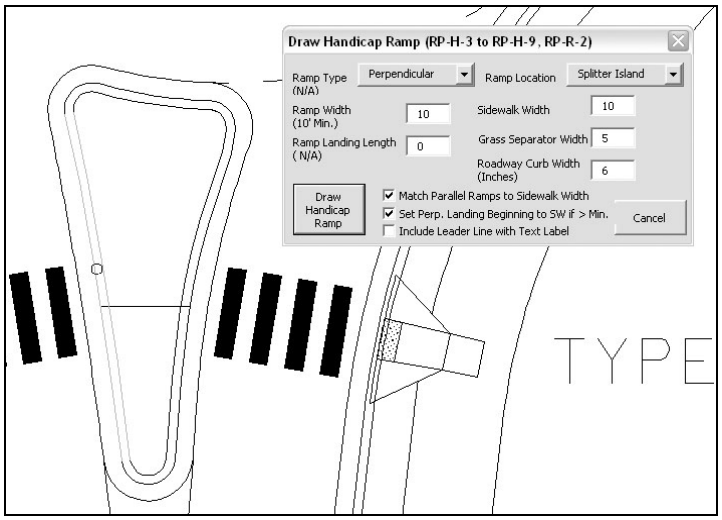
Usage: Splitter Island (Pedestrian Refuge Area)

Step 3. Make your final settings on the dialog. Set the Ramp Location to **Splitter Island**. The Ramp Type setting is not applicable for this kind of handicap ramp and is noted as N/A.

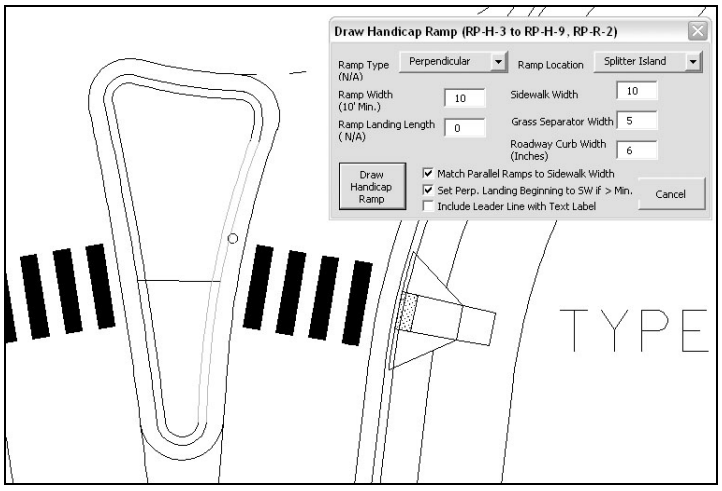
You will need to locate the pedestrian refuge area's center points at the splitter island curb lines prior to placing the ramp. There is a minimum offset of 20' from the roundabout to the edge of the crossing location. The minimum width of the ramp is 10' so the ramp center must be at least 25' from the roundabout.

Adjust the value for **Ramp Width** as needed. Minimum values from the standard roadway drawings are specified by default.

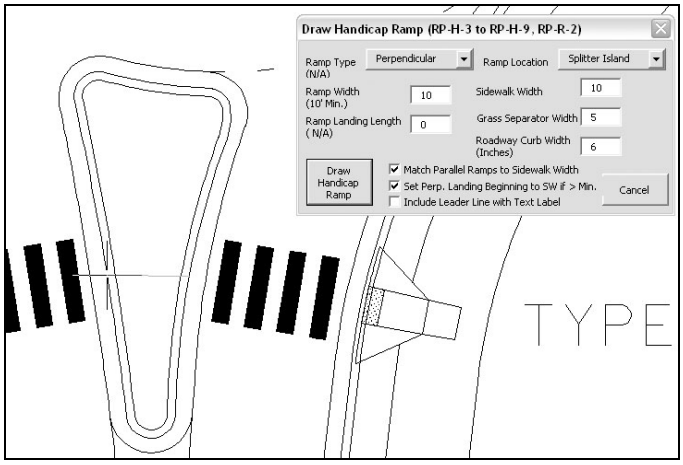
Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **ID splitter island curb on one side**. Data point on the curb at either side of the island. Once identified, data point to accept.



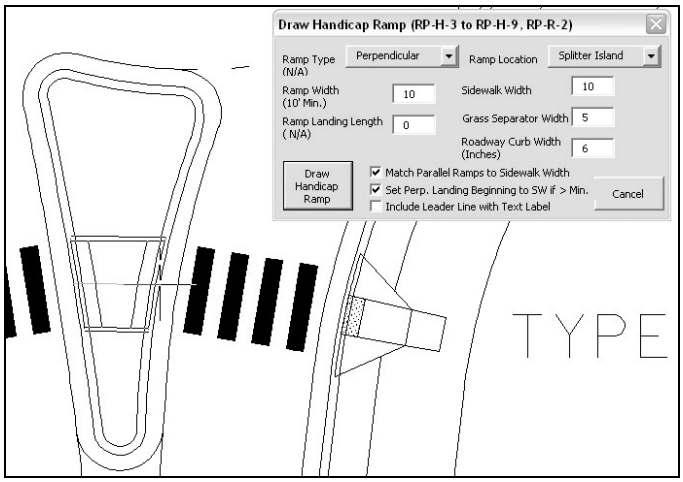
Step 5. The user is then prompted to **ID splitter island curb on other side**. Data point on the curb on the other side of the island. Once identified, data point to accept.



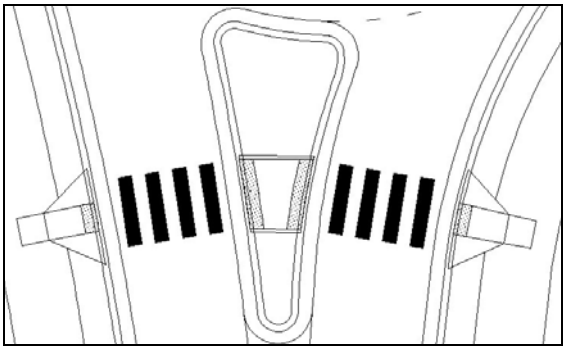
Step 6. After identifying the curbs, the user is prompted to **Identify Point at Curb for Ramp Begin**. Snap and data point at the center location for the ramp on the beginning side.



Step 7. The user is then prompted to **Identify Point at Curb for Ramp End**. Snap and data point at the center location for the ramp on the ending side. The handicap ramp is shown dynamically to aide in placement.



When the end center point is given, the handicap ramp is drawn in. This handicap ramp does not have a defined type number so no text labeling is needed.



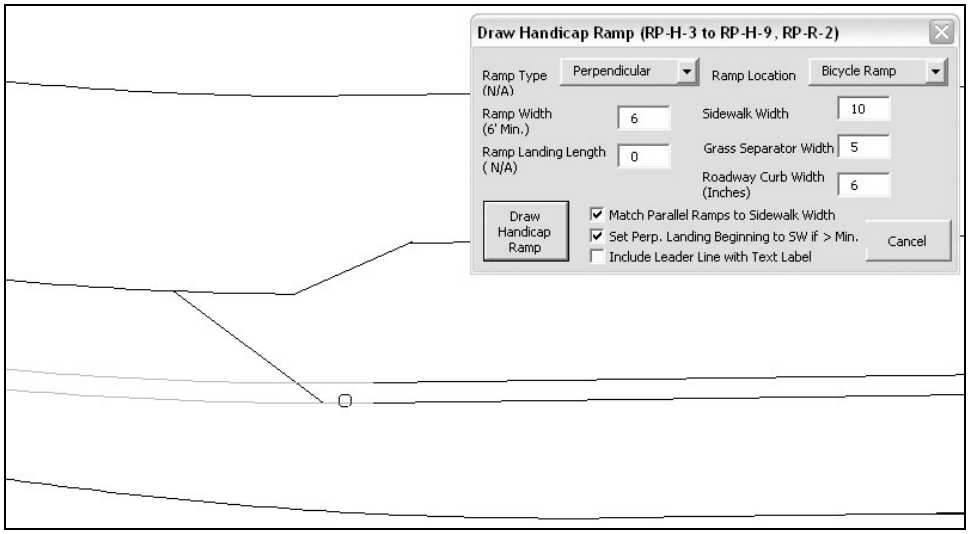
Usage: Bicycle Ramp

Step 3. Make your final settings on the dialog. Set the Ramp Location to **Bicycle Ramp**. The Ramp Type setting is not applicable for this kind of ramp and is noted as N/A.

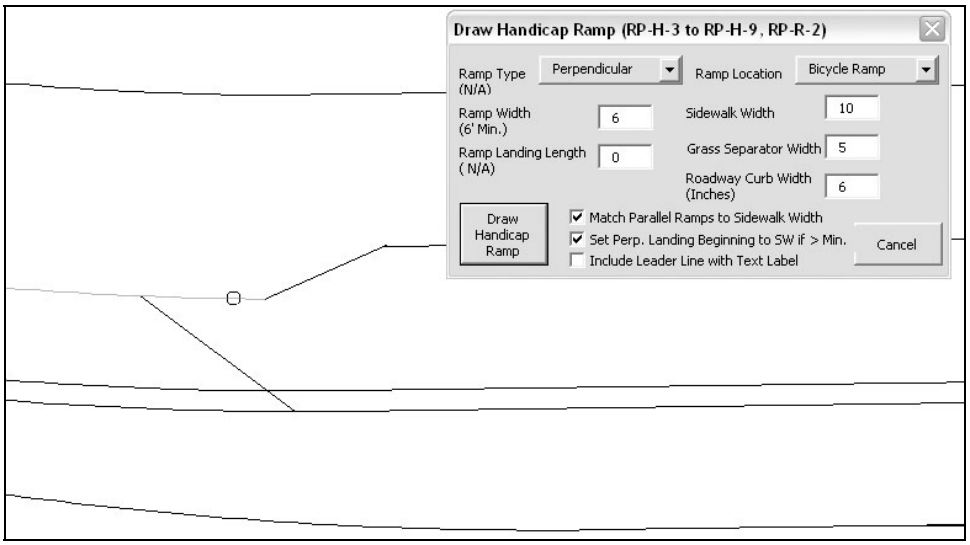
You will need to locate the bicycle ramp's center points at the roadway curb line and the sidewalk prior to placing the ramp.

Adjust the value for **Ramp Width** as needed. Minimum values from the standard roadway drawings are specified by default.

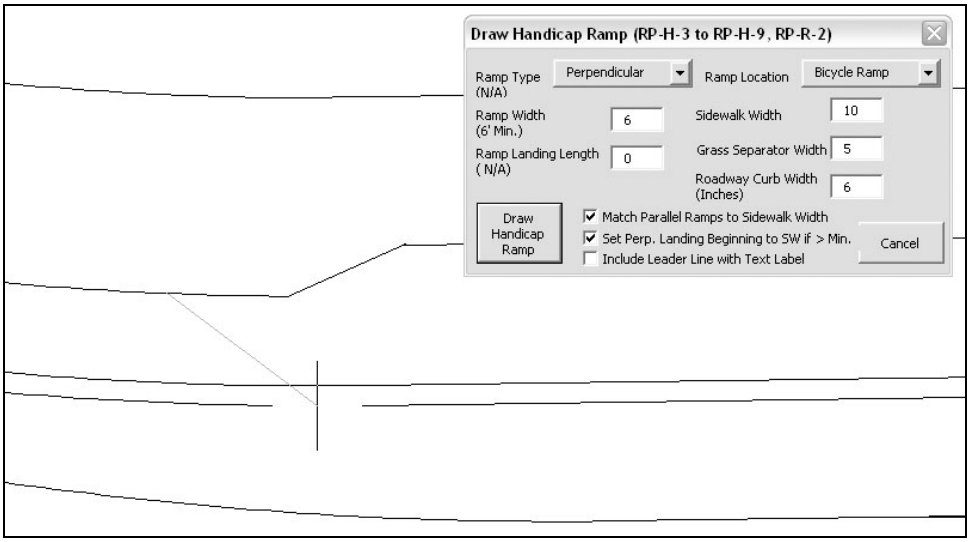
Step 4. Click on the **Draw Handicap Ramp** command button. The user is prompted to **Identify curb at roadway**. Data point on the curb near the beginning of the bicycle ramp. Once identified, data point to accept.



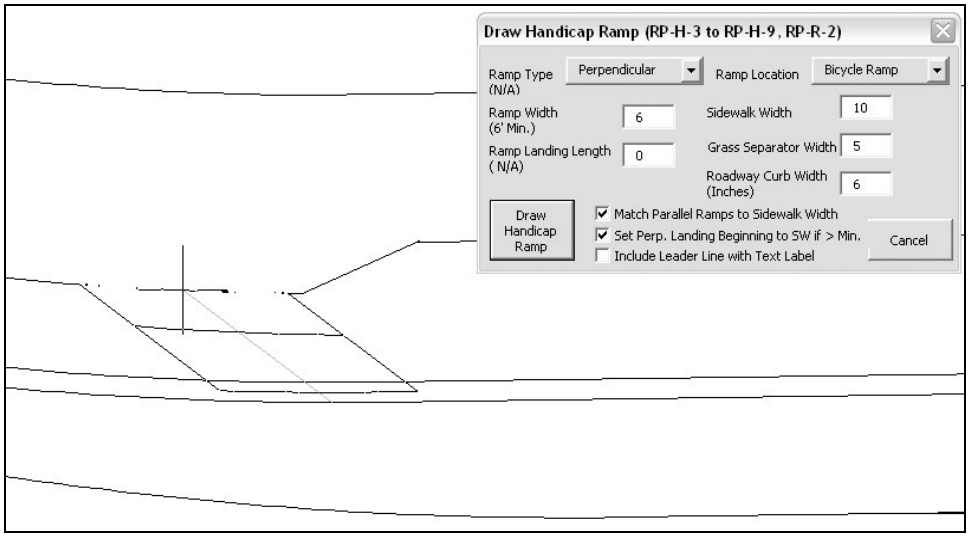
Step 5. The user is then prompted to **Identify sidewalk**. Data point on the edge of the sidewalk near the end of the bicycle ramp. Once identified, data point to accept.



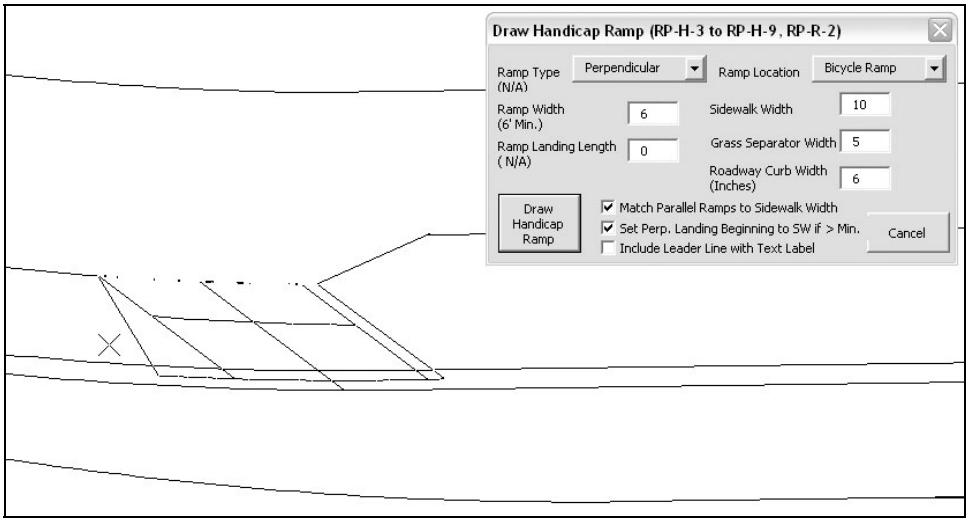
Step 6. The user is prompted to **Identify Point at Curb for Ramp Begin**. Snap and data point at the center location for the bicycle ramp beginning at the curb.



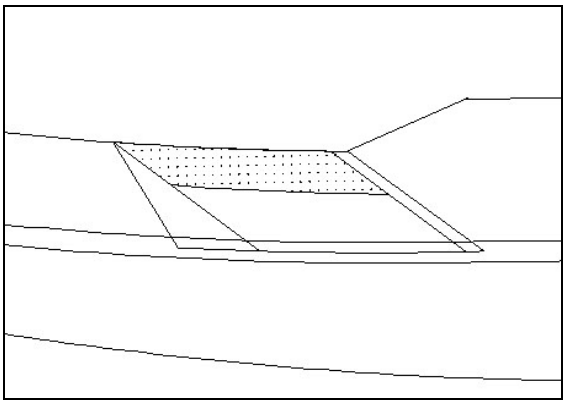
Step 7. The user is then prompted to **ID Point at Sidewalk for Ramp End & Angle**. Snap and data point at the center location for the bicycle ramp ending at the sidewalk. The ramp center portion is shown dynamically to aide in placement.



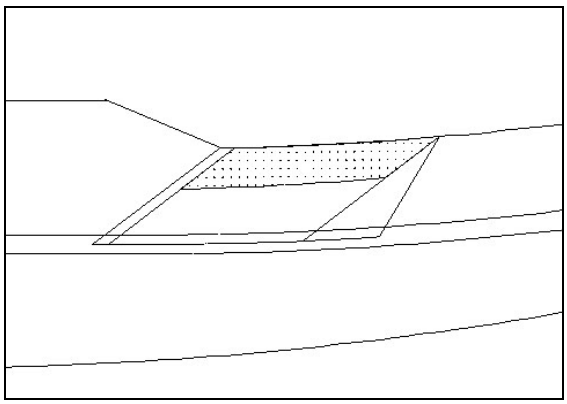
Step 8. The user is last prompted to **ID flare side, Entry (LT) or Exit (RT)**. This ramp type includes a concrete flare to the inside for transitioning to the sidewalk. The outside has a tapering curb to transition into the sidewalk. As indicated in the prompts, entry bicycle ramps will have the flare to the left while on exit ramps the flare should be placed to the right. The ramp is shown dynamically to aide in setting the flare side.



When the flare side point is given, the bicycle ramp is drawn in. This ramp does not have a defined type number so no text labeling is needed.



Entry Bicycle Ramp



Exit Bicycle Ramp.

Pattern Scarified Pvmt. Area

D&C location: Drafting Standards > Roadway Linework > Scarify Pvmt

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern an exist. pavement scarify area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]Scarify.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

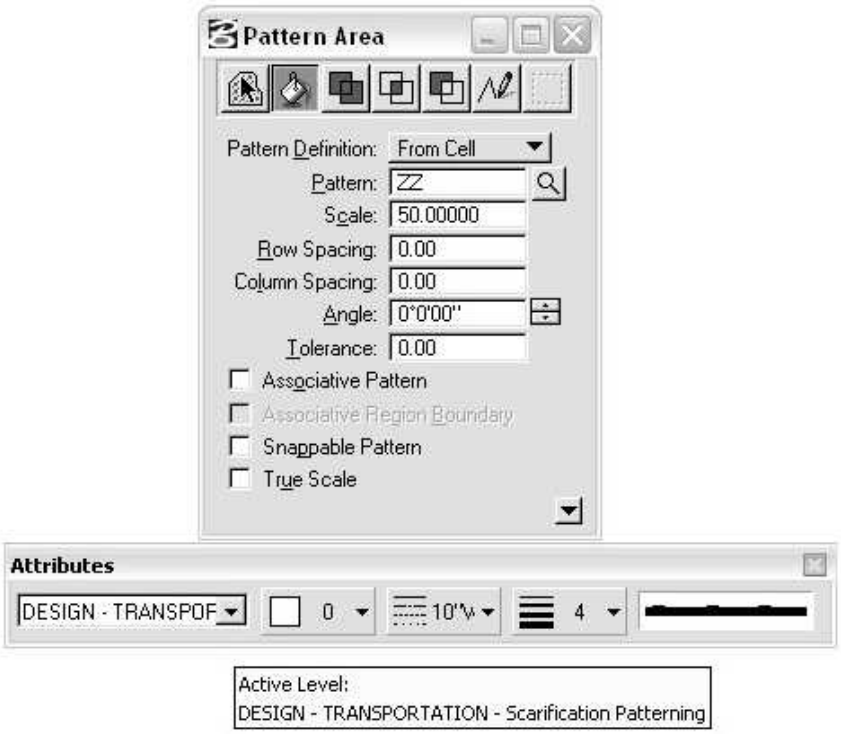
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

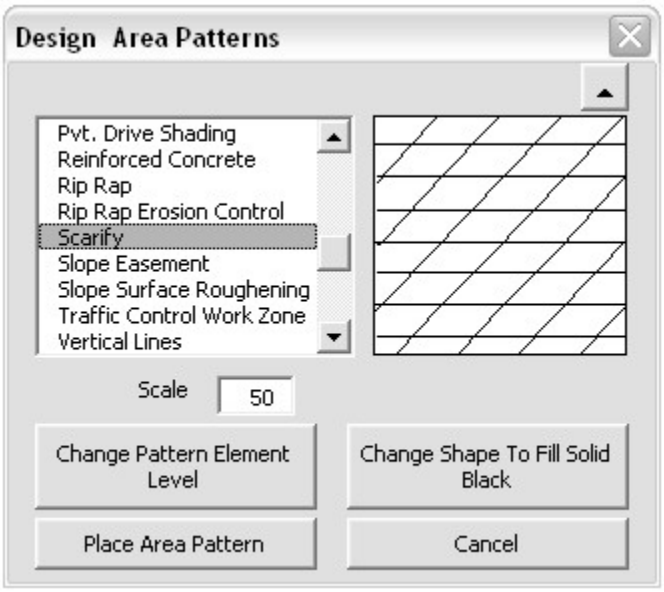
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Scarify Pvmt**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

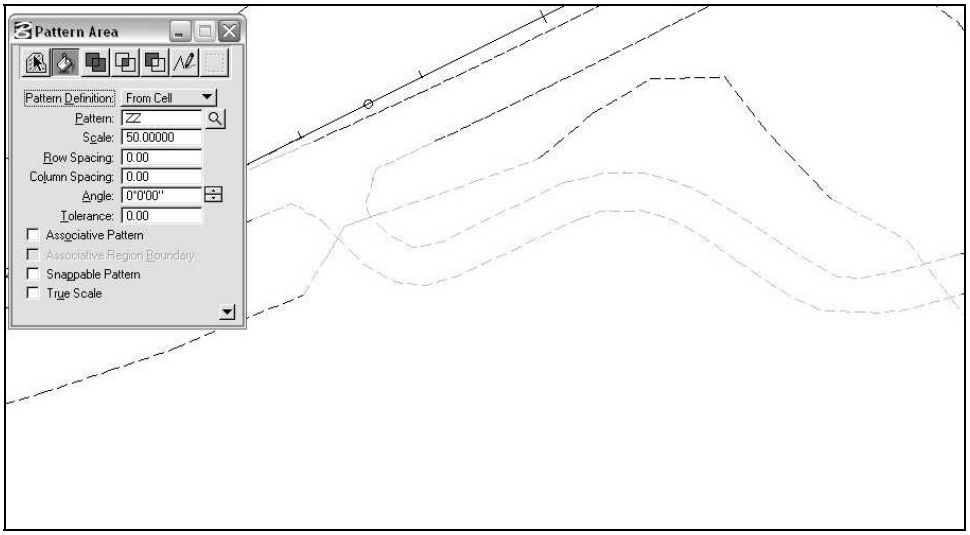


Or from the drop down menu in the **Design Area Patterns** dialog …

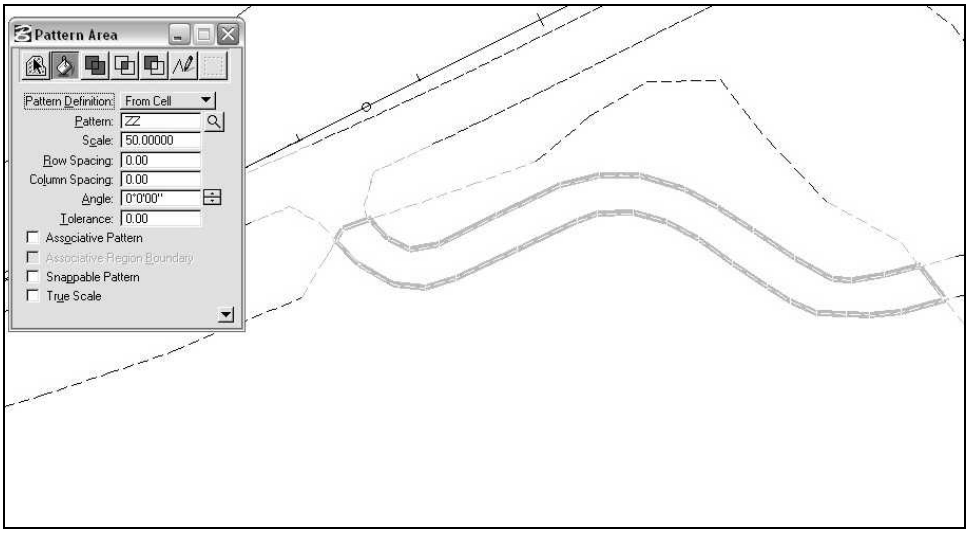


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

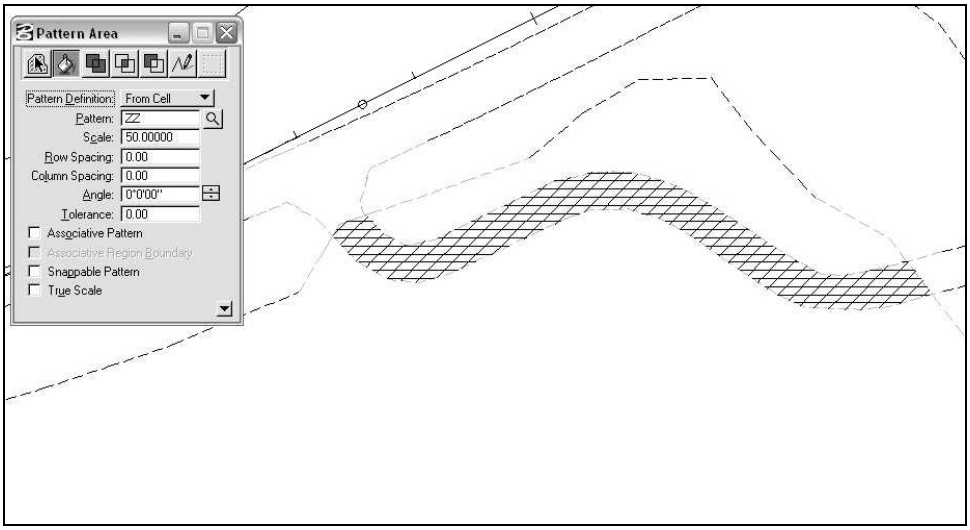
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Reinforced Concrete Area

D&C location: Drafting Standards > Roadway Linework > Reinf Concrete

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a reinforced concrete area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]ReinforcedConcrete.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

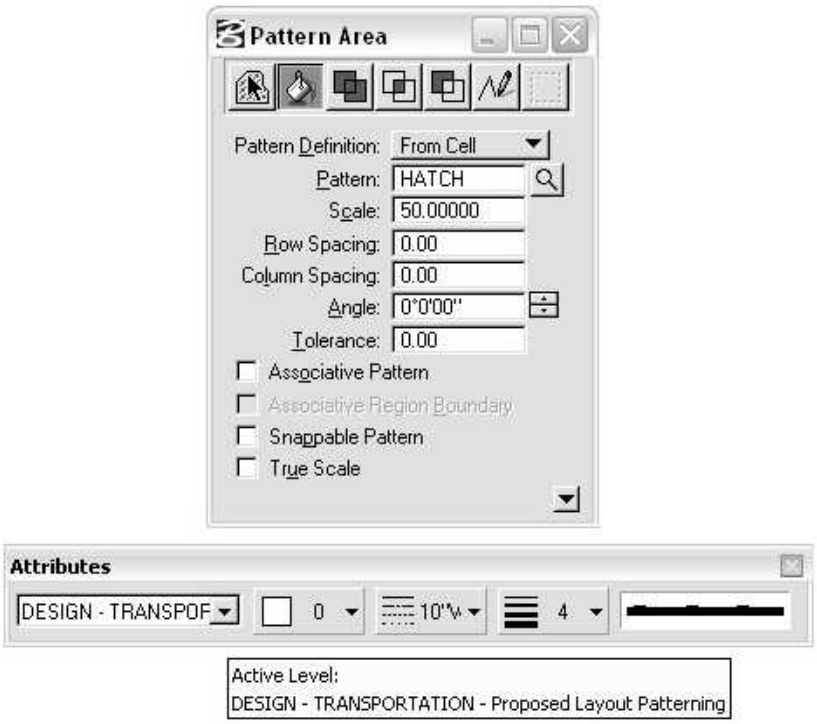
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

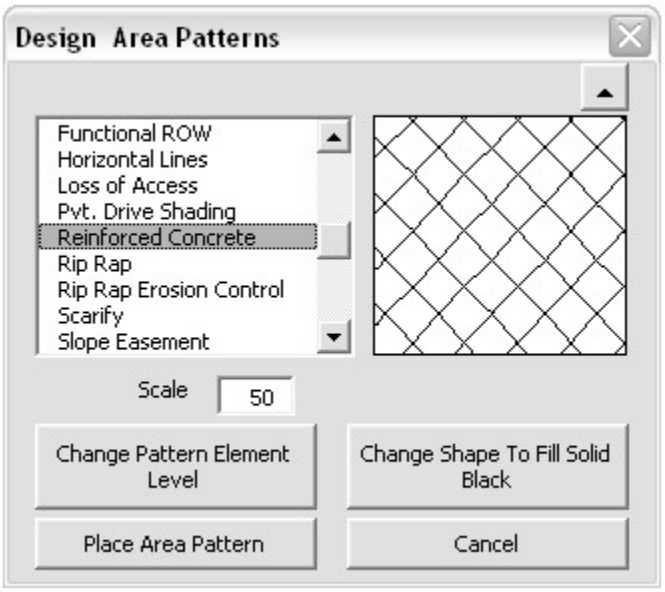
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Reinf Concrete**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

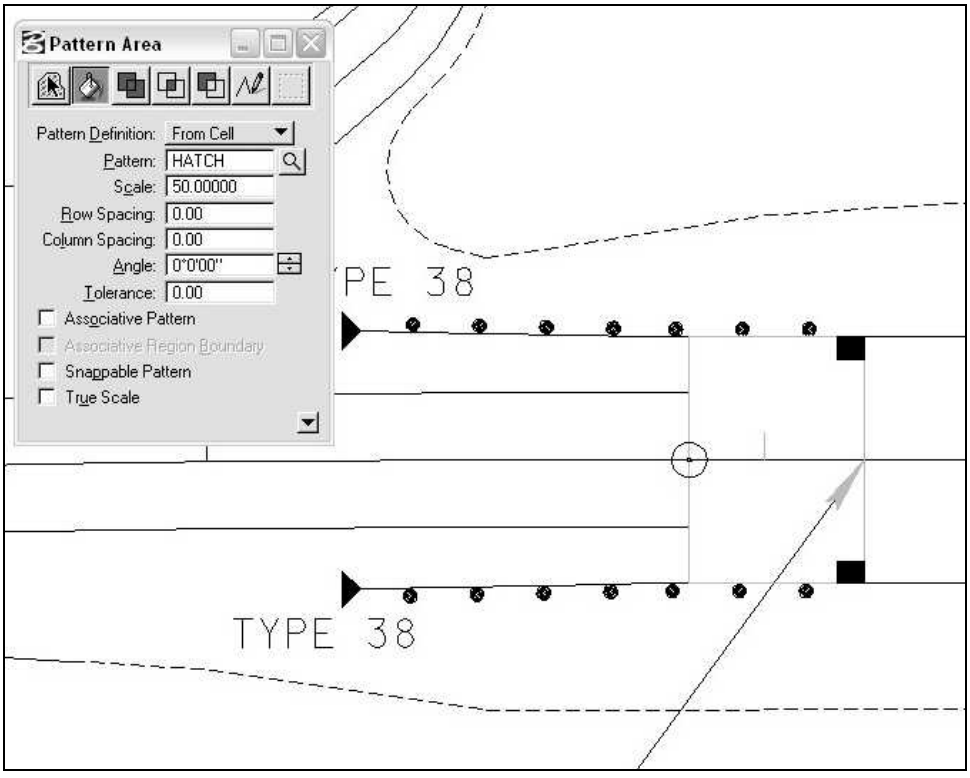


Or from the drop down menu in the **Design Area Patterns** dialog …

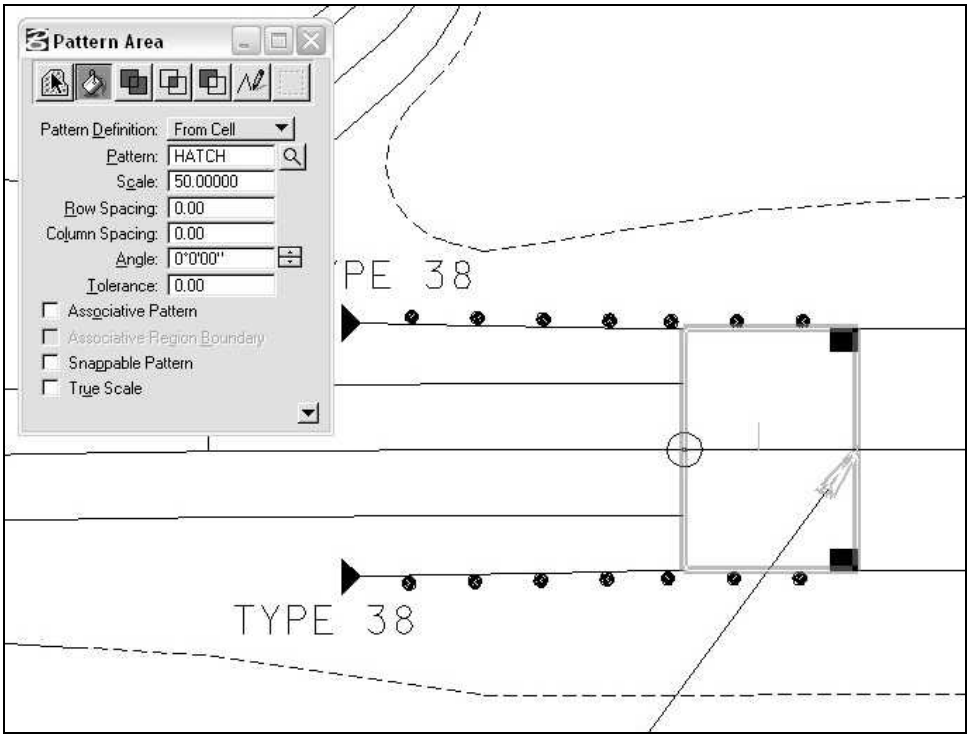


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

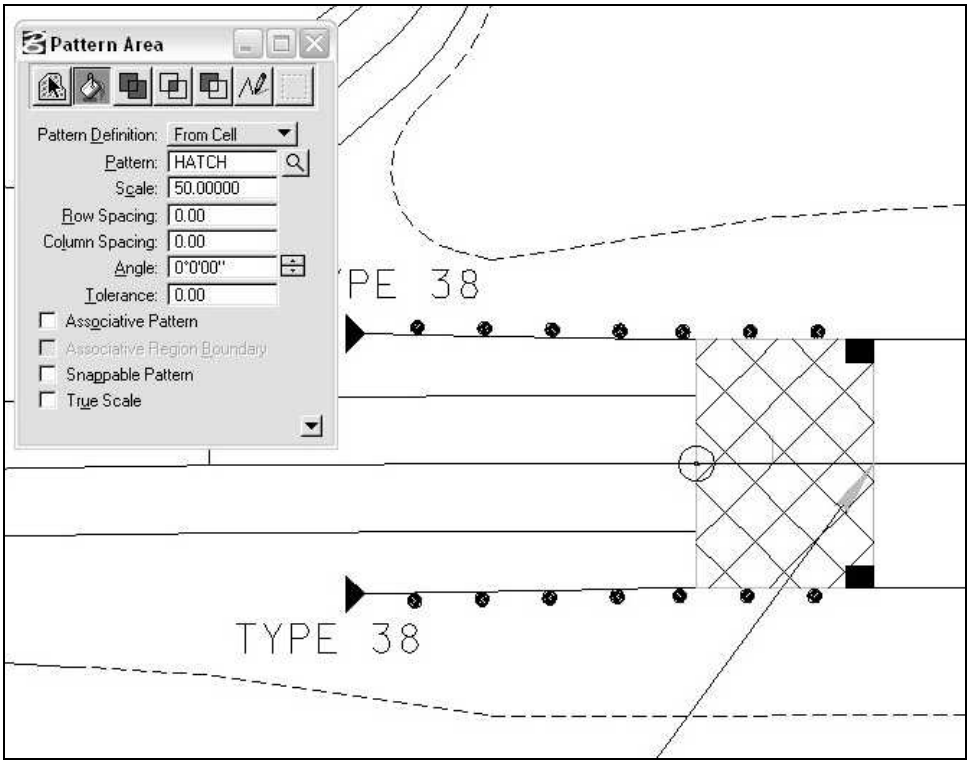
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Crown Vetch Area

D&C location: Drafting Standards > Roadway Linework > Crown Vetch

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a crown vetch slope area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]CrownVetch.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

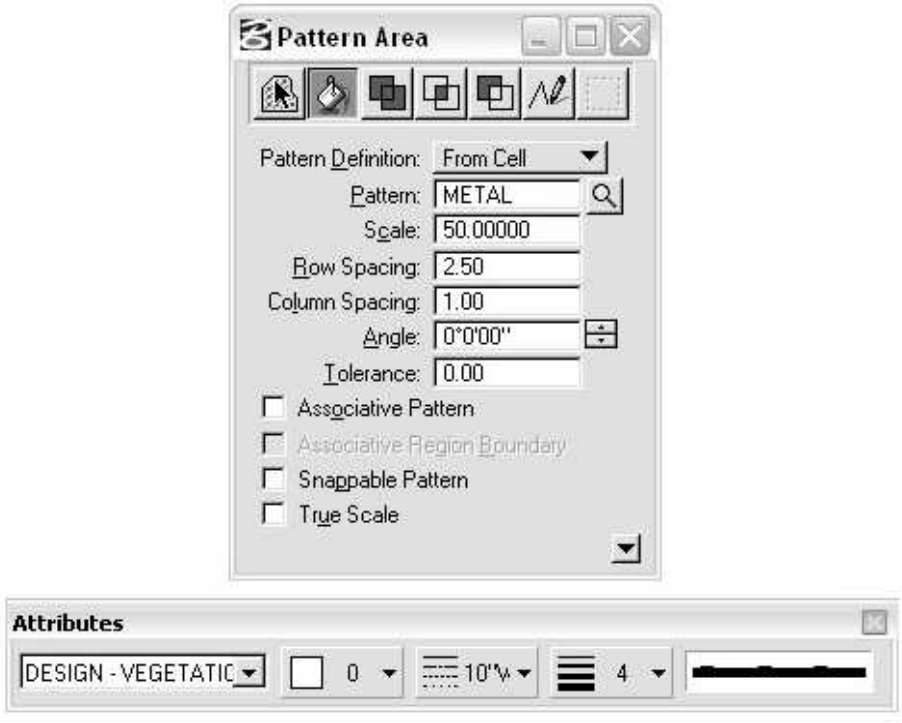
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

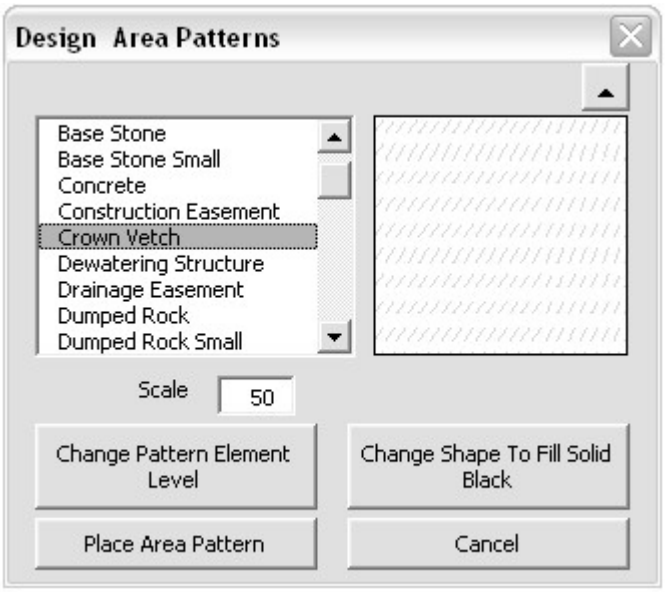
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Crown Vetch**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

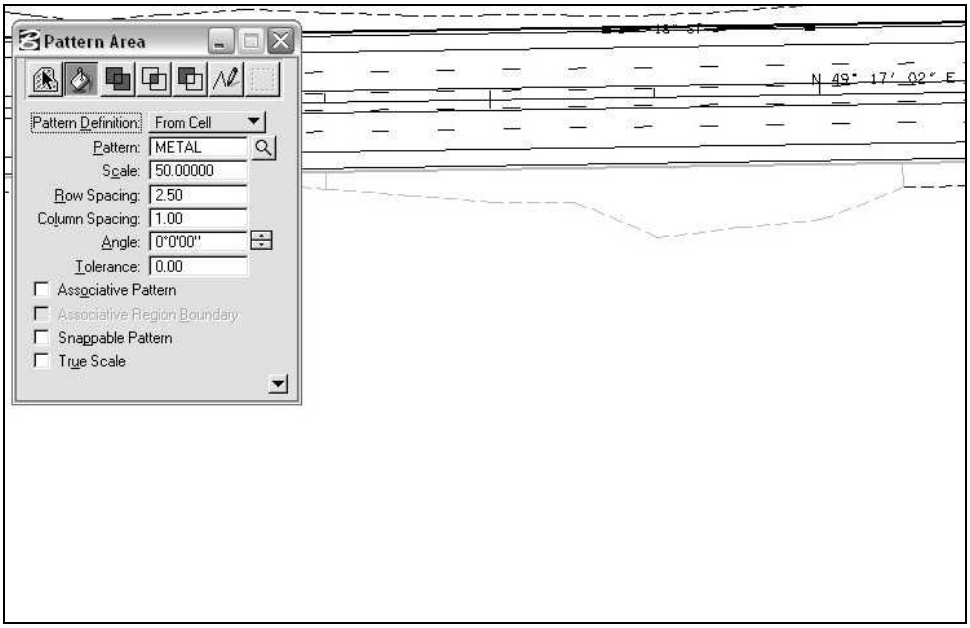


Or from the drop down menu in the **Design Area Patterns** dialog …

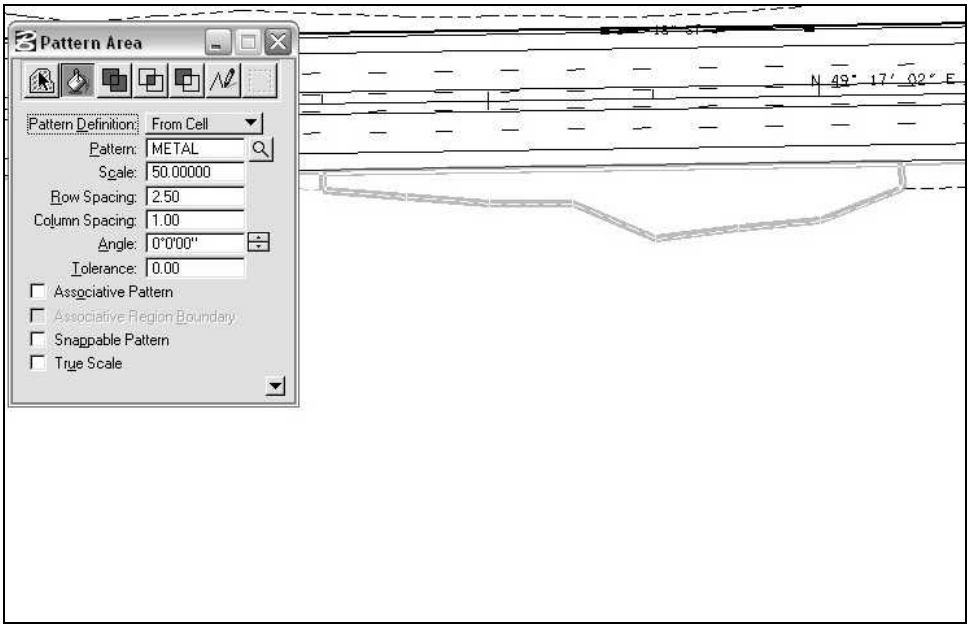


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

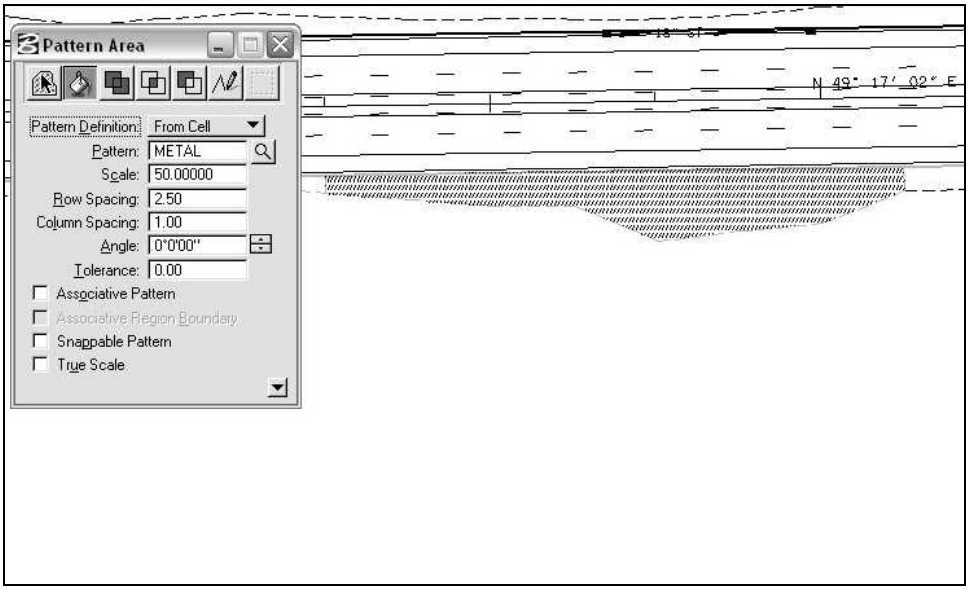
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Traffic Flow Diagrams

D&C location: Drafting Standards > Roadway Linework > Traffic Flow Dg

MicroStation VBA Program: TrafficFlowDiagramCells.mvba

Description:

This program provides access to TDOT Design Division traffic flow diagram cells.

Command buttons are provided to access MicroStation commands Auto Fill in Enter_Data Fields and Fill in Single Enter_Data Field.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

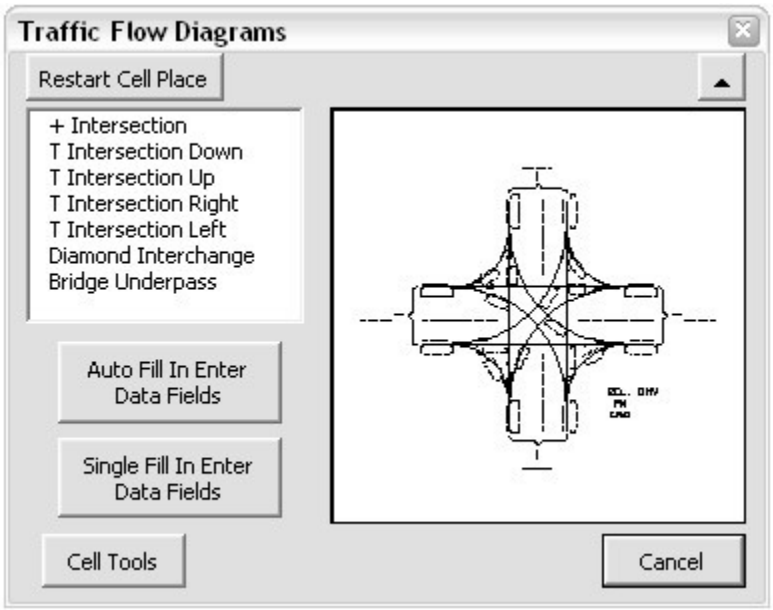
This program can also be activated from the MicroStation drop down menu
TDOT > Traffic Flow Diagrams
or by using the keyin
vba run [TrafficFlowDiagramCells]TrafficFlowcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Traffic Flow Dg**. The **Traffic Flow Diagrams** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool

bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Private Drives

Pattern Pvt. Dr. Shading

D&C location: Drafting Standards > Private Drives > Pvt Dr Shading

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to shade in private drives and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]PvtDriveShading.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

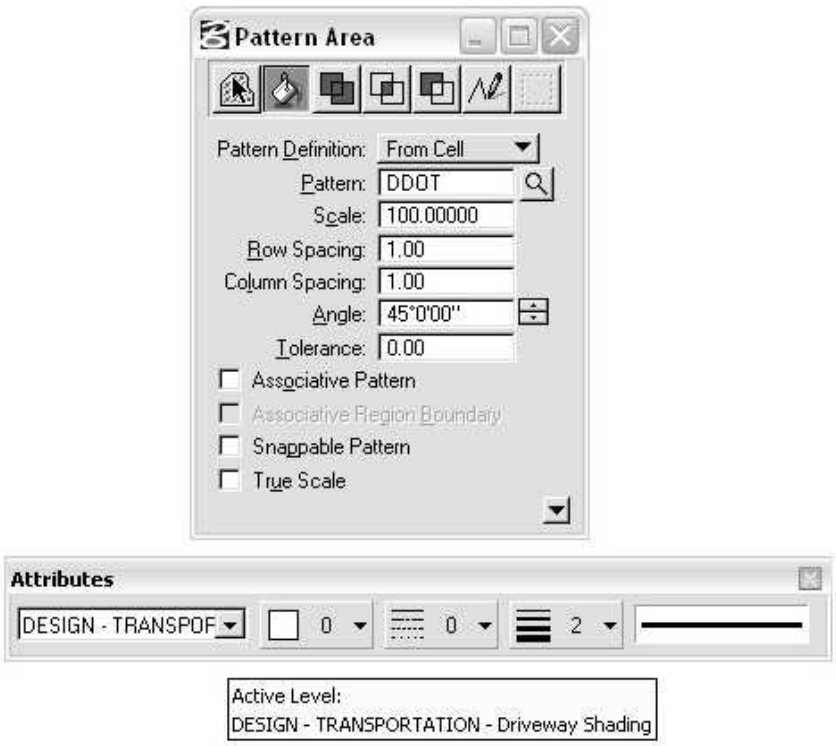
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

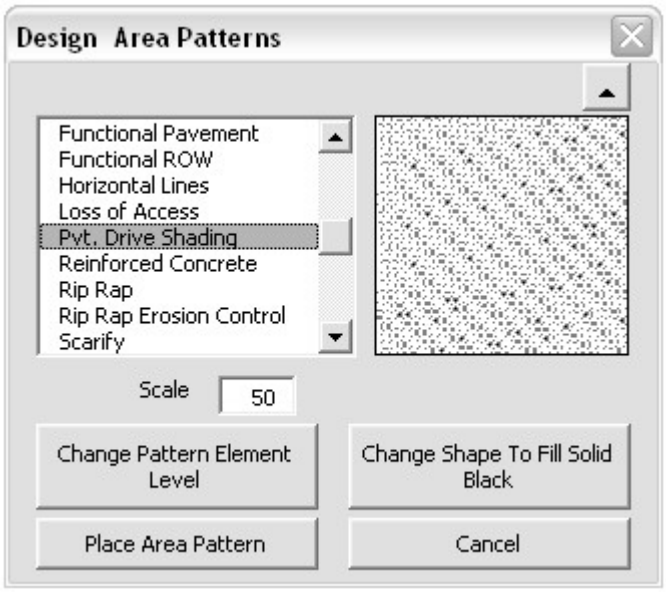
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Pvt Dr Shading**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

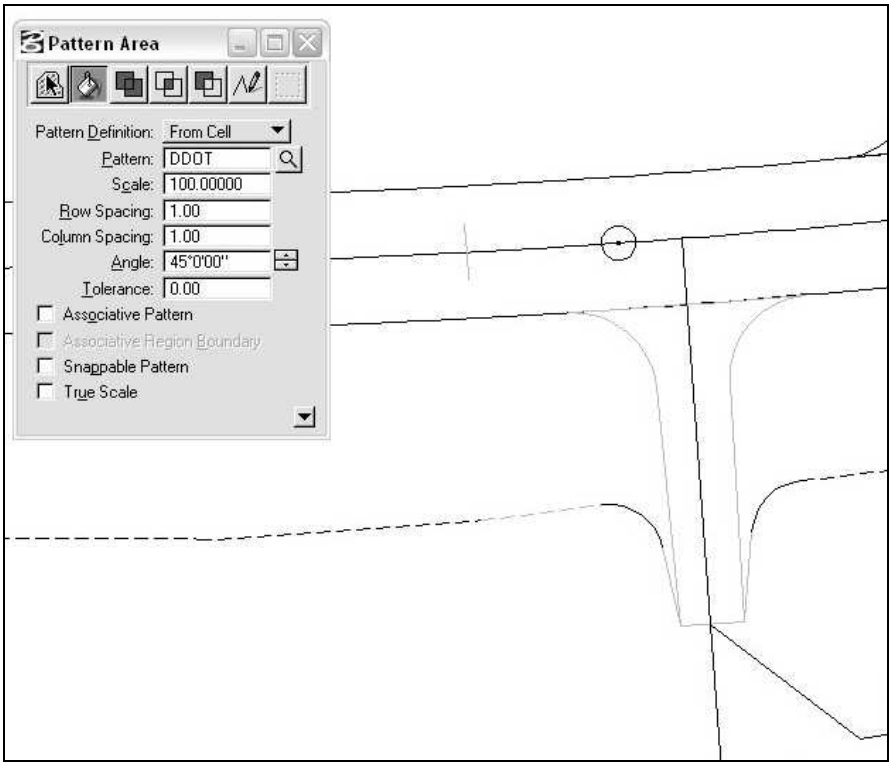


Or from the drop down menu in the **Design Area Patterns** dialog …

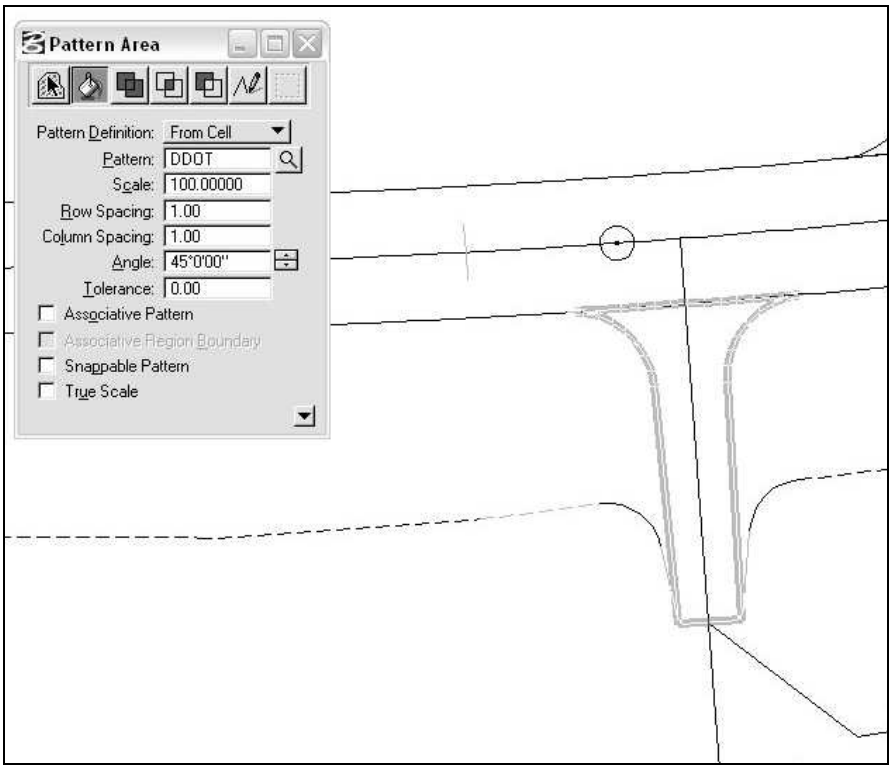


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

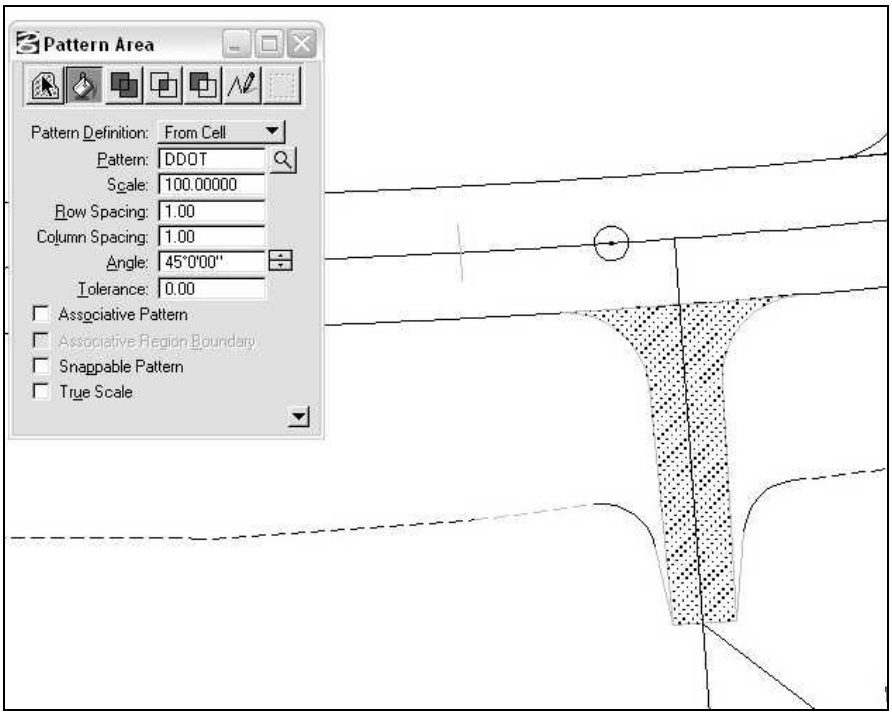
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Place Horizontal Alignment Points

D&C location: Drafting Standards > Private Drives > HA Driveway Pts

MicroStation VBA Program: HApoints.mvba

Description:

This program places the required point text symbols for all keypoints of any horizontal alignment/chain stored in the project GPK file in the plan view. The PI symbol (triangle) with short sub tangents are placed for all spiral-curve combinations or simple curves. The point on chain symbol (circle) is placed at the begin & end and at all on chain curve points. The PI symbol (triangle) by itself is placed at any break in tangent direction without a curve along the horizontal alignment. This is applicable to the following horizontal alignment types: Proposed Roadway Centerline, Preliminary Roadway Centerline, Existing Roadway Centerline, Proposed Special Ditch Centerline, Existing Stream Baseline, Functional Roadway Centerline, Proposed Private Drive Centerline.

All graphics are placed in a single graphic group for easy deletion as needed.

This tool stores the current location of the dialog, GPK job number, chain name and horizontal alignment type in the file **C:\Temp\MVBA_FormStorage.log** when the dialog is closed. When opened later it uses this information if applicable to bring up the dialog as you last used it.

This tool is only used on more complex or critically located private drives which are developed using roadway tools.

This program can also be activated from the MicroStation drop down menu at
TDOT > Centerlines > Place Horizontal Alignment Points
or by using the keyin
vba run [HApoints]HApointsStart.main

Special Requirements:

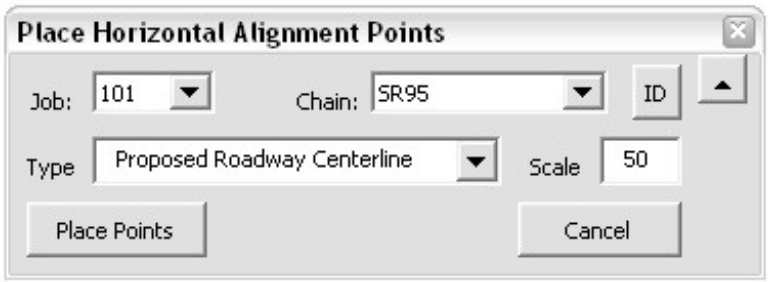
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

The **ID Chain** function uses a special VBA reference to program **GetCogoElement.mvba** which was provided by Bentley and must be present with the program for it to function.

Usage:

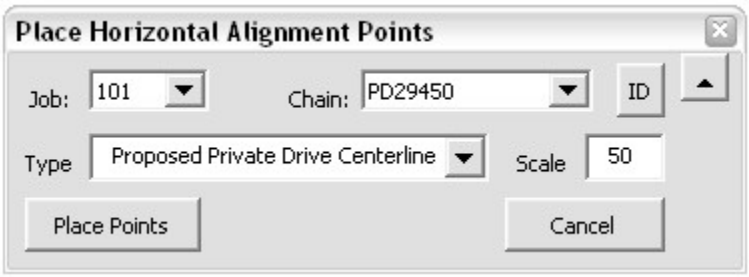
Step 1. In D&C manager activate **HA Driveway Pts**. The **Place Horizontal Alignment Points** dialog is displayed.

All Geopak jobs found within the current active folder are listed in the Job drop down box. If this tool was used previously for that job, the last chain processed is set as well as the last horizontal alignment type which was used. Scale defaults to active scale set in the MicroStation DGN file.



Step 2. After selecting the Geopak **Job** number as needed, the **Chain** drop down is populated with all chains stored in the job. Select the chain to place point symbols for. If you do not know the chain name but have chain graphics, the **ID** button can be used to select the chain.

Step 3. Set the **Type** to **Proposed Private Drive Centerline** by clicking that option in the drop down list provided**.** This setting controls the level, symbology, etc. for the point symbols which are to be placed.



If this tool was used previously, the last horizontal alignment type which was used is set automatically when the tool is activated.

Step 4. Reset the **Scale** if needed and click the **Place Points** command button. Point symbols are displayed for the specified chain.

Step 5. If you need to place point symbols for other chains, reset the chain name and click the **Place Points** command button for each one.

Label Vertical Alignment

D&C location: Drafting Standards > Private Drives > VA Labeler

MicroStation/Geopak VBA Program: VA_Labeler.mvba

Description:

This program was designed to label pertinent vertical alignment information on the profile. The user has the ability to choose the options they would like to label by selecting the check box corresponding to the label. Chain, reference datum, and scale information is attained when the user selects the Geopak profile cell.

Only profiles applicable to the identified Geopak profile cell are offered for labeling.

Type option allows for application for roadways, private drives or special ditches. The type controls text sizes, orientation and symbology.

Program is set up for use on English or Metric projects.

This is only used on more complex or critically located private drives which are developed using roadway tools.

This program can also be activated from the MicroStation drop down menu
TDOT > Profiles > Vertical Alignment Labeler
or by using the keyin
vba run [VA_Labeler]modStartUp.label_VApts

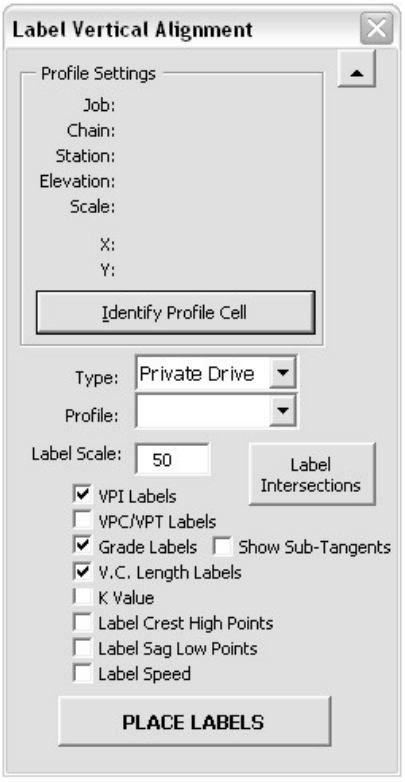
Special Requirements:

A Geopak profile cell must be present.

K value text file, **VALabel_Speed_kvl.txt** must be present in TDOT Design Division's GeopakStandards folder at C:\Program Files\GeopakStandards\.

Usage:

Step 1. In D&C manager activate **VA Labeler**. The **Label Vertical Alignment** dialog is opened. By default the type is set to Roadway. Reset **Type** to **Private Drive**.



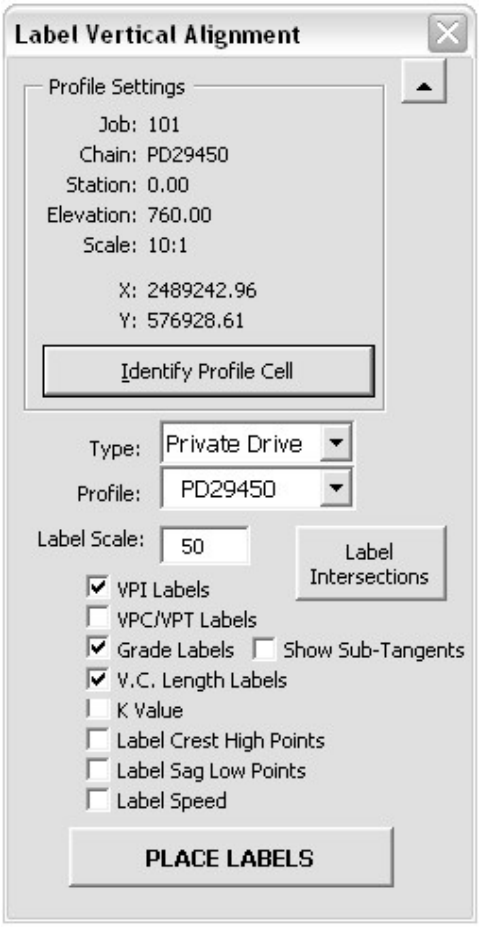
Step 2. Click on the **Identify Profile Cell** command button and data point on the Geopak profile cell for the profile. The window shade button on the upper right of the dialog can be used to get the dialog out of the way as you identify the profile cell. Just click it again to re-expand the dialog after identifying the cell.

Note:
After reading the profile cell and populating the Profile Settings at the top of the dialog, the GPK file is read for all profiles/vertical alignments applicable for display on this profile and fills the profile list box

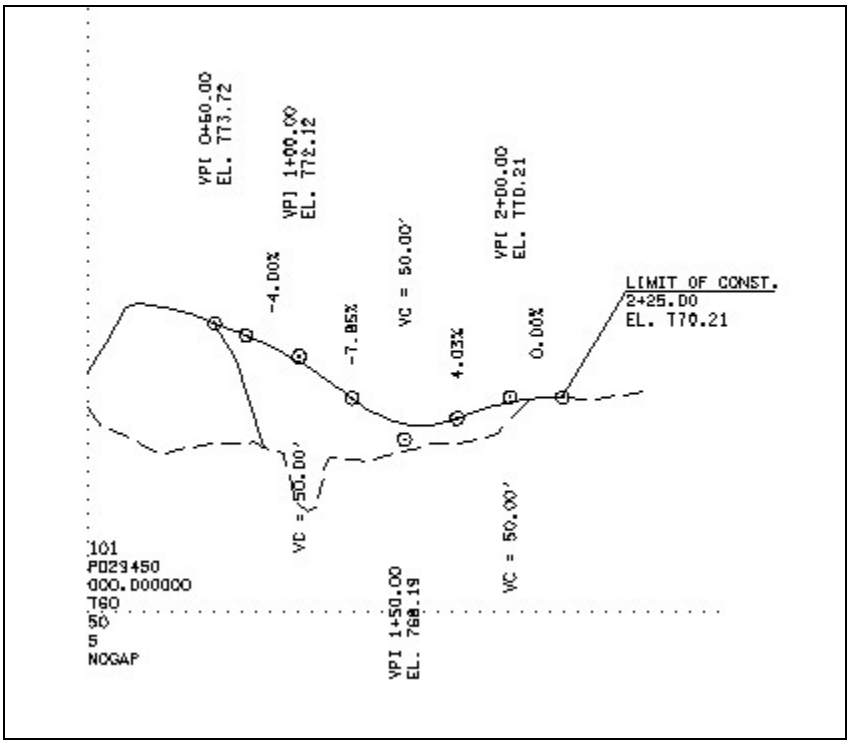
Step 3. Scroll through the **Profile** list and choose the vertical alignment that you wish to annotate.

Step 4. Set the **Scale** value as needed. The current active scale is read when the program is started to fill in this field automatically. Scale controls text sizes & label offsets.

Step 5. Finally the label options can be adjusted as needed. The type of profile to be labeled determines which default options are turned on.



Step 5. Now that all control values are set, click on the **Place Labels** command button and the vertical alignment is annotated. Review the annotation graphics and click the red X to close the dialog.



Vertical Curve Design Tool

D&C location: Drafting Standards > Private Drives > VC Design Tool

MicroStation/Geopak VBA Program: VerticalCurveDesign.mvba

Description:

This program is set up to be used to design or check vertical curves for roadways. Entrance and exit grades for the vertical curve can be keyed in or identified graphically. They must be identified graphically for visual vertical curve displays. Command buttons are provided to identify these lines together or individually as needed. After the grades are set, one of 3 Design Controls must be set, length, K value or design speed. Then click on the Calculate Curve command button and the unknown design values are computed, shown in the dialog and the curve is temporarily visualized in graphics.

If desired, the curve can be drawn in permanently by clicking the Draw Curve command button. Curve graphics include the curve and circle point text symbols at the VPC, VPI & VPT. All graphics are joined as a graphic group. Current active level and element symbology are used for permanent curve displays. The current active scale controls the size of the point symbols.

Options are provided for the use of either RD or RD01 vertical curve design standards which are read from the text file VALabel_Speed_kvl.txt.

A key in field is provided to enter the profile vertical exaggeration factor. This value defaults to the standard 10 times exaggeration but can be reset as needed. This controls grade values that are computed from graphics and how the vertical curve will appear on the profile.

Program is set up for use on English or Metric projects

This program can also be activated from the MicroStation drop down menu
TDOT > Profiles > Vertical Curve Design Tool
or by using the keyin
vba run [VerticalCurveDesign]VCDesign.main

Special Requirements:

K value text file, **VALabel_Speed_kvl.txt** must be present in TDOT Design Division's GeopakStandards folder at C:\Program Files\GeopakStandards\.

Usage:

This tool has been described previously under **Drafting Standards > Roadway Vertical Alignments**. See the description of usage at that location.

Exist. Drainage

Place Horizontal Alignment Points

D&C location: Drafting Standards > Exist. Drainage > HA Stream Pts

MicroStation VBA Program: HApoints.mvba

Description:

This program places the required point text symbols for all keypoints of any horizontal alignment/chain stored in the project GPK file in the plan view. The PI symbol (triangle) with short sub tangents are placed for all spiral-curve combinations or simple curves. The point on chain symbol (circle) is placed at the begin & end and at all on chain curve points. The PI symbol (triangle) by itself is placed at any break in tangent direction without a curve along the horizontal alignment. This is applicable to the following horizontal alignment types: Proposed Roadway Centerline, Preliminary Roadway Centerline, Existing Roadway Centerline, Proposed Special Ditch Centerline, Existing Stream Baseline, Functional Roadway Centerline, Proposed Private Drive Centerline.

All graphics are placed in a single graphic group for easy deletion as needed.

This tool stores the current location of the dialog, GPK job number, chain name and horizontal alignment type in the file **C:\Temp\MVBA_FormStorage.log** when the dialog is closed. When opened later it uses this information if applicable to bring up the dialog as you last used it.

This program can also be activated from the MicroStation drop down menu at
TDOT > Centerlines > Place Horizontal Alignment Points
or by using the keyin
vba run [HApoints]HApointsStart.main

Special Requirements:

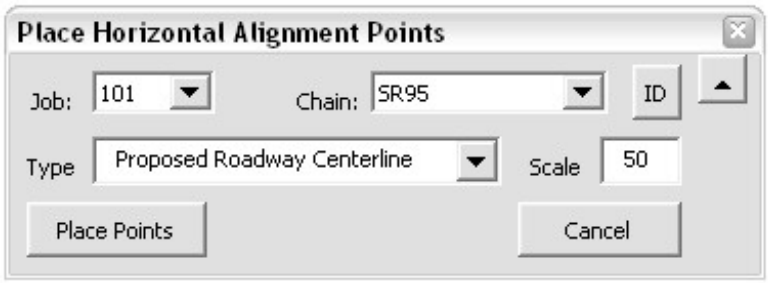
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

The **ID Chain** function uses a special VBA reference to program **GetCogoElement.mvba** which was provided by Bentley and must be present with the program for it to function.

Usage:

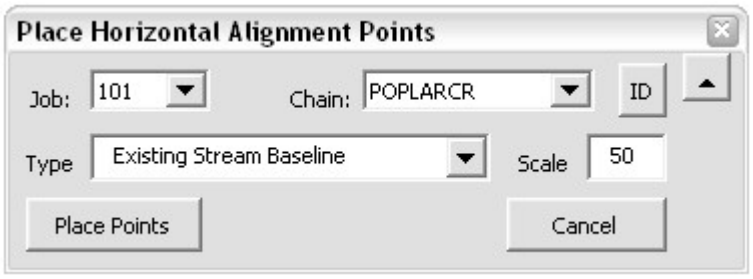
Step 1. In D&C manager activate **HA Stream Pts**. The **Place Horizontal Alignment Points** dialog is displayed.

All Geopak jobs found within the current active folder are listed in the Job drop down box. If this tool was used previously for that job, the last chain processed is set as well as the last horizontal alignment type which was used. Scale defaults to active scale set in the MicroStation DGN file.



Step 2. After selecting the Geopak **Job** number as needed, the **Chain** drop down is populated with all chains stored in the job. Select the chain to place point symbols for. If you do not know the chain name but have chain graphics, the **ID** button can be used to select the chain.

Step 3. Set the **Type** to **Existing Stream Baseline** by clicking that option in the drop down list provided**.** This setting controls the level, symbology, etc. for the point symbols which are to be placed.



If this tool was used previously, the last horizontal alignment type which was used is set automatically when the tool is activated.

Step 4. Reset the **Scale** if needed and click the **Place Points** command button. Point symbols are displayed for the specified chain.

Step 5. If you need to place point symbols for other chains, reset the chain name and click the **Place Points** command button for each one.

Prop. Drainage

Draw Prop. Box Culvert or Bridge in Plan by 2 Points

D&C location: Drafting Standards >Prop. Drainage > Structures in Plan > Plan Box

MicroStation Basic Program: drawboxplan.ba

Description:

This application is used to draw a proposed box culvert or bridge in the plan view.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Draw Box Culvert or Br.
or by using the keyin
macro drawboxplan.

Special Requirements:

The centerline of the structure must be established prior to running the application.

Usage:

Step 1. Establish the centerline of the structure. This may have been done during the design process using Geopak Drainage or with MicroStation tools but here we will illustrate the use of Geopak's **Draw Pattern** tool to get this done.

From Project Manager or the Geopak tool box activate the **Draw Pattern** tool.

Set the **job number** and **chain name** for the roadway.

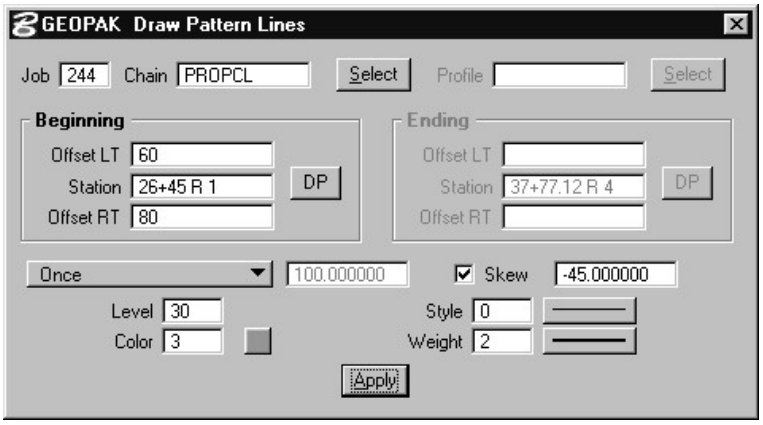
Change the placement control at the bottom for placement **Once** and change symbology settings as desired.

Only the Beginning side of the dialog should be active now and there you now can set the **Offset LT, Station** & **Offset RT.**

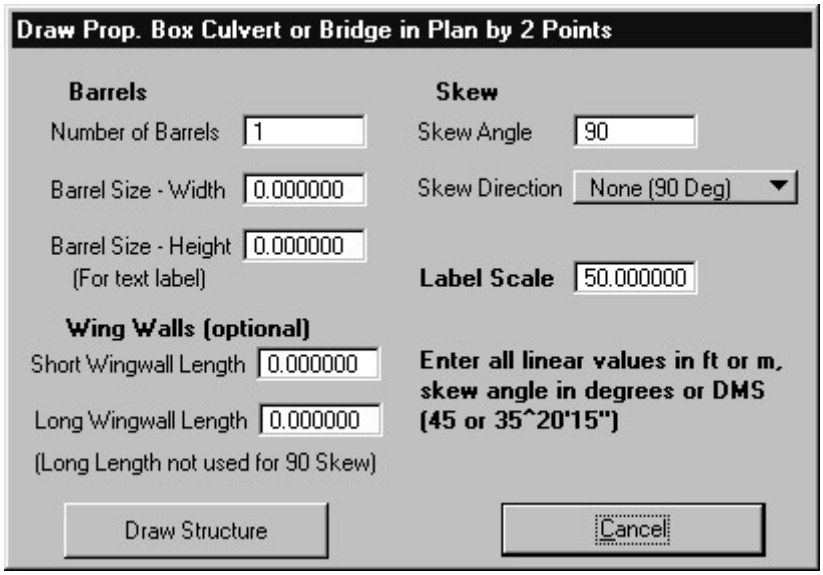
If the structure is at 90 degrees (0 degrees on dialog) you can go ahead and hit **Apply** to draw the structure. If the structure is skewed click on the **Skew** option.

Skew values in this dialog are measured from a normal 90 degree line not the centerline as we normally consider them. So to get the skew value to enter in the dialog. subtract the skew from 90. Skews to the left should be entered as positive and skews to the right as negative. (Example: 60 degree skew left 90-60=30)

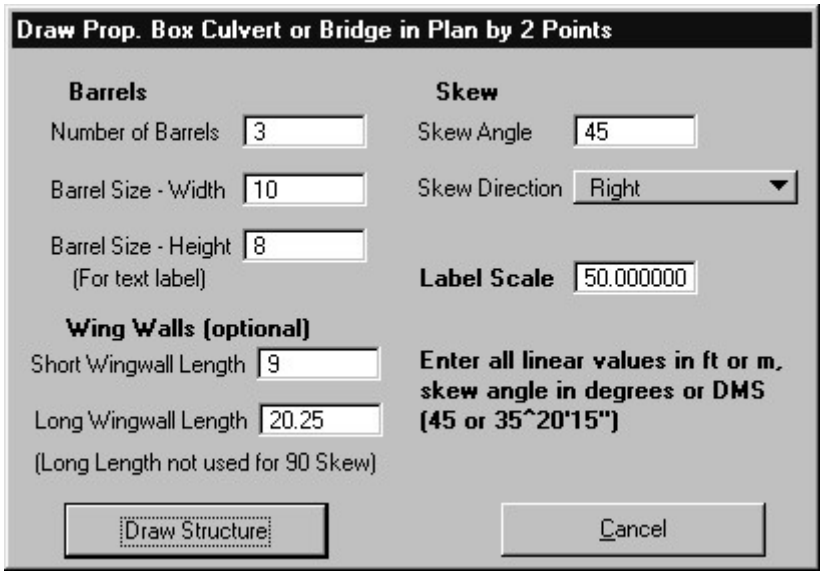
In this example our box bridge is 45 degrees right so we enter a -45 for the skew value. Hit **Apply** to draw the structure centerline.



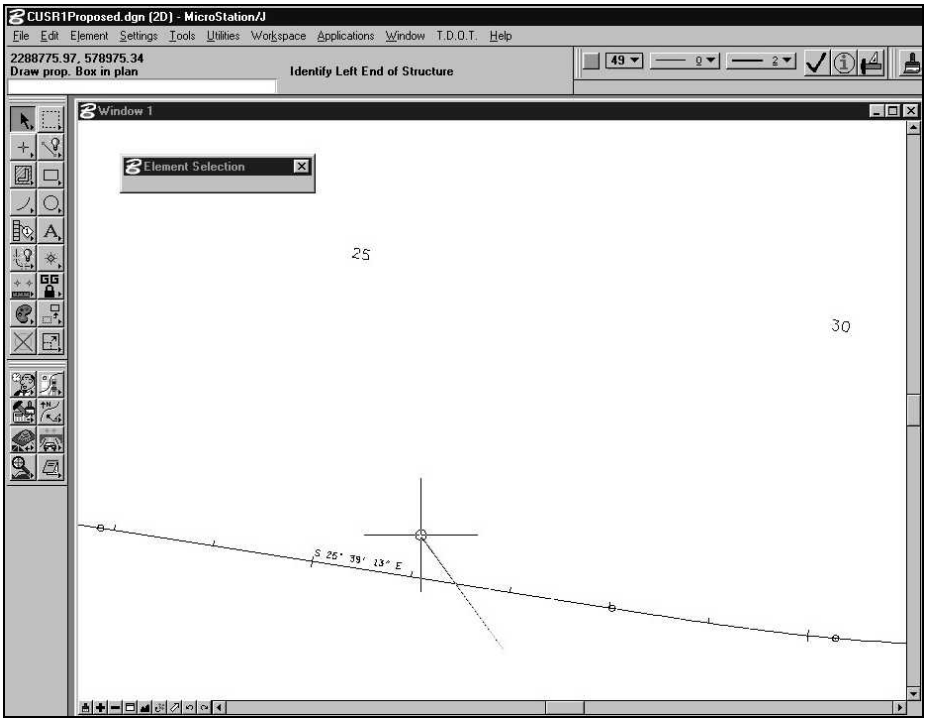
Step 2. In D&C manager activate **Plan Box**. The **Draw Prop. Box Culvert or Bridge in Plan by 2 Points** dialog opens**.** Defaults which are displayed . . . **Number of Barrels 1, Skew Angle 90, Skew Direction None** & **Label Scale (Current Active Scale).** Note that skew angles in degrees minutes & seconds are supported and wing walls are optional.



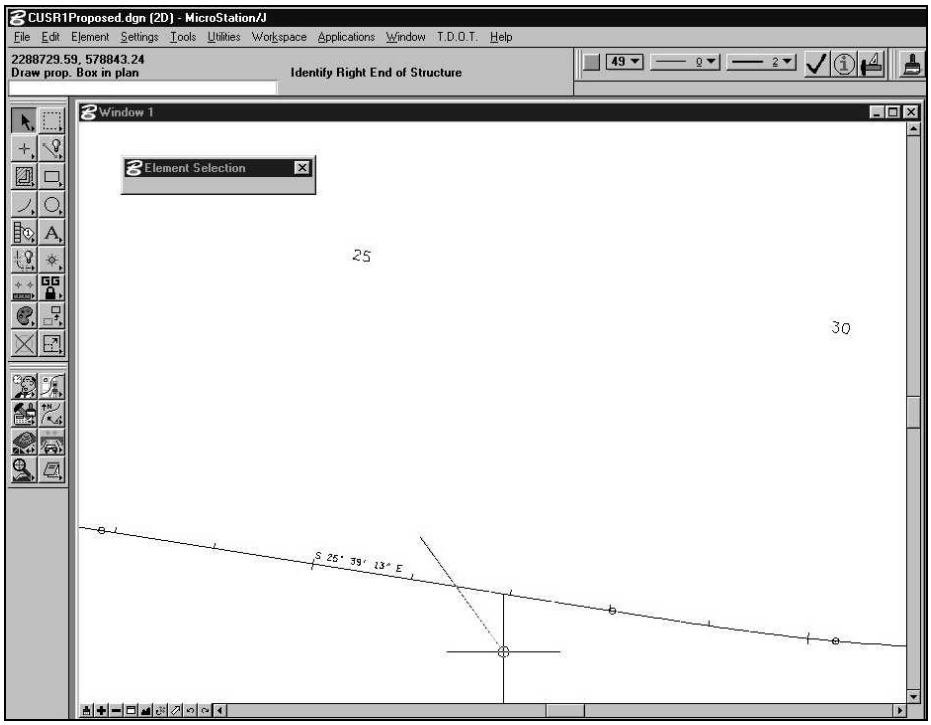
Step 3. Make settings in the dialog as needed for the structure you need to draw. In our example we are placing a 3 @ 10X8 structure at a 45 degree skew right. From standard structure drawing STD-15-111 we get the short wingwall (WS) length of 9' and a long wingwall (WL) length of 20.25'. Once settings are made click on the **Draw Structure** button.



