Contents

Introduction

Drafting existing drainage information for catch basins, manholes, inlets, and drainage pipes on ODOT plans can be a time consuming process, particularly on the profile and cross sections.

The drainage information is typically taken from an old plan or from field collected survey data. To complicate matters, several different methods have been used by ODOT's survey personnel to collect the drainage information.

In an effort to standardize field data collection techniques used by ODOT personnel, and to present the information to ODOT's designers in a consistent manner which will better facilitate the task of drafting this information on the profile and cross sections, ODOT has developed the following VBA applications briefly summarized below:

Application Name:	ODOT_DrainagePlan1.mvba
Current version:	11.04.15
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to store COGO points representing the drainage structures (catch basins, manholes, and inlets) and the information for the drainage pipes terminating within the structure.

Application Name:	ODOT_EXDrainageAttributeChecker.mvba
Current version:	11.04.15
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to review the COGO points to ensure the correct format for the pipe attributes.

Application Name:	ODOT_DrainagePlan2.mvba
Current version:	11.04.15
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to read drainage structure points stored in a GEOPAK Coordinate Geometry database (.gpk file) and draft the plan view representation of the pipes in a MicroStation design file.

Application Name:	ODOT_DrainagePlan3.mvba
Current version:	11.04.15
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to annotate pipes drawn in the plan view with ODOT_DrainagePlan2.mvba.

Application Name:	ODOT_ExDrainageHeadwalls.mvba
Current version:	11.01.21
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to place headwalls cells.

Application Name:	ODOT_DrainageProfile1.mvba
Current version:	11.04.15
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to read drainage structure information from the .gpk file in order to draw the structures in the profile.

Application Name:	ODOT_DrainageProfile2.mvba
Current version:	11.04.15
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to draw the pipes in the profile.

Application Name:	ODOT_DrainageXS1.mvba
Current version:	11.04.15
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to read drainage structure information from the .gpk file in order to draw the structures on the cross sections in a MicroStation design file.

Application Name:	ODOT_DrainageXS2.mvba
Current version:	12.01.20
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to draw the pipes on the cross sections in a MicroStation design file at the location of the drainage structures.

Application Name:	ODOT_DrainageXS3.mvba
Current version:	12.01.20
Required MicroStation Version:	MicroStation V8i
Required GEOPAK Version:	GEOPAK V8i
Description	This application is used to draw pipes in the cross sections between the drainage structure locations.

In order to use the programs listed above, the drainage information must be stored in the COGO database in a consistent manner regardless of whether the data is entered in the Office from an old plan or surveyed in the field.

This document will detail each of the applications listed above, as well as the field procedures that must be followed by ODOT's Survey personnel to use these programs. These applications were developed specifically to support existing drainage features using the field codes defined in ODOT's GEOPAK Survey Manager Database (ODOT.smd).

1.0 Process Overview
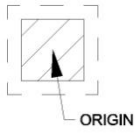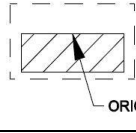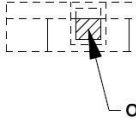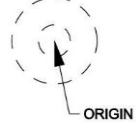
In order to use the ODOT drainage applications, each drainage structure must be stored as a point in the GEOPAK Coordinate Geometry database (.gpk file). These points can be stored by processing survey data with GEOPAK Survey or by storing COGO points using COGO commands or by use of the **ODOT_DrainagePlan1.mvba** application.

GEOPAK Survey
COGO Commands ⟶ COGO Points ⟶ ODOT Drainage Applications
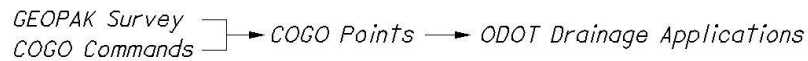
Each point must be stored using a Feature from the ODOT Survey Manager Database file (ODOT.smd) and tagged with information defining the drainage pipes that terminate within the structure.

1.1 Field Use Feature Codes for Existing Drainage Structures

The ODOT Survey Manager Database file, **ODOT.smd**, contains several "generic" feature codes for drainage structures as detailed in the table below.

Code Name	Description	Cell	Attributes	Shoot…
CBS	Catch Basin Square	CB22B-X	P1, P2, P3, P4, P5, N5	The top center of the catch basin grate.
CBR	Catch Basin Round	CB7-X	P1, P2, P3, P4, P5, N5	The top center of the catch basin grate.
CI	Curb Inlet	CB3-X	P1, P2, P3, P4, P5, N5	The top of the catch basin grate at the face of the curb.
MI	Median Inlet	I-D-SS-X	P1, P2, P3, P4, P5, N5	The top center of the inlet grate.
SSMH	Sanitary Sewer Manhole	MH1D-X-SAN	P1, P2, P3, P4, P5, N5	The top center of the manhole.
STMH	Storm Sewer Manhole	MH1D-X	P1, P2, P3, P4, P5, N5	The top center of the manhole.

Each field code representing a drainage structure has six attributes assigned. Attributes P1, P2, P3, P4, and P5 are used to define up to five (5) drainage pipes terminating within the drainage structure. Regardless of whether the attribute data is entered in the field or in the office, the format for the drainage pipe information must be entered in the following format:

dip-size-material-dir

Where:

dip	=	A numeric value representing the depth of the pipe flow line as measured from the drainage structure grate. The *dip* measurement is subtracted from the elevation of the COGO Point to determine the flow elevation of each pipe. Values less than 200 are assumed to represent the *dip* measurement. Values 200 or greater are assumed to represent the actual elevation of the pipe.
size	=	The size of the pipe in inches. Elliptical pipes are supported in rise x span format.
material	=	The material of the pipe (CONC, CMP, etc.). If the material is unknown, a value of "X" should be entered.
dir	=	The direction of the pipe as it emanates away fro the structure (NE, S, etc.). 2-character max.

Examples using a *dip* measurement:

> 7.0-12-CONC-N
> 5.5-24x36-CONC-SW

Examples using an elevation instead of a *dip* value:

> 995.63-12-CMP-N
> 752.50-24x36-RCP-NE

Note that each parameter is separated by a dash.

When the point is stored, the pipe information is stored as the **Description** for the COGO point.

Important! The VBA applications described in this document assume that pipe information is stored using the format described above. Any deviation from the format described above will yield unpredictable results.

The attribute N5 is used to store a note with the structure. There are no special format requirements for the contents of the note.

Not every pipe terminates within a drainage structure. Inlet and outlet pipes begin or end outside of a structure. In some cases the surveyor may encounter a case where they cannot find the other end of a pipe emanating from a given drainage structure. The following field codes have been established for these conditions:

| Code Name	Description	Cell	Attributes	Shoot…
FDO	For Direction Only	NA	What?	This code is used when the second end of the pipe can not be located to take a shot in the approximate direction of the pipe.
PIO	Pipe Inlet or outlet	NA	P1	The invert of the pipe.

The **FDO** field code can be used to identify the direction of any utility line, not just drainage pipes. When using this code for a drainage pipe, the attribute is ignored.

The **PIO** field code has one attribute, P1, for the pipe data. The format of the data is the same as it is for the drainage structure codes. If the rod is located at the invert, a dip value of zero should be entered. If the rod is located at the top of the pipe, a dip value equal to the pipe diameter in feet should be entered.

1.2 Drainage Cells

The cells placed for the various feature codes listed in section 1.2 are contained in the OCOT cell library **ODOT_Drainage.cel**. These cells were originally developed for use with GEOPAK Drainage. At this time, ODOT is not supporting GEOPAK drainage; however we have elected to use the cells in our CADD Standards.

Each cell representing a catch basin, manhole, or inlet in **ODOT_Drainage.cel** has several "nodes" used by GEOPAK Drainage to as connection points for pipes and as orientation points for the cell. The ODOT VBA application **ODOT_DrainagePlan2.mvba**, described in Section 3 of this document, uses these nodes to connect pipes from one structure to another. The figure below illustrates the four connection nodes for the cell CB22B-X which is placed by the CBS (Catch Basin Square) feature code.
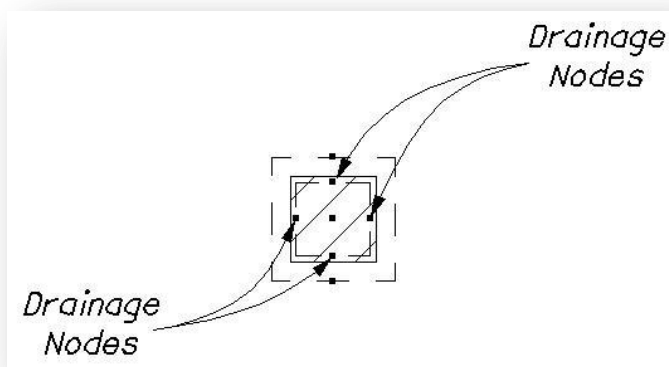

When the pipes are drawn using the ODOT VBA application **ODOT_DrainagePlan2.mvba**, the pipes are connected from node to node as shown in the example below.
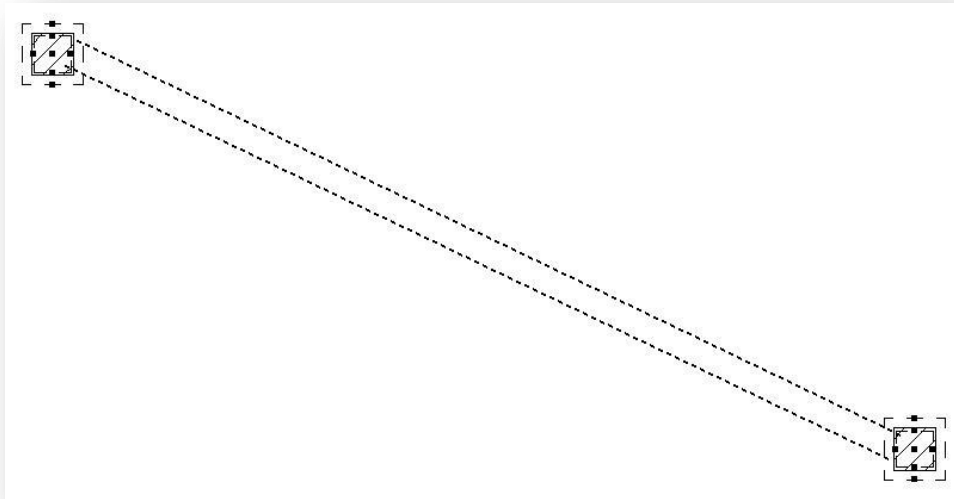
The following cells/feature codes each have four connection nodes:

Feature Code Name	Description	Cell
CBS	Catch Basin Square	CB22B-X
CBR	Catch Basin Round	CB7-X
CI	Curb Inlet	CB3-X
MI	Median Inlet	I-D-SS-X

The cells used for manholes do not use four nodes. Rather, these cells use a circle as the "node" so that pipes connecting to a manhole can emanate from the manhole in any direction as shown below.
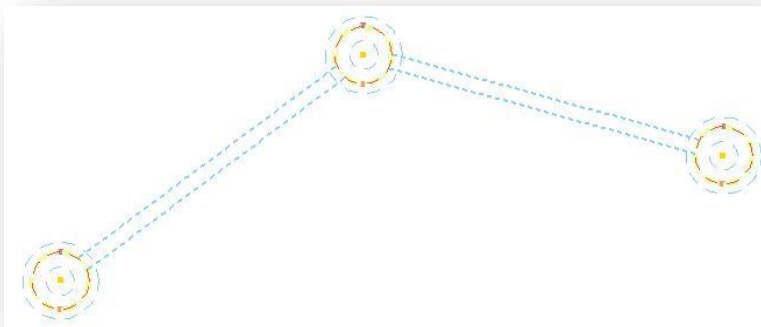

The following cells/feature codes use a circle for the connection node:

Feature Code Name	Description	Cell
SSMH	Sanitary Sewer Manhole	MH1D-X-SAN
STMH	Storm Sewer Manhole	MH1D-X

1.3 Rotating Point Symbols Prior to Drawing the Pipes

When the drainage features are processed using GEOPAK Survey, the cells are all placed at a zero degree rotation. In some cases, the user may wish to orient the cell relative to the existing roadway before using the ODOT **ODOT_DrainagePlan2.mvba** application to draw the pipes between the structures.

GEOPAK Survey provides a tool to rotate a selection set of cells relative to a selected GEOPAK Chain or a MicroStation element. Select **Plans Preparation > Rotate Point Symbols** from the GEOPAK Survey menu bar as shown below to access the *Rotate Point Symbols* dialog box.
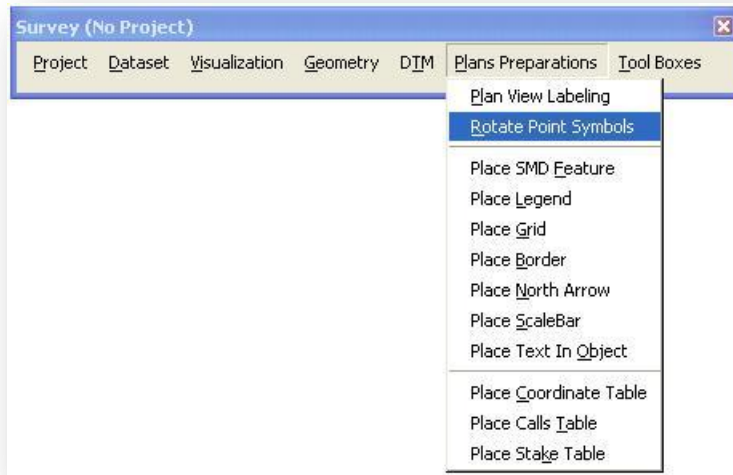
The **Baseline** option is used to select the **MS Element** or **Chain** that will be used as the basis for the cell rotation. When the **GEOPAK Chain** option is selected, the user must pick the **Job** number and the **Chain** as shown in the example below.

When the cells are rotated, five **Rotation** options are provided to control the orientation of the cell relative to the **MS Element** or **GEOPAK Chain**. The options are shown below.
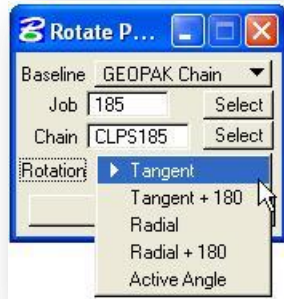

This tool requires that you use the MicroStation **Selection tool**, or **Power Selector**, to select the elements that you wish to rotate. Once the desired elements are selected, pressing the **Start** button will initiate the process. Two examples are given on the following pages.

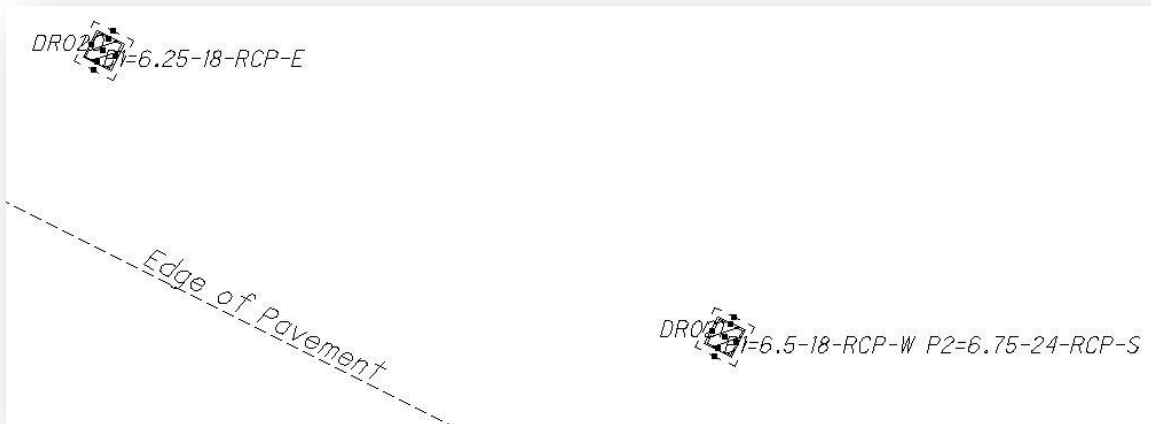**Example 1: Rotating Catch Basin cells relative to a MS Element**

In the example below, the catch basins (Feature = CBS, Cell = CB22B-X) were mapped by GEOPAK Survey at a zero degree rotation. The catch basins need to be rotated relative to the edge of pavement for the completed plans.
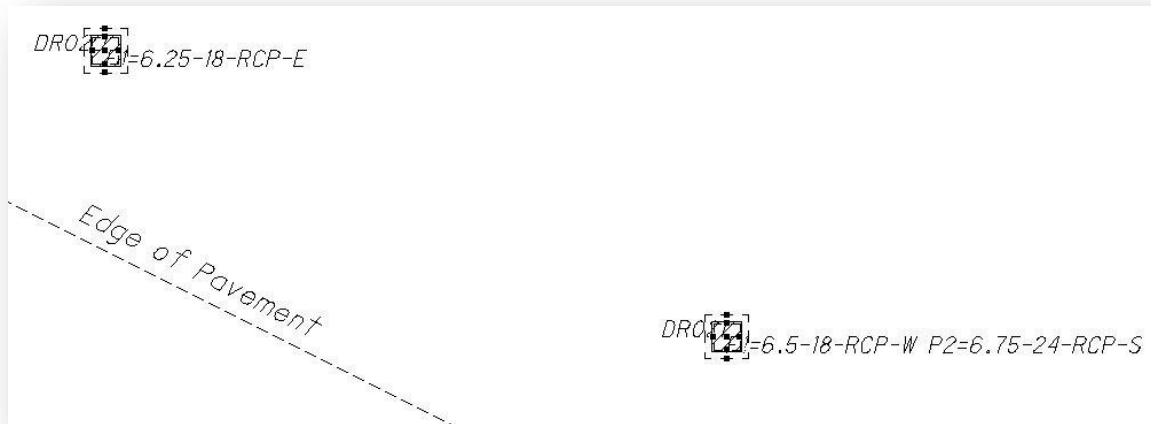
The following steps are used to rotate the cells for the catch basins.

- Use the MicroStation **Power Selector** to add the cells to a selection set.

- Once the desired cells are selected, select the **Start** button to initiate the process. MicroStation will prompt you to select the **Baseline Element**.

- Select the **MS Element** you wish to use as the basis for the cell rotation. Issue another Data Point to accept the reference element. You will be prompted in the lower left to **Accept/Reject Rotation Of Point Symbols**. Issue another data point to accept the rotation.

In the example below, the edge of pavement was used as the **MS Element** with the **Rotation** option set to **Tangent**.

