

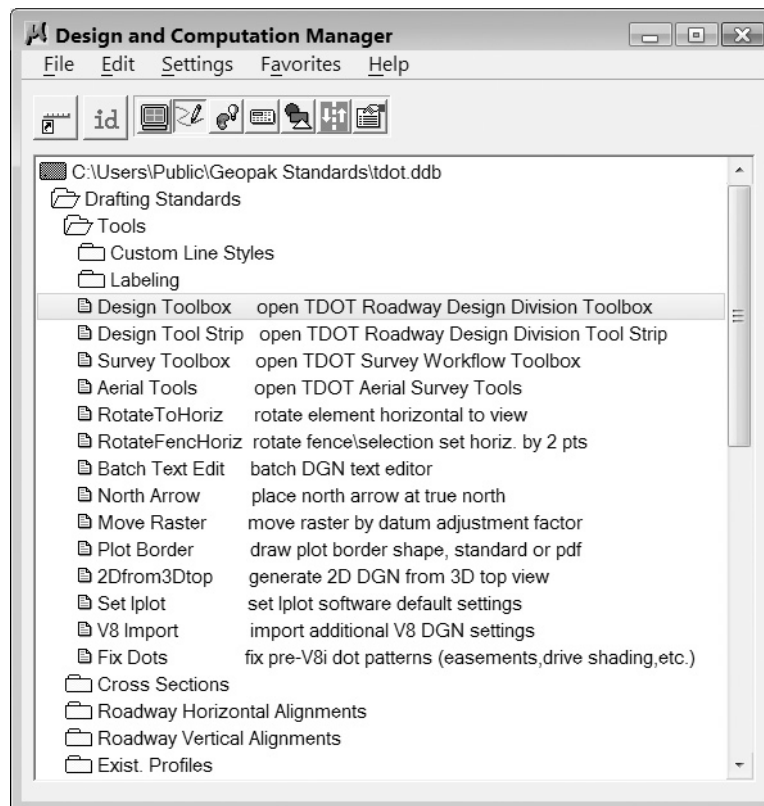
T.D.O.T. Roadway Design Division Programs

The T.D.O.T. Roadway 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, and MicroStation Visual Basic Applications.

All of them can be accessed from Geopak's Design & Computation Manager. When running the T.D.O.T. Roadway 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 Roadway Design Division Toolbox program\dialog provides access to many of the tools, commands and functions used most often by TDOT Roadway 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 Roadway 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 Roadway Design Division personnel. It is an alternative to access of them through the TDOT interface drop down menu or Geopak's Design &Computation Manager.

This program can also be activated from the TDOT Design Division tool strip or the drop down menu at

TDOT > Tools > Roadway Design Division Toolbox

or by using the keyin

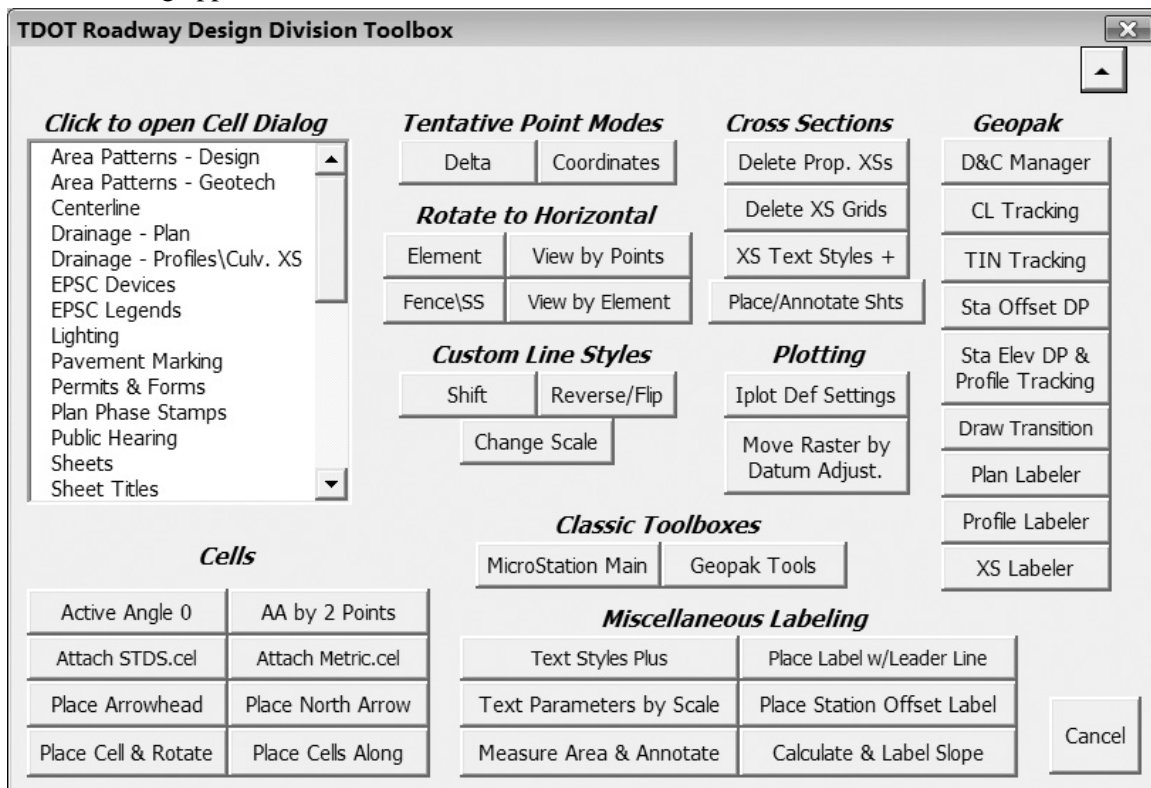
vba run [TDOTDesignDivToolbox]DesignToolbox.Main

Special Requirements:

None

Usage:

Step 1. In D&C manager activate **Design Toolbox**. The **TDOT Roadway 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

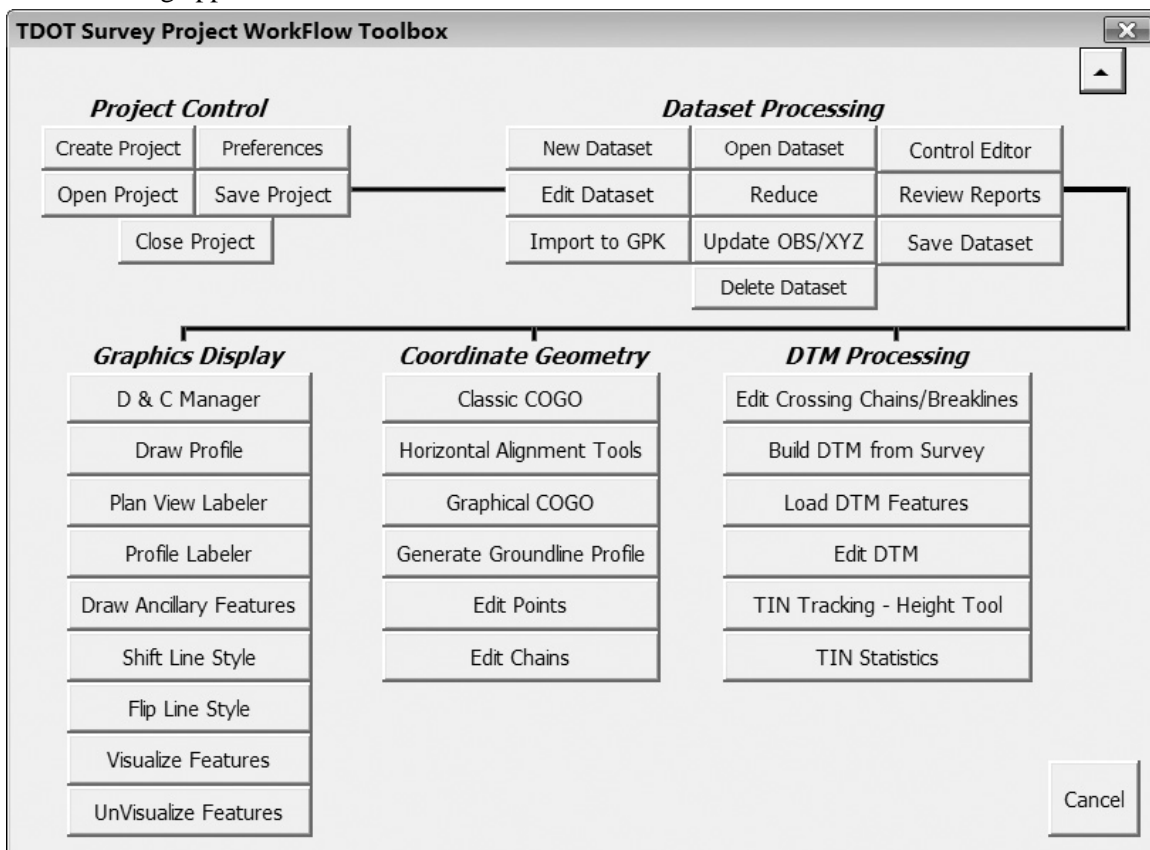
vba run [SurveyProjectWorkFlowToolbox]SurveyToolbox.main

Special Requirements:

None

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.

Aerial Survey Tools

D&C location: Drafting Standards>Tools > Aerial Tools

MicroStation VBA Program: AerialSurveyTools.mvba

Description:

This program provides a dialog access point to various aerial survey tools not automatically used by aerial survey software including the following programs:

MFC to DTM

Convert Aerial Survey topographic data to DTM specifications

View On 1 to 4

Set views in Aerial Survey files for photo review and clean up in MicroStation

Update Contours

Delete contour graphics, update the ISEE Surface, generate new contours & restart ISSD software.

Fix Topo Levels by ISFC Feature Number

Fix topographic graphics levels by ISFC feature number

Fix levels in DTM files by Element Type

Fix surface graphics levels in DTM files by MicroStation element type.

This program can also be activated from the MicroStation drop down menu

TDOT > Aerial Survey Tools

or by using the keyin

vba run [AerialSurveyTools]AStools.main

Special Requirements:

None

Usage: Access Dialog

Step 1. In D&C manager activate **Aerial Tools** or from MicroStation's keyin field enter the keyin **vba run [AerialSurveyTools]AStools.main**. The **Aerial Survey Tools** dialog appears.



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

The next several pages of this document describe the use of these tools ...

Name: mfc2dtm.mvba

Keyin: vba run [mfc2dtm]Start.Main

Special Requirements:

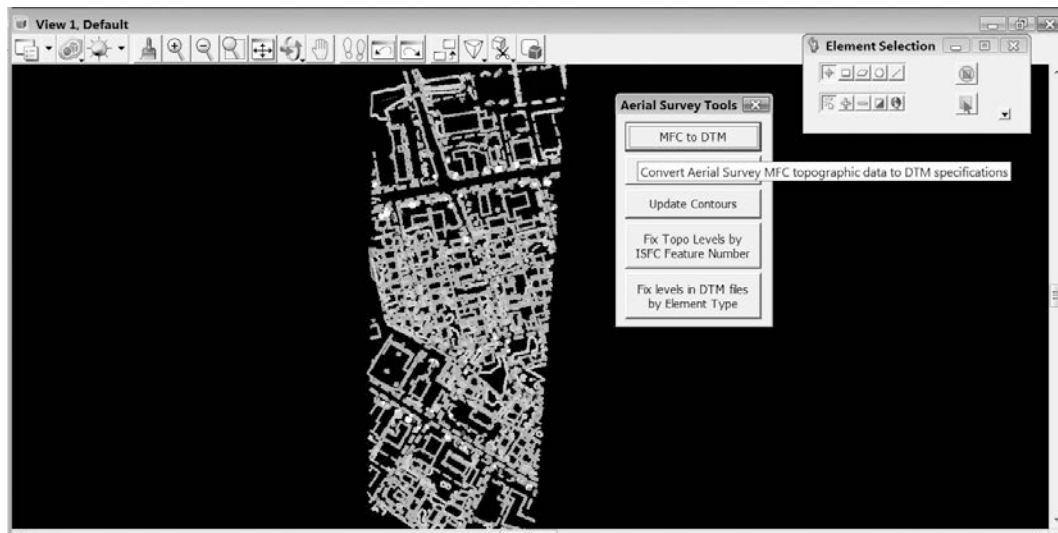
Aerial Survey software ISFC & ISSD

Copy completed .MFC topography graphics file to new .DTM version

Usage: MFC to DTM

Step 1. Open the new .DTM file.

Step 2. In the Aerial Survey Tools dialog click the **MFC to DTM** command button.



Step 2. Program automatically steps through the following functions:

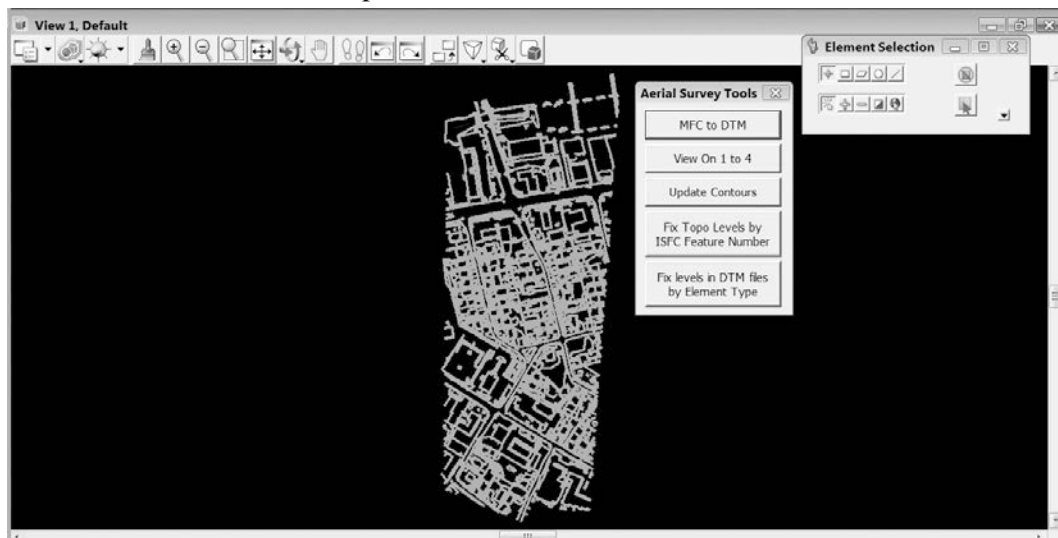
View 1 is adjusted to include all levels and all graphics.

All graphics are turned off except for obscure areas which are tagged as ISFC feature isdc_3.

All other levels are turned on and all graphics are tagged as ISFC feature isdc_4.

Obscure areas are turned off and all remaining graphics are changed to standard level and symbology for breaklines.

The file is re-opened to go back to the file layout when Save Settings was last used and ISSD stereo view is invoked to set up for further work.



Name: ViewON1thru4.mvba

Keyin: vba run [ViewON1thru4]Start.Main

Special Requirements:

MicroStation file with mosaic of aerial photography raster image(s) attached.

Usage: View On 1 to 4

Step 1. In the Aerial Survey Tools dialog click the **View On 1 to 4** command button.

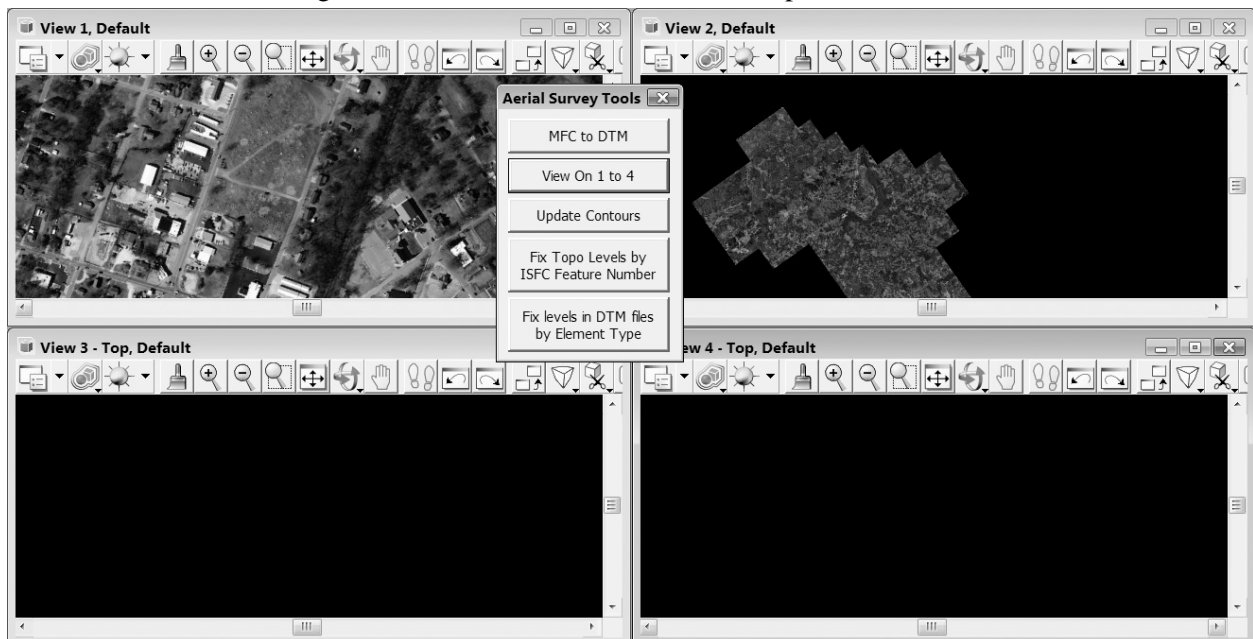


Step 2. Program automatically steps through the following functions:

Views 1 through 4 are turned on.

Views 5 through 8 are turned off.

Views 1 through 4 are tiled to the MicroStation workspace.



Name: AerialSurveyUpdateContours.mvba

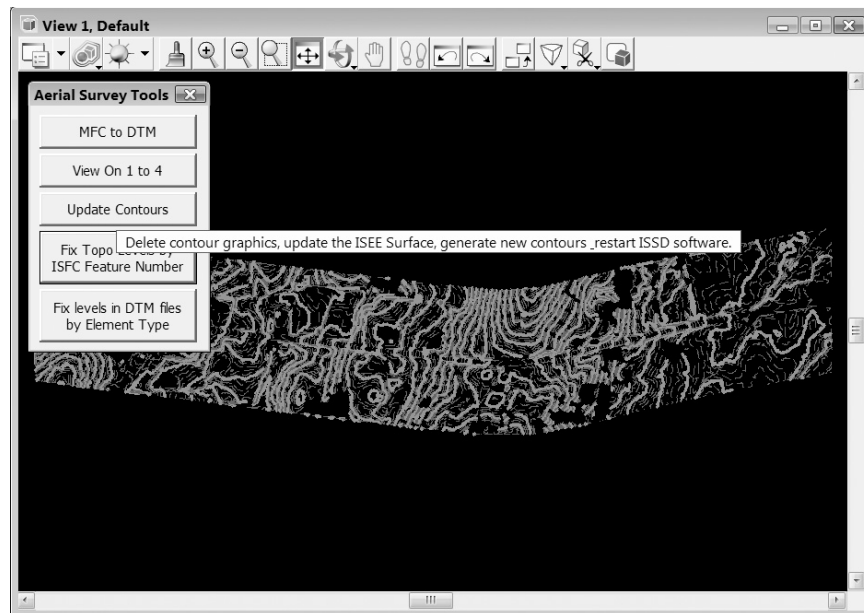
Keyin: vba run [AerialSurveyUpdateContours]Start.Main

Special Requirements:

Aerial Survey software ISEE & ISSD

Usage: Update Contours

Step 1. In the Aerial Survey Tools dialog click the **Update Contours** command button.



Step 2. Program prompts user to **Data point to start**. Data point anywhere in a view to begin processing of contours.

Step 2. Program automatically steps through the following functions:

Graphics are deleted from ISEE default contour level numbers 30, 31 & 40 and T.D.O.T. standard contour level numbers 326, 327 & 328.

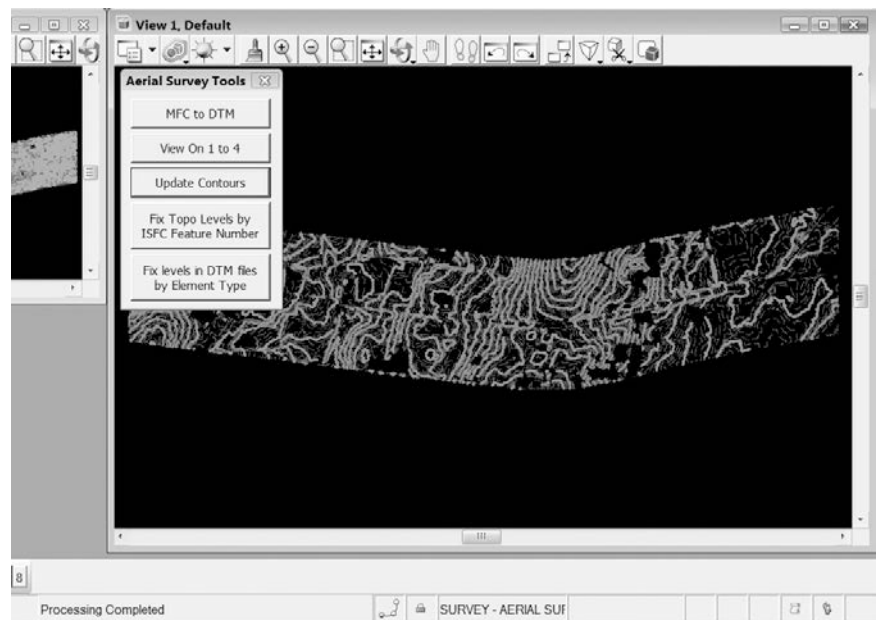
MicroStation file is compressed to clean out deleted graphics.

ISEE surface is updated.

ISEE surface contours are re-displayed.

ISSD stereo view is invoked to set up for further surface contour review.

When all graphics have been processed, the user is prompted **Processing Completed**.



Name: AerialSurveyGraphicsLevelFix.mvba

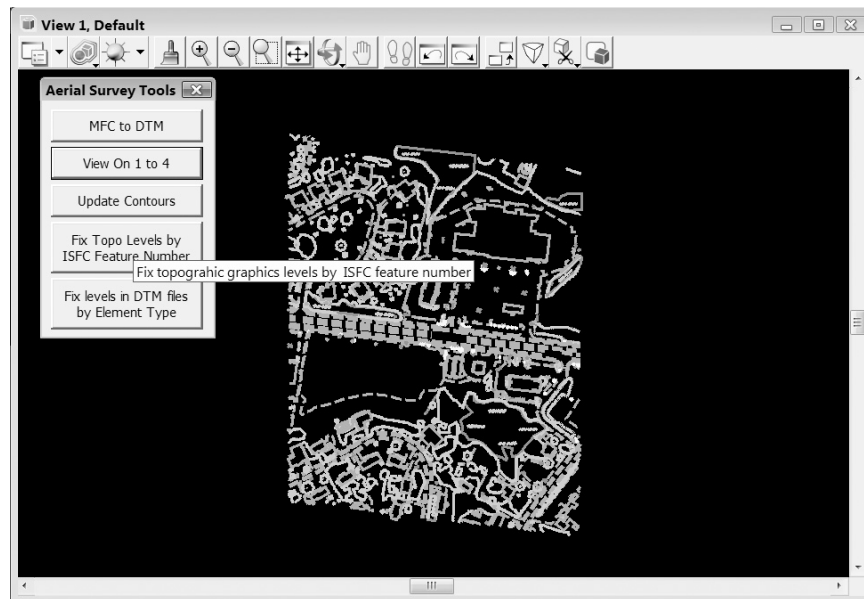
Keyin: vba run [AerialSurveyGraphicsLevelFix]Start.Main

Special Requirements:

Aerial Survey topographic file with element graphic group numbers set at appropriate ISFC feature code numbers.

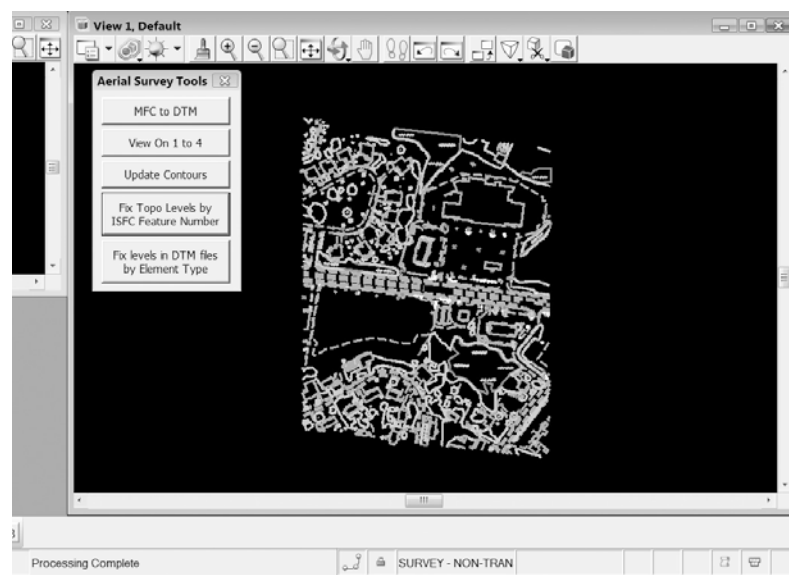
Usage: Update Contours

Step 1. In the Aerial Survey Tools dialog click the **Fix Topo Levels by ISFC Feature Number** command button.



Step 2. Program prompts user to **Data point to start**. Data point anywhere in a view to begin processing of topographic elements.

Step 2. Program scans all graphics in file reading the graphic group number from each to determine the appropriate level for that ISFC feature and then moves the element to that level.



When all graphics have been processed, the user is prompted **Processing Complete**.

Name: AerialSurveySurfaceGraphicsLevelFix.mvba

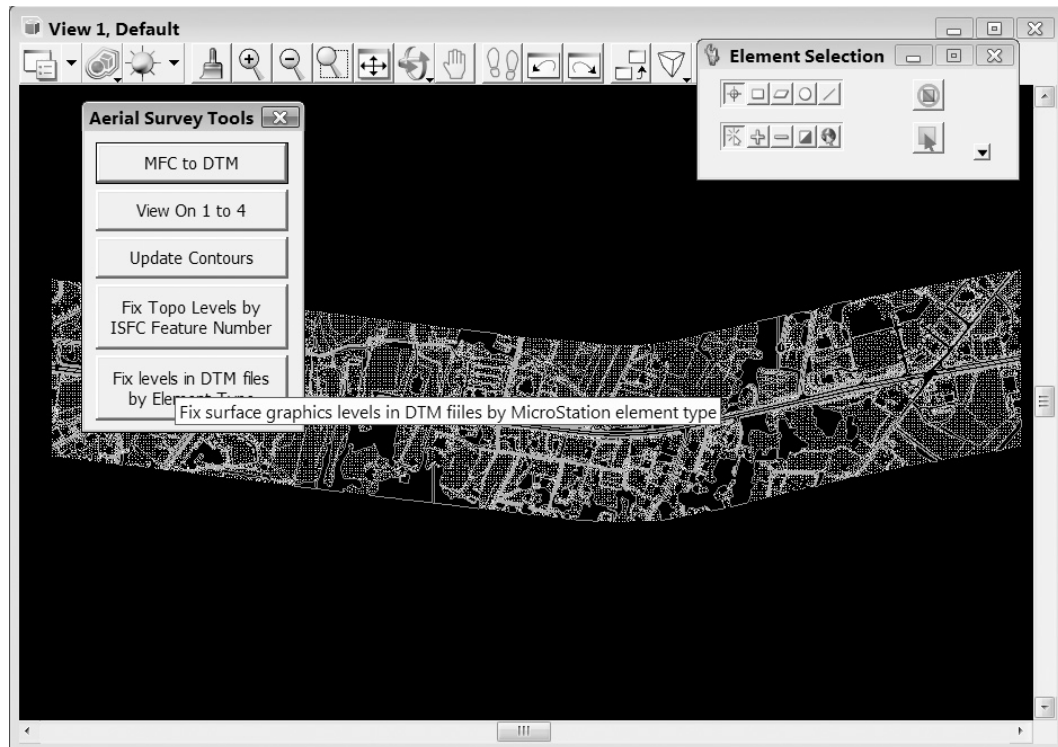
Keyin: vba run [AerialSurveySurfaceGraphicsLevelFix]Start.Main

Special Requirements:

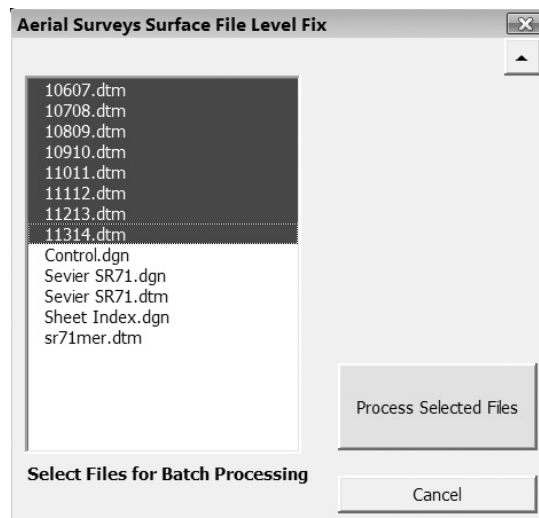
One or more Aerial Survey DTM graphics files.

Usage: Update Contours

Step 1. In the Aerial Survey Tools dialog click the **Fix levels in DTM files by Element Type** command button.



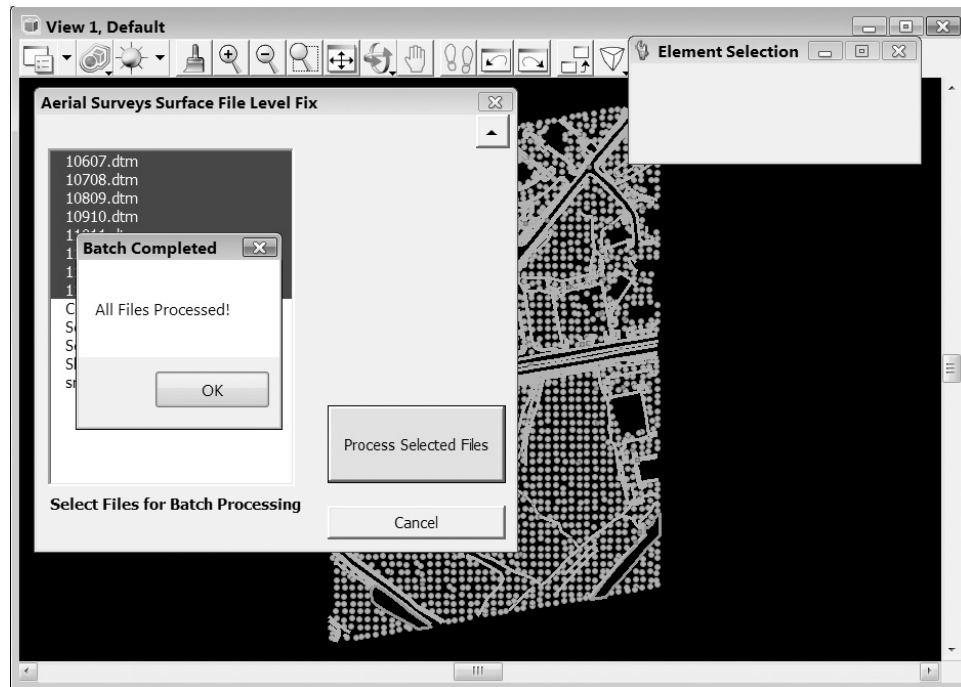
Step 2. The **Aerial Surveys Surface File Level Fix** dialog appears with a list of all MicroStation graphics files from the currently open folder. Select the DTM graphics files you wish to process and click the **Process Selected Files** command button.



Step 3. The program opens each file and scans for points, lines, line strings and complex strings.

All points are moved to the level SURVEY - AERIAL SURVEY - Collected Point (level # 325). All lines, line strings and complex strings are moved to level SURVEY - DTM – Breaklines (level # 29)

When finished, a message box appears indicating **All Files Processed**. Click **OK** to dismiss the message.



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 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 TDOT Design Division tool strip or the drop down menu at **TDOT > Tools > Rotate Element To Horizontal**

or by using the keyin

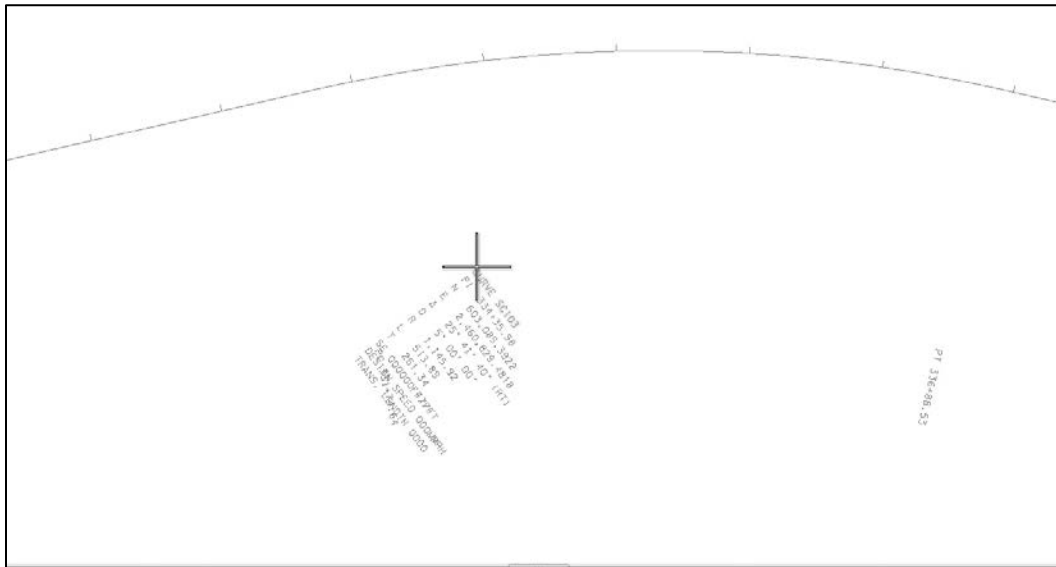
vba run [RotateElementHorizontal]RotateElementHoriz.Main

Special Requirements:

None.

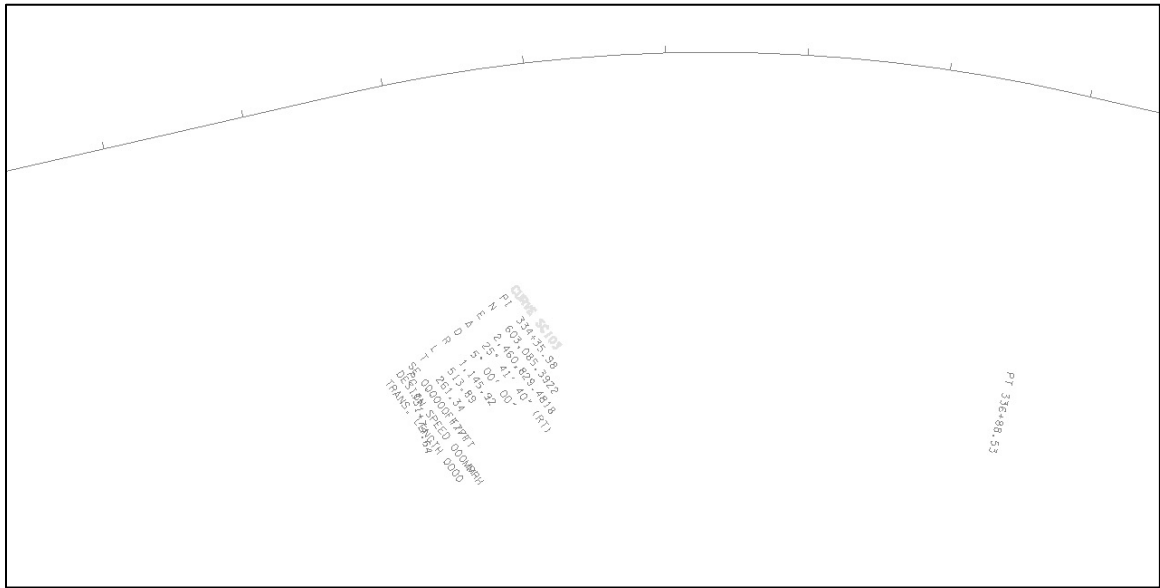
Usage:

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

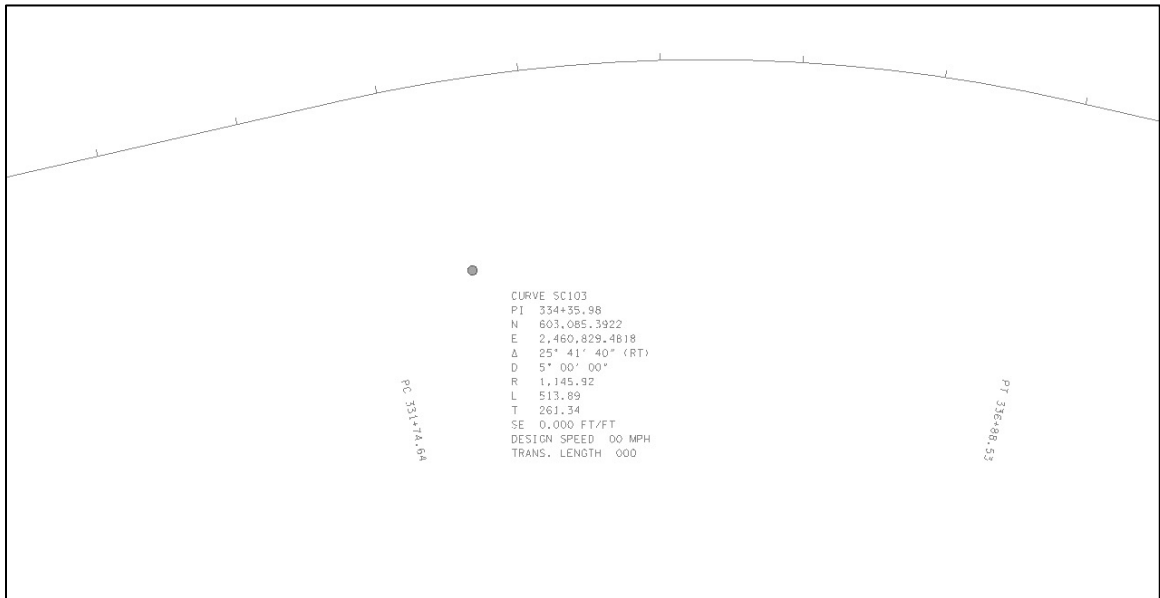


In this example we will use the tool to rotate a set of curve data to be horizontal on the plan sheet. To rotate all of the text at once the graphic group lock is turned on. This lock setting can be changed while using the command.

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 TDOT Design Division tool strip or the drop down menu at **TDOT > Tools > Rotate Fence\SS Horizontal** or by using the keyin

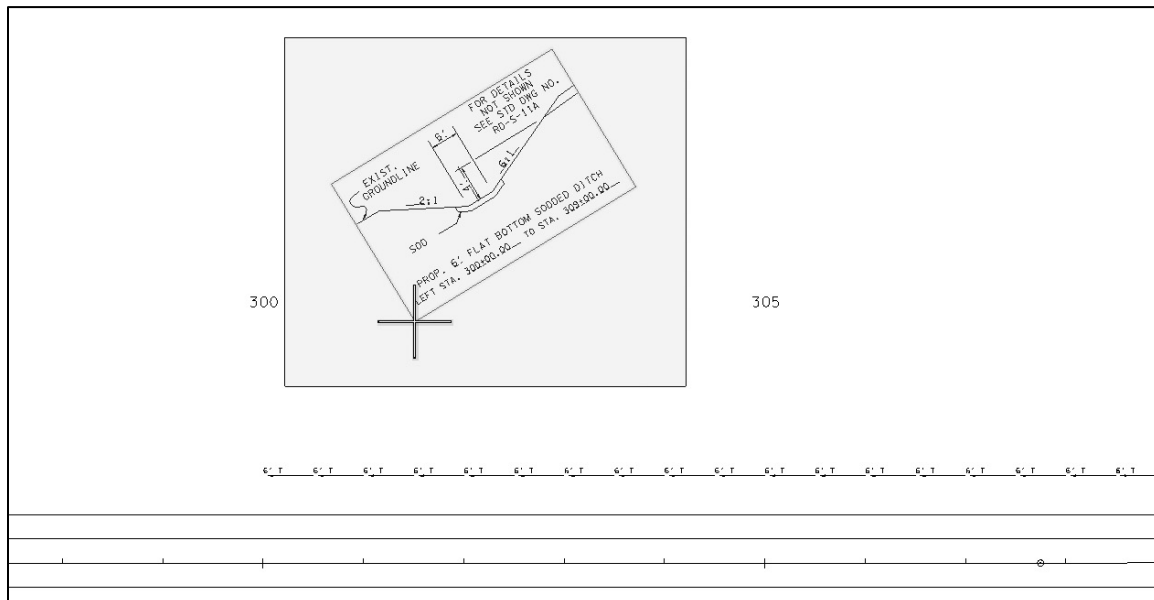
vba run [RotateFenceContentsHorizontal]RotateFenceContentsHoriz.Main

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.

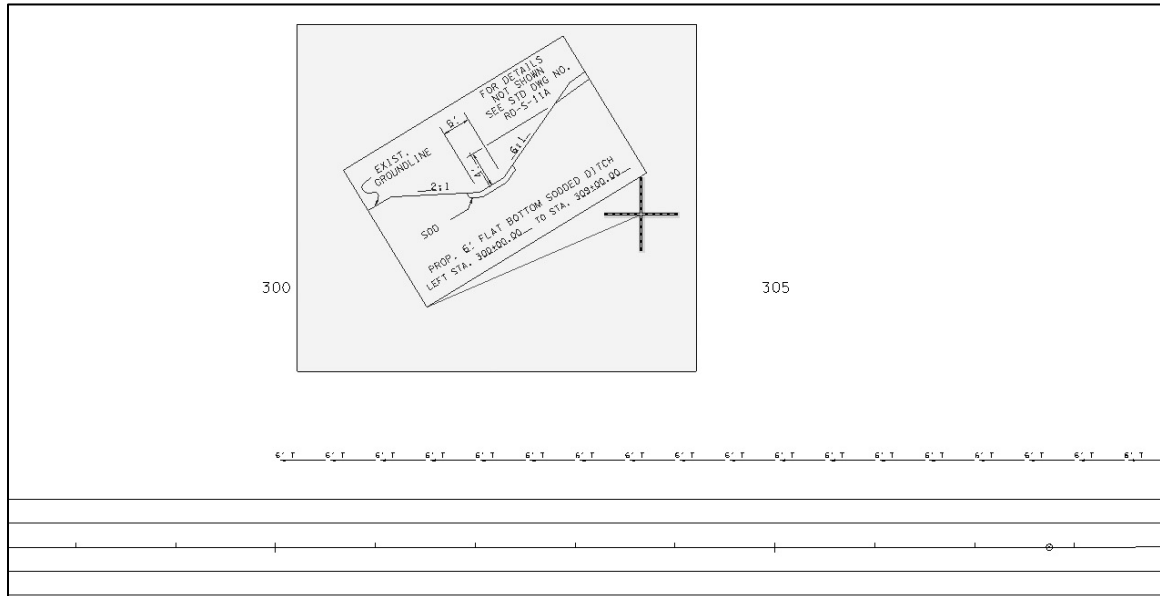
Usage:

- 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.

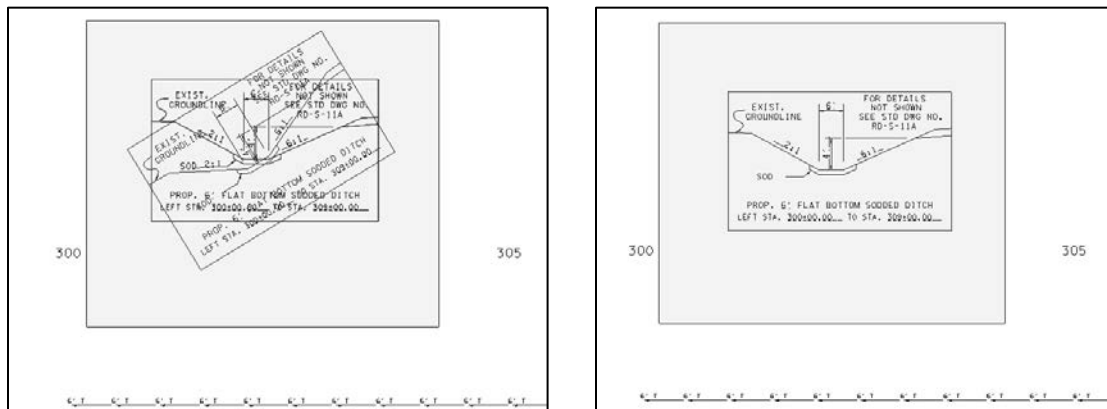


In this example we are rotating a special ditch detail originally set up on another sheet.

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.



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. The Find options Match Case, Whole Words and Change in Cells are enabled by default. 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

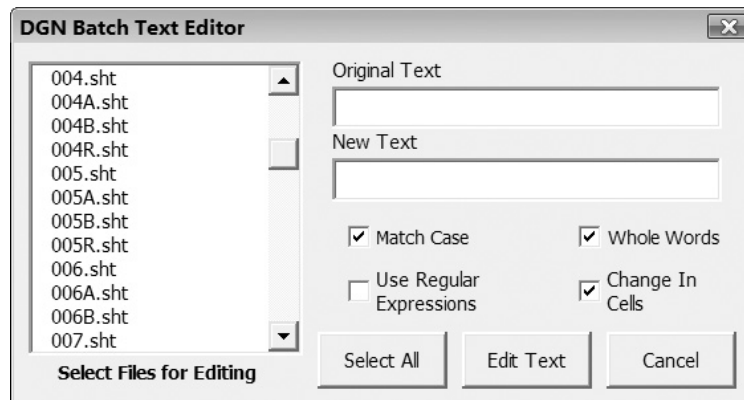
vba run [BatchTextEditor]EditTexttStart.main

Special Requirements:

None.

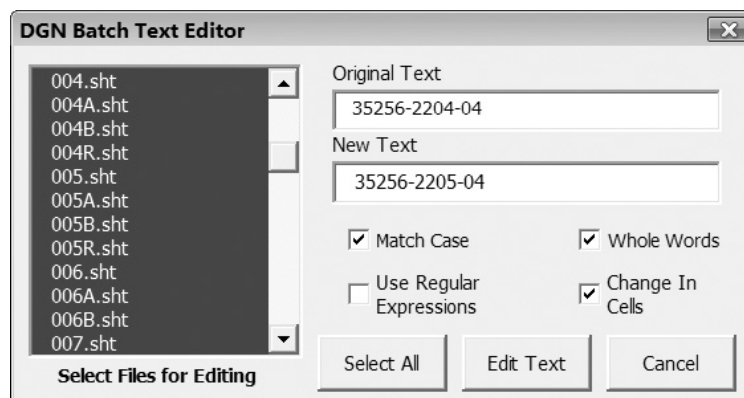
Usage:

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. Adjust the Find option controls as needed.

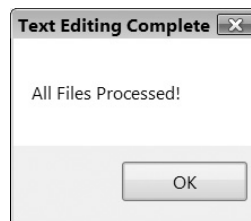


Step 4. Click on the **Edit Text** command button to start edits. Each file is opened and MicroStation's Find/Replace Text tool is used to make the changes.

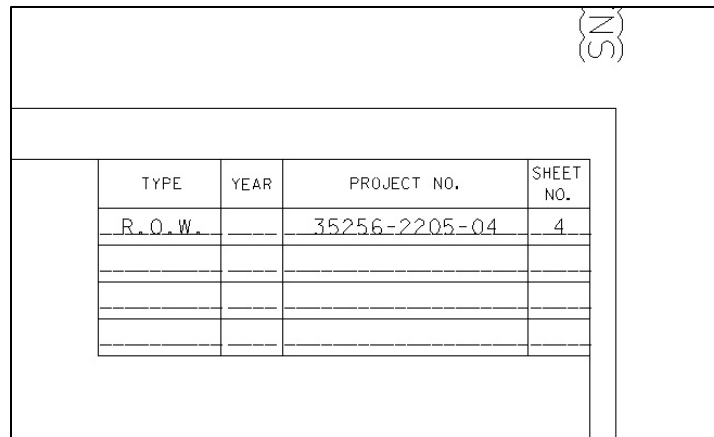
The Find/Replace tool generates a completion message for each file as they are processed. Hold the **Enter** key down on the keyboard to quickly jump through these.



Step 5. 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.



TYPE	YEAR	PROJECT NO.	SHEET NO.
R.O.W.		35256-2205-04	4

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

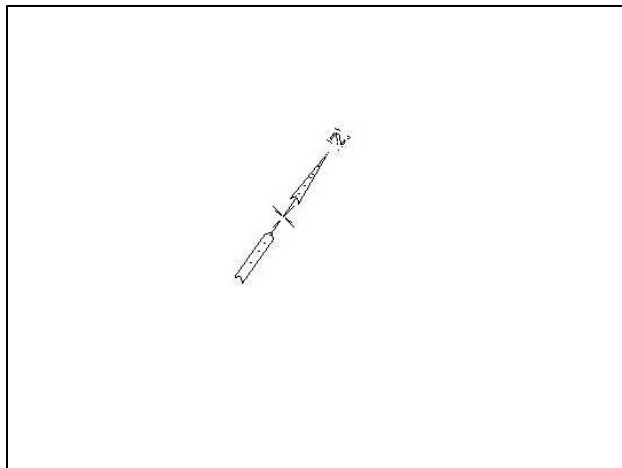
vba run [PlaceNorthArrow]NorthArrow.main

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.

Move Raster by Datum Adjustment Factor

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

MicroStation VBA Program: MoveRasterbyDatumAdjust.mvba

Description:

This application moves the active raster attachment(s) 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.

Command buttons are provided to Open Raster Manager and to Move Raster(s) Back to Original Position.

This macro can also be activated from the MicroStation drop down menu

TDOT > Raster – Move by Datum Adjust

or by using the keyin

vba run [MoveRasterbyDatumAdjust]start.main.

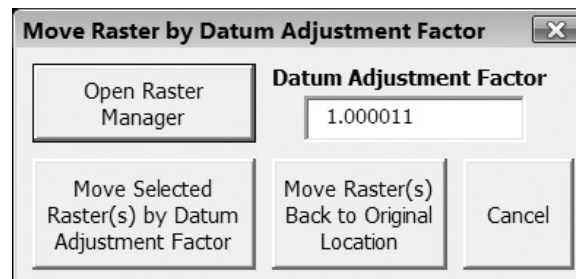
Special Requirements:

Raster Manager must be open with the raster image(s) to be moved highlighted in the dialog.

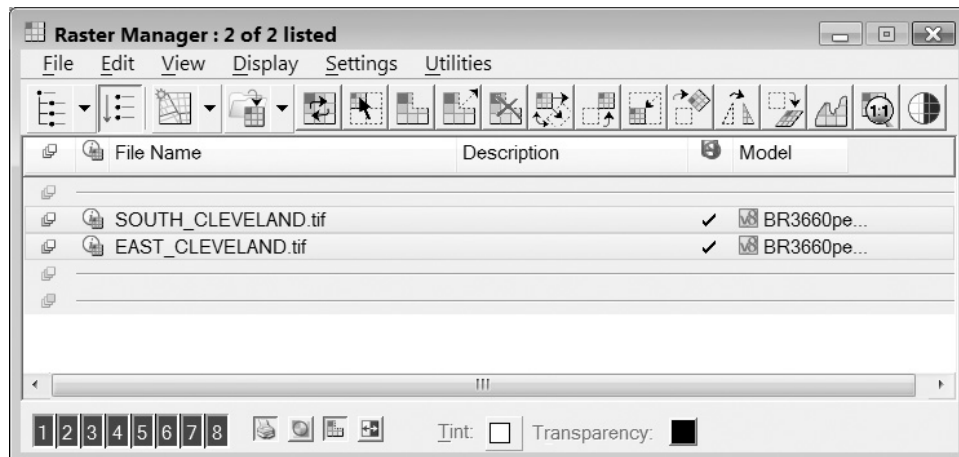
Usage:

Step 2. In D&C manager activate **Move Raster**. Key in the datum adjustment factor for the project area. If set previously, factor is automatically entered for you.

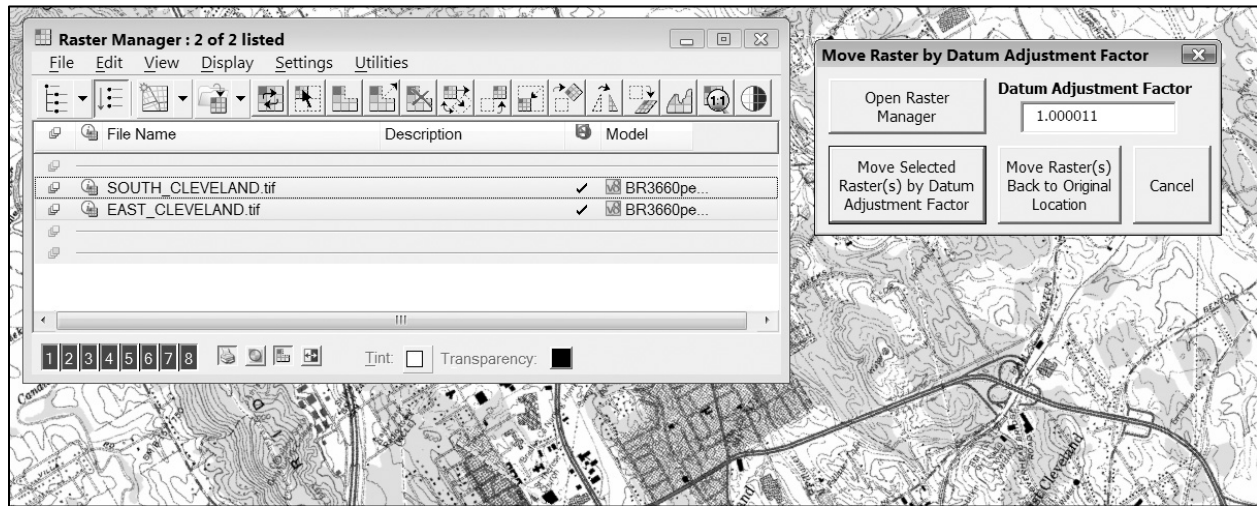
Once that is set click on **Open Raster Manager**.



Step 1. In Raster Manager, highlight the raster attachment(s) to be moved.



Step 3. Click on the **Move Selected Raster(s) by Datum Adjustment Factor** command button.
The raster attachment(s) are automatically moved to overlay the project data correctly.



The **Move Raster(s) Back to Original Position** command button is provided to undo moves in cases where the factor may have been entered incorrectly.

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:

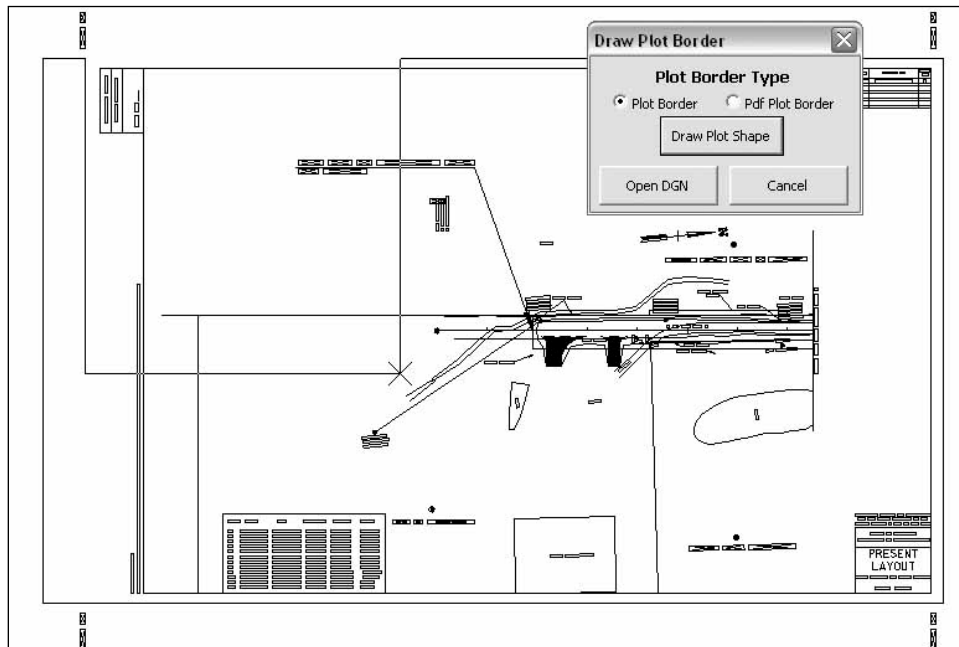
Step 1. In D&C manager activate **Plot Border**. The **Draw Plot Border** dialog appears.



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

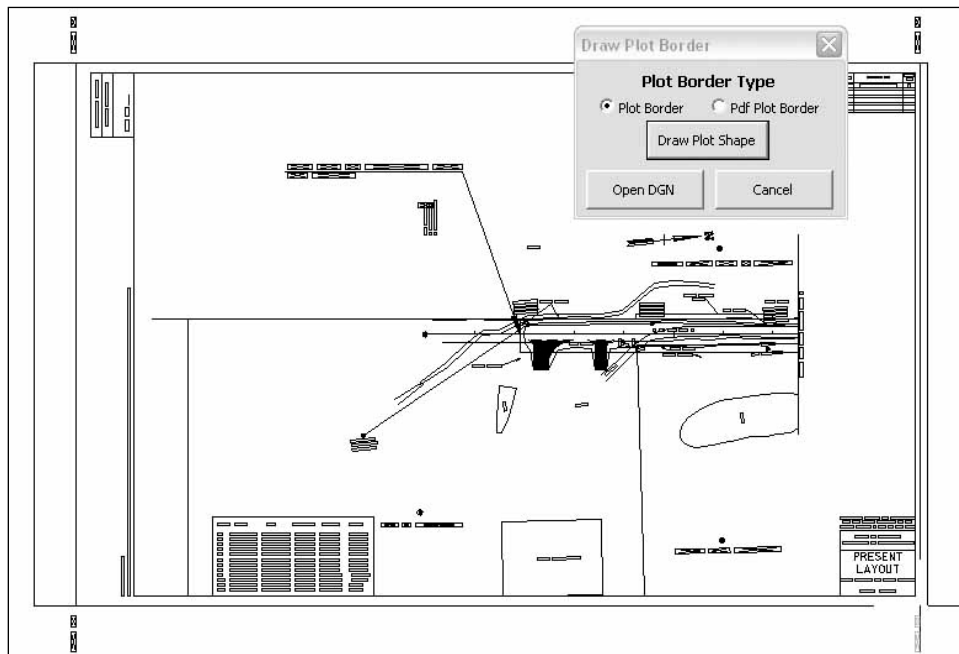
Step 3. Click on the **Draw Plot Shape** command button to start placement. The user is prompted to **Identify 1st Corner**

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.

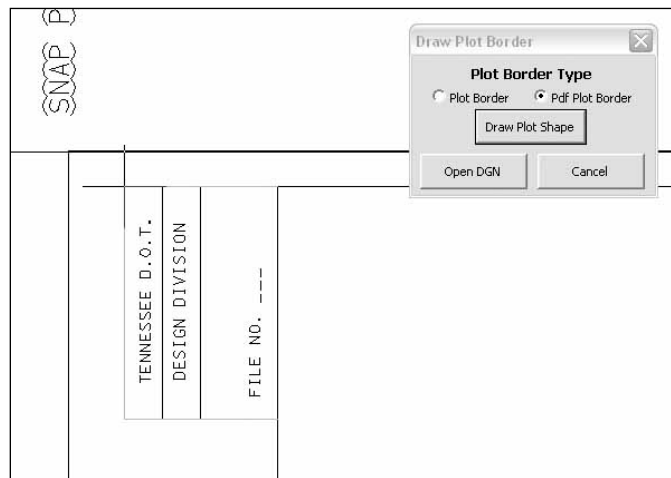


The plot shapes go on level **DESIGN - SHEET - Plot Shape** so that level must be on to see them after placement. This level **does not** need to be turned on to be recognized for batch plotting.

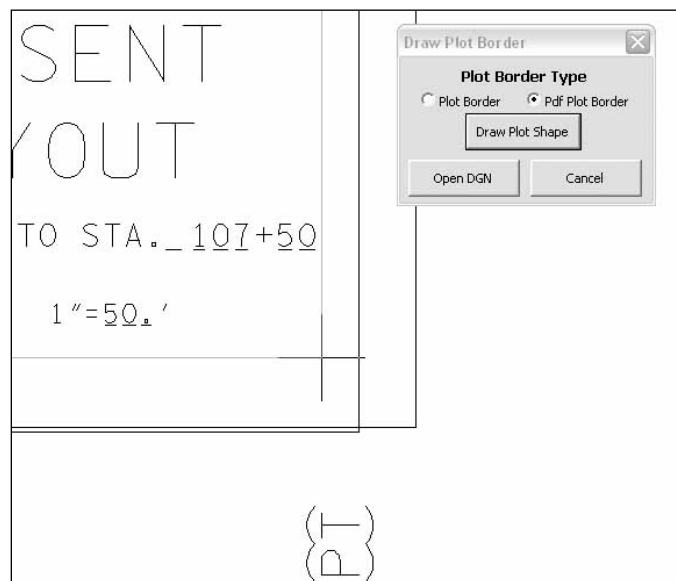
Step 5. Click the **Open DGN** command button to jump to the next sheet file.

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 old 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.

Generate 2D DGN from 3D Model's Top View

D&C location: Drafting Standards > Tools > 2Dfrom3Dtop

MicroStation VBA Program: Generate2Dfrom3DTop.mvba

Description:

This program generates a 2D design file of a 3D model from the top view maintaining all elements and their X & Y coordinate values.

All views except 1 are turned off and view 1 is updated to turn all levels on, fitted to include the full display depth and set at top view to maintain coordinate values.

Traps are provided to check for attempts to use this tool in a 2D DGN file and to check for the existence of the file to be created with an option to overwrite.

After 2D DGN file creation, you are offered an option to open the file.

This program can also be activated from the MicroStation drop down menu

TDOT > Tools > Generate 2D DGN from 3D Top View

or by using the keyin

vba run [Generate2Dfrom3DTop]start.main

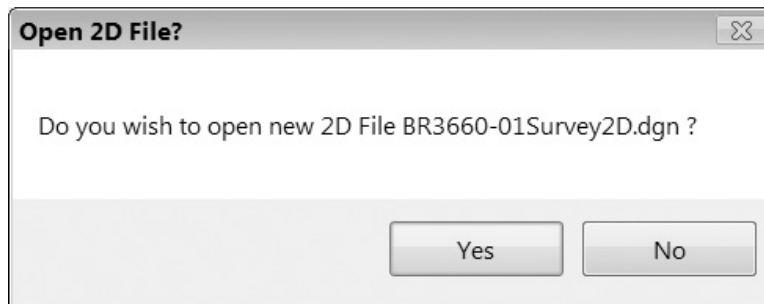
Special Requirements:

User must be in a MicroStation 3D model.

Usage:

Step 1. In D&C manager activate **2Dfrom3Dtop**. The new 2D DGN file is created using the original filename with the letters “2D” added to the end.

The user is prompted with the option to open the new file.



Set Iplot Default Settings

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

MicroStation VBA Program: IplotSet.mvba

Description:

This program copies the Iplot settings file chosen to iplot.set so that those settings will be used by default when Iplot is opened in MicroStation.

A file list dialog box is opened with a list of the Iplot settings files from the default settings folder. When the desired file is selected, the program deletes the existing iplot.set file, copies the new file to iplot.set and then displays a success message on the dialog to indicate the settings file that was activated.

The settings file list dialog remains active so that other settings can be chosen later if desired.

This program can also be activated from the MicroStation drop down menu

TDOT > Iplot – Default Settings

or by using the keyin

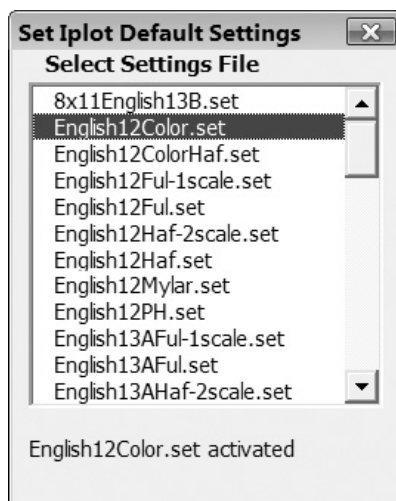
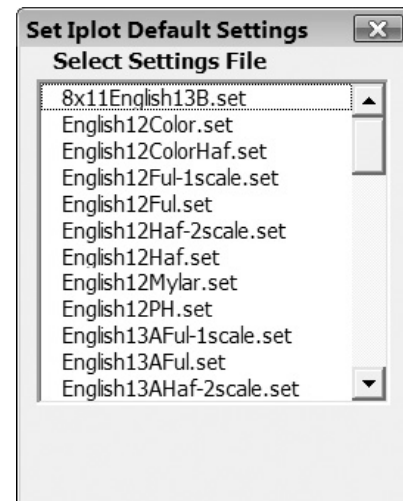
vba run [IplotSet]start.main

Special Requirements:

InterPlot software must be present. Standard settings files for use with Iplot must be available in standard settings file folder.

Usage:

Step 1. In D&C manager activate **Set Iplot**. The **Set Iplot Default Settings** dialog appears.



Step 2. Click on the desired default settings file and the dialog indicates that it has been activated.

Iplot can now be opened and used.

Prior to dismissing the dialog, reset normal default settings that are desired.

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 be 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

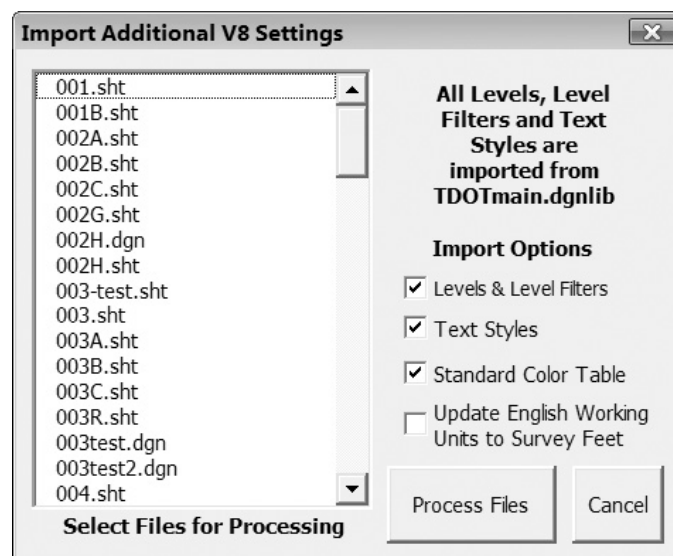
vba run [V8_Import]V8_ImportStart.main

Special Requirements:

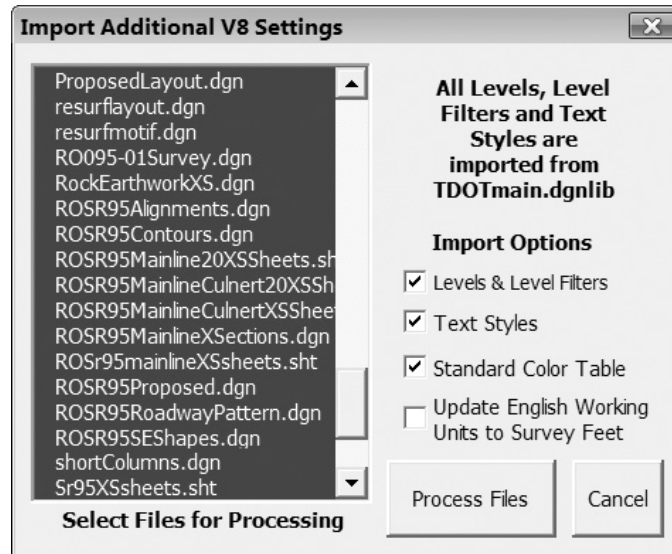
MicroStation DGN file opened from the folder in which files which need to be updated reside.

Usage:

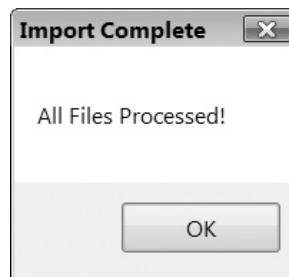
- Step 1.** Open a DGN file from the folder where files are to be processed. This can be one of the files to which you wish to import additional V8 settings.
- Step 2.** In D&C manager activate **V8 Import**. When the command is first started the **Import Additional V8 Settings** dialog is displayed.



- Step 3.** Under **Import Options**, choose which of the V8 additional settings are desired for import. By default levels, level filters, text styles and color table 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.

Fix Pre-V8i Dot Patterns

D&C location: Drafting Standards > Tools > Fix Dots

MicroStation VBA Program: PreV8iDotPatternFix.mvba

Description:

This program scans all graphics in the active file and then reads for any dot pattern elements and duplicates the circle for the filled dot without fill so that they will plot correctly and create printable patterns in PDF documents as well.

This replicates the way MicroStation V8i patterns with filled shapes where it duplicates the shape without fill so that the weight of the shape is honored when printing.

This macro can also be activated from the MicroStation drop down menu

TDOT > Area Patterns> Fix Pre-V8i Dot Patterns

or by using the keyin

vba run [PreV8iDotPatternFix]FixDots.main

Special Requirements:

MicroStation DGN file with dot area patterns created prior to implementation of MicroStation V8i software.

Usage:

- Step 1.** Open a DGN file that includes dot patterns created with older versions of MicroStation.
- Step 2.** In D&C manager activate **Fix Dots**. The program immediately starts processing and displays the status message **Fixing Dot Pattern Graphics**. When finished, it displays the message **Processing Complete**.

Text Styles Plus

D&C location: Drafting Standards > Tools > Labeling> 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 Roadway Design Division vba program which is used to set any standard text size based on scale (command button: Set Alternate STD Text Size).

A command button is also 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

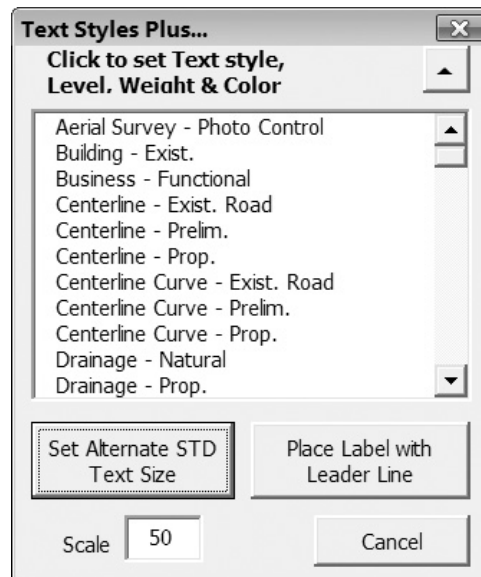
vba run [TextstylesPlus]Textstyles.Main

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.

Set Text Parameters by Active Scale

D&C location: Drafting Standards > Tools > Labeling> 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 program, **Text Styles Plus**, which will set the appropriate level and color for the text.

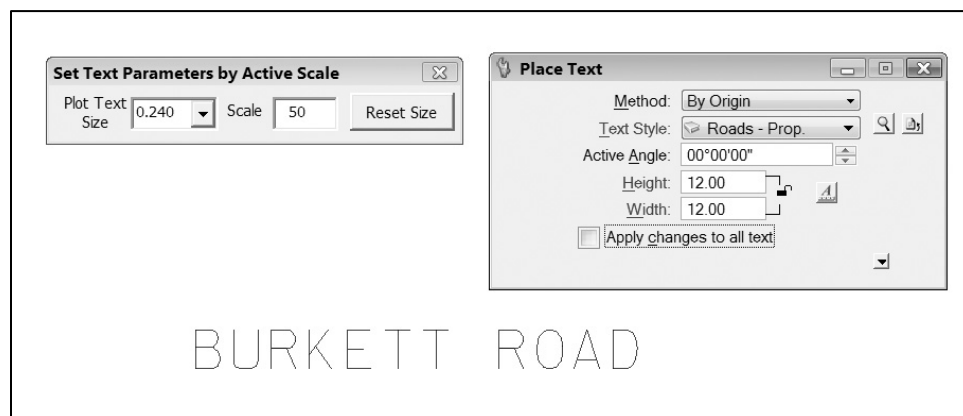
Usage:

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.

Place Label with Leader Line

D&C location: Drafting Standards > Tools > Labeling> 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

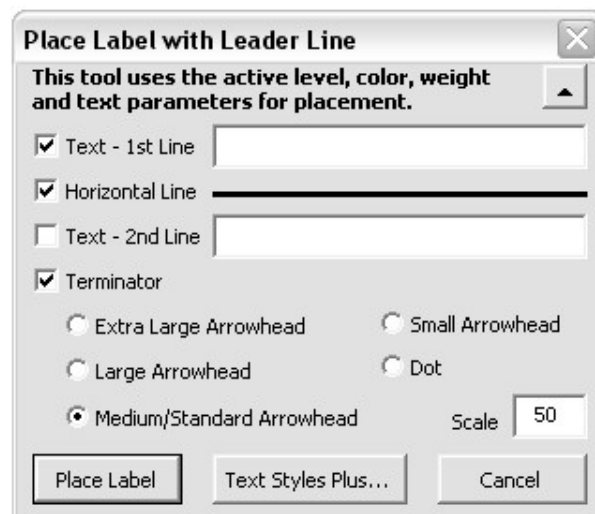
vba run [PlaceLabel]TDOTLabel.Main

Special Requirements:

None.

Usage:

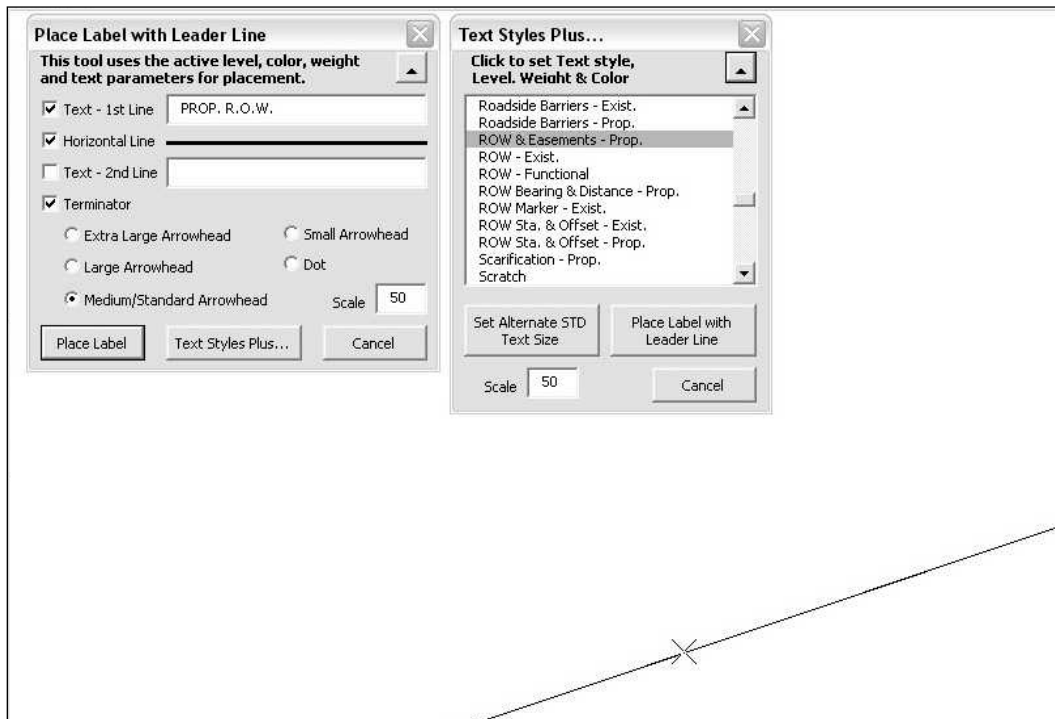
Step 1. In D&C manager activate **LabelwithLeader**. The **Place Label with Leader Line** dialog appears.



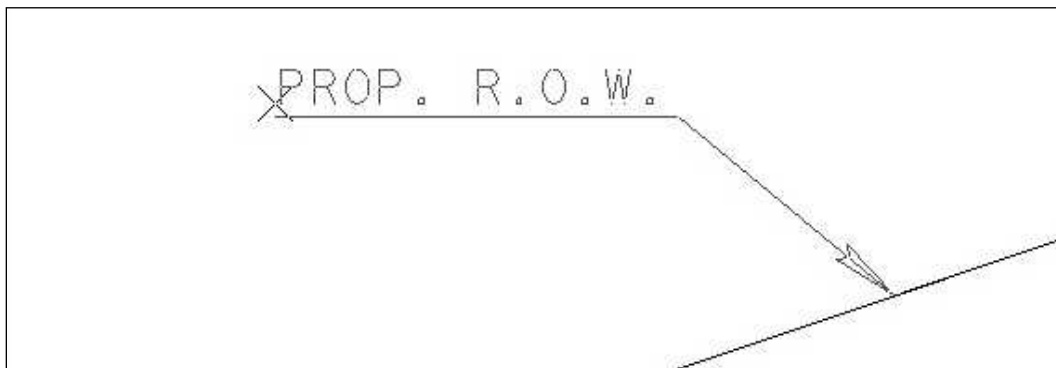
Step 2. In the Place Label with Leader Line dialog click on the desired options and keyin text for the label in the keyin fields provided. If a terminator is requested click on the desired type. Check and reset the scale as needed. Since this program uses the current active settings you may wish to start 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 > Labeling> 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. This data along with the current location of the dialog is stored in the file

C:\Temp\MVBA_FormStorage.log when the dialog is closed.

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.

Label Station / Offset

This tool uses the active level, color, weight and text parameters for placement.

Job: 101 Chain: SR95 ID

☐ Title Text (Optional)

9+99(9).12 Station: Lock

☒ Divider Line

99.12 Offset: Lock

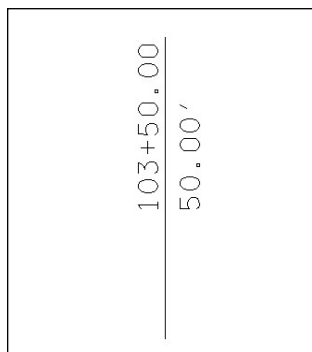
☒ Place Leader Line Terminator Type: None

Dynamic Scale 50 ☐ Perpendicular to Chain ☒ Horizontal

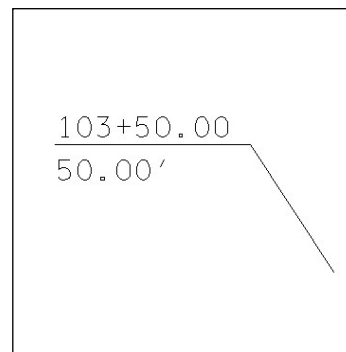
Place Label Text Styles Plus... Cancel

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

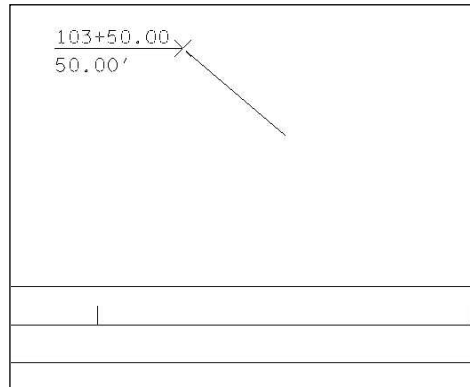


Horizontal with View

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

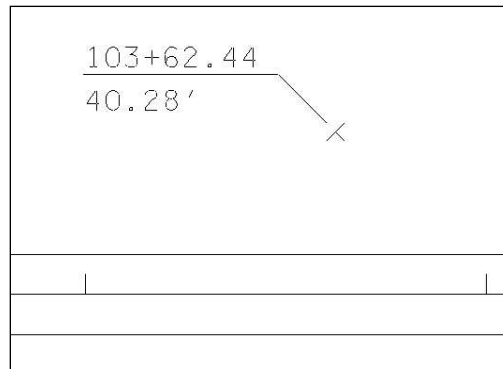
end of the line will be at the station and offset entered, and the label moves dynamically with the cursor. Data point to place the label in the desired location or reset to stop placement.



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 > Labeling> 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:

Geopak project GPK file must be present in folder with currently open MicroStation DGN file.

A Geopak profile cell must be present.

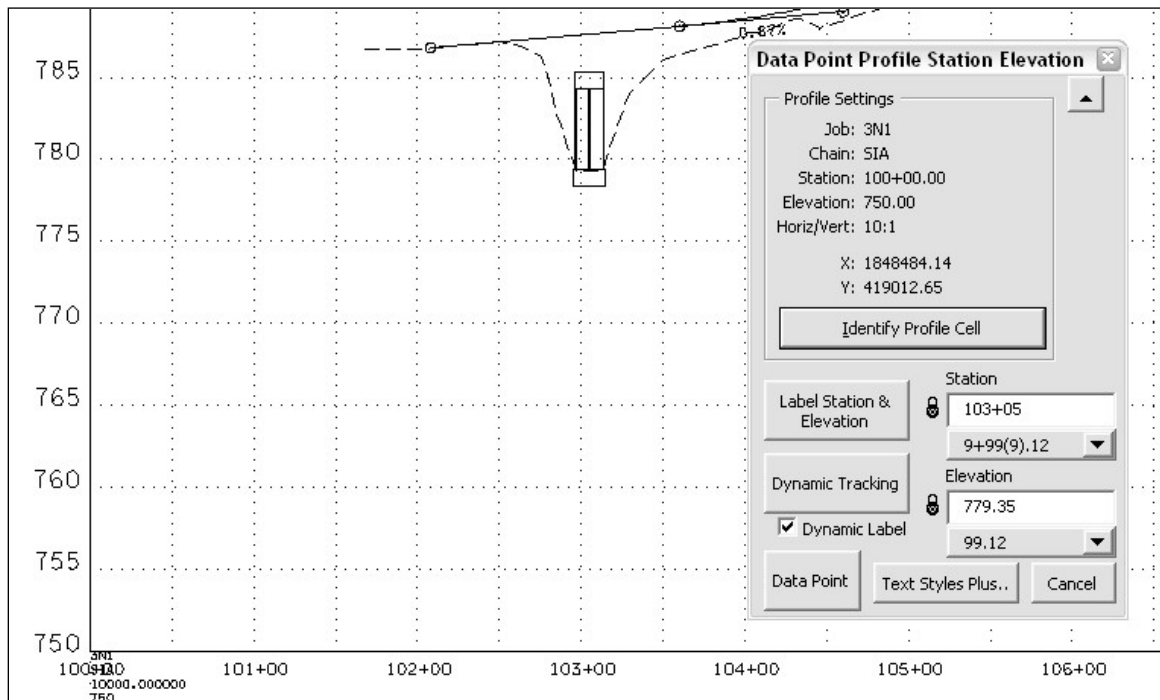
Usage: Send Profile Data Point

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

The screenshot shows the 'Data Point Profile Station Elevation' dialog box. It features a 'Profile Settings' section with input fields for Job, Chain, Station, Elevation, Horiz/Vert, X, and Y. An 'Identify Profile Cell' button is located below these fields. The main area contains a 'Label Station & Elevation' button and a 'Dynamic Tracking' section with a checked 'Dynamic Label' checkbox. Two dropdown menus are present: 'Station' with the value '9+99(9).12' and 'Elevation' with the value '99.12'. At the bottom, there are three buttons: 'Data Point', 'Text Styles Plus..', and 'Cancel'.

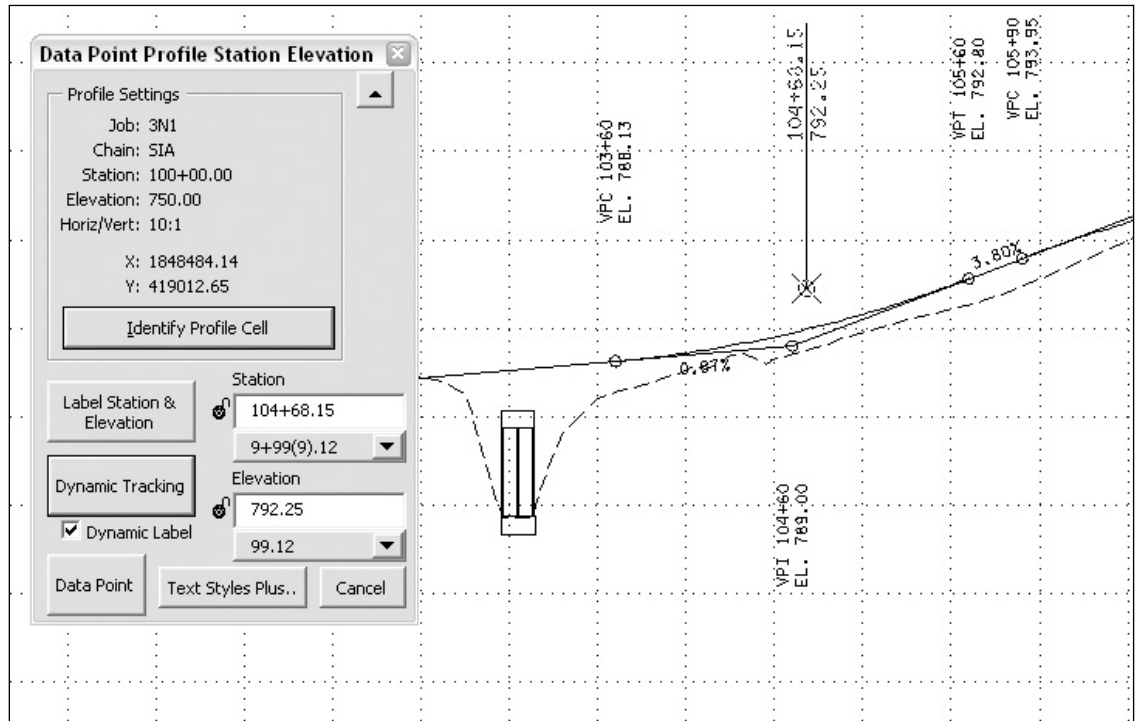
- Step 2.** Click on the **Identify Profile Cell** command button and data point on the Geopak profile cell for the profile. The window shade button on the upper right of the dialog can be used to get the dialog out of the way as you identify the profile cell. Just click it again to re-expand the dialog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

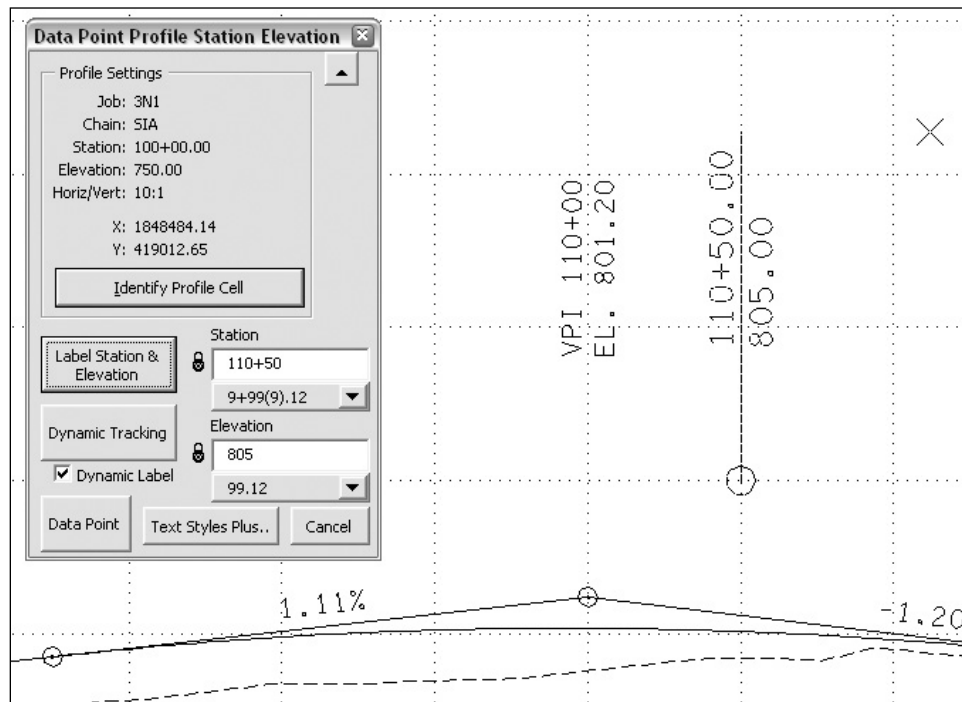
The lock symbols can be clicked at any time to lock or un-lock the station or elevation values. If the station is locked, but elevation is not, the temporary label will then only move up & down on the profile at that station. If the elevation is locked, and the station is not, the temporary label will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

Calculate & Label Slope

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

MicroStation VBA Program: SlopeCalculator.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

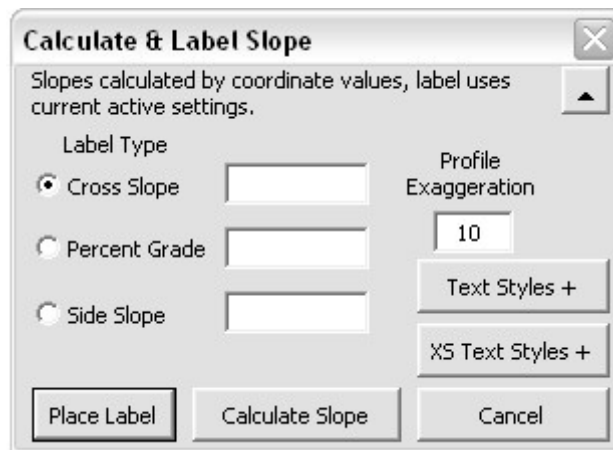
vba run [SlopeCalculator]SlopeToolStart.main

Special Requirements:

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

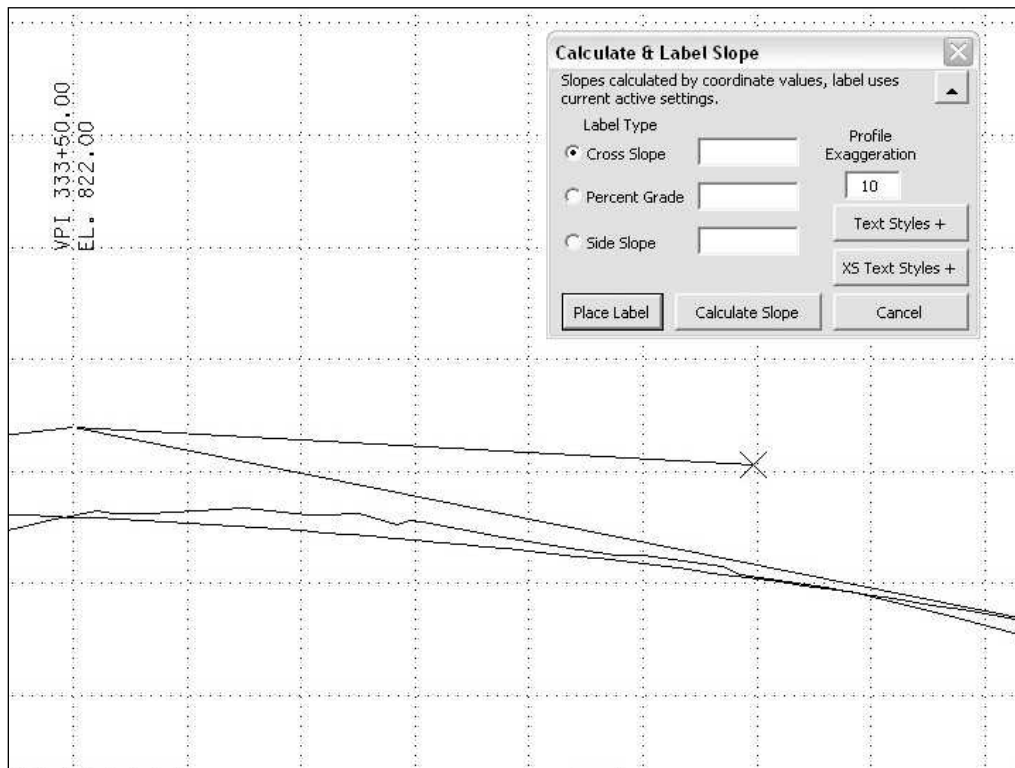
Usage:

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

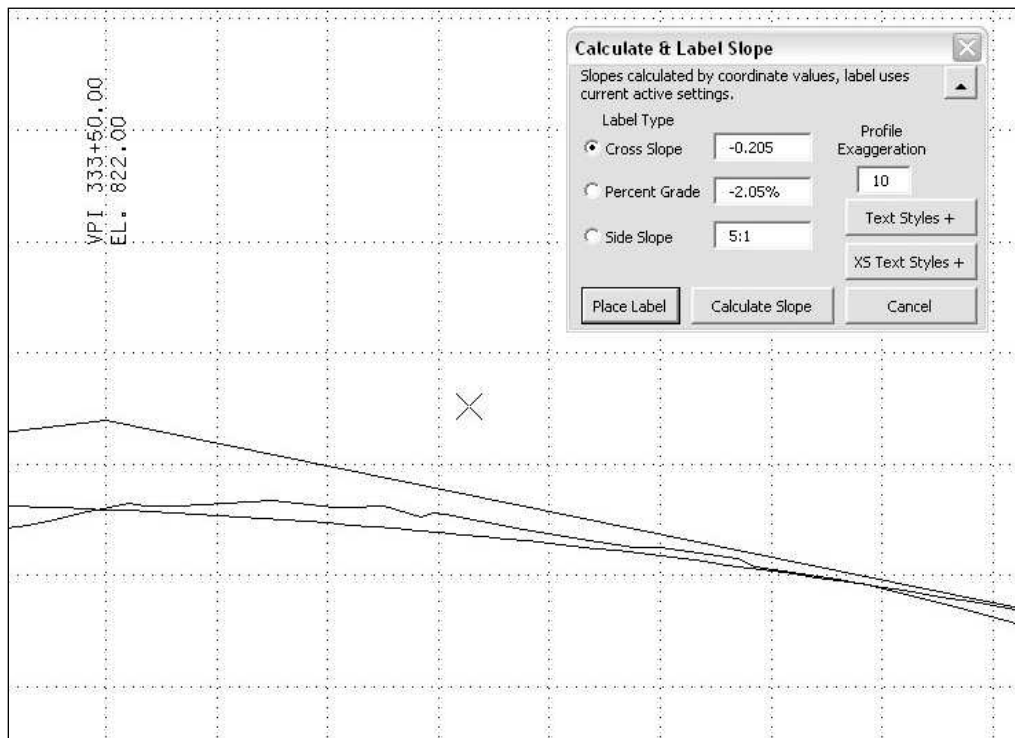


Step 2. As soon as the dialog opens the slope calculator starts and the user is prompted to **Identify Begin Point**. Data point or snap and data point on the end of an element as needed to mark the beginning of the slope you wish to calculate. If you are calculating on a profile, make sure the **Profile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

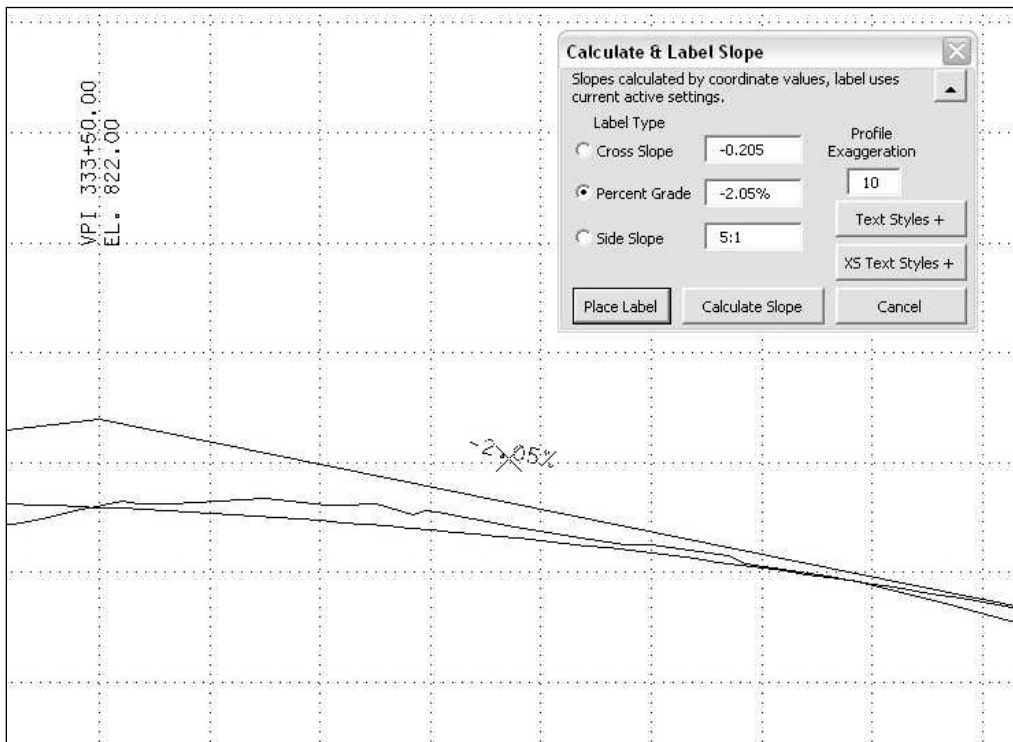
Step 3. After giving the beginning point the user is then prompted to **Identify End Point**. A temporary line is shown dynamically to indicate the slope that is being measured.



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.

Measure Area & Annotate

D&C location: Drafting Standards > Tools > Labeling> 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

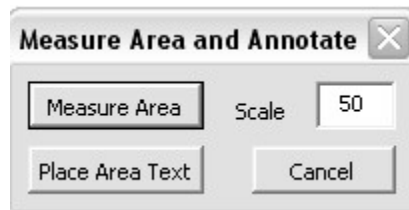
vba run [MeasureAreaandAnnotate]AnnotateArea.main

Special Requirements:

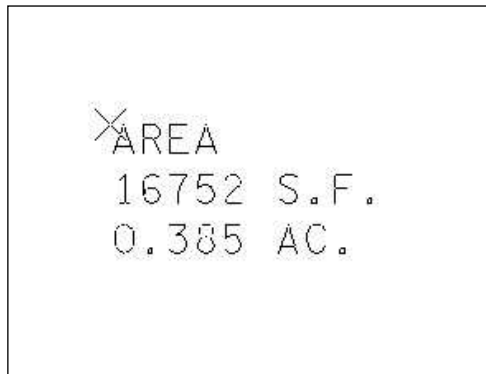
None.

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.

Place Arrowhead

D&C location: Drafting Standards > Tools > Labeling> 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

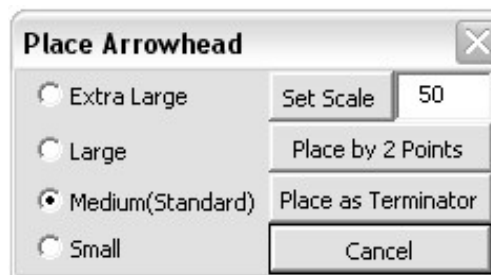
vba run [PlaceArrowHead]Arrowhead.main

Special Requirements:

None.

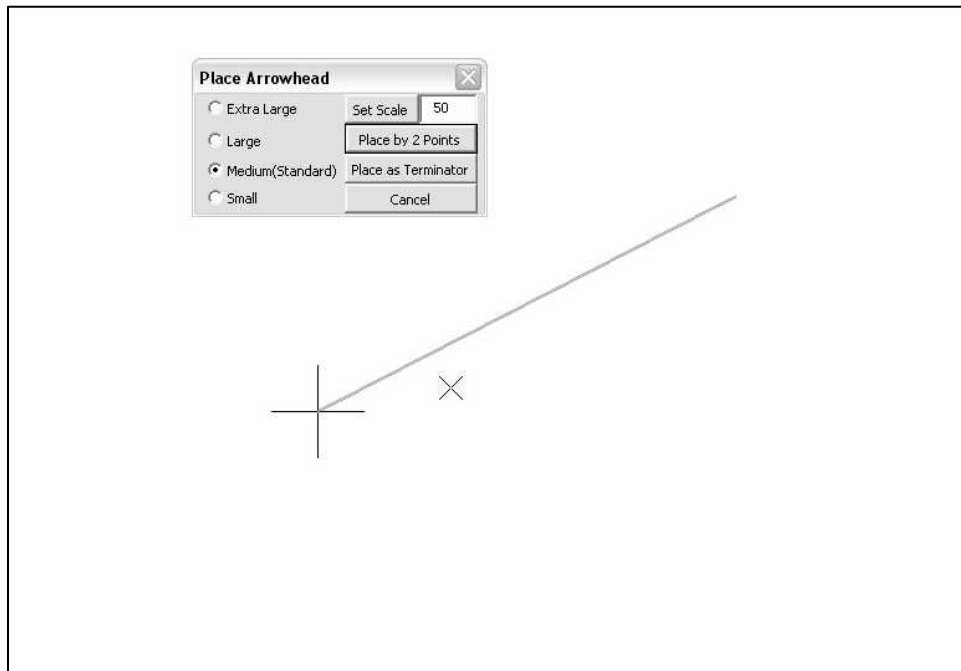
Usage:

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

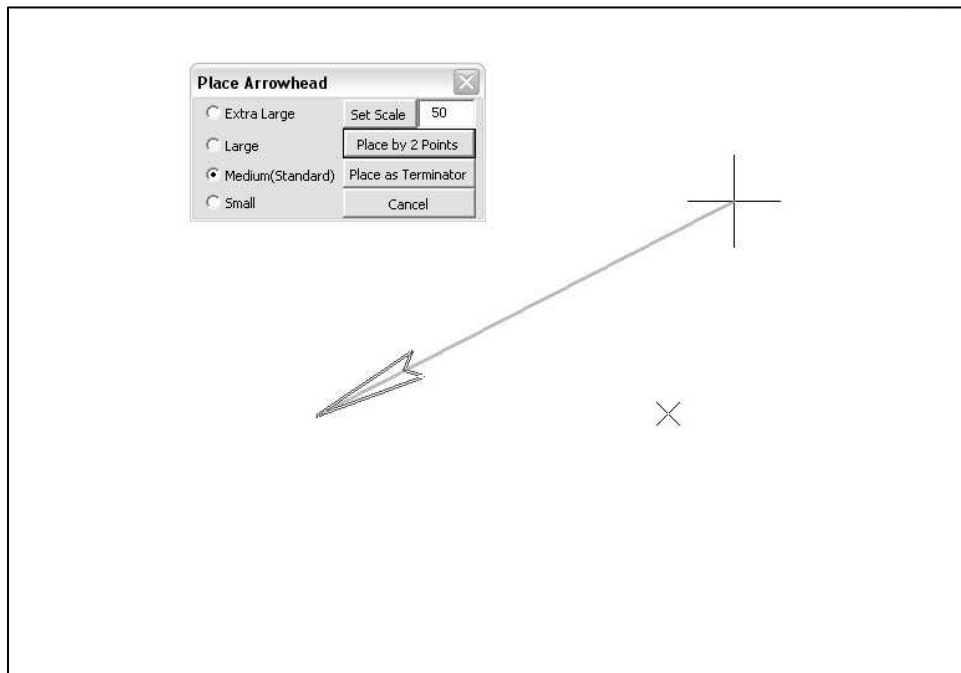


Step 2. Choose the type of arrowhead and check the scale. Then click on the **Place by 2 Points** command button to start placement of the arrowhead.

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.

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 Roadway 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 Roadway 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 Roadway 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 Roadway 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 Roadway 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 Roadway 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: SlopeCalclater.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 [SlopeCalclater]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

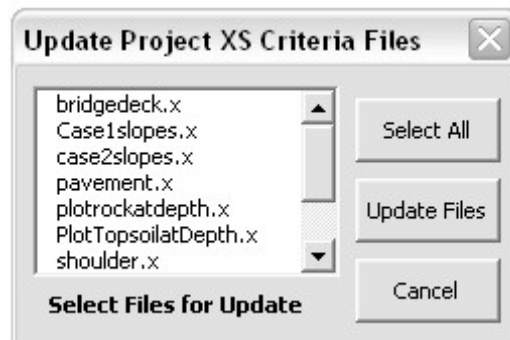
vba run [UpdateProjectCriteriaFiles]UpdatetStart.main.

Special Requirements:

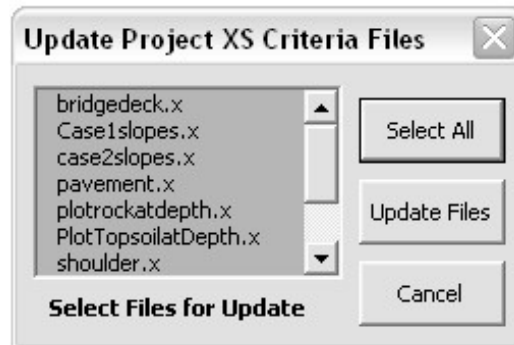
MicroStation DGN file opened from the folder in which criteria files which need to be updated reside.

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

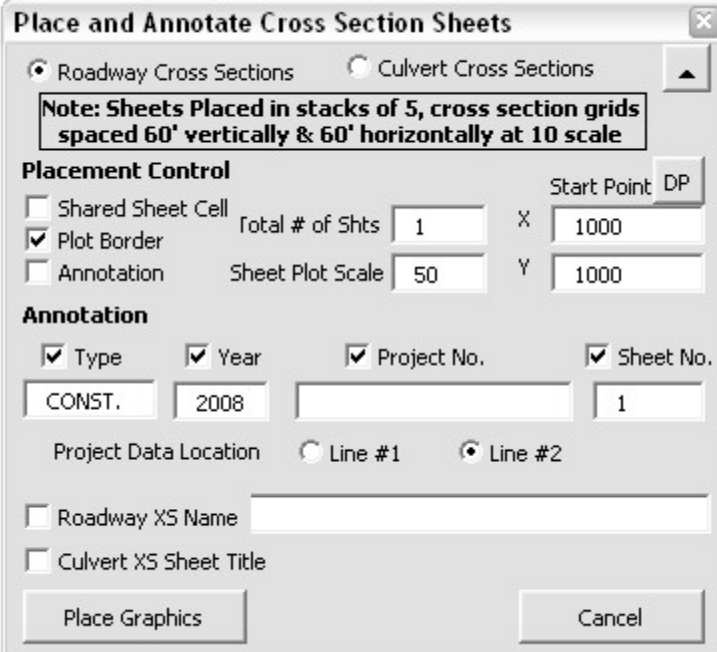
vba run [PlaceandAnnotateXSsheets]XSsheets.main

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.

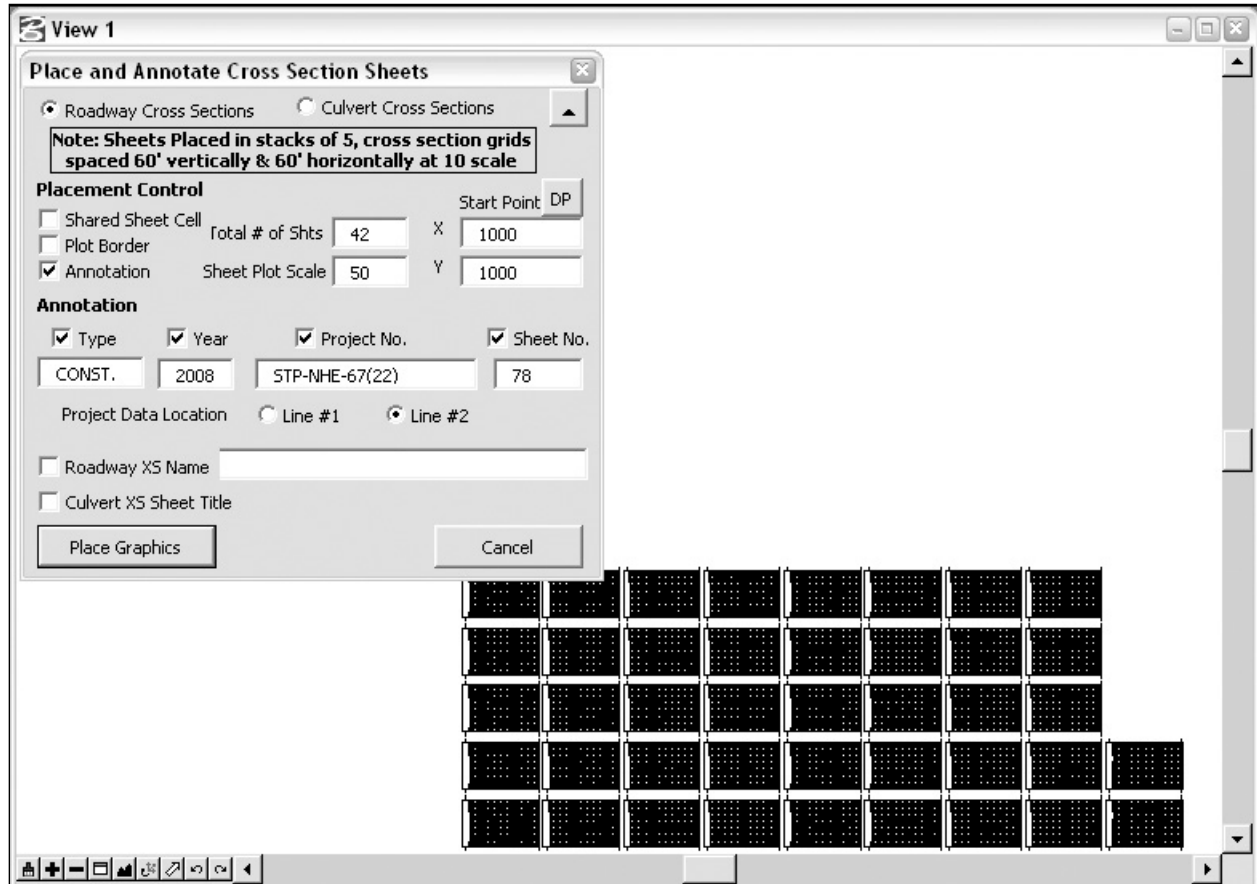
Usage:

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



The dialog box is titled "Place and Annotate Cross Section Sheets". It has two radio buttons at the top: "Roadway Cross Sections" (selected) and "Culvert Cross Sections". Below them is a note box: "Note: Sheets Placed in stacks of 5, cross section grids spaced 60' vertically & 60' horizontally at 10 scale". The "Placement Control" section has three checkboxes: "Shared Sheet Cell" (unchecked), "Plot Border" (checked), and "Annotation" (unchecked). To the right of these are input fields for "Total # of Shts" (1), "Sheet Plot Scale" (50), and "Start Point" (DP). The "Annotation" section has four checkboxes: "Type" (checked), "Year" (checked), "Project No." (checked), and "Sheet No." (checked). Below these are input fields for "CONST.", "2008", a blank field for "Project No.", and "1" for "Sheet No.". There are two radio buttons for "Project Data Location": "Line #1" (unchecked) and "Line #2" (checked). At the bottom, there are two checkboxes: "Roadway XS Name" (unchecked) and "Culvert XS Sheet Title" (unchecked). Below these are two buttons: "Place Graphics" and "Cancel".