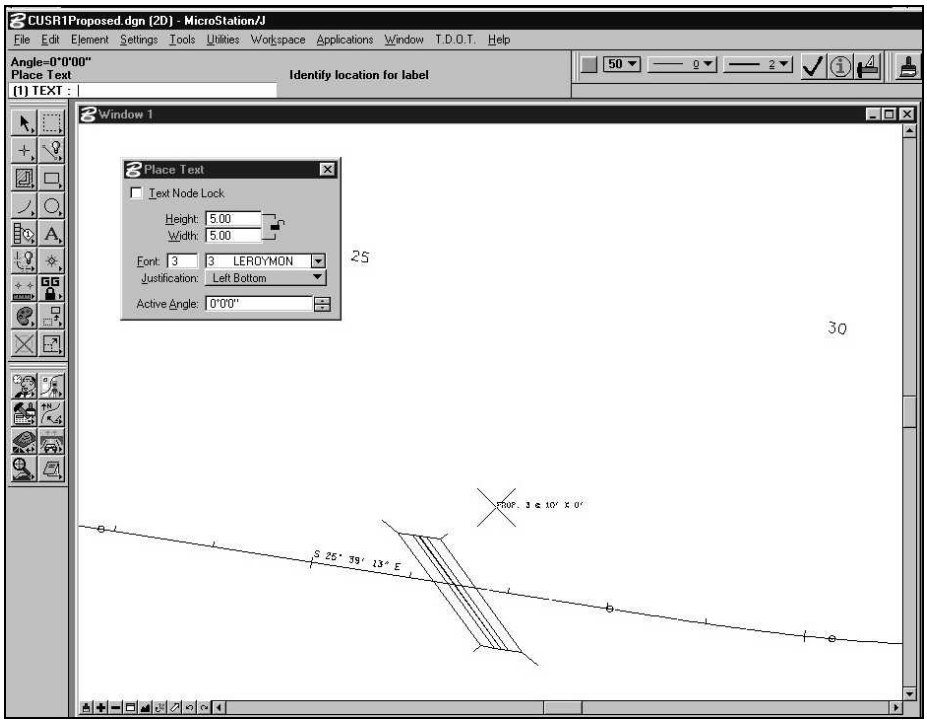
Step 4. You are then prompted to **Identify Left End of Structure**. **Snap** and **Data point** at that end of the structure centerline.



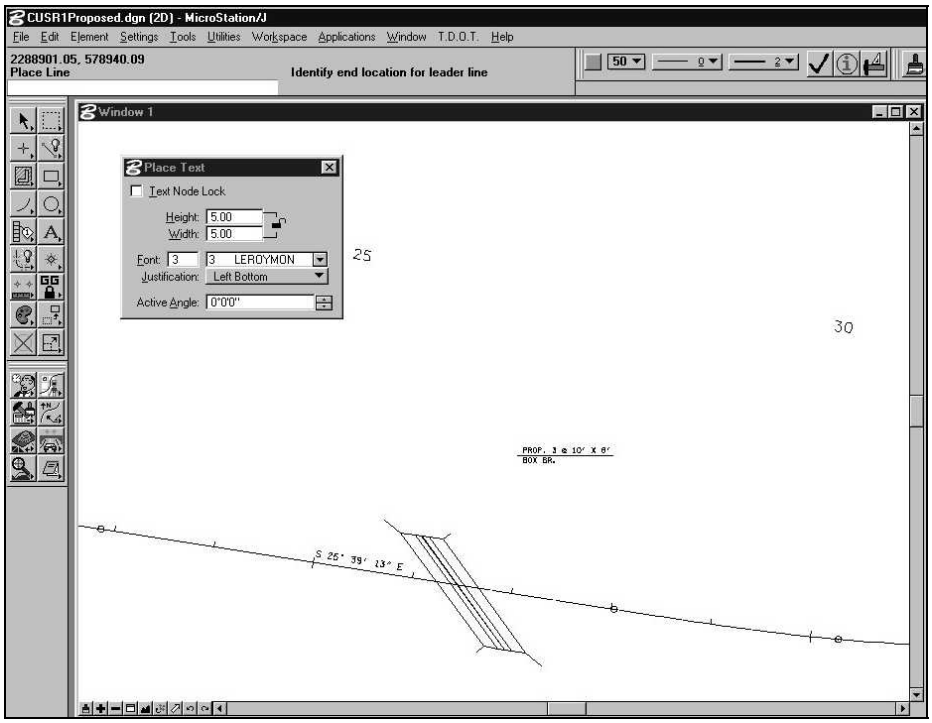
Step 5. You are then prompted to **Identify Right End of Structure**. **Snap** and **Data point** at that end of the structure centerline.



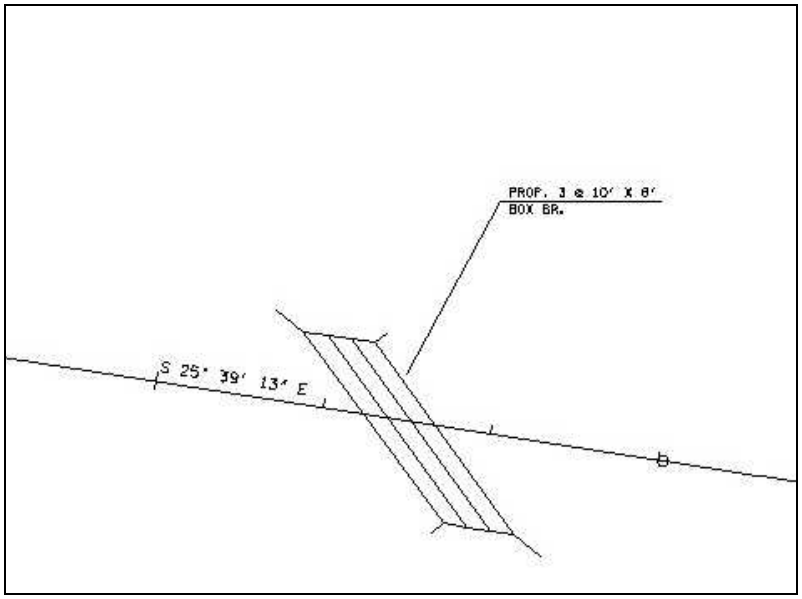
Step 6. The structure is drawn and the user is prompted to **Identify location for label.** A **Reset** can be given to skip placement or **Data point** at location for label to be placed.



Step 7. Finally if the label was placed you are prompted to **Identify location for leader line**. **Data point** at structure where you wish the leader line to end.



Step 8. The structure with label is now complete. Note that centerline length of structure is checked to determine whether label should specify bridge or culvert.



Draw Prop. Type "A" Pipe Endwall in Plan

D&C location: Drafting Standards > Prop. Drainage > Structures in Plan > A Endwall

MicroStation Basic Program: drawAEWplan.ba

Description:

This application used draw a proposed type A endwall on a pipe end in the plan view. All control values in dialog are based on data in standard roadway drawing D-PE-1.

Endwall information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv**.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Draw Type A Endwall
or by using the keyin
macro drawAEWplan.

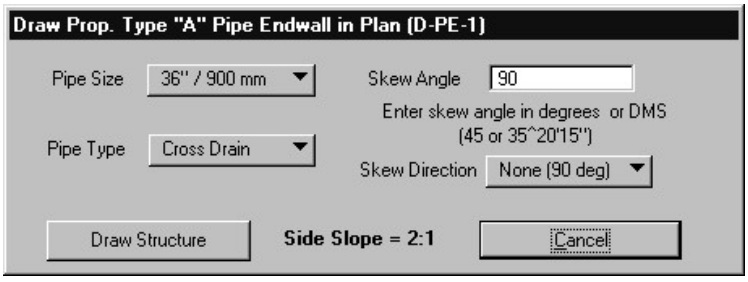
Special Requirements:

The proposed pipe must be drawn in the plan view.

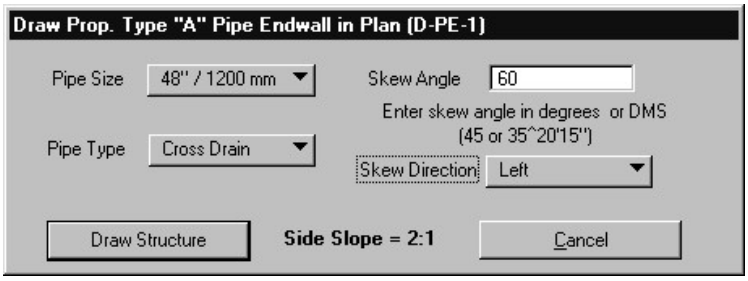
Usage:

Step 1. Draw the proposed pipe in the plan view. This may have been done during the design process using Geopak Drainage, with MicroStation tools or by using Geopak's **Draw Pattern** tool with D&C Manager's **Place Influence** on to set the appropriate symbology for the desired pipe size. See Step 1 of the **Plan Box** program description above for an explanation of using the Draw Pattern tool for this.

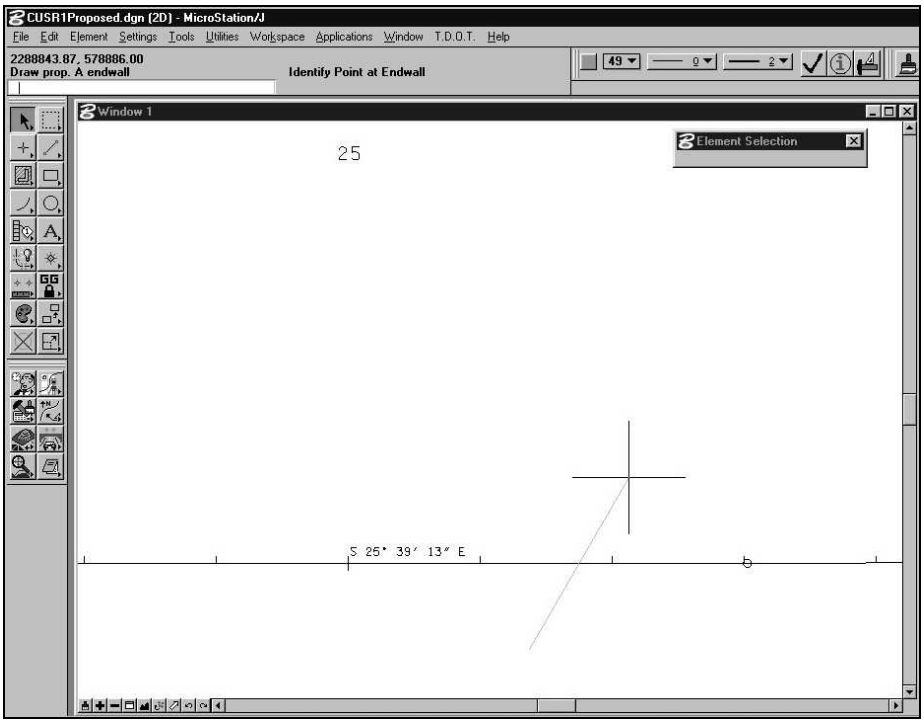
Step 2. In D&C manager activate **A Endwall**. The **Draw Prop. Type "A" Pipe Endwall in Plan** dialog opens**.** Defaults which are displayed . . . **Pipe Size 36", Pipe Type Cross Drain, Skew Angle 90** & **Skew Direction None.** Also note that skew angles in degrees minutes & seconds are supported.



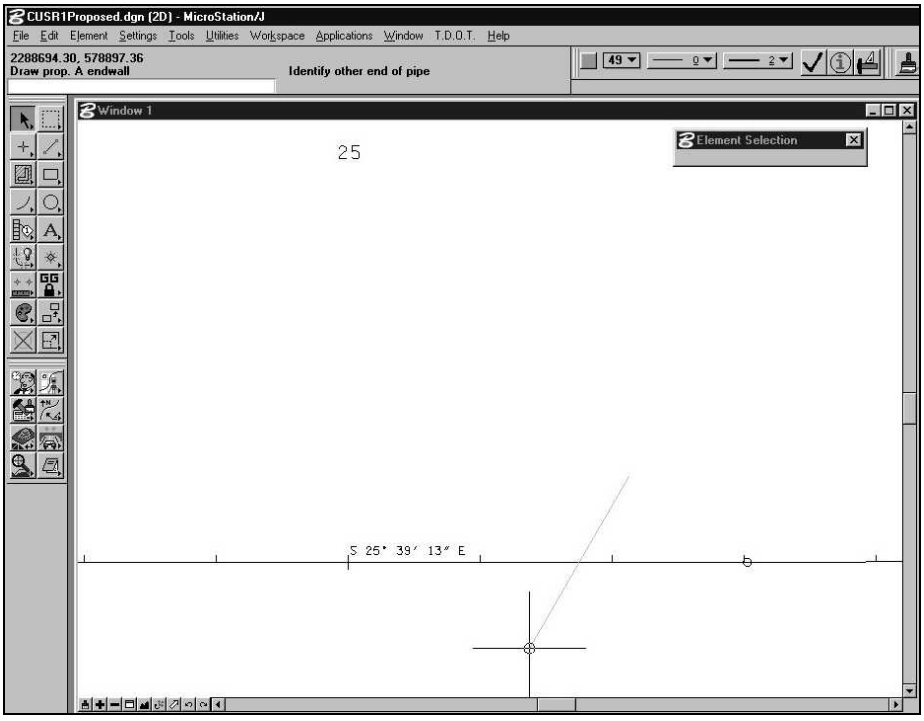
Step 3. Make settings in the dialog as needed for the pipe endwall you need to draw. In our example we are placing an endwall on a 48" pipe cross drain at a 60 degree skew left. The **Pipe Type** setting controls the level for placement. Once settings are made click on the **Draw Structure** button.



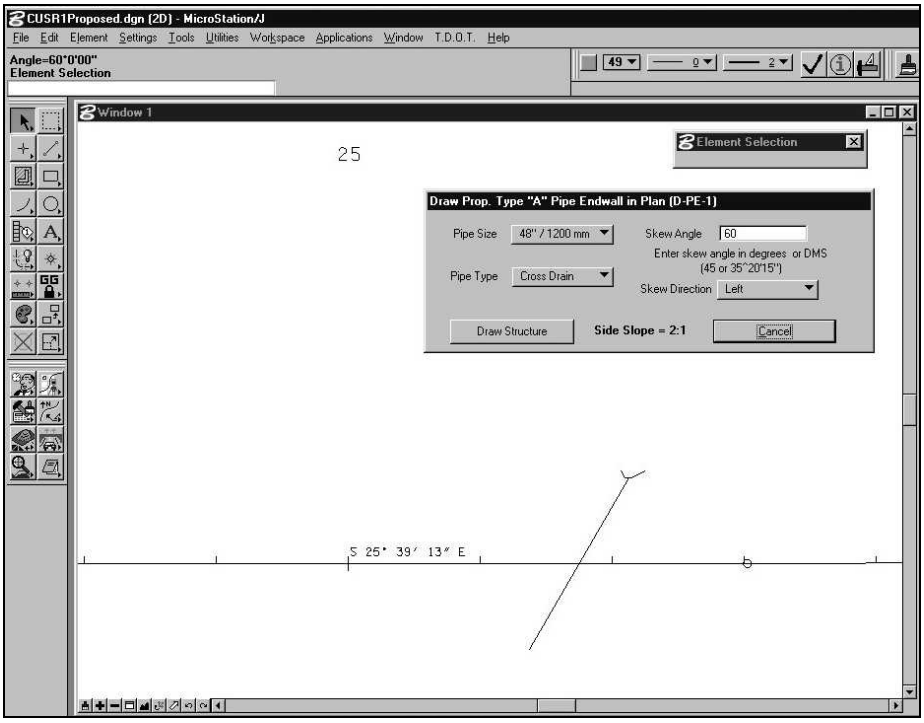
Step 4. You are then prompted to **Identify Point at Endwall**. **Snap** and **Data point** at the end of the pipe where endwall should be drawn.



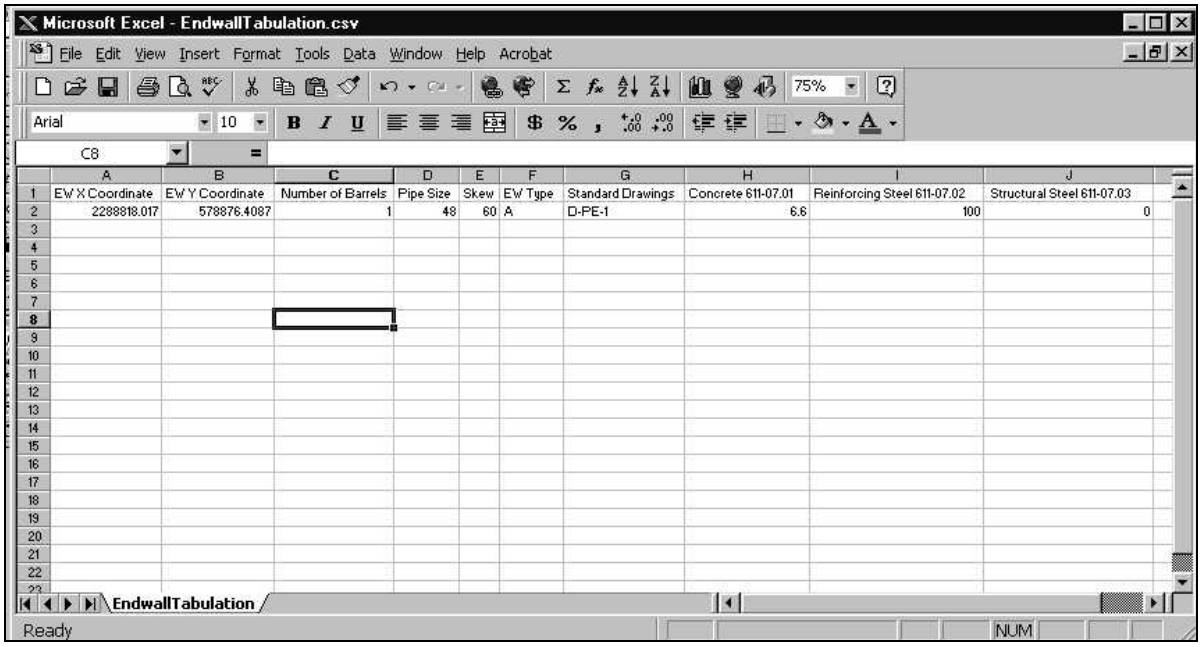
Step 5. You are then prompted to **Identify other end of pipe**. **Snap** and **Data point** at the other end of the pipe.



Step 6. The endwall is drawn and the dialog re-appears. You can click on **Draw Structure** to place another endwall of the same type at the other end or click on **Cancel** to exit the program.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv** in your project directory. Data from this file can later be imported into Excel and used to tabulate final quantities for endwalls.



Draw Prop. Type "U" Pipe Endwall in Plan

D&C location: Drafting Standards > Prop. Drainage > Structures in Plan > U Endwall

MicroStation VBA Program: DrawTypeUEndwall.mvba

Description:

This application is used draw a proposed type U endwall on a pipe end in the plan view. Endwall can be placed with safety grate if required. All control values in dialog are based on data in standard roadway drawings D-PE-3B, D-PE-4, D-PE-4B & D-PE-6B.

Endwall information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv**.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Draw Type U Endwall
or by using the keyin
vba run [DrawTypeUEndwall]EW.Main

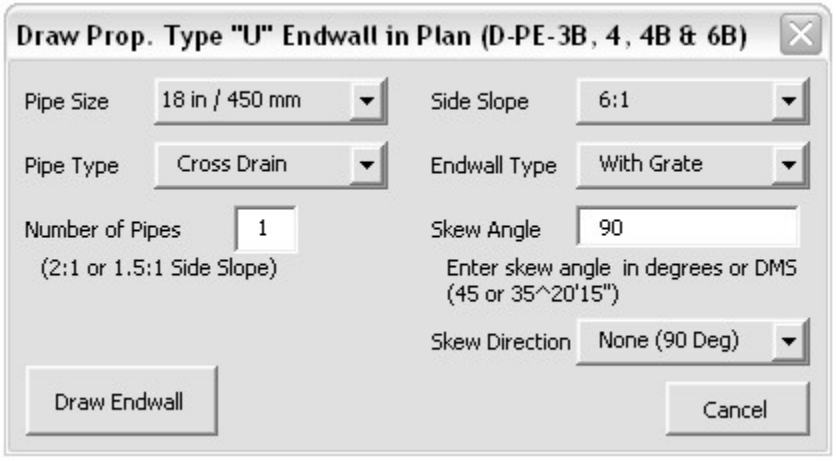
Special Requirements:

The proposed pipe must be drawn in the plan view.

Usage:

Step 1. Draw the proposed pipe in the plan view. This may have been done during the design process using Geopak Drainage, with MicroStation tools or by using Geopak's **Draw Pattern** tool with D&C Manager's **Place Influence** on to set the appropriate symbology for the desired pipe size. See Step 1 of the **Plan Box** program description above for an explanation of using the Draw Pattern tool for this.

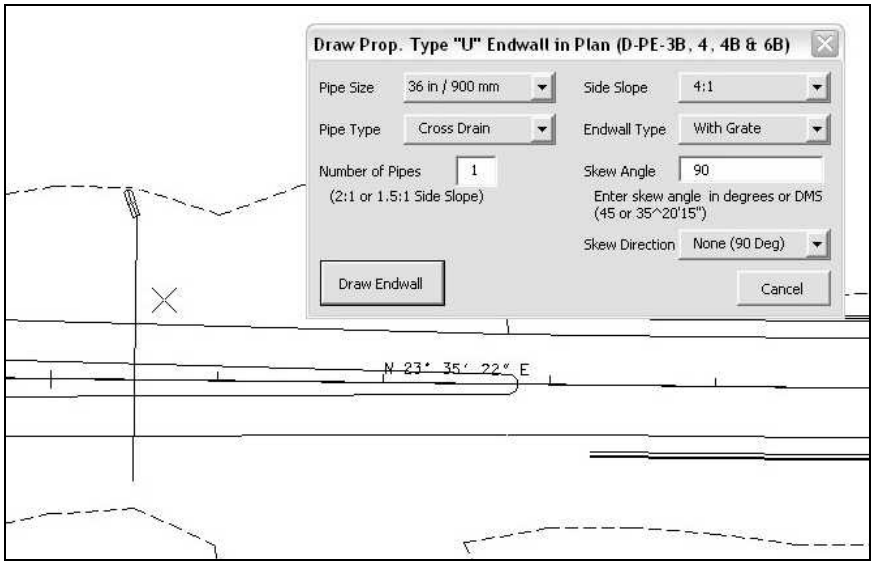
Step 2. In D&C manager activate **U Endwall**. The **Draw Prop. Type "U" Pipe Endwall in Plan** dialog opens**.** Defaults which are displayed . . . **Pipe Size 18", Pipe Type Cross Drain, Number of Pipes 1, Side Slope 6:1, Endwall Type w/grate, Skew Angle 90** & **Skew Direction None(90 Deg).** Note that multiple pipes and 2:1 or 1.5:1 slopes are only allowed with pipe sizes 18"-30" and if a grate is specified but not required the endwall is drawn without the grate.



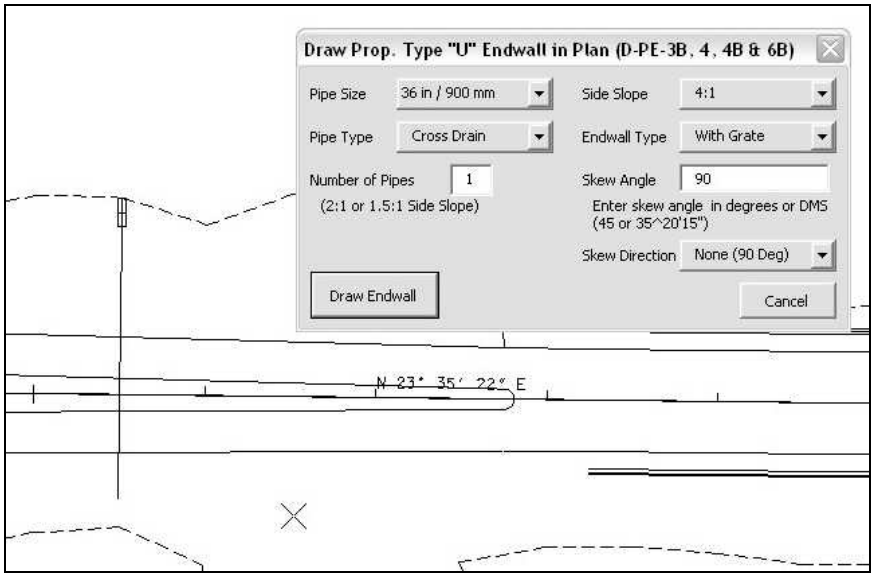
Step 3. Make settings in the dialog as needed for the pipe endwall you need to draw. The **Pipe Type** setting controls the level for placement. Once settings are made click on the **Draw Endwall** button.

Step 4. You are then prompted to **Identify Point at Endwall**. **Snap** and **Data point** at the end of the pipe where endwall should be drawn.

Step 5. The endwall is dynamically shown and you are then prompted to **Identify other end of pipe**. **Snap** and **Data point** at the other end of the pipe.



Step 6. The endwall is drawn into the file. You can click on **Draw Endwall** to place another endwall of the same type at the other end or click on **Cancel** to exit the program.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv** in your project directory. Data from this file can later be imported into Excel and used to tabulate final quantities for endwalls.

Draw Prop. Type "SD" Pipe Endwall in Plan

D&C location: Drafting Standards > Prop. Drainage > Structures in Plan > SD Endwall

MicroStation Basic Program: drawSDEWplan.ba

Description:

This application used draw a proposed type SD endwall on a pipe end in the plan view. All control values in dialog are based on data in standard roadway drawings D-SEW-6DA & D-SEW-12D.

Endwall information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv**.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Draw Type SD Endwall
or by using the keyin
macro drawSDEWplan

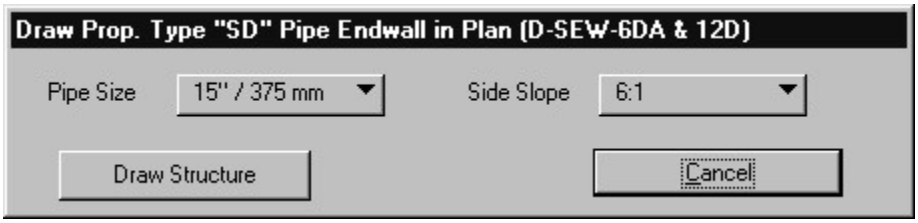
Special Requirements:

The proposed pipe must be drawn in the plan view.

Usage:

Step 1. Draw the proposed pipe in the plan view. This may have been done during the design process using Geopak Drainage, with MicroStation tools or by using Geopak's **Draw Pattern** tool with D&C Manager's **Place Influence** on to set the appropriate symbology for the desired pipe size. See Step 1 of the **Plan Box** program description above for an explanation of using the Draw Pattern tool for this.

Step 2. In D&C manager activate **SD Endwall**. The **Draw Prop. Type "SD" Pipe Endwall in Plan** dialog opens**.** Defaults which are displayed . . . **Pipe Size 15"** & **Side Slope 6:1.** Note that 12:1 side slopes are only allowed with pipe sizes 15"-18".

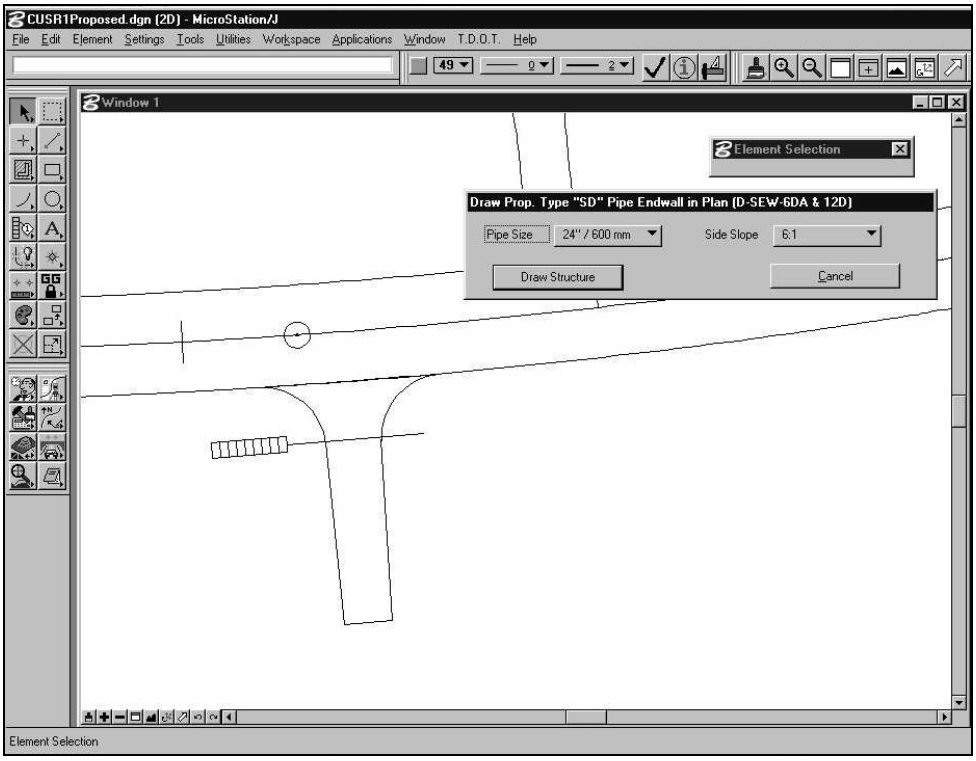


Step 3. Make settings in the dialog as needed for the pipe endwall you need to draw. Once settings are made click on the **Draw Structure** button.

Step 4. You are then prompted to **Identify Point at Endwall**. **Snap** and **Data point** at the end of the pipe where endwall should be drawn.

Step 5. You are then prompted to **Identify other end of pipe**. **Snap** and **Data point** at the other end of the pipe.

Step 6. The endwall is drawn and the dialog re-appears. You can click on **Draw Structure** to place another endwall of the same type at the other end or click on **Cancel** to exit the program.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv** in your project directory. Data from this file can later be imported into Excel and used to tabulate final quantities for endwalls.

Draw Prop. Type Straight Pipe Endwall in Plan

D&C location: Drafting Standards > Prop. Drainage > Structures in Plan > ST Endwall

MicroStation Basic Program: drawSTEWplan.ba

Description:

This application used draw a proposed type ST/straight endwall on a pipe end in the plan view. All control values in dialog are based on data in standard roadway drawing D-PE-4.

Endwall information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv**.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Draw Type ST Endwall
or by using the keyin
macro drawSTEWplan.

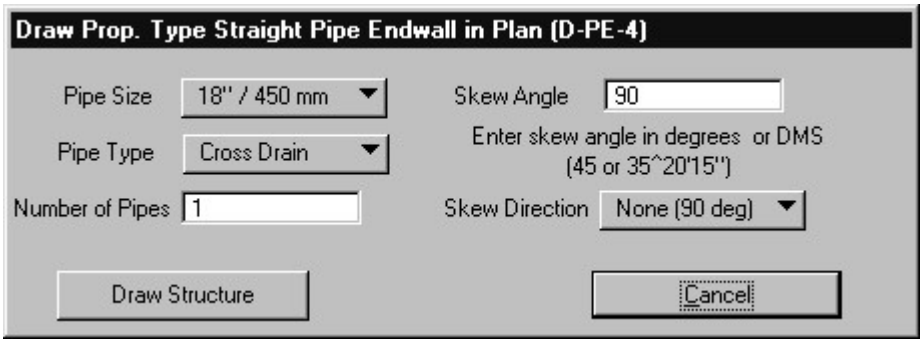
Special Requirements:

The proposed pipe must be drawn in the plan view.

Usage:

Step 1. Draw the proposed pipe in the plan view. This may have been done during the design process using Geopak Drainage, with MicroStation tools or by using Geopak's **Draw Pattern** tool with D&C Manager's **Place Influence** on to set the appropriate symbology for the desired pipe size. See Step 1 of the **Plan Box** program description above for an explanation of using the Draw Pattern tool for this.

Step 2. In D&C manager activate **ST Endwall**. The **Draw Prop. Type Straight Pipe Endwall in Plan** dialog opens**.** Defaults which are displayed . . . **Pipe Size 18", Pipe Type Cross Drain, Number of Pipes 1, Skew Angle 90** & **Skew Direction None.** Note that skew angles in degrees minutes & seconds are supported.

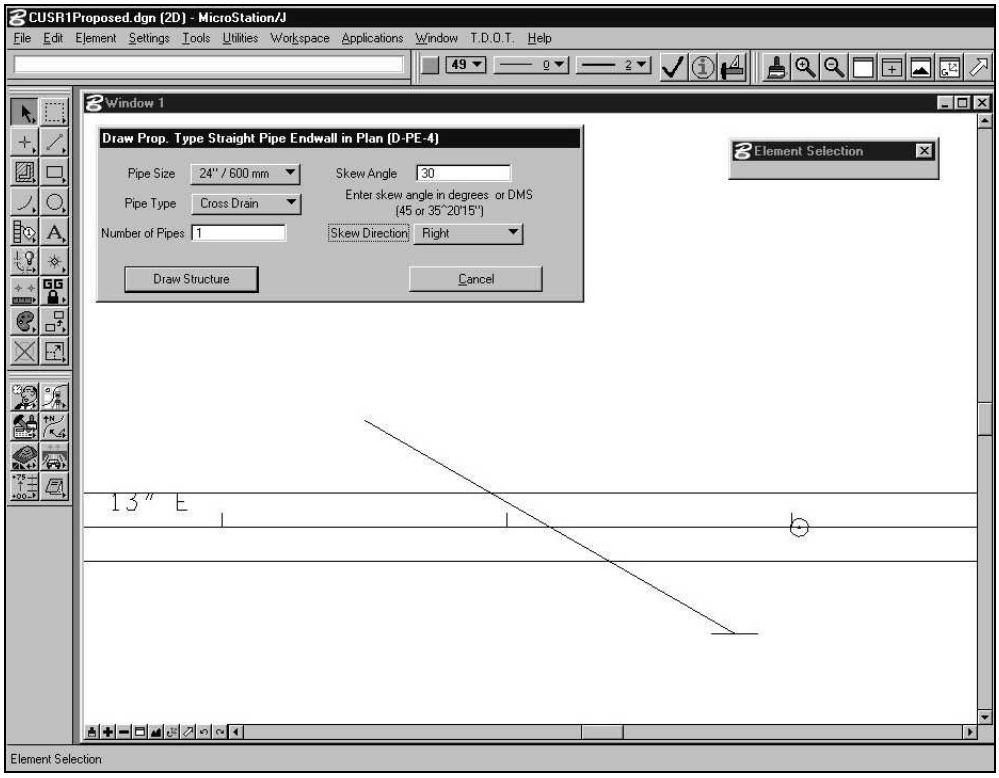


Step 3. Make settings in the dialog as needed for the pipe endwall you need to draw. The **Pipe Type** setting controls the level for placement. Once settings are made click on the **Draw Structure** button.

Step 4. You are then prompted to **Identify Point at Endwall**. **Snap** and **Data point** at the end of the pipe where endwall should be drawn.

Step 5. You are then prompted to **Identify other end of pipe**. **Snap** and **Data point** at the other end of the pipe.

Step 6. The endwall is drawn and the dialog re-appears. You can click on **Draw Structure** to place another endwall of the same type at the other end or click on **Cancel** to exit the program.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv** in your project directory. Data from this file can later be imported into Excel and used to tabulate final quantities for endwalls.

Draw Prop. Type L Pipe Endwall in Plan

D&C location: Drafting Standards > Prop. Drainage > Structures in Plan > L Endwall

MicroStation Basic Program: drawLEWplan.ba

Description:

This application used draw a proposed type L endwall on a pipe end in the plan view. All control values in dialog are based on data in standard roadway drawing D-PE-4.

Endwall information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv**.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Draw Type L Endwall
or by using the keyin
macro drawLEWplan.

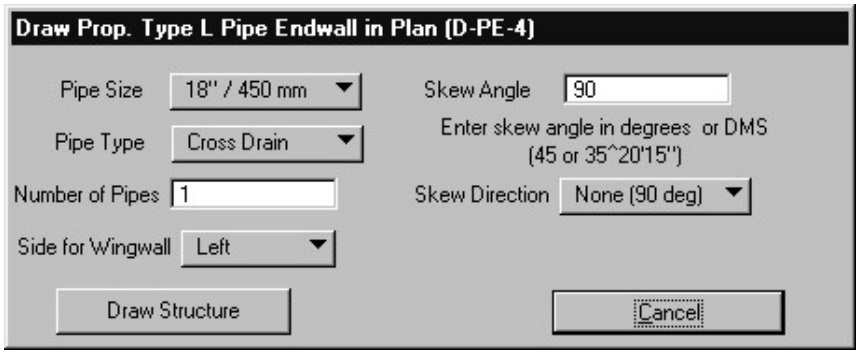
Special Requirements:

The proposed pipe must be drawn in the plan view.

Usage:

Step 1. Draw the proposed pipe in the plan view. This may have been done during the design process using Geopak Drainage, with MicroStation tools or by using Geopak's **Draw Pattern** tool with D&C Manager's **Place Influence** on to set the appropriate symbology for the desired pipe size. See Step 1 of the **Plan Box** program description above for an explanation of using the Draw Pattern tool for this.

Step 2. In D&C manager activate **L Endwall**. The **Draw Prop. Type L Pipe Endwall in Plan** dialog opens**.** Defaults which are displayed . . . **Pipe Size 18", Pipe Type Cross Drain, Number of Pipes 1, Side for Wingwall Left, Skew Angle 90** & **Skew Direction None.** Note that skew angles in degrees minutes & seconds are supported.

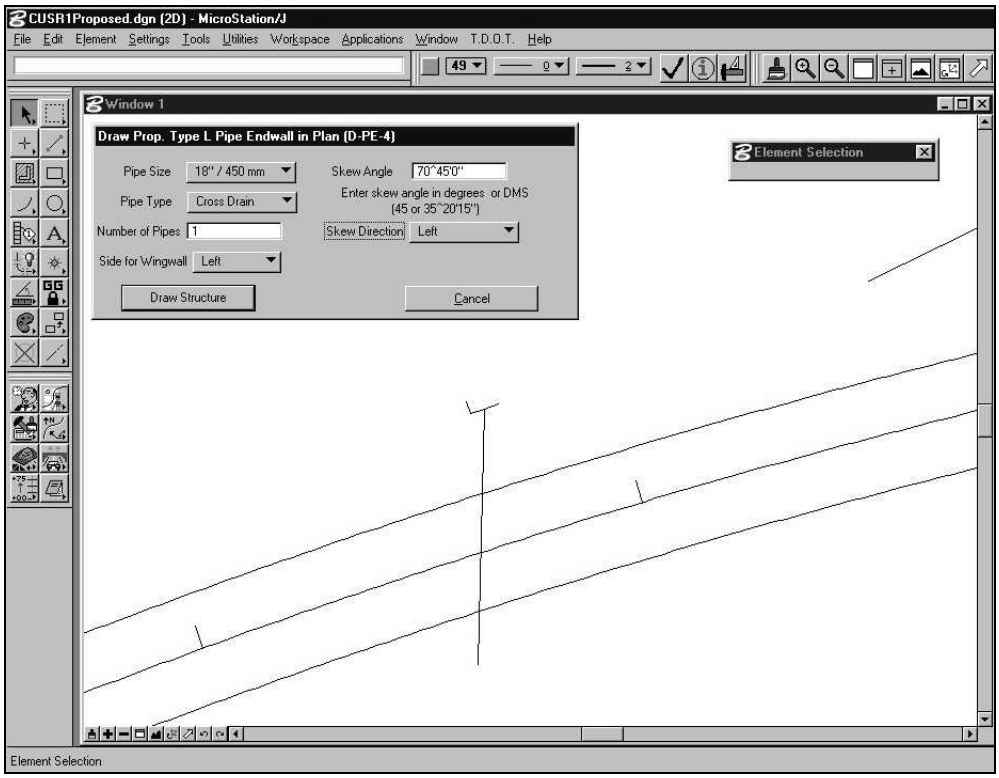


Step 3. Make settings in the dialog as needed for the pipe endwall you need to draw. The **Pipe Type** setting controls the level for placement. **Side for wingwall** is as seen looking out away from roadway. Once settings are made click on the **Draw Structure** button.

Step 4. You are then prompted to **Identify Point at Endwall**. **Snap** and **Data point** at the end of the pipe where endwall should be drawn.

Step 5. You are then prompted to **Identify other end of pipe**. **Snap** and **Data point** at the other end of the pipe.

Step 6. The endwall is drawn and the dialog re-appears. You can click on **Draw Structure** to place another endwall of the same type at the other end or click on **Cancel** to exit the program.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are added to CSV file **EndwallTabulation.csv** in your project directory. Data from this file can later be imported into Excel and used to tabulate final quantities for endwalls.

Draw Permanent Slope Drain

D&C location:
Drafting Standards > Prop. Drainage > Structures in Plan > Perm Slope Drain

MicroStation VBA Program: DrawPermSlopeDrain.mvba

Description:
This program draws in a permanent slope drain with inlet symbol and rip-rap pad at the outlet end. The pipe is drawn in with the appropriate custom line style. Geopak Adhoc data for pay item number, description, unit and roadway side slope is added to the pipe line element so that quantities can be calculated later by Geopak's D&C Manager. The pipe size and side slope value are used to calculate the 45 degree bend location in the slope drain pipe. During final quantity calculations the side slope is used to adjust the measured horizontal length of pipe since these pipes follow the roadway slope.

On the Draw Permanent Slope Drain dialog is a command button for Pay Item Info. When the user clicks on this option, the User Specified Pay Item Values dialog opens. This dialog contains fields for entering pay item number, description, unit and roadway side slope information. A Modify Pay Item Values command button is provided to change data assigned to previously placed graphics. The Read Element command button on the dialog is provided to check the pay item values from slope drains placed previously. For both of these functions, once activated, identify any slope drain and its values are changed or read and used to populate the dialog.

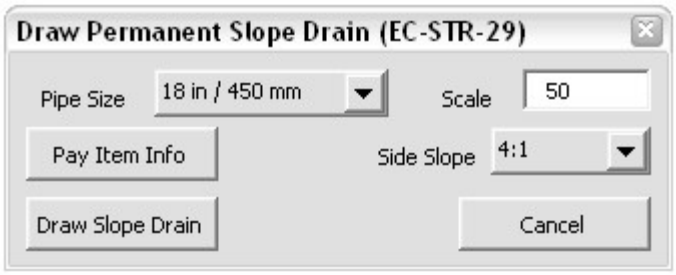
This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Permanent Slope Drains
or by using the keyin
vba run [DrawPermSlopeDrain]PermSlopeDrain.main

Special Requirements:
The slope lines and ditch line must be drawn/located in the plan view.

Usage:

Step 1. In D&C manager activate **Perm Slope Drain**. The **Draw Permanent Slope Drain** dialog opens**.**

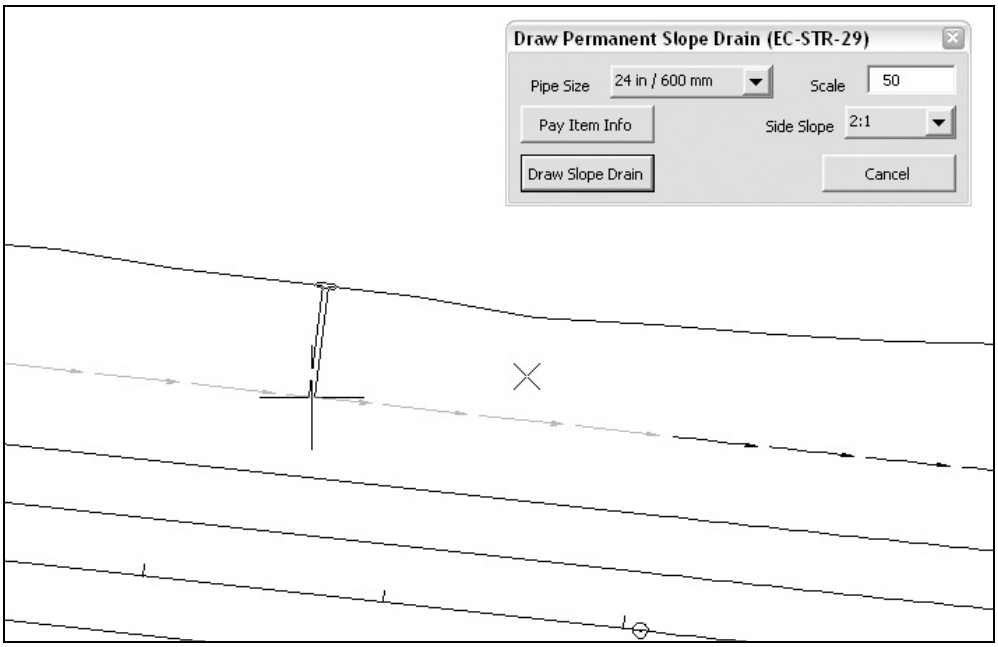
Defaults are set to **Pipe Size: 18 in/450 mm** and **Side Slope: 4:1. Scale** defaults to active scale set in the MicroStation DGN file.



Step 2. Make settings in the dialog as needed for the slope drain you need to draw. Once settings are made click on the **Draw Slope Drain** button.

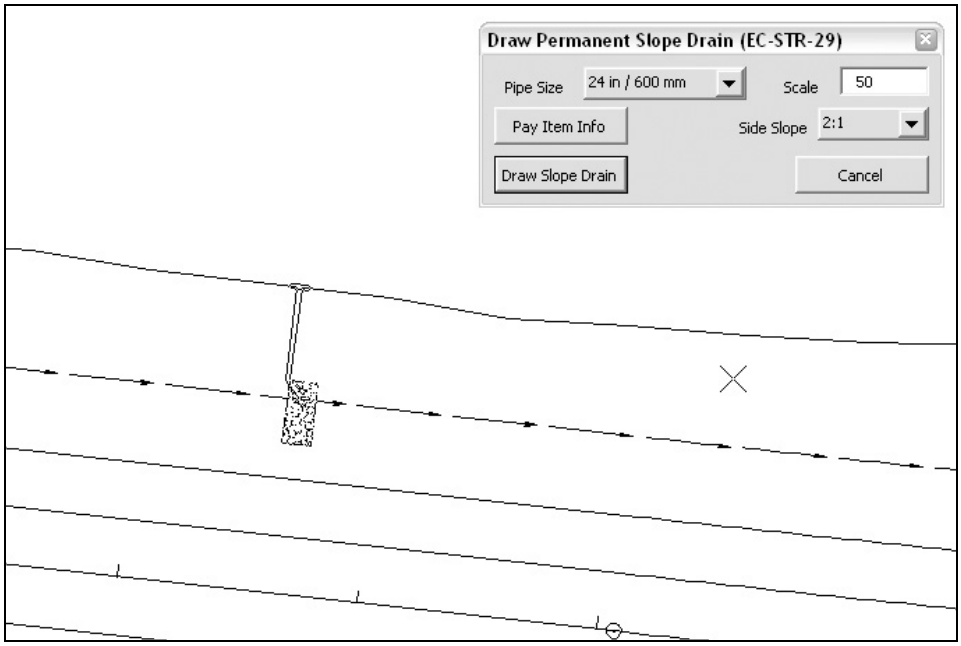
Step 3. You are then prompted to **Identify Point at Inlet**. **Snap** and **Data point** at the slope line location where the inlet is to be placed.

Step 4. After the initial data point, the inlet and pipe are shown dynamically and the user is prompted to **ID Point Perpendicular at Ditch**. **Snap** and **Data point** at the ditch line location where the pipe is perpendicular to the ditch.

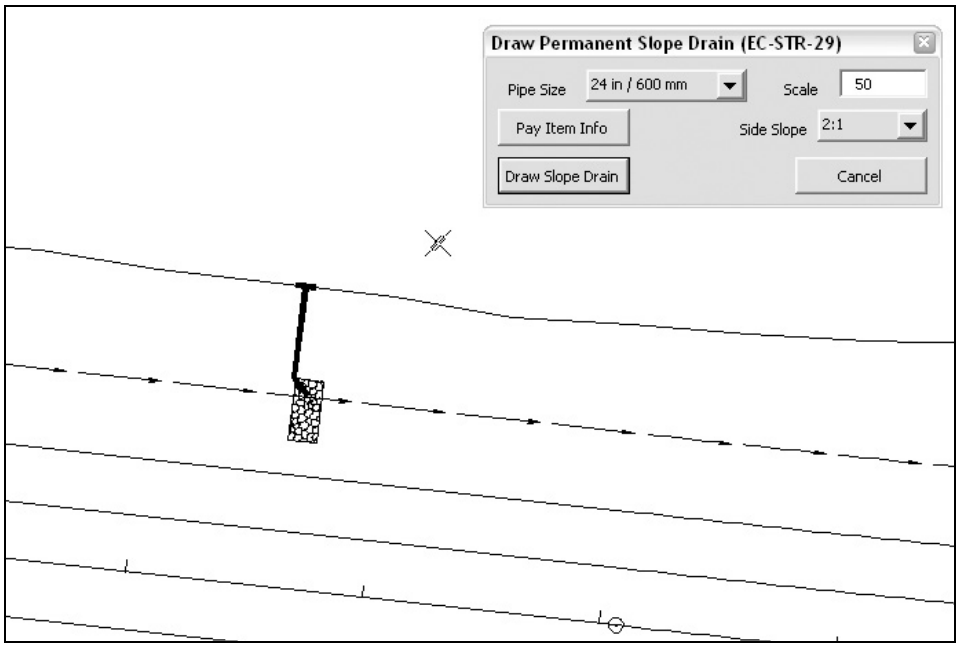


The program then uses the settings given for side slope & pipe size to calculate the 45 degree bend location in the pipe back from the ditch.

Step 5. The completed slope drain pipe with rip-rap outlet pad is shown dynamically and the user is prompted to **ID Side\Direction for Outlet**. **Data point** to indicate the direction of flow in the ditch.



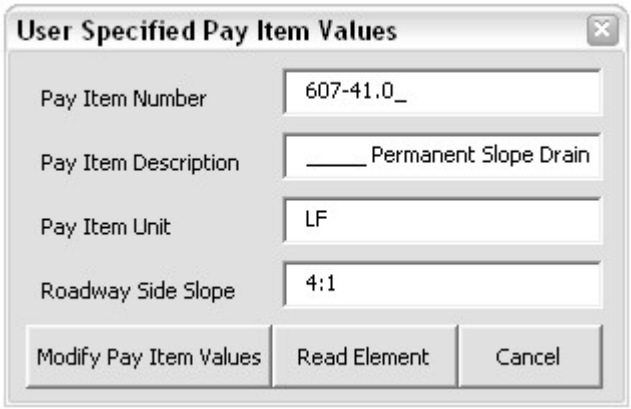
Step 6. After giving this last point, all slope drain graphics are placed in the file.



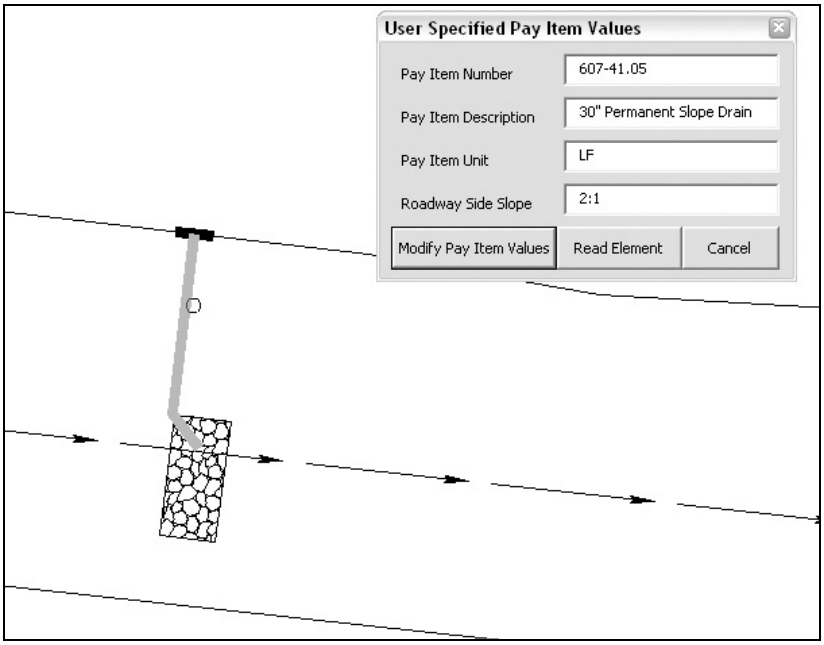
Step 7. You can adjust settings if needed and continue to place additional slope drains.

Usage: Pay Item Info

Step 1. If you wish to assign, modify or just check the pay item values which are assigned to a slope drain, click on the **Pay Item Info** command button on the Draw Permanent Slope Drain dialog. The **User Specified Pay Item Values** dialog opens. This dialog contains fields for entering pay item number, description, unit and roadway side slope information.

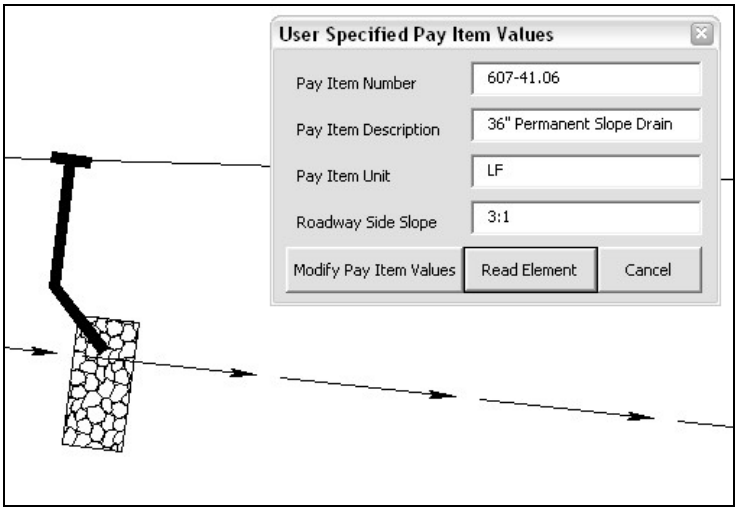


Step 2. To assign or modify the pay item values for a slope drain, first enter the information in the data entry fields provided. Any standard item number for slope drain pipe will automatically update the description field. When data has been entered, click on the **Modify Pay Item Values** command button and you are prompted to **Data point on slope drain pipe.** Data point on the slope drain pipe.



Once identified, **Data point** again to accept and assign the pay item values. This function can be used to assign pay item values to slope drains that were placed prior to the implementation of this tool.

Step 3. To check the pay item values assigned to a slope drain that has been placed previously, then click the **Read Element** command button on the User Specified Pay Item Values dialog. The user is prompted to **Data point on slope drain pipe**. Once accepted, the pay item values are read from the pipe element and are used to populate the dialog.



Draw Prop. Pipe(s) on Profile by Center Flow Point

D&C location: Drafting Standards > Prop. Drainage > Structures on Profiles > Profile Pipe

MicroStation Basic Program: drawpipeprofile.ba

Description:

This application is used to draw a proposed pipe(s) on a profile.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Profiles\Culv. Sections) > Draw Pipe
or by using the keyin
macro drawpipeprofile.

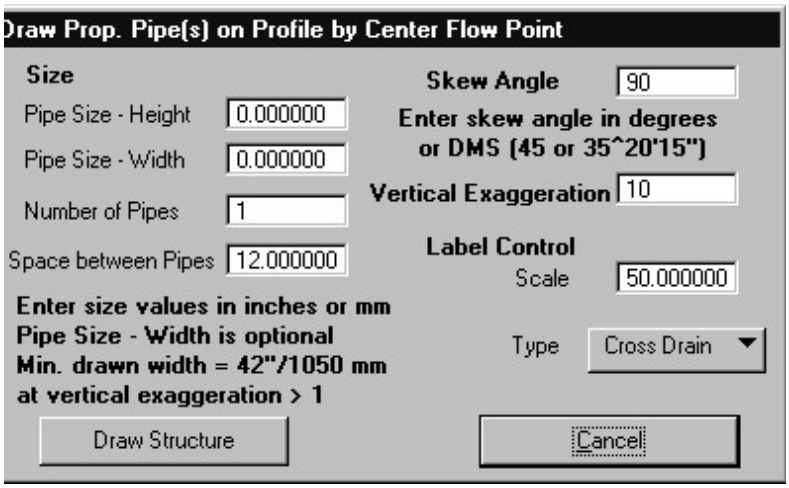
Special Requirements:

The center flow line point of the pipe(s) must be located in graphics prior to running the application.

Usage:

Step 1. Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Geopak's **Vertical Alignment Generator** and it's **Issue Data Point** tool.

Step 2. In D&C manager activate **Profile Pipe**. The **Draw Prop. Pipe(s) on Profile by Center Flow Point** dialog opens**.** Defaults which are displayed . .**Number of Pipes 1, Space between Pipes 12 inches, Skew Angle 90, Vertical Exaggeration 10, Label Control - Scale (Current Active Scale) & Label Control - Type Cross Drain.** Note that skew angles in degrees minutes & seconds are supported.

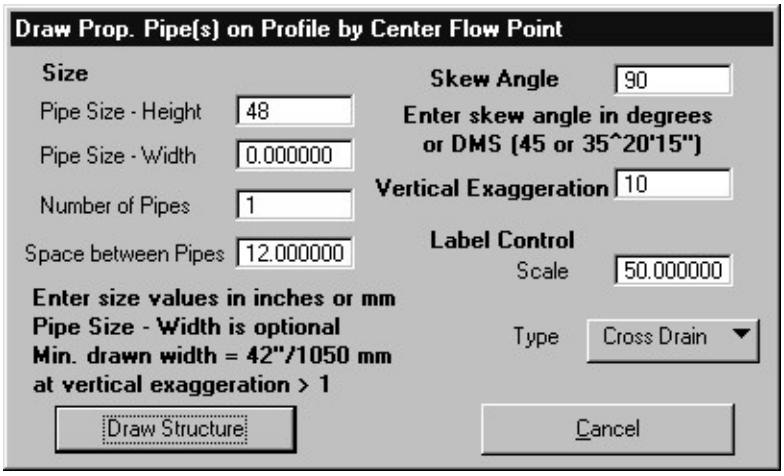


Pipe Size - Width is optional and is provided so that horizontal & vertical oval pipes can be drawn as needed.

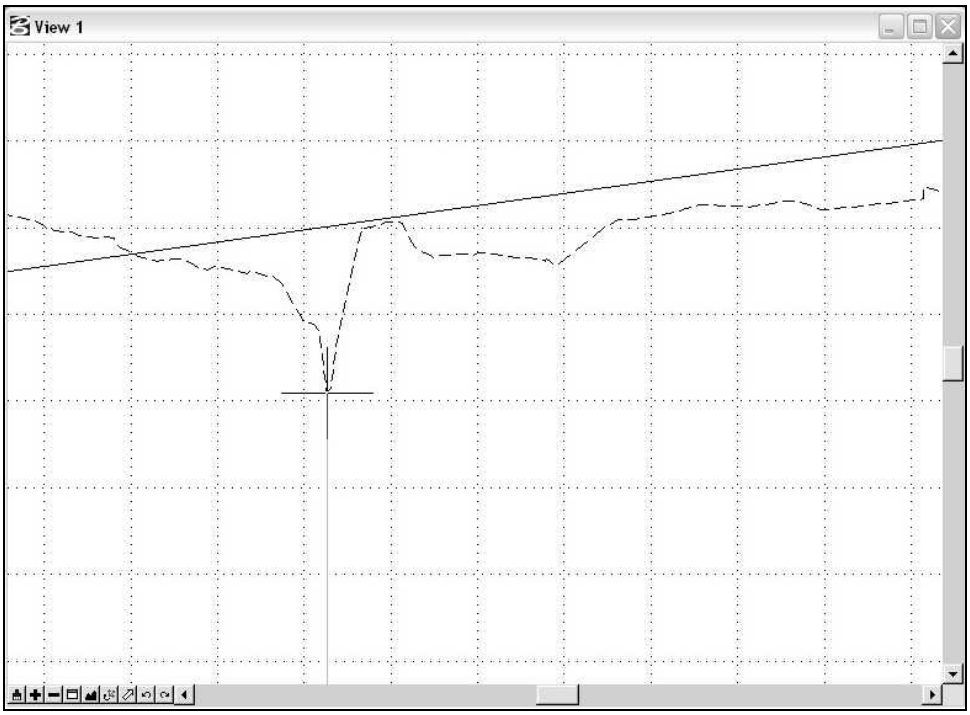
Vertical Exaggeration should usually be 10 for profiles …
(Example: 50 scale horiz. / 5 scale vert. = 10)
It is provided for special profile cases and for the occasional need to draw on culvert sections which would use an exaggeration value of 1.

Label Control - Type controls the format of labeling provided.
Cross Drain - Profile Drainage Data Cell
Storm Sewer - EW storm sewer drainage code cell with leader line
Side Drain - Text label: __' OF *pipe size*" S.D. REQD.

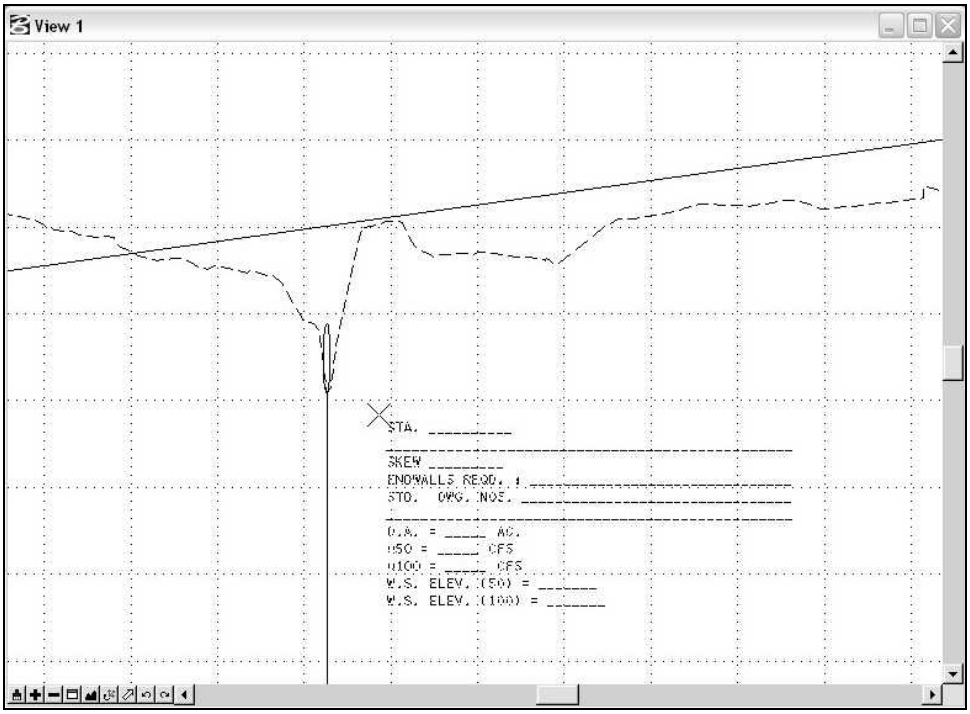
Step 3. Make settings in the dialog as needed for the pipe(s) you need to draw. In our example we are placing a 48" cross drain at a 90 degree skew. Once settings are made click on the **Draw Structure** button.



Step 4. You are then prompted to **Identify Flow Line Location at Center**. **Snap** and **Data point** at the flow line point.

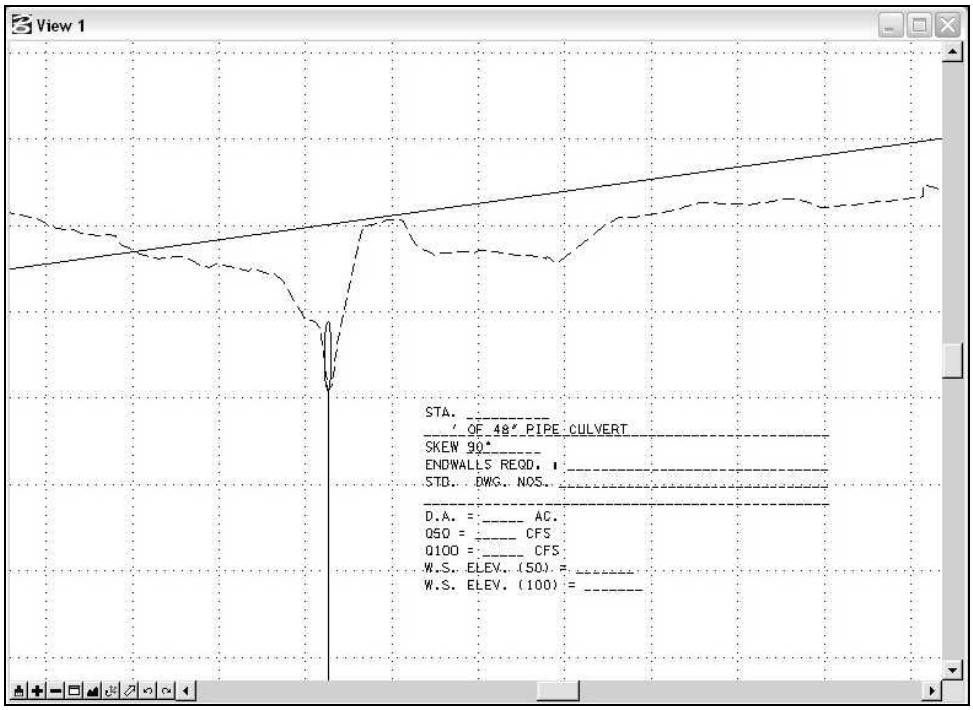


Step 6. The pipe is drawn and the user is prompted to **Identify location for Drainage Data.** A **Reset** can be given to skip placement or **Data point** at location for the data cell to be placed.

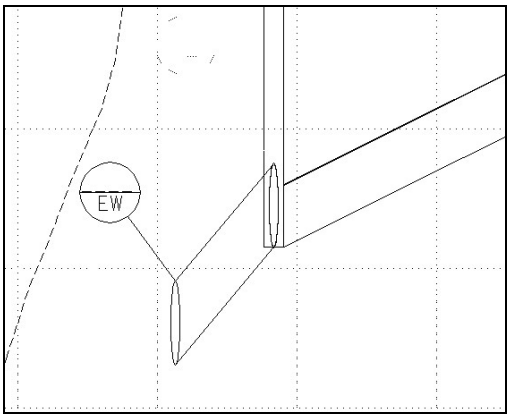


Since it is difficult to see small pipes on profiles when drawn at actual size, this program plots pipes at a **minimum width of 42"(3.5')** when the Vertical Exaggeration is greater than 1. The pipe height is always shown at actual size times the Vertical Exaggeration value.

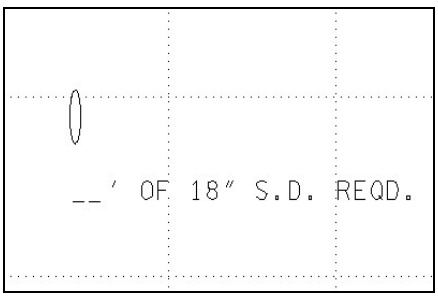
Step 8. The data cell is placed and **size, type & skew data** is added.



Storm Sewer label example:



Side Drain label example:



Draw Prop. Box Culvert or Bridge on Profile by Flow Point

D&C location: Drafting Standards > Prop. Drainage > Structures on Profiles > Profile Box

MicroStation Basic Program: drawboxprofile.ba

Description:

This application is used to draw a proposed box culvert or bridge on a profile.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Profiles\Culv. Sections) > Draw Box Culvert or Br.
or by using the keyin
macro drawboxprofile.

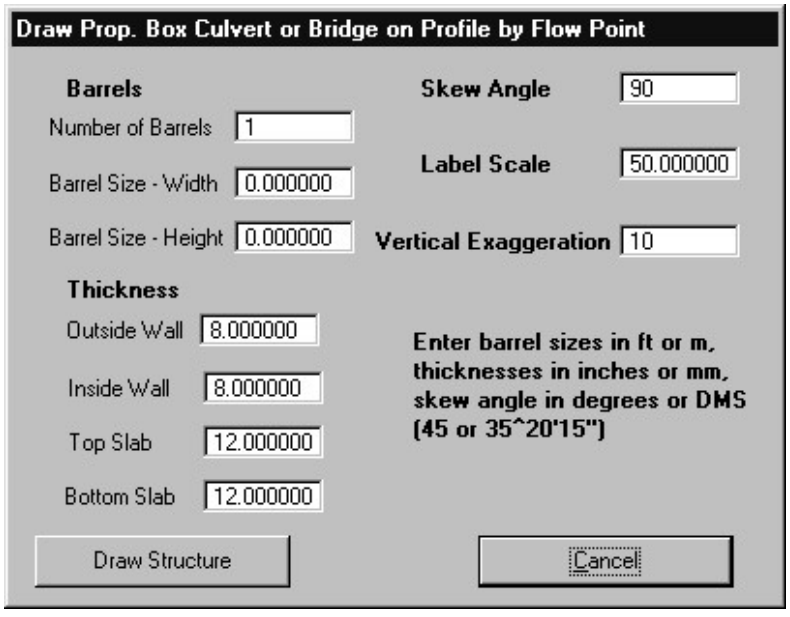
Special Requirements:

The center flow line point of the structure must be located in graphics prior to running the application.

Usage:

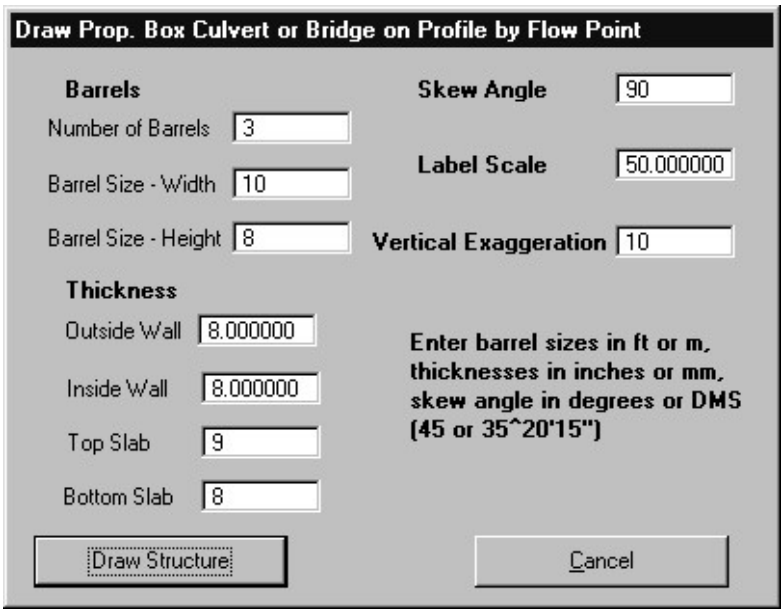
Step 1. Establish the center flow line point of the structure. This may be located with MicroStation tools or with Geopak's **Vertical Alignment Generator** and it's **Issue Data Point** tool.

Step 2. In D&C manager activate **Profile Box**. The **Draw Prop. Box Culvert or Bridge on Profile by Flow Point** dialog opens**.** Defaults which are displayed . . . **Number of Barrels 1, Outside Wall 8 inches, Inside Wall 8 inches, Top Slab 12 inches, Bottom slab 12 inches, Skew Angle 90, Label Scale (Current Active Scale)** & **Vertical Exaggeration 10.** Note that skew angles in degrees minutes & seconds are supported.

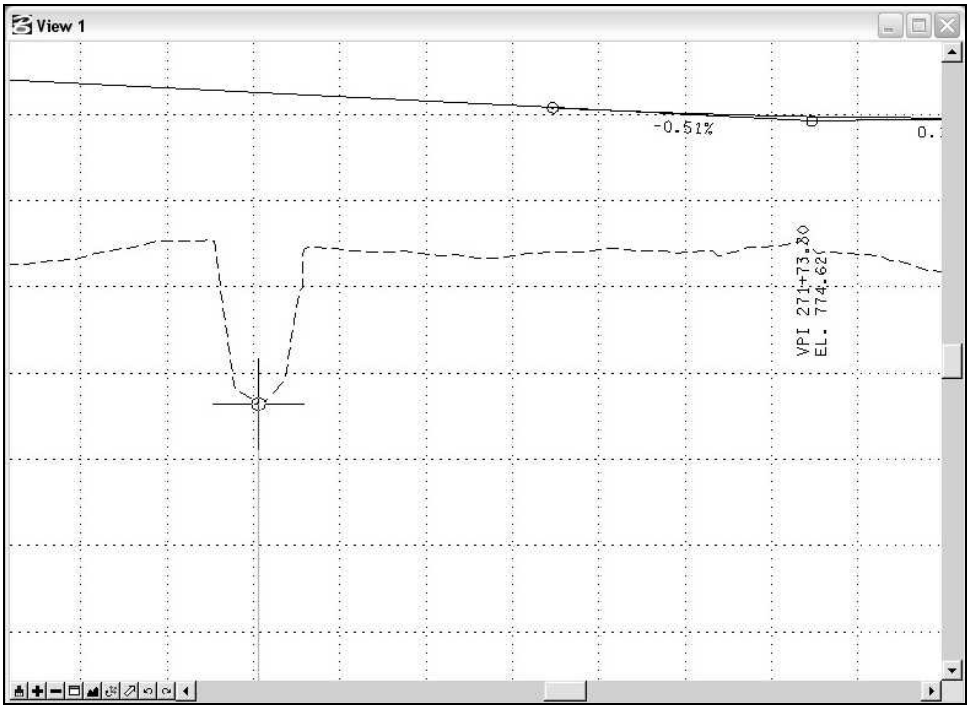


Vertical Exaggeration should usually be 10 for profiles …
(Example: 50 scale horiz. / 5 scale vert. = 10)
It is provided for special profile cases and for the occasional need to draw on culvert sections which would use an exaggeration value of 1.

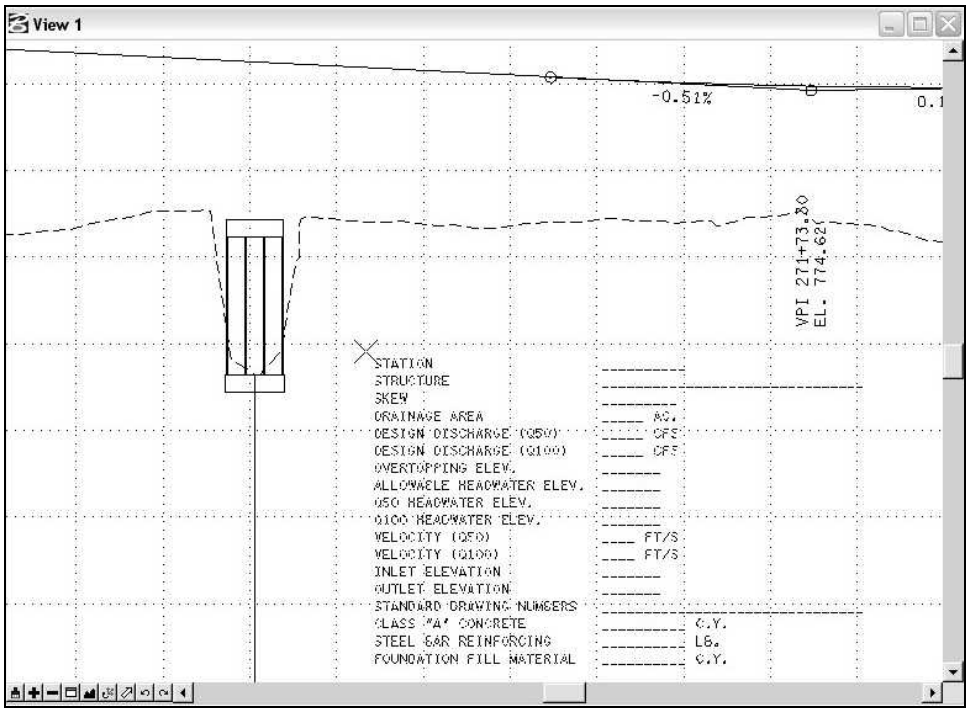
Step 3. Make settings in the dialog as needed for the structure you need to draw. In our example we are placing a 3 @ 10X8 structure with a 3' fill height at a 90 degree skew. From standard structure drawing STD-15-79 we get the outside wall (WT) thickness of 8" and an inside wall (IT) thickness of 8" so we can use the defaults. The top slab (ST) thickness is 9" and the bottom slab (SB) thickness is 8" so we enter those. Once settings are made click on the **Draw Structure** button.



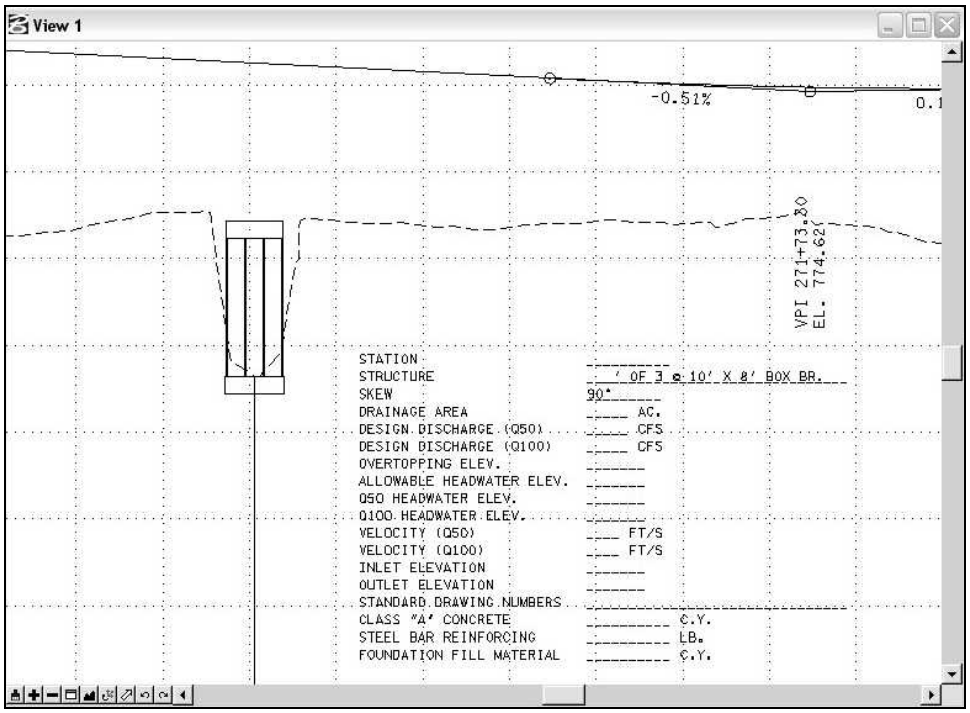
Step 4. You are then prompted to **Identify Flow Line Location at Center**. **Snap** and **Data point** at the flow line point.



Step 6. The structure is drawn and the user is prompted to **Identify location for Drainage Data.** A **Reset** can be given to skip placement or **Data point** at location for the data cell to be placed.



Step 8. The data cell is placed and **size, type & skew data** is added. Note that centerline length of structure is checked to determine whether text should specify bridge or culvert.



Draw Prop. Slab Culvert or Bridge on Profile by Flow Point

D&C location: Drafting Standards > Prop. Drainage > Structures on Profiles > Profile Slab

MicroStation Basic Program: drawslabprofile.ba

Description:
This application is used to draw a proposed slab culvert or bridge on a profile.

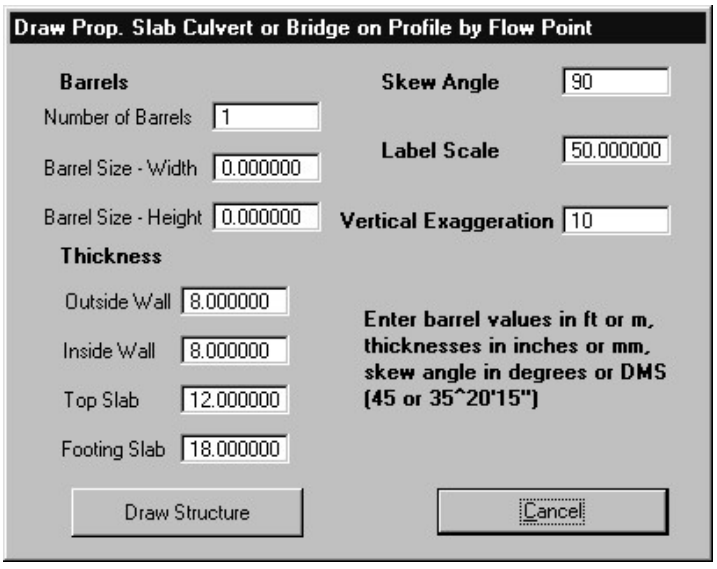
This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Profiles\Culv. Sections) > Draw Slab Culvert or Br.
or by using the keyin
macro drawslabprofile.

Special Requirements:
The center flow line point of the structure must be located in graphics prior to running the application.

Usage:

Step 1. Establish the center flow line point of the structure. This may be located with MicroStation tools or with Geopak's **Vertical Alignment Generator** and it's **Issue Data Point** tool.

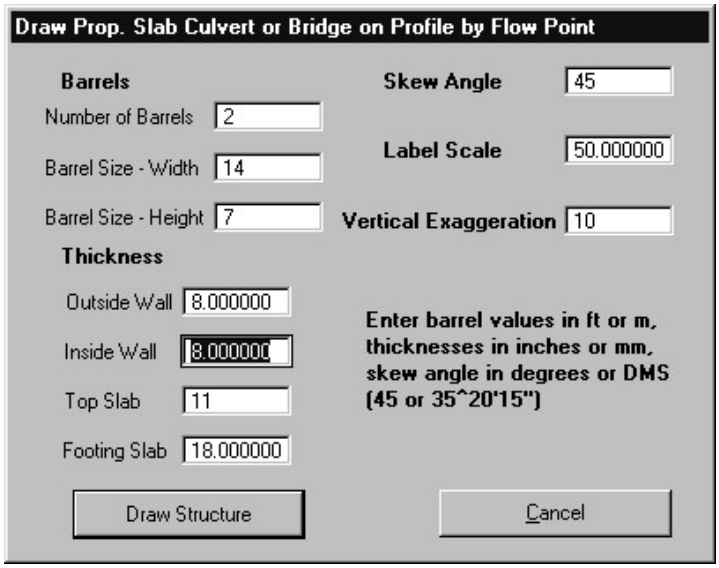
Step 2. In D&C manager activate **Profile Slab**. The **Draw Prop. Slab Culvert or Bridge on Profile by Flow Point** dialog opens**.** Defaults which are displayed . . . **Number of Barrels 1, Outside Wall 8 inches, Inside Wall 8 inches, Top Slab 12 inches, Footing slab 18 inches, Skew Angle 90, Label Scale (Current Active Scale)** & **Vertical Exaggeration 10.** Note that skew angles in degrees minutes & seconds are supported.



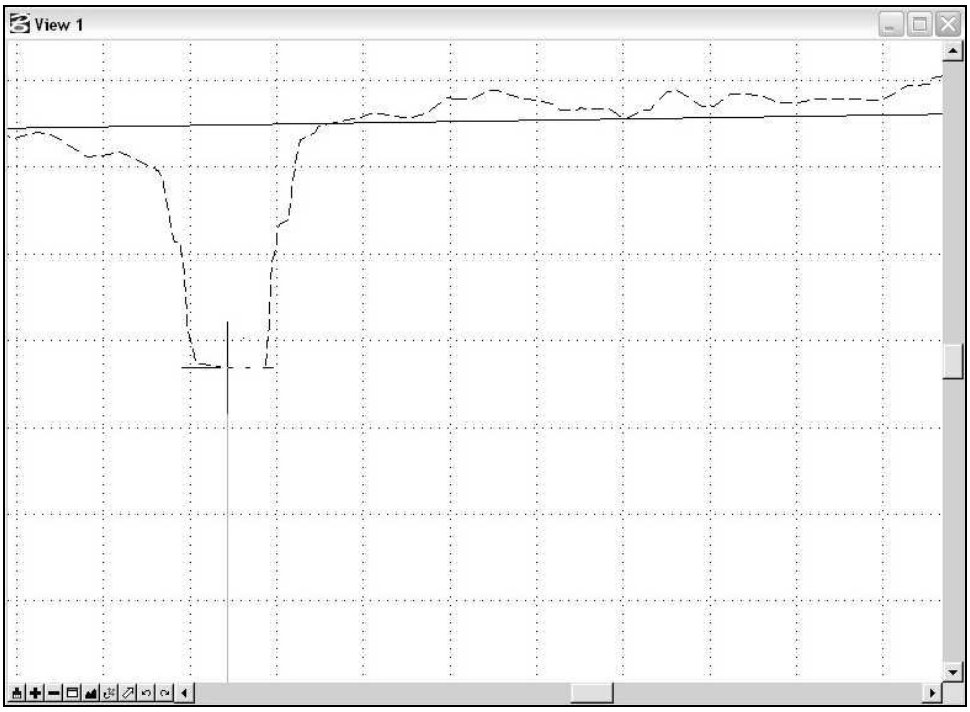
Vertical Exaggeration should usually be 10 for profiles …
(Example: 50 scale horiz. / 5 scale vert. = 10)
It is provided for special profile cases and for the occasional need to draw on culvert sections which would use an exaggeration value of 1.

Footing Slab thickness should be 18" for most standard slab culvert and bridge structures but is provided for special cases where it may not be.