Example 2: Rotating Inlet cells relative to a MS Element

In the example below, the curb inlets (Feature = CI, Cell = CB3-X) were mapped by GEOPAK Survey at a zero degree rotation. The inlets need to be rotated relative to the edge of pavement for the completed plans.
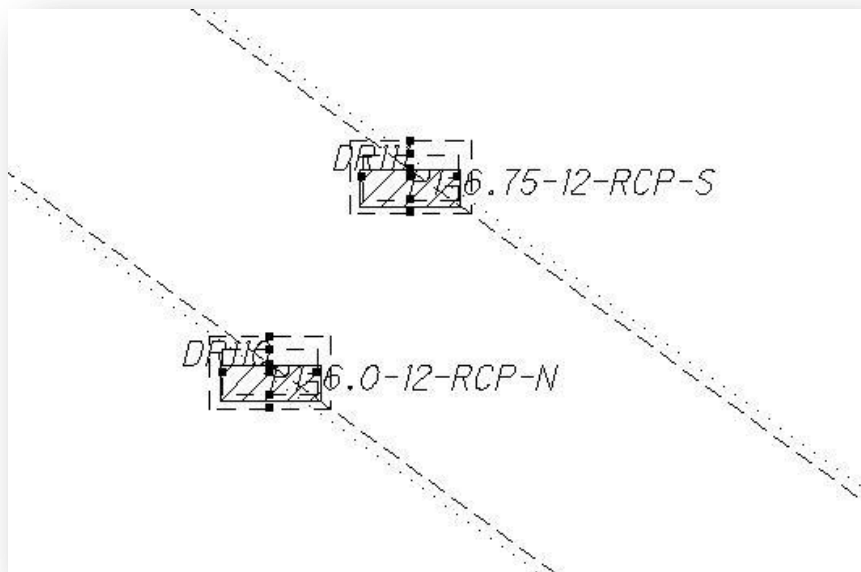
Rotating curb inlets is a little different than rotating catch basins. The grate of the cell should be inside the pavement. Rotating both cells in the example above relative to the edge of pavement will result in the grate for the cells on one side of the pavement falling on the wrong side of the curb. For this reason, it is necessary to rotate the inlet cells on each side of the roadway separately. The following steps are used to rotate the cells for the median inlets.

- Use the MicroStation **Power Selector** to add the cells on one side of the roadway to a selection set.

- Once the desired cells are selected, select the **Start** button to initiate the process. MicroStation will prompt you to select the **Baseline** element.

- Select the **MS Element** you wish to use as the basis for the cell rotation. Issue another Data Point to accept the reference element. You will be prompted to **Accept/Reject Rotation Of Point Symbols** and the rotation will be displayed as shown below.
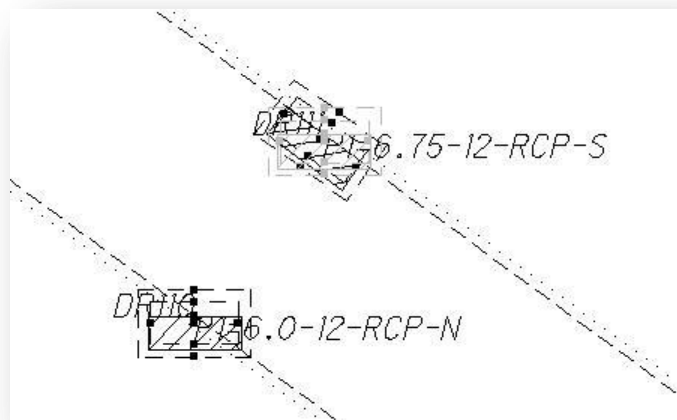
- Issue a Data Point to accept the rotation.

- Repeat the procedure to rotate curb inlets on the other side of the road. The only difference is that the **Rotation** option will be set to **Tangent +180** as shown on the following page.
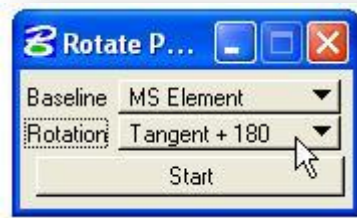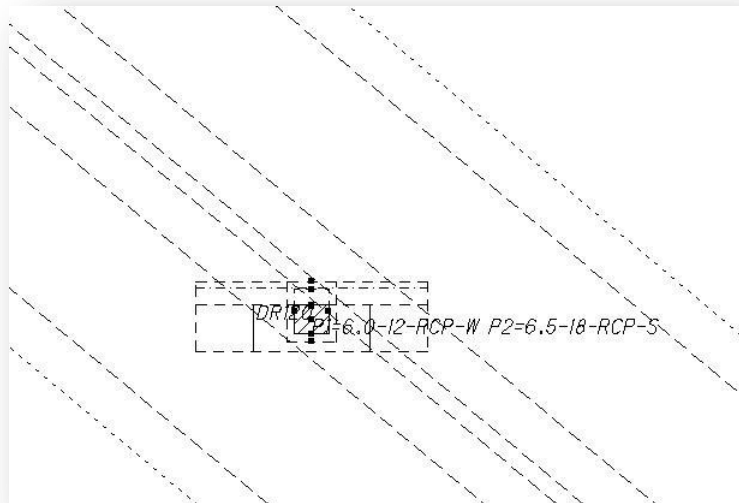

After the inlets on both sides of the road are rotated, they should appear as shown in the example below.
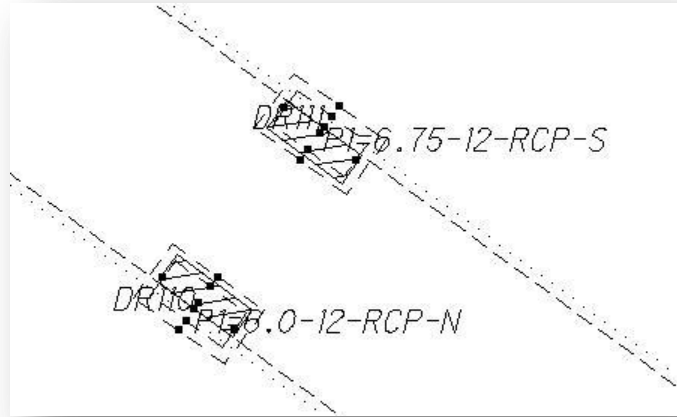
Example 3: Rotating Median Inlet cells relative to a MS Element

The example below shows a Median Inlet (Feature = MI, Cell = I-D-SS-X) as it was mapped by GEOPAK Survey at a rotation of zero degrees.

Follow the same steps detailed in the previous examples to select and rotate the elements.

After the cell for the median inlet is rotated, it should appear similar to the example shown below. The example below was rotated using the **Tangent** option and the edge of pavement line for the **MS Element**. Median Inlets may need to be rotated using the **Tangent +180** option depending on which side of the road the grate is located on.
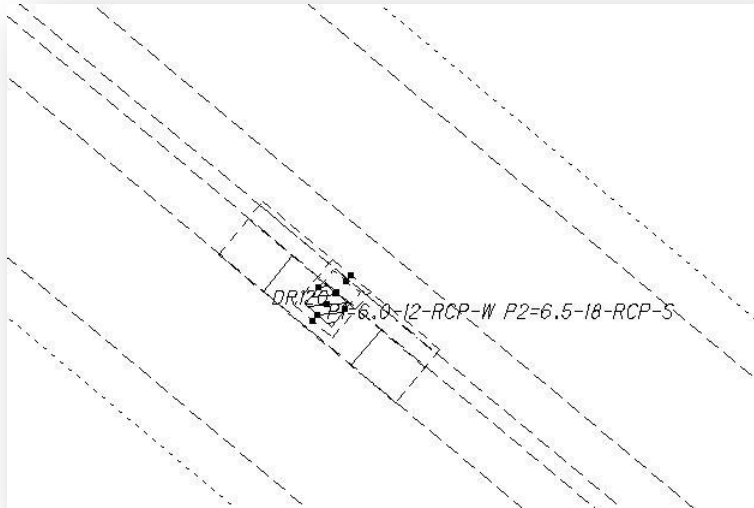
Example 4: Rotating cells relative to a GEOPAK Chain

The example below shows a sanitary sewer manhole (Feature = SSMH, Cell = MH1D-X-SAN) that was mapped by GEOPAK Survey at a zero degree rotation.
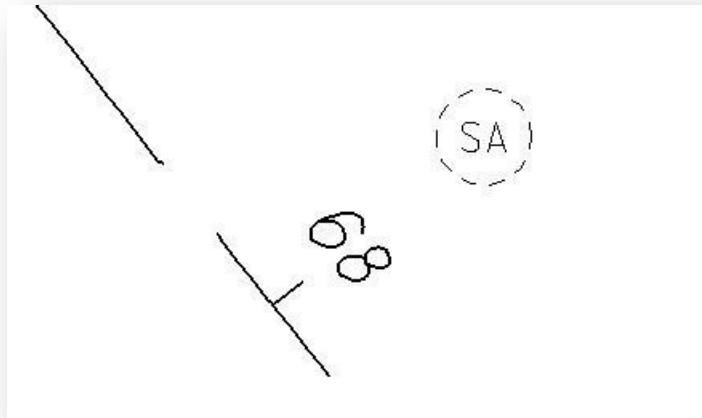
The example below shows the manhole after it has been rotated relative to a GEOPAK Chain. The following steps were taken to rotate the cells:

- Add the desired cells to a MicroStation Selection Set
- Select the **Job**, **Chain**, and **Rotation** options to rotate the cells
- Select the **Start** button. You are prompted to **Accept/Reject Rotation Of Points** in the lower left portion of the MicroStation window.
- Issue a data point to accept the rotation.
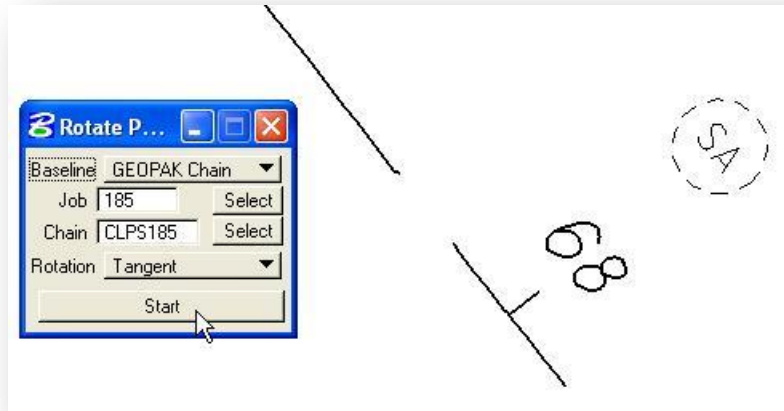
1.4 Re-visualizing or Re-mapping Rotated Points