- 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: HApnts.mvba

Description:

This program places the required point text symbols for all key points 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 [HApnts]HApntsStart.main

Special Requirements:

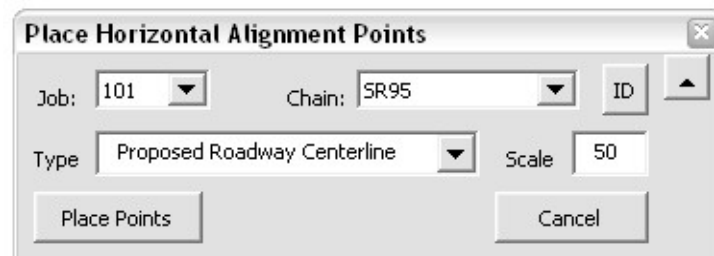
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

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.

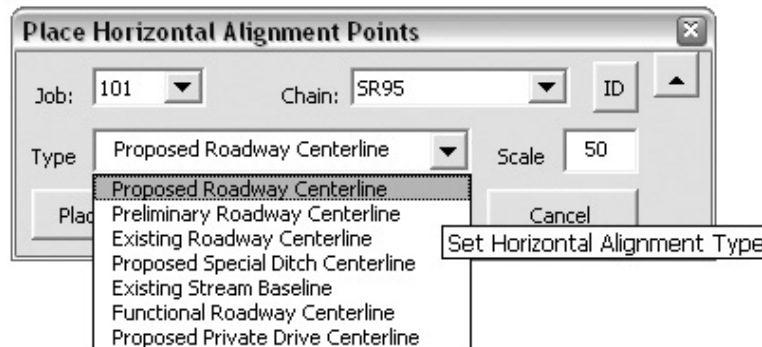
Usage:

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 Roadway Design Division centerline cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Centerlines > Cells

or by using the keyin

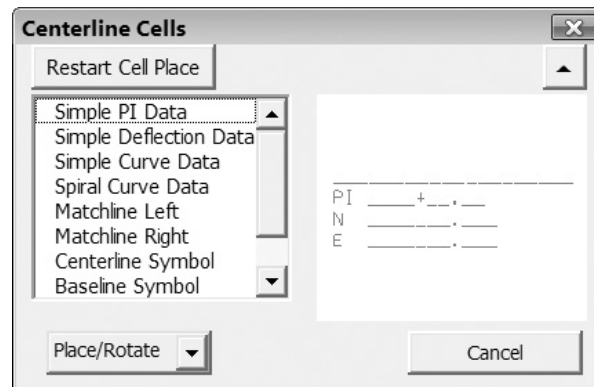
vba run [CenterlineCells]CLcells.main

Special Requirements:

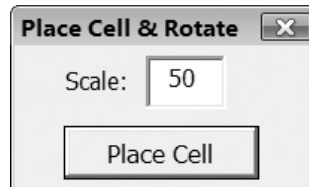
None.

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 the **Place Cell & Rotate** tool is activated.



Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

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 its location

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 > Centerlines > HA Intersection Labeler

or by using the keyin

vba run [HA_IntersectLabel]modMain.main

Special Requirements:

Geopak project GPK file must be present in folder with currently open MicroStation DGN file.

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.

Label Intersections

Job: 101 Mainline Chain: SR95

Scale: 50 Type: Proposed Centerline

Intersecting Chain: LTPGL

Mainline Chain Text: SR95 STA. 328+25.00 =

Intersecting Chain Text: LTPGL STA. 11+46.07

Terminator Type: None

Coordinate Decimals: 4

SR95 STA. 328+25.00 =
LTPGL STA. 11+46.07
N 602525.8869
E 2460585.1618

Label Cancel

Label Chain Ends Dialog >>

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

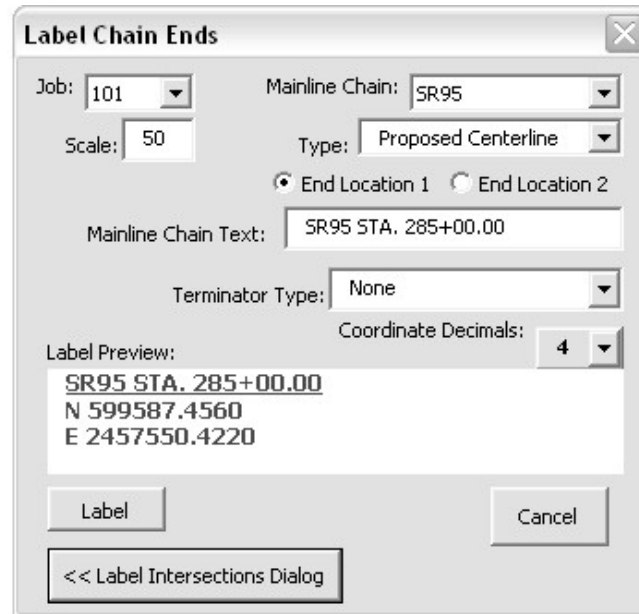
- Step 2.** Set the **Intersecting Chain** for the label. Chain names are used by default in the label text but these can be edited as desired in the Text fields provided. Click the **Label** command button and the user is prompted to **Data Point to Accept/Reset to Exit**. Data point to place the label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

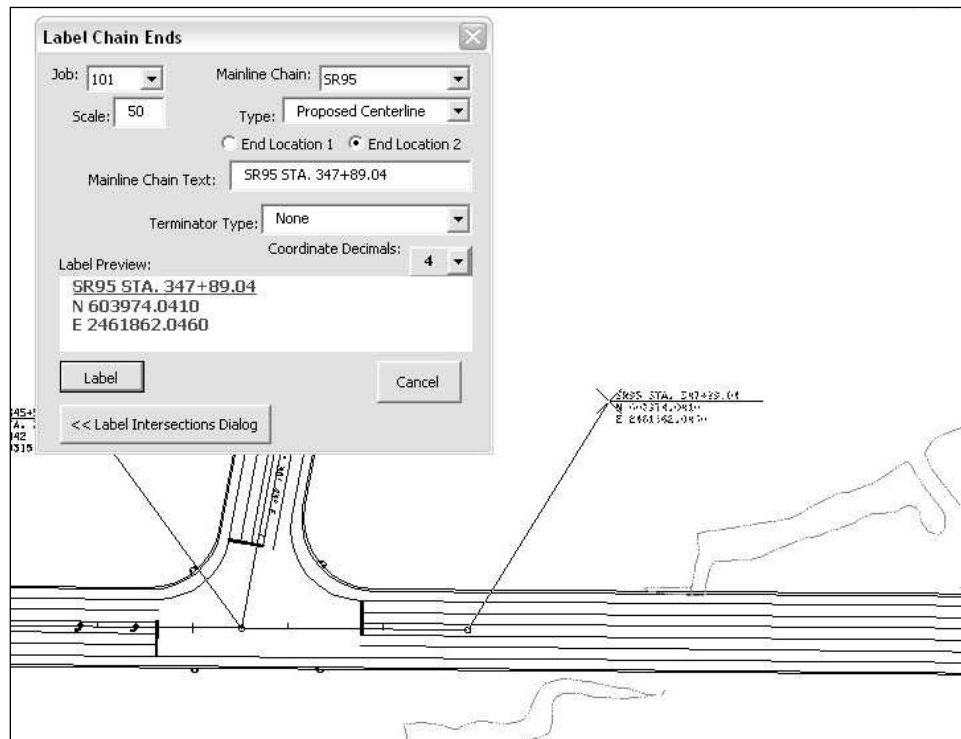
Step 1. At the bottom left of the **Label Intersections** dialog, click the **Chain Ends Dialog** command button and the dialog switches to **Label Chain Ends**.

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



The screenshot shows the 'Label Chain Ends' dialog box. It has a title bar with a close button. The fields are: Job: 101, Mainline Chain: SR95, Scale: 50, Type: Proposed Centerline. There are two radio buttons: 'End Location 1' (selected) and 'End Location 2'. The Mainline Chain Text field contains 'SR95 STA. 285+00.00'. The Terminator Type is set to 'None'. The Coordinate Decimals are set to 4. The Label Preview section shows: 'SR95 STA. 285+00.00', 'N 599587.4560', and 'E 2457550.4220'. At the bottom, there are 'Label' and 'Cancel' buttons, and a '<< Label Intersections Dialog' button.

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.

RD01 vertical curve design standards are read from the text file **VALabel_Speed_kvl.txt**.

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.

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:

Geopak project GPK file must be present in folder with currently open MicroStation DGN file.

A Geopak profile cell must be present.

K value text file, **VALabel_Speed_kvl.txt** must be present in TDOT Roadway Design Division's Geopak Standards folder at **C:\Users\Public\Geopak Standards**.

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.

The screenshot shows the 'Label Vertical Alignment' dialog box. It has a title bar with a close button. The dialog is divided into sections. The 'Profile Settings' section at the top contains fields for Job, Chain, Station, Elevation, Scale, X, and Y, followed by an 'Identify Profile Cell' button. Below this is the 'Type' dropdown menu set to 'Roadway' and an empty 'Profile' dropdown. The 'Label Scale' is set to 50. To the right of the scale is a 'Label Intersections' button. A list of checkboxes follows: VPI Labels (checked), VPC/VPT Labels (checked), Grade Labels (checked), V.C. Length Labels (checked), K Value (checked), Label Crest High Points (unchecked), Label Sag Low Points (unchecked), and Label Speed (checked). At the bottom, there is a 'Maximum Speed' field with a unit 'mph' and a 'Label (Optional):' field. A large 'PLACE LABELS' button is at the very bottom.

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.

Label Vertical Alignment

Profile Settings

Job: 101
Chain: SR95
Station: 285+00.00
Elevation: 700.00
Scale: 10:1
X: 2490000.00
Y: 581000.00

Identify Profile Cell

Type: Roadway
Profile: SR95

Label Scale: 50

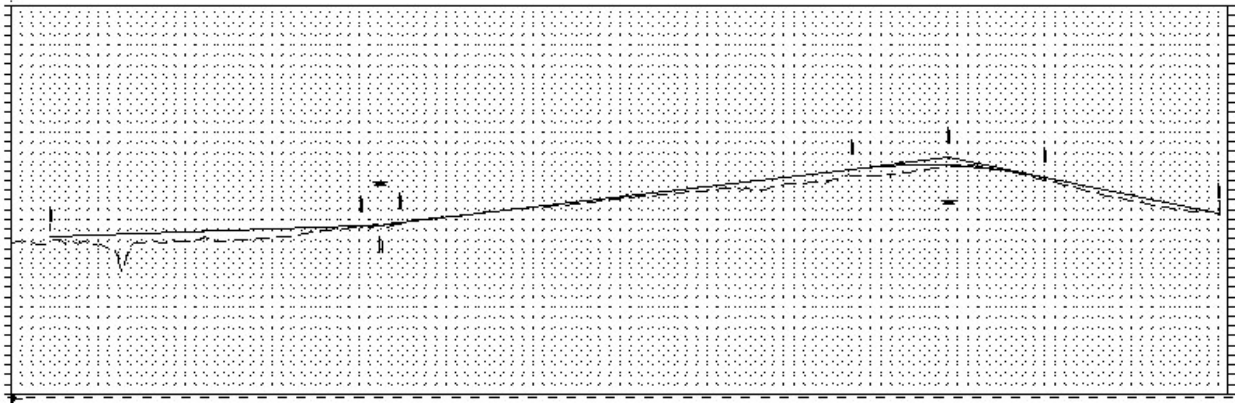
Label Intersections

☒ VPI Labels
☒ VPC/VPT Labels
☒ Grade Labels
☒ V.C. Length Labels
☒ K Value
☐ Label Crest High Points
☐ Label Sag Low Points
☒ Label Speed

Maximum Speed Label (Optional): 60 mph

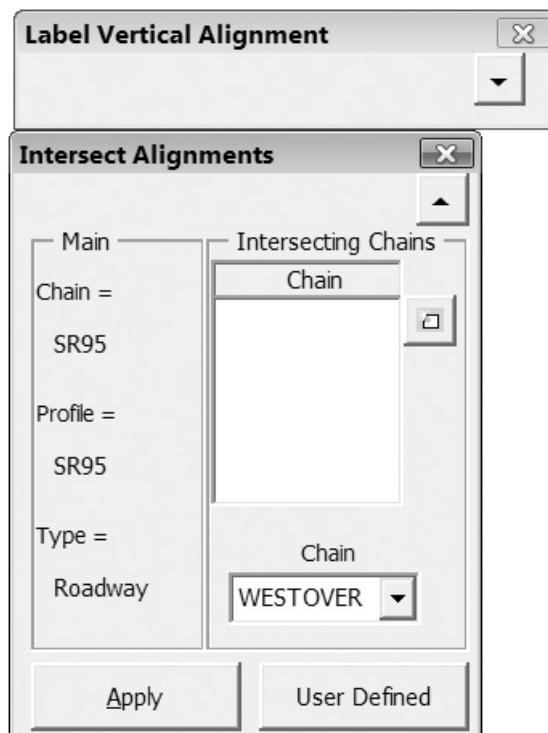
PLACE LABELS

- 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.



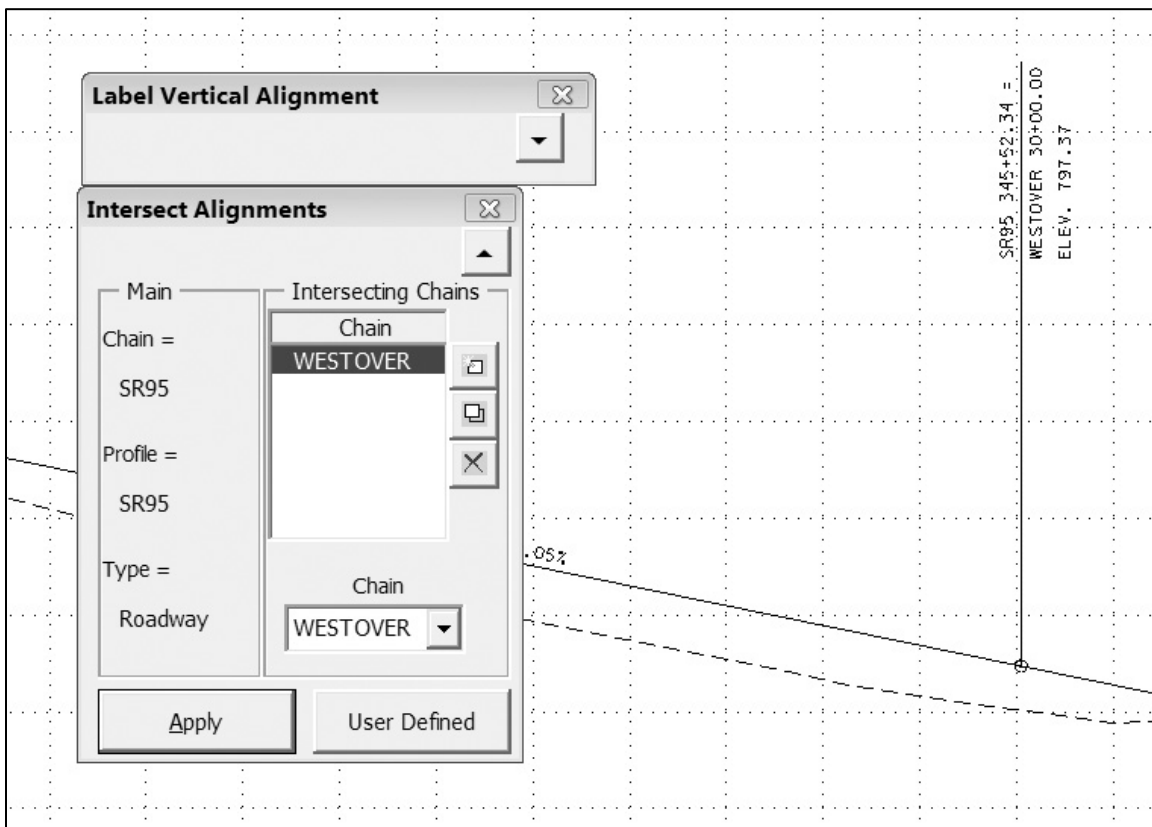
Label Intersections Usage:

- 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.

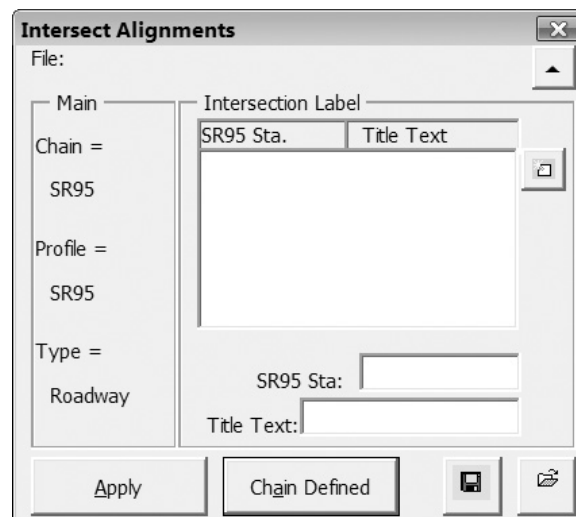


The drop down chain selection list is automatically populated with all chains that intersect the mainline chain whose profile is being annotated.

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: SlopeCalculator.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 [SlopeCalculator]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.

RD01 vertical curve design standards 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

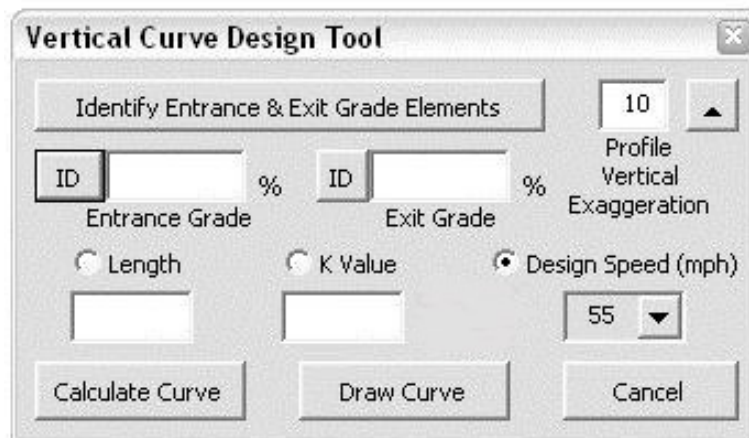
vba run [VerticalCurveDesign]VCDesign.main

Special Requirements:

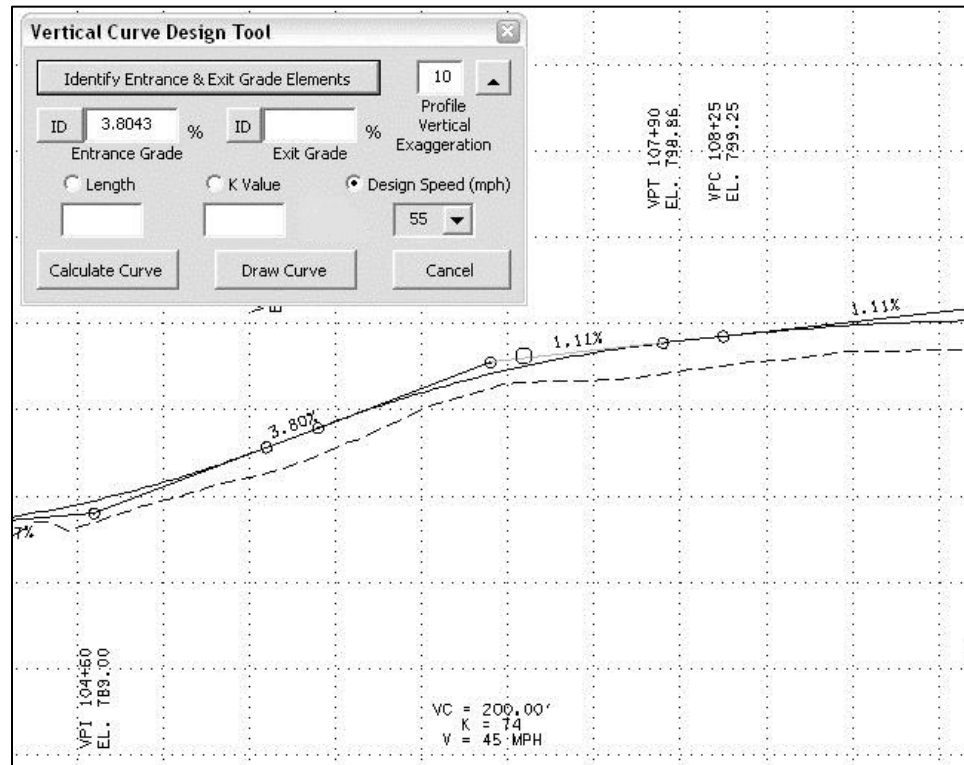
K value text file, **VALabel_Speed_kvl.txt** must be present in TDOT Roadway Design Division's Geopak Standards folder at C:\Users\Public\Geopak Standards\.

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.



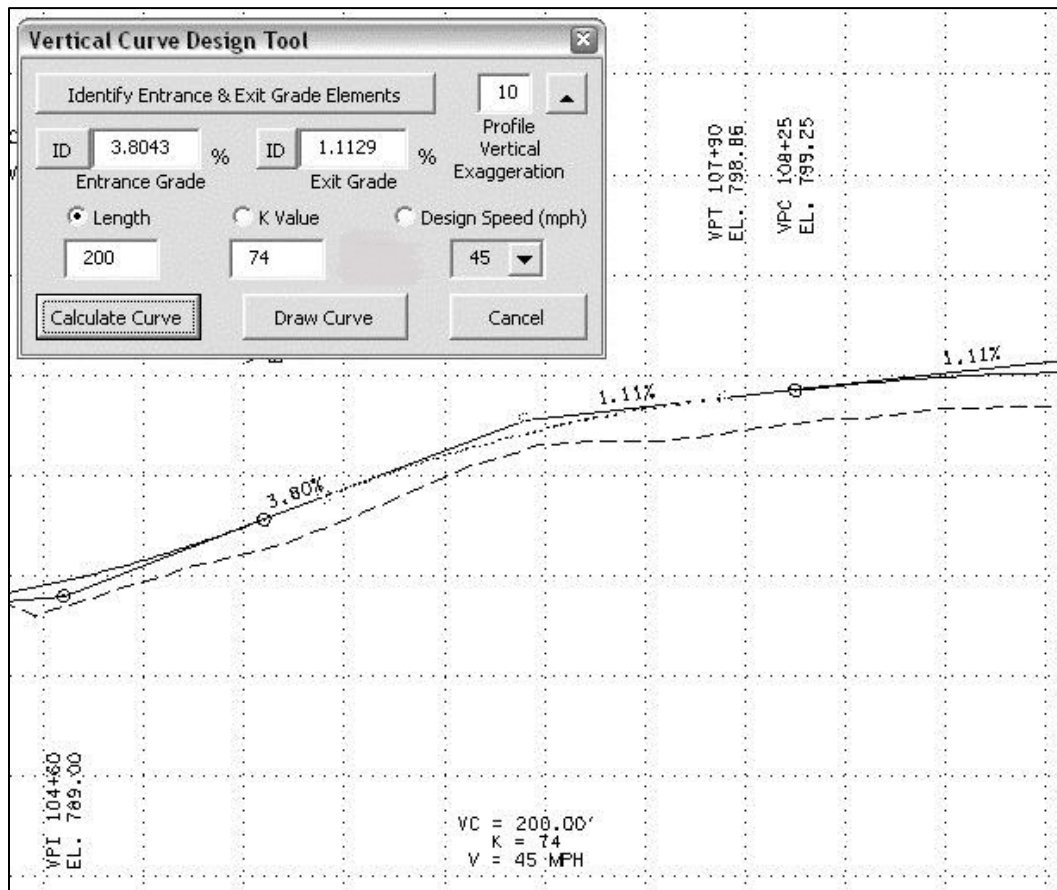
Individual **ID** buttons are provided so that you can reset either the entrance or exit grades separately.

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.



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

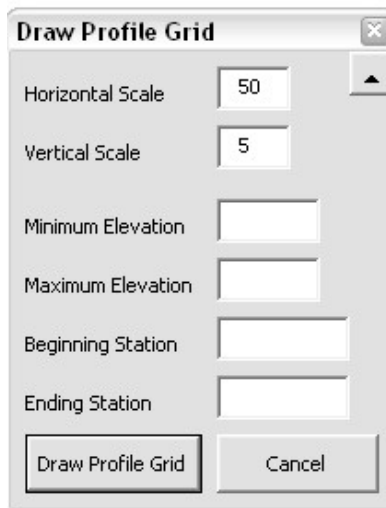
vba run [DrawProfileGrid]DrawGrid.main

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:

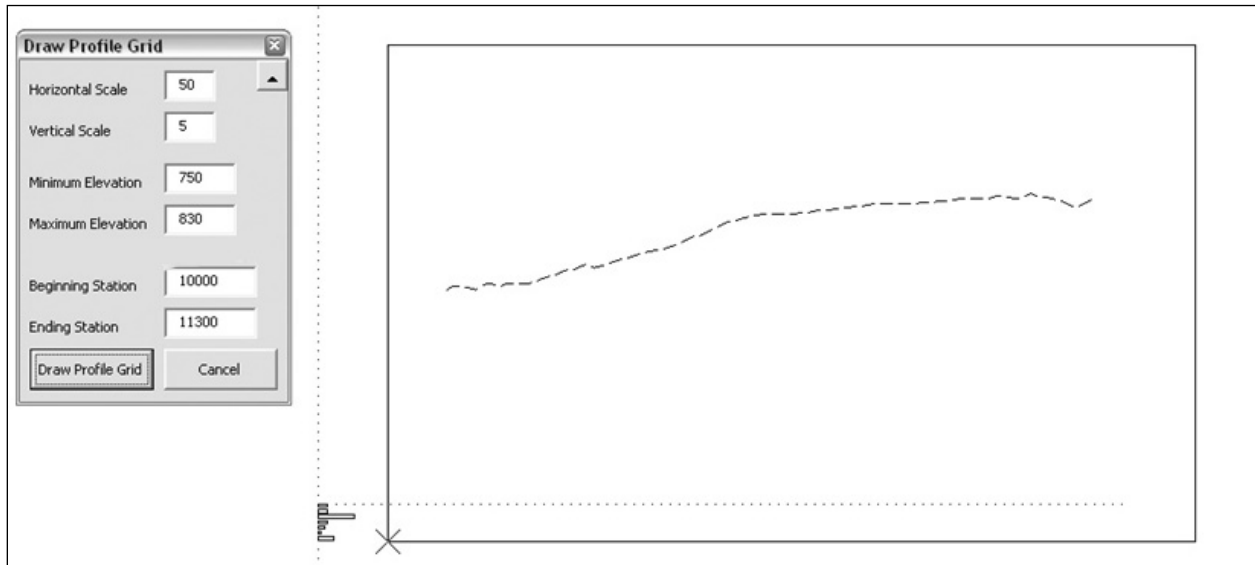
- Step 1.** Set your view so that the lower left reference origin location of the profile area is visible.
- Step 2.** In D&C manager activate **Profile Grid**. The **Draw Profile Grid** dialog opens. The current active scale is read from the DGN file to set the **Horizontal Scale & Vertical Scale**.



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

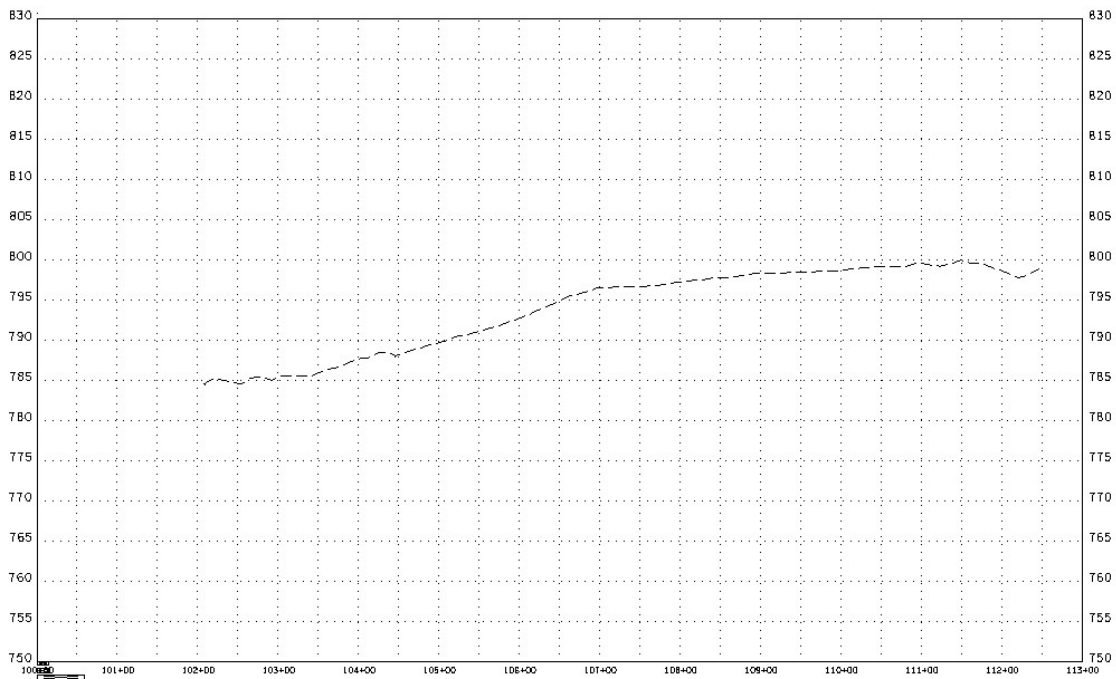
- Step 3.** When all control values have been set, click on the **Draw Profile Grid** command button.

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:

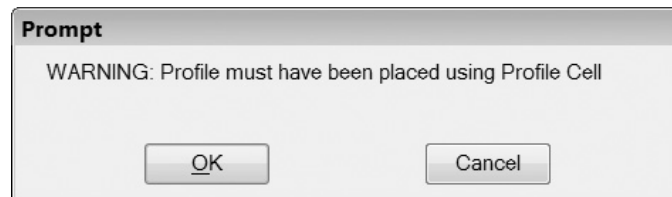
All graphics must be in a MicroStation selection set prior to running the program and a Geopak profile cell must be present. This must be a 3D MicroStation DGN file since the tool reads the graphics for elevation values.

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.



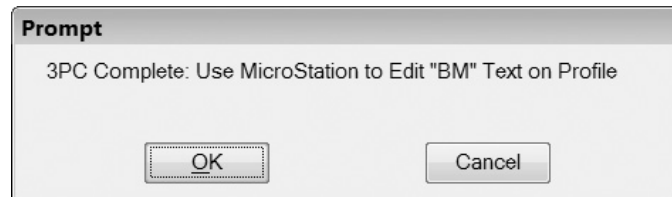
- Step 3.** You are then prompted for a **job no.** Key that in and click **OK**.



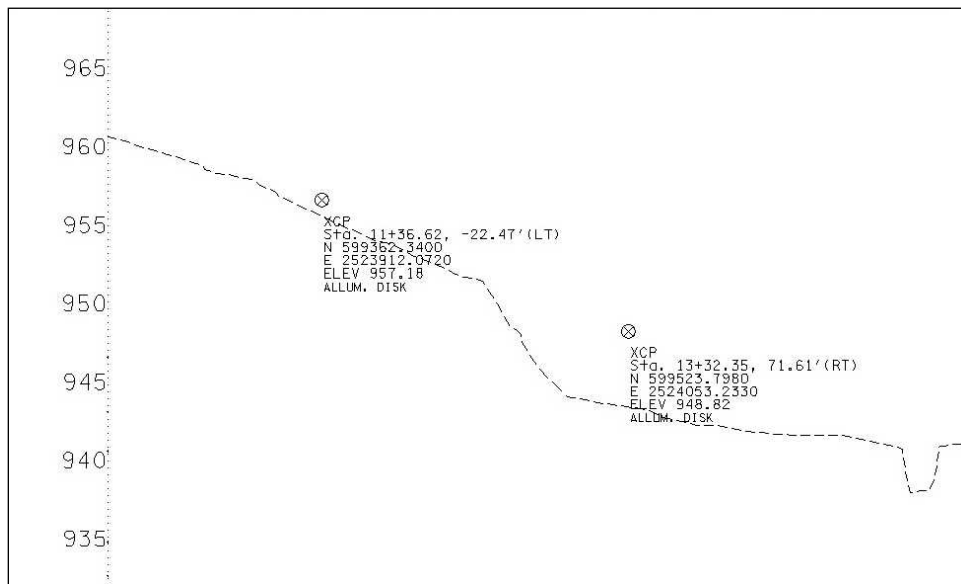
- Step 4.** You are then prompted for the **chain name.** Key that in and click **OK**.



Step 5. If no benchmarks are found then a message prompt is given indicating that situation, otherwise the final completion message is given. Click on **OK** to dismiss this message.



Step 6. Edit/check text on profile as needed to indicate the correct elevation. Any points which are not desired on the profile should be deleted.



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.

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.

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.

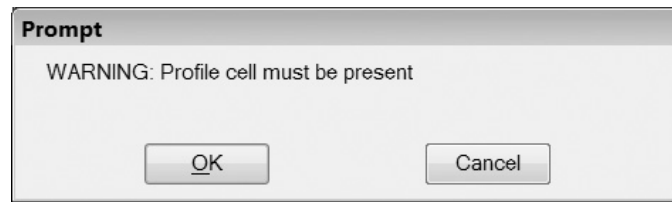
If there is a run of pipe that begins or ends outside the limits of the horizontal alignment this run of pipe needs to be adjusted in the office by placing a **XINV** cell on the pipe run within the limit of the alignment and setting a break in the existing pipe line at that location. To get this done:

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.



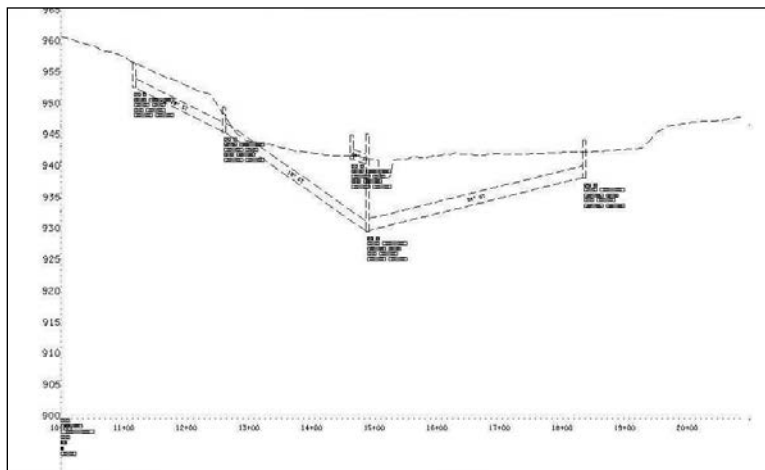
Step 3. You are then prompted for a **job no.** Key that in and click **OK**.



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



Step 6. Edit or move text on profile as required. Add CB, MH and DI numbers if a table is used.



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.

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.

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.

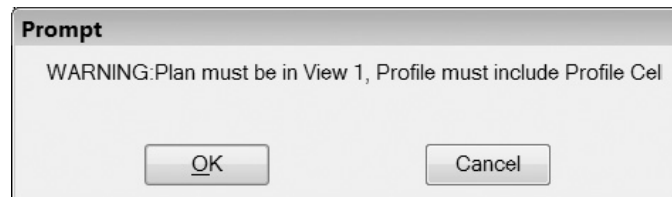
Special Requirements:

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.



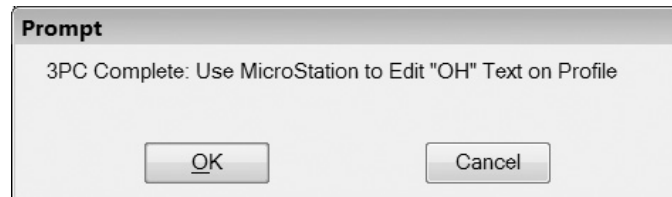
- Step 3.** You are then prompted for a **job no.** Key that in and click **OK**.



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



- Step 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.

	☉ OH WIRE STA. 10+48.87 LOW WIRE EL. 977.27' TEMP. ---- DEG. - POWER - TELEPHONE - TV - GUY WIRE	
965		

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.

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.

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

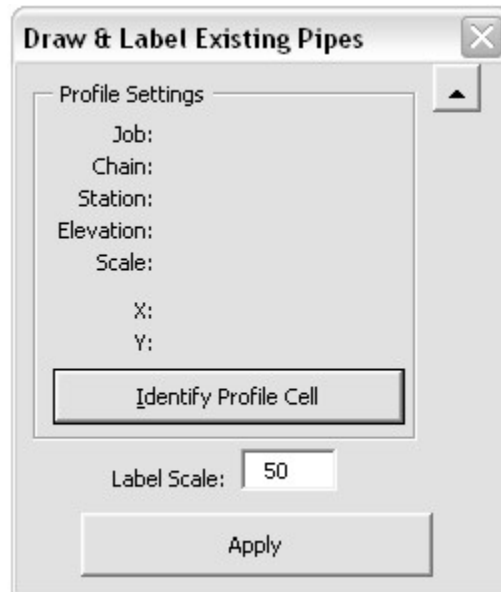
vba run [ExistingPipeProfileLabeler]modMain.Exist_ProfileLabelMain

Special Requirements:

None.

Usage:

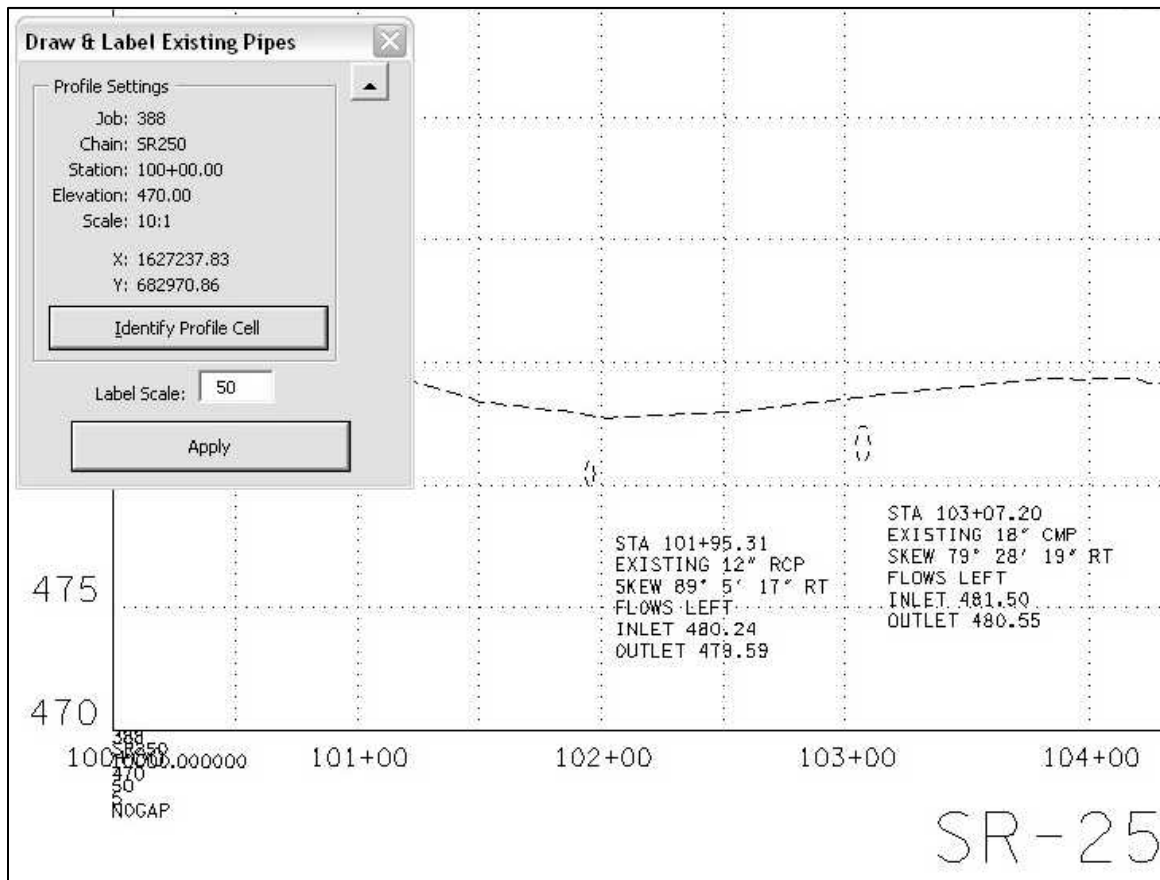
Step 1. In D&C manager activate **Profile ExPipes**. The **Draw & Label Existing Pipes** dialog appears.



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.

The screenshot shows a dialog box titled "Pipe Size Needed". It contains the following text:

Pipe Size Not Found at Station STA 108+95.28.
Please Enter Size in Inches

Below the text is a text entry field. To the right of the field are two buttons: "OK" and "Cancel".

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/Geopak VBA Program: DrawPipeProfile.mvba

Description:

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

A command button is provided to access Roadway Design Division's Data **Point Profile Station Elevation** tool which can be used to issue the flow line point by its station and elevation.

This program can also be activated by using the keyin
vba run [DrawPipeProfile]DrawExistPipe.Main

Special Requirements:

None.

Usage:

- Step 1.** Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Roadway Design Division's Data **Point Profile Station Elevation** tool.
- Step 2.** In D&C manager activate **Profile Pipe Ex**. The **Draw Pipe 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.

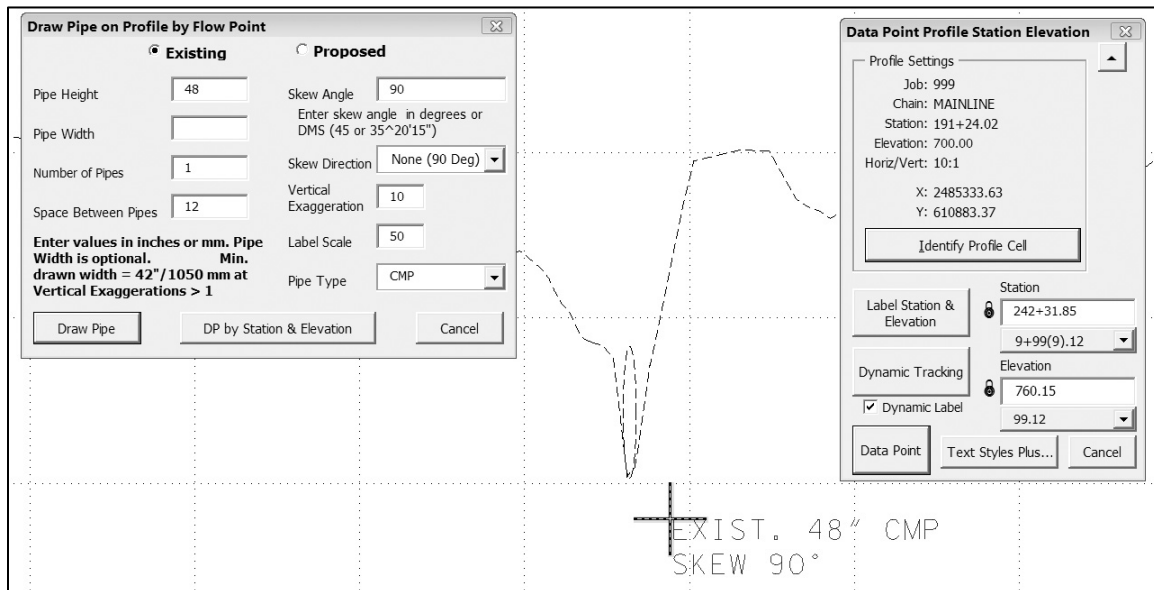
Vertical Exaggeration should usually be 10 for profiles ...
(Example: 50 scale horiz. / 5 scale vert. = 10)

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.

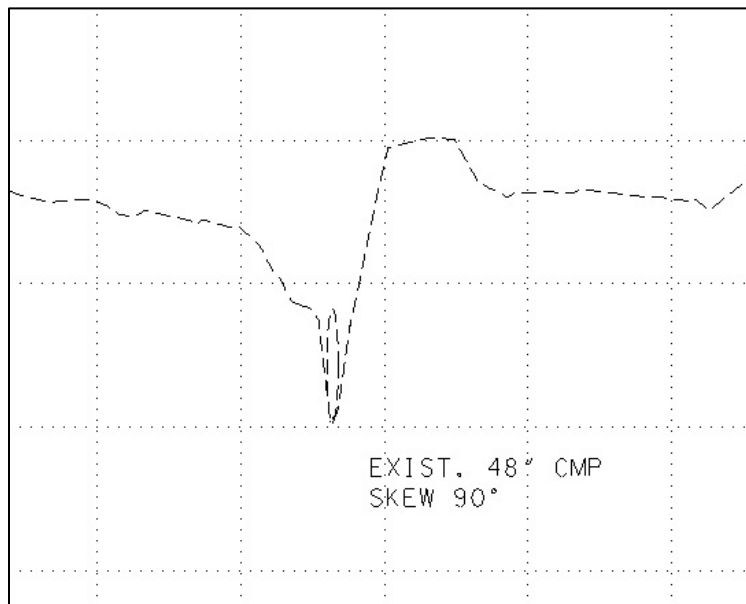
- Step 4.** You are then prompted to **Identify Flow Line Location at Center**. Snap and Data point to graphically identify the flow line point or use the **Data Point Profile Station Elevation** tool to set the point by station & elevation.

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 or Bridge on Profile by Flow Point

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

MicroStation/Geopak VBA Program: VA_Labeler.mvba

Description:

This application is used to draw an 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.

A command button is provided to access Roadway Design Division's Data **Point Profile Station Elevation** tool which can be used to issue the flow line point by its station and elevation.

This program can also be activated by using the keyin
vba run [DrawBoxProfile]DrawExistBox.Main

Special Requirements:

None.

Usage:

- Step 1.** Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Roadway Design Division's Data **Point Profile Station Elevation** tool.
- Step 2.** In D&C manager activate **Profile Box Ex**. The **Draw 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.

Draw Box Culvert or Bridge on Profile by Flow Point

☒ **Existing** ☐ **Proposed**

Barrels

Number of Barrels:

Barrel Width:

Barrel Height:

Thickness

Outside Wall:

Inside Wall:

Top Slab:

Bottom Slab:

Skew Angle:
Enter skew angle in degrees or DMS (45 or 35^20'15")

Skew Direction: ▼

Label Scale:

Vertical Exaggeration:

Enter barrel sizes in feet or meters and thicknesses in inches or millimeters.

Vertical Exaggeration should usually be 10 for profiles ...

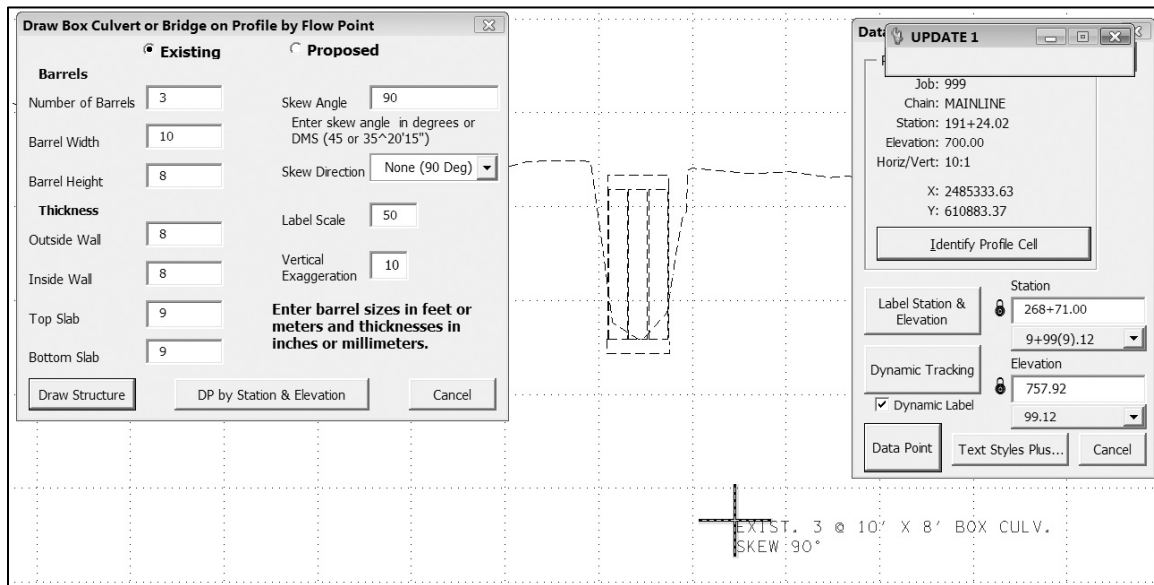
(Example: 50 scale horiz. / 5 scale vert. = 10)

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.

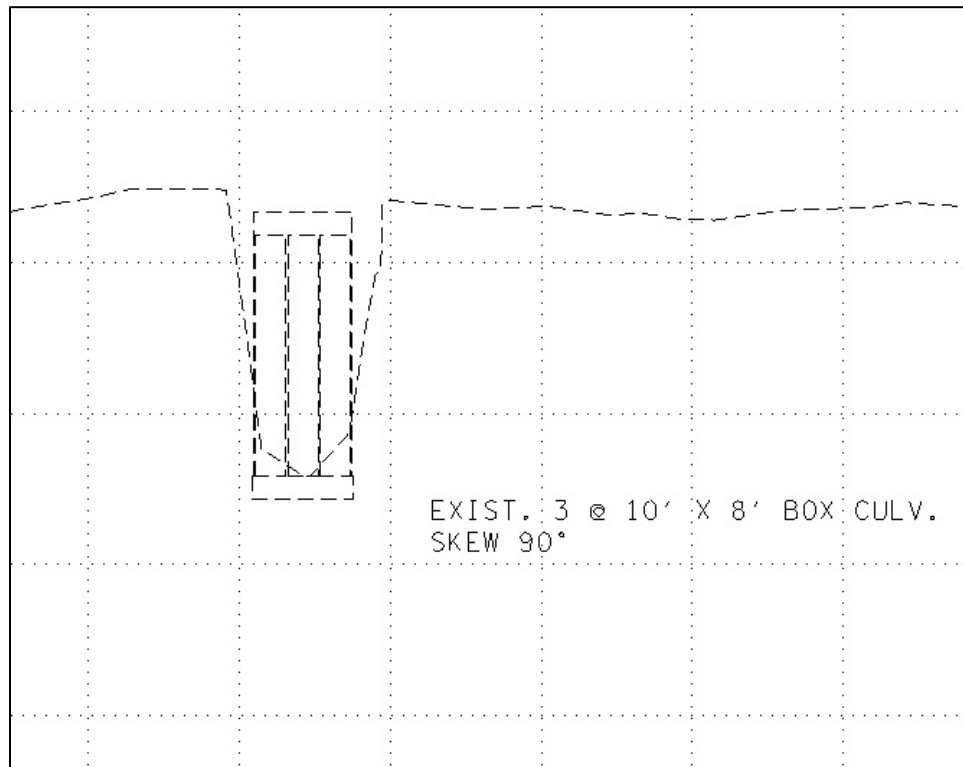
Step 3. Make settings in the dialog as needed for the structure you need to draw. In our example we are placing a 3 @ 10X8 structure at a 90 degree skew. It has an outside wall thickness of 8" and an inside wall thickness of 8" so we can use the defaults. The top slab thickness is 9" and the bottom slab thickness is 9" 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 to graphically identify the flow line point or use the **Data Point Profile Station Elevation** tool to set the point by station & elevation.

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 or Bridge on Profile by Flow Point

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

MicroStation/Geopak VBA Program: VA_Labeler.mvba

Description:

This application is used to draw an 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.

A command button is provided to access Roadway Design Division's Data **Point Profile Station Elevation** tool which can be used to issue the flow line point by its station and elevation.

This program can also be activated by using the keyin
vba run [DrawSlabProfile]DrawExistSlab.Main

Special Requirements:

None.

Usage:

- Step 1.** Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Roadway Design Division's Data **Point Profile Station Elevation** tool.
- Step 2.** In D&C manager activate **Profile Slab Ex.** The **Draw 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.

Draw Slab Culvert or Bridge on Profile by Flow Point

☒ **Existing** ☐ **Proposed**

Barrels

Number of Barrels:

Barrel Width:

Barrel Height:

Thickness

Outside Wall:

Inside Wall:

Top Slab:

Footing Slab:

Skew Angle:
Enter skew angle in degrees or DMS (45 or 35^20'15")

Skew Direction:

Label Scale:

Vertical Exaggeration:

Enter barrel sizes in feet or meters and thicknesses in inches or millimeters.

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 @ 14X8 structure at a 45 degree skew to the right. 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 to graphically identify the flow line point or use the **Data Point Profile Station Elevation** tool to set the point by station & elevation.

Due to the 45 degree skew, structure widths are adjusted.

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.

Draw Slab Culvert or Bridge on Profile by Flow Point

☒ Existing ☐ Proposed

Barrels

Number of Barrels: 2

Barrel Width: 14

Barrel Height: 8

Thickness

Outside Wall: 8

Inside Wall: 8

Top Slab: 11

Footing Slab: 18

Skew Angle: 45
Enter skew angle in degrees or DMS (45 or 35^20'15")

Skew Direction: Right

Label Scale: 50

Vertical Exaggeration: 10

Enter barrel sizes in feet or meters and thicknesses in inches or millimeters.

Draw Structure DP by Station & Elevation Cancel

Data Point Profile Station Elevation

Profile Settings

Job: 999

Chain: MAINLINE

Station: 191+24.02

Elevation: 700.00

Horiz/Vert: 10:1

X: 2485333.63

Y: 610883.37

Identify Profile Cell

Label Station & Elevation

Station: 268+71.00

9+99(9).12

Dynamic Tracking

Elevation: 757.92

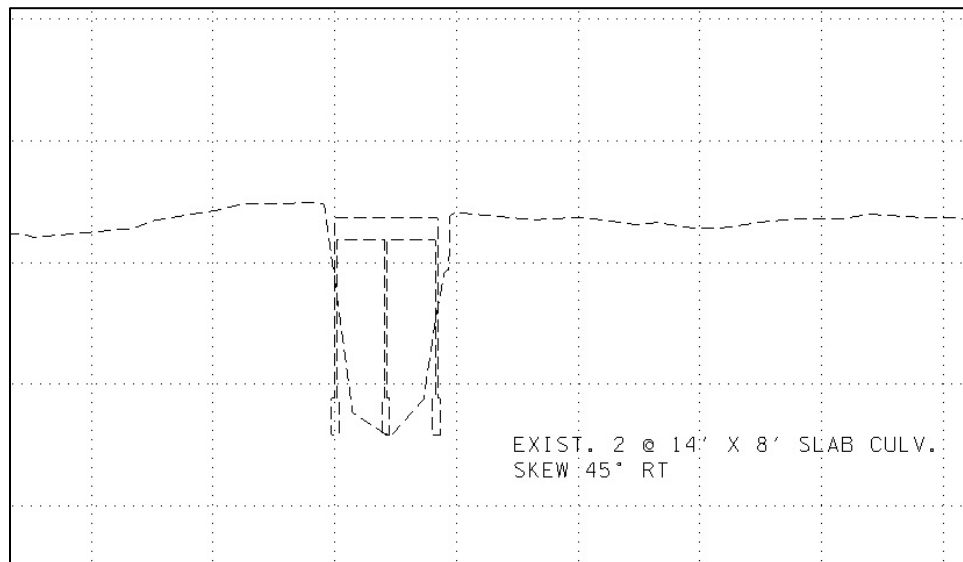
99.12

☒ Dynamic Label

Data Point Text Styles Plus... Cancel

EXIST. 2 @ 14' X 8' SLAB CULV.
SKEW 45° RT

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_ctrl_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:

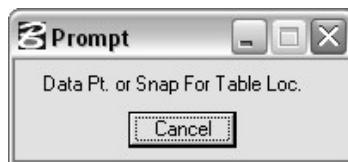
- Step 1.** Using MicroStation's Selection Set tool add all plan view graphics to a selection set.
- Step 2.** In D&C manager activate **Cntrl Pt Table**. You are prompted for a **job no.** Key that in and click **OK**.



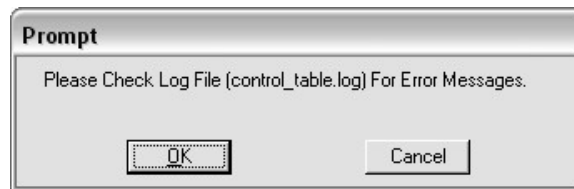
- Step 3.** You are then prompted for the **chain name**. Key that in and click **OK**.



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

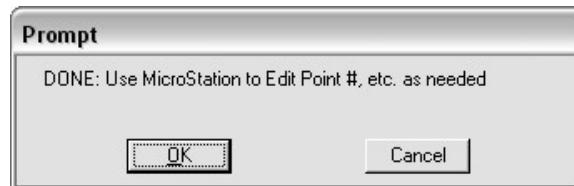


- Step 5.** If errors are encountered then an error log file named **control_table.log** is created and the user is notified with a message prompt. Click on **OK** to dismiss this message.



- 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

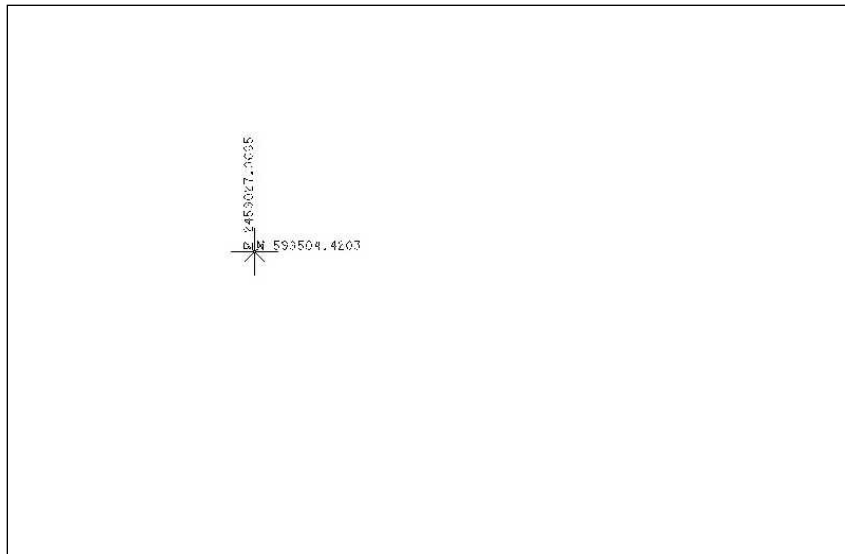
vba run [PlaceCoorGridTick]GridTick.main

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

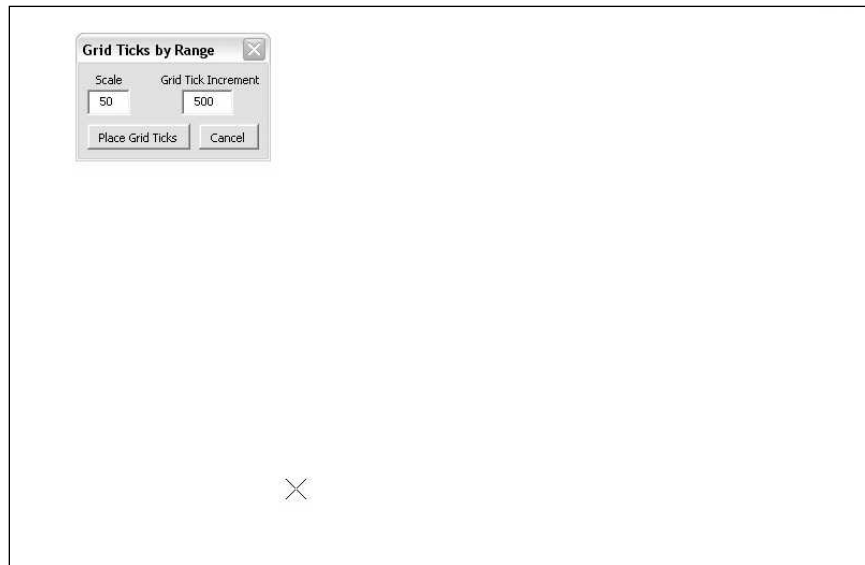
vba run [PlaceCoorGridTick]GridTickRange.main

Special Requirements:

None.

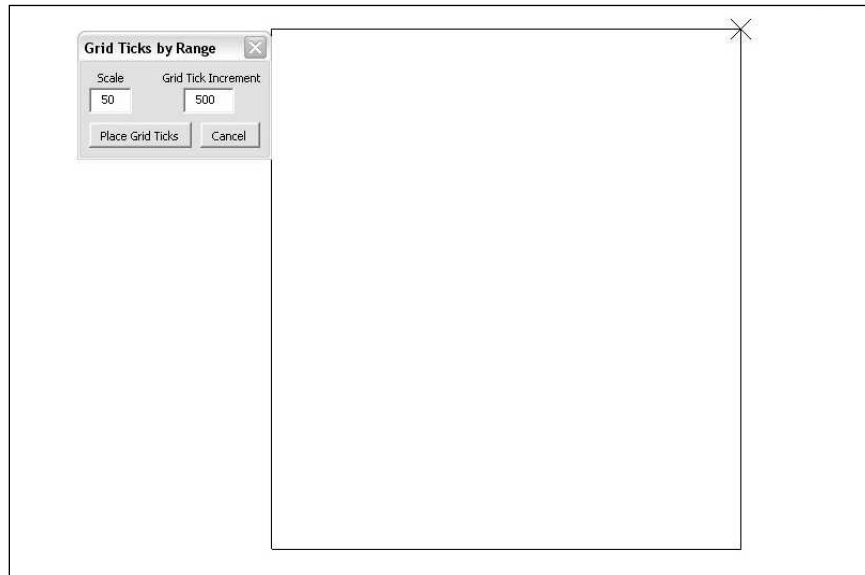
Usage:

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.

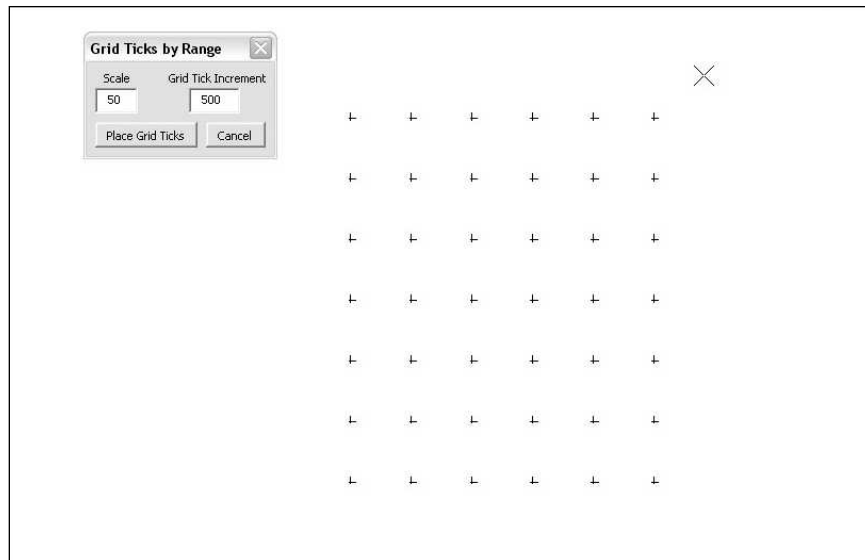


Once settings are made, enter a data point at any corner of the range to which you wish apply coordinate grid ticks.

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:

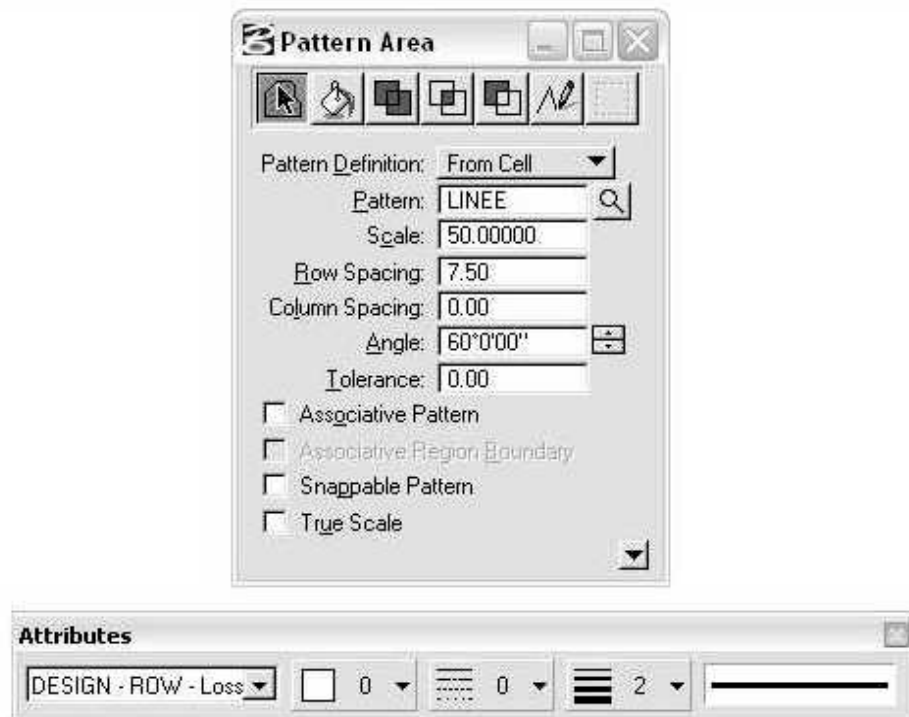
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

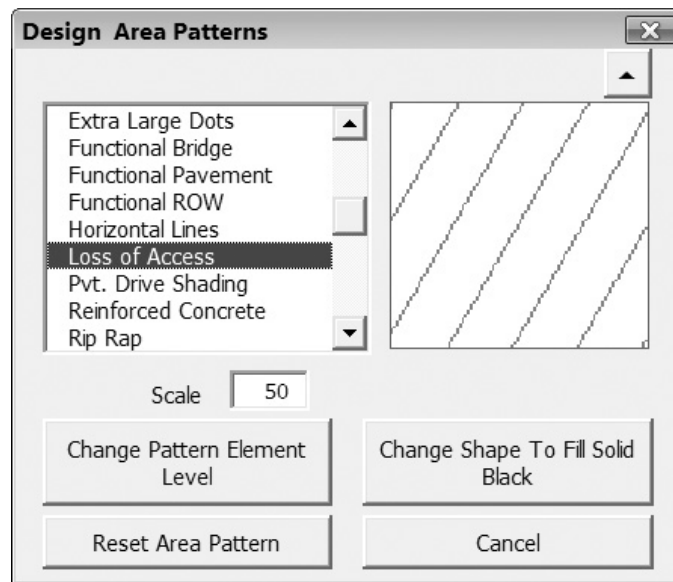
Fence method: Create a fence bounding the area to be patterned.

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.

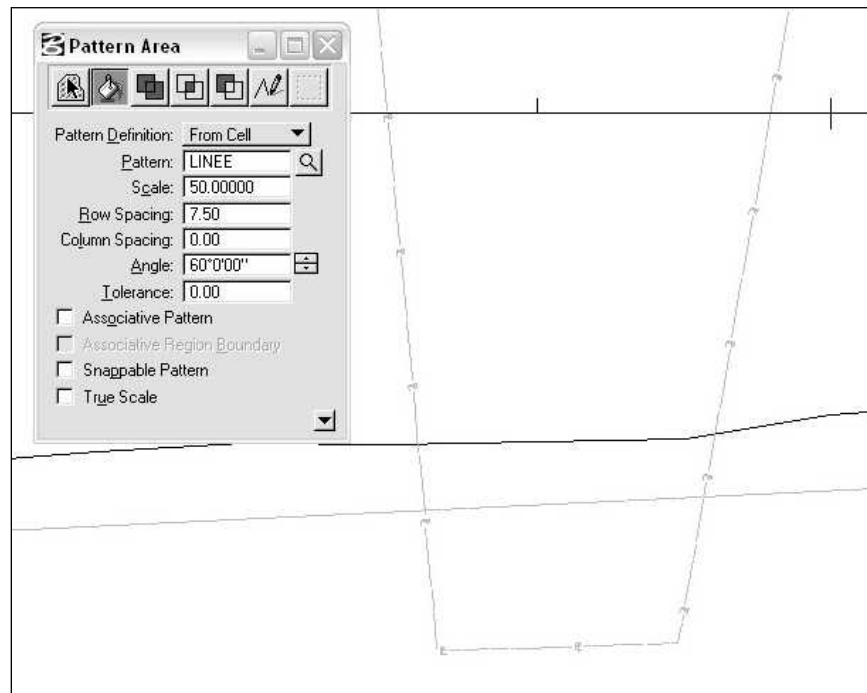


Or from the drop down menu in the **Design Area Patterns** dialog ...

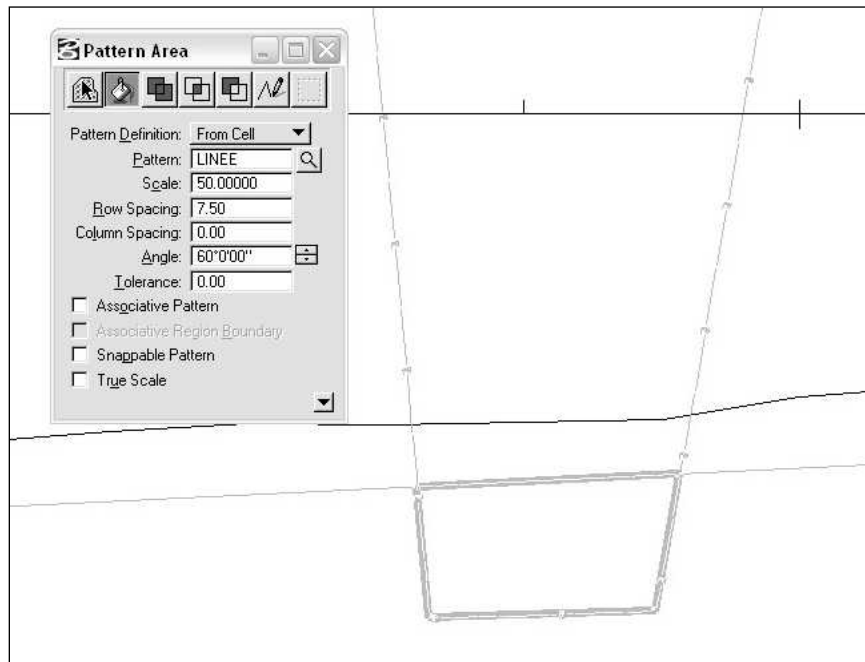


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

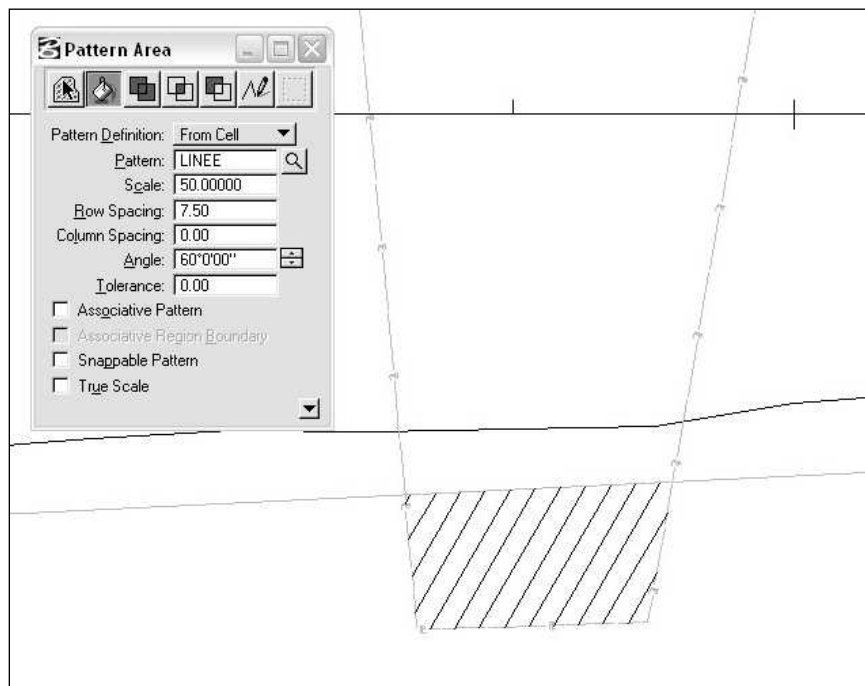
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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:

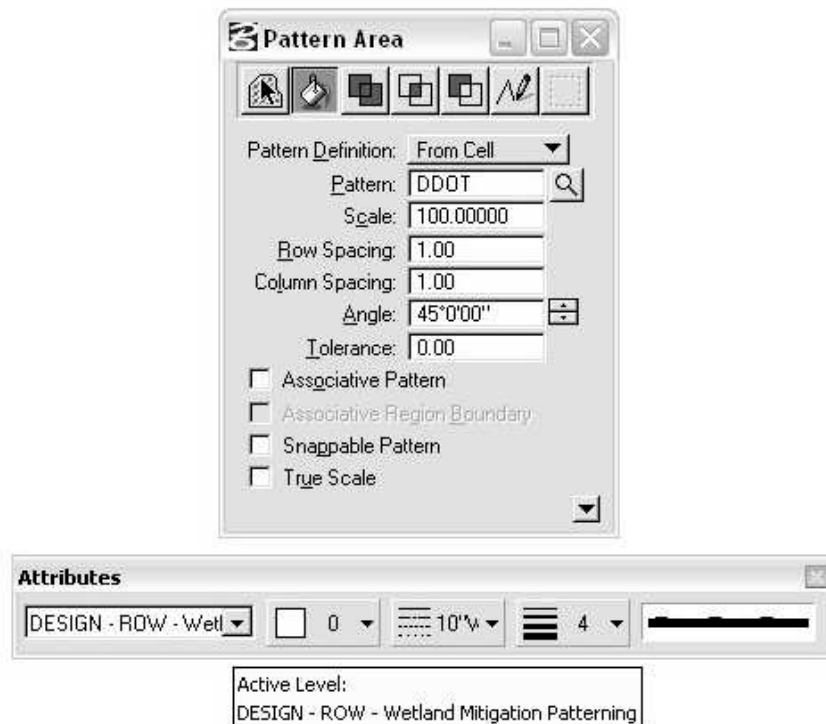
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

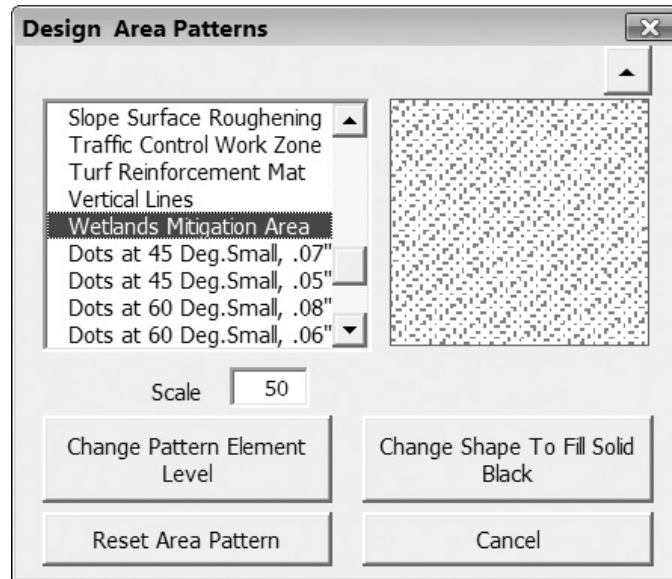
Fence method: Create a fence bounding the area to be patterned.

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.

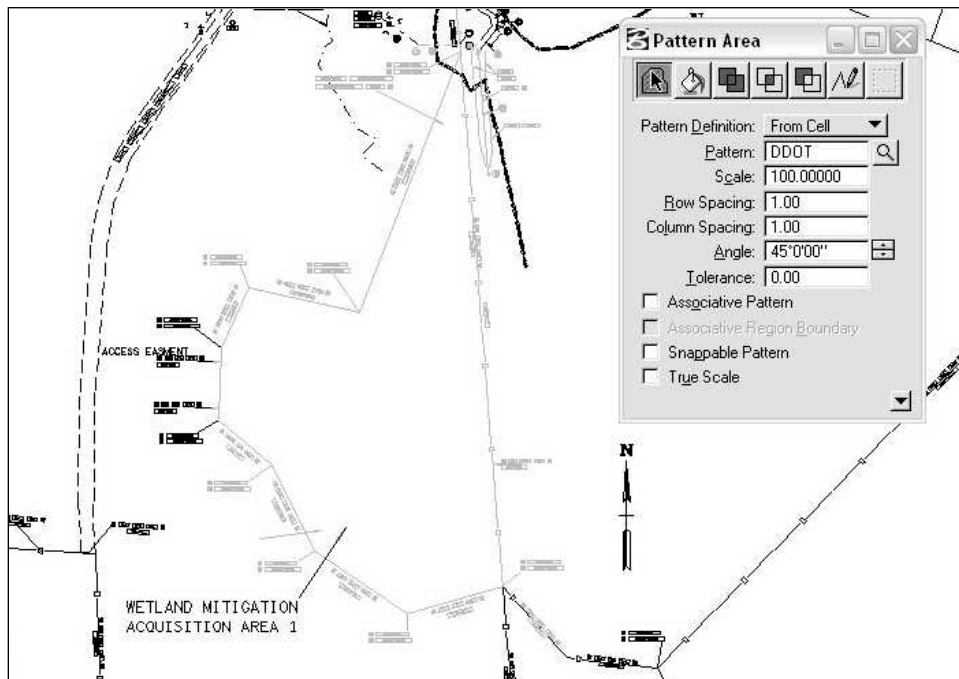


Or from the drop down menu in the **Design Area Patterns** dialog ...

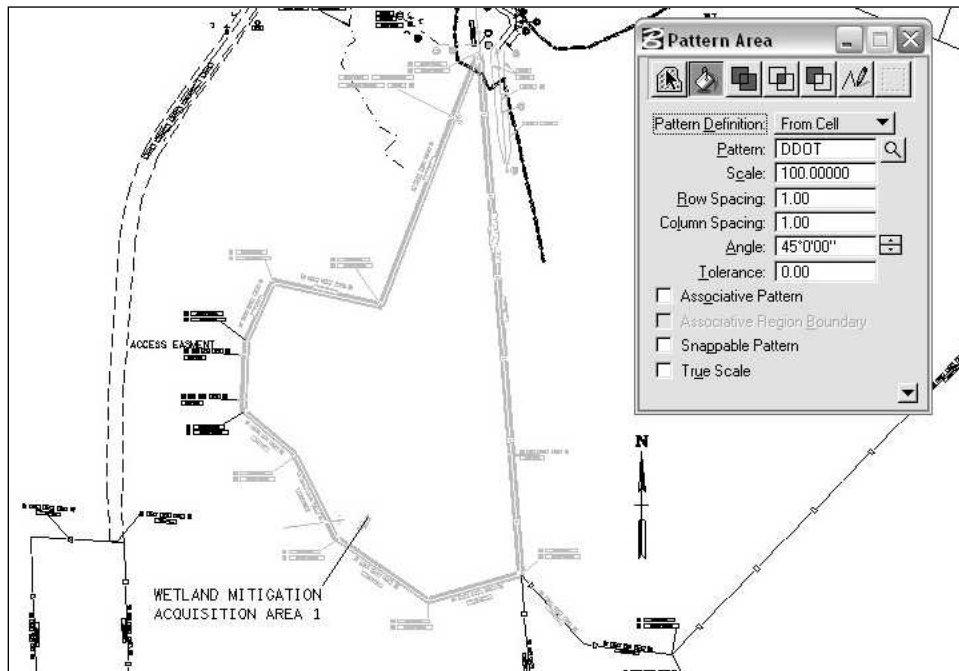


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

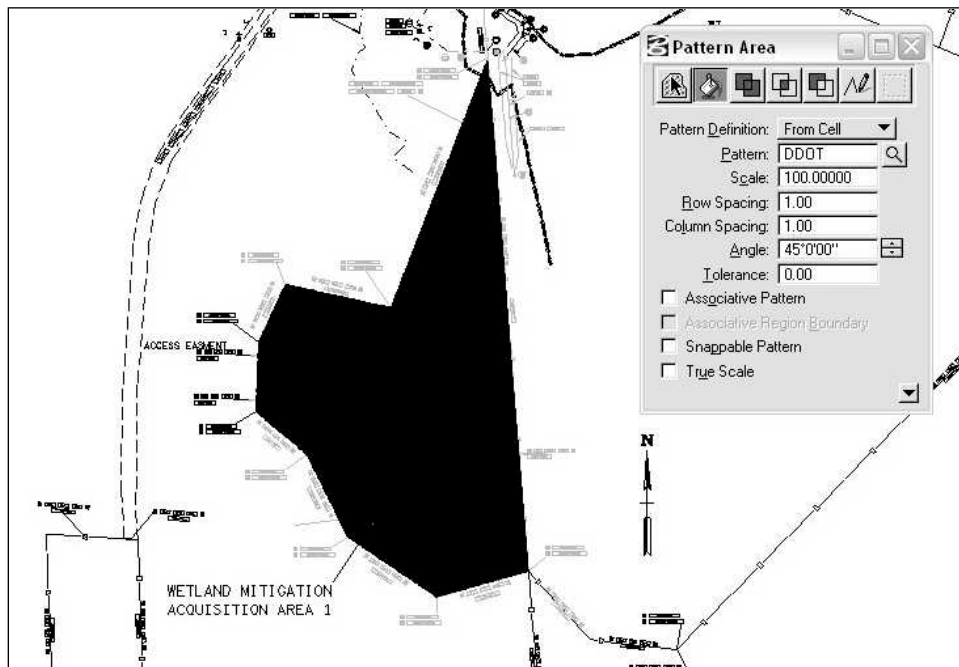
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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 its 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 its 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 its 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**.

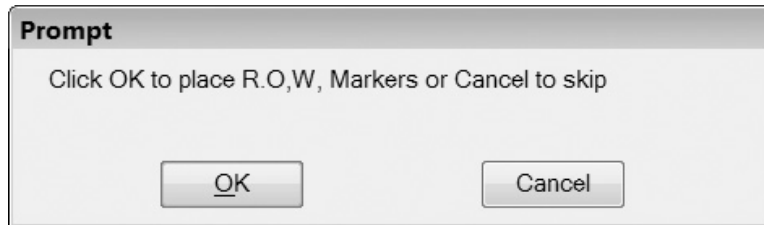


Step 5. You are then prompted for the **chain name**. Key that in and click **OK**.



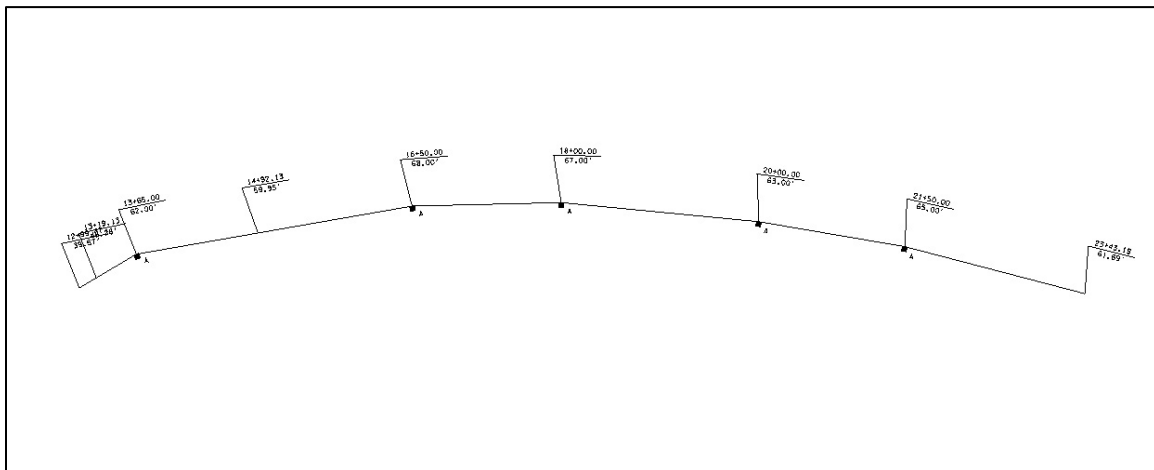
A dialog box titled "Prompt" with a text input field containing "SR1" and two buttons: "OK" and "Cancel".

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.



A dialog box titled "Prompt" with the text "Click OK to place R.O.W, Markers or Cancel to skip" and two buttons: "OK" and "Cancel".

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 its 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 its text label to avoid moving the marker.

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

Special Requirements:

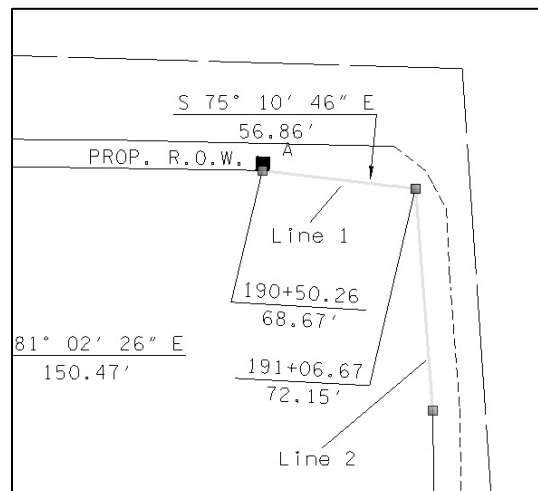
Two adjoining proposed R.O.W. lines must be previously displayed using D&C manager and added to a MicroStation selection set.

Use of line strings or complex chains are not supported.

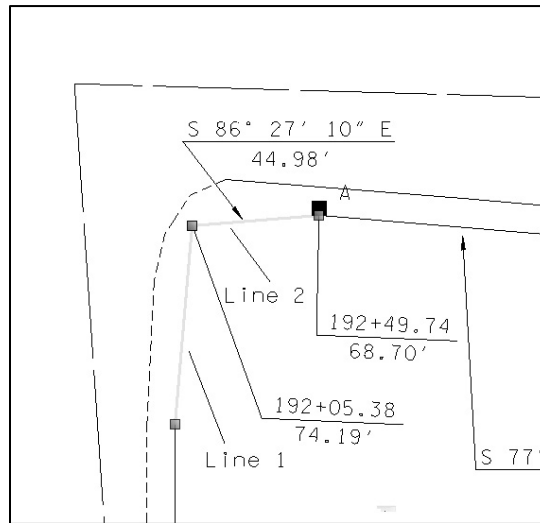
Usage:

- 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**.

Prompt

Keyin Job Number

4z4

OK Cancel

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

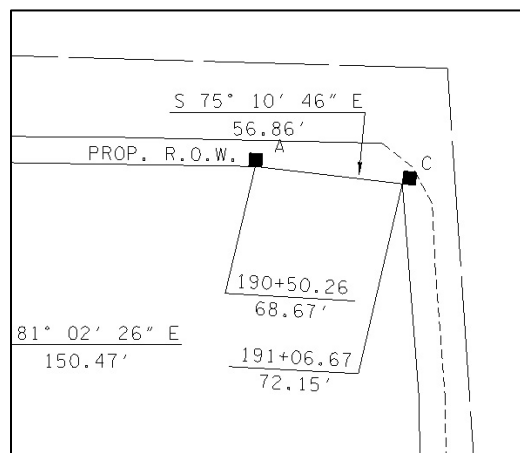
Prompt

Keyin Roadway Chain Name

mainline

OK Cancel

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.

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. 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

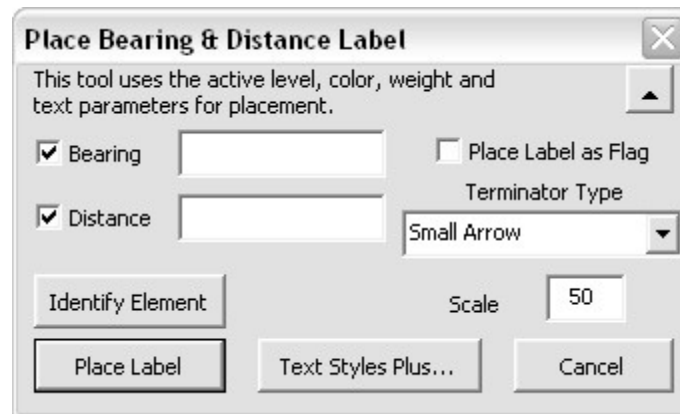
vba run [DistanceBearingLabel]DistanceBearing.Main

Special Requirements:

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

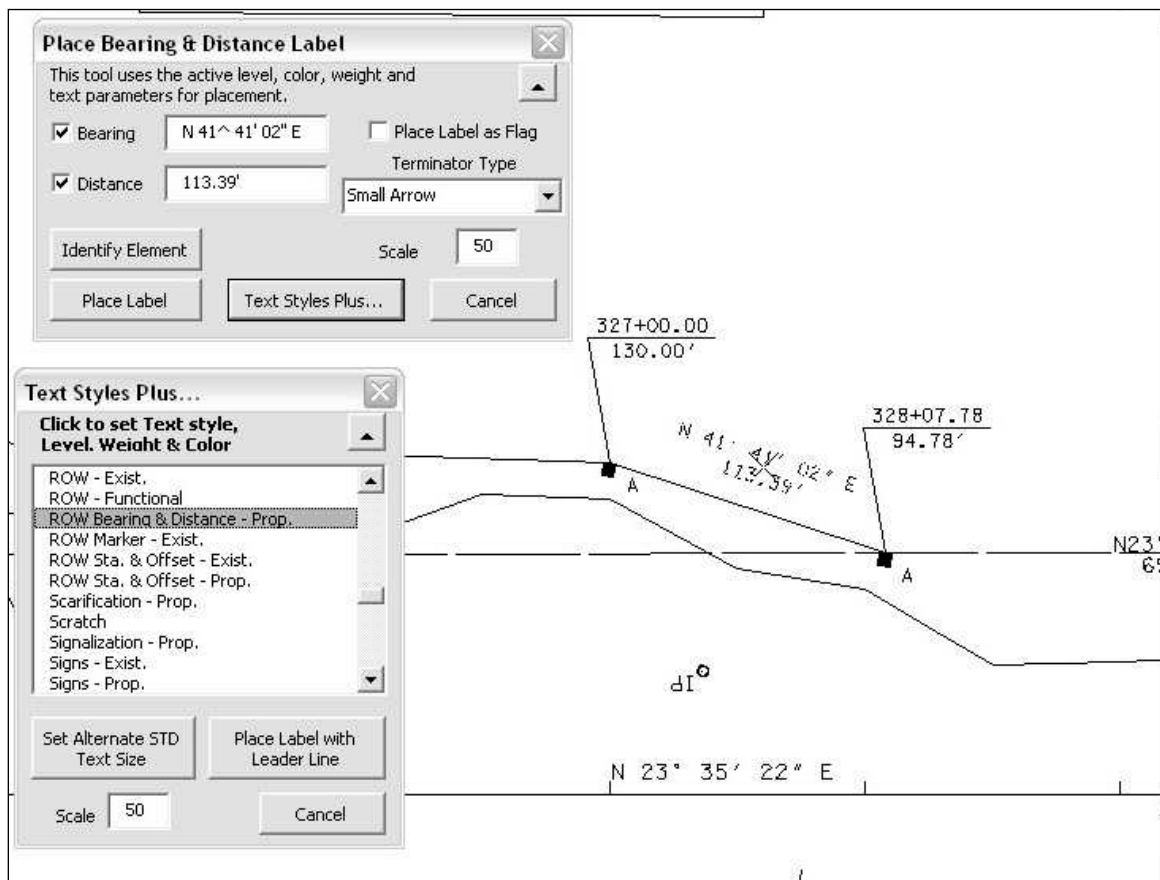
Usage:

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.

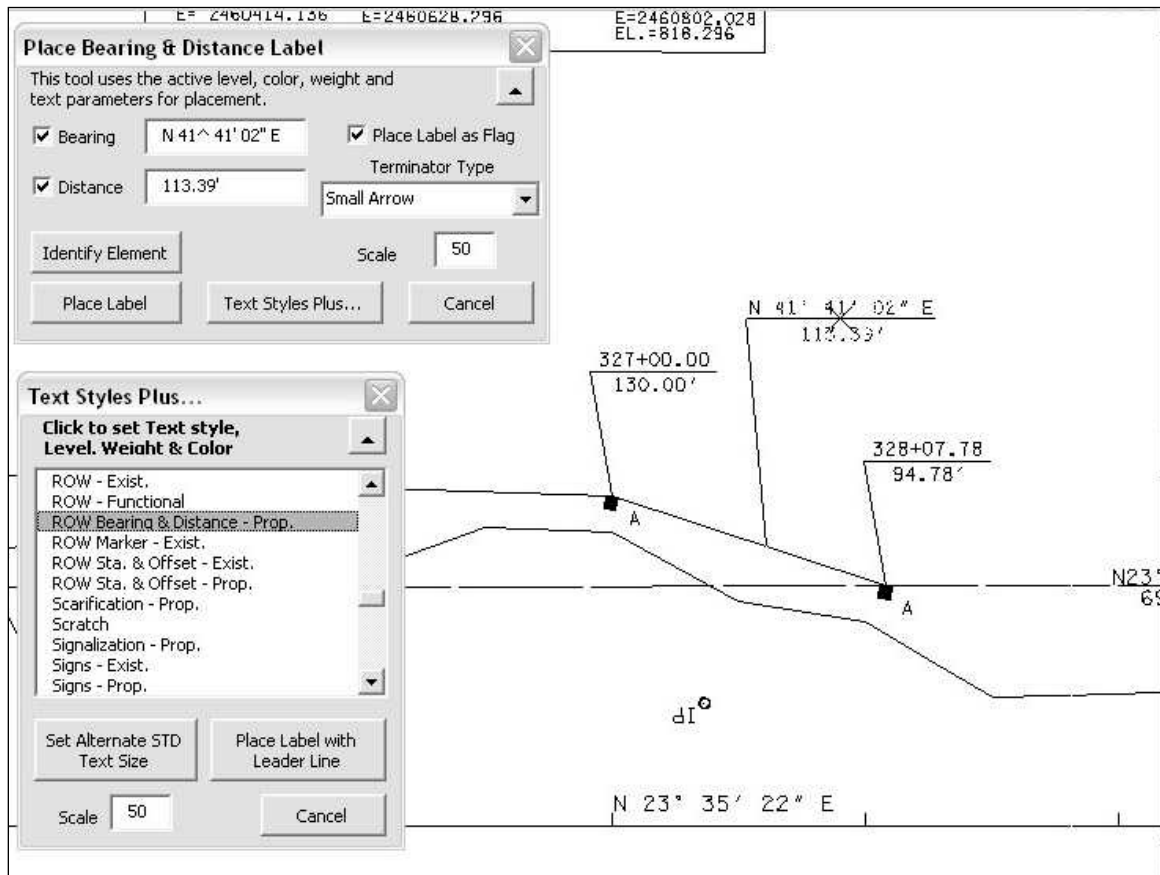
Label placement with Leader line as a Flag:

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

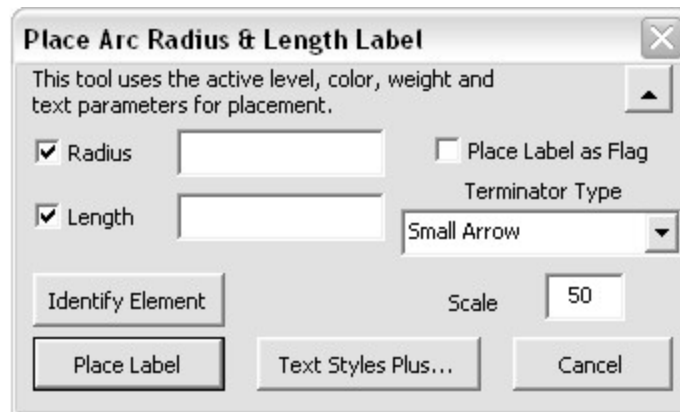
vba run [ArcRadiusLengthLabel]LabelArc.Main

Special Requirements:

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

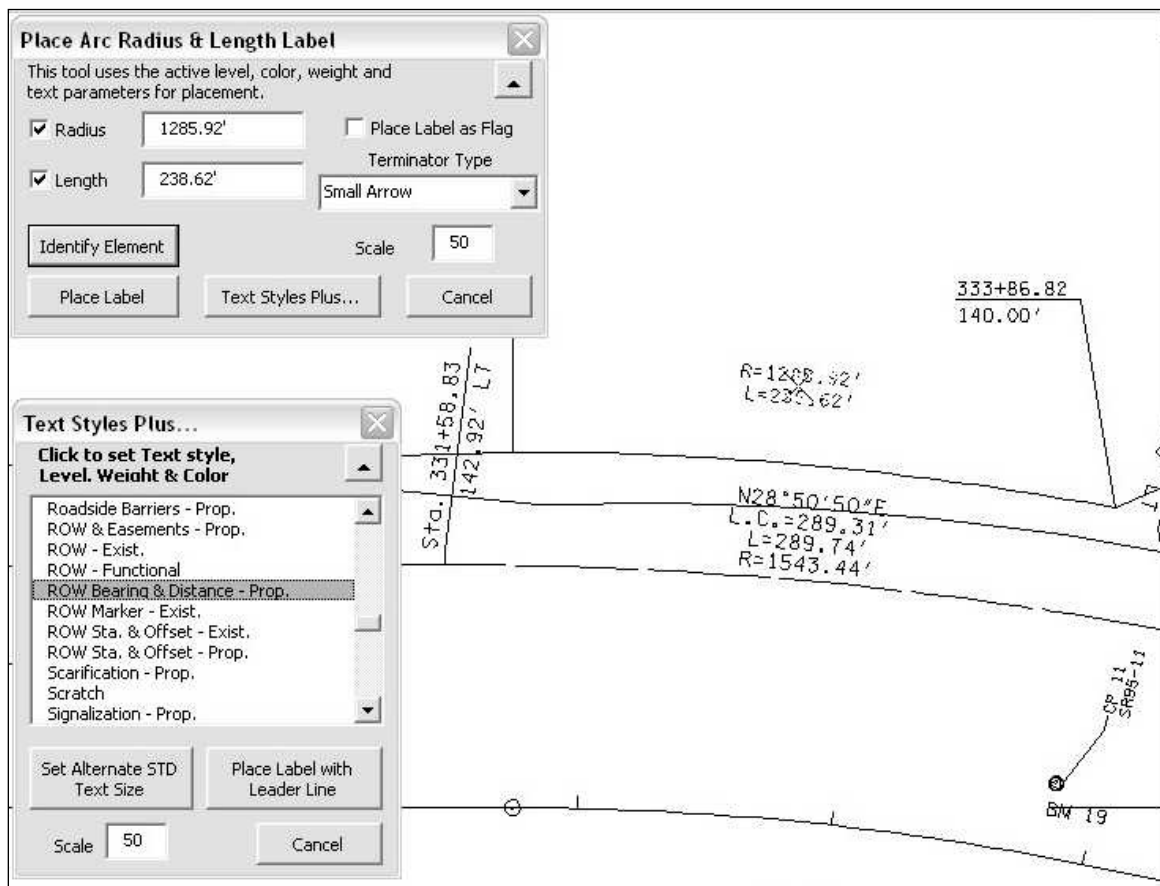
Usage:

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.

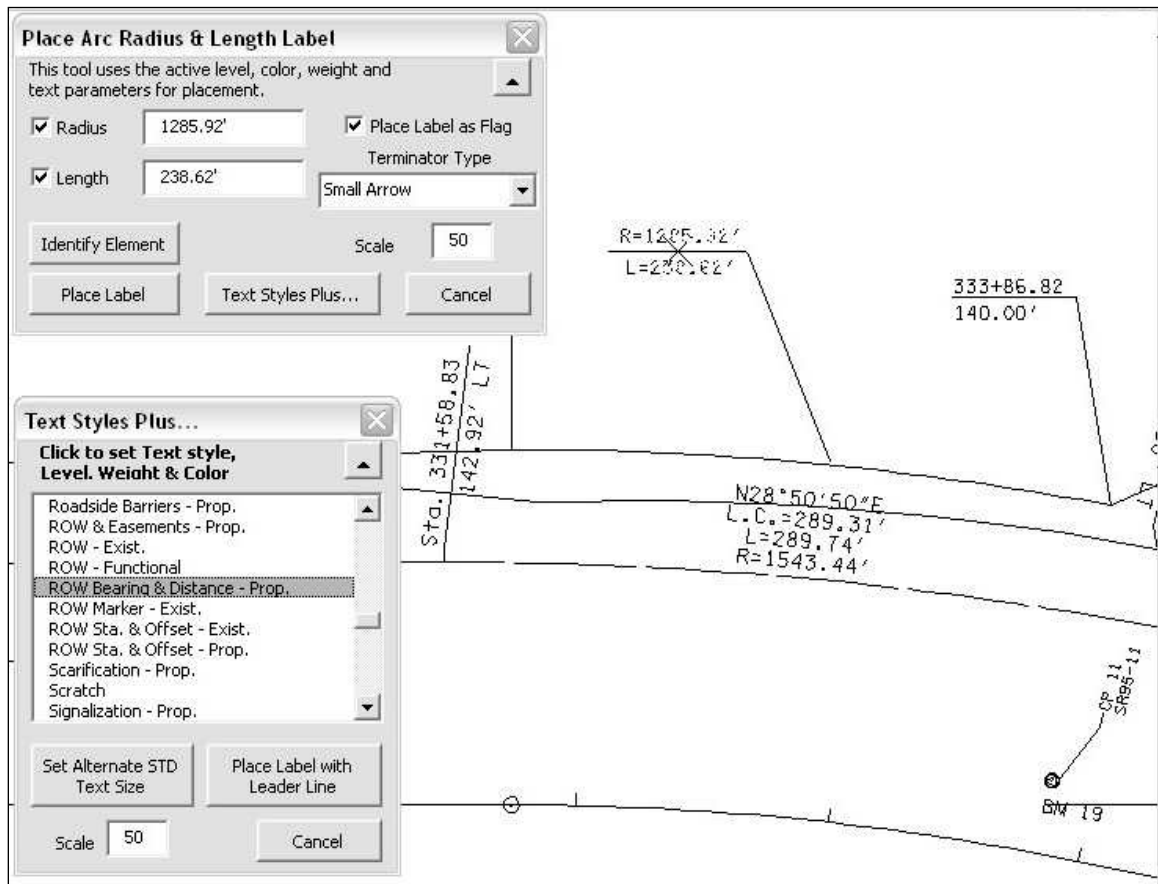
Label placement with Leader line as a Flag:

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:

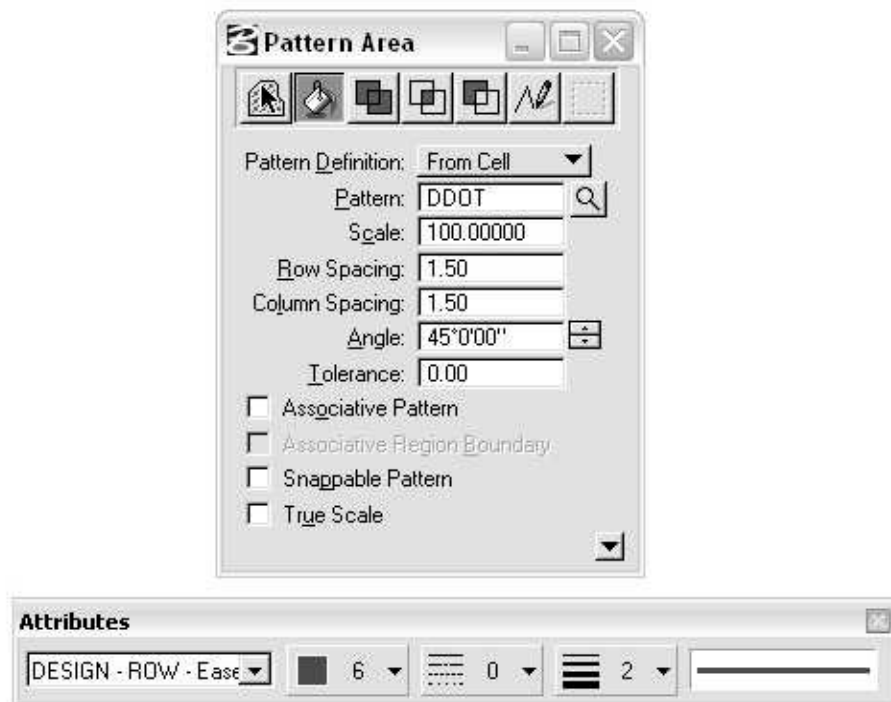
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

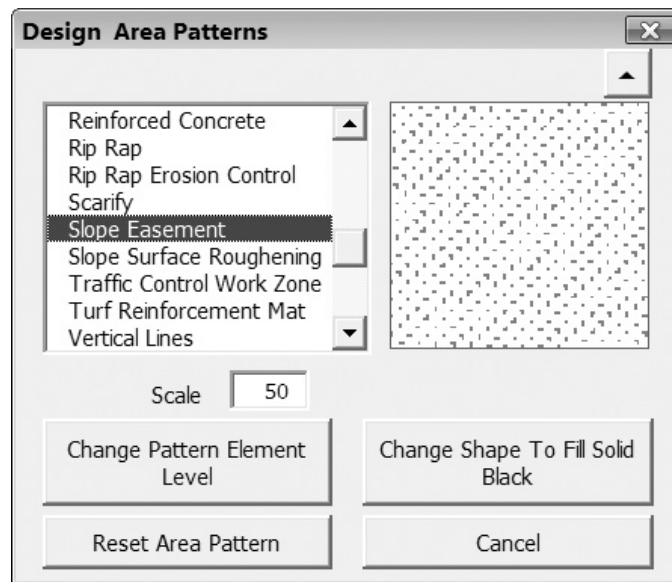
Fence method: Create a fence bounding the area to be patterned.

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.

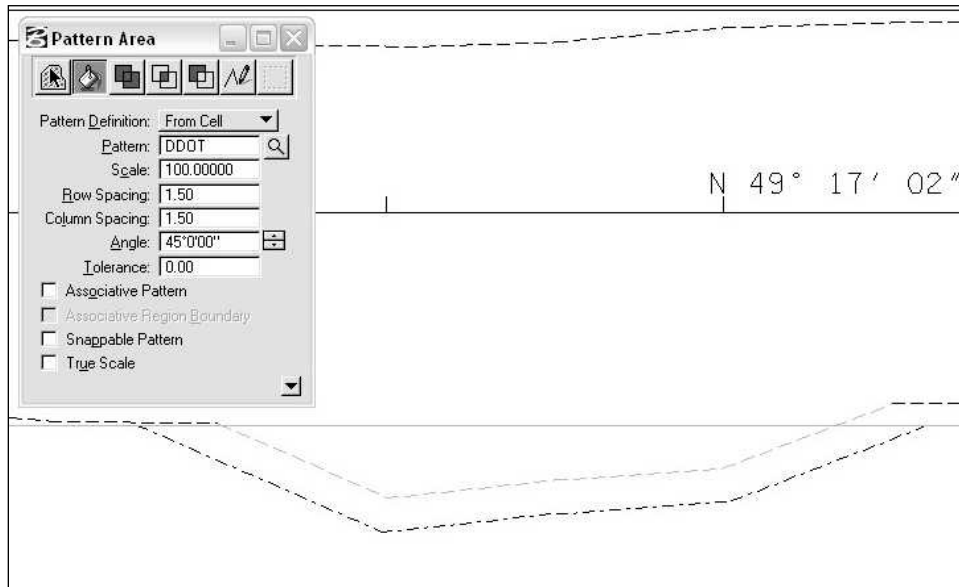


Or from the drop down menu in the **Design Area Patterns** dialog ...