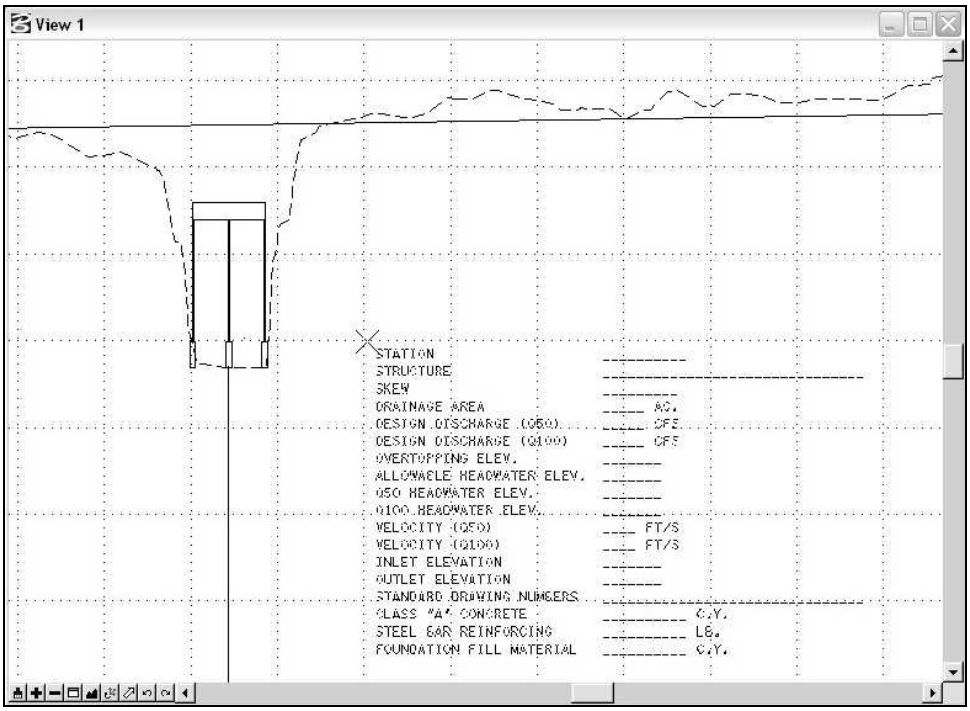
Step 3. Make settings in the dialog as needed for the structure you need to draw. In our example we are placing a 2 @ 14X7 structure with a 6' fill height at a 45 degree skew. From standard structure drawing STD-15-122 we get the outside wall (WT) thickness of 8", an inside wall (IT) thickness of 8" and a footing slab thickness of 18" so we can use the defaults. The top slab (ST) thickness is 11" so we enter that. Once settings are made click on the **Draw Structure** button.



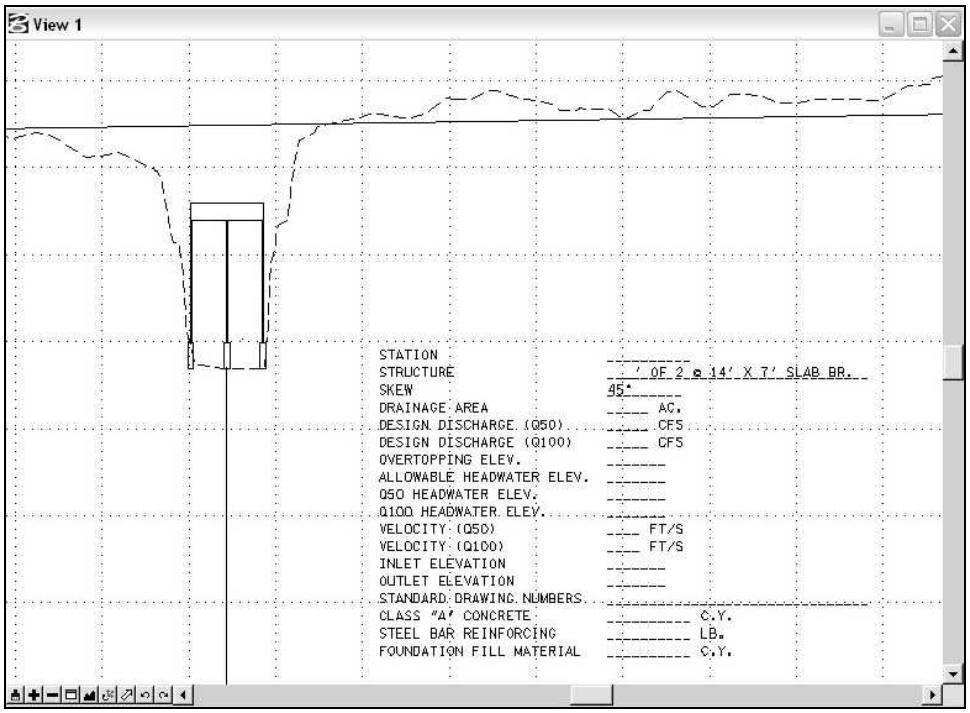
Step 4. You are then prompted to **Identify Flow Line Location at Center**. **Snap** and **Data point** at the flow line point.



Step 6. The structure is drawn and the user is prompted to **Identify location for Drainage Data.** A **Reset** can be given to skip placement or **Data point** at location for the data cell to be placed. Due to the 45 degree skew, structure widths are adjusted.



Step 8. The data cell is placed and **size, type & skew data** is added. Note that centerline length of structure is checked to determine whether text should specify bridge or culvert.



Place Horizontal Alignment Points

D&C location: Drafting Standards > Prop. Drainage > Special Ditches > HA Ditch Pts

MicroStation VBA Program: HApoints.mvba

Description:

This program places the required point text symbols for all keypoints of any horizontal alignment/chain stored in the project GPK file in the plan view. The PI symbol (triangle) with short sub tangents are placed for all spiral-curve combinations or simple curves. The point on chain symbol (circle) is placed at the begin & end and at all on chain curve points. The PI symbol (triangle) by itself is placed at any break in tangent direction without a curve along the horizontal alignment. This is applicable to the following horizontal alignment types: Proposed Roadway Centerline, Preliminary Roadway Centerline, Existing Roadway Centerline, Proposed Special Ditch Centerline, Existing Stream Baseline, Functional Roadway Centerline, Proposed Private Drive Centerline.

All graphics are placed in a single graphic group for easy deletion as needed.

This tool stores the current location of the dialog, GPK job number, chain name and horizontal alignment type in the file **C:\Temp\MVBA_FormStorage.log** when the dialog is closed. When opened later it uses this information if applicable to bring up the dialog as you last used it.

This program can also be activated from the MicroStation drop down menu at
TDOT > Centerlines > Place Horizontal Alignment Points
or by using the keyin
vba run [HApoints]HApointsStart.main

Special Requirements:

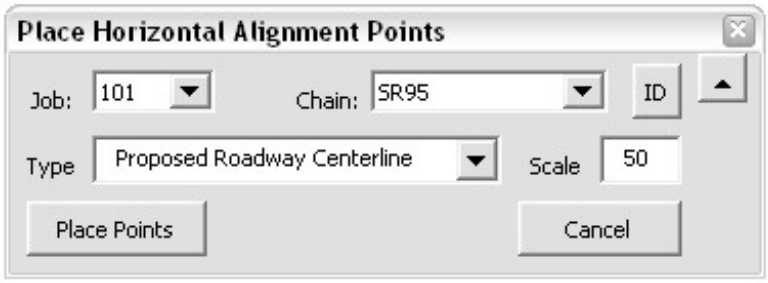
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

The **ID Chain** function uses a special VBA reference to program **GetCogoElement.mvba** which was provided by Bentley and must be present with the program for it to function.

Usage:

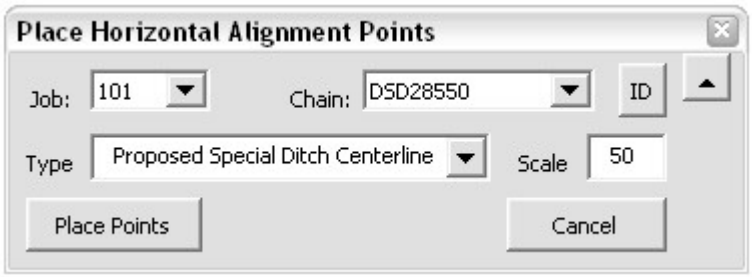
Step 1. In D&C manager activate **HA Ditch Pts**. The **Place Horizontal Alignment Points** dialog is displayed.

All Geopak jobs found within the current active folder are listed in the Job drop down box. If this tool was used previously for that job, the last chain processed is set as well as the last horizontal alignment type which was used. Scale defaults to active scale set in the MicroStation DGN file.



Step 2. After selecting the Geopak **Job** number as needed, the **Chain** drop down is populated with all chains stored in the job. Select the chain to place point symbols for. If you do not know the chain name but have chain graphics, the **ID** button can be used to select the chain.

Step 3. Set the **Type** to **Proposed Special Ditch Centerline** by clicking that option in the drop down list provided**.** This setting controls the level, symbology, etc. for the point symbols which are to be placed.



If this tool was used previously, the last horizontal alignment type which was used is set automatically when the tool is activated.

Step 4. Reset the **Scale** if needed and click the **Place Points** command button. Point symbols are displayed for the specified chain.

Step 5. If you need to place point symbols for other chains, reset the chain name and click the **Place Points** command button for each one.

Label Vertical Alignment

D&C location: Drafting Standards Prop. Drainage > Special Ditches > VA Labeler

MicroStation/Geopak VBA Program: VA_Labeler.mvba

Description:

This program was designed to label pertinent vertical alignment information on the profile. The user has the ability to choose the options they would like to label by selecting the check box corresponding to the label. Chain, reference datum, and scale information is attained when the user selects the Geopak profile cell.

Only profiles applicable to the identified Geopak profile cell are offered for labeling.

Type option allows for application for roadways, private drives or special ditches. The type controls text sizes, orientation and symbology.

Program is set up for use on English or Metric projects

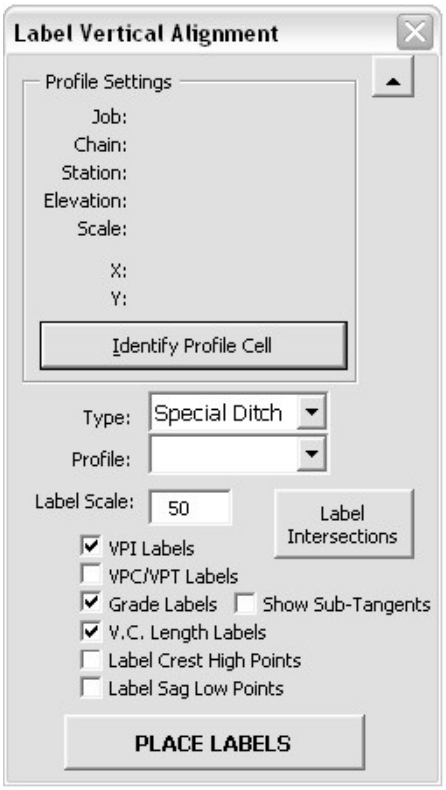
This program can also be activated from the MicroStation drop down menu
TDOT > Profiles > Vertical Alignment Labeler
or by using the keyin
vba run [VA_Labeler]modStartUp.label_VApts

Special Requirements:

A Geopak profile cell must be present.

Usage:

Step 1. In D&C manager activate **VA Labeler**. The **Label Vertical Alignment** dialog is opened. By default the type is set to Roadway. Reset **Type** to **Special Ditch**.



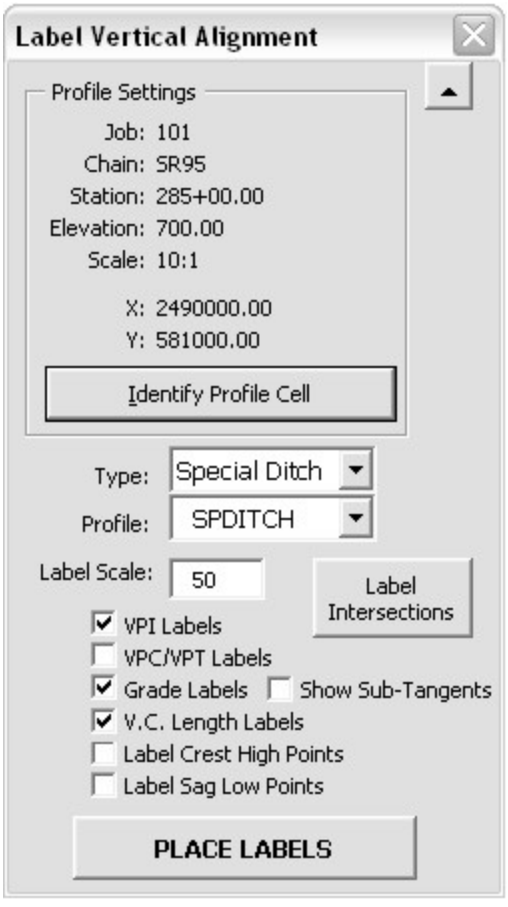
Step 2. Click on the **Identify Profile Cell** command button and data point on the Geopak profile cell for the profile. The window shade button on the upper right of the dialog can be used to get the dialog out of the way as you identify the profile cell. Just click it again to re-expand the dialog after identifying the cell.

Note:
After reading the profile cell and populating the Profile Settings at the top of the dialog, the GPK file is read for all profiles/vertical alignments applicable for display on this profile and fills the profile list box

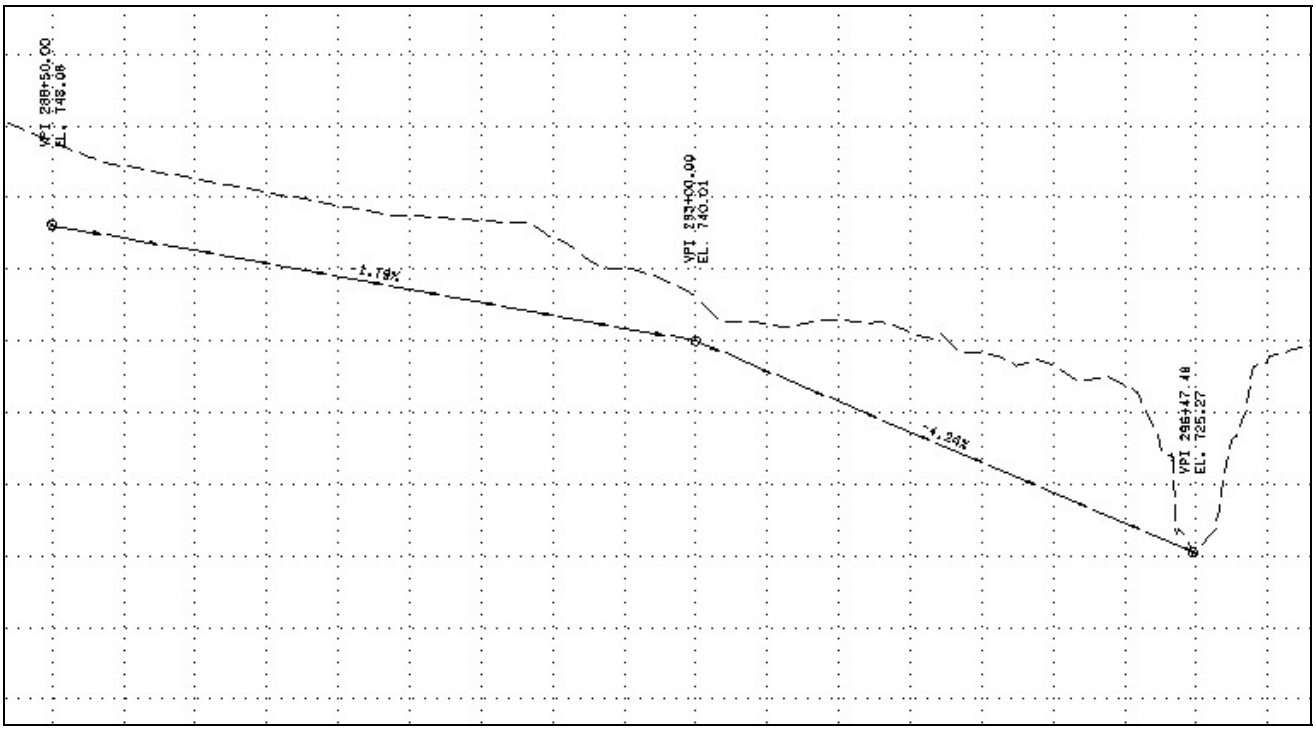
Step 3. Scroll through the **Profile** list and choose the vertical alignment that you wish to annotate.

Step 4. Set the **Scale** value as needed. The current active scale is read when the program is started to fill in this field automatically. Scale controls text sizes & label offsets.

Step 5. Finally the label options can be adjusted as needed. The type of profile to be labeled determines which default options are turned on.



Step 5. Now that all control values are set, click on the **Place Labels** command button and the vertical alignment is annotated. Review the annotation graphics and click the red X to close the dialog.



Drainage Plan Cells

D&C location: Drafting Standards > Prop. Drainage > Plan Cells

MicroStation VBA Program: DrainagePlanCells.mvba

Description:

This program provides access to TDOT Design Division drainage plan view cells.

Command buttons are provided to access TDOT Design Division MicroStation Basic macros which are used to draw box culverts/bridges, A, ST, L, SD or U endwalls and drainage flow direction plan view graphics.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

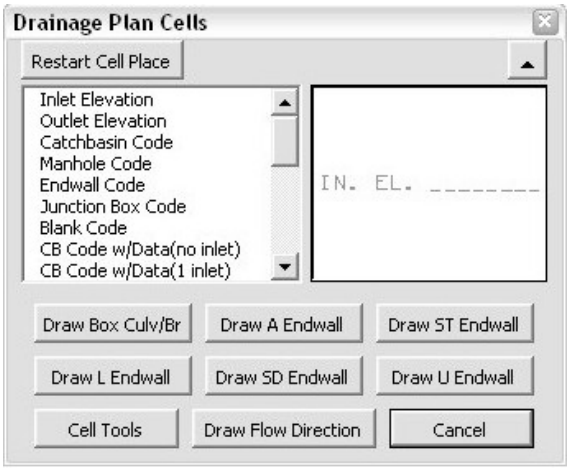
This program can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Cells
or by using the keyin
vba run [DrainagePlanCells]DrainPLancells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Plan Cells**. The **Drainage Plan Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Drainage Profile & Culvert Section Cells

D&C location: Drafting Standards > Prop. Drainage > Profile Cells

MicroStation VBA Program: DrainageProfileCells.mvba

Description:

This program provides access to TDOT Design Division drainage profile and culvert cross section cells.

Command buttons are provided to access TDOT Design Division MicroStation Basic macros which are used to draw box culverts/bridges, slab culverts/bridges and pipe profile graphics.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

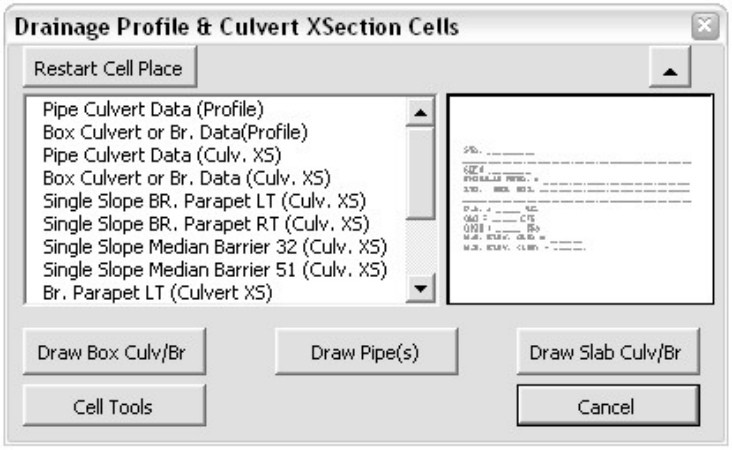
This program can also be activated from the MicroStation drop down menu
TDOT > Drainage (Profile\Culv. Sections) > Cells
or by using the keyin
vba run [DrainageProfileCells]DrainProfilecells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Profile Cells**. The **Drainage Profile & Culvert Section Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Pattern Rip-Rap Area

D&C location: Drafting Standards > Prop. Drainage > Rip-Rap Area

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a rip-rap area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]RipRap.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

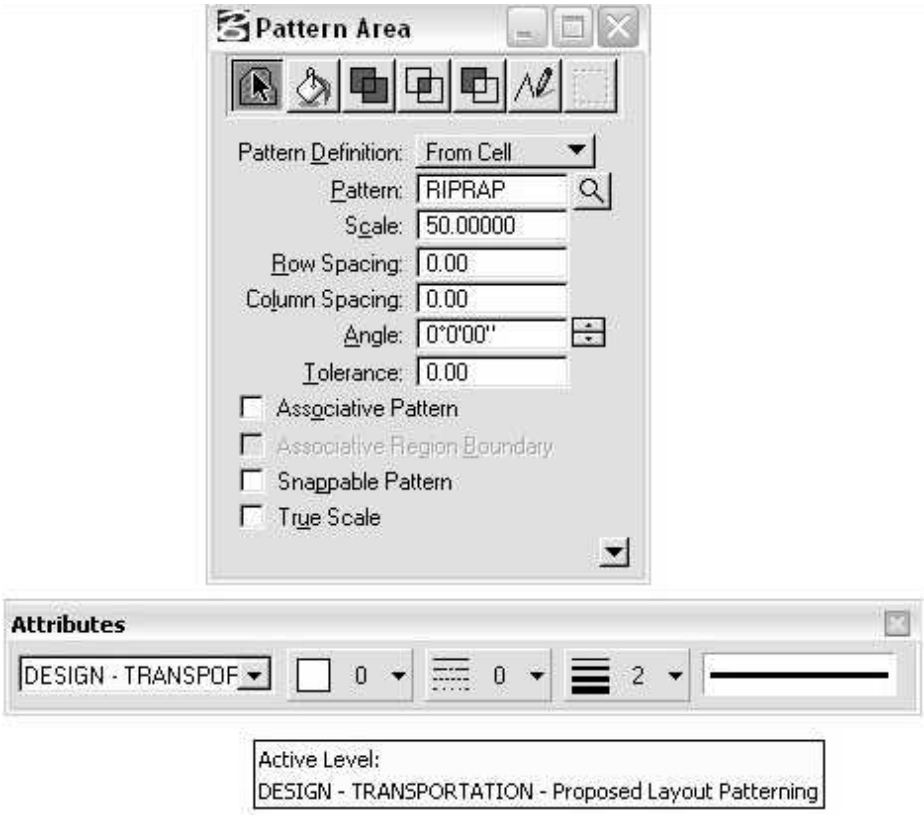
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

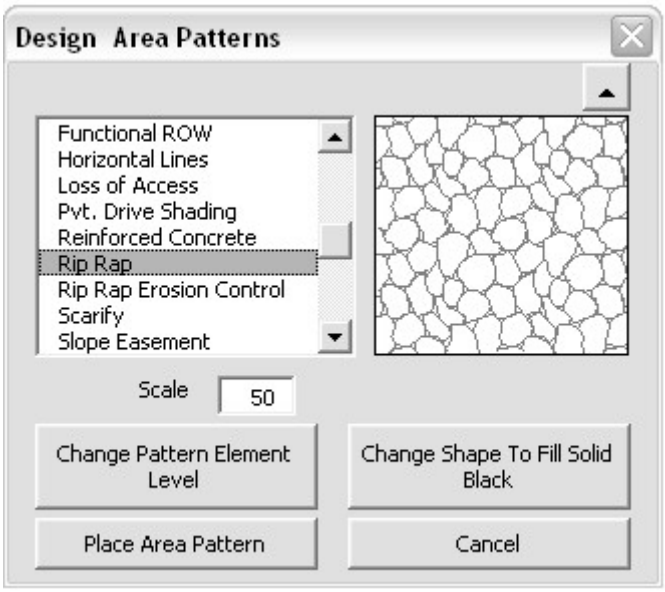
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Rip-Rap Area**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

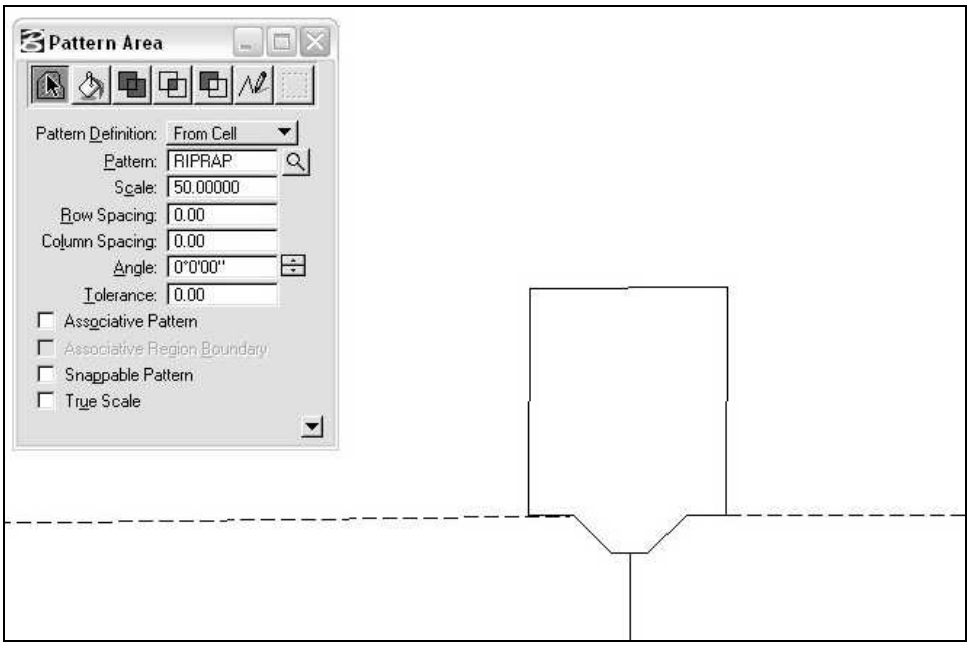


Or from the drop down menu in the **Design Area Patterns** dialog …

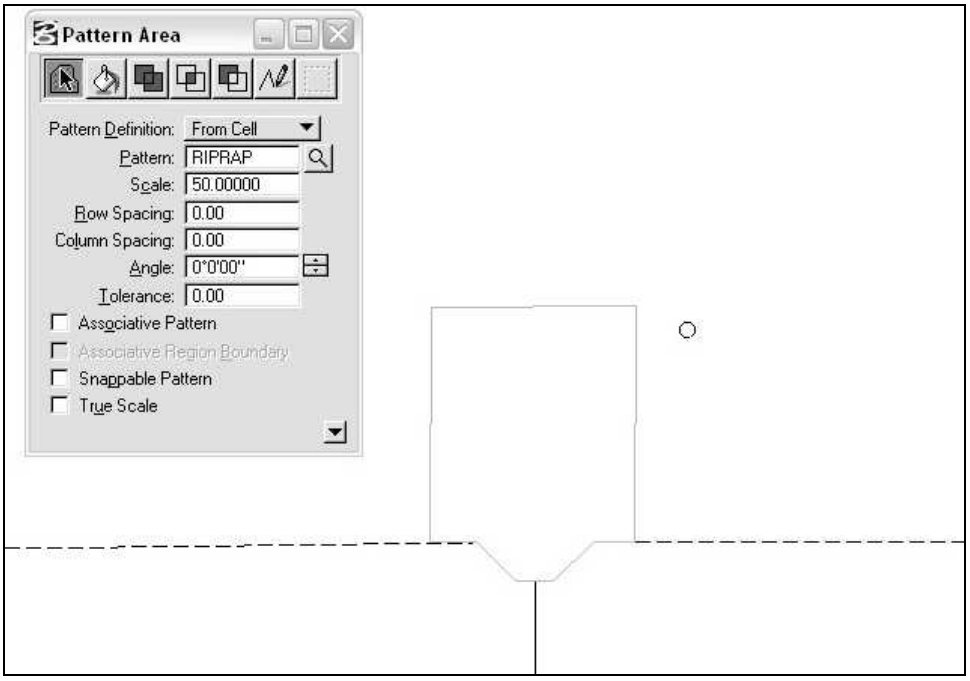


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Element**.

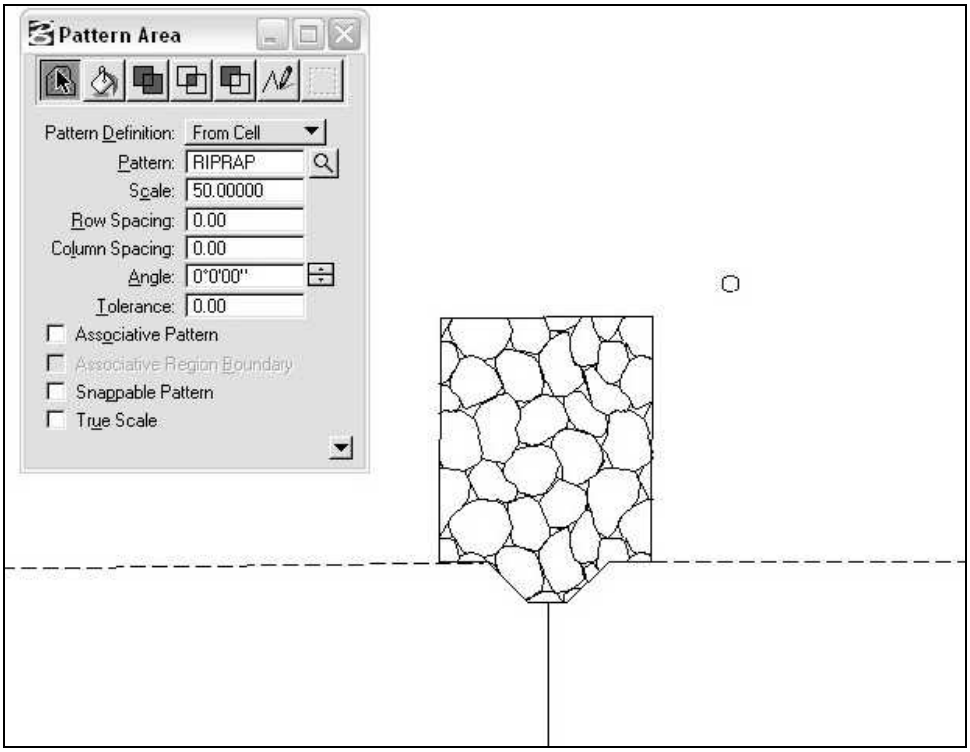
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Element, the user is prompted to **Identify Element**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Draw Drainage Flow Direction by 2 Points

D&C location: Drafting Standards > Prop. Drainage > Flow Direction

MicroStation VBA Program: DrawFlowDirection.mvba

Description:

This program is set up for use in placing drainage flow direction graphics for drainage maps, creeks, streams or rivers. To use, first check the scale and adjust as needed for the final plot scale. Then click the Draw Flow command button to start placement. The user is first promptesd for a point for the arrowhead. Once this point is given,the arrowhead and leader line are shown dynamically and the user is prompted for a second point to set the end of the leader line. All graphics are combined in a graphic group.

Scale controls the arrowhead size. The standard small drainage arrowhead is placed by this program. If the given scale value is reset, it will be necessary to re-start the command by clicking on the Draw Flow command button again.

This macro can also be activated from the MicroStation drop down menu
TDOT > Drainage (Plan) > Draw Flow Direction
or by using the keyin
vba run [DrawFlowDirection]DrawDrainageFlow.main

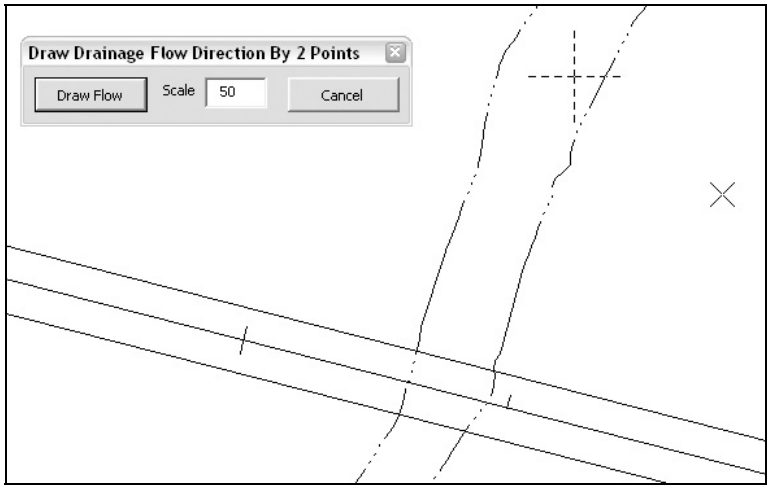
Special Requirements:

None

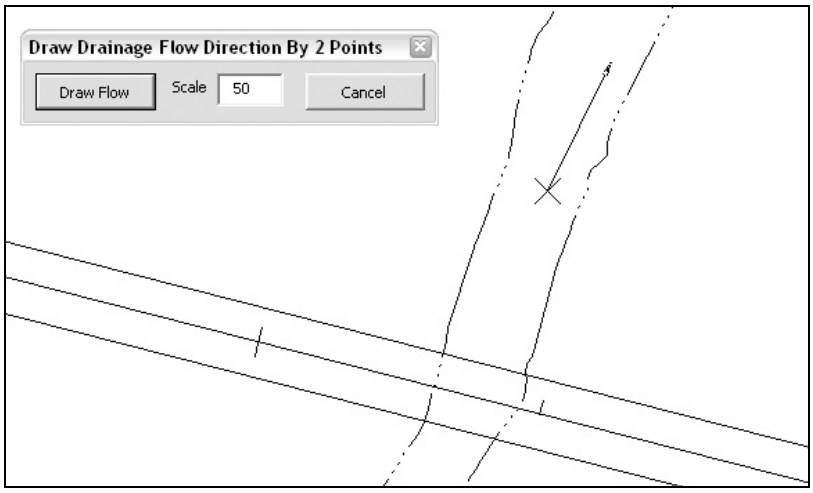
Usage:

Step 1. In D&C manager activate **Flow Direction**. The **Draw Drainage Flow Direction by 2 Points** dialog opens**.** The only entry field is **Scale** which reflects the current active scale. Reset this value if needed and click on the **Draw Flow** button.

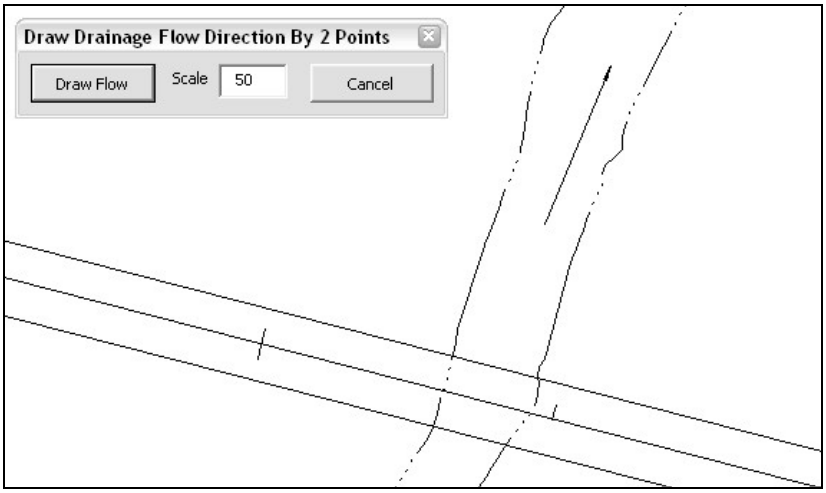
Step 2. You are then prompted to **Identify Point for Arrowhead**. Data point at the location for the arrowhead.



Step 3. You are then prompted to **Identify End of Leader Line**. Data point at the location for the other end of the leader line.



The leader line and the arrowhead are drawn in the file. You can continue to place additional flow direction indicators if desired. These graphics are a graphic group so they can easily be moved if needed.



This application can also be used to develop flow patterns for a drainage map.

Place Proposed Storm Drainage Pipe Label

D&C location: Drafting Standards > Prop. Drainage > Label ST Pipe

MicroStation VBA Program: StormDrainagePipeLabel.mvba

Description:

This program places proposed storm drainage pipe labels. It is intended for use on short pipes which canot display the size portion of the storm drainage pipe custom line style. It includes an option to identify the pipe to automatically set up the desired label text. An option to place the label as a flag with terminator is provided. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of label text and terminator.

If the initial scale given was in error, it is necessary to re-start the command by clicking on the Place Label command button after reseting the given scale value. The terminator option can be reset at any time during label placement.

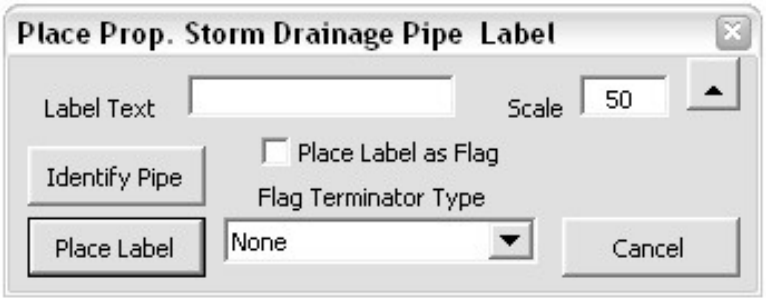
This program can also be activated from the MicroStation drop down menu at
TDOT > Drainage (Plan) > Place Storm Drainage Pipe Label
or by using the keyin
vba run [StormDrainagePipeLabel]StormDrainagePipe.main

Special Requirements:

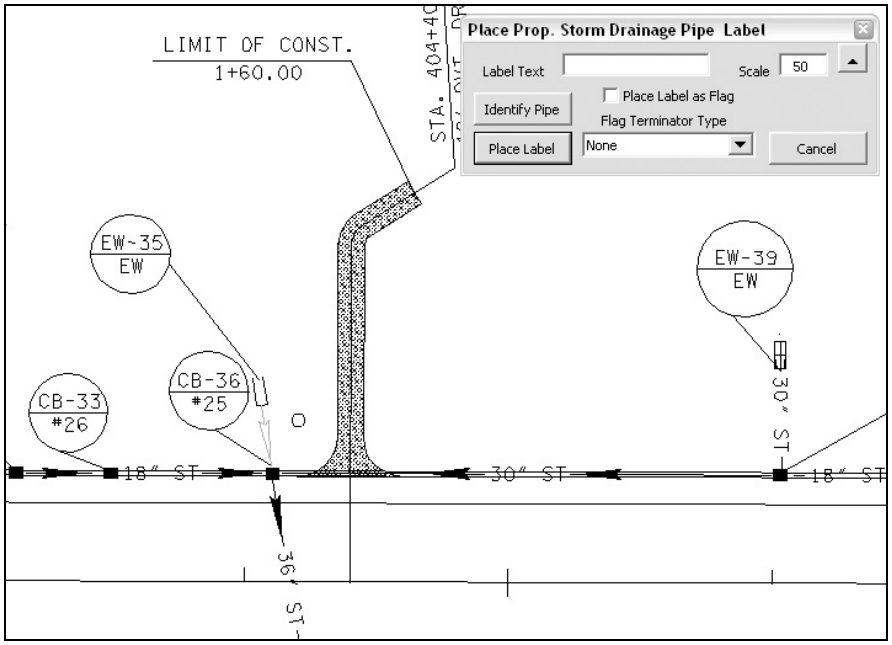
Storm drainage pipe must be drawn with the correct level and symbology for the Identify Pipe function.

Usage:

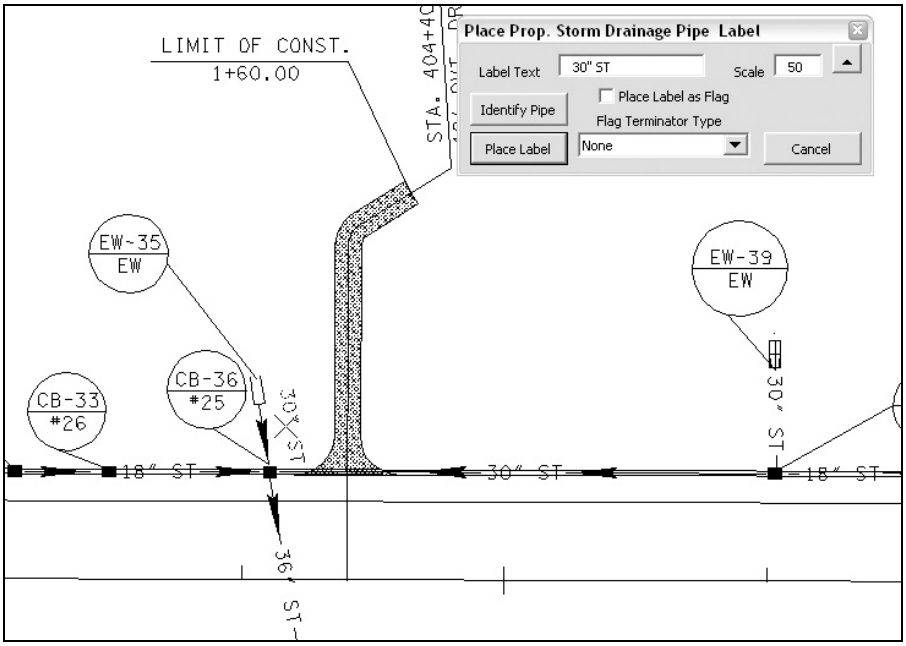
Step 1. In D&C manager activate **Label ST Pipe**. The **Place Prop. Storm Drainage Pipe Label** dialog appears. When started program immediately prompts user to **Identify Element** for annotation.



Step 2. Adjust the **Scale** shown on the dialog if needed and then **Data point** on the pipe line element that you wish to label. As an alternative, the user can enter the label text in its keyin field manually.



Step 3. After giving a point to accept the element selected, the dialog is populated with label information and the label text appears on the cursor. The user is prompted to **Identify location for text**.



After the text location point is given, the text remains available for additional placements as needed. A reset will stop text placement and restart the tool to identify another pipe.

If the dialog is populated with label information but the user does something else such as setting symbologies, the **Place Label** command button can be used to go on and place that label afterwards.

When other tools are accessed, the **Identify Pipe** command button can be clicked to restart the tool.

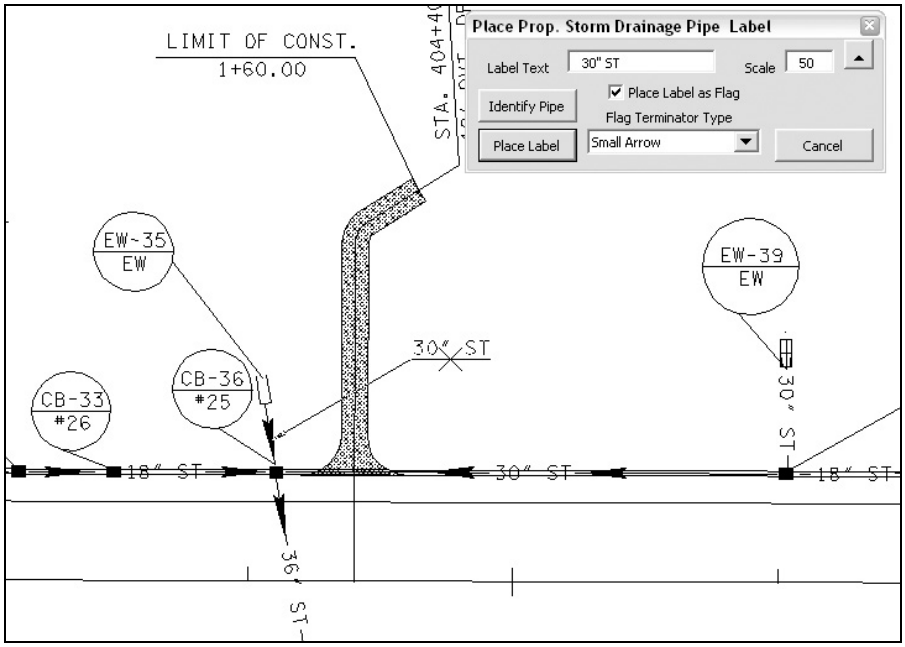
Label placement with Leader line as a Flag:

Step 1. With the **Place Prop. Storm Drainage Pipe Label** dialog open, click on the option to **Place Label as Flag** and choose the **Terminator Type** if one is desired. Following prompts, **Identify Element** for annotation.

This option is most often used when in tight places or when labeling short elements.

Step 2. After giving a point to accept the element selected, the dialog is populated with label information and the user is prompted to **Identify location for End of Leader**.

Data point on or near the element being labeled and you are prompted to **Position Label** . Movement of the cursor allows dynamic control of the leader line to the label text.



After the label location point is given, the user is again prompted for the end of the leader point allowing for additional placements as needed. A reset will stop label placement and restart the tool.

Guardrail

Draw Vehicle Trajectory Path

D&C location: Drafting Standards > Guardrail > Vehicle Path

MicroStation Basic Program: traject.ba

Description:
This application used draw a vehicle trajectory path to help determine the point of need for guardrail.

The vehicle path is placed at a user defined angle from the edge of the traveled way in tangent sections and in curves a tangent is generated from the curve element.

This macro can also be activated by using the keyin
macro traject.

Special Requirements:
The edge of traveled way linework (prop. edge of pavement and/or centerline) and hazard location must be drawn in the file.

When placement is near the end of tangent sections then the path should be checked since it may start beyond the end of the tangent.

When the path falls within a spiral or curve then good engineering judgment should be used to ensure adequate protection from the hazard.

In spirals you may wish to use a path located by divergent angle based on the tangent near the beginning of the spiral and a tangent line from the spiral as it nears the curve. Since Geopak uses curve strings to plot in spirals then only tangent paths can be placed from spirals using this program.

Usage:

Step 1. Locate hazard locations and display centerline and edge of proposed pavements.

Step 2. In D&C manager activate **Vehicle Path**. The **Draw Vehicle Trajectory Path** dialog opens**.** It contains the following settings to control the program's function:

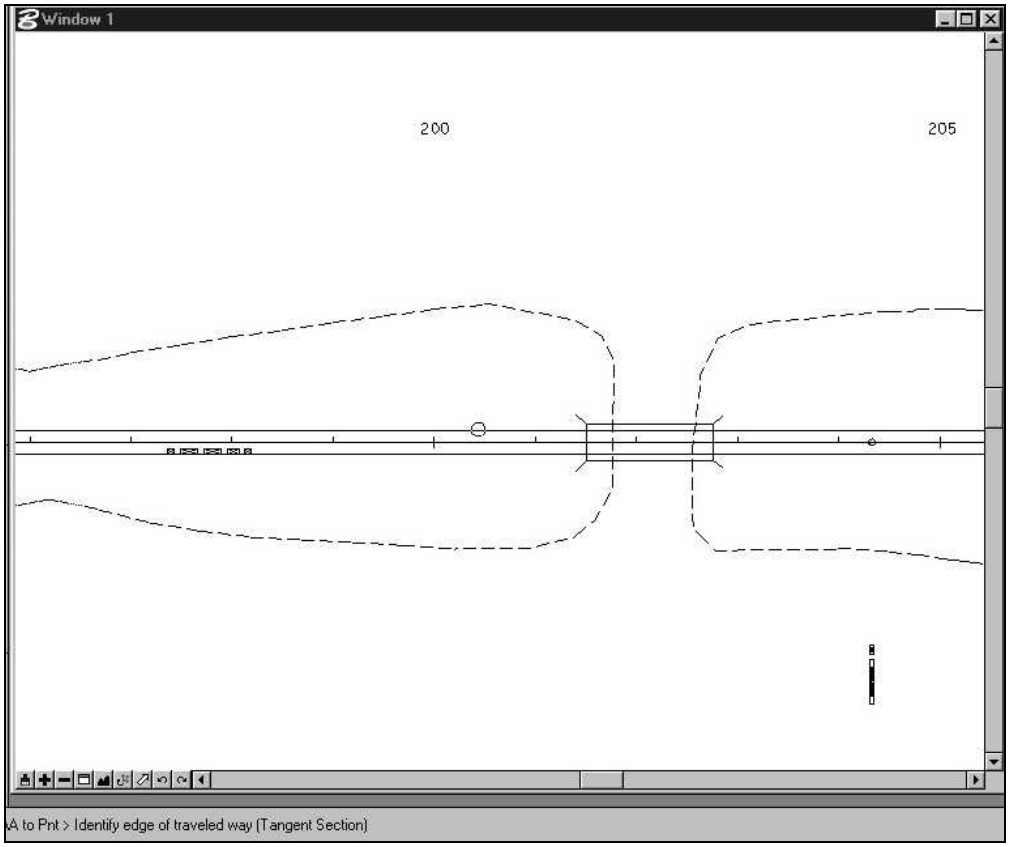
Alignment Orientation : Tangent Section or **Curve Section**
For tangent sections a line is drawn at the given angle from the edge of the traveled way to the hazard. For curve sections a line tangent to the curve is drawn from the edge of the traveled way to the hazard.

Path to Hazard Location: Begin or **End** & **Left** or **Right**.
This is the general location of where the path originates in relation to the hazard going forward along the centerline.

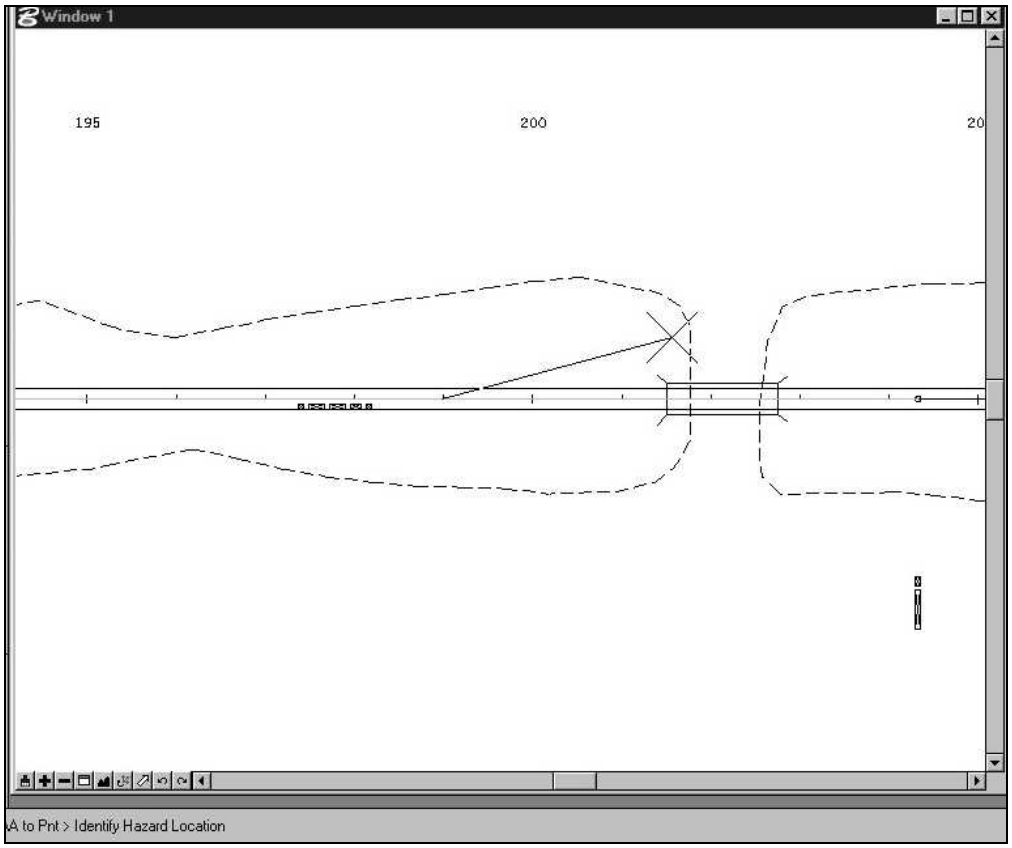
Tangent Trajectory Angle: numeric value.
This is the angle which will be used to draw trajectory paths from tangents. Default value of 15 degrees is given.

Make settings as needed and click on the **Draw Trajectory Line** button.

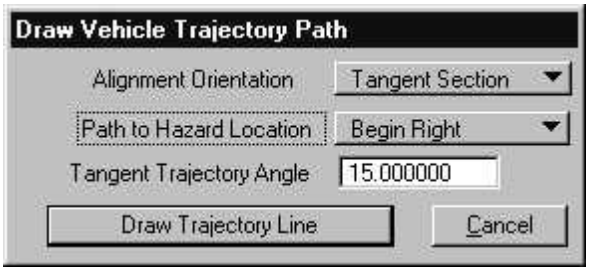
Step 3. You are then prompted to **Identify edge of travel way. Data point** on the edge of pavement or centerline. In this example we are working with a 2 lane roadway in a tangent section at the beginning of a bridge on the left so we data point on the centerline for that location.



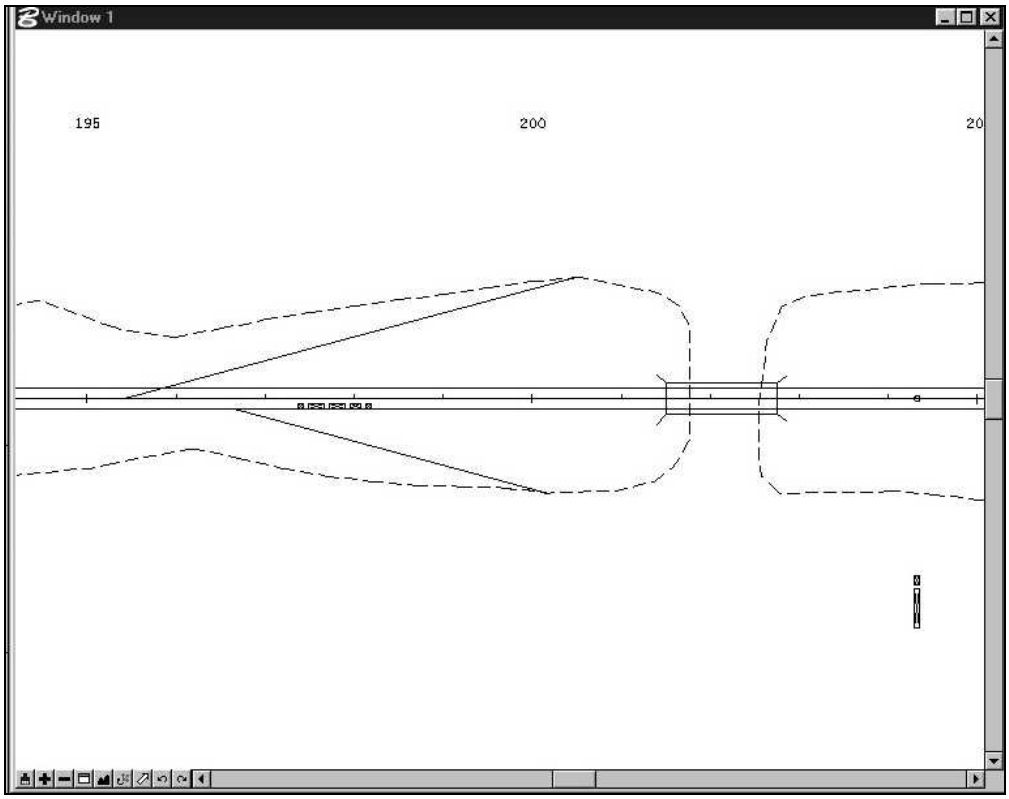
Step 4. The trajectory line appears floating along the centerline and you are then prompted to **Identify Hazard Location.** I our example the first hazard is a 2:1 slope prior to the bridge so we snap to that slope tie and **Data point**. The path line is drawn and the **Draw Vehicle Trajectory Path** dialog re-appears.



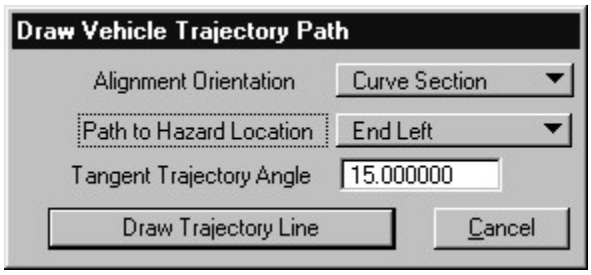
Step 5. You can click **Cancel** to quit or make new settings and click **Draw Trajectory Line** to place another trajectory line. In our example we reset it to **Begin Right** to continue.



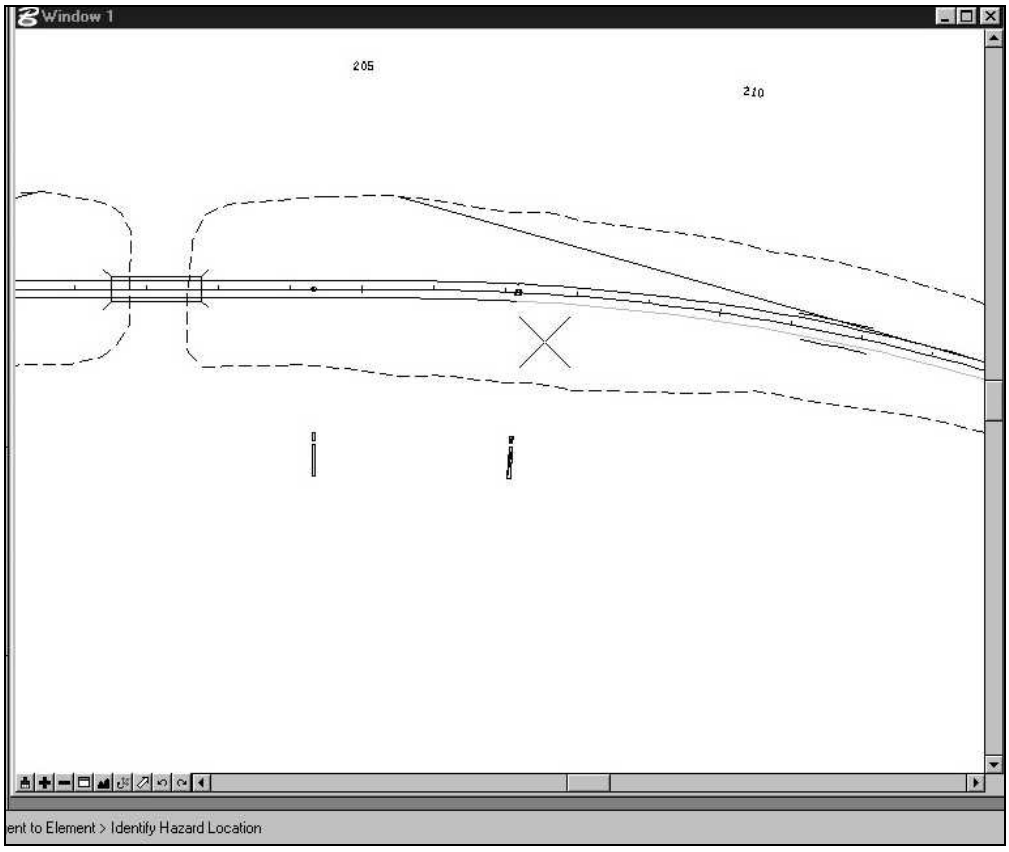
Step 6. Repeating steps 3 & 4 this time we identify the right edge of pavement and data point at the beginning of 2:1 slopes on the right side.



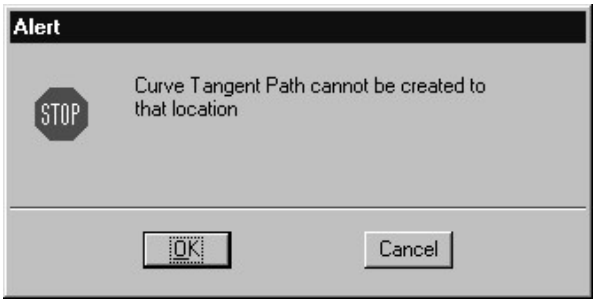
Step 7. In our example the roadway approach at the end of the bridge is in a curve so we reset the Alignment Orientation to a **Curve Section**, the Path to Hazard Location to **End Left** and click **Draw Trajectory Line** to continue.



Step 8. Repeating steps 3 & 4 this time we identify the left edge of pavement past the bridge in the curve and data point at the end of 2:1 slopes on the left side. A curve tangent path line is drawn. After resetting to **End Right** we attempt to place a tangent from the centerline to the end of 2:1 slopes on the right.



Since a tangent cannot be placed on the inside of a curve the following error message is displayed. Good engineering judgment will have to be used in areas such as this one.



WARNING:
Anytime the trajectory path begins within a spiral or curve then good engineering judgment should always be used to ensure adequate protection from the hazard.

Place Bridge End Guardrail

D&C location: Drafting Standards > Guardrail > GR Br End Prop.

Geopak 3PC Program: place_Br_end_GR.x

Description:
This application plots the standard length of bridge end guardrail (26' 10 3/4") with the appropriate custom linestyle.

This 3PC is used to plot the bridge end guardrail separately when minimum installations of guardrail at bridge ends which already include this guardrail section do not provide adequate protection.

Locations for guardrail are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

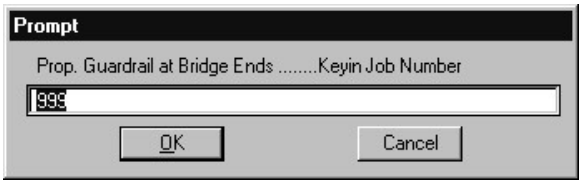
Special Requirements:
Bridge end location for beginning of guardrail must be located graphically so that it can be identified when using program.

Usage:

Step 1. Locate bridge end location for beginning of guardrail.

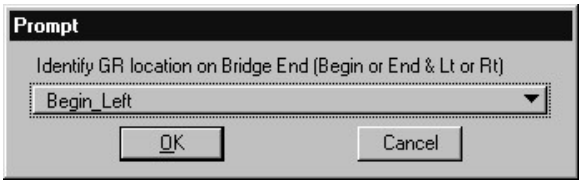
Step 2. In D&C manager activate **GR Br End Prop.**

Step 3. You are prompted for a **job no.** Key that in and click **OK**.



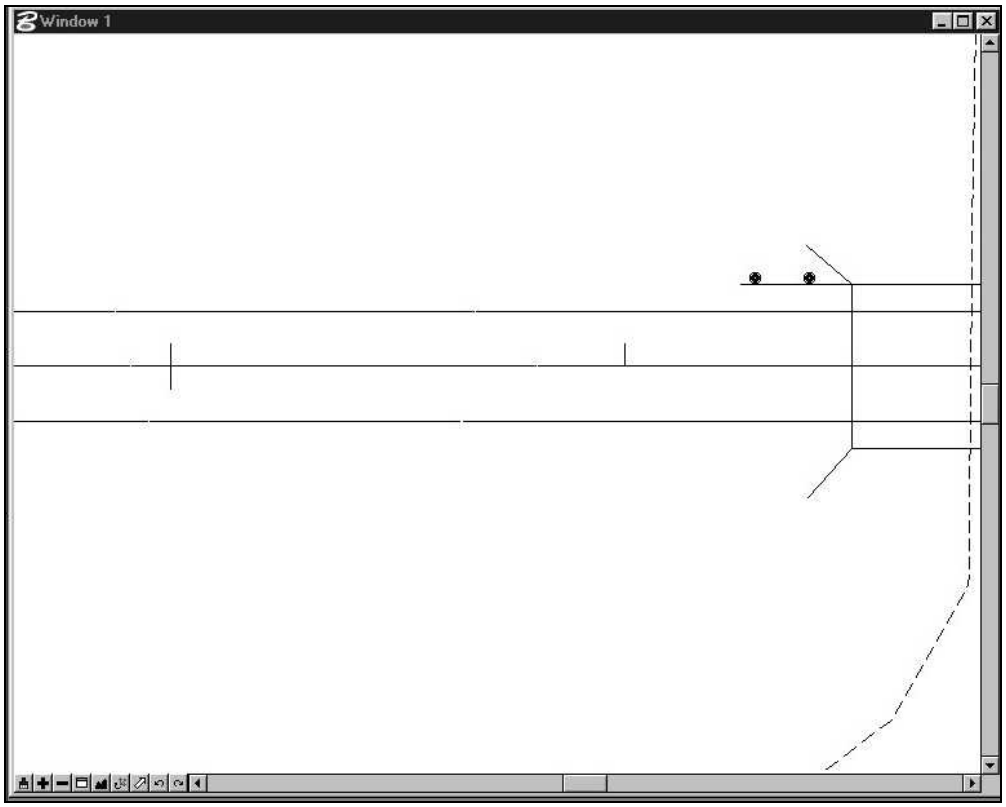
Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the guardrail location in relation to the bridge end, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



Step 6. You are then prompted to **Snap & Data end of the bridge Rail** where the guardrail begins**. Snap** and **Data Point** at that location.

The standard length of bridge end guardrail (26' 10 3/4") is drawn in using the appropriate custom linestyle.



Place Type 12 Guardrail Terminal

D&C location: Drafting Standards > Guardrail > GR TermType 12

Geopak 3PC Program: place_12_terminal_EQ.x

Description:

This application takes input for job number, chain name, location on the guardrail run (begin or end) and user supplied data points for the point of need location at the ditch line & location of GR at the roadside and then plots the guardrail terminal, the flare taper and 50' curve to tie to the guardrail at the roadside at the appropriate custom linestyle. A type text label is also placed for the terminal. After ploting in the terminal and its associated guardrail then the special slope limit lines used by cross section criteria to show pads and alter side slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Approach length of the alternate slope area is controlled by values generated from the point of need guardrail equation.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

Point of need at ditch line and guardrail offset location at roadside must be located graphically so that they can be identified when using program.

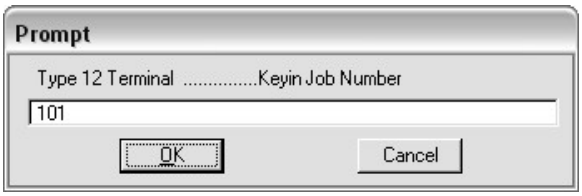
The following numeric values must be known from the point of need guardrail equation (see Std Dwg. No. S-GR-21):
Runout Length (**L_R** from equation)
Length from point of need to hazard (**x** from equation)
Offset distance from edge of travel lane to tangent section of guardrail (**L_2** from equation).

Usage:

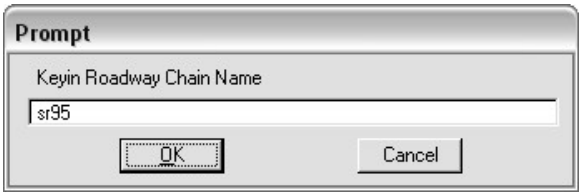
Step 1. Locate point of need at ditch line and guardrail offset location at roadside.

Step 2. In D&C manager activate **GR Term Type 12**.

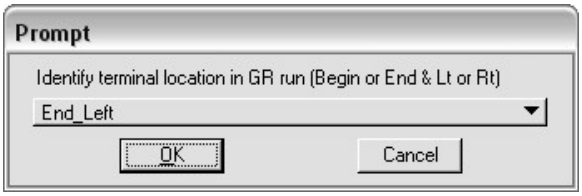
Step 3. You are prompted for a **job no.** Key that in and click **OK**.



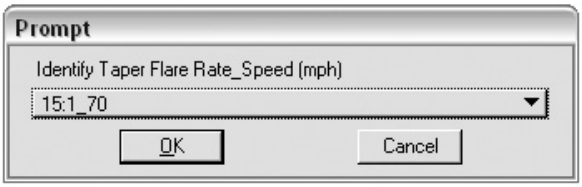
Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.



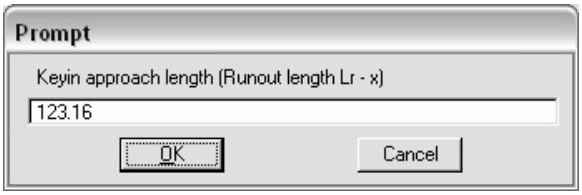
Step 5. You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



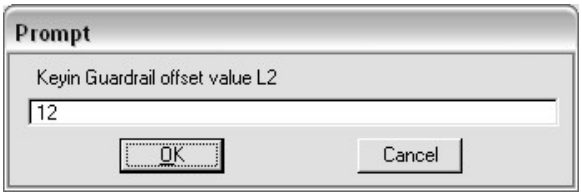
Step 5. You are then prompted for the **Taper Flare Rate_Speed(mph)**, **15:1_70, 14:1_60, 11:1_50, 8:1_40** or **7:1_30**. Pick the appropriate value from the list box and click **OK**.



Step 6. You are then prompted to **Keyin approach length (Runout length Lr – x)**. From the guardrail equation take the runout length value **L_R** and subtract the calculated distance to the point of need **x** to determine the approach length. Enter the resulting value and click **OK**.



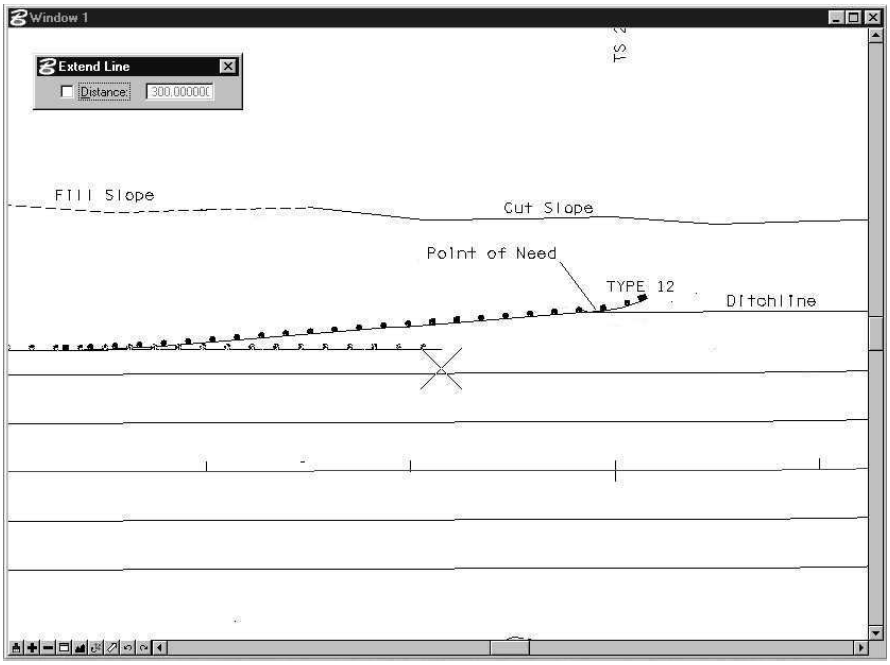
Step 7. You are then prompted to **Keyin Guardrail offset value L2**. This is the offset distance from the edge of the travel lane to the tangent section of guardrail which is variable **L_2** from the guardrail equation. Usually this will be at the back of the graded shoulder and is the shoulder width. Enter the requested value and click **OK**.



Step 6. You are then prompted for the **Point of Need at Ditch.** Snap to that location and **Data Point**.

Step 7. Finally you are prompted to **Data on guardrail at roadside. Snap** and **Data Point** on the guardrail anywhere along the roadway. This **does not** have to be at any critical location in the guardrail line. The location where the 13:1 taper starts will be calculated and located by the program.

Step 8. All line work is plotted in the file based on the given information. Use MicroStation's modify commands to adjust the guardrail run along the roadway to end where curve into 15:1 taper begins.



Special slope limit lines are placed on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines. It may be necessary to turn that level on to see them after processing.

Place Type 13 Guardrail Terminal

D&C location: Drafting Standards > Guardrail > GR Term Type 13

Geopak 3PC Program: place_13_terminal.x

Description:
This application places a type 13 guardrail terminal cell, a type text label and a point at the terminal location for later use in calculating quantities.

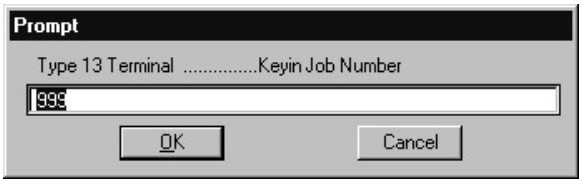
Special Requirements:
Terminal location at guardrail along roadside must be located graphically so that it can be identified when using program.

Usage:

Step 1. Locate terminal location at guardrail along roadside. For the type 13 terminal this is **6.25' past the end of hazard location (except for median bridge pier protection which requires a minimum distance of 12.5' past the pier)**.

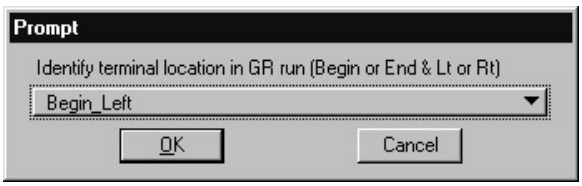
Step 2. In D&C manager activate **GR Term Type 13**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.



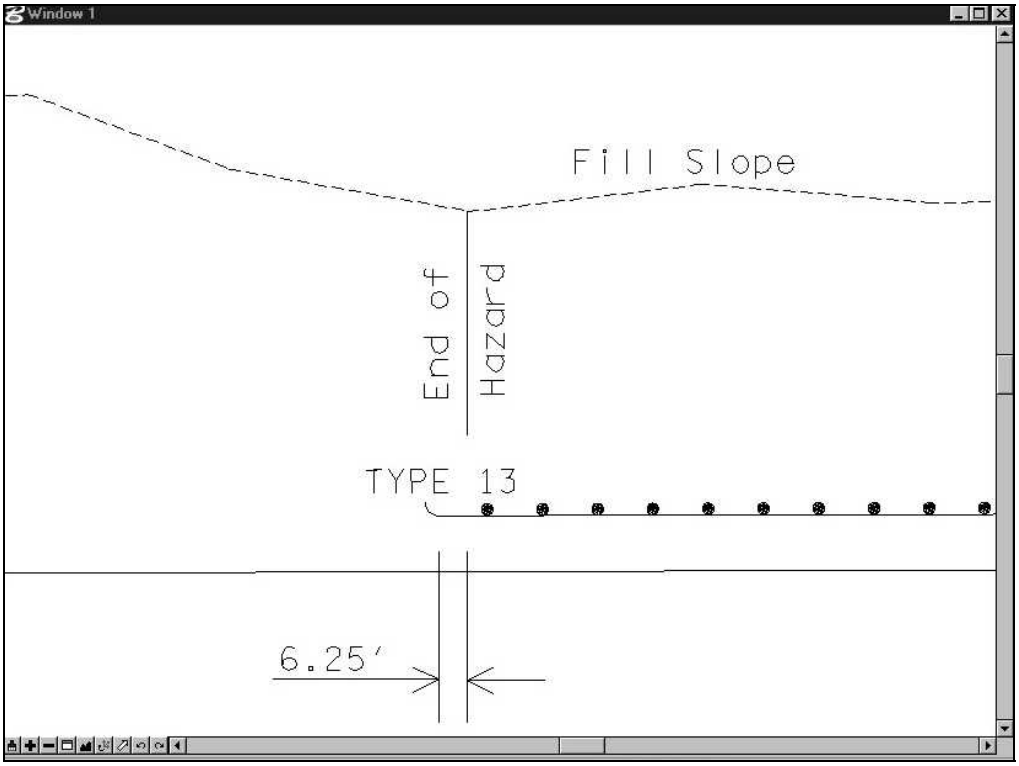
Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



Step 6. Finally you are prompted to **Snap & Data terminal location. Snap** and **Data Point** on the guardrail at the terminal location.

All graphics are placed in the file based on the given information.



Place Type 21 Guardrail Terminal

D&C location: Drafting Standards > Guardrail > GR Term Type 21

Geopak 3PC Program: place_21_terminal.x

Description:
This application plots a type 21 guardrail terminal with the appropriate custom linestyle and terminal end cap. A type text label is placed for the terminal. The special slope limit lines used by cross section criteria to show pads and alter side slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

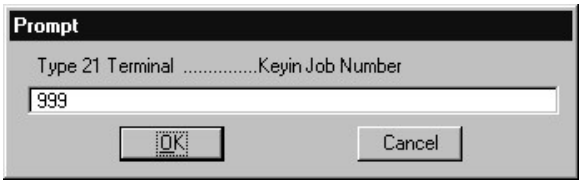
Special Requirements:
Terminal beginning location at guardrail along roadside must be located graphically so that it can be identified when using program.

Usage:

Step 1. Locate beginning of terminal location at guardrail along roadside. For the type 21 terminal this is **12.5' back from the point of need location**.

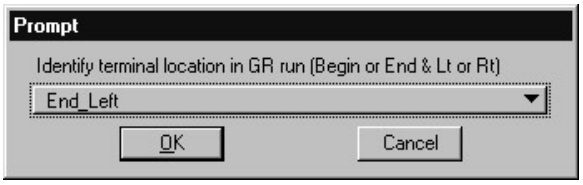
Step 2. In D&C manager activate **GR Term Type 21**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.



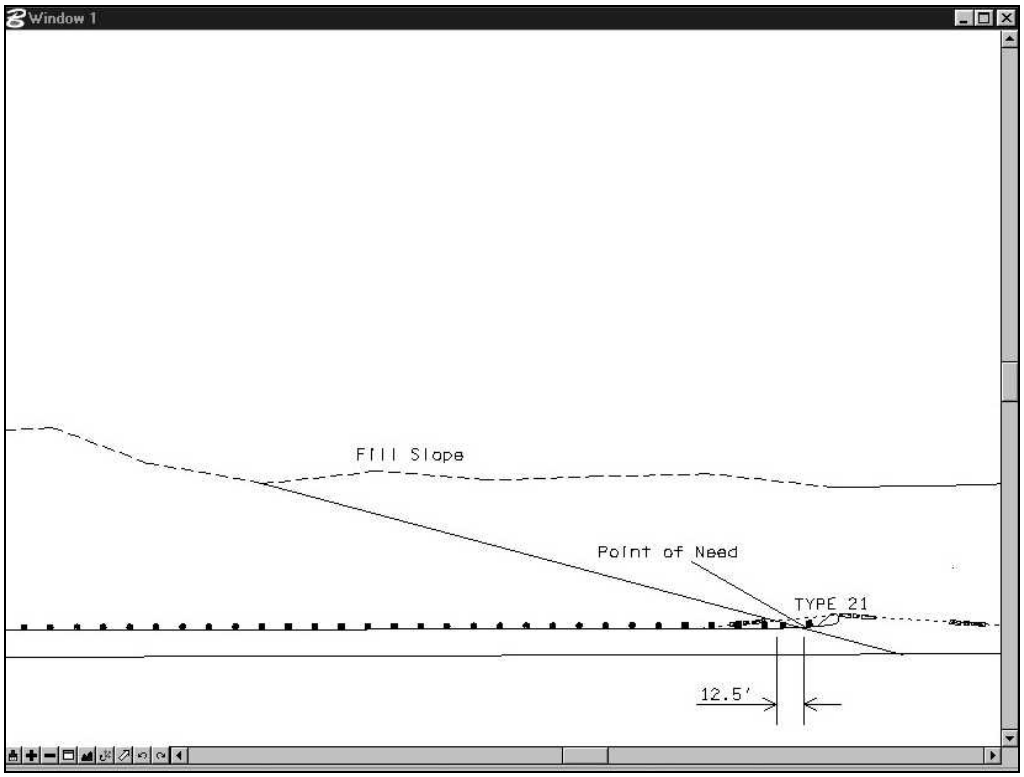
Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



Step 6. Finally you are prompted to **Snap & Data terminal location. Snap** and **Data Point** on the guardrail at the terminal location.

All line work is plotted in the file based on the given information.



Special slope limit lines are placed on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines. It may be necessary to turn that level on to see them after processing.

Place Type 21 GR Terminal - Minimum Installation at Br. End

D&C location: Drafting Standards > Guardrail > GR Min Inst 21

Geopak 3PC Program: place_21_min_install.x

Description:
This application plots a type 21 guardrail terminal, regular guardrail and bridge end guardrail with the appropriate custom linestyles and terminal end cap for a minimum installation at a bridge end. A type text label is placed for the terminal. The special slope limit lines used by cross section criteria to show pads and alter side slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

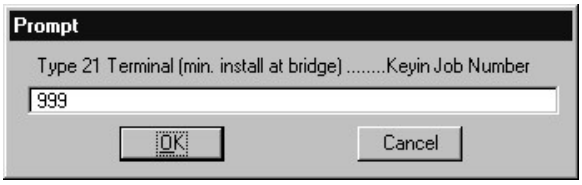
Special Requirements:
Bridge end location for beginning of guardrail must be located graphically so that it can be identified when using program.

Usage:

Step 1. Locate bridge end location for beginning of guardrail.

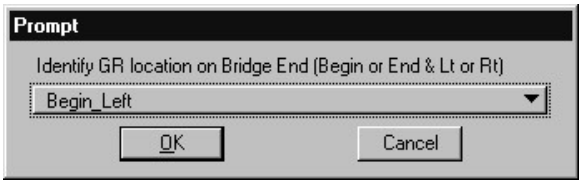
Step 2. In D&C manager activate **GR Min Inst 21**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.



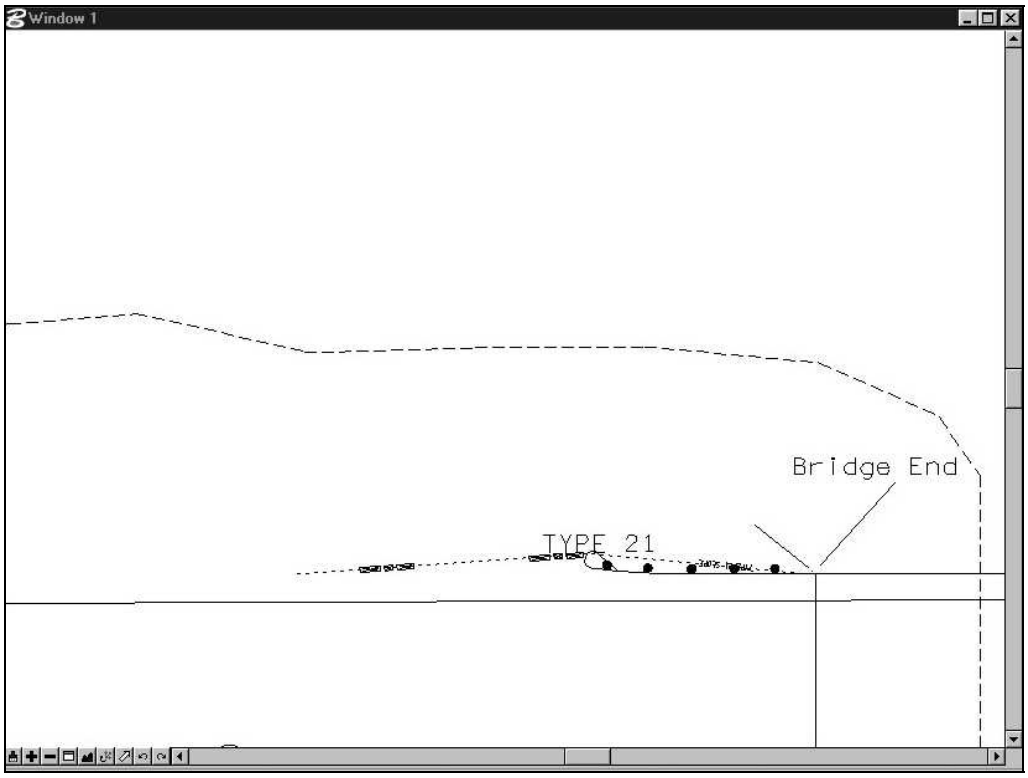
Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the guardrail location at bridge end, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



Step 6. Finally you are prompted to **Snap & Data GR begin location. Snap** and **Data Point** on the bridge end where guardrail begins.

All line work is plotted in the file based on the given information.



Special slope limit lines are placed on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines. It may be necessary to turn that level on to see them after processing.

Place Type 21 GR Terminal (ADT<=400) - Minimum Installation at Br. End

D&C location: Drafting Standards > Guardrail > GR Min Inst 400

Geopak 3PC Program: place_21_400_min_install.x

Description:
This application plots a type 21 guardrail terminal and bridge end guardrail with the appropriate custom linestyles and terminal end cap for a minimum installation at a bridge end. This tool is set up specifically for roadways with ADT<=400. A type text label is placed for the terminal.

Locations for guardrail lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:
Bridge end location for beginning of guardrail must be located graphically so that it can be identified when using program.

Usage:

Step 1. Locate bridge end location for beginning of guardrail.

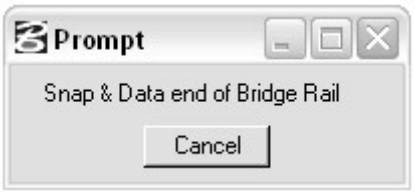
Step 2. In D&C manager activate **GR Min Inst 400**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.