If you re-visualize points that have been rotated, they will default back to the original rotation at zero degrees depending on the current User Preferences within GEOPAK.
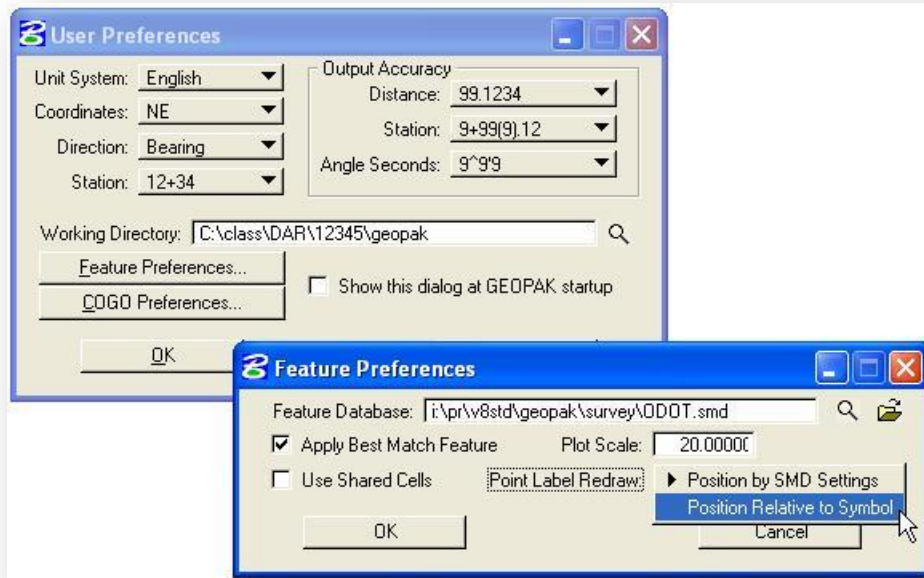
If you are using GEOPAK Road, select **Applications > GEOPAK Road > User Preferences**, and then select the **Feature Preferences** button as shown below.


The **Point Label Redraw** option is used to set how points will be drawn if they are re-visualized using GEOPAK COGO Visualization. Select the **Position Relative to Symbol** option for the points to retain their rotation is you re-visualize the data.

Note: If the points are deleted and visualized, they will return to the original rotation. This option is only useful if the points are not deleted first and are being re-visualized. Also note that visualizing the data in a new design file will result in the points retaining their original rotation.

Note: Changing the preferences by selecting **Applications > GEOPAK Road > User Preferences** is only changing your current setting and the change will not be saved with a GEOPAK Project. If you are using the GEOPAK Road Project Manager, select **Projects > Edit** from the *Project Manager* dialog as shown at right to edit the setting and retain the edited value with the project. The *Project Info Edit* dialog shown on the next page is opened.
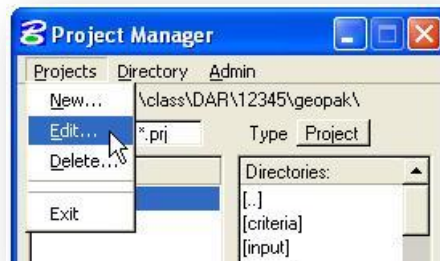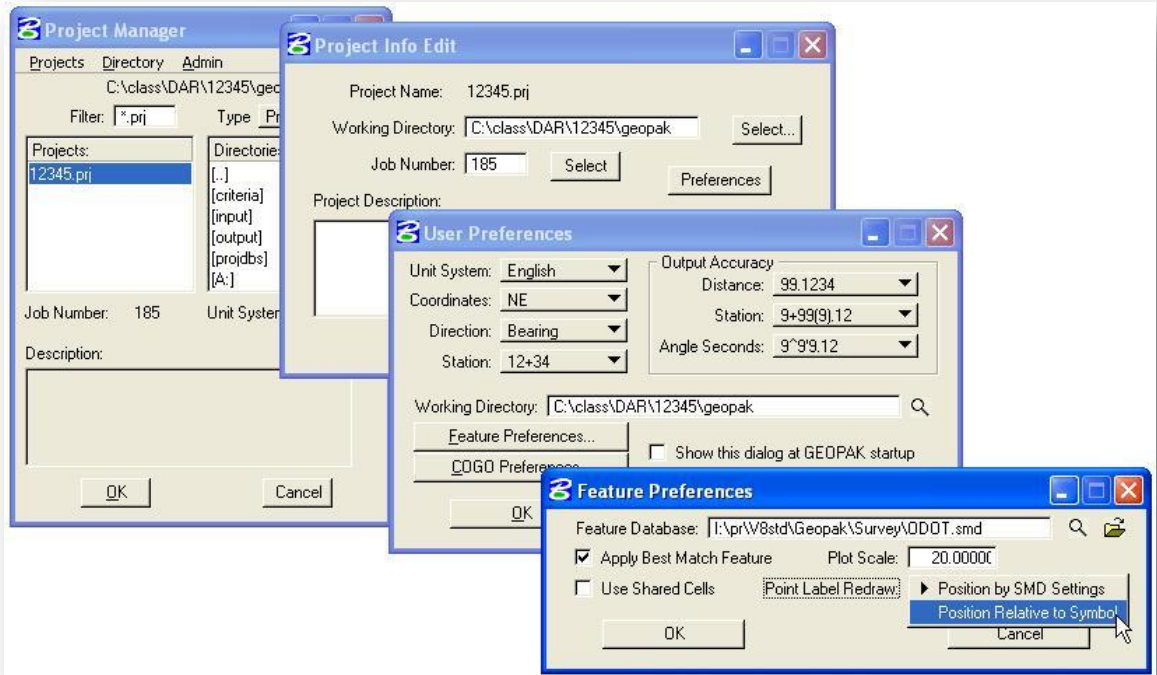
From the *Project Info Edit* dialog, select the **Preferences** button to access the *User Preferences* dialog shown above.

From the *User Preferences* dialog select **Feature Preferences** to access the *Feature Preferences* dialog. Change the **Point Label Redraw** option to **Rotation Relative to Symbol** as shown above.

If you are using GEOPAK Survey, select **Project > Preferences** from the Survey menu bar to access the dialog shown below. The **Point Label Re-Mapping** option should be set to **Position relative to symbol** as show below.
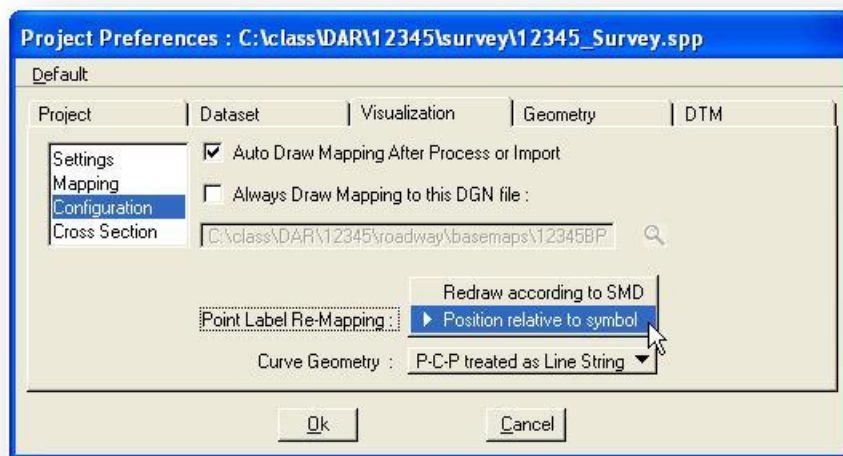
1.5 "Office Use" SMD Codes

With the October 15, 2010 DRRC update, several new "Office Use" codes were added to the **ODOT.smd** file. These codes can be used in one of two ways as summarized below:

1. Drainage data collected in the field using one of the "generic" field codes (see Section 1.1 of this guide) can be edited in the office to change the feature code to one of the codes listed in the tables below. The drainage attributes will be retained, but the cell will be changed to the cell listed in the tables below.
2. Drainage structures stored by use of ODOT_DraiangePlan1.mvba can be placed using any of the codes listed in the tables below. See section 2.0 of this guide for more information.

The following "Office Use" codes are available:

Code Name	Description	Cell
CB-2-2A		CB22A-X
CB-2-2B		CB22B-X
CB-2-3		CB23-X
CB-2-4		CB24-X
CB-2-5		CB25-X
CB-2-6		CB26-X
CB-3		CB3-X
CB-3A		CB3A-X
CB-4		CB4-X
CB-4A		CB4A-X
CB-4A-42	For 42" Pipe	CB4A-42-X
CB-4A-48	For 48" Pipe	CB4A-48-X
CB-4A-54	For 54" Pipe	CB4A-54-X
CB-4A-60	For 60" Pipe	CB4A-60-X
CB-4A-66	For 66" Pipe	CB4A-66-X
CB-4A-72	For 72" Pipe	CB4A-72-X
CB-5		CB5-X
CB-5A		CB5A-X
CB-5A-42	For 42" Pipe	CB5A-42-X
CB-5A-48	For 48" Pipe	CB5A-48-X
CB-5A-54	For 54" Pipe	CB5A-54-X
CB-5A-60	For 60" Pipe	CB5A-60-X
CB-5A-66	For 66" Pipe	CB5A-66-X
CB-5A-72	For 72" Pipe	CB5A-72-X
CB-6		CB6-X
CB-7		CB7-X
CB-8		CB8-X
CB-8A		CB8A-X
CB-8A-42	For 42" Pipe	CB8A-42-X
CB-8A-48	For 48" Pipe	CB8A-48-X
CB-8A-54	For 54" Pipe	CB8A-54-X
CB-8A-60	For 60" Pipe	CB8A-60-X
CB-8A-66	For 66" Pipe	CB8A-66-X
CB-8A-72	For 72" Pipe	CB8A-72-X