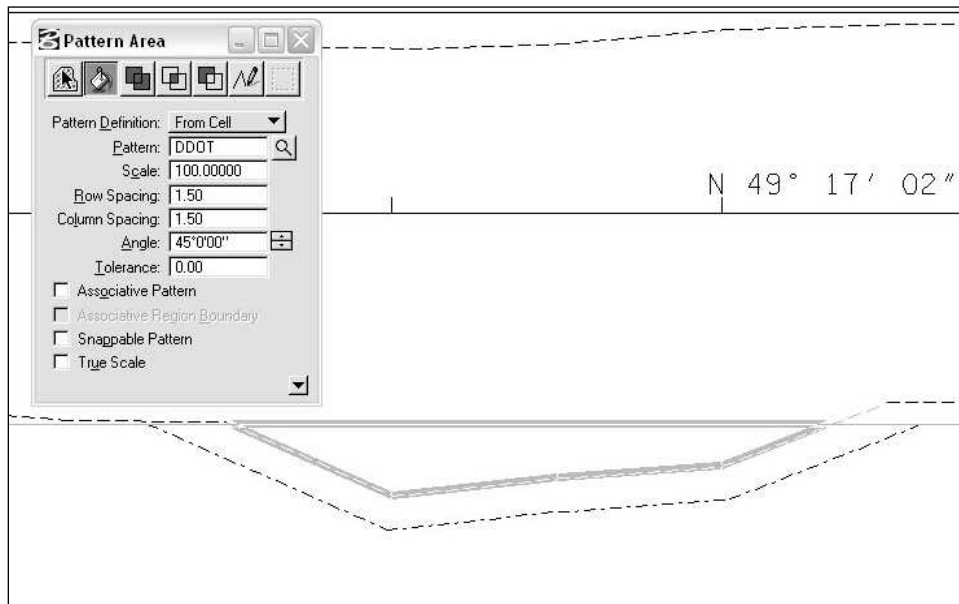


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

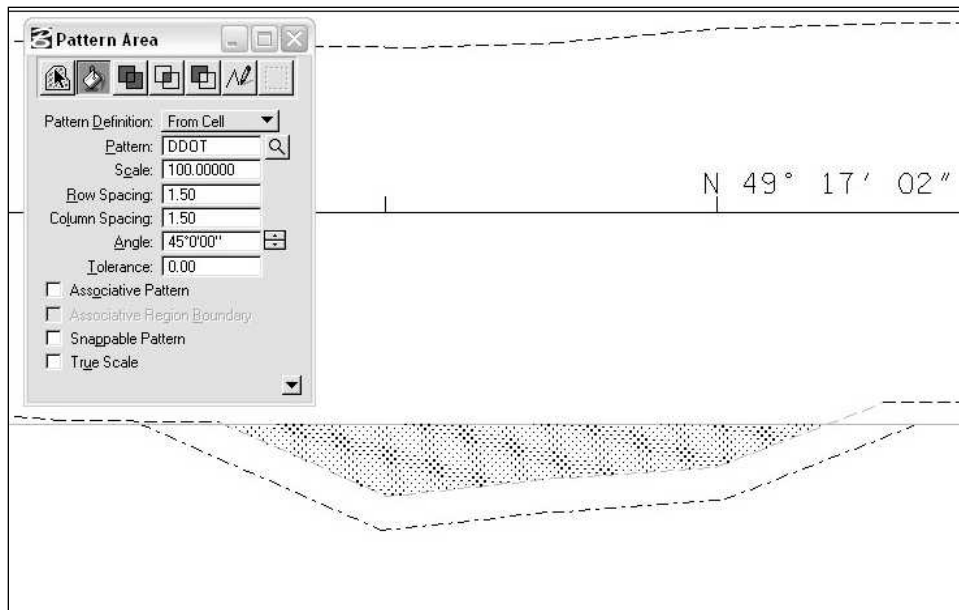
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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:

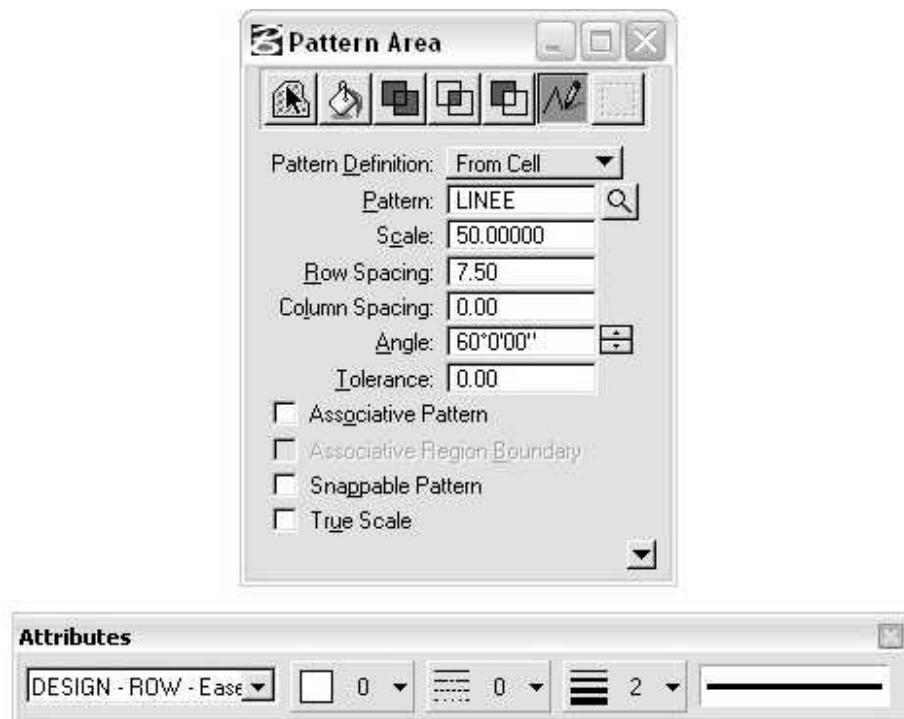
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

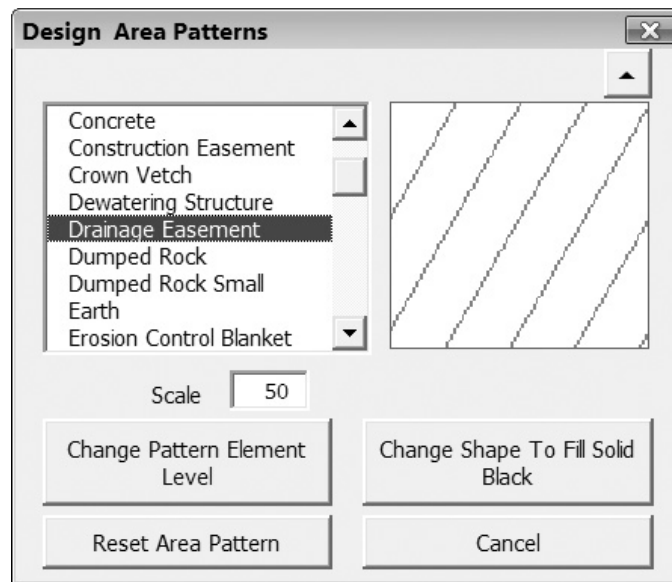
Fence method: Create a fence bounding the area to be patterned.

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.

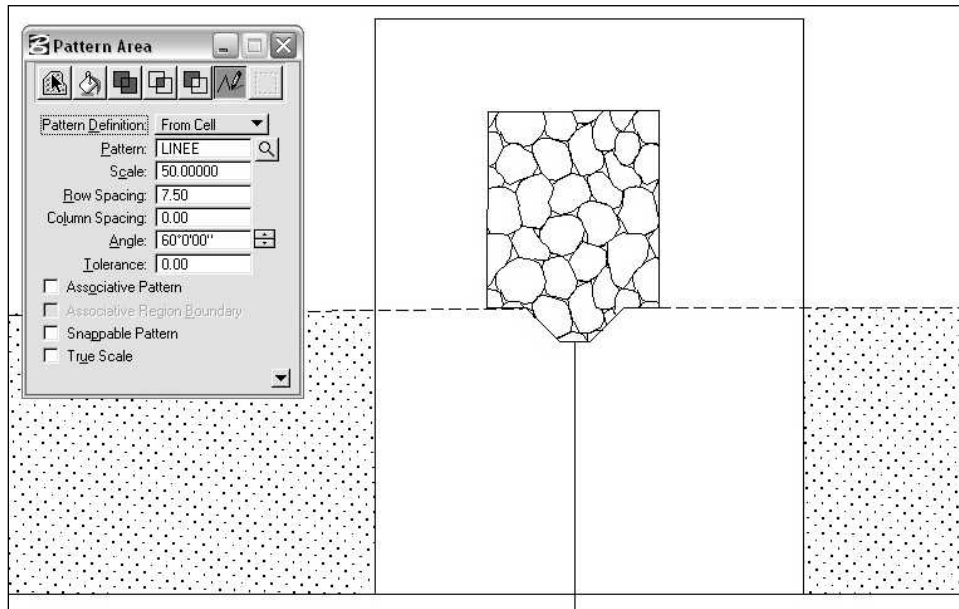


Or from the drop down menu in the **Design Area Patterns** dialog ...

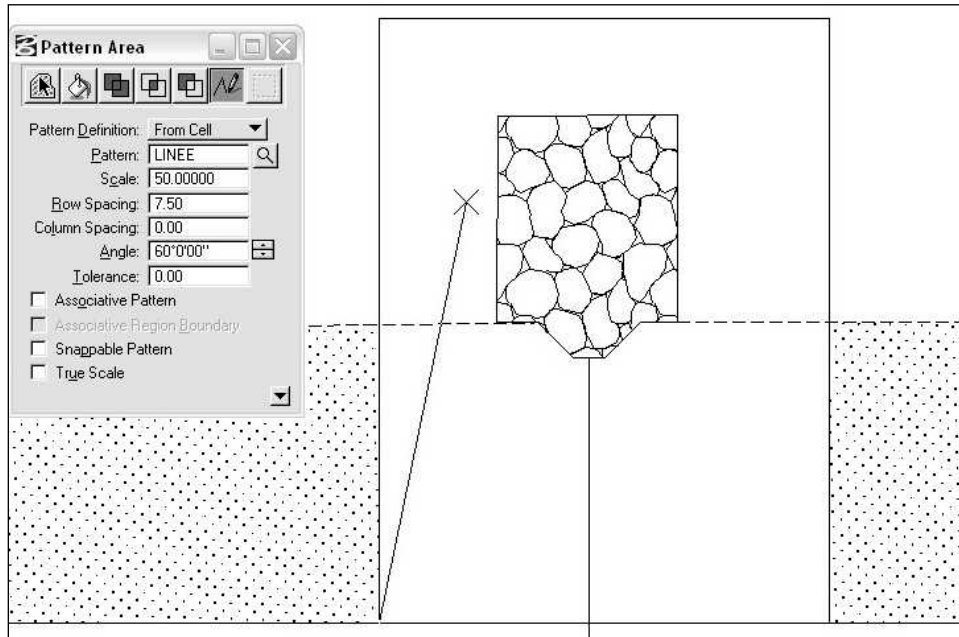


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Points**.

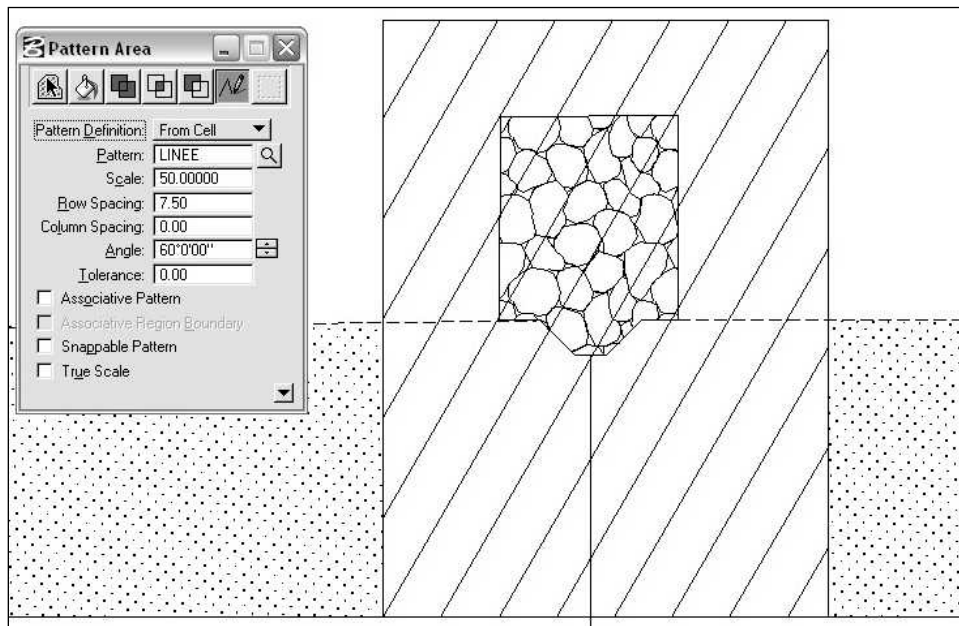
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Points, the user is prompted to **Enter shape vertex**.



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:

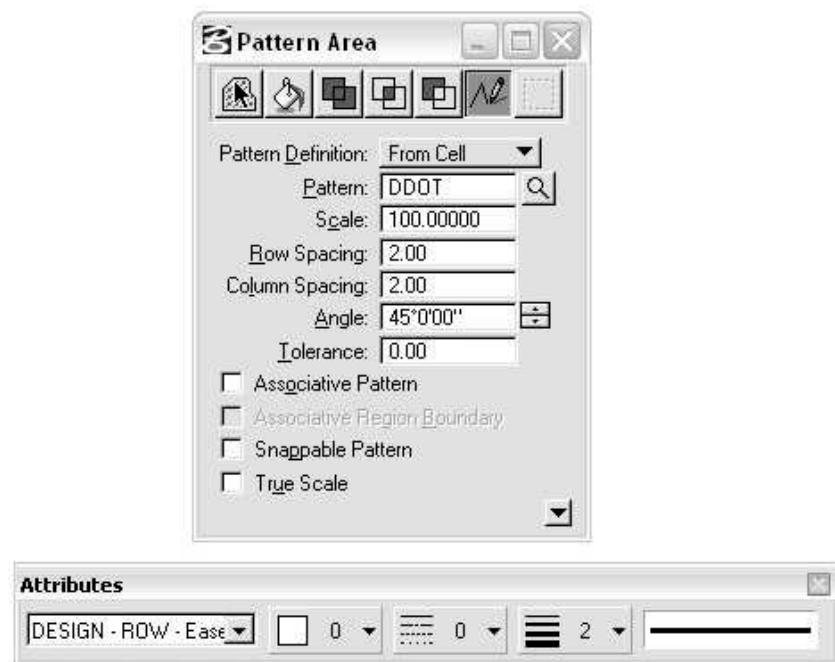
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

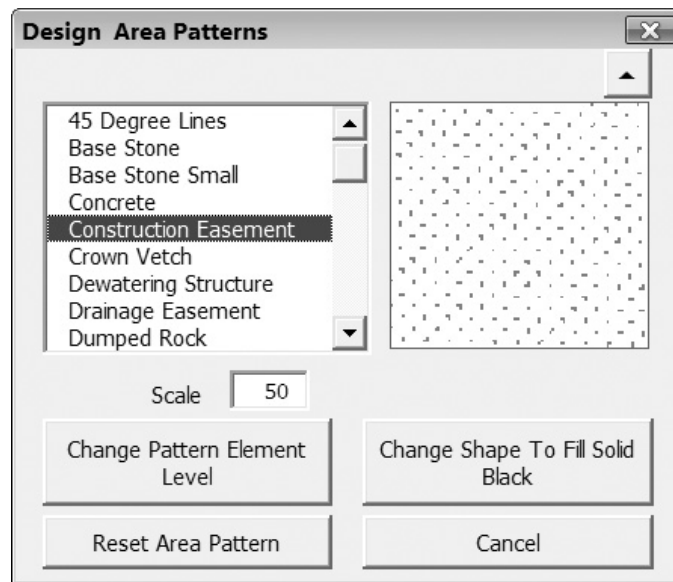
Fence method: Create a fence bounding the area to be patterned.

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.

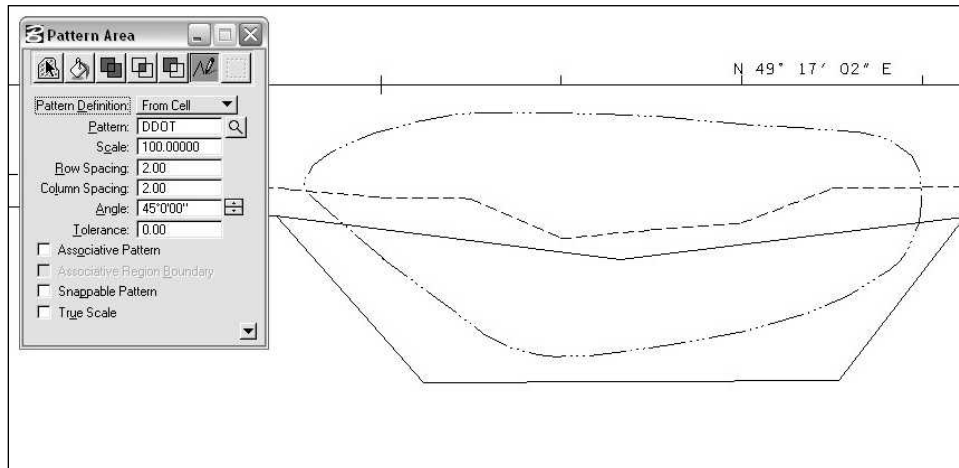


Or from the drop down menu in the **Design Area Patterns** dialog ...

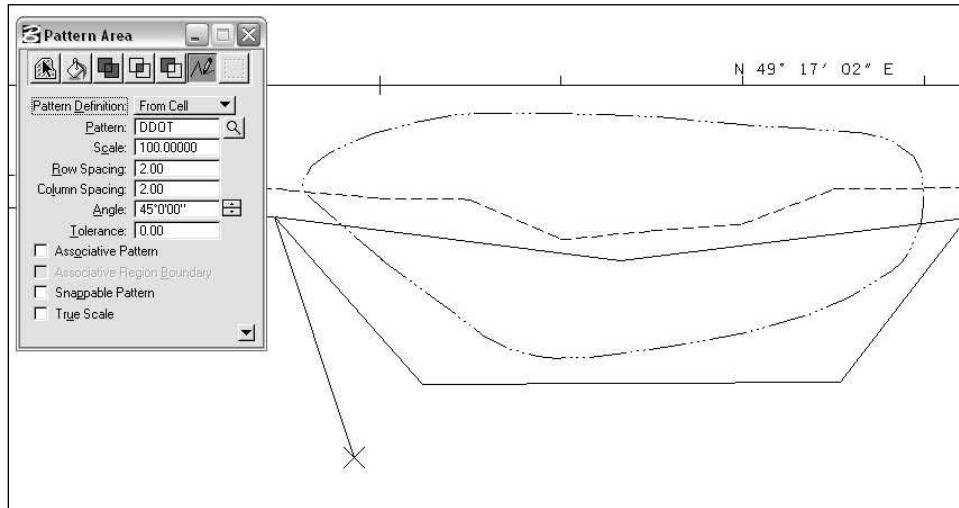


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Points**.

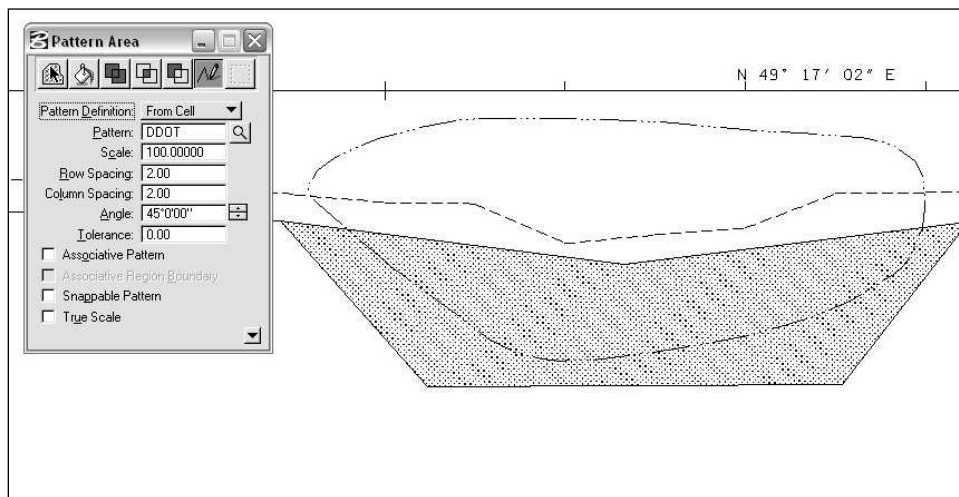
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Points, the user is prompted to **Enter shape vertex**.



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 Curb Ramp

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

MicroStation VBA Program: DrawCurbRamp.mvba

Description:

This program draws proposed curb 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 curb 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 the minimum of 6'6" 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 curb ramp line style so that later area calculations can be done with Geopak's D&C Manager quantity calculation tools. All curb 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 > Curb Ramps

or by using the keyin

vba run [DrawCurbRamp]CRamp.main

Special Requirements:

Curb lines must be present in the DGN file. The center of the curb 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 **Curb Ramp**. The **Draw Curb Ramp** dialog appears.

The screenshot shows the 'Draw Curb Ramp (RP-H-3 to RP-H-9, RP-R-2)' dialog box. It contains the following controls:

- Ramp Type:** A dropdown menu set to 'Perpendicular'.
- Ramp Location:** A dropdown menu set to 'Radius Midpoint'.
- Ramp Width (4' Min.):** A text input field containing the value '4'.
- Sidewalk Width:** A text input field containing the value '5'.
- Ramp Landing Length (4' Min., 5' Preferred):** A text input field containing the value '4'.
- Grass Separator Width:** A text input field containing the value '0'.
- Roadway Curb Width (Inches):** A text input field containing the value '6'.
- Match Parallel Ramps to Sidewalk Width:** A checked checkbox.
- Set Perp. Landing Beginning to SW if > Min.:** A checked checkbox.
- Include Leader Line with Text Label:** An unchecked checkbox.
- Buttons:** 'Draw Curb Ramp' (left), 'Cancel' (right), and a close button (top right).

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 curb 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 6' 6" 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.

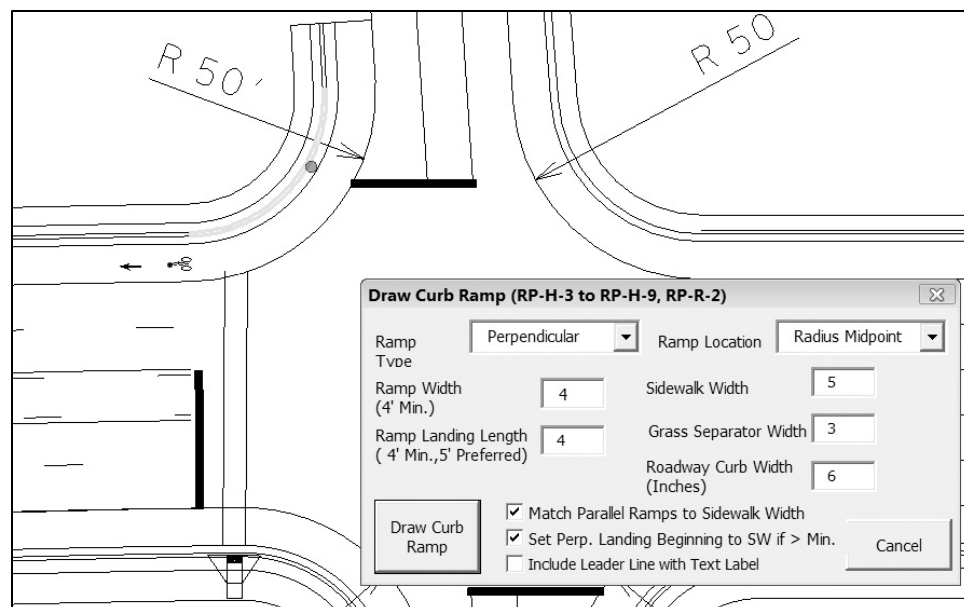
Depending on the curb ramp type and location, the default values for **Ramp Width & Ramp Landing Width** as well as the steps required for placement will vary. Listed below are the additional steps the user goes through to place the various types/locations of proposed curb ramps.

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**.

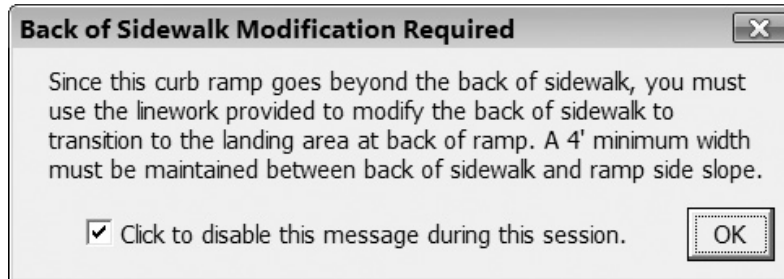
Adjust the values for **Ramp Width & Ramp Landing Length** as needed. Minimum values from the standard roadway drawings are specified by default. A notation of N/A indicates that the value is non-applicable for that ramp type.

Step 4. Click on the **Draw Curb 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.

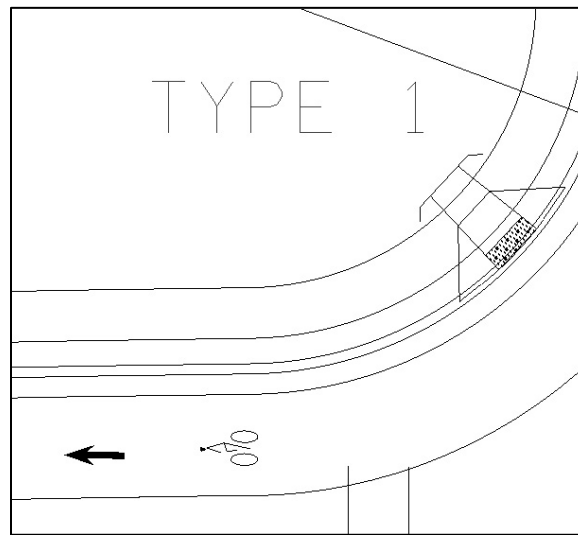


When placing a curb ramp at the radius midpoint, the program gets everything it needs for placement from the arc which was identified and the ramp is immediately drawn in.

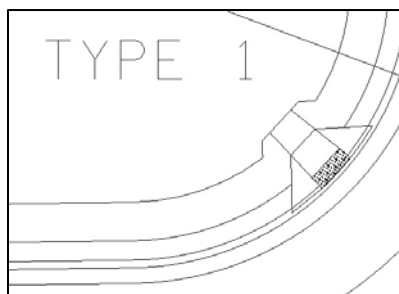
If a perpendicular curb ramp is placed which goes beyond the back edge of the sidewalk then the following warning message is given. When this situation occurs, the program adds sidewalk lines at the back of the ramp for use in adjusting the sidewalk. To prevent this message from coming up every time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



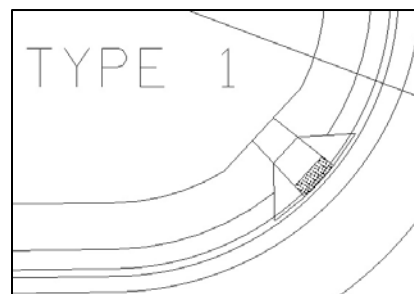
Step 5. The user is then prompted to **Identify Location** for placement of the curb ramp type text label. Data point to place the label. If the option for a leader line was turned on then the user is also prompted to identify the begin and end locations for the leader.



Step 6. The final step for perpendicular curb 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

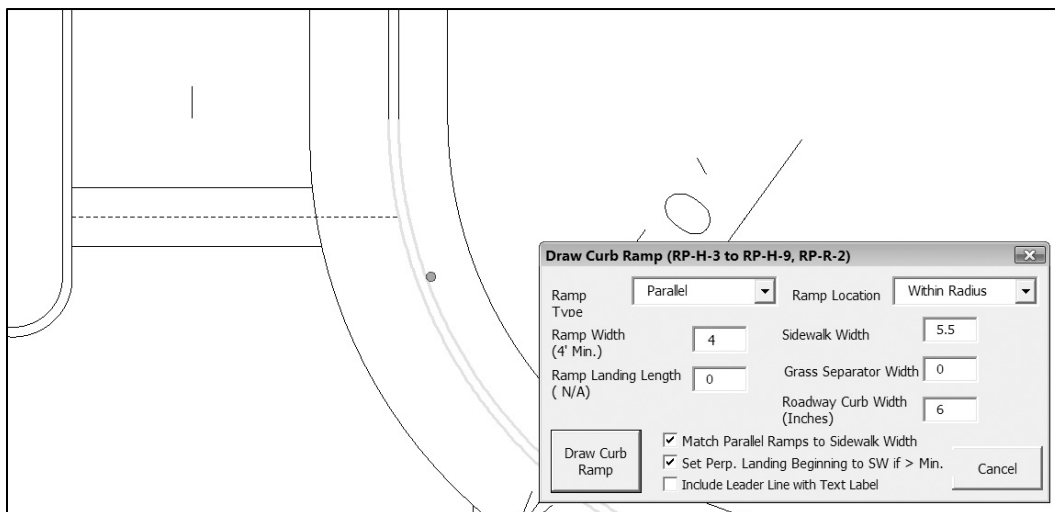
Usage: Perpendicular or Parallel within radius

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

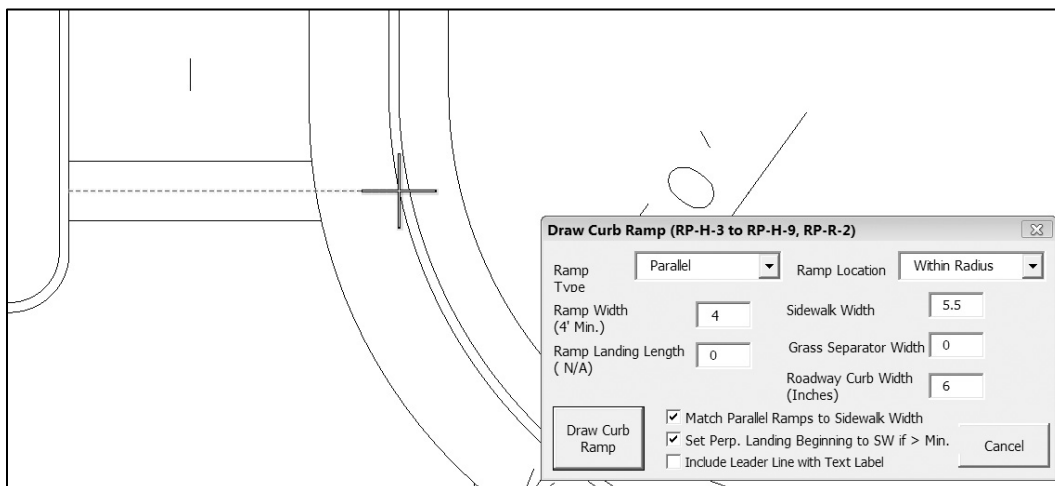
This location option is for use on any radius where the preferred midpoint or radius end locations are not workable. **You will need to locate the curb ramp's center point at the curb line prior to placing the ramp.**

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.

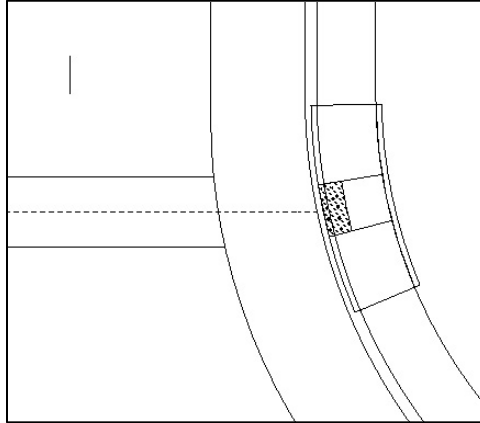
Step 4. Click on the **Draw Curb Ramp** command button. The user is prompted to **Identify curb arc**. Data point anywhere on the radius curb arc. Once identified, data point to accept.



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 curb ramp.

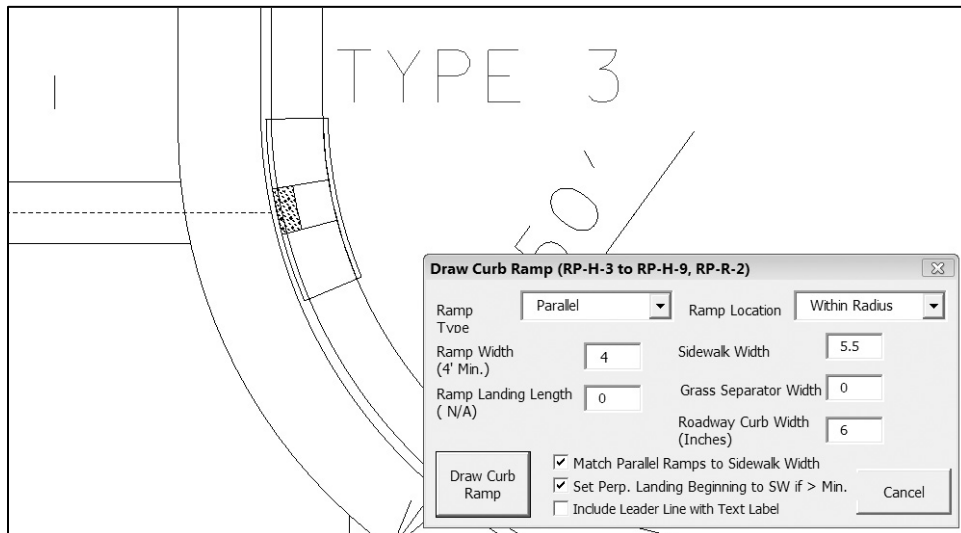


When the ramp center point is given, the curb ramp is drawn in.



If a perpendicular curb 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 curb 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.



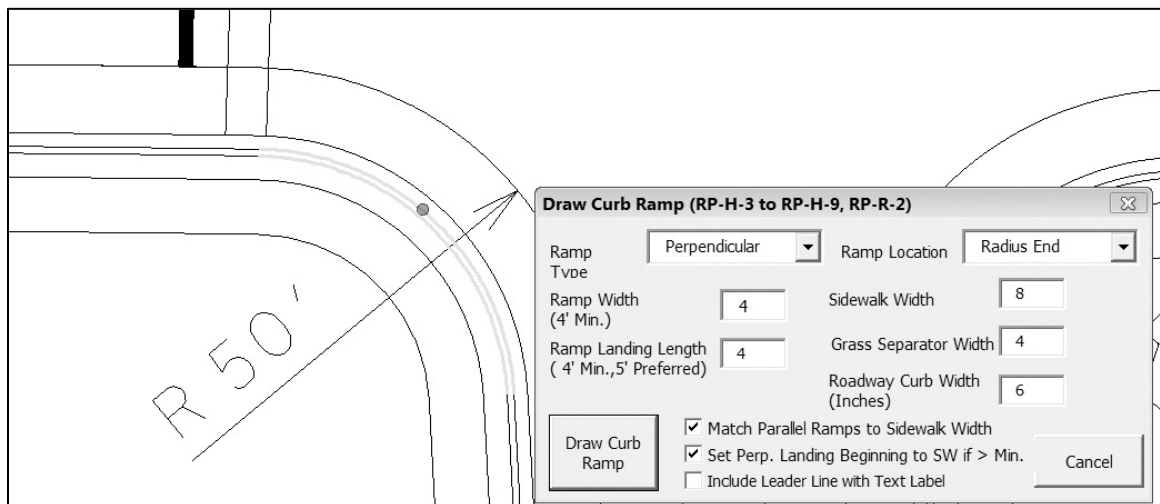
Step 7. The final step for perpendicular curb ramps would be to clean up the sidewalk lines on the inside if a grass separator is specified and on the outside if the ramp extends past the back of sidewalk. Use regular MicroStation graphics commands to make these adjustments.

Usage: Perpendicular or Parallel at radius end

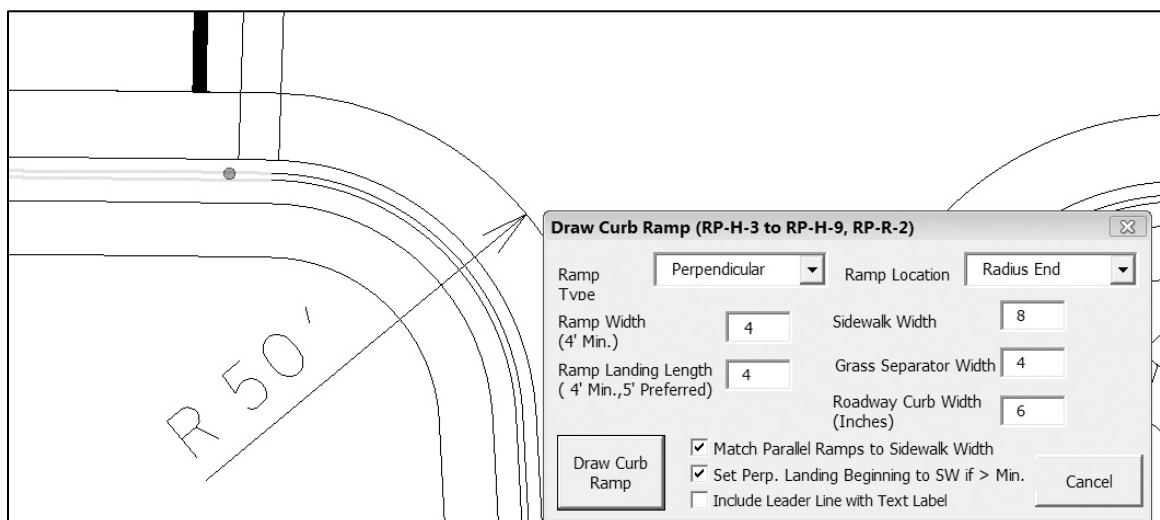
Step 3. Make your final settings on the dialog. Set the Ramp Type to **Perpendicular** or **Parallel** and the Ramp Location to **Radius End**.

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.

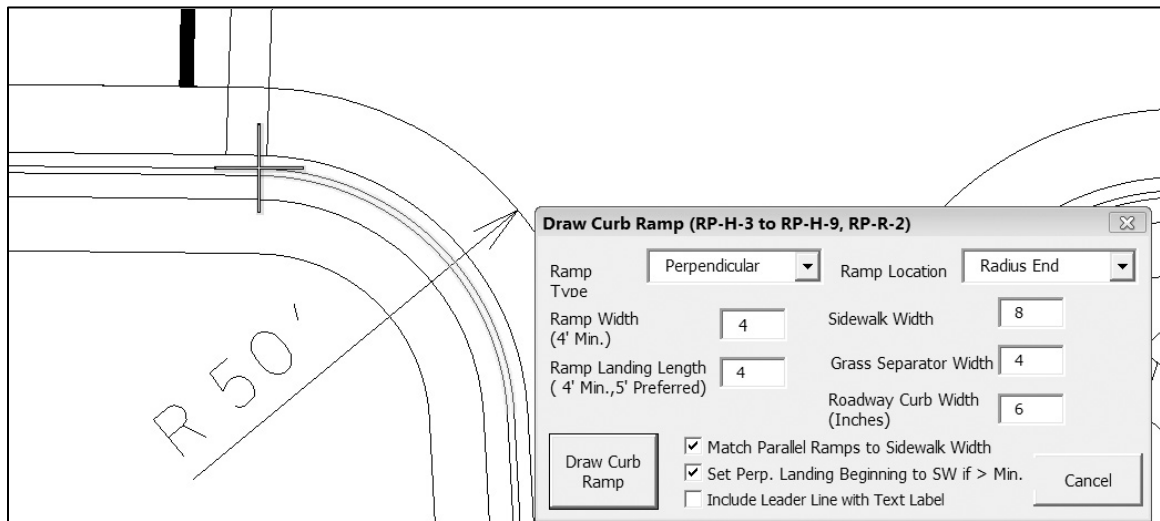
Step 4. Click on the **Draw Curb Ramp** command button. The user is prompted to **Identify curb arc**. Data point anywhere on the radius curb arc. Once identified, data point to accept.



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.



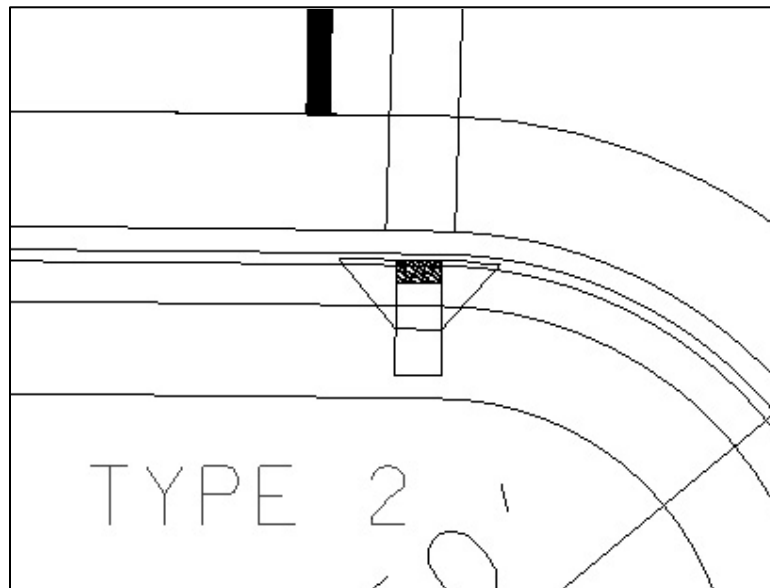
Step 6. After identifying the curbs, the user is prompted to **Snap to end of curb radius**. Snap and data point at the radius end location for the curb ramp.



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

If a perpendicular curb 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 curb 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 curb 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.

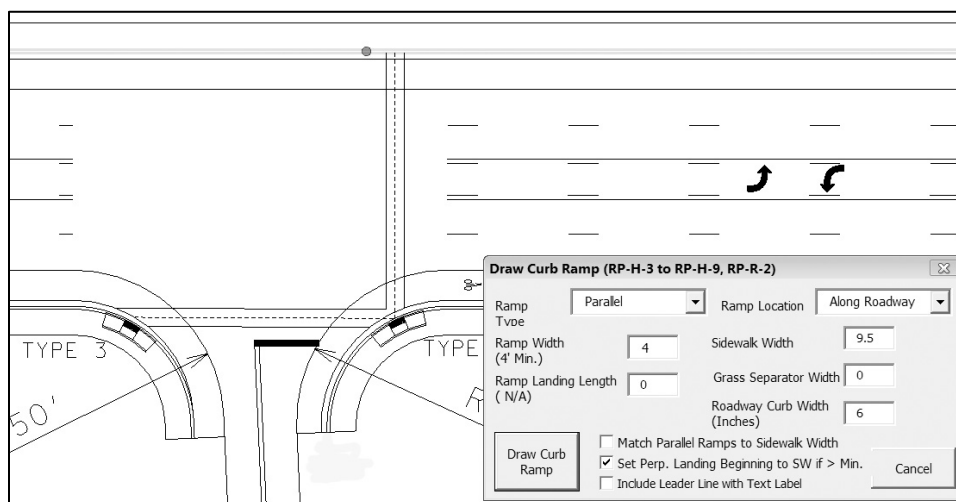
Usage: Perpendicular or Parallel along roadway

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 curb ramp needs to be placed along the roadway where no radius is present. **You will need to locate the curb ramp’s center point at the curb line prior to placing the ramp.**

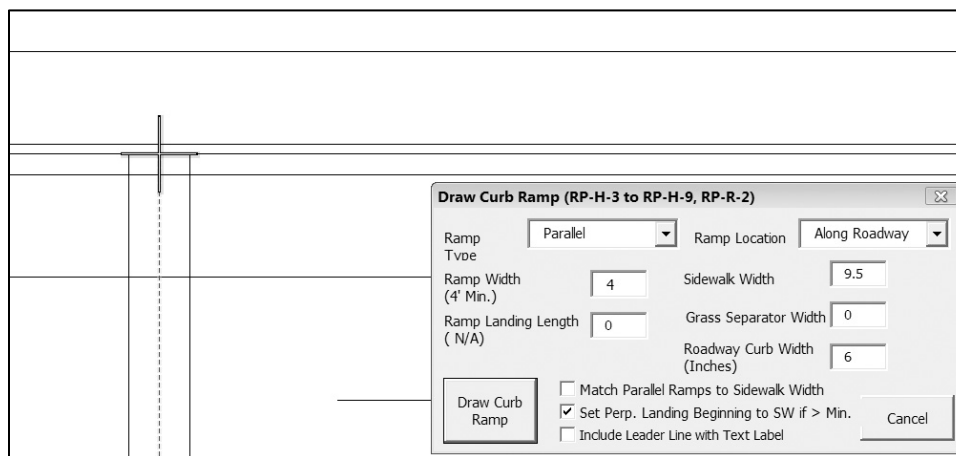
Adjust the values for **Ramp Width & Ramp Landing Length** as needed. Minimum values from the standard roadway drawings are specified by default. A notation of **N/A** indicates that the value is non-applicable for that ramp type.

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

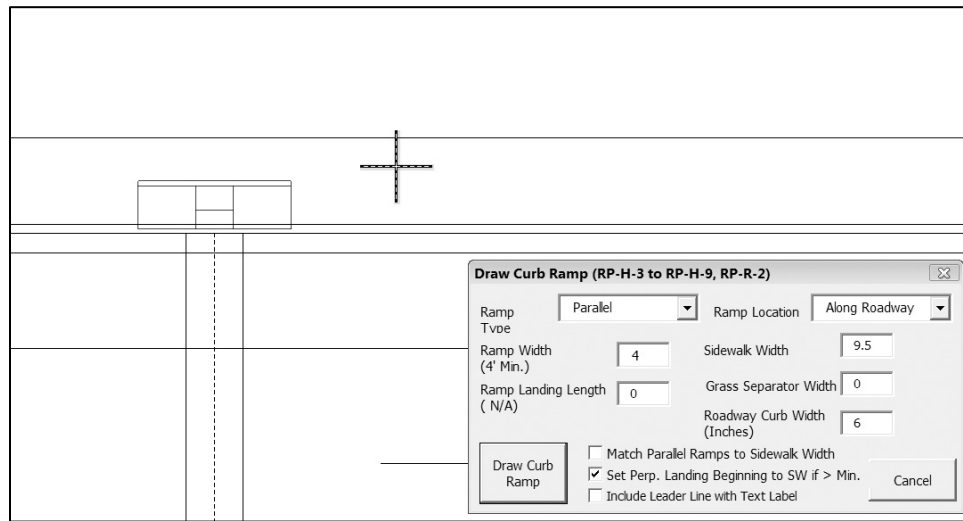


Note that in this example, the option to **Match Parallel Ramps to Sidewalk Width** is turned off. The sidewalk is greater than 9' wide and this will let the ramp be placed at the minimum distance of 5' across the sidewalk.

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 curb ramp.



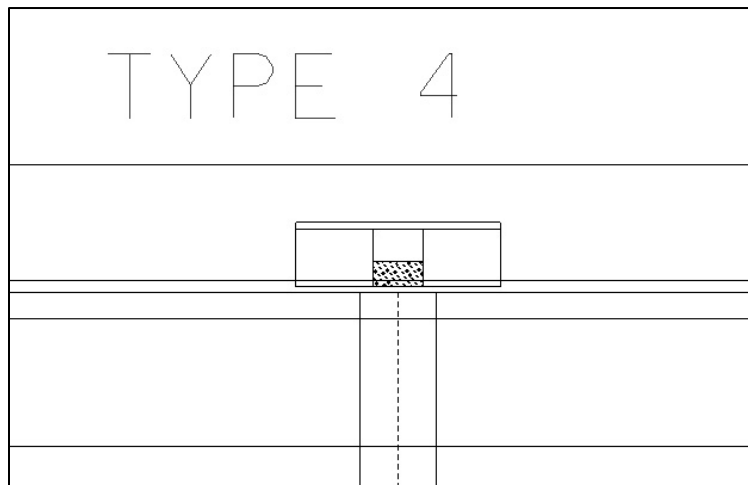
Step 6. After identifying the center point, the user is prompted to **Identify side for placement**. The curb ramp is shown dynamically to help the user set the side where it should be placed. Data point to set the location.



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

If a perpendicular curb 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 curb 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 curb 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.

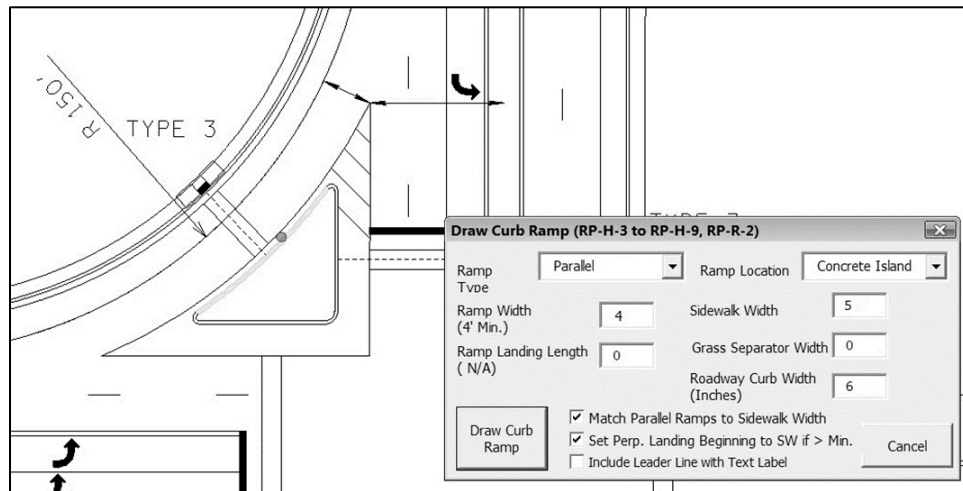
Usage: Concrete Island

- 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 curb ramp and is ignored.

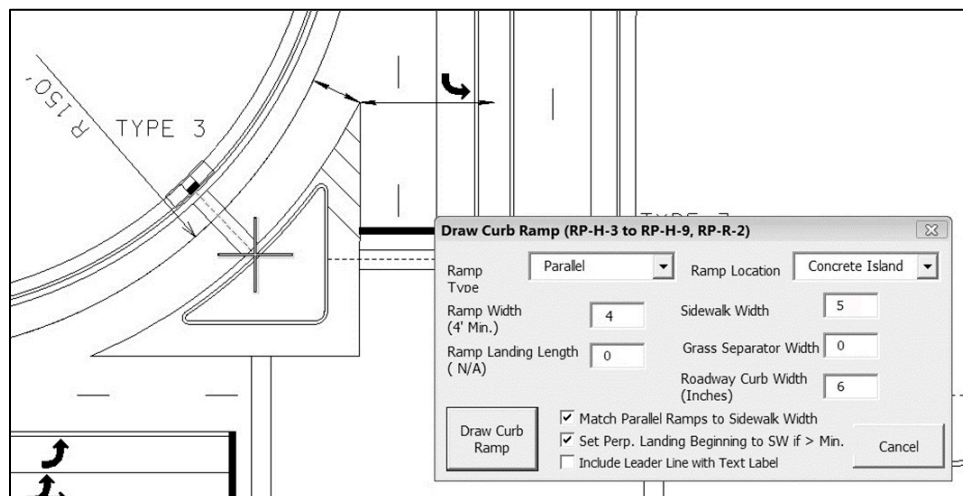
You will need to locate the curb ramp's center point at the curb line prior to placing the ramp.

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

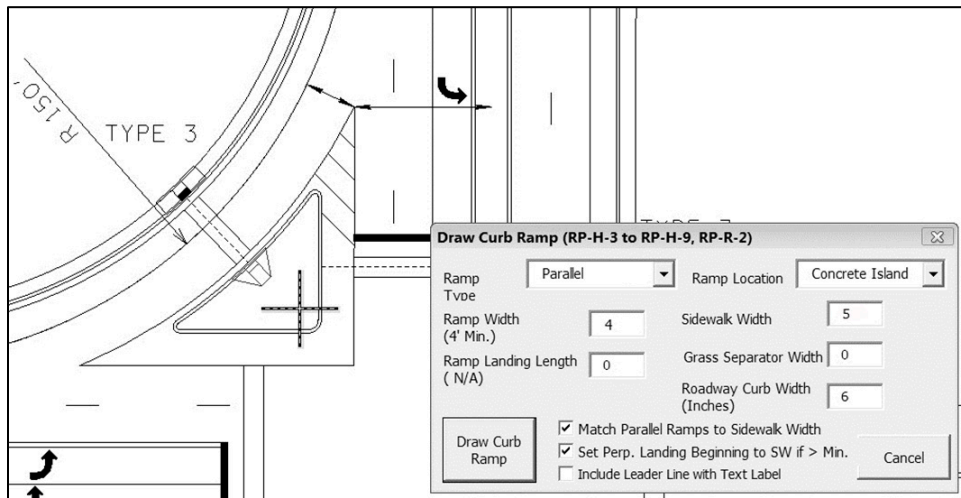
- Step 4.** Click on the **Draw Curb Ramp** command button. The user is prompted to **Identify curb element**. Data point on the curb element near the location for the curb ramp. Once identified, data point to accept.



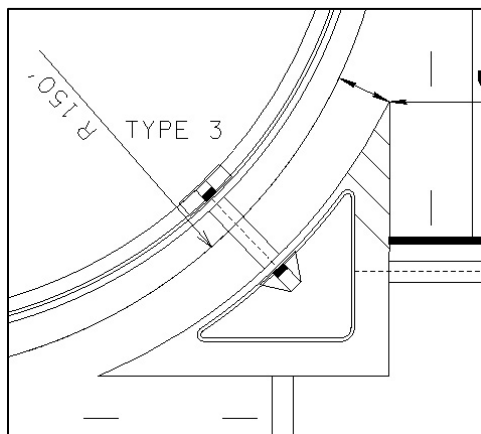
- Step 5.** The user is then prompted to **Identify Point at Curb for Ramp Center**. Snap and data point at the center location for the curb ramp.



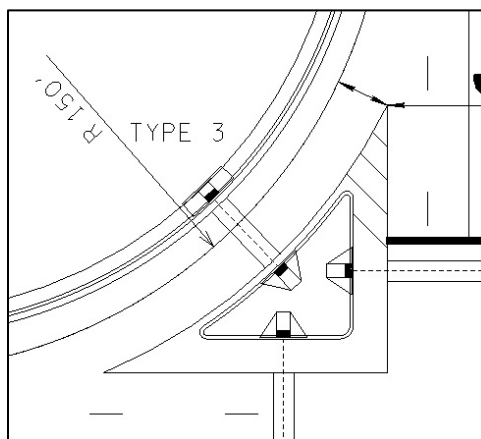
Step 6. After identifying the center point, the user is prompted to **Identify side for placement**. The curb ramp is shown dynamically to help the user set the side where it should be placed. Data point to set the location.



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



This curb 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 curb ramps.



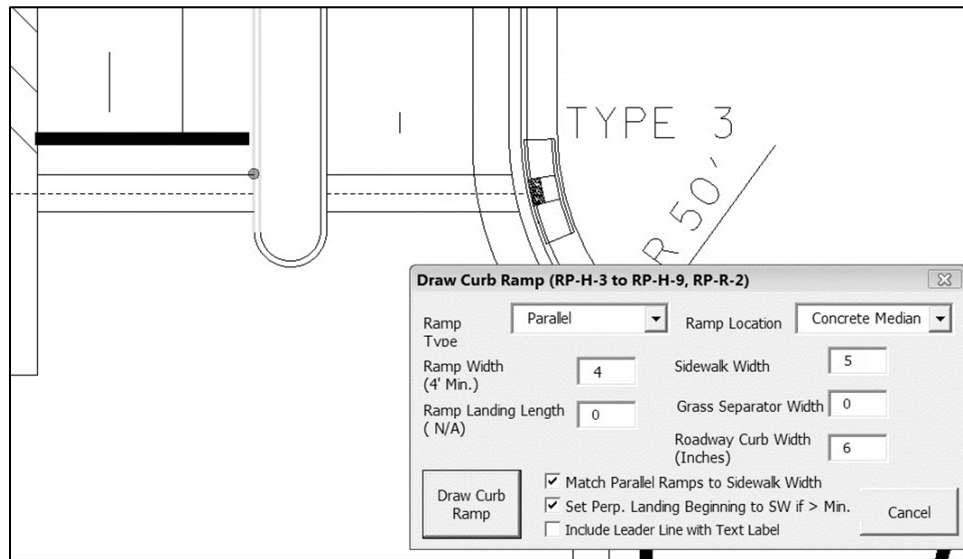
Usage: Concrete Median

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 curb ramp and is ignored.

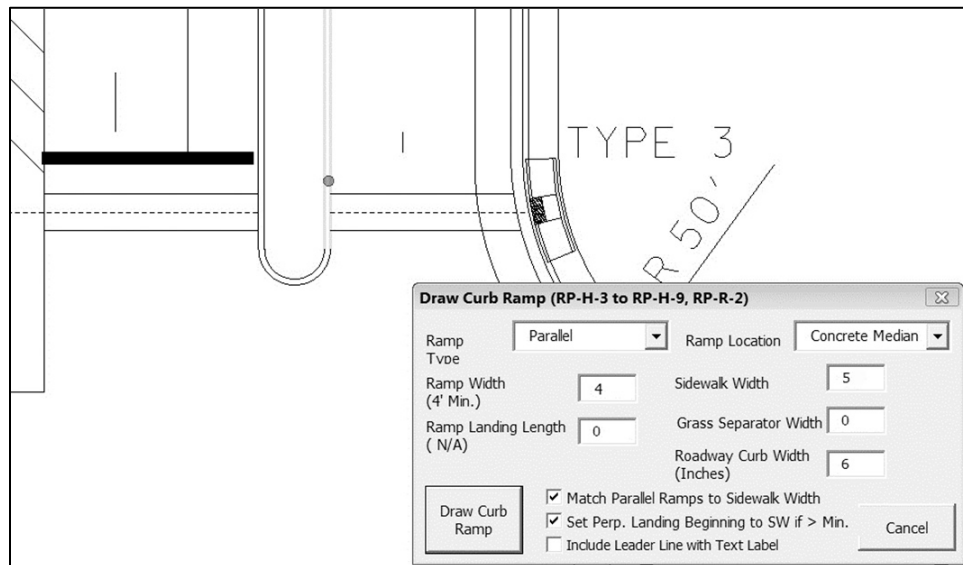
You will need to locate the curb ramp's center points at the median curb lines prior to placing the ramp.

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

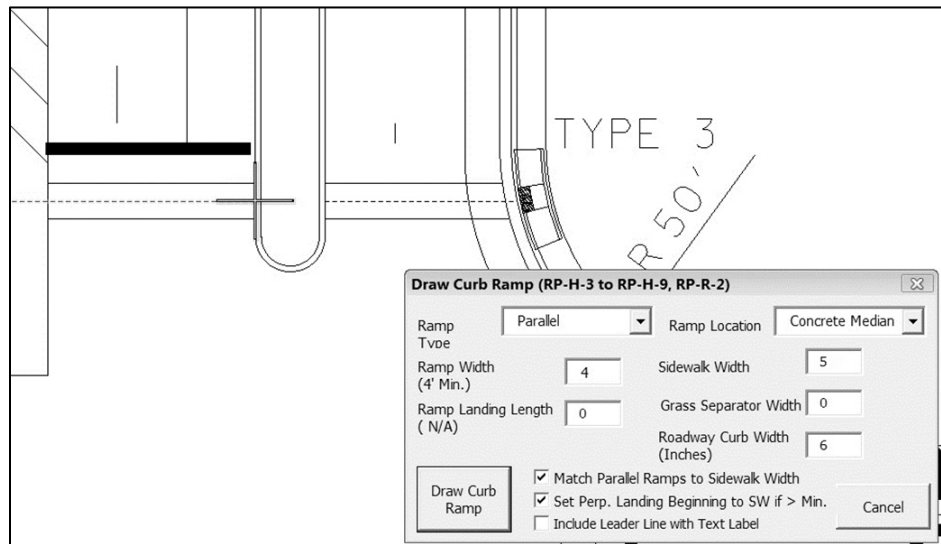
Step 4. Click on the **Draw Curb Ramp** command button. The user is prompted to **Identify median curb on one side**. Data point on the median curb at either side of the median. Once identified, data point to accept.



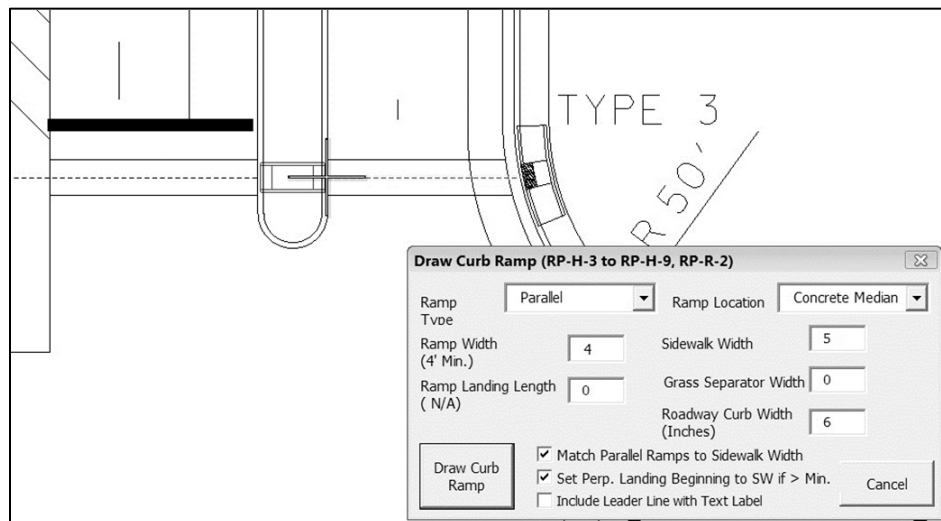
Step 5. The user is then prompted to **Identify median curb on other side**. Data point on the median curb on the other side of the median. Once identified, data point to accept.



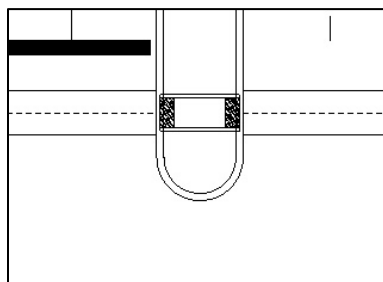
- Step 6.** After identifying the curbs, the user is prompted to **Identify Point at Curb for Ramp Begin.** Snap and data point at the center location for the curb ramp on the beginning side.



- 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 curb ramp on the ending side. The curb ramp is shown dynamically to aide in placement.



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



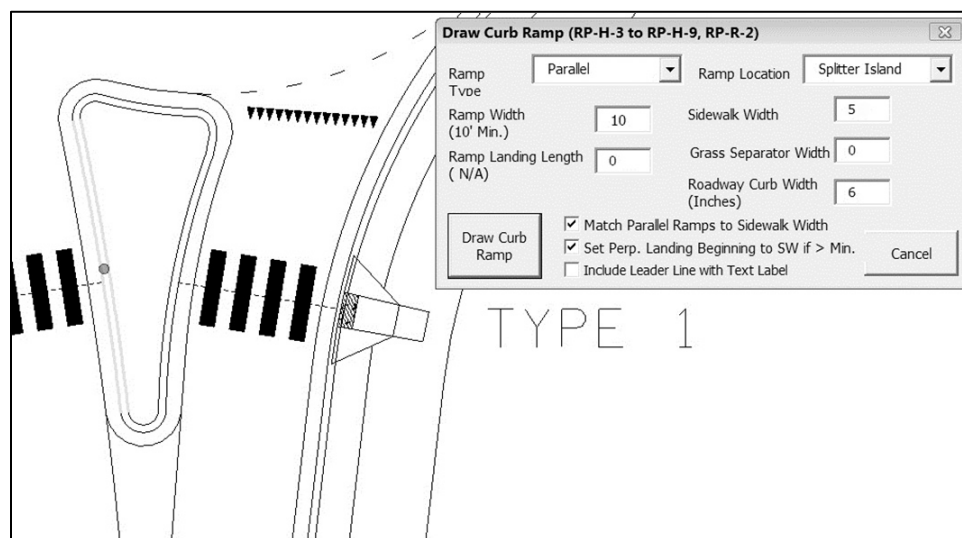
Usage: Splitter Island (Pedestrian Refuge Area)

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 curb ramp and is ignored.

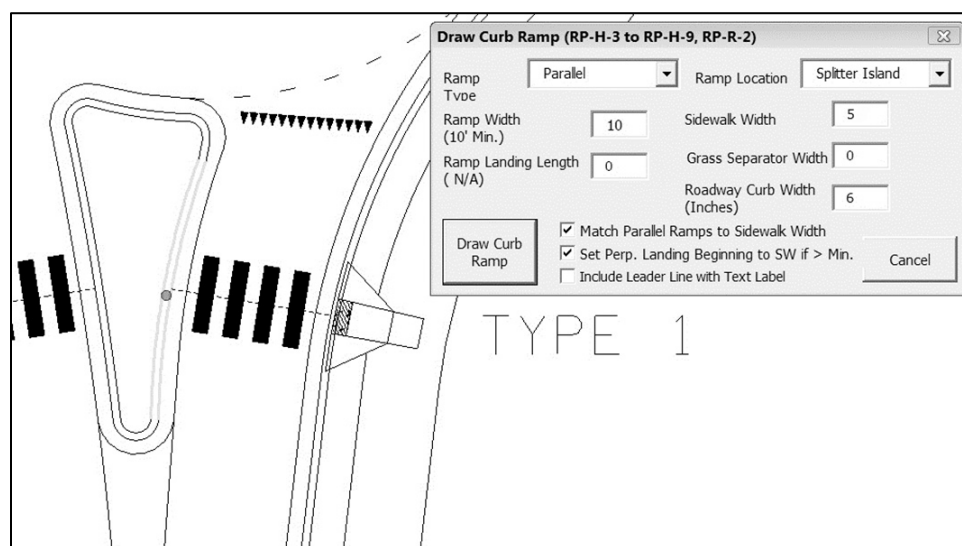
You will need to locate the pedestrian refuge area's center points at the splitter island curb lines prior to placing the ramp. There is a minimum offset of 20' from the roundabout to the edge of the crossing location. The minimum width of the ramp is 10' so the ramp center must be at least 25' from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

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

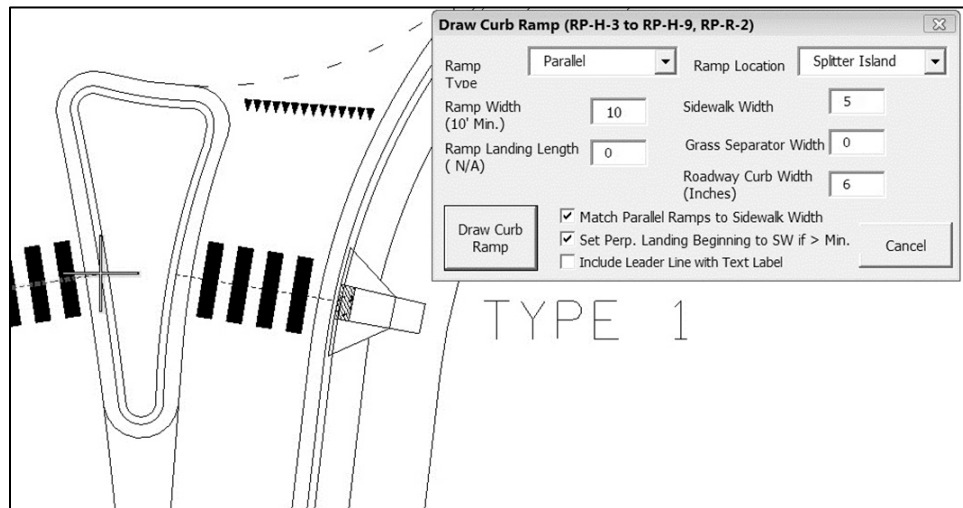
Step 4. Click on the **Draw Curb Ramp** command button. The user is prompted to **ID splitter island curb on one side**. Data point on the curb at either side of the island. Once identified, data point to accept.



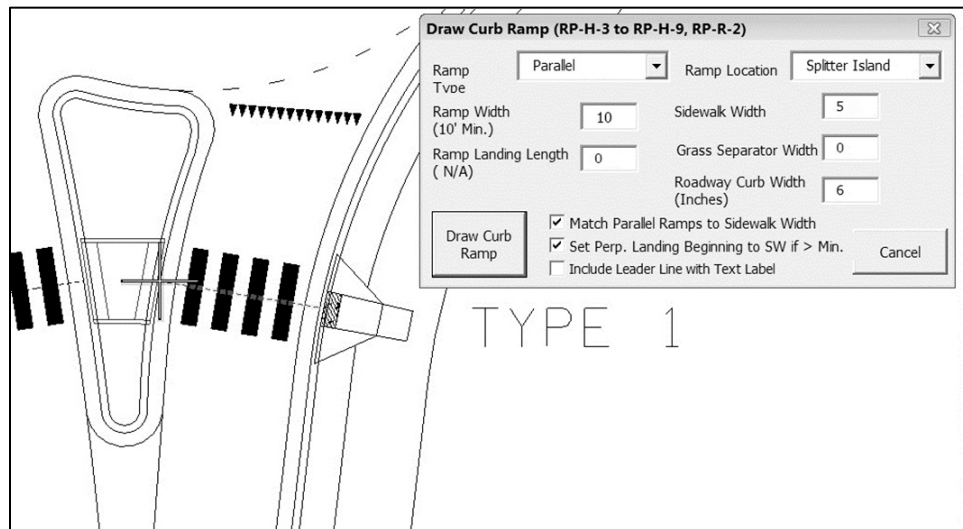
Step 5. The user is then prompted to **ID splitter island curb on other side**. Data point on the curb on the other side of the island. Once identified, data point to accept.



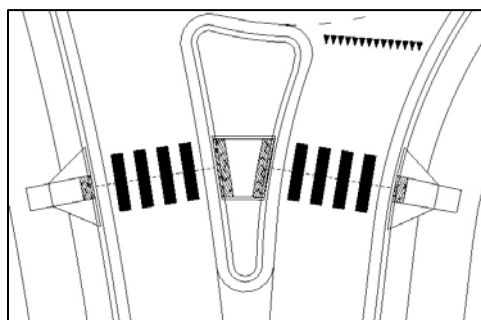
Step 6. After identifying the curbs, the user is prompted to **Identify Point at Curb for Ramp Begin**. Snap and data point at the center location for the ramp on the beginning side.



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 curb ramp is shown dynamically to aide in placement.



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



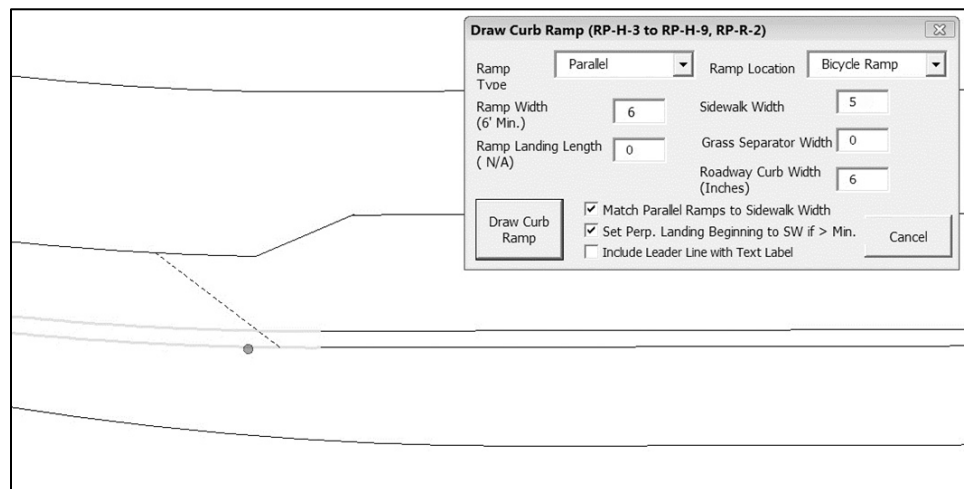
Usage: Bicycle Ramp

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 ignored.

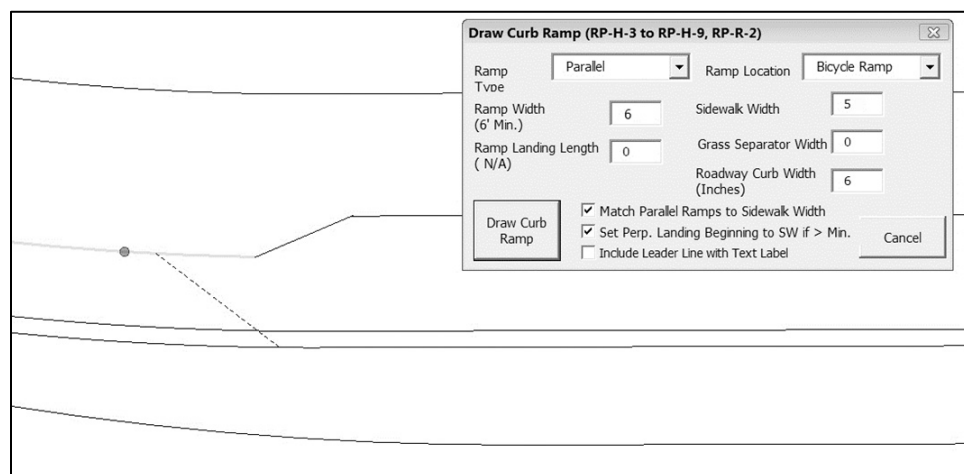
You will need to locate the bicycle ramp's center points at the roadway curb line and the sidewalk prior to placing the ramp.

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

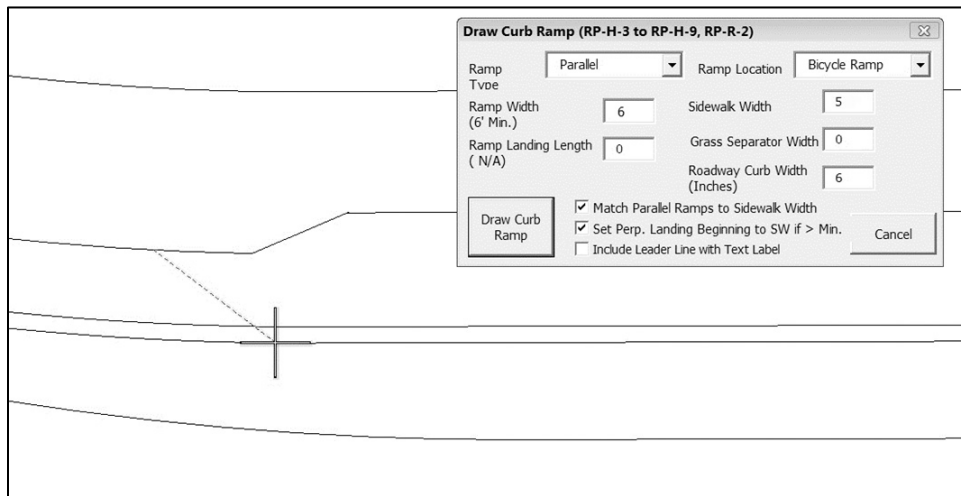
Step 4. Click on the **Draw Curb Ramp** command button. The user is prompted to **Identify curb at roadway**. Data point on the curb near the beginning of the bicycle ramp. Once identified, data point to accept.



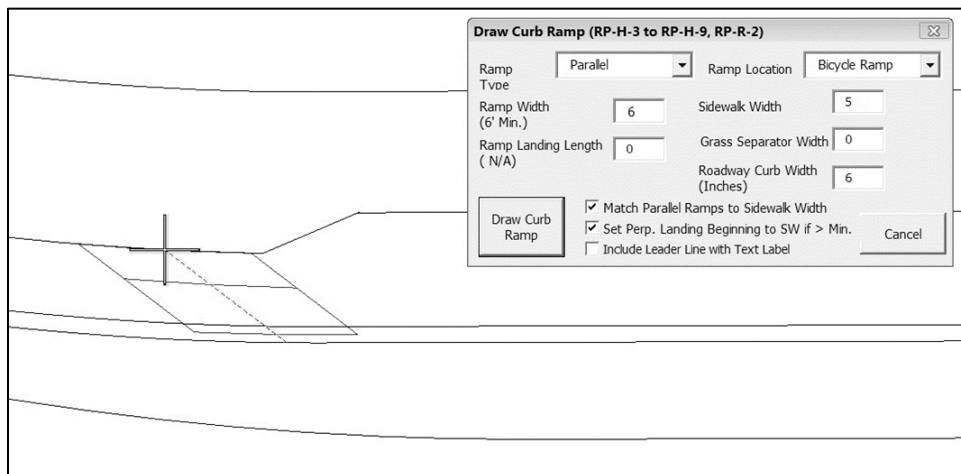
Step 5. The user is then prompted to **Identify sidewalk**. Data point on the edge of the sidewalk near the end of the bicycle ramp. Once identified, data point to accept.



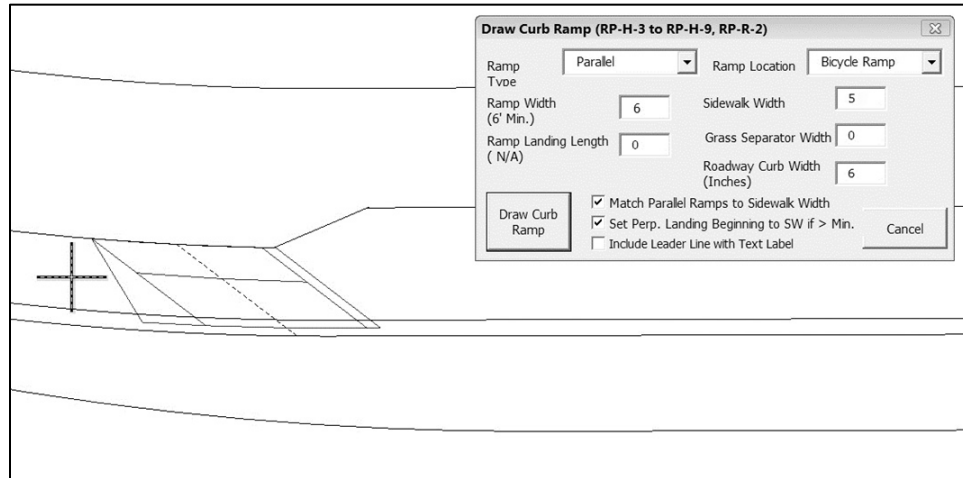
Step 6. The user is prompted to **Identify Point at Curb for Ramp Begin**. Snap and data point at the center location for the bicycle ramp beginning at the curb.



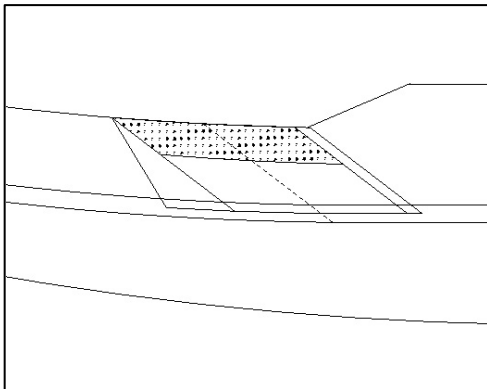
Step 7. The user is then prompted to **ID Point at Sidewalk for Ramp End & Angle**. Snap and data point at the center location for the bicycle ramp ending at the sidewalk. The ramp center portion is shown dynamically to aide in placement.



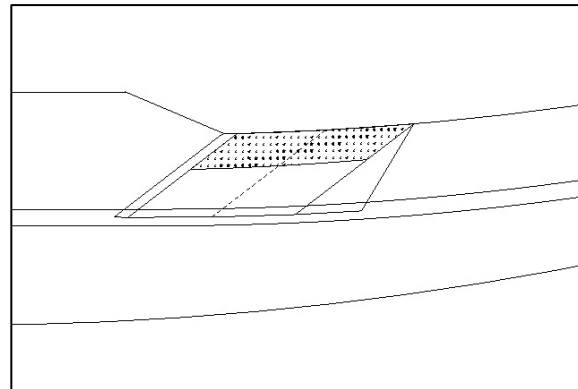
Step 8. The user is last prompted to **ID flare side, Entry (LT) or Exit (RT)**. This ramp type includes a concrete flare to the inside for transitioning to the sidewalk. The outside has a tapering curb to transition into the sidewalk. As indicated in the prompt, entry bicycle ramps will have the flare 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:

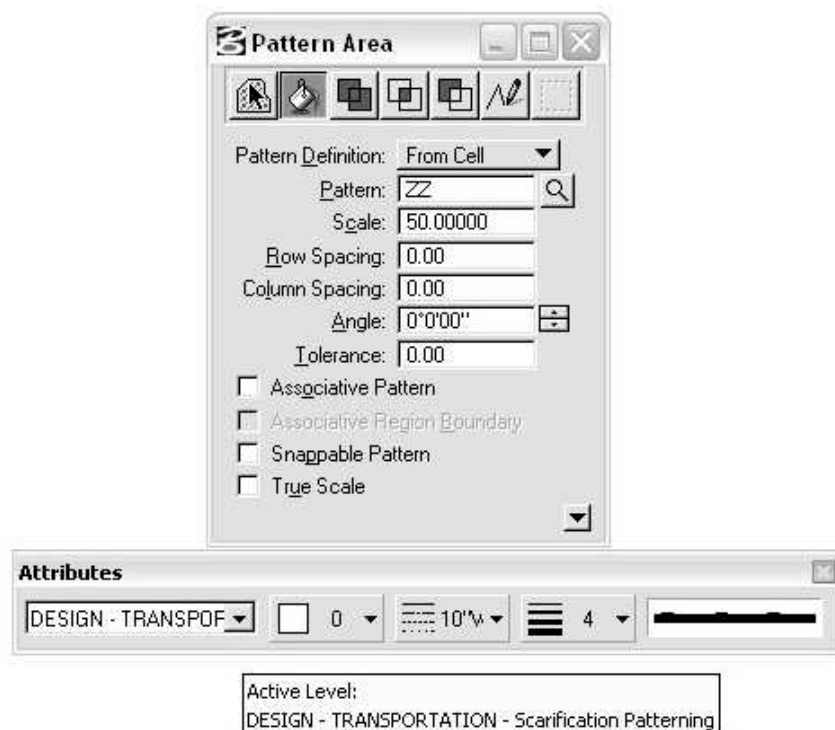
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

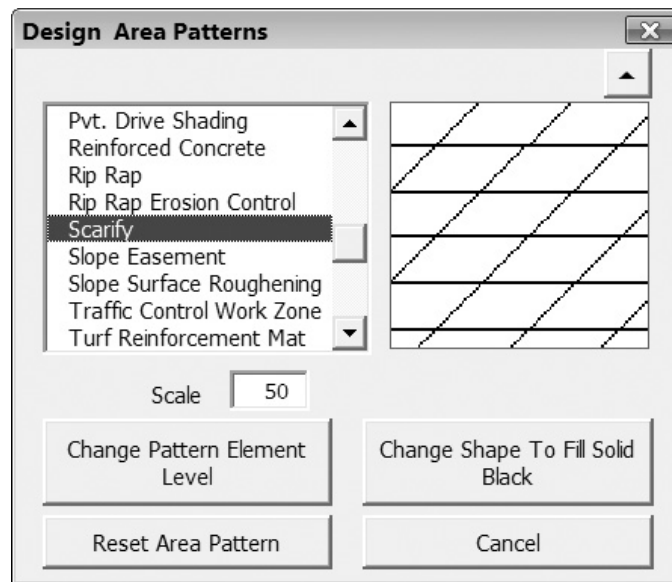
Fence method: Create a fence bounding the area to be patterned.

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.

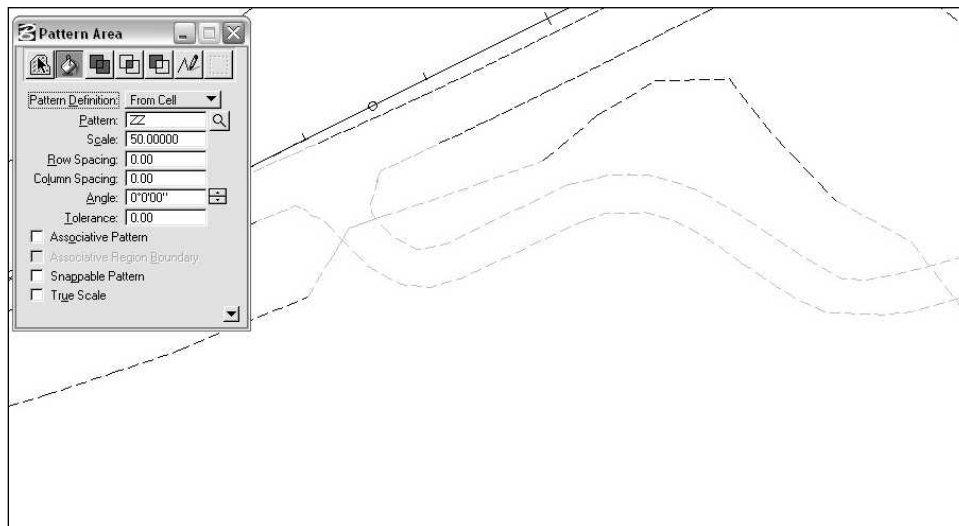


Or from the drop down menu in the **Design Area Patterns** dialog ...

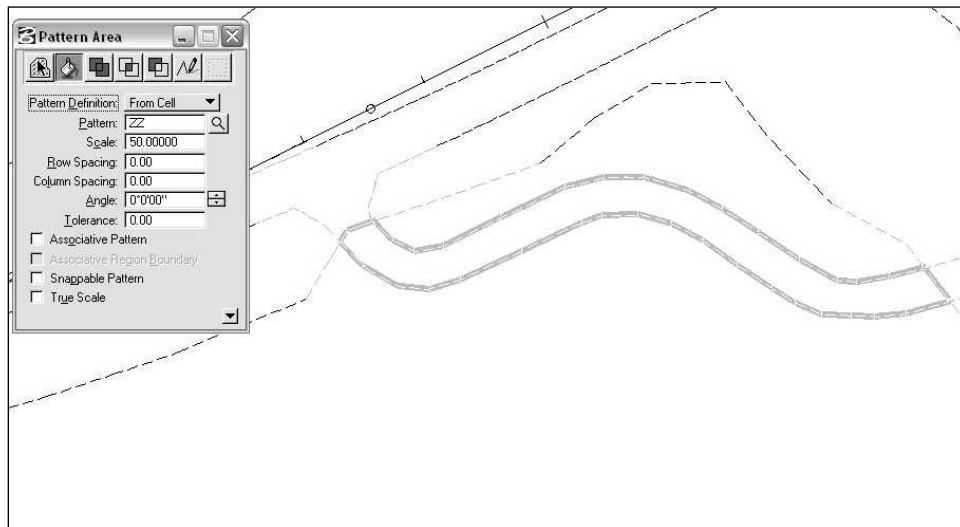


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

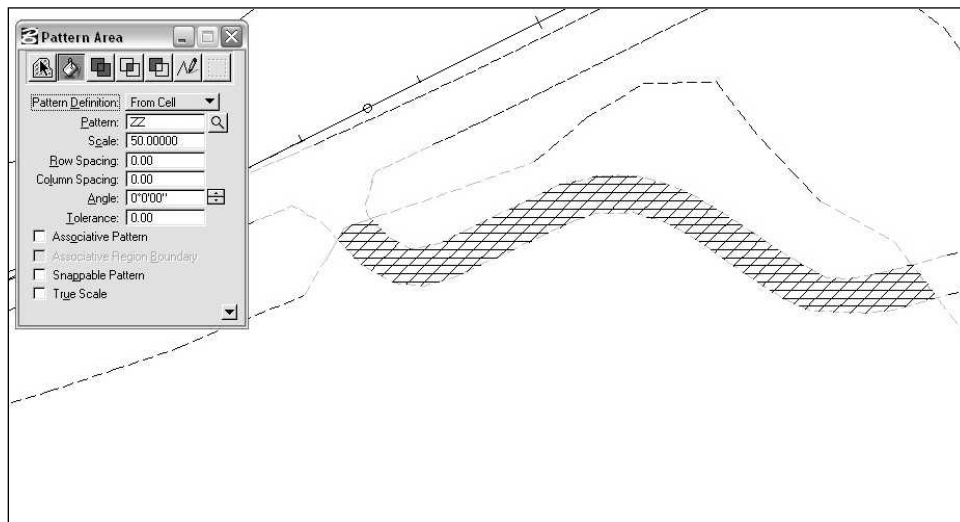
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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:

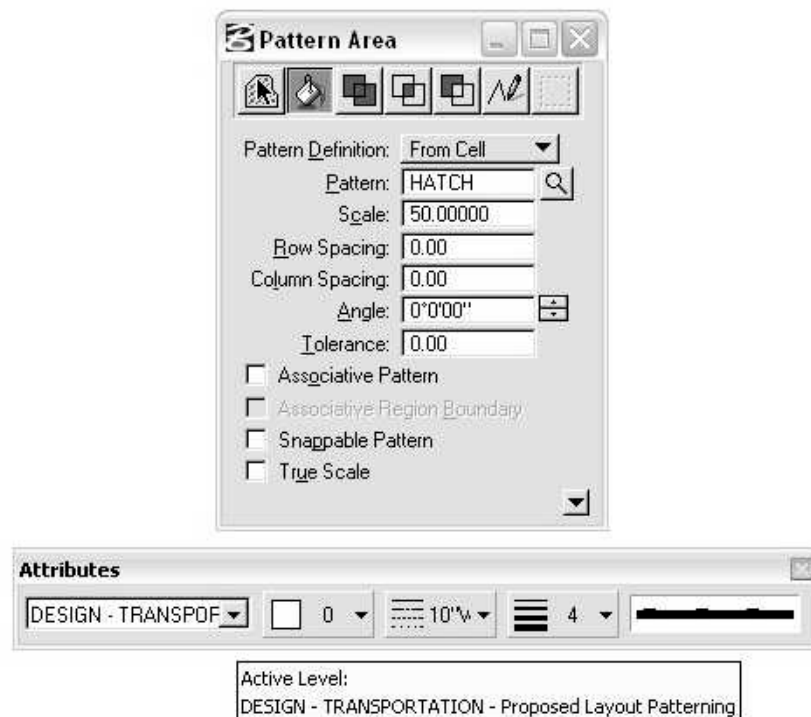
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

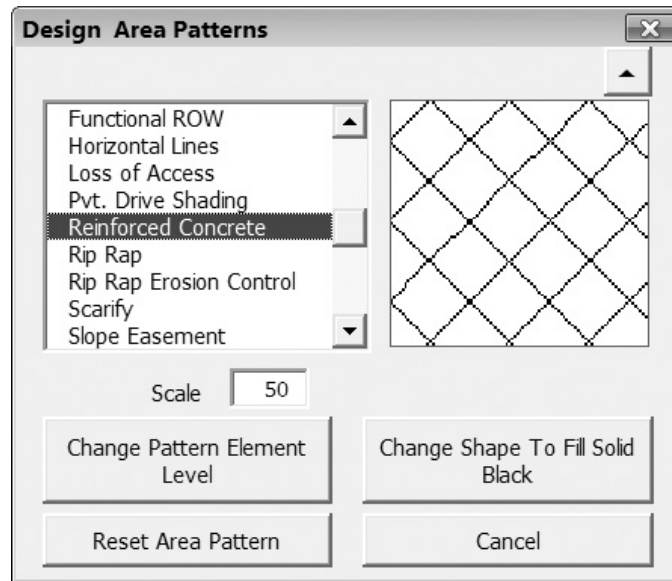
Fence method: Create a fence bounding the area to be patterned.

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.

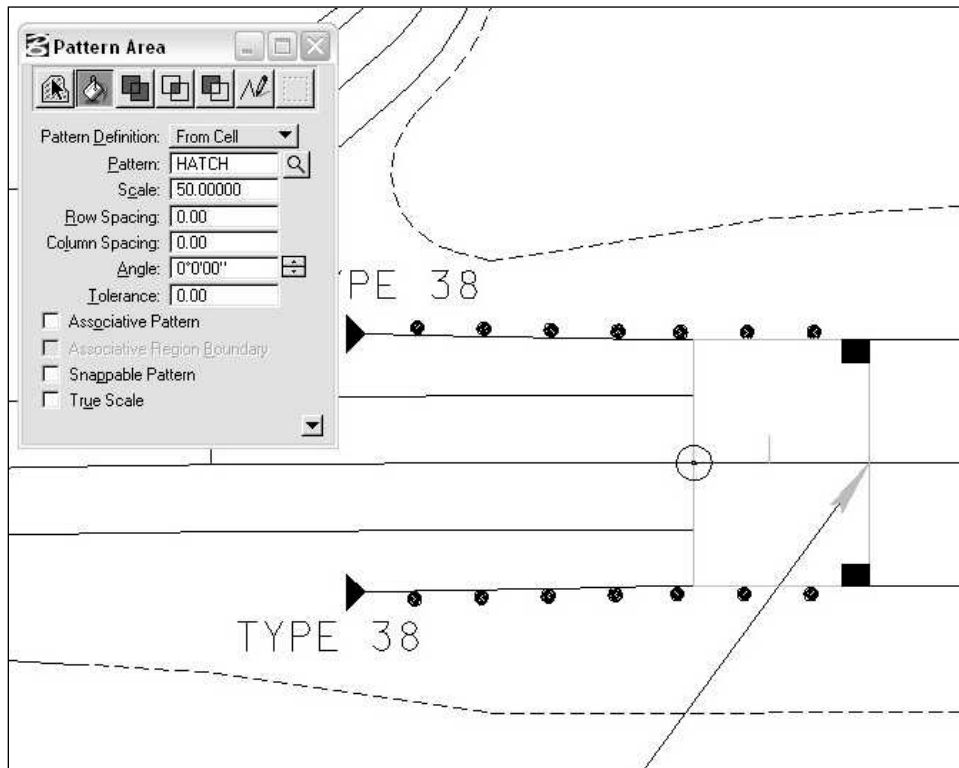


Or from the drop down menu in the **Design Area Patterns** dialog ...

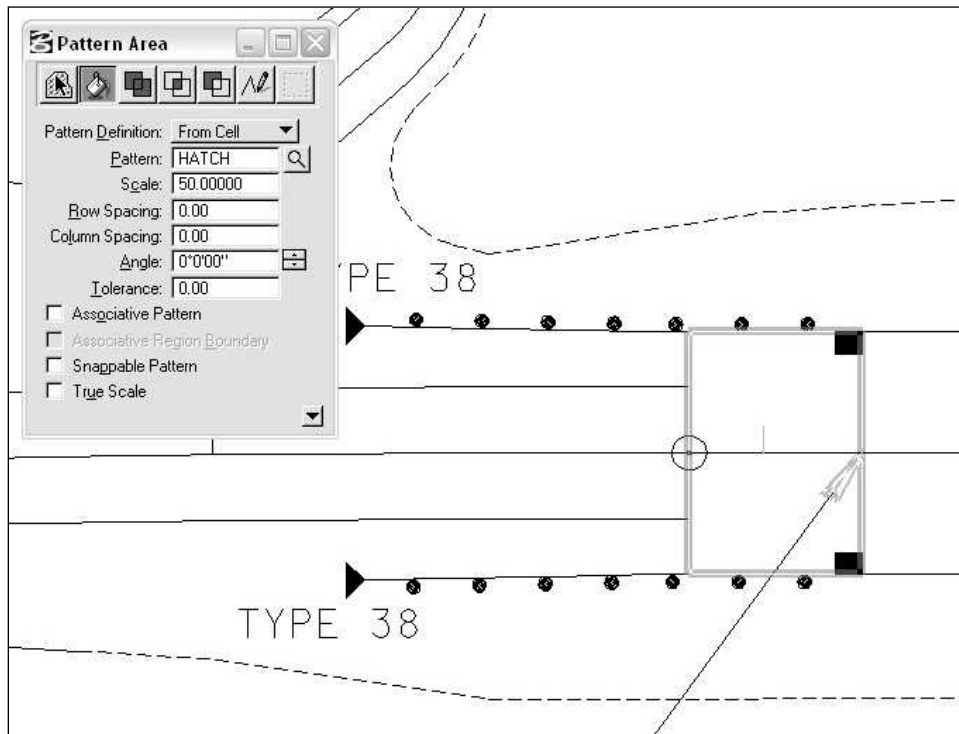


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

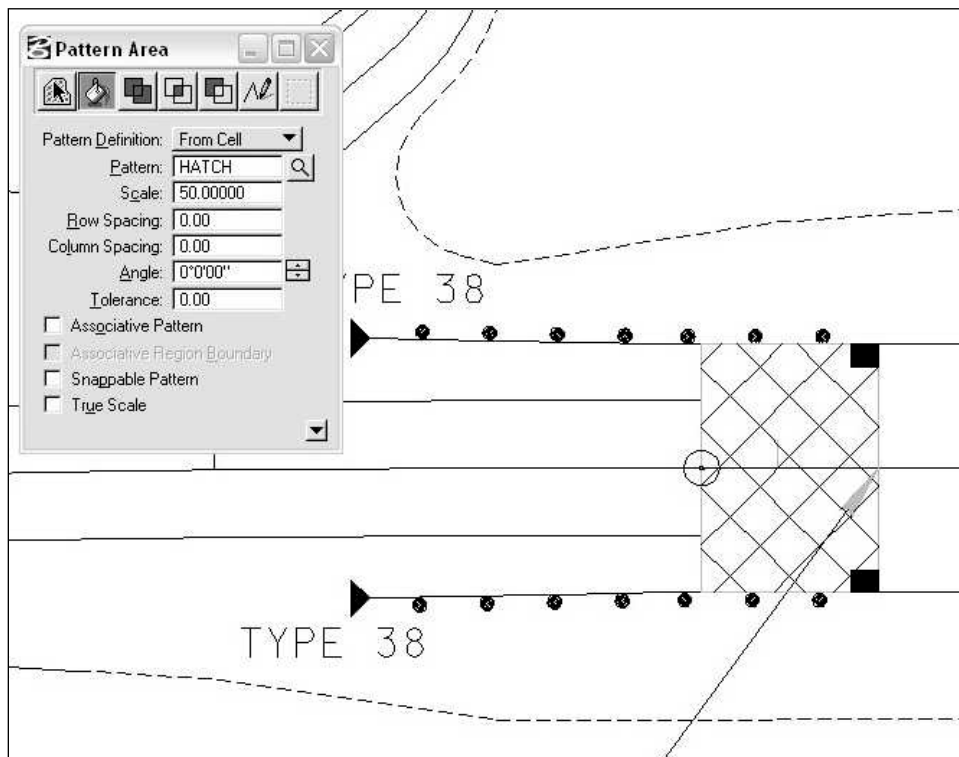
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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:

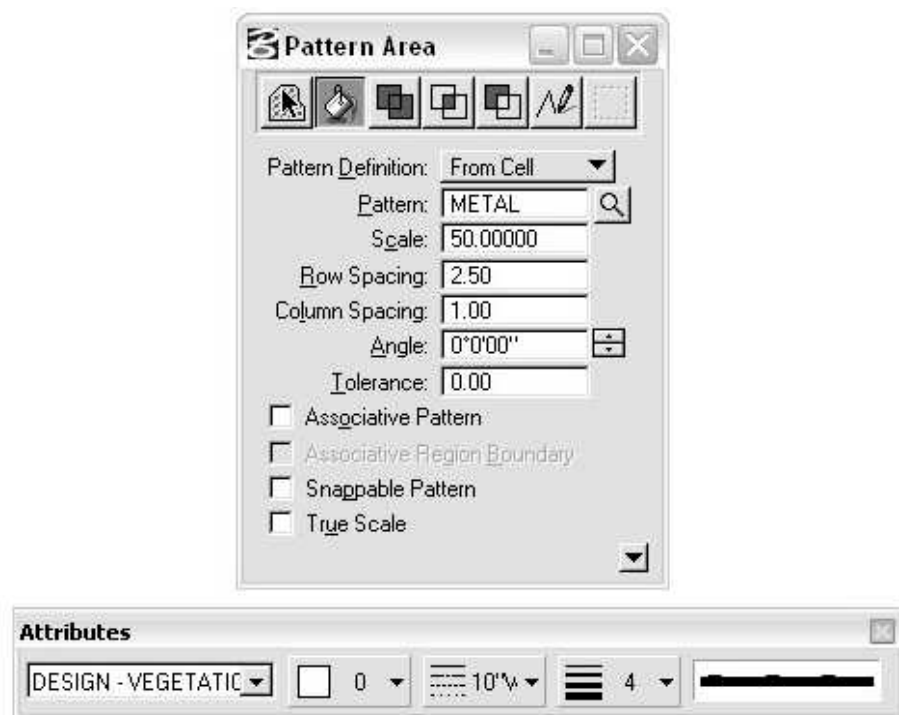
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

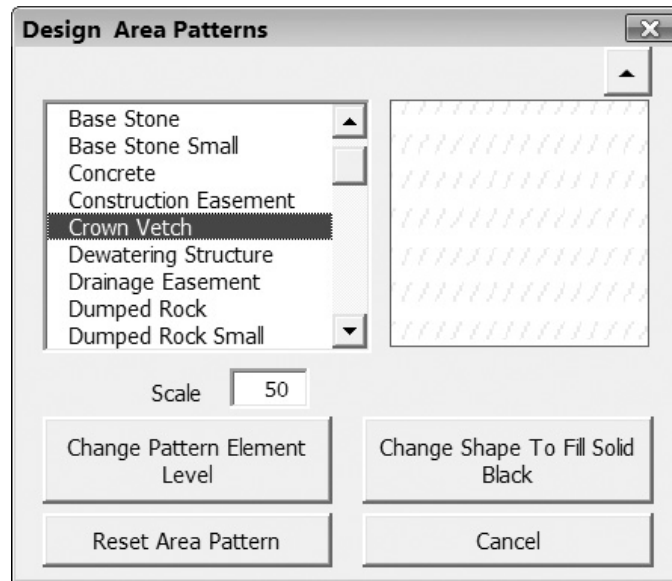
Fence method: Create a fence bounding the area to be patterned.

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.

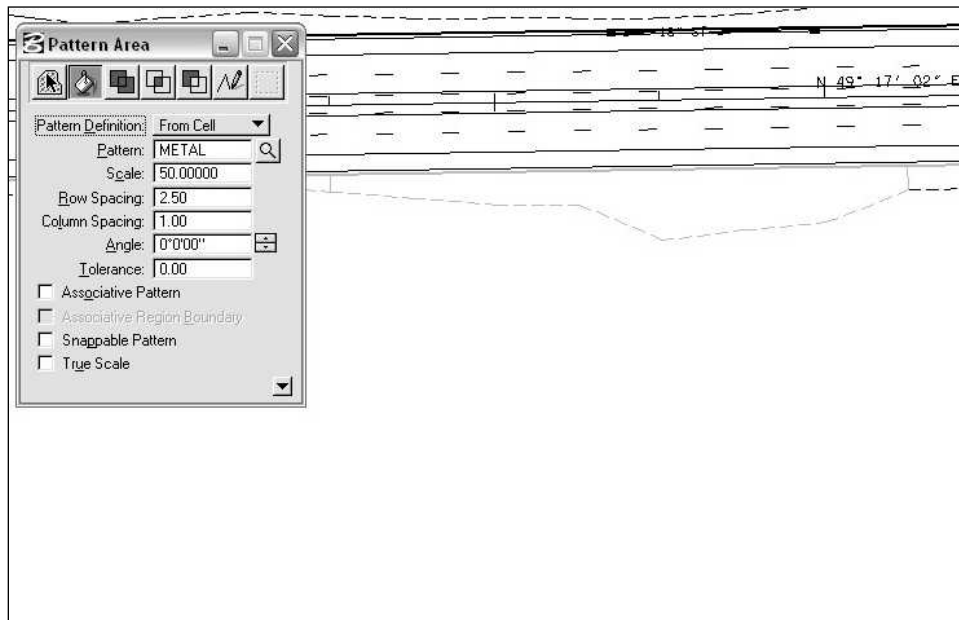


Or from the drop down menu in the **Design Area Patterns** dialog ...

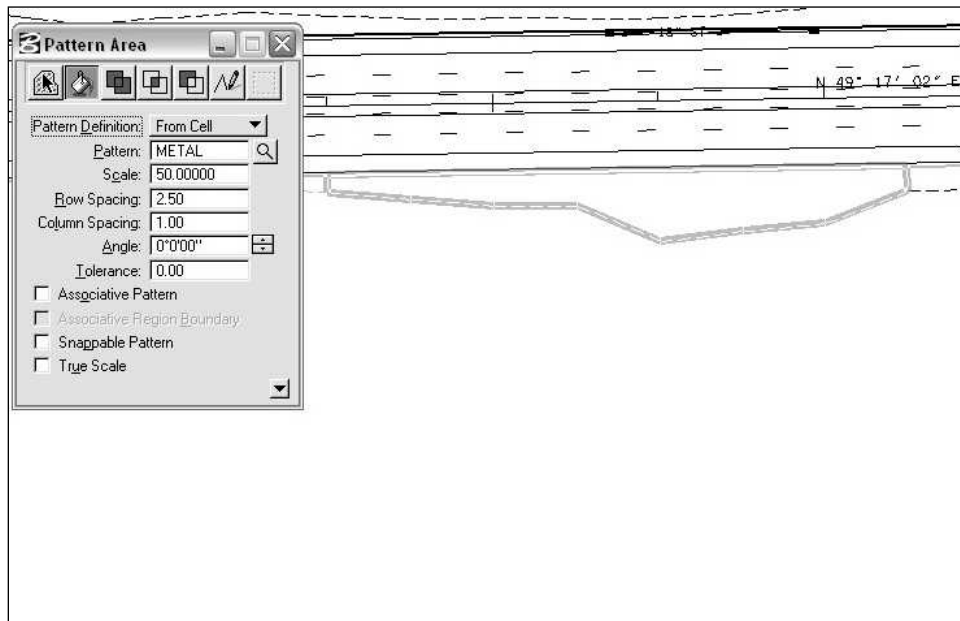


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

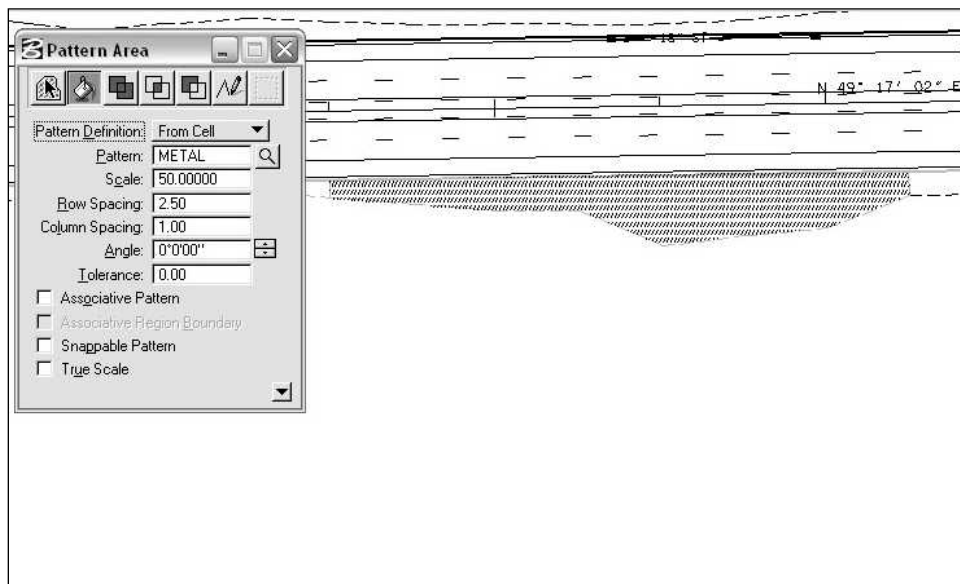
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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 Roadway 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Traffic Flow Diagrams

or by using the keyin

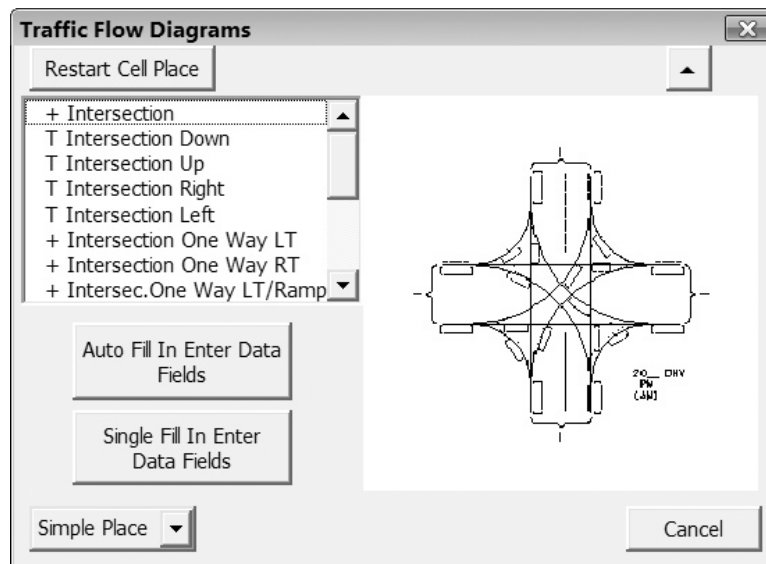
vba run [TrafficFlowDiagramCells]TrafficFlowcells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

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:

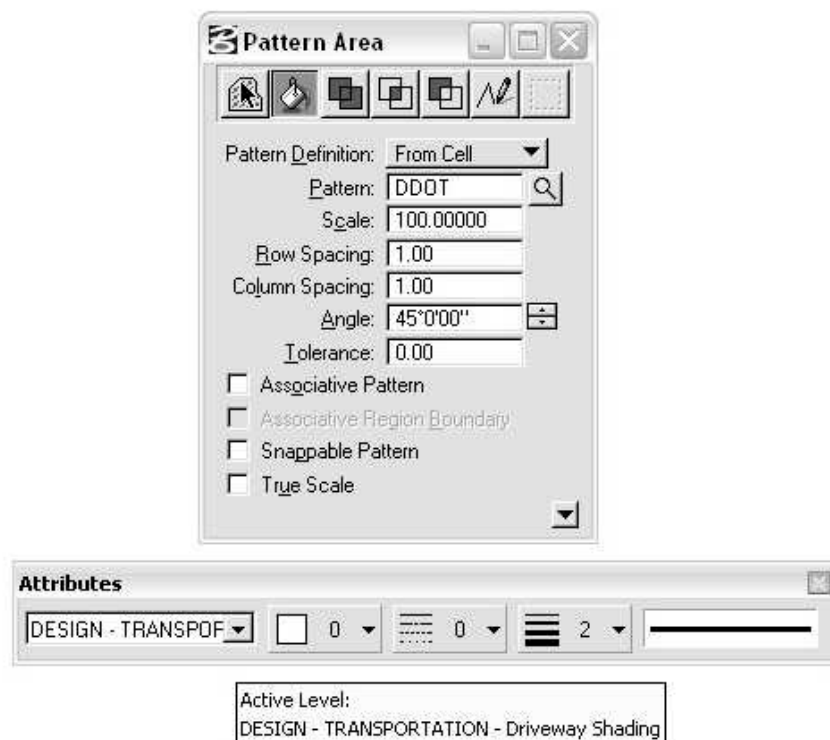
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

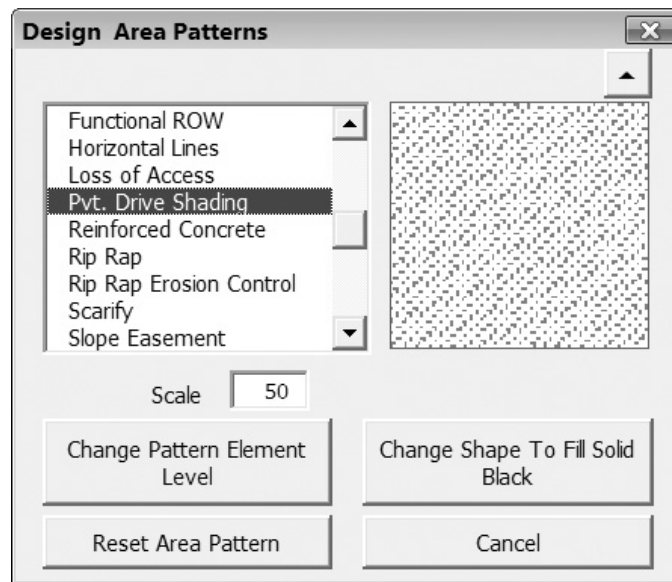
Fence method: Create a fence bounding the area to be patterned.