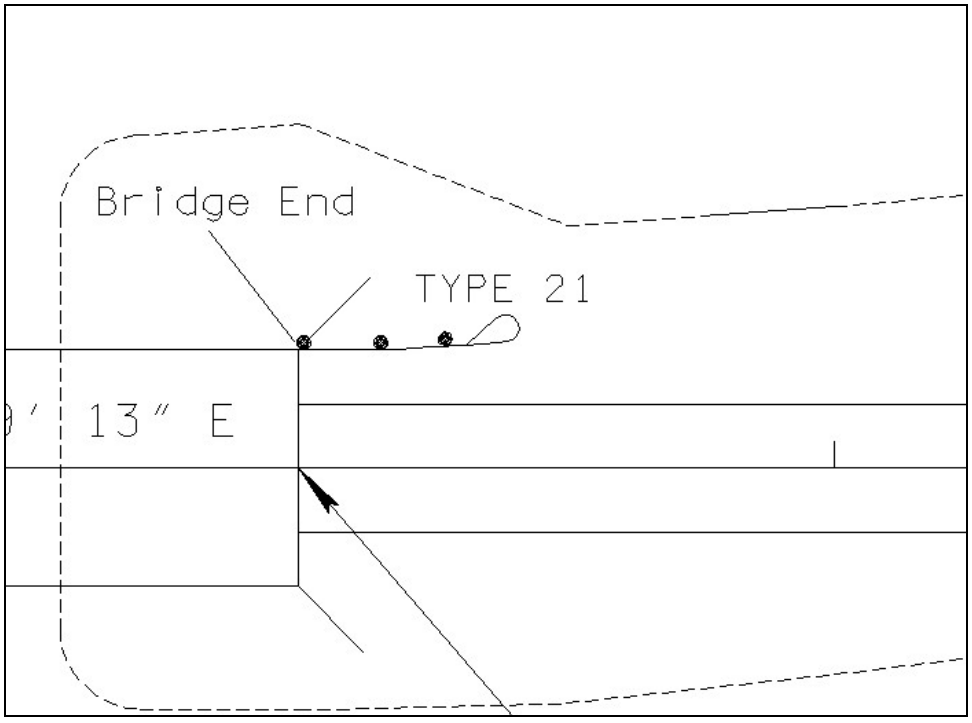
Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the guardrail location at bridge end, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.

Step 6. Finally you are prompted to **Snap & Data GR begin location. Snap** and **Data Point** on the bridge end where guardrail begins.



All line work is plotted in the file based on the given information.



Place Type 38 Guardrail Terminal

D&C location: Drafting Standards > Guardrail > GR Term Type 38

Geopak 3PC Program: place_38_terminal.x

Description:
This application plots a type 38 guardrail terminal with the appropriate custom linestyle and terminal end cap. A type text label is placed for the terminal. The special slope limit lines used by cross section criteria to show pads and alter side slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

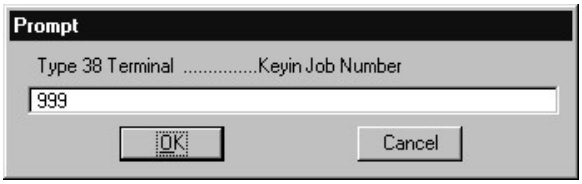
Special Requirements:
Terminal beginning location at guardrail along roadside must be located graphically so that it can be identified when using program.

Usage:

Step 1. Locate beginning of terminal location at guardrail along roadside. For the type 38 terminal this is **37.5' back from the point of need location**.

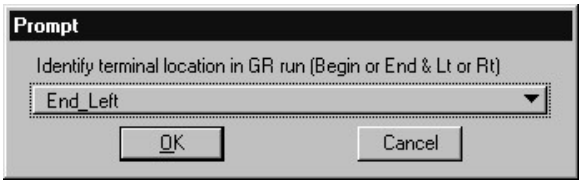
Step 2. In D&C manager activate **GR Term Type 38**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.



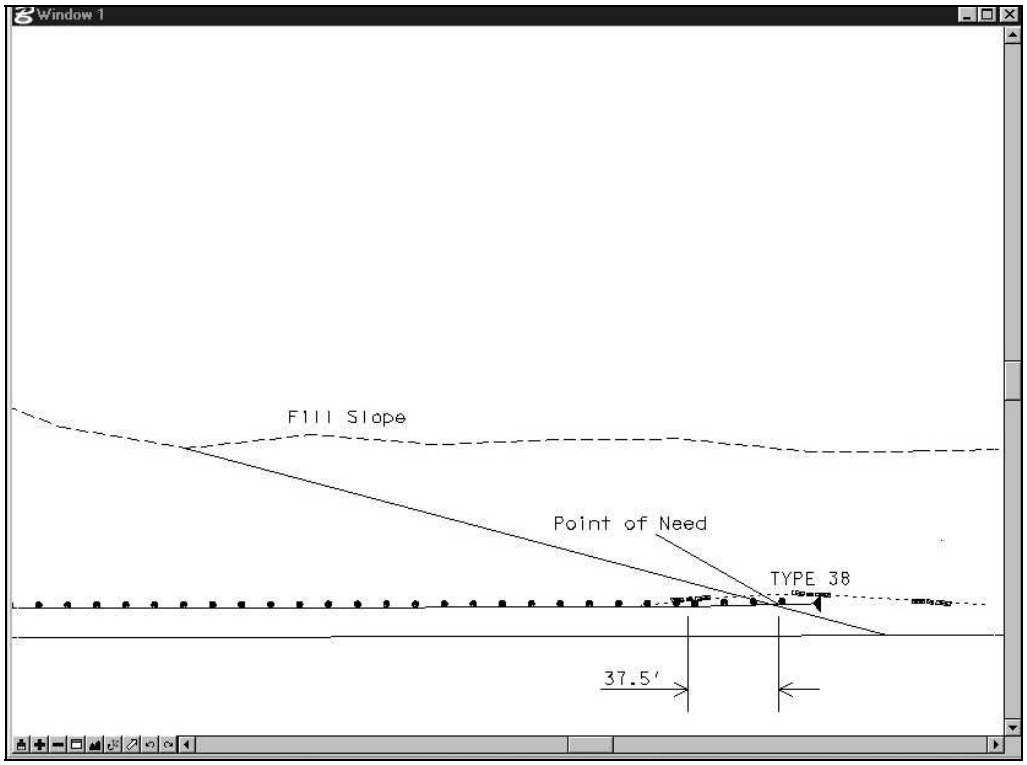
Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



Step 6. Finally you are prompted to **Snap & Data terminal location. Snap** and **Data Point** on the guardrail at the terminal location.

All line work is plotted in the file based on the given information.



Special slope limit lines are placed on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines. It may be necessary to turn that level on to see them after processing.

Place Type 38 GR Terminal - Minimum Installation at Br. End

D&C location: Drafting Standards > Guardrail > GR Min Inst 38

Geopak 3PC Program: place_38_min_install.x

Description:

This application plots a type 38 guardrail terminal and bridge end guardrail with the appropriate custom linestyles and terminal end cap for a minimum installation at a bridge end. A type text label is placed for the terminal. The special slope limit lines used by cross section criteria to show pads and alter side slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

Bridge end location for beginning of guardrail must be located graphically so that it can be identified when using program.

Usage:

This option functions just the same as **Place Type 21 GR Terminal - Minimum Installation at Br. End**. See the description of it's usage for details.

Place Type In-Line Guardrail Terminal

D&C location: Drafting Standards > Guardrail > GR Term In-Line

Geopak 3PC Program: place_InLine_terminal.x

Description:
This application places a type in-line guardrail terminal cell, a type text label and a point at the terminal location for later use in calculating quantities.

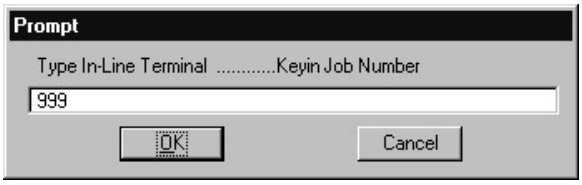
Special Requirements:
Guardrail radius location for this terminal must be located graphically so that it can be identified when using program.

Usage:

Step 1. Draw guardrail radius along roadway pavement radius.

Step 2. In D&C manager activate **GR Term In-Line**.

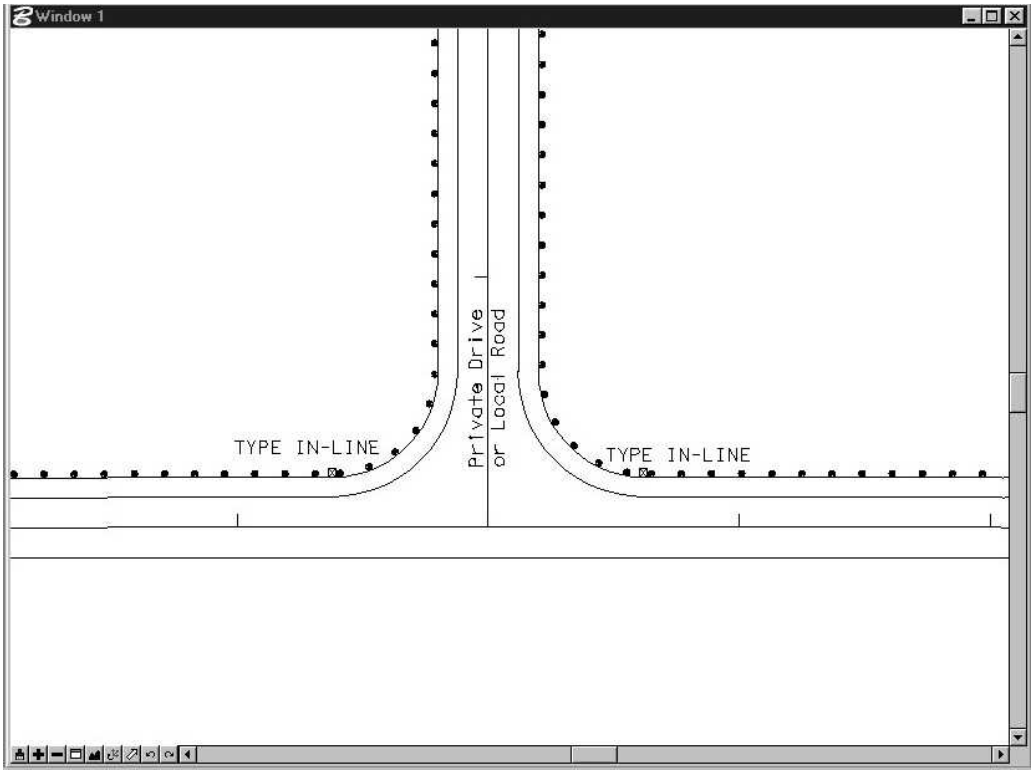
Step 3. You are prompted for a **job no.** Key that in and click **OK**.



Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. Finally you are prompted to **Snap & Data terminal location. Snap** and **Data Point** at the end of the radius of guardrail for the terminal location.

Step 6. All graphics are placed in the file based on the given information. Move text label as needed for clarity and if needed add a leader line.



Place Median Guardrail - Minimum Installation at Br. End

D&C location: Drafting Standards > Guardrail > Median GR > GR Min Inst Med

Geopak 3PC Program: place_median_min_br_end.x

Description:
This application plots in the minimum length of guardrail required in the median at tangent non-skewed bridges with the appropriate custom linestyle and terminal end cap. A type text label is placed for the terminal. The special slope limit lines used by cross section criteria to alter median slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

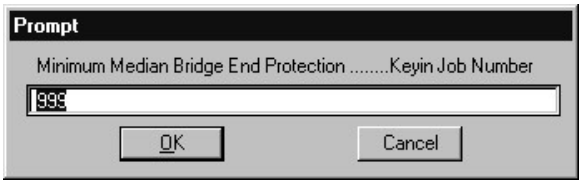
Special Requirements:
Bridge end location for beginning of guardrail must be located graphically so that it can be identified when using program.

Usage:

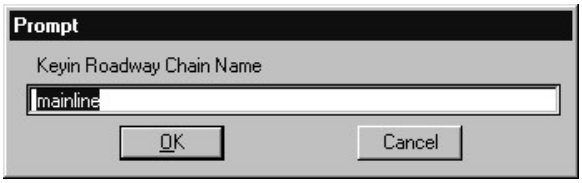
Step 1. Locate bridge end location for beginning of guardrail.

Step 2. In D&C manager activate **GR Min Inst Med**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.



Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

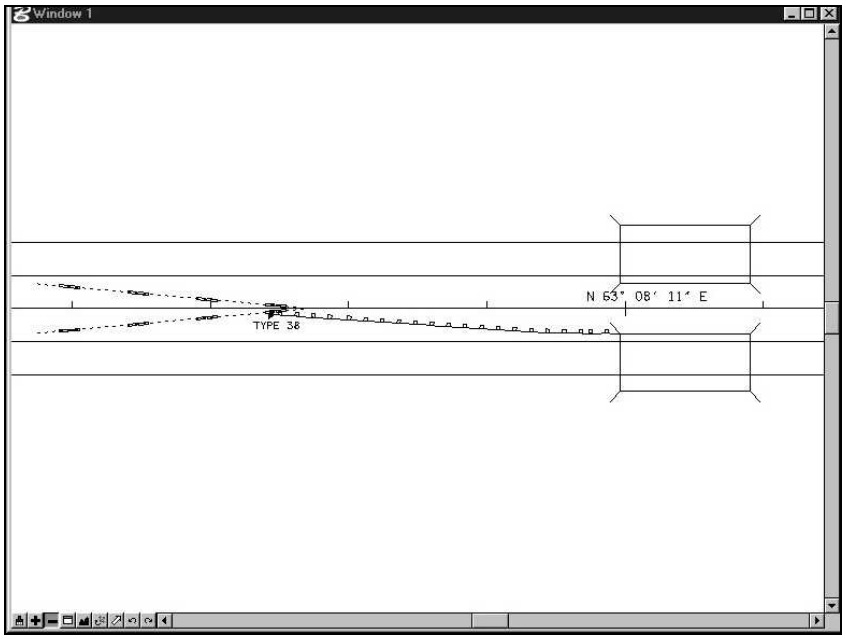


Step 5. You are then prompted for the median width (**30'. 36', 48', 60' or 64'**). This refers to distance between the inside edges of the proposed travel lanes. Pick the appropriate width from the list box and click **OK**.

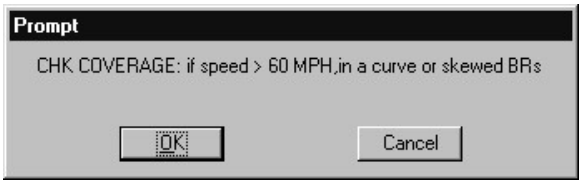
Step 6. You are then prompted for the guardrail location on the bridge end, **Begin** (on right bridge) or **End** (on left bridge). Pick the appropriate option from the list box and click **OK**.

Step 7. Finally you are prompted to **Snap & Data end of Bridge Rail. Snap** and **Data Point** on the end of the bridge where guardrail begins.

All line work is plotted in the file based on the given information.



After completion of graphics the following warning message is given reminding the user that this guardrail layout is based on a tangent roadway with 2 non-skewed bridges. **If either of these are not true for this installation or your design speed is greater than 60 miles per hour then the guardrail should be checked for adequate coverage of the hazard.**



Note that in cases where this standard length of rail does not provide adequate coverage then additional rail can be added and then **Place Median Br. End Guardrail** can be used to plot in the guardrail from the 50' curve through the terminal.

Place Median Br. End Guardrail

D&C location: Drafting Standards > Guardrail > Median GR > GR Med Br Ends

Geopak 3PC Program: place_median_br_end_prot.x

Description:

This application places guardrail from the beginning of the 50' curve through the taper to the terminal in the median at bridge ends. It is intended for use in areas where the minimum installation is not adequate due to design speed, curvature or skewed bridges. After setting up the bridge end rail and the extra regular rail for additional protection then this program can be utilized to plot in the remaining guardrail with terminal using the appropriate custom linestyle and terminal end cap. A type text label is placed for the terminal. The special slope limit lines used by cross section criteria to alter median slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

End of guardrail beside shoulder / beginning of 50' guardrail curve location must be located graphically so that it can be identified when using program.

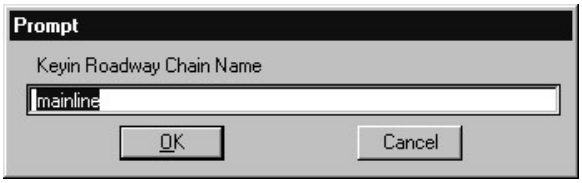
Usage:

Step 1. After establishing additional guardrail coverage needed, draw in guardrail beside shoulder to location for beginning of 50' guardrail curve.

Step 2. In D&C manager activate **GR Med Br Ends**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.

Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

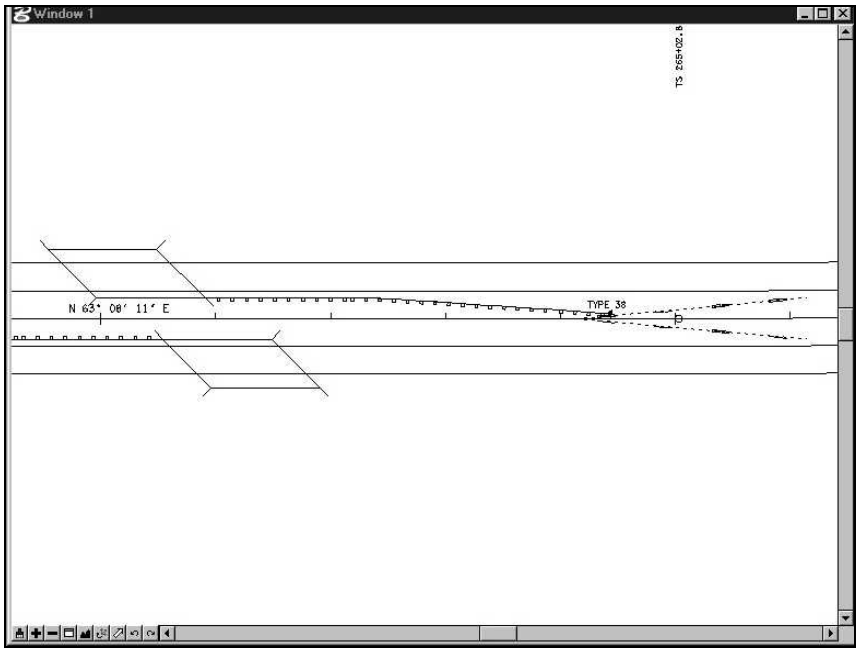


Step 5. You are then prompted for the median width (**30'. 36', 48', 60' or 64'**). This refers to distance between the inside edges of the proposed travel lanes. Pick the appropriate width from the list box and click **OK**.

Step 6. You are then prompted for the guardrail location on the bridge end, **Begin** (on right bridge) or **End** (on left bridge). Pick the appropriate option from the list box and click **OK**.

Step 7. Finally you are prompted to **Snap & Data end of regular GR. Snap** and **Data Point** at the end of the guardrail along the shoulder where the 50' guardrail curve begins.

All line work is plotted in the file based on the given information.



Place Median Earth Berm

D&C location: Drafting Standards > Guardrail > Median GR > GR Med Earth Berm

Geopak 3PC Program: place_median_earth_berm.x

Description:
This application plots in the proposed median earth berm required at the end of bridges. The quantity of earth required for the berm in cubic yards is calculated and appended to a CSV file named **MedianEarthBerms.csv** along with the station and chain of the earth berm.

This program is based on distances in feet so it is **not** applicable on metric projects.

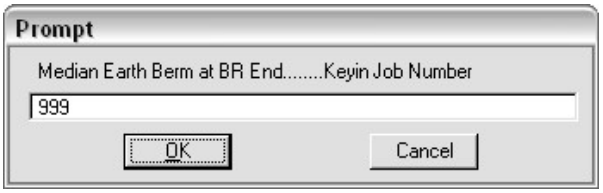
Special Requirements:
Bridge end locations must be located graphically so that it can be identified when using program.

Usage:

Step 1. Locate bridge end locations.

Step 2. In D&C manager activate **GR Med Earth Berm**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.

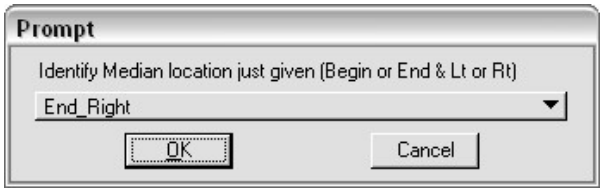


Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

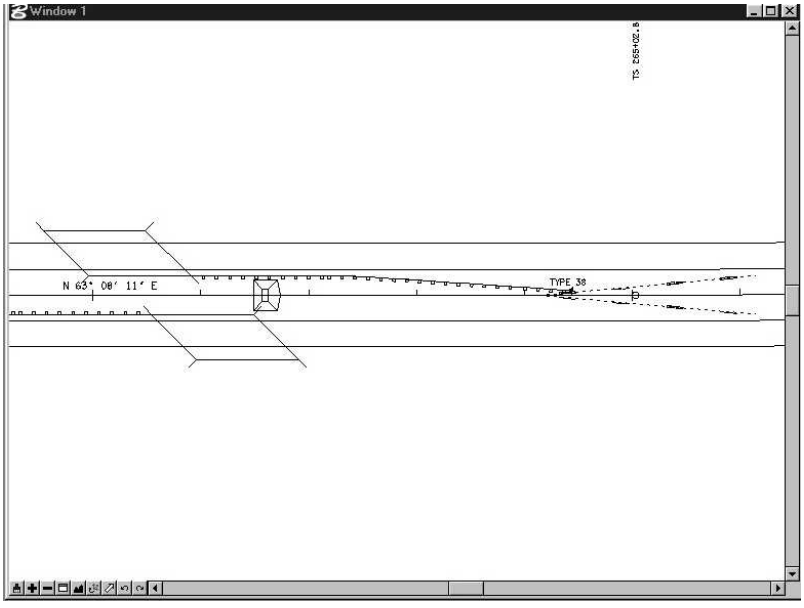
Step 5. You are then prompted for the median width (**30'. 36', 48', 60', 64' or 88**'). This refers to distance between the inside edges of the proposed travel lanes. Pick the appropriate width from the list box and click **OK**.

Step 6. Next you are prompted to **Data at extreme end of BR Rail. Snap** and **Data Point** at the end of the bridge rail of the bridge on left or right that is first encountered moving towards the structures from either direction along the roadway centerline.

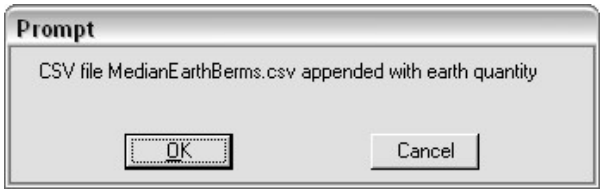
Step 7. You are then prompted for the median location just given, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



All line work is plotted in the file based on the given information.



After completion of graphics the quantity of earth required for the berm in cubic yards is calculated and appended to a CSV file named **MedianEarthBerms.csv** along with the station and chain of the earth berm which is indicated to user in the following message prompt.



Example of berm earthwork data placed in **MedianEarthBerms.csv** (based on 48' median):

mainline	259+96.23	68
mainline	261+48.57	68
mainline	272+65.15	68
mainline	274+86.06	68

Place Median Br. Piers Guardrail

D&C location: Drafting Standards > Guardrail > Median GR > GR Med Br Piers

Geopak 3PC Program: place_median_br_pier_prot.x

Description:

This application places guardrail from the beginning of the 50' curve through the taper to the terminal in the median for protection at bridge piers. After setting up the guardrail beside the shoulder in front of the bridge piers then this program can be utilized to plot in the remaining guardrail with terminal using the appropriate custom linestyle and terminal end cap. A type text label is placed for the terminal. The special slope limit lines used by cross section criteria to alter median slopes are also plotted on level DESIGN - TRANSPORTATION - GR Special Slope Limit Lines.

Locations for guardrail and special slope limit lines are plotted by station and offset to directly reflect alignment conditions.

This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

End of guardrail beside shoulder / beginning of 50' guardrail curve location must be located graphically so that it can be identified when using program.

Usage:

Step 1. Draw in guardrail beside shoulder to location for beginning of 50' guardrail curve.

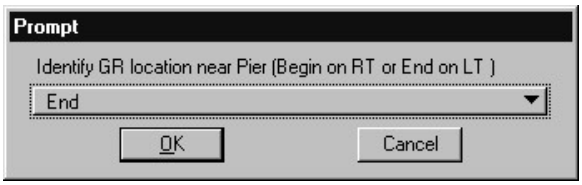
Step 2. In D&C manager activate **GR Med Br Piers**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.

Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

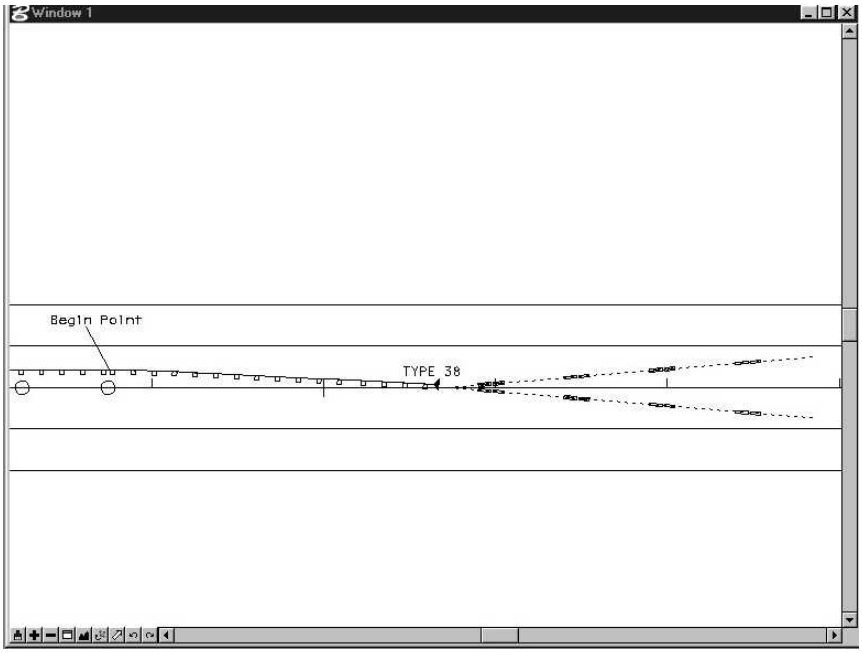
Step 5. You are then prompted for the median width (**30'. 36', 48', 60' or 64'**). This refers to distance between the inside edges of the proposed travel lanes. Pick the appropriate width from the list box and click **OK**.

Step 6. You are then prompted for the guardrail location near the bridge pier, **Begin** (on right bridge) or **End** (on left bridge). Pick the appropriate option from the list box and click **OK**.

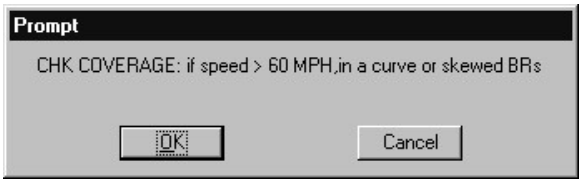


Step 7. Finally you are prompted to **Snap & Data end of regular GR. Snap** and **Data Point** at the end of the guardrail along the shoulder where the 50' guardrail curve begins.

All line work is plotted in the file based on the given information.



After completion of graphics the following warning message is given reminding the user that **if the roadway is in a curve, the bridges are skewed or if the design speed is greater than 60 miles per hour then the guardrail should be checked for adequate coverage of the hazard.**



Erosion Control

Erosion Control Device Cells

D&C location: Drafting Standards > Erosion Control > EC Device Cells

MicroStation VBA Program: ErosionControlCells.mvba

Description:

This program provides access to TDOT Design Division erosion control device cells.

Command buttons are provided to access the vba programs used to area pattern dewatering structures, erosion control blankets, turf reinforcement mats, slope surface roughening or rip-rap.

Command buttons are provided to access vba programs Draw Permanent Slope Drains, Draw Temporary Slope Drains, Place Filter Assembly by Catch Basin Type, Proposed Trees and Label Storm Water Outfalls.

A command button is provided to access the Erosion Control Legend cell dialog.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

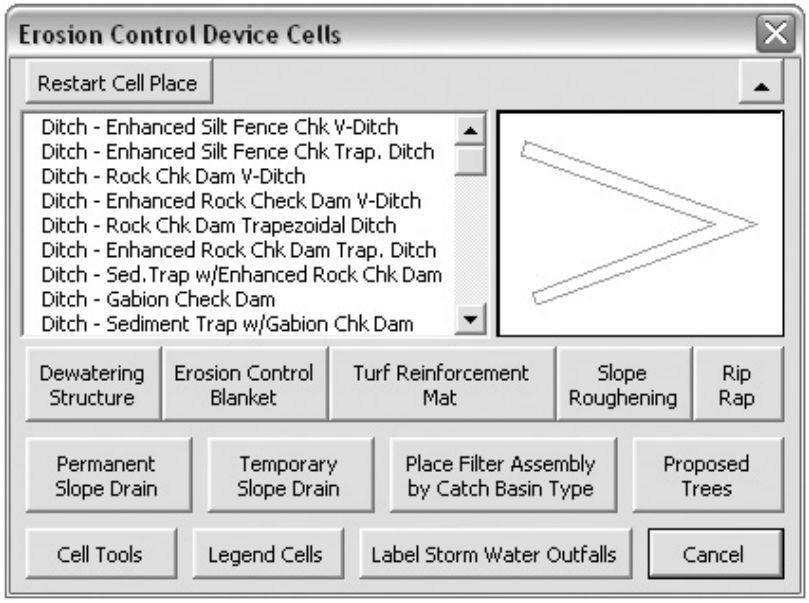
This program can also be activated from the MicroStation drop down menu
TDOT > Erosion Control > Device Cells
or by using the keyin
vba run [ErosionControlCells]ErosionCntrlcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **EC Device Cells**. The **Erosion Control Device Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation’s Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Erosion Control Legend Cells

D&C location: Drafting Standards > Erosion Control > EC Legend Cells

MicroStation VBA Program: ErosionControlLegendCells.mvba

Description:

This program provides access to TDOT Design Division erosion control legend cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

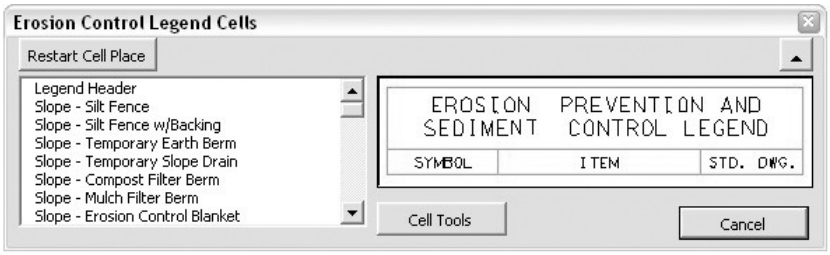
This program can also be activated from the MicroStation drop down menu
TDOT > Erosion Control > Legend Cells
or by using the keyin
vba run [ErosionControlLegendCells]ErosionCntrlLegendcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **EC Legend Cells**. The **Erosion Control Legend Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Draw Temporary Slope Drain

D&C location: Drafting Standards > Erosion Control > Tmp Slope Drain

MicroStation VBA Program: DrawTempSlopeDrain.mvba

Description:

This program draws in a temporary slope drain with inlet synmbol and optional rip-rap at the outlet end. The pipe is drawn in with the appropriate custom line style. Geopak Adhoc data for pay item number, description, unit and roadway side slope is added to the pipe line element so that quantities can be calulated later by Geopaks D&C Manager. The side slope value is used during final quantity calculations to adjust the measured horizontal length of pipe since these pipes follow the roadway slope.

On the Draw Temporary Slope Drain dialog is a command button for Pay Item Info. When the user clicks on this option, the User Specified Pay Item Values dialog opens. This dialog contains fields for entering pay item number, description, unit and roadway side slope information. A Modify Pay Item Values command button is provided to change data assigned to previously placed graphics. The Read Element command button on the dialog is provided to check the pay item values from slope drains placed previously. For both of these functions, once activated, identify any slope drain and its values are changed or read and used to populate the dialog.

This macro can also be activated from the MicroStation drop down menu
TDOT > Erosion Control > Temporary Slope Drains
or by using the keyin
vba run [DrawTempSlopeDrain]TempSlopeDrain.main

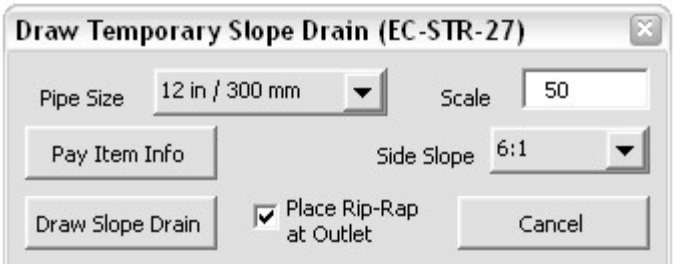
Special Requirements:

The slope lines and earth berm lines must be drawn/located in the plan view.

Usage:

Step 1. In D&C manager activate **Tmp Slope Drain**. The **Draw Temporary Slope Drain** dialog opens**.**

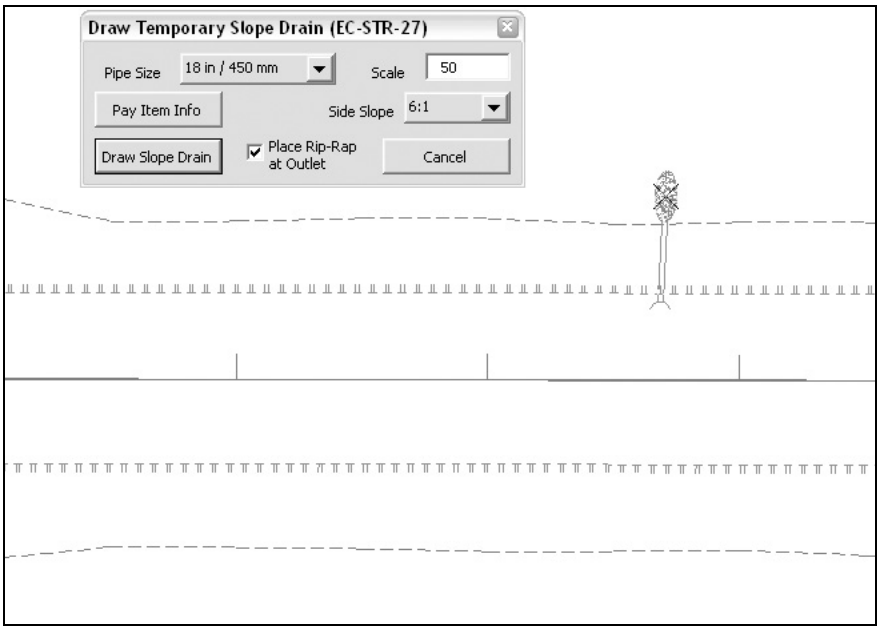
Defaults are set to **Pipe Size: 12 in/300 mm** and **Side Slope: 6:1. Scale** defaults to active scale set in the MicroStation DGN file.



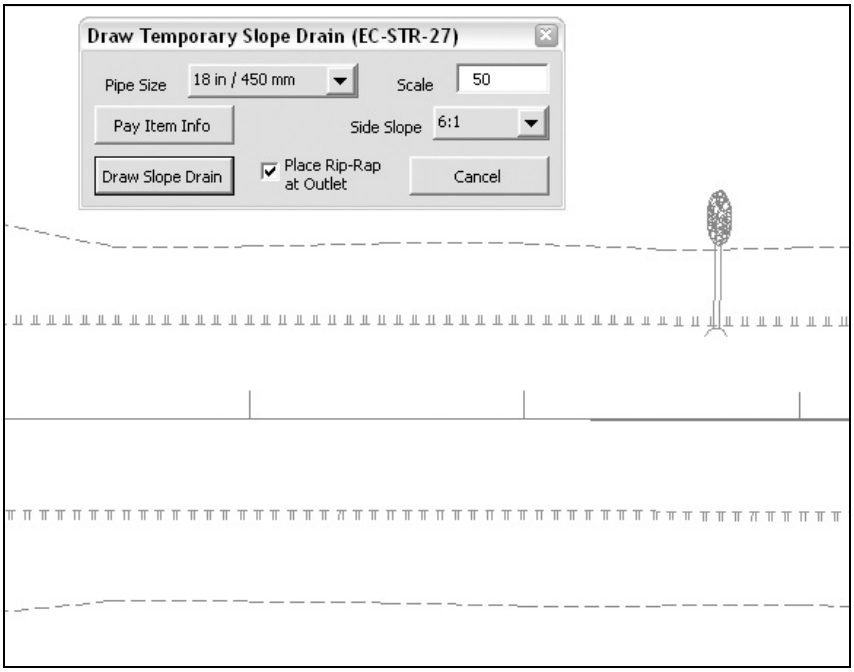
Step 2. Make settings in the dialog as needed for the slope drain you need to draw. Once settings are made click on the **Draw Slope Drain** button.

Step 3. You are then prompted to **Identify Point at Inlet**. **Data point** at the location where the inlet is to be placed.

Step 4. After the initial data point, the inlet, pipe are and rip-rap outlet pad are shown dynamically and the user is prompted to **Identify Outlet point**. **Data point** at the location for the outlet.



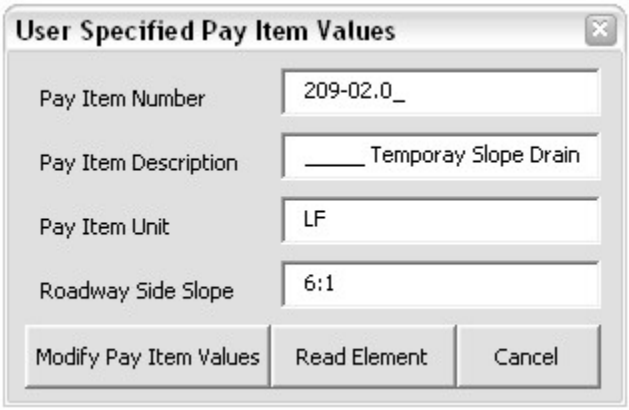
Step 6. After giving this last point, all slope drain graphics are placed in the file.



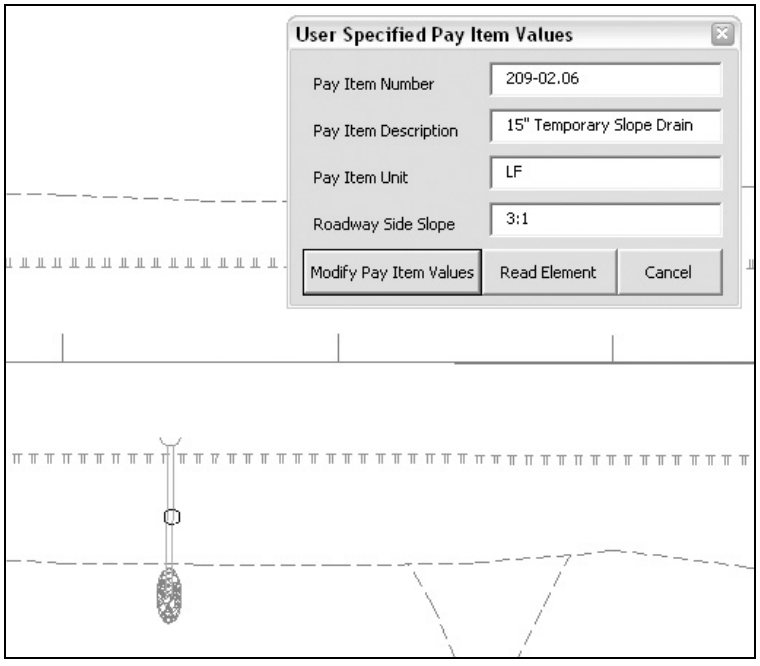
Step 7. You can adjust settings if needed and continue to place additional slope drains.

Usage: Pay Item Info

Step 1. If you wish to assign, modify or just check the pay item values which are assigned to a slope drain, click on the **Pay Item Info** command button on the Draw Temporary Slope Drain dialog. The **User Specified Pay Item Values** dialog opens. This dialog contains fields for entering pay item number, description, unit and roadway side slope information.

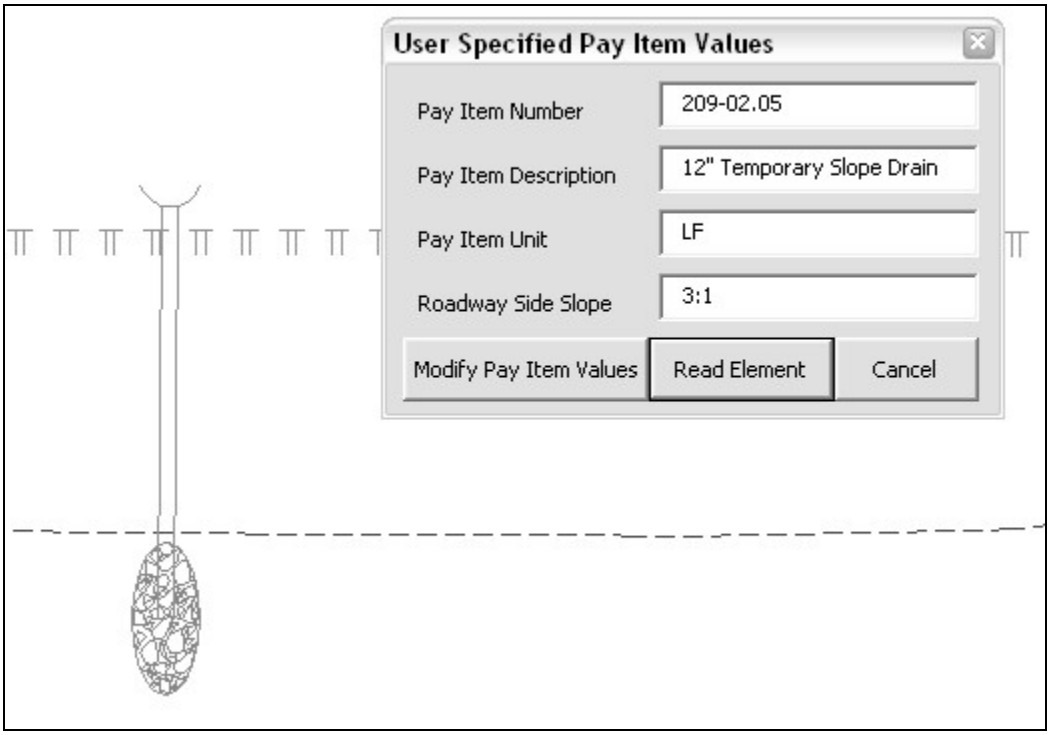


Step 2. To assign or modify the pay item values for a slope drain, first enter the information in the data entry fields provided. Any standard item number for slope drain pipe will automatically update the description field. When data has been entered, click on the **Modify Pay Item Values** command button and you are prompted to **Data point on slope drain pipe.** Data point on the slope drain pipe.



Once identified, **Data point** again to accept and assign the pay item values. This function can be used to assign pay item values to slope drains that were placed prior to the implementation of this tool.

Step 3. To check the pay item values assigned to a slope drain that has been placed previously, then click the **Read Element** command button on the User Specified Pay Item Values dialog. The user is prompted to **Data point on slope drain pipe**. Once accepted, the pay item values are read from the pipe element and are used to populate the dialog.



Place Filter Assembly by CB Type

D&C location: Drafting Standards > Erosion Control > Place FA by CB

MicroStation VBA Program: IDCBandPlaceFilterAssembly.mvba

Description:

This program places the appropriate erosion control filter assembly cell for any identified catch basin cell. The catch basin cells are placed automatically when defined with Geopak Drainage. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of cells.

This program can also be activated from the MicroStation drop down menu
TDOT > Erosion Control > Place Filter Assembly by CB Type
or by using the keyin
vba run [IDCBandPlaceFilterAssembly]IDandPlaceFA.main

Special Requirements:

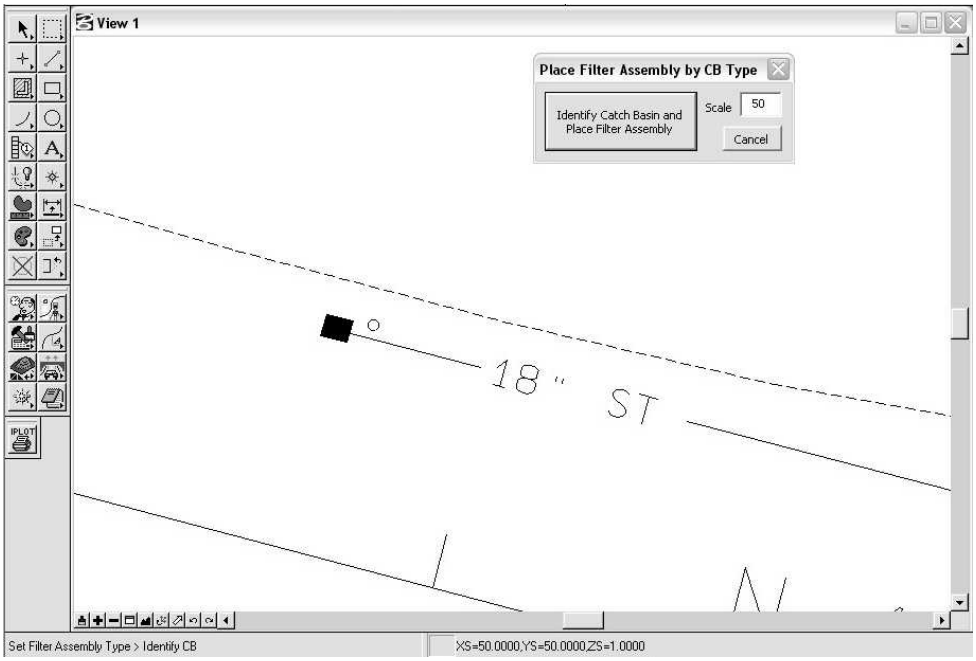
Previous placement of special catch basin cells which indicate size of sub-structure.

Usage:

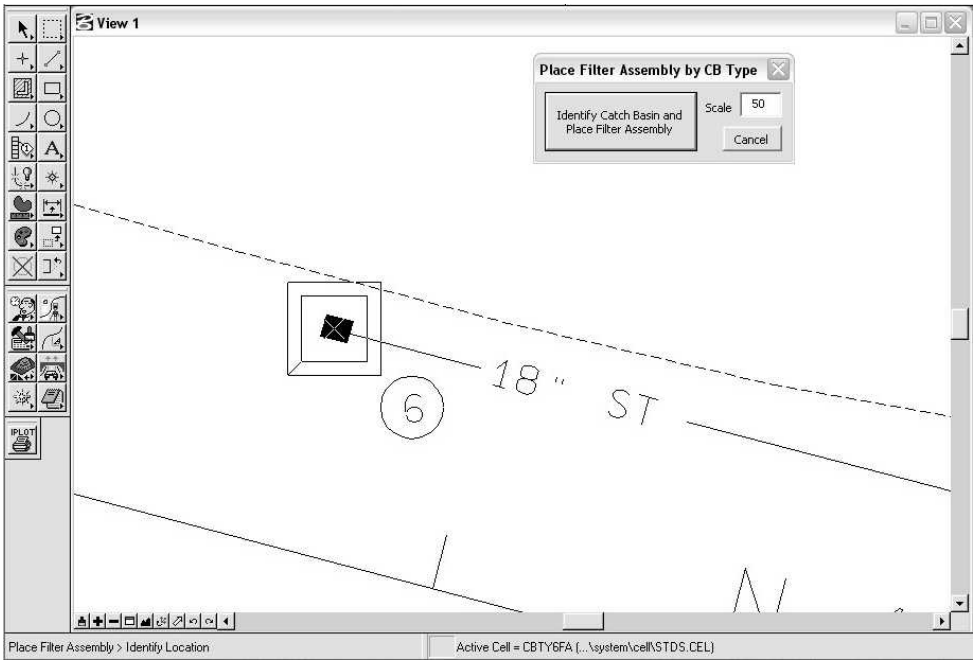
Step 1. In D&C manager activate **Place FA by CB**. The **Place Filter Assembly by CB Type** dialog appears.

Step 2. Check the scale and then click on the **Identify Catch Basin and Place Filter Assembly** command button to start.

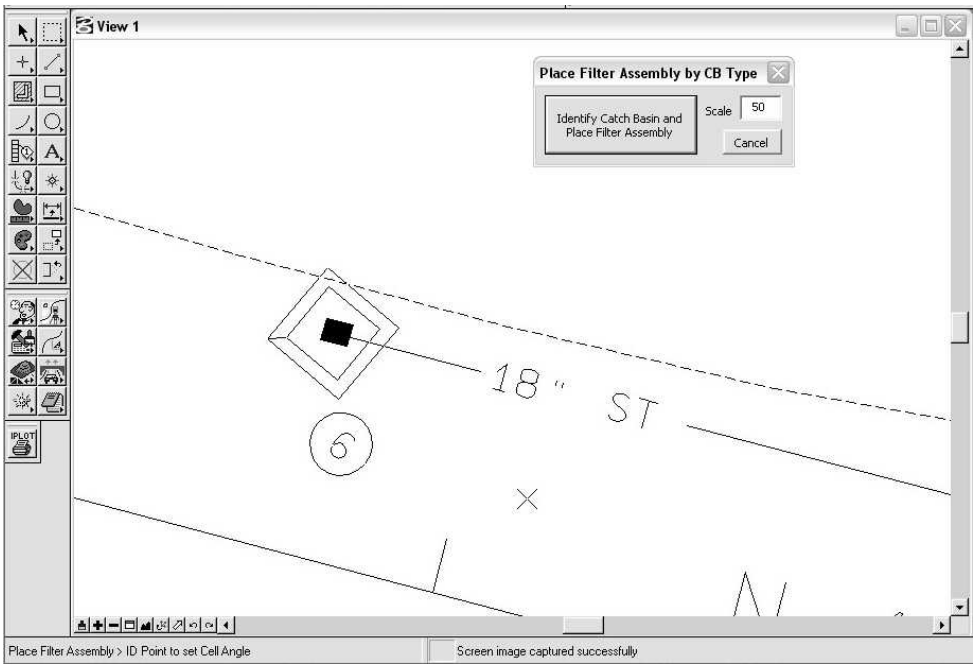
Step 3. The user is first prompted to **Identify CB**. Data point on the catch basin cell.



Step 4. When a data point is given to accept the cell, the program reads the cell name and then activates the appropriate filter assembly cell which appears dynamically on the cursor point. You are then prompted to **Identify Location** for placement. Data point near the center of catch basin symbol.



Step 5. Once this point is given, the filter assembly cell is put into a spin and you are prompted to **Identify Point to set Cell Angle**.



This final point finishes placement of the filter assembly cell and your are again prompted to Identify CB, allowing you to continue placements.

Label EPSC Storm Water Outfalls

D&C location: Drafting Standards > Erosion Control > Label Outfalls

MicroStation VBA Program: LabelEPSCStormWaterOutfalls.mvba

Description:

This program places storm water outfall labels on EPSC sheets. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the text size and arrowhead size in the label. All graphics are added to a graphic group. An option is provided to increment the number in the label after each placement.

If the initial scale given was in error, it is necessary to re-start the command by clicking on the Place Label command button after resetting the given scale value.

This macro can also be activated from the MicroStation drop down menu
TDOT > Erosion Control > Label Storm Water Outfalls
or by using the keyin
vba run [LabelEPSCStormWaterOutfalls]LabelOutfalls.main

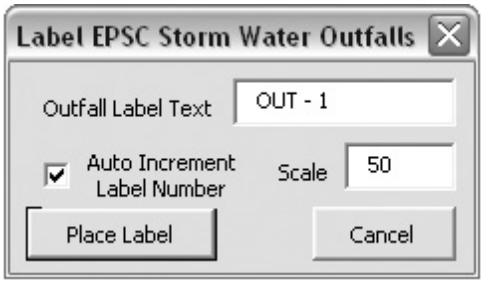
Special Requirements:

None

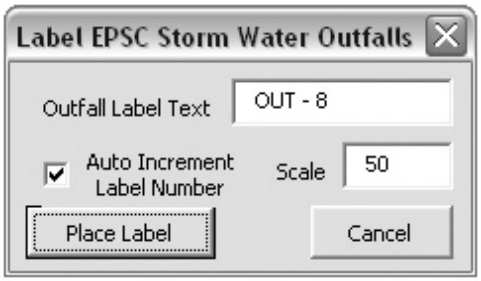
Usage:

Step 1. In D&C manager activate **Label Outfalls**. The **Label EPSC Storm Water Outfalls** dialog opens**.**

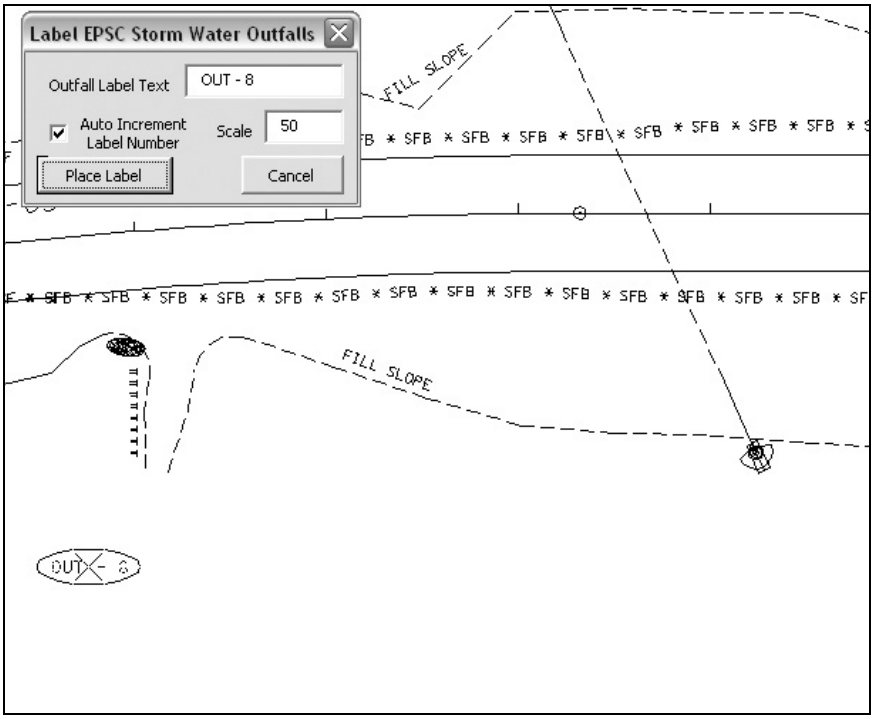
The Outfall Label Text is set to **OUT - 1** by default**. Scale** defaults to active scale set in the MicroStation DGN file.



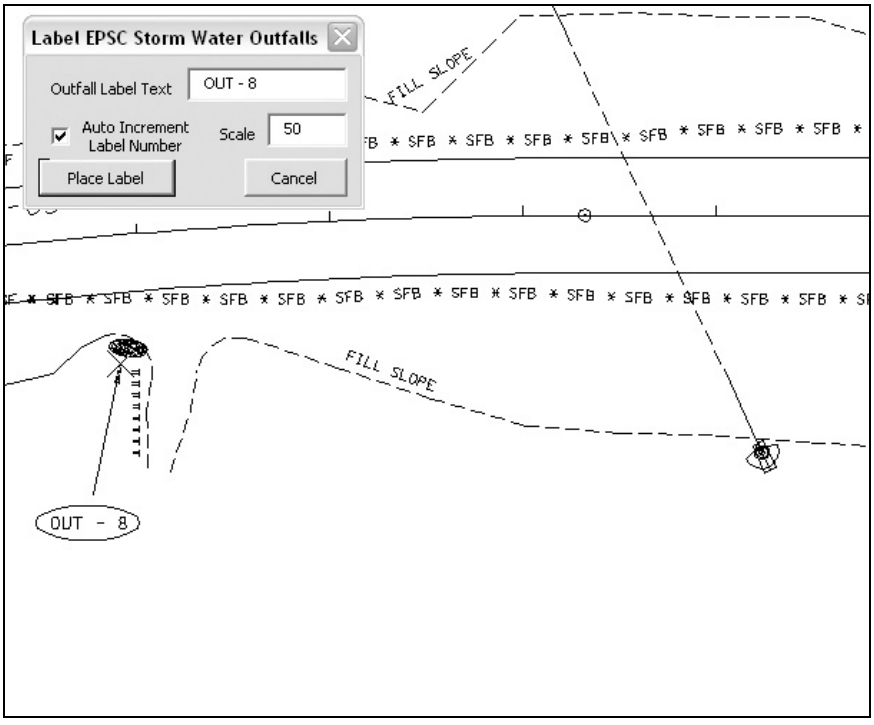
Step 2. Make settings in the dialog as needed. Set the beginning outfall number and if desired change the prefix text or add a suffix letter. If more than one outfall needs to be labeled with that number, turn off the **Auto Increment Label Number** option. Reset the **Scale** if not correct. Once settings are made, click on the **Place Label** button.



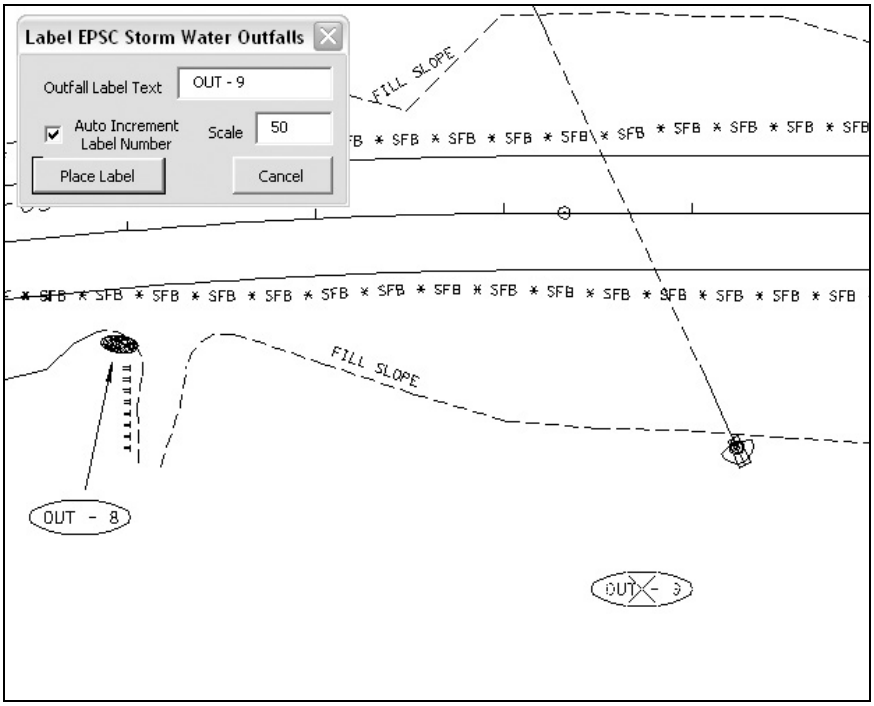
Step 3. The label text in an ellipse shows dynamically on the cursor and you are prompted to **Identify Location**. **Data point** at the location for the label text.



Step 4. After the initial data point, the leader line with arrowhead is shown dynamically and the user is prompted to **Place Leader end point**. **Data point** at the location for the leader line end.



Step 6. After giving this last point, the leader line and arrowhead are placed in the file.



Step 7. If the **Auto Increment Label Number** option is clicked on, the label text is updated to the next number preserving the current prefix and any suffix the text label may contain. You can continue to place additional labels.

If the increment option is off and you need to place additional labels there, update the suffix letter and place the label(s).

Whenever you stop placement temporarily to do other things, the **Place Label** button can be clicked to restart labeling storm water outfalls.

Pattern Dewatering Structure

D&C location: Drafting Standards > Erosion Control > Dewatering Stru

MicroStation VBA Program: AreaPatterns.mvba

Description:

This application sets the area pattern parameters and active level needed to pattern a dewatering structure and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Erosion Control > Dewatering Structure AP
using the keyin
vba run [AreaPatterns]DewateringStructure.SetPattern

Special Requirements:

This item used with D&C Manager's **Place influence** mode can be used along with MicroStation to define the dewatering structure limit with a shape or other elements prior to applying pattern using program.

Depending on the method of area pattern placement to be used take the following actions:

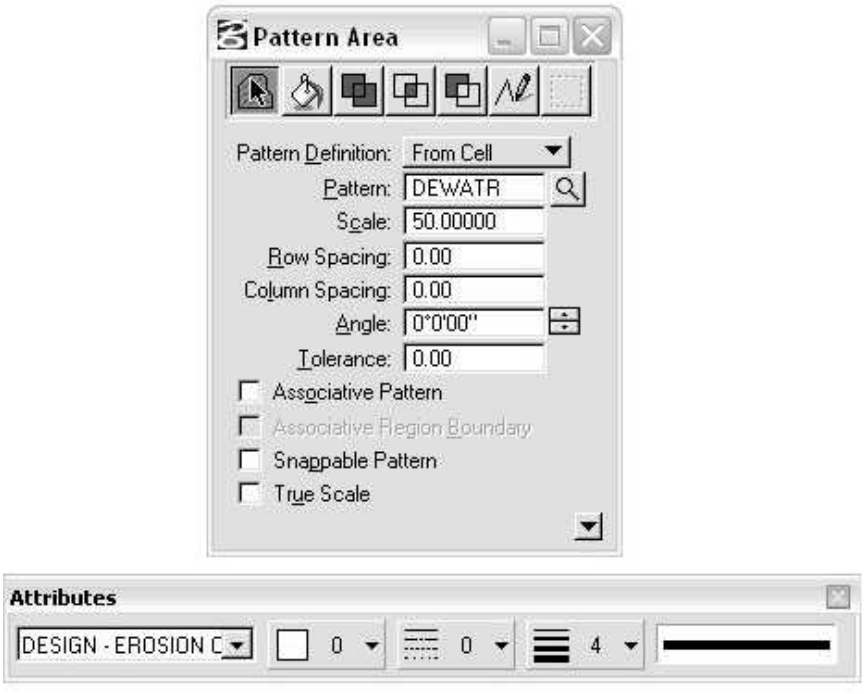
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

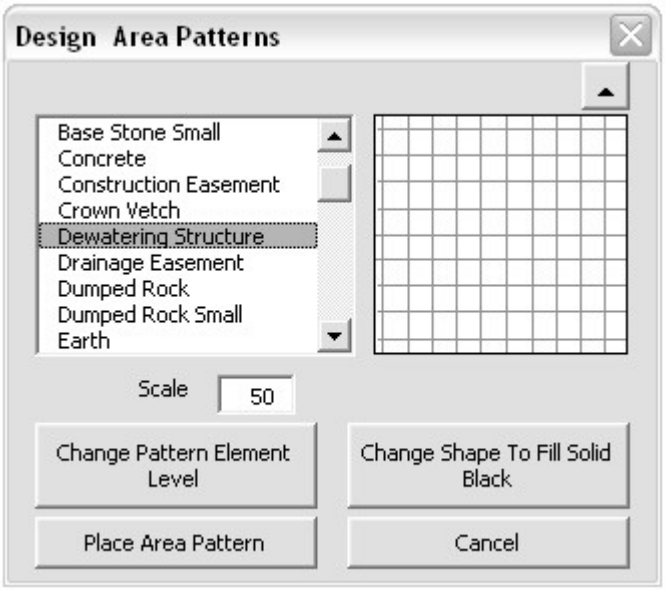
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Dewatering Stru**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

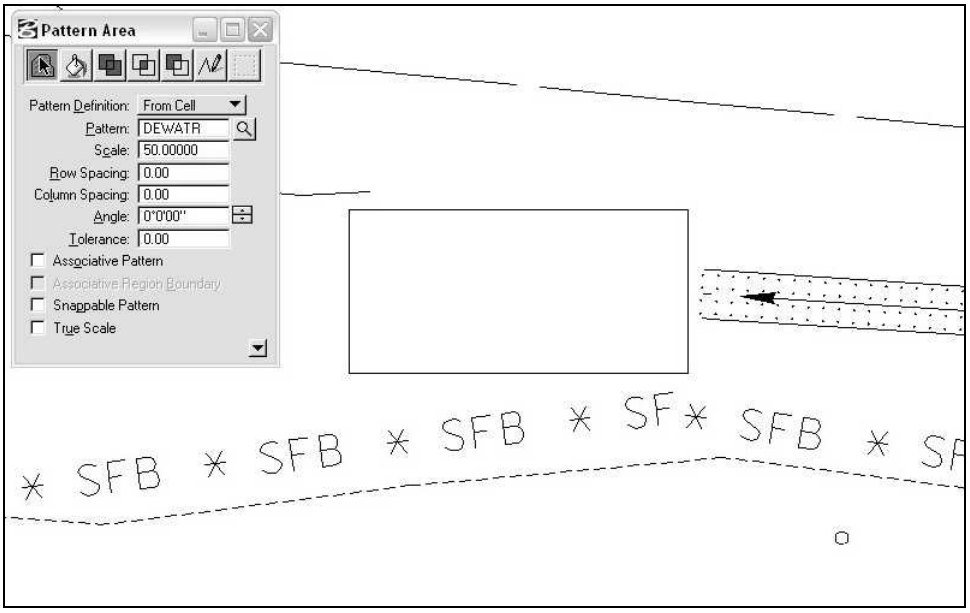


Or from the drop down menu in the **Design Area Patterns** dialog …

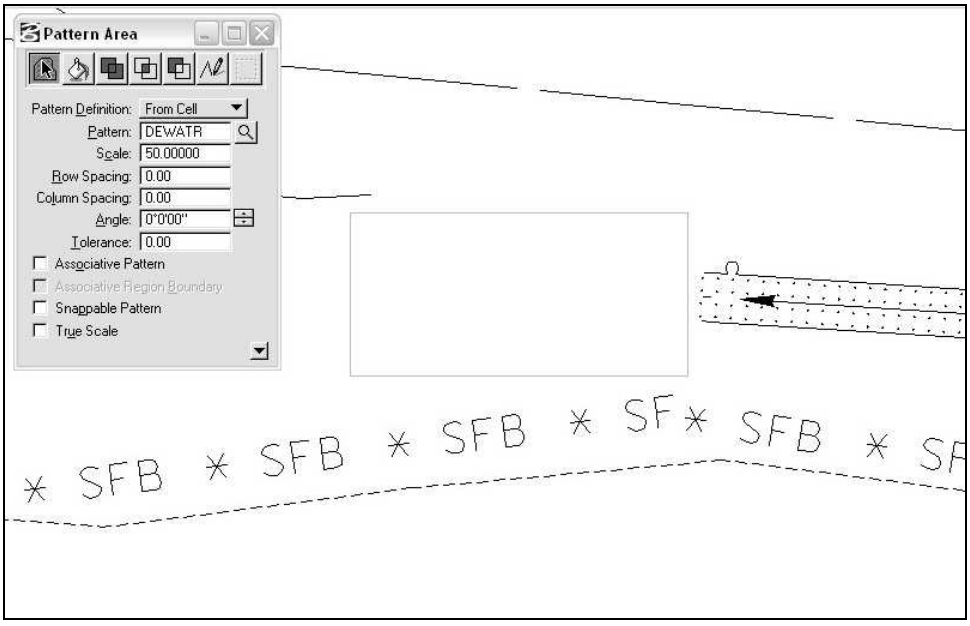


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Element**.

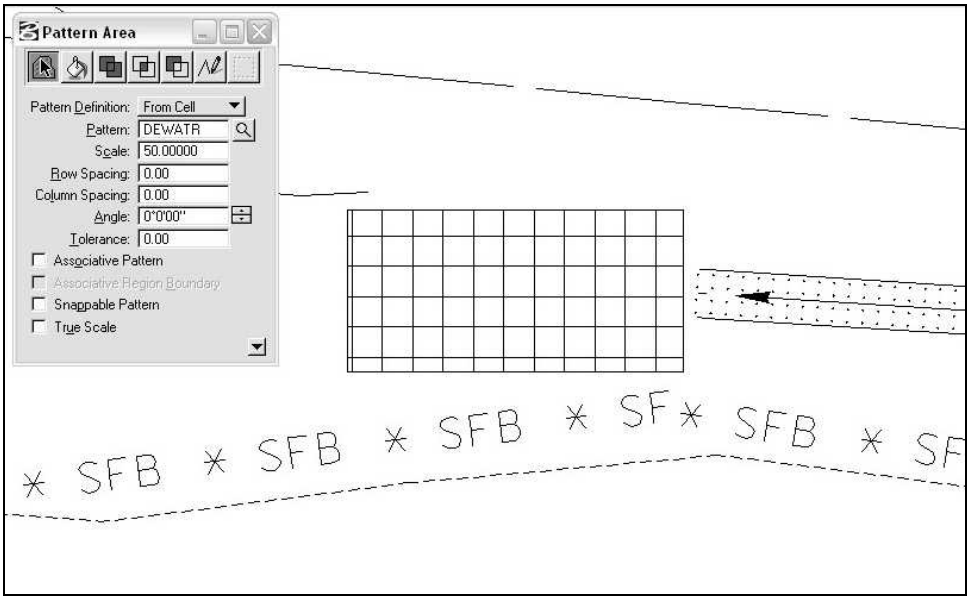
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Element, the user is prompted to **Identify Element**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Slope Surface Roughening Area

D&C location: Drafting Standards > Erosion Control > Slope Roughen

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a slope surface roughening area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Erosion Control > Slope Surface Roughening AP
or by using the keyin
vba run [AreaPatterns]SlopeSurfaceRoughening.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

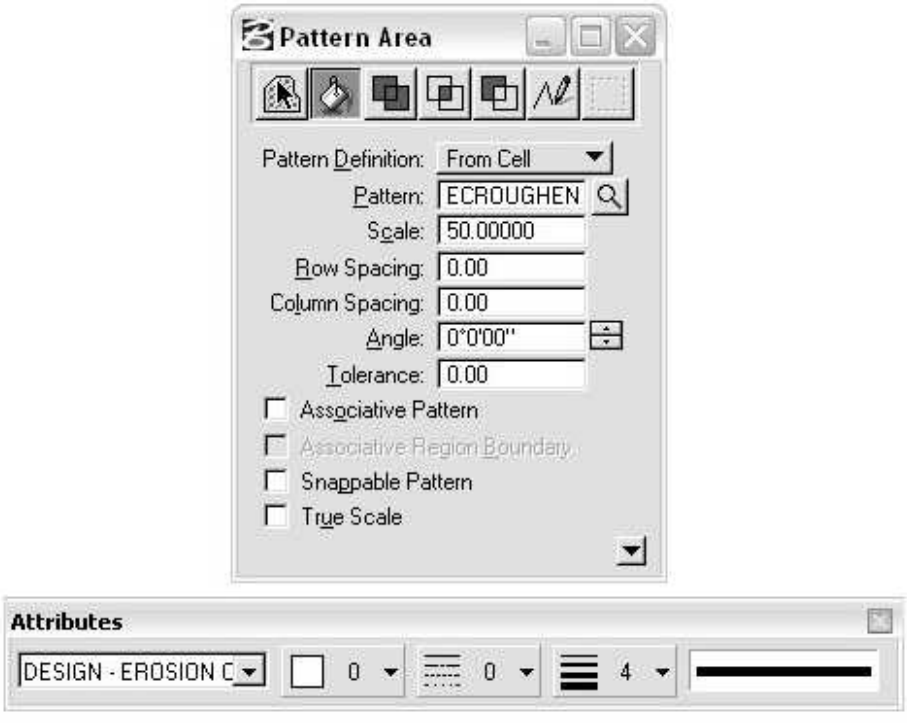
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

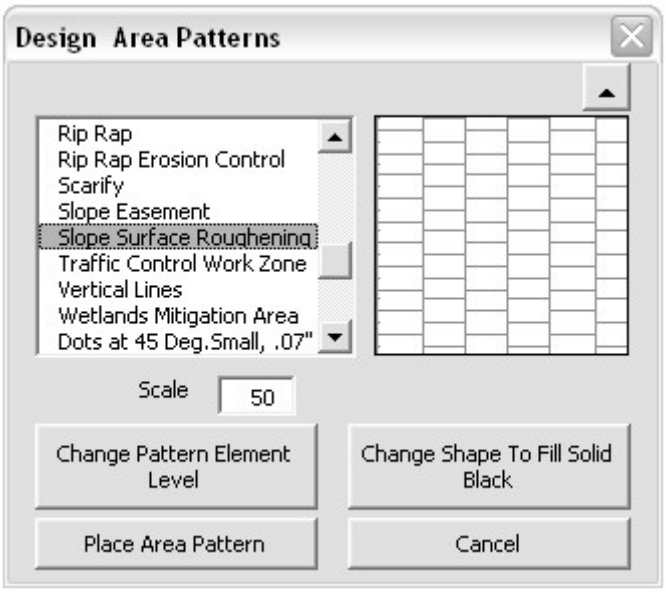
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Slope Roughen**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

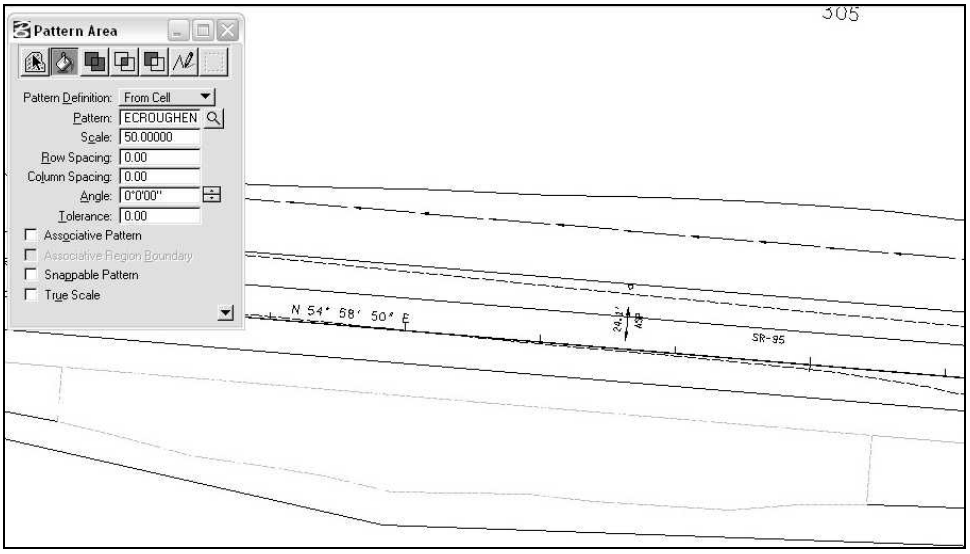


Or from the drop down menu in the **Design Area Patterns** dialog …

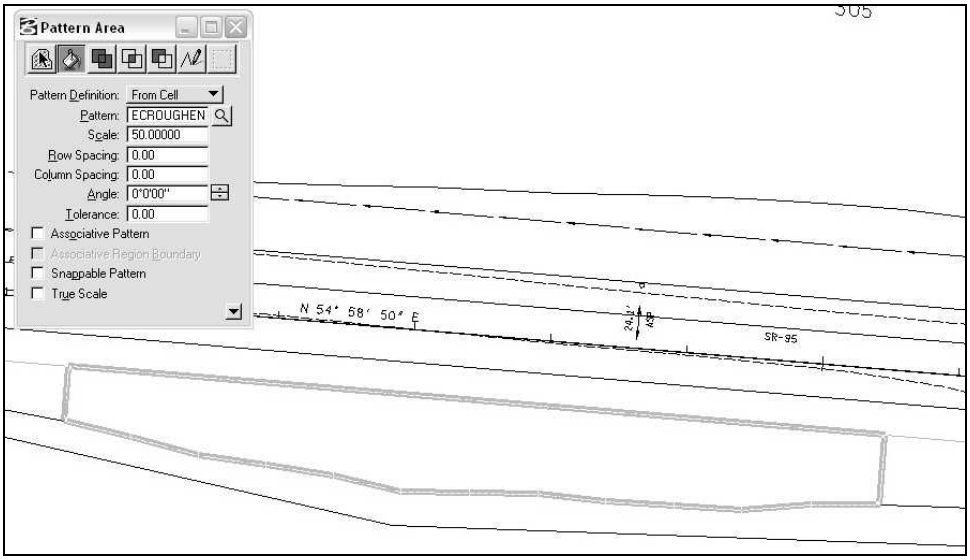


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

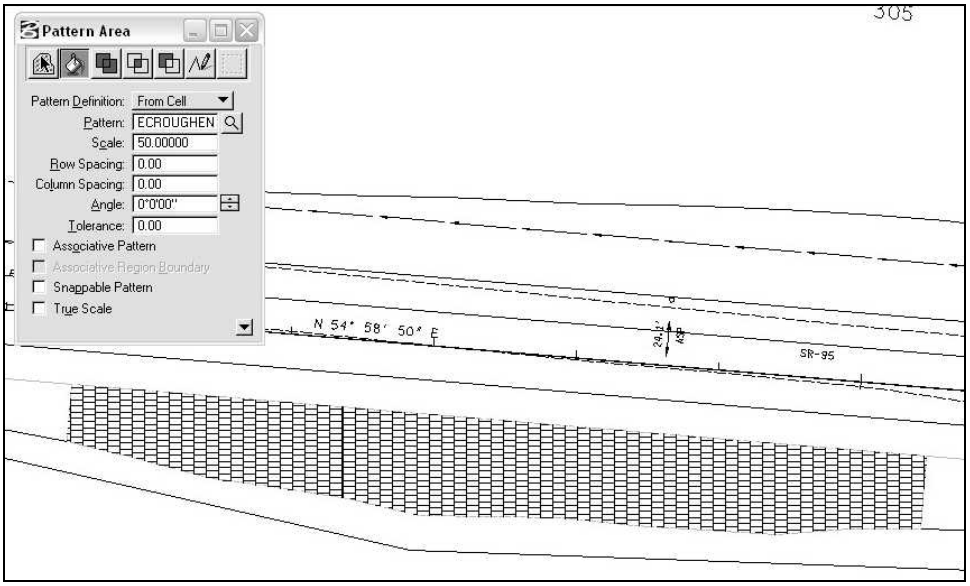
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Erosion Control Rip-Rap Area

D&C location: Drafting Standards > Erosion Control > EC Rip-Rap Area

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern an erosion control rip-rap area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Erosion Control > Rip-Rap AP
or by using the keyin
vba run [AreaPatterns]RipRapEC.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

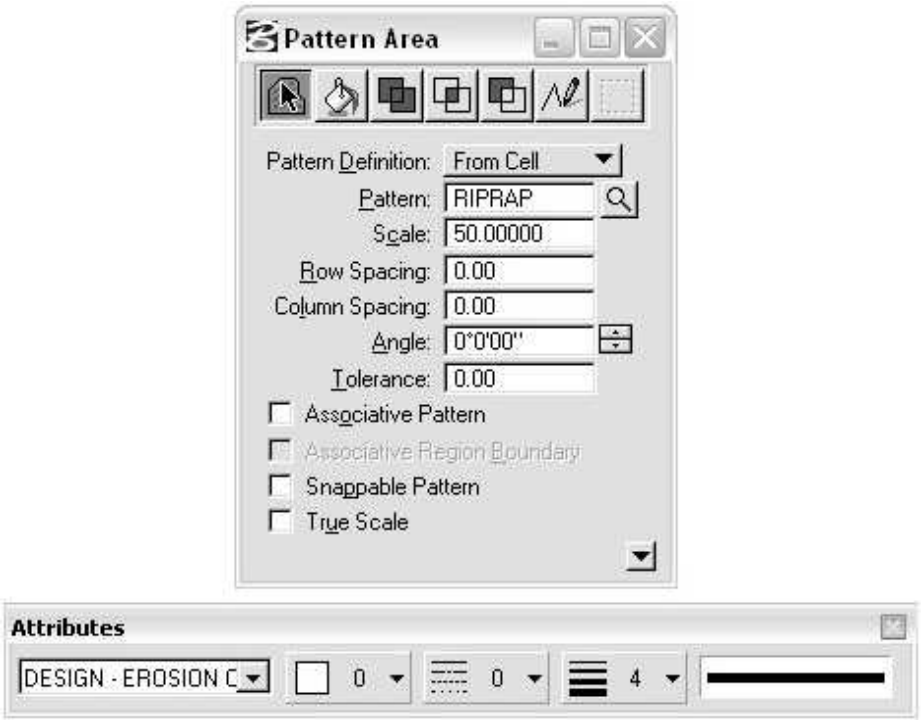
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

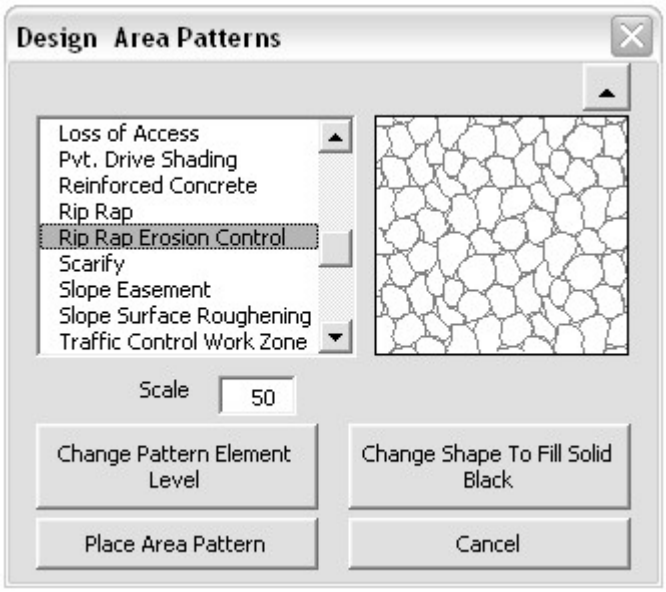
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **EC Rip-Rap Area**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

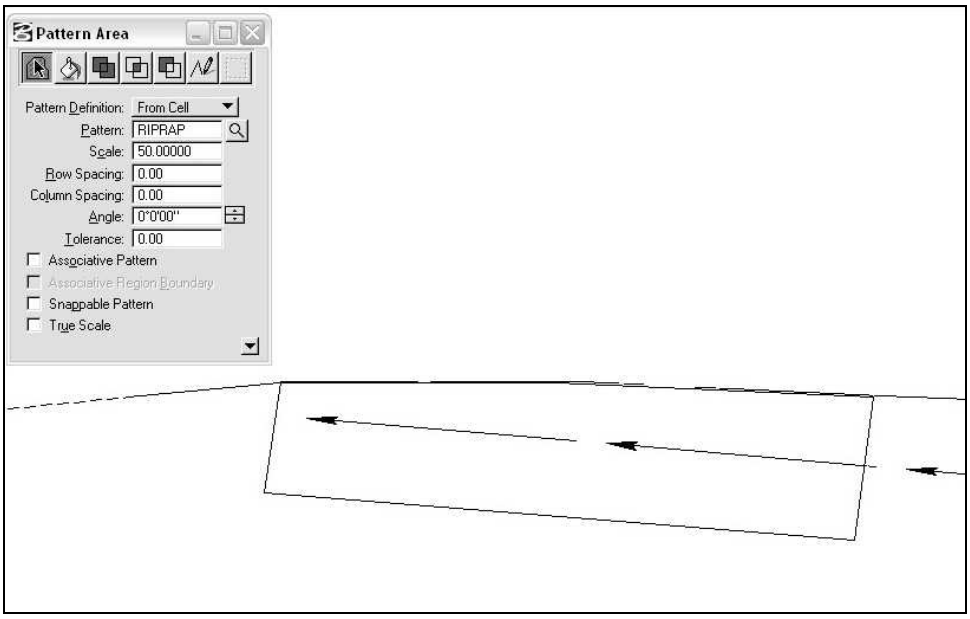


Or from the drop down menu in the **Design Area Patterns** dialog …

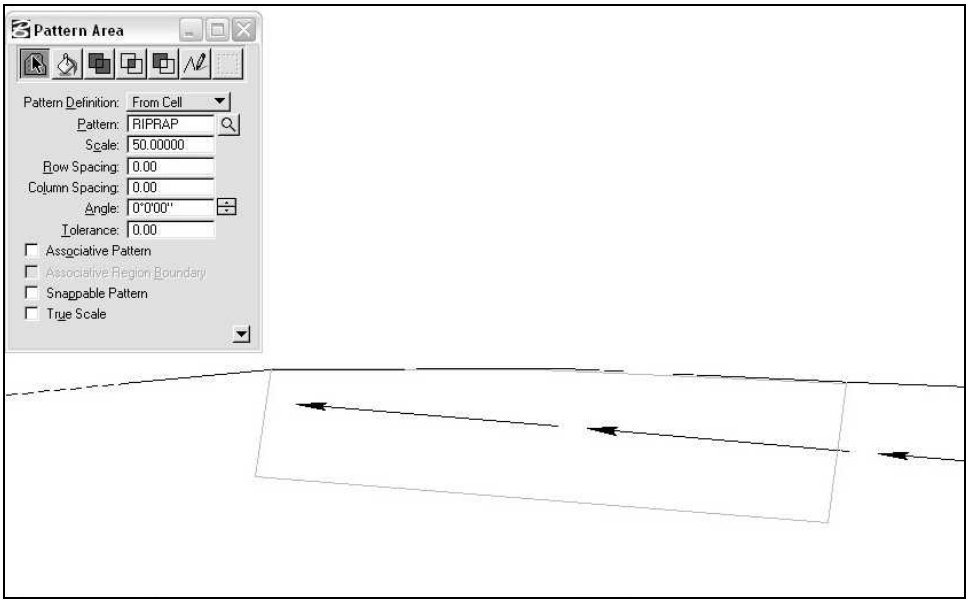


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Element**.