Code Name	Description	Cell
MH-1	Storm MH No. 1	MH1D-X
MH-1-SAN	Sanitary MH No. 1	MH1D-X-SAN
MH-3-48	Storm MH No. 3, 48" Diameter	MH3-48D-X
MH-3-60	Storm MH No. 3, 60" Diameter	MH3-60D-X
MH-3-72	Storm MH No. 3, 72" Diameter	MH3-72D-X
MH-3-84	Storm MH No. 3, 84" Diameter	MH3-84D-X
MH-3-90	Storm MH No. 3, 90" Diameter	MH3-90D-X
MH-3-96	Storm MH No. 3, 96" Diameter	MH3-96D-X
MH-3-108	Storm MH No. 3, 108" Diameter	MH3-108D-X
MH-4-72	Storm MH No. 4, 72" Diameter	MH4-72D-X
MH-4-84	Storm MH No. 4, 84" Diameter	MH4-84D-X
MH-4-90	Storm MH No. 4, 90" Diameter	MH4-90D-X
MH-4-96	Storm MH No. 4, 96" Diameter	MH4-96D-X
MH-4-102	Storm MH No. 4, 102" Diameter	MH4-102D-X
MH-4-108	Storm MH No. 4, 108" Diameter	MH4-108D-X
MH-4-114	Storm MH No. 4, 114" Diameter	MH4-114D-X
MH-4-120	Storm MH No. 4, 120" Diameter	MH4-120D-X
MH-4-126	Storm MH No. 4, 126" Diameter	MH4-126D-X
MH-4-132	Storm MH No. 4, 132" Diameter	MH4-132D-X
MH-4-144	Storm MH No. 4, 144" Diameter	MH4-144D-X

Code Name	Description	Cell
I-D-JS	Jersey Barrier Inlet, Type D	I-D-JS-X
I-D-SS	Single Slope Barrier Inlet, Type D	I-D-SS-X
I-2-6	Median Inlet No 2, 6'	I26-X
I-2-8	Median Inlet No 2, 8'	I28-X
I-2-10	Median Inlet No 2, 10'	I210-X
I-2-12	Median Inlet No 2, 12'	I212-X
I-2-14	Median Inlet No 2, 14'	I214-X
I-2-16	Median Inlet No 2, 16'	I216-X
I-2-18	Median Inlet No 2, 18'	I218-X
I-2-20	Median Inlet No 2, 20'	I220-X
I-2A-6	Median Inlet No 3, 6'	I2A6-X
I-2A-8	Median Inlet No 3, 8'	I2A8-X
I-2A-10	Median Inlet No 3, 10'	I2A10-X
I-2A-12	Median Inlet No 3, 12'	I2A12-X
I-2A-14	Median Inlet No 3, 14'	I2A14-X
I-2A-16	Median Inlet No 3, 16'	I2A16-X
I-2A-18	Median Inlet No 3, 18'	I2A18-X
I-2A-20	Median Inlet No 3, 20'	I2A20-X
I-3A-JS	Jersey Barrier Median Inlet 3A or 3A50	I3A-JS-X
I-3B-JS	Jersey Barrier Median Inlet 3B or 3B50	I3B-JS-X
I-3C-JS	Jersey Barrier Median Inlet 3C or 3C50	I3C-JS-X
I-3D-JS	Jersey Barrier Median Inlet 3D or 3D50	I3D-JS-X
I-915	Single Slope Barrier, Median Inlet 915, A or B	I915-X
I-915-2	Single Slope Barrier, Median Inlet 915-2, A or B	I915-2-X
I-915-C	Single Slope Barrier, Median Inlet 915, C	I915C-X
I-915-C1	Single Slope Barrier, Median Inlet 915, C1	I915C1-X

The GEOPAK COGO Navigator can be used to edit the Feature Code as shown in the example below.
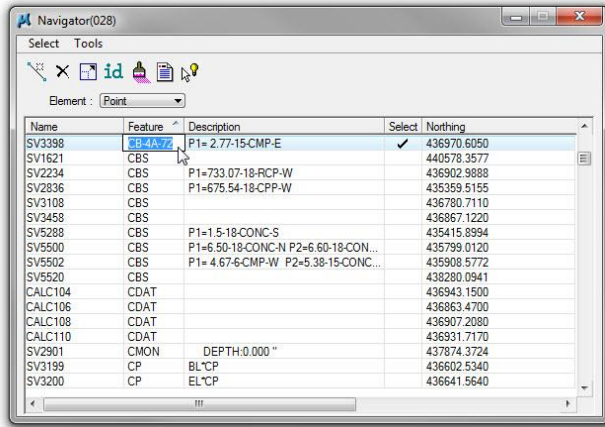
Notes:

- Pipe attributes assigned to the COGO point will be retained if the code is changed.

- The cell for the drainage structure will be redrawn using the cell assigned to the new feature code.

2.0 ODOT_DrainagePlan1.mvba

The ODOT MicroStation Visual Basic Application **ODOT_DrainagePlan1.mvba** has been developed to assist users with the task of storing COGO points representing existing drainage structures (catch basins, manholes, inlets, etc.) with the information defining the pipes that terminate within the structure.

The Application is available from the MicroStation pull-down menu by selecting **ODOT > Drainage Apps > Existing > Plan View – Store Points**. The application can also be loaded using the following MicroStation key-in command:

> vba load ODOT_DrainagePlan1.mvba;vba run DrainagePointsMain

When the application is loaded, it will check to make sure GEOPAK COGO is active. If COGO is not running, the message shown below is displayed:
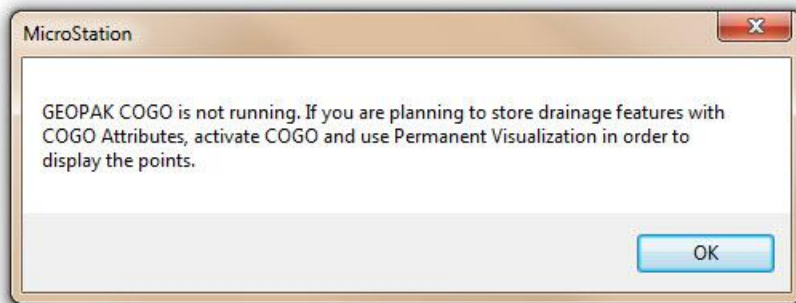
After selecting OK, the main dialog box for the application, shown below, is opened.
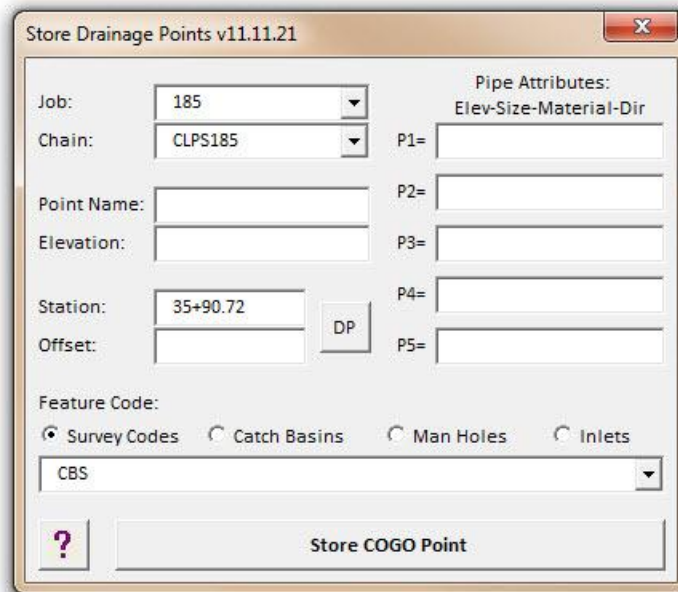
This application will allow users to easily store COGO points with all the attributes necessary to use the various ODOT Drainage Applications to draft the existing drainage information in the plan, profile, and cross section.

The various options on the *Store Drainage Points* dialog are described in the following pages.

Job

The **Job** menu is used to select the GEOPAK Coordinate Geometry database to store the points. The **Job** menu will list all of the .gpk files found in the current GEOPAK Working directory. If COGO is active when the application is loaded, the **Job** menu will contain only the currently active GPK file.

Chain

The **Chain** list box will list all the chains in the current GPK file. Select the **Chain** to be used to store the drainage items.

Point Name

The **Point Name** key-in field is used to specify the name for the COGO point that will be stored to represent the drainage feature.

Elevation

The **Elevation** key-in field is used to specify the grate elevation of the drainage structure.

Station

Key in the **Station**, relative to the selected **Chain**, to store the COGO point representing the drainage item.

Offset

Key in the **Offset**, relative to the selected **Chain**, to store the COGO point representing the drainage item. Negative values are used to store points to the left of the selected **Chain**.
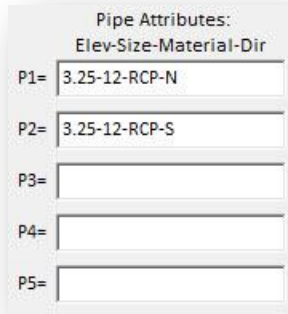
Feature

The **Feature** menu is used to select the GEOPAK Survey Field Code that will be used to control the visualization of the stored COGO point.
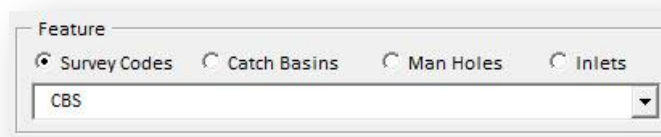
The features are contained in the Survey Manager Database, **ODOT.SMD**.

Pipe Attributes

The **Drainage Pipes** key-in fields are used to enter the information for each drainage pipe contained in the structure.

Up to five (5) pipes can be entered for each drainage structure. The format for the drainage pipe information must be entered in the following format:

Elev-Size-Material-Dir

Where:

Elev	=	A numeric value representing the elevation of the pipe invert or the depth of the pipe flow line as measured from the drainage structure grate (the *dip* measurement). The *dip* measurement is subtracted from the elevation of the COGO Point to determine the flow elevation of each pipe. Values less than 200 are assumed to represent the *dip* measurement. Values 200 or greater are assumed to represent the *Elev* of the pipe.
Size	=	The size of the pipe in inches. Elliptical pipes are supported in rise x span format.
Material	=	The material of the pipe (CONC, CMP, etc.). If the material is unknown, a value of "X" should be entered.
Dir	=	The direction of the pipe as it emanates away fro the structure (NE, S, etc.). 2-character max.