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.

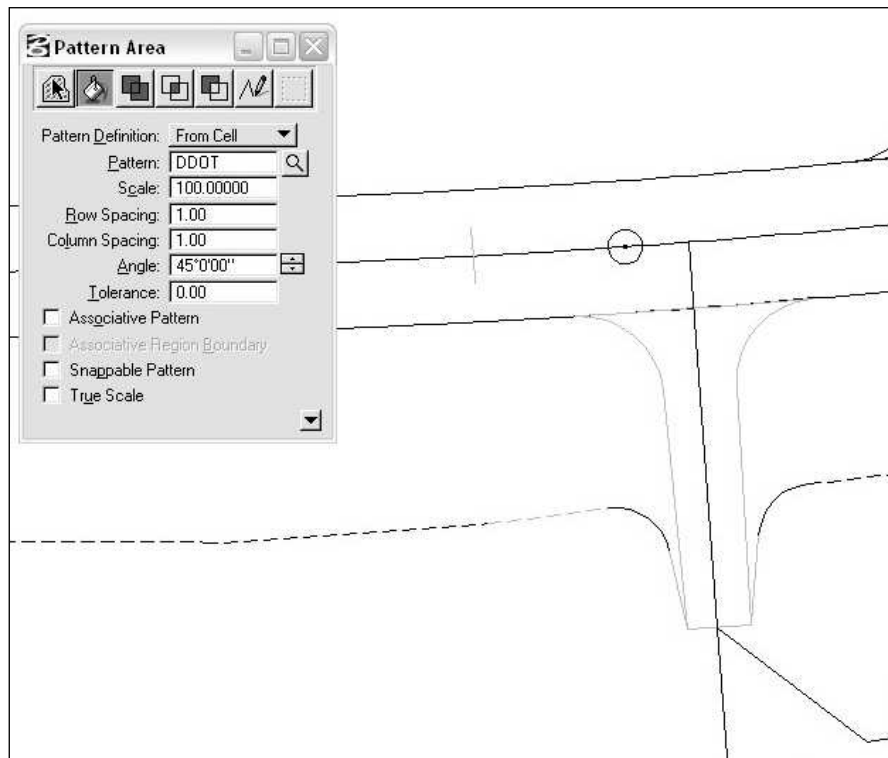


Or from the drop down menu in the **Design Area Patterns** dialog ...

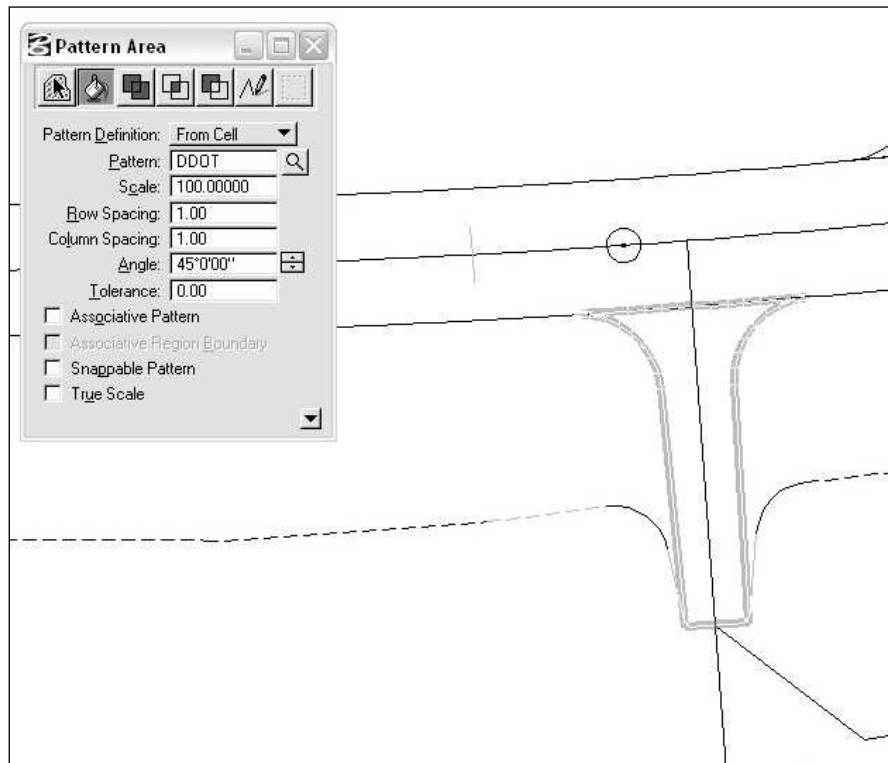


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

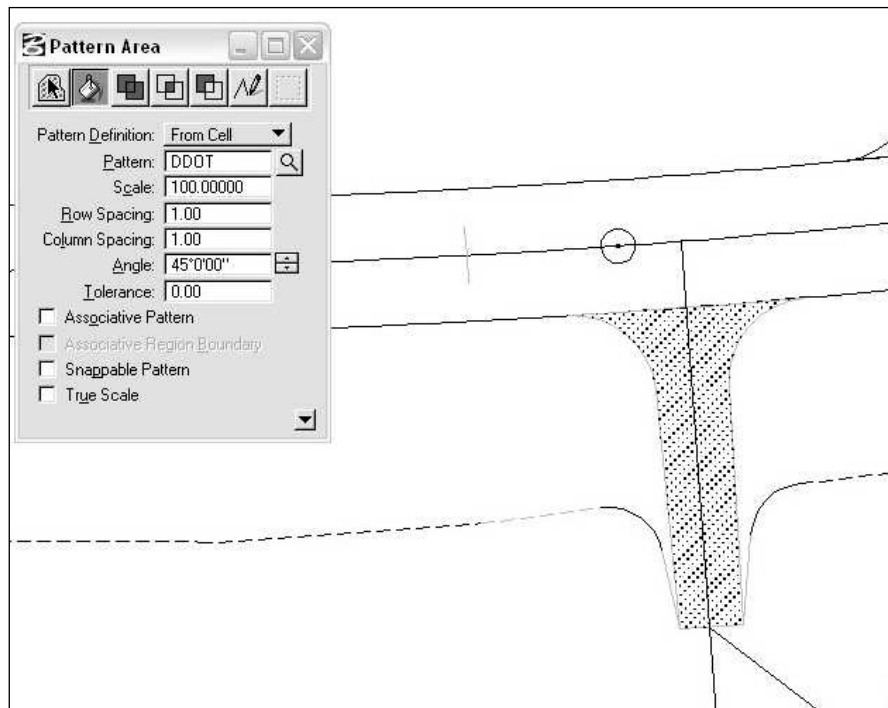
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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.

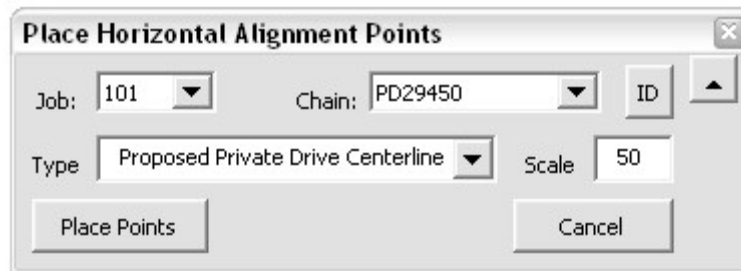
Usage:

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.



The screenshot shows a software dialog box titled "Place Horizontal Alignment Points". It features a "Job" dropdown menu set to "101" and a "Chain" dropdown menu set to "PD29450". An "ID" button with an upward arrow is located to the right of the "Chain" dropdown. Below these, the "Type" dropdown menu is set to "Proposed Private Drive Centerline", and the "Scale" field is set to "50". At the bottom of the dialog are two buttons: "Place Points" and "Cancel".

- 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.

RD01 vertical curve design standards are read from the text file **VALabel_Speed_kvl.txt**.

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.

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:

Geopak project GPK file must be present in folder with currently open MicroStation DGN file.

A Geopak profile cell must be present.

K value text file, **VALabel_Speed_kvl.txt** must be present in TDOT Roadway Design Division's Geopak Standards folder at C:\Users\Public\Geopak Standards\.

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**.

Label Vertical Alignment

Profile Settings

Job:
Chain:
Station:
Elevation:
Scale:
X:
Y:

Identify Profile Cell

Type: Private Drive
Profile:

Label Scale: 50

Label Intersections

☒ VPI Labels
☐ VPC/VPT Labels
☒ Grade Labels ☐ Show Sub-Tangents
☒ V.C. Length Labels
☐ K Value
☐ Label Crest High Points
☐ Label Sag Low Points
☐ Label Speed

PLACE LABELS

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.

Label Vertical Alignment

Profile Settings

Job: 101
Chain: PD29450
Station: 0.00
Elevation: 760.00
Scale: 10:1
X: 2489242.96
Y: 576928.61

Identify Profile Cell

Type: Private Drive
Profile: PD29450

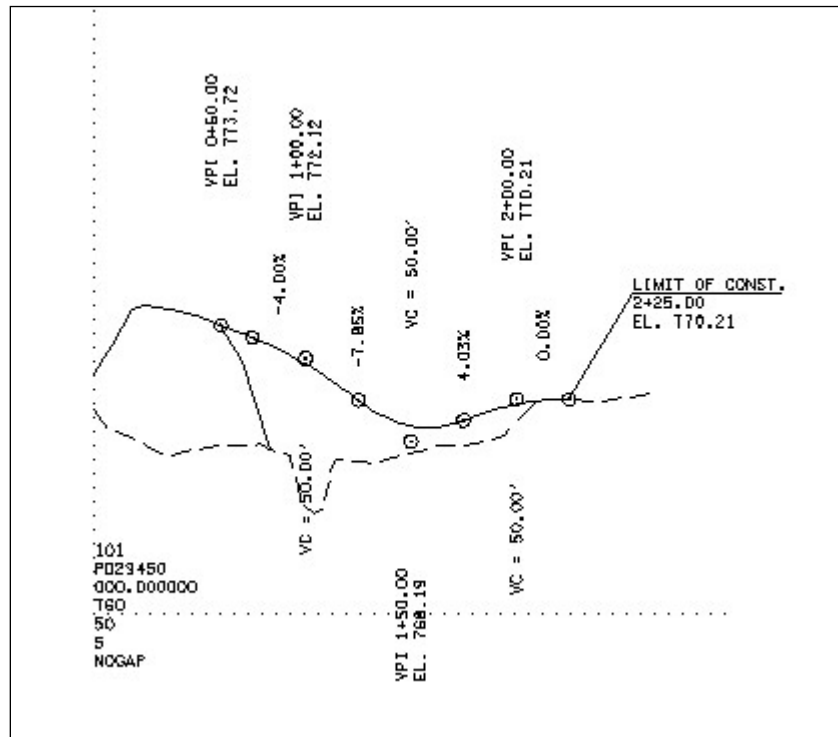
Label Scale: 50

Label Intersections

☒ VPI Labels
☐ VPC/VPT Labels
☒ Grade Labels ☐ Show Sub-Tangents
☒ V.C. Length Labels
☐ K Value
☐ Label Crest High Points
☐ Label Sag Low Points
☐ Label Speed

PLACE LABELS

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.

RD01 vertical curve design standards 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 Roadway Design Division's Geopak Standards folder at C:\Users\Public\Geopak Standards\.

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:

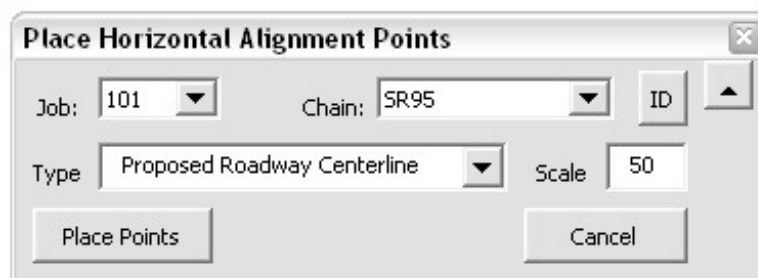
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

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.

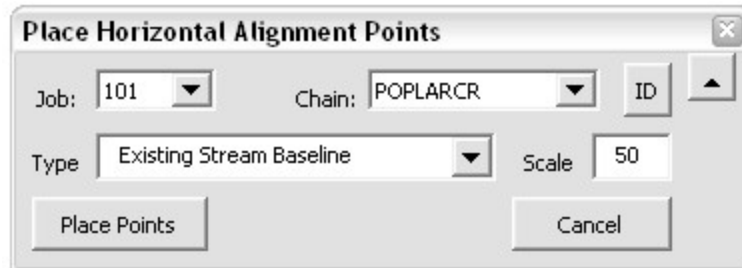
Usage:

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 VBA Program: HApoints.mvba

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

vba run [DrawBoxPlan]DrawBox.Main

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.

Draw Pattern Lines - BridgeCL

Job: 101 Chain: SR95 Profile: <Select>

Beginning

Left Offset(+): 78.50

Station: 339+45.00

Right Offset(+): 98.25

Ending

Left Offset(+):

Station: 347+89.04

Right Offset(+):

Once 100.00 ☒ Skew Angle -45.00

Level Symbology: Draw Pattern Lines

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), Place Label as Flag ON & Wall Thickness 1.000**. Note that skew angles in degrees minutes & seconds are supported and wing walls are optional.

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

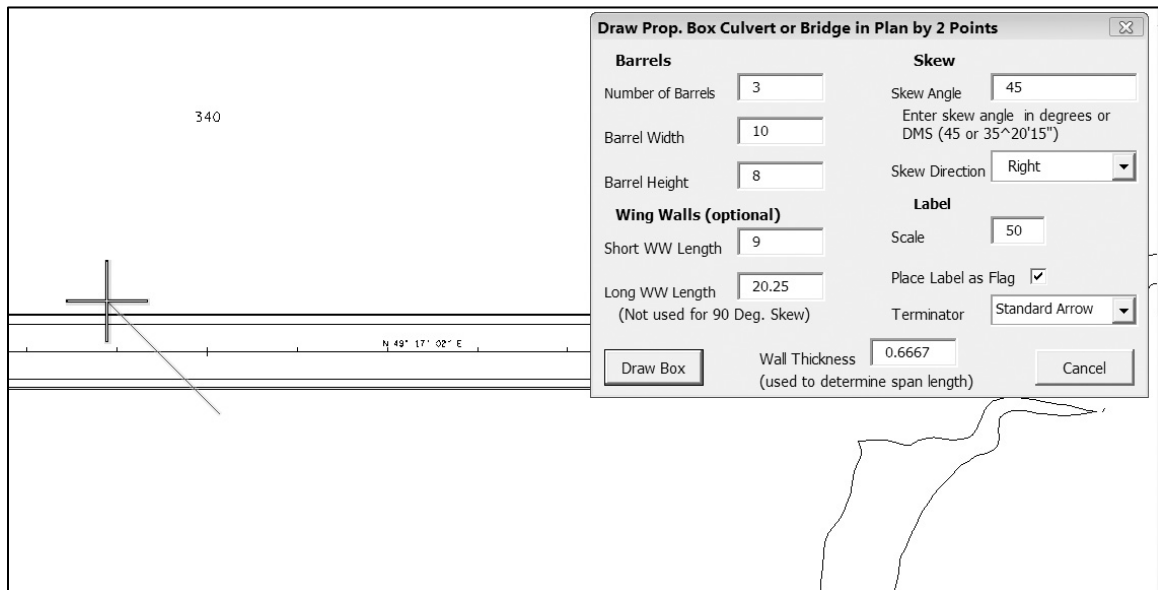
Barrels		Skew	
Number of Barrels	1	Skew Angle	90
Barrel Width		Enter skew angle in degrees or DMS (45 or 35^20'15")	
Barrel Height		Skew Direction	None (90 Deg)
Wing Walls (optional)		Label	
Short WW Length	0	Scale	50
Long WW Length	0	Place Label as Flag	<input checked="" type="checkbox"/>
(Not used for 90 Deg. Skew)		Terminator	Standard Arrow
Draw Box		Wall Thickness	1.000
		(used to determine span length)	
		Cancel	

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-15-11 we get the short wingwall (WS) length of 9' and a long wingwall (WL) length of 20.25'. From standard structure drawing STD-15-79 we get the wall thickness (WT & IT) of 8" (0.6667'). Once settings are made click on the **Draw Structure** button.

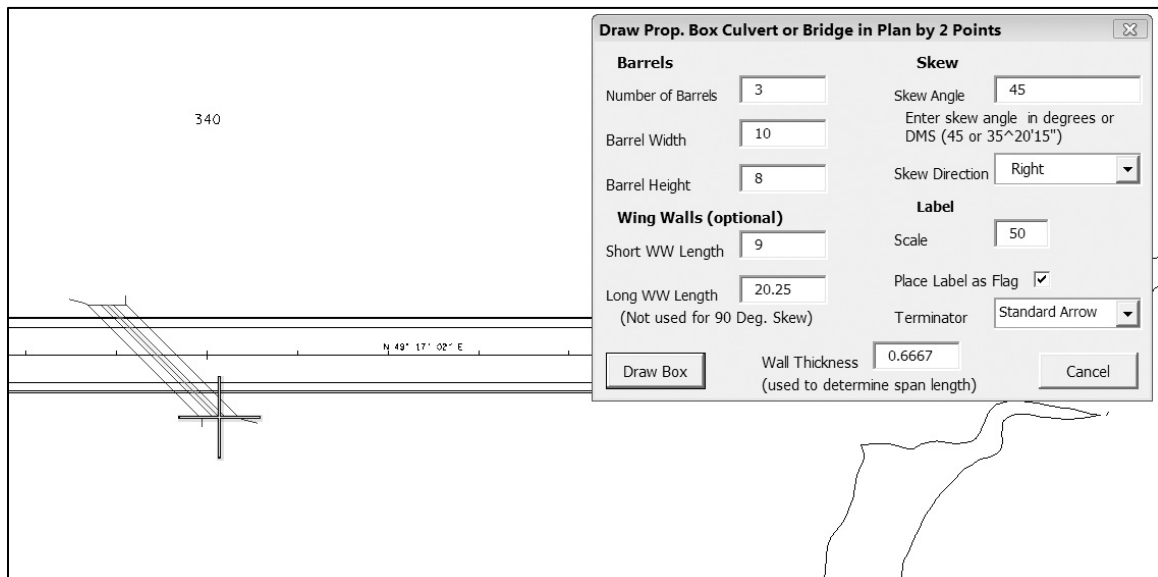
Draw Prop. Box Culvert or Bridge in Plan by 2 Points

Barrels		Skew	
Number of Barrels	3	Skew Angle	45
Barrel Width	10	Enter skew angle in degrees or DMS (45 or 35^20'15")	
Barrel Height	8	Skew Direction	Right
Wing Walls (optional)		Label	
Short WW Length	9	Scale	50
Long WW Length	20.25	Place Label as Flag	<input checked="" type="checkbox"/>
(Not used for 90 Deg. Skew)		Terminator	Standard Arrow
Draw Box		Wall Thickness	0.6667
		(used to determine span length)	
		Cancel	

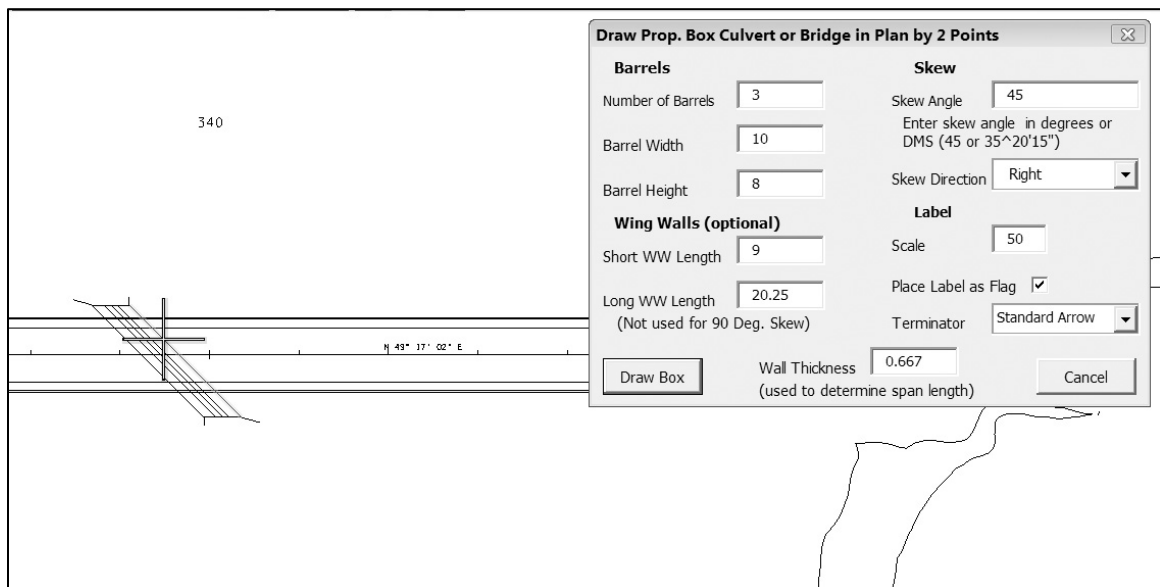
Step 4. You are then prompted to **Identify Left End of Structure. Snap** and **Data point** at that end of the structure centerline.



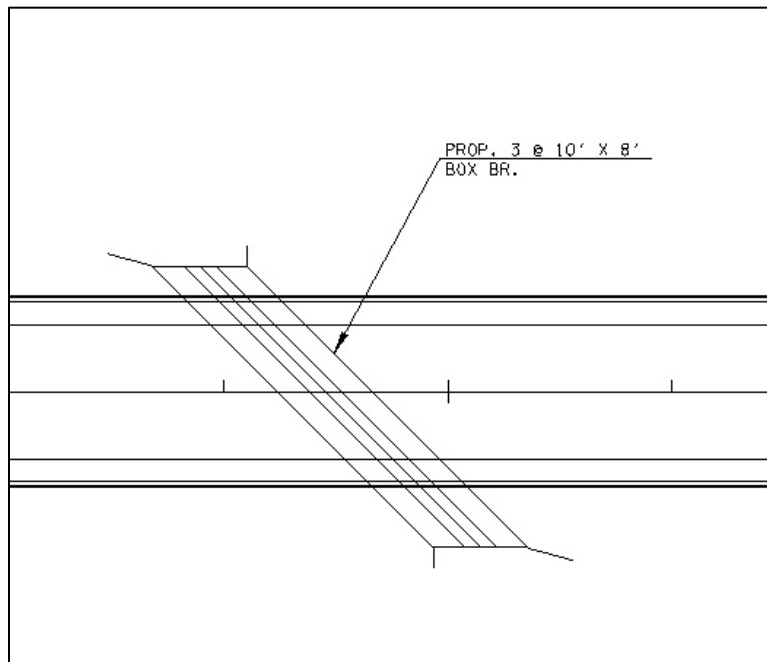
Step 5. You are then prompted to **Identify Right End. Snap** and **Data point** at that end of the structure centerline. The structure is shown dynamically as you set this point.



- Step 6.** The structure is drawn and the user is prompted to **Identify location for End of Leader**. A **Reset** can be given to skip placement or **Data point** at or near the structure for the end of the label's leader line.



- Step 7.** Finally you are prompted to **Position Label**. The label is shown dynamically as you move the cursor to position the text. **Data point** to place the label and finish.



The centerline length of structure using the dimension given for the wall thickness is checked to determine whether the label should specify bridge or culvert.

If the **Place Label as Flag** option is turned off, the text label is provided without a leader line at the angle of the structure.

Draw Prop. Type "A" Pipe Endwall in Plan

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

MicroStation VBA Program: DrawTypeAEndwall.mvba

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 written to the endwall graphics as Geopak adhoc data. The Read Endwall Data command button provides a dialog where all data may be reviewed. Note that some of this information is shown with MicroStation's element pop up info if Geopak software is activated.

This macro can also be activated from the MicroStation drop down menu

TDOT > Drainage (Plan) > Draw Type A Endwall

or by using the keyin

vba run [DrawTypeAEndwall]AEW.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 **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**. The side slope is locked at 2:1 since this endwall is only applicable on that slope. Also note that skew angles in degrees minutes & seconds are supported.

Draw Prop. Type "A" Endwall in Plan (D-PE-1)

Pipe Size	36 in / 900 mm	Skew Angle	90
Pipe Type	Cross Drain	Enter skew angle in degrees or DMS (45 or 35^20'15")	
Side Slope	2:1	Skew Direction	None (90 Deg)

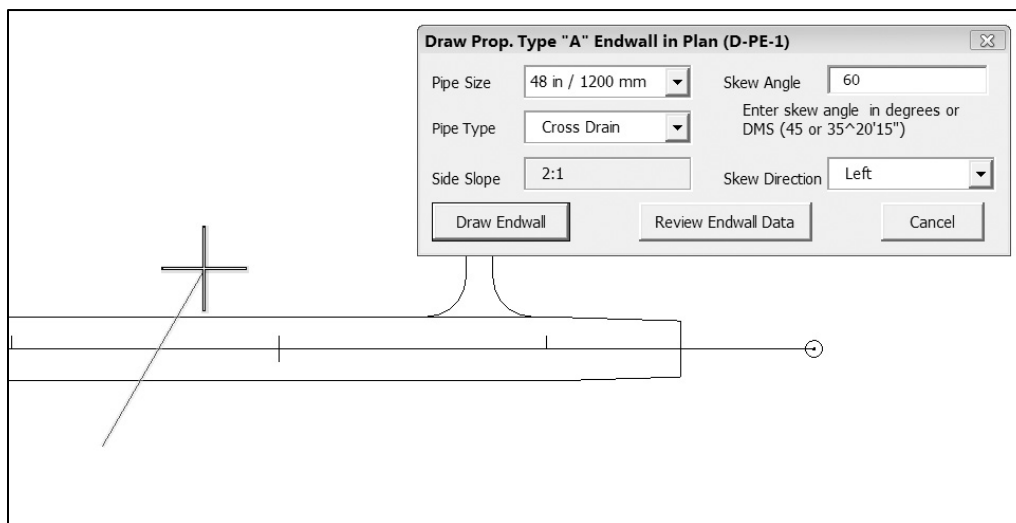
Draw Endwall Review Endwall Data Cancel

- 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 Endwall** button.

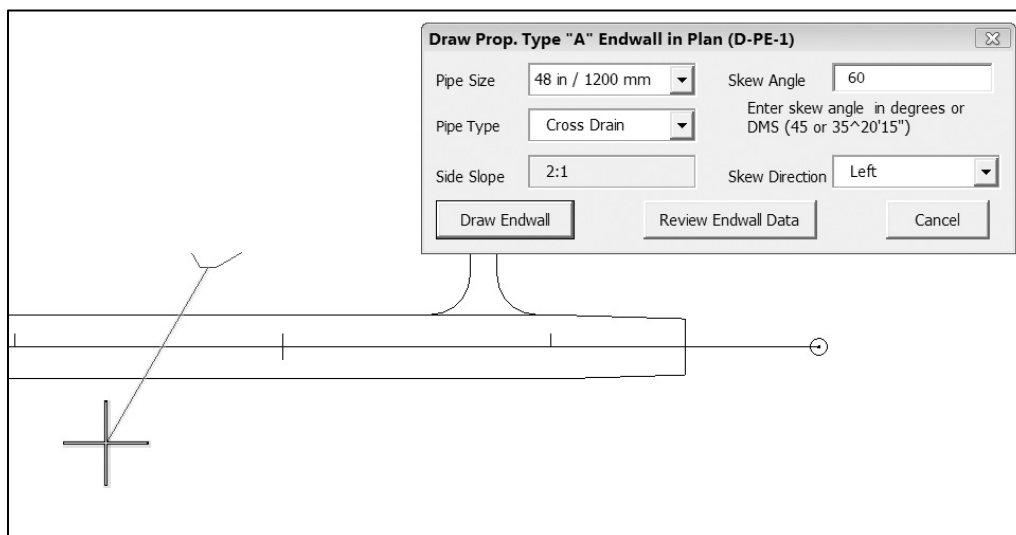
The dialog box is titled "Draw Prop. Type 'A' Endwall in Plan (D-PE-1)". It contains the following fields and buttons:

- Pipe Size:** 48 in / 1200 mm (dropdown)
- Pipe Type:** Cross Drain (dropdown)
- Side Slope:** 2:1 (text input)
- Skew Angle:** 60 (text input)
- Skew Direction:** Left (dropdown)
- Buttons:** Draw Endwall, Review Endwall Data, Cancel
- Text:** Enter skew angle in degrees or DMS (45 or 35^20'15")

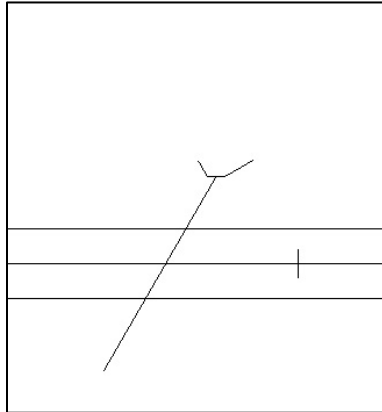
- Step 4.** You are then prompted to **Identify Point at Endwall. Snap and Data point** at the end of the pipe where endwall should be drawn.



- Step 5.** You are then prompted to **Identify other end of pipe. Snap and Data point** at the other end of the pipe. The endwall is rotated dynamically as you provide the last point to set its angle.

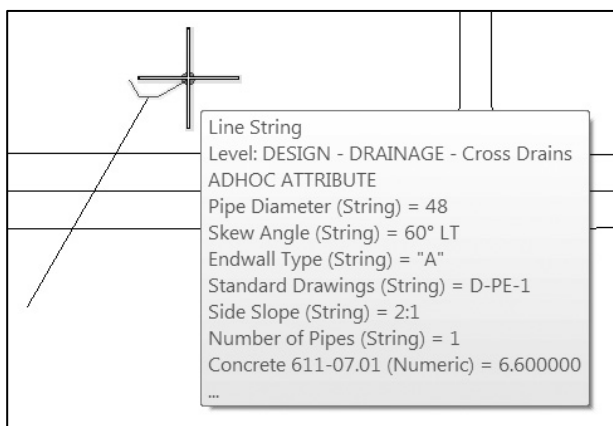


Step 6. The endwall is drawn. You are prompted again to **Identify Point at Endwall** in case you wish to place another endwall of the same type at the other end.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are written to the endwall graphics as Geopak Adhoc data. Click the **Read Endwall Data** command button to open a dialog where all data may be reviewed. In the dialog, click **Read Endwall** and data point on the wall. Information is then used to populate the dialog.

Review Endwall Data Values	
Pipe Diameter	48
Skew Angle	60° LT
Endwall Type	"A"
Standard Drawings	D-PE-1
Side Slope	2:1
Number of Pipes	1
Concrete 611-07.01	6.6
Reinf. Steel 611-07.02	100
Safety EW	0
X Coordinate	2311404.37
Y coordinate	317811.89
<input type="button" value="Read Endwall"/> <input type="button" value="Cancel"/>	



Some of this information is shown with MicroStation's element pop up info if Geopak software is activated. Snap to the endwall line and float the cursor over the element.

Geopak's D&C Manager pay items for endwalls read this data to compute total quantities.

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-15A to D-PE-48A.

Endwall information used for placement and associated quantities are written to the endwall graphics as Geopak adhoc data. The Read Endwall Data command button provides a dialog where all data may be reviewed. Note that some of this information is shown with MicroStation's element pop up info if Geopak software is activated.

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]UEW.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 24"**, **Pipe Type Cross Drain**, **Side Slope 6:1**, **Grate Option Without Grate**, **Skew Angle 90** & **Skew Direction None**. Note that if a grate is specified but not required the user is notified with a message and the option is switched back to Without Grate. Also note that skew angles in degrees minutes & seconds are supported.

Draw Prop. Type "U" Endwall in Plan (D-PE-15A to 48A)

Pipe Size	24 in / 600 mm	Grate Option	Without Grate
Pipe Type	Cross Drain	Skew Angle	90
Side Slope	6:1	Enter skew angle in degrees or DMS (45 or 35^20'15")	
		Skew Direction	None (90 Deg)

Draw Endwall **Review Endwall Data** **Cancel**

- 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 36" pipe cross drain with a grate at a 90 degree skew on a 4:1 side slope. The **Pipe Type** setting controls the level for placement. Once settings are made, click on the **Draw Endwall** button.

Draw Prop. Type "U" Endwall in Plan (D-PE-15A to 48A)

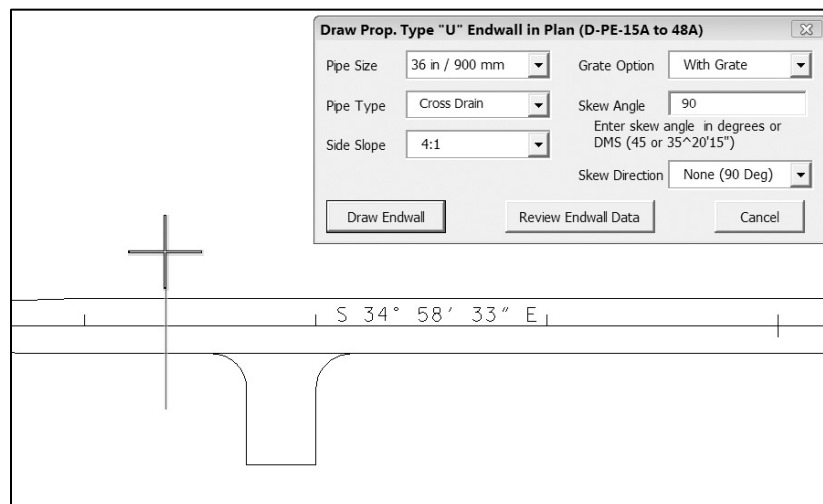
Pipe Size: 36 in / 900 mm Grate Option: With Grate

Pipe Type: Cross Drain Skew Angle: 90
Enter skew angle in degrees or DMS (45 or 35^20'15")

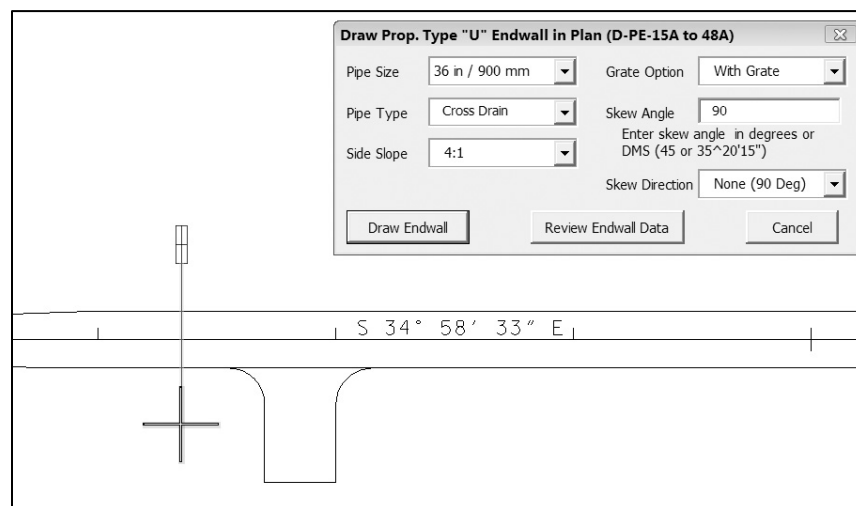
Side Slope: 4:1 Skew Direction: None (90 Deg)

Draw Endwall Review Endwall Data Cancel

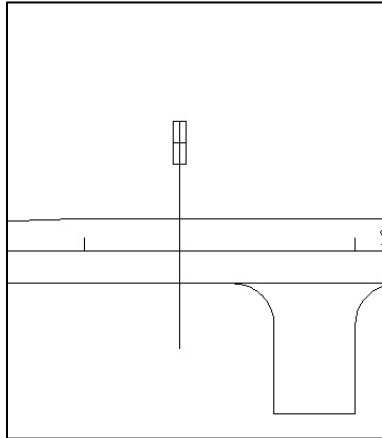
- Step 4.** You are then prompted to **Identify Point at Endwall. Snap and Data point** at the end of the pipe where endwall should be drawn.



- Step 5.** You are then prompted to **Identify other end of pipe. Snap and Data point** at the other end of the pipe. The endwall is rotated dynamically as you provide the last point to set its angle.



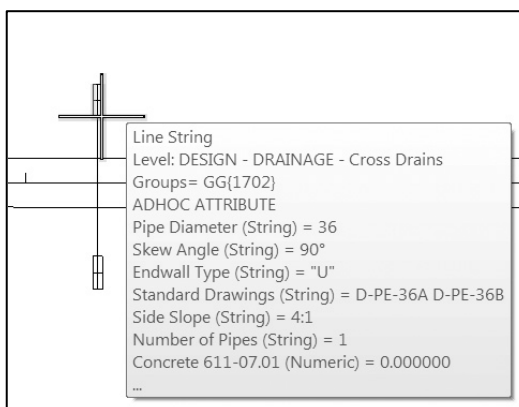
Step 6. The endwall is drawn. You are prompted again to **Identify Point at Endwall** in case you wish to place another endwall of the same type at the other end.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are written to the endwall graphics as Geopak Adhoc data. Click the **Read Endwall Data** command button to open a dialog where all data may be reviewed. In the dialog, click **Read Endwall** and data point on the wall. Information is then used to populate the dialog.

Review Endwall Data Values	
Pipe Diameter	36
Skew Angle	90°
Endwall Type	"U"
Standard Drawings	D-PE-36A D-PE-36B
Side Slope	4:1
Number of Pipes	1
Concrete 611-07.01	0
Reinf. Steel 611-07.02	0
Safety EW 611-07.64	1
X Coordinate	2311259.4
Y coordinate	318023.96

Read Endwall Cancel



Some of this information is shown with MicroStation's element pop up info if Geopak software is activated. Snap to the endwall line and float the cursor over the element.

Geopak's D&C Manager pay items for endwalls read this data to compute total quantities.

Draw Prop. Type "SEW" Pipe Endwall in Plan

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

MicroStation VBA Program: DrawTypeSDEndwall.mvba

Description:

This application used draw a proposed type SEW endwall on a pipe end in the plan view. All control values in dialog are based on data in standard roadway drawings D-SEW-1A & D-SEW-12D.

Endwall information used for placement and associated quantities are written to the endwall graphics as Geopak adhoc data. The Read Endwall Data command button provides a dialog where all data may be reviewed. Note that some of this information is shown with MicroStation's element pop up info if Geopak software is activated.

This macro can also be activated from the MicroStation drop down menu

TDOT > Drainage (Plan) > Draw Type SEW Endwall

or by using the keyin

vba run [DrawTypeSDEndwall]SDEW.Main

Special Requirements:

The proposed pipe must be drawn in the plan view.

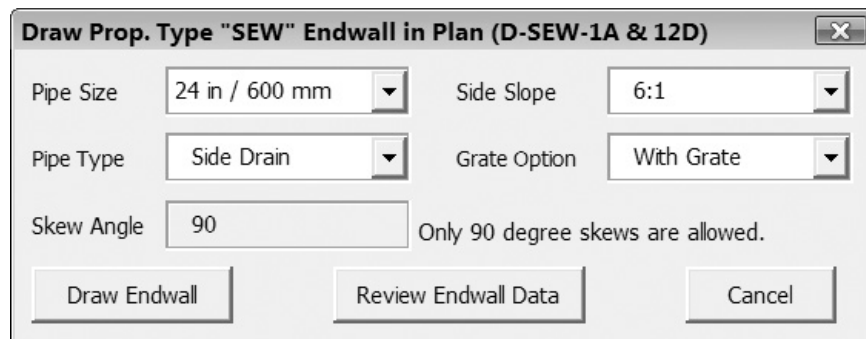
Usage:

- 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 **SD Endwall**. The **Draw Prop. Type "SEW" Pipe Endwall in Plan** dialog opens. Defaults which are displayed . . . **Pipe Size 15"**, **Side Slope 6:1**, **Pipe Type Side Drain & Grate Option With Grate**. The skew angle is locked at 90 degrees since this endwall is only applicable at that skew. If a grate is not specified but is required the user is notified with a message and the option is switched back to With Grate. Also note that 12:1 side slopes are only allowed with pipe sizes 15"-18".

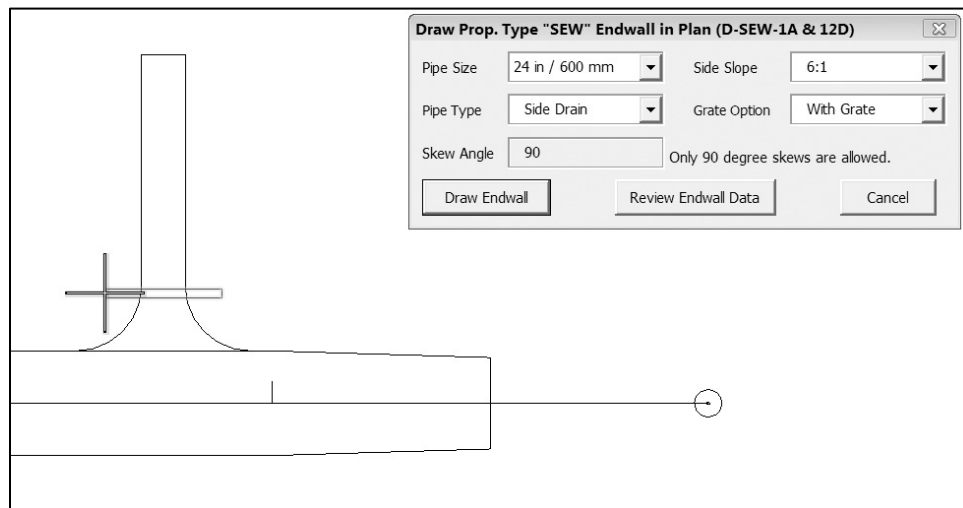
Draw Prop. Type "SEW" Endwall in Plan (D-SEW-1A & 12D)

Pipe Size	15 in / 375 mm	Side Slope	6:1
Pipe Type	Side Drain	Grate Option	With Grate
Skew Angle	90	Only 90 degree skews are allowed.	

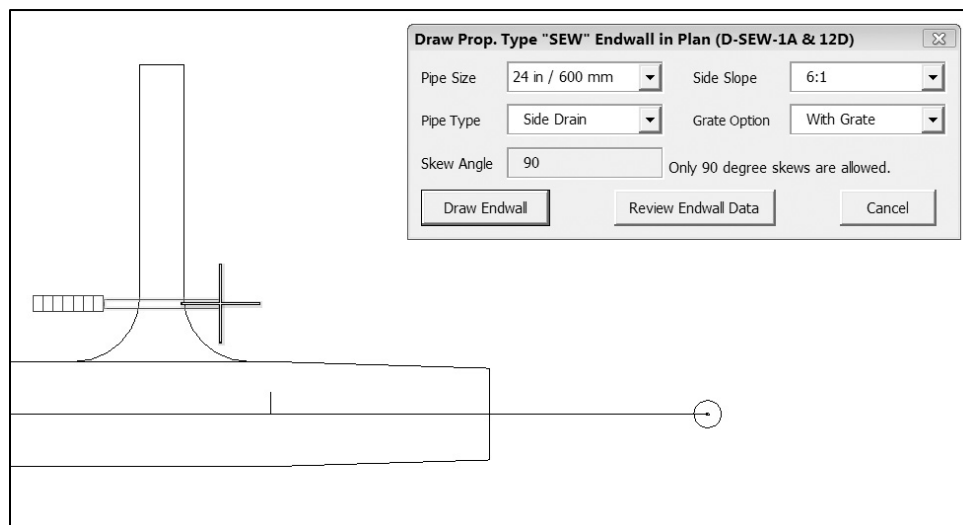
- Step 3.** Make settings in the dialog as needed for the pipe endwall you need to draw. In our example we are placing an endwall on a 24" pipe side drain with a grate on a 6:1 side slope. The **Pipe Type** setting controls the level for placement. Once settings are made, click on the **Draw Endwall** button.



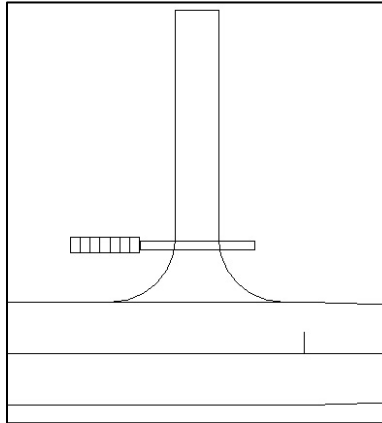
- Step 4.** You are then prompted to **Identify Point at Endwall. Snap** and **Data point** at the end of the pipe where endwall should be drawn.



- Step 5.** You are then prompted to **Identify other end of pipe. Snap** and **Data point** at the other end of the pipe. The endwall is rotated dynamically as you provide the last point to set its angle.



Step 6. The endwall is drawn. You are prompted again to **Identify Point at Endwall** in case you wish to place another endwall of the same type at the other end.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are written to the endwall graphics as Geopak Adhoc data. Click the **Read Endwall Data** command button to open a dialog where all data may be reviewed. In the dialog, click **Read Endwall** and data point on the wall. Information is then used to populate the dialog.

Review Endwall Data Values	
Pipe Diameter	24
Skew Angle	90°
Endwall Type	"SEW"
Standard Drawings	D-PE-24A D-PE-24B D-
Side Slope	6:1
Number of Pipes	1
Concrete 611-07.01	0
Reinf. Steel 611-07.02	0
Safety EW 611-07.32	1
X Coordinate	2311441.76
Y coordinate	317754.57
<input type="button" value="Read Endwall"/> <input type="button" value="Cancel"/>	

Line String	Level: DESIGN - DRAINAGE - Side Drains - less than 42 Inches
Groups=	GG(1705)
ADHOC ATTRIBUTE	
Pipe Diameter (String) =	24
Skew Angle (String) =	90°
Endwall Type (String) =	"SEW"
Standard Drawings (String) =	D-PE-24A D-PE-24B D-SEW-1A
Side Slope (String) =	6:1
Number of Pipes (String) =	1
Concrete 611-07.01 (Numeric) =	0.000000
...	

Some of this information is shown with MicroStation's element pop up info if Geopak software is activated. Snap to the endwall line and float the cursor over the element.

Geopak's D&C Manager pay items for endwalls read this data to compute total quantities.

Draw Prop. Type Straight Pipe Endwall in Plan

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

MicroStation VBA Program: DrawTypeSTEndwall.mvba

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 written to the endwall graphics as Geopak adhoc data. The Read Endwall Data command button provides a dialog where all data may be reviewed. Note that some of this information is shown with MicroStation's element pop up info if Geopak software is activated.

This macro can also be activated from the MicroStation drop down menu

TDOT > Drainage (Plan) > Draw Type ST Endwall

or by using the keyin

vba run [DrawTypeSTEndwall]STEW.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 **ST Endwall**. The **Draw Prop. Type "ST" 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.

Draw Prop. Type "ST" Endwall in Plan (D-PE-4)

Pipe Size	18 in / 450 mm	Skew Angle	90
Pipe Type	Cross Drain	Enter skew angle in degrees or DMS (45 or 35^20'15")	
Number of Pipes	1	Skew Direction	None (90 Deg)
Draw Endwall		Review Endwall Data	
Cancel			

- 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 single 30" pipe cross drain at a 30 degree skew right. The **Pipe Type** setting controls the level for placement. Once settings are made, click on the **Draw Endwall** button.

Draw Prop. Type "ST" Endwall in Plan (D-PE-4)

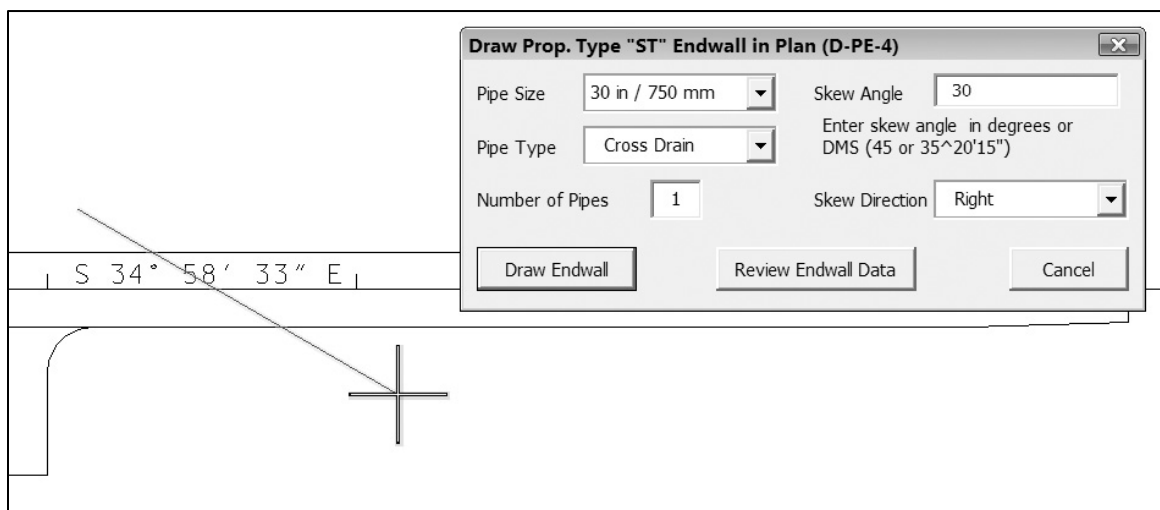
Pipe Size: 30 in / 750 mm Skew Angle: 30

Pipe Type: Cross Drain Enter skew angle in degrees or DMS (45 or 35^20'15")

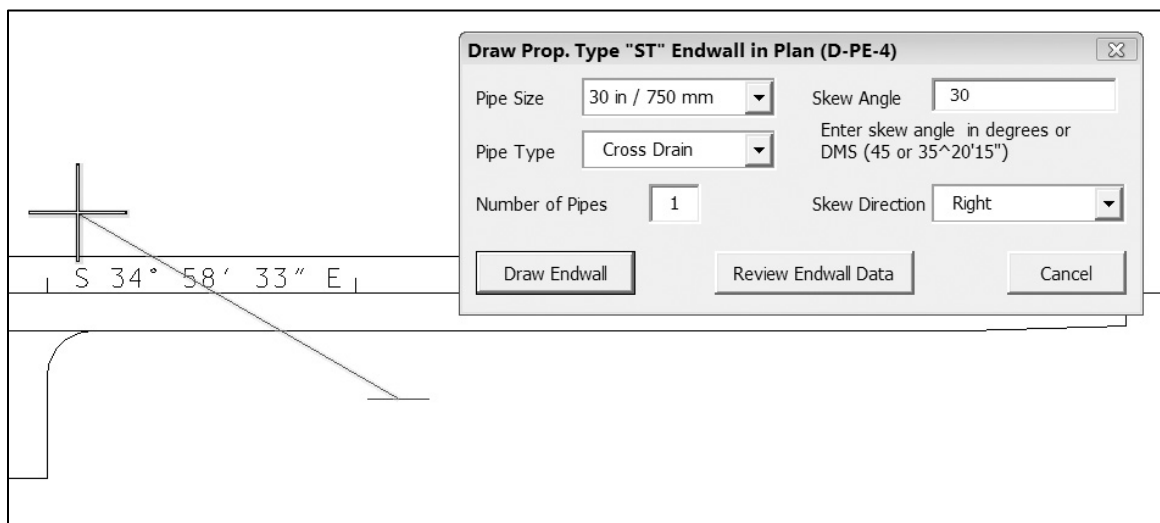
Number of Pipes: 1 Skew Direction: Right

Draw Endwall Review Endwall Data Cancel

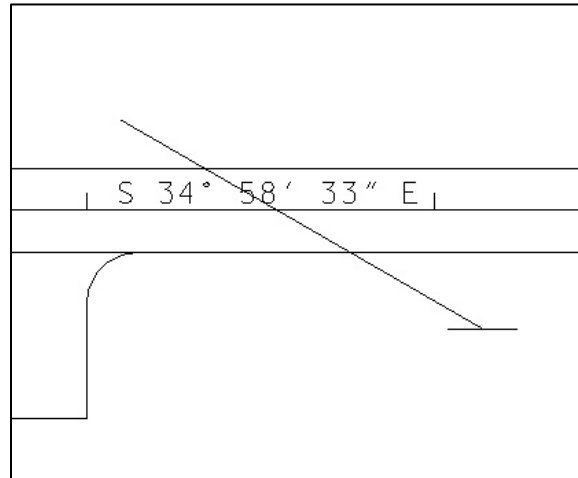
- Step 4.** You are then prompted to **Identify Point at Endwall. Snap** and **Data point** at the end of the pipe where endwall should be drawn.



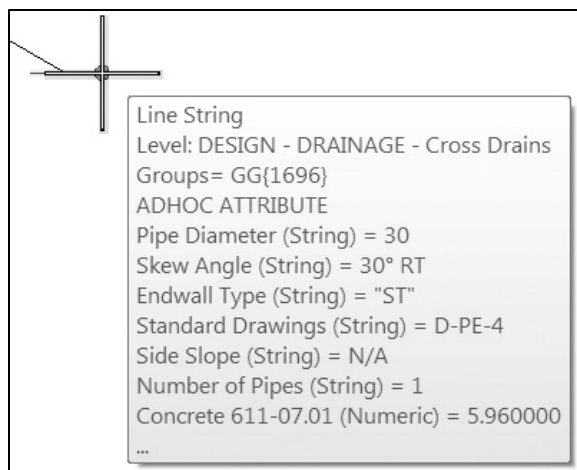
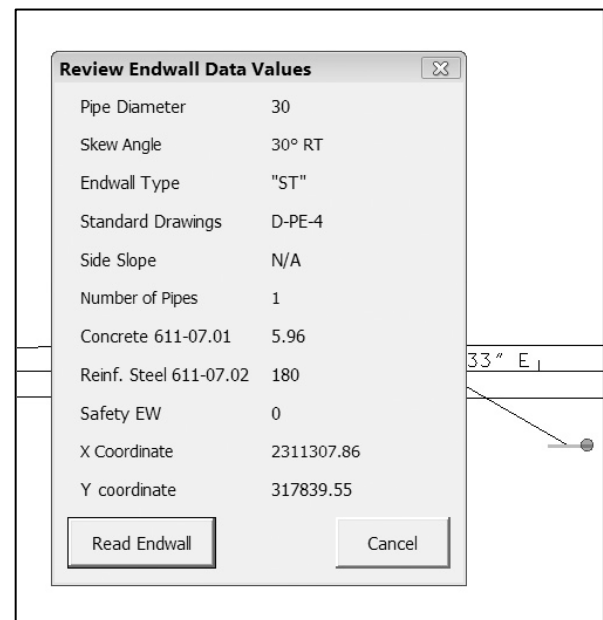
- Step 5.** You are then prompted to **Identify other end of pipe. Snap** and **Data point** at the other end of the pipe. The endwall is rotated dynamically as you provide the last point to set its angle.



Step 6. The endwall is drawn. You are prompted again to **Identify Point at Endwall** in case you wish to place another endwall of the same type at the other end.



Step 7. When endwalls are placed in graphics, information used for placement and associated quantities are written to the endwall graphics as Geopak Adhoc data. Click the **Read Endwall Data** command button to open a dialog where all data may be reviewed. In the dialog, click **Read Endwall** and data point on the wall. Information is then used to populate the dialog.



Some of this information is shown with MicroStation's element pop up info if Geopak software is activated. Snap to the endwall line and float the cursor over the element.

Geopak's D&C Manager pay items for endwalls read this data to compute total quantities.

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 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 side 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

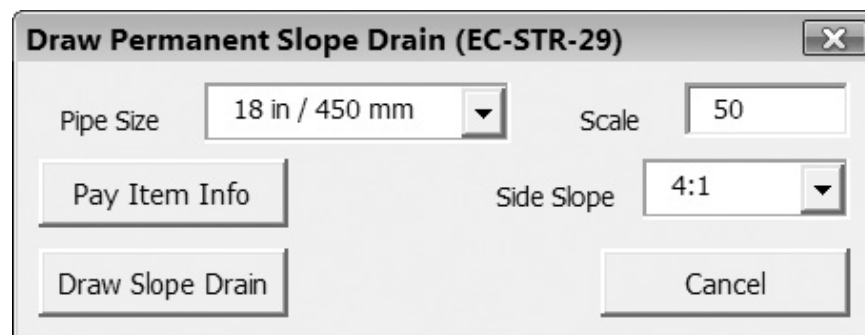
Special Requirements:

The slope lines and ditch line must be drawn/located in the plan view.

Usage:

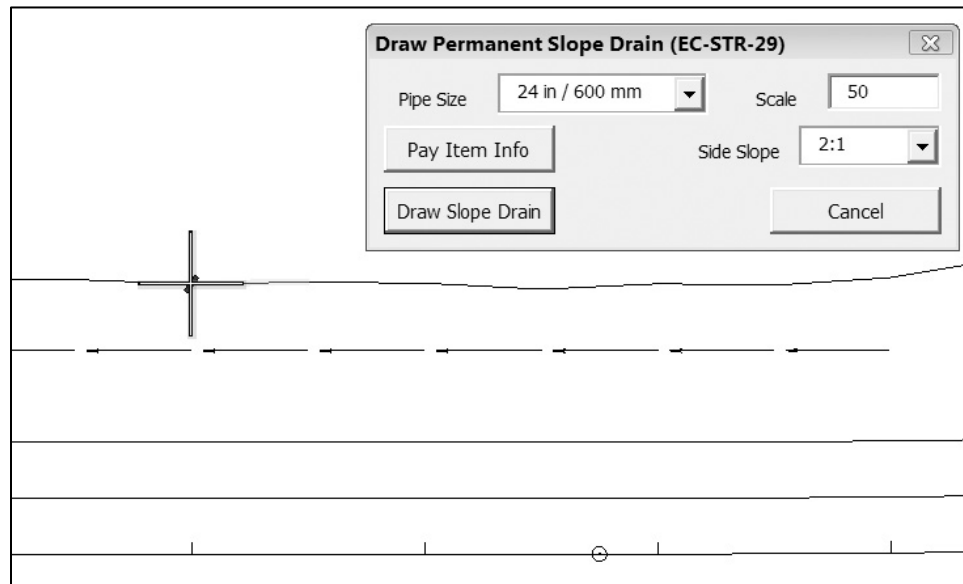
Step 1. In D&C manager activate **Perm Slope Drain**. The **Draw Permanent Slope Drain** dialog opens.

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.

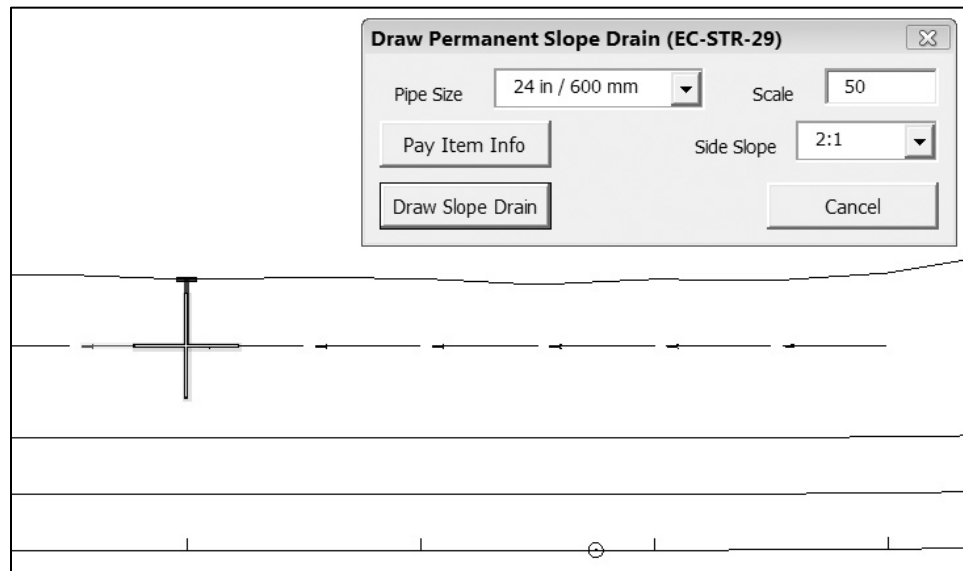


Step 2. Make settings in the dialog as needed for the slope drain you need to draw. Once settings are made click on the **Draw Slope Drain** button.

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.

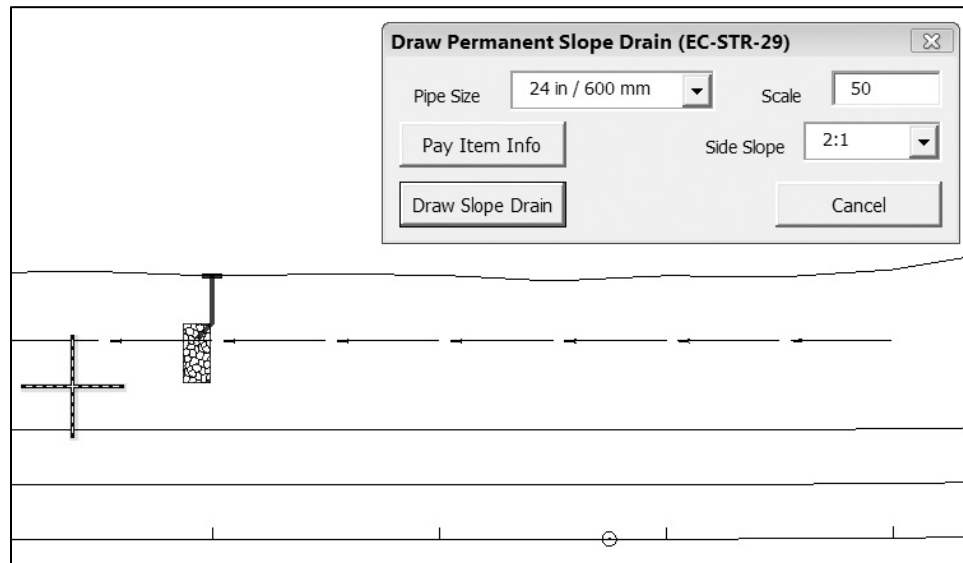


Step 4. After the initial data point, the inlet and pipe are shown dynamically and the user is prompted to **ID Point Perpendicular at Ditch. Snap** and **Data point** at the ditch line location where the pipe is perpendicular to the ditch.

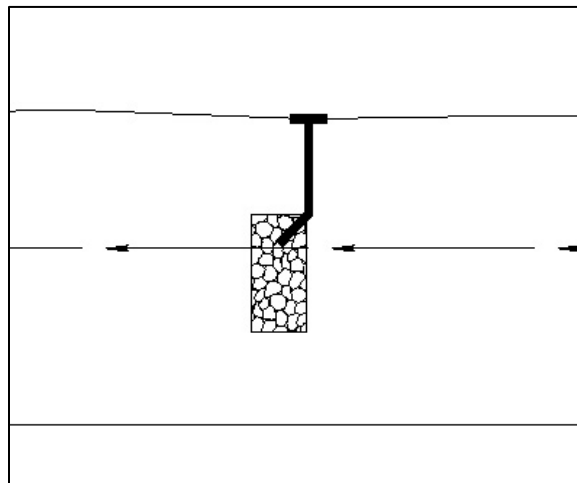


The program then uses the settings given for side slope & pipe size to calculate the 45 degree bend location in the pipe back from the ditch.

- 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.



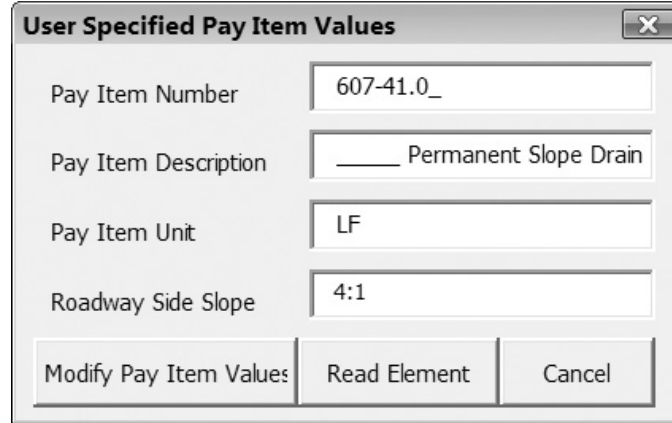
- Step 6.** After giving this last point, all slope drain graphics are placed in the file.



- 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.



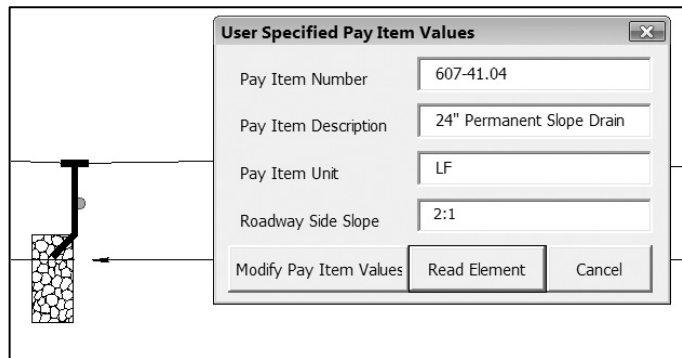
The dialog box titled "User Specified Pay Item Values" contains the following fields and buttons:

Pay Item Number	607-41.0_
Pay Item Description	_____ Permanent Slope Drain
Pay Item Unit	LF
Roadway Side Slope	4:1
Modify Pay Item Values Read Element Cancel	

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.

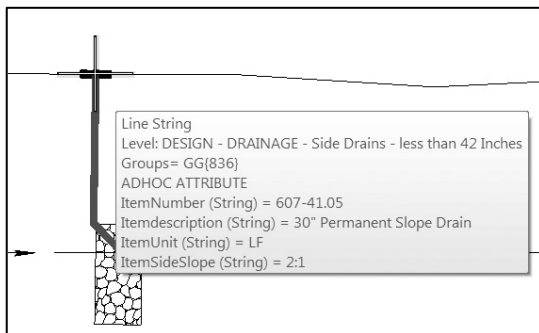
Once identified, **Data point** again to accept and assign the pay item values. This function can be used to assign pay item values to slope drains that were placed prior to the implementation of this tool.

Step 3. To check the pay item values assigned to a slope drain that has been placed previously, 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.



The dialog box is shown next to a graphical representation of a slope drain element. The dialog fields are populated with the following values:

Pay Item Number	607-41.04
Pay Item Description	24" Permanent Slope Drain
Pay Item Unit	LF
Roadway Side Slope	2:1
Modify Pay Item Values Read Element Cancel	



This information is shown with MicroStation's element pop up info if Geopak software is activated. Snap to the slope drain and float the cursor over the element.

Geopak's D&C Manager pay items read this data to compute total quantities.

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

D&C location: Drafting Standards > Prop. Drainage > Structures on Profiles > Profile Pipe

MicroStation VBA Program: DrawPipeProfile.mvba

Description:

This application is used to draw a proposed pipe(s) on a profile.

A command button is provided to access Roadway Design Division's Data **Point Profile Station Elevation** tool which can be used to issue the flow line point by its station and elevation.

This macro can also be activated from the MicroStation drop down menu

TDOT > Drainage (Profiles\Culv. Sections) > Draw Pipe

or by using the keyin

vba run [DrawPipeProfile]DrawPropPipe.Main

Special Requirements:

None.

Usage:

- Step 1.** Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Roadway Design Division's **Data Point Profile Station Elevation** tool.
- Step 2.** In D&C manager activate **Profile Pipe**. The **Draw Pipe on Profile by Flow Point** dialog opens. Defaults which are displayed . **Number of Pipes 1, Space between Pipes 12 inches, Skew Angle 90, Skew Direction None, Vertical Exaggeration 10, Label Scale (Current Active Scale) & Pipe 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.

Pipe Type controls the format of labeling provided.

Cross Drain - Profile Drainage Data Cell

Storm Drainage - 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 Pipe** button.

Step 4. You are then prompted to **Identify Flow Line Point at CL**. Snap and Data point to graphically identify the flow line point or use the **Data Point Profile Station Elevation** tool to set the point by station & elevation.

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 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.

Draw Pipe on Profile by Flow Point

☐ Existing ☒ Proposed

Pipe Height: 48
 Pipe Width:
 Number of Pipes: 1
 Space Between Pipes: 12

Enter values in inches or mm. Pipe Width is optional. Min. drawn width = 42"/1050 mm at Vertical Exaggerations > 1

Skew Angle: 90
 Enter skew angle in degrees or DMS (45 or 35^20'15")
 Skew Direction: None (90 Deg)
 Vertical Exaggeration: 10
 Label Scale: 50
 Pipe Type: Cross Drain

Buttons: Draw Pipe, DP by Station & Elevation, Cancel

Data Point Profile Station Elevation

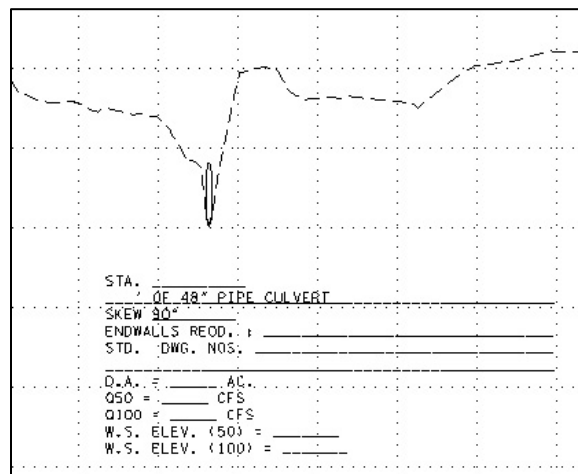
Profile Settings
 Job: 999
 Chain: MAINLINE
 Station: 191+24.02
 Elevation: 700.0000
 Horiz/Vert: 10:1
 X: 2485333.6265
 Y: 610883.3685

Buttons: Identify Profile Cell

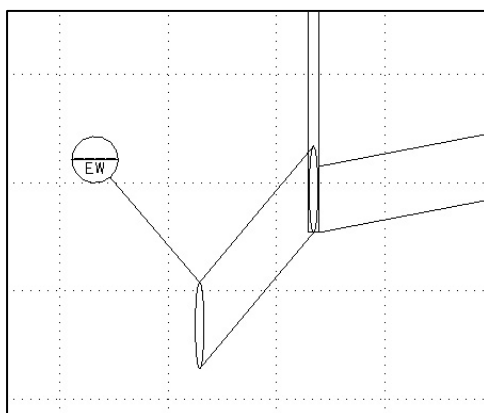
Station: 242+32.00
 Elevation: 760.15
 Dynamic Label: ☒

Buttons: Data Point, Text Styles Plus..., Cancel

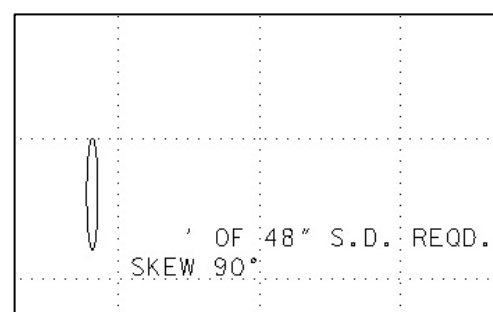
Step 8. The data cell is placed and **size, type & skew data** is added.



Storm Drainage 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 VBA Program: DrawBoxProfile.mvba

Description:

This application is used to draw a proposed box culvert or bridge on a profile.

A command button is provided to access Roadway Design Division's **Data Point Profile Station Elevation** tool which can be used to issue the flow line point by its station and elevation.

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

vba run [DrawBoxProfile]DrawPropBox.Main

Special Requirements:

None.

Usage:

- Step 1.** Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Roadway Design Division's **Data Point Profile Station Elevation** tool.
- Step 2.** In D&C manager activate **Profile Box**. The **Draw 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, Skew Direction None, Label Scale (Current Active Scale) & Vertical Exaggeration 10.** Note that skew angles in degrees minutes & seconds are supported.

Draw Box Culvert or Bridge on Profile by Flow Point

☐ Existing ☒ Proposed

Barrels

Number of Barrels: 1

Skew Angle: 90
Enter skew angle in degrees or DMS (45 or 35^20'15")

Skew Direction: None (90 Deg)

Thickness

Outside Wall: 8

Inside Wall: 8

Top Slab: 12

Bottom Slab: 12

Label Scale: 50

Vertical Exaggeration: 10

Enter barrel sizes in feet or meters and thicknesses in inches or millimeters.

Draw Structure DP by Station & Elevation Cancel

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 60 degree skew left. From standard structure drawing STD-17-95 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 13" and the bottom slab (SB) thickness is 13" 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 to graphically identify the flow line point or use the **Data Point Profile Station Elevation** tool to set the point by station & elevation. Due to the 60 degree skew, structure widths are adjusted.

Step 6. The structure is drawn and the user is prompted to **ID location for Drainage Data**. A **Reset** can be given to skip placement or **Data point** at location for the data cell to be placed.

The screenshot shows two dialog boxes over a profile view of a road. The 'Draw Box Culvert or Bridge on Profile by Flow Point' dialog box is on the left, with 'Proposed' selected. It contains input fields for:

- Barrels: Number of Barrels (3), Barrel Width (10), Barrel Height (8)
- Thickness: Outside Wall (8), Inside Wall (8), Top Slab (13), Bottom Slab (13)
- Skew Angle (60) with a note 'Enter skew angle in degrees or DMS (45 or 35^20'15")'
- Skew Direction (Left)
- Label Scale (50)
- Vertical Exaggeration (10)

 A note at the bottom says 'Enter barrel sizes in feet or meters and thicknesses in inches or millimeters.' Buttons include 'Draw Structure', 'DP by Station & Elevation', and 'Cancel'.

The 'Data Point Profile Station Elevation' dialog box is on the right. It shows:

- Profile Settings: Job: 999, Chain: MAINLINE, Station: 191+24.02, Elevation: 700.0000, Horiz/Vert: 10:1, X: 2485333.6265, Y: 610883.3685. A button 'Identify Profile Cell' is present.
- Label Station & Elevation: Station (290+92.00), Elevation (9+99(9).12)
- Dynamic Tracking: Elevation (763.23)
- Dynamic Label: checked, Elevation (99.12)
- Buttons: 'Data Point', 'Text Styles Plus...', and 'Cancel'.

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.

The screenshot shows the profile view with the culvert structure drawn. Below the structure, a data cell is placed with the following text:

STATION	_____
STRUCTURE	_____
SKEW	60° LT
DRAINAGE AREA	_____ AC.
DESIGN DISCHARGE (Q50)	_____ CFS
DESIGN DISCHARGE (Q100)	_____ CFS
OVERTOPPING ELEV.	_____
ALLOWABLE HEADWATER ELEV.	_____
Q50 HEADWATER ELEV.	_____
Q100 HEADWATER ELEV.	_____
VELOCITY (Q50)	_____ FT/S
VELOCITY (Q100)	_____ FT/S
INLET ELEVATION	_____
OUTLET ELEVATION	_____
STANDARD DRAWING NUMBERS	_____
CLASS "A" CONCRETE	_____ C.Y.
STEEL BAR REINFORCING	_____ LB.
FOUNDATION FILL MATERIAL	_____ C.Y.

Draw Prop. Slab Culvert or Bridge on Profile by Flow Point

D&C location: Drafting Standards > Prop. Drainage > Structures on Profiles > Profile Slab

MicroStation VBA Program: DrawSlabProfile.mvba

Description:

This application is used to draw a proposed slab culvert or bridge on a profile.

A command button is provided to access Roadway Design Division's Data **Point Profile Station Elevation** tool which can be used to issue the flow line point by its station and elevation.

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
vba run [DrawSlabProfile]DrawPropSlab.Main

Special Requirements:

None.

Usage:

- Step 1.** Establish the center flow line point of the pipe(s). This may be located with MicroStation tools or with Roadway Design Division's Data **Point Profile Station Elevation** tool.
- Step 2.** In D&C manager activate **Profile Slab**. The **Draw 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, Skew Direction None, Label Scale (Current Active Scale) & Vertical Exaggeration 10.** Note that skew angles in degrees minutes & seconds are supported.

Draw Slab Culvert or Bridge on Profile by Flow Point

☐ Existing ☒ Proposed

Barrels

Number of Barrels: 1

Barrel Width:

Barrel Height:

Thickness

Outside Wall: 8

Inside Wall: 8

Top Slab: 12

Footing Slab: 18

Skew Angle: 90
Enter skew angle in degrees or DMS (45 or 35^20'15")

Skew Direction: None (90 Deg)

Label Scale: 50

Vertical Exaggeration: 10

Enter barrel sizes in feet or meters and thicknesses in inches or millimeters.

Draw Structure DP by Station & Elevation Cancel

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 5' fill height at a 45 degree skew right. From standard structure drawing STD-17-139 we get the outside wall (WT) thickness of 8" and an inside wall (IT) thickness of 8" so we can use the defaults for those. The top slab (ST) thickness is 14" 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 to graphically identify the flow line point or use the **Data Point Profile Station Elevation** tool to set the point by station & elevation. Due to the 45 degree skew, structure widths are adjusted.

Step 6. The structure is drawn and the user is prompted to **ID location for Drainage Data**. A **Reset** can be given to skip placement or **Data point** at location for the data cell to be placed.

Draw Slab Culvert or Bridge on Profile by Flow Point

☐ Existing ☒ Proposed

Barrels

Number of Barrels: 2

Barrel Width: 14

Barrel Height: 7

Thickness

Outside Wall: 8

Inside Wall: 8

Top Slab: 14

Footing Slab: 18

Skew Angle: 45
Enter skew angle in degrees or DMS (45 or 35^20'15")

Skew Direction: Right

Label Scale: 50

Vertical Exaggeration: 10

Enter barrel sizes in feet or meters and thicknesses in inches or millimeters.

Draw Structure DP by Station & Elevation Cancel

Data Point Profile Station Elevation

Profile Settings

Job: 999

Chain: MAINLINE

Station: 191+24.02

Elevation: 700.0000

Horiz/Vert: 10:1

X: 2485333.6265

Y: 610883.3685

Identify Profile Cell

Station: 290+92.00

Label Station & Elevation 9+99(9).12

Dynamic Tracking 763.23

Dynamic Label 99.12

Data Point Text Styles Plus... Cancel

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.

STATION

STRUCTURE

SKEW

DRAINAGE AREA

DESIGN DISCHARGE (Q50)

DESIGN DISCHARGE (Q100)

OVERTOPPING ELEV.

ALLOWABLE HEADWATER ELEV.

Q50 HEADWATER ELEV.

Q100 HEADWATER ELEV.

VELOCITY (Q50)

VELOCITY (Q100)

INLET ELEVATION

OUTLET ELEVATION

STANDARD DRAWING NUMBERS

CLASS 'A' CONCRETE

STEEL BAR REINFORCING

FOUNDATION FILL MATERIAL

OF 2 @ 14' X 7' SLAB BR.

45° RT

AC.

CFS

CFS

FT/S

FT/S

C.Y.

LB.

C.Y.

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:

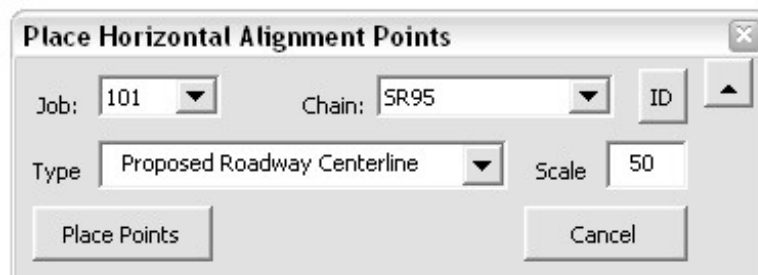
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

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.

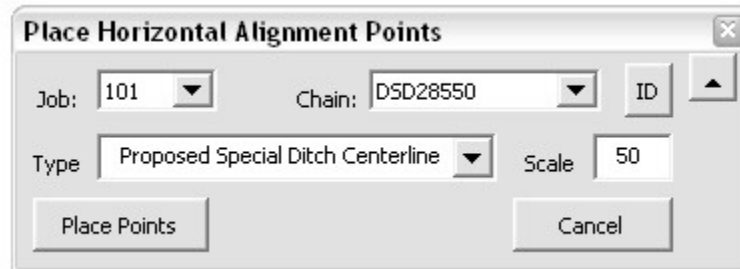
Usage:

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.

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.

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:

Geopak project GPK file must be present in folder with currently open MicroStation DGN file.

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**.

Label Vertical Alignment

Profile Settings

Job:
Chain:
Station:
Elevation:
Scale:
X:
Y:

Identify Profile Cell

Type: Special Ditch
Profile:

Label Scale: 50

Label Intersections

☒ VPI Labels
☐ VPC/VPT Labels
☒ Grade Labels ☐ Show Sub-Tangents
☒ V.C. Length Labels
☐ Label Crest High Points
☐ Label Sag Low Points

PLACE LABELS

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.

Label Vertical Alignment

Profile Settings

Job: 101
Chain: SR95
Station: 285+00.00
Elevation: 700.00
Scale: 10:1
X: 2490000.00
Y: 581000.00

Identify Profile Cell

Type: Special Ditch
Profile: SPDITCH

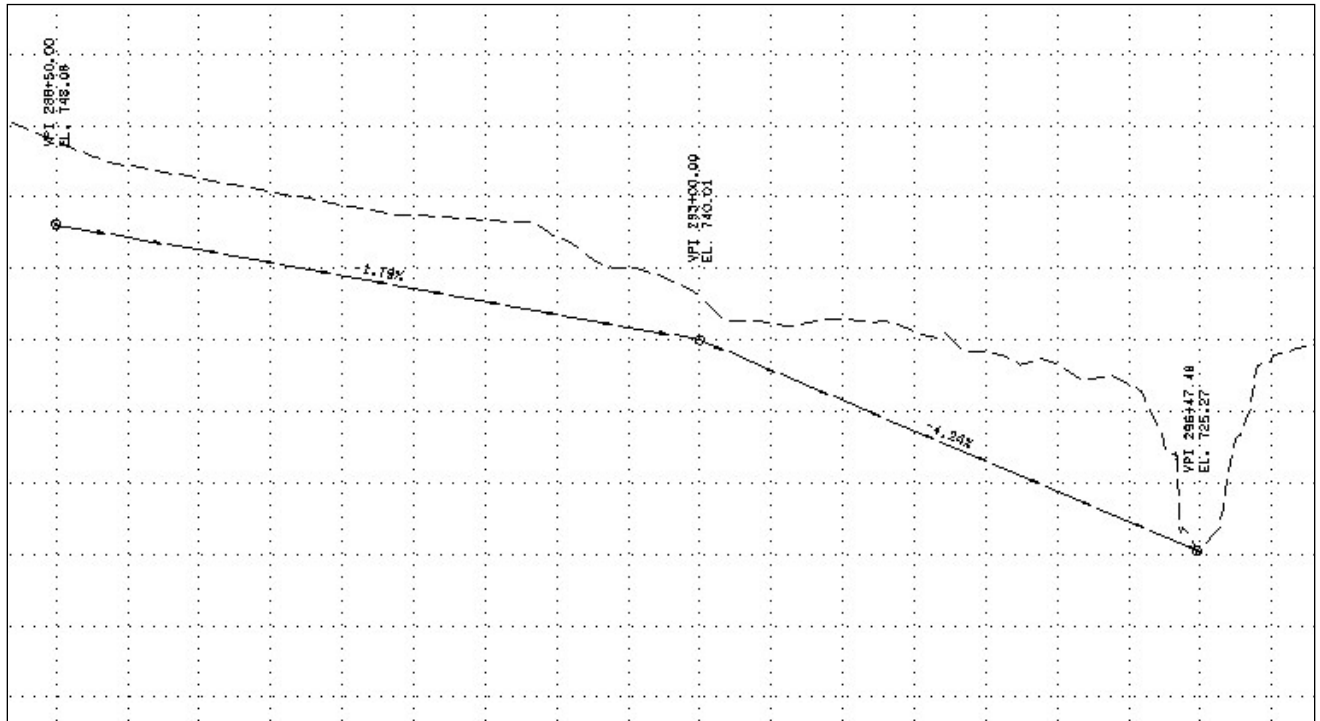
Label Scale: 50

Label Intersections

☒ VPI Labels
☐ VPC/VPT Labels
☒ Grade Labels ☐ Show Sub-Tangents
☒ V.C. Length Labels
☐ Label Crest High Points
☐ Label Sag Low Points

PLACE LABELS

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 Roadway Design Division drainage plan view cells.

Command buttons are provided to access TDOT Roadway Design Division vba programs which are used to draw box culverts/bridges, A, ST, L, SD or U endwalls and drainage flow direction plan view graphics.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

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

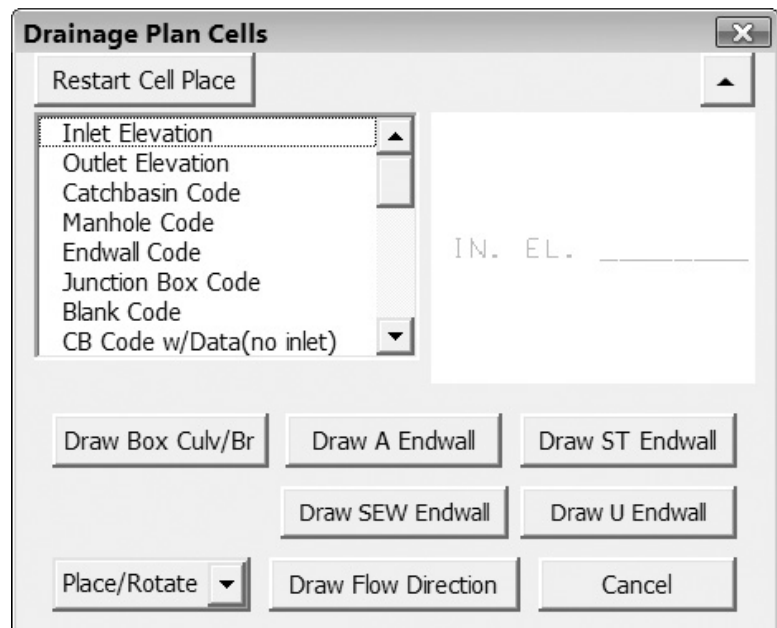
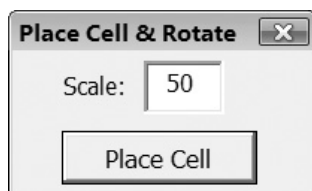
Special Requirements:

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 the **Place Cell & Rotate** tool is activated.



Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

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 Roadway Design Division drainage profile and culvert cross section cells.

Command buttons are provided to access TDOT Roadway Design Division vba programs which are used to draw box culverts/bridges, slab culverts/bridges and pipe profile graphics.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Drainage (Profile\Culv. Sections) > Cells

or by using the keyin

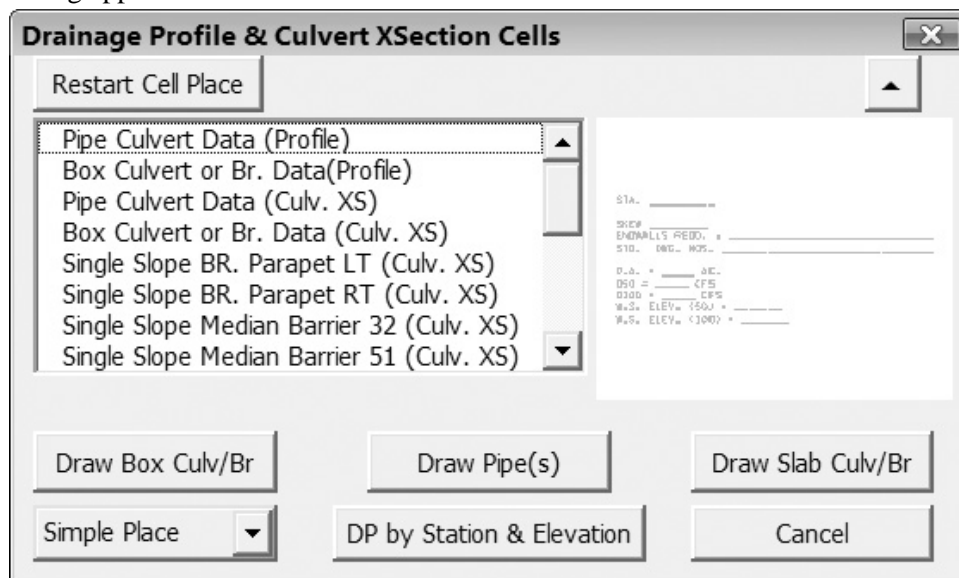
vba run [DrainageProfileCells]DrainProfilecells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

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:

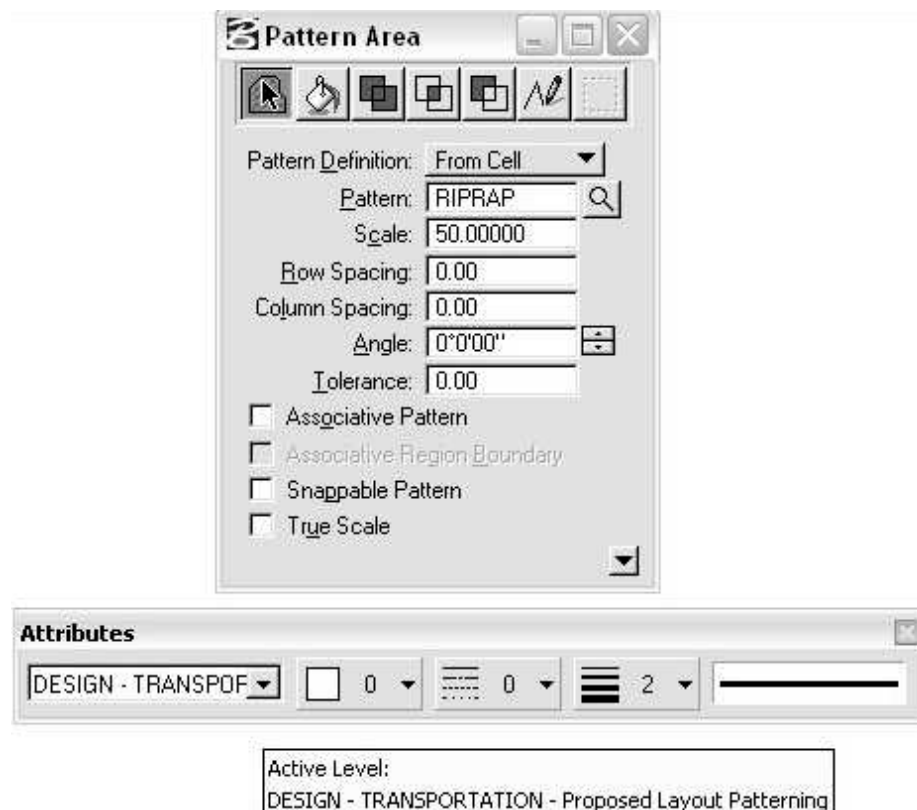
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

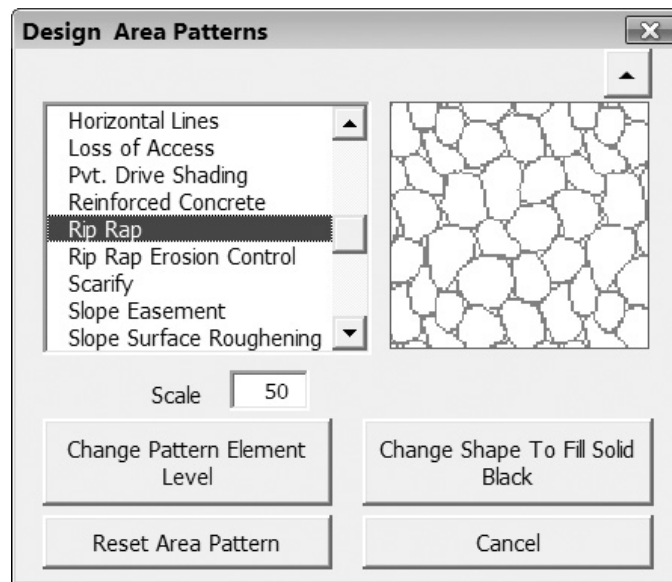
Fence method: Create a fence bounding the area to be patterned.

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.

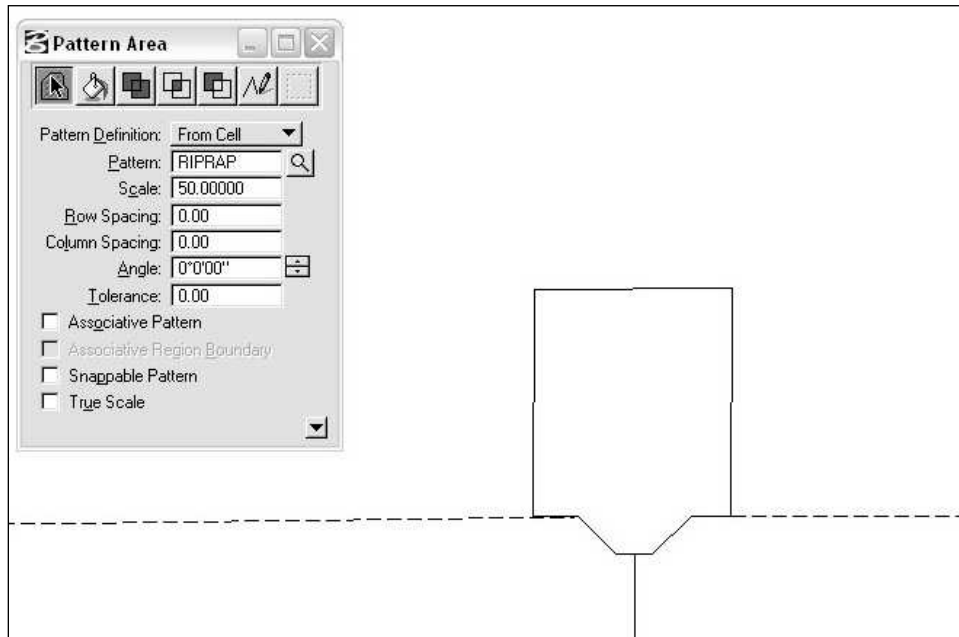


Or from the drop down menu in the **Design Area Patterns** dialog ...

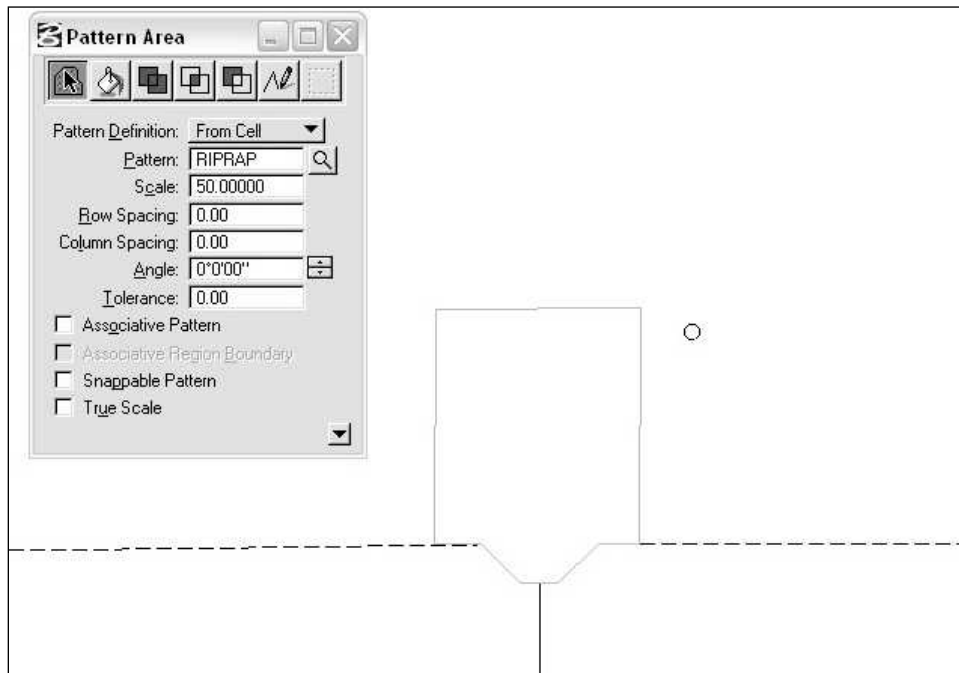


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Element**.

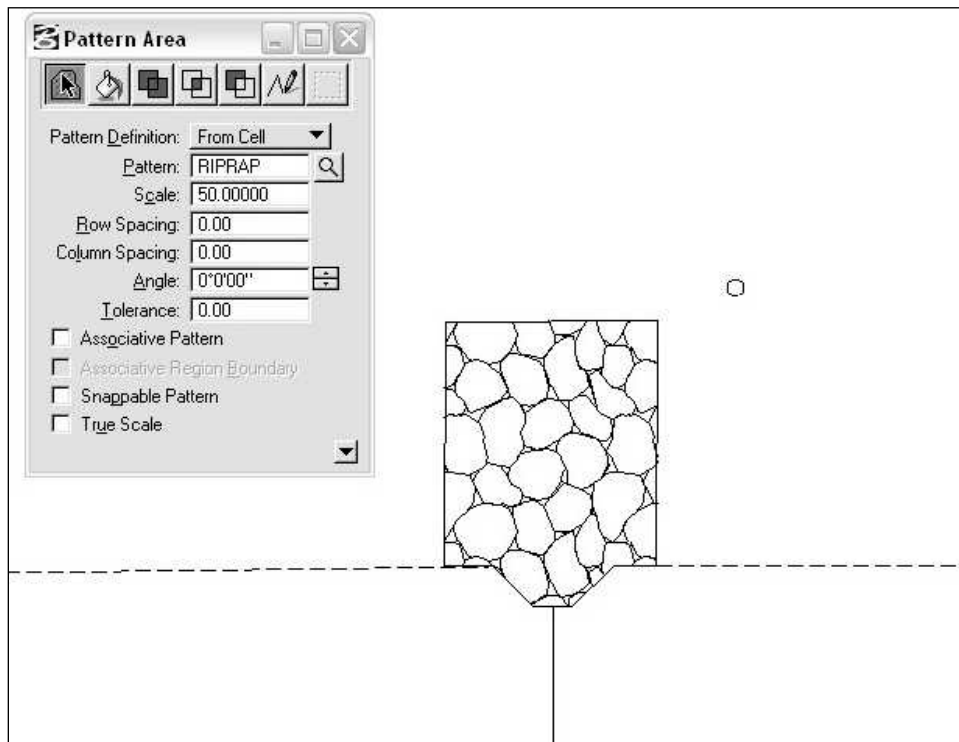
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Element, the user is prompted to **Identify Element**.



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 prompted 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

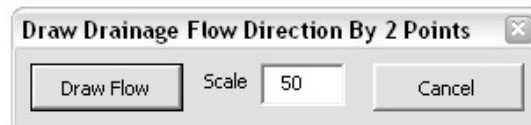
vba run [DrawFlowDirection]DrawDrainageFlow.main

Special Requirements:

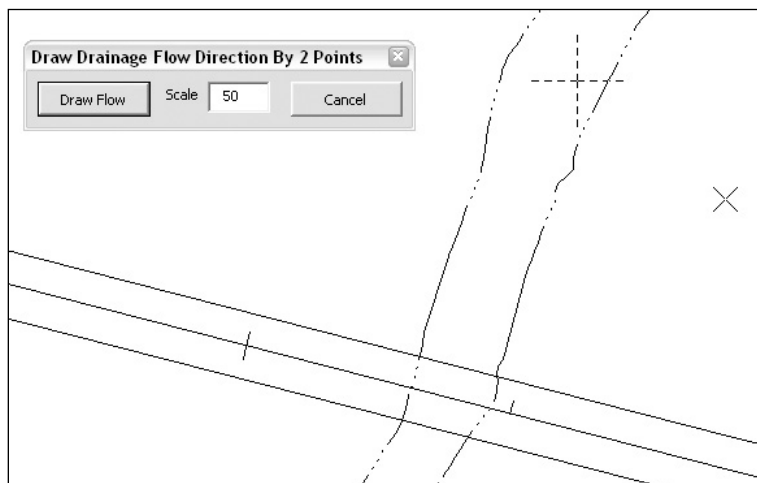
None

Usage:

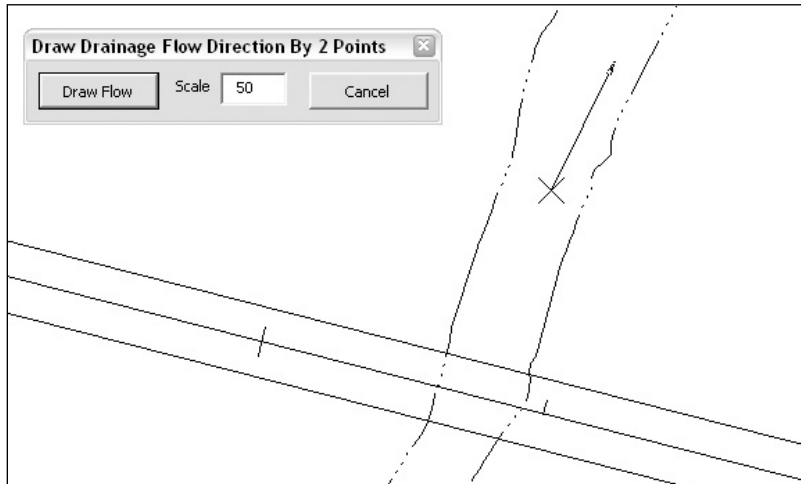
- Step 1.** In D&C manager activate **Flow Direction**. The **Draw Drainage Flow Direction by 2 Points** dialog opens. The only entry field is **Scale** which reflects the current active scale. Reset this value if needed and click on the **Draw Flow** button.



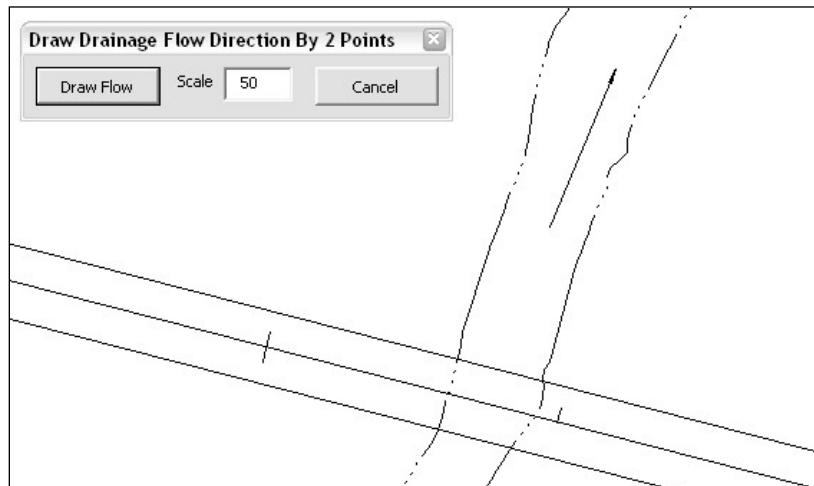
- Step 2.** You are then prompted to **Identify Point for Arrowhead**. Data point at the location for the arrowhead.



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 cannot 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 resetting 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

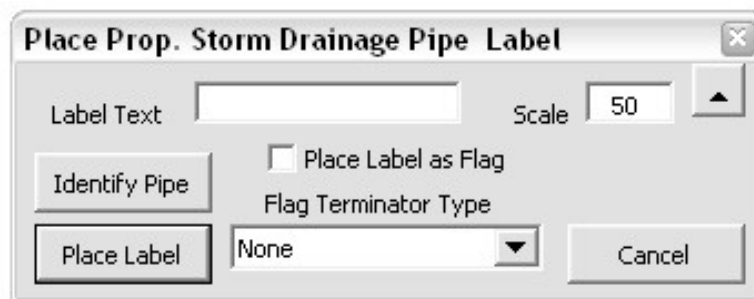
vba run [StormDrainagePipeLabel]StormDrainagePipe.main

Special Requirements:

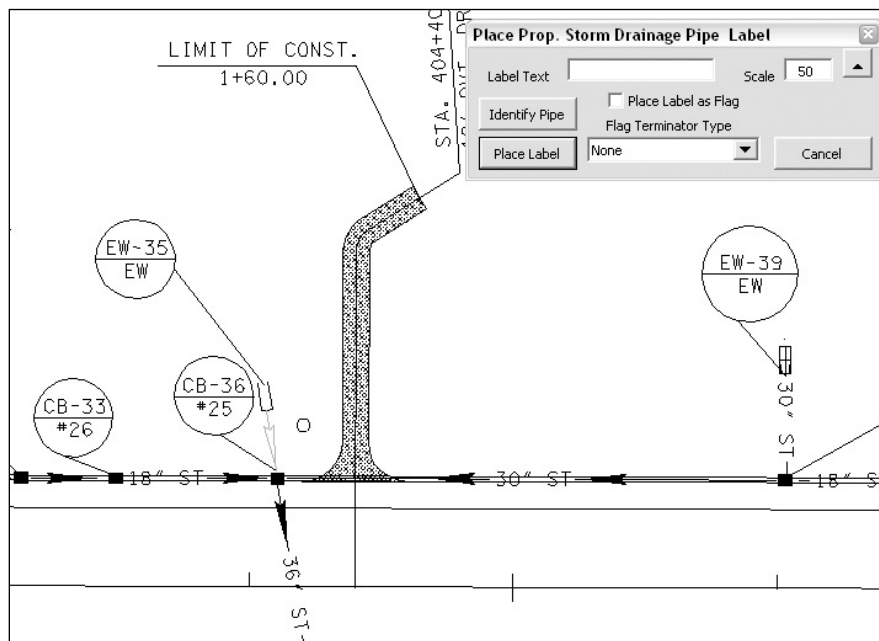
Storm drainage pipe must be drawn with the correct level and symbology for the Identify Pipe function.