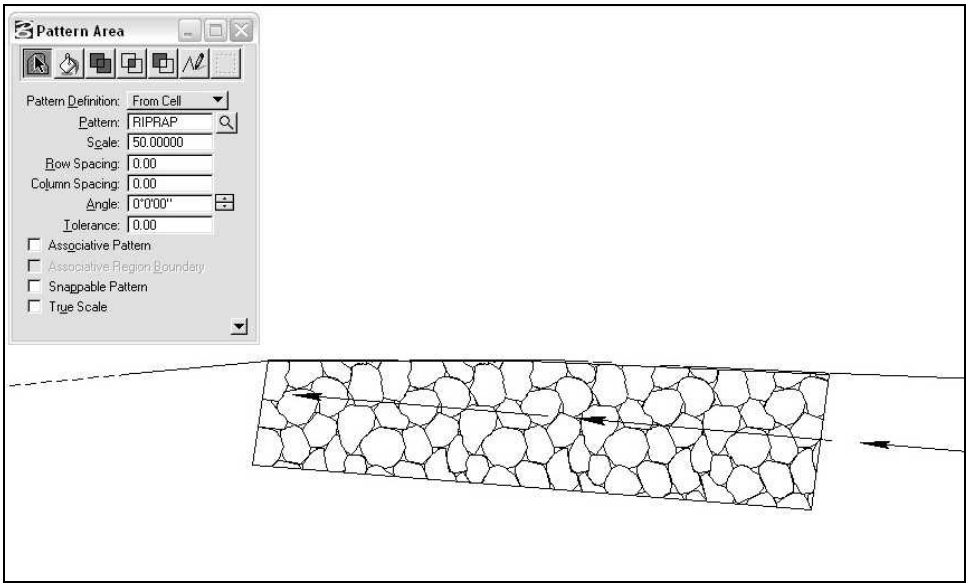
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Element, the user is prompted to **Identify Element**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Draw Permanent Slope Drain

D&C location: Drafting Standards > Erosion Control > Perm Slope Drain

MicroStation VBA Program: DrawPermSlopeDrain.mvba

Description:

This program draws in a permanent slope drain with inlet symbol and rip-rap pad at the outlet end. The pipe is drawn in with the appropriate custom line style. Geopak Adhoc data for pay item number, description, unit and roadway side slope is added to the pipe line element so that quantities can be calculated later by Geopak's D&C Manager. The pipe size and side slope value are used to calculate the 45 degree bend location in the slope drain pipe. During final quantity calculations the side slope is used to adjust the measured horizontal length of pipe since these pipes follow the roadway slope.

On the Draw Permanent Slope Drain dialog is a command button for Pay Item Info. When the user clicks on this option, the User Specified Pay Item Values dialog opens. This dialog contains fields for entering pay item number, description, unit and roadway side slope information. A Modify Pay Item Values command button is provided to change data assigned to previously placed graphics. The Read Element command button on the dialog is provided to check the pay item values from slope drains placed previously. For both of these functions, once activated, identify any slope drain and its values are changed or read and used to populate the dialog.

This macro can also be activated from the MicroStation drop down menu
TDOT > Eroasion Control > Permanent Slope Drains
or by using the keyin
vba run [DrawPermSlopeDrain]PermSlopeDrain.main

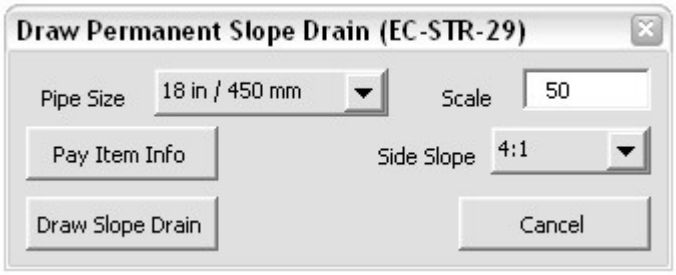
Special Requirements:

The slope lines and ditch line must be drawn/located in the plan view.

Usage:

Step 1. In D&C manager activate **Perm Slope Drain**. The **Draw Permanent Slope Drain** dialog opens**.**

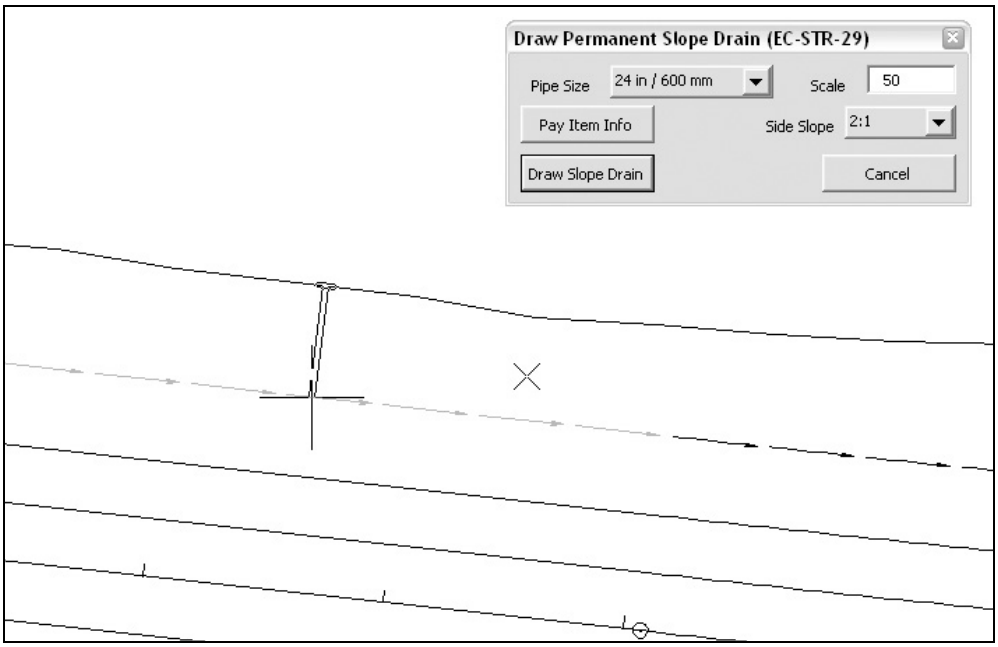
Defaults are set to **Pipe Size: 18 in/450 mm** and **Side Slope: 4:1. Scale** defaults to active scale set in the MicroStation DGN file.



Step 2. Make settings in the dialog as needed for the slope drain you need to draw. Once settings are made click on the **Draw Slope Drain** button.

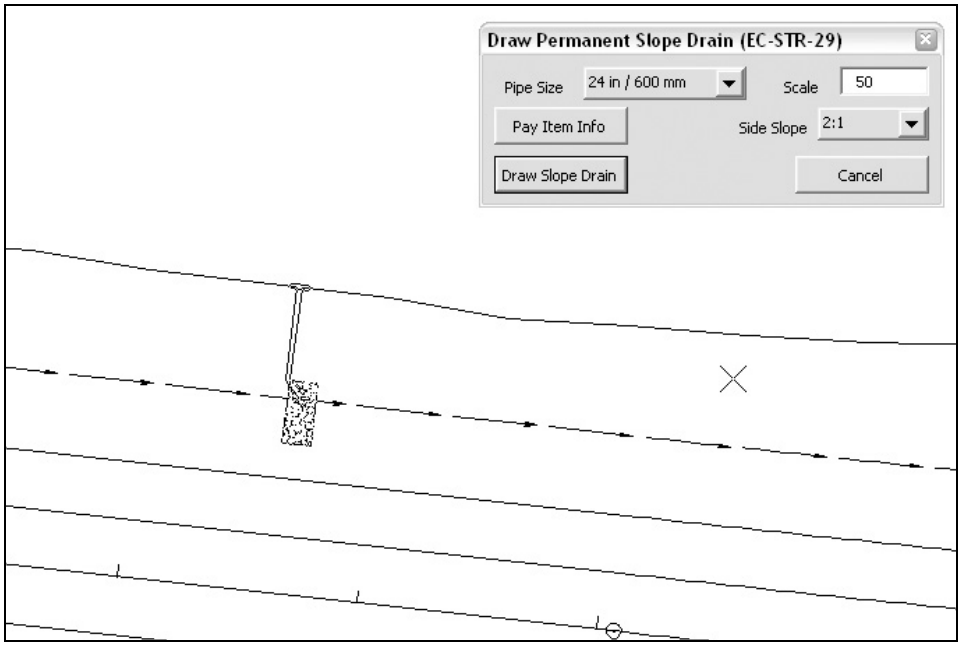
Step 3. You are then prompted to **Identify Point at Inlet**. **Snap** and **Data point** at the slope line location where the inlet is to be placed.

Step 4. After the initial data point, the inlet and pipe are shown dynamically and the user is prompted to **ID Point Perpendicular at Ditch**. **Snap** and **Data point** at the ditch line location where the pipe is perpendicular to the ditch.

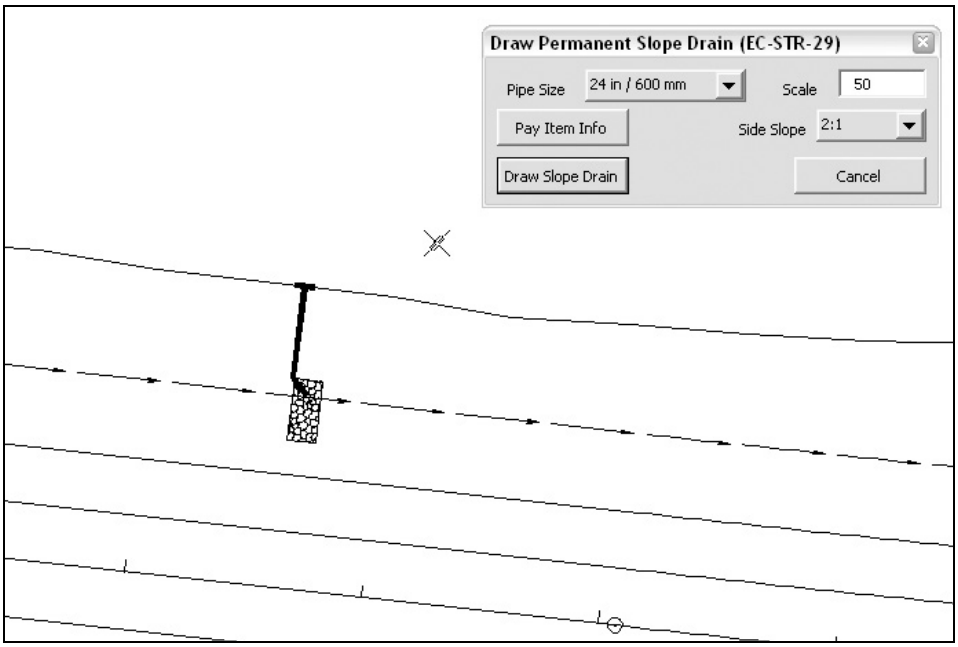


The program then uses the settings given for side slope & pipe size to calculate the 45 degree bend location in the pipe back from the ditch.

Step 5. The completed slope drain pipe with rip-rap outlet pad is shown dynamically and the user is prompted to **ID Side\Direction for Outlet**. **Data point** to indicate the direction of flow in the ditch.



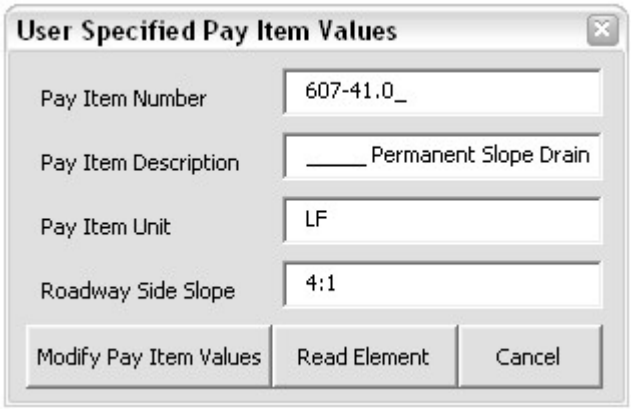
Step 6. After giving this last point, all slope drain graphics are placed in the file.



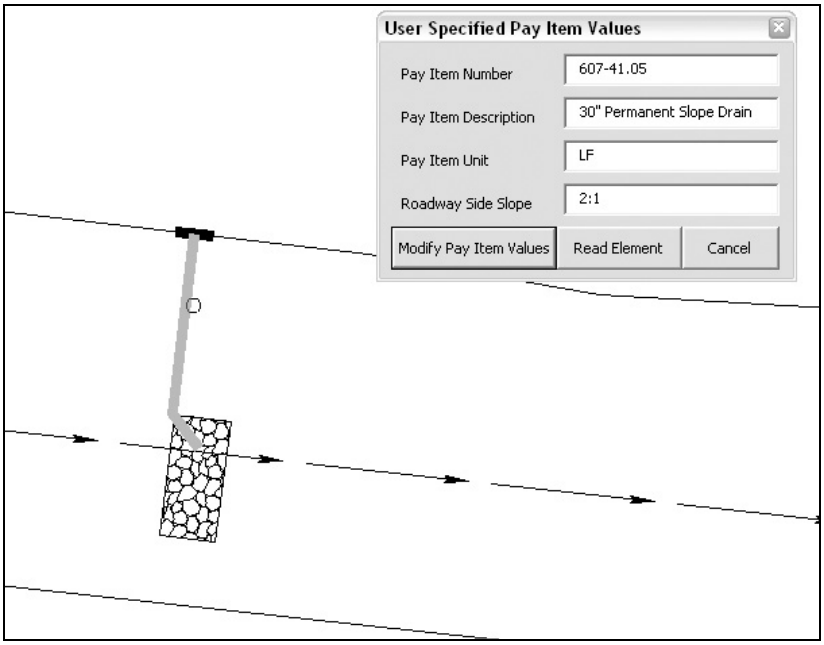
Step 7. You can adjust settings if needed and continue to place additional slope drains.

Usage: Pay Item Info

Step 1. If you wish to assign, modify or just check the pay item values which are assigned to a slope drain, click on the **Pay Item Info** command button on the Draw Permanent Slope Drain dialog. The **User Specified Pay Item Values** dialog opens. This dialog contains fields for entering pay item number, description, unit and roadway side slope information.

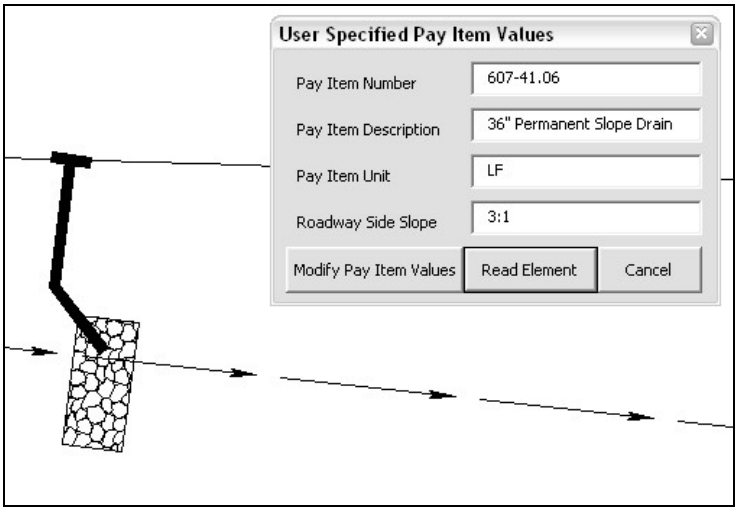


Step 2. To assign or modify the pay item values for a slope drain, first enter the information in the data entry fields provided. Any standard item number for slope drain pipe will automatically update the description field. When data has been entered, click on the **Modify Pay Item Values** command button and you are prompted to **Data point on slope drain pipe.** Data point on the slope drain pipe.



Once identified, **Data point** again to accept and assign the pay item values. This function can be used to assign pay item values to slope drains that were placed prior to the implementation of this tool.

Step 3. To check the pay item values assigned to a slope drain that has been placed previously, then click the **Read Element** command button on the User Specified Pay Item Values dialog. The user is prompted to **Data point on slope drain pipe**. Once accepted, the pay item values are read from the pipe element and are used to populate the dialog.



Place Proposed Trees

D&C location: Drafting Standards > Erosion Control > Place Prop Trees

MicroStation VBA Program: PlaceProposedTrees.mvba

Description:

This program places proposed trees and adds Geopak adhoc data for pay item number, description, unit and quantity information to the cell element. This data is used later by Geopak's D&C Manager to compile final quantities. The size of the tree cell is controlled by the current active scale which is shown on the dialog for adjustment as needed.

At the end of the list on the Place Proposed Tree dialog is an option for a user specified tree. When the user clicks on this option, the User Specified Pay Item Values dialog opens. This dialog contains fields for entering pay item number, description, unit and quantity information. Once data is entered the user must click on the Apply Pay Item Values command button to assign the values entered and re-start the Place Tree function. The Read Element command button on the dialog is provided in case the user wishes to duplicate the pay item values from a tree placed previously. Once activated, identify any tree and its values are used to populate the dialog. This can also be used to just check trees already placed.

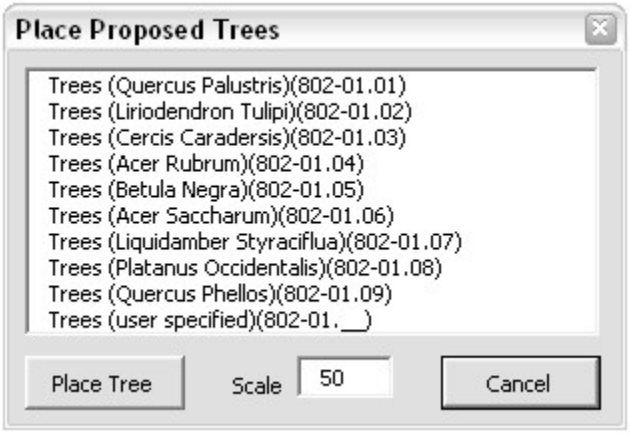
This program can also be activated from the MicroStation drop down menu
TDOT > Erosion Control > Place Proposed Trees
or by using the keyin
vba run [PlaceProposedTrees]PropTrees.main

Special Requirements:

None.

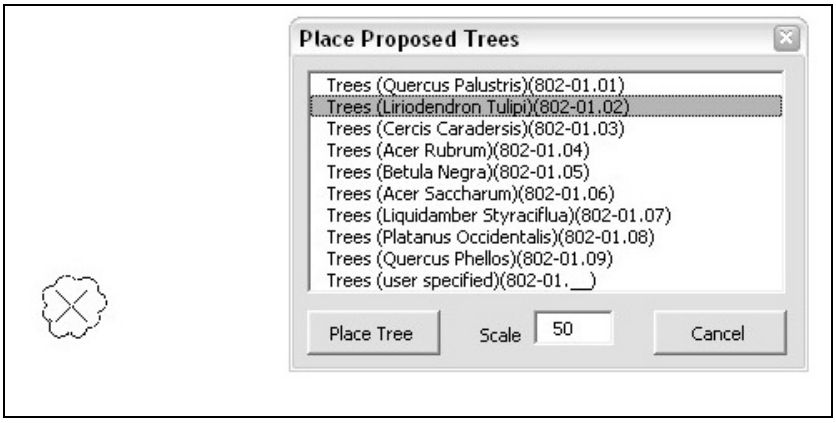
Usage:

Step 1. In D&C manager activate **Place Prop Trees**. The **Place Proposed Trees** dialog appears.



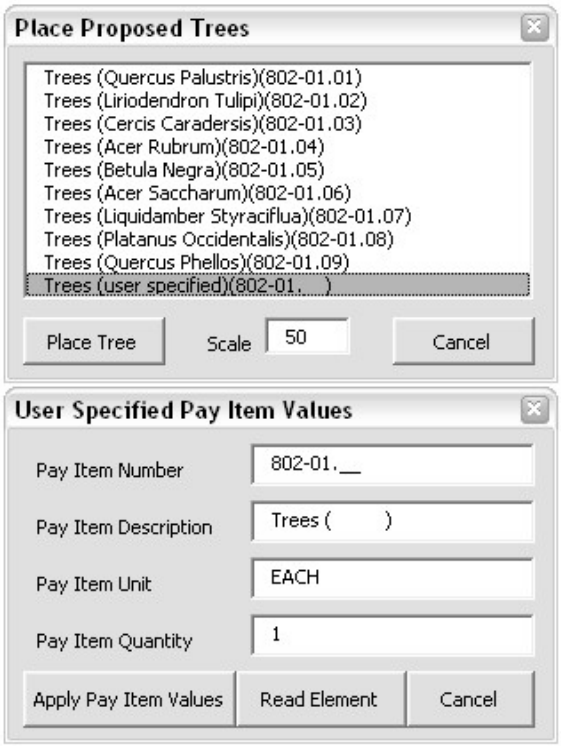
The current active scale is read and populated in the **Scale** key in field. Adjust the scale as needed.

Step 2. The Place Proposed Tree dialog includes all standard proposed tree pay items which can be chosen for placement. After selection, the Place Tree function is activated so that the chosen tree can be placed. **Data point** when satisfied with the location.

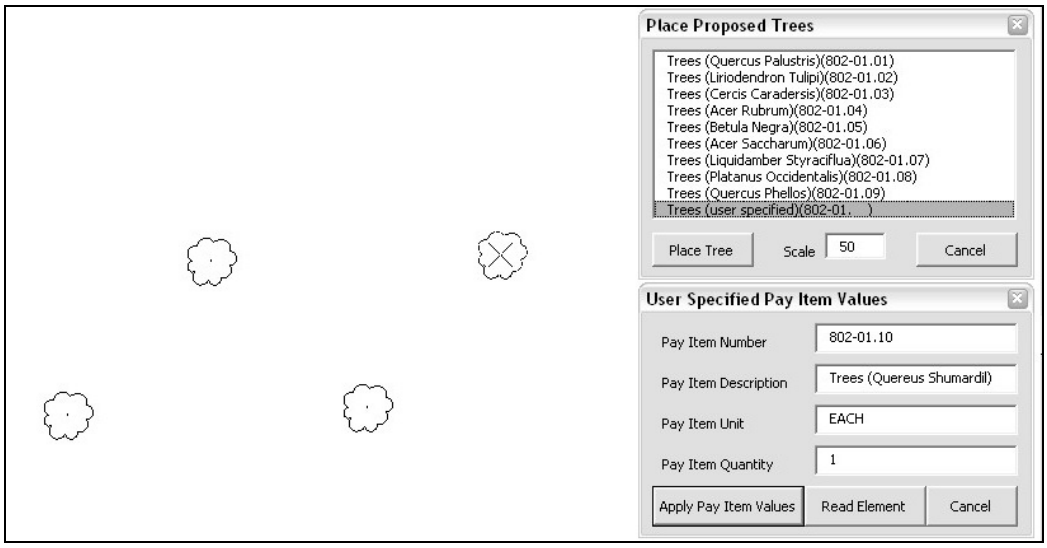


At any time, the user can pick a different tree type for placement. The Place Tree command button is provided so that when other MicroStation tools are used, the Place Tree function can be re-started.

Step 3. If proposed trees other than the standard genus species are required then the user can pick the last item in the list for user specified trees. The **User Specified Pay Item Values** dialog opens. This dialog contains fields for entering pay item number, description, unit and quantity information.



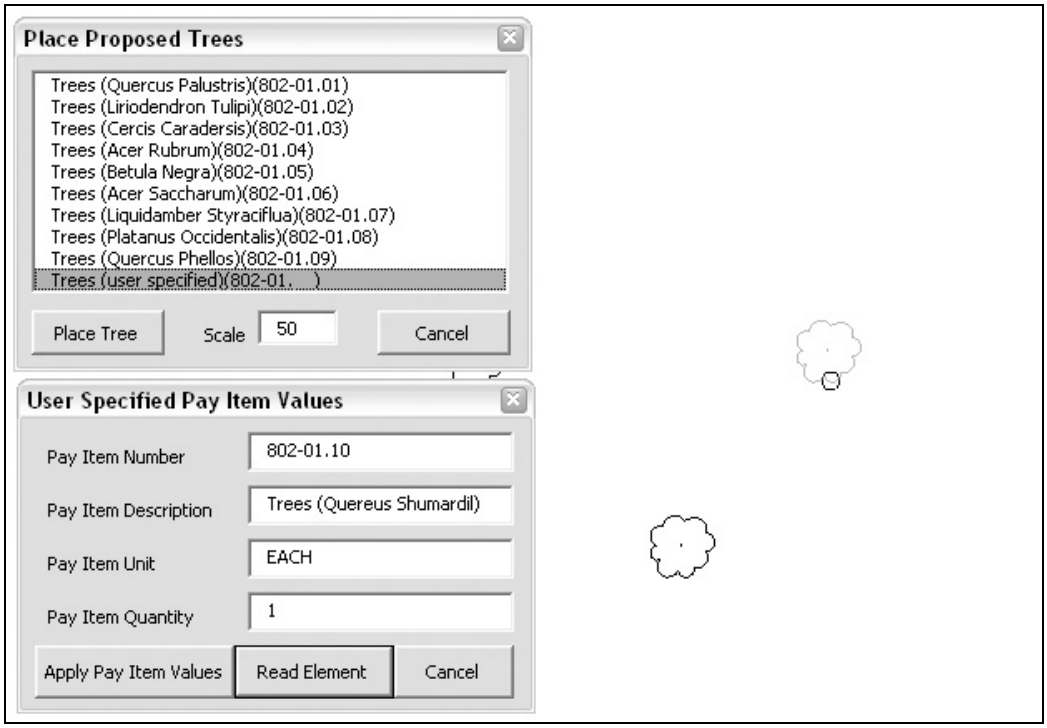
Step 4. Once the pay item information is entered, the user must click on the **Apply Pay Item Values** command button to assign the values entered and re-start the Place Tree function. .



Data point when satisfied with the location.

Step 5. To check the type of a proposed tree that has been placed previously or to re-call the pay item information of a user specified tree type, then click the **Read Element** command button on the User Specified Pay Item Values dialog.

The user is prompted to **Data point on cell**. Once accepted, the pay item values are read from the tree cell and are used to populate the dialog.



Pattern Erosion Control Blanket Area

D&C location: Drafting Standards > Erosion Control > EC Blankets> EC Blanket AP

MicroStation VBA Program: AreaPatterns.mvba

Description:

This application sets the area pattern parameters and active level needed to pattern an erosion control blanket area and starts MicroStation's Pattern Area tool.

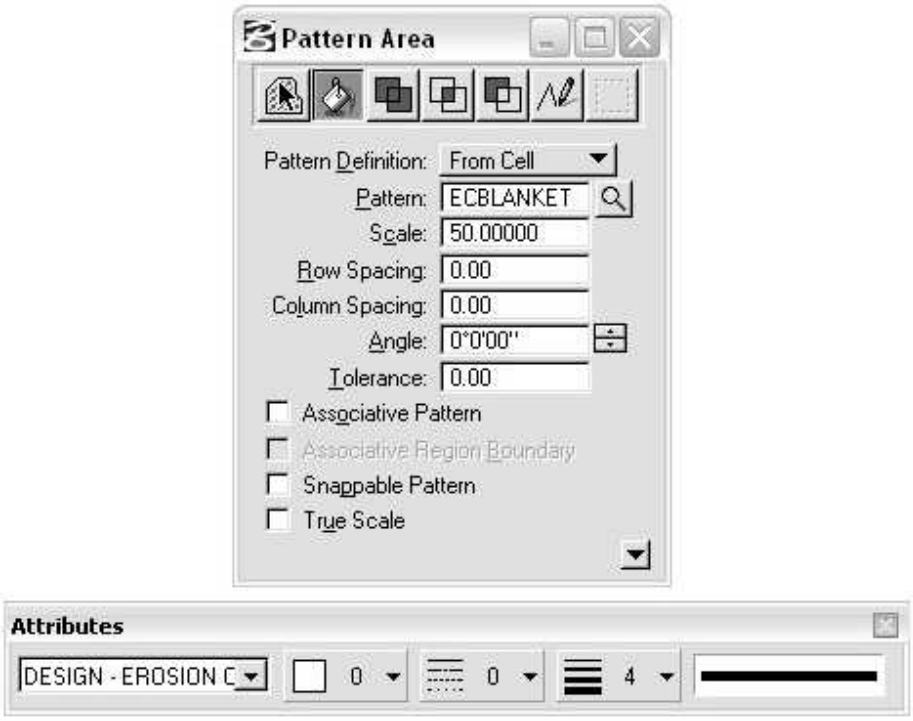
This program can also be activated from the MicroStation drop down menu at
TDOT > Erosion Control > Erosion Control Blanket AP
or by using the keyin
vba run [AreaPatterns]ErosionControlBlanket.SetPattern

Special Requirements:

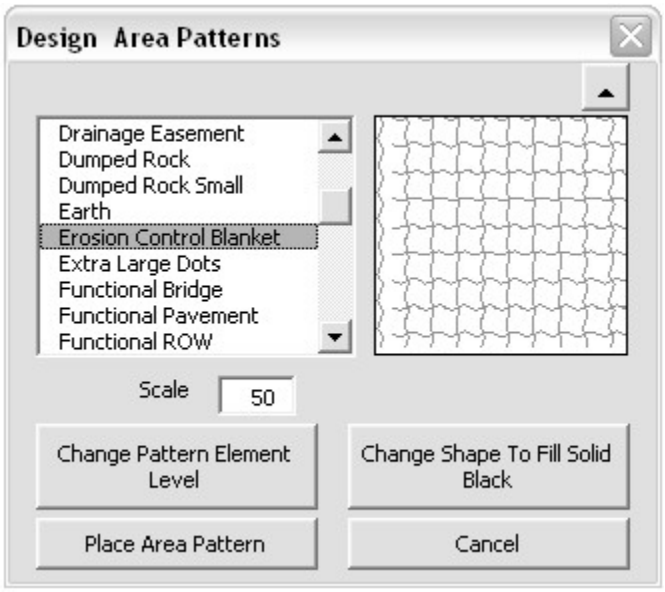
Create a shape element bounding the area to be patterned using the appropriate item from **Drafting Standards > Erosion Control > EC Blankets** to define the erosion control blanket type.

Usage:

Step 1. In D&C manager activate **EC Blanket AP**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

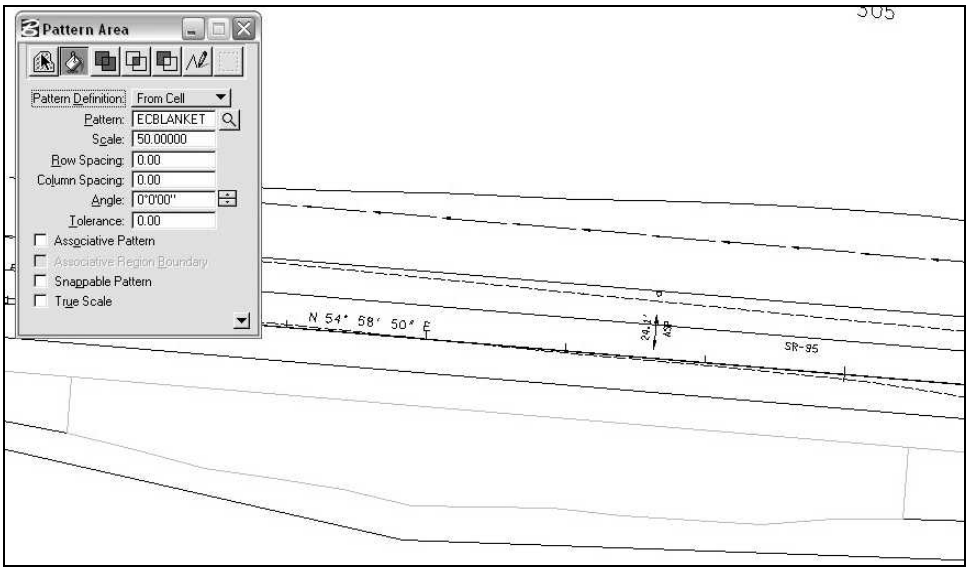


Or from the drop down menu in the **Design Area Patterns** dialog …

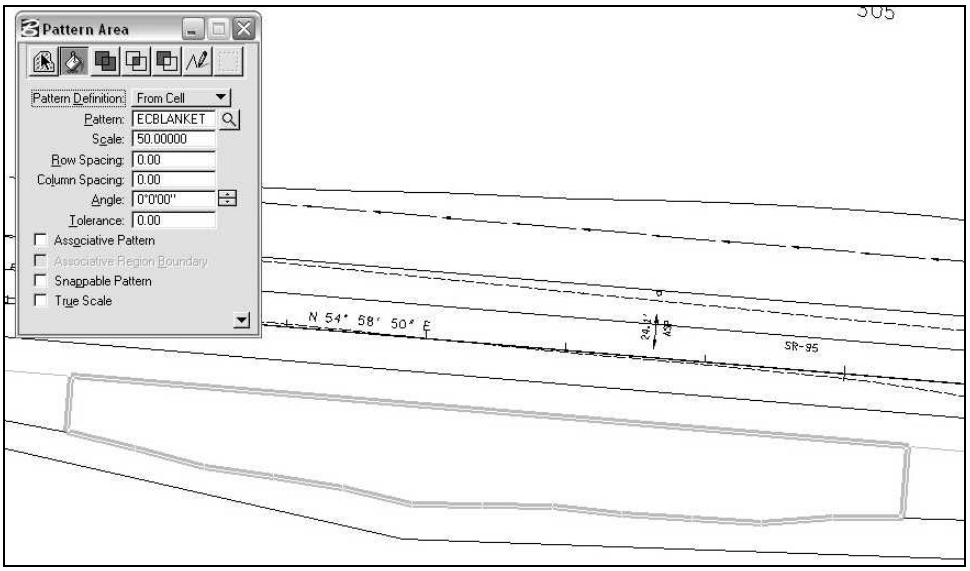


Step 2. Set the method of placing the area pattern to **Element**.

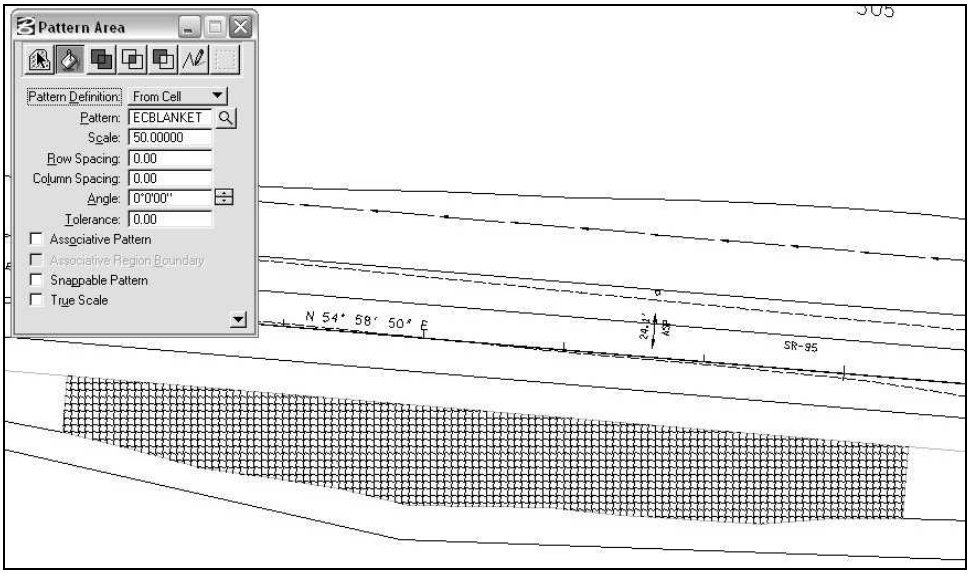
Step 3. The user is prompted to **Identify Element**. **Data point** on the erosion comtrol blanket shape.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Turf Reinforcement Mat Area

D&C location:
Drafting Standards > Erosion Control > Turf Reinforcement Mats > Turf Mat AP

MicroStation VBA Program: AreaPatterns.mvba

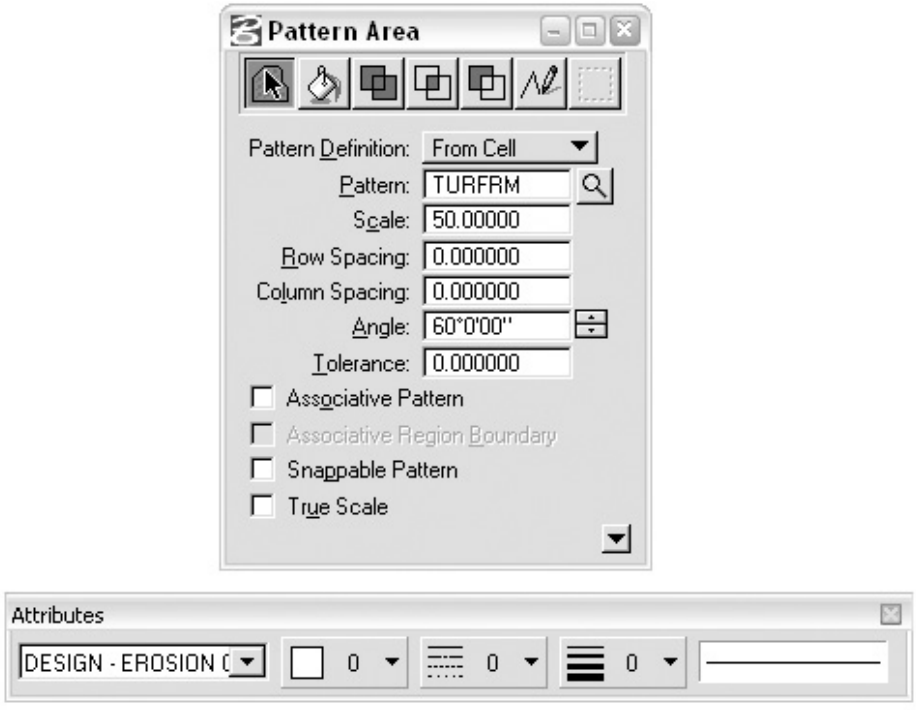
Description:
This application sets the area pattern parameters and active level needed to pattern an turf reinforcement mat area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Erosion Control > Turf Reinforcement Mat AP
or by using the keyin
vba run [AreaPatterns]TurfReinforcementMat.SetPattern

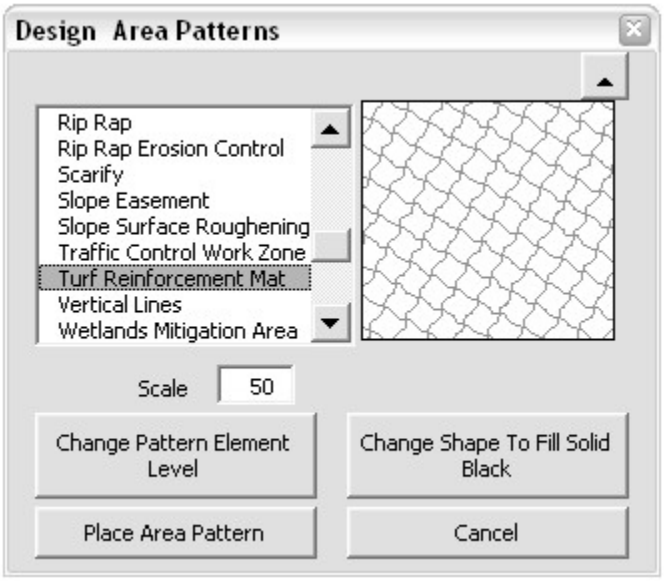
Special Requirements:
Create a shape element bounding the area to be patterned using the appropriate item from **Drafting Standards > Erosion Control > Turf Reinforcement Mats** to define the turf reinforcement mat class.

Usage:

Step 1. In D&C manager activate **Turf Mat AP**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

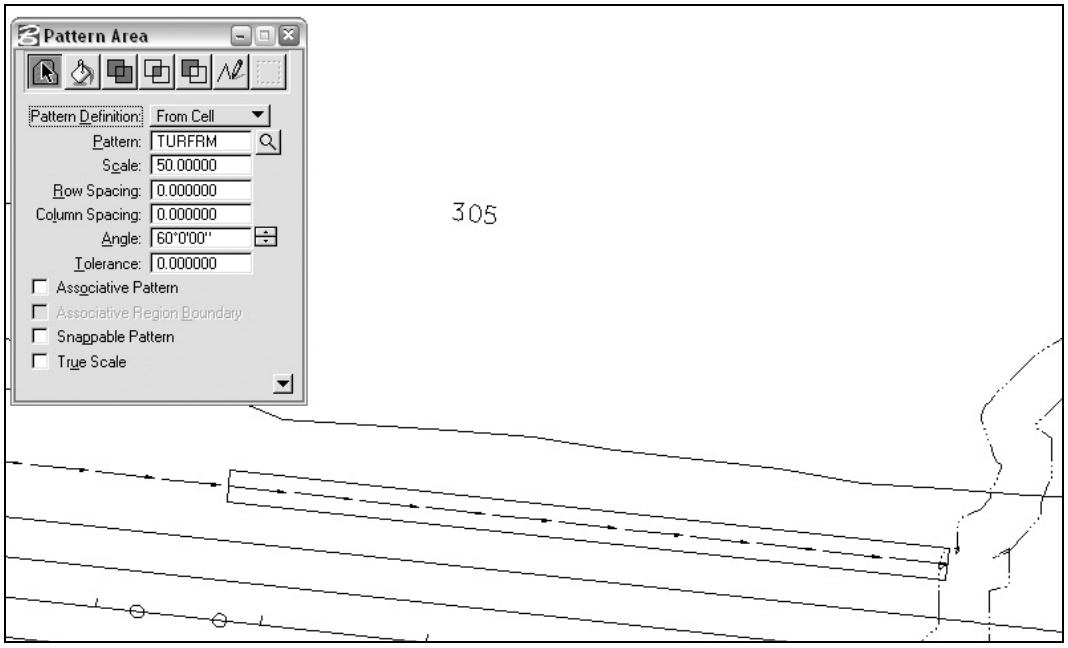


Or from the drop down menu in the **Design Area Patterns** dialog …

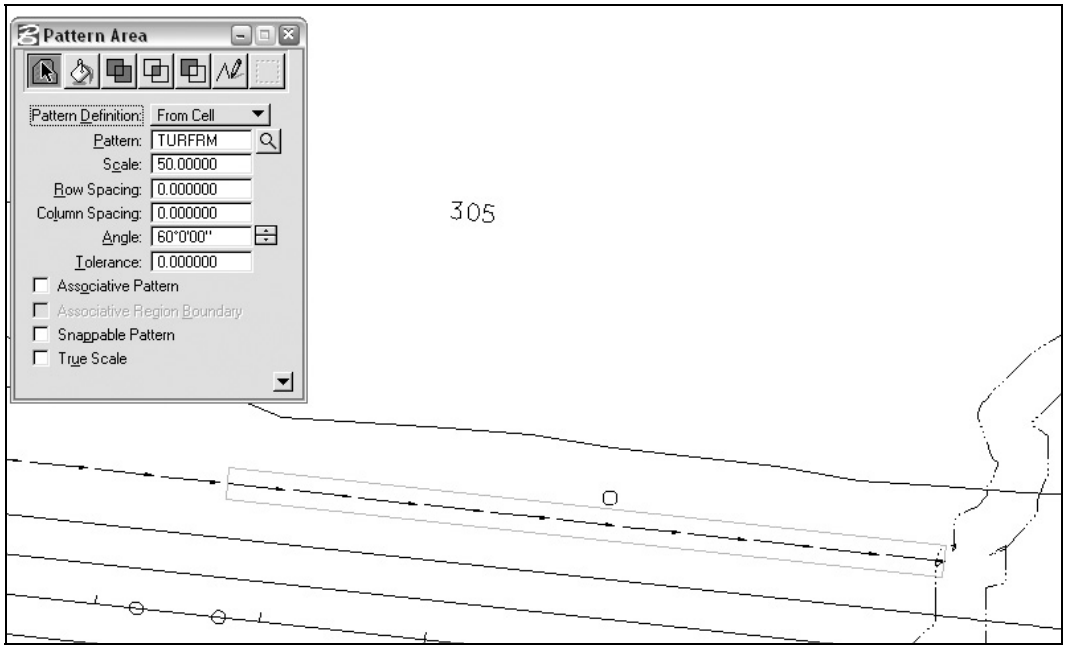


Step 2. Set the method of placing the area pattern to **Element**.

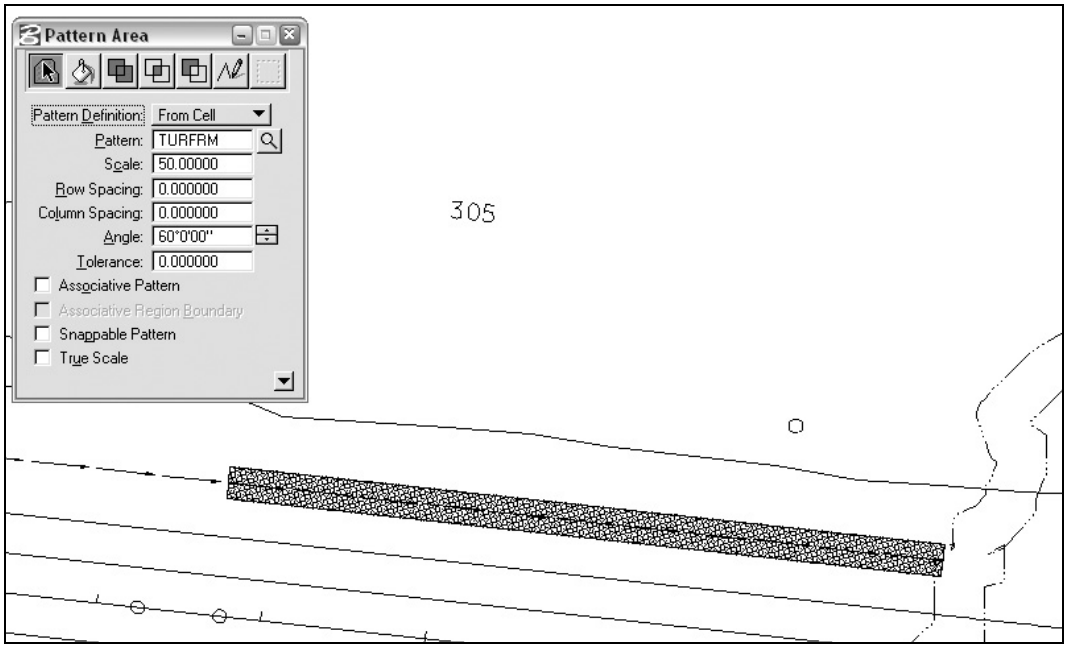
Step 3. The user is prompted to **Identify Element**. **Data point** on the turf reinforcement mat shape.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Lighting

Lighting Cells

D&C location: Drafting Standards > Lighting > Lighting Cells

MicroStation VBA Program: LightingCells.mvba

Description:

This program provides access to TDOT Design Division lighting cells.

Command buttons are provided to access the vba programs Place Jacked or Bored Conduit, Label Conduit and Label Pull Box.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

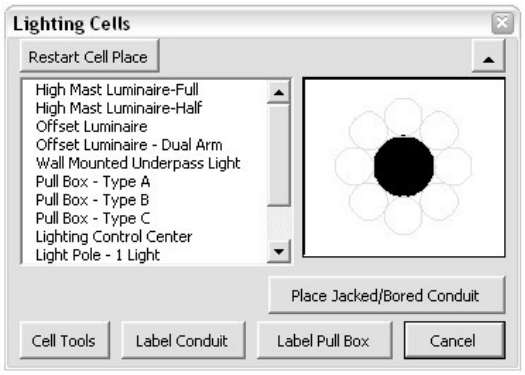
This program can also be activated from the MicroStation drop down menu
TDOT > Lighting > Cells
or by using the keyin
vba run [LightingCells]Lightngcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Lighting Cells**. The **Lighting Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Label Conduit

D&C location: Drafting Standards > Lighting > Label Conduit

MicroStation VBA Program: LabelConduit.mvba

Description:

This program places proposed conduit labels with size & type. A toggle option is given for lighting or signalization application which controls the level of placement. It also includes an option to identify the conduit or fiber optic line to automatically set up the desired label text. A terminator option of a regular or small arrowhead or dot is provided. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of label text and terminator. All label graphics are combined in a graphic group for easy movement or deletion.

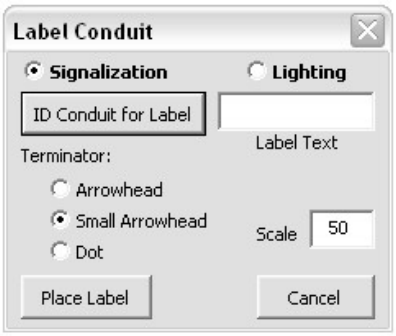
This program can also be activated from the MicroStation drop down menu
TDOT > Lighting > Label Conduit
or by using the keyin
vba run [LabelConduit]IDandLabelConduit.Main

Special Requirements:

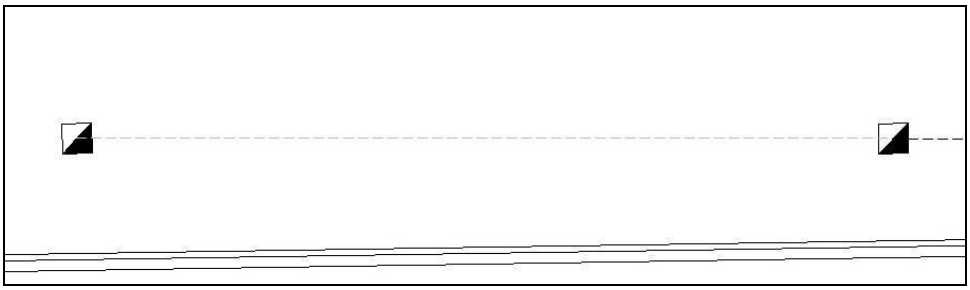
None.

Usage:

Step 1. In D&C manager activate **Label Conduit**. The **Label Conduit** dialog appears.

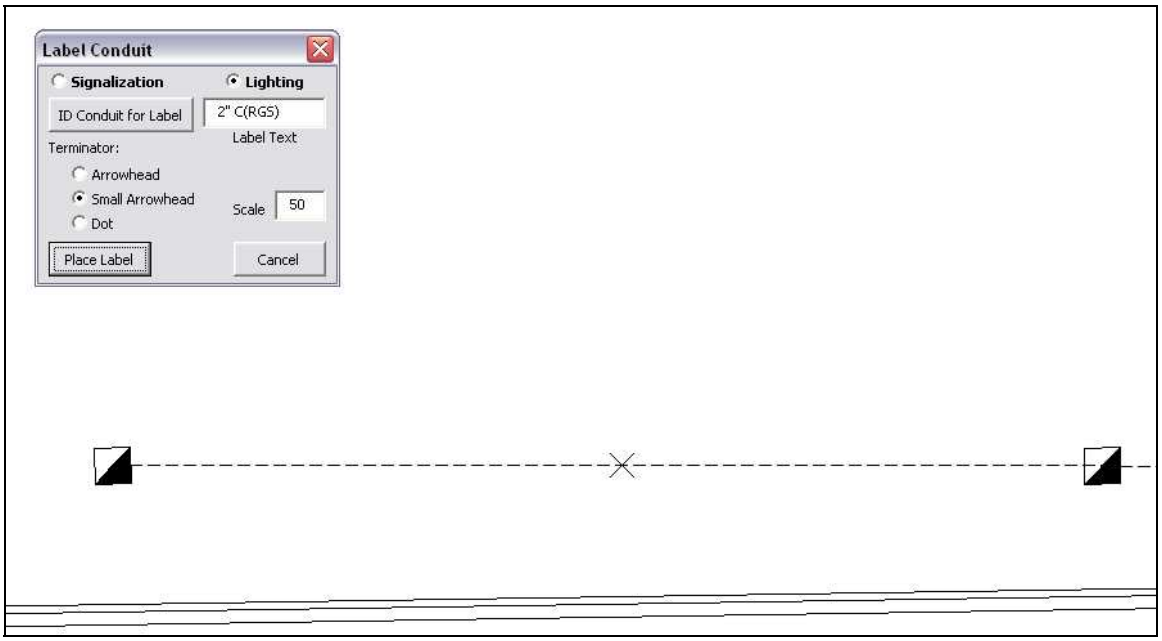


Step 2. First the signalization or lighting toggle should be set as needed. Then the user either enters the label text in its keyin field manually or by using the **ID Conduit for Label** command button to identify the conduit to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Conduit**. Data point on the conduit line and another data point to accept the element.

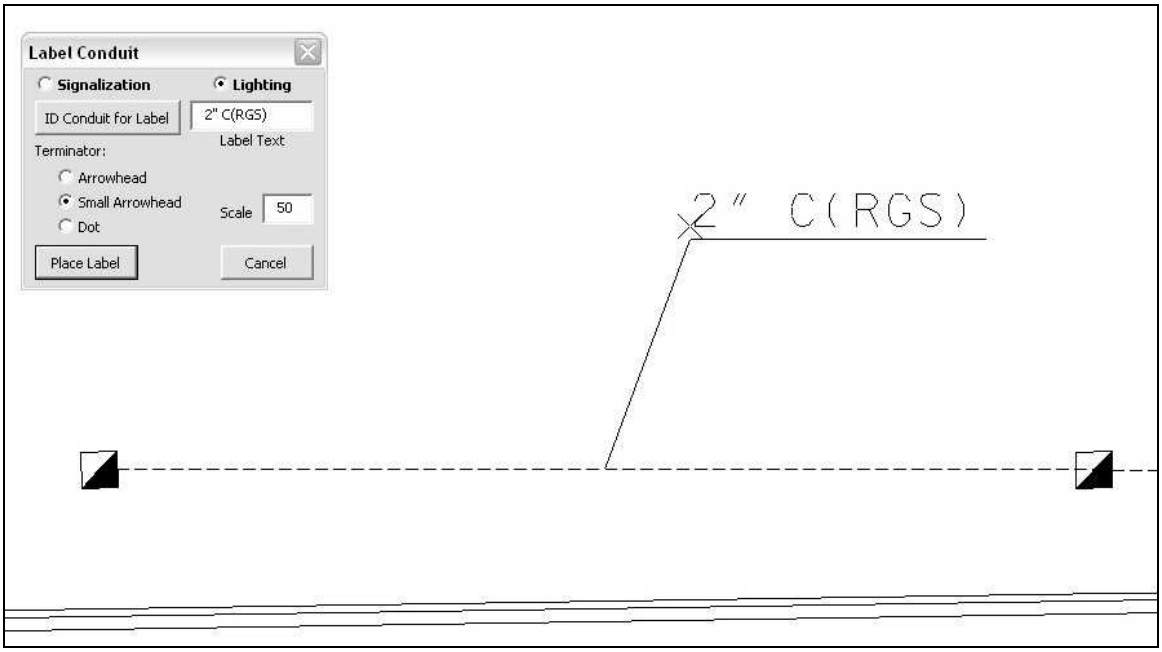


Conduit must be placed with the correct standard symbology for this function to recognize it. An error message is generated for invalid elements.

Step 3. To place the label, choose the terminator type desired, check the scale and then click on the **Place Label** command button. You are prompted to **Identify location for End of Leader**. Data point on the conduit line.

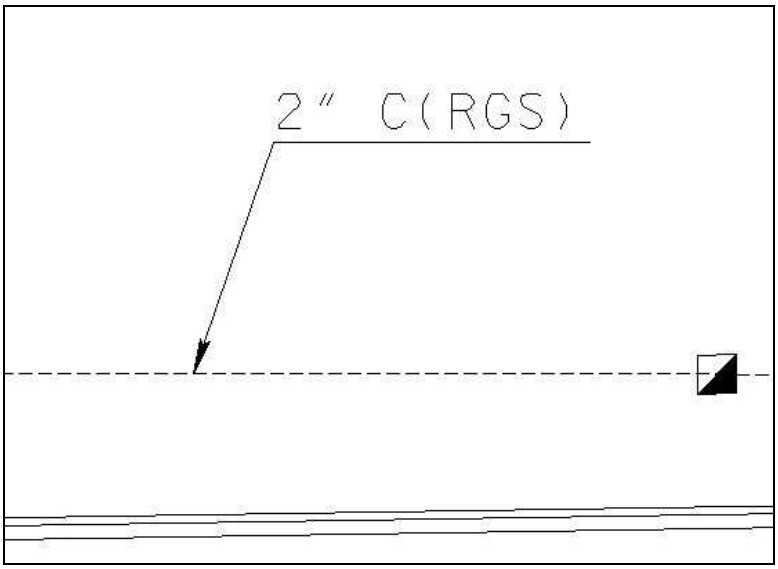


Step 4. Once this point is given, the label is shown dynamically and the user is prompted for a second point **to Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



Data point when satisfied with the location

Step 5. Graphics are placed and combined in a graphic group. At this point the program loops back to the prompt to identify location for end of leader allowing for additional placements of the label.



If the initial scale given was in error, it is necessary to re-start the command by clicking on the Place Label command button after resetting the given scale value. The terminator option can be reset at any time during label placement.

Label Pull Box

D&C location: Drafting Standards > Lighting > Label Pull Box

MicroStation VBA Program: LabelPullBox.mvba

Description:

This program places proposed pull box labels. A toggle option is given for lighting or signalization application which controls the level of placement. It also includes an option to identify the pull box to automatically set up the desired label text. A terminator option of an arrowhead (medium), small arrowhead or none is available. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of label text and terminator. All label graphics are combined in a graphic group for easy movement or deletion.

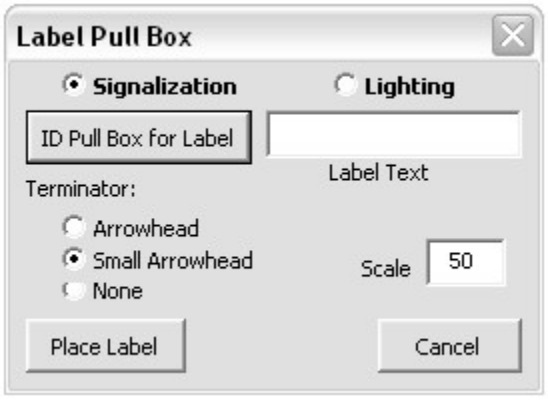
This program can also be activated from the MicroStation drop down menu
TDOT > Lighting > Label Pull Box
or by using the keyin
vba run [LabelPullBox]IDandLabelPullBox.Main

Special Requirements:

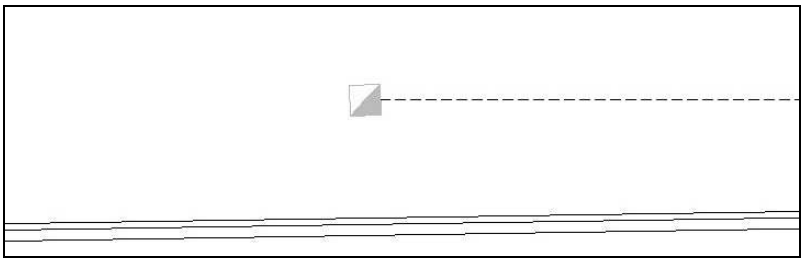
None.

Usage:

Step 1. In D&C manager activate **Label Pull Box**. The **Label Pull Box** dialog appears.

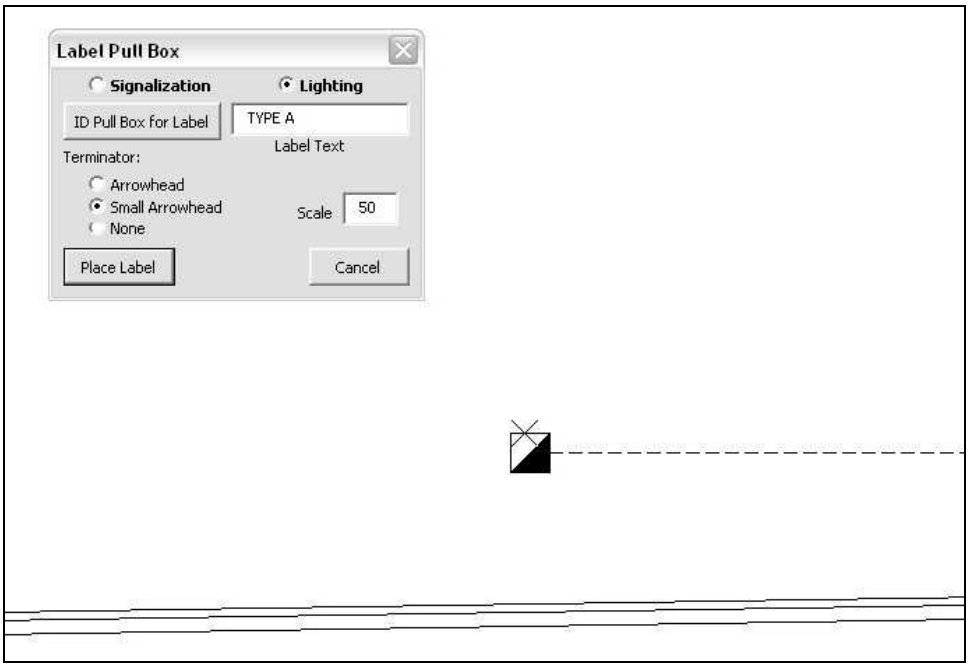


Step 2. First the signalization or lighting toggle should be set as needed. Then the user either enters the label text in its keyin field manually or by using the **ID Pull Box for Label** command button to identify the pull box to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Pull Box**. Data point on the pull box cell and another data point to accept the element.

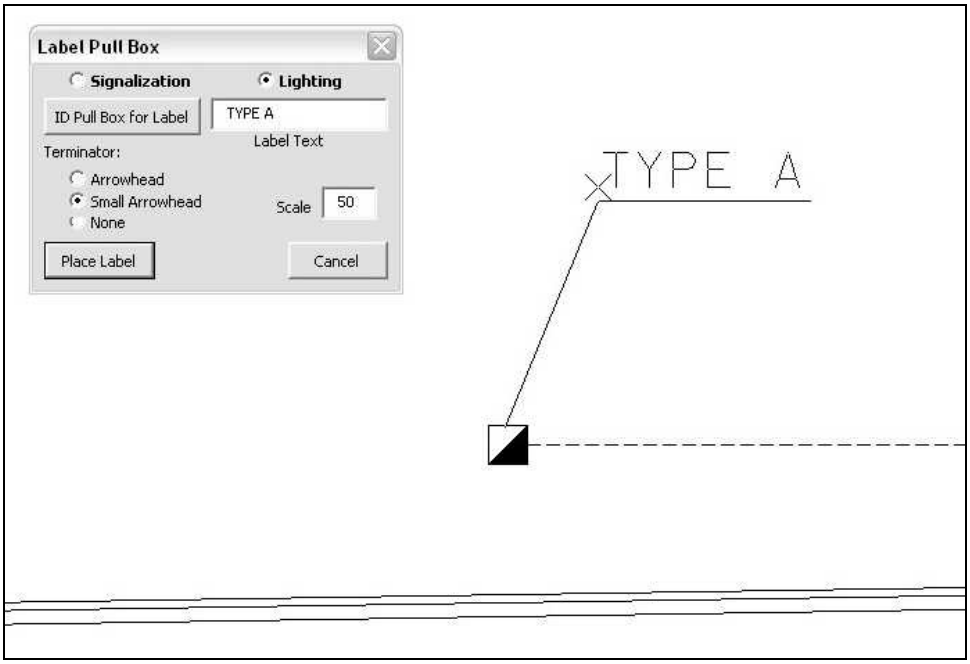


Pull box cells must be placed on the correct level for this function to recognize it. An error message is generated for invalid elements.

Step 3. To place the label, choose the terminator type desired, check the scale and then click on the **Place Label** command button. You are prompted to **Identify location for End of Leader**. Data point on the pull box.

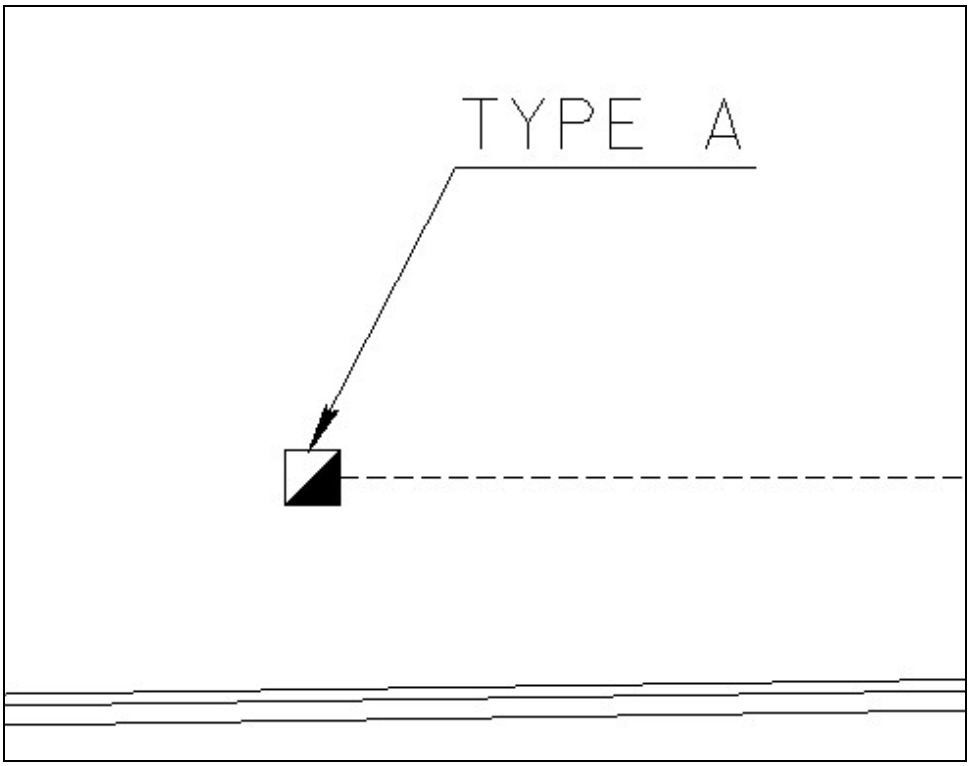


Step 4. Once this point is given, the label is shown dynamically and the user is prompted for a second point **to Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



Data point when satisfied with the location

Step 5. Graphics are placed and combined in a graphic group. At this point the program loops back to the prompt to identify location for end of leader allowing for additional placements of the label.



If the initial scale given was in error, it is necessary to re-start the command by clicking on the Place Label command button after resetting the given scale value. The terminator option can be reset at any time during label placement.

Place Jacked or Bored Conduit

D&C location: Drafting Standards > Lighting > Place Jacked

MicroStation VBA Program: PlaceJackedBoredConduit.mvba

Description:

This program places jacked/bored conduit under roadways. A toggle option is given for lighting or signalization application which controls the level of placement. Choices are given for the pull box type (Type A, Type B, Type C, Fiber Optic Type A or Fiber Optic Type B) and conduit size (2" or 3"). The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of pull boxes and other symbolization. All graphics are combined in a graphic group for easy deletion.

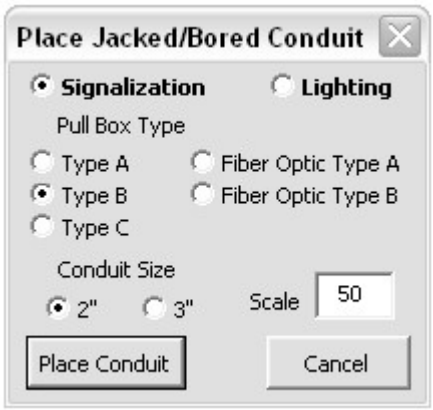
This program can also be activated from the MicroStation drop down menu
TDOT > Lighting > Place Jacked/Bored Conduit
or by using the keyin
vba run [PlaceJackedBoredConduit]Jacked.Main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Place Jacked**. The **Place Jacked/Bored Conduit** dialog appears.



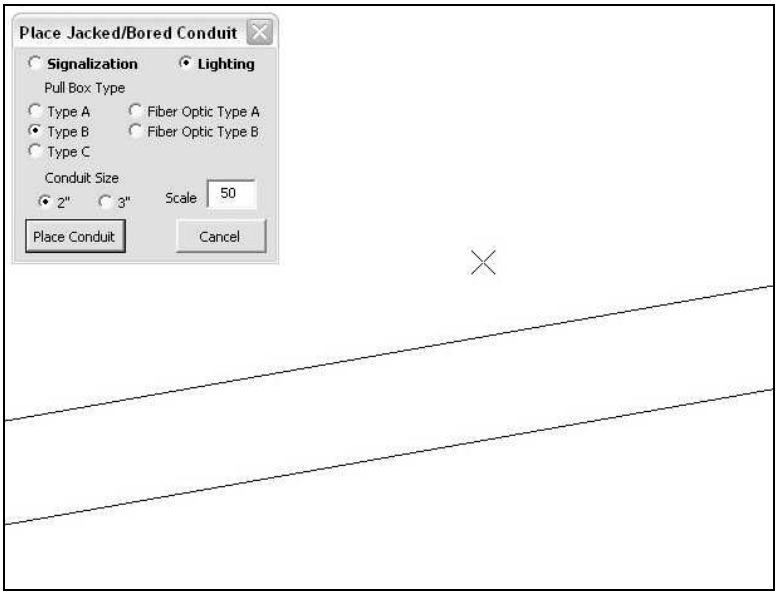
Step 2. Make the required settings.

First the **Signalization** or **Lighting** toggle should be set as needed.

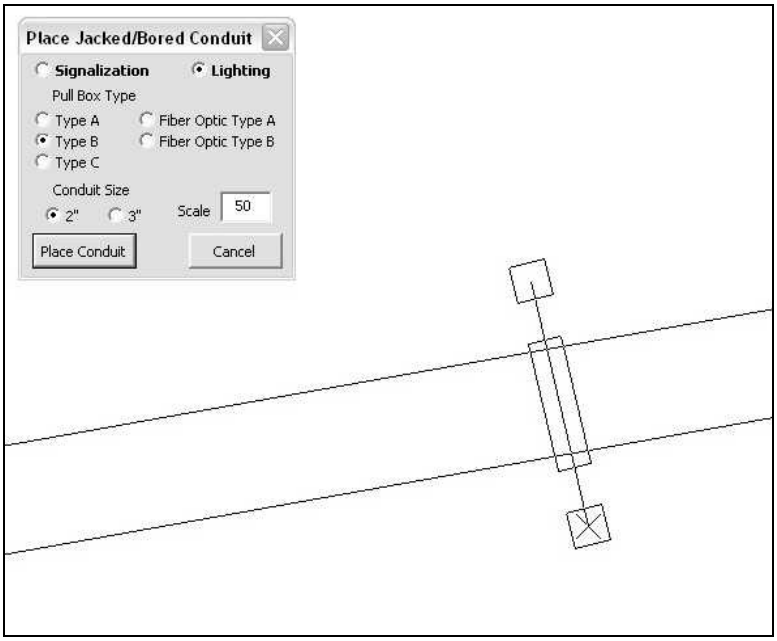
Then the user needs to choose the **Pull Box Type** to be placed at the ends. Note that only pull box types A, B or C are valid for Lighting application. All are valid for Signalization application except for type C.

Finally pick the **Conduit Size** and check the **Scale** value shown.

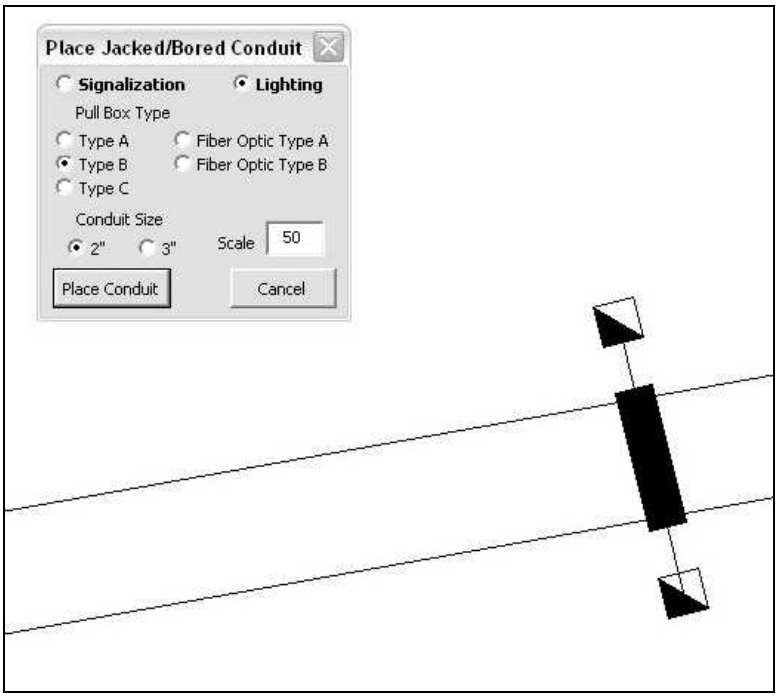
Step 3. Click on the **Place Conduit** command button. You are prompted to **Identify Pull Box Location on Left**. Data point on the left side of the roadway or other feature which conduit is to be jacked or bored under.



Step 4. Once this point is given, the graphics are shown dynamically and you are prompted to **Identify Pull Box Location on Right**. Data point at the pull box location on the right side.



Step 5. Graphics are placed and combined in a graphic group. At this point the program loops back to the beginning for additional placements.



Graphics are placed so that D&C Manager can be used later to calculate the quantities for pull boxes and jacked or bored conduit line.

Pavement Marking

Pavement Marking Cells

D&C location: Drafting Standards > Pavement Marking > Pvmt Mk Cells

MicroStation VBA Program: PavementMarkingCells.mvba

Description:

This program provides access to TDOT Design Division pavement marking cells.

Command buttons are provided to access the Place Stop Bar, Place Crosswalk and Place Yield Line vba programs.

A command button is provided to access MicroStation's Set Angle by 2 Points command so that lane lines can be used to set the angle for pavement markings.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

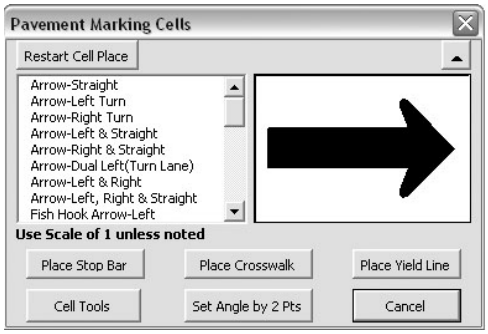
This program can also be activated from the MicroStation drop down menu
TDOT > Pavement Marking > Cells
or by using the keyin
vba run [PavementMarkingCells]PvmtMarkingcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Pvmt Mk Cells**. The **Pavement Marking Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale in the MicroStation Tool Settings dialog to **1** unless noted otherwise in the cell description. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Crosswalk

D&C location: Drafting Standards > Pavement Marking > Cross-walk

MicroStation VBA Program: PlaceCrosswalk.mvba

Description:

This program places standard parallel or longitudinal bar crosswalks. A Width keyin field is provided to control the width of the crosswalk. Default for parallel crosswalks is 6' (1.8 meters) and longitudinal crosswalks is 10' (3 meters).

Additional graphics are placed within longitudinal crosswalk shapes to facilitate quantity calculation using Geopak's D&C Manager. Logitudinal crosswalk shapes are automatically centered between the begin and end points of the crosswalk.

All label graphics are combined in a graphic group for easy deletion.

This program can also be activated from the MicroStation drop down menu
TDOT > Pavement Marking > Place Crosswalk
or by using the keyin
vba run [PlaceCrossWalk]Crosswalk.main

Special Requirements:

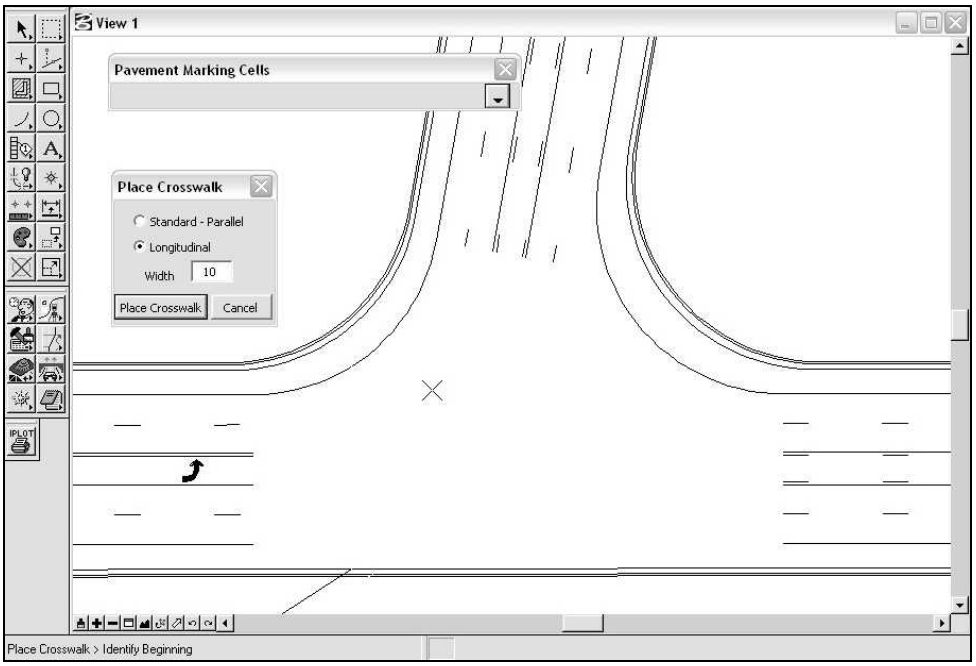
None.

Usage:

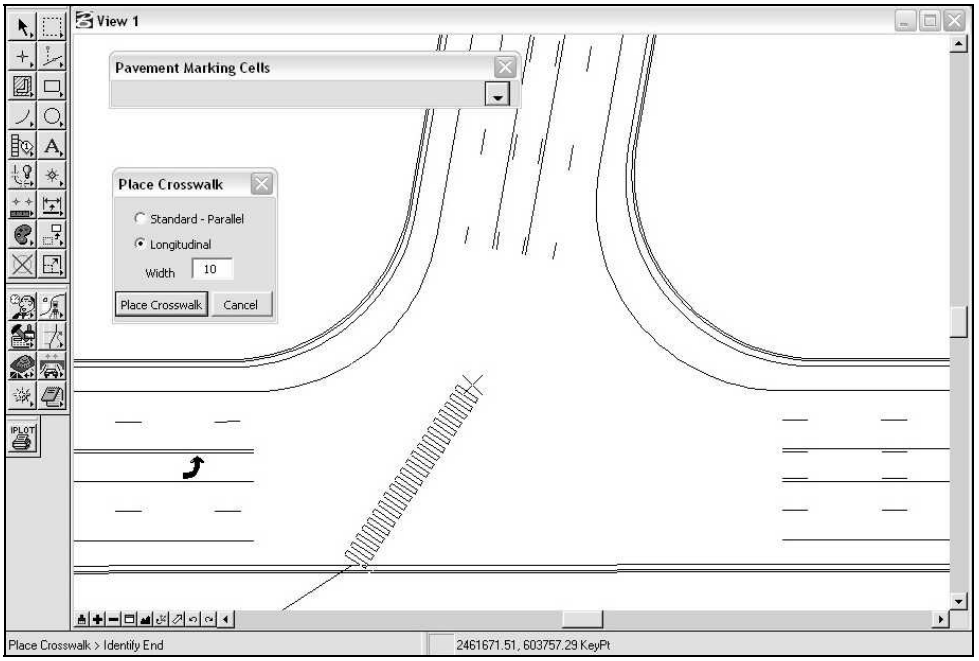
Step 1. In D&C manager activate **Cross-walk**. The **Place Crosswalk** dialog appears.

Step 2. First the Parallel or Longitudinal toggle should be set as needed. Default widths are automatically added to the **Width** keyin field. Adjust the width if needed.

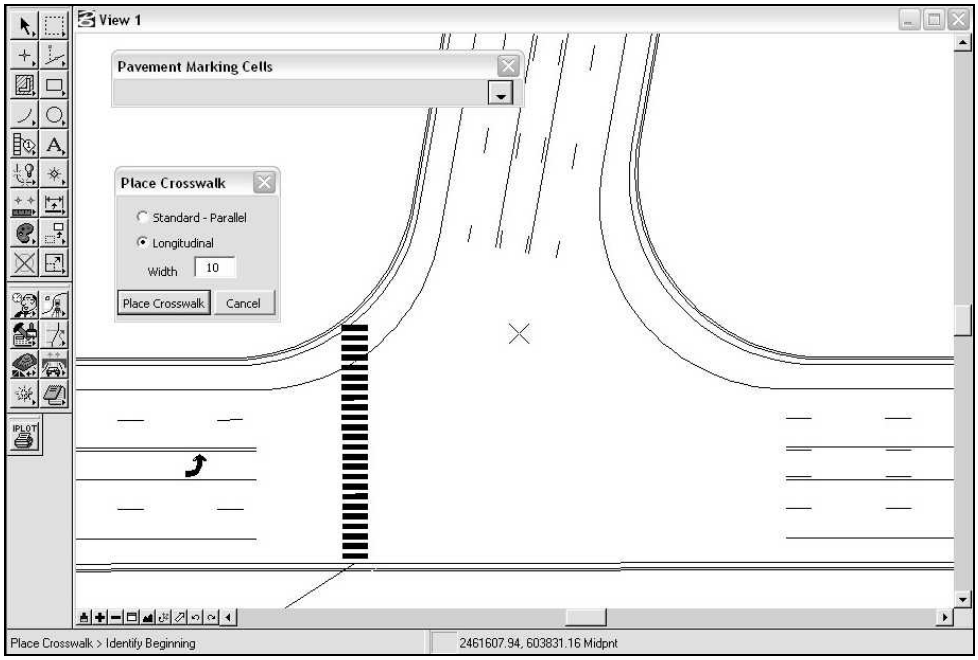
Step 3. When started, program immediately prompts user to **Identify Beginning** .



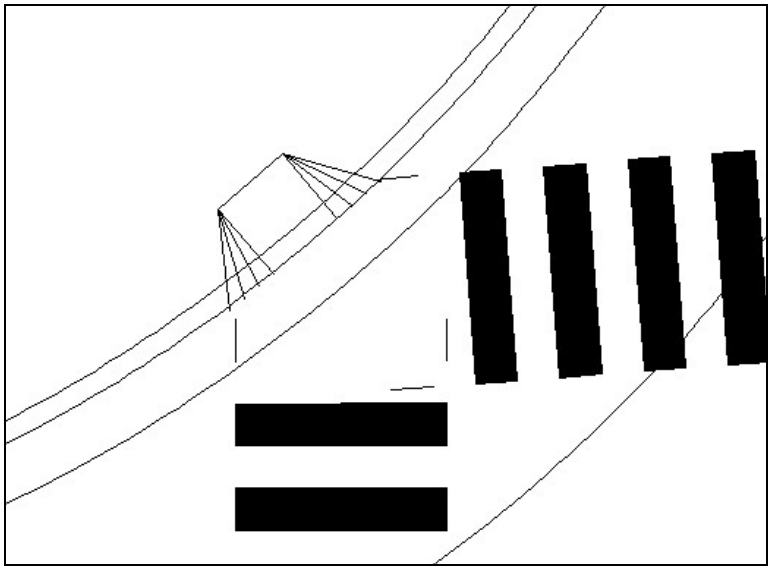
Step 4. After data pointing for the beginning of the crosswalk, the crosswalk is shown dynamically and you are prompted to **Identify End**.



Step 5. When the second point is given, graphics are placed and user is again prompted for beginning point of the crosswalk allowing for additional crosswalks to be placed.



Step 6. When clean up of graphics is necessary for longitudinal crosswalks, first make sure graphic group lock is off. If any of the filled shapes are deleted or modified you will see extra short lines left over. Each filled shape in the crosswalk includes 2 extra lines which are used to calculate a linear quantity for the crosswalk. If a shape is deleted, delete the 2 lines as well. If the end of a shape is just modified move the line to the other end of the shape so that it will not show. This will ensure the correct quantity is calculated from the graphics.



Parallel crosswalks are composed of just the 2 parallel lines. The quantity calculated for these is simply cut in half to come up with the length of crosswalk

Place Stop Bar

D&C location: Drafting Standards > Pavement Marking > Stop Bar

MicroStation VBA Program: PlaceStopBar.mvba

Description:

This program places stop bar pavement marking.

An additional line is placed within the stop bar shape to facilitate quantity calculation using Geopak's D&C Manager.

All label graphics are combined in a graphic group for easy deletion.