Examples using a *dip* measurement:
    7.0-12-CONC-N
    5.5-24x36-CONC-SW

Examples using an *Elev* value:
    995.63-12-CMP-N
   752.50-24x36-RCP-NE

Note that each parameter is separated by a dash.

When the point is stored, the pipe information is stored as the **Description** for the COGO point.

Important! The VBA applications described in this document assume that pipe information is stored using the format described above. Any deviation from the format described above will yield unpredictable results.

**Example: Storing Drainage Points from and old plan**

The example below shows the values used to store point DR001 at a specific Station and Offset value, with two drainage pipes contained within the structure.
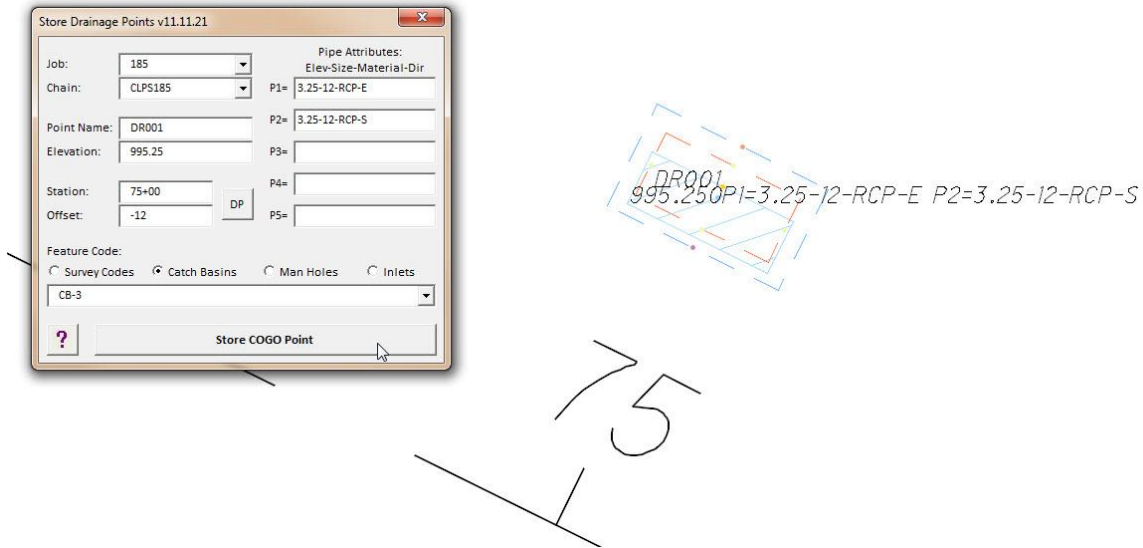

When the **Store COGO Point** button is selected, the application will check to see if the **Point Name** is already defined in the **.gpk** file specified by the **Job** menu. If the point already exists, the user will be prompted whether to overwrite the point.

The cell drawn for the drainage structure will automatically be rotated in relation to the centerline as shown in the example above. **Note:** If you re-visualize the point using GEOPAK COGO commands, the cell may be redrawn at a zero degree rotation depending on your settings. See section **1.4 Revisualizing or Remapping Rotated Points** for more information.

When the COGO point is stored, four COGO commands are processed to store the point and the attribute data as shown on the following page.
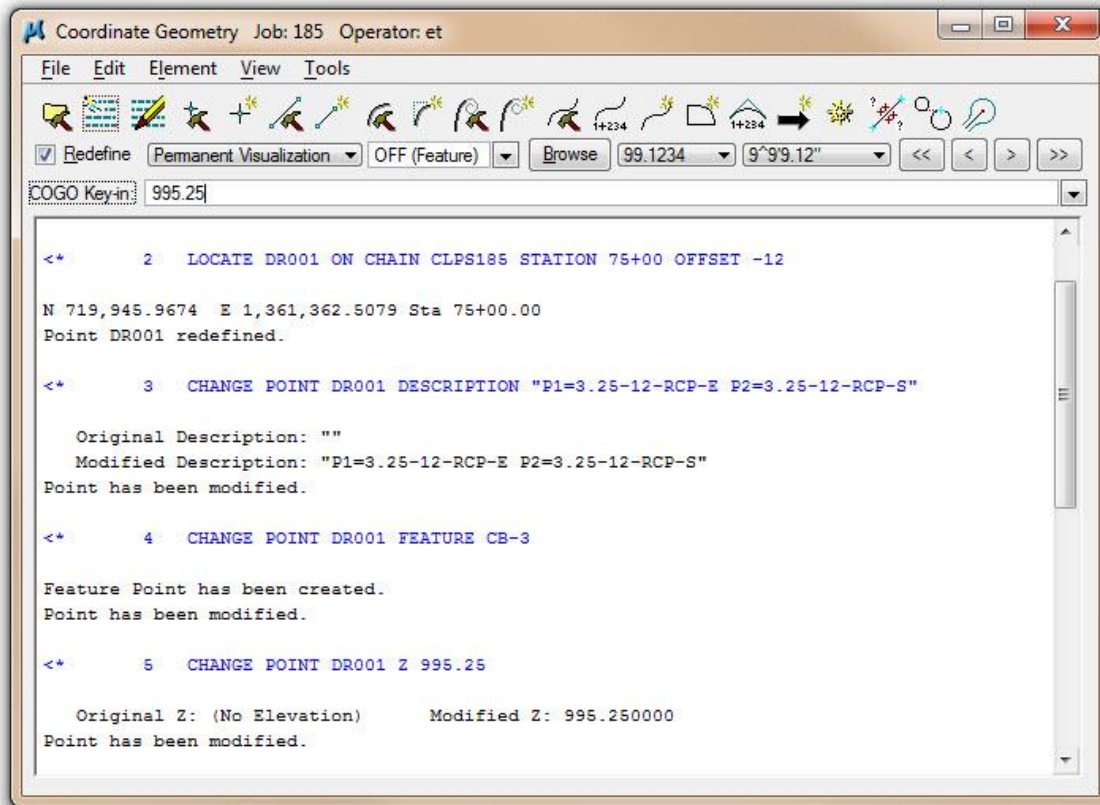
The attributes for the pipes are stored as the point Description. The COGO Navigator can be used to edit the attributes as shown in the example below.
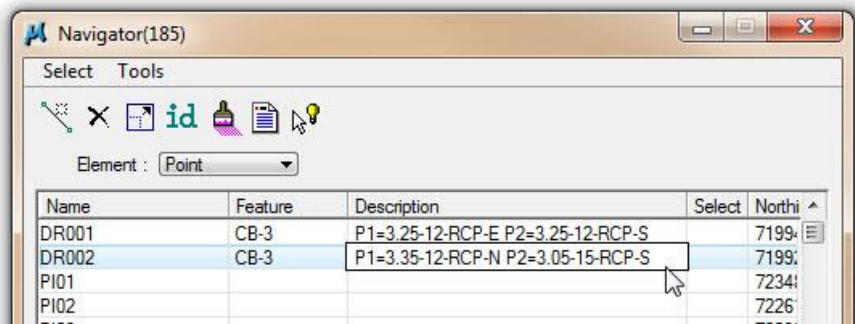
3.0 ODOT_ExDrainageAttributeChecker.mvba

The ODOT MicroStation Visual Basic Application **ODOT_ExDrainageAttributeChecker.mvba** is provided to review the COGO points stored for the drainage structures to ensure that the pipe attribute data has been entered in the correct format.

The Application is available from the MicroStation pull-down menu by selecting **ODOT > Drainage Apps > Existing > Plan View – Attribute Checker**.   The application can also be loaded using the following MicroStation key-in command:

> vba load ODOT_ExDrainageAttributeChecker.mvba;vba run AttributeCheckerMain

The dialog show below is opened:
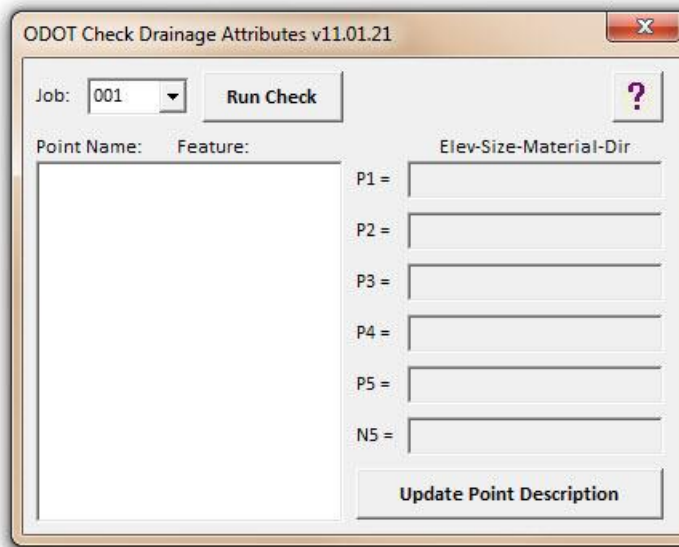
Job
The **Job** menu is used to select the GEOPAK Coordinate Geometry database that was used to store the drainage points. The **Job** menu will list all of the .gpk files found in the current GEOPAK Working directory.

Run Check
Select this command button to initiate the process. Drainage points an incorrect attribute format are displayed in the list as shown below.
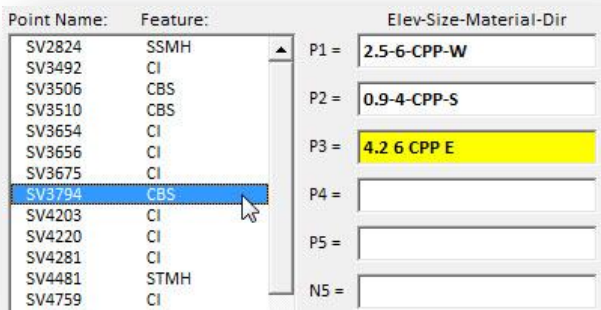
Select a point to view its attributes as shown in the example at left.