Usage:

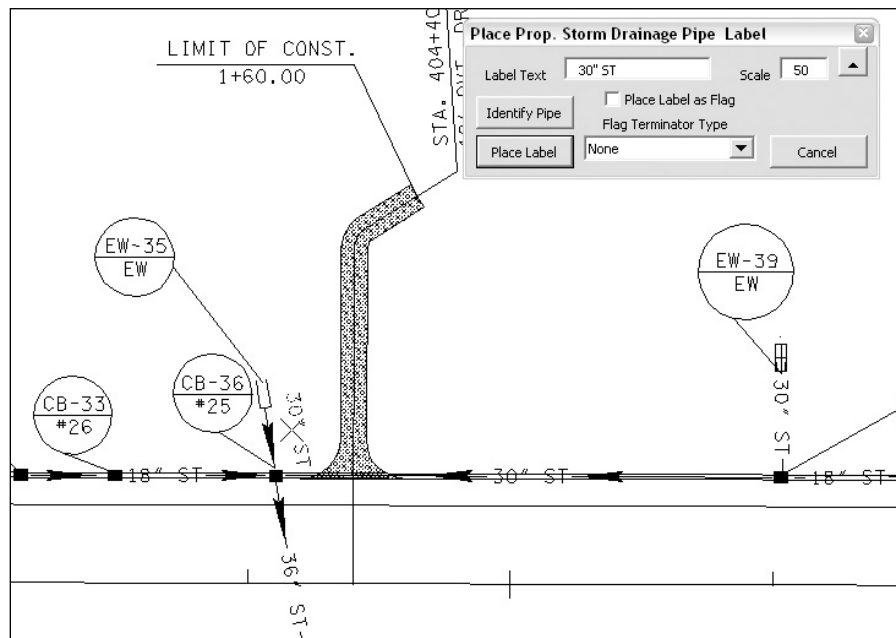
Step 1. In D&C manager activate **Label ST Pipe**. The **Place Prop. Storm Drainage Pipe Label** dialog appears. When started program immediately prompts user to **Identify Element** for annotation.



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.

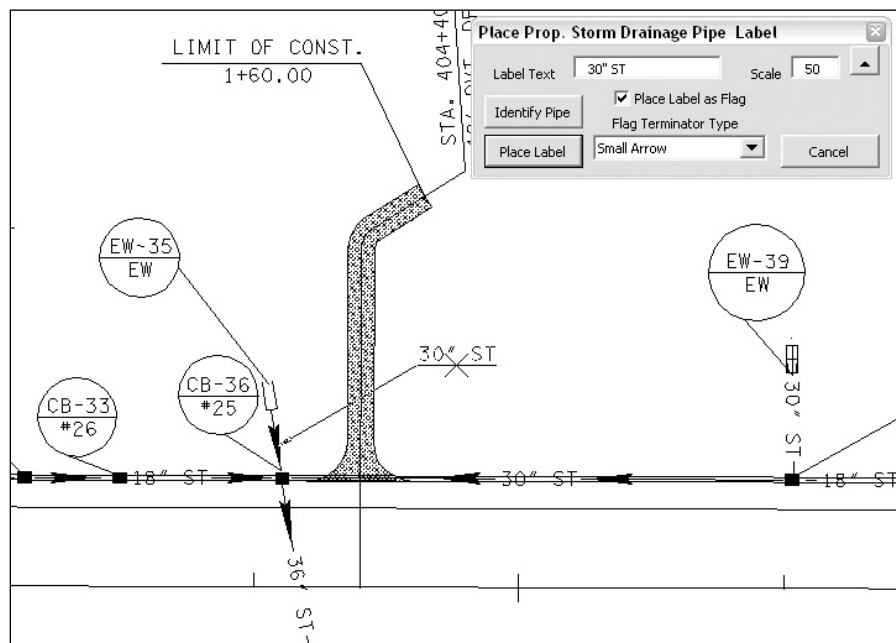
Label placement with Leader line as a Flag:

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 VBA Program: DrawVehicleTrajectoryPath.mvba

Description:

This application is used to 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
vba run [DrawVehicleTrajectoryPath]start.main

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:

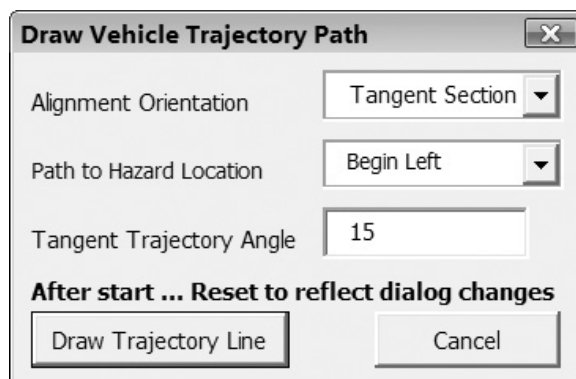
Begin or End & Left or Right.

This is the general location of where the path originates in relation to the hazard going forward along the centerline.

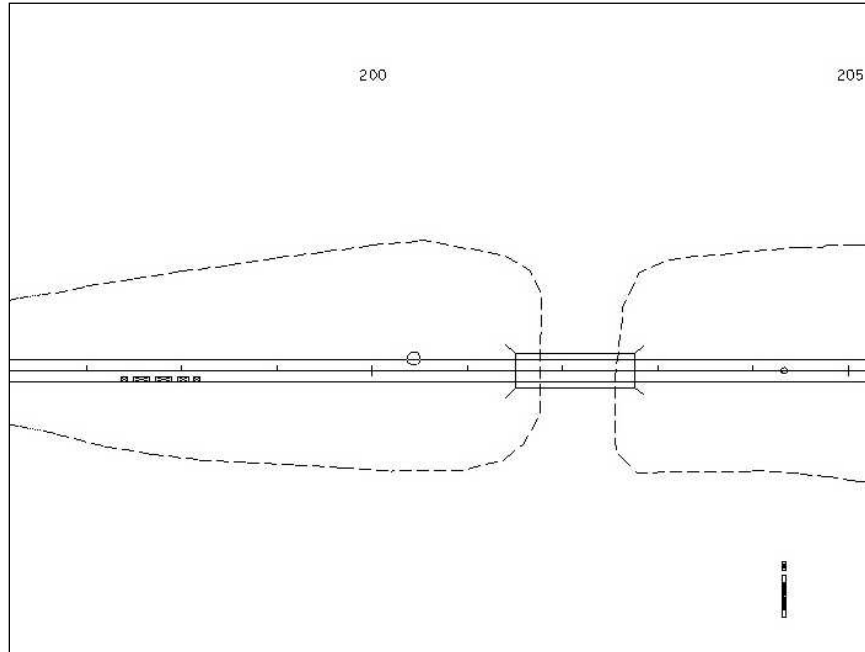
Tangent Trajectory Angle: numeric value.

This is the angle which will be used to draw trajectory paths from tangents. Default value of 15 degrees is given.

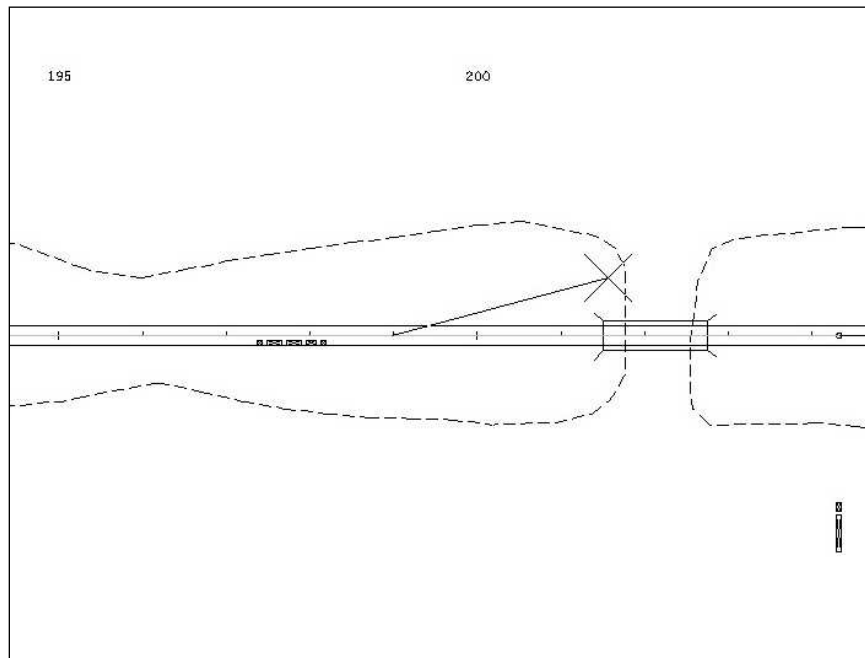
Make settings as needed and click on the **Draw Trajectory Line** button.




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.



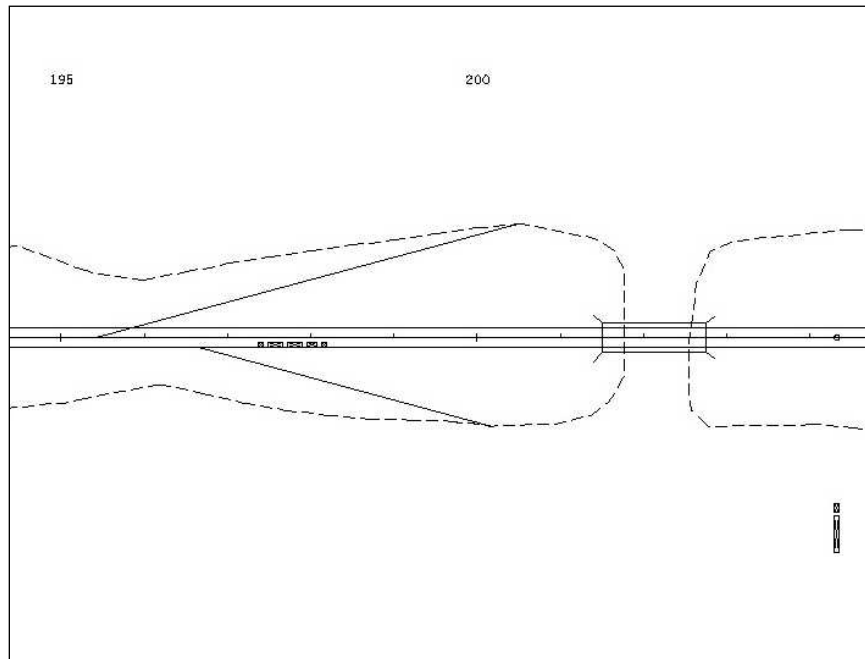
Step 4. The trajectory line appears floating along the centerline and you are then prompted to **Identify Hazard Location**. In our example the first hazard is a 2:1 slope prior to the bridge so we snap to that slope tie and **Data point**. The path line is drawn and the **Draw Vehicle Trajectory Path** dialog re-appears.



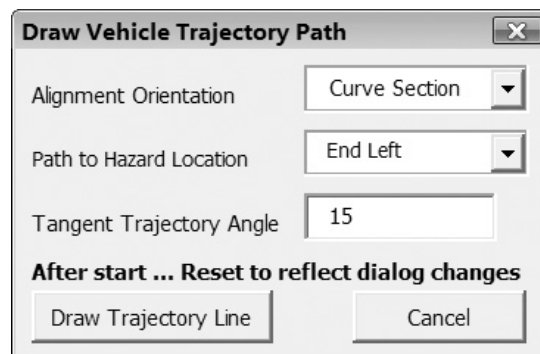
Step 5. You can click **Cancel** to quit or make new settings and click **Draw Trajectory Line** to place another trajectory line. In our example we reset it to **Begin Right** to continue.



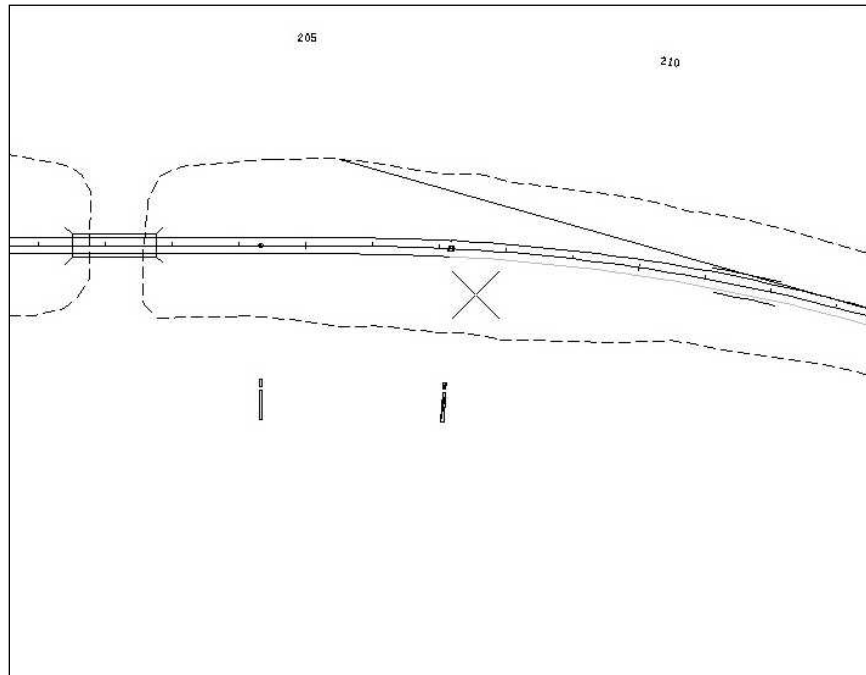
Step 6. Repeating steps 3 & 4 this time we identify the right edge of pavement and data point at the beginning of 2:1 slopes on the right side.



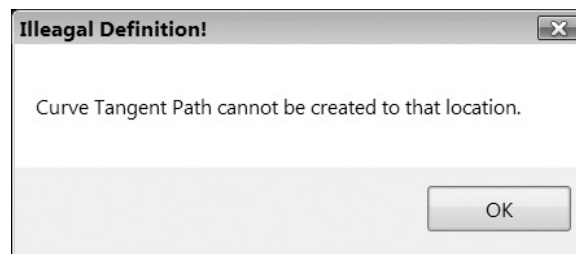
Step 7. In our example the roadway approach at the end of the bridge is in a curve so we reset the Alignment Orientation to a **Curve Section**, the Path to Hazard Location to **End Left** and click **Draw Trajectory Line** to continue.



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:

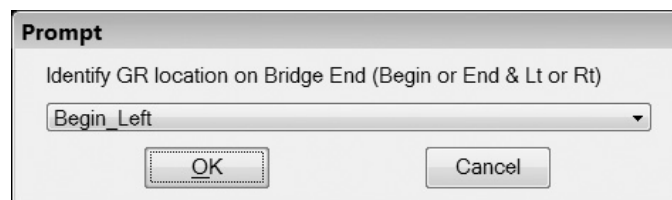
- Step 1.** Locate bridge end location for beginning of guardrail.
- Step 2.** In D&C manager activate **GR Br End Prop.**
- Step 3.** You are prompted for a **job no.** Key that in and click **OK.**



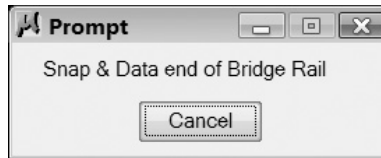
- Step 4.** You are then prompted for the **chain name.** Key that in and click **OK.**



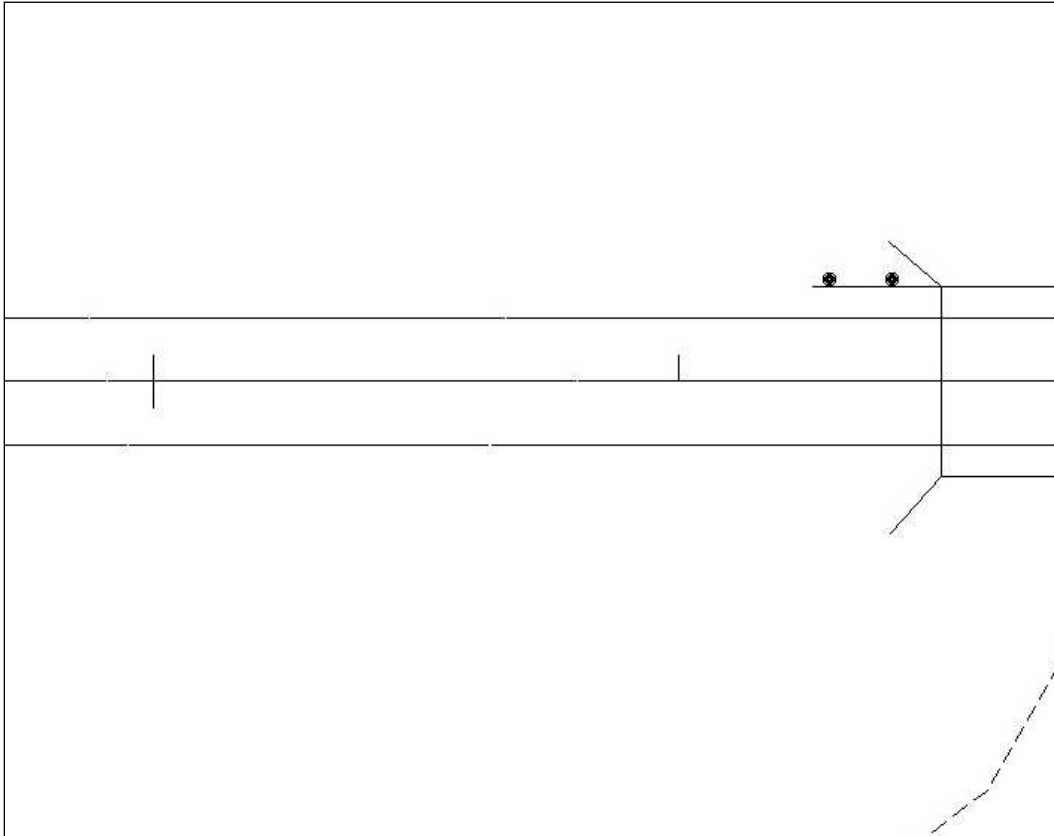
- Step 5.** You are then prompted for the guardrail location in relation to the bridge end, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK.**



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 plotting 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)

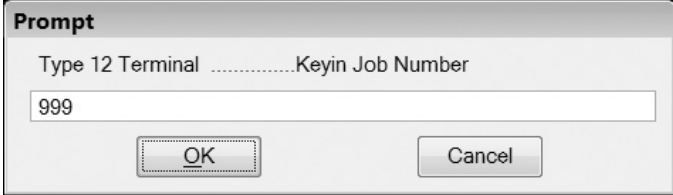
Offset distance from edge of travel lane to tangent section of guardrail (**L₂** from equation).

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**.

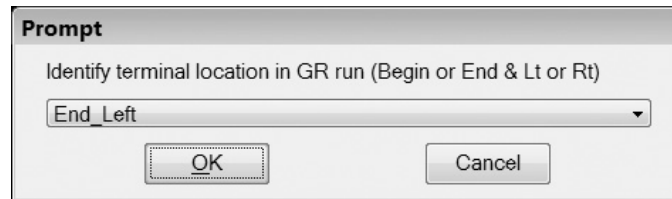
Step 3. You are prompted for a **job no.** Key that in and click **OK**.



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

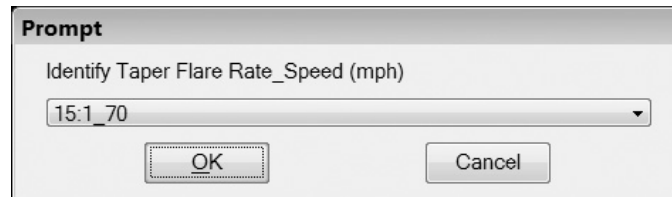


- Step 5.** You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



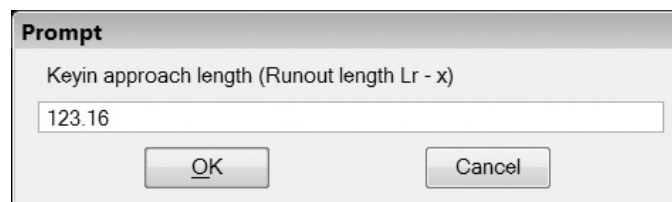
A dialog box titled "Prompt" with the text "Identify terminal location in GR run (Begin or End & Lt or Rt)". It features a dropdown menu with "End_Left" selected. At the bottom are "OK" and "Cancel" buttons.

- 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**.



A dialog box titled "Prompt" with the text "Identify Taper Flare Rate_Speed (mph)". It features a dropdown menu with "15:1_70" selected. At the bottom are "OK" and "Cancel" buttons.

- Step 6.** You are then prompted to **Keyin approach length (Runout length L_r - 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**.



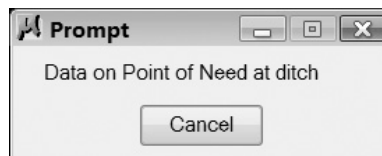
A dialog box titled "Prompt" with the text "Keyin approach length (Runout length L_r - x)". It features a text input field containing "123.16". At the bottom are "OK" and "Cancel" buttons.

- Step 7.** You are then prompted to **Keyin Guardrail offset value L_2** . 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**.



A dialog box titled "Prompt" with the text "Keyin Guardrail offset value L_2 ". It features a text input field containing "12". At the bottom are "OK" and "Cancel" buttons.

- Step 6.** You are then prompted **Data on Point of Need at Ditch**. Snap to that location and **Data Point**.

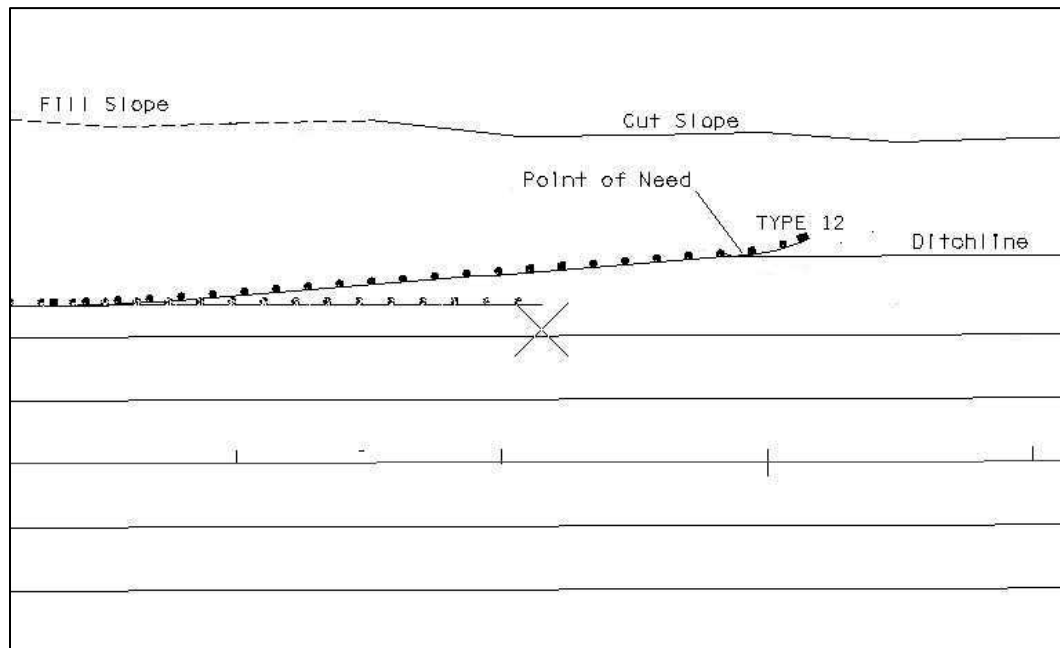


A dialog box titled "Prompt" with the text "Data on Point of Need at ditch". It features a "Cancel" button at the bottom.

- 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:

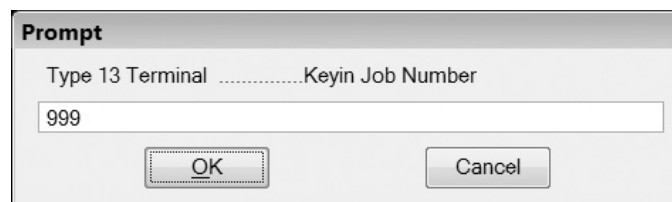
This application places a type 13 guardrail terminal cell, a type text label and a point at the terminal location for later use in calculating quantities.

Special Requirements:

Terminal location at guardrail along roadside must be located graphically so that it can be identified when using program.

Usage:

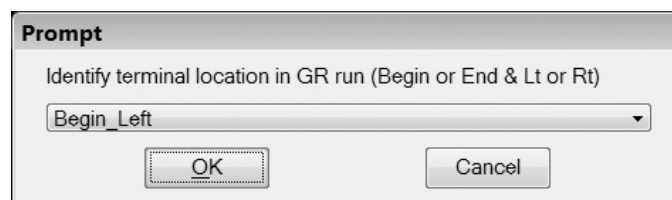
- Step 1.** Locate terminal location at guardrail along roadside. For the type 13 terminal this is **6.25' past the end of hazard location (except for median bridge pier protection which requires a minimum distance of 12.5' past the pier).**
- Step 2.** In D&C manager activate **GR Term Type 13.**
- Step 3.** You are prompted for a **job no.** Key that in and click **OK.**



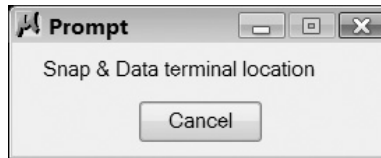
- Step 4.** You are then prompted for the **chain name.** Key that in and click **OK.**



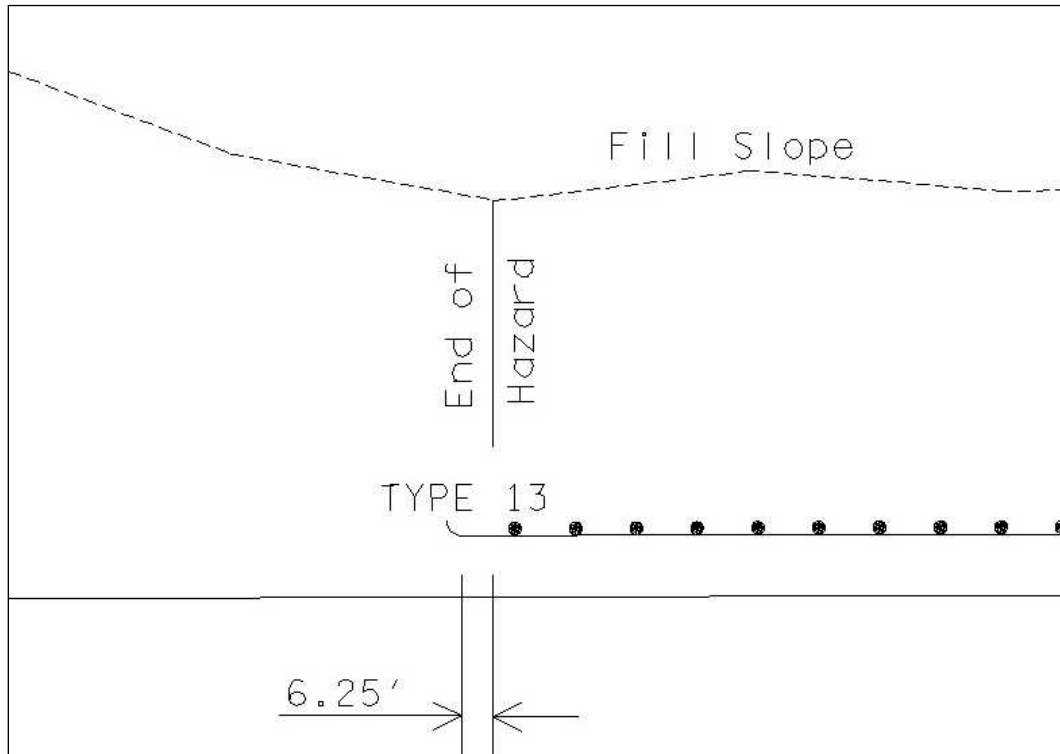
- Step 5.** You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK.**



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.

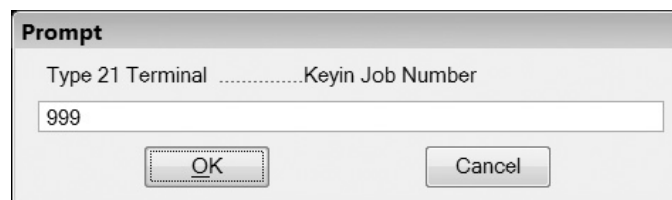
This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

Terminal beginning location at guardrail along roadside must be located graphically so that it can be identified when using program.

Usage:

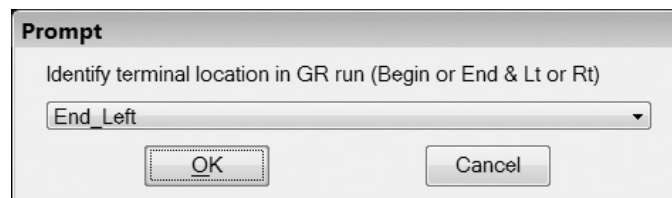
- Step 1.** Locate beginning of terminal location at guardrail along roadside. For the type 21 terminal this is **12.5' back from the point of need location**.
- Step 2.** In D&C manager activate **GR Term Type 21**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



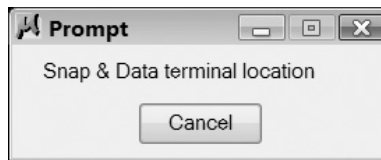
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



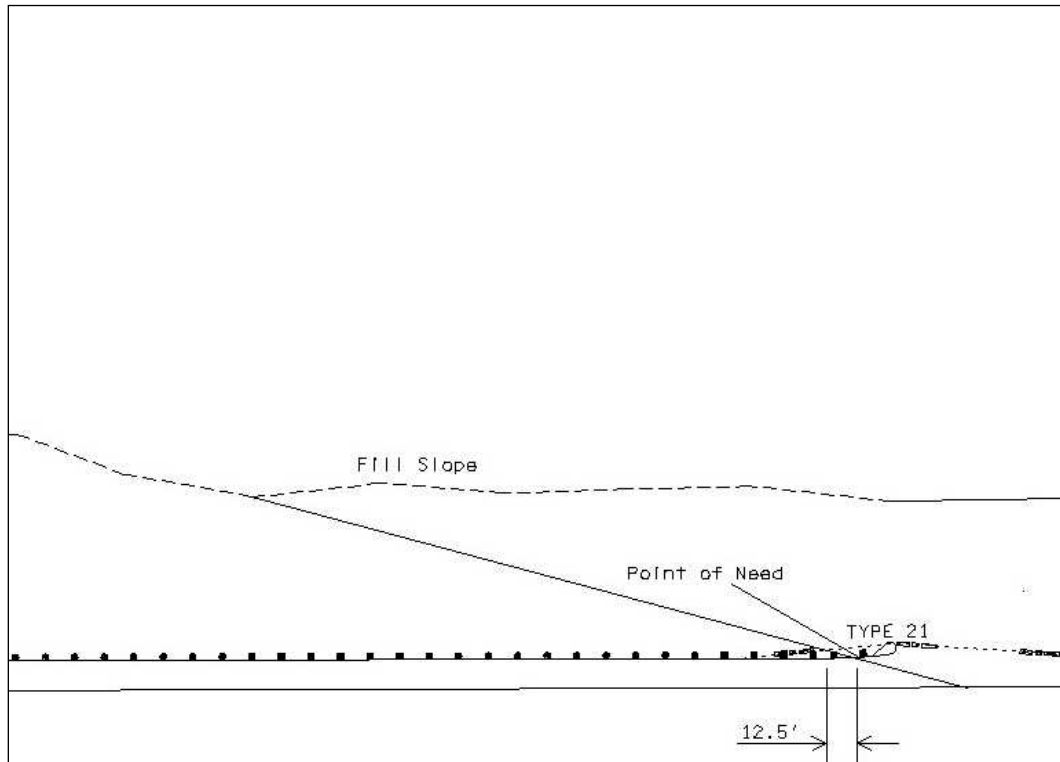
- Step 5.** You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



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.

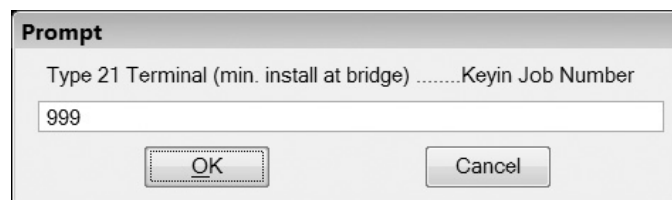
This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

Bridge end location for beginning of guardrail must be located graphically so that it can be identified when using program.

Usage:

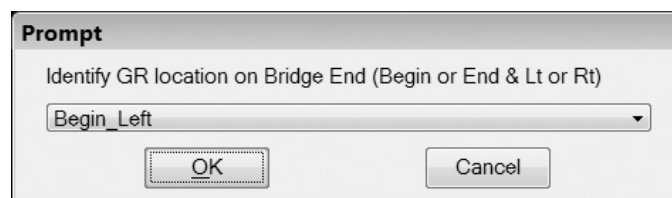
- Step 1.** Locate bridge end location for beginning of guardrail.
- Step 2.** In D&C manager activate **GR Min Inst 21**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



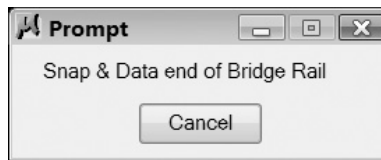
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



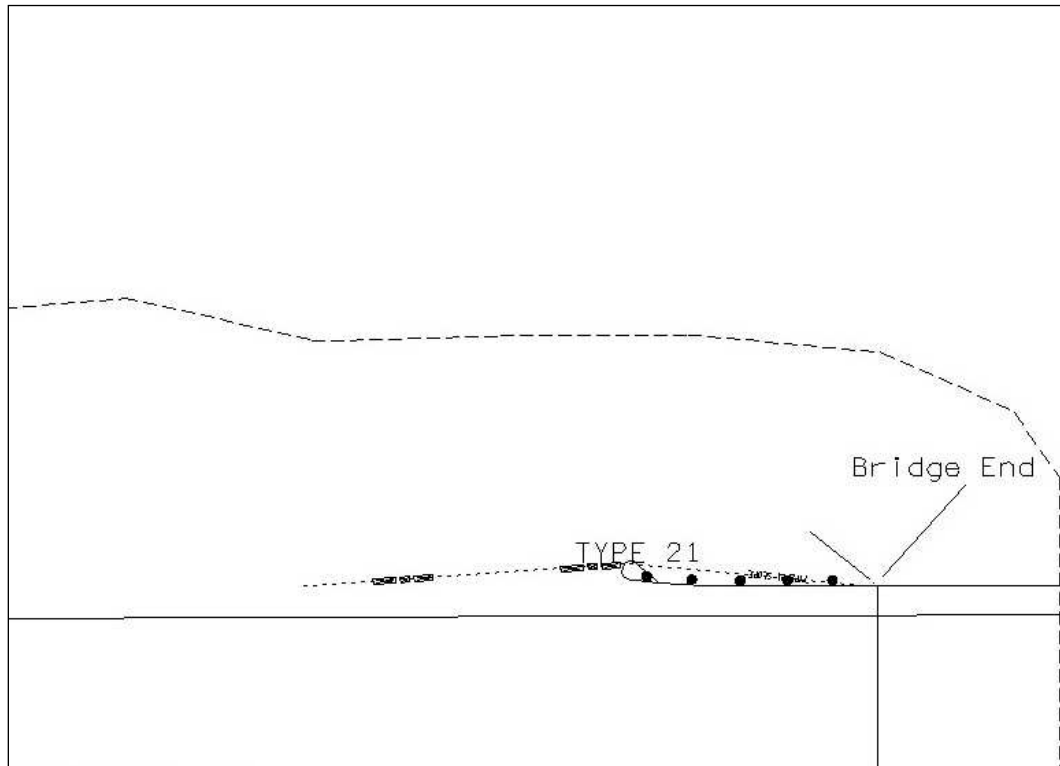
- Step 5.** You are then prompted for the guardrail location at bridge end, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



Step 6. Finally you are prompted to **Snap & Data end of Bridge Rail. 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.

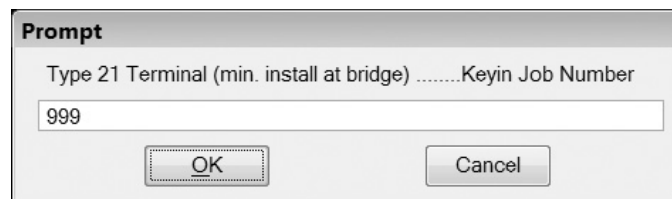
This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

Bridge end location for beginning of guardrail must be located graphically so that it can be identified when using program.

Usage:

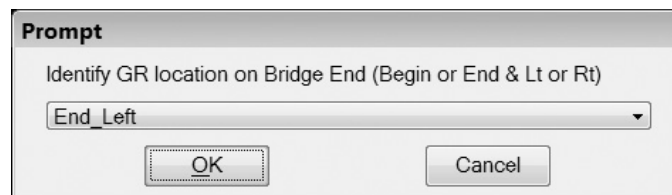
- Step 1.** Locate bridge end location for beginning of guardrail.
- Step 2.** In D&C manager activate **GR Min Inst 400**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



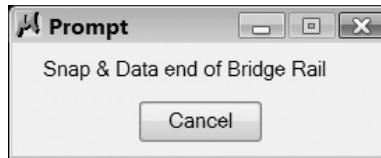
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



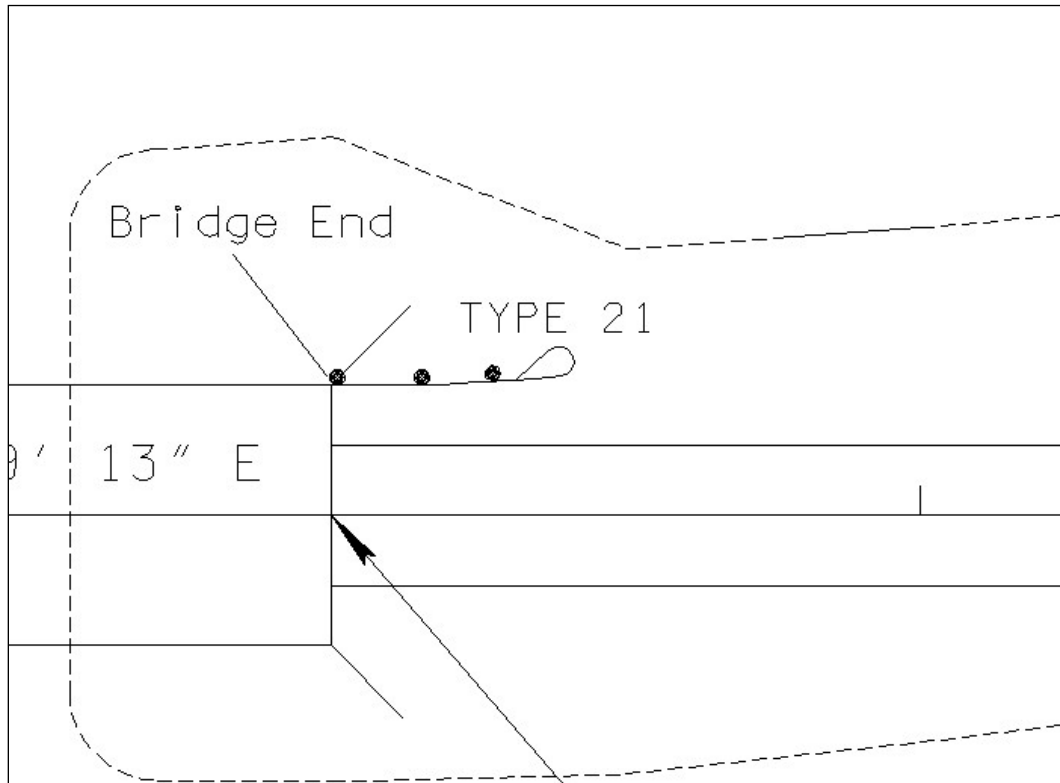
- Step 5.** You are then prompted for the guardrail location at bridge end, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



- Step 6.** Finally you are prompted to **Snap & Data end of Bridge Rail**. **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.

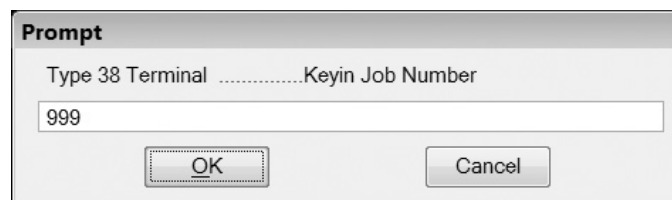
This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

Terminal beginning location at guardrail along roadside must be located graphically so that it can be identified when using program.

Usage:

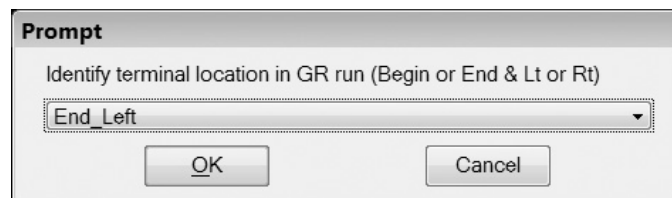
- Step 1.** Locate beginning of terminal location at guardrail along roadside. For the type 38 terminal this is **37.5' back from the point of need location**.
- Step 2.** In D&C manager activate **GR Term Type 38**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



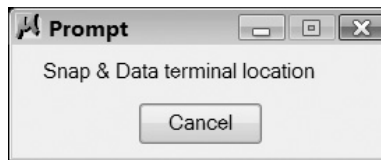
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



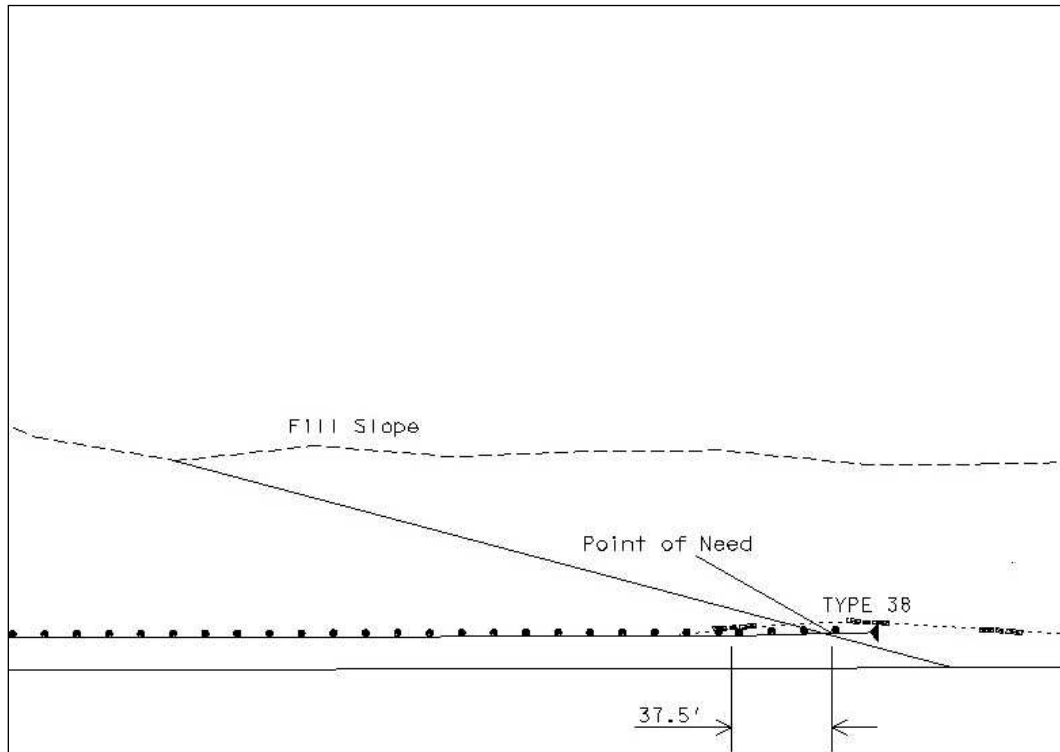
- Step 5.** You are then prompted for the terminal location in the guardrail run, **Begin** or **End** and **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



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 its 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:

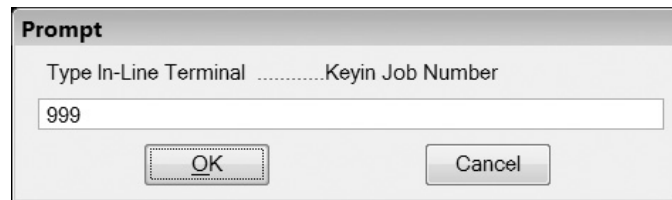
This application places a type in-line guardrail terminal cell, a type text label and a point at the terminal location for later use in calculating quantities.

Special Requirements:

Guardrail radius location for this terminal must be located graphically so that it can be identified when using program.

Usage:

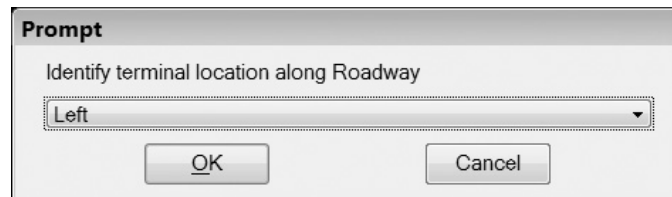
- Step 1.** Draw guardrail radius along roadway pavement radius.
- Step 2.** In D&C manager activate **GR Term In-Line**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



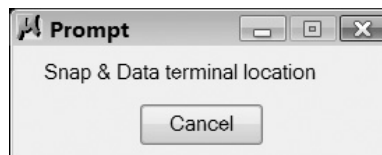
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



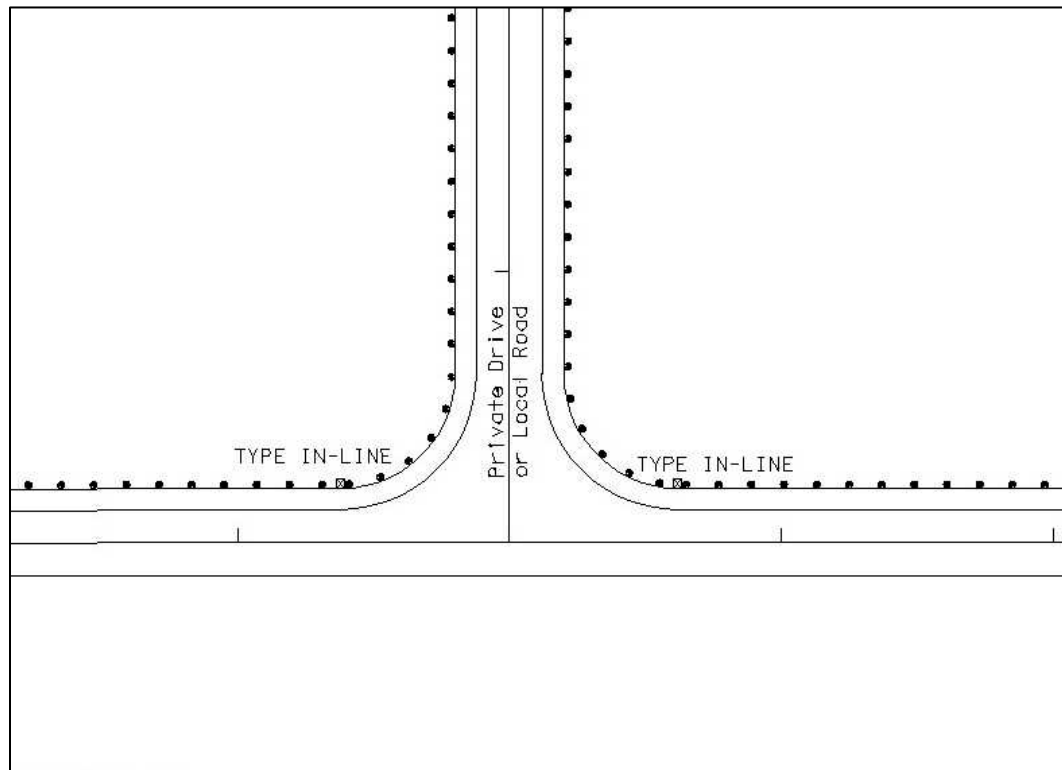
- Step 4.** You are then prompted for the terminal location along the roadway, **Left** or **Right** (going in the direction of the centerline). Pick the appropriate option from the list box and click **OK**.



- 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:

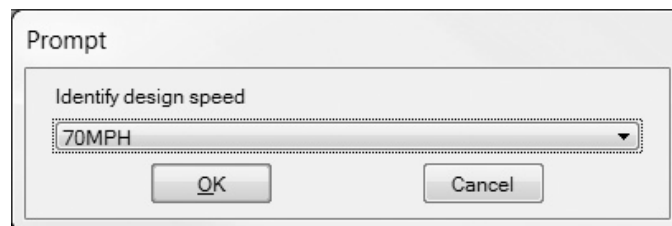
- Step 1.** Locate bridge end location for beginning of guardrail.
- Step 2.** In D&C manager activate **GR Min Inset Med**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



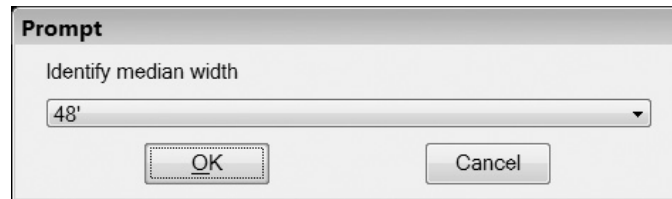
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



- Step 5.** You are then prompted for the design speed (**70MPH. 60MPH or 55MPHorLess**). Pick the appropriate speed from the list box and click **OK**.

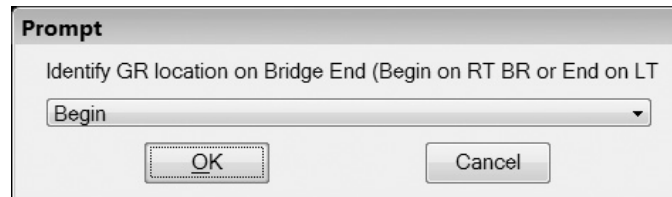


- Step 6.** You are then prompted for the median width (**36', 48', 60' or 64'**). This refers to distance between the inside edges of the proposed travel lanes. Pick the appropriate width from the list box and click **OK**.



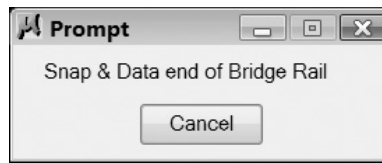
A dialog box titled "Prompt" with the text "Identify median width". Below the text is a list box containing "48'". At the bottom are "OK" and "Cancel" buttons.

- Step 7.** 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**.



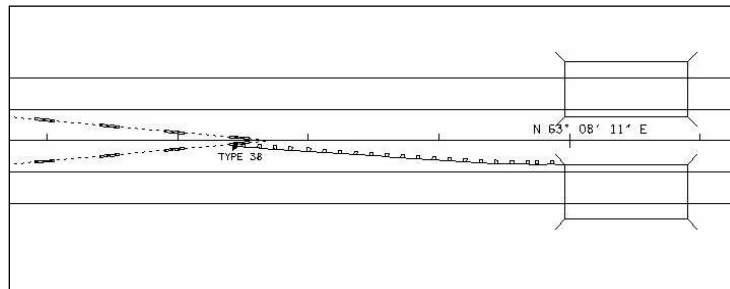
A dialog box titled "Prompt" with the text "Identify GR location on Bridge End (Begin on RT BR or End on LT)". Below the text is a list box containing "Begin". At the bottom are "OK" and "Cancel" buttons.

- Step 8.** Finally you are prompted to **Snap & Data end of Bridge Rail**. **Snap** and **Data Point** on the end of the bridge where guardrail begins.

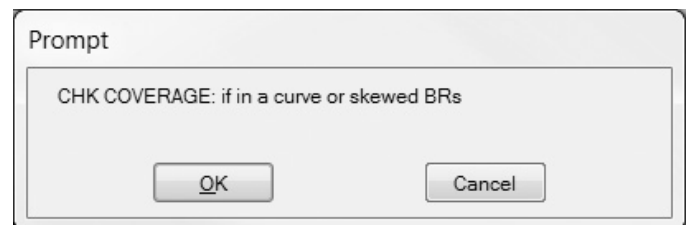


A dialog box titled "Prompt" with the text "Snap & Data end of Bridge Rail". At the bottom is a "Cancel" button.

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 then the guardrail should be checked for adequate coverage of the hazard.**



A dialog box titled "Prompt" with the text "CHK COVERAGE: if in a curve or skewed BRs". At the bottom are "OK" and "Cancel" buttons.

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 taper 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 guardrail taper through 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 guardrail taper location must be located graphically so that it can be identified when using program.

Usage:

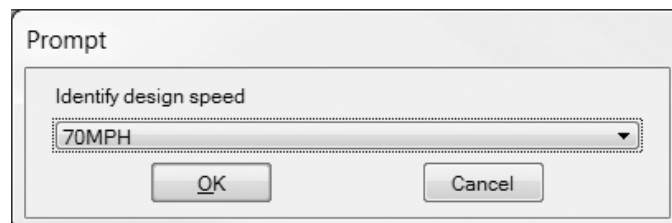
- Step 1.** After establishing additional guardrail coverage needed, draw in guardrail beside shoulder to location for beginning of guardrail taper.
- Step 2.** In D&C manager activate **GR Med Br Ends**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



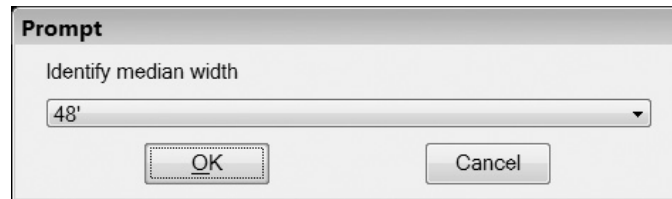
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



- Step 5.** You are then prompted for the design speed (**70MPH. 60MPH or 55MPHorLess**). Pick the appropriate speed from the list box and click **OK**.

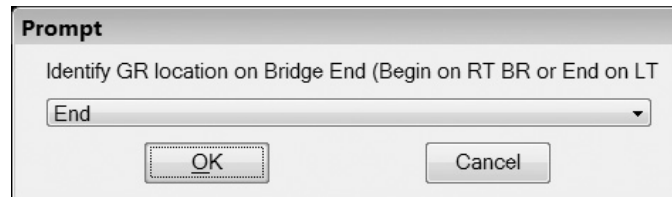


Step 6. You are then prompted for the median width (**36', 48', 60' or 64'**). This refers to distance between the inside edges of the proposed travel lanes. Pick the appropriate width from the list box and click **OK**.



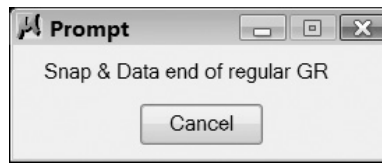
A dialog box titled "Prompt" with the text "Identify median width". Below the text is a list box containing the value "48'". At the bottom of the dialog are two buttons: "OK" and "Cancel".

Step 7. 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**.



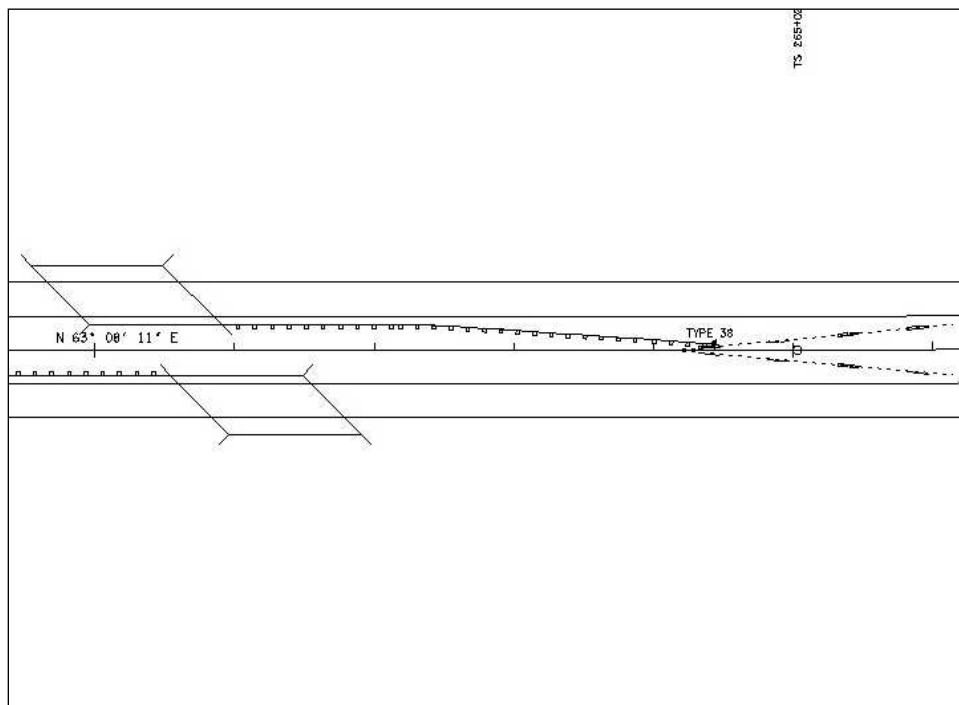
A dialog box titled "Prompt" with the text "Identify GR location on Bridge End (Begin on RT BR or End on LT)". Below the text is a list box containing the value "End". At the bottom of the dialog are two buttons: "OK" and "Cancel".

Step 8. 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 guardrail taper begins.



A dialog box titled "Prompt" with the text "Snap & Data end of regular GR". At the bottom of the dialog is a single button: "Cancel".

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.

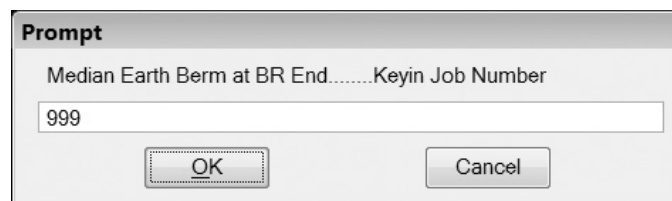
This program is based on distances in feet so it is **not** applicable on metric projects.

Special Requirements:

Bridge end locations must be located graphically so that it can be identified when using program.

Usage:

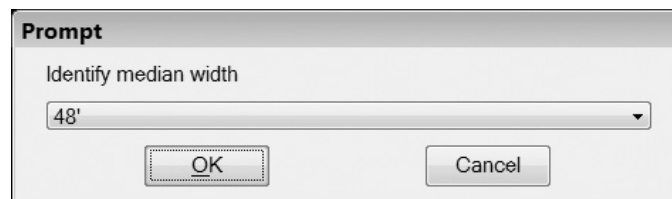
- Step 1.** Locate bridge end locations.
- Step 2.** In D&C manager activate **GR Med Earth Berm**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



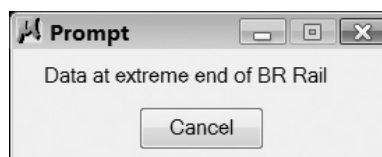
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



- 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**.



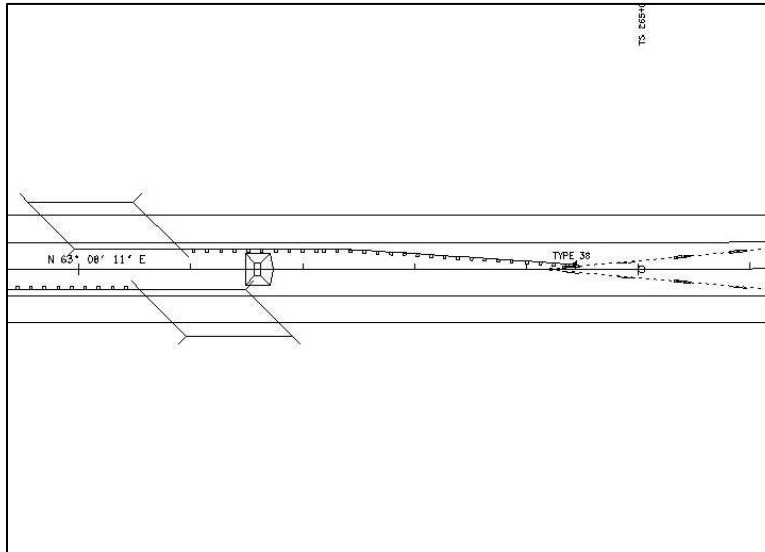
- Step 6.** Next you are prompted to **Data at extreme end of BR Rail. Snap and Data Point** at the end of the bridge rail of the bridge on left or right that is first encountered moving towards the structures from either direction along the roadway centerline.



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**.

A dialog box titled "Prompt" with the text "Identify Median location just given (Begin or End & Lt or Rt)". Below the text is a dropdown menu showing "End_Right". At the bottom are two buttons: "OK" and "Cancel".

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 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.

A dialog box titled "Prompt" with the text "CSV file MedianEarthBerms.csv appended with earth quantity". At the bottom are two buttons: "OK" and "Cancel".

Example of berm earthwork data placed in **MedianEarthBerms.csv** (based on 48' median):

mainline	259+96.23	49
mainline	261+48.57	49
mainline	272+65.15	49
mainline	274+86.06	49

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 51" median barrier wall from the shoulder line at the face of the first pier, bridge end guardrail and the type 38 terminal in the median for protection at bridge piers. After setting up the median barrier wall adjacent to the piers then this program can be utilized to plot in the remaining protection in 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 median barrier wall, 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:

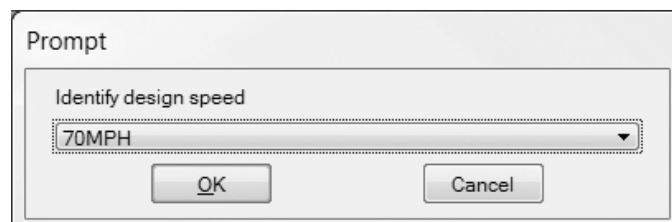
- Step 1.** Draw in median barrier wall adjacent to the piers to the face of the first pier from each direction.
- Step 2.** In D&C manager activate **GR Med Br Piers**.
- Step 3.** You are prompted for a **job no.** Key that in and click **OK**.



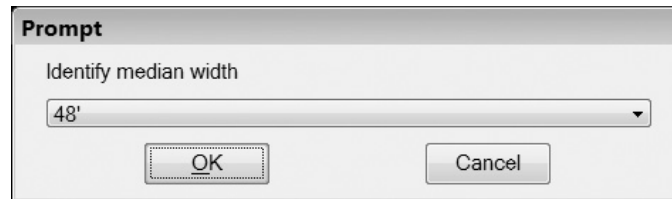
- Step 4.** You are then prompted for the **chain name**. Key that in and click **OK**.



- Step 5.** You are then prompted for the design speed (**70MPH. 60MPH or 50MPH**). Pick the appropriate speed from the list box and click **OK**.

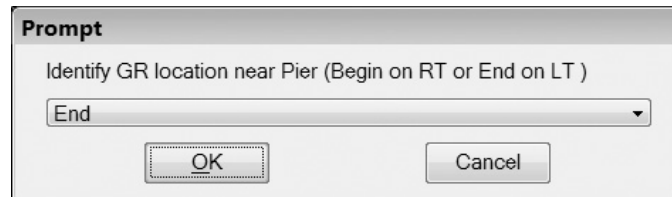


Step 6. You are then prompted for the median width (24', **36', 48' or 60'**). This refers to distance between the inside edges of the proposed travel lanes. Pick the appropriate width from the list box and click **OK**.



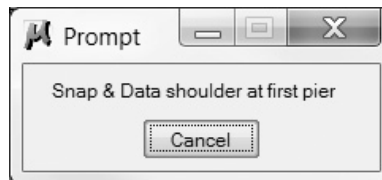
A dialog box titled "Prompt" with the text "Identify median width". Below the text is a list box containing the value "48'". At the bottom of the dialog are two buttons: "OK" and "Cancel".

Step 7. 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**.



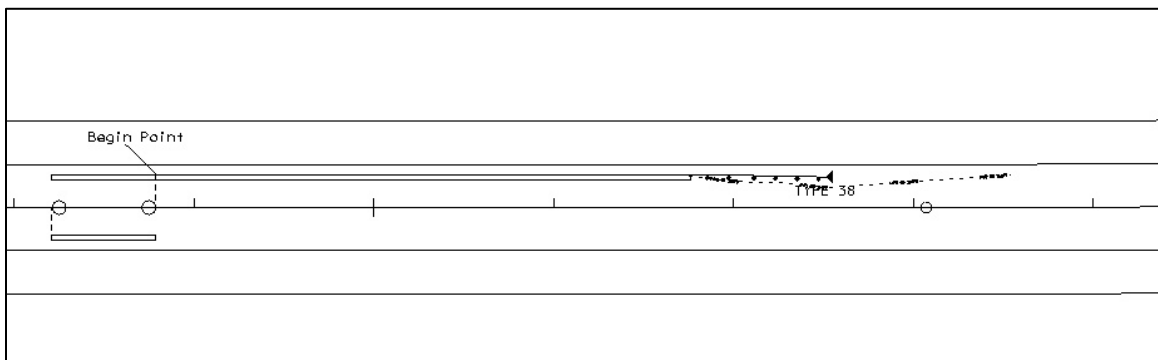
A dialog box titled "Prompt" with the text "Identify GR location near Pier (Begin on RT or End on LT)". Below the text is a list box containing the value "End". At the bottom of the dialog are two buttons: "OK" and "Cancel".

Step 8. Finally you are prompted to **Snap & Data shoulder at first pier**. **Snap** and **Data Point** at the end of the median barrier wall along the shoulder at the face of first pier.



A dialog box titled "Prompt" with the text "Snap & Data shoulder at first pier". At the bottom of the dialog is a button labeled "Cancel".

All line work is plotted in the file based on the given information.



EPSC

EPSC Device Cells

D&C location: Drafting Standards > EPSC > EPSC Device Cells

MicroStation VBA Program: ErosionControlCells.mvba

Description:

This program provides access to TDOT Roadway Design Division erosion prevention sediment 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 Prevention Sediment Control Legend cell dialog.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Erosion Prevention Sediment Control > Device Cells

or by using the keyin

vba run [ErosionControlCells]ErosionCntrlcells.main

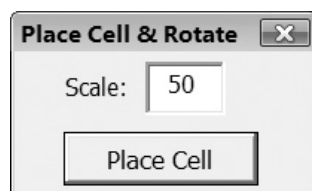
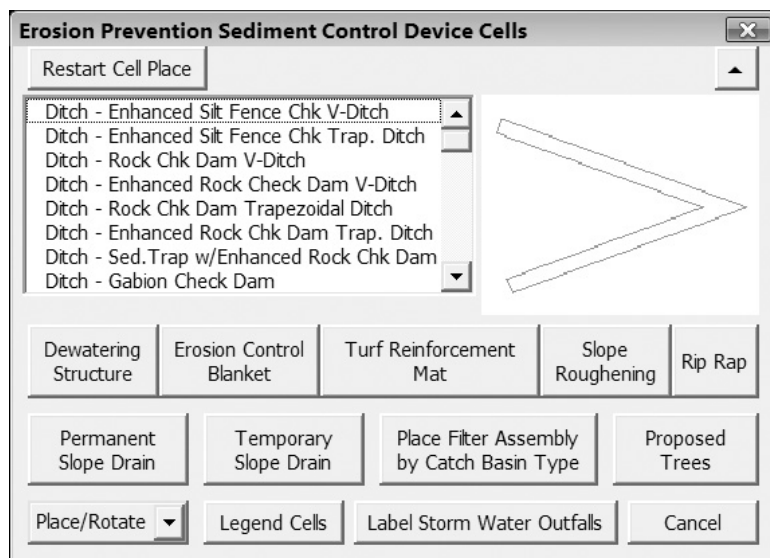
Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **EPSC Device Cells**. The **Erosion Prevention Sediment Control Device Cells** dialog appears.

Step 2. Click on any cell description in the dialog list. The cell is made active and the **Place Cell & Rotate** tool is activated.



Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

Erosion Prevention Sediment Control Legend Cells

D&C location: Drafting Standards > EPSC > EPSC Legend Cells

MicroStation VBA Program: ErosionControlLegendCells.mvba

Description:

This program provides access to TDOT Roadway Design Division erosion prevention sediment control legend cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Erosion Prevention Sediment Control > Legend Cells

or by using the keyin

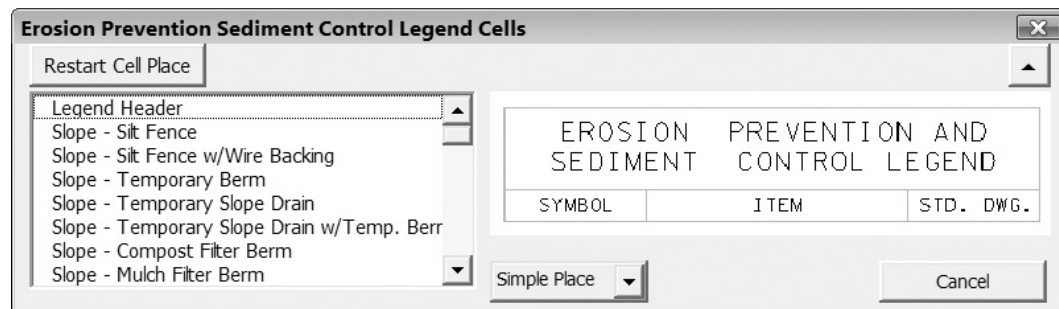
vba run [ErosionControlLegendCells]ErosionCntrlLegendcells.main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **EPSC Legend Cells**. The **Erosion Prevention Sediment 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 **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Draw Temporary Slope Drain

D&C location: Drafting Standards > EPSC > Tmp Slope Drain

MicroStation VBA Program: DrawTempSlopeDrain.mvba

Description:

This program draws in a temporary slope drain with inlet symbol 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 calculated later by Geopak's 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 Prevention Sediment 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.

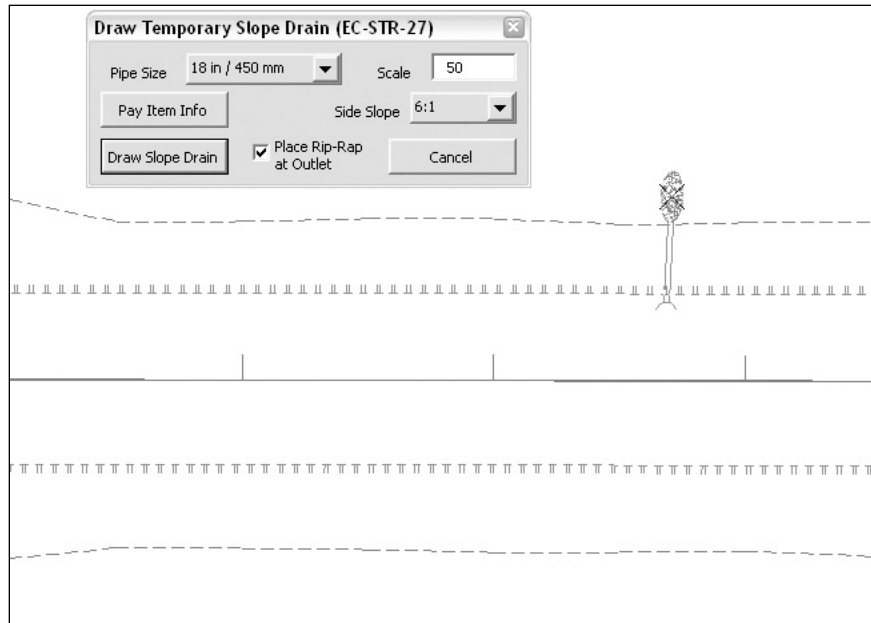
Defaults are set to **Pipe Size: 12 in/300 mm** and **Side Slope: 6:1**. **Scale** defaults to active scale set in the MicroStation DGN file.



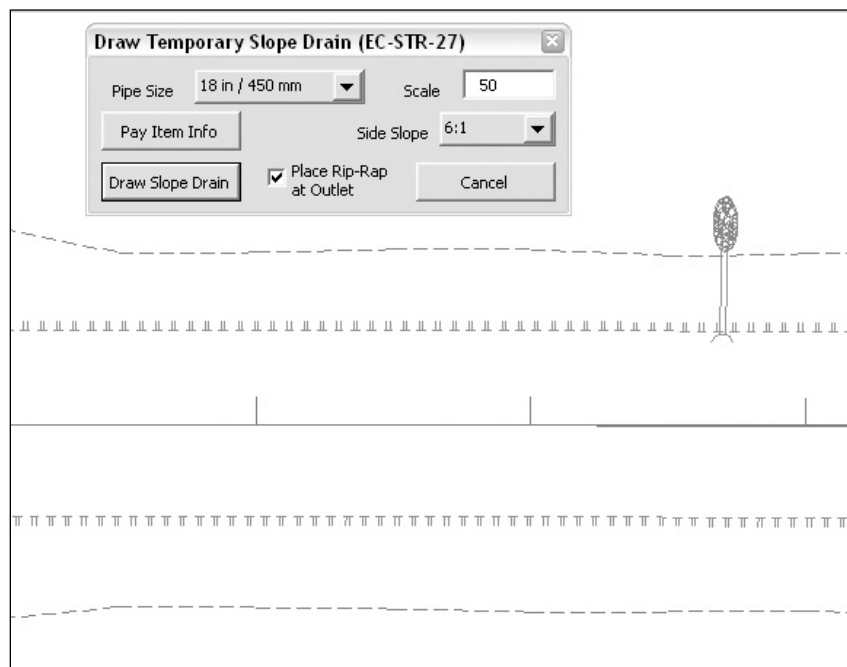
Step 2. Make settings in the dialog as needed for the slope drain you need to draw. Once settings are made click on the **Draw Slope Drain** button.

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.



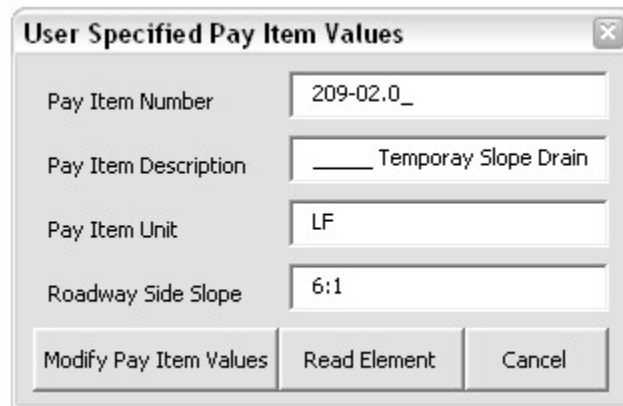
Step 6. After giving this last point, all slope drain graphics are placed in the file.



Step 7. You can adjust settings if needed and continue to place additional slope drains.

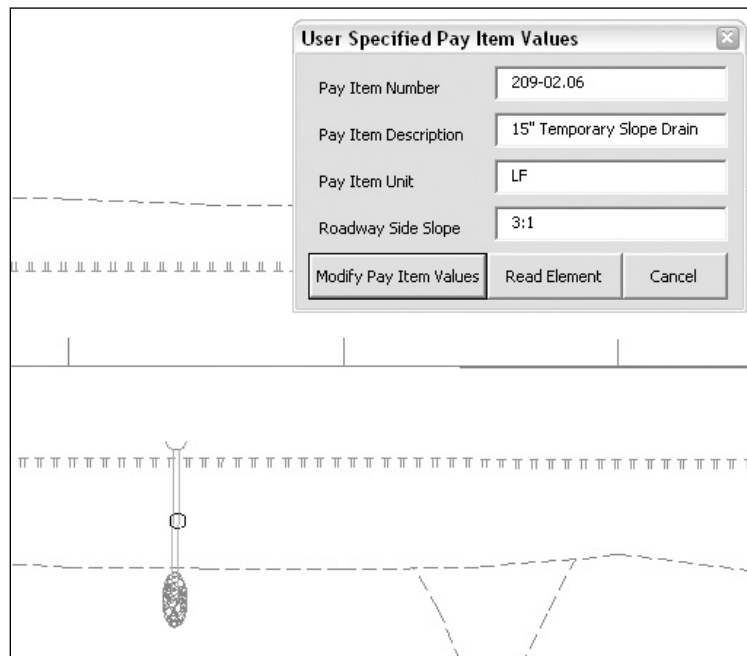
Usage: Pay Item Info

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.



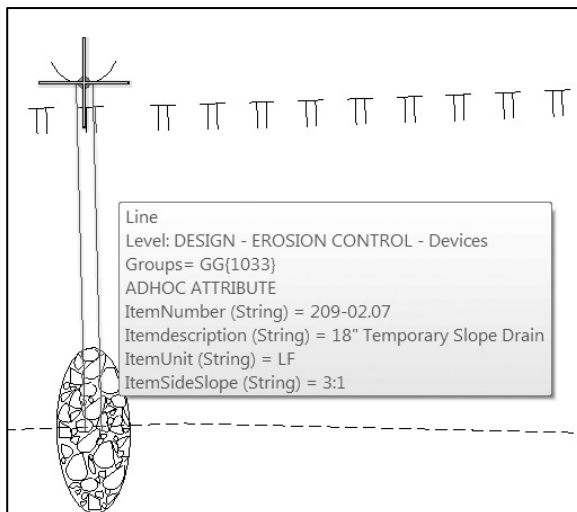
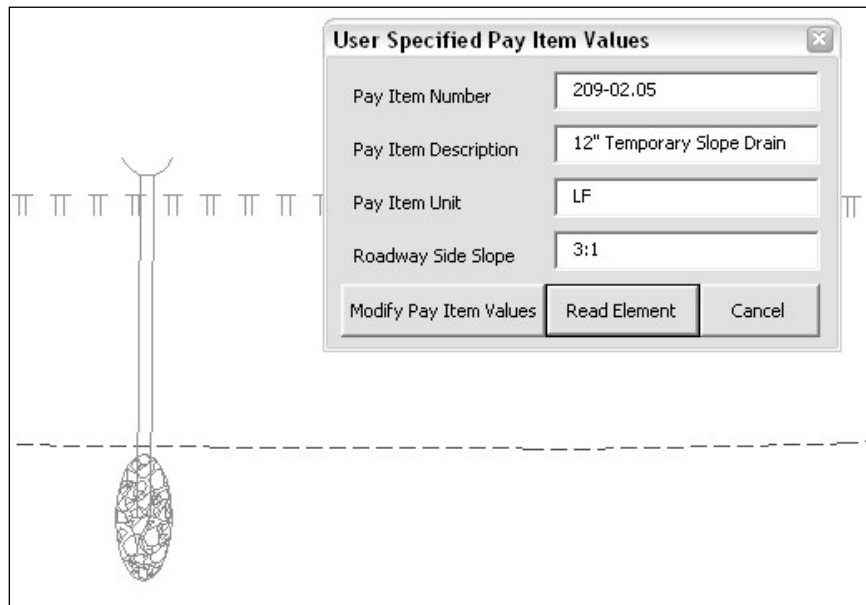
The dialog box titled "User Specified Pay Item Values" contains four input fields and three buttons. The fields are: "Pay Item Number" with the value "209-02.0_", "Pay Item Description" with the value "____ Temporary Slope Drain", "Pay Item Unit" with the value "LF", and "Roadway Side Slope" with the value "6:1". The buttons at the bottom are "Modify Pay Item Values", "Read Element", and "Cancel".

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, 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.



This information is shown with MicroStation's element pop up info if Geopak software is activated. Snap to the slope drain and float the cursor over the element.

Geopak's D&C Manager pay items read this data to compute total quantities.

Place Filter Assembly by CB Type

D&C location: Drafting Standards > EPSC > 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 Prevention Sediment Control > Place Filter Assembly by CB Type

or by using the keyin

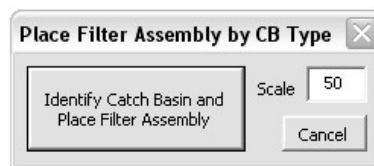
vba run [IDCBandPlaceFilterAssembly]IDandPlaceFA.main

Special Requirements:

Previous placement of special catch basin cells which indicate size of sub-structure.

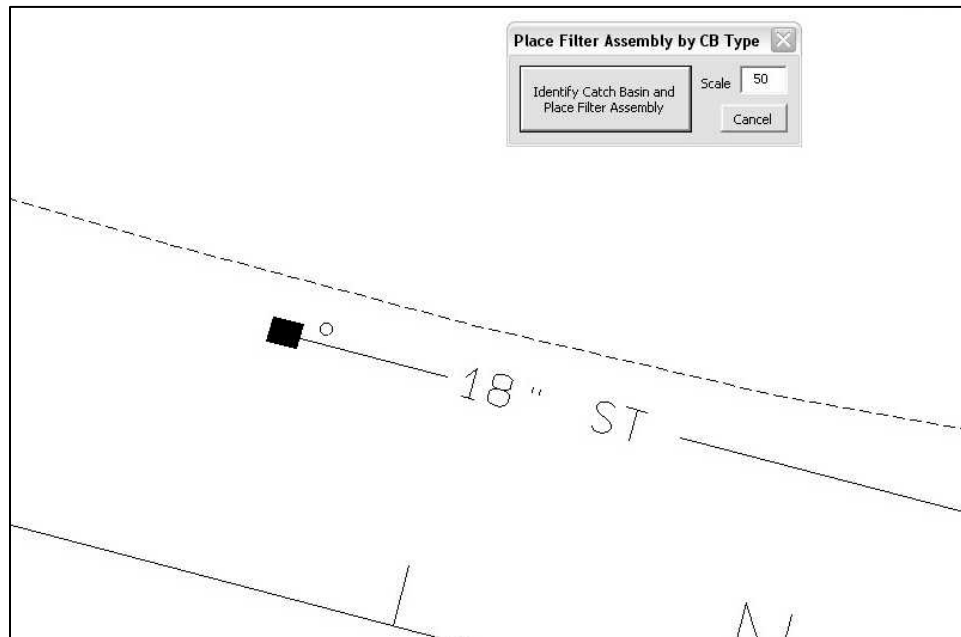
Usage:

Step 1. In D&C manager activate **Place FA by CB**. The **Place Filter Assembly by CB Type** dialog appears.

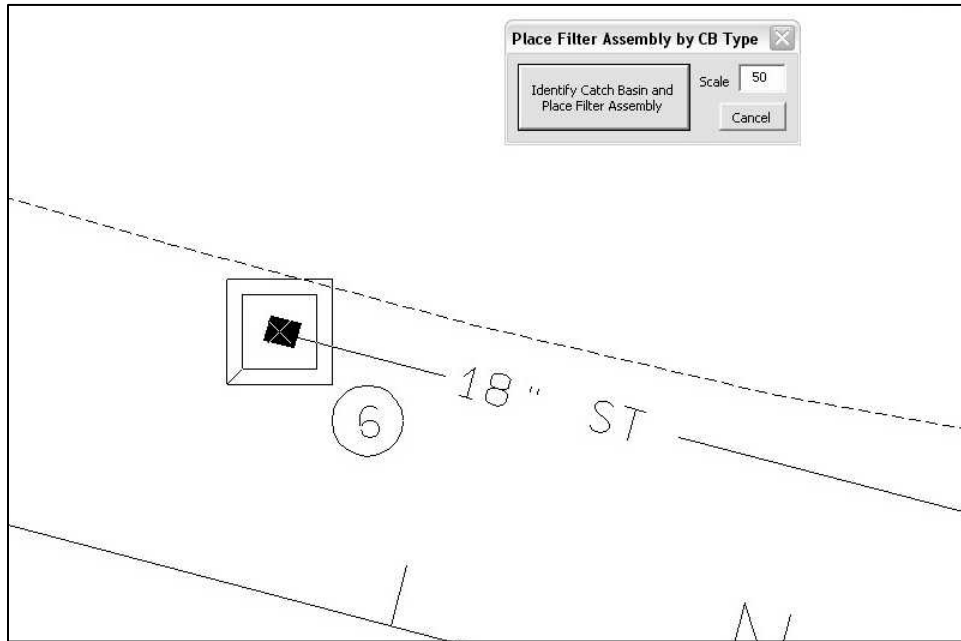


Step 2. Check the scale and then click on the **Identify Catch Basin and Place Filter Assembly** command button to start.

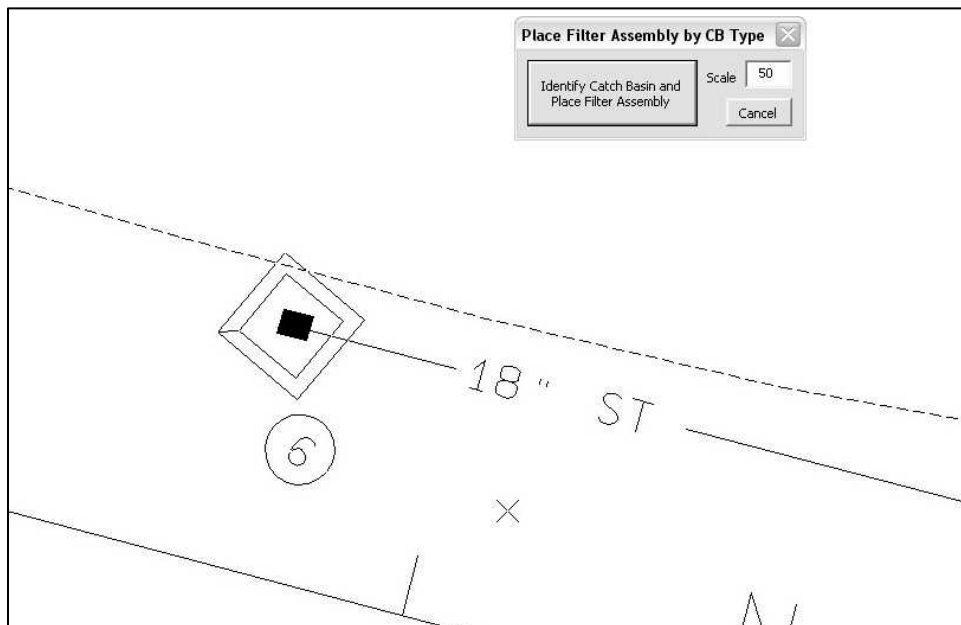
Step 3. The user is first prompted to **Identify CB**. Data point on the catch basin cell.



- 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 you are again prompted to Identify CB, allowing you to continue placements.

Label EPSC Storm Water Outfalls

D&C location: Drafting Standards > EPSC > 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 either the number in the label or a letter suffix as required for sub-outfalls 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 Prevention Sediment Control > Label Storm Water Outfalls

or by using the keyin

vba run [LabelEPSCStormWaterOutfalls]LabelOutfalls.main

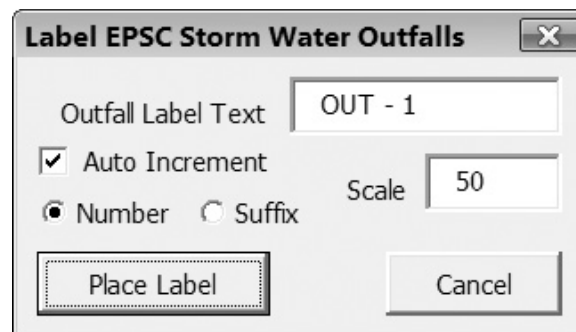
Special Requirements:

None

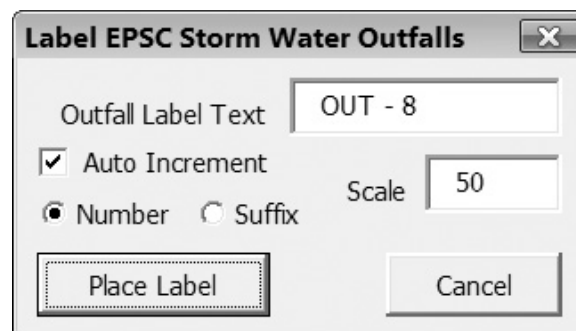
Usage:

Step 1. In D&C manager activate **Label Outfalls**. The **Label EPSC Storm Water Outfalls** dialog opens.

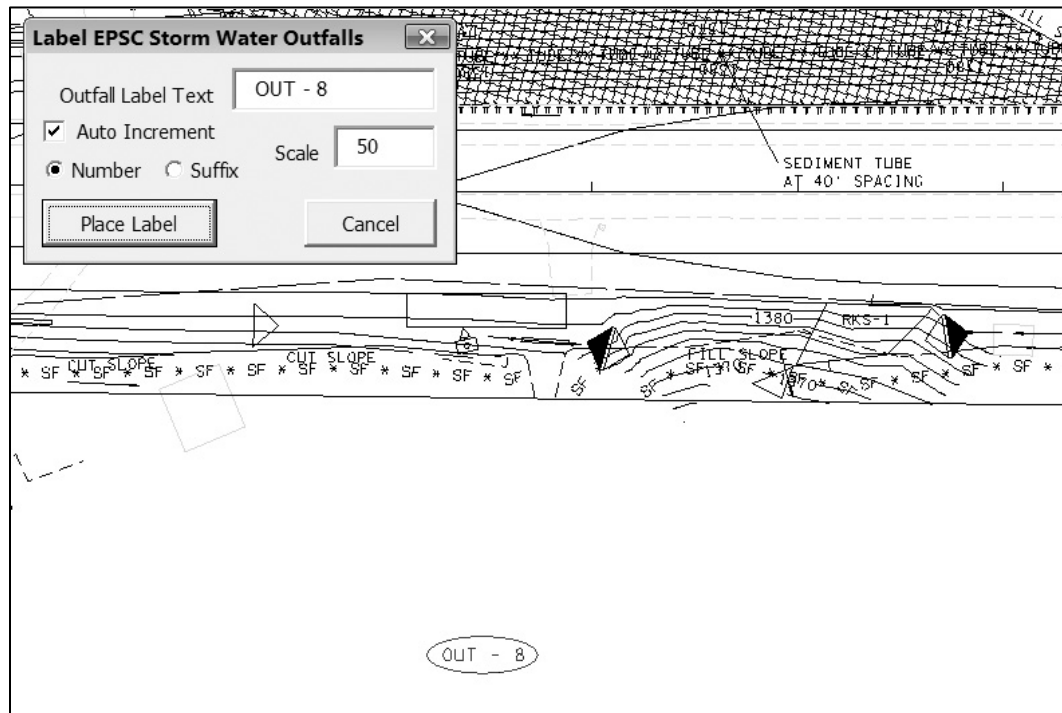
The Outfall Label Text is set to **OUT - 1** by default. **Scale** defaults to active scale set in the MicroStation DGN file.



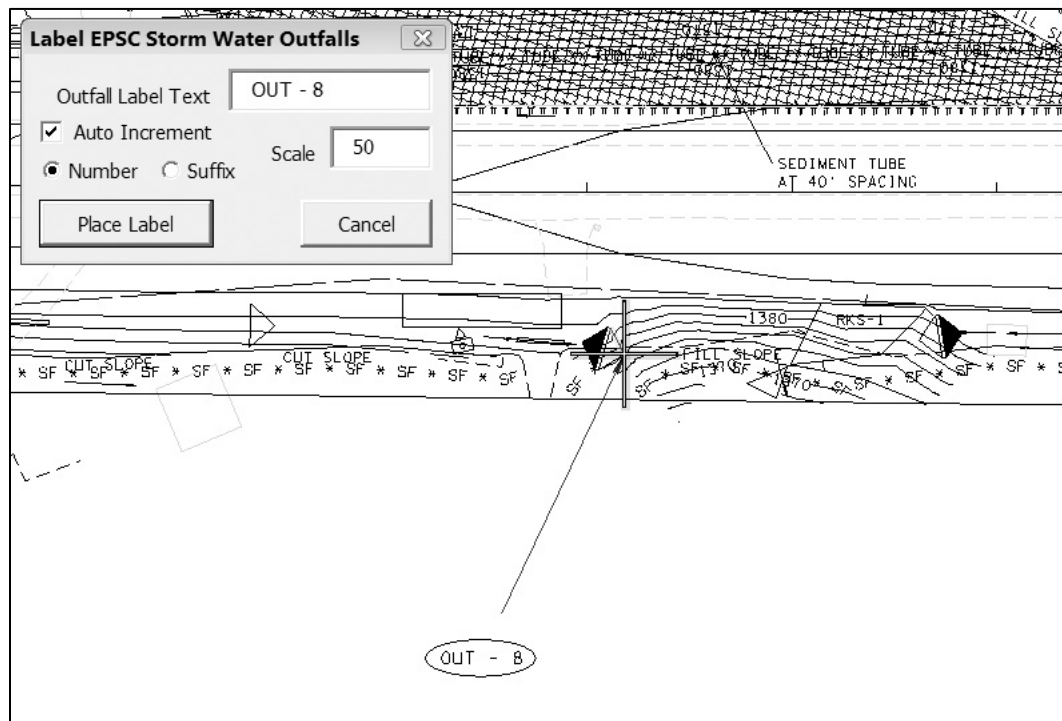
Step 2. Make settings in the dialog as needed. Set the beginning outfall number and if desired change the prefix text or add a suffix letter. If sub-outfalls need to be labeled with that number and an incremented letter suffix, click the **Suffix** option under **Auto Increment**. Reset the **Scale** if not correct. Once settings are made, click on the **Place Label** button.



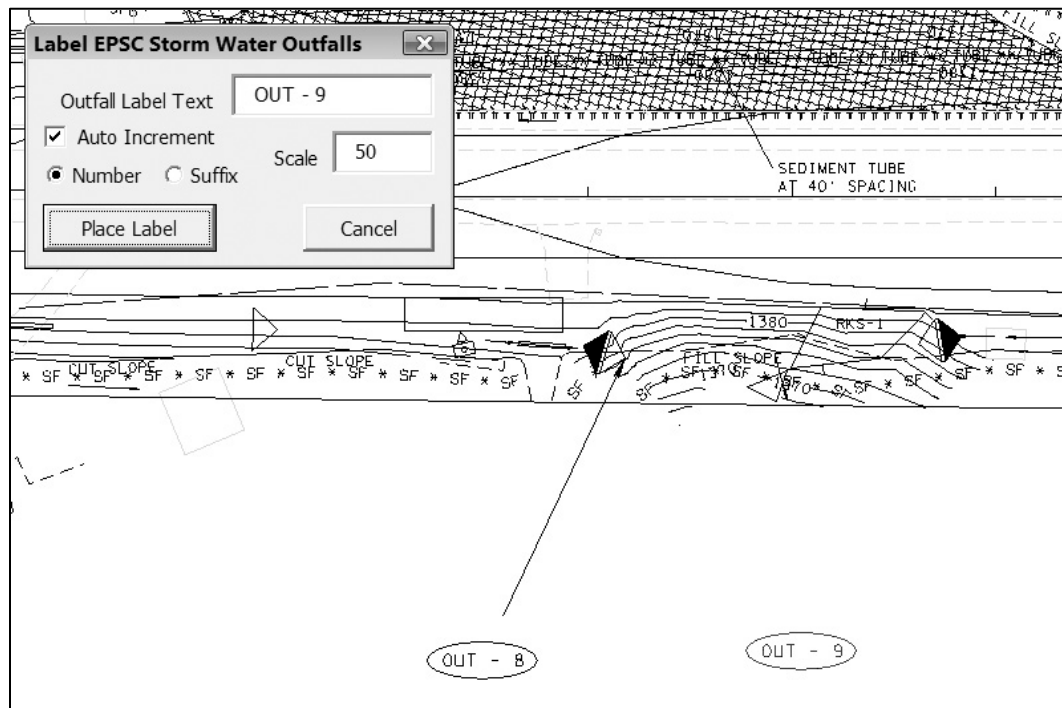
- Step 3.** The label text in an ellipse shows dynamically on the cursor and you are prompted to **Identify Location. Data point** at the location for the label text.



- 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.

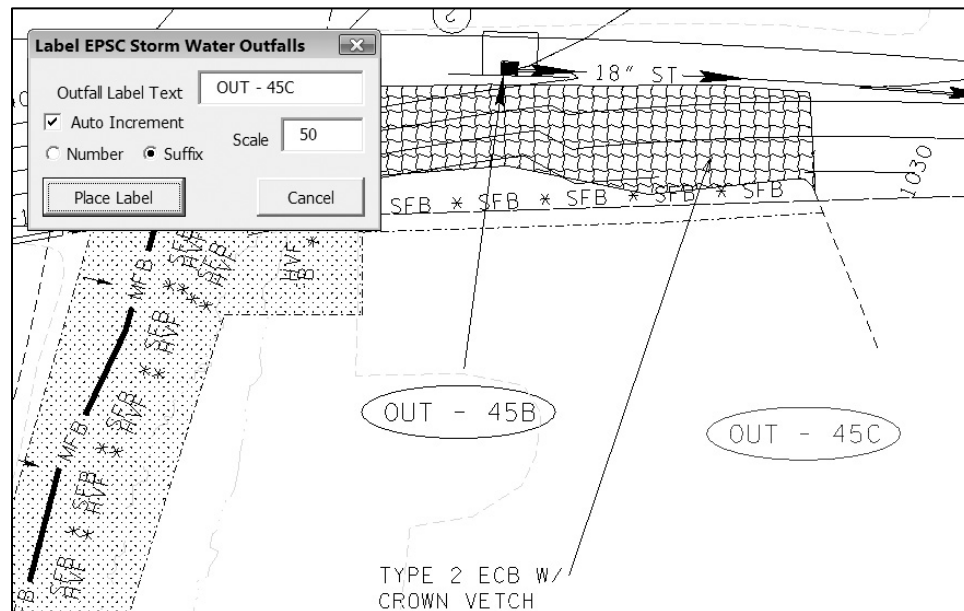


Step 6. After giving this last point, the leader line and arrowhead are placed in the file.



If **Auto Increment** option is clicked on with the **Number** option, 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 that option is clicked on with the **Suffix** option, the suffix part of the label text is updated to the next letter preserving the current prefix and number in the text label.



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 > EPSC > 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 Prevention Sediment 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:

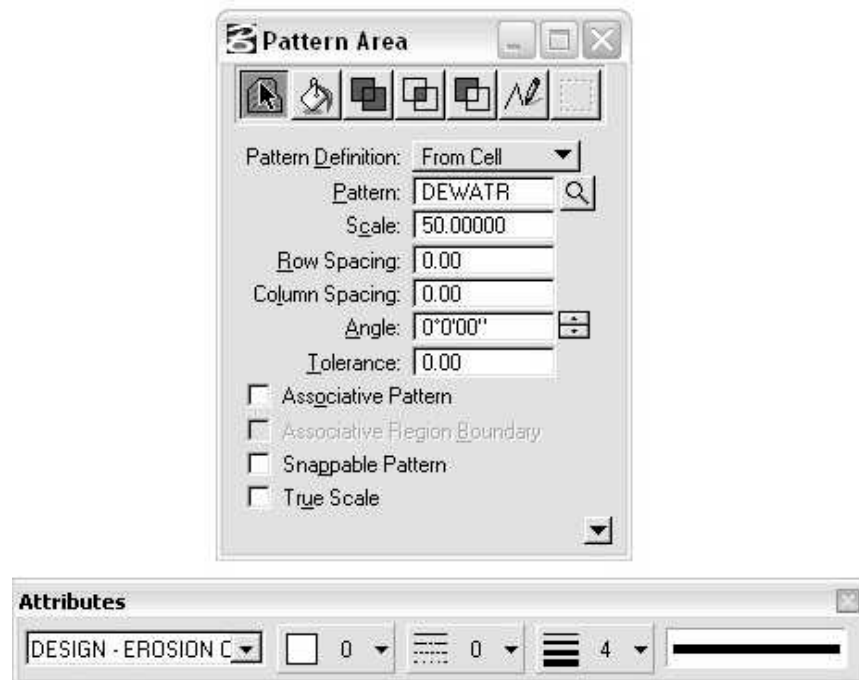
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

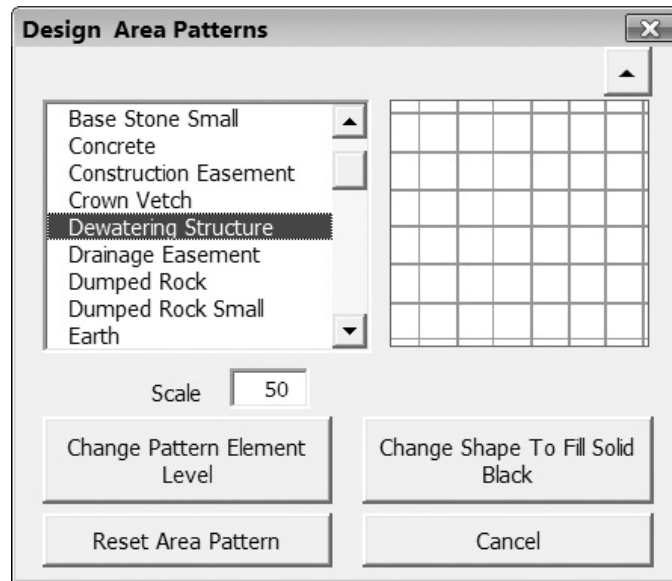
Fence method: Create a fence bounding the area to be patterned.

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.

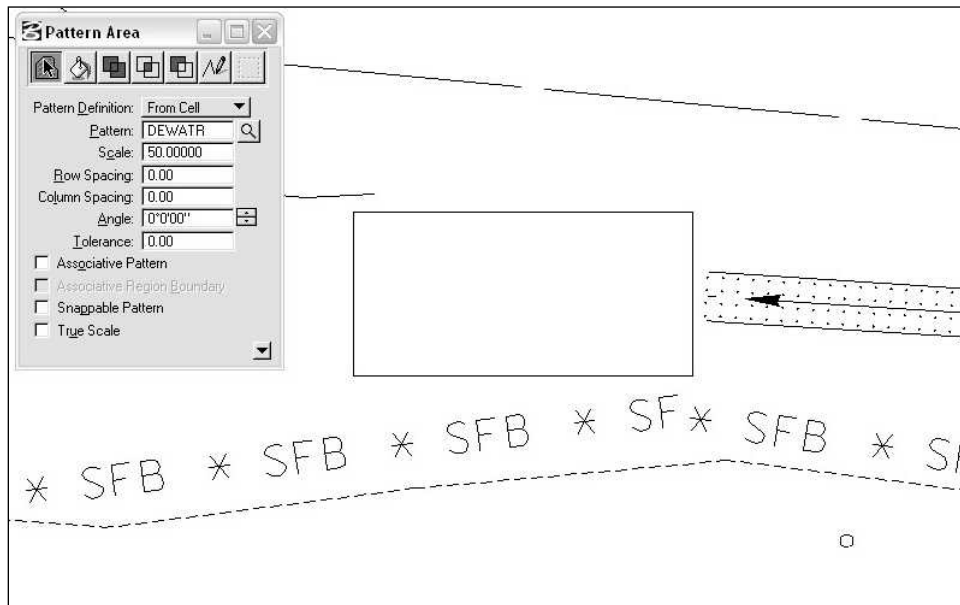


Or from the drop down menu in the **Design Area Patterns** dialog ...

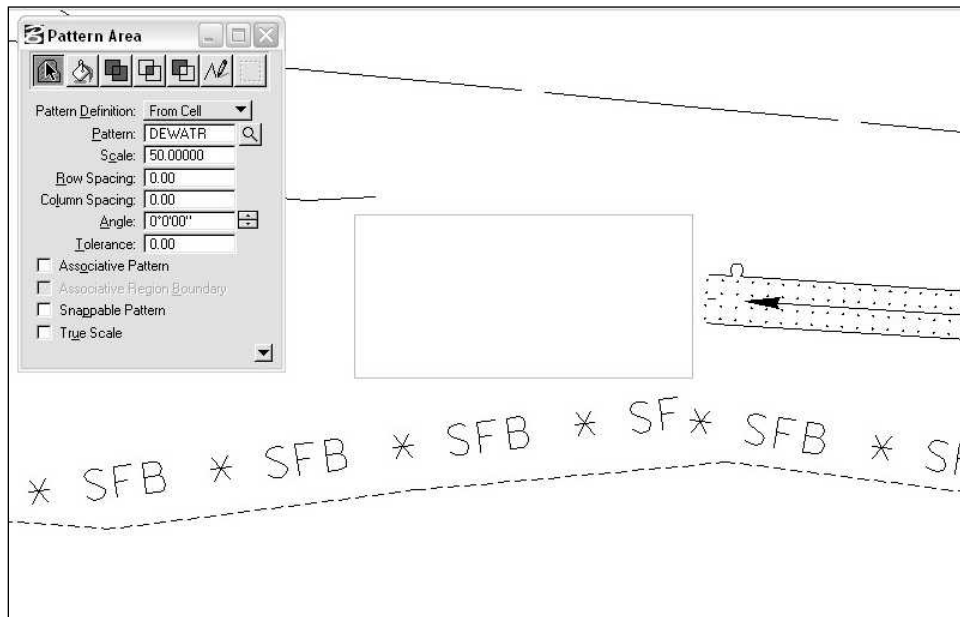


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Element**.

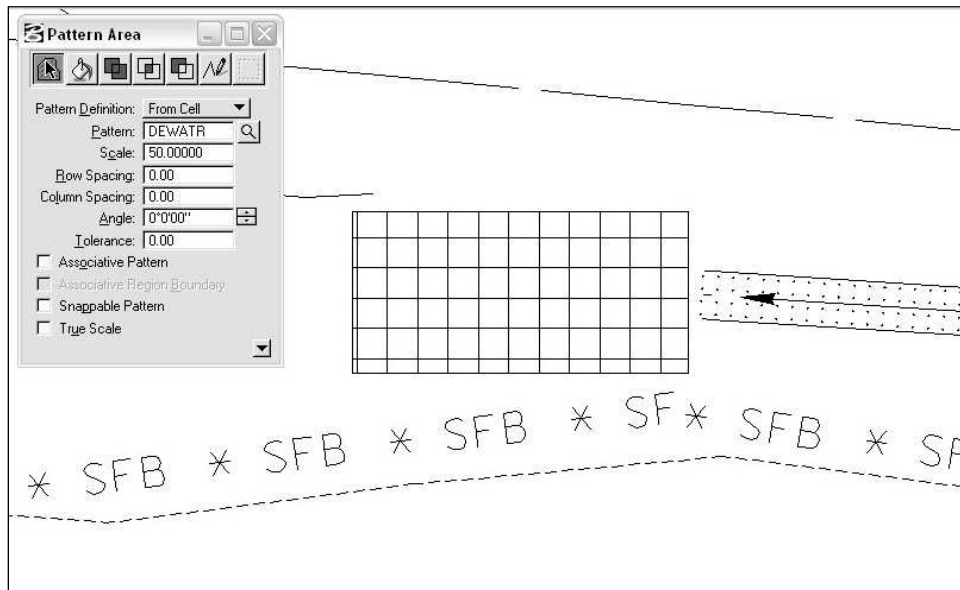
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Element, the user is prompted to **Identify Element**.



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 > EPSC > 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 Prevention Sediment 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:

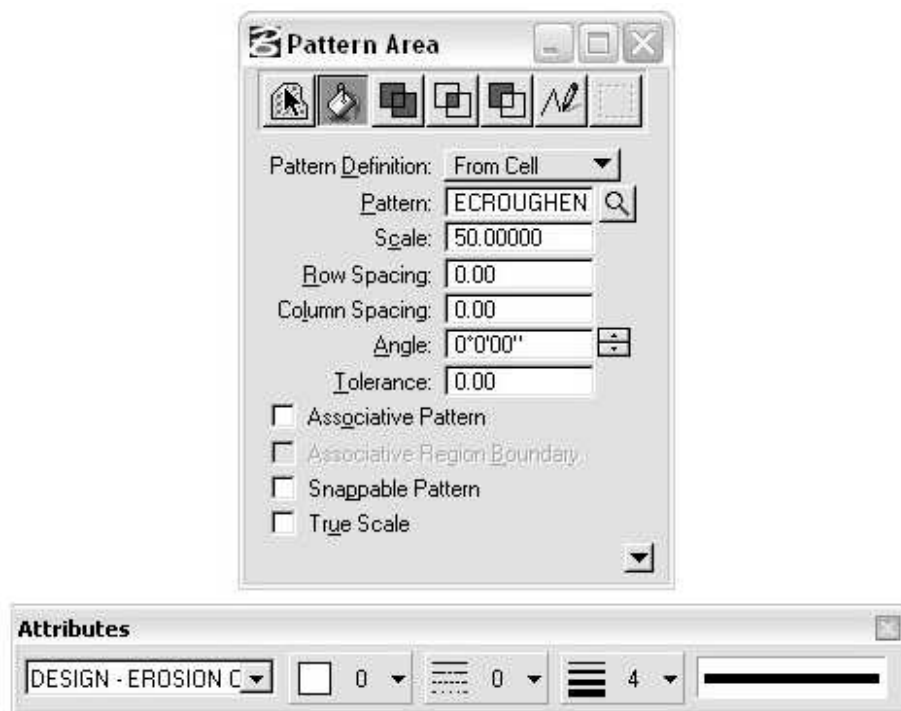
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

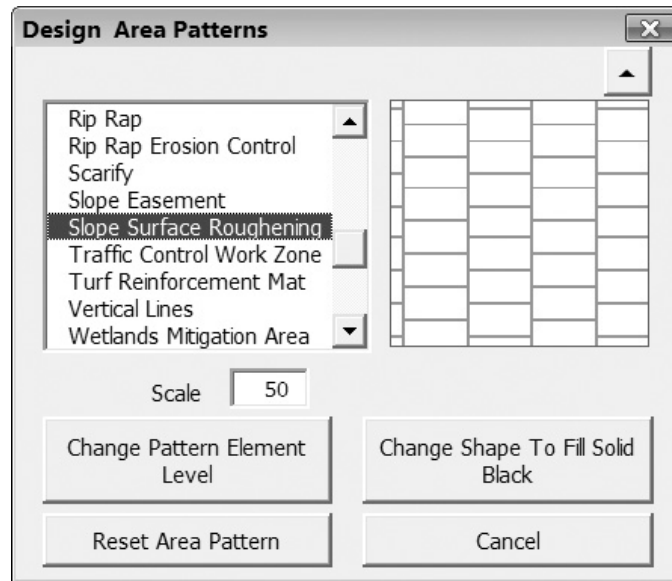
Fence method: Create a fence bounding the area to be patterned.