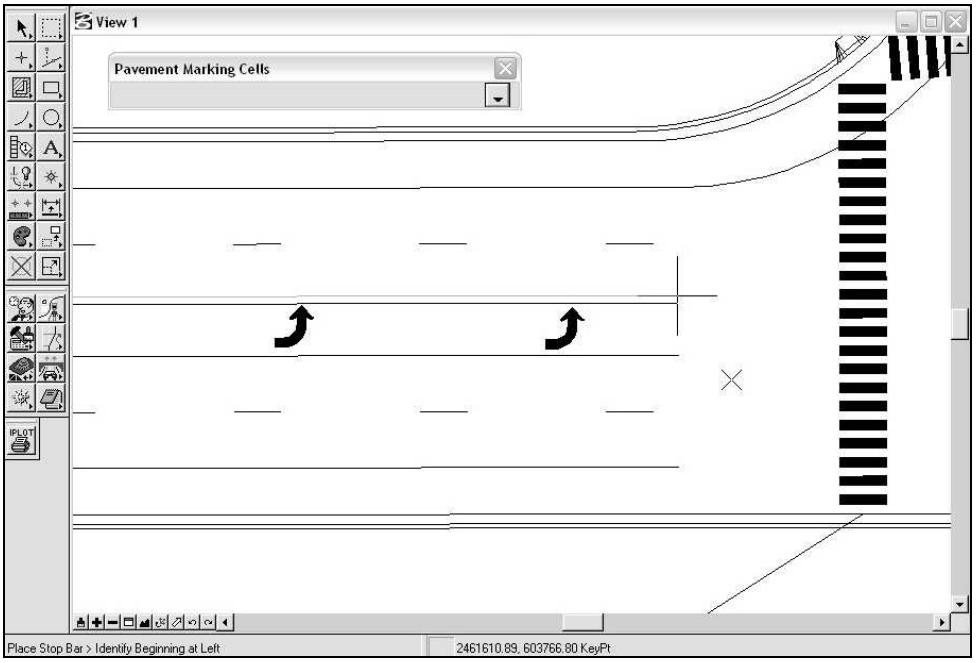
This program can also be activated from the MicroStation drop down menu
TDOT > Pavement Marking > Place Stop Bar
or by using the keyin
vba run [PlaceStopBar]StopBar.main

Special Requirements:

None.

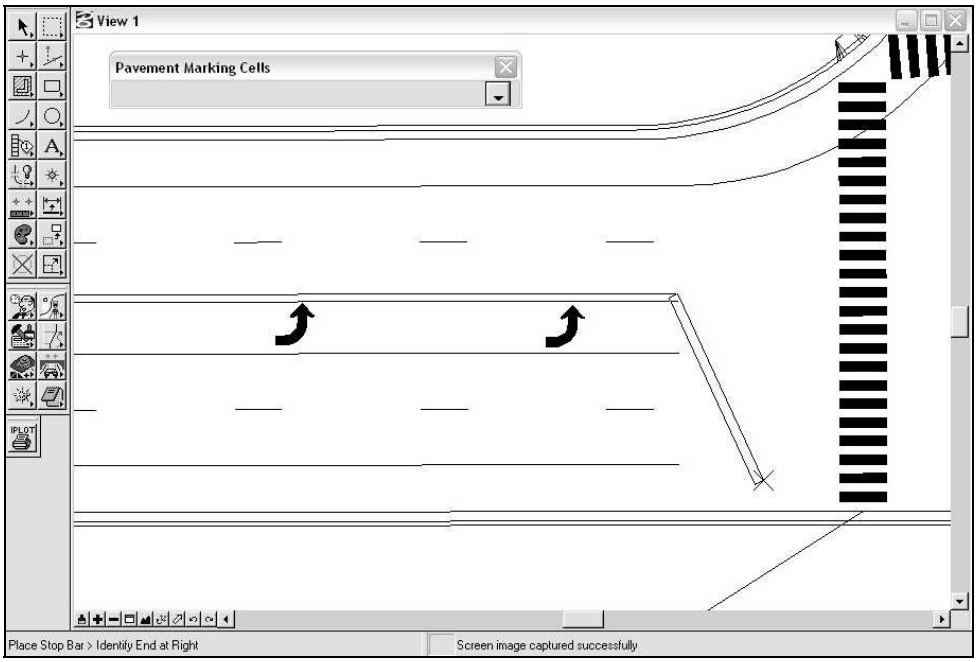
Usage:

Step 1. In D&C manager activate **Stop Bar**. When started, program immediately prompts user to **Identify Beginning at Left**.



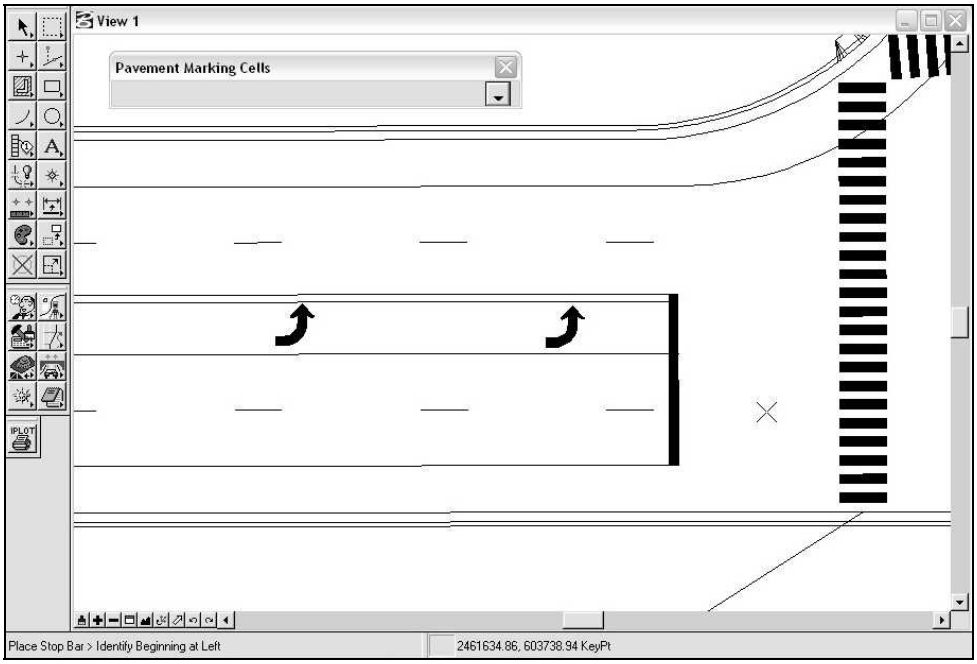
Snap and data point on the left lane line of the lane(s) where the stop bar is needed.

Step 2. After data pointing for the beginning of the stop bar, the stop bar is shown dynamically and you are prompted to **Identify End at Right**.



Snap and data point on the right lane line of the lane(s) where the stop bar is needed.

Step 3. When the second point is given, graphics are placed and user is again prompted for the beginning point on the left allowing for additional stop bars to be placed.



If it becomes necessary to delete the stop bar, always turn on graphic group lock first so that the quantity calculation line behind the fill shape is deleted as well.

Place Yield Line

D&C location: Drafting Standards > Pavement Marking > Yield Line

MicroStation VBA Program: PlaceYieldLine.mvba

Description:

This program places standard yield line pavement marking triangle shapes. These are used at locations where lanes merge with other lanes such as at entrances to roundabout intersections or where right turn lanes merge with other roadways.

Base Width and Spacing Width keyin fields are provided to control the placement of the triangle shapes. The height is set at 1.5 times the base width as specified by the M.U.T.C.D. manual. Defaults for the base and spacing widths are set at the recommended minimum of 12” (300 mm) and 3" (75 mm). The recommended ranges of minimum to maximum sizes for these are displayed on the dialog for guidance to the user.

The triangle shapes are created with the yield line custom line style to facilitate quantity calculation using Geopak's D&C Manager. Triangle shapes are automatically centered in the distance specified by the begin and end points.

All label graphics are combined in a graphic group for easy deletion.

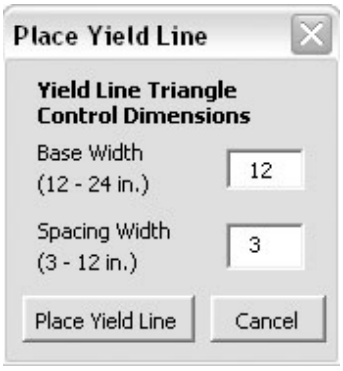
This program can also be activated from the MicroStation drop down menu
TDOT > Pavement Marking > Place Yield Line
or by using the keyin
vba run [PlaceYieldLine]YieldLine.main

Special Requirements:

None.

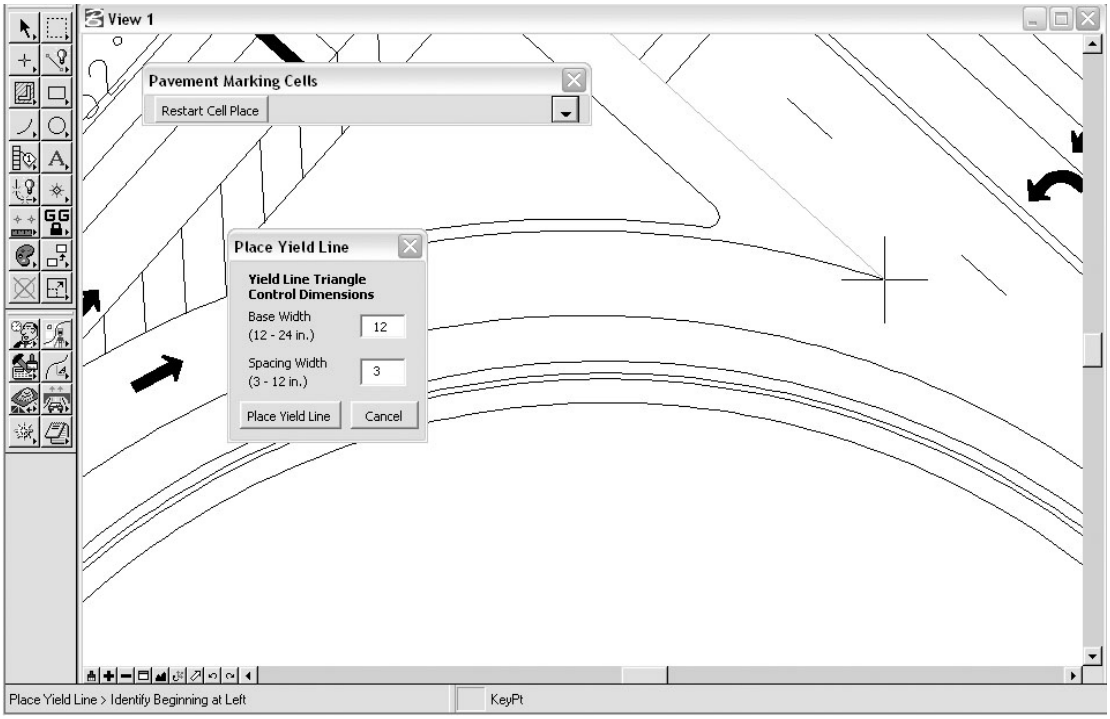
Usage:

Step 1. In D&C manager activate **Yield Line**. The **Place Yield Line** dialog appears.

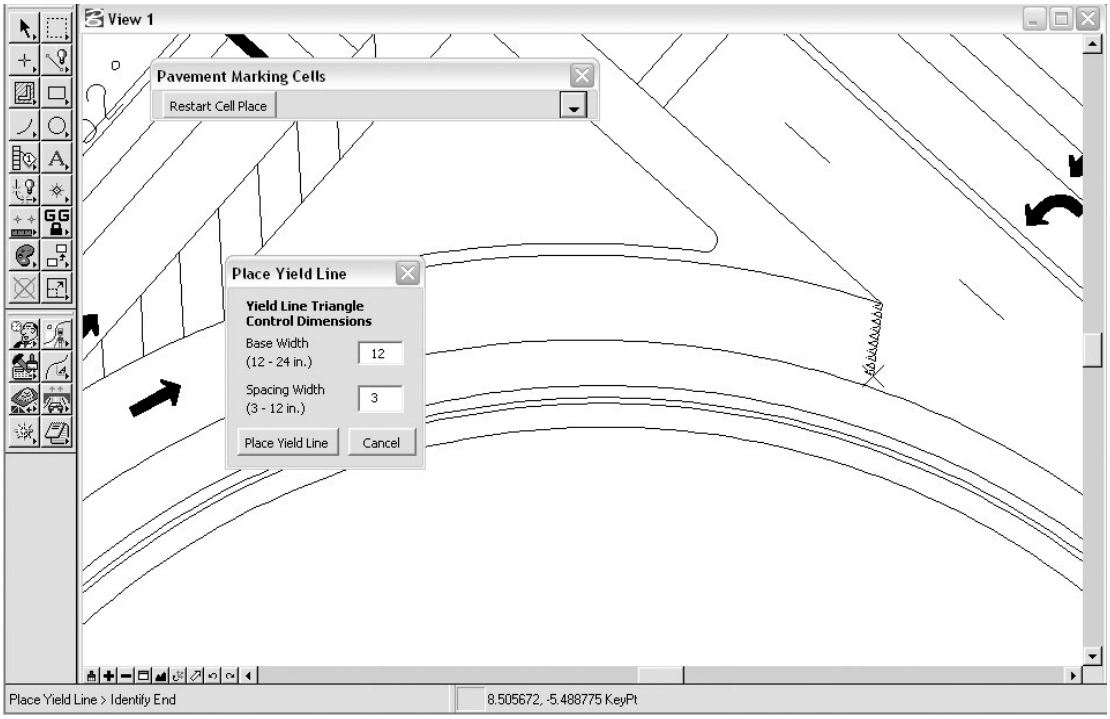


Step 2. Adjust the default values for the **Base Width** and **Spacing Width** if something other than the minimums is desired.

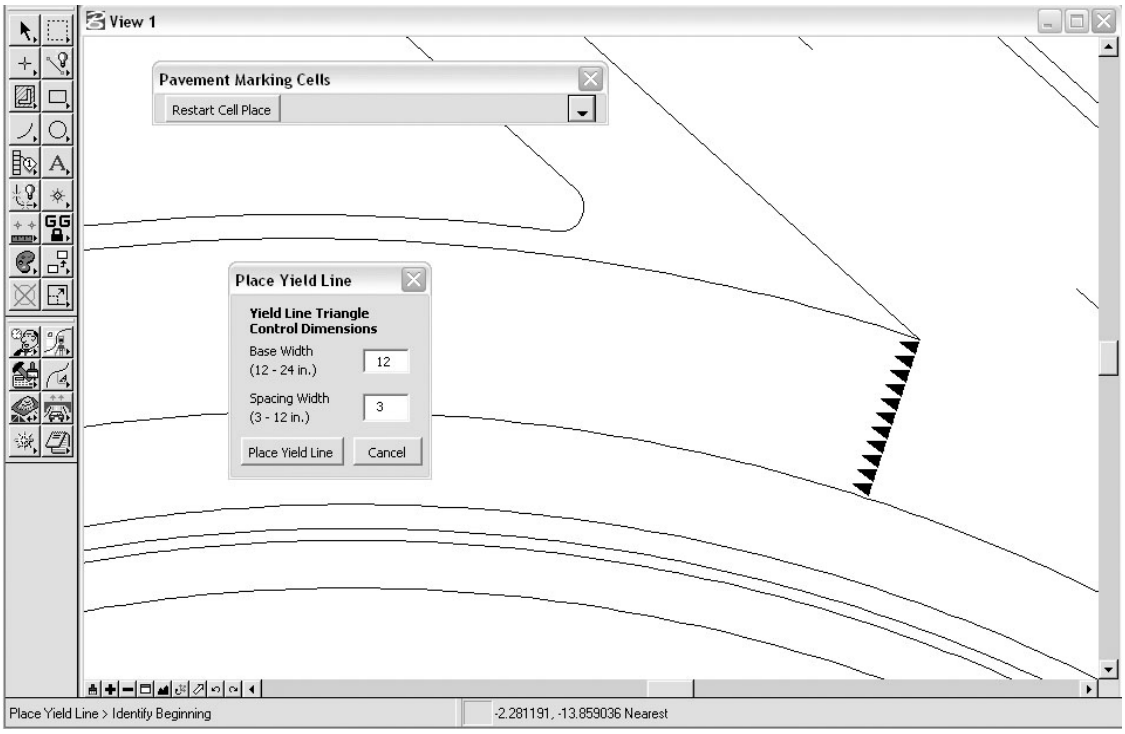
Step 3. When started, program immediately prompts user to **Identify Beginning at Left**. The yield line triangles should point back towards oncoming traffic so the beginning should always be identified on the left side of the lane



Step 4. After data pointing for the beginning of the yield line, the yield line triangles are shown dynamically and you are prompted to **Identify End**.



Step 5. When the second point is given, graphics are placed and user is again prompted for beginning point of the yield line allowing for additional placements as needed.



The **Place Yield Line** command button can be utilized at any time to restart placement after other MicroStation tools are used.

Sheets

Sheet Cells

D&C location: Drafting Standards > Sheets > Sheet Cells

MicroStation VBA Program: StandardSheetCells.mvba

Description:

This program provides access to TDOT Design Division sheet cells.

Command buttons are provided to access the Sheet Title Cells and Place North Arrow vba programs.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

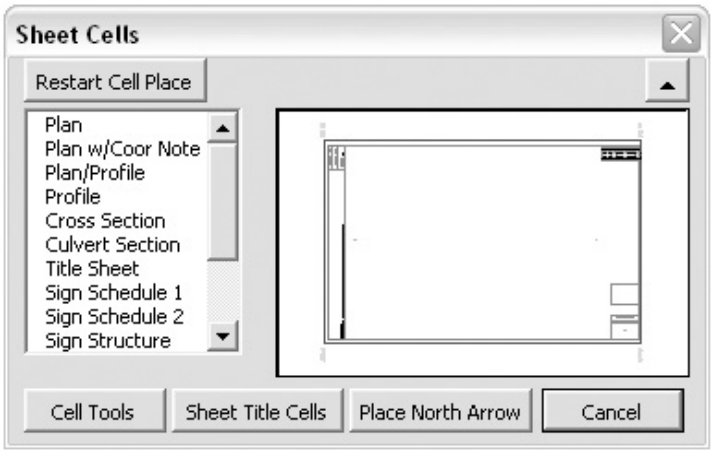
This program can also be activated from the MicroStation drop down menu
TDOT > Sheet Cells
or by using the keyin
vba run [StandardSheetCells]STDSheetcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Sheet Cells**. The **Sheet Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Sheet Title Cells

D&C location: Drafting Standards > Sheets > Sheet Titles

MicroStation VBA Program: SheetTitleCells.mvba

Description:

This program provides access to TDOT Design Division sheet title cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

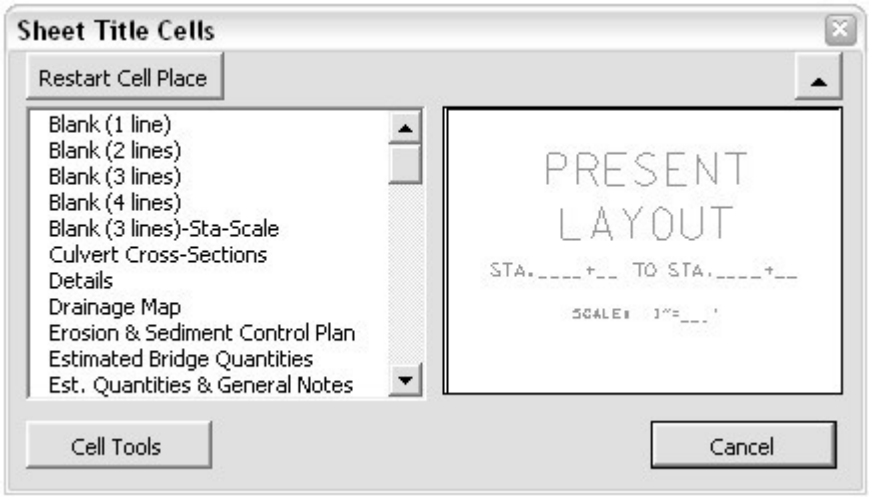
This program can also be activated from the MicroStation drop down menu
TDOT > Sheet Titles
or by using the keyin
vba run [SheetTitleCells]SHTTitlecells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Sheet Titles**. The **Sheet Title Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Permits and Forms

D&C location: Drafting Standards > Sheets > Permits & Forms

MicroStation VBA Program: PermitFormsCells.mvba

Description:

This program provides access to TDOT Design Division permit and form cells.

A command button is provided to access MicroStation's Drop Complex Status command (Drop Cell for Editing command button on dialog).

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

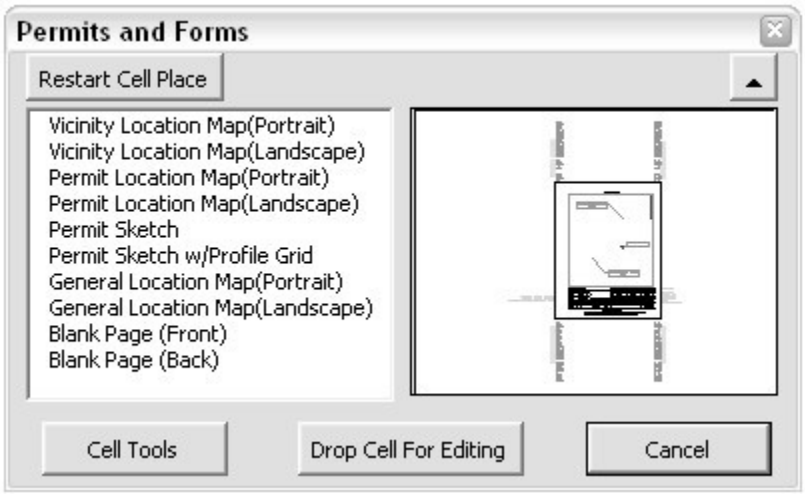
This program can also be activated from the MicroStation drop down menu
TDOT > Permits & Forms
or by using the keyin
vba run [PermitFormsCells]Permitcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Permits & Forms**. The **Permits and Forms** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Step 4. After the cell has been placed click on the **Drop Cell for Editing** command button and identify the form to drop its complex status. Now graphics can be edited as needed for your project.

Plan Phase Stamps

D&C location: Drafting Standards > Sheets > PlanPhase Stmps

MicroStation VBA Program: PlanPhaseCells.mvba

Description:

This program provides access to TDOT Design Division plan phase stamp cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

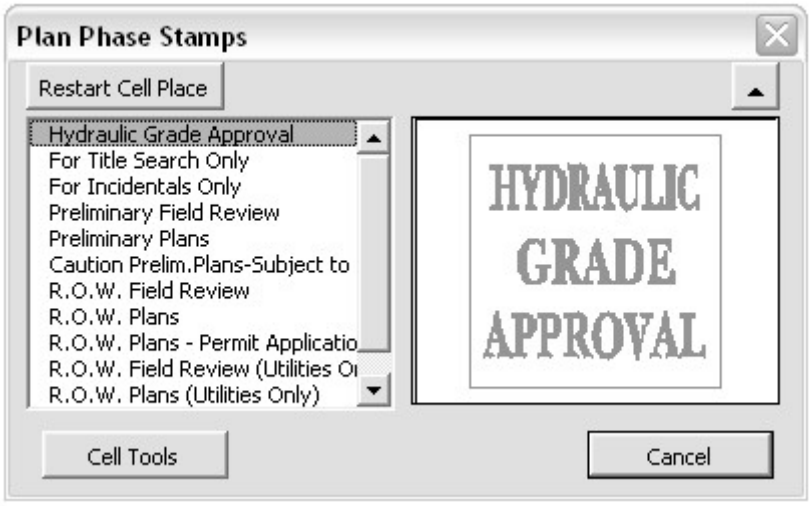
This program can also be activated from the MicroStation drop down menu
TDOT > Plan Phase Stamps
or by using the keyin
vba run [PlanPhaseCells]PlnPhasecells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **PlanPhase Stmps**. The **Plan Phase Stamps** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Public Hearing Cells

D&C location: Drafting Standards > Sheets > Public Hearing

MicroStation VBA Program: PublicHearingCells.mvba

Description:

This program provides access to TDOT Design Division public hearing cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

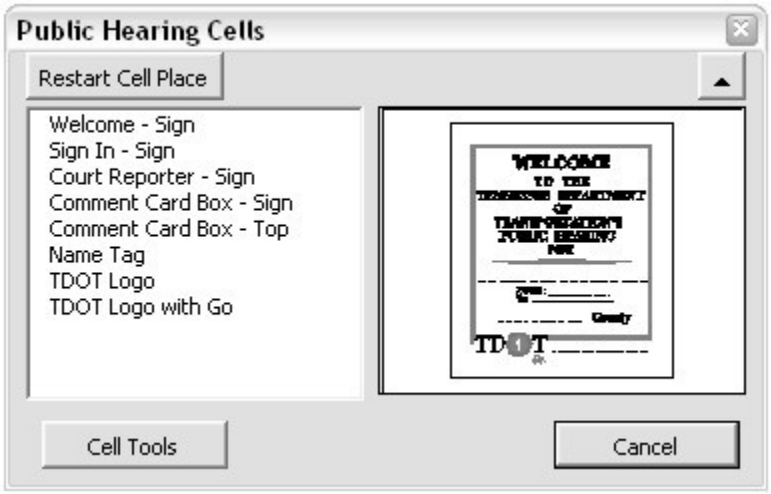
This program can also be activated from the MicroStation drop down menu
TDOT > Public Hearing Cells
or by using the keyin
vba run [PublicHearingCells]PublicHearngcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Public Hearing**. The **Public Hearing Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Title Sheet Cells

D&C location: Drafting Standards > Sheets > Title Sht Cells

MicroStation VBA Program: TitleSheetCells.mvba

Description:

This program provides access to TDOT Design Division title sheet cells.

A command button is provided to access the Place North Arrow vba program.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

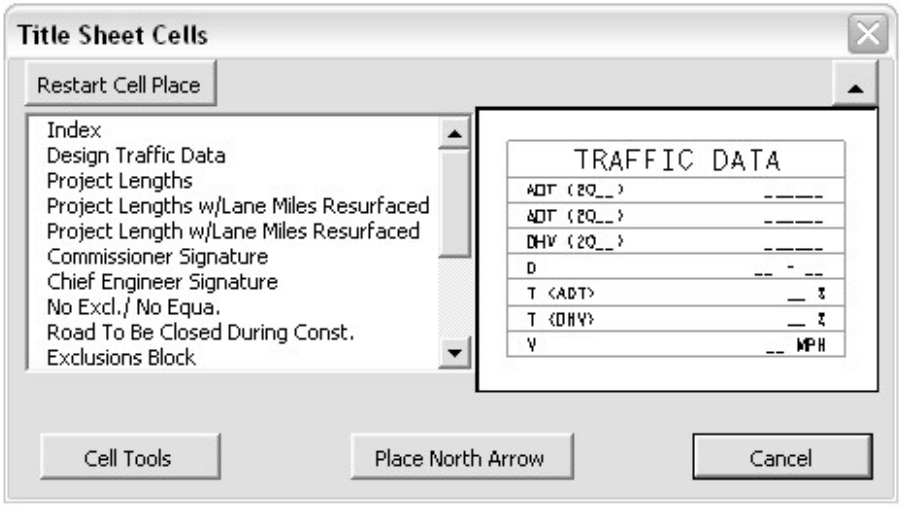
This program can also be activated from the MicroStation drop down menu
TDOT > Title Sheet Cells
or by using the keyin
vba run [TitleSheetCells]TitleSHTcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Title Sht Cells**. The **Title Sheet Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Signalization

Signalization Device Cells

D&C location: Drafting Standards > Signalization > Signal Cells

MicroStation VBA Program: SignalizationDeviceCells.mvba

Description:

This program provides access to TDOT Design Division signalization device cells.

A command button and keyin field are provided to place signal head number annotation.

Includes options to place signal head number with circle, place mast arm by length and place pedestrian signal head with leader. Also includes command buttons to access Signal Head Cells, Place Signal Attachment Height Diagram, Place Jack/Bored Conduit, Label Conduit, Label Pull Box, Draw Handicap Ramp, Station Offset Labeler, Geopak's D& C Manager, DP Station & Offset and Draw Transition tool.

A command button is provided to access MicroStation's Set Active Angle by 2 Points command.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

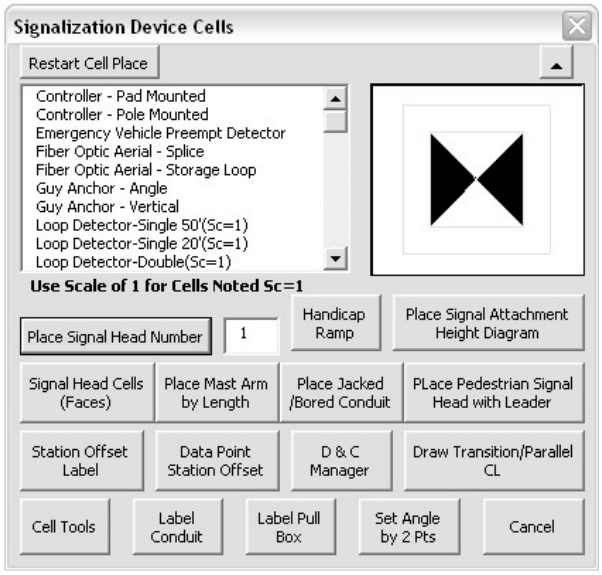
This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Device Cells
or by using the keyin
vba run [SignalizationDeviceCells]SignalDevicecells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Signal Cells**. The **Signalization Device Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation’s Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Note that some "actual size" cells should be placed at scale of 1 as noted in their description. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

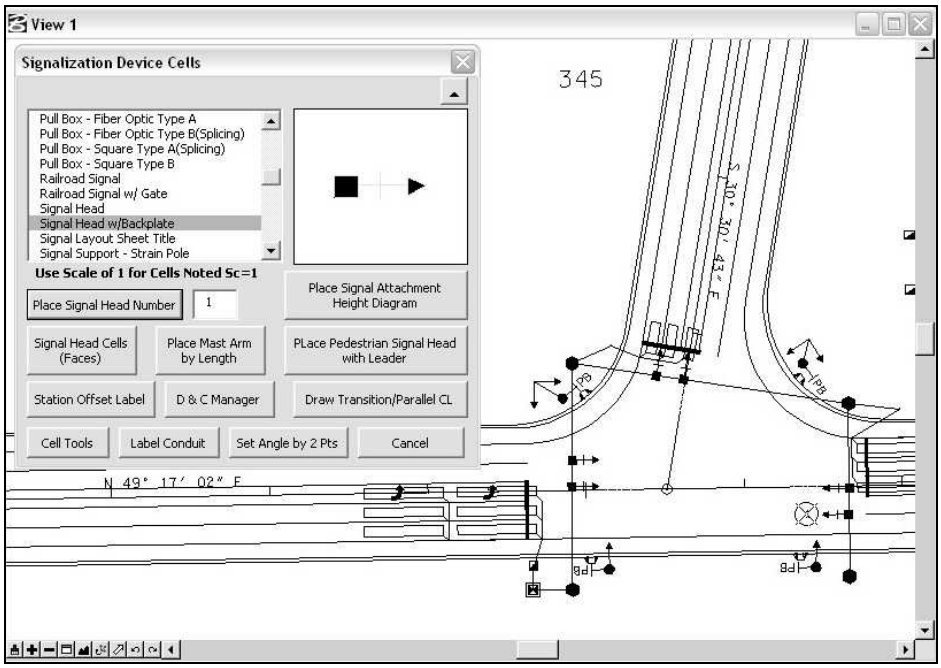
Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Signal Head Number:

Step 1. In the **Signal Head Number** keyin field enter the number for a given signal head and then click on the **Place Signal Head Number** command button.

Step 2. The user is prompted to **Identify Location** for text label placement. Text is placed within a circle for labeling signal heads in the plan view.



Step 3. A data point places the label and the command remains active allowing multiple placements of signal head label. To change the number in the label simply change the number in the keyin field at any time. A reset will end placement of labels.

Signal Head Cells

D&C location: Drafting Standards > Signalization > Signal Hd Cells

MicroStation VBA Program: SignalHeadCells.mvba

Description:

This program provides access to TDOT Design Division signal head cells.

A command button and keyin field are provided to place signal head number annotation.

A command button is provided to place left turn signal sign faces with sign name annotation.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

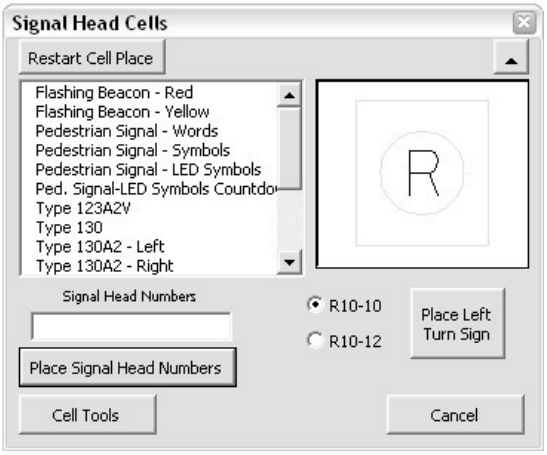
This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Device Cells
or by using the keyin
vba run [SignalHeadCells]SignlHeadcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Signal Hd Cells**. The **Signal Head Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

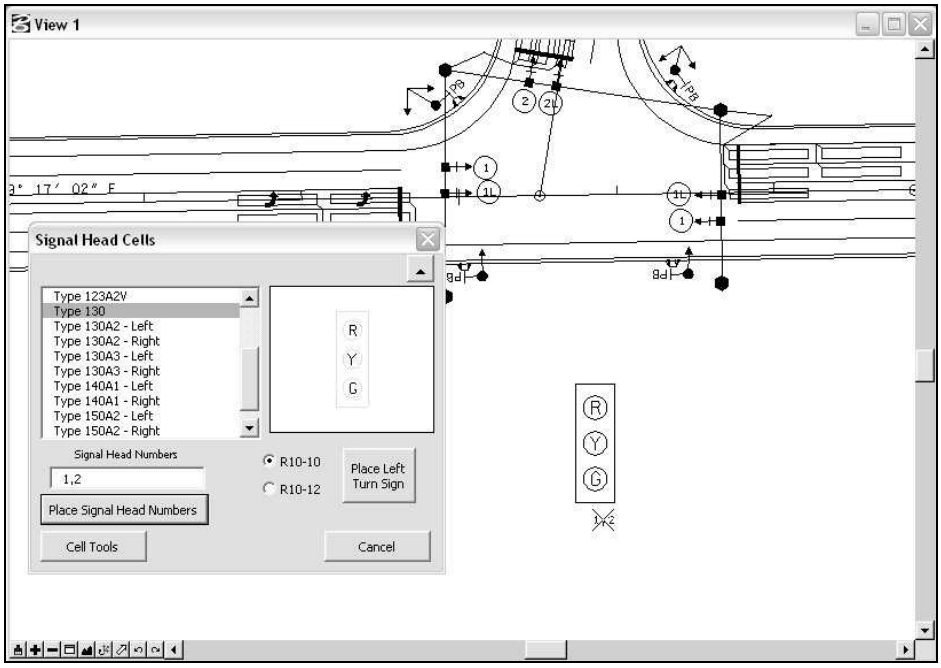
This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Signal Head Numbers:

Step 1. In the **Signal Head Numbers** keyin field, enter the numbers for a given signal head and then click on the **Place Signal Head Numbers** command button.

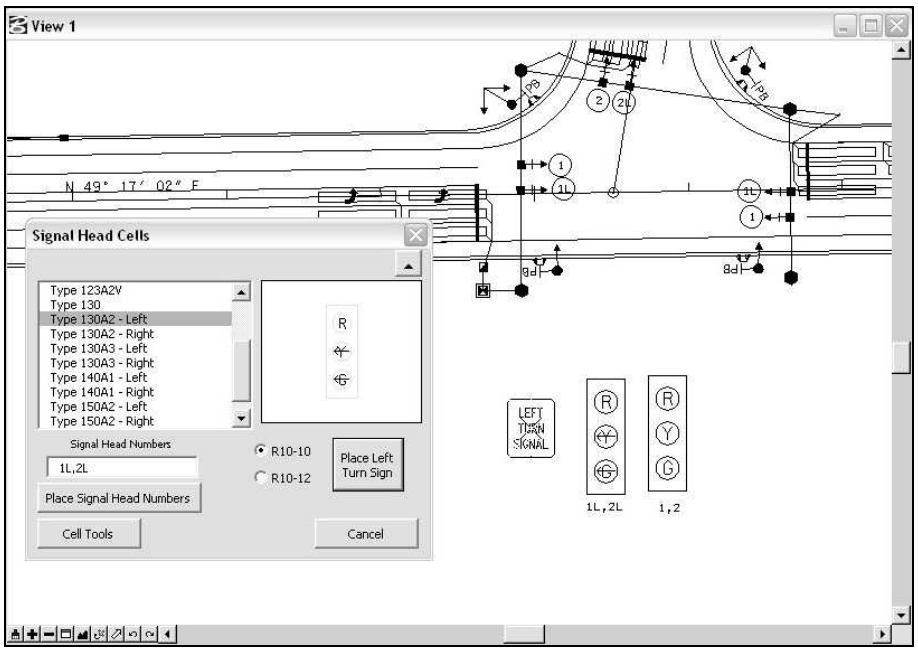
Step 2. The user is prompted to **Identify Location** for text label placement.



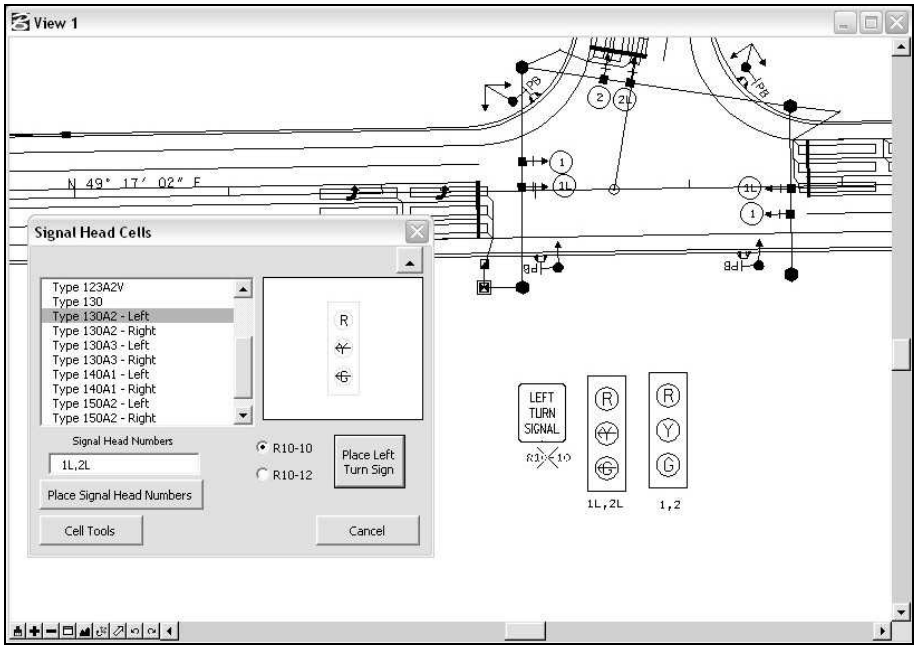
Step 3. A data point places the text label.

Place Left Turn Signal Sign:

Step 1. First choose the desired left turn sign option, **R10-10** (Left Turn Signal) or **R10-12** (Left Turn Yield On Green). Click on the **Place Left Turn Signal Sign** command button. The user is prompted to **Identify Location** for the sign face.



Step 2. After placing the sign face the sign name annotation is activated and the user is prompted to **Identify Location** for text label placement.



Step 3. A data point places the label.

Place Signal Attachment Height Diagram

D&C location: Drafting Standards > Signalization > AH Diagram

MicroStation VBA Program: SignalHeightAttachmentDiagram.mvba

Description:

This program generates a signal attachment height diagram from proposed signalization plan view graphics in a selection set. The diagram scale factor and the current active scale is shown with keyin fields to reset as needed. Plot Scale is used to control the text sizes used in the diagram.

All diagram graphics are combined in a graphic group to aide in moving or deleting after initial placement.

This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Place Signal AH Diagram
or by using the keyin
vba run [SignalHeightAttachmentDiagram]SignalHeightDiagram.Main

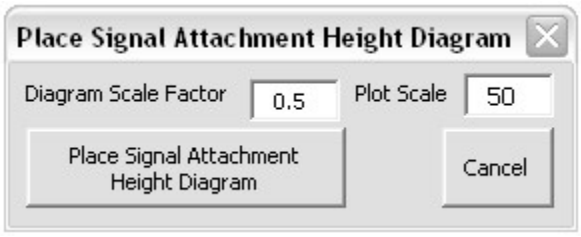
Special Requirements:

MicroStation Selection Set including support poles and span wire. Other intersection graphics may be in selection set as well but are ignored.

This program **does not** currently support suspended box style of signalization design.

Usage:

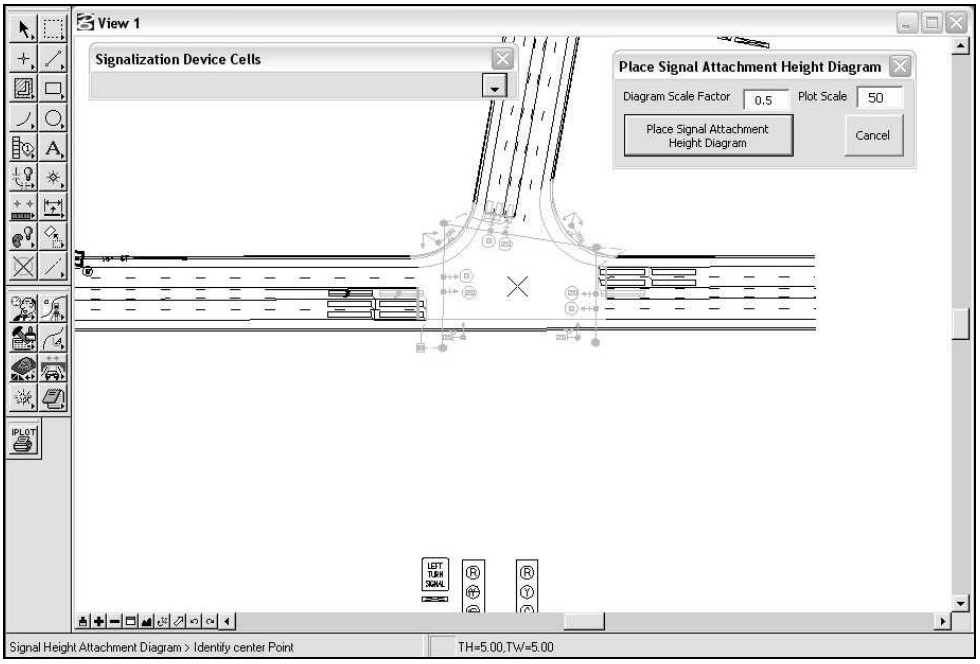
Step 1. In D&C manager activate **AH Diagram**. The **Place Signal Attachment Height Diagram** dialog appears.



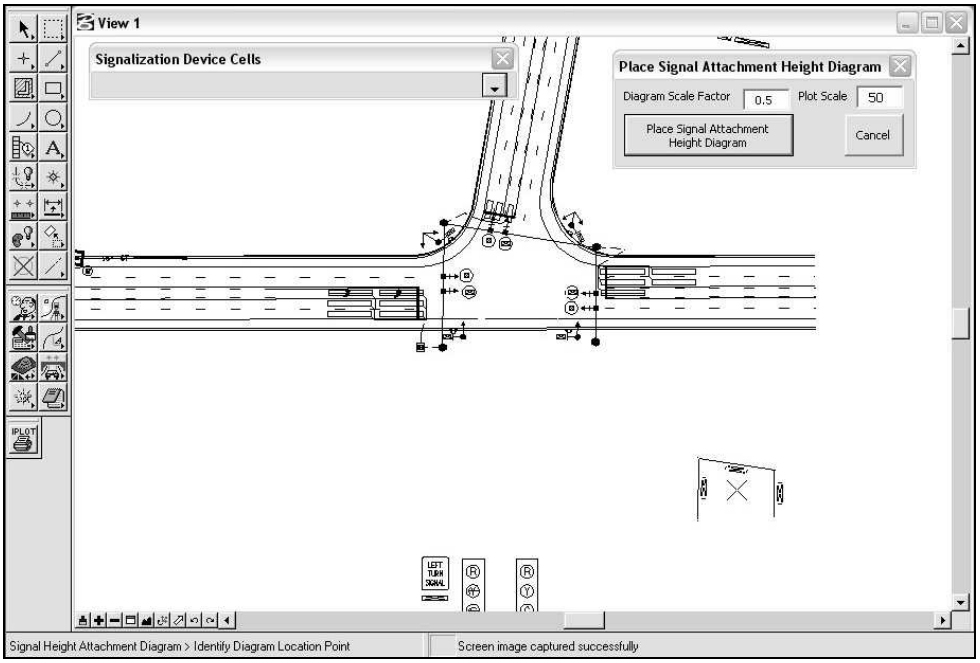
Step 2. Review **Diagram Scale Factor** and **Plot Scale** and adjust as needed.

Step 3. Create a selection set of intersection graphics using MicroStation's **Element Selection** tool. Specific items do not need to be selected but the selection set should include all signal support poles and span wire.

Step 4. Click on the **Place Signal Height Attachment Diagram** command button. The user is prompted to **Identify Center Point** of the intersection. Data point in the general location of the middle of the intersection, this point does not have to be exact.

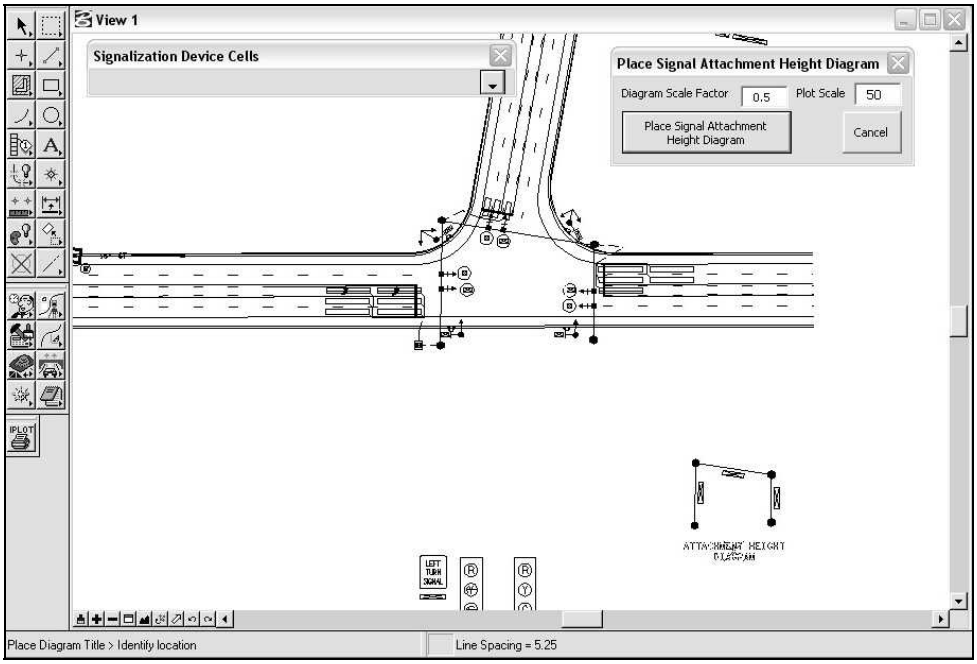


Step 5. The selection set is then read and all signal support poles and span wire graphics are picked out and then scaled as specified by the diagram scale factor. Signal heights are calculated and generated as text labels. Diagram graphics are dynamically shown and then the user is prompted to **Identify Diagram Location Point** .



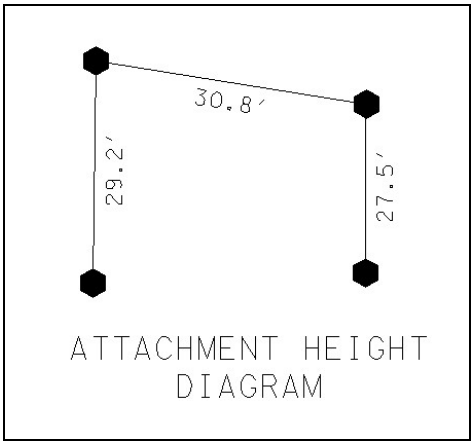
Data point when satisfied with the location

Step 6. After placing the diagram, the title text annotation is activated and the user is prompted to **Identify Location** for text label placement.



Step 6. After placing the title text, the user can start again with step 3 to place additional signal attachment height diagrams for any other intersections on the project.

If the **Diagram Scale Factor** or **Plot Scale** given were in error, it will be necessary to re-run the program after resetting those values.



Remember to delete or move a diagram, turn on the graphic group lock and then perform the needed operation.

Place Pedestrian Signal Head with Leader

D&C location: Drafting Standards > Signalization > Ped Signal

MicroStation VBA Program: SignalizationDeviceCells.mvba

Description:

This program places 1 or more pedestrian signal head symbols with a leader line.

All graphics are combined in a graphic group to aide in moving or deleting after initial placement.

This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Place Pedestrian Signal Head & Leader
or by using the keyin
vba run [SignalizationDeviceCells]PlacePedSignalHeadwithLeader.main

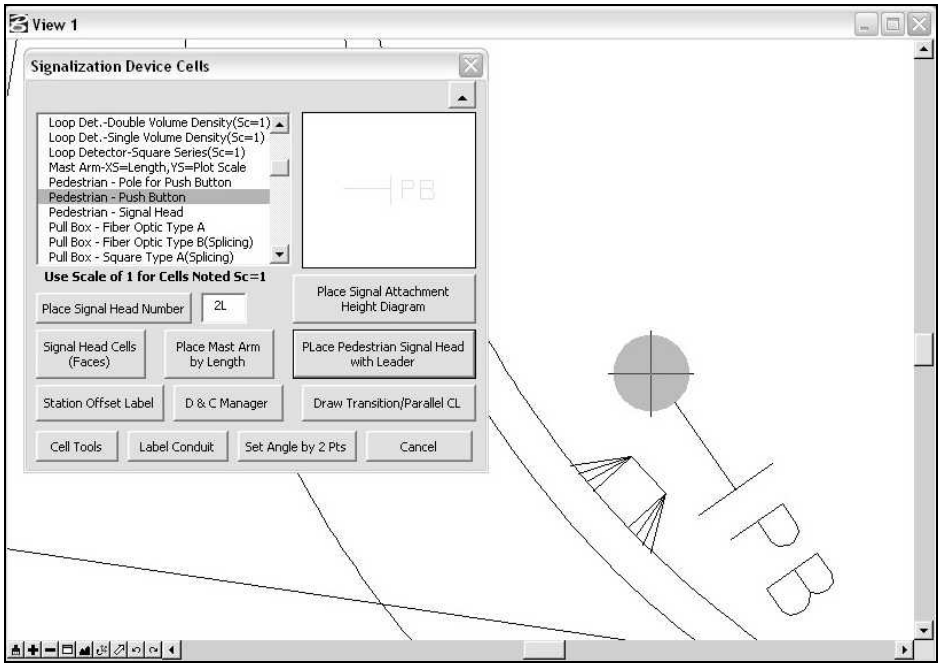
Special Requirements:

None

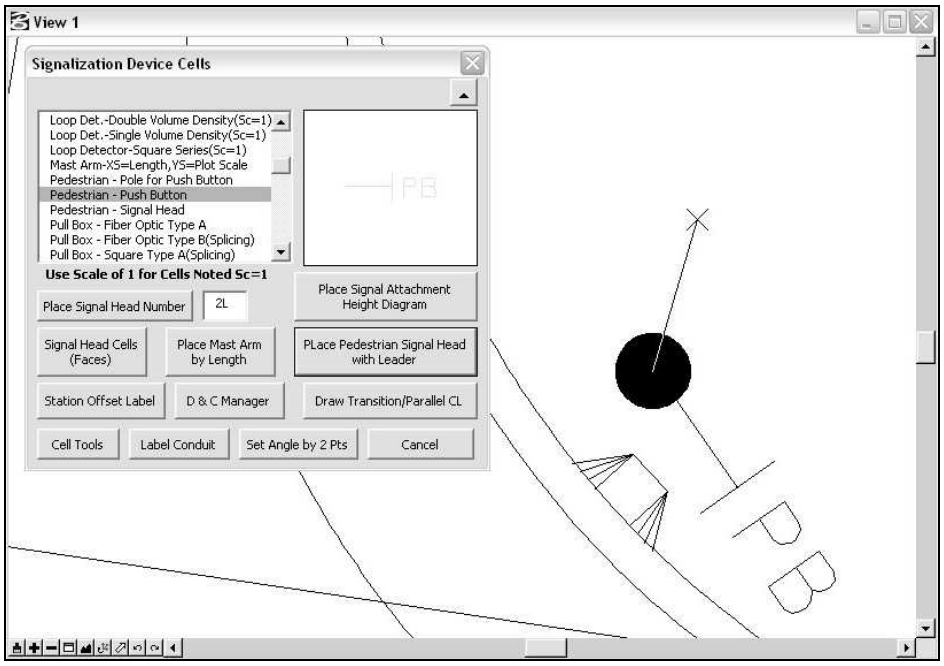
Usage:

Step 1. In D&C manager activate **Ped Signal**.

Step 2. The user is prompted to **Place Begin Point** for the leader. Snap & data point in the center of the pole on which pedestrian signal heads are mounted.

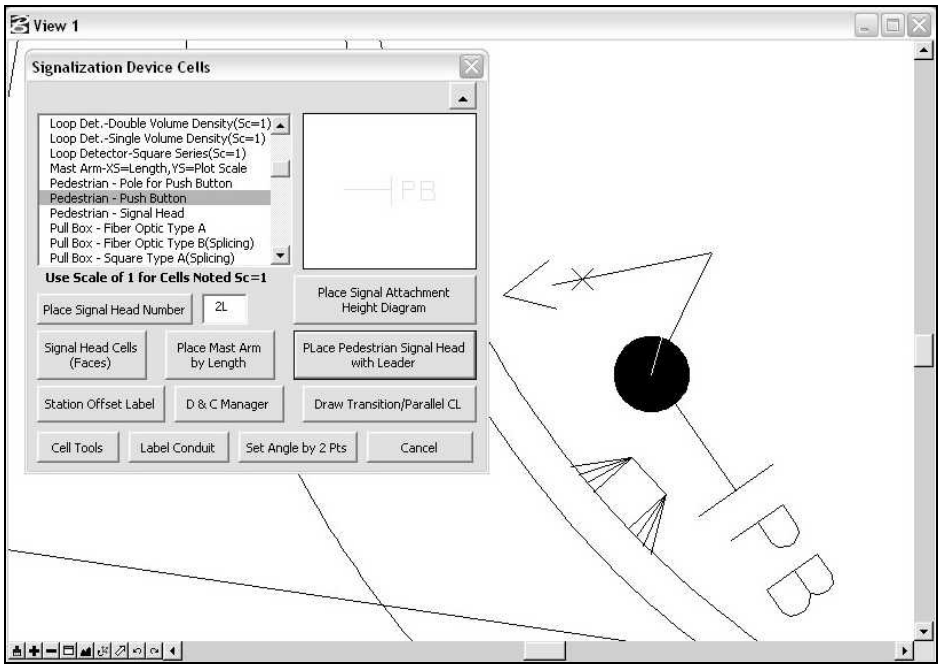


Step 3. Leader line is shown dynamically and the user is prompted to **Place end point**.



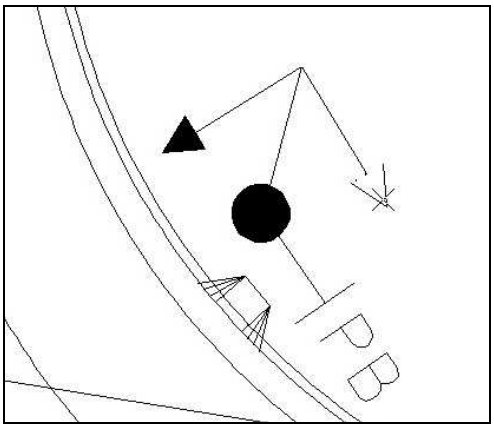
Data point when satisfied with the location.

Step 4. After the end of the leader is given, a pedestrian signal head symbol cell is placed at the end in a spin mode and you are prompted to **ID Point to set Cell Angle**.



Data point when satisfied with the angle.

Step 5. After that point is given, another pedestrian signal head is offered at that location allowing multiple signal heads to be placed. When finished at that location, a reset will loop the program back to the beginning allowing placement of leader line and signal heads at another location.



Place Mast Arm by Length

D&C location: Drafting Standards > Signalization > MastArm Length

MicroStation VBA Program: SignalizationDeviceCells.mvba

Description:

This program places a mast arm with user specified length.

The mast arm cell is built so that at a scale of 1 it is 1' long in English or 1 meter long for metric. This allows an odd scale to be specified for the X axis to control the length. The Y axis is applied at the normal plot scale. The cell also includes a dotted centerline to aide in placement of signal head symbols. Since the cell includes a filled shape for the mast arm it will be necessary to turn off fill display to see its centerline.

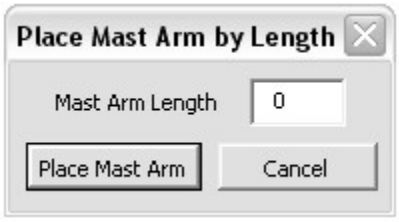
This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Place Mast Arm by Length
or by using the keyin
vba run [SignalizationDeviceCells]PlaceMastArm.main

Special Requirements:

AccuSnap **must be turned off** for this tool to function correctly.

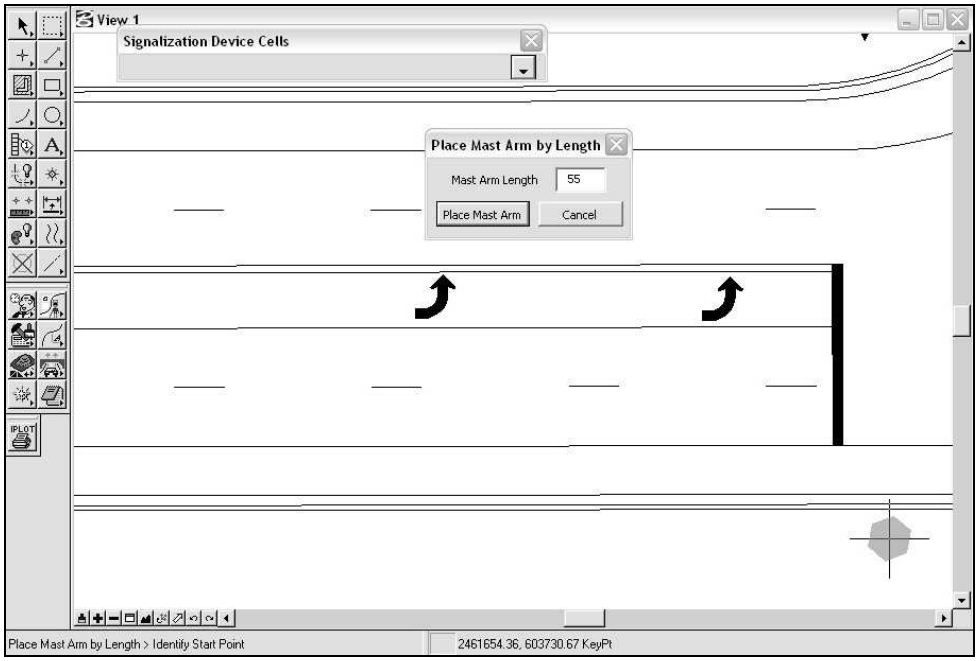
Usage:

Step 1. In D&C manager activate **MastArm Length**. The **Place Mast Arm by Length** dialog appears.

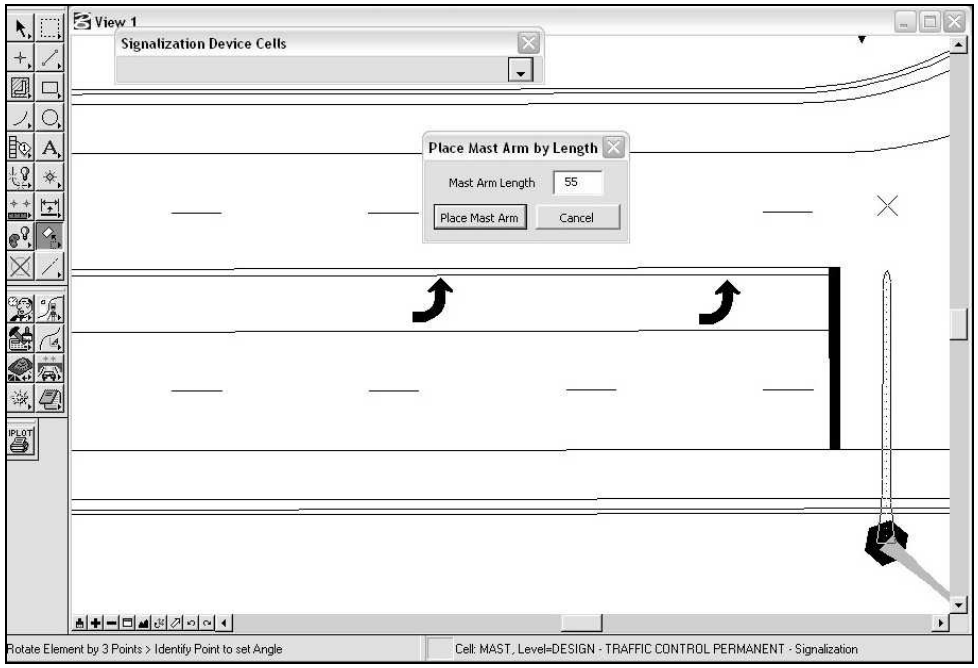


Step 2. Enter the desired mast arm length in the keyin field.

Step 3. Click on the **Place Mast Arm** command button. The user is prompted to **Identify Start Point** for the mast arm. Snap & data point in the center of the support pole which the mast arm extends from.

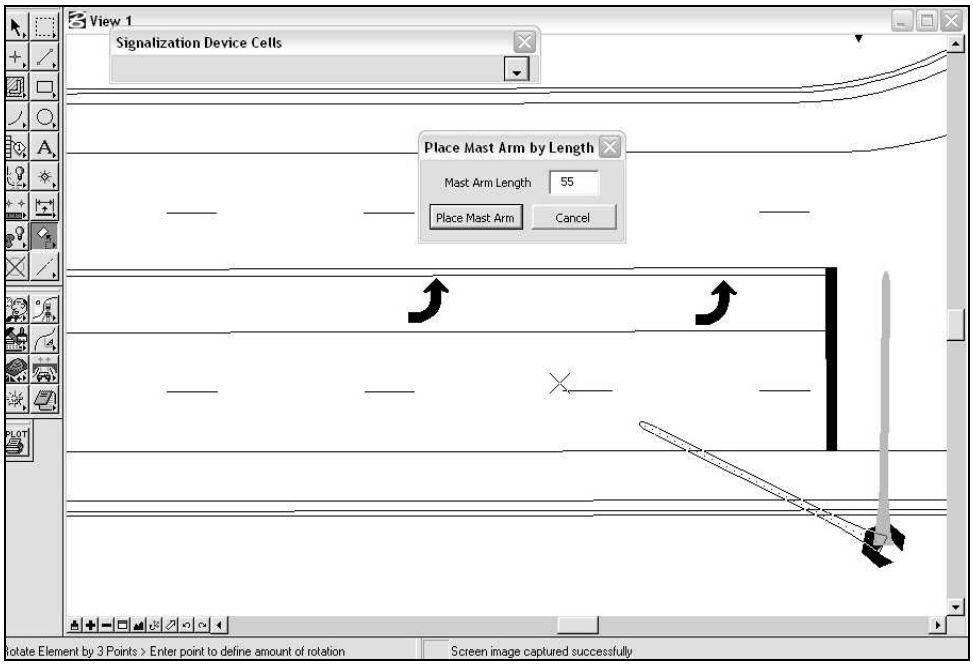


Step 4. The cell is placed at an angle of 0 and then automatically passed into MicroStation's Rotate Element command. The user is prompted to **Identify Point to set Angle** .



Data point when satisfied with the angle.

Step 5. After giving the point, the mast arm still remains in a rotation mode. If satisfied with the angle, reset to stop the rotation of the mast arm or enter another point to reset the angle.



Label Conduit

D&C location: Drafting Standards > Signalization > Label Conduit

MicroStation VBA Program: LabelConduit.mvba

Description:

This program places proposed conduit labels with size & type. A toggle option is given for lighting or signalization application which controls the level of placement. It also includes an option to identify the conduit or fiber optic line to automatically set up the desired label text. A terminator option of a regular or small arrowhead or dot is provided. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of label text and terminator. All label graphics are combined in a graphic group for easy movement or deletion.

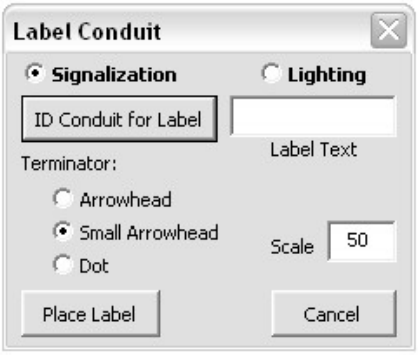
This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Label Conduit
or by using the keyin
vba run [LabelConduit]IDandLabelConduit.Main

Special Requirements:

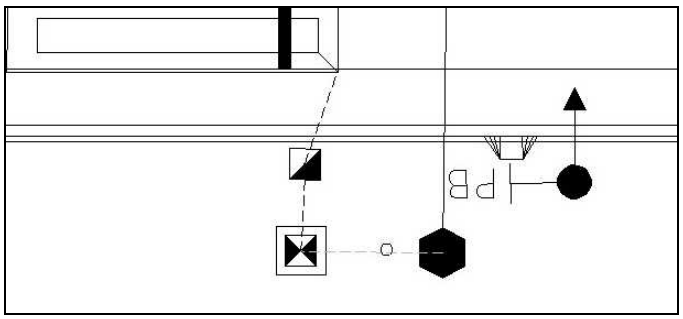
None.

Usage:

Step 1. In D&C manager activate **Label Conduit**. The **Label Conduit** dialog appears.

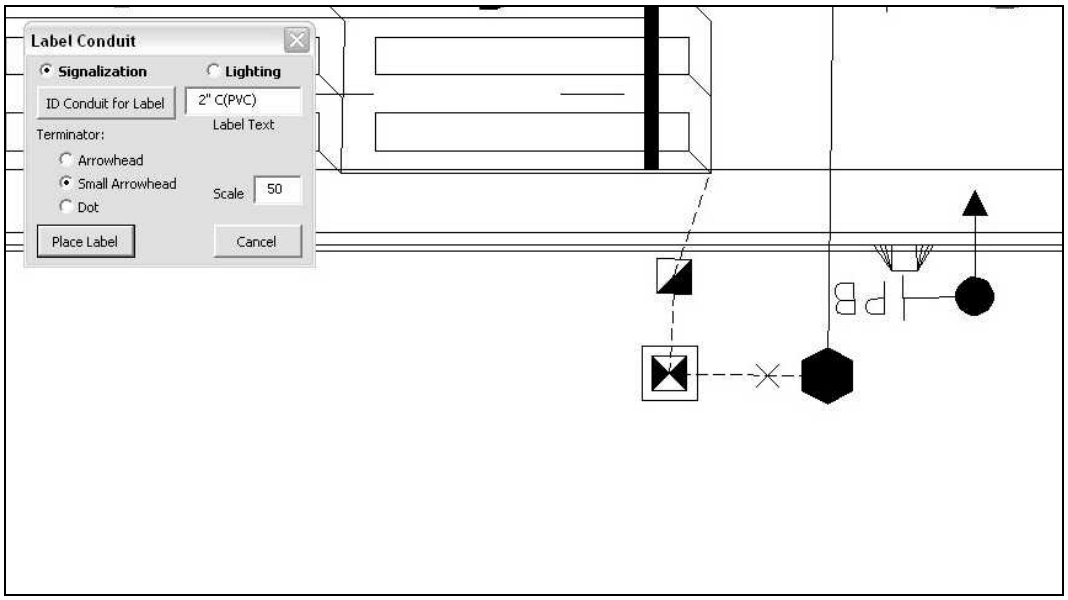


Step 2. First the signalization or lighting toggle should be set as needed. Then the user either enters the label text in its keyin field manually or by using the **ID Conduit for Label** command button to identify the conduit to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Conduit**. Data point on the conduit line and another data point to accept the element.

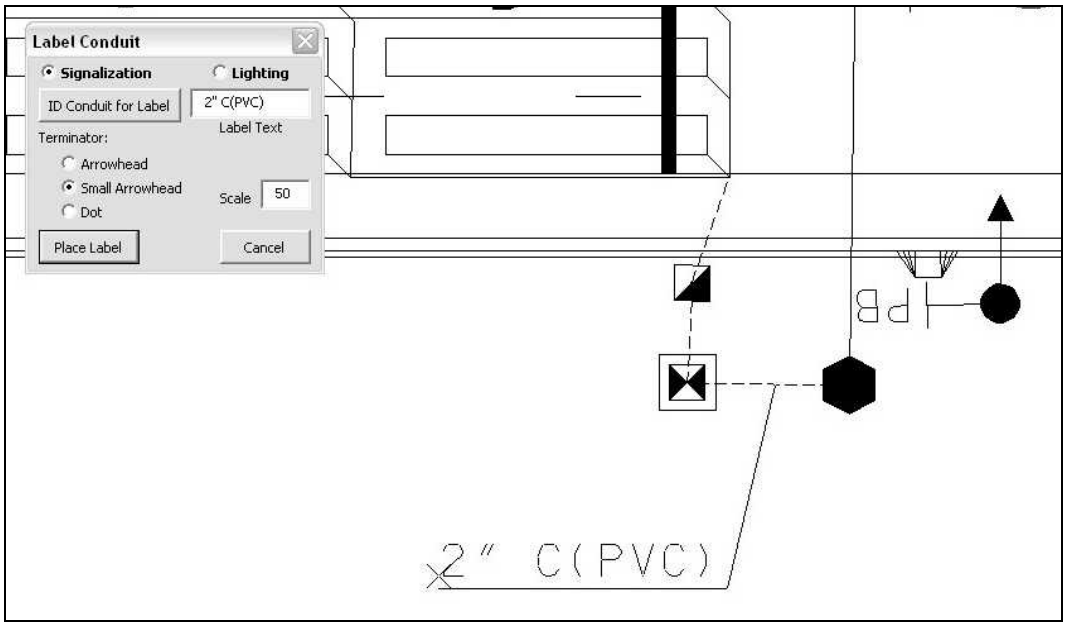


Conduit must be placed with the correct standard symbology for this function to recognize it. An error message is generated for invalid elements.

Step 3. To place the label, choose the terminator type desired, check the scale and then click on the **Place Label** command button. You are prompted to **Identify location for End of Leader**. Data point on the conduit line.

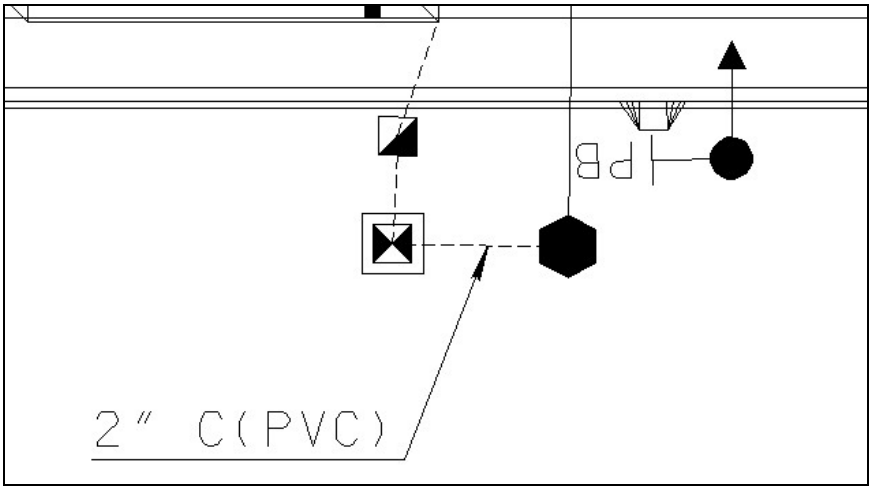


Step 4. Once this point is given, the label is shown dynamically and the user is prompted for a second point **to Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



Data point when satisfied with the location

Step 5. Graphics are placed and combined in a graphic group. At this point the program loops back to the prompt to identify location for end of leader allowing for additional placements of the label.



If the initial scale given was in error, it is necessary to re-start the command by clicking on the Place Label command button after resetting the given scale value. The terminator option can be reset at any time during label placement.

Label Pull Box

D&C location: Drafting Standards > Signalization > Label Pull Box

MicroStation VBA Program: LabelPullBox.mvba

Description:

This program places proposed pull box labels. A toggle option is given for lighting or signalization application which controls the level of placement. It also includes an option to identify the pull box to automatically set up the desired label text. A terminator option of an arrowhead (medium), small arrowhead or none is available. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of label text and terminator. All label graphics are combined in a graphic group for easy movement or deletion.

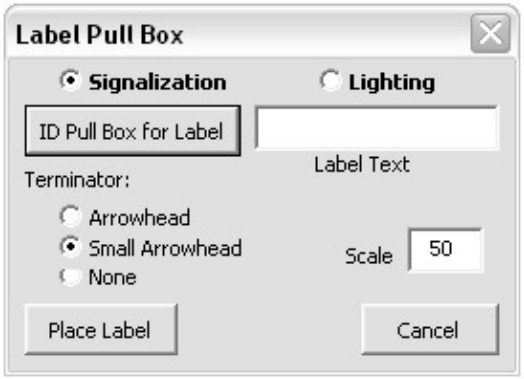
This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Label Pull Box
or by using the keyin
vba run [LabelPullBox]IDandLabelPullBox.Main

Special Requirements:

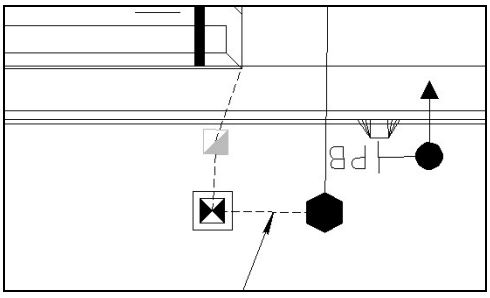
None.

Usage:

Step 1. In D&C manager activate **Label Pull Box**. The **Label Pull Box** dialog appears.

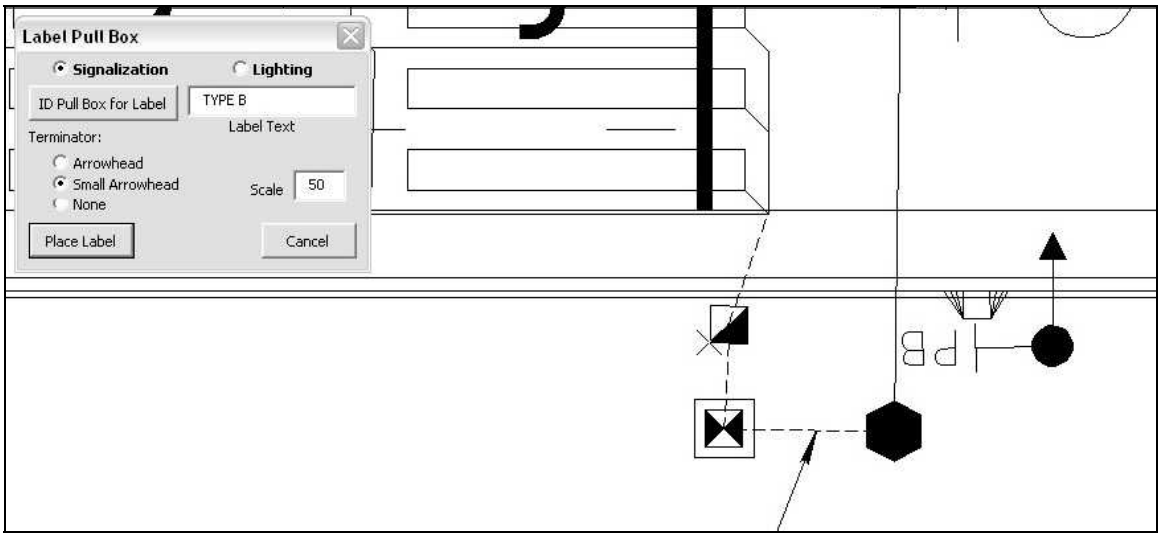


Step 2. First the signalization or lighting toggle should be set as needed. Then the user either enters the label text in its keyin field manually or by using the **ID Pull Box for Label** command button to identify the pull box to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Pull Box**. Data point on the pull box cell and another data point to accept the element.

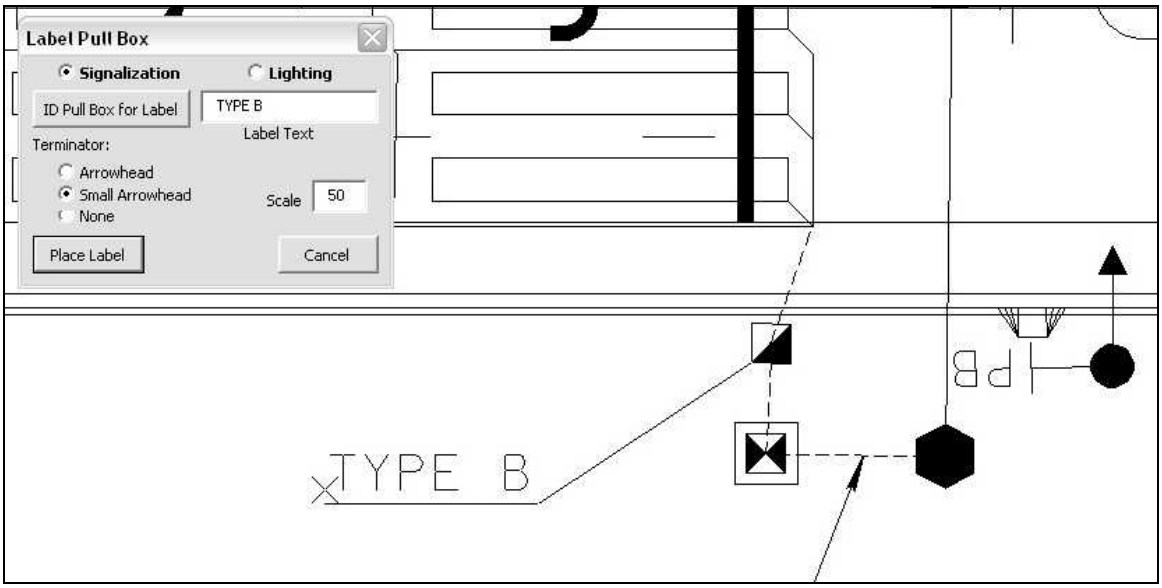


Pull box cells must be placed on the correct level for this function to recognize it. An error message is generated for invalid elements.

Step 3. To place the label, choose the terminator type desired, check the scale and then click on the **Place Label** command button. You are prompted to **Identify location for End of Leader**. Data point on the pull box.

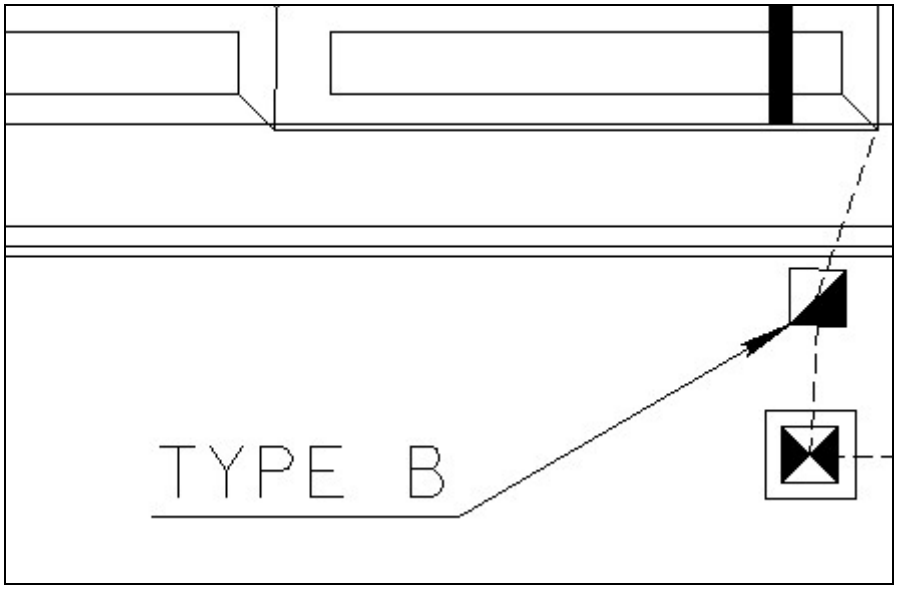


Step 4. Once this point is given, the label is shown dynamically and the user is prompted for a second point **to Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



Data point when satisfied with the location

Step 5. Graphics are placed and combined in a graphic group. At this point the program loops back to the prompt to identify location for end of leader allowing for additional placements of the label.



If the initial scale given was in error, it is necessary to re-start the command by clicking on the Place Label command button after resetting the given scale value. The terminator option can be reset at any time during label placement.

Place Jacked or Bored Conduit

D&C location: Drafting Standards > Signalization > Place Jacked

MicroStation VBA Program: PlaceJackedBoredConduit.mvba

Description:

This program places jacked/bored conduit under roadways. A toggle option is given for lighting or signalization application which controls the level of placement. Choices are given for the pull box type (Type A, Type B, Type C, Fiber Optic Type A or Fiber Optic Type B) and conduit size (2" or 3"). The current active scale is shown with a keyin field to reset as needed. Scale is used to control the size of pull boxes and other symbolization. All graphics are combined in a graphic group for easy deletion.

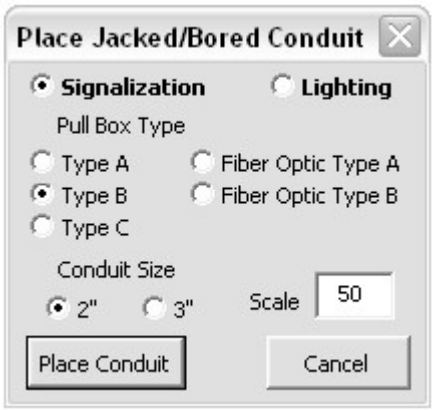
This program can also be activated from the MicroStation drop down menu
TDOT > Signalization > Place Jacked/Bored Conduit
or by using the keyin
vba run [PlaceJackedBoredConduit]Jacked.Main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Place Jacked**. The **Place Jacked/Bored Conduit** dialog appears.



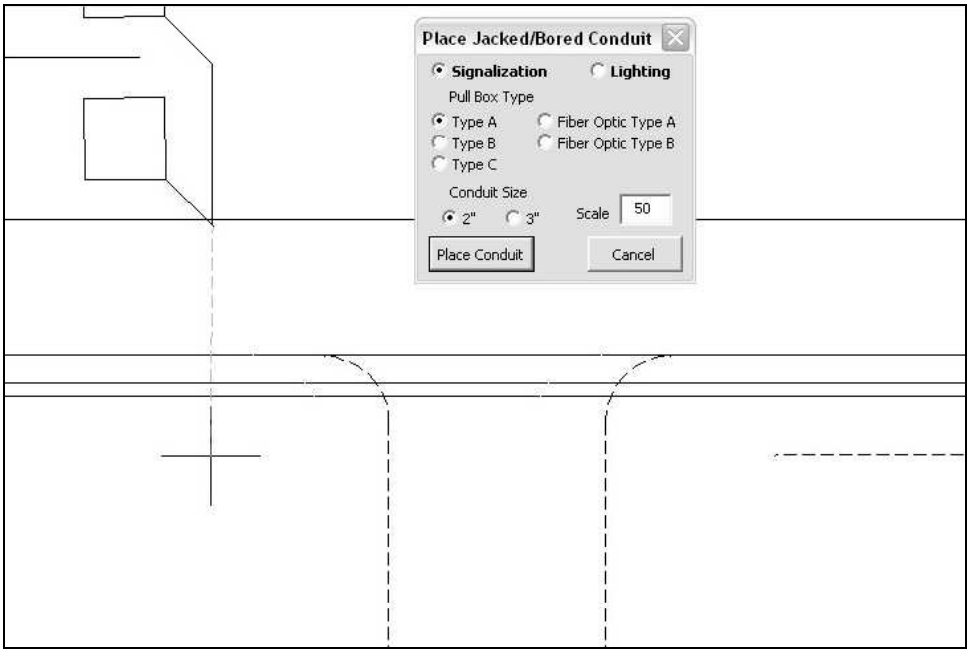
Step 2. Make the required settings.

First the **Signalization** or **Lighting** toggle should be set as needed.