Incorrect attributes are highlighted in yellow as shown at left.

After correcting the attributes, select **Update Point Description** to apply the changes. The point is removed from the list after the update is applied.

4.0 ODOT_DrainagePlan2.mvba

The ODOT Visual Basic Application **ODOT_DrainagePlan2.mvba** is used to draw pipes between structures as well as inlet/outlet pipes. Use the following key-in command to run the application:
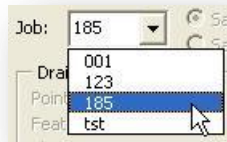
vba load ODOT_DrainagePlan2.mvba;vba run drainagePlanMain

The *Drainage Pipes* dialog shown below is opened.
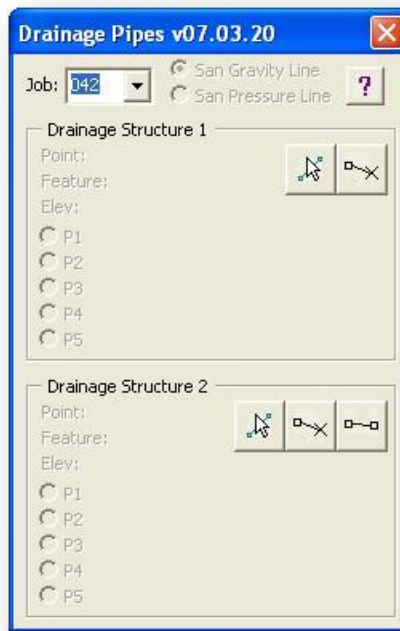
The various options on the *Drainage Pipes* dialog are described in the following pages.

Job

The **Job** menu, shown above, is used to select the GEOPAK Coordinate Geometry database to store the points. The **Job** menu will list all of the .gpk files found in the current GEOPAK Working directory.

Drainage Structure 1

Use the **Select Structure 1** icon to select the COGO point that will be used as **Drainage Structure 1**.

In the example below, COGO Point DR001 has been selected. The **Feature** and **Elevation** are displayed for the selected point. The elevation, size, material, and direction for each drainage pipe defined for the structure is displayed in the dialog as shown below.
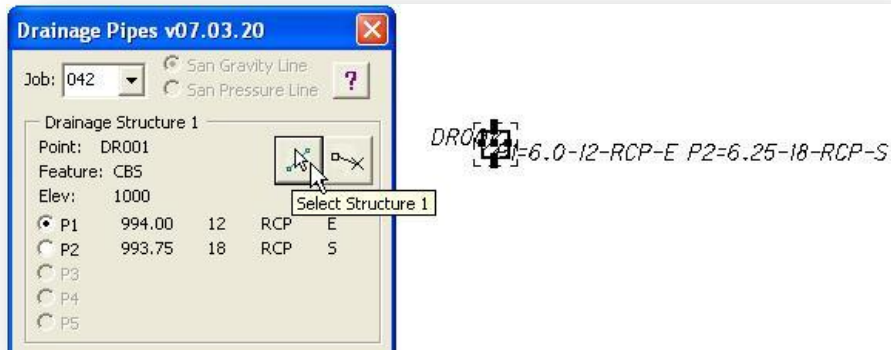

Note: Points stored using the FDO **Feature** cannot be selected as **Drainage Structure 1**. FDO points can only be selected as **Drainage Structure 2**.

Drainage Structure 2

Use the **Select Structure 2** icon to select the COGO point that will be used as **Drainage Structure 2**.

In the example below, COGO Point DR002 has been selected. The **Feature** and **Elevation** are displayed for the selected point. The elevation, size, material, and direction for each drainage pipe defined for the structure is displayed in the dialog as shown below.
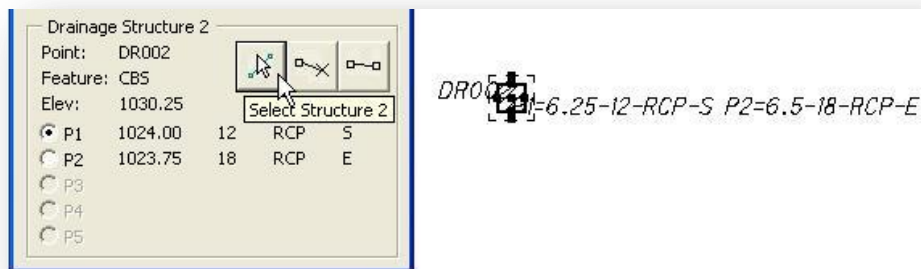
The elevation for each pipe is calculated by subtracting the *dip* value from the point elevation. For example, point DR002 was stored with an elevation of 1030.25 in the example above. The parameters for pipe P1 were defined are as follows:

> P1=6.25-12-RCP-S

The *dip* value of 6.25 is subtracted from the point elevation to determine the invert elevation of the pipe.

Drawing Drainage Pipes

The three icons are used to draw drainage pipes and label the pipe. Each icon is described on the following pages.

Draw from 1 to DP
Draw from 2 to DP
This command is used to draw a pipe from either **Drainage Structure 1** or **Drainage Structure 2** to a data point location specified by the user.

In cases where there are multiple pipes contained within the drainage structure, the user must first select which pipe is to be drawn as shown in the example below.
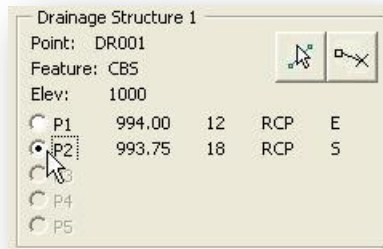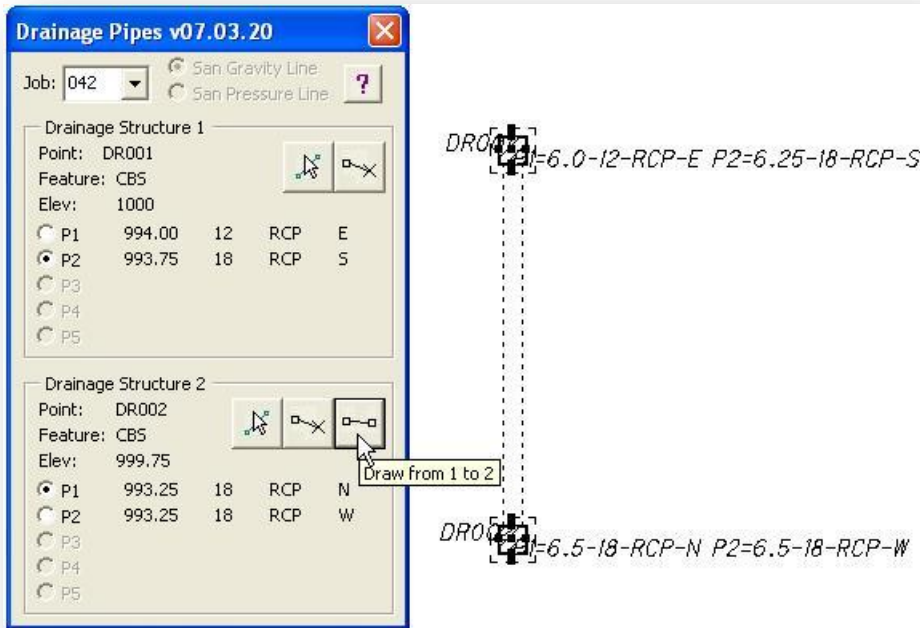

When the **Draw from 1 to DP** or **Draw from 2 to DP** icon is selected, the user is prompted to enter a data point for the pipe end point. After the point is entered, you are prompted to enter the elevation as shown below.
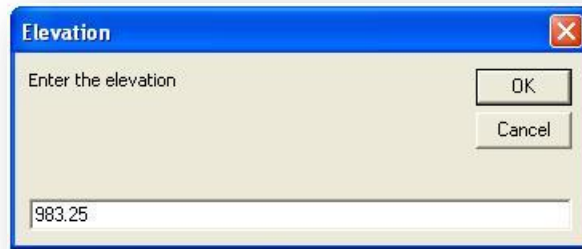

Draw from 1 to 2
This command is used to draw a drainage pipe from **Drainage Structure 1** to **Drainage Structure 2**.