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.

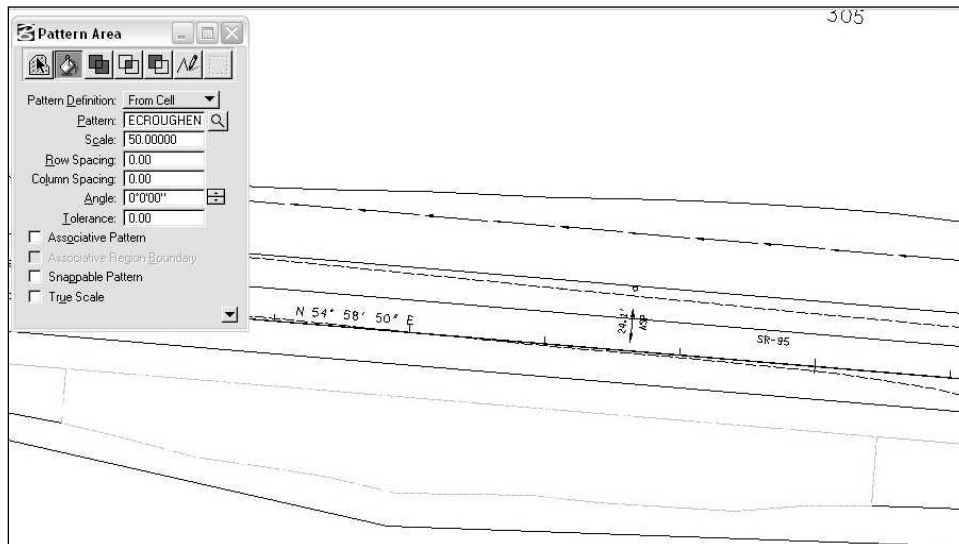


Or from the drop down menu in the **Design Area Patterns** dialog ...

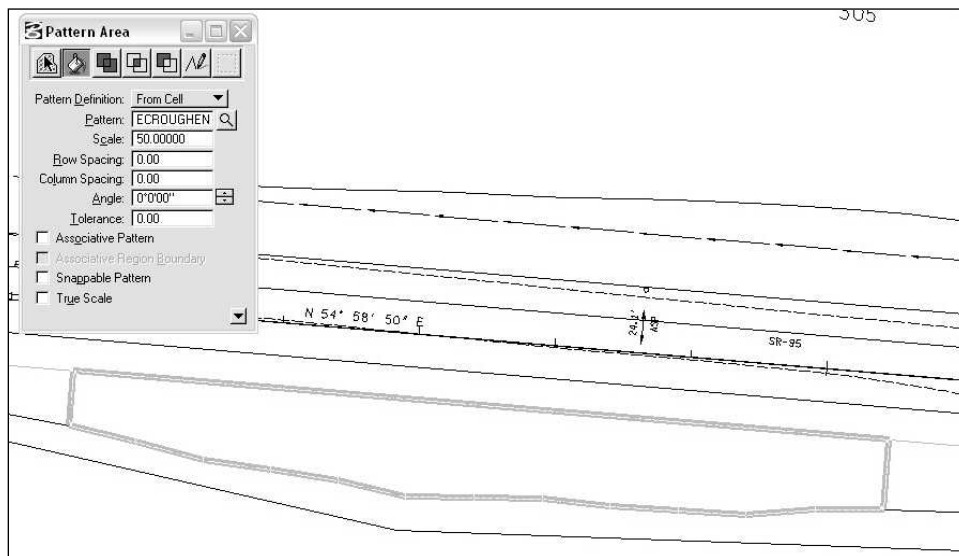


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

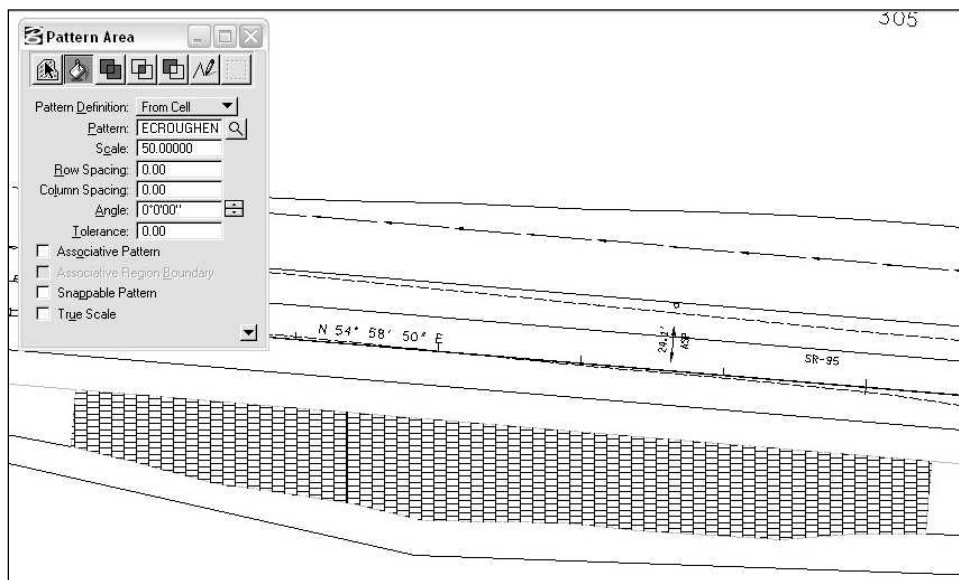
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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



After giving the accept point, the area is patterned.



Pattern EPSC Rip-Rap Area

D&C location: Drafting Standards > EPSC > 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 Prevention Sediment 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:

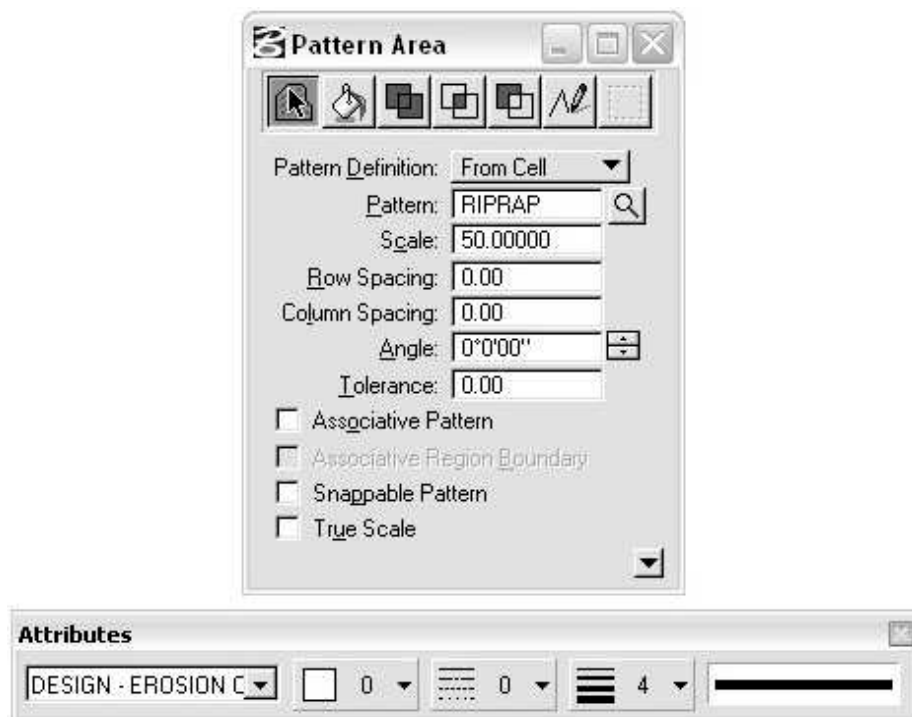
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

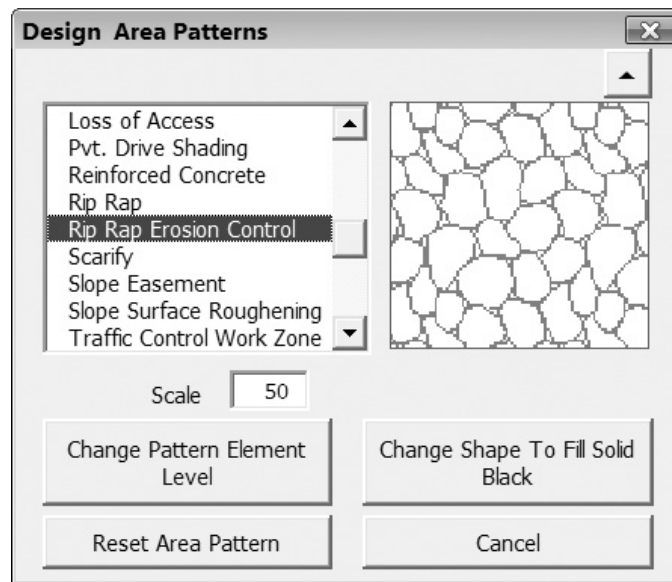
Fence method: Create a fence bounding the area to be patterned.

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.

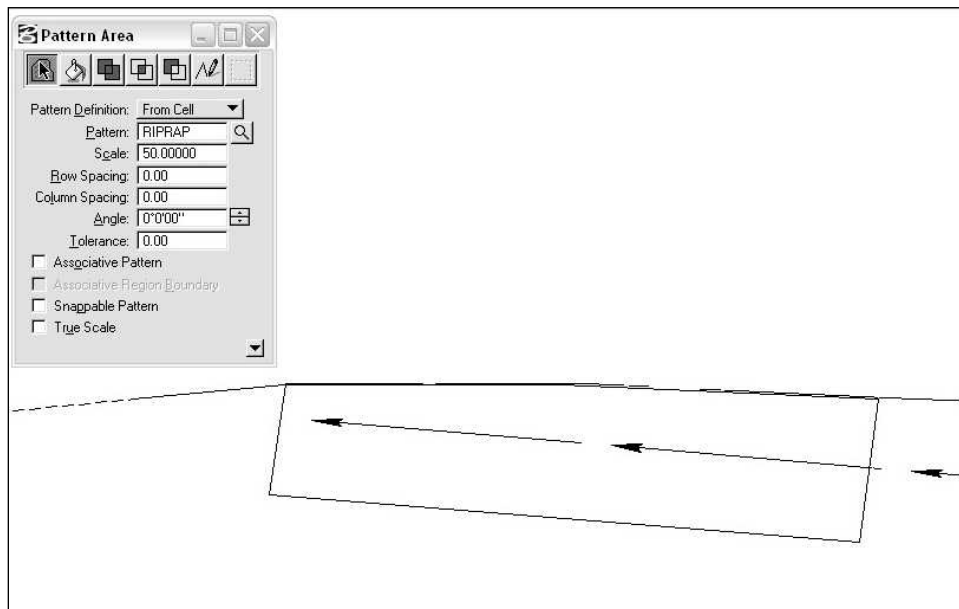


Or from the drop down menu in the **Design Area Patterns** dialog ...

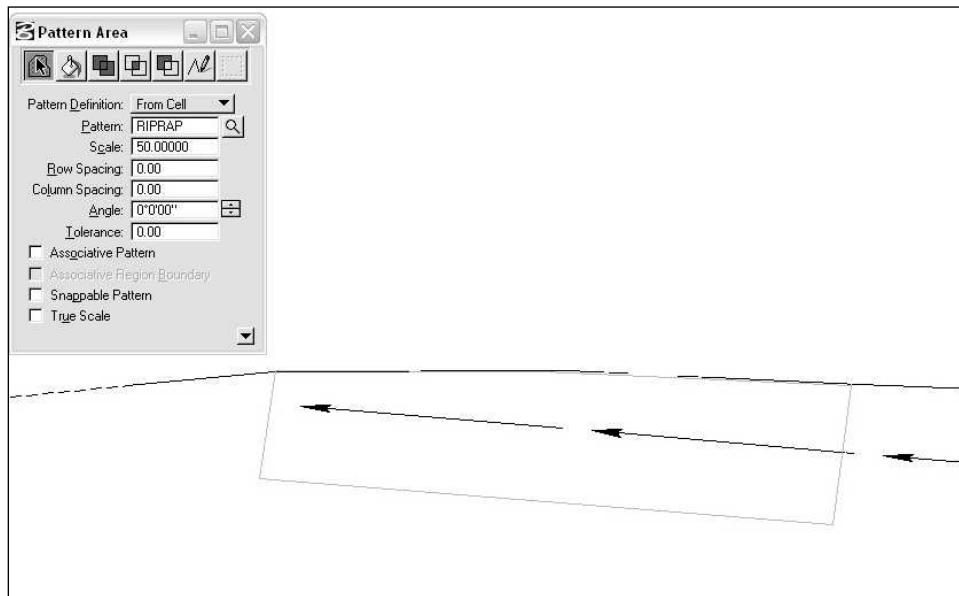


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Element**.

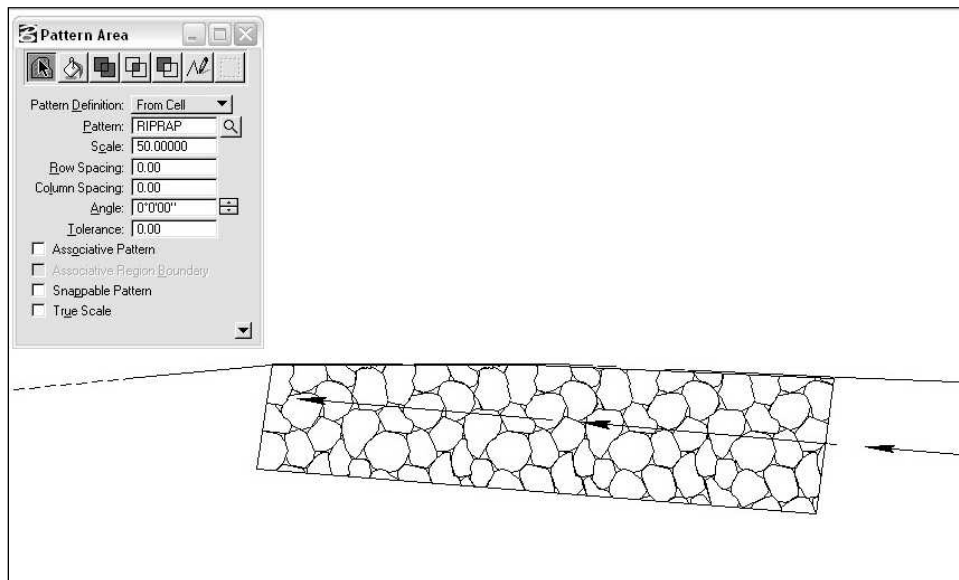
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Element, the user is prompted to **Identify Element**.



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 > EPSC > 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 > Erosion Prevention Sediment 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:

Usage:

This tool has been described previously under **Drafting Standards > Prop. Drainage > Structures in Plan > Perm Slope Drain**. See the description of usage at that location.

Place Proposed Trees

D&C location: Drafting Standards > EPSC > 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 Prevention Sediment Control > Place Proposed Trees

or by using the keyin

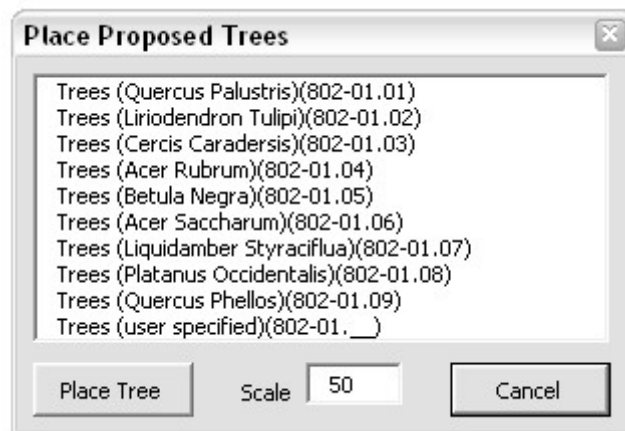
vba run [PlaceProposedTrees]PropTrees.main

Special Requirements:

None.

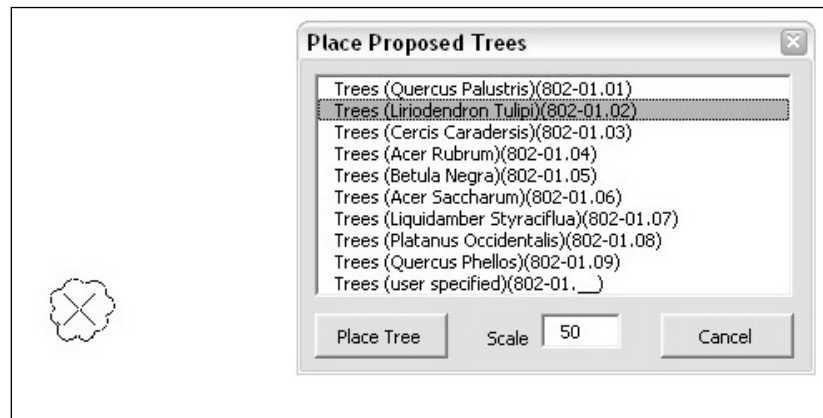
Usage:

Step 1. In D&C manager activate **Place Prop Trees**. The **Place Proposed Trees** dialog appears.



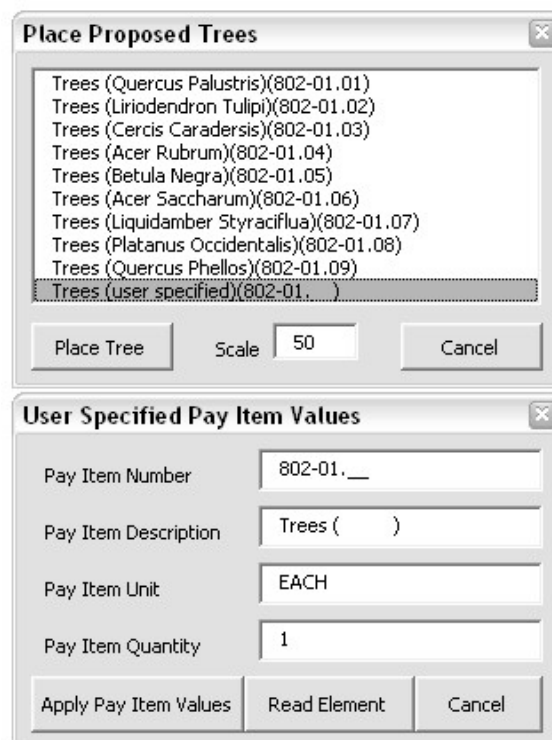
The current active scale is read and populated in the **Scale** key in field. Adjust the scale as needed.

- 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.

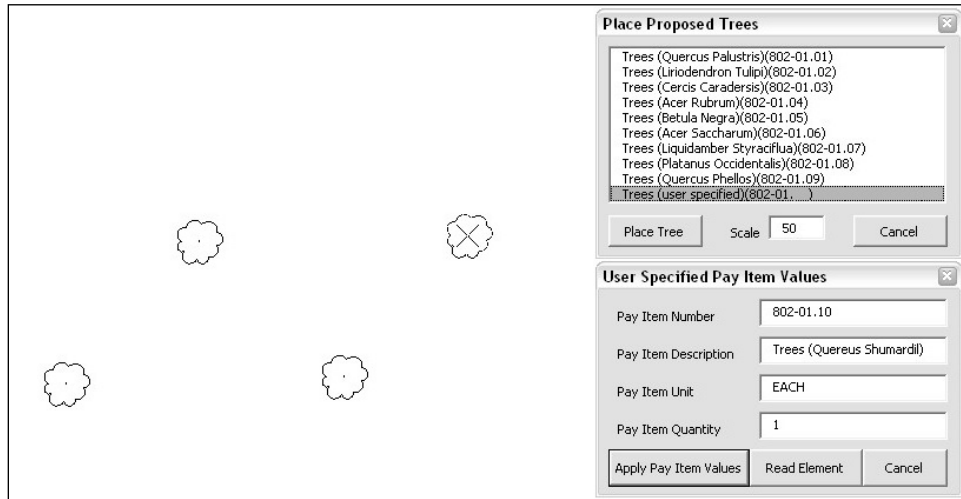


At any time, the user can pick a different tree type for placement. The Place Tree command button is provided so that when other MicroStation tools are used, the Place Tree function can be re-started.

- 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.



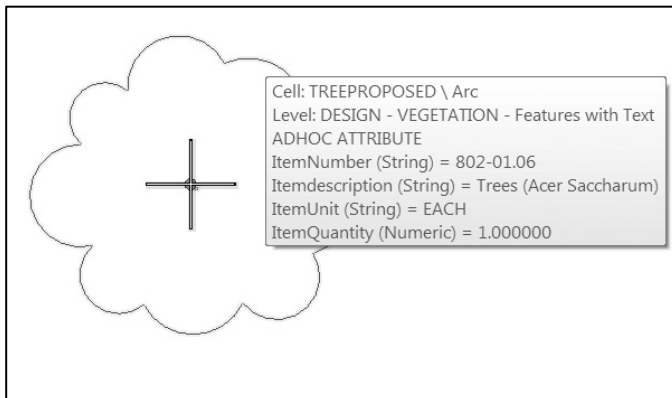
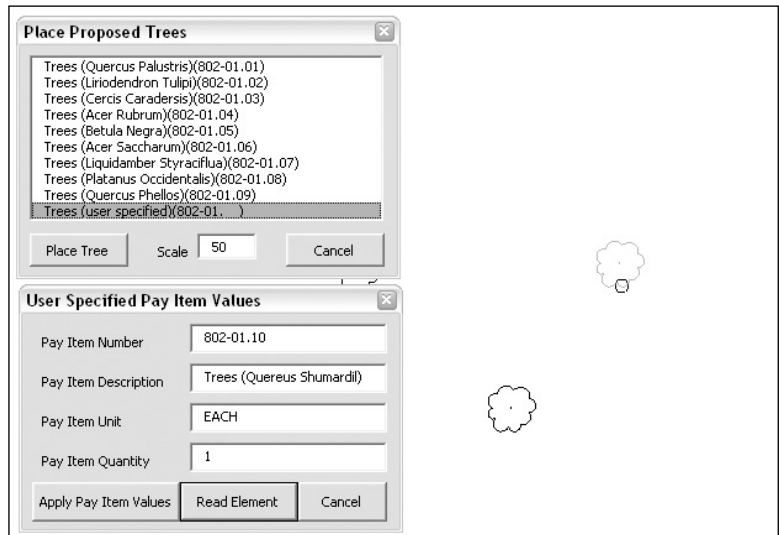
Step 4. Once the pay item information is entered, the user must click on the **Apply Pay Item Values** command button to assign the values entered and re-start the Place Tree function. .



Data point when satisfied with the location.

Step 5. To check the type of a proposed tree that has been placed previously or to recall the pay item information of a user specified tree type, 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.



This information is shown with MicroStation's element pop up info if Geopak software is activated. Snap to the tree and float the cursor over the element.

Geopak's D&C Manager pay items read this data to compute total quantities.

Pattern Erosion Control Blanket Area

D&C location: Drafting Standards > EPSC > 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 Prevention Sediment Control > Erosion Control Blanket AP

or by using the keyin

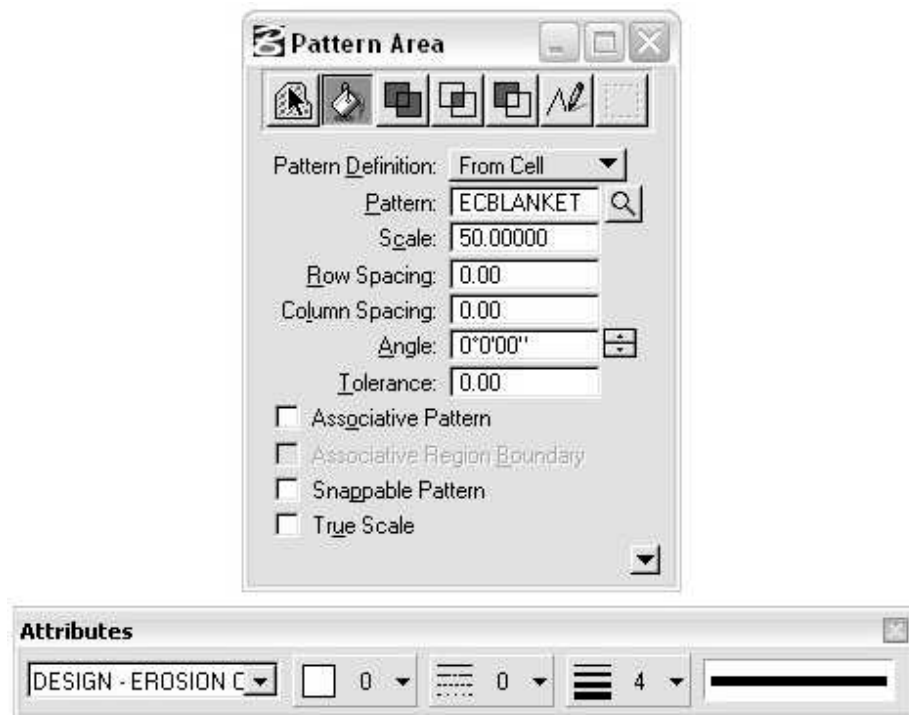
vba run [AreaPatterns]ErosionControlBlanket.SetPattern

Special Requirements:

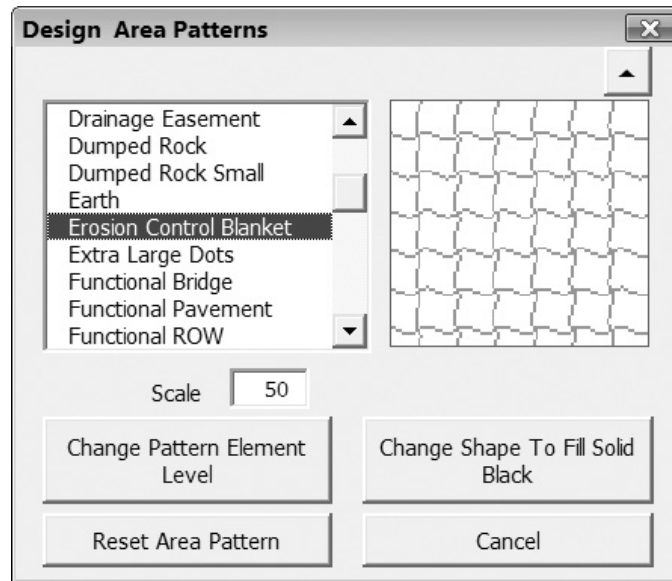
Create a shape element bounding the area to be patterned using the appropriate item from **Drafting Standards > EPSC > EC Blankets** to define the erosion control blanket type.

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.

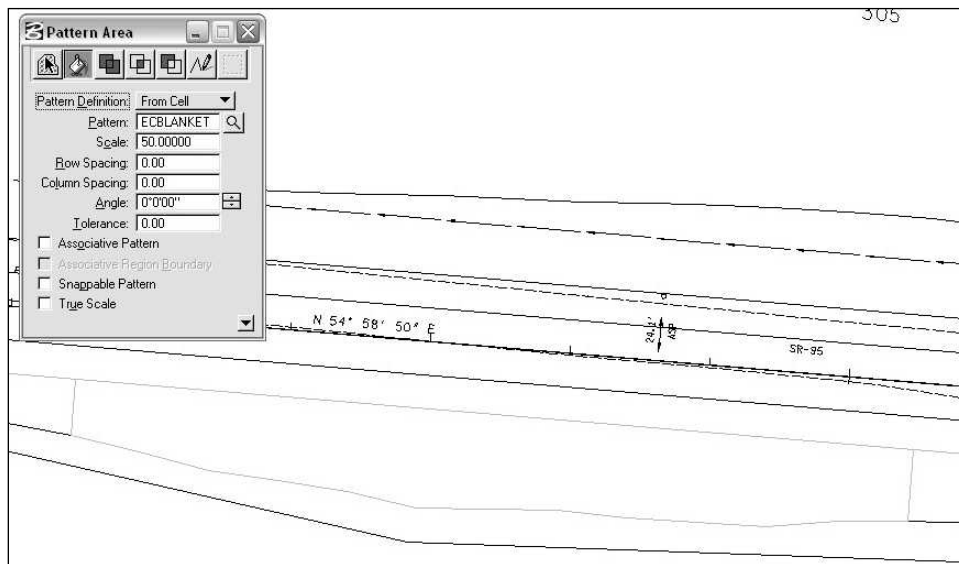


Or from the drop down menu in the **Design Area Patterns** dialog ...

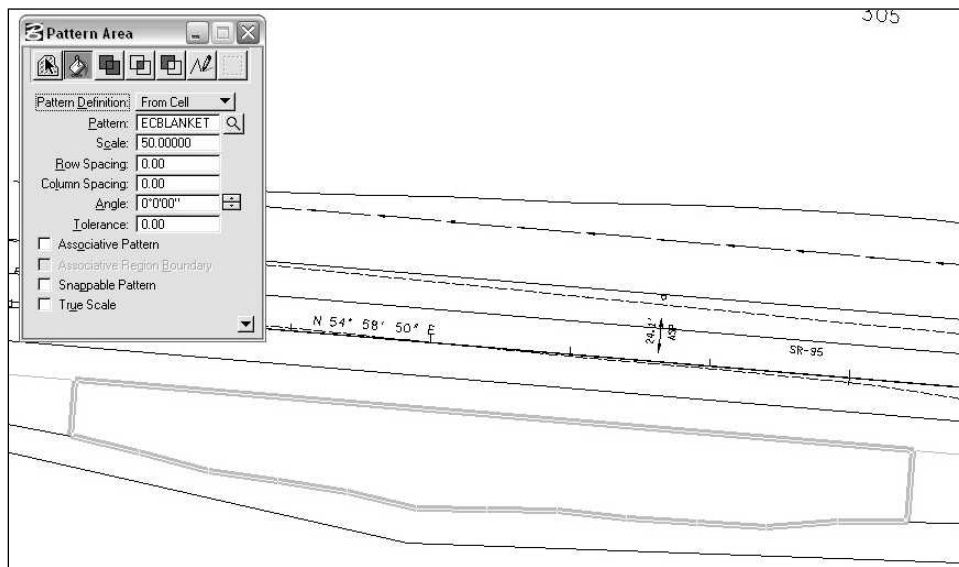


Step 2. Set the method of placing the area pattern to **Element**.

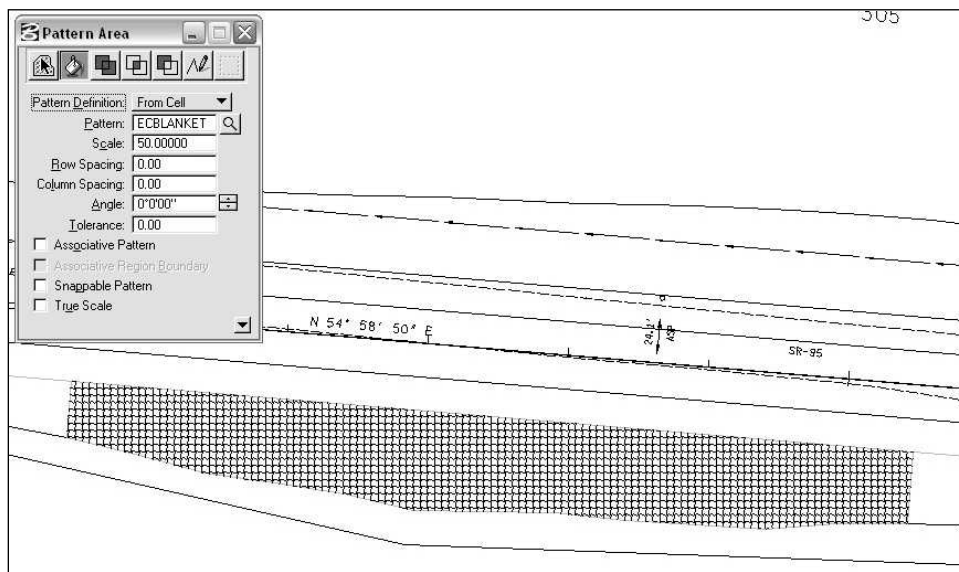
Step 3. The user is prompted to **Identify Element. Data point** on the erosion control blanket shape.



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 > EPSC > 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 a 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 Prevention Sediment Control > Turf Reinforcement Mat AP

or by using the keyin

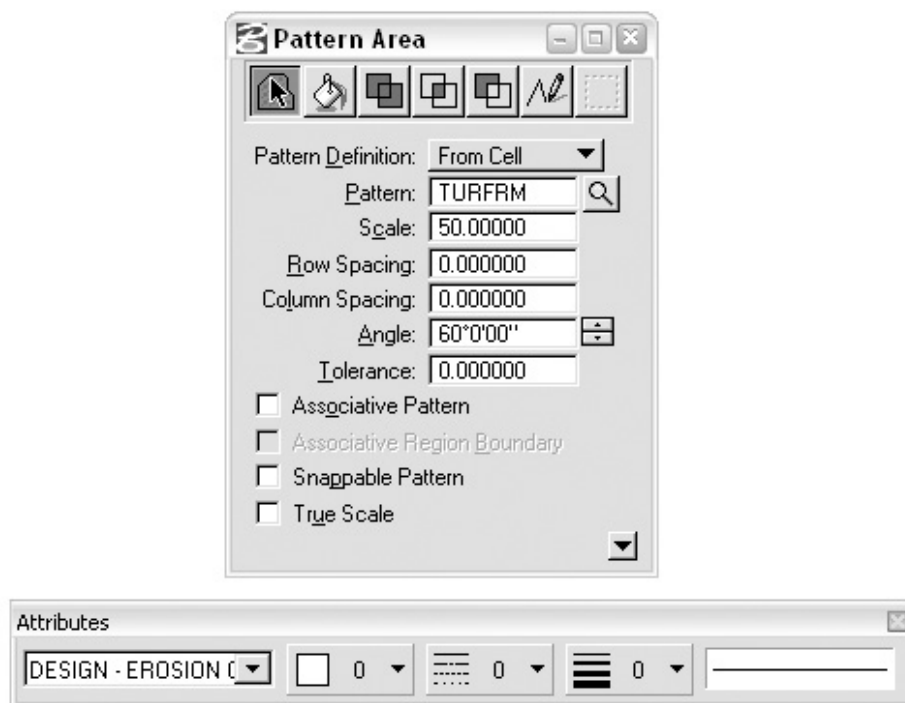
vba run [AreaPatterns]TurfReinforcementMat.SetPattern

Special Requirements:

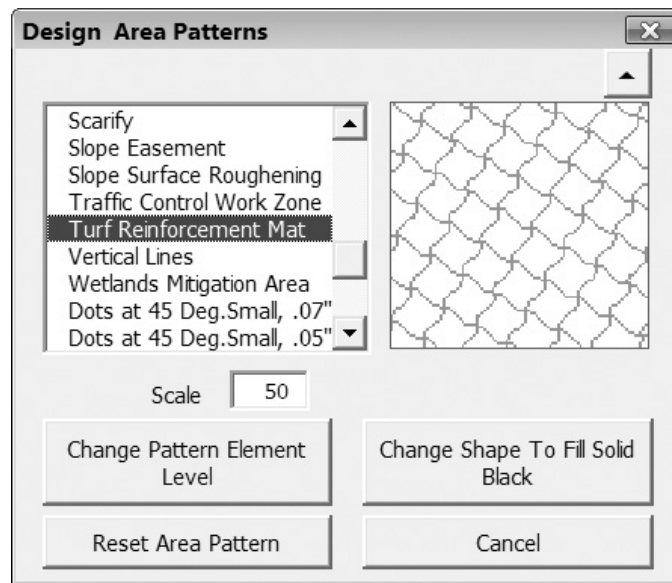
Create a shape element bounding the area to be patterned using the appropriate item from **Drafting Standards > EPSC > Turf Reinforcement Mats** to define the turf reinforcement mat class.

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.

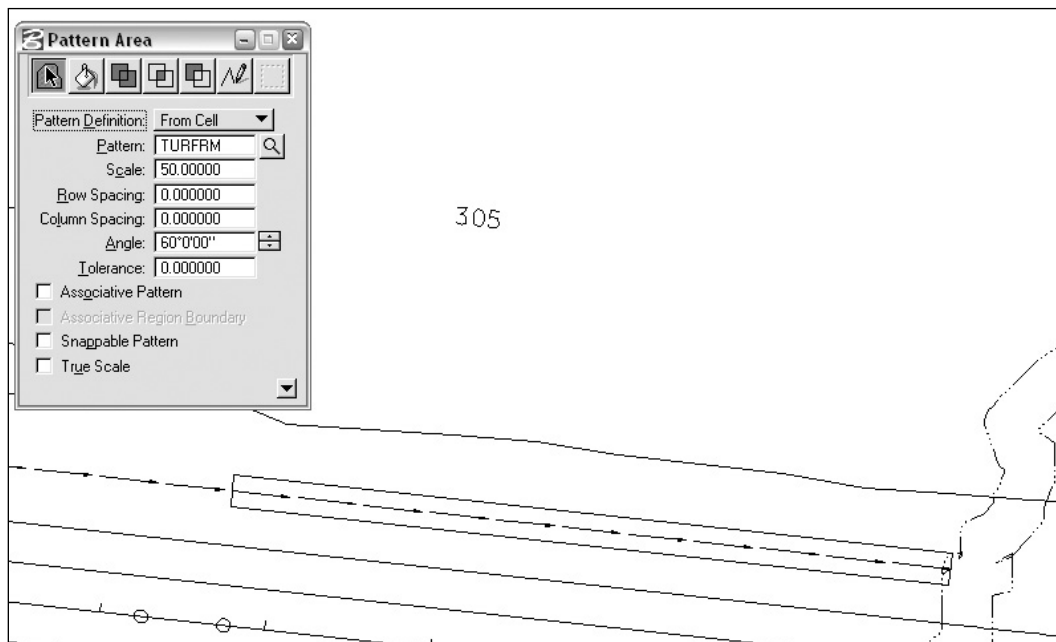


Or from the drop down menu in the **Design Area Patterns** dialog ...

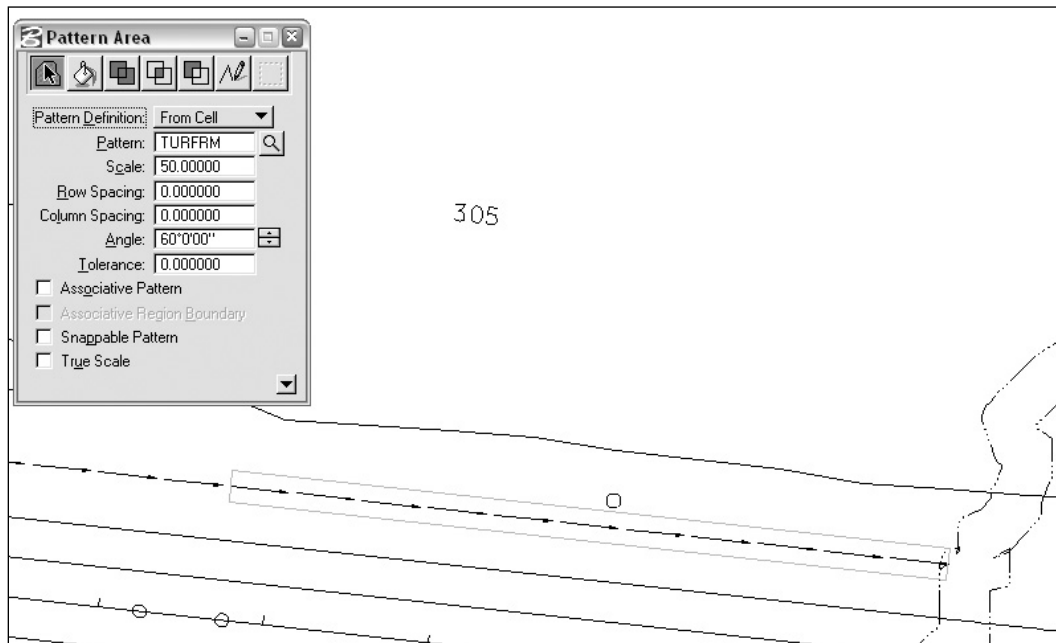


Step 2. Set the method of placing the area pattern to **Element**.

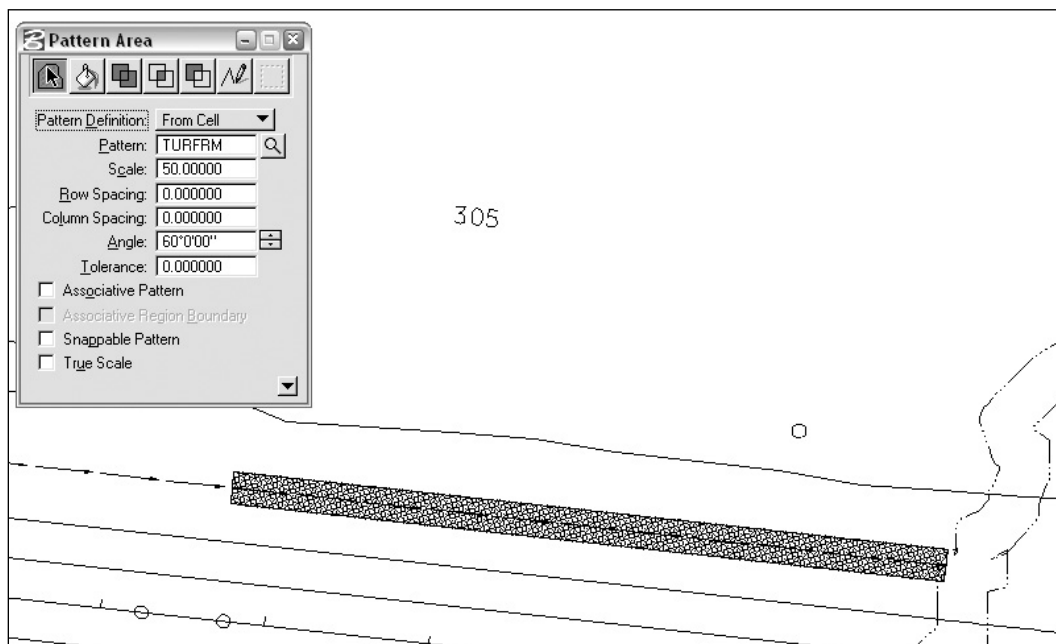
Step 3. The user is prompted to **Identify Element. Data point** on the turf reinforcement mat shape.



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 Roadway 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

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

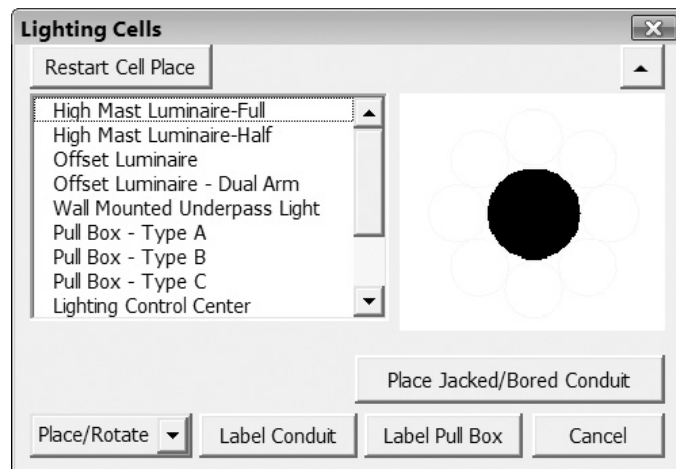
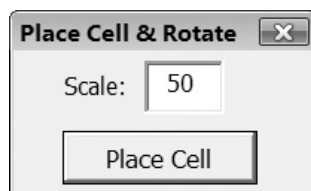
Special Requirements:

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 the **Place Cell & Rotate** tool is activated.



Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

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

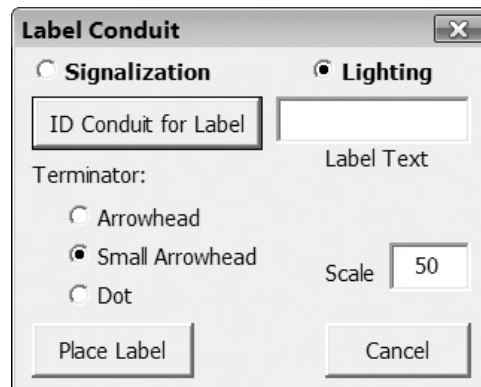
vba run [LabelConduit]IDandLabelLightConduit.Main

Special Requirements:

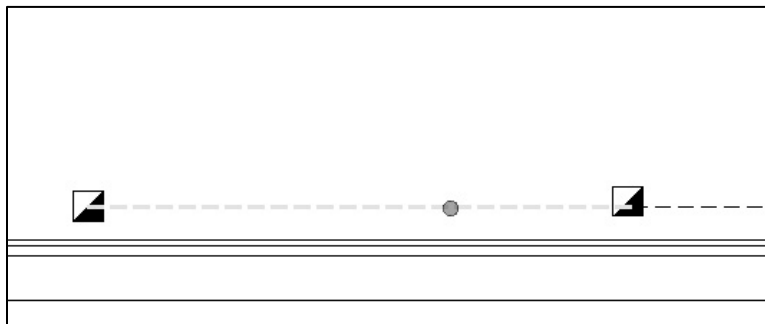
None.

Usage:

Step 1. In D&C manager activate **Label Conduit**. The **Label Conduit** dialog appears.

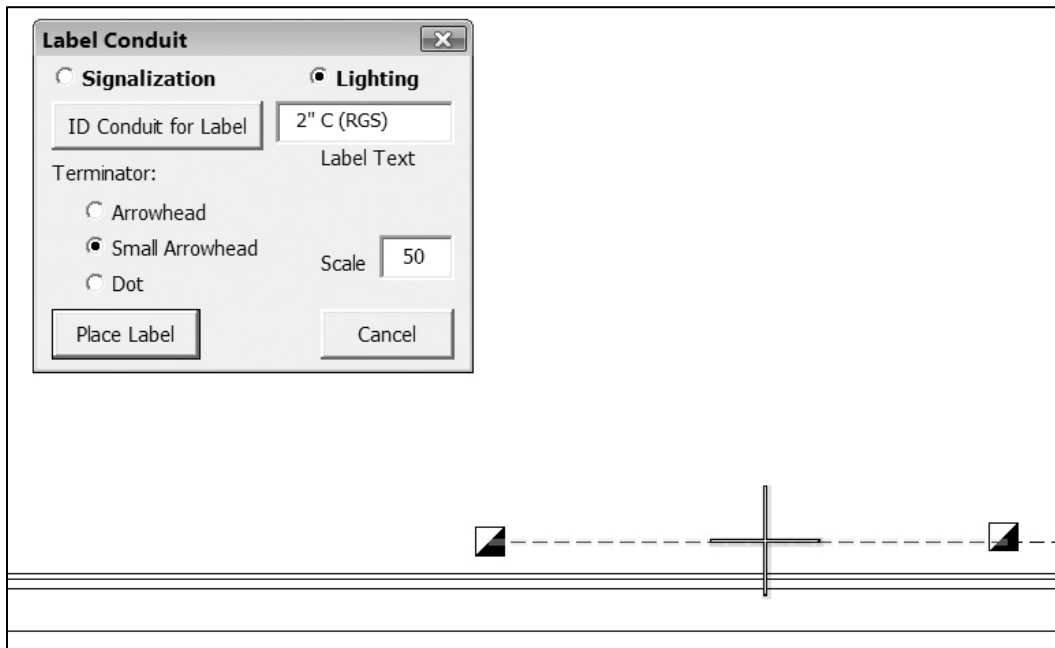


Step 2. The user must either enter the label text in its keyin field manually or by using the **ID Conduit for Label** command button to identify the conduit to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Conduit**. Data point on the conduit line and another data point to accept the element.

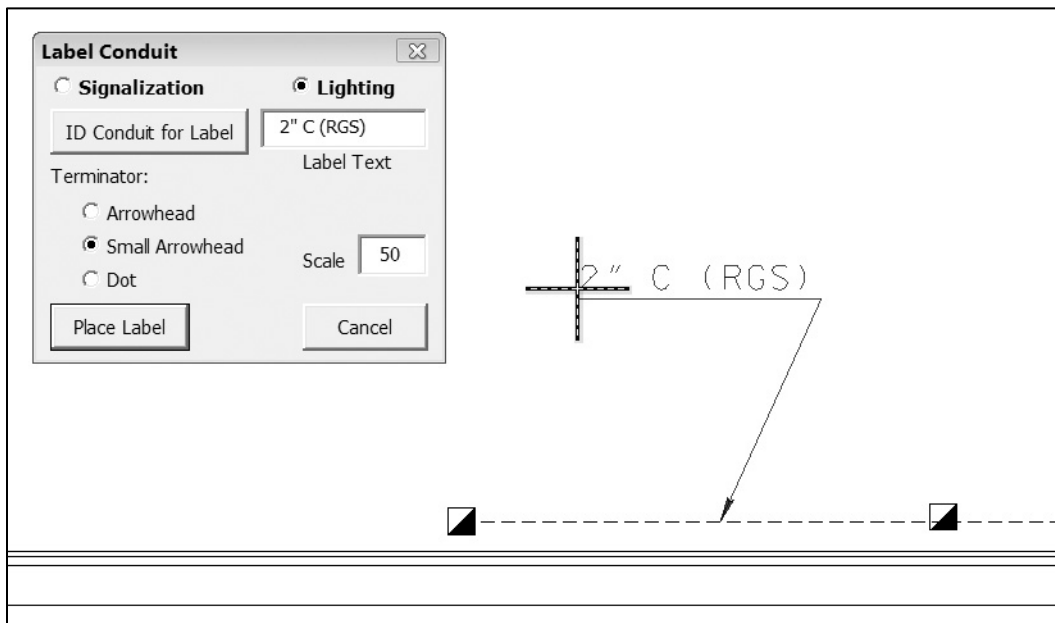


Conduit must be placed with the correct standard symbology for this function to recognize it. An error message is generated for invalid elements.

- 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.

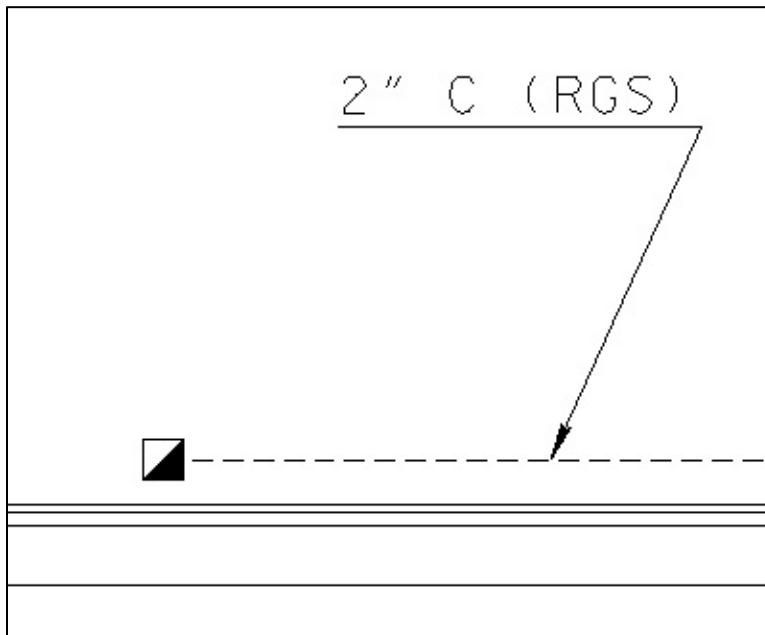


- Step 4.** Once this point is given, the label is shown dynamically and the user is prompted for a second point to **Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



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

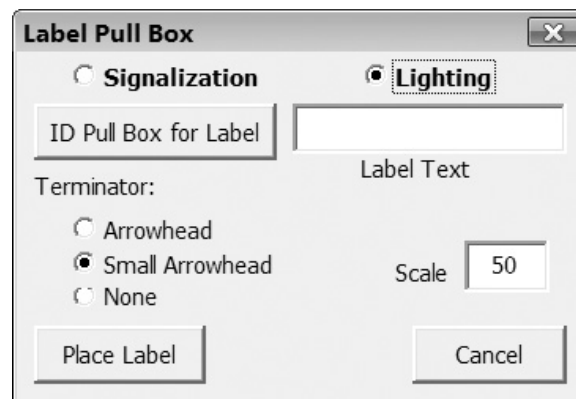
vba run [LabelPullBox]IDandLabelLightPullBox.Main

Special Requirements:

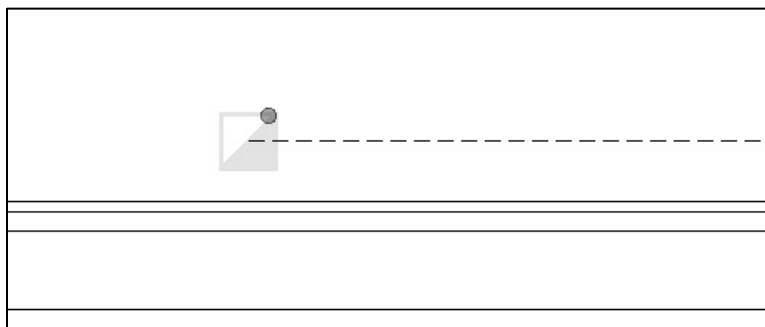
None.

Usage:

Step 1. In D&C manager activate **Label Pull Box**. The **Label Pull Box** dialog appears.

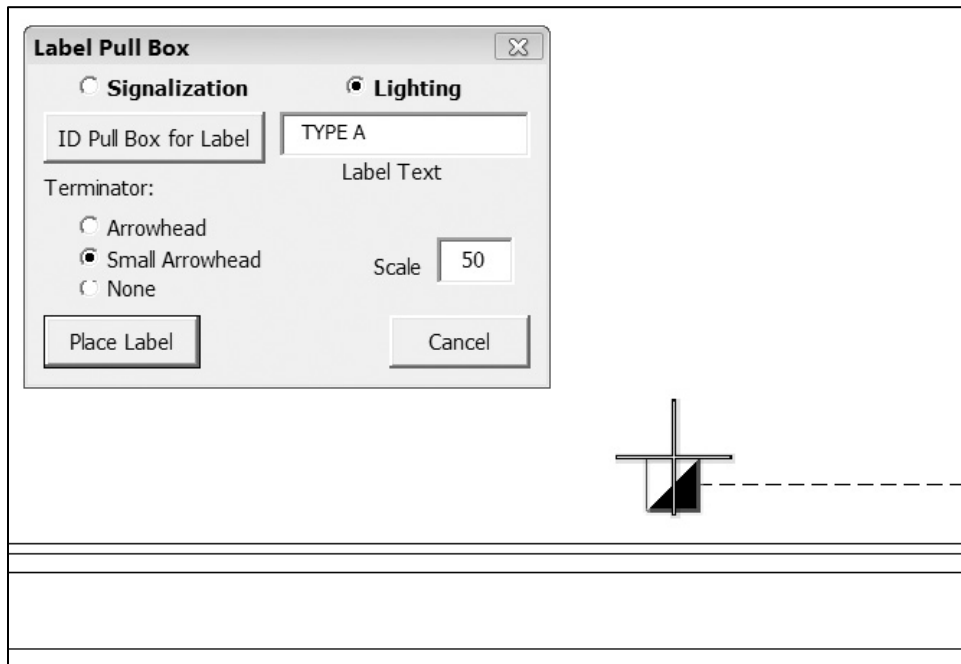


Step 2. The user must either enter the label text in its keyin field manually or by using the **ID Pull Box for Label** command button to identify the pull box to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Pull Box**. Data point on the pull box cell and another data point to accept the element.

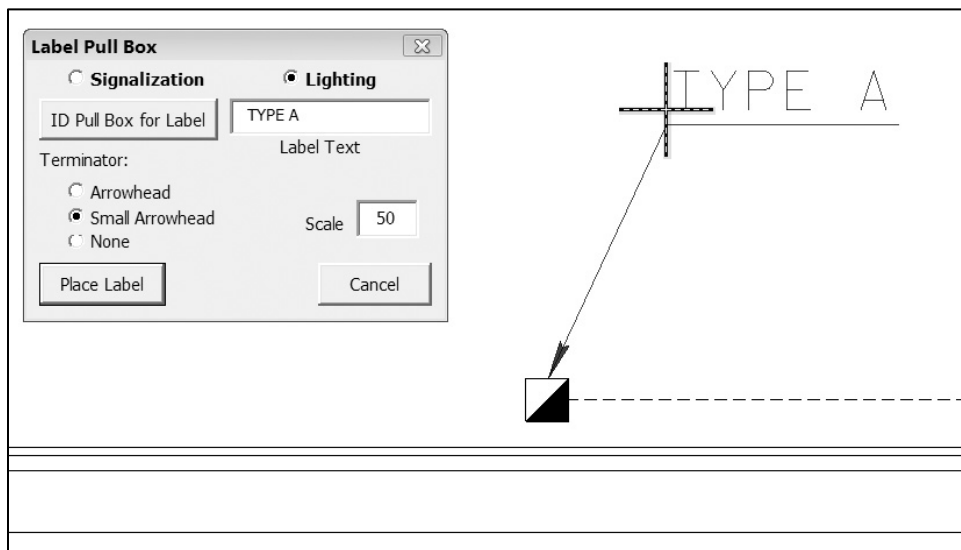


Pull box cells must be placed on the correct level for this function to recognize it. An error message is generated for invalid elements.

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.

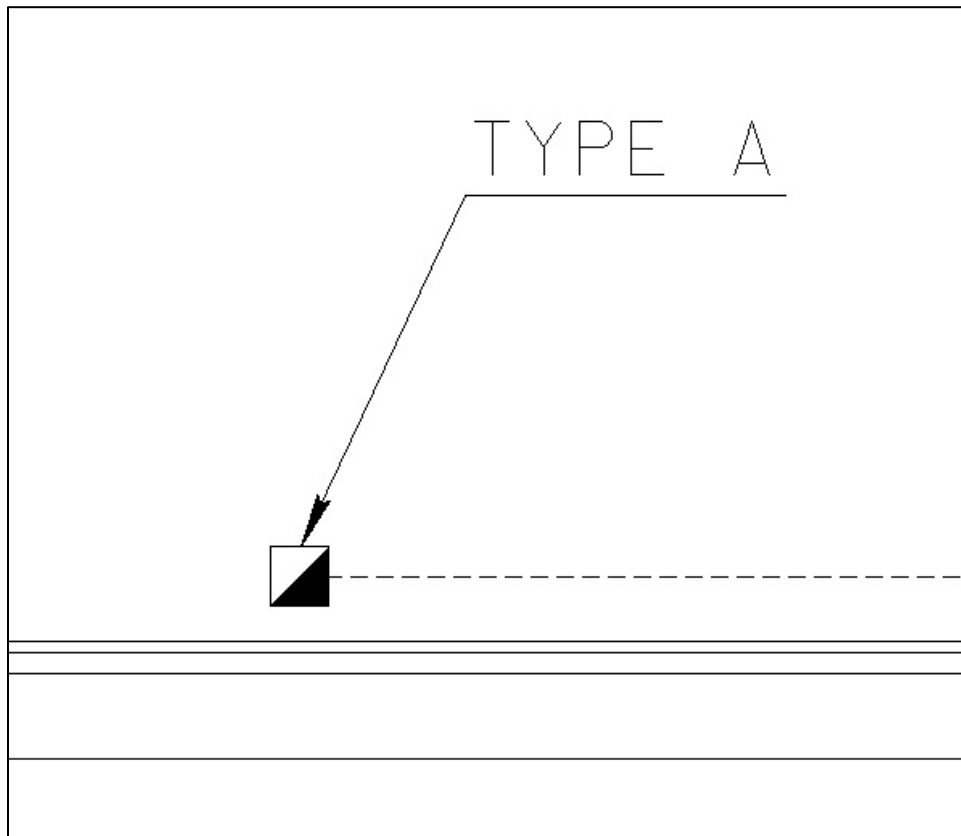


Step 4. Once this point is given, the label is shown dynamically and the user is prompted for a second point **to Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



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

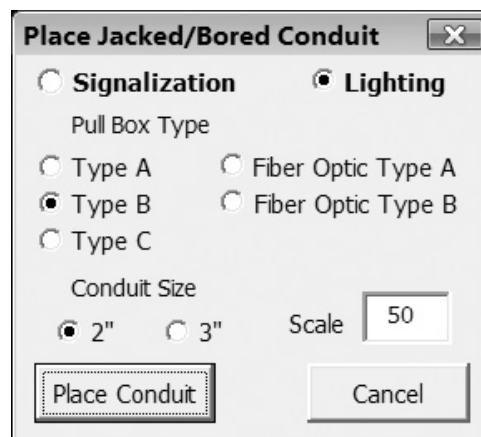
vba run [PlaceJackedBoredConduit]LightingJacked.Main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Place Jacked**. The **Place Jacked/Bored Conduit** dialog appears.

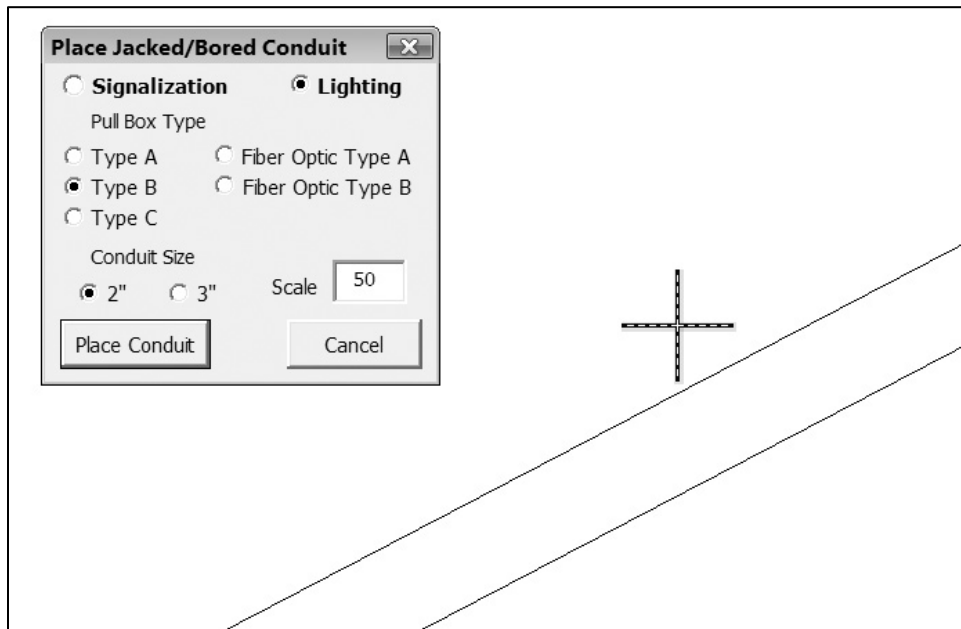


Step 2. Make the required settings.

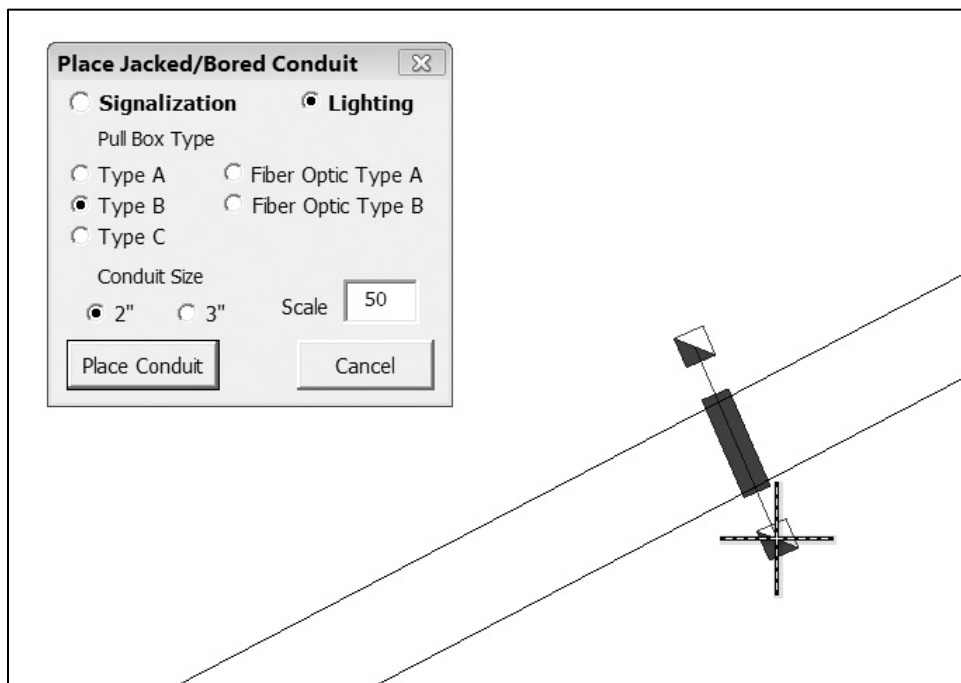
The user needs to choose the **Pull Box Type** to be placed at the ends. Note that only pull box types A, B or C are valid for Lighting application. All are valid for Signalization application except for type C.

Finally pick the **Conduit Size** and check the **Scale** value shown.

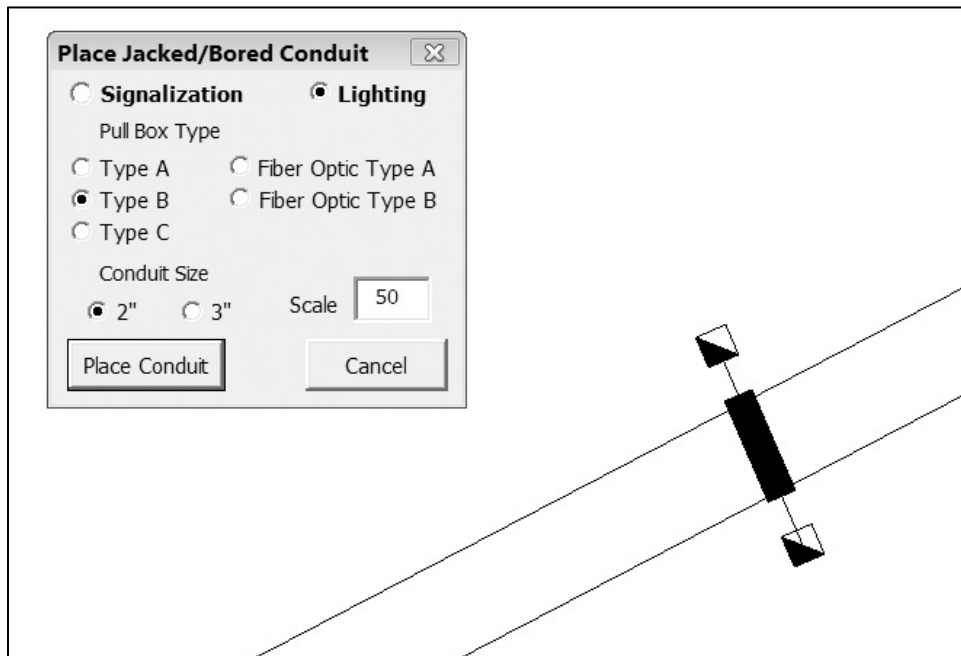
- Step 3.** Click on the **Place Conduit** command button. You are prompted to **Identify Pull Box Location on Left**. Data point on the left side of the roadway or other feature which conduit is to be jacked or bored under.



- 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 Roadway 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Pavement Marking > Cells

or by using the keyin

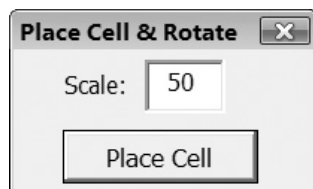
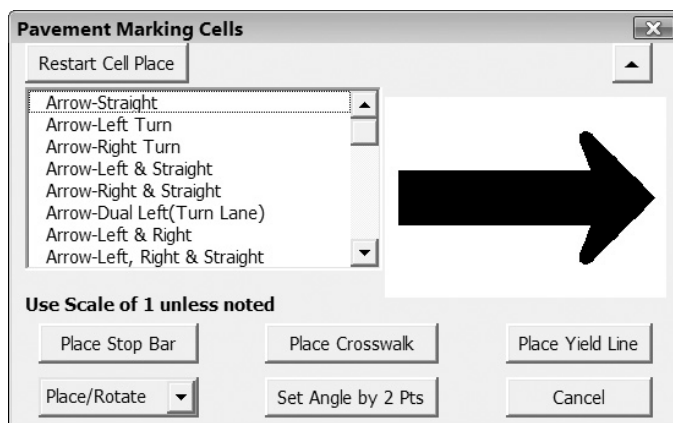
vba run [PavementMarkingCells]PvmtMarkingcells.main

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 the **Place Cell & Rotate** tool is activated.



- Step 3.** Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

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. Longitudinal 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.

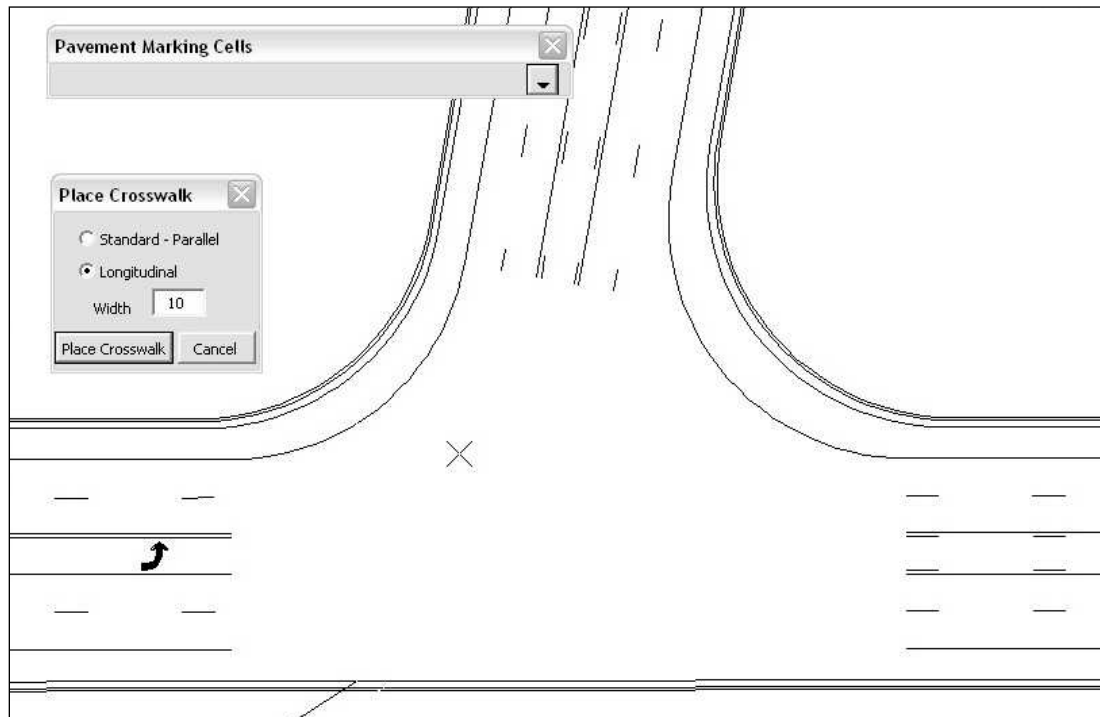
Usage:

Step 1. In D&C manager activate **Cross-walk**. The **Place Crosswalk** dialog appears.

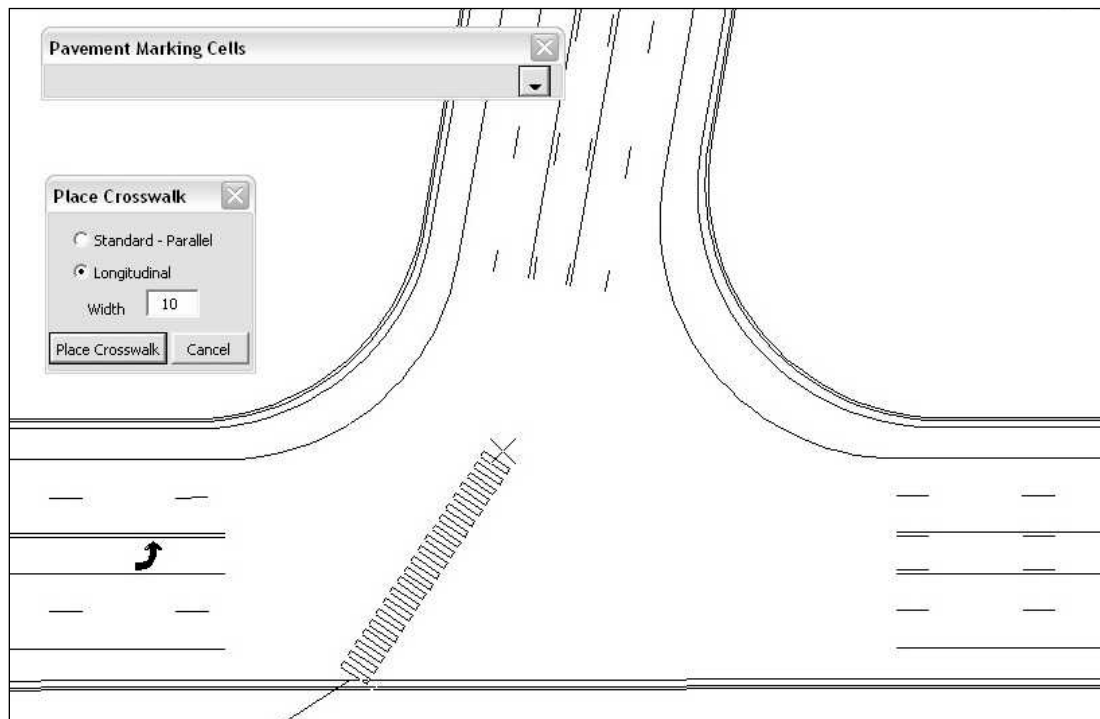


Step 2. First the Parallel or Longitudinal toggle should be set as needed. Default widths are automatically added to the **Width** keyin field. Adjust the width if needed.

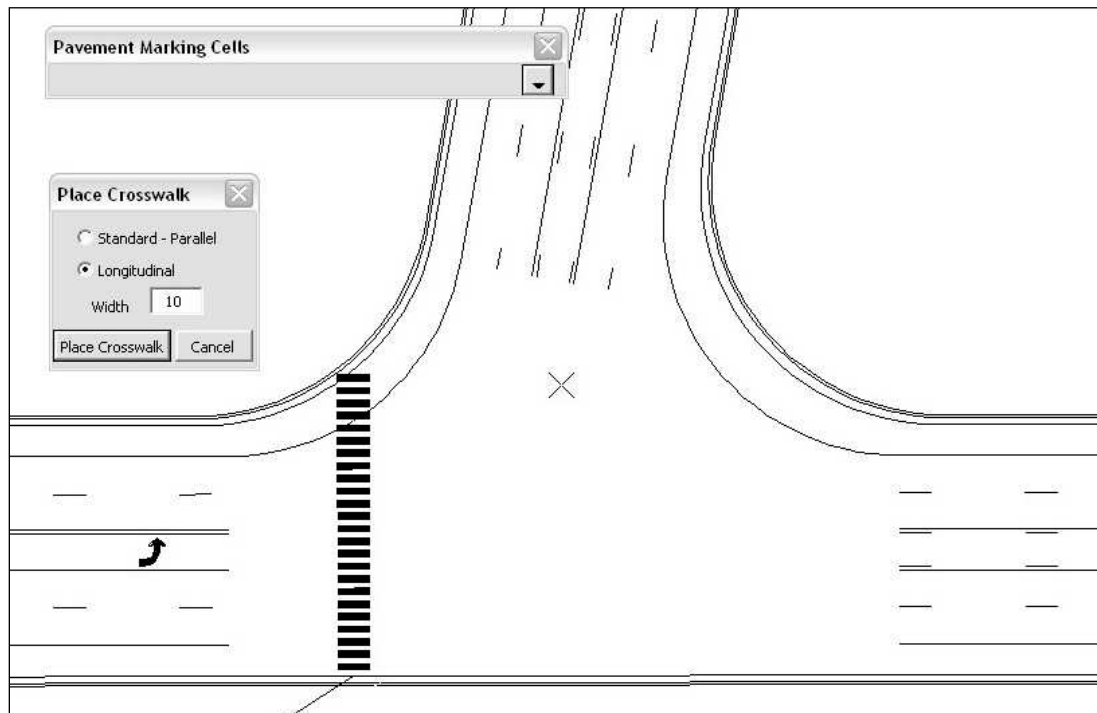
Step 3. When started, program immediately prompts user to **Identify Beginning** .



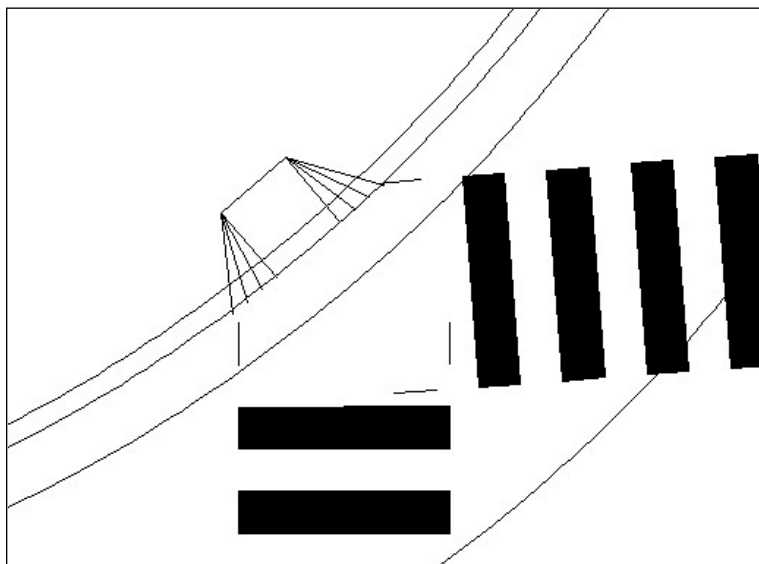
Step 4. After data pointing for the beginning of the crosswalk, the crosswalk is shown dynamically and you are prompted to **Identify End**.



- 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

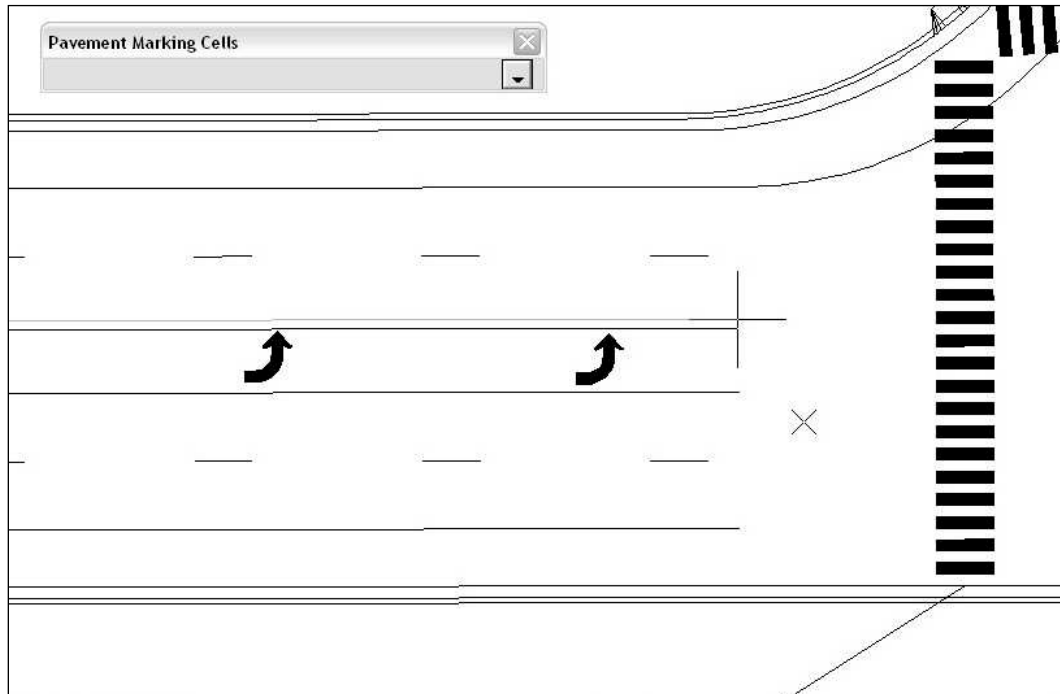
vba run [PlaceStopBar]StopBar.main

Special Requirements:

None.

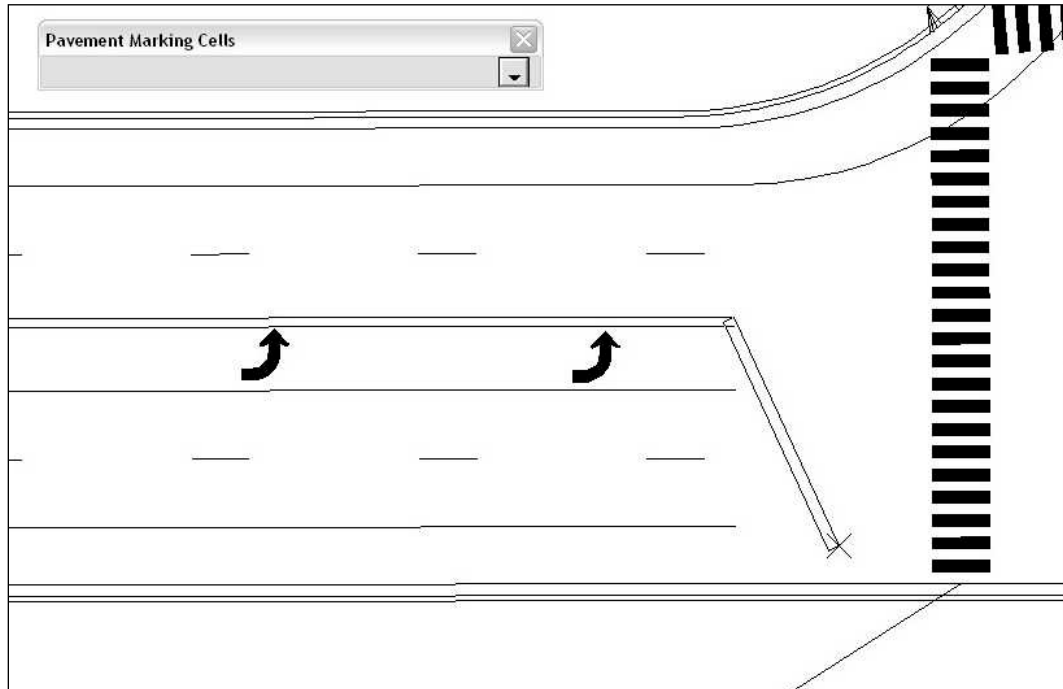
Usage:

Step 1. In D&C manager activate **Stop Bar**. When started, program immediately prompts user to **Identify Beginning at Left**.



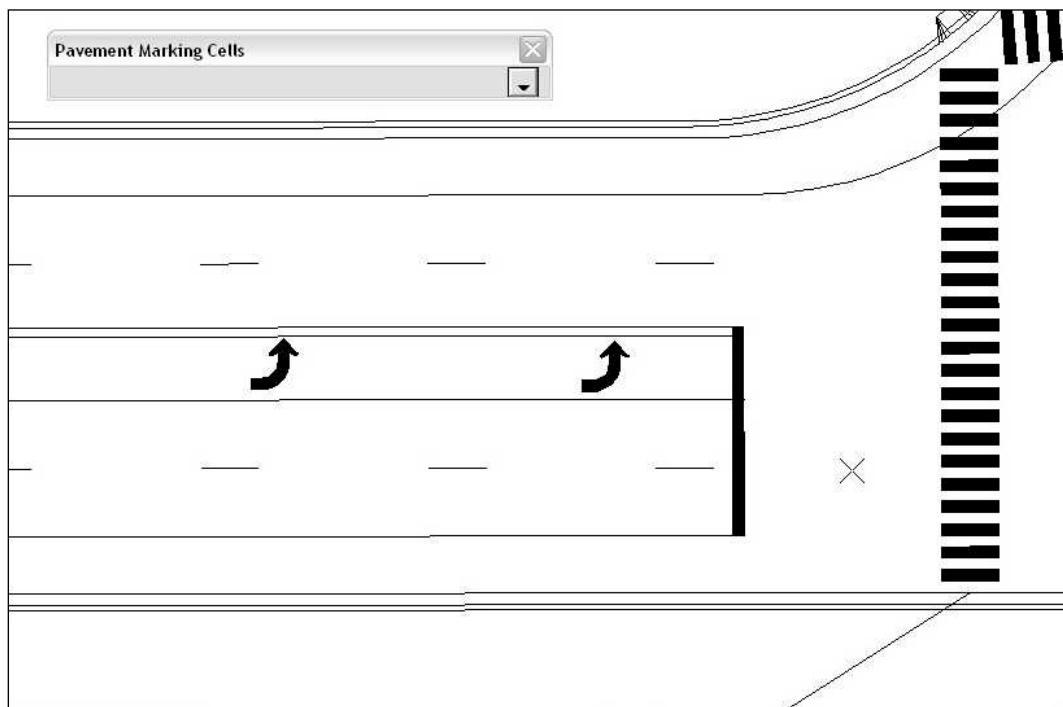
Snap and data point on the left lane line of the lane(s) where the stop bar is needed.

- 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

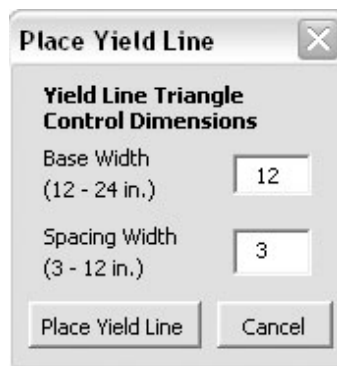
vba run [PlaceYieldLine]YieldLine.main

Special Requirements:

None.

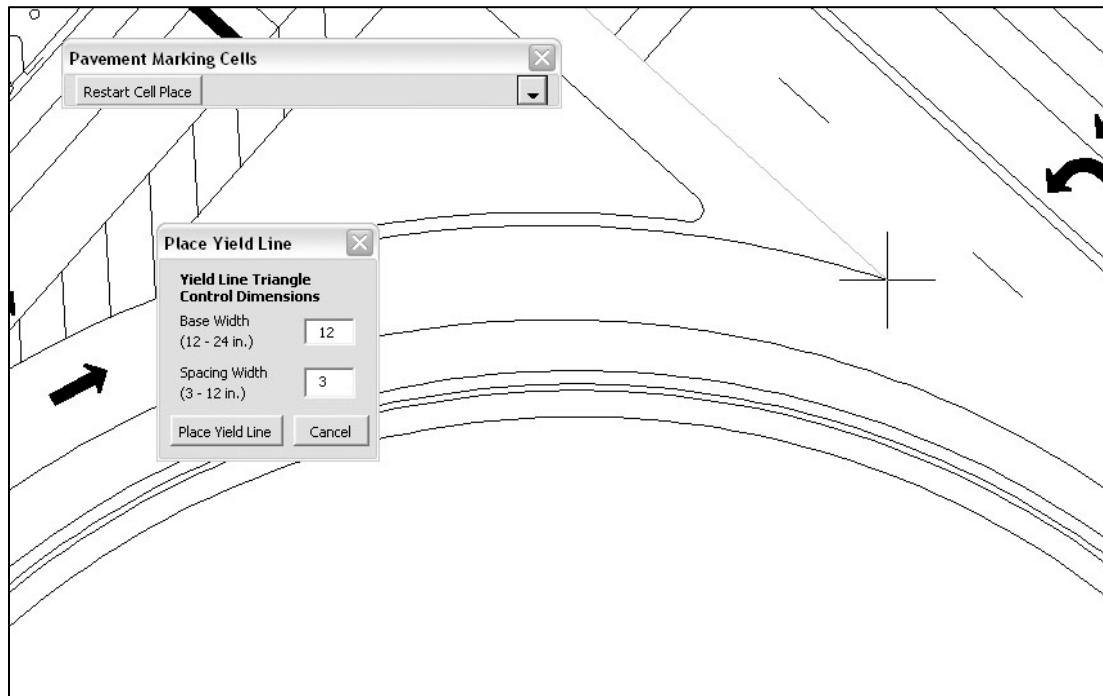
Usage:

Step 1. In D&C manager activate **Yield Line**. The **Place Yield Line** dialog appears.

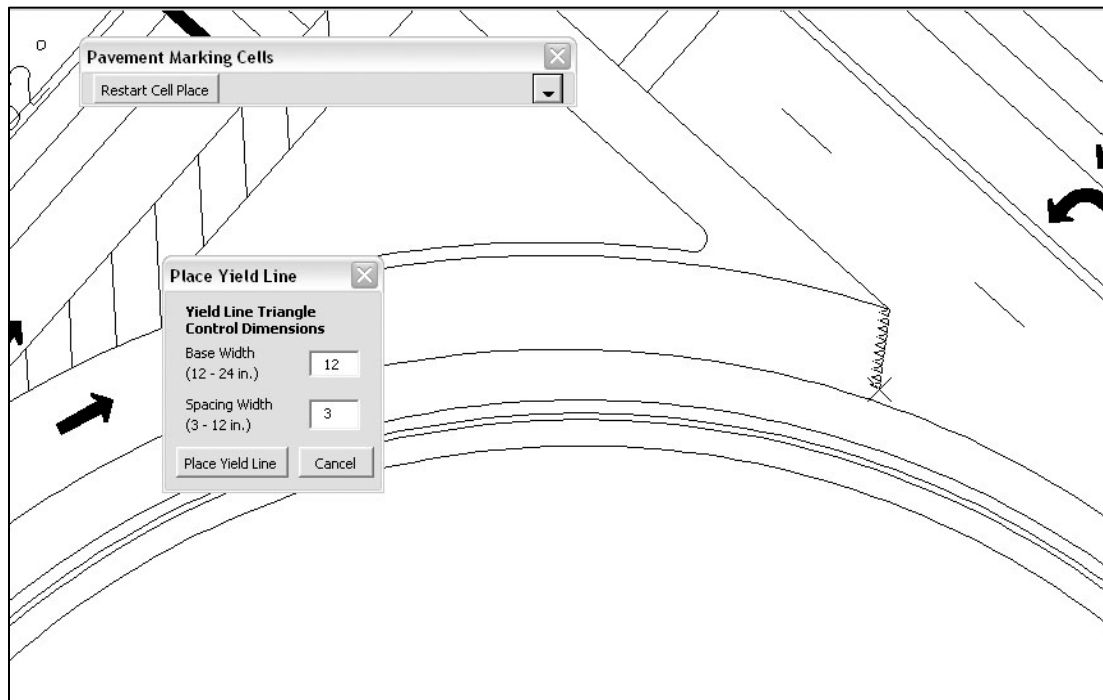


Step 2. Adjust the default values for the **Base Width** and **Spacing Width** if something other than the minimums is desired.

- 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 Roadway Design Division sheet cells.

Command buttons are provided to access the Sheet Title Cells and Place North Arrow vba programs.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Sheet Cells

or by using the keyin

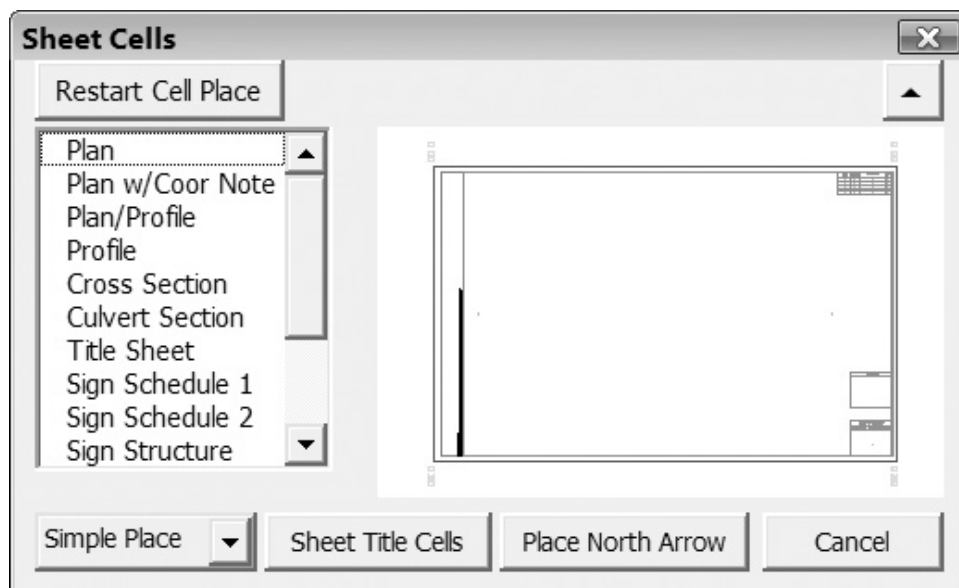
vba run [StandardSheetCells]STDSheetcells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Sheet Title Cells

D&C location: Drafting Standards > Sheets > Sheet Titles

MicroStation VBA Program: SheetTitleCells.mvba

Description:

This program provides access to TDOT Roadway Design Division sheet title cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Sheet Titles

or by using the keyin

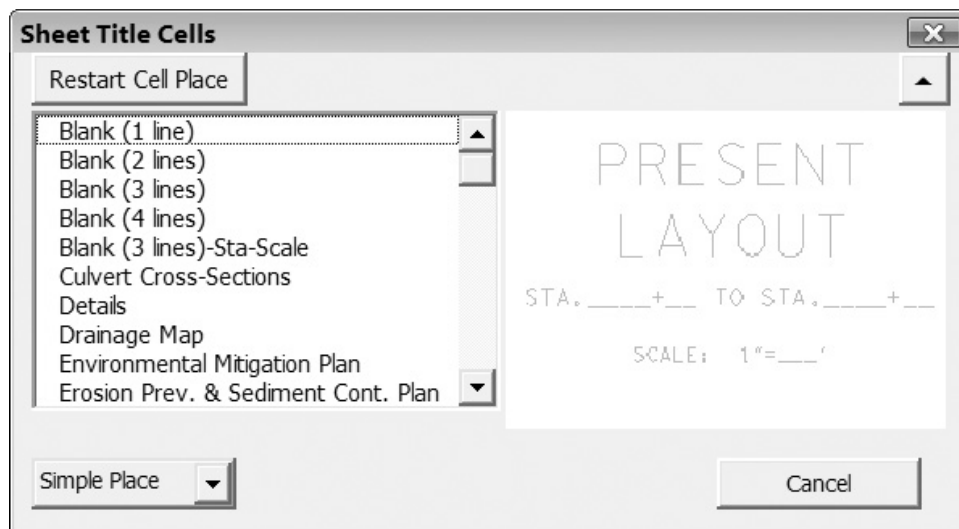
vba run [SheetTitleCells]SHTTitlecells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Permits and Forms

D&C location: Drafting Standards > Sheets > Permits & Forms

MicroStation VBA Program: PermitFormsCells.mvba

Description:

This program provides access to TDOT Roadway 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Permits & Forms

or by using the keyin

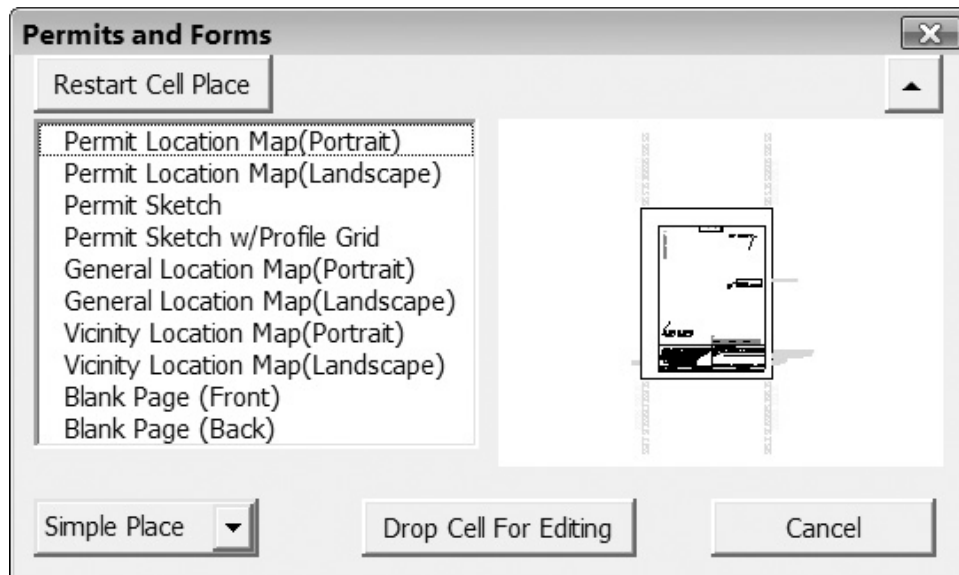
vba run [PermitFormsCells]Permitcells.main

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 **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

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 Roadway Design Division plan phase stamp cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

A command button is provided to access vba program Place Plan Phase Stamps in Files.

This program can also be activated from the MicroStation drop down menu

TDOT > Plan Phase Stamps

or by using the keyin

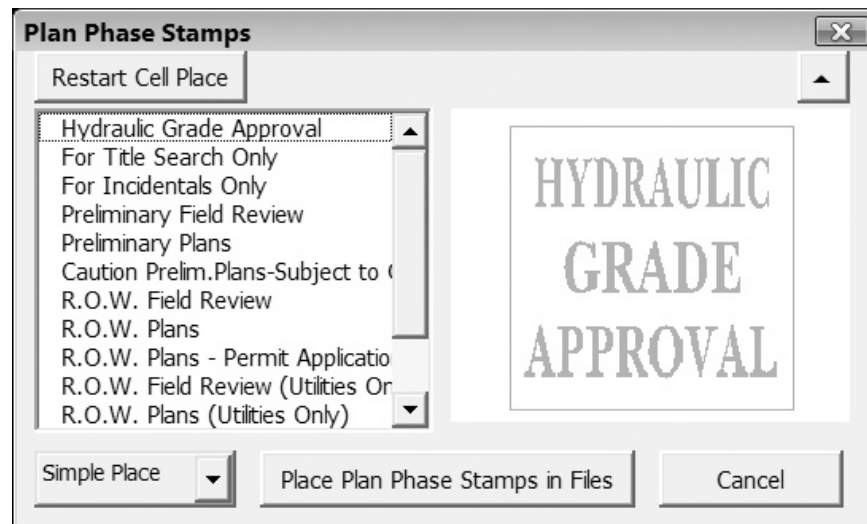
vba run [PlanPhaseCells]PlnPhasecells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Plan Phase Stamps in Files

D&C location: Drafting Standards > Sheets > Stamps in Files

MicroStation VBA Program: PlacePlanPhaseStamps.mvba

Description:

This program is used to place (for the first time), replace or remove plan phase stamp cells in plan sheet files. Drop down lists are provided to specify plan phase stamp to be replaced, new plan phase stamp to be placed and plan phase stamp to be just removed.

The option None in the Remove Current Stamp w/o Replacement: list allows first time placement or replacement using the other lists. If the remove option is set to anything else then that is searched for and removed and the other list values are ignored.

The option None in the Replace Current Stamp: list allows for first time placement of a plan phase stamp in the sheet files. As noted in the dialog, first time placements are set at a default location based on the sheet type which is normally above the engineer's seal block. After a first time placement, sheets should be reviewed for location adjustment as needed. If any stamp other than the None option is set under Replace Current Stamp:, then the files are searched for that stamp cell which when found is replaced by the value set under Place New Stamp:

All files with DGN, 2D, 3D or SHT extensions from the open DGN file's folder are included in the list. Command buttons are provided to select just the SHT files and to select all of the files.

This program can also be activated from the MicroStation drop down menu

TDOT > Place Plan Phase Stamps in Files

or by using the keyin

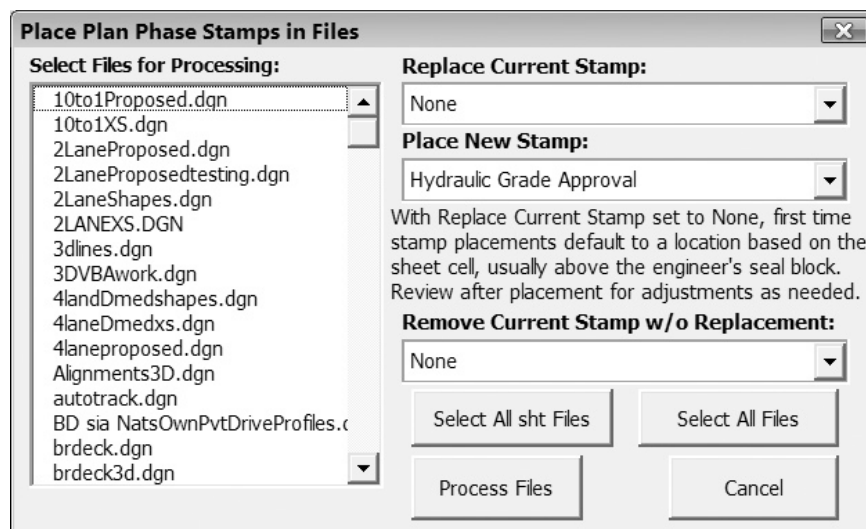
vba run [PlacePlanPhaseStamps]PlaceStamps.main

Special Requirements:

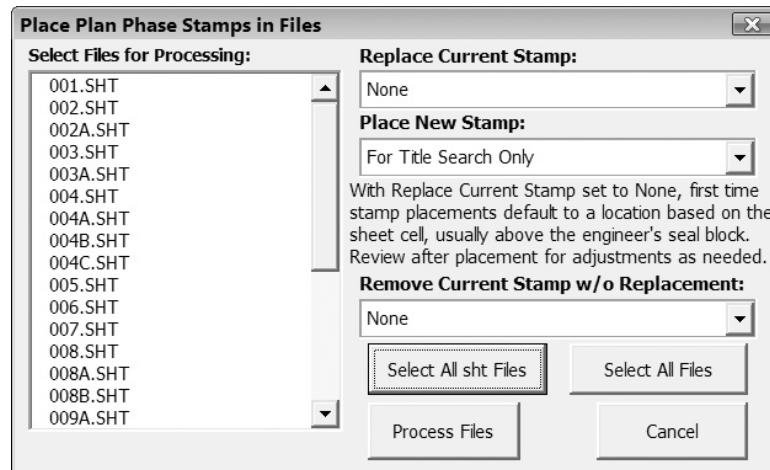
None.

Usage: First Time Placement

Step 1. In D&C manager activate **Stamps in Files**. The **Place Plan Phase Stamps in Files** dialog appears.

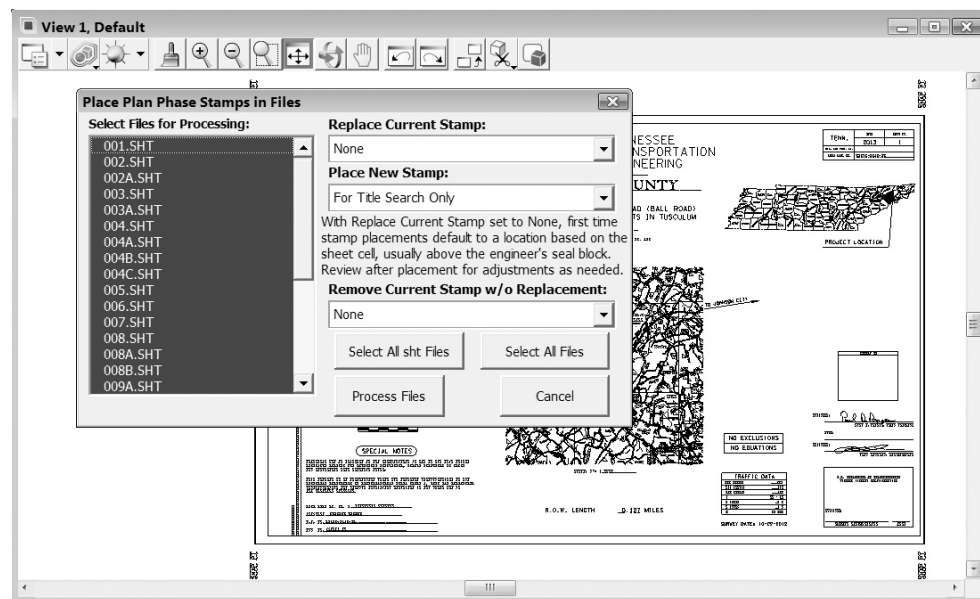


- Step 2.** Under the **Place New Stamp:** drop down list, set the plan phase stamp option for first time placement. The Replace Current Stamp: and Remove Current Stamp w/o Replacement: options must be set to **None**.



- Step 3.** In the **Select Files for Processing:** list on the right, 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.

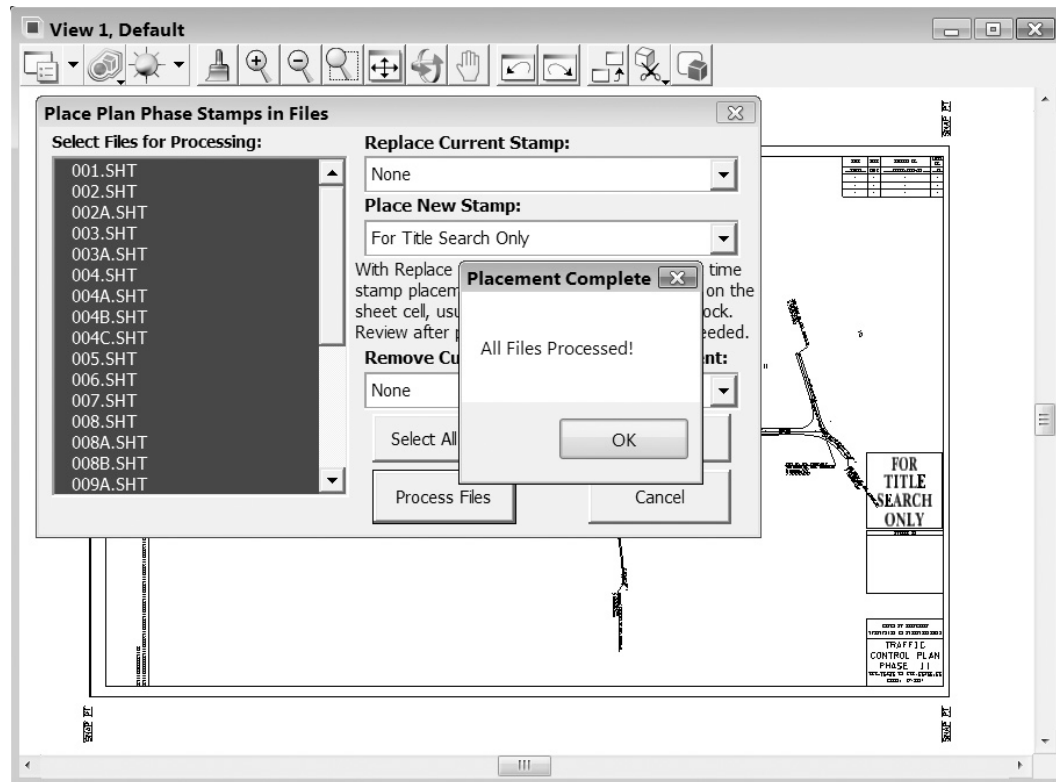
You can also use the command buttons provided to **Select All sht Files** (all files with a .sht extension) or to **Select All Files**.



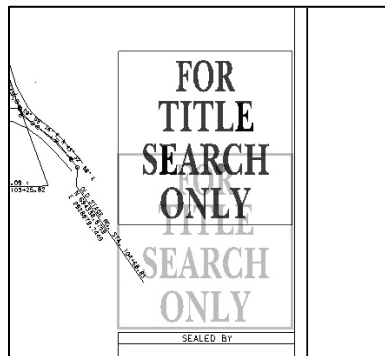
Step 4. Click the **Process Files** command button to start placement.

As files are processed, a status prompt message lists the current file number with the total number to be processed as in **“Processing File 8 of 19”**.

Step 5. A message box appears stating **All Files Processed** when all stamp placements are completed. Click **OK** to dismiss the message.



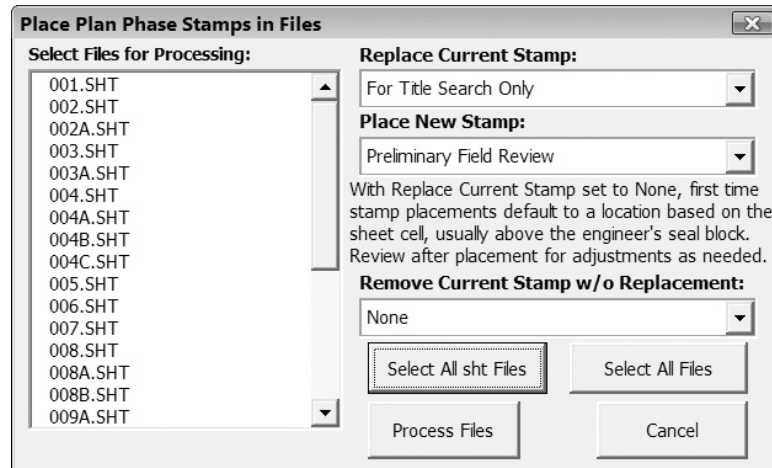
Step 5. Since this is a first time placement, all sheets should be reviewed for any locations where the stamp may need to be moved to avoid encroaching project data. Future stamp replacements will automatically go in the location of the previous stamp.