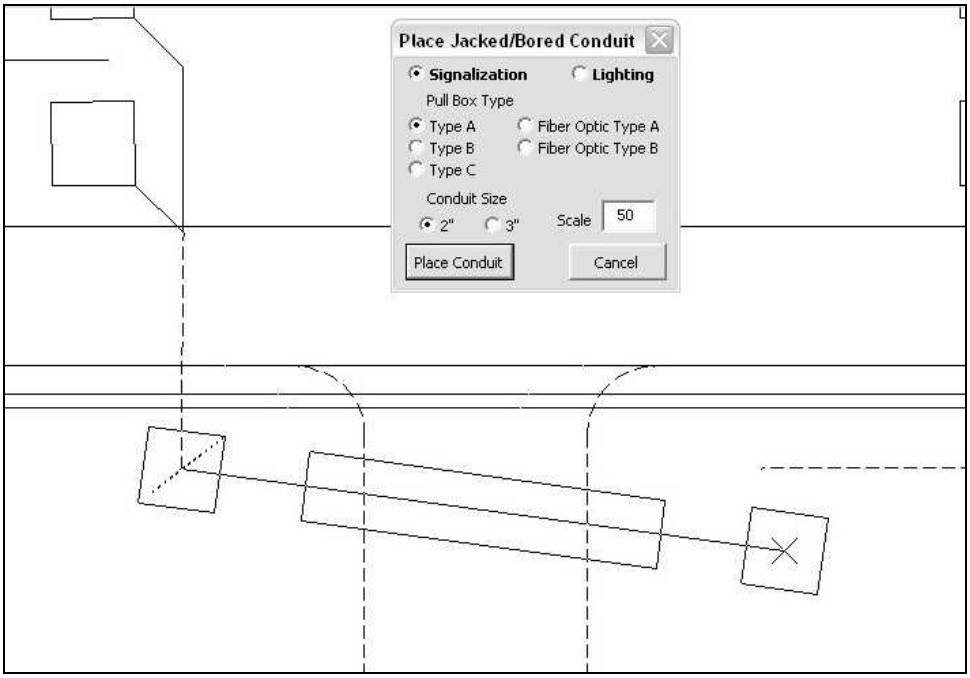
Then the user needs to choose the **Pull Box Type** to be placed at the ends. Note that only pull box types A, B or C are valid for Lighting application. All are valid for Signalization application except for type C.

Finally pick the **Conduit Size** and check the **Scale** value shown.

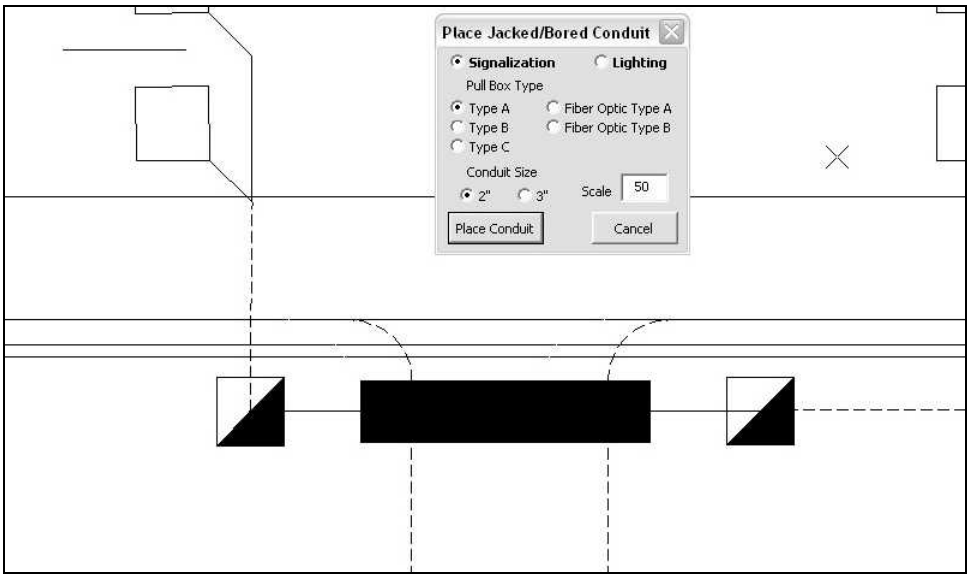
Step 3. Click on the **Place Conduit** command button. You are prompted to **Identify Pull Box Location on Left**. Data point on the left side of the roadway or other feature which conduit is to be jacked or bored under.



Step 4. Once this point is given, the graphics are shown dynamically and you are prompted to **Identify Pull Box Location on Right**. Data point at the pull box location on the right side.



Step 5. Graphics are placed and combined in a graphic group. At this point the program loops back to the beginning for additional placements.



Graphics are placed so that D&C Manager can be used later to calculate the quantities for pull boxes and jacked or bored conduit line.

Signs

Blank Signs, Etc.

D&C location: Drafting Standards > Signs > Blanks,etc.

MicroStation VBA Program: BlankSignCells.mvba

Description:
This program provides access to TDOT Design Division blank sign cells as well as cells used to set up new signs.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

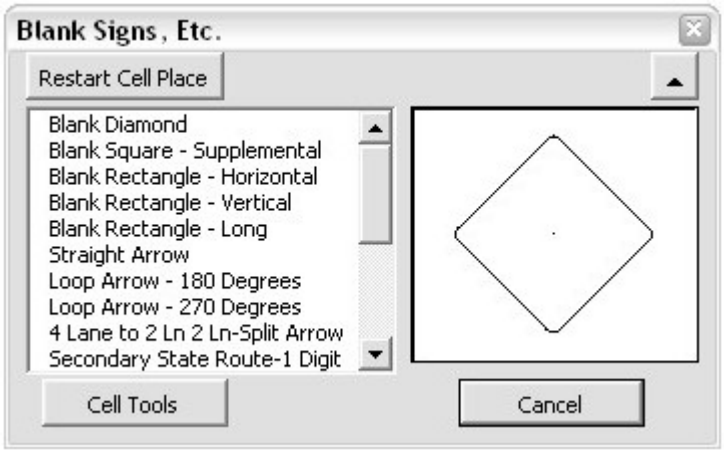
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Blank Signs, Etc.
or by using the keyin
vba run [BlankSignCells]BlnkSigncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Blanks,etc.** The **Blank Signs, Etc.** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Construction Sign Cells

D&C location: Drafting Standards > Signs > Construction

MicroStation VBA Program: ConstructionSignCells.mvba

Description:

This program provides access to TDOT Design Division construction sign face cells. Cell list also includes various permanent & temporary sign symbols near the end

A command button and keyin fields are provided to place sign face with associated optional graphics including a text label, leader line and sign symbol (single post & face). Option for placement as Permanent or Temporary sign is given which controls the level and text label type which is used. As a permanent sign, sign number text is placed with enclosing ellipse and as a temporary sign, sign name and optional size is placed. All text values are displayed in keyin fields allowing adjustment by the user if needed. When a sign number is placed with permanent signs, the value is automatically incremented by one with each placement. All text in keyin fields can be altered on the fly during placement. By default these signs are set for placement as Temporary signs.

A command button is provided to place permanent sign # only.

A command button is provided to access the Warning Sign cell dialog.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

Since English sign cells are used in metric files, a keyin field is provided which shows the desired Metric Plot Scale. This value is used to alter the active scale temporarily so that sign faces are placed at the correct size. When the Cancel button is clicked to close the dialog, the active scale is reset to match the specified plot scale.

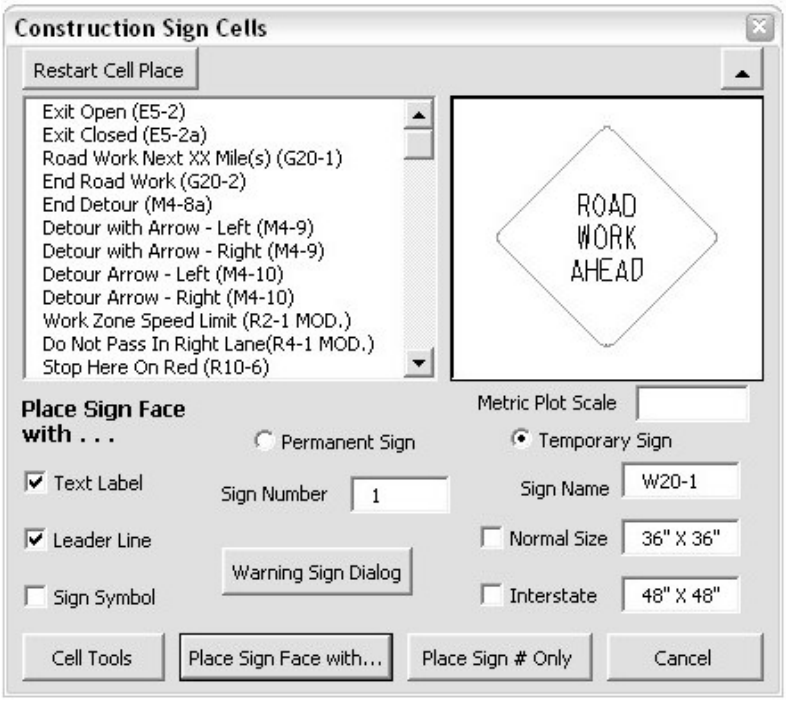
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Construction
or by using the keyin
vba run [ConstructionSignCells]ConstSigncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Construction**. The **Construction Sign Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

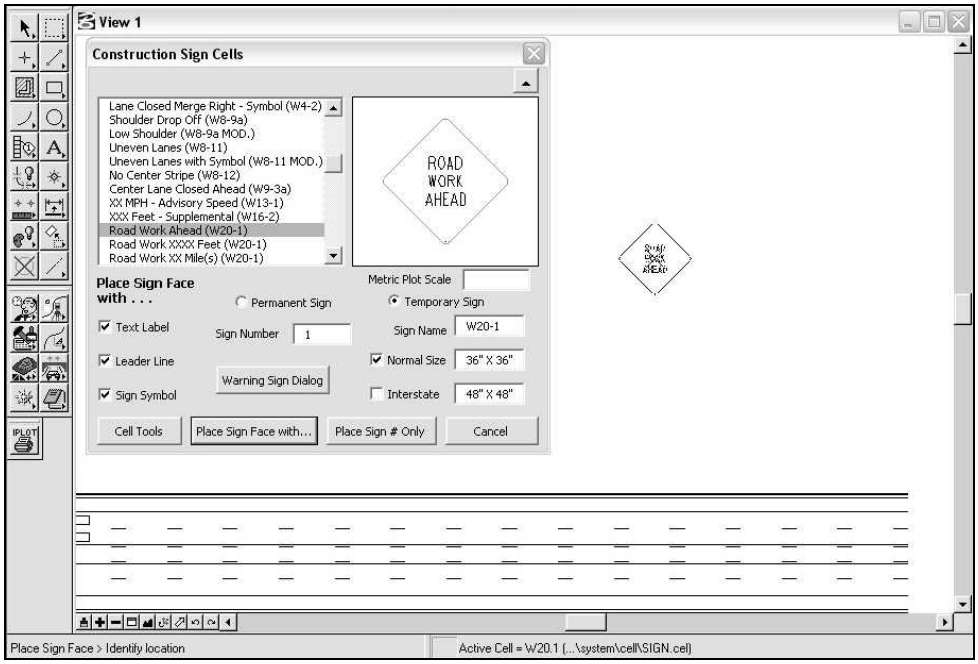
Place Sign Face with…:

Step 1. Make dialog settings. First set **Permanent** or **Temporary** placement.

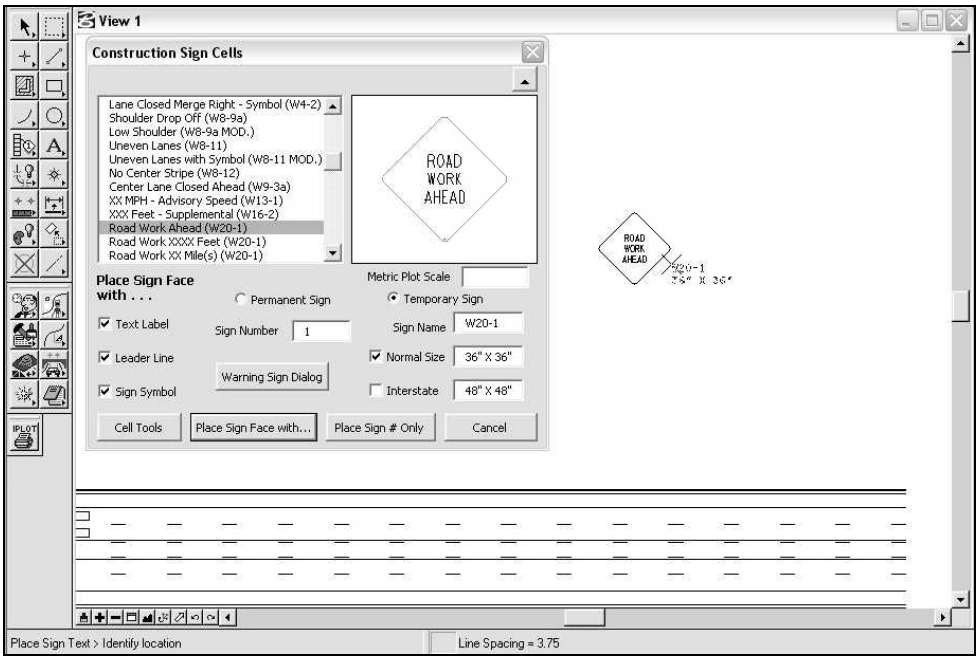
Under the optional graphics list on the left side of the dialog, turn on the desired graphics to be placed with the sign face. In this example we will place a temporary sign with all extra graphics.

When placing temporary signs the text label includes an option to include the sign size. Click on the appropriate size if desired. If needed, edit text in keyin fields.

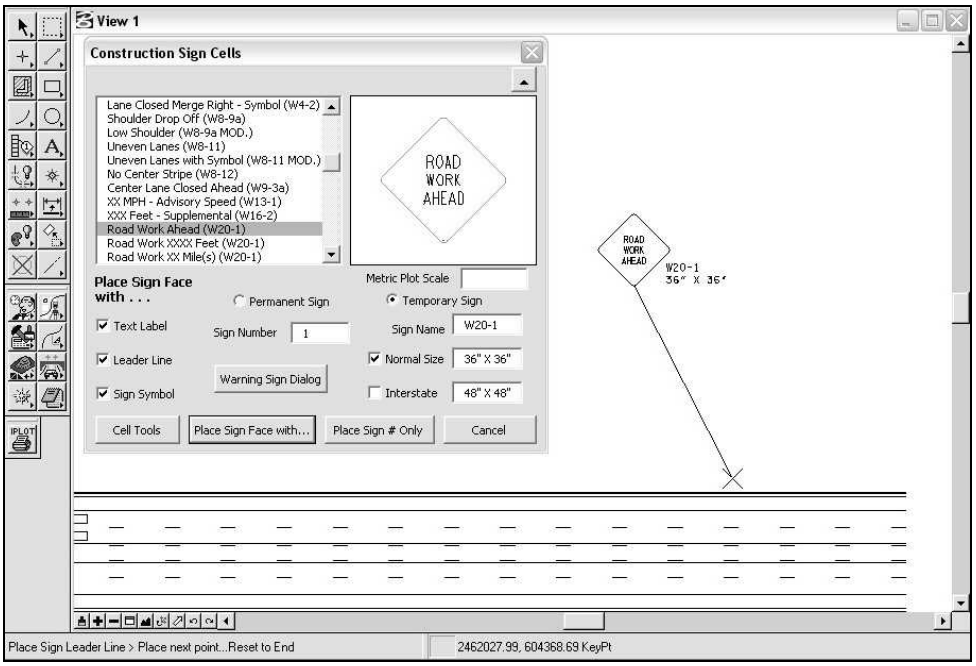
Step 2. Once required values and options are set click on the **Place Sign Face with.** command button. The user is prompted to **Identify Location** for sign face.



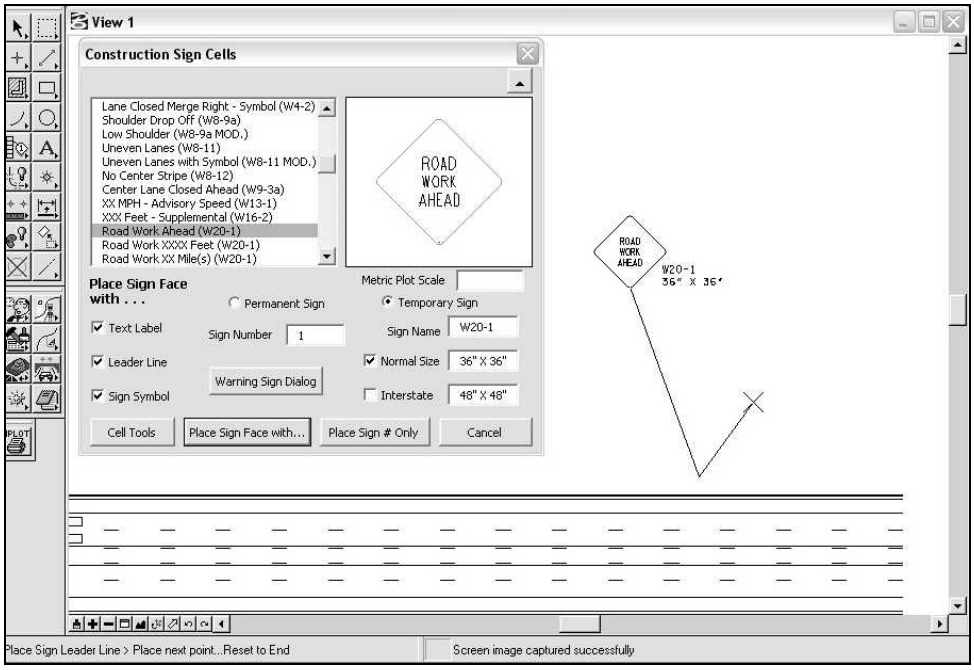
Step 3. After placing the sign face the sign name annotation is activated and the user is prompted to **Identify Location** for text label placement.



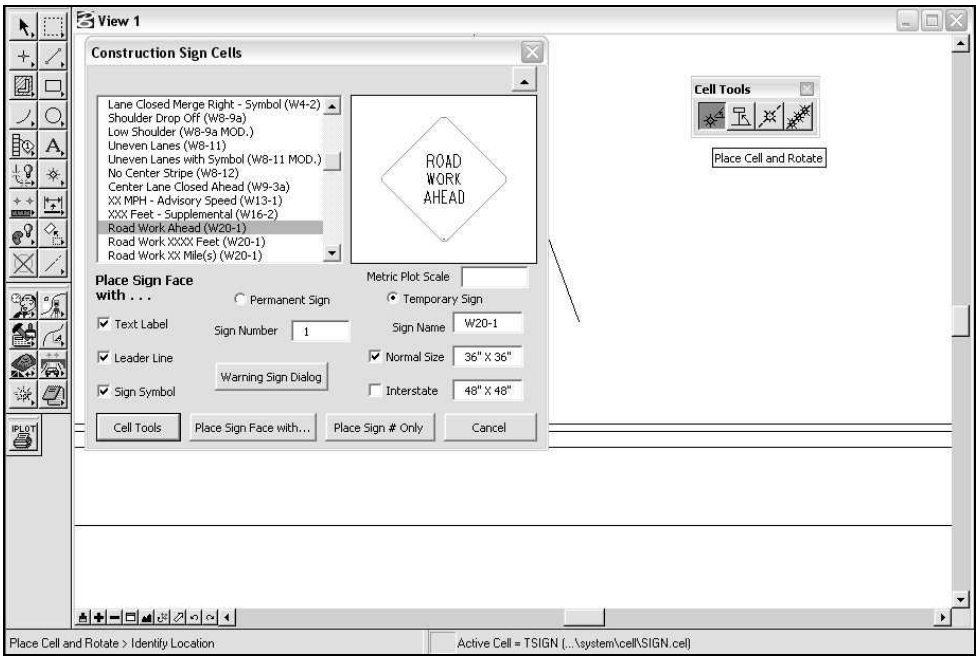
Step 4. The program then starts placement of the leader line with the initial prompt to **Place Begin Point**. After giving the begin point the user is prompted to **Place next point…Reset to End**. Continue entering additional points for the leader as needed up to a maximum of 4 vertices.



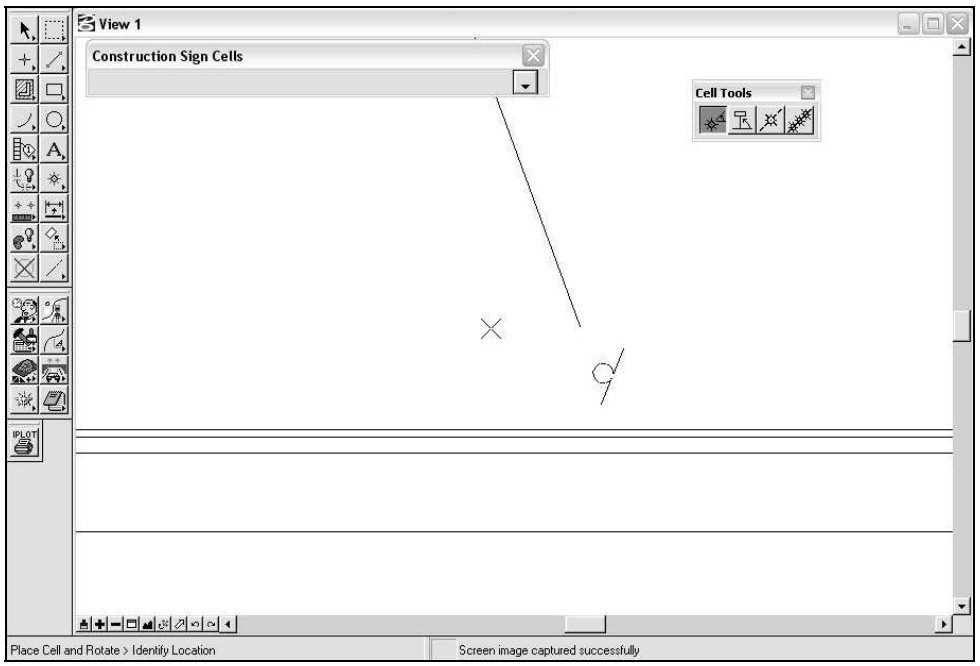
Step 5. When leader line is completed, click the reset on your mouse to end the leader.



Step 6. In our example we also requested a sign symbol cell. The program prompts to **Identify location** but rather just data pointing to place the symbol we will use the **Place Cell & Rotate** function from **Cell Tools**. If the Cell Tools toolbar is not open, click on the Cell Tools command button and then click on the first icon in the toolbar.



Step 6. Zoom in to the location for the sign and you may wish to click on the dialog window shade button to clear the view area. Data point at the location for the sign symbol and then data point again to set the cell angle. Geopak's DP Station/Offset tool could be used to place the sign symbol at a specific station and offset.

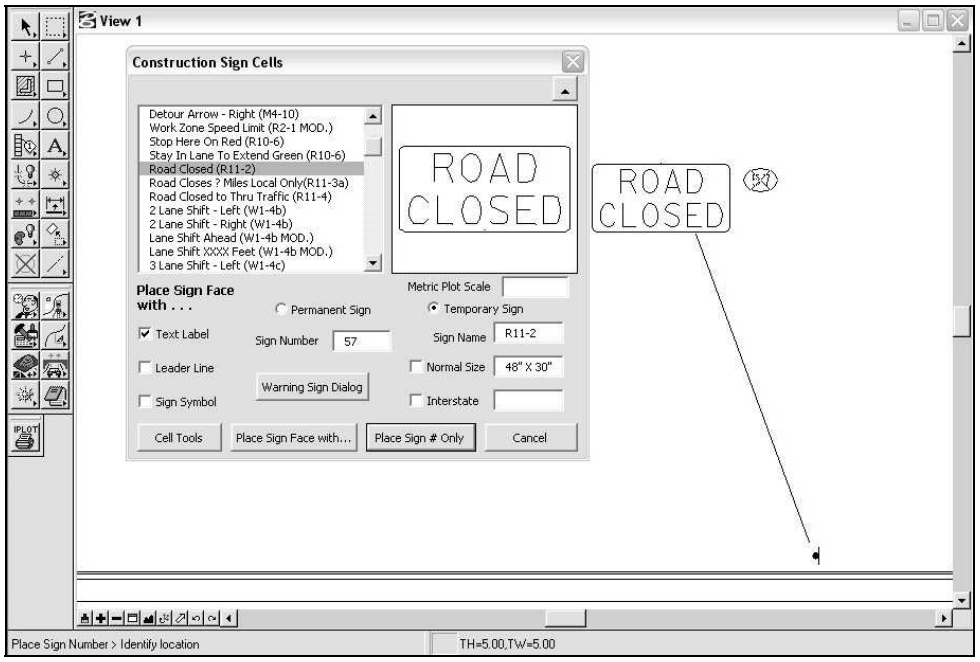


Place Sign # Only:

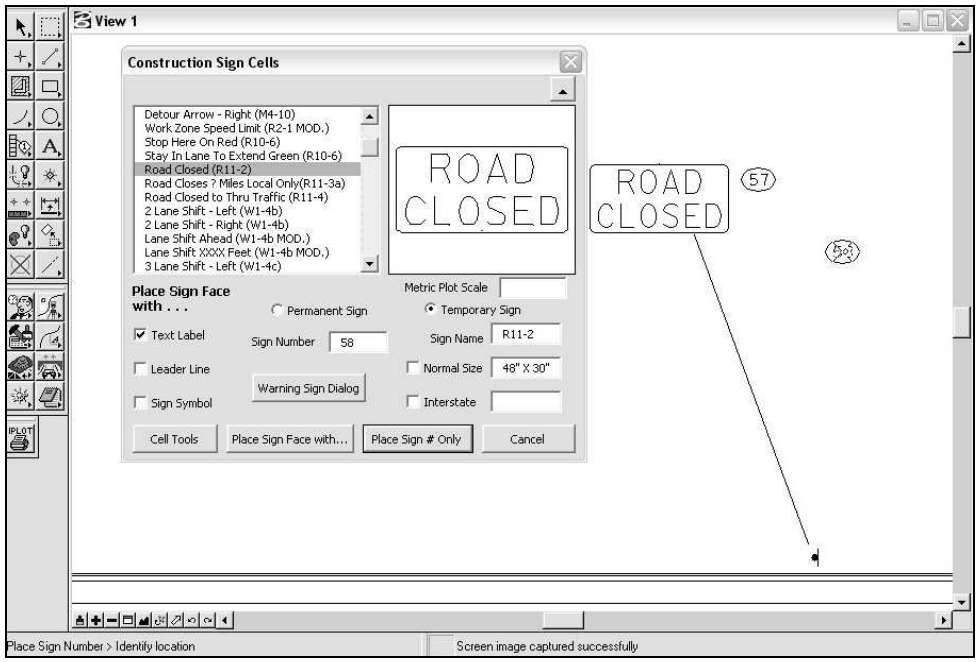
If it is necessary to replace the sign number on a permanent sign or to place it at a later time than when the sign face was first placed then use the Place Sign # Only command.

Step 1. First enter the needed sign number in the keyin field provided and then click on the **Place Sign # Only** command button.

The user is prompted to **Identify Location** for sign number placement



Step 2. After placing the label, the sign number is incremented by 1 and offered to place additional sign numbers. A reset will end placement of sign numbers.



Sign Detail Cells

D&C location: Drafting Standards > Signs > Details

MicroStation VBA Program: SignDetailCells.mvba

Description:

This program provides access to TDOT Design Division sign detail cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

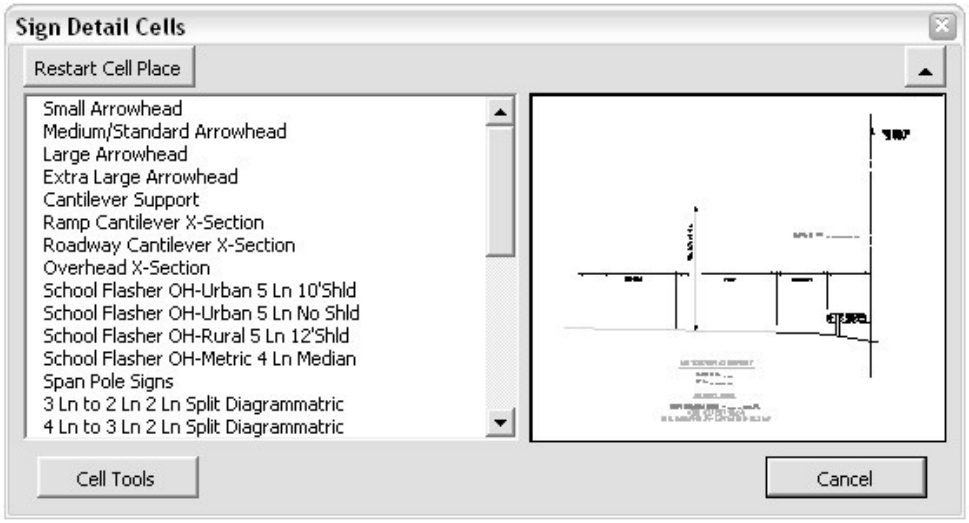
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Details
or by using the keyin
vba run [SignDetailCells]SGNDetailcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Details**. The **Sign Detail Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Highway Route Sign Cells

D&C location: Drafting Standards > Signs > Highway Route

MicroStation VBA Program: HighwayRouteSignCells.mvba

Description:

This program provides access to TDOT Design Division highway route sign face cells. Cell list also includes various permanent & temporary sign symbols near the end

A command button and keyin fields are provided to place sign face with associated optional graphics including the route number, a text label, leader line and sign symbol (single post & face). Option for placement as Permanent or Temporary sign is given which controls the level and text label type which is used. As a permanent sign, sign number text is placed with enclosing ellipse and as a temporary sign, sign name and optional size is placed. All text values are displayed in keyin fields allowing adjustment by the user if needed. When a sign number is placed with permanent signs, the value is automatically incremented by one with each placement. All text in keyin fields can be altered on the fly during placement. By default these signs are set for placement as Permanent signs.

A command button is provided to place permanent sign # only.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

Since English sign cells are used in metric files, a keyin field is provided which shows the desired Metric Plot Scale. This value is used to alter the active scale temporarily so that sign faces are placed at the correct size. When the Cancel button is clicked to close the dialog, the active scale is reset to match the specified plot scale.

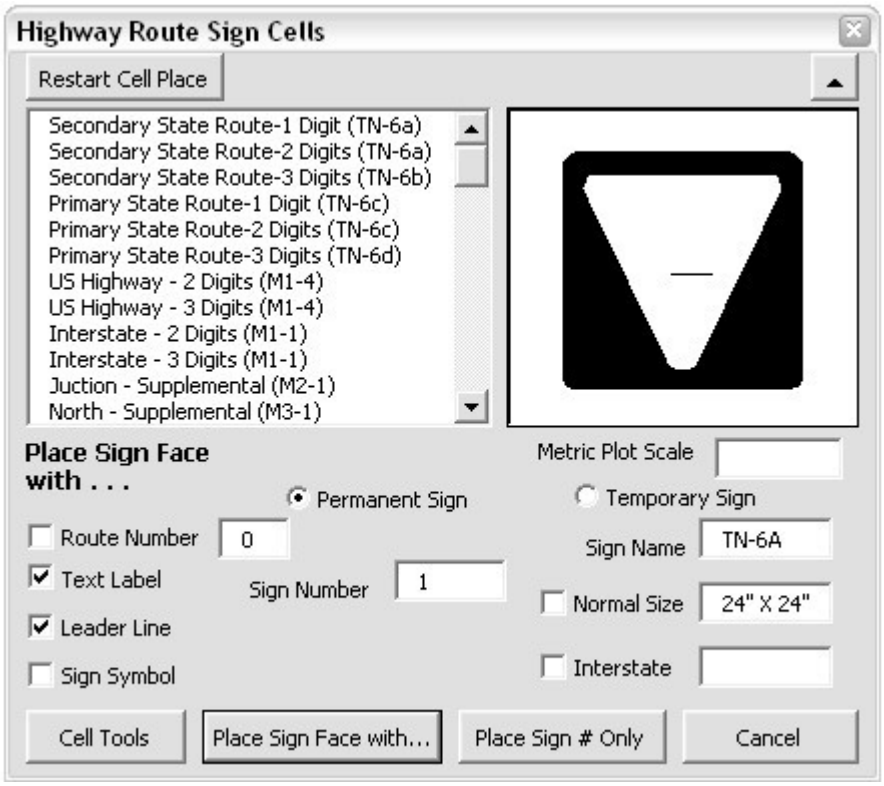
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Highway Route
or by using the keyin
vba run [HighwayRouteSignCells]HwyRouteSigncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Highway Route**. The **Highway Route Sign Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Sign Face with…:

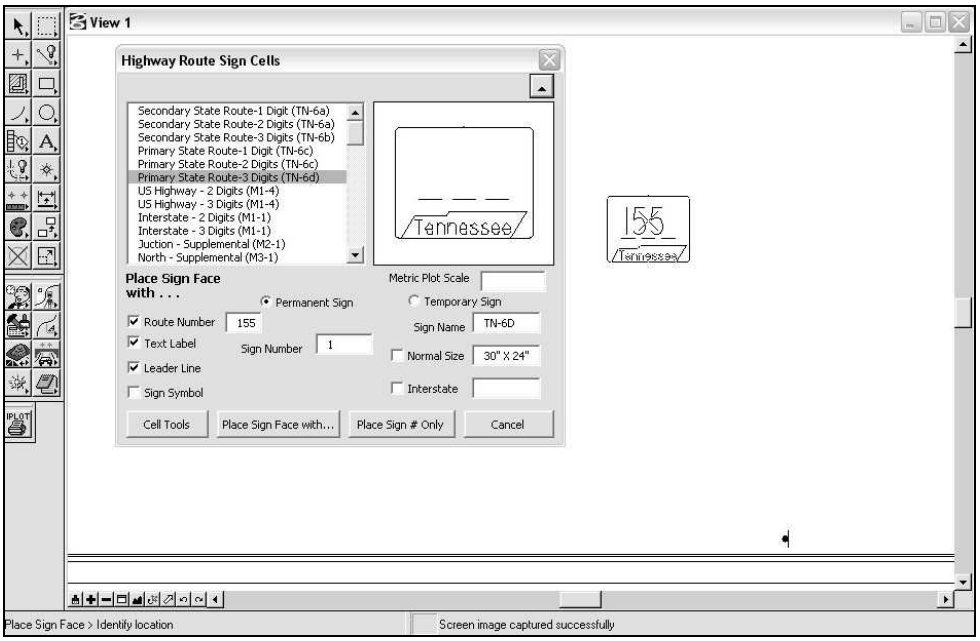
Step 1. Make dialog settings. First set **Permanent** or **Temporary** placement.

Under the optional graphics list on the left side of the dialog, turn on the desired graphics to be placed with the sign face. In this example we will place a permanent sign with all extra graphics except the sign symbol.

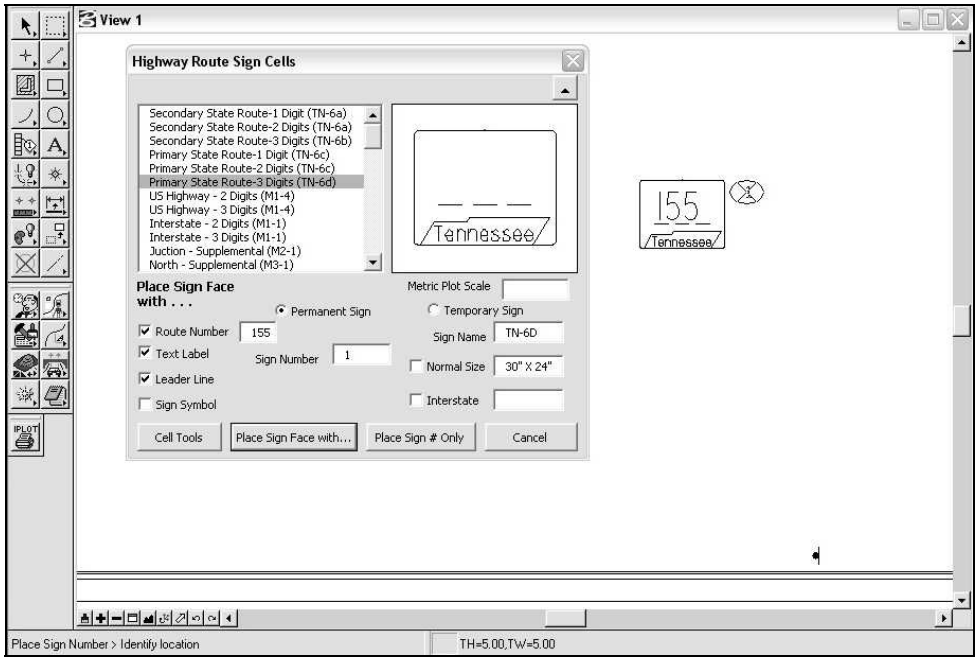
When placing permanent signs with sign numbers be sure and set the number in the keyin field provided.

When placing highway route signs, an extra option to include the route number on the sign face is given. If this option is selected, enter the route number in its keyin field

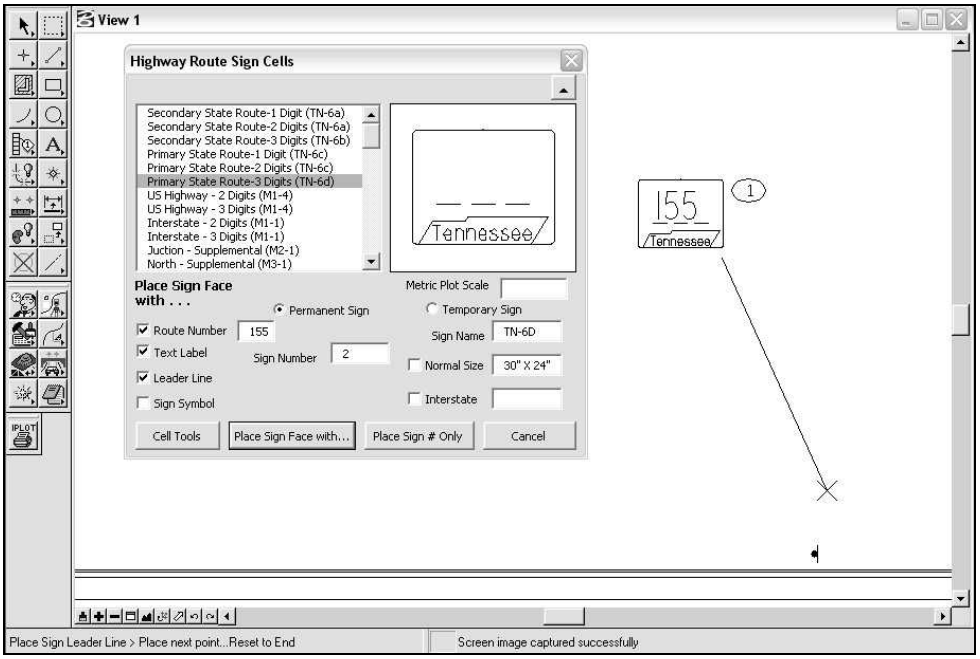
Step 2. Once required values and options are set click on the **Place Sign Face with.** command button. The user is prompted to **Identify Location** for sign face.



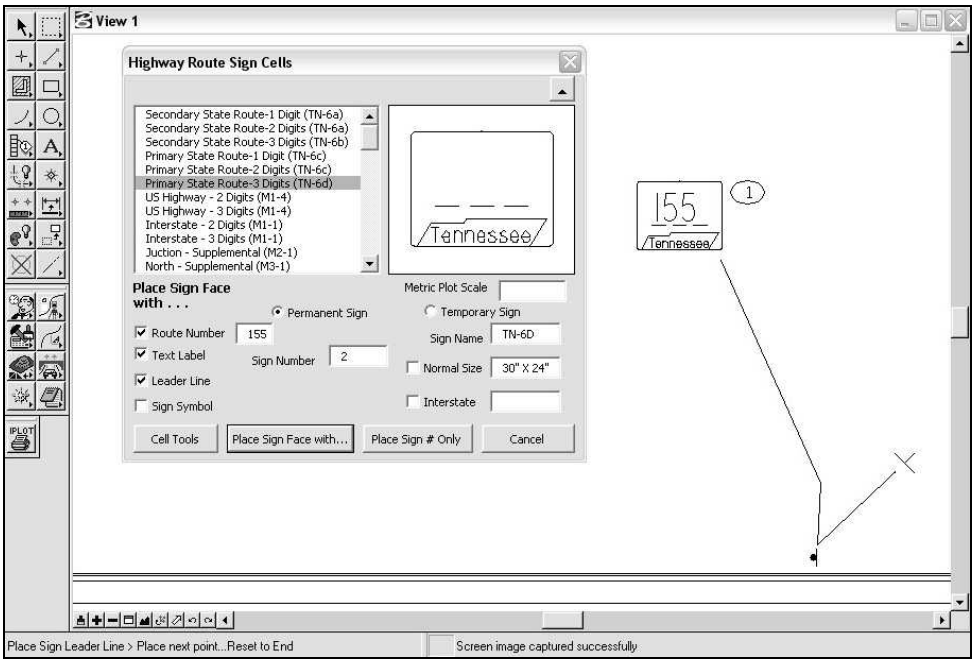
Step 3. After placing the sign face the sign number annotation is activated and the user is prompted to **Identify Location** for text label placement.



Step 4. The program then starts placement of the leader line with the initial prompt to **Place Begin Point**. After giving the begin point the user is prompted to **Place next point…Reset to End**. Continue entering additional points for the leader as needed up to a maximum of 4 vertices.



Step 5. When leader line is completed, click the reset on your mouse to end the leader.

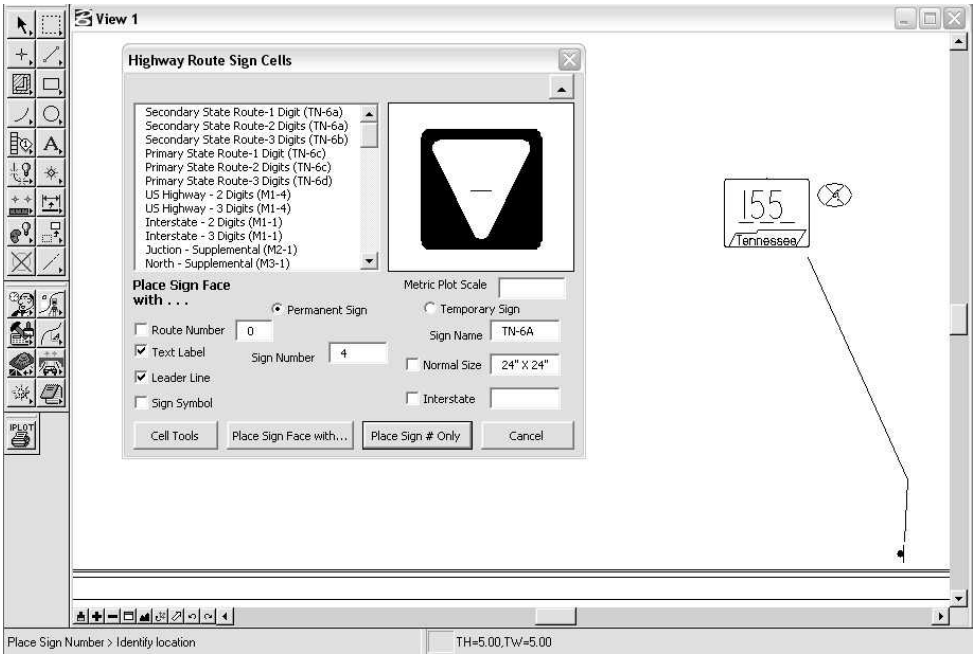


Place Sign # Only:

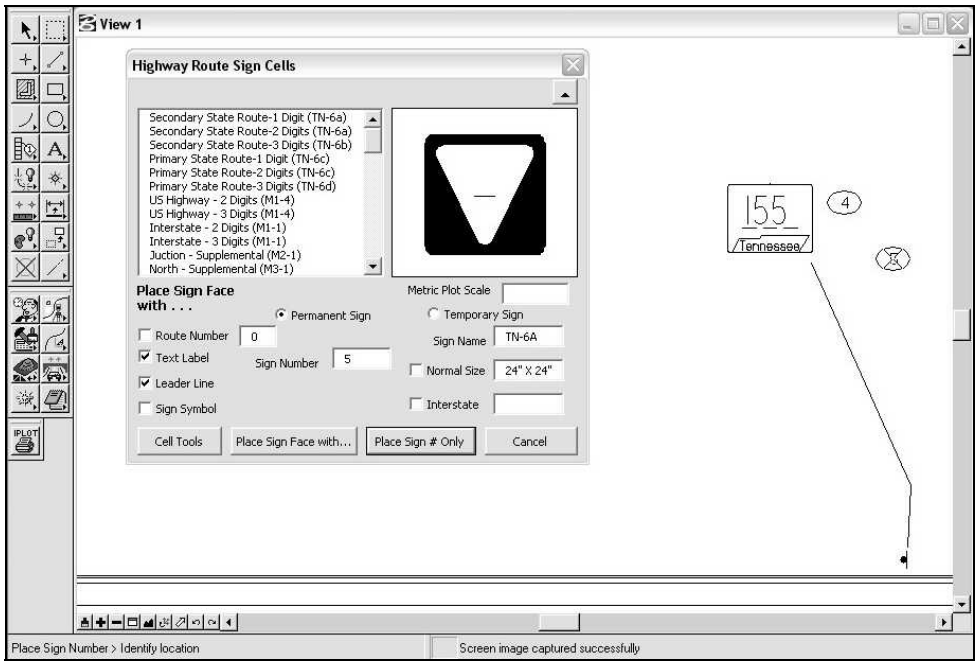
If it is necessary to replace the sign number on a permanent sign or to place it at a later time than when the sign face was first placed then use the Place Sign # Only command.

Step 1. First enter the needed sign number in the keyin field provided and then click on the **Place Sign # Only** command button.

The user is prompted to **Identify Location** for sign number placement



Step 2. After placing the label, the sign number is incremented by 1 and offered to place additional sign numbers. A reset will end placement of sign numbers.



Regulatory Sign Cells

D&C location: Drafting Standards > Signs > Regulatory

MicroStation VBA Program: RegulatorySignCells.mvba

Description:

This program provides access to TDOT Design Division regulatory sign face cells. Cell list also includes various permanent & temporary sign symbols near the end

A command button and keyin fields are provided to place sign face with associated optional graphics including a text label, leader line and sign symbol (single post & face). Option for placement as Permanent or Temporary sign is given which controls the level and text label type which is used. As a permanent sign, sign number text is placed with enclosing ellipse and as a temporary sign, sign name and optional size is placed. All text values are displayed in keyin fields allowing adjustment by the user if needed. When a sign number is placed with permanent signs, the value is automatically incremented by one with each placement. All text in keyin fields can be altered on the fly during placement. By default these signs are set for placement as Permanent signs.

A command button is provided to place permanent sign # only.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

Since English sign cells are used in metric files, a keyin field is provided which shows the desired Metric Plot Scale. This value is used to alter the active scale temporarily so that sign faces are placed at the correct size. When the Cancel button is clicked to close the dialog, the active scale is reset to match the specified plot scale.

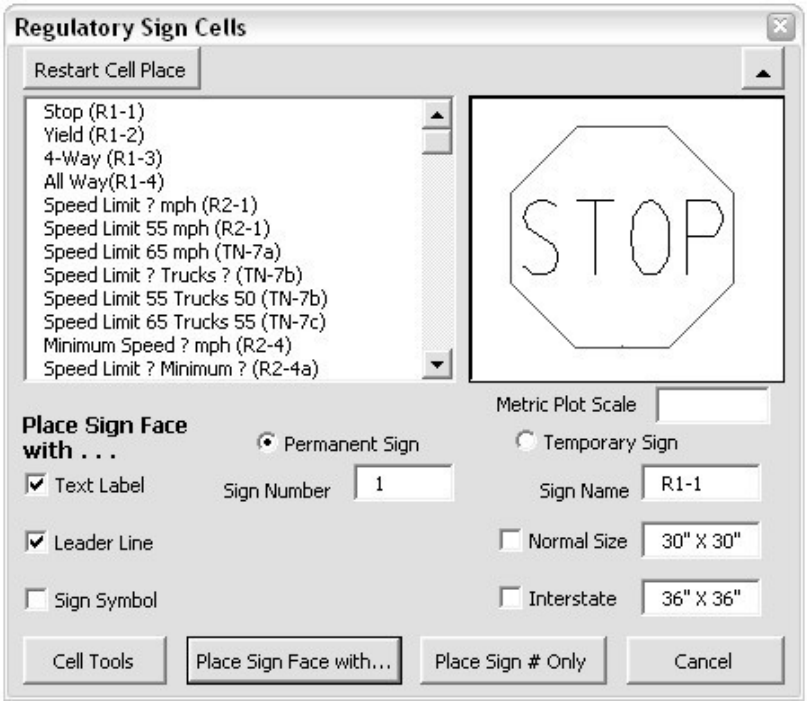
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Regulatory
or by using the keyin
vba run [RegulatorySignCells]RegSigncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Regulatory**. The **Regulatory Sign Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Sign Face with… & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements.

School Sign Cells

D&C location: Drafting Standards > Signs > Schools

MicroStation VBA Program: SchoolSignCells.mvba

Description:

This program provides access to TDOT Design Division school sign face cells. Cell list also includes various permanent & temporary sign symbols near the end

A command button and keyin fields are provided to place sign face with associated optional graphics including a text label, leader line and sign symbol (single post & face). Option for placement as Permanent or Temporary sign is given which controls the level and text label type which is used. As a permanent sign, sign number text is placed with enclosing ellipse and as a temporary sign, sign name and optional size is placed. All text values are displayed in keyin fields allowing adjustment by the user if needed. When a sign number is placed with permanent signs, the value is automatically incremented by one with each placement. All text in keyin fields can be altered on the fly during placement. By default these signs are set for placement as Permanent signs.

A command button is provided to place permanent sign # only.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

Since English sign cells are used in metric files, a keyin field is provided which shows the desired Metric Plot Scale. This value is used to alter the active scale temporarily so that sign faces are placed at the correct size. When the Cancel button is clicked to close the dialog, the active scale is reset to match the specified plot scale.

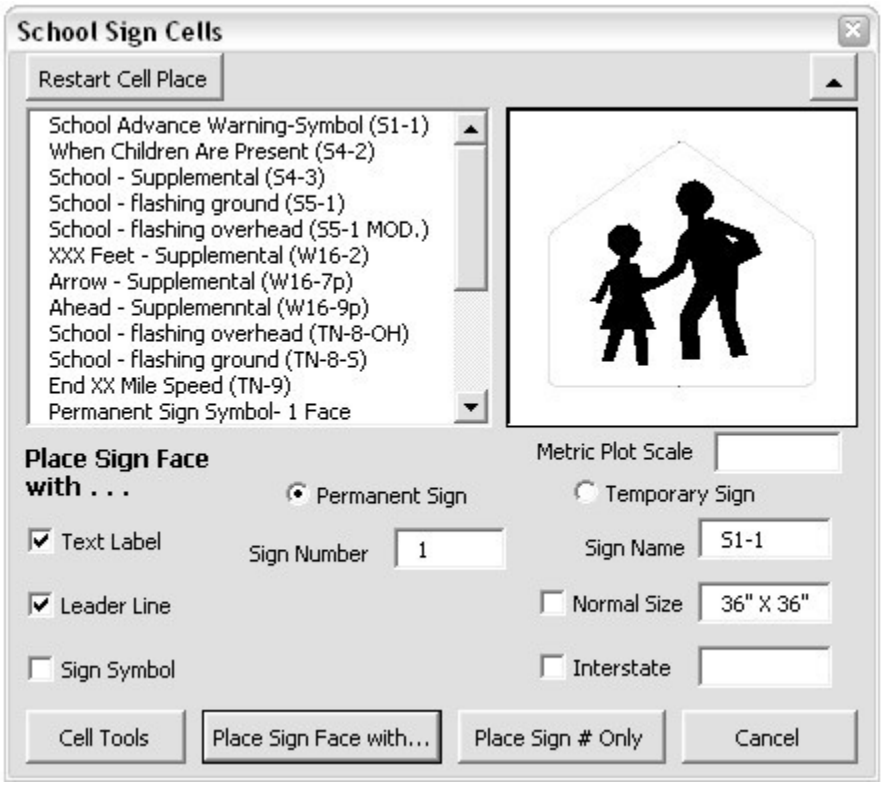
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Schools
or by using the keyin
vba run [SchoolSignCells]ScoolSigncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Schools**. The **School Sign Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Sign Face with… & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements.

Tennessee Sign Cells

D&C location: Drafting Standards > Signs > Tennessee

MicroStation VBA Program: TennesseeSignCells.mvba

Description:

This program provides access to TDOT Design Division special Tennessee sign face cells. Cell list also includes various permanent & temporary sign symbols near the end

A command button and keyin fields are provided to place sign face with associated optional graphics including a text label, leader line and sign symbol (single post & face). Option for placement as Permanent or Temporary sign is given which controls the level and text label type which is used. As a permanent sign, sign number text is placed with enclosing ellipse and as a temporary sign, sign name and optional size is placed. All text values are displayed in keyin fields allowing adjustment by the user if needed. When a sign number is placed with permanent signs, the value is automatically incremented by one with each placement. All text in keyin fields can be altered on the fly during placement. By default these signs are set for placement as Permanent signs.

A command button is provided to place permanent sign # only.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

Since English sign cells are used in metric files, a keyin field is provided which shows the desired Metric Plot Scale. This value is used to alter the active scale temporarily so that sign faces are placed at the correct size. When the Cancel button is clicked to close the dialog, the active scale is reset to match the specified plot scale.

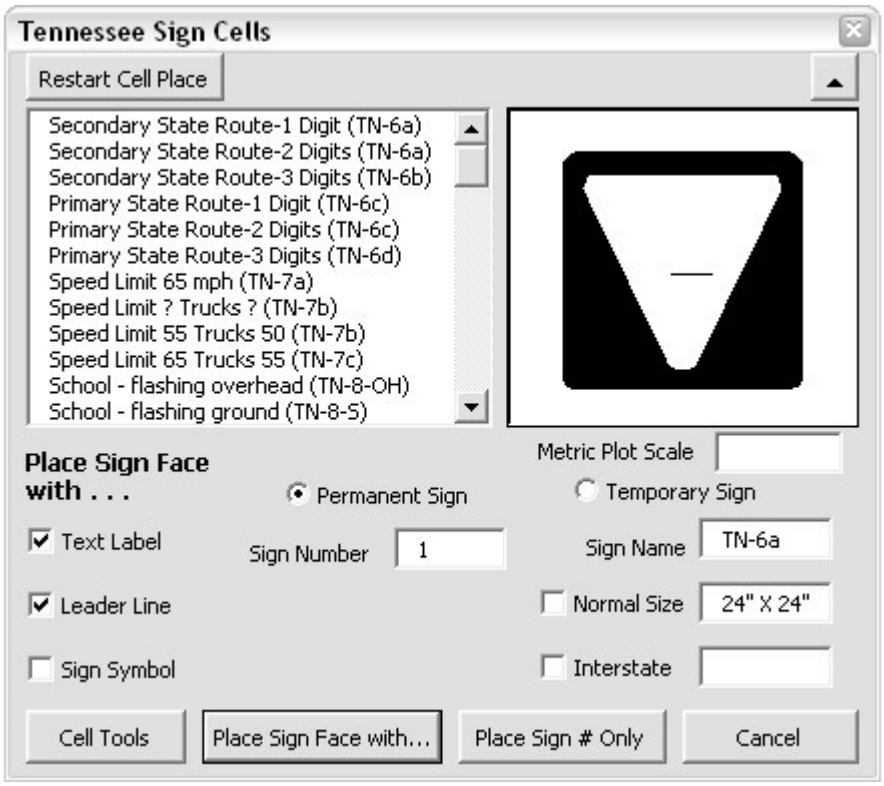
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Tennessee
or by using the keyin
vba run [TennesseeSignCells]TNSigncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Tennessee**. The **Tennessee Sign Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Sign Face with… & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements.

Warning Sign Cells

D&C location: Drafting Standards > Signs > Warning

MicroStation VBA Program: WarningSignCells.mvba

Description:

This program provides access to TDOT Design Division warning sign face cells. Cell list also includes various permanent & temporary sign symbols near the end

A command button and keyin fields are provided to place sign face with associated optional graphics including a text label, leader line and sign symbol (single post & face). Option for placement as Permanent or Temporary sign is given which controls the level and text label type which is used. As a permanent sign, sign number text is placed with enclosing ellipse and as a temporary sign, sign name and optional size is placed. All text values are displayed in keyin fields allowing adjustment by the user if needed. When a sign number is placed with permanent signs, the value is automatically incremented by one with each placement. All text in keyin fields can be altered on the fly during placement. By default these signs are set for placement as Permanent signs.

A command button is provided to place permanent sign # only.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

Since English sign cells are used in metric files, a keyin field is provided which shows the desired Metric Plot Scale. This value is used to alter the active scale temporarily so that sign faces are placed at the correct size. When the Cancel button is clicked to close the dialog, the active scale is reset to match the specified plot scale.

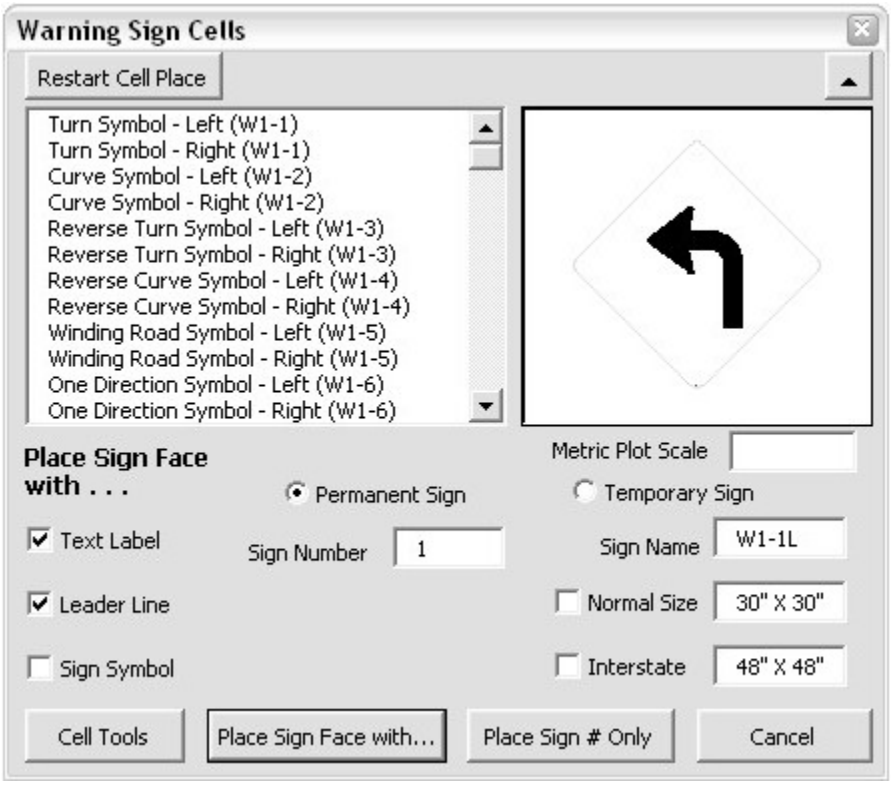
This program can also be activated from the MicroStation drop down menu
TDOT > Signs > Warning
or by using the keyin
vba run [WarningSignCells]WarnngSigncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Warning**. The **Warning Sign Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Place Sign Face with… & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements.

Traffic Control (Temporary)

Traffic Control Device Cells

D&C location: Drafting Standards > Traffic Control (Temporary) > TC Device Cells

MicroStation VBA Program: TrafficControlCells.mvba

Description:

This program provides access to TDOT Design Division traffic control device cells.

A command button is provided to access the MicroStation Basic macro which is used to pattern work zone areas.

Command buttons are provided to access the Traffic Control Legend cell dialog and the Construction Sign cell dialog.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

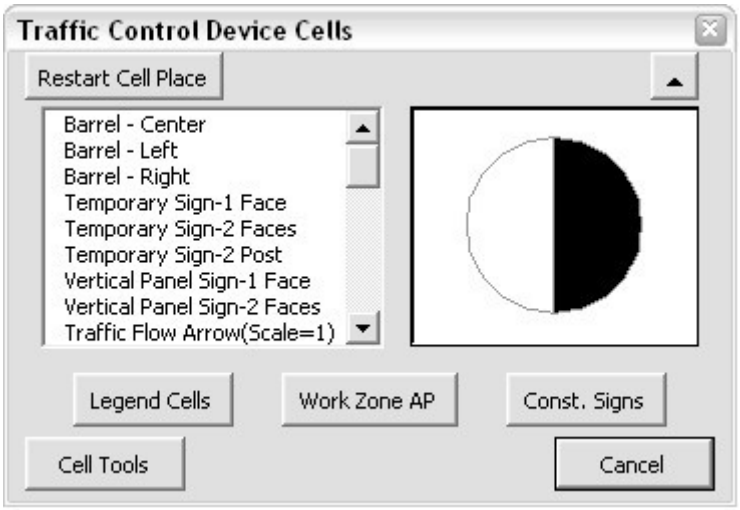
This program can also be activated from the MicroStation drop down menu
TDOT > Traffic Control > Device Cells
or by using the keyin
vba run [TrafficControlCells]TrafficCntrlcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **TC Device Cells**. The **Traffic Control Device Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation’s Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Traffic Control Legend Cells

D&C location: Drafting Standards > Traffic Control (Temporary) > TC Legend Cells

MicroStation VBA Program: TrafficControlLegendCells.mvba

Description:

This program provides access to TDOT Design Division traffic control legend cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

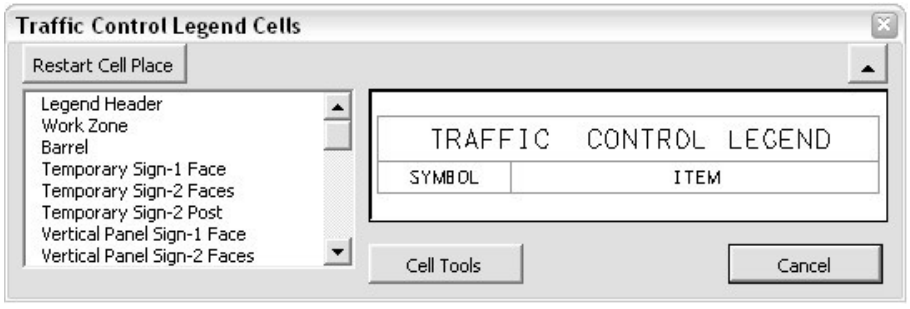
This program can also be activated from the MicroStation drop down menu
TDOT > Traffic Control > Legend Cells
or by using the keyin
vba run [TrafficControlLegendCells]TrafficCntrlLegendcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **TC Legend Cells**. The **Traffic Control Legend Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

Pattern Work Zone Area

D&C location: Drafting Standards >Traffic Control (Temporary) > Work Zone Area

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a work zone area and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Traffic Control > Work Zone AP
or by using the keyin
vba run [AreaPatterns]TrafficControlWorkZone.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

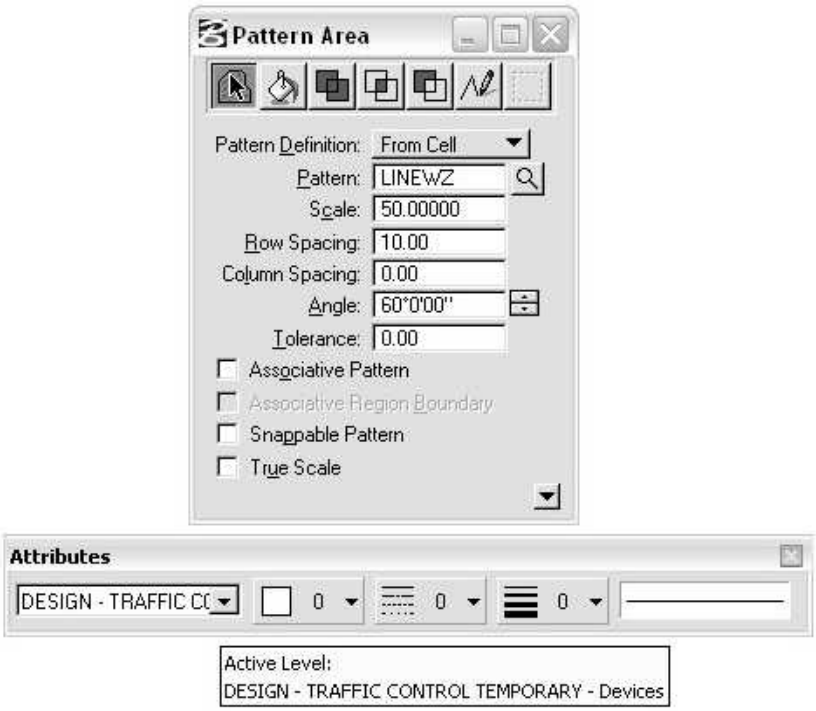
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

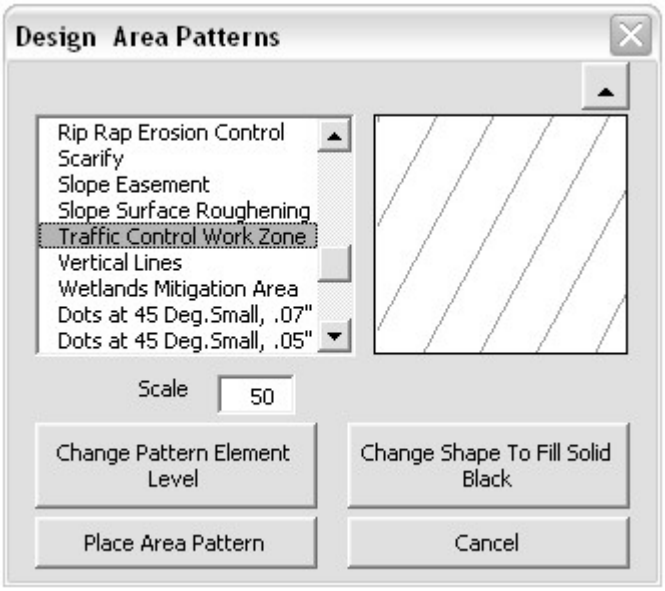
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Work Zone Area**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

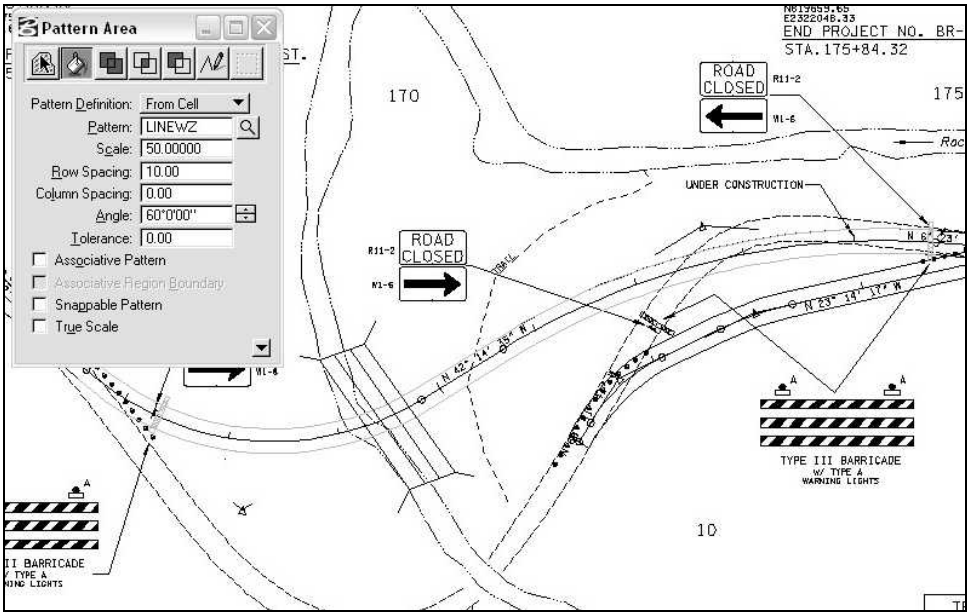


Or from the drop down menu in the **Design Area Patterns** dialog …

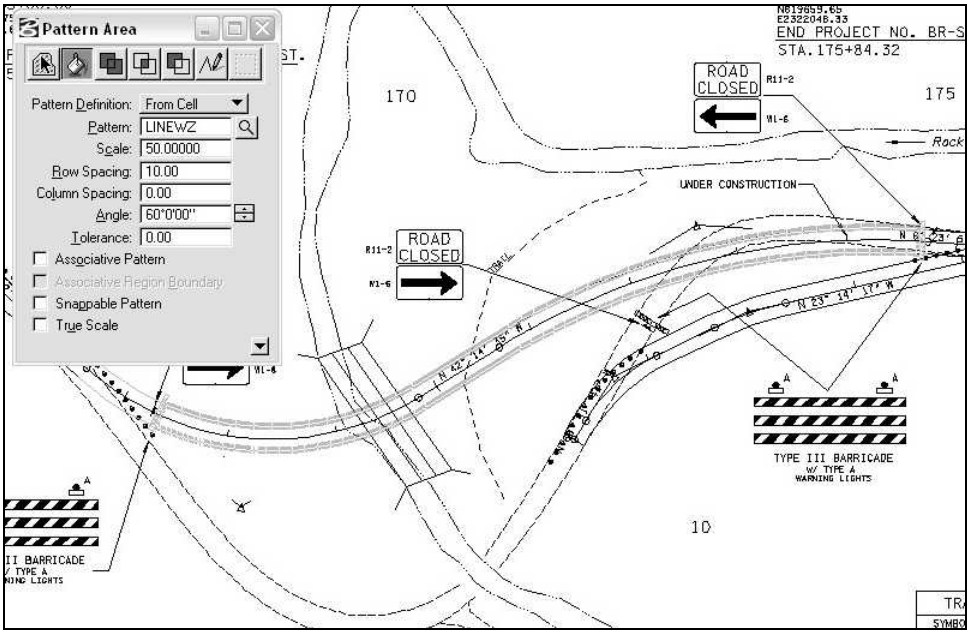


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

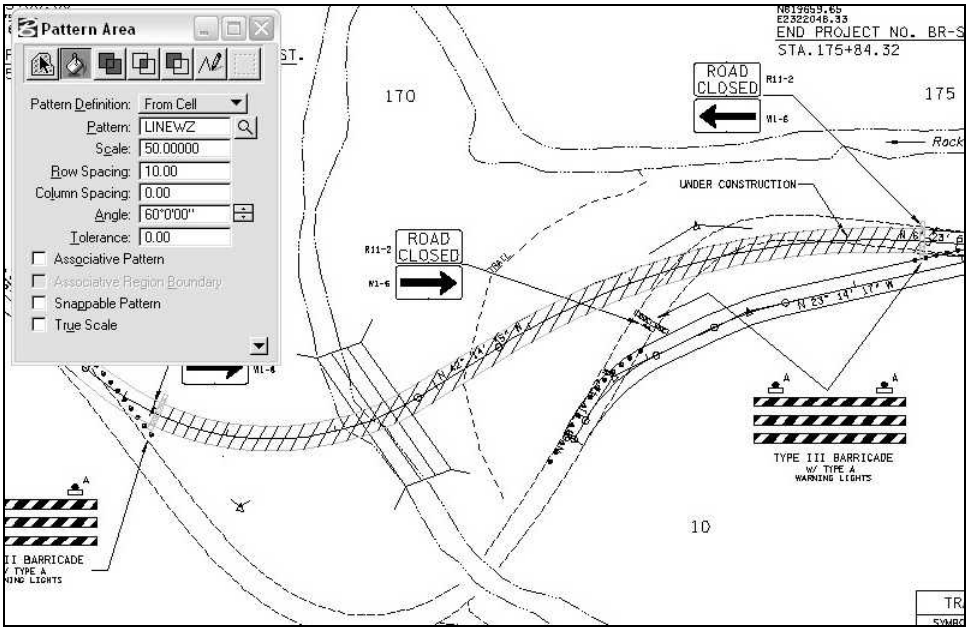
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Topo Cells

Topographic Cells

D&C location: Drafting Standards > Topo Cells

MicroStation VBA Program: TopographicCells.mvba

Description:

This program provides access to TDOT Design Division topographic cells.

Command buttons are provided to access the Place North Arrow at True North, Place Coordinate Grid Tick and Place Grid Ticks by Range vba programs.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

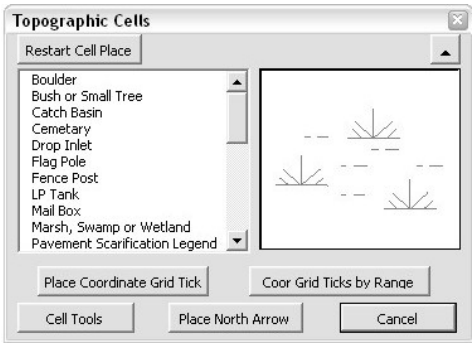
This program can also be activated from the MicroStation drop down menu
TDOT > Topographic > Cells
or by using the keyin
vba run [TopographicCells]Topocells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Topo Cells**. The **Topographic Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Typical Sections

Typical Section Cells

D&C location: Drafting Standards > Typical Sections > Typ Sec Cells

MicroStation VBA Program: TypicalSectionCells.mvba

Description:

This program provides access to TDOT Design Division typical section cells.

A command button is provided to access MicroStation command Drop Complex (command button Drop Cell For Editing).

A command button is provided to access vba programs Area Patterns and Code Pavement Layers.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

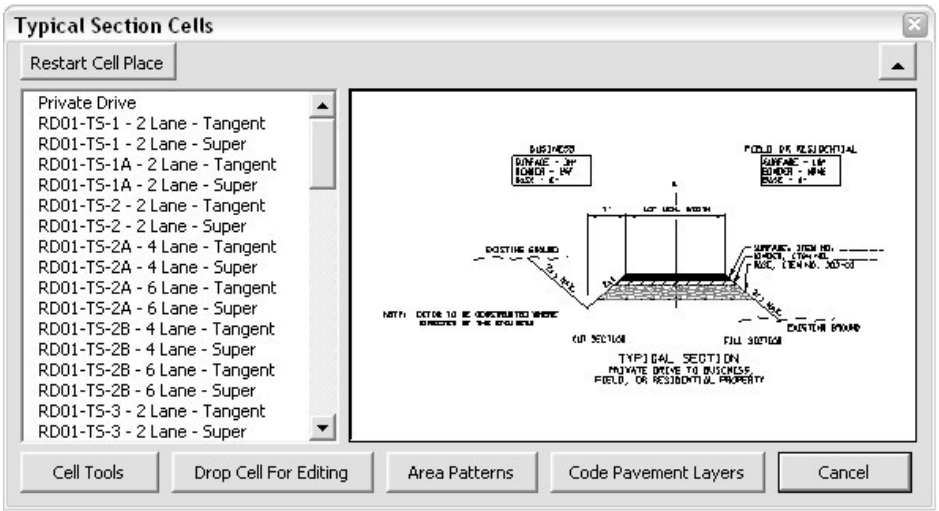
This program can also be activated from the MicroStation drop down menu
TDOT > Typical Sections > Cells
or by using the keyin
vba run [TypicalSectionCells]TypSectioncells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Typ Sec Cells**. The **Typical Section Cells** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

Step 4. If changes in the typical section are needed: After cell has been placed click on the **Drop Cell for Editing** command button and identify the typical section to drop its complex status. Now the typical can be edited as needed for your roadway.

Area Patterns

D&C location: Drafting Standards > Typical Sections > Area Patterns

MicroStation VBA Program: AreaPatterns.mvba

Description:

This program provides access to TDOT Design Division area pattern cells. Clicking on any area pattern description in the dialog list, will make all needed settings for that area pattern, start the area pattern tool and show an example in the preview window. In addition, it sets the active level used for the area pattern and sets the pattern cell as the active cell for review as needed. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the pattern scale and pattern delta which is applied.

The Change Pattern Element Level command button turns on the graphic group lock and starts the change level command so the user can correct area pattern's level as needed.

The Place Area Pattern command button is provided to restart the area pattern command without re-selecting from the area pattern list.

'The Change Shape To Fill Solid Black command button is provided to change shape elements to fill outlined with white fill which plots as black.

This program can also be activated from the MicroStation drop down menu
TDOT > Area Patterns > Design Area Patterns or
TDOT > Typical Sections > Area Patterns
or by using the keyin
vba run [AreaPatterns]AP.Main

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

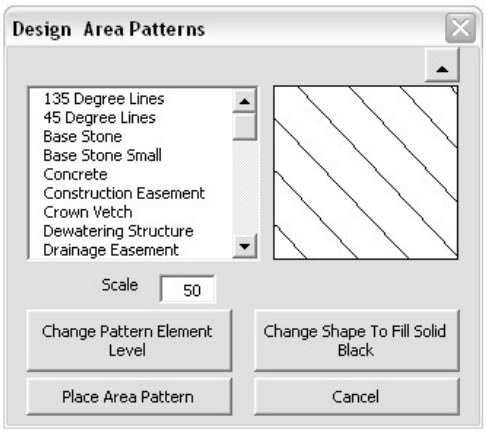
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

Fence method: Create a fence bounding the area to be patterned.

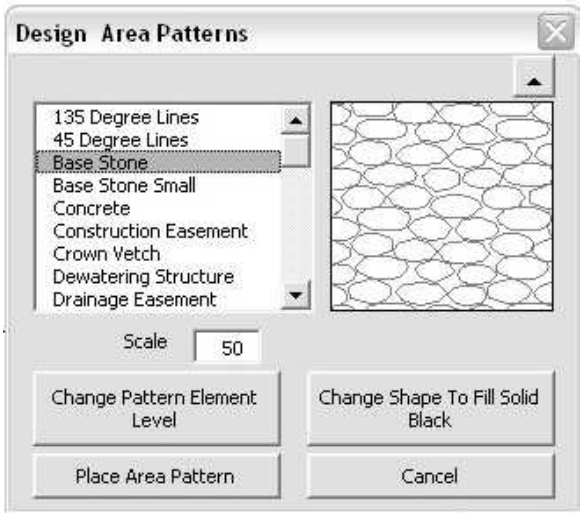
Usage:

Step 1. In D&C manager activate **Area Patterns**. The **Design Area Patterns** dialog appears.

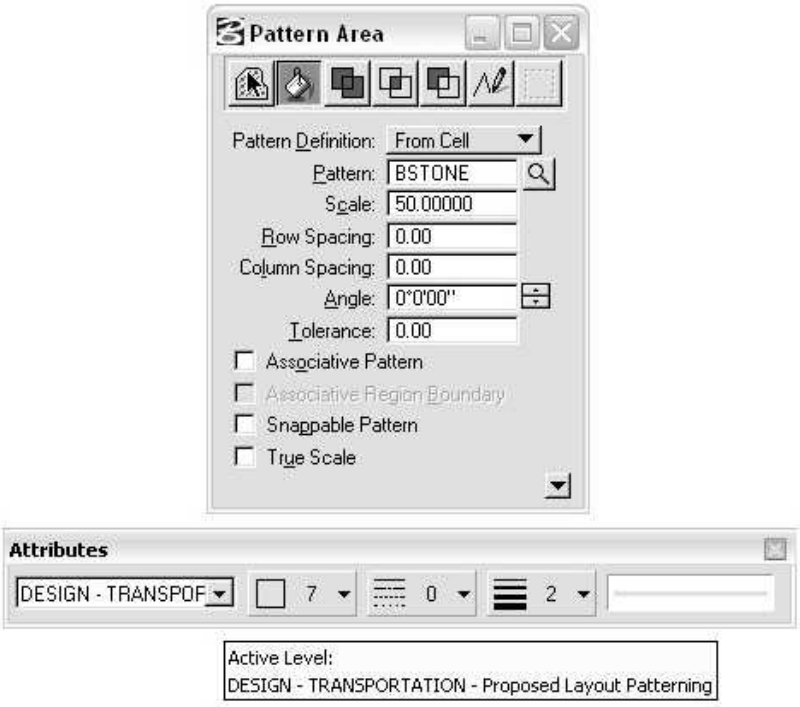


Step 2. Check and reset **Scale** if needed. Pattern scale, row spacing & column spacing are based on the current active scale. Note that in some cases the resulting pattern scale **will not** be the same as the active scale.

Step 3. Click on any area pattern description in the dialog list. The area pattern settings are made and an area pattern example is displayed in the preview window.



The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.



Step 4. Set the desired method for area patterning in the Pattern Area tool settings and you are ready to apply the area pattern.

Code Pavement Layers

D&C location: Drafting Standards > Typical Sections > Code Pvmt Layer

MicroStation VBA Program: CodePavementLayers.mvba

Description:

This program places pavement layer code labels on typical sections. Option for vertical or dynamic leader is given. The current active scale is shown with a keyin field to reset as needed. Scale is used to control the text size of label.

The code number is automatically incremented by one after each placement, allowing continuous placement of codes for the typical section.

If any given code number needs to be placed again it will be necessary to re-enter the value in the Code Number keyin field on the dialog before continuing with the placement of code labels. The type of leader can be changed on the fly as well, simply click the alternate leader type prior to placing the code number.

If the initial scale given was in error, it is necessary to re-start the command by clicking on the Place Pavement Layer Code command button after resetting the given scale value.

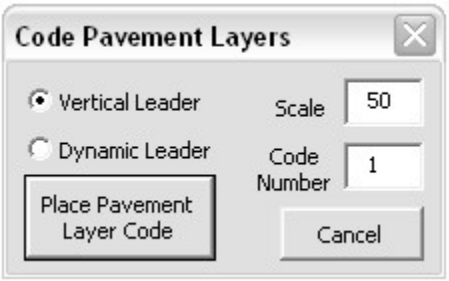
This program can also be activated from the MicroStation drop down menu
TDOT > Typical Sections > Code Pavement Layers
or by using the keyin
vba run [CodePavementLayers]CodePavement.main

Special Requirements:

None.

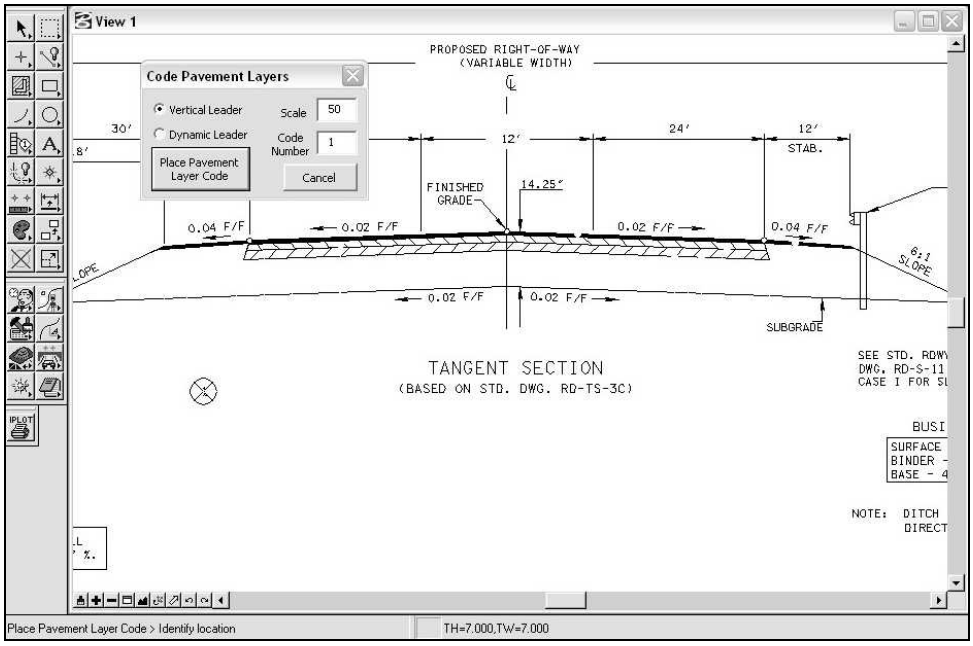
Usage:

Step 1. In D&C manager activate **Code Pvmt Layer**. The **Code Pavement Layers** dialog appears.

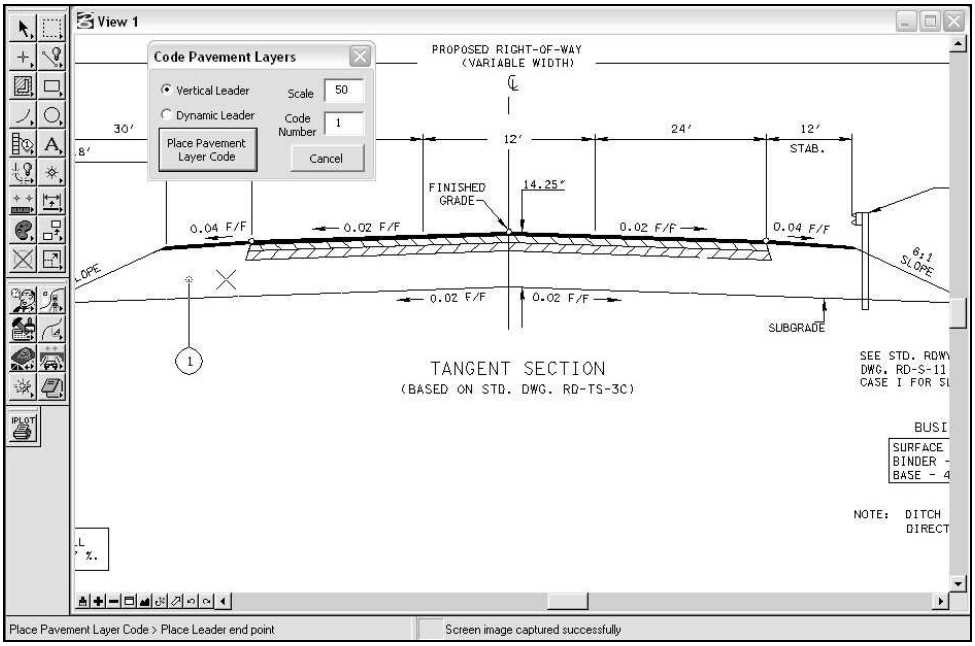


Step 2. First choose the type of leader and check the scale. Enter the code number to start placement with and click on the **Place Pavement Layer Code** command button to start placement of the code.

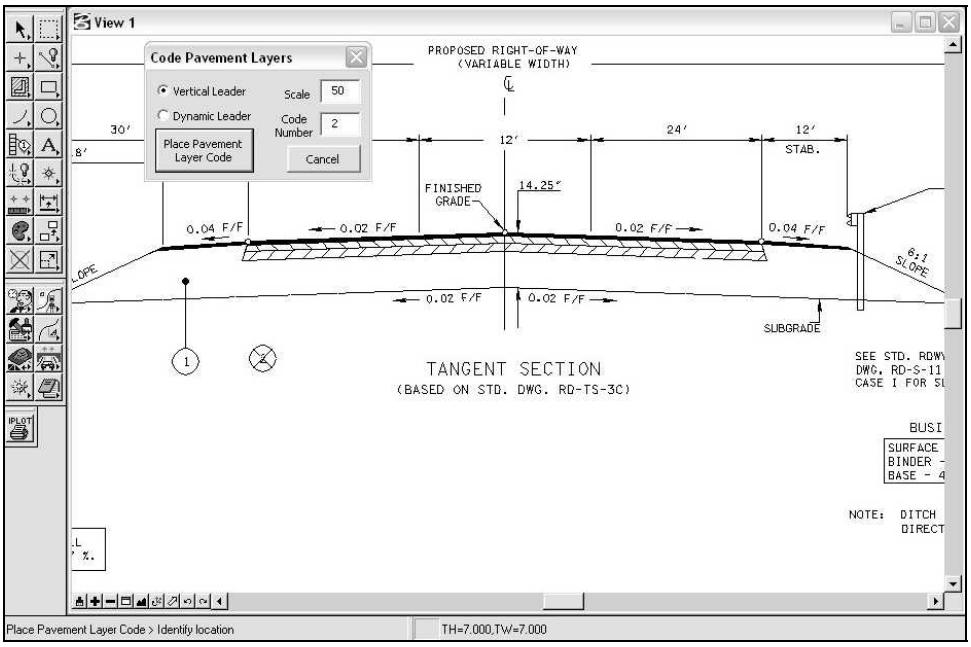
The code text in a circle shows dynamically on the cursor and the user is prompted **Identify Location** for placement.



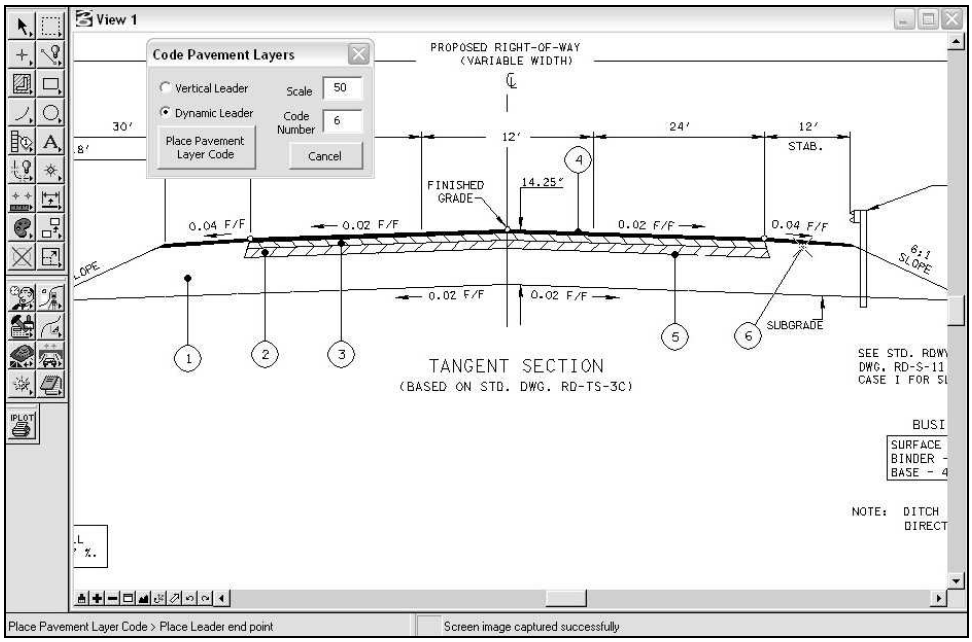
Step 3. Once this point is given, a second point is required to set the leader length. The user is prompted to **Place Leader end point**.



Step 4. The leader is placed with a filled dot for the terminator and all graphics are combined in a graphic group The code number is automatically incremented by one and again prompts the user to **Identify Location** for the code label, allowing continuous placement of codes for the typical section.



Step 5. The type of leader can be changed on the fly, simply click the alternate leader type prior to placing the code number. Here we have switched to a dynamic leader which allows a leader to be placed at any angle



Construction Supers

TDOTsuper1

D&C location: Construction Supers > TDOTsuper1

Geopak 3PC Program: tdotsup1.x

Description:
Adds user specified superelevation data to horizontal alignment curves. Used by Construction personnel.

Special Requirements:
All horizontal alignment graphics must be visible in View Window #1.

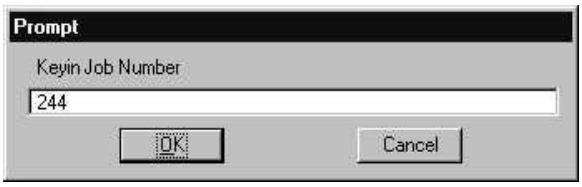
Usage:

Step 1. Using D&C item **HA Roadway** display the horizontal alignment(s).

Step 2. In **View Window #1** fit view so that all graphics are displayed in the view. If needed turn on level DESIGN - CENTERLINE - Proposed.

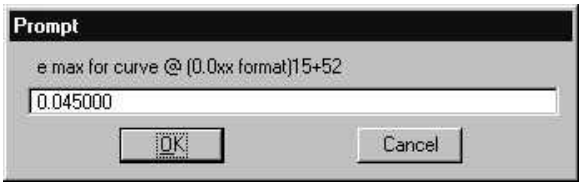
Step 3. In D&C manager activate **TDOTsuper1**.

Step 4. You are prompted for a **job no.** Key that in and click **OK**.



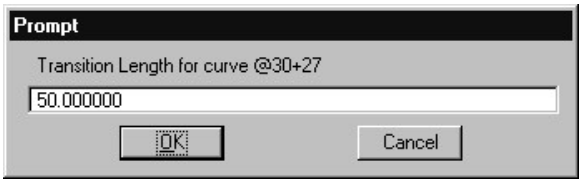
Step 5. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 6. The 3PC processes the chain and finds the first curve. You are first prompted for the **superelevation rate (e max)** for the curve. Key that in and click **OK**.

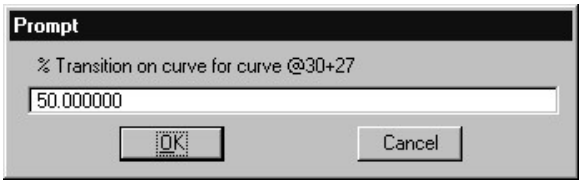


If the curve is a simple curve without spirals:

Step 7. You are then prompted for the **transition length** for the curve. Key that in and click **OK**. Complex curves with spirals use the spiral length instead of prompting for this value.



Step 8. You are then prompted for the **% of the transition on the curve**. Key that in and click **OK**.



If the curve is a complex curve with spirals or when steps 6 through 8 are completed for a simple curve:

Step 9. The 3PC processes the chain and looks for additional curves. Depending on the type of curve found, steps 6 through 8 are repeated as needed. On each curve the data entered is written to the curve elements. When all curves are processed the chain completion message is displayed.

Once the chain is completed D&C item **TDOTsuper2** or **TDOTsuper3** can then be used.

TDOTsuper2

D&C location: Construction Supers > TDOTsuper2

Geopak 3PC Program: tdotsup2.x

Description:
Draws pattern lines with station values at critical superelevation transition points as well as the begin & end and builds autoshape input file for superelevation using values entered with D&C item **TDOTsuper1.** Used by Construction personnel.

This application is specifically for **undivided crown roadways**.

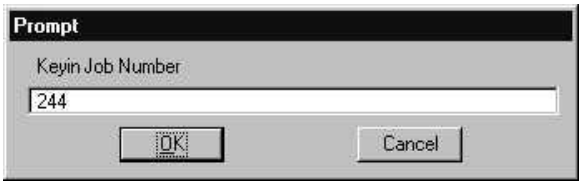
Special Requirements:
Superelevation information must be written to horizontal alignment graphics with D&C item **TDOTsuper1**.

Usage:

Step 1. Using D&C item **TDOTsuper1** to set up superelevation information.

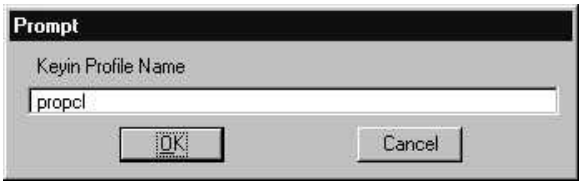
Step 2. In D&C manager activate **TDOTsuper2**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.

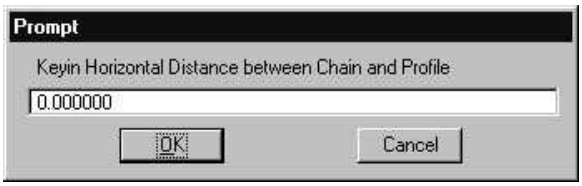


Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the **profile name.** Key that in and click **OK**.

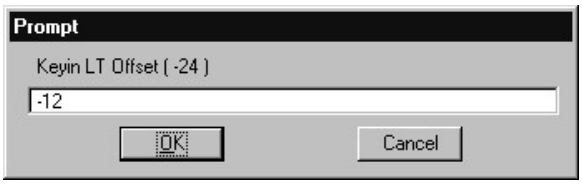


Step 6. You are then prompted for the **Horizontal Distance between Chain and Profile.** Key that in and click **OK**.



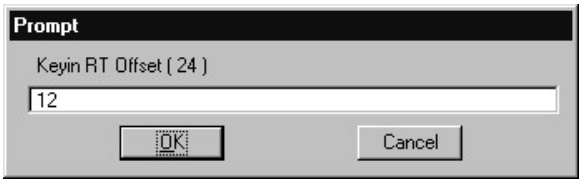
This is referring to the **tie offset** which is usually **0** for undivided crown roadways which is the default value given.

Step 7. You are then prompted for the **Left Offset** which is used to define the outside limit of the superelevation shape to the left. Key that in and click **OK**.

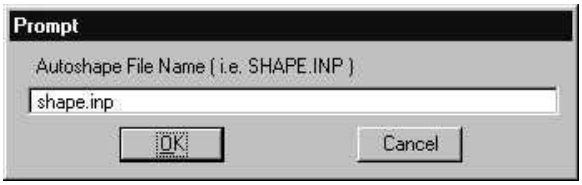


Offsets to the left of the centerline are always negative numbers.

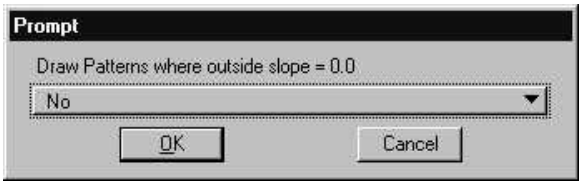
Step 8. You are then prompted for the **Right Offset** which is used to define the outside limit of the superelevation shape to the right. Key that in and click **OK**.



Step 9. You are then prompted for the **Autoshape File Name**. This is the superelevation shape input file the program is to create. Key that in and click **OK**.

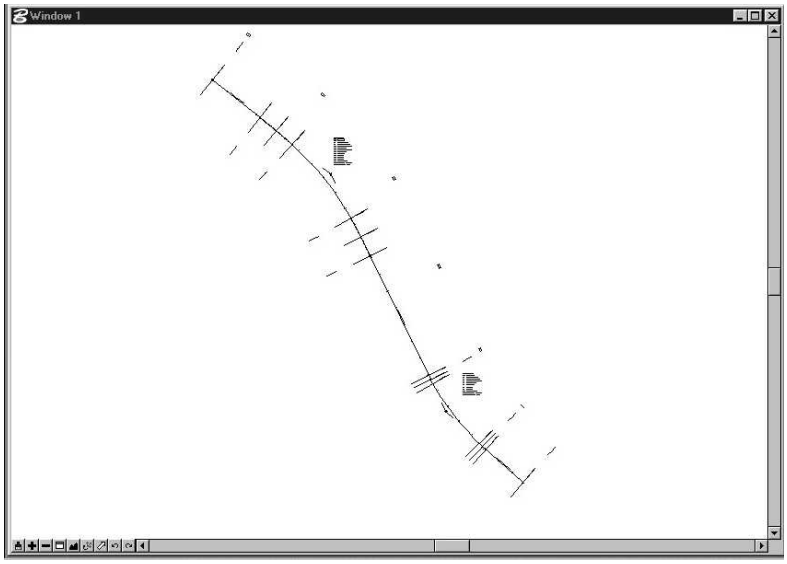


Step 10. You are then given the option to place patterns where the outside slope = 0.000 (zero slope). Pick **Yes** or **No** and click **OK**.

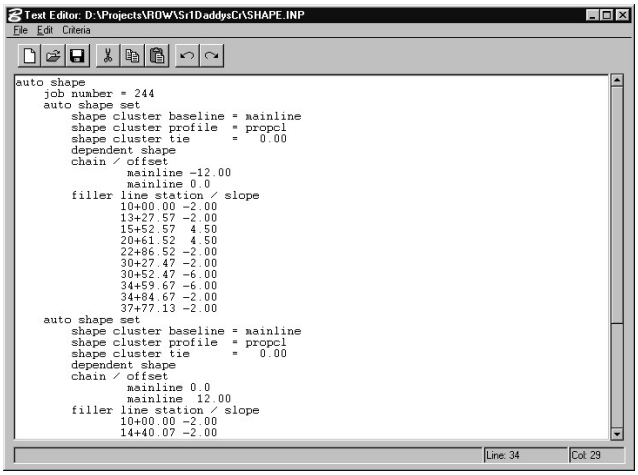


Step 11. Finally you are prompted for the **MicroStation DGN filename** that super shapes are to be written into. Key in the filename and click **OK**.

The pattern lines are drawn and annotated with station values in the open MicroStation DGN file.



The autoshape input file is created and can be reviewed with any text editor. If desired, transitions back to existing cross slopes can be added at the ends by editing station and cross slopes listed. Note that cross slopes must be in a percentage format.



Geopak's **Autoshape Builder** can now be used to process this input file to build superelevation shapes for the roadway.

TDOTsuper3

D&C location: Construction Supers > TDOTsuper3

Geopak 3PC Program: tdotsup3.x

Description:
Draws pattern lines with station values at critical superelevation transition points as well as the begin & end and builds autoshape input file for superelevation using values entered with D&C item **TDOTsuper1.** Used by Construction personnel.

This application is specifically for **divided roadways** or **ramps**.

Special Requirements:
Superelevation information must be written to horizontal alignment graphics with D&C item **TDOTsuper1**.

This program **must** be run twice to set up autoshape input files for left & right side of divided highways.

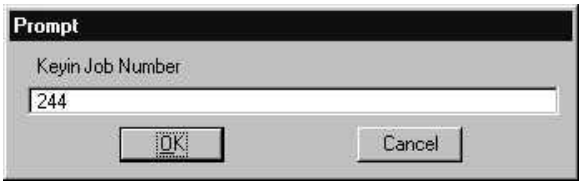
In most cases it is only necessary to run once to the left for ramps.

Usage:

Step 1. Using D&C item **TDOTsuper1** to set up superelevation information.

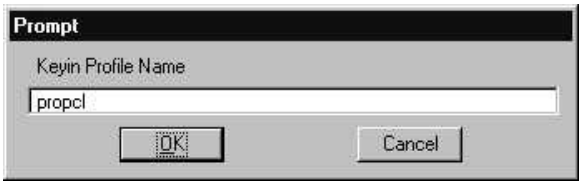
Step 2. In D&C manager activate **TDOTsuper3**.

Step 3. You are prompted for a **job no.** Key that in and click **OK**.



Step 4. You are then prompted for the **chain name.** Key that in and click **OK**.

Step 5. You are then prompted for the **profile name.** Key that in and click **OK**.



Step 6. You are then prompted for the **Offset to the inside edge of pavement or PGL (profile grade line).** Key that in and click **OK**.

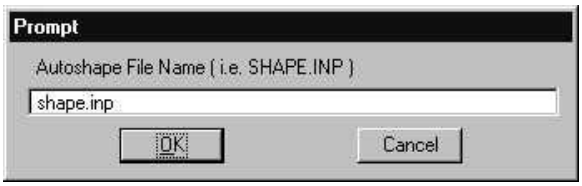
Normally for ramps… this value would be **0**. All other offsets to the left of the centerline are **always** negative numbers.

Step 7. You are then prompted for the **Offset to the outside edge of pavement** which is used to define the outside limit of the superelevation shape. Key that in and click **OK**.

Step 8. You are then prompted for the **Normal Crown slope.** This must be entered in a percentage format such as -2. Key that in and click **OK**.

Normally for ramps… this value would be a **positive 2 percent** (i.e. 2). Only in special cases where ramp superelevation shapes are set up to the right would this value be -2.

Step 9. You are then prompted for the **Autoshape File Name**. This is the superelevation shape input file the program is to create. Key that in and click **OK**.

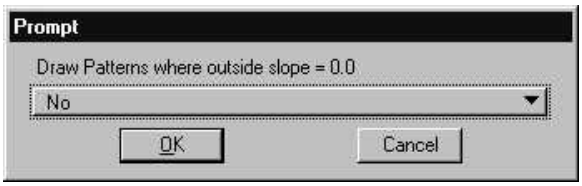


On the second pass for the opposite side of the road, keyin a different filename than entered on the first pass to avoid overwriting the first file (i.e. shape2.inp).

Step 10. You are then given the option to **Draw Patterns?**. Pick **Yes** or **No** and click **OK**.

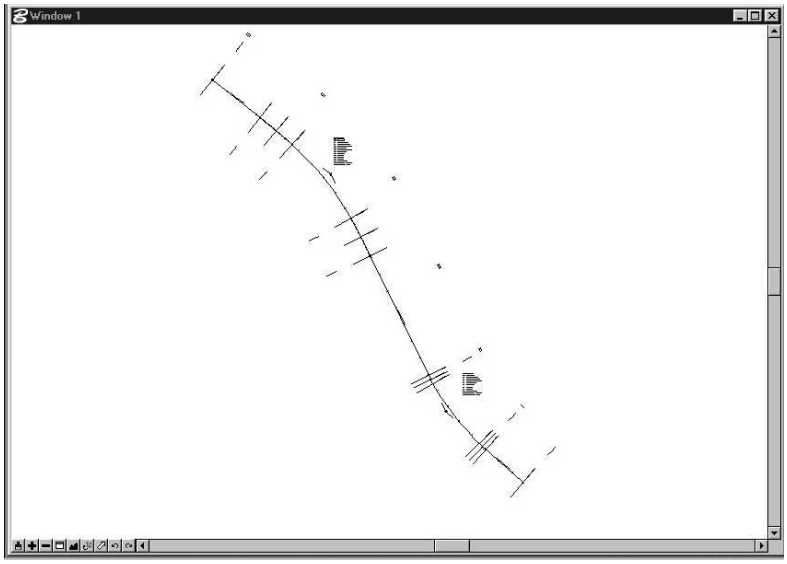
On the first pass using this program you would normally say **Yes** and on the second pass to set up the other side of the divided roadway you would say **No** having already placed patterns.

Step 11. If you said Yes to place patterns then you are then given the option to place patterns where the outside slope = 0.000 (zero slope). Pick **Yes** or **No** and click **OK**.

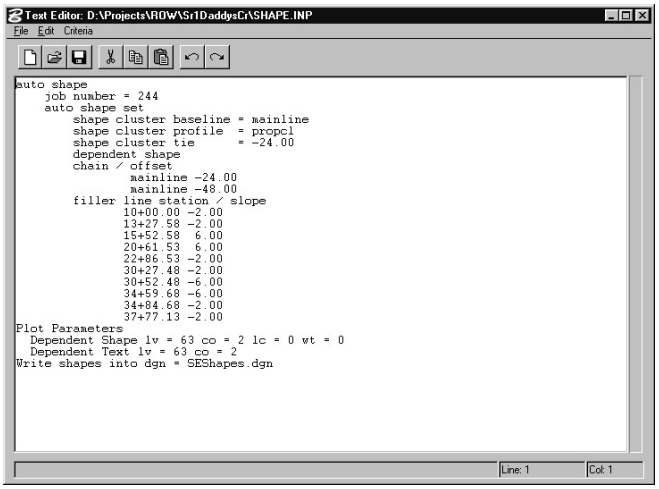


Step 12. Finally you are prompted for the **MicroStation DGN filename** that superelevation shapes are to be written into. Key in the filename and click **OK**.

If the pattern line option was chosen then they are drawn and annotated with station values in the open MicroStation DGN file.



The autoshape input file is created and can be reviewed with any text editor. If desired, transitions back to existing cross slopes can be added at the ends by editing station and cross slopes listed. Note that cross slopes must be in a percentage format.



Geopak's **Autoshape Builder** can now be used to process this input file to build superelevation shapes for one side of the roadway or you may wish to run this program again to set up the opposite side of the roadway and then process both autoshape input files at the same time.

Step 13. Repeat steps 2 through 12 to set up the opposite side of a divided highway.

Functional

Place Horizontal Alignment Points

D&C location: Functional > HA Points F

MicroStation VBA Program: HApoints.mvba

Description:

This program places the required point text symbols for all keypoints of any horizontal alignment/chain stored in the project GPK file in the plan view. The PI symbol (triangle) with short sub tangents are placed for all spiral-curve combinations or simple curves. The point on chain symbol (circle) is placed at the begin & end and at all on chain curve points. The PI symbol (triangle) by itself is placed at any break in tangent direction without a curve along the horizontal alignment. This is applicable to the following horizontal alignment types: Proposed Roadway Centerline, Preliminary Roadway Centerline, Existing Roadway Centerline, Proposed Special Ditch Centerline, Existing Stream Baseline, Functional Roadway Centerline, Proposed Private Drive Centerline.

All graphics are placed in a single graphic group for easy deletion as needed.

This tool stores the current location of the dialog, GPK job number, chain name and horizontal alignment type in the file **C:\Temp\MVBA_FormStorage.log** when the dialog is closed. When opened later it uses this information if applicable to bring up the dialog as you last used it.

This program can also be activated from the MicroStation drop down menu at
TDOT > Centerlines > Place Horizontal Alignment Points
or by using the keyin
vba run [HApoints]HApointsStart.main

Special Requirements:

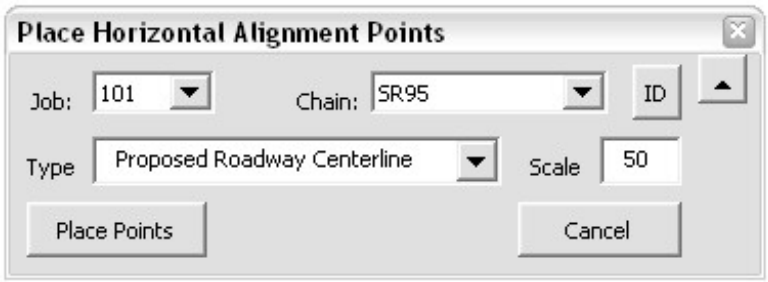
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

The **ID Chain** function uses a special VBA reference to program **GetCogoElement.mvba** which was provided by Bentley and must be present with the program for it to function.

Usage:

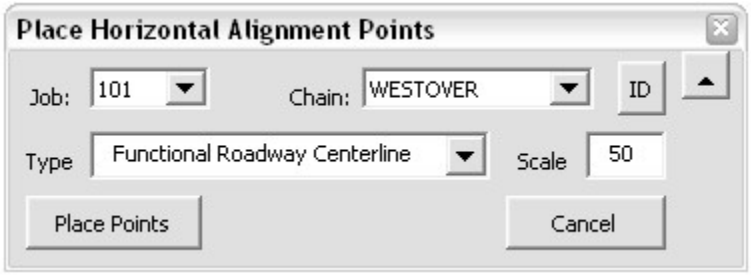
Step 1. In D&C manager activate **HA Points F**. The **Place Horizontal Alignment Points** dialog is displayed.

All Geopak jobs found within the current active folder are listed in the Job drop down box. If this tool was used previously for that job, the last chain processed is set as well as the last horizontal alignment type which was used. Scale defaults to active scale set in the MicroStation DGN file.



Step 2. After selecting the Geopak **Job** number as needed, the **Chain** drop down is populated with all chains stored in the job. Select the chain to place point symbols for. If you do not know the chain name but have chain graphics, the **ID** button can be used to select the chain.

Step 3. Set the **Type** to **Functional Roadway Centerline** by clicking that option in the drop down list provided**.** This setting controls the level, symbology, etc. for the point symbols which are to be placed.



If this tool was used previously, the last horizontal alignment type which was used is set automatically when the tool is activated.

Step 4. Reset the **Scale** if needed and click the **Place Points** command button. Point symbols are displayed for the specified chain.

Step 5. If you need to place point symbols for other chains, reset the chain name and click the **Place Points** command button for each one.

Pattern Functional Pavement Area

D&C location: Functional > Pvmt Pattern F

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern Functional pavement areas and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]FunctionalPavement.SetPattern

Special Requirements:
Depending on the method of area pattern placement to be used take the following actions:

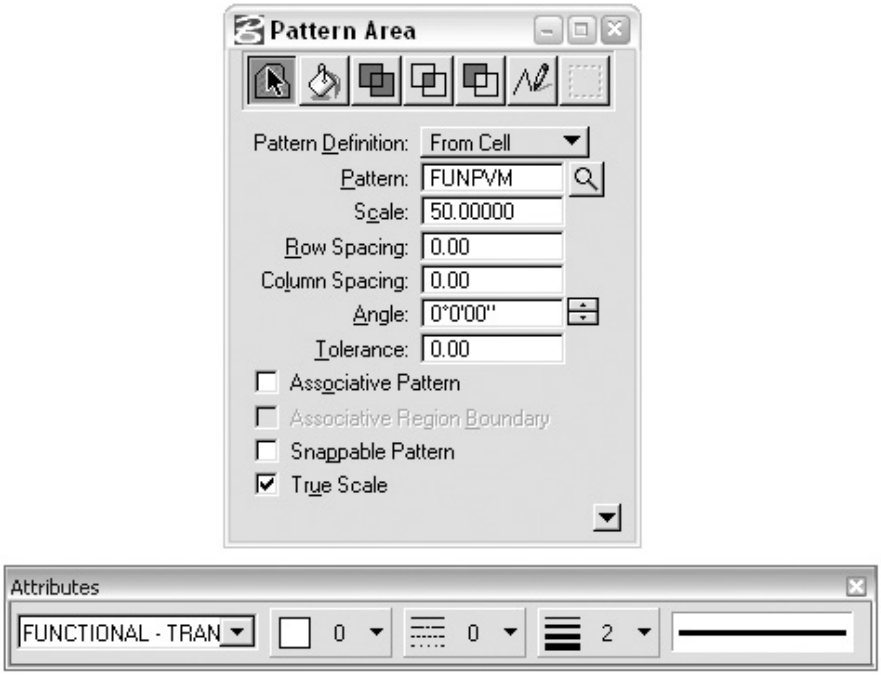
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

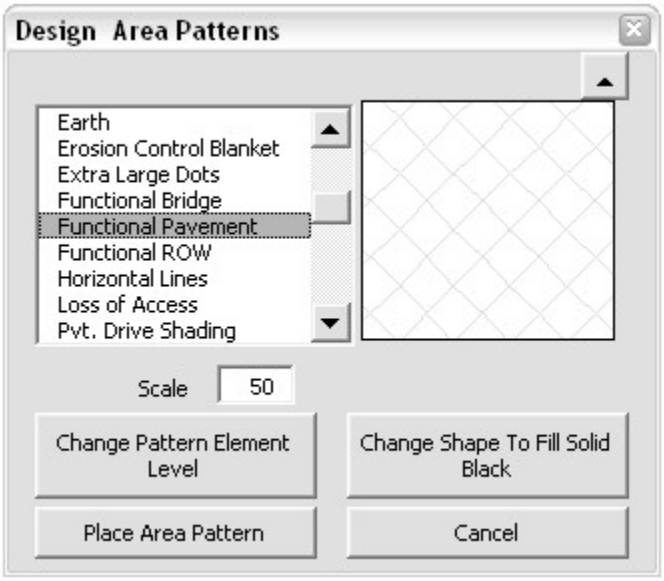
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Pvmt Pattern F**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

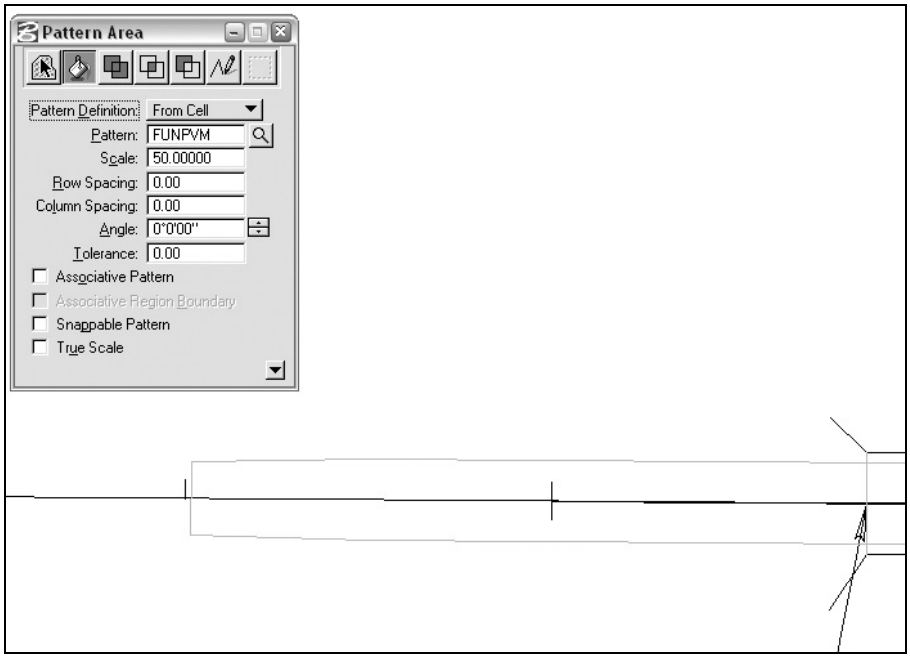


Or from the drop down menu in the **Design Area Patterns** dialog …

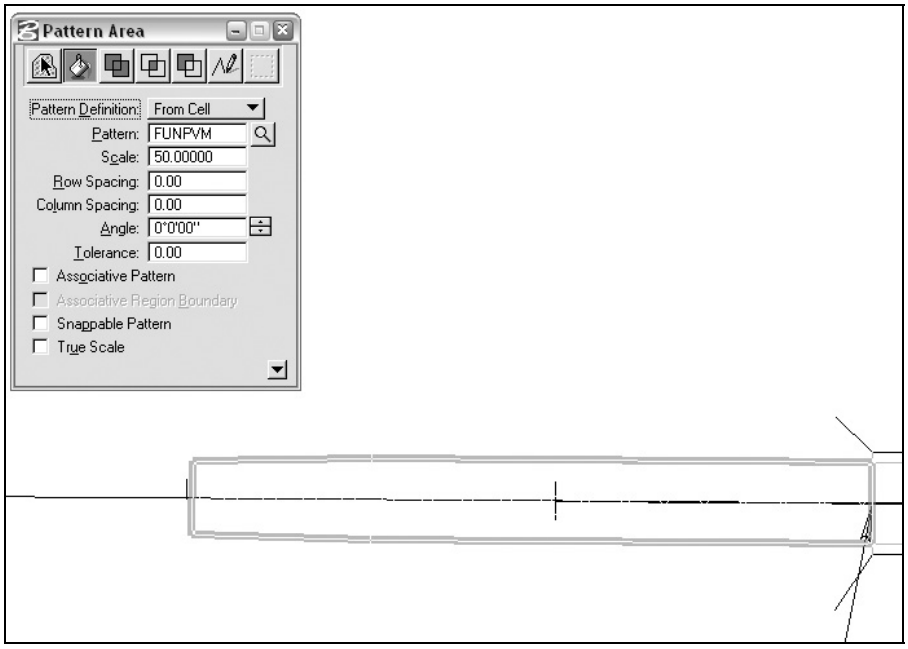


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

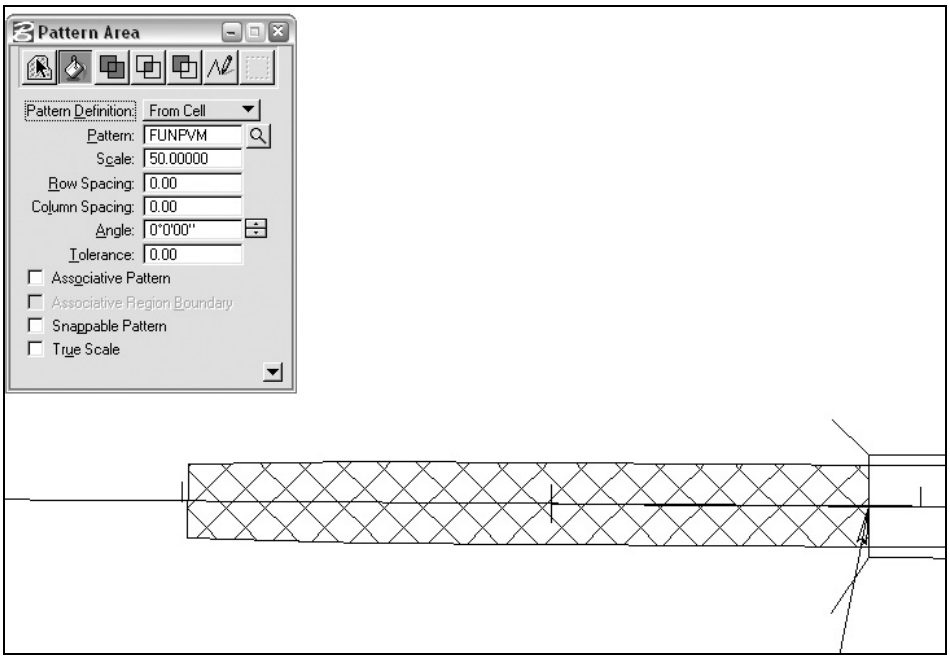
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Functional Bridge Area

D&C location: Functional > Br Pattern F

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a Functional bridge areas and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]FunctionalBridge.SetPattern

Special Requirements:

Depending on the method of area pattern placement to be used take the following actions:

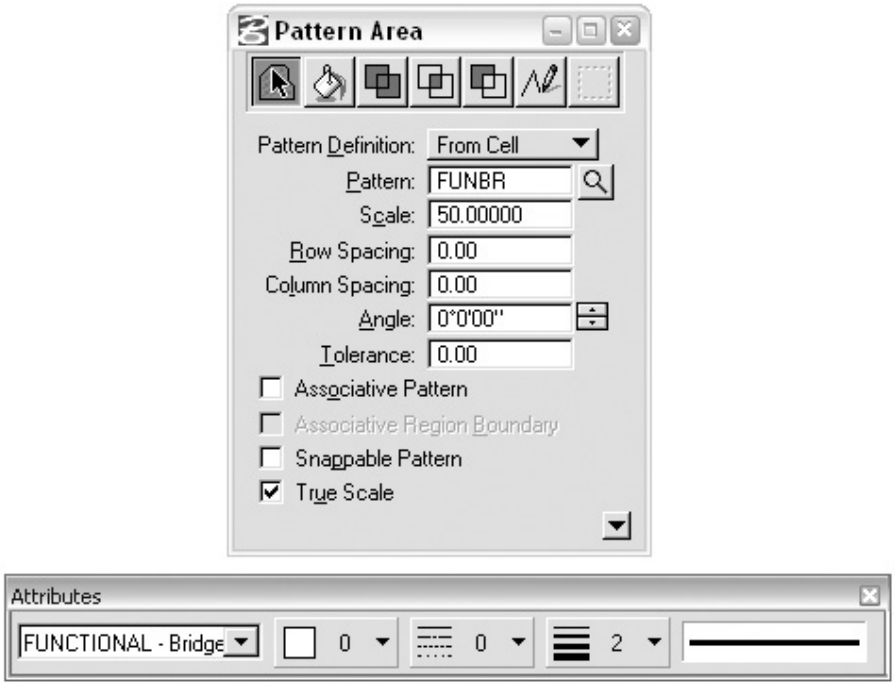
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

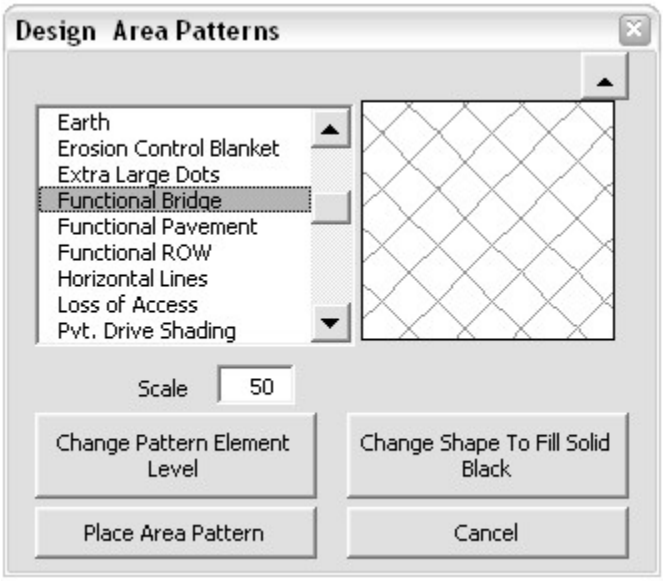
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **Br Pattern F**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

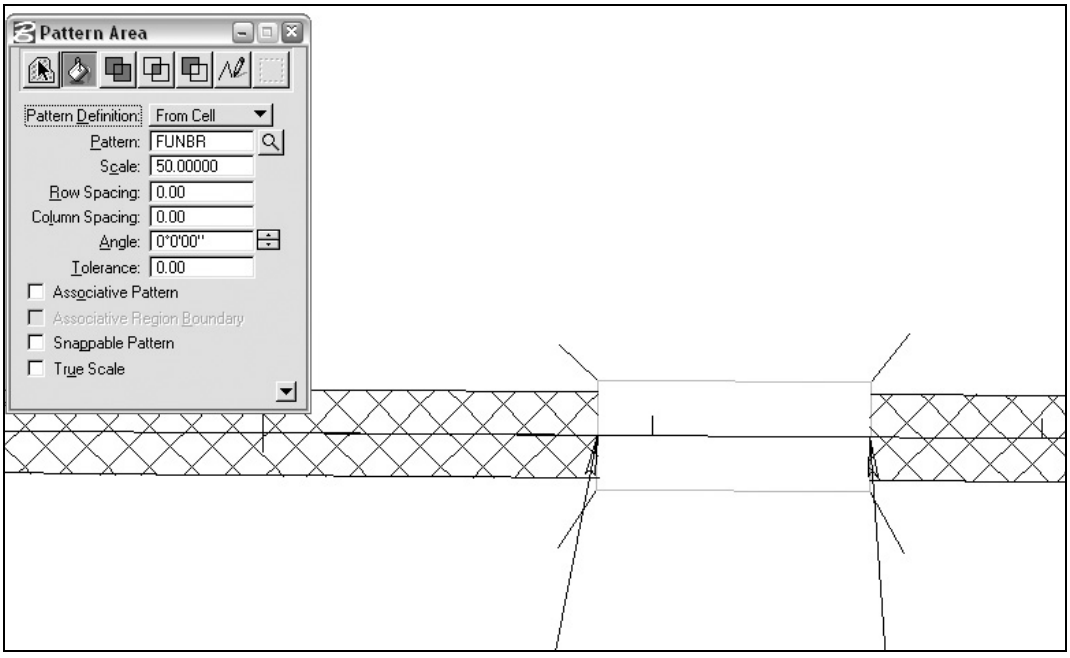


Or from the drop down menu in the **Design Area Patterns** dialog …

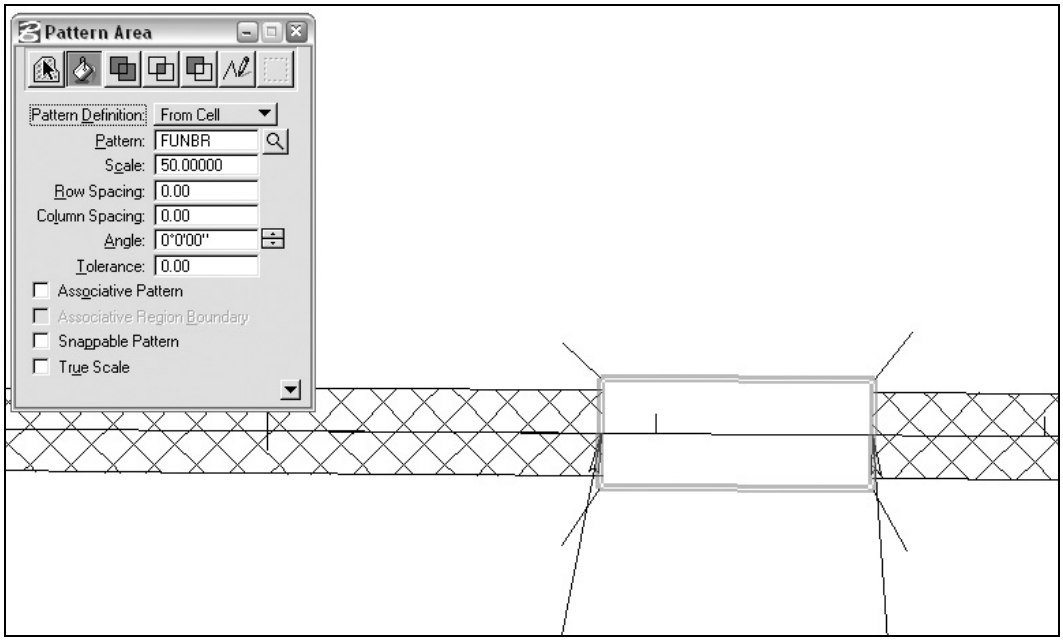


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

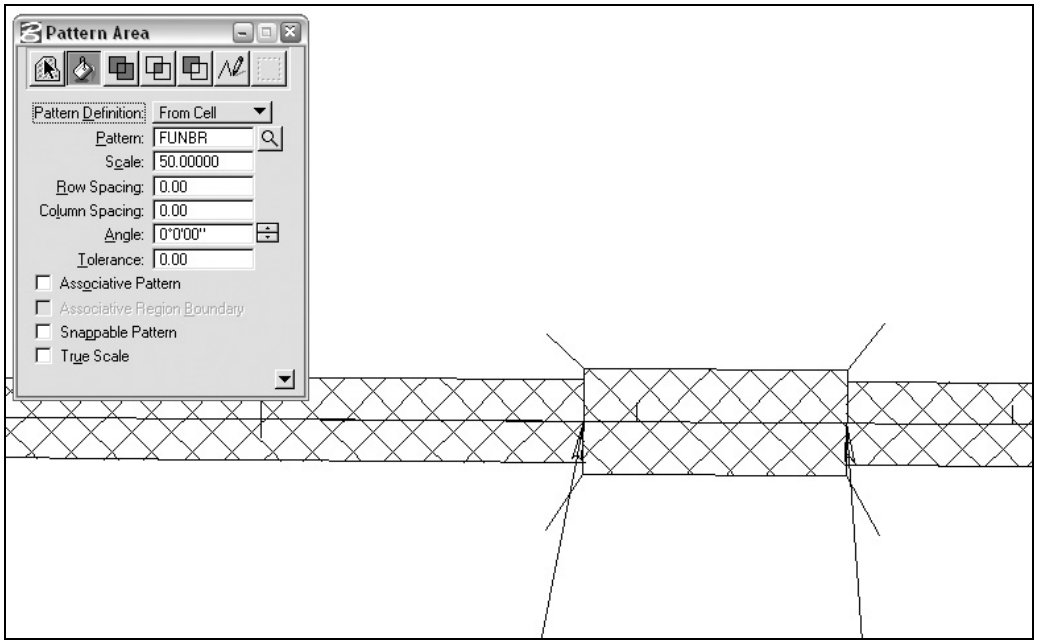
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Pattern Functional ROW Area

D&C location: Functional > ROW Pattern F

MicroStation VBA Program: AreaPatterns.mvba

Description:
This application sets the area pattern parameters and active level needed to pattern a Functional R.O.W. areas and starts MicroStation's Pattern Area tool.

This program can also be activated from the MicroStation drop down menu at
TDOT > Area Patterns > Design Area Patterns
or by using the keyin
vba run [AreaPatterns]FunctionalROW.SetPattern

Special Requirements:

Depending on the method of area pattern placement to be used take the following actions:

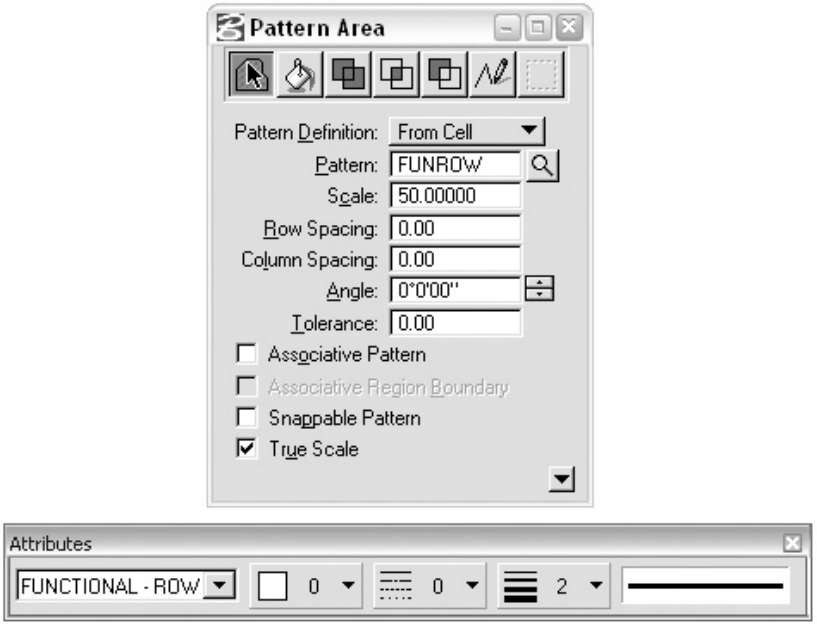
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

Element, Union, Intersection or Difference methods: Create shape element(s) bounding the area to be patterned.

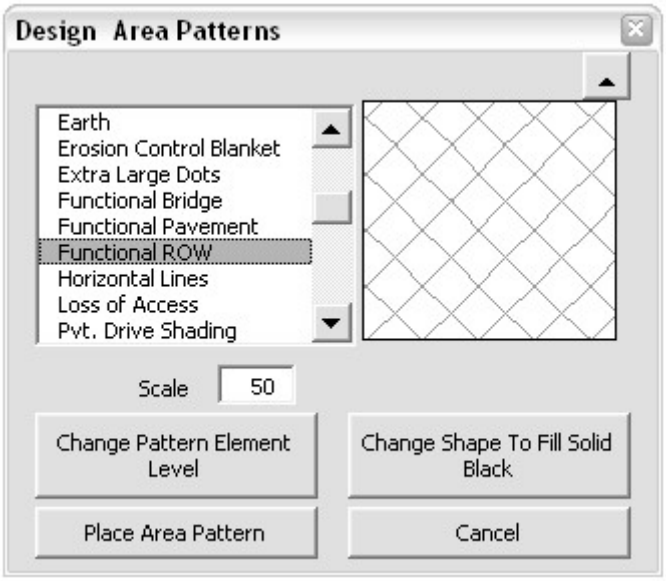
Fence method: Create a fence bounding the area to be patterned.

Usage:

Step 1. In D&C manager activate **ROW Pattern F**. The **Pattern Area** tool is activated with the appropriate settings. The active level is set as well.

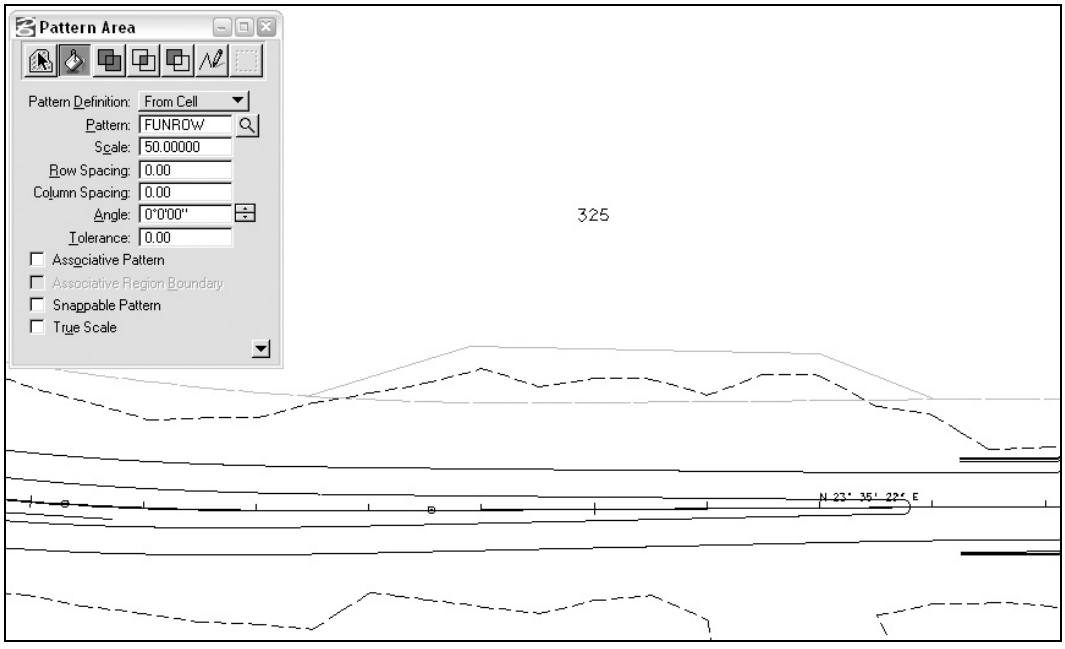


Or from the drop down menu in the **Design Area Patterns** dialog …

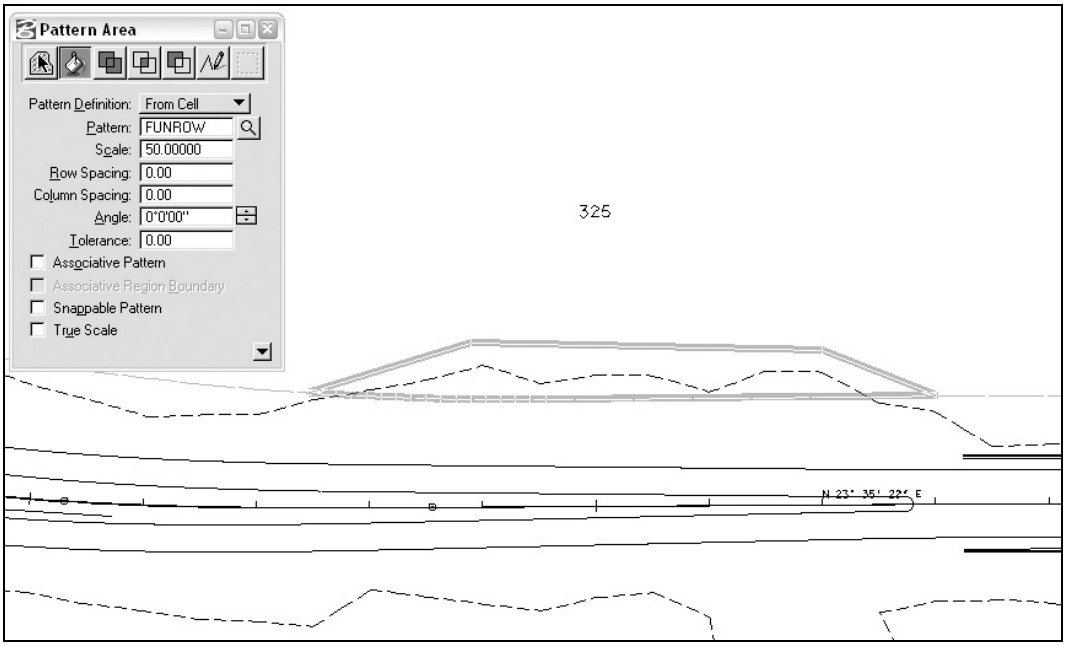


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

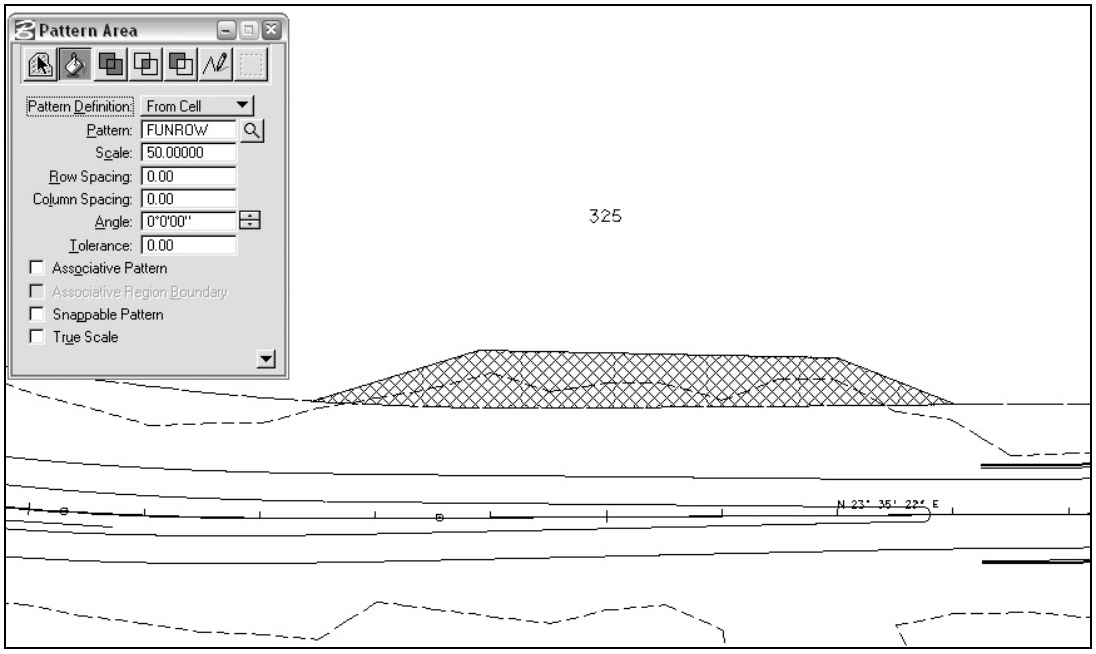
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



Step 4. The user is then prompted to **Accept @pattern intersection point**.



After giving the accept point, the area is patterned.



Utilities - Plan

Utility Cells - Proposed

D&C location: Utilities – Plan > Proposed > Utility Cells Pr

MicroStation VBA Program: UtilityCellsProp.mvba

Description:
This program provides access to TDOT Design Division proposed utility cells. These do include existing guy anchors.

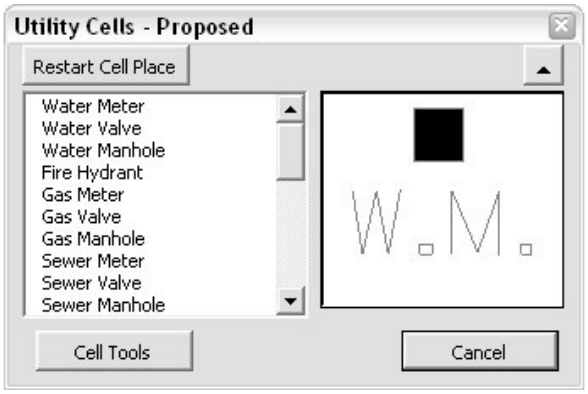
A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

This program can also be activated from the MicroStation drop down menu
TDOT > Utilities > Proposed Cells
or by using the keyin
vba run [UtilityCellsProp]Utiltycells.main

Special Requirements:
None.

Usage:

Step 1. In D&C manager activate **Utility Cells Pr**. The **Utility Cells - Proposed** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Utility Cells - Existing

D&C location: Utilities – Plan > Existing > Utility Cells E

MicroStation VBA Program: UtilityCellsExist.mvba

Description:

This program provides access to TDOT Design Division existing utility cells.

A command button is provided to access MicroStation's Cell Tools mdl program for various placement control options. When clicked the Cell Tools tool bar is opened.

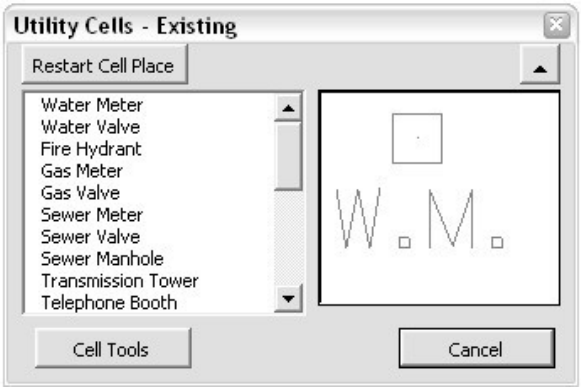
This program can also be activated from the MicroStation drop down menu
TDOT > Utilities > Existing Cells
or by using the keyin
vba run [UtilityCellsExist]Utiltycells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Utility Cells E**. The **Utility Cells - Existing** dialog appears.



Step 2. Click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. MicroStation's Place Cell command is automatically started.

Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

This can be done with Place Cell which is currently active or by accessing MicroStation's Cell Tools with the command button provided. The Cell Tools tool bar has additional cell placement options including place cell with a spin to set the angle or place cells along an element at a specific spacing, offset and angle.

Any of these cell placement options can also be used in conjunction with Geopak's DP Station/Offset tool to place the cell at a specific station and offset along the horizontal alignment.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used and you wish to go back to placing the currently selected cell.

Pay Items

Curb 702-01

Concrete Curb Volume Computation

D&C location: Pay Items > Curb 702-01 > (all curb items)

Geopak 3PC Program: Curb_Computation.x

Description:

This application reads a D&C Manager set of curb lines, prompts the user for the volume per linear foot rate for each line & then calculates the total volume and reports the quantity back to D&C Manager.

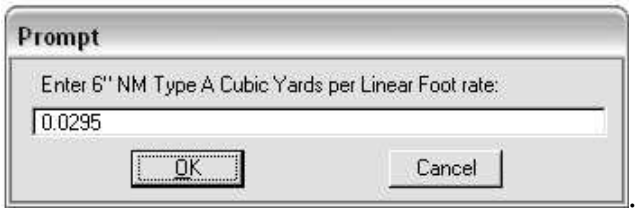
Special Requirements:

None

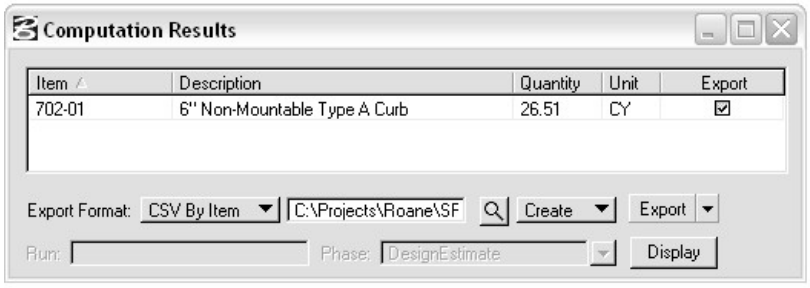
Usage:

Step 1. Set up any of the computational methods provided by Geopak's D&C Manager and click on the **Compute Quantities** command button in the Plan Quantity Computation Dialog.

Step 2. As Geopak reads the individual curb lines, a prompt is given for the user to provide the cubic yards of concrete per linear foot of curb. Enter the appropriate rate and click **OK**. These rates can be found on standard roadway drawings RP-MC-1, RP-MC-2 and RP-NMC-10.



Step 3. This prompt is repeated for each curb element computed. The initial rate which was entered is retained so the user can simply click the OK button each time. When all elements have been measured the total quantity is passed back to D&C Manager's Computation Results dialog.



If more than one type of curb is found on the project, it will be necessary to add their volumes together to get the total volume for item number 702-01 Concrete Curb.

If side roads include the same type of curb but with a different cubic yards of concrete per linear foot rate, then it is recommended that they be computed separately to ensure accurate results.

Curb & Gutter 702-03

Concrete Curb & Gutter Volume Computation

D&C location: Pay Items > Curb & Gutter 702-03 > (all curb & gutter items)

Geopak 3PC Program: CurbGutter_Computation.x

Description:
This application reads a D&C Manager set of curb & gutter lines, prompts the user for the volume per linear foot rate for each line & then calculates the total volume and reports the quantity back to D&C Manager.

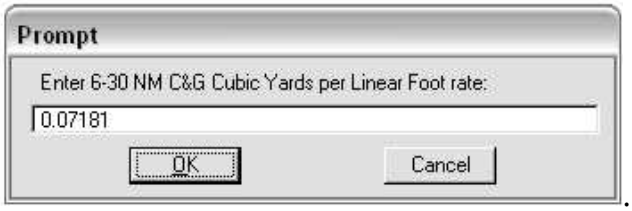
Special Requirements:

None

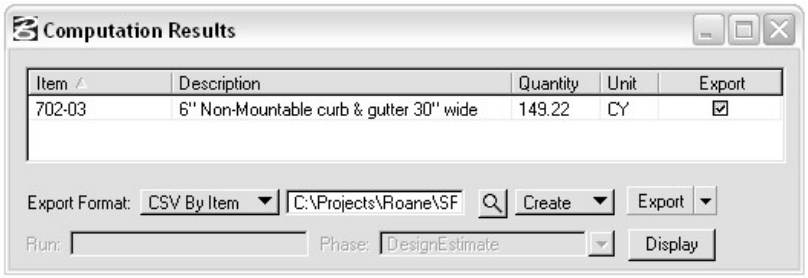
Usage:

Step 1. Set up any of the computational methods provided by Geopak's D&C Manager and click on the **Compute Quantities** command button in the Plan Quantity Computation Dialog.

Step 2. As Geopak reads the individual curb & gutter lines, a prompt is given for the user to provide the cubic yards of concrete per linear foot of curb & gutter. Enter the appropriate rate and click **OK**. These rates can be found on standard roadway drawings RP-MC-1, RP-MC-2 and RP-NMC-10.



Step 3. This prompt is repeated for each curb & gutter element computed. The initial rate which was entered is retained so the user can simply click the OK button each time. When all elements have been measured the total quantity is passed back to D&C Manager's Computation Results dialog.



If more than one type of curb & gutter is found on the project, it will be necessary to add their volumes together to get the total volume for item number 702-03 Concrete Combined Curb and Gutter.

If side roads include the same type of curb & gutter but with a different cubic yards of concrete per linear foot rate, then it is recommended that they be computed separately to ensure accurate results.

Drainage Items

Permanent Slope Drain Computation

D&C location: Pay Items > Drainage Items > 607-41.__ permanent slope drain (all sizes)

Geopak 3PC Program: SlopeDrain_Computation.x

Description:

This application reads a D&C Manager set & then takes the length of each slope drain pipe, adjusts for slope distance, using side slope adhoc information attached to them and reports the adjusted lengths back to D&C Manager with other pay item data stored as adhoc info. This program is used to tabulate either temporary or permanent slope drains.

This application of the program looks for linework that matches standard level and symbology for permanent slope drains.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically calculates the quantity from the permanent slope drains found and sends the total back to D&C Manager.

Erosion Control Items

Berm Volume Computation

D&C location: Pay Items > Erosion Control > (all berm items)

Geopak 3PC Program: Berm_Computation.x

Description:
This application reads a D&C Manager set of erosion control earth, compost or mulch berm lines, prompts the user for the cross section area of each line & then calculates the total volume and reports the quantity back to D&C Manager.

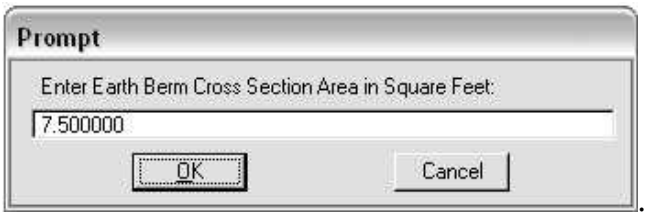
Special Requirements:

None

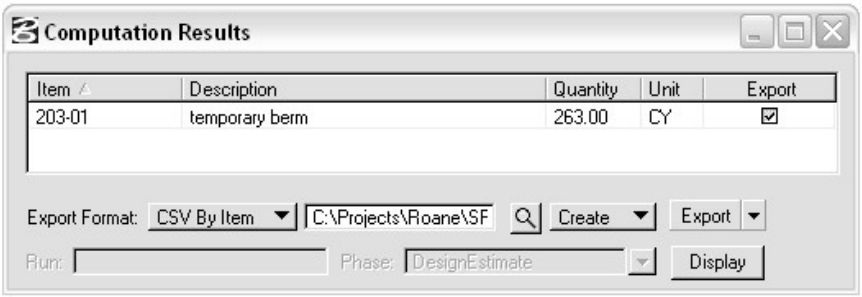
Usage:

Step 1. Set up any of the computational methods provided by Geopak's D&C Manager and click on the **Compute Quantities** command button in the Plan Quantity Computation Dialog.

Step 2. As Geopak reads the individual berm lines, a prompt is given for the user to provide the cross section area of the berm. Enter the appropriate area or use the default area given and click **OK**. Default area values are based on standard roadway drawings EC-STR-27 and EC-STR-35.



Step 3. This prompt is repeated for each berm element computed. Default areas are given each time so it will be necessary to re-enter if you are using a different value. Click OK to proceed. When all elements have been measured the total quantity is passed back to D&C Manager's Computation Results dialog.



If more than one size of a given berm type is used on your project , then it is recommended that they be computed separately and then added together later to ensure accurate results.

Temporary Slope Drain Computation

D&C location: Pay Items > Erosion Control > 209-02.__ temporary slope drain (all sizes)

Geopak 3PC Program: SlopeDrain_Computation.x

Description:

This application reads a D&C Manager set & then takes the length of each slope drain pipe, adjusts for slope distance, using side slope adhoc information attached to them and reports the adjusted lengths back to D&C Manager with other pay item data stored as adhoc info. This program is used to tabulate either temporary or permanent slope drains.

This application of the program looks for linework that matches standard level and symbology for temporary slope drains.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically calculates the quantity from the temporary slope drains found and sends the total back to D&C Manager.

Rock Check Dam Computation

D&C location: Pay Items > Erosion Control > 209-08.07

Geopak 3PC Program: RockCheckDams_Computation.x

Description:

This application reads a D&C Manager set & then counts the rock check dam cells and reports the quantity back to D&C Manager.

This includes "V" ditch rock check dams (cell name: RCDV) and trapezoidal ditch rock check dams (cell name: RCDT).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Enhanced Rock Check Dam Computation

D&C location: Pay Items > Erosion Control > 209-08.08

Geopak 3PC Program: EnhancedRockCheckDams_Computation.x

Description:

This application reads a D&C Manager set & then counts the enhanced rock check dam cells and reports the quantity back to D&C Manager.

This includes “V” ditch enhanced rock check dams (cell name: ERCDV), trapezoidal ditch enhanced rock check dams (cell name: ERCDT), channel enhanced rock check dams (cell name: ERCDCH) and sediment traps with trapezoidal ditch enhanced rock check dams (cell name: STERCD).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Proposed Tree Computation

D&C location: Pay Items > Erosion Control > 802-01.__ proposed trees(all types)

Geopak 3PC Program: Tree_Computation.x

Description:

This application reads a D&C Manager set & then counts the proposed tree cells, reading pay item adhoc information attached to them and reports pay item number, description and quantities back to D&C Manager.

This program looks for cell name: TREEPROPOSED.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Level Spreaders Computation

D&C location: Pay Items > Erosion Control > 805-01.69

Geopak 3PC Program: LevelSpreaders_Computation.x

Description:

This application reads a D&C Manager set & then counts the level spreader cells and reports the quantity back to D&C Manager.

This includes level spreaders with single direction of in-flow (cell name: LEVELSPS) and level spreaders with dual direction of in-flow (cell name: LEVELSPD).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Pavement Marking

Thermoplastic Flatline Pavement Striping Lines with LM units Computation

D&C location: Pay Items > Pavement Marking > Thermoplastic Striping > ThermoFlat LM

Geopak 3PC Program: Striping_Thermo_Flatline_Computation.x

Description:
This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear miles (4” and 6” stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the thermoplastic flatline type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with painted or spray thermoplastic pavement striping computational items since lines may be counted twice yielding incorrect quantities.

Thermoplastic Flatline Pavement Striping Lines with LF units Computation

D&C location: Pay Items > Pavement Marking > Thermoplastic Striping > ThermoFlat LF

Geopak 3PC Program: Striping_Thermo_Flatline_Computation.x

Description:
This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear feet (4”, 6” & 8” dotted stripes, 8” & 24” barrier stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the thermoplastic flatline type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with painted or spray thermoplastic pavement striping computational items since lines may be counted twice yielding incorrect quantities.Care should be taken when setting up the control for what elements should be computed so that 8” barrier striping lines used as borders around channelization areas are not included.

Thermoplastic Spray (60mil) Pavement Striping Lines with LM units Computation

D&C location: Pay Items > Pavement Marking > Thermoplastic Striping > ThermoSpray60 LM

Geopak 3PC Program: Striping_Thermo_Spray60_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear miles (4” and 6” stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the spray thermoplastic (60mil) type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with painted, spray thermoplastic (40mil) or thermoplastic flatline pavement striping computational items since lines may be counted twice yielding incorrect quantities.

Thermoplastic Spray (60mil) Pavement Striping Lines with LF units Computation

D&C location: Pay Items > Pavement Marking > Thermoplastic Striping > ThermoSpray60 LF

Geopak 3PC Program: Striping_Thermo_Spray60_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear feet (4”, 6” & 8” dotted stripes, 8” & 24” barrier stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the spray thermoplastic (60mil) type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with painted, spray thermoplastic (40mil) or thermoplastic flatline pavement striping computational items since lines may be counted twice yielding incorrect quantities. Care should be taken when setting up the control for what elements should be computed so that 8” barrier striping lines used as borders around channelization areas are not included.

Thermoplastic Spray (40mil) Pavement Striping Lines with LM units Computation

D&C location: Pay Items > Pavement Marking > Thermoplastic Striping > ThermoSpray40 LM

Geopak 3PC Program: Striping_Thermo_Spray40_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear miles (4” and 6” stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the spray thermoplastic (40mil) type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with painted, spray thermoplastic (60mil) or thermoplastic flatline pavement striping computational items since lines may be counted twice yielding incorrect quantities.

Thermoplastic Spray (40mil) Pavement Striping Lines with LF units Computation

D&C location: Pay Items > Pavement Marking > Thermoplastic Striping > ThermoSpray40 LF

Geopak 3PC Program: Striping_Thermo_Spray40_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear feet (4”, 6” & 8” dotted stripes, 8” & 24” barrier stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the spray thermoplastic (40mil) type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with painted, spray thermoplastic (60mil) or thermoplastic flatline pavement striping computational items since lines may be counted twice yielding incorrect quantities. Care should be taken when setting up the control for what elements should be computed so that 8” barrier striping lines used as borders around channelization areas are not included.

Thermoplastic Channelization Lines with SY units Computation

D&C location: Pay Items >Pavement Marking >Thermoplastic Striping >T Channelizaton

Geopak 3PC Program: Striping_Thermo_Channelization_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement channelization striping lines (8” and 12” stripes), calculates the area and reports the quantity, item number & description back to D&C Manager. This program is specifically set up to tabulate pavement channelization striping lines as the thermoplastic type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with painted pavement striping computational items since lines may be counted twice yielding incorrect quantities. Care should be taken when setting up the control for what elements should be computed so that regular 8” pavement striping lines and 12” transverse shoulder striping lines are not included with channelization striping lines.

Thermoplastic Transverse Shoulder Lines Computation

D&C location: Pay Items >Pavement Marking >Thermoplastic Striping >Transverse Shld

Geopak 3PC Program: Striping_Thermo_Transverse_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement transverse shoulder striping lines (12” stripes) and reports the quantity, item number & description back to D&C Manager. This program is specifically set up to tabulate pavement transverse shoulder striping lines as the thermoplastic type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

Care should be taken when setting up the control for what elements should be computed so that other channelization striping lines are not included with transverse shoulder striping lines.

Painted Pavement Striping Lines with LM units Computation

D&C location: Pay Items > Pavement Marking > Painted Striping > Paint LM

Geopak 3PC Program: Striping_Paint_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear miles (4” and 6” stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the painted type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with flatline or spray thermoplastic pavement striping computational items since lines may be counted twice yielding incorrect quantities.

Painted Pavement Striping Lines with LF units Computation

D&C location: Pay Items > Pavement Marking > Painted Striping > Paint LF

Geopak 3PC Program: Striping_Paint_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement striping lines that are measured in linear feet (4”, 6” & 8” dotted stripes, 8” & 24” barrier stripes) and reports the quantity, item number & description back to D&C Manager. Program automatically adjusts for gaps & double lines. This program is specifically set up to tabulate pavement striping lines as the painted type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with flatline or spray thermoplastic pavement striping computational items since lines may be counted twice yielding incorrect quantities. Care should be taken when setting up the control for what elements should be computed so that 8” barrier striping lines used as borders around channelization areas are not included.

Painted Channelization Lines with SY units Computation

D&C location: Pay Items >Pavement Marking > Painted Striping >P Channelizaton

Geopak 3PC Program: Striping_Painted_Channelization_Computation.x

Description:

This application reads a D&C Manager set and then counts the length of pavement channelization striping lines (8” and 12” stripes), calculates the area and reports the quantity, item number & description back to D&C Manager. This program is specifically set up to tabulate pavement channelization striping lines as the painted type.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the line work found and sends the total back to D&C Manager.

This should not be used in conjunction with flatline or spray thermoplastic pavement striping computational items since lines may be counted twice yielding incorrect quantities.

Care should be taken when setting up the control for what elements should be computed so that regular 8” pavement striping lines, 12” transverse shoulder striping lines are not included with channelization striping lines.

Pavement Marking Turn Arrow Computation

D&C location: Pay Items > Pavement Marking > 716-02.06

Geopak 3PC Program: TurnArrow_Computation.x

Description:

This application reads a D&C Manager set & then counts the turn arrow pavement marking cells and reports the quantity back to D&C Manager.

This includes left turn arrow (cell name: PVAL), right turn arrow (cell name: PVAR), left turn lane arrows (cell name: PVA2L) and left turn fish-hook arrow (cell name: PVFHAL).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Pavement Marking Straight-Turn Arrow Computation

D&C location: Pay Items > Pavement Marking > 716-04.01

Geopak 3PC Program: StraightTurnArrow_Computation.x

Description:

This application reads a D&C Manager set & then counts the combination straight or turn arrow pavement marking cells and reports the quantity back to D&C Manager.

This includes the following cells:
straight or left turn arrows (cell name: PVASL)
straight or right turn arrows (cell name: PVASR)
straight, left or right turn arrows (cell name: PVASB)
straight or left turn fish-hook arrows (cell name: PVFHALS)
straight or right turn fish-hook arrows (cell name: VFHARS)
straight, left or right turn fish-hook arrows (cell name: PVFHARSL).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Pavement Marking Double -Turn Arrow Computation

D&C location: Pay Items > Pavement Marking > 716-04.02

Geopak 3PC Program: DoubleTurnArrow_Computation.x

Description:

This application reads a D&C Manager set & then counts the double-turn arrow pavement marking cells and reports the quantity back to D&C Manager.

This includes left & right turn arrow (cell name: PVALR) and left & right turn fish-hook arrow (cell name: PVFHARL).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Pavement Marking Exit Only Arrow Computation

D&C location: Pay Items > Pavement Marking > 716-04.07

Geopak 3PC Program: ExitOnlyArrow_Computation.x

Description:

This application reads a D&C Manager set & then counts the exit only arrow pavement marking cells and reports the quantity back to D&C Manager.

This includes straight exit arrow (cell name: PVASI) and right exit arrow (cell name: PVARI).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

R.O.W.

Count ROW Markers by Sheet Area

D&C location: Pay Items > R.O.W. > ROW Markers

Geopak 3PC Program: count_row_markers.x

Description:
This application reads a selection set of a given sheet area & then counts all R.O.W. markers and appends this info to a CSV file named **ROWmarkers.csv**.

Data in the file reads sheet no., number of A's, number of B's, number of C's.

Special Requirements:
MicroStation selection set which includes graphics from level DESIGN - ROW - Right-of-Way Markers must be active.

Usage:

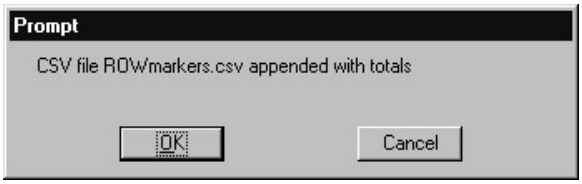
Step 1. Turn on level 46 if not already on. Create a MicroStation selection set of elements for the first sheet area.

Step 2. In D&C manager activate **ROW Markers**.

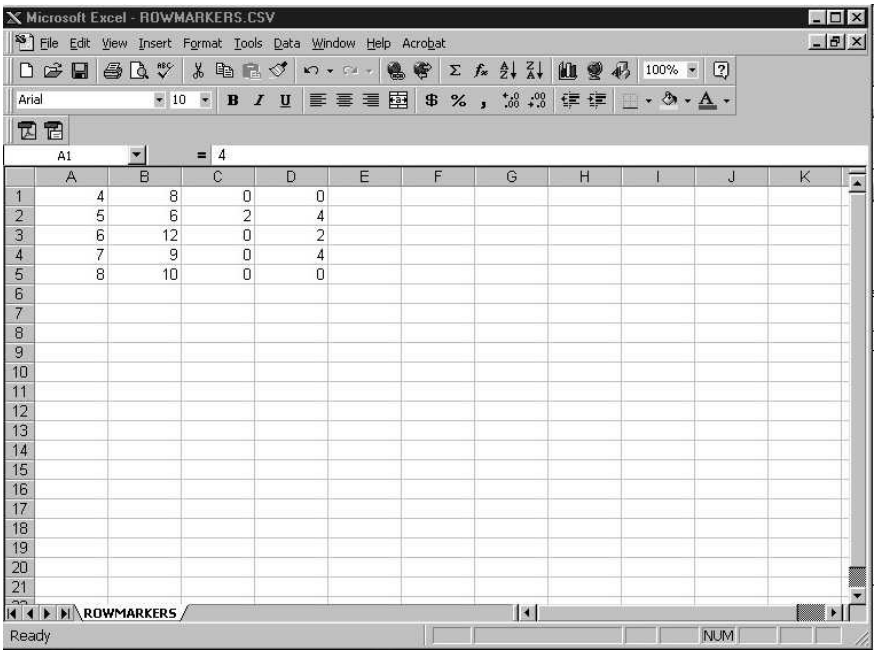
Note: Although under the Pay Items group this function is activated in D&C Manager's **Design** mode.

Step 3. You are prompted for the **sheet no.** Key that in and click **OK**.

Step 4. The selection set is processed and graphics are read looking for proposed R.O.W. marker cells (**PROWA**, **PROWB** & **PROWC**). When processing is finished the numbers are totaled and appended to CSV file **ROWmarkers.csv** .Click **OK** to dismiss the completion message.

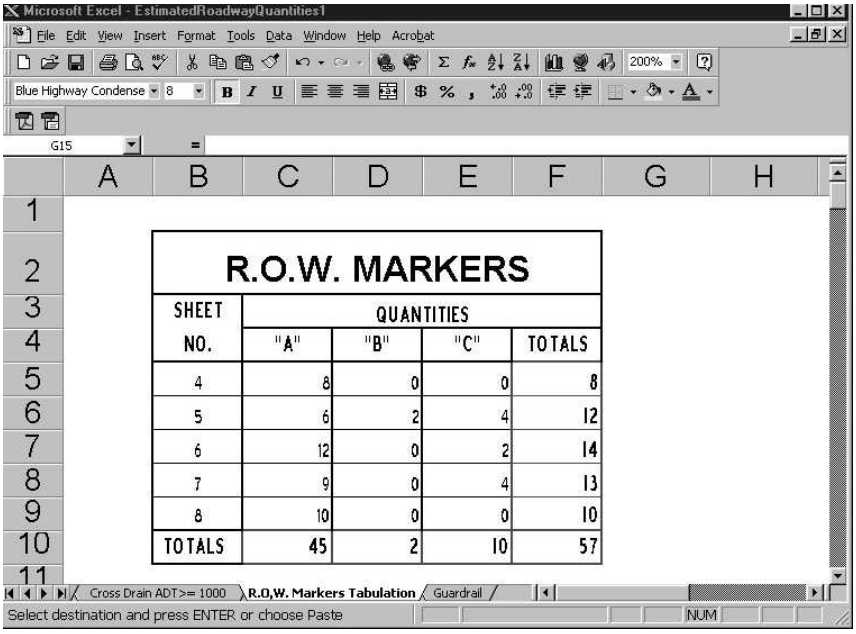


Step 5. Repeat steps 1 through 4 for the remaining sheet areas. At any time Excel can be used to review the contents of the CSV data file being built. Remember the data in the file reads sheet no., number of A's, number of B's, number of C's.



	A	B	C	D
1	4	8	0	0
2	5	6	2	4
3	6	12	0	2
4	7	9	0	4
5	8	10	0	0

Step 6. When all sheets have been counted, open **ROWmarkers.csv** with Excel, highlight all the data and click **Copy**. Open your projects estimated roadway quantities Excel file to your R.O.W. markers tabulation worksheet. Use Insert to add this worksheet if needed. Click into the first field of the block, right click choose **Paste Special,** set to **Values** and click **OK** to paste the data into the block.



R.O.W. MARKERS				
SHEET NO.	QUANTITIES			
	"A"	"B"	"C"	TOTALS
4	8	0	0	8
5	6	2	4	12
6	12	0	2	14
7	9	0	4	13
8	10	0	0	10
TOTALS	45	2	10	57

ROW Markers Computation

D&C location: Pay Items > R.O.W. > ROW Markers

Geopak 3PC Program: ROW_Markers_Computation.x

Description:

This application reads a D&C Manager set & then counts the R.O.W. marker cells and reports the quantity back to D&C Manager.

This includes type A markers (cell name: PROWA), type B markers (cell name: PROWB) and type C markers (cell name: PROWC).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Signalization Items

Saw Slot from Signal Loop Detector Cells Computation

D&C location: Pay Items > Signalization Items > 730-14.02+

Geopak 3PC Program: SignalLoop_Computation.x

Description:
This application reads a D&C Manager set & then counts the signal loop detector cells and reports the saw slot linear feet quantity back to D&C Manager.

This includes single 50’ loop (cell name: LDS), double 50’ loop (cell name: LDD), single 20’ loop (cell name: LDS20), quadrapole loop (cell name: LDQUAD), single density loop (cell name: LDVDS), double density loop (cell name: LDVD) and square series loop (cell name: LDSQSE).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Loop Wire from Signal Loop Detector Cells Computation

D&C location: Pay Items > Signalization Items > 730-14.03+

Geopak 3PC Program: SignalLoop_Computation.x

Description:
This application reads a D&C Manager set & then counts the signal loop detector cells and reports the loop wire linear feet quantity back to D&C Manager.

This includes single 50’ loop (cell name: LDS), double 50’ loop (cell name: LDD), single 20’ loop (cell name: LDS20), quadrapole loop (cell name: LDQUAD), single density loop (cell name: LDVDS), double density loop (cell name: LDVD) and square series loop (cell name: LDSQSE).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak’s D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Traffic Control Items

Traffic Control Flexible Drum/Barrel Computation

D&C location: Pay Items > Traffic Control Items > 712-04.01

Geopak 3PC Program: Barrel_Computation.x

Description:
This application reads a D&C Manager set & then counts the flexible drum cells and reports the quantity back to D&C Manager.

This includes left barrel (cell name: BARRLT), right barrel (cell name: BARRRT) and center barrel (cell name: BARREL).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.

Traffic Control Vertical Panel Computation

D&C location: Pay Items > Traffic Control Items > 712-06.01

Geopak 3PC Program: VerticalPanel_Computation.x

Description:
This application reads a D&C Manager set & then counts the vertical panel sign cells and reports the square feet quantity back to D&C Manager.

This includes single faced vertical panel signs (cell name: TVP) and double faced vertical panel signs (cell name: T2VP).

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantity from the cells found and sends the total back to D&C Manager.