**Example 1: Drawing a pipe between two structures**

Note: The user must select the pipe in each structure that is to be drawn between the structures. If unequal pipe sizes are selected, the user will be prompted whether to draw the pipe anyway. If you select **Yes**, the pipe size for the pipe selected in **Drainage Structure 1** will be used to draw the pipe.
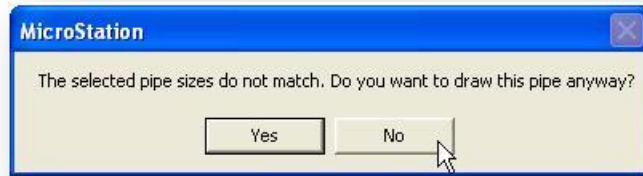
Example 2: Drawing a pipe from a structure to a FDO or PIO point
The feature PIO (Pipe Inlet/Outlet) is used to define a point representing the inlet or outlet location of a pipe. The feature FDO (For Direction Only) is used by survey personnel to take a shot representing the direction of a pipe when the other end of the pipe cannot be located in the field.
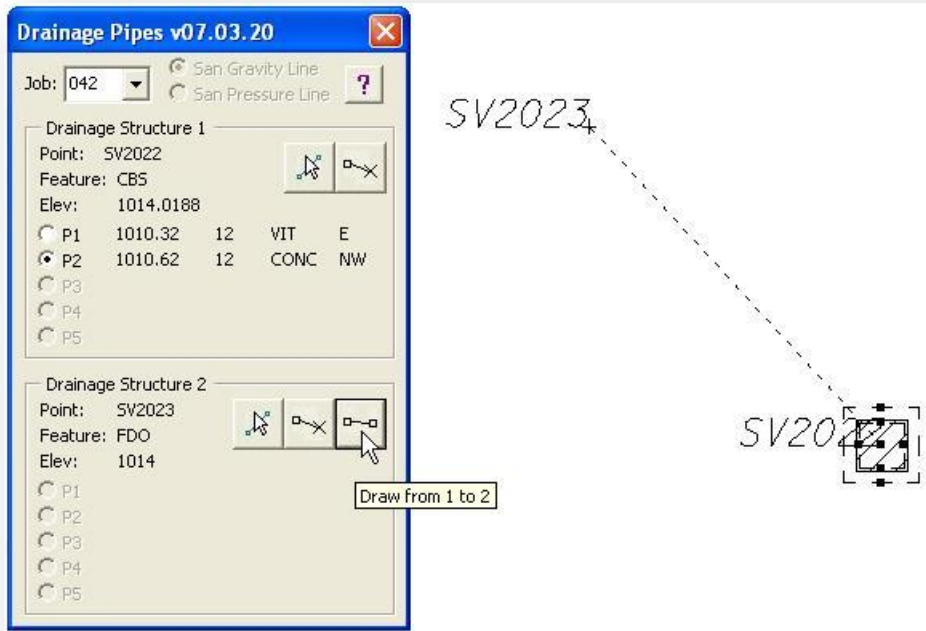
Example 3: Drawing a pipe from a PIO point to another PIO point
The end points of a pipe can also be drawn by selecting two PIO points as shown in the example below.
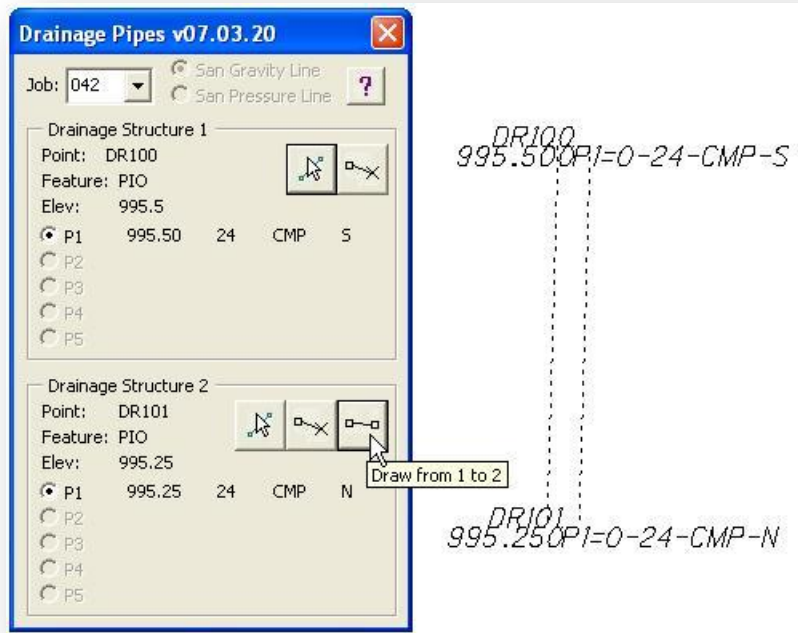
In this case, notice that each point was stored by taking a shot at the invert elevation of the pipe. The description is entered as follows for point DR100:

P1=0-18-CMP-S

The DIP value of 0 is used in cases where the elevation entered for the point is the invert of the pipe. If the elevation for the point represented the top of the pipe, a DIP value equal to the size of the pipe should be used. Remember, the DIP value is entered in feet, not inches.
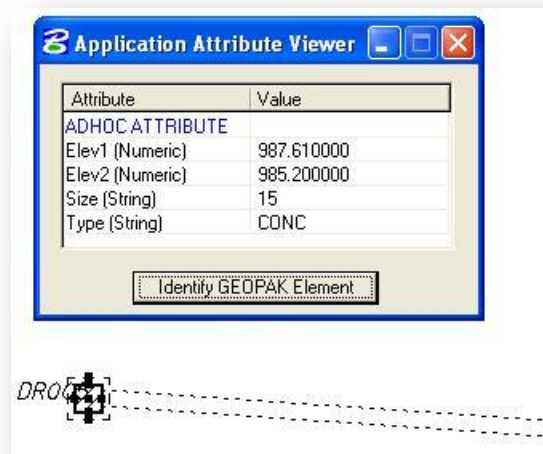
5.0 ODOT_DrainagePlan3.mvba

This application is used to label drainage pipes drawn using the **ODOT_DrainagePlan3.mvba** application.

When each drainage pipe is drawn using the **ODOT_DrainagePlan3.mvba** application, the graphic for the pipe is tagged with four GEOPAK adHoc attributes defining the pipe parameters. These attributes are read to determine the Type, Size, and flow direction for the pipe. The Adhoc attributes can be reviewed using the **GEOPAK Attribute Viewer**. The **Attribute Viewer** is accessed from the *GEOPAK Road* tool palette as shown below:


To review the attributes, select the **Identify GEOPAK Element** button, and then select the desired element. The attributes are displayed as shown below.


These attributes can be used to label the drainage pipe. Key in the following command in MicroStation to load and run the **ODOT_DrainagePlan3.mvba** application:

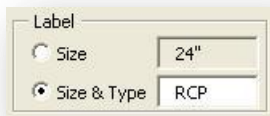vba load ODOT_DrainagePlan3.mvba;vba run labelPipesMain

The dialog shown at right is opened.
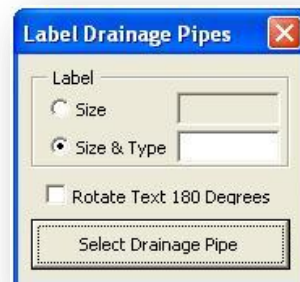
Select the **Select Drainage Pipe** button, and then pick the drainage pipe. The Adhoc attributes assigned to the pipe are read to generate the label as shown in the example below.
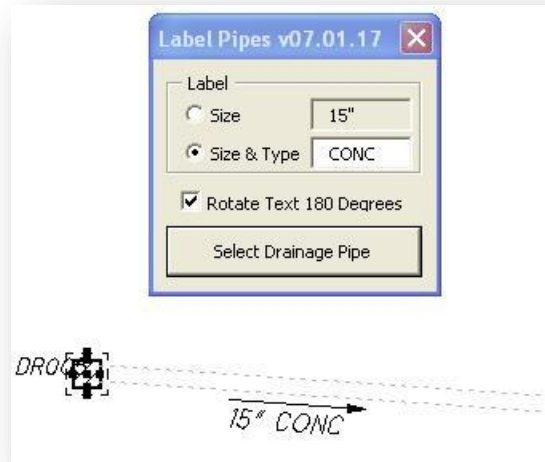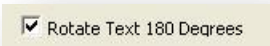

Label

The **Label** option is used to select whether the label will contain the **Size** of the pipe, or both the **Size and Type**. Users have the option to key in a new value for the **Type** option.

Rotate Text 180 Degrees

This option is used to flip the orientation of the text in relation to the selected drainage pipe.

6.0 ODOT_ExDrainageHeadwalls.mvba

The ODOT MicroStation Visual Basic Application **ODOT_ExDrainageHeadwalls.mvba** is available to place headwall cells from the cell library ODOT_Drainage.cel. The Application is available from the MicroStation pull-down menu by selecting **ODOT > Drainage Apps > Existing > Plan View – Headwalls**. The application can also be loaded using the following MicroStation key-in command:

vba load ODOT_ExDrainageHeadwalls.mvba;vba run HWMain

When the application is loaded, ODOT_Drainage.cel is attached to the current design file. The application will take a few seconds to load as it sorts through the library to build a list of the available existing headwall cells. When the list is completed, the dialog shown below is opened:
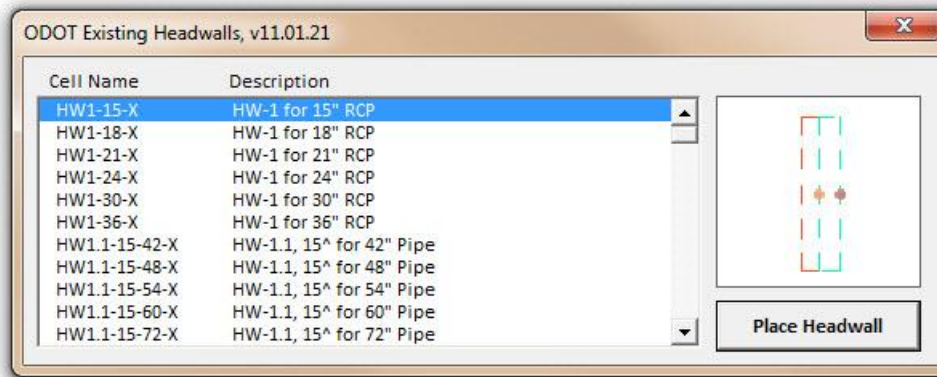
Select the desired headwall cell from the list. A picture of the selected cell is shown at right.

Click the **Place Headwall** button to initiate placement of the headwall cell. Select the desired line in the MicroStation file. The cell is displayed at the nearest endpoint of the selected line. As you move the cursor, the headwall cell will be displayed to the endpoint of the line nearest to the current cursor location. Issue a Data Point to place the headwall cell. An example of a HW1-15-X cell placed at the end of a 15" pipe is show below.
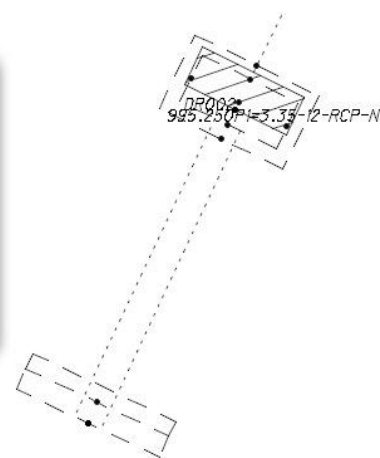