Note that first time placements use the sheet cells for stamp location, scale and rotation. **If any sheet cell has been dropped from cell status, then the program will not recognize it and no stamp will be placed.** You can use the Plan Phase Stamps cell dialog to place these manually.

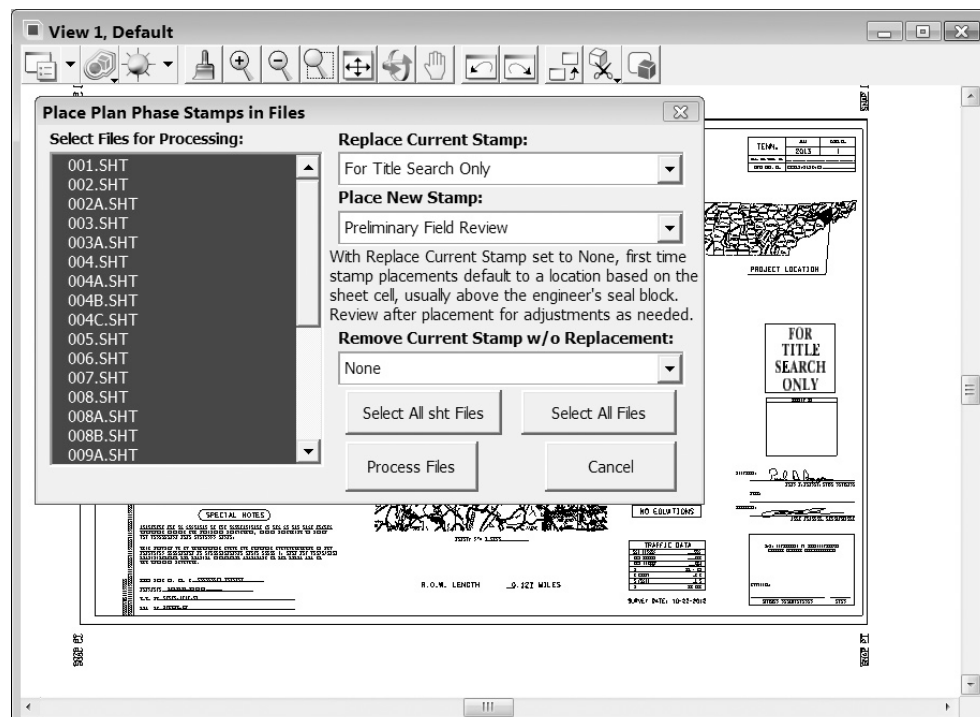
Usage: Replace Current Stamp

- Step 1.** In D&C manager activate **Stamps in Files**. The **Place Plan Phase Stamps in Files** dialog appears.
- Step 2.** Under the **Replace Current Stamp**: drop down list, set the plan phase stamp that is currently on the sheets. Use the drop down list for **Place New Stamp**: to set the new stamp that needs to be placed on the sheets. The Remove Current Stamp w/o Replacement: option must be set to **None**.



- Step 3.** In the **Select Files for Processing**: list on the right, 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.

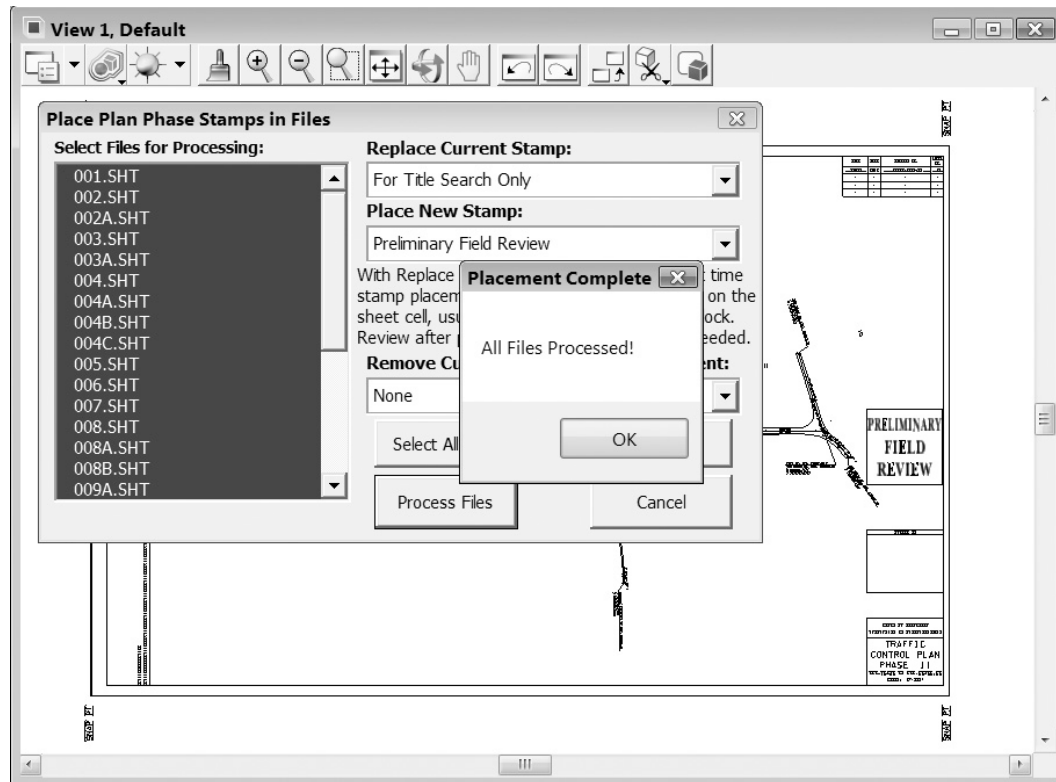
You can also use the command buttons provided to **Select All sht Files** (all files with a .sht extension) or to **Select All Files**.



Step 4. Click the **Process Files** command button to start stamp replacement.

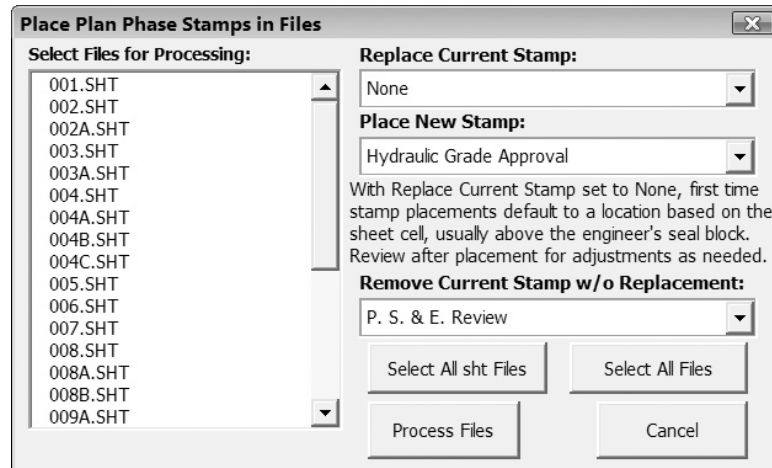
As files are processed, a status prompt message lists the current file number with the total number to be processed as in “**Processing File 8 of 19**”.

Step 5. A message box appears stating **All Files Processed** when all stamp replacements are completed. Click **OK** to dismiss the message.



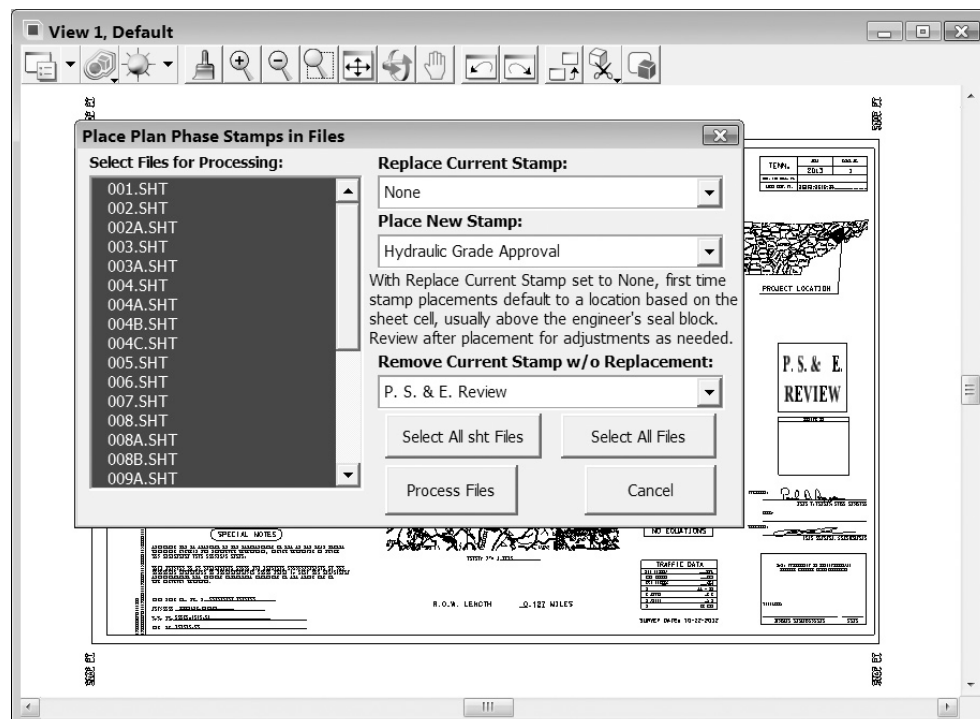
Usage: Remove Current Stamp w/o Replacement

- Step 1.** In D&C manager activate **Stamps in Files**. The **Place Plan Phase Stamps in Files** dialog appears.
- Step 2.** Under the **Remove Current Stamp w/o Replacement**: drop down list, set the plan phase stamp you wish to remove from the sheets. The settings for the Replace Current Stamp: and Place New Stamp: options will be ignored and do not matter when the remove option is set to anything other than None.



- Step 3.** In the **Select Files for Processing**: list on the right, 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.

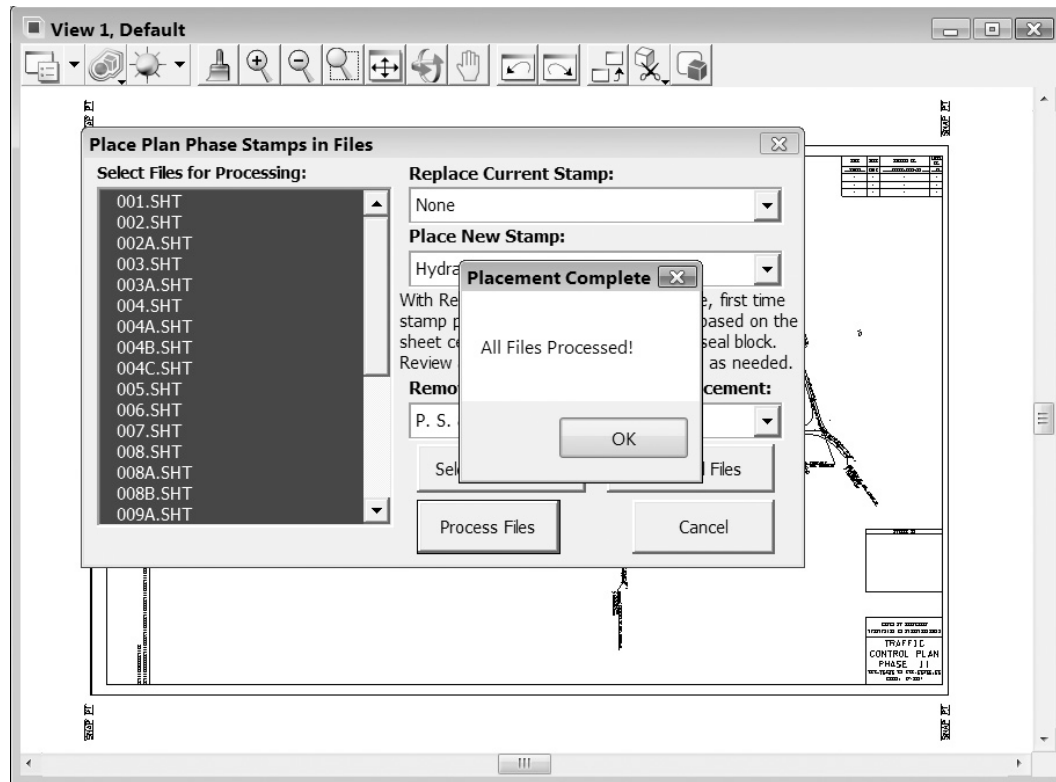
You can also use the command buttons provided to **Select All sht Files** (all files with a .sht extension) or to **Select All Files**.



Step 4. Click the **Process Files** command button to start removal.

As files are processed, a status prompt message lists the current file number with the total number to be processed as in **“Processing File 8 of 19”**.

Step 5. A message box appears stating **All Files Processed** when all stamp removals are completed. Click **OK** to dismiss the message.



Public Hearing Cells

D&C location: Drafting Standards > Sheets > Public Hearing

MicroStation VBA Program: PublicHearingCells.mvba

Description:

This program provides access to TDOT Roadway Design Division public hearing cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Public Hearing Cells

or by using the keyin

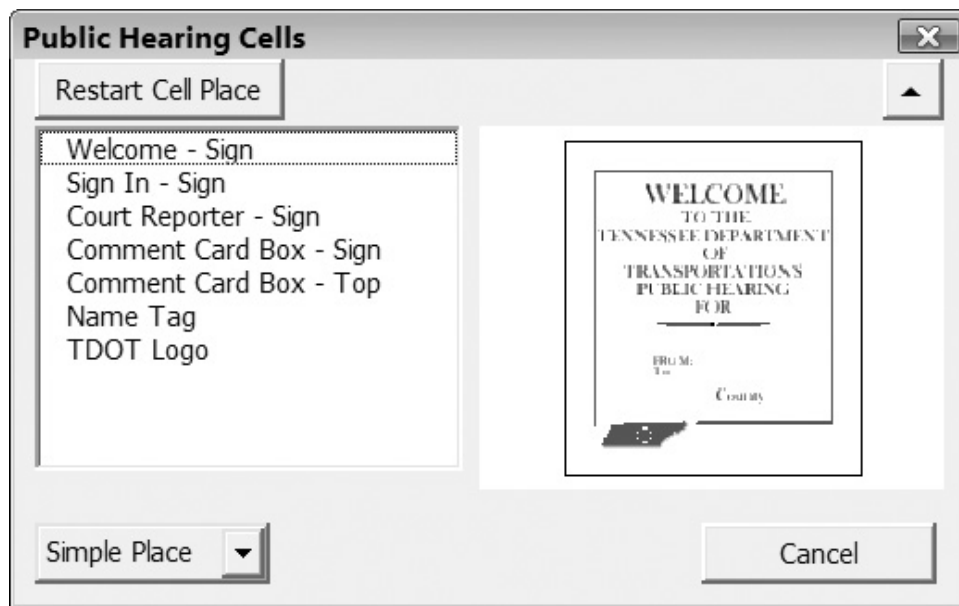
vba run [PublicHearingCells]PublicHearngcells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Title Sheet Cells

D&C location: Drafting Standards > Sheets > Title Sht Cells

MicroStation VBA Program: TitleSheetCells.mvba

Description:

This program provides access to TDOT Roadway Design Division title sheet cells.

A command button is provided to access the Place North Arrow vba program.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Title Sheet Cells

or by using the keyin

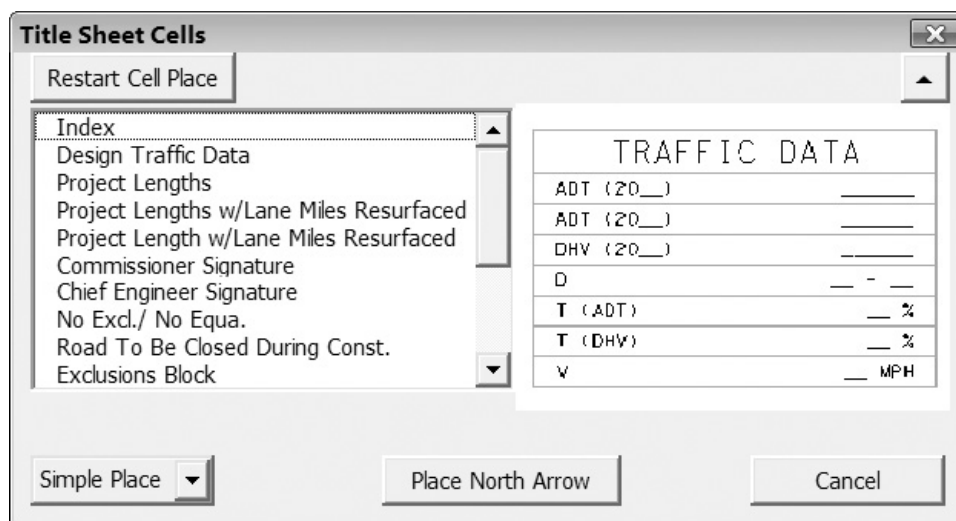
vba run [TitleSheetCells]TitleSHTcells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Signalization

Signalization Device Cells

D&C location: Drafting Standards > Signalization > Signal Cells

MicroStation VBA Program: SignalizationDeviceCells.mvba

Description:

This program provides access to TDOT Roadway 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 Curb 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

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

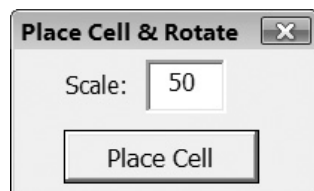
Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Signal Cells**. The **Signalization Device Cells** dialog appears.

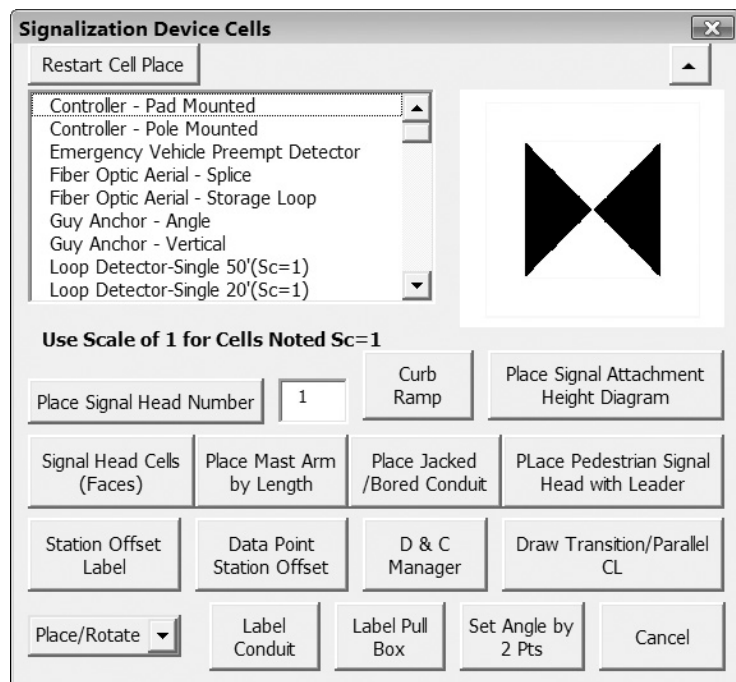
Step 2. Click on any cell description in the dialog list. The cell is made active and the **Place Cell & Rotate** tool is activated.



Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

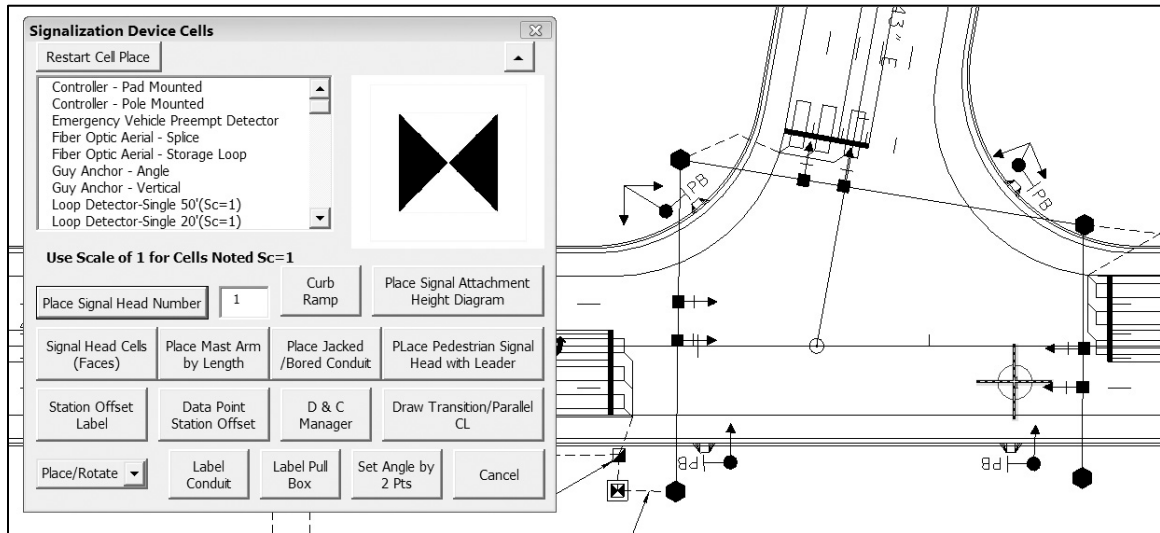


This tool can also be used in conjunction with Geopak's **DP Station/Offset** tool to place the cell at a specific station and offset along the horizontal alignment.

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 Roadway 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Signalization > Device Cells

or by using the keyin

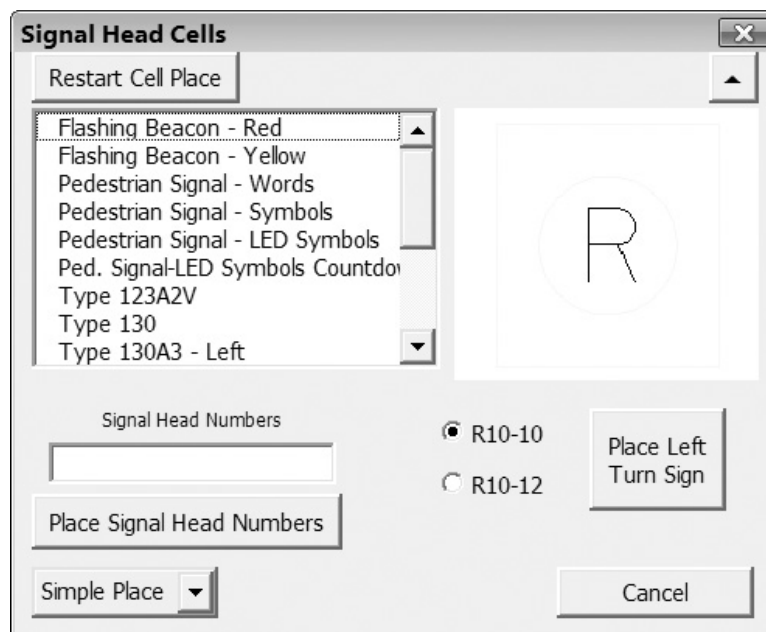
vba run [SignalHeadCells]SignalHeadcells.main

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.

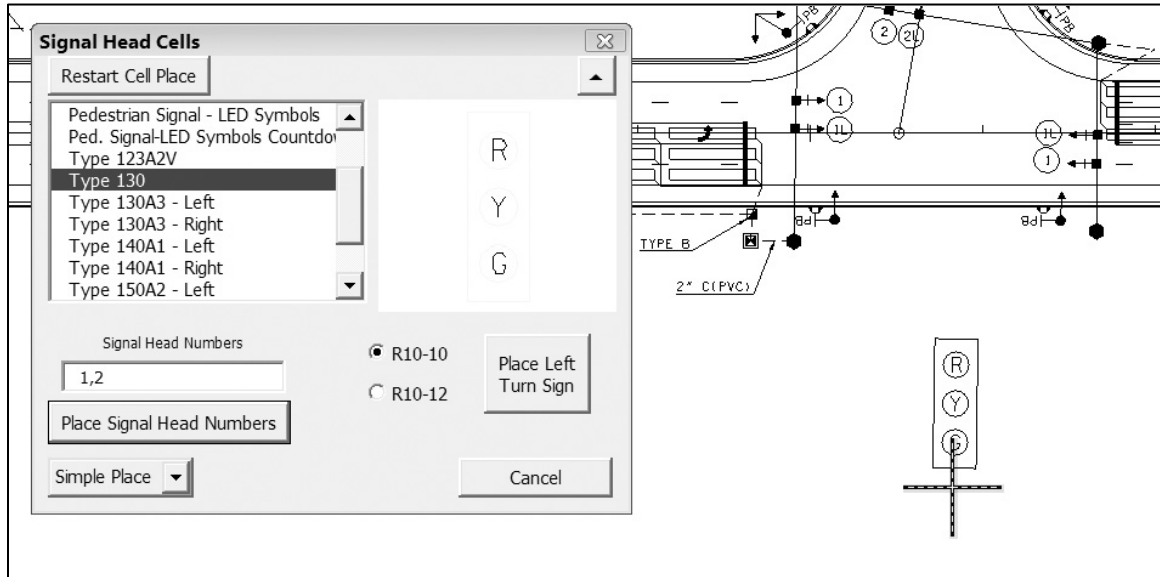
Step 3. Adjust scale if needed in the MicroStation Tool Settings dialog. Place cell as desired.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Signal Head Numbers:

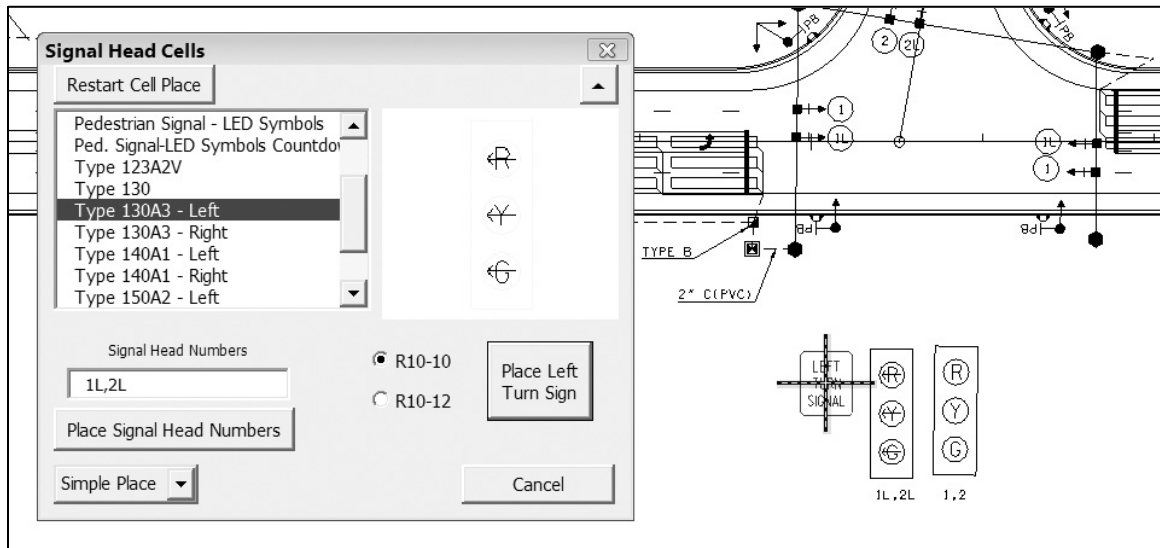
- Step 1.** In the **Signal Head Numbers** keyin field, enter the numbers for a given signal head and then click on the **Place Signal Head Numbers** command button.
- Step 2.** The user is prompted to **Identify Location** for text label placement.



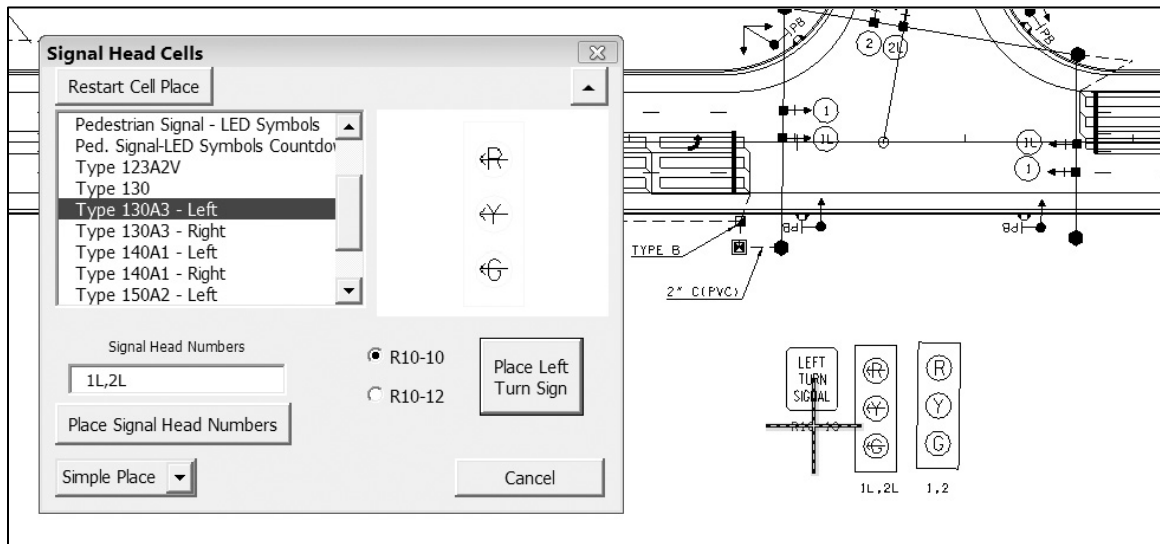
- Step 3.** A data point places the text label.

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 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:

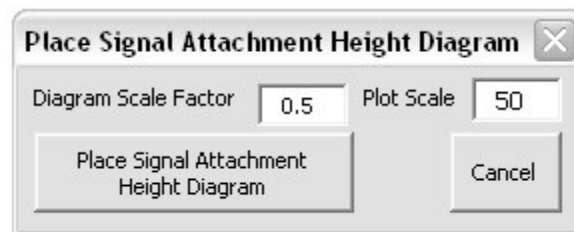
MicroStation Selection Set including support poles and span wire. Other intersection graphics may be in selection set as well but are ignored.

Span wires must be simple lines. They cannot be drawn in as line strings or as a shape.

This program **does not** currently support suspended box style of signalization design.

Usage:

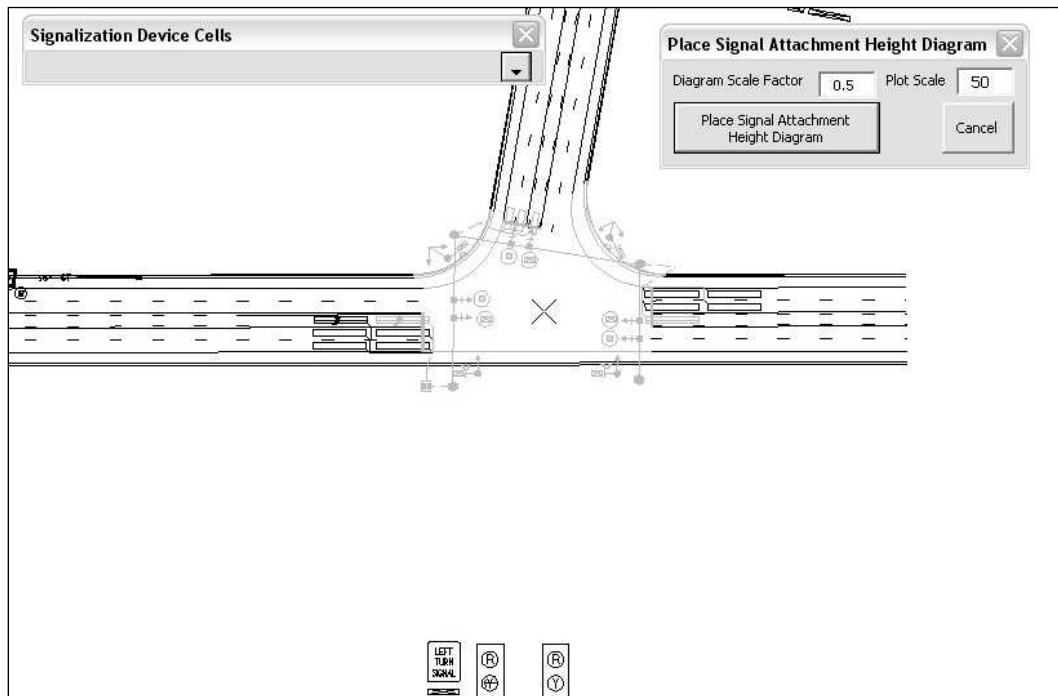
Step 1. In D&C manager activate **AH Diagram**. The **Place Signal Attachment Height Diagram** dialog appears.



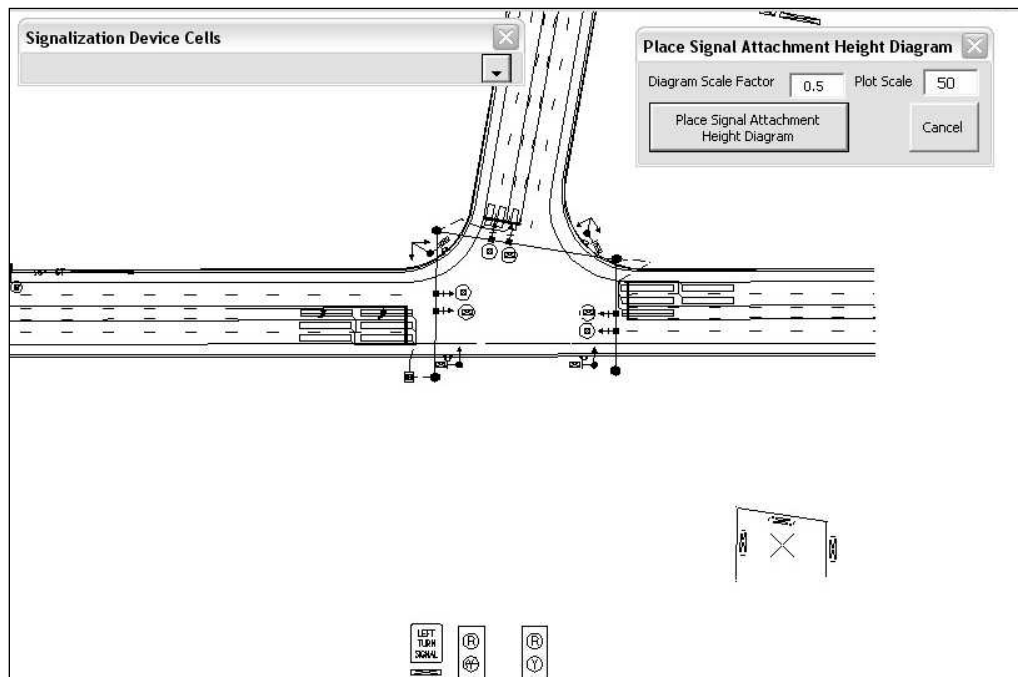
Step 2. Review **Diagram Scale Factor** and **Plot Scale** and adjust as needed.

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.

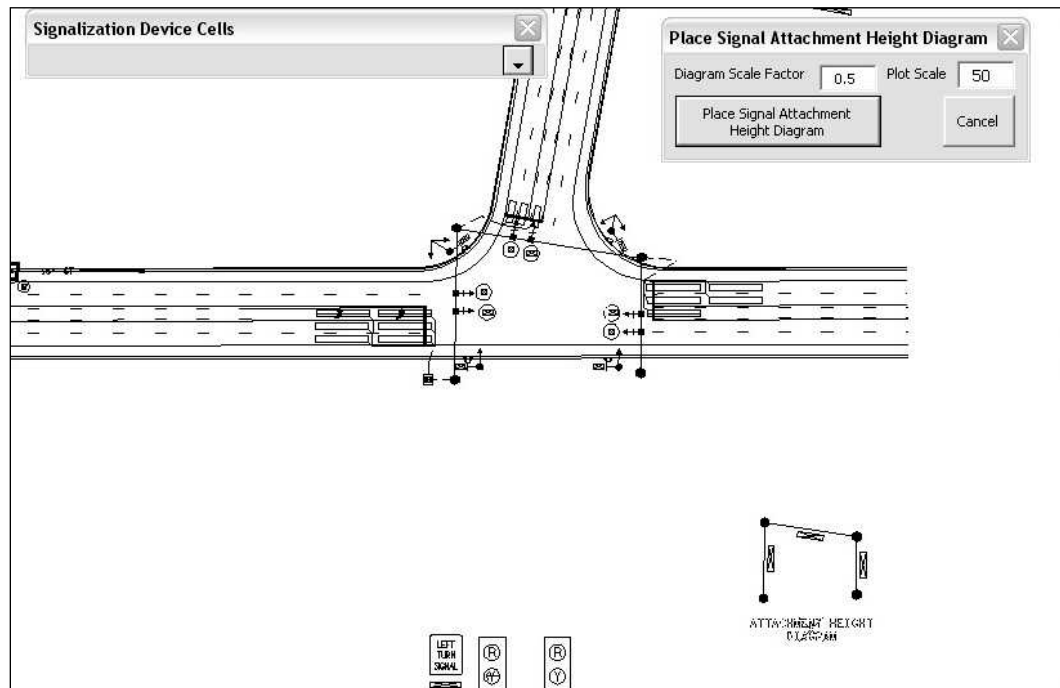


Step 5. The selection set is then read and all signal support poles and span wire graphics are picked out and then scaled as specified by the diagram scale factor. Signal heights are calculated and generated as text labels. Diagram graphics are dynamically shown and then the user is prompted to **Identify Diagram Location Point**.



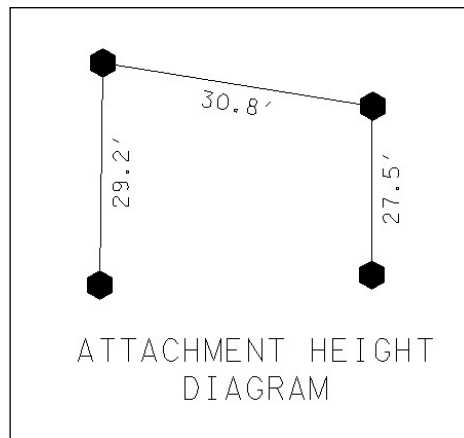
Data point when satisfied with the location

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

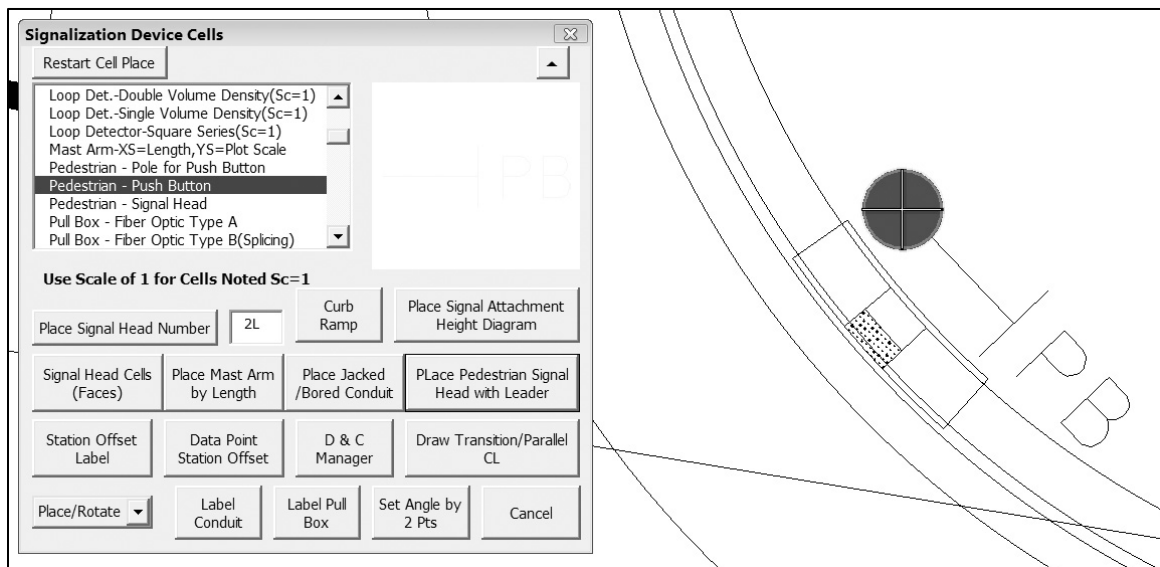
Special Requirements:

None

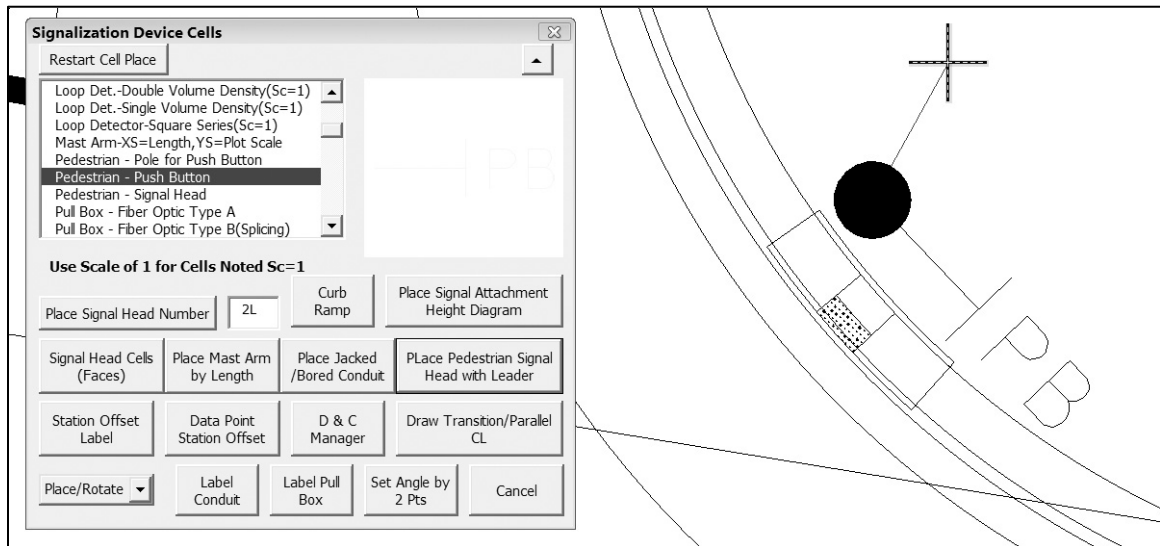
Usage:

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.

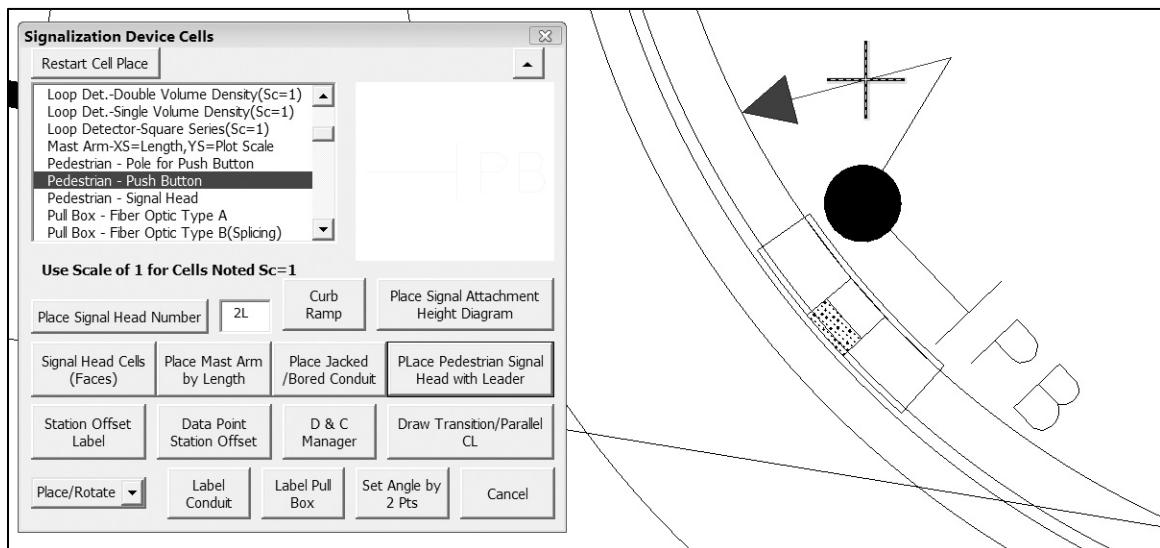


Step 3. Leader line is shown dynamically and the user is prompted to **Place end point**.



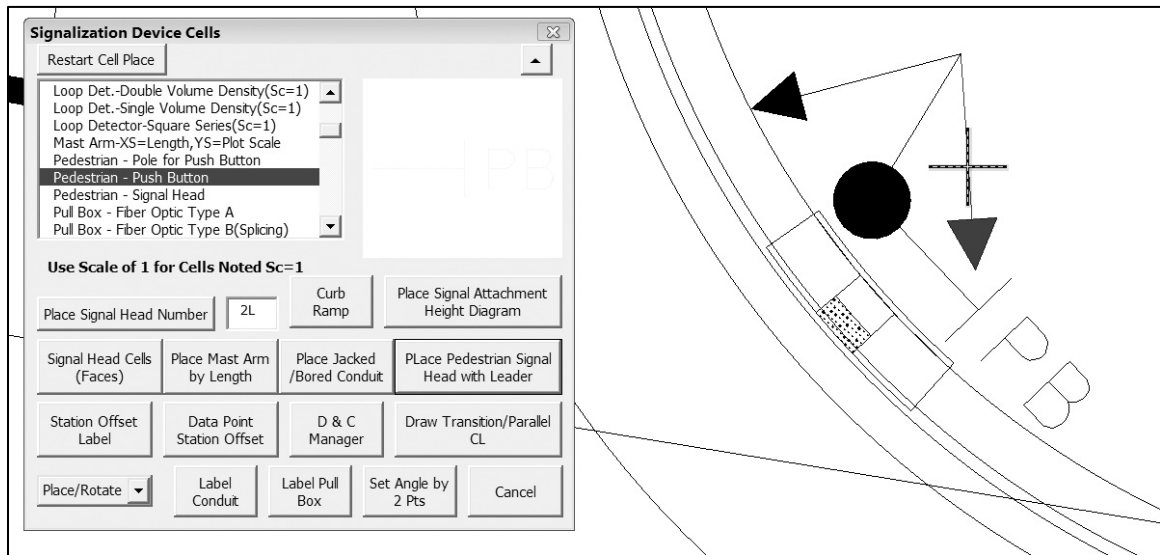
Data point when satisfied with the location.

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.

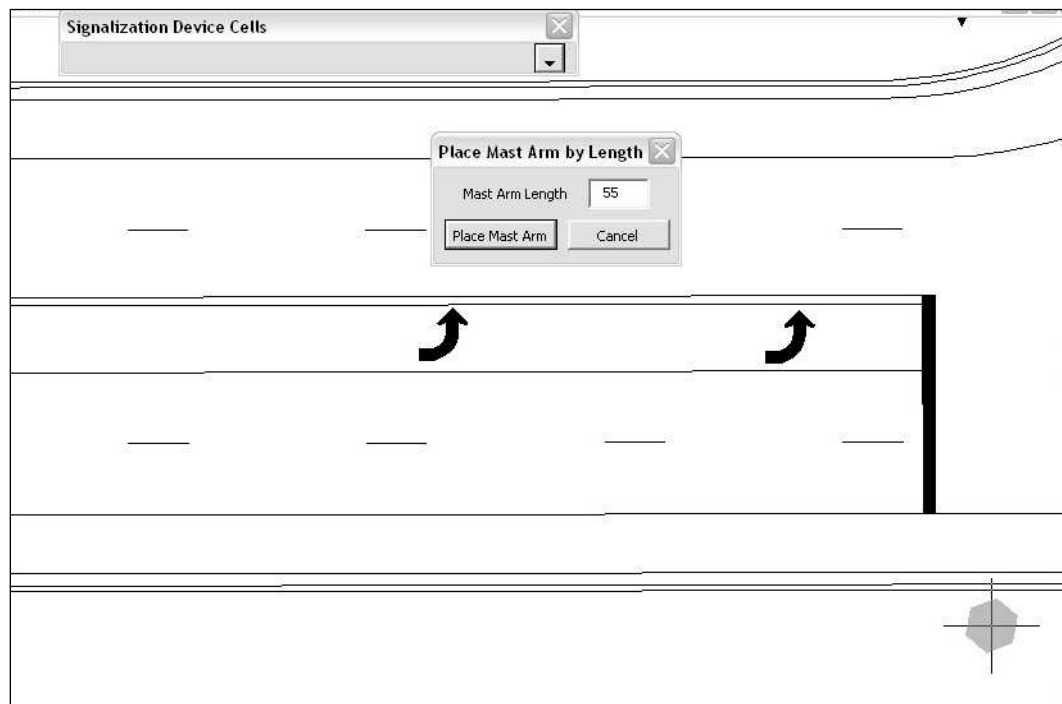
Usage:

Step 1. In D&C manager activate **MastArm Length**. The **Place Mast Arm by Length** dialog appears.

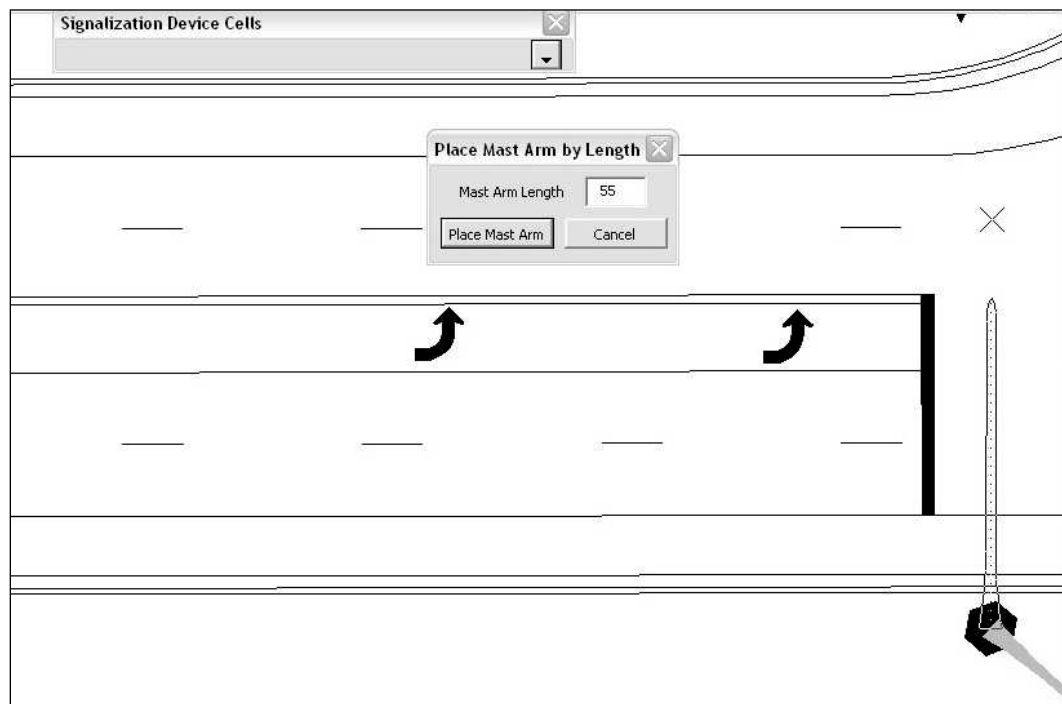


Step 2. Enter the desired mast arm length in the keyin field.

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.

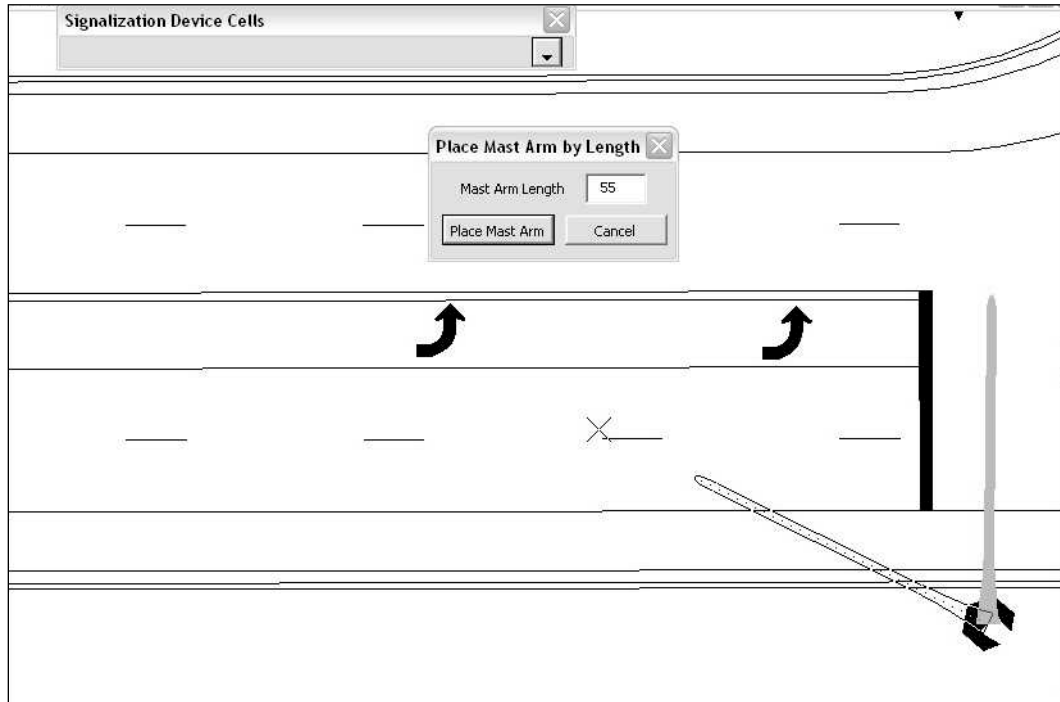


Step 4. The cell is placed at an angle of 0 and then automatically passed into MicroStation's Rotate Element command. The user is prompted to **Identify Point to set Angle**.



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

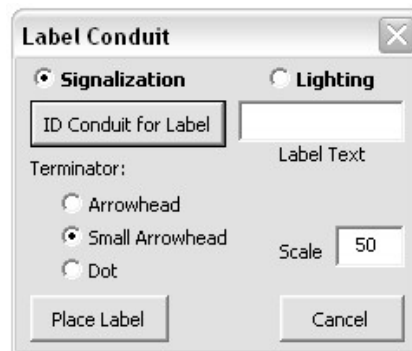
vba run [LabelConduit]IDandLabelSignalConduit.Main

Special Requirements:

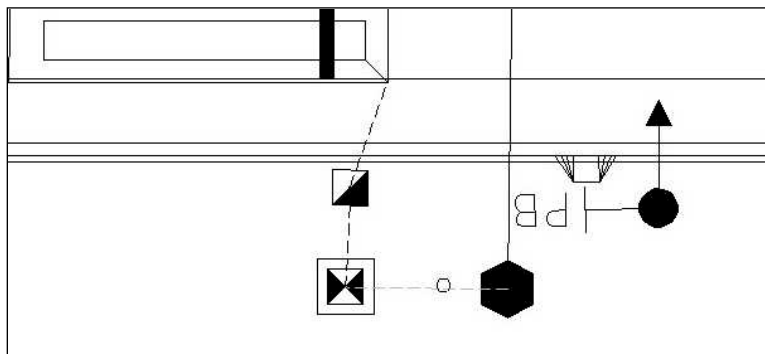
None.

Usage:

Step 1. In D&C manager activate **Label Conduit**. The **Label Conduit** dialog appears.

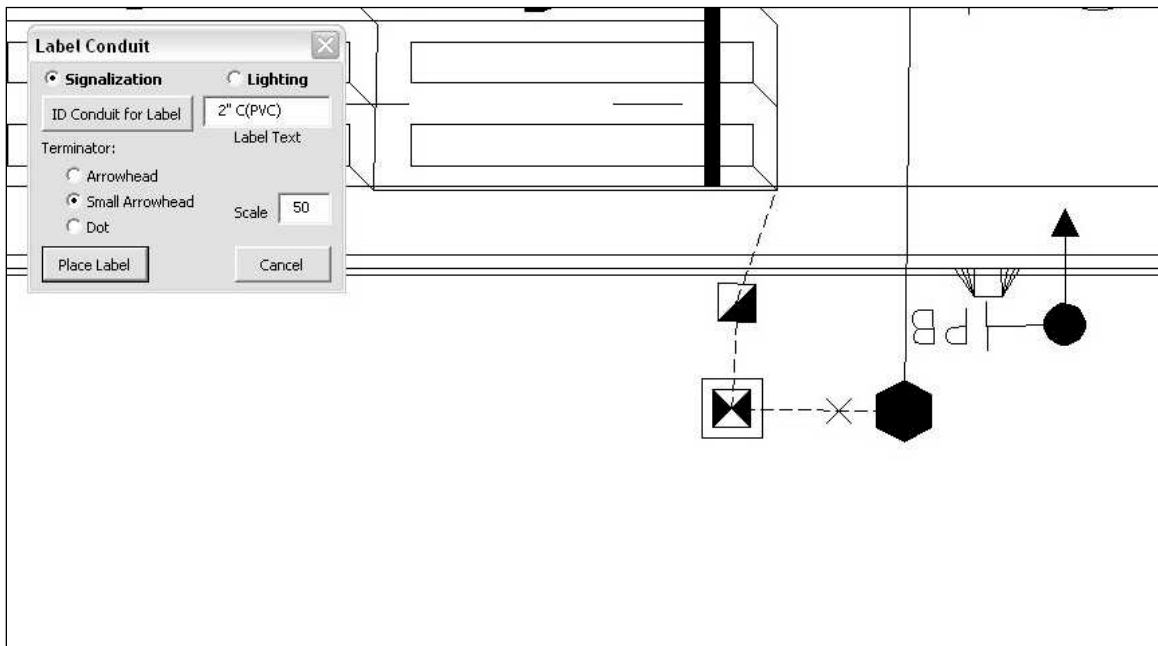


Step 2. The user must either enter the label text in its keyin field manually or by using the **ID Conduit for Label** command button to identify the conduit to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Conduit**. Data point on the conduit line and another data point to accept the element.

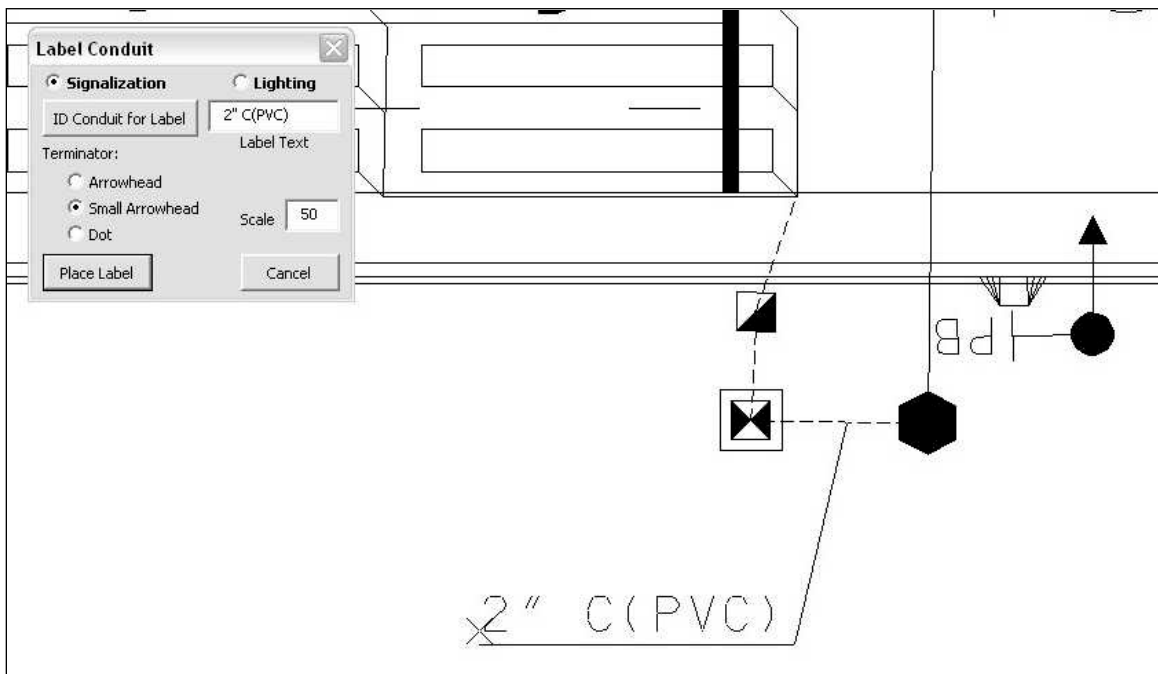


Conduit must be placed with the correct standard symbology for this function to recognize it. An error message is generated for invalid elements.

- 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.

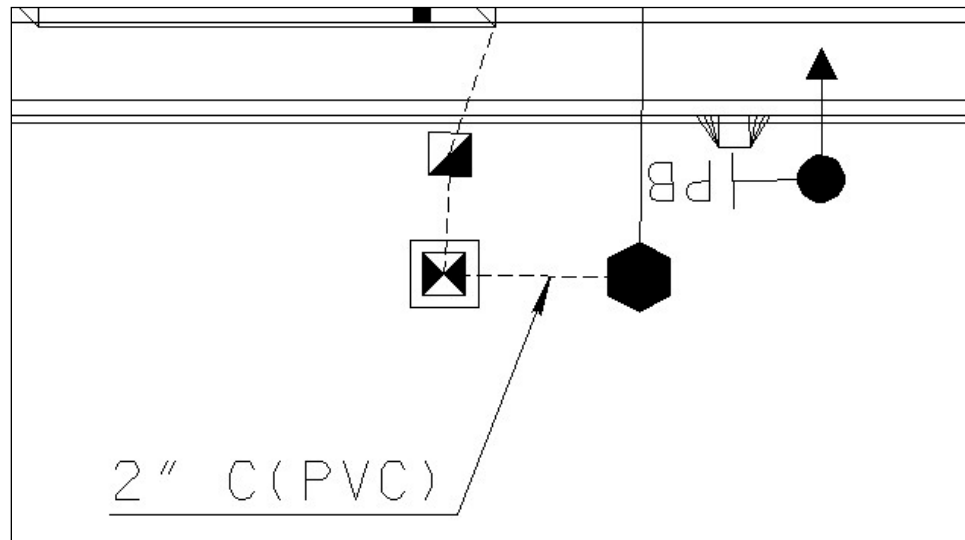


- Step 4.** Once this point is given, the label is shown dynamically and the user is prompted for a second point **to Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



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

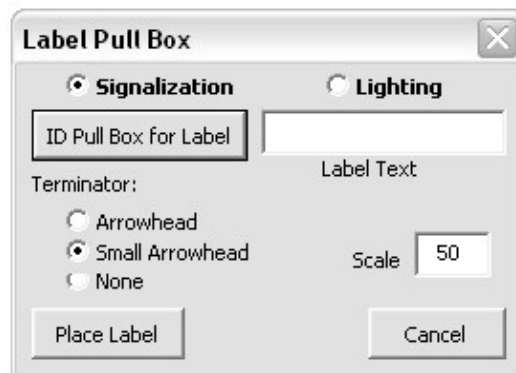
vba run [LabelPullBox]IDandLabelSignalPullBox.Main

Special Requirements:

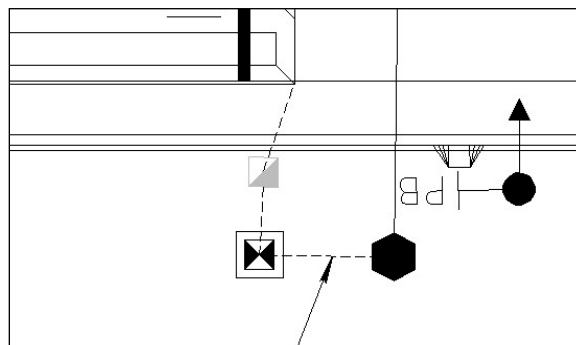
None.

Usage:

Step 1. In D&C manager activate **Label Pull Box**. The **Label Pull Box** dialog appears.

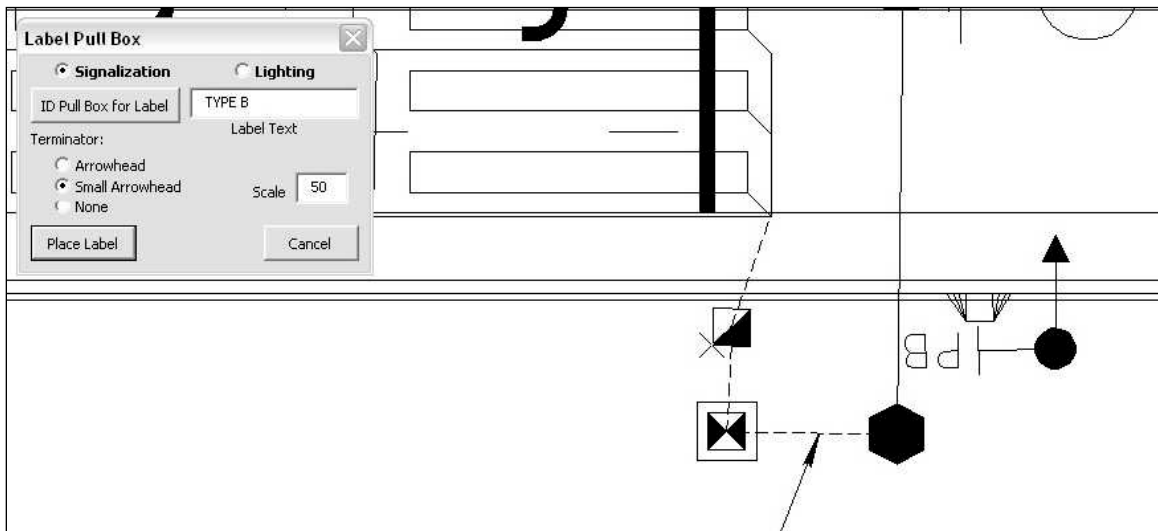


Step 2. The user must either enter the label text in its keyin field manually or by using the **ID Pull Box for Label** command button to identify the pull box to be labeled in order to fill in the keyin field automatically. Click on the ID command button and you are prompted to **Identify Pull Box**. Data point on the pull box cell and another data point to accept the element.

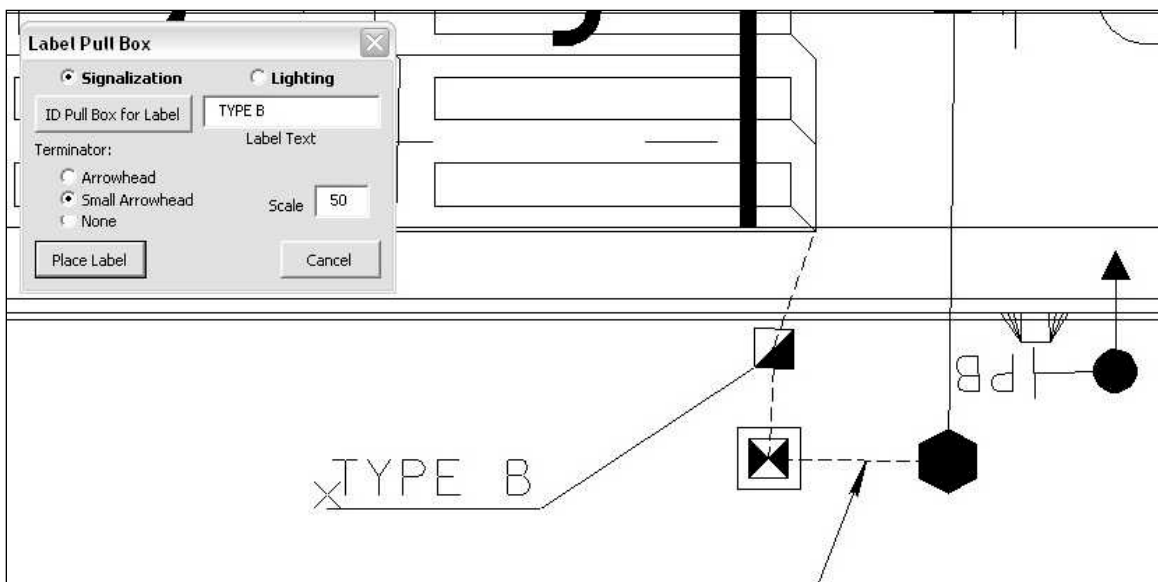


Pull box cells must be placed on the correct level for this function to recognize it. An error message is generated for invalid elements.

- 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.

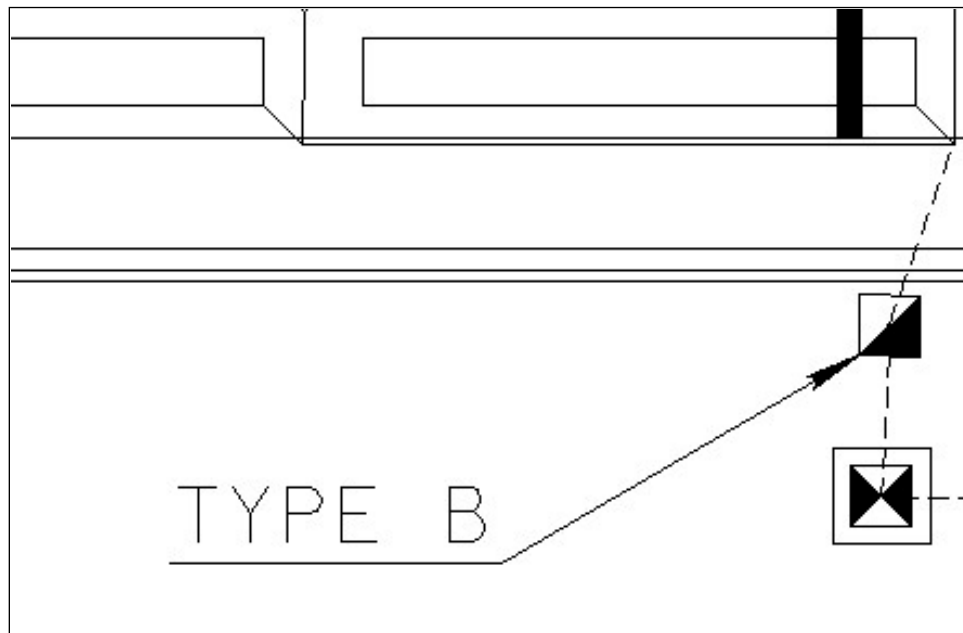


- Step 4.** Once this point is given, the label is shown dynamically and the user is prompted for a second point to **Position Label**. As the label is moved around the leader is adjusted to come from either end of the horizontal line in the label.



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

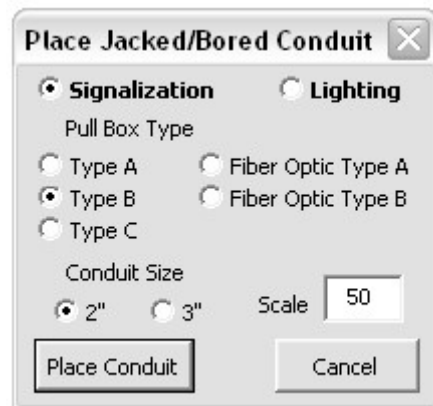
vba run [PlaceJackedBoredConduit]SignalJacked.Main

Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Place Jacked**. The **Place Jacked/Bored Conduit** dialog appears.

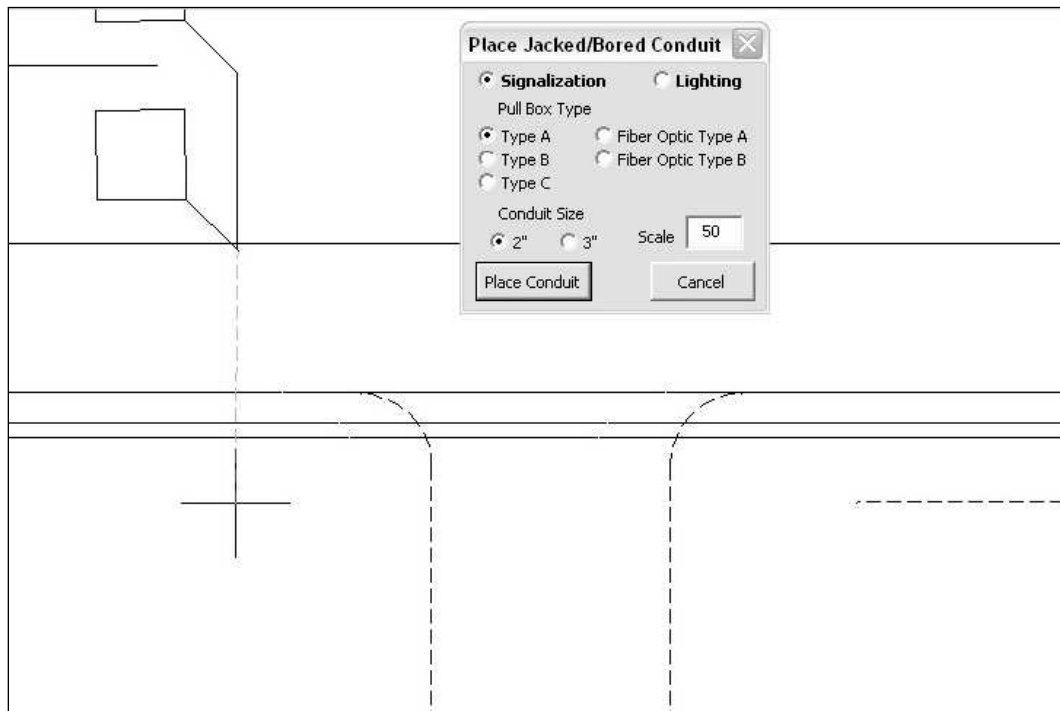


Step 2. Make the required settings.

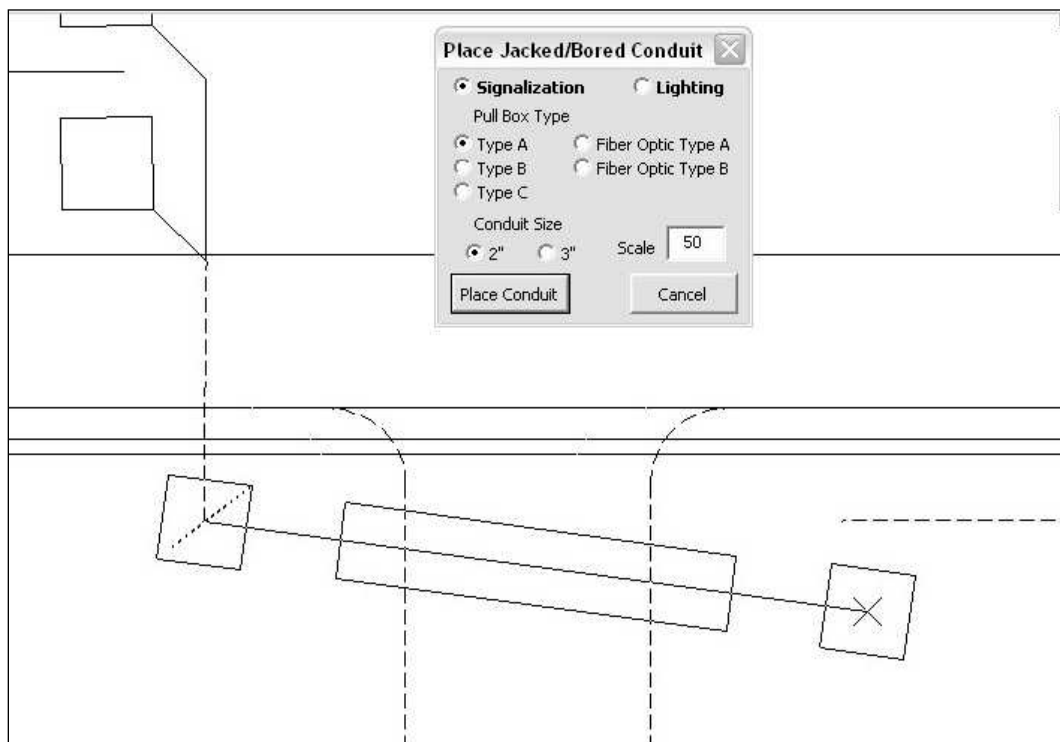
Then the user needs to choose the **Pull Box Type** to be placed at the ends. All are valid for Signalization application except for type C. Only pull box types A, B or C are valid for Lighting application.

Finally pick the **Conduit Size** and check the **Scale** value shown.

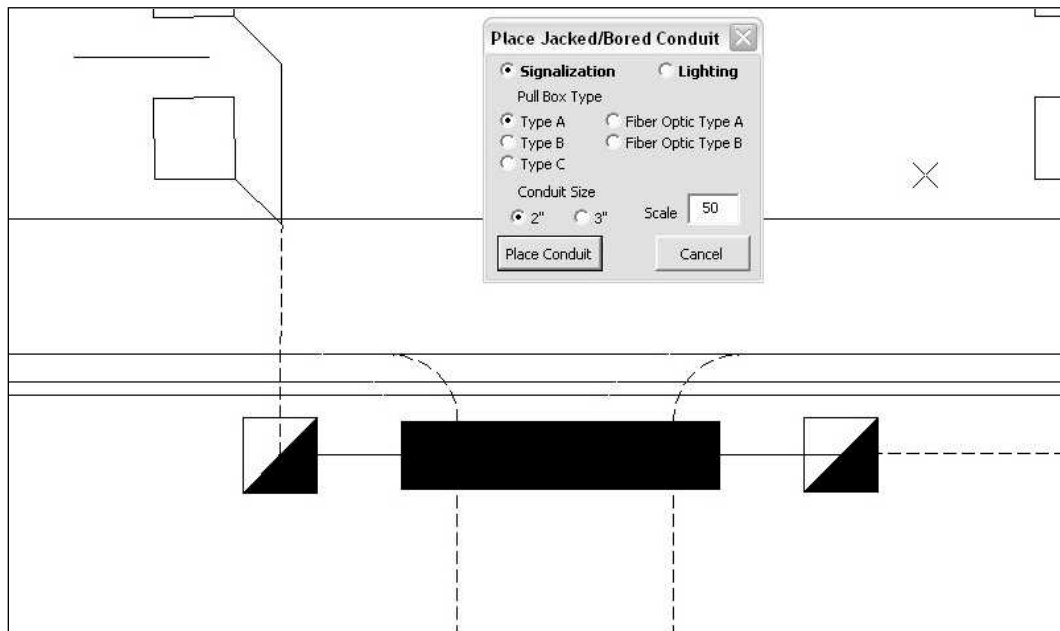
- Step 3.** Click on the **Place Conduit** command button. You are prompted to **Identify Pull Box Location on Left**. Data point on the left side of the roadway or other feature which conduit is to be jacked or bored under.



- 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 Roadway Design Division blank sign cells as well as cells used to set up new signs.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Signs > Blank Signs, Etc.

or by using the keyin

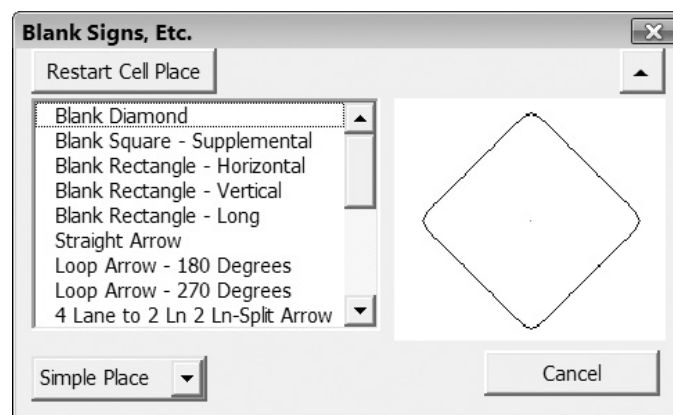
vba run [BlankSignCells]BlkSigncells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Construction Sign Cells

D&C location: Drafting Standards > Signs > Construction

MicroStation VBA Program: ConstructionSignCells.mvba

Description:

This program provides access to TDOT Roadway 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 types which are used.

As a permanent sign, you have a choice of either sign number text placed with an enclosing ellipse when sign schedule sheets are used or sign name and size. As a temporary sign, sign name and 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate, Place Along and Place Sign Face with.

A Scale field is provided to control the size of cells and text which are placed. Since English sign cells are used in metric files, the keyin field shows the desired Metric Plot Scale in metric files. 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 in Metric DGN files, 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

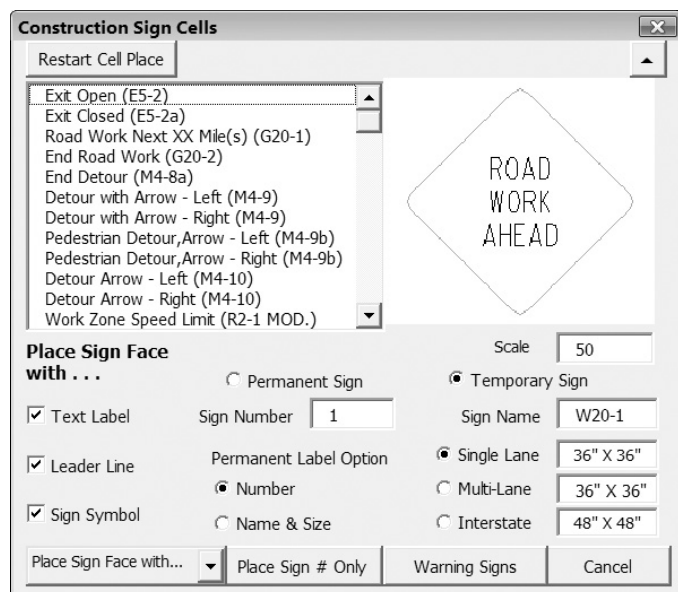
Special Requirements:

None.

Usage:

Step 1. In D&C manager activate **Construction**. The **Construction Sign Cells** dialog appears.

Step 2. Adjust the scale in the keyin field provided on the dialog as needed. The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed. By default this dialog is set to the option **Place Sign Face with ...**



The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Sign Face with....:

Step 1. Finalize dialog settings.

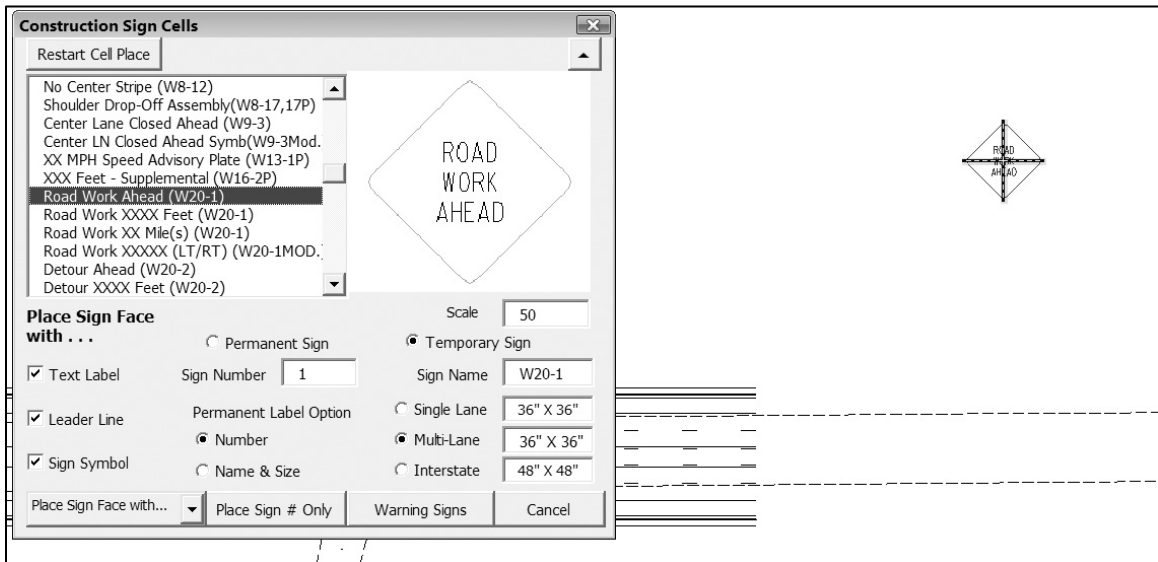
First set the **Permanent** or **Temporary** placement type.

Under the optional **Place Sign Face with ...** graphics list on the left side of the dialog, set the desired graphics to be placed with the sign face. All options are on by default. In this example we will place a temporary sign with all extra graphics.

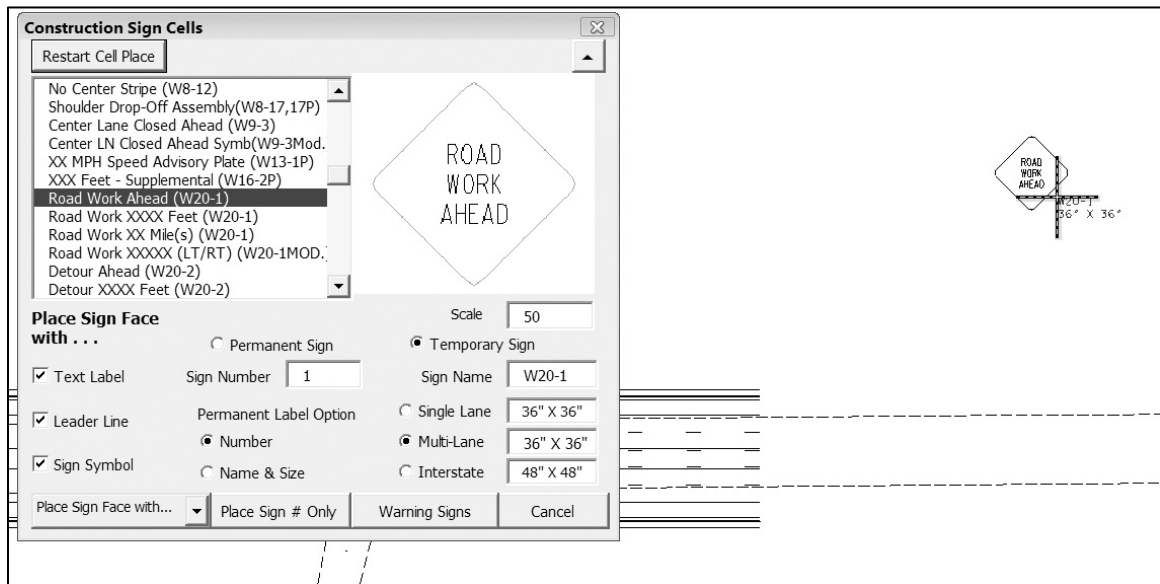
When placing temporary signs the text label includes the sign size. Click on the appropriate **roadway type** at the lower right of the dialog.

If needed, edit label text in the keyin fields.

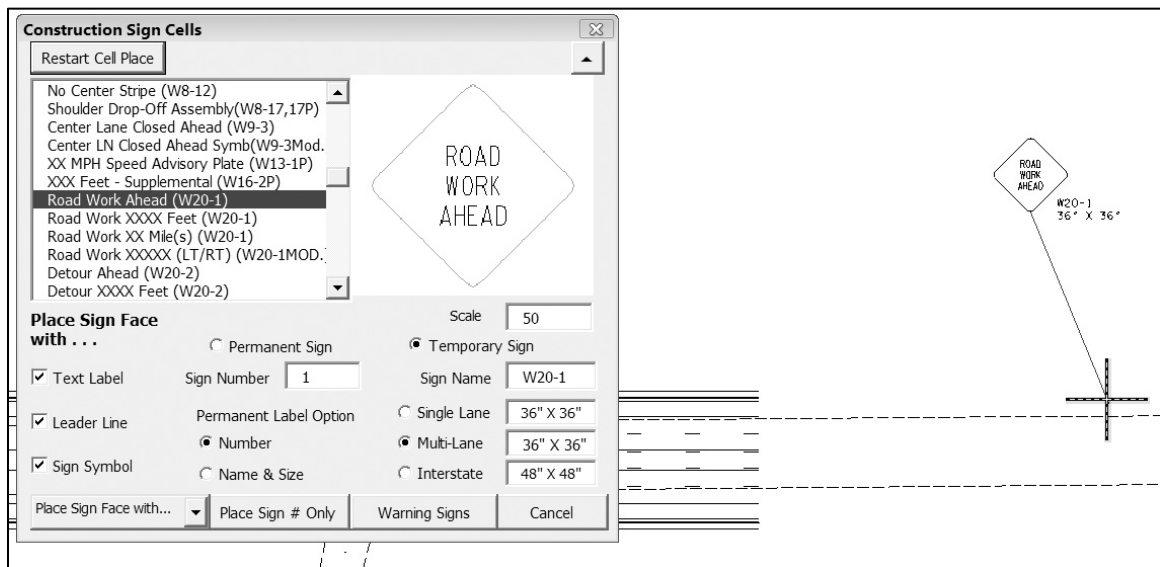
Step 2. Once required values and options are set, click on any cell description in the dialog list. The cell is made active and is displayed in the preview window. The user is prompted to **Identify Location** for the sign face.



- 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.

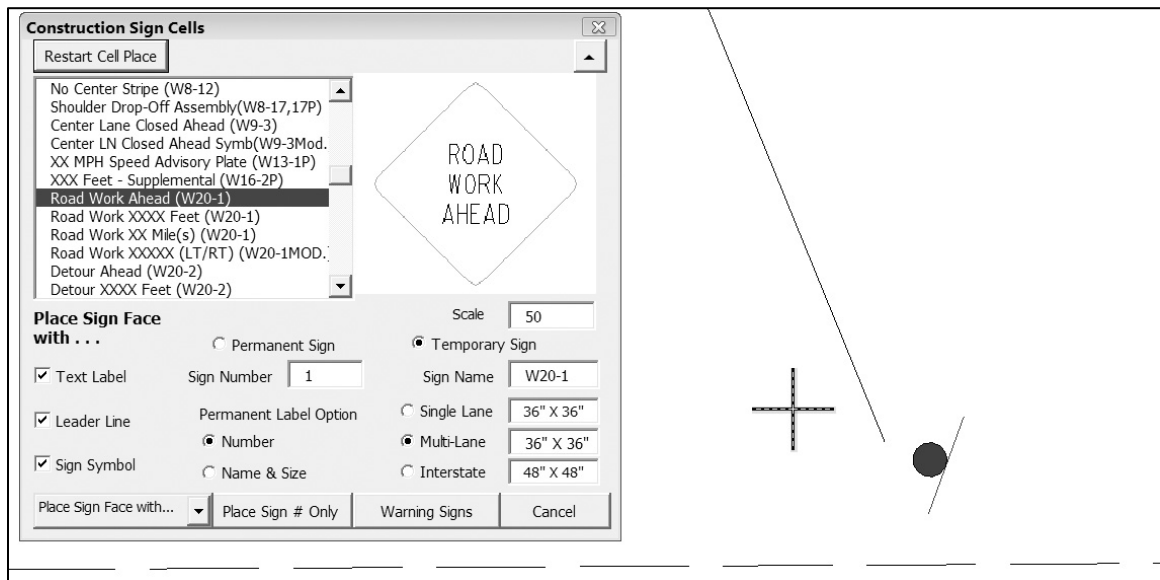


- Step 4.** The program then starts placement of the leader line with the initial prompt to **Place Begin Point**. After giving the begin point the user is prompted to **Place next point...Reset to End**. Continue entering additional points for the leader as needed up to a maximum of 4 vertices.

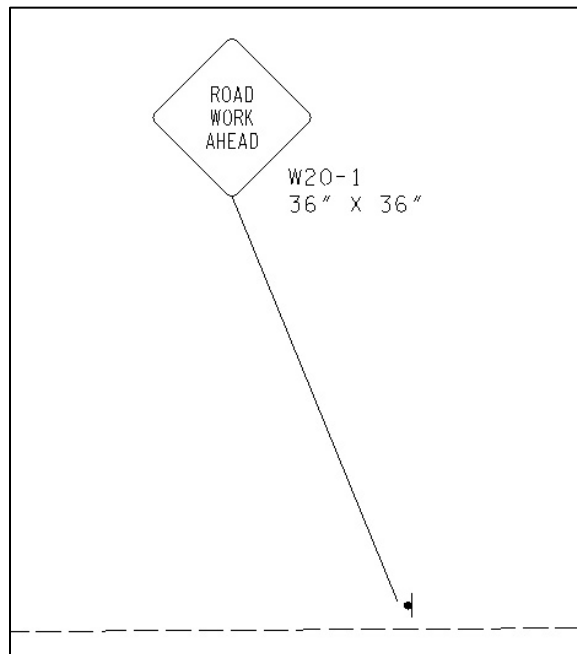


When leader line is completed, click the reset on your mouse to end the leader.

Step 6. Now we are ready to place the sign symbol cell. The program prompts to **Identify location**. Zoom in to the location for the sign. Data point at the location for the sign symbol. The cell goes into a dynamic rotation and a second data point sets the cell angle.



Geopak's **DP Station/Offset** tool can be used to place the sign symbol at a specific station and offset.



Sign Detail Cells

D&C location: Drafting Standards > Signs > Details

MicroStation VBA Program: SignDetailCells.mvba

Description:

This program provides access to TDOT Roadway Design Division sign detail cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Signs > Details

or by using the keyin

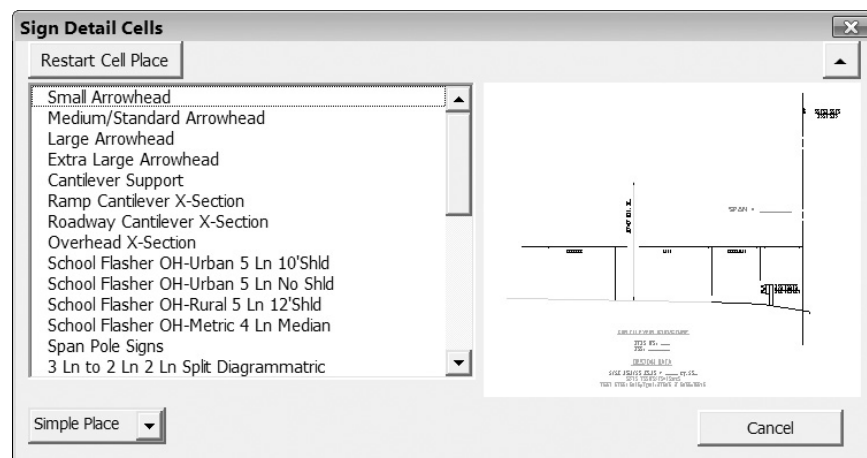
vba run [SignDetailCells]SGNDetailcells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Highway Route Sign Cells

D&C location: Drafting Standards > Signs > Highway Route

MicroStation VBA Program: HighwayRouteSignCells.mvba

Description:

This program provides access to TDOT Roadway 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 types which are used.

As a permanent sign, you have a choice of either sign number text placed with an enclosing ellipse when sign schedule sheets are used or sign name and size. As a temporary sign, sign name and 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate, Place Along and Place Sign Face with.

A Scale field is provided to control the size of cells and text which are placed. Since English sign cells are used in metric files, the keyin field shows the desired Metric Plot Scale in metric files. 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 in Metric DGN files, 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. Adjust the scale in the keyin field provided on the dialog as needed. The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed. By default this dialog is set to the option **Place Sign Face with ...**

Highway Route Sign Cells

Restart Cell Place

Secondary State Route-1 Digit (TN-6a)
Secondary State Route-2 Digits (TN-6a)
Secondary State Route-3 Digits (TN-6b)
Primary State Route-1 Digit (TN-6c)
Primary State Route-2 Digits (TN-6c)
Primary State Route-3 Digits (TN-6d)
US Highway - 2 Digits (M1-4)
US Highway - 3 Digits (M1-4)
Interstate - 2 Digits (M1-1)
Interstate - 3 Digits (M1-1)
Junction - Supplemental (M2-1)
North - Supplemental (M3-1)

Place Sign Face with ...

☒ Permanent Sign ☐ Temporary Sign

☒ Route Number 0 Sign Number 1 Sign Name TN-6A

☒ Text Label Permanent Label Option ☒ Single Lane 24" X 24"

☒ Leader Line ☒ Number ☐ Multi-Lane 24" X 24"

☒ Sign Symbol ☐ Name & Size ☐ Interstate 36" X 36"

Scale 50

Place Sign Face with... Place Sign # Only Cancel

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Sign Face with....:

Step 1. Finalize dialog settings.

First set the **Permanent** or **Temporary** placement type.

Under the optional **Place Sign Face with ...** graphics list on the left side of the dialog, set the desired graphics to be placed with the sign face. All options are on by default. In this example we will place a permanent sign with all extra graphics.

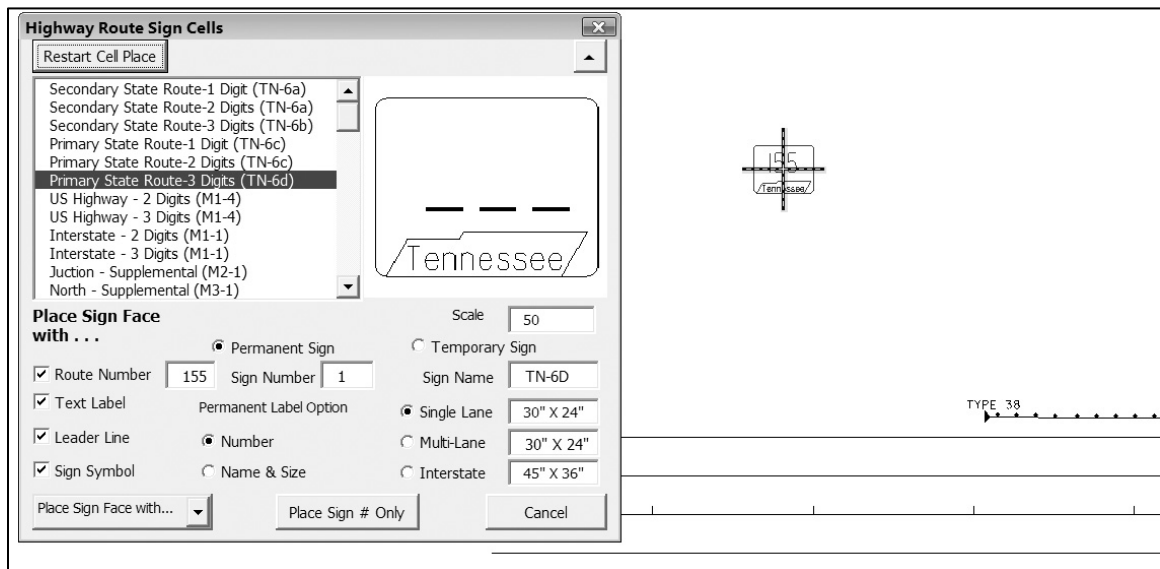
When placing highway route signs, an extra option to include the route number on the sign face is given. If this option is selected, enter the **Route Number** in its keyin field

When placing permanent signs with sign numbers, be sure and set the number in the keyin field provided.

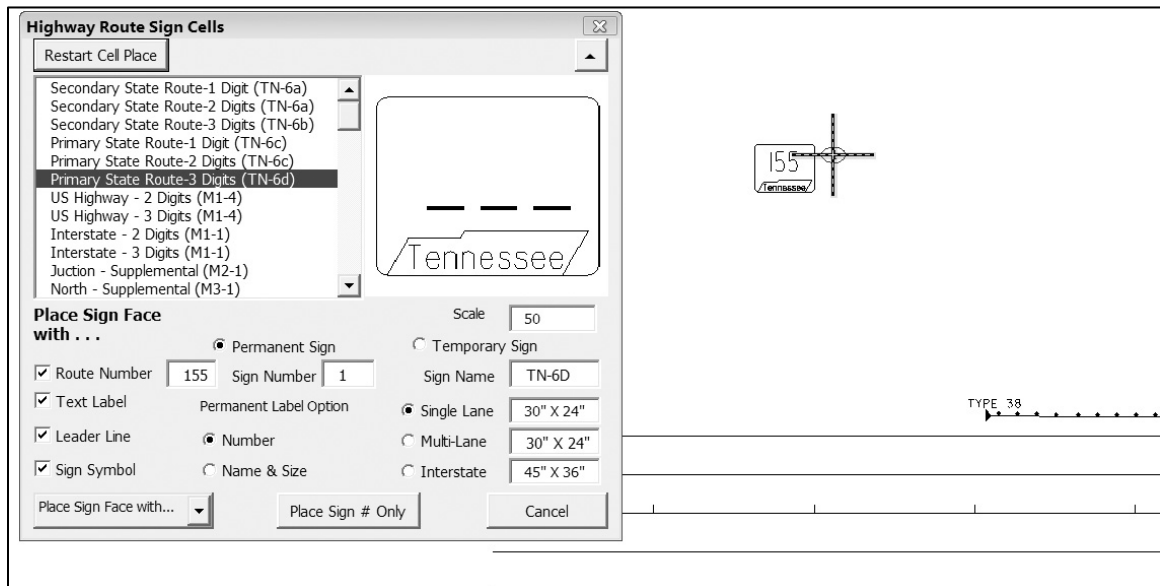
If no sign schedule sheet is to be provided with the plans you will need to click on the option for **Name & Size** under **Permanent Label Option**. Click on the appropriate **roadway type** at the lower right of the dialog to control the sign size that is specified.

If needed, edit label text in the keyin fields.

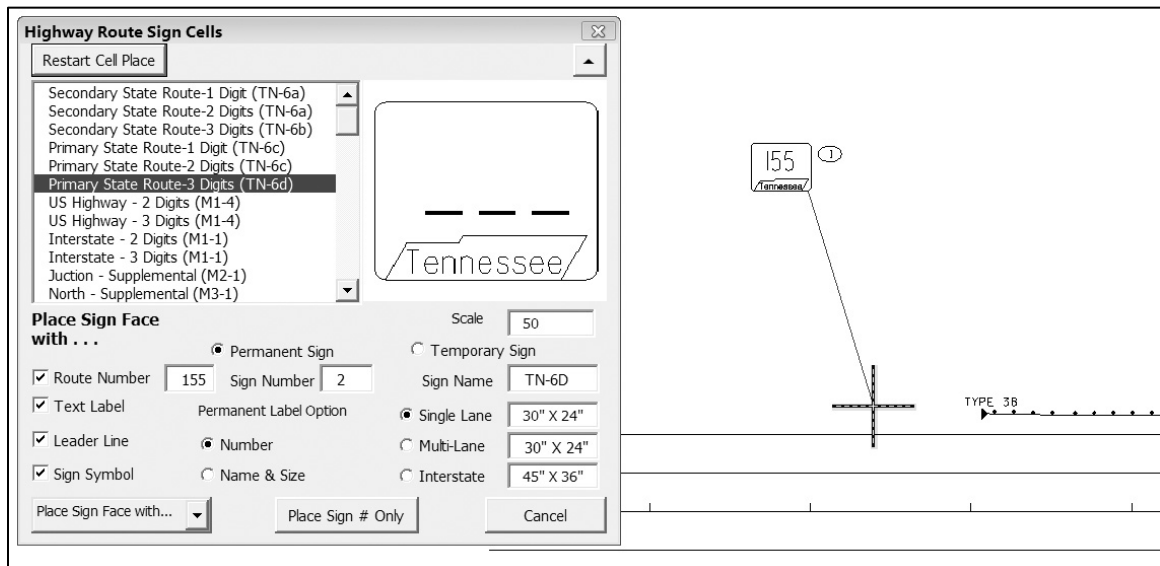
Step 2. Once required values and options are set click on the **Place Sign Face with.** command button. The user is prompted to **Identify Location** for sign face.



Step 3. After placing the sign face the sign number annotation is activated and the user is prompted to **Identify Location** for text label placement.

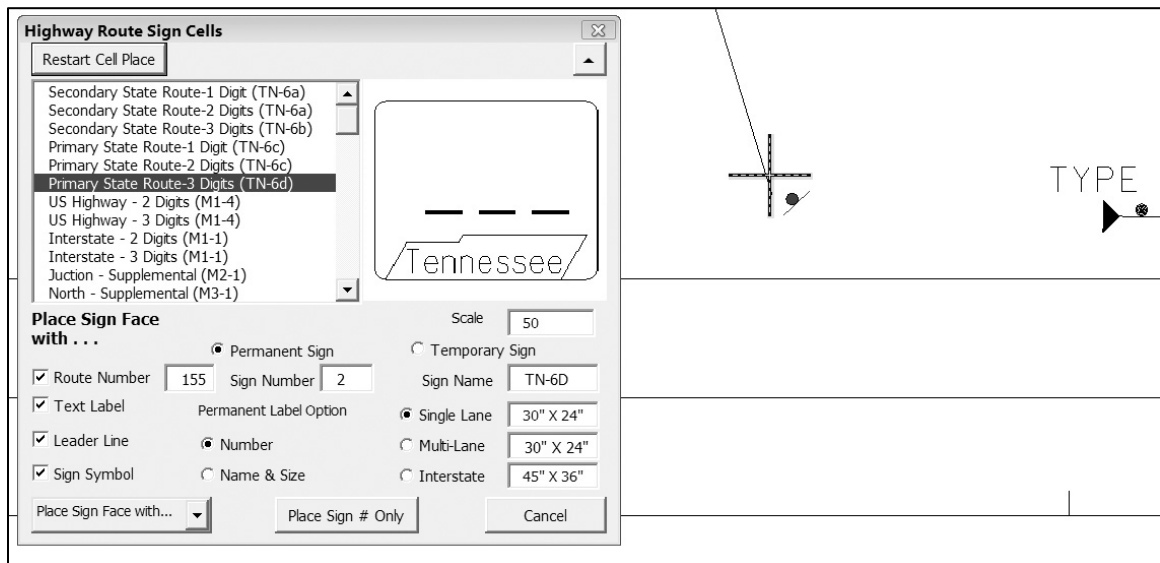


Step 4. The program then starts placement of the leader line with the initial prompt to **Place Begin Point**. After giving the begin point the user is prompted to **Place next point...Reset to End**. Continue entering additional points for the leader as needed up to a maximum of 4 vertices.



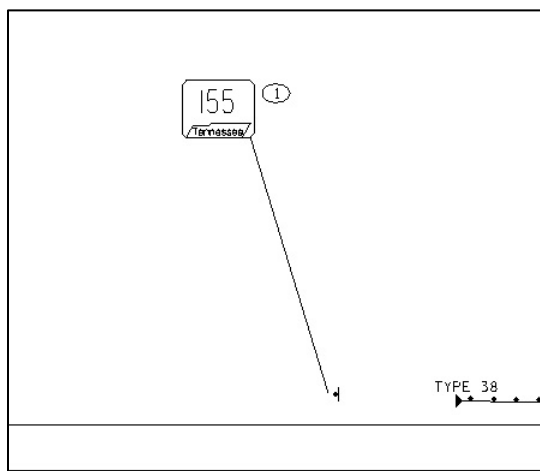
When leader line is completed, click the reset on your mouse to end the leader.

Step 6. Now we are ready to place the sign symbol cell. The program prompts to **Identify location**. Zoom in to the location for the sign. Data point at the location for the sign symbol. The cell goes into a dynamic rotation and a second data point sets the cell angle.

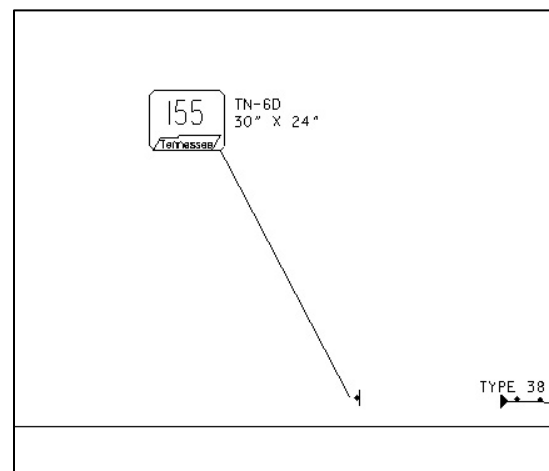


Geopak's **DP Station/Offset** tool can be used to place the sign symbol at a specific station and offset.

Label with Sign Number



Label with Name & Size

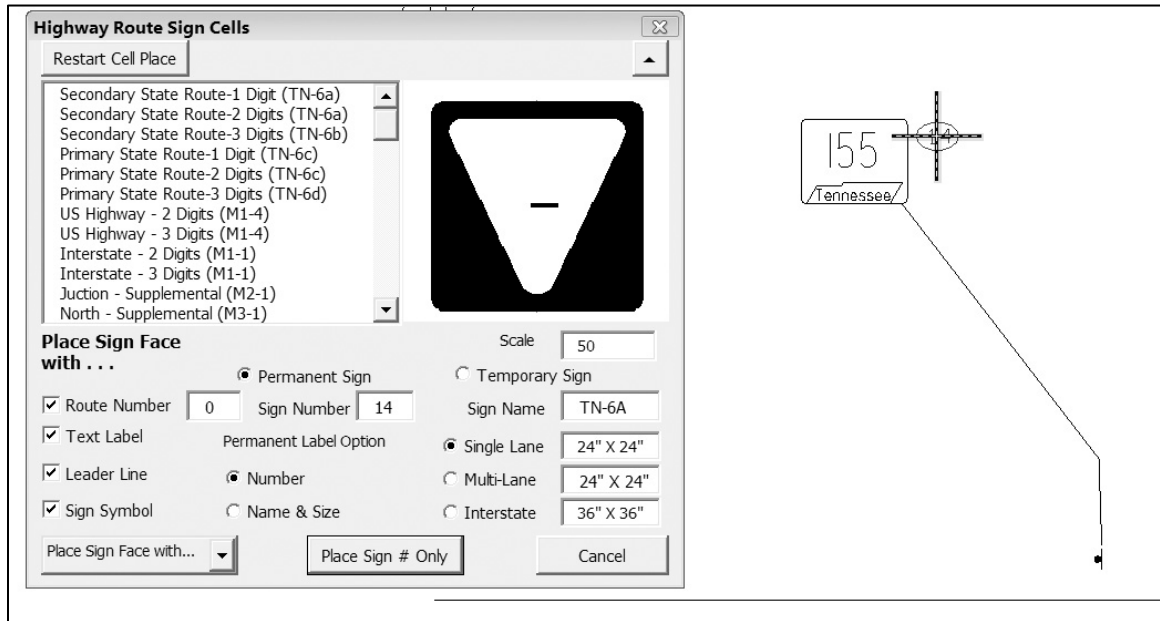


Place Sign # Only:

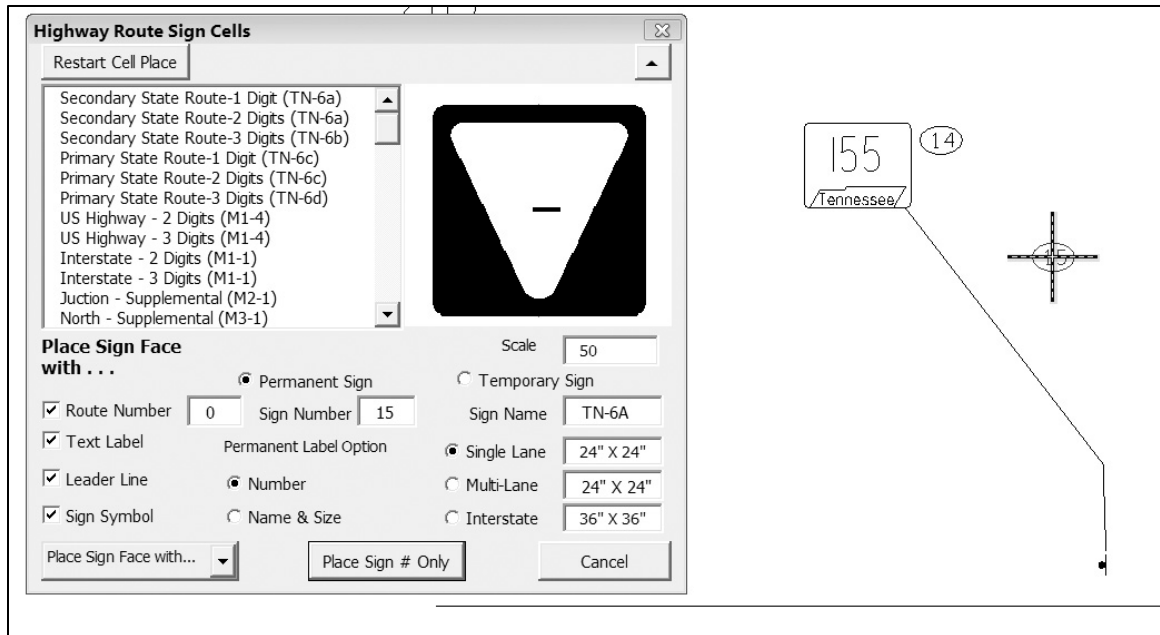
If it is necessary to replace the sign number on a permanent sign or to place it at after the sign face was first placed then use the Place Sign # Only command.

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 Roadway 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 types which are used.

As a permanent sign, you have a choice of either sign number text placed with an enclosing ellipse when sign schedule sheets are used or sign name and size. As a temporary sign, sign name and 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate, Place Along and Place Sign Face with.

A Scale field is provided to control the size of cells and text which are placed. Since English sign cells are used in metric files, the keyin field shows the desired Metric Plot Scale in metric files. 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 in Metric DGN files, 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:

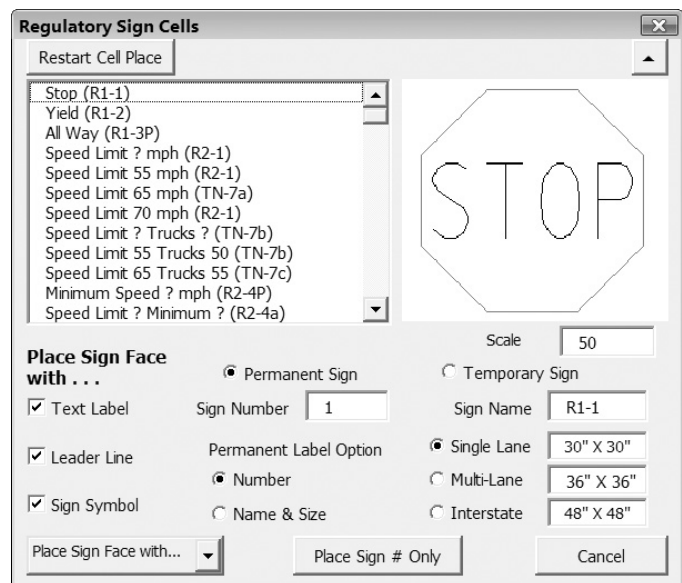
None.

Usage:

Step 1. In D&C manager activate **Regulatory**. The **Regulatory Sign Cells** dialog appears.

Step 2. Adjust the scale in the keyin field provided on the dialog as needed.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed. By default this dialog is set to the option **Place Sign Face with ...**

The image shows a software dialog box titled "Regulatory Sign Cells". It has a list of sign types on the left, including "Stop (R1-1)", "Yield (R1-2)", "All Way (R1-3P)", and various speed limit signs. To the right of the list is a preview of a stop sign with the word "STOP" in the center. Below the list and preview are several controls: a "Restart Cell Place" button, a "Scale" field set to 50, and radio buttons for "Permanent Sign" (selected) and "Temporary Sign". Under "Permanent Sign", there are checkboxes for "Text Label", "Leader Line", and "Sign Symbol", along with fields for "Sign Number" (set to 1) and "Sign Name" (set to "R1-1"). There are also radio buttons for "Single Lane", "Multi-Lane", and "Interstate", each with a corresponding size field (e.g., "30\" X 30\"", "36\" X 36\"", "48\" X 48\""). At the bottom, there is a dropdown menu labeled "Place Sign Face with...", a "Place Sign # Only" button, and a "Cancel" button.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Sign Face with... & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements including the Place Sign # Only tool.

School Sign Cells

D&C location: Drafting Standards > Signs > Schools

MicroStation VBA Program: SchoolSignCells.mvba

Description:

This program provides access to TDOT Roadway 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 types which are used.

As a permanent sign, you have a choice of either sign number text placed with an enclosing ellipse when sign schedule sheets are used or sign name and size. As a temporary sign, sign name and 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate, Place Along and Place Sign Face with.

A Scale field is provided to control the size of cells and text which are placed. Since English sign cells are used in metric files, the keyin field shows the desired Metric Plot Scale in metric files. 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 in Metric DGN files, 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. Adjust the scale in the keyin field provided on the dialog as needed.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed. By default this dialog is set to the option **Place Sign Face with ...**

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Sign Face with... & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements including the Place Sign # Only tool.

Tennessee Sign Cells

D&C location: Drafting Standards > Signs > Tennessee

MicroStation VBA Program: TennesseeSignCells.mvba

Description:

This program provides access to TDOT Roadway 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 types which are used.

As a permanent sign, you have a choice of either sign number text placed with an enclosing ellipse when sign schedule sheets are used or sign name and size. As a temporary sign, sign name and 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate, Place Along and Place Sign Face with.

A Scale field is provided to control the size of cells and text which are placed. Since English sign cells are used in metric files, the keyin field shows the desired Metric Plot Scale in metric files. 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 in Metric DGN files, 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. Adjust the scale in the keyin field provided on the dialog as needed.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed. By default this dialog is set to the option **Place Sign Face with ...**

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Sign Face with... & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements including the Place Sign # Only tool.

Warning Sign Cells

D&C location: Drafting Standards > Signs > Warning

MicroStation VBA Program: WarningSignCells.mvba

Description:

This program provides access to TDOT Roadway 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 types which are used.

As a permanent sign, you have a choice of either sign number text placed with an enclosing ellipse when sign schedule sheets are used or sign name and size. As a temporary sign, sign name and 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate, Place Along and Place Sign Face with.

A Scale field is provided to control the size of cells and text which are placed. Since English sign cells are used in metric files, the keyin field shows the desired Metric Plot Scale in metric files. 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 in Metric DGN files, 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:

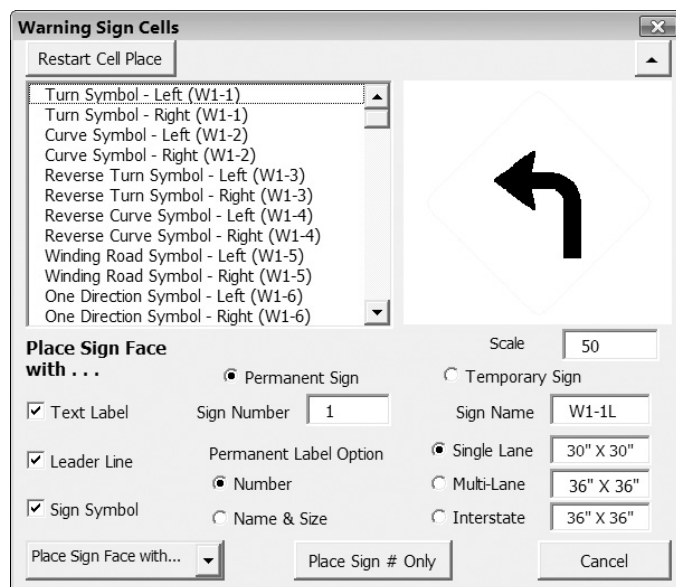
None.

Usage:

Step 1. In D&C manager activate **Warning**. The **Warning Sign Cells** dialog appears.

Step 2. Adjust the scale in the keyin field provided on the dialog as needed.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed. By default this dialog is set to the option **Place Sign Face with ...**



The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

Place Sign Face with... & Place Sign # Only:

See **Construction Sign Cells** for temporary sign placements and **Highway Route Sign Cells** for permanent sign placements including the Place Sign # Only tool.

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 Roadway Design Division traffic control device cells.

A command button is provided to access the vba program 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Traffic Control > Device Cells

or by using the keyin

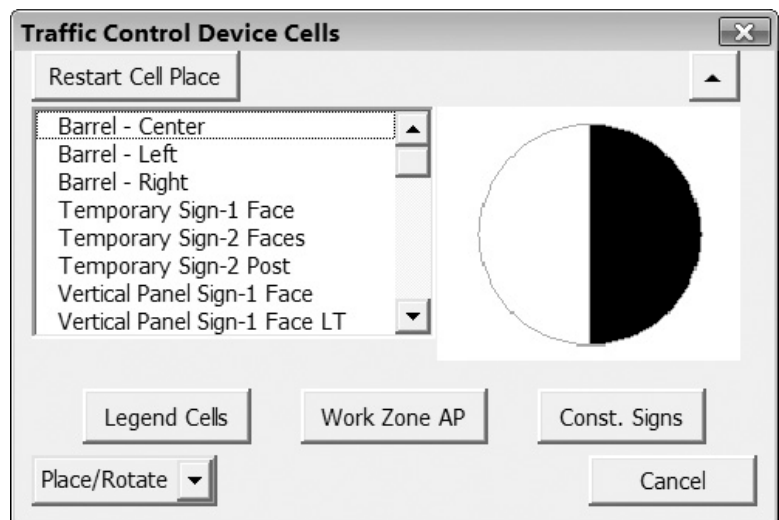
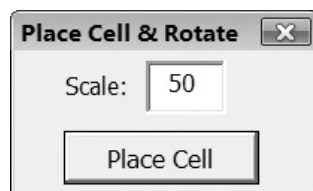
vba run [TrafficControlCells]TrafficCntrlcells.main

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 the **Place Cell & Rotate** tool is activated.



- Step 3.** Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

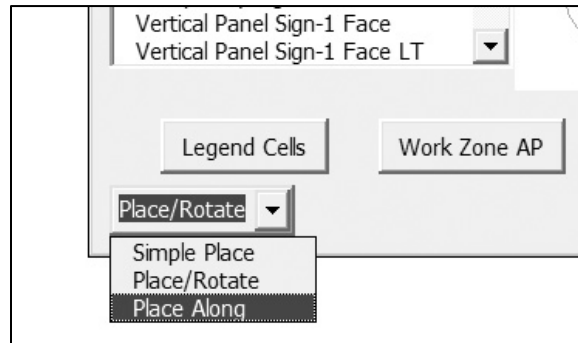
The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

Place Along:

In cases where you wish to place cells along an element at a specific spacing you can use the Place Along Cell Placement Type as described below.

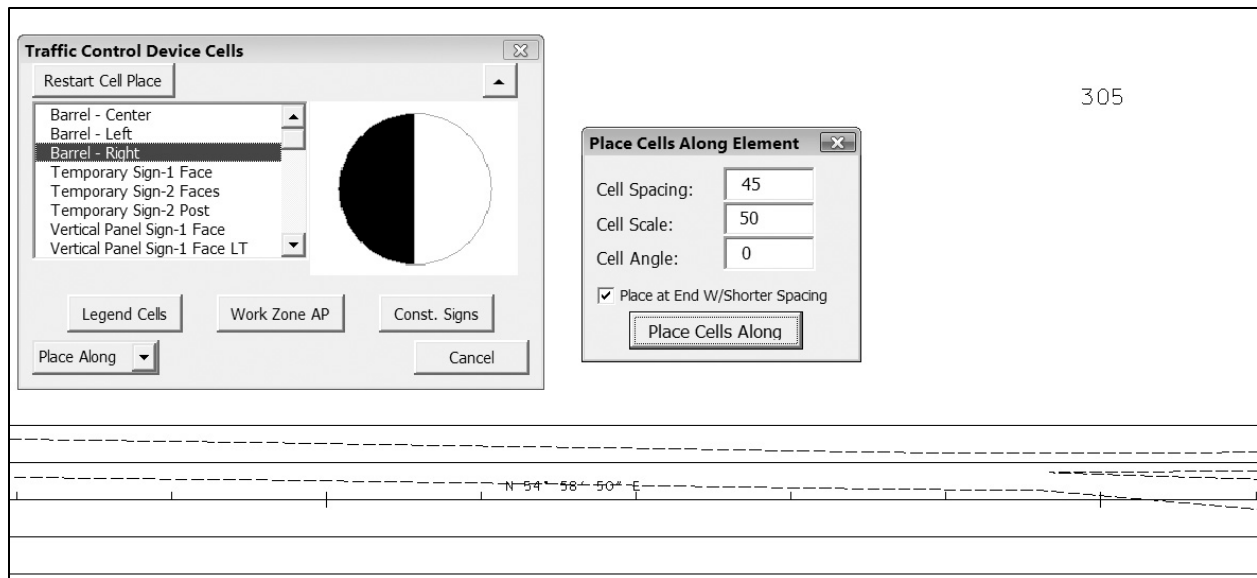
Step 1. First set the Cell Placement Type option at the lower left of the dialog to **Place Along**.



Step 2. Select the cell you wish to place and the **Place Cells Along Element** dialog is opened.

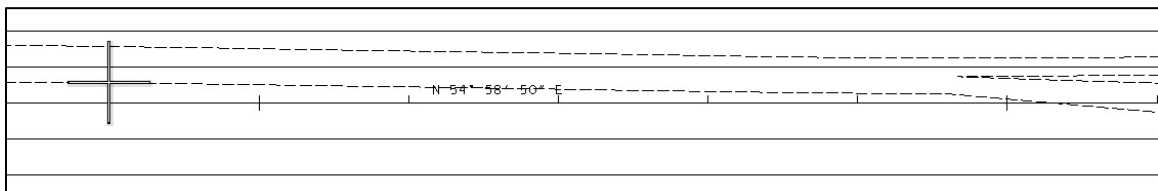
Adjust the settings for **Cell Spacing**, **Scale** and **Angle** as desired.

The **Place at End W/Shorter Spacing** option should be clicked on if you want a cell placed at the end regardless of the final distance.



Step 2. Click the **Place Cells Along** command button to start the tool.

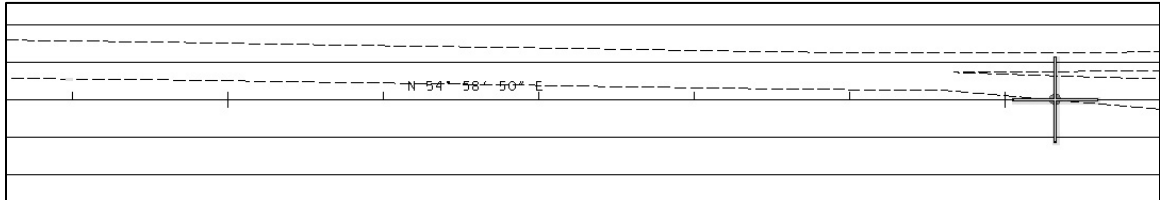
You are first prompted to **Identify Element at beginning location**. Data point on the element to place cells along at the location where you wish to start the cells.



Step 3. Then you are prompted to **Accept/Reject ... Identify direction\end.**

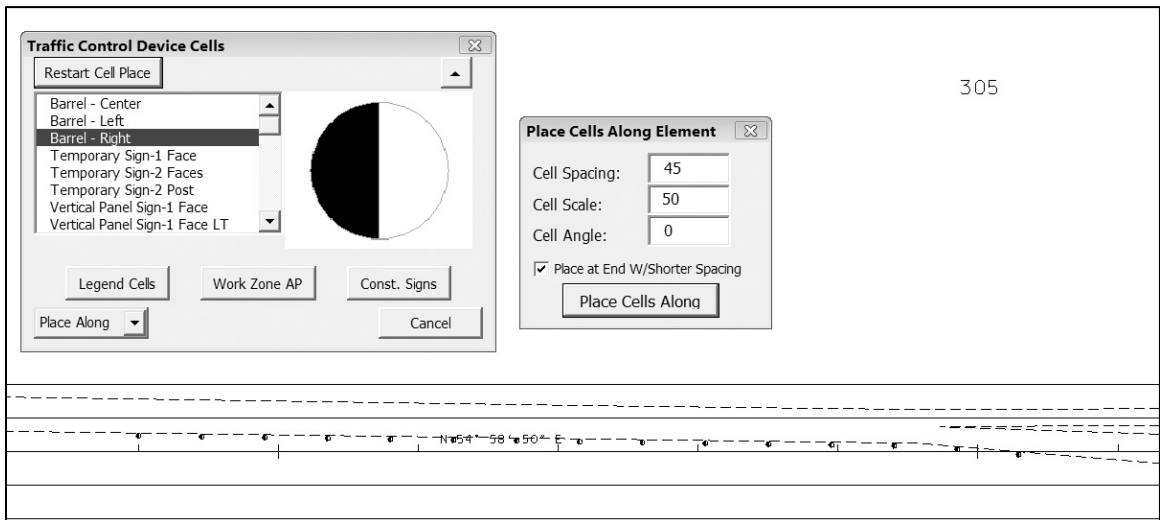
If the correct element was identified, data point to accept it at the location where you wish end cell placement. This point also indicates the direction for placement.

If the wrong element was identified, reset to jump to other elements in that area.



Cells are placed along the element at the specified settings.

All cells are added to a graphic group so they can be easily eliminated if changes are required at a later time.



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 Roadway Design Division traffic control legend cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

This program can also be activated from the MicroStation drop down menu

TDOT > Traffic Control > Legend Cells

or by using the keyin

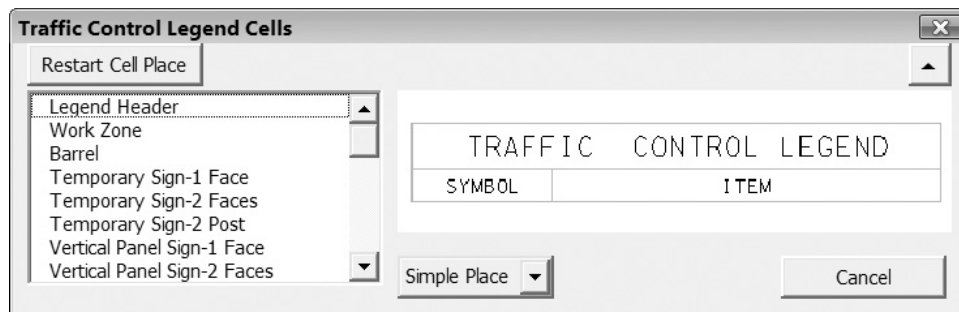
vba run [TrafficControlLegendCells]TrafficCntrlLegendcells.main

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

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:

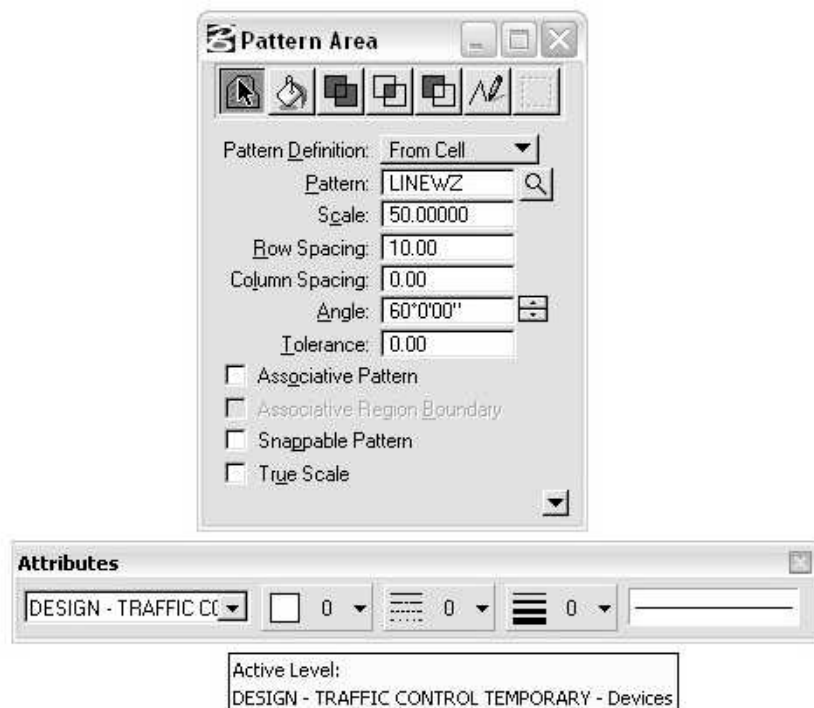
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

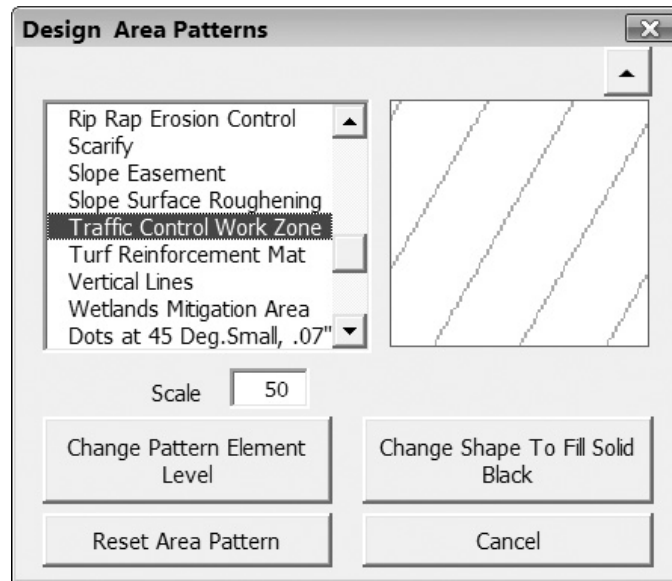
Fence method: Create a fence bounding the area to be patterned.

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.

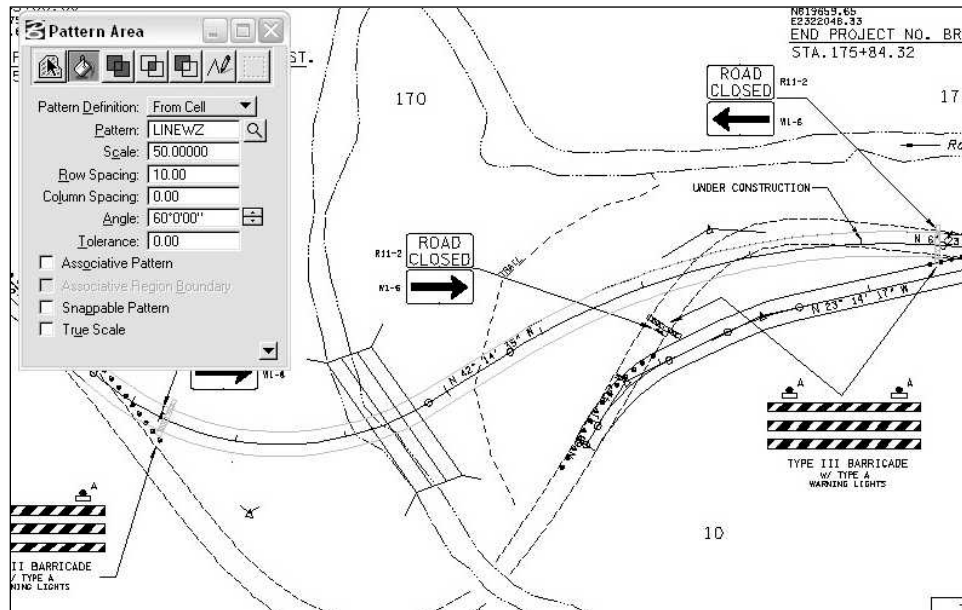


Or from the drop down menu in the **Design Area Patterns** dialog ...

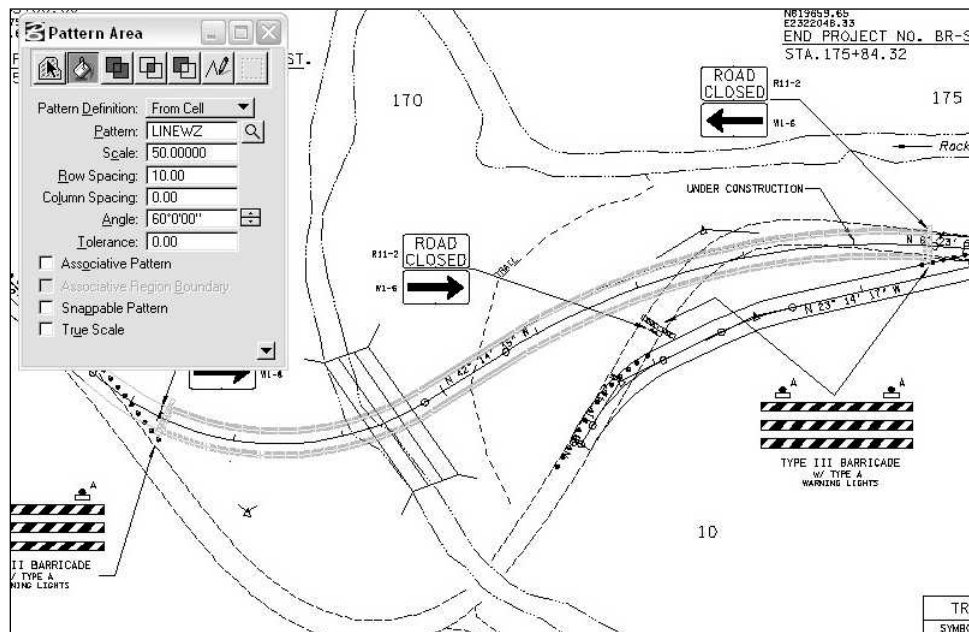


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

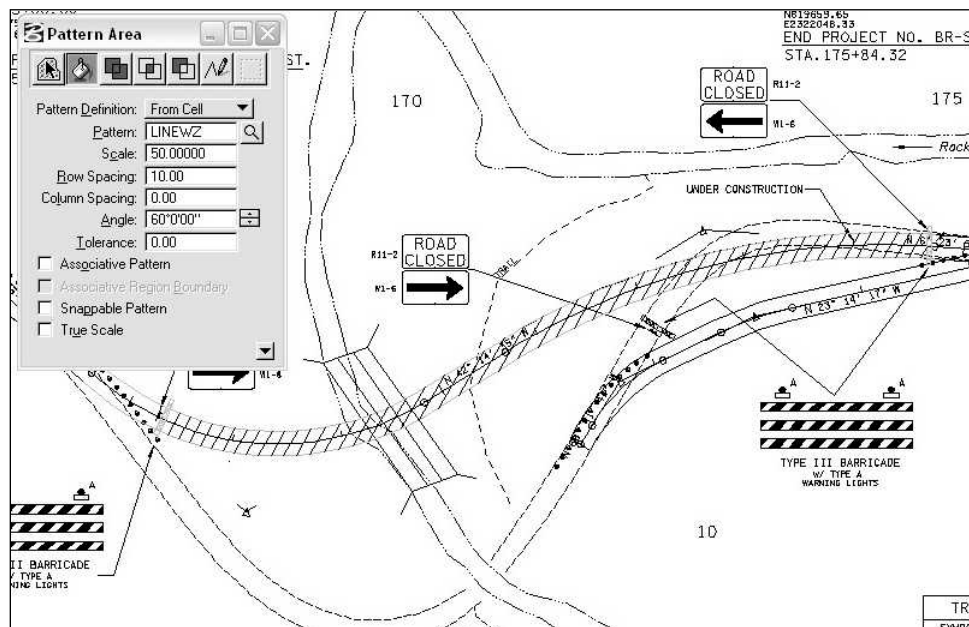
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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 Roadway 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

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

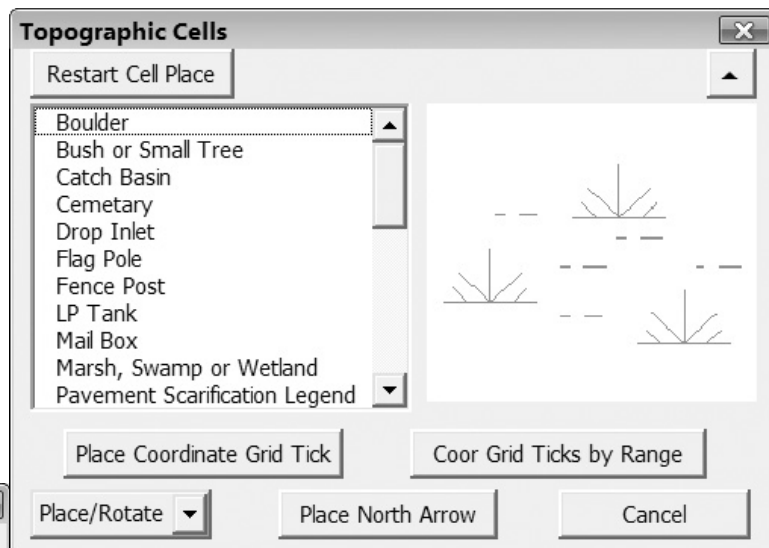
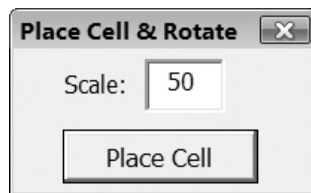
Special Requirements:

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 the **Place Cell & Rotate** tool is activated.



Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

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 Roadway 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 drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

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

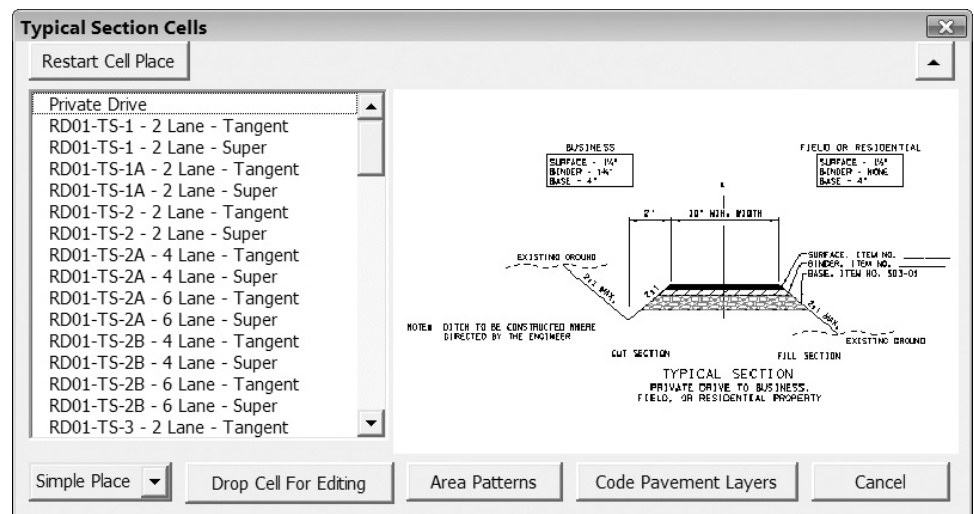
Special Requirements:

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.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

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 Roadway 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 Reset Area Pattern command button is provided to reset the current selection's area pattern settings and 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:

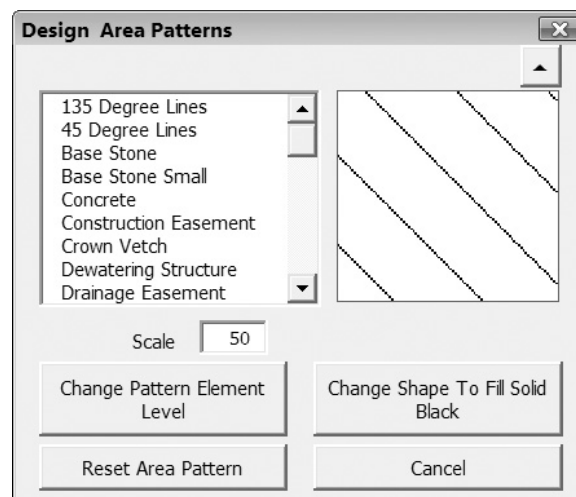
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

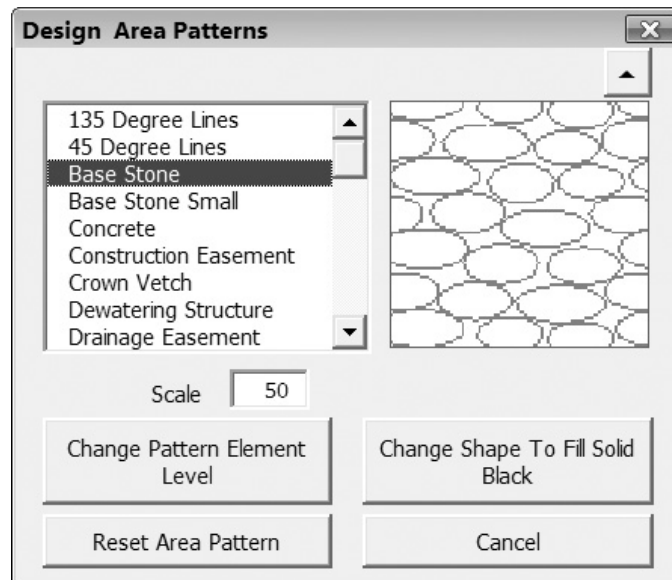
Fence method: Create a fence bounding the area to be patterned.

Usage:

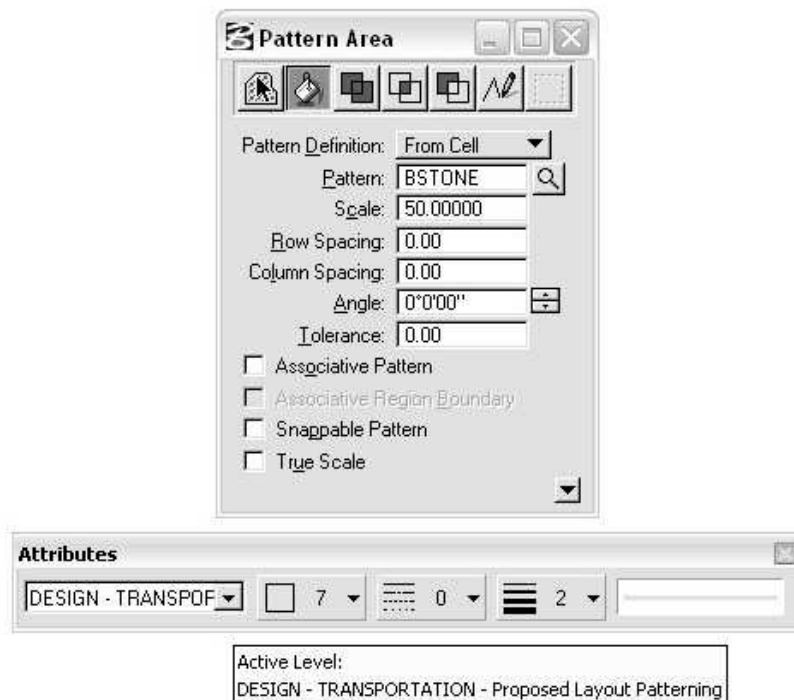
Step 1. In D&C manager activate **Area Patterns**. The **Design Area Patterns** dialog appears.



- Step 2.** Check and reset **Scale** if needed. Pattern scale, row spacing & column spacing are based on the current active scale.
- 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 Pvmnt 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

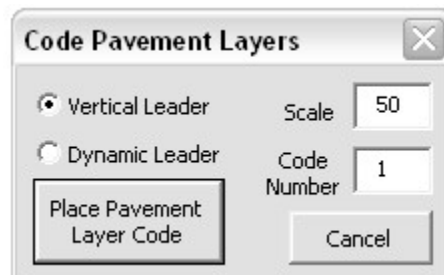
vba run [CodePavementLayers]CodePavement.main

Special Requirements:

None.

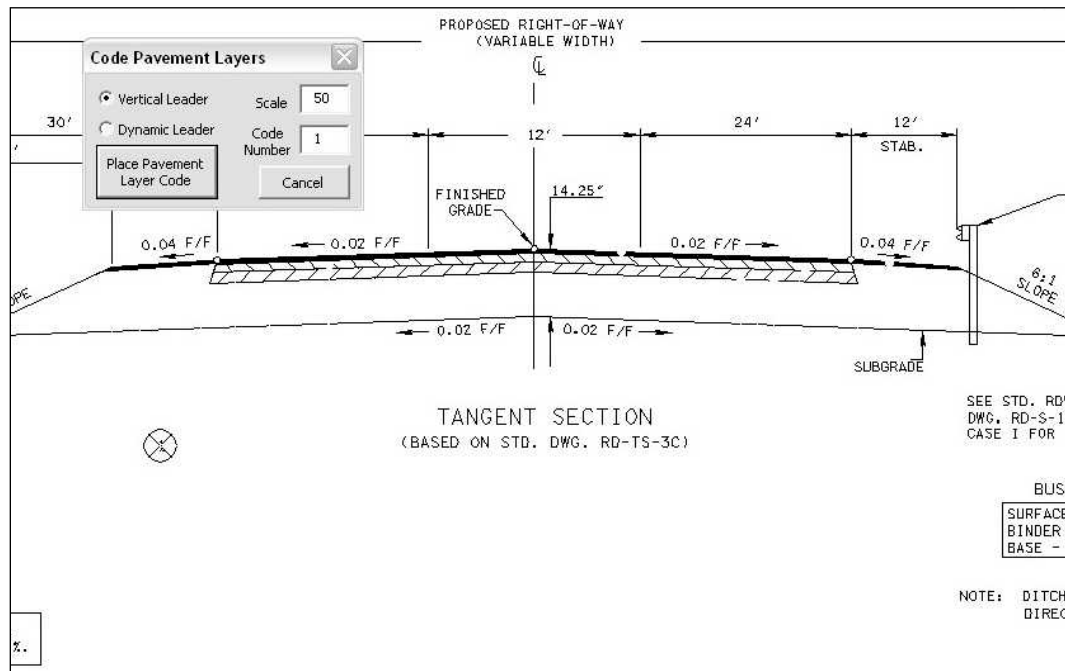
Usage:

Step 1. In D&C manager activate **Code Pvmnt Layer**. The **Code Pavement Layers** dialog appears.

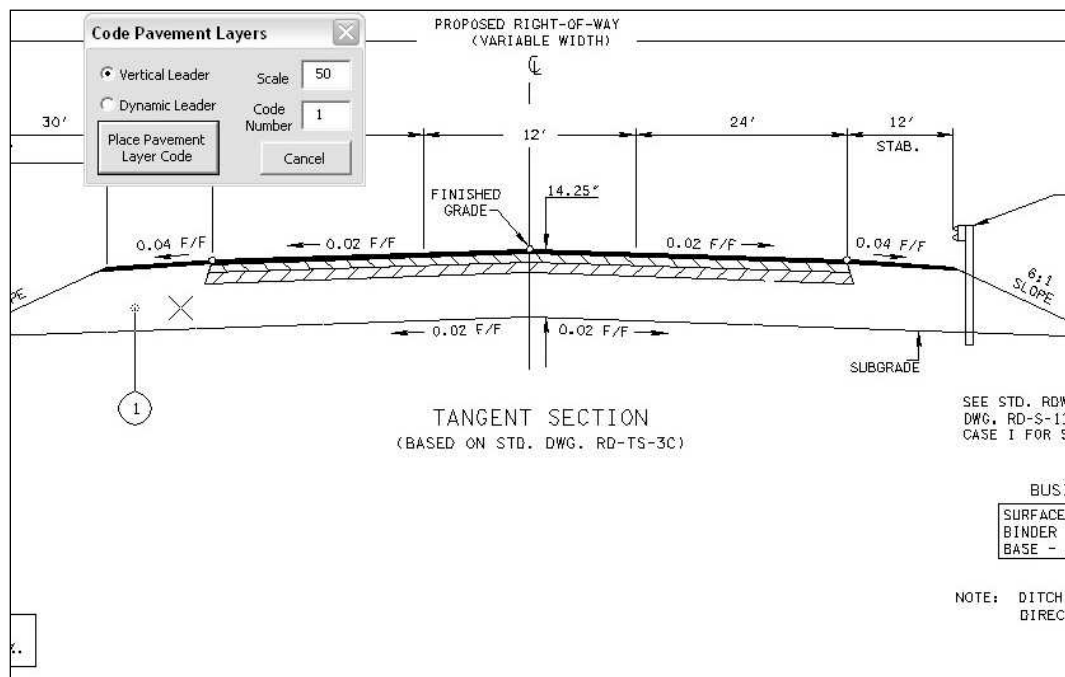


Step 2. First choose the type of leader and check the scale. Enter the code number to start placement with and click on the **Place Pavement Layer Code** command button to start placement of the code.

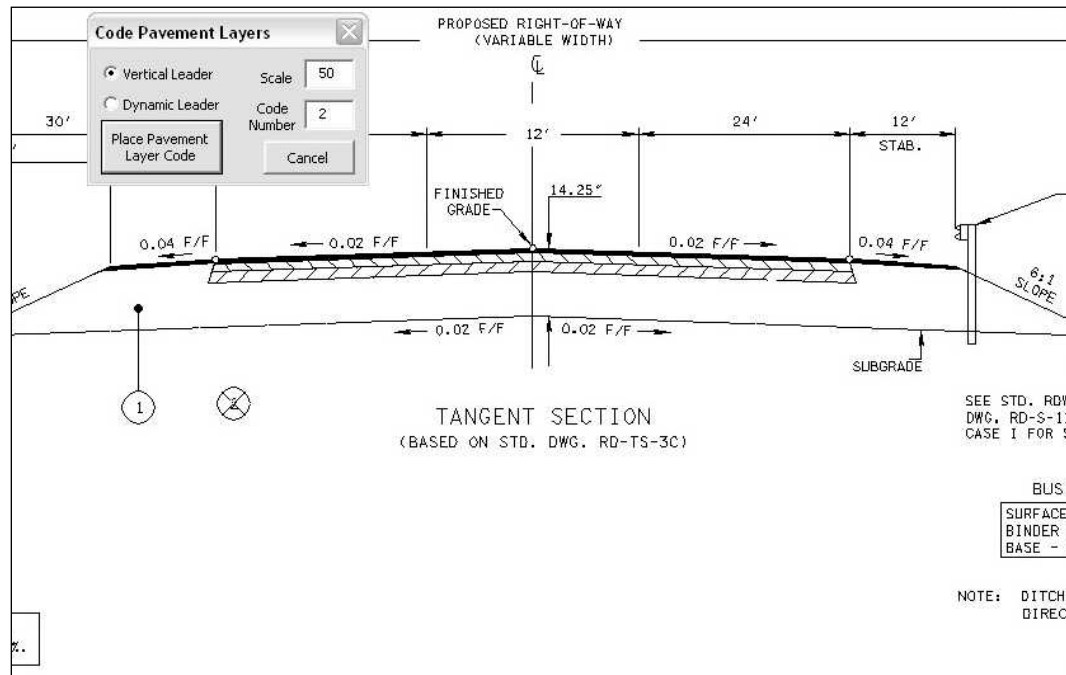
The code text in a circle shows dynamically on the cursor and the user is prompted **Identify Location** for placement.



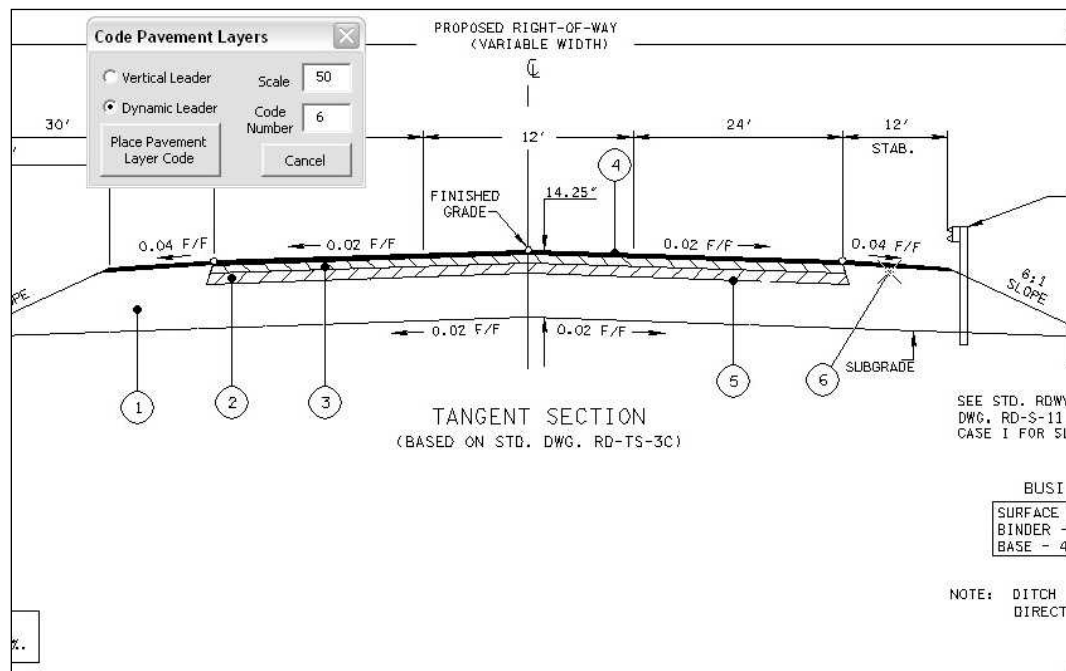
Step 3. Once this point is given, a second point is required to set the leader length. The user is prompted to **Place Leader end point**.



- 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**.



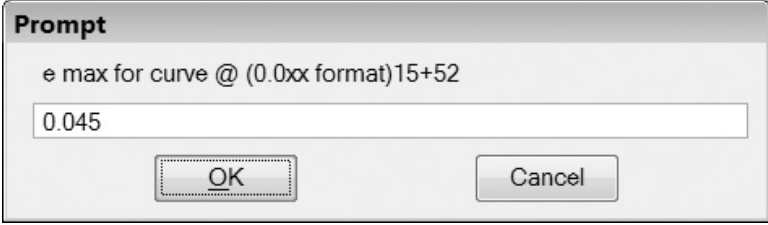
A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Job Number" above a text input field. The input field contains the number "244". Below the input field are two buttons: "OK" and "Cancel".

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



A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Chain Name" above a text input field. The input field contains the text "mainline". Below the input field are two buttons: "OK" and "Cancel".

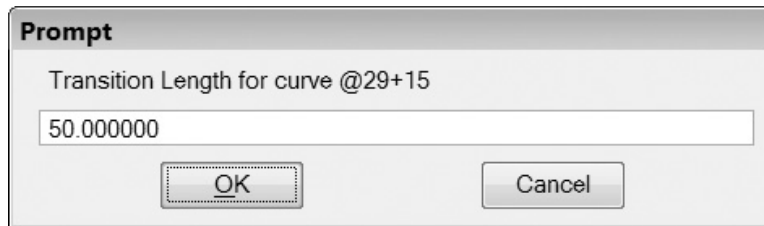
- Step 6.** The 3PC processes the chain and finds the first curve. You are first prompted for the **superelevation rate (e max)** for the curve. Key that in and click **OK**.



A screenshot of a software dialog box titled "Prompt". It contains a label "e max for curve @ (0.0xx format)15+52" above a text input field. The input field contains the value "0.045". Below the input field are two buttons: "OK" and "Cancel".

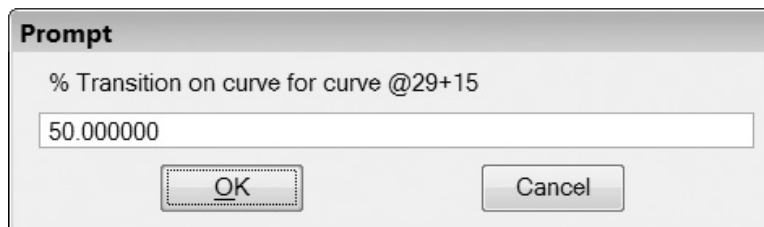
If the curve is a simple curve without spirals:

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.



A screenshot of a software dialog box titled "Prompt". The text inside reads "Transition Length for curve @29+15". Below this text is a text input field containing the value "50.000000". At the bottom of the dialog are two buttons: "OK" and "Cancel".

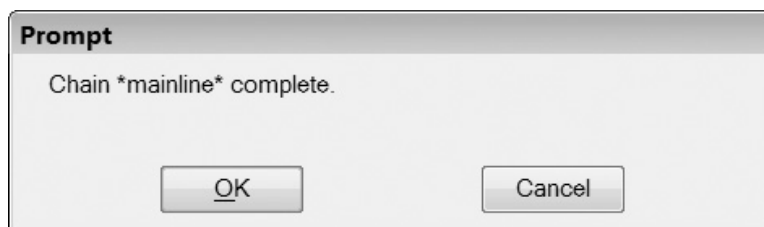
Step 8. You are then prompted for the **% of the transition on the curve**. Key that in and click **OK**.



A screenshot of a software dialog box titled "Prompt". The text inside reads "% Transition on curve for curve @29+15". Below this text is a text input field containing the value "50.000000". At the bottom of the dialog are two buttons: "OK" and "Cancel".

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.



A screenshot of a software dialog box titled "Prompt". The text inside reads "Chain *mainline* complete.". At the bottom of the dialog are two buttons: "OK" and "Cancel".

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**.



A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Job Number" above a text input field. The input field contains the number "244". Below the input field are two buttons: "OK" and "Cancel".

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



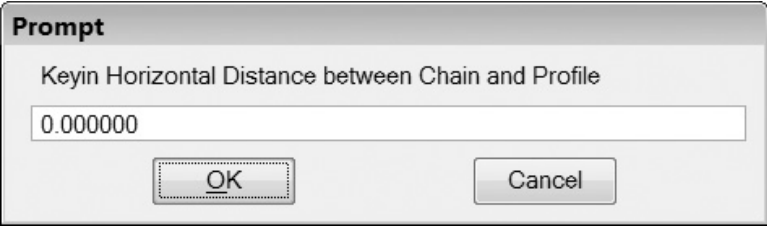
A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Chain Name" above a text input field. The input field contains the text "mainline". Below the input field are two buttons: "OK" and "Cancel".

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



A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Profile Name" above a text input field. The input field contains the text "propcl". Below the input field are two buttons: "OK" and "Cancel".

- Step 6.** You are then prompted for the **Horizontal Distance between Chain and Profile**. Key that in and click **OK**.



A dialog box titled "Prompt" with a light gray background. The text "Keyin Horizontal Distance between Chain and Profile" is displayed above a text input field containing "0.000000". Below the input field are two buttons: "OK" and "Cancel".

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**.



A dialog box titled "Prompt" with a light gray background. The text "Keyin LT Offset (-24)" is displayed above a text input field containing "-12". Below the input field are two buttons: "OK" and "Cancel".

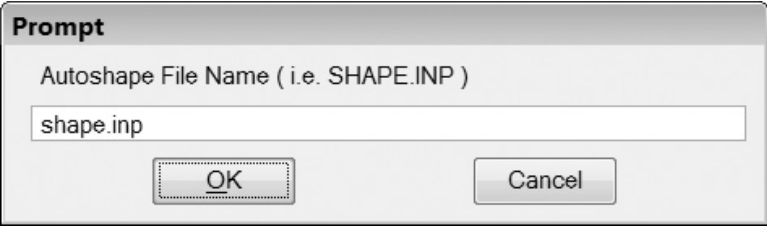
Offsets to the left of the centerline are always negative numbers.

- 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**.



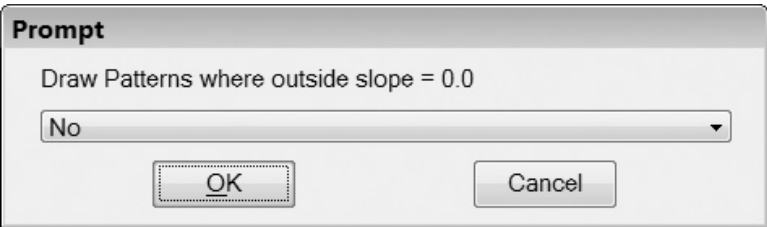
A dialog box titled "Prompt" with a light gray background. The text "Keyin RT Offset (24)" is displayed above a text input field containing "12". Below the input field are two buttons: "OK" and "Cancel".

- 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**.



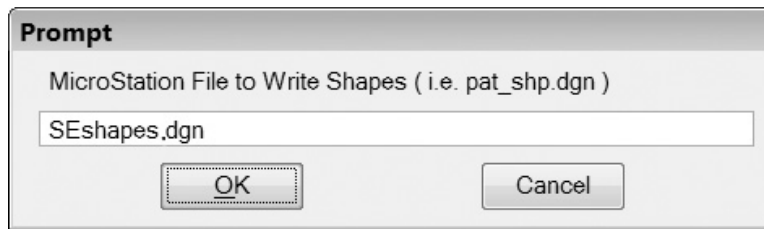
A dialog box titled "Prompt" with a light gray background. The text "Autoshape File Name (i.e. SHAPE.INP)" is displayed above a text input field containing "shape.inp". Below the input field are two buttons: "OK" and "Cancel".

- 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**.

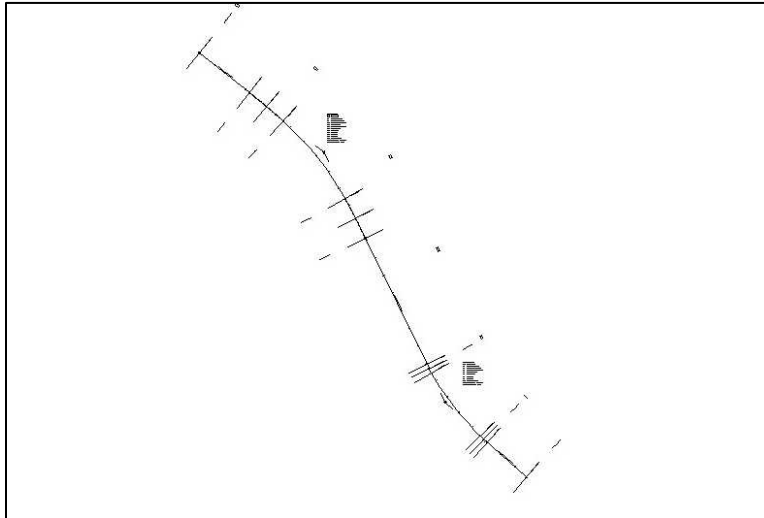


A dialog box titled "Prompt" with a light gray background. The text "Draw Patterns where outside slope = 0.0" is displayed above a dropdown menu showing "No". Below the dropdown are two buttons: "OK" and "Cancel".

- 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**.

A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Job Number" above a text input field. The input field contains the number "244". Below the input field are two buttons: "OK" and "Cancel".

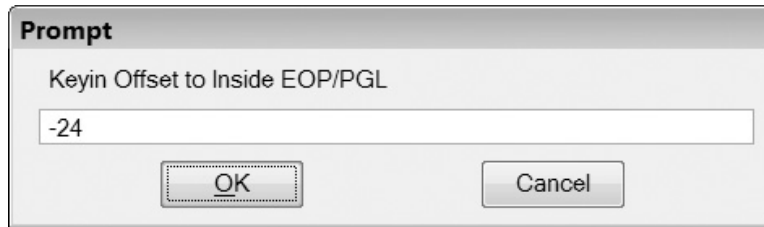
Step 4. You are then prompted for the **chain name**. Key that in and click **OK**.

A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Chain Name" above a text input field. The input field contains the text "mainline". Below the input field are two buttons: "OK" and "Cancel".

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

A screenshot of a software dialog box titled "Prompt". It contains a label "Keyin Profile Name" above a text input field. The input field contains the text "propcl". Below the input field are two buttons: "OK" and "Cancel".

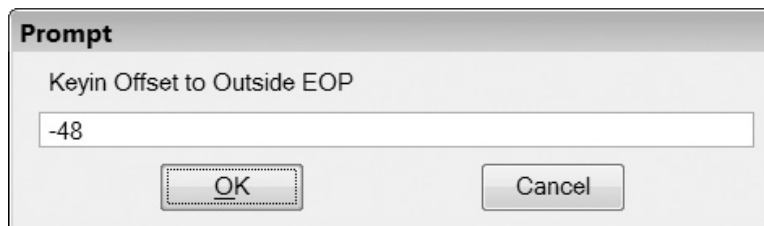
- Step 6.** You are then prompted for the **Offset to the inside edge of pavement or PGL (profile grade line)**. Key that in and click **OK**.



A screenshot of a software dialog box titled "Prompt". The text inside reads "Keyin Offset to Inside EOP/PGL". Below this text is a text input field containing the value "-24". At the bottom of the dialog are two buttons: "OK" and "Cancel".

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**.



A screenshot of a software dialog box titled "Prompt". The text inside reads "Keyin Offset to Outside EOP". Below this text is a text input field containing the value "-48". At the bottom of the dialog are two buttons: "OK" and "Cancel".

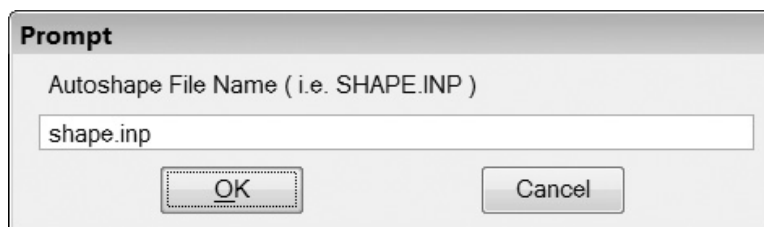
- Step 8.** You are then prompted for the **Normal Crown slope**. This must be entered in a percentage format such as -2. Key that in and click **OK**.



A screenshot of a software dialog box titled "Prompt". The text inside reads "Keyin Normal Crown Slope (-2)". Below this text is a text input field containing the value "-2.000000". At the bottom of the dialog are two buttons: "OK" and "Cancel".

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.

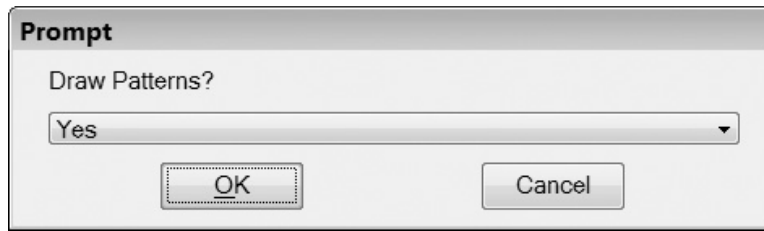
- Step 9.** You are then prompted for the **Autoshape File Name**. This is the superelevation shape input file the program is to create. Key that in and click **OK**.



A screenshot of a software dialog box titled "Prompt". The text inside reads "Autoshape File Name (i.e. SHAPE.INP)". Below this text is a text input field containing the value "shape.inp". At the bottom of the dialog are two buttons: "OK" and "Cancel".

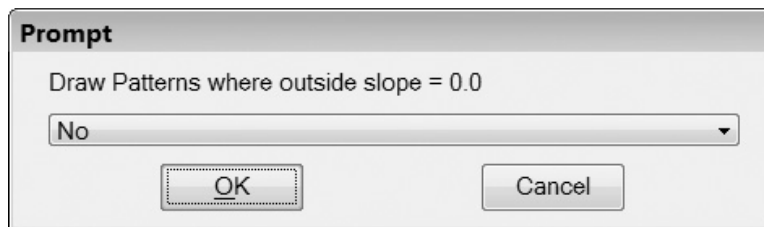
On the second pass for the opposite side of the road, keyin a different filename than entered on the first pass to avoid overwriting the first file (i.e. shape2.inp).

Step 10. You are then given the option to **Draw Patterns?**. Pick **Yes** or **No** and click **OK**.

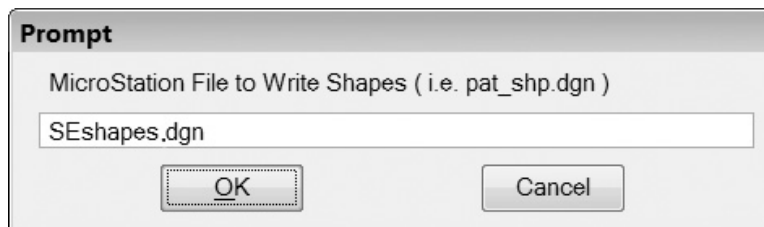


On the first pass using this program you would normally say **Yes** and on the second pass to set up the other side of the divided roadway you would say **No** having already placed patterns.

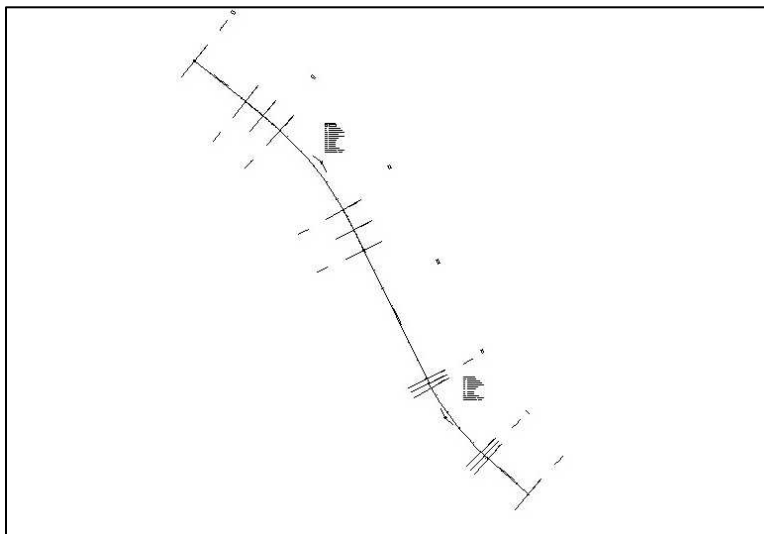
Step 11. If you said Yes to place patterns then you are then given the option to place patterns where the outside slope = 0.000 (zero slope). Pick **Yes** or **No** and click **OK**.



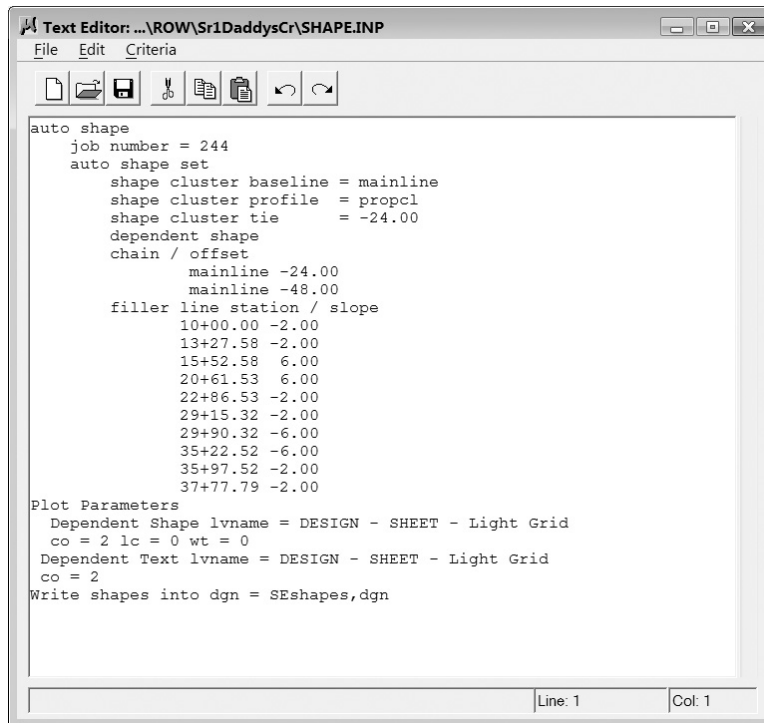
Step 12. Finally you are prompted for the **MicroStation DGN filename** that superelevation shapes are to be written into. Key in the filename and click **OK**.



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.



```

auto shape
  job number = 244
  auto shape set
    shape cluster baseline = mainline
    shape cluster profile = propcl
    shape cluster tie = -24.00
  dependent shape
  chain / offset
    mainline -24.00
    mainline -48.00
  filler: line station / slope
    10+00.00 -2.00
    13+27.58 -2.00
    15+52.58 6.00
    20+61.53 6.00
    22+86.53 -2.00
    29+15.32 -2.00
    29+90.32 -6.00
    35+22.52 -6.00
    35+97.52 -2.00
    37+77.79 -2.00

Plot Parameters
  Dependent Shape lvname = DESIGN - SHEET - Light Grid
  co = 2 lc = 0 wt = 0
  Dependent Text lvname = DESIGN - SHEET - Light Grid
  co = 2
Write shapes into dgn = Seshapes,dgn
  
```

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:

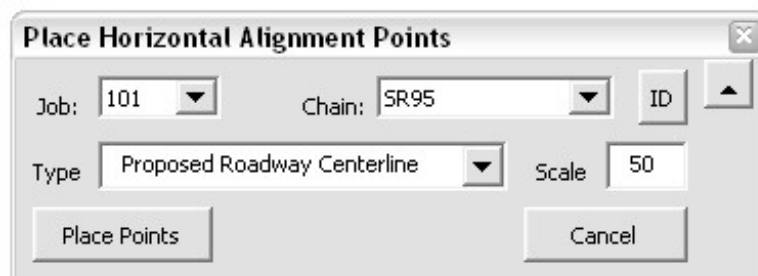
Chains that are to be processed must be stored in a Geopak GPK file in the folder where the MicroStation DGN file resides.

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 > Pvm 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:

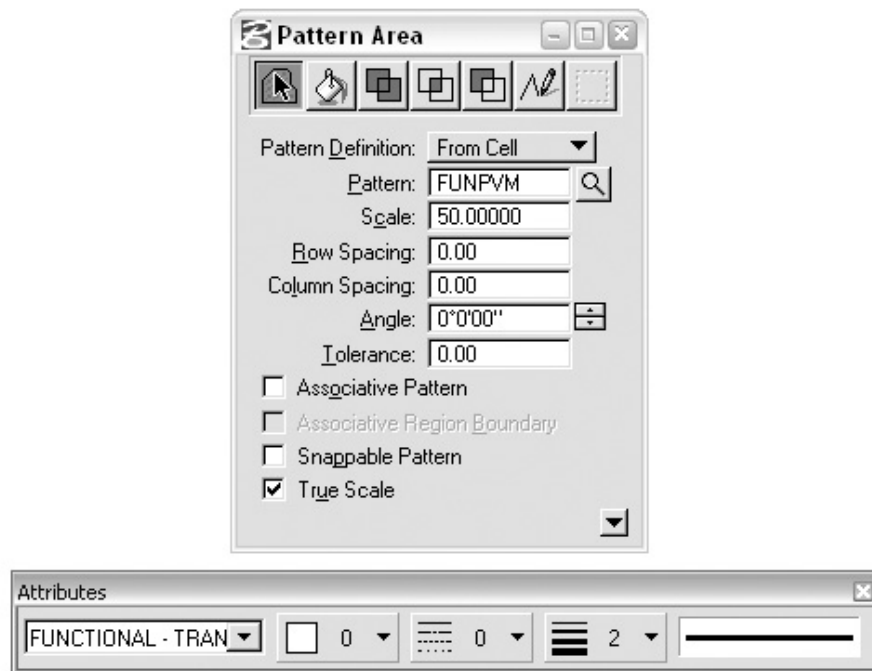
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

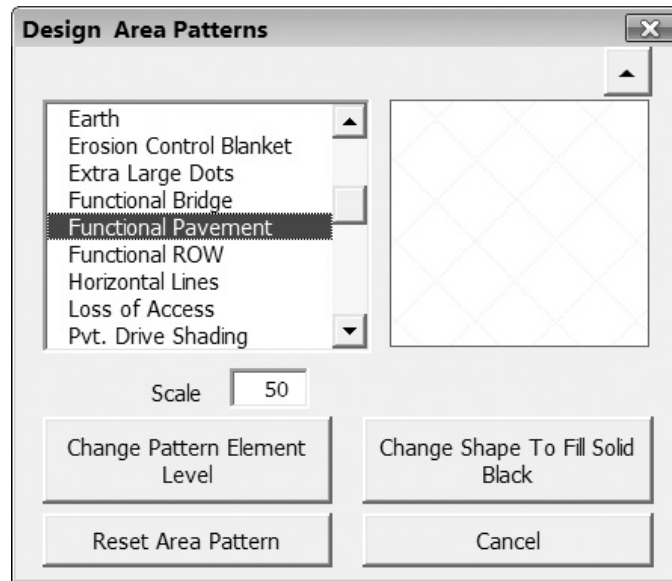
Fence method: Create a fence bounding the area to be patterned.

Usage:

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

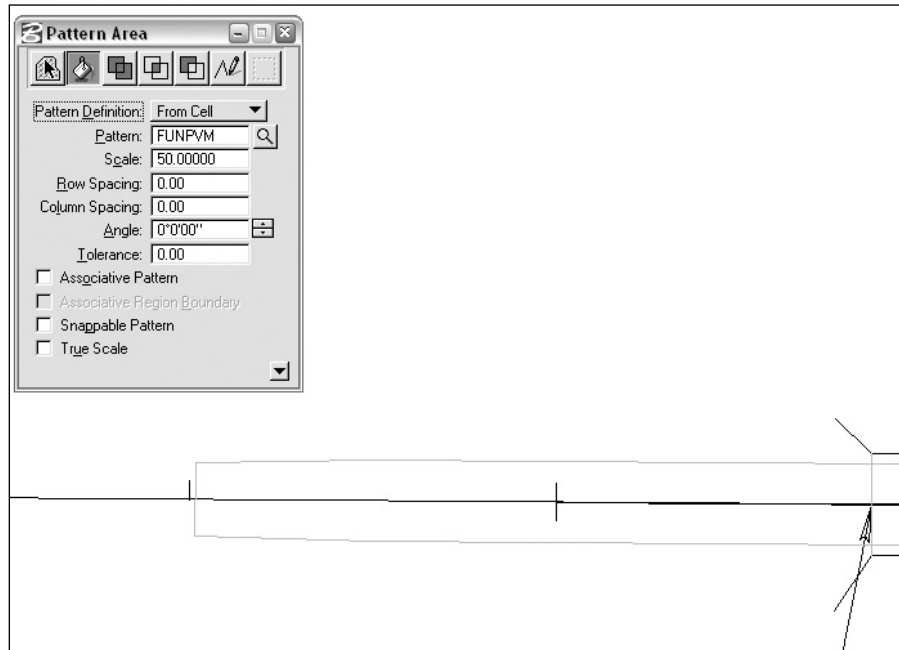


Or from the drop down menu in the **Design Area Patterns** dialog ...

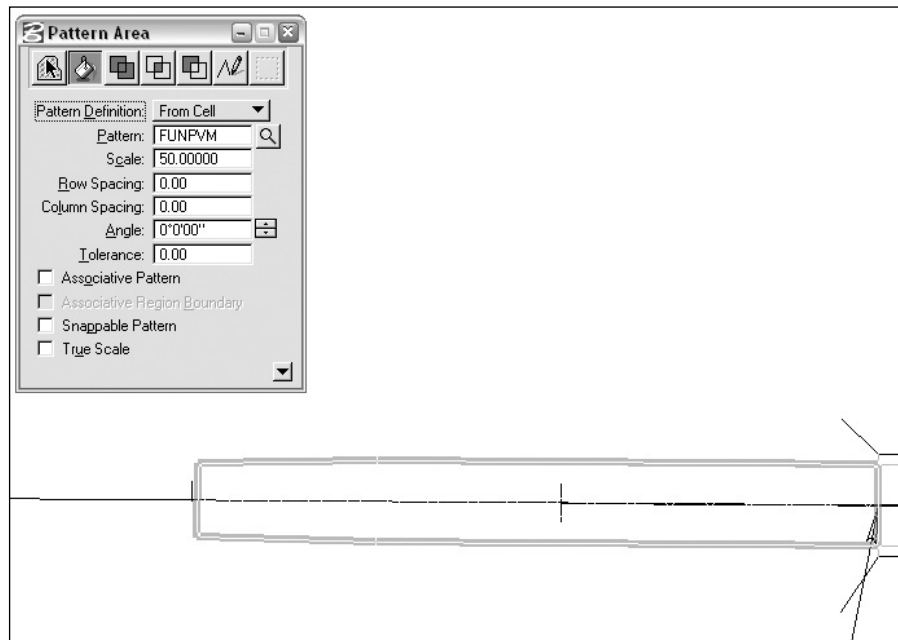


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

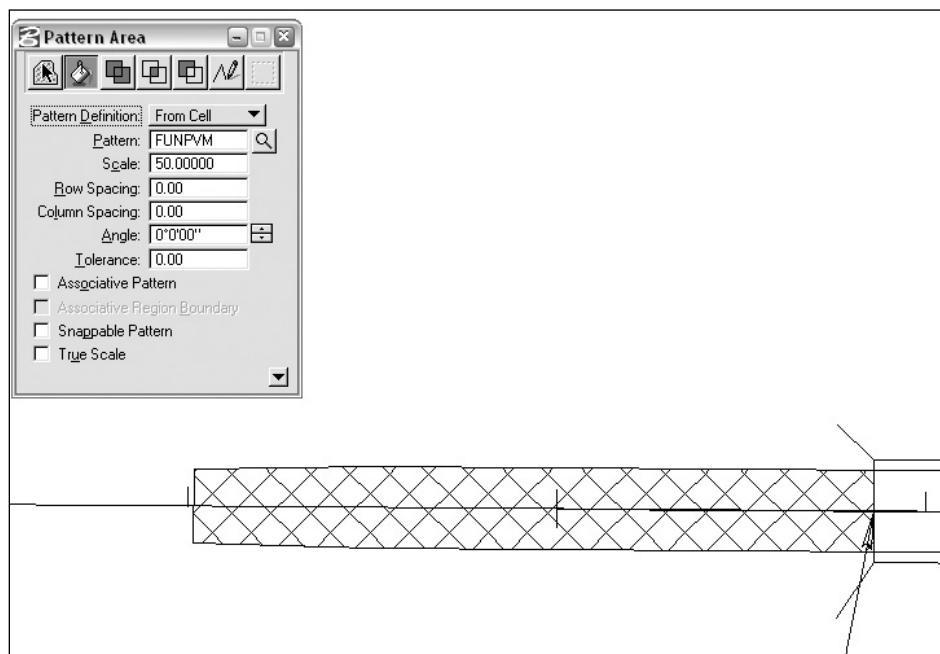
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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:

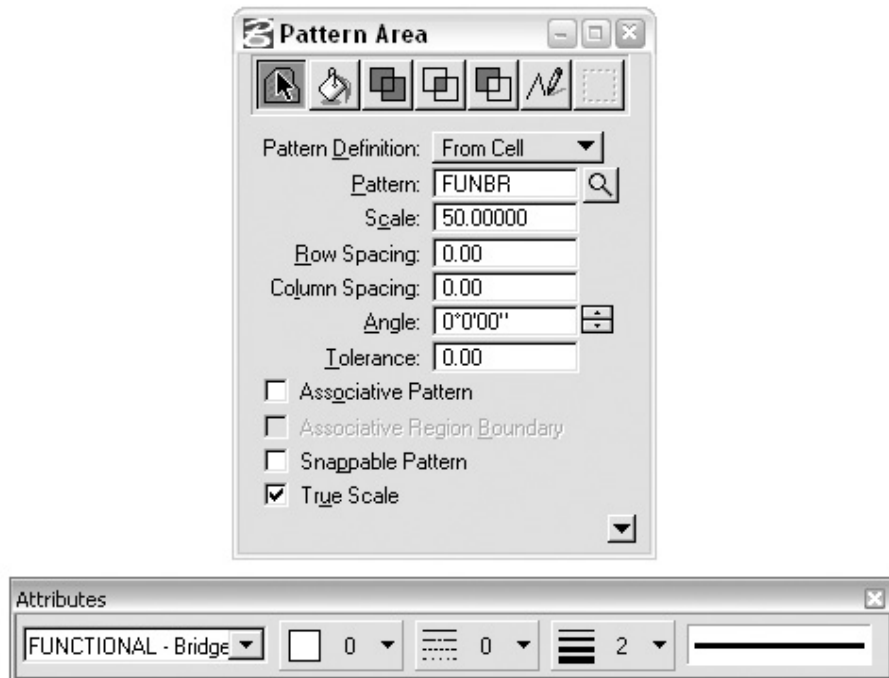
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

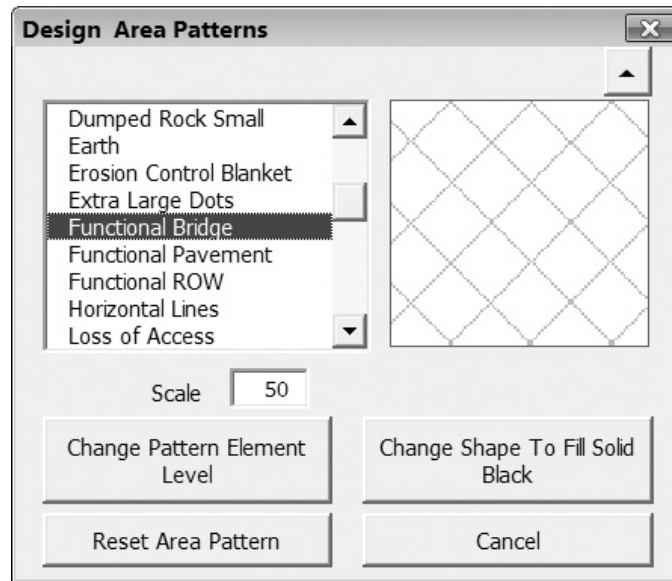
Fence method: Create a fence bounding the area to be patterned.

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.

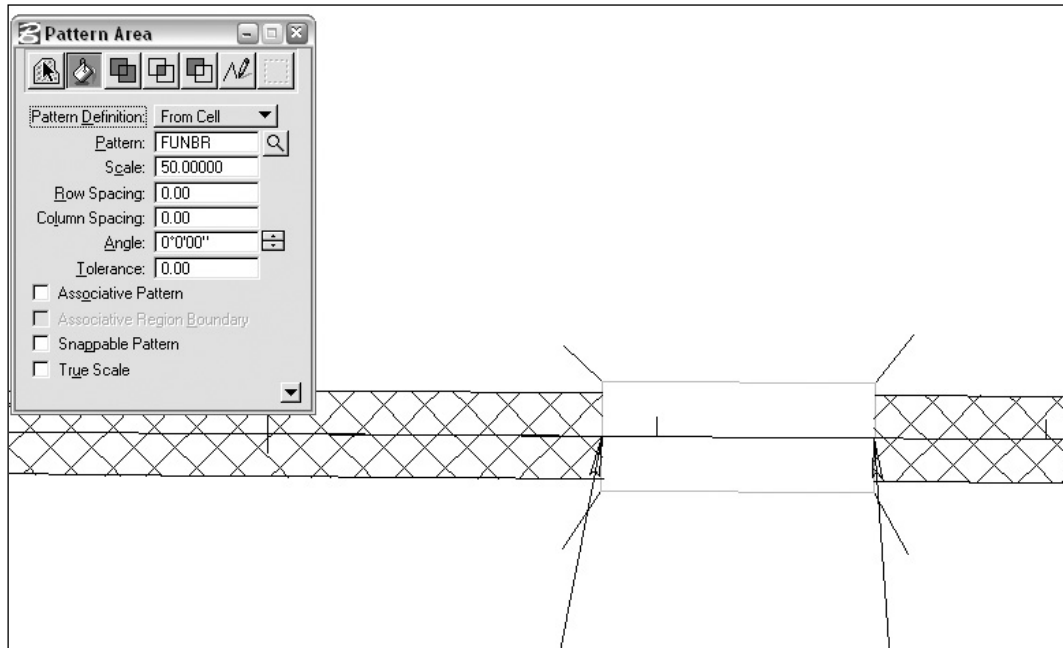


Or from the drop down menu in the **Design Area Patterns** dialog ...

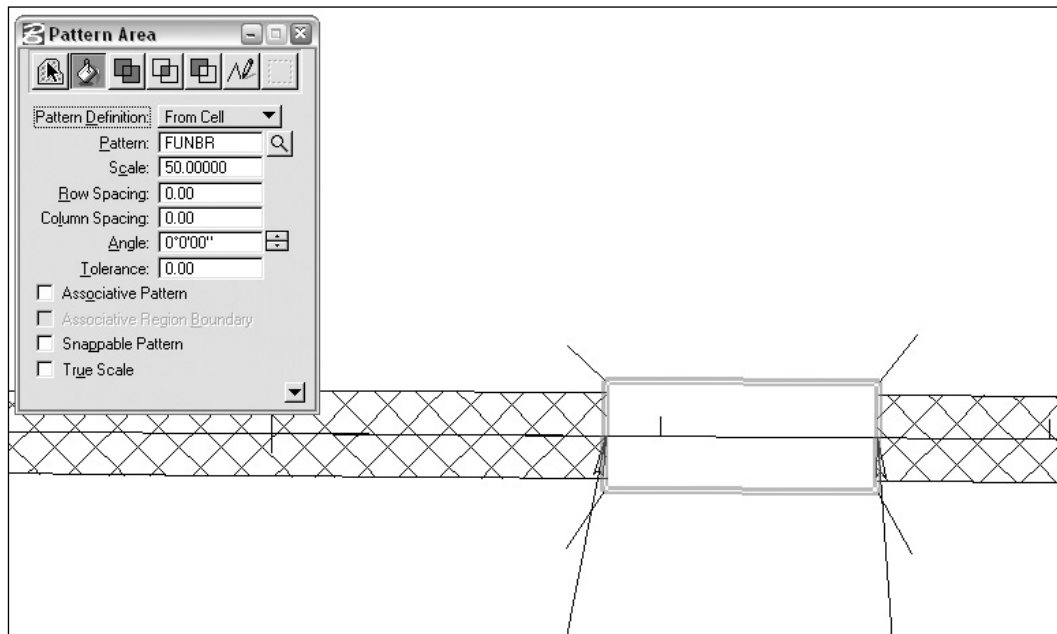


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

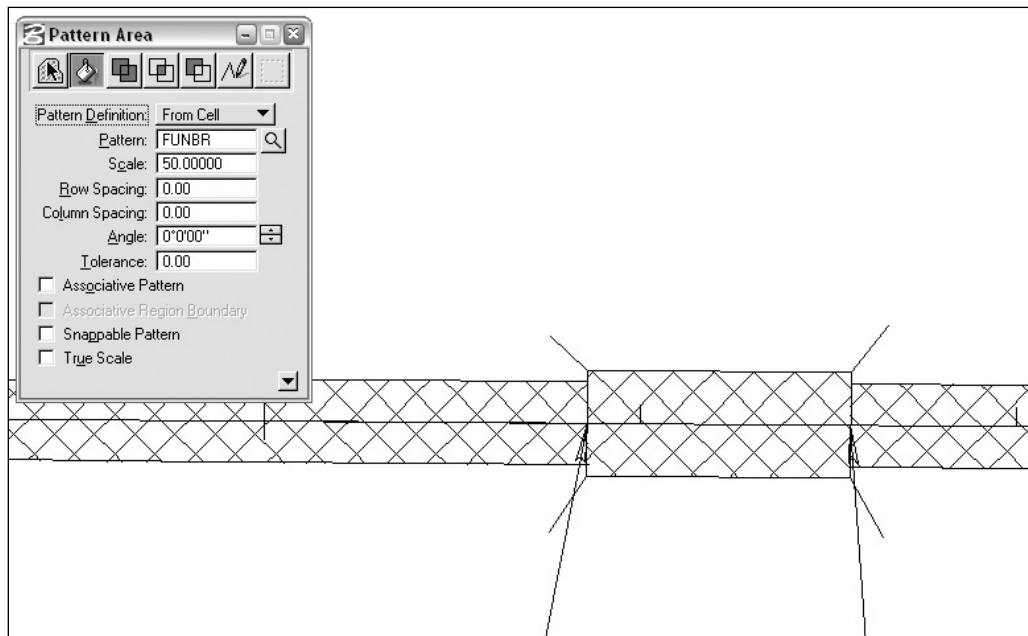
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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:

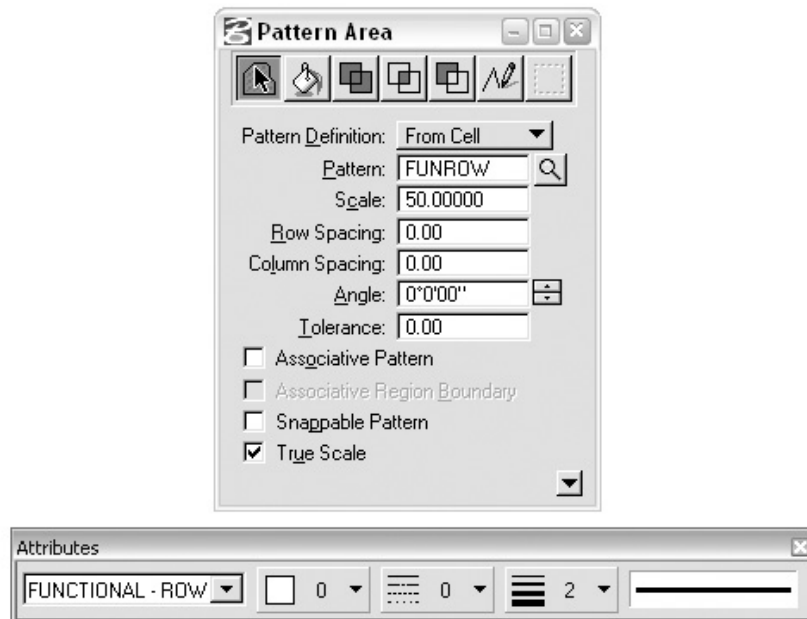
Flood method: Create a Selection Set of the elements bounding the area to be patterned.

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

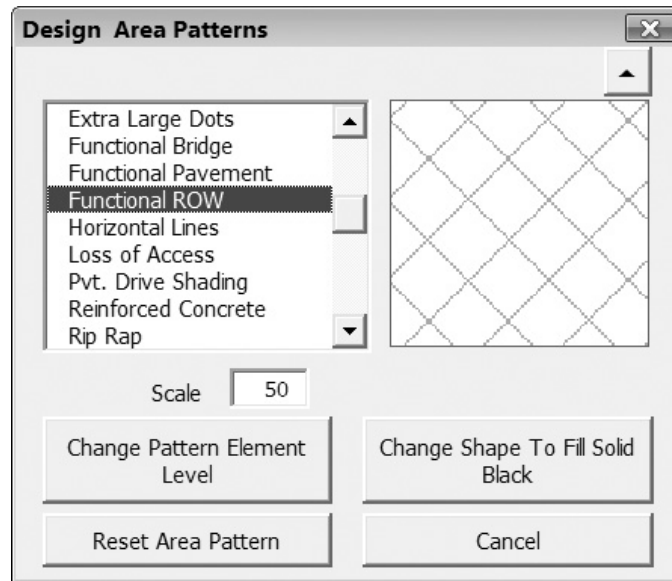
Fence method: Create a fence bounding the area to be patterned.

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.

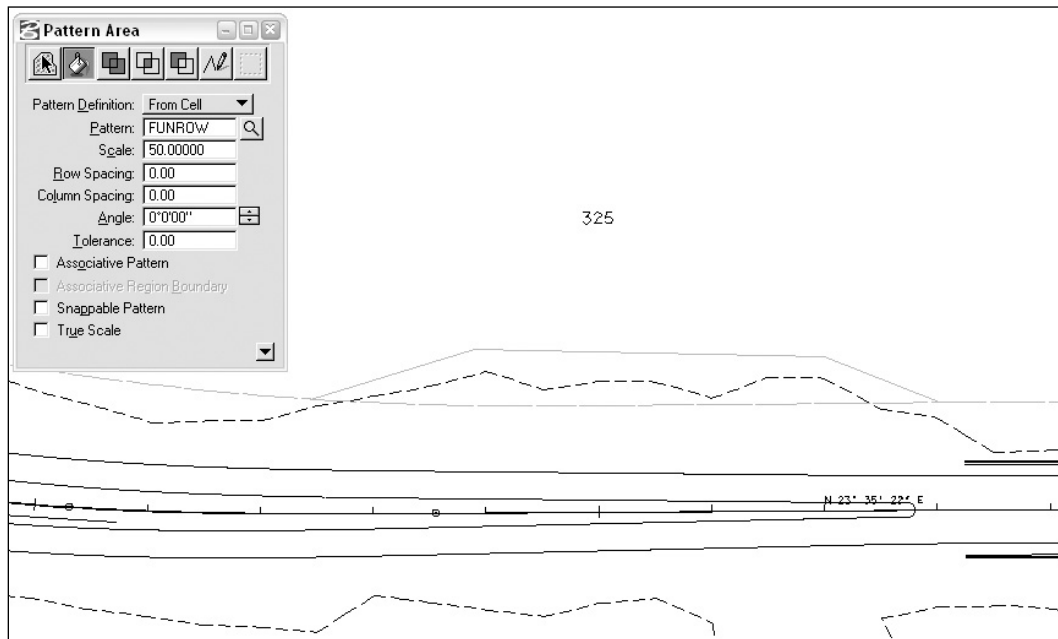


Or from the drop down menu in the **Design Area Patterns** dialog ...

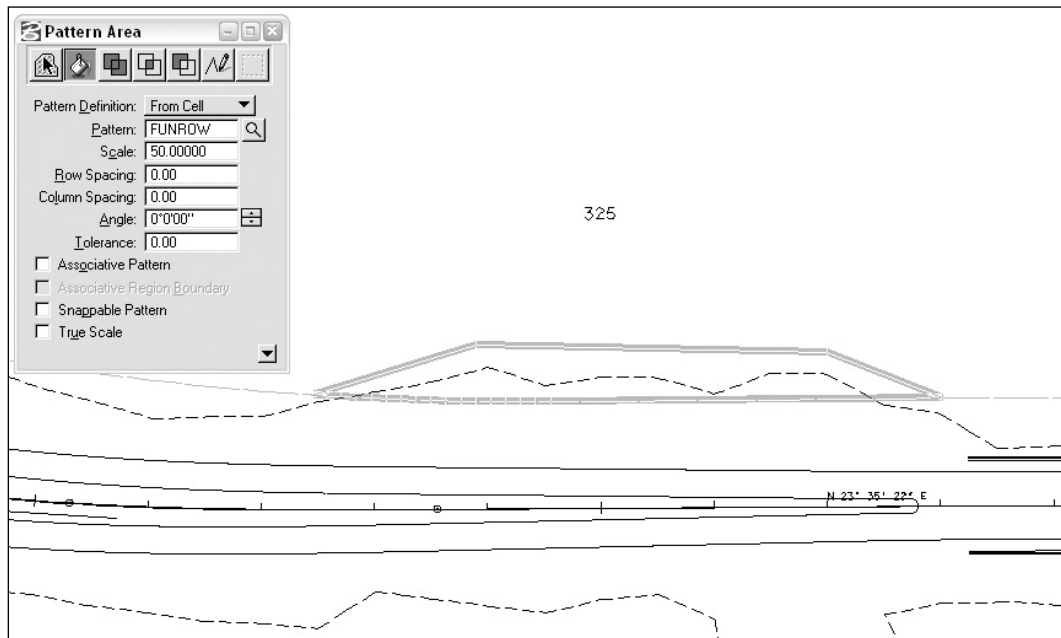


Step 2. Choose the method of placing the area pattern from the choices at the top of the tool settings for Pattern Area. In this example we are using **Flood**.

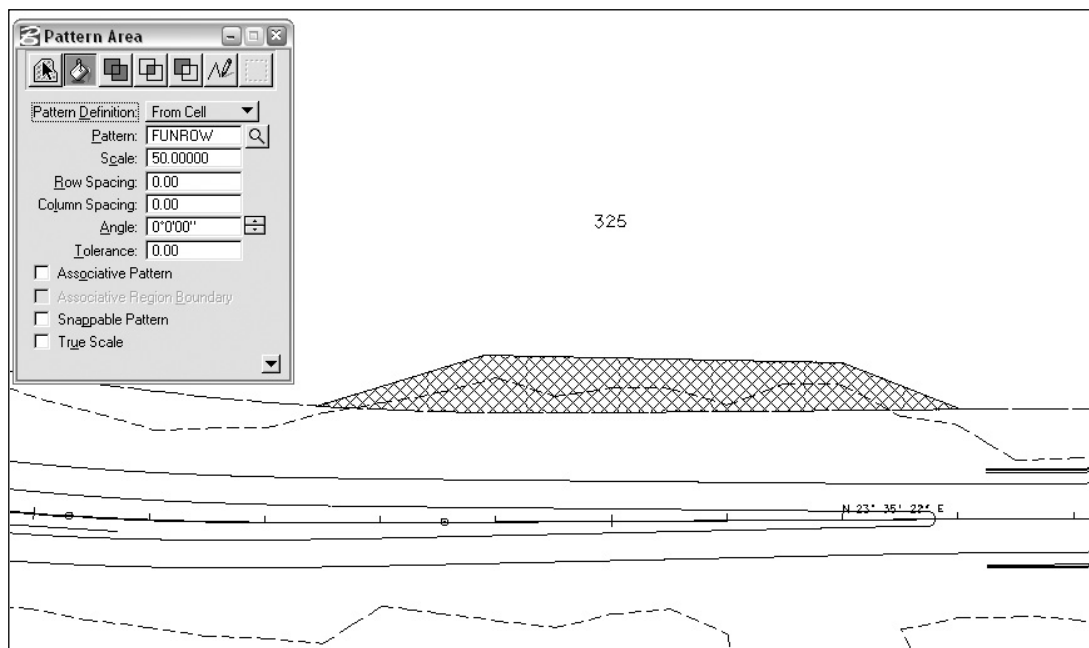
Step 3. Depending on the method chosen, the user is prompted for a data point or points to initiate the area patterning. With Flood, the user is prompted to **Enter data point inside area**.



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 Roadway Design Division proposed utility cells. These do include existing guy anchors.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

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

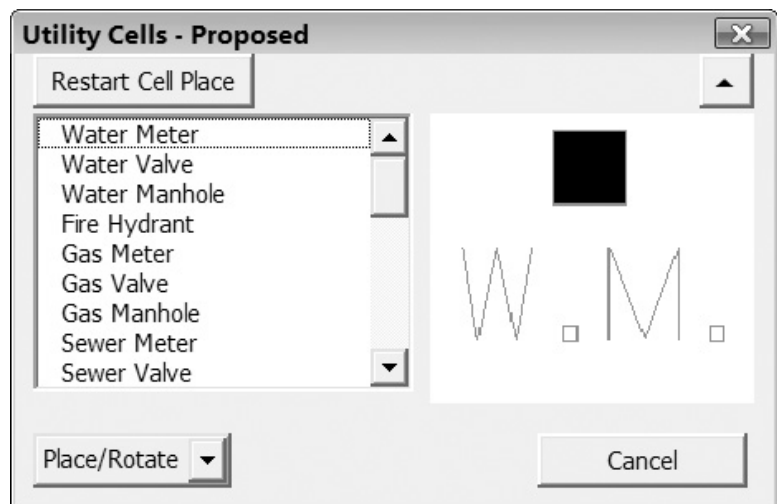
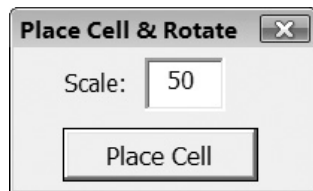
Special Requirements:

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 the **Place Cell & Rotate** tool is activated.



Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.

Utility Cells - Existing

D&C location: Utilities – Plan > Existing > Utility Cells E

MicroStation VBA Program: UtilityCellsExist.mvba

Description:

This program provides access to TDOT Roadway Design Division existing utility cells.

A drop down list for Cell Placement Type is provided at the lower left of the dialog. Options include Simple Place, Place/Rotate and Place Along.

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

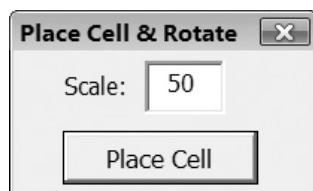
Special Requirements:

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 the **Place Cell & Rotate** tool is activated.

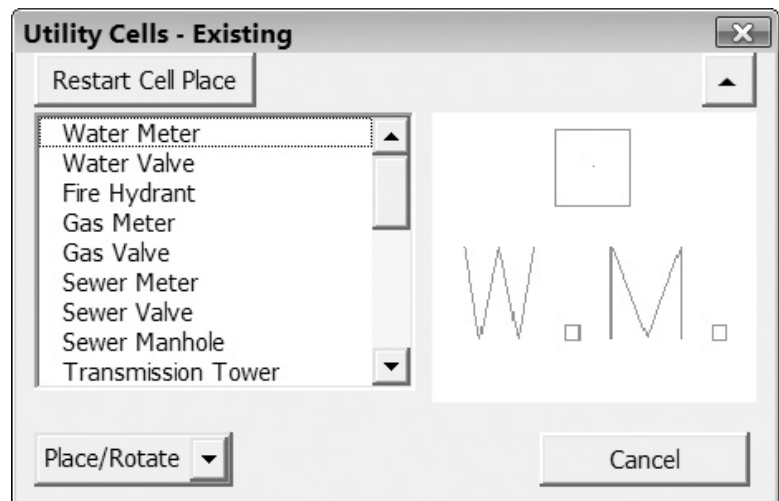


Step 3. Adjust scale if needed in the Place Cell & Rotate dialog. Place cell as desired. The first data point will place the cell and the 2nd point sets the cell angle.

The **Cell Placement Type** drop down list at the lower left of the cell dialog can be reset as needed to control how cells are placed.

The **Restart Cell Place** command button can be used anytime other MicroStation commands have been used or the Cell Placement Type is changed.

This tool 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.



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:

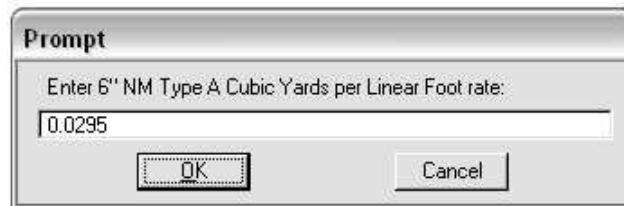
This application reads a D&C Manager set of curb lines, prompts the user for the volume per linear foot rate for each line & then calculates the total volume and reports the quantity back to D&C Manager.

Special Requirements:

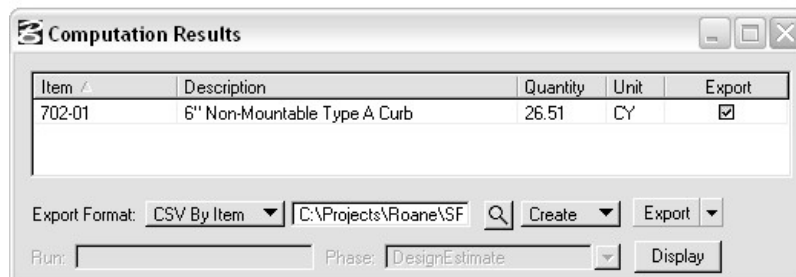
None

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:

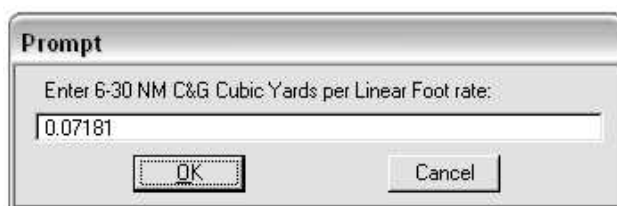
This application reads a D&C Manager set of curb & gutter lines, prompts the user for the volume per linear foot rate for each line & then calculates the total volume and reports the quantity back to D&C Manager.

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.



A dialog box titled "Prompt" with a text input field and two buttons. The text input field contains "0.07181". The buttons are labeled "OK" and "Cancel".

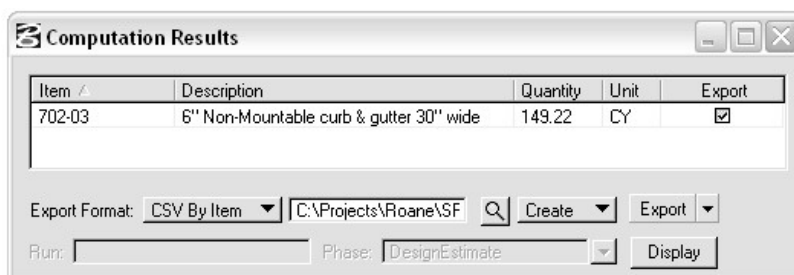
Prompt

Enter 6-30 NM C&G Cubic Yards per Linear Foot rate:

0.07181

OK Cancel

- 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.



A dialog box titled "Computation Results" with a table and several buttons. The table has columns: Item, Description, Quantity, Unit, and Export. The first row shows Item 702-03, Description 6" Non-Mountable curb & gutter 30" wide, Quantity 149.22, Unit CY, and Export checked. Below the table are buttons for Export Format (CSV By Item), a file path (C:\Projects\Roane\SF), a search icon, Create, Export, Run, Phase (DesignEstimate), and Display.

Computation Results

Item	Description	Quantity	Unit	Export
702-03	6" Non-Mountable curb & gutter 30" wide	149.22	CY	<input checked="" type="checkbox"/>

Export Format: CSV By Item C:\Projects\Roane\SF Search Create Export

Run: Phase: DesignEstimate Display

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.

Slotted Drain Computation

D&C location: Pay Items > Drainage Items > 607-45.__ slotted drain (all sizes)

Geopak 3PC Program: SlottedDrains_Computation.x

Description:

This application reads a D&C Manager set & then counts the slotted drain cells and reports the linear feet quantity back to D&C Manager. Cells are defined in a 20 foot length so each cell counts as 20 linear feet of that size slotted drain.

This includes 12", 15", 18", 24", 30" and 36" slotted drains (cell names: SLOT12, SLOT15, SLOT18, SLOT24, SLOT30 & SLOT36).

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 slotted drains found and sends the total back to D&C Manager.

Pipe Endwall Computation

D&C location: Pay Items > Drainage Items > Pipe Endwalls> 611-07.01, 611-07.02,
611-07.30 thru 611-07.36
611-07.51 thru 611-07.73

Geopak 3PC Program: PipeEndwall_Computation.x

Description:

This application reads a D&C Manager set & then then pulls the quantities for concrete, reinforcing steel and safety endwalls from pipe endwall graphics that had that data written to them as adhoc information when they were created.

Special Requirements:

None

Usage:

Use any of the computational methods provided by Geopak's D&C Manager and the program automatically tabulates the quantities rom all pipe endwalls found and sends the total back to D&C Manager.

EPSC Items

Berm Volume Computation

D&C location: Pay Items > EPSC Items > (all berm items)

Geopak 3PC Program: Berm_Computation.x

Description:

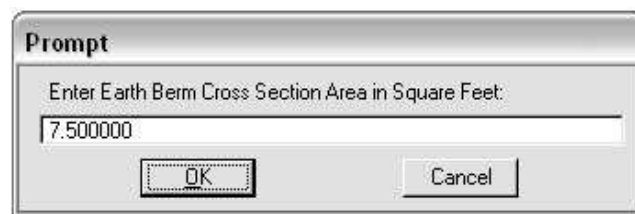
This application reads a D&C Manager set of erosion control earth, compost or mulch berm lines, prompts the user for the cross section area of each line & then calculates the total volume and reports the quantity back to D&C Manager.

Special Requirements:

None

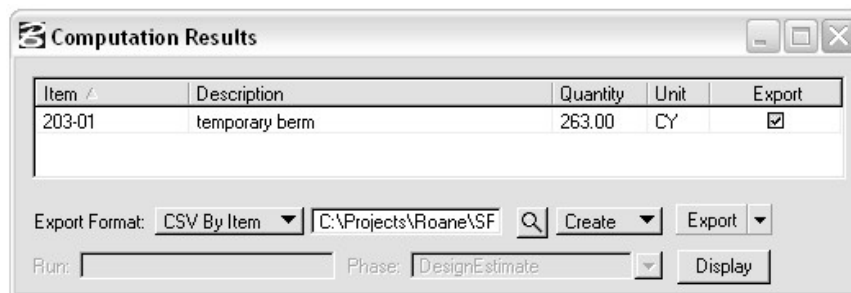
Usage:

- 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.



A small dialog box titled "Prompt" with a text input field containing "7.500000" and two buttons labeled "OK" and "Cancel". The text above the input field reads "Enter Earth Berm Cross Section Area in Square Feet:".

- 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.



A dialog box titled "Computation Results" containing a table with the following data:

Item	Description	Quantity	Unit	Export
203-01	temporary berm	263.00	CY	<input checked="" type="checkbox"/>

Below the table are controls for "Export Format" (set to "CSV By Item"), a file path "C:\Projects\Roane\SF", and buttons for "Create", "Export", "Run", "Phase" (set to "DesignEstimate"), and "Display".

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 > EPSC Items > 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 > EPSC Items > 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 > EPSC Items > 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 > EPSC Items > 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 > EPSC Items > 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", 12" & 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", 12" & 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 Channelization

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", 12" & 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 Channelization

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.

Snowplowable Pavement Markers Computation

D&C location: Pay Items > Pavement Marking > 716-01.21, 716-01.22, 716-01.23

Geopak 3PC Program: SnowPlwPvmtMarkers_Computation.x

Description:

This application reads a D&C Manager set & then counts the specified snowplowable pavement marker cells and reports the quantity back to D&C Manager.

This includes snowplowable pavement marker cells at center (cell name: PVMRKC), to the left (cell name: PVMRKL) or to the right (cell name: PVMRKR) of pavement stripes.

Special Requirements:

Cells must be separated by type using fence, selection set or other means to avoid double counting.

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 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 > 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**.



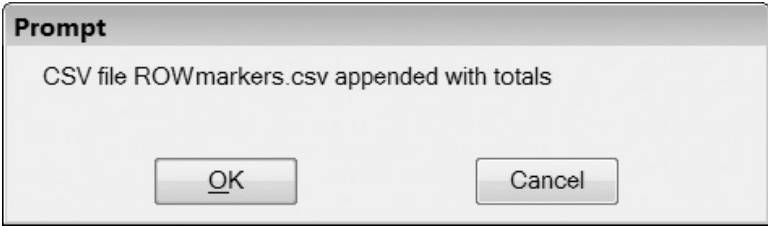
Prompt

Keyin Sheet No.

4

OK Cancel

- 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.



Prompt

CSV file ROWmarkers.csv appended with totals

OK Cancel

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	E	F	G	H	I	J	K	L	M	N
1	4	8	0	0										
2	5	12	2	2										
3	6	10	0	1										
4	7	12	1	2										
5	8	18	2	0										
6	9	8	0	2										
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
21														
22														
23														
24														
25														

Using the CSV file:

Open your project's estimated roadway quantities Excel file to the main work sheets with macro buttons. Click **Insert CSV**, identify **ROWmarkers.csv**, click on your R.O.W. markers tabulation worksheet (use Insert to add this worksheet if needed) and click the first field of the block to add the data.

Manual Method:

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 and choose **Paste Special & Values** to paste the data into the block.

R.O.W. MARKERS				
SHEET NO.	"A"	"B"	"C"	TOTALS
4	8	0	0	8
5	12	2	2	16
6	10	0	1	11
7	12	1	2	15
8	18	2	0	20
9	8	0	2	10
TOTALS	68	5	7	80

ROW Markers Computation

D&C location: Pay Items > 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 names: TVP & TVPOLT) 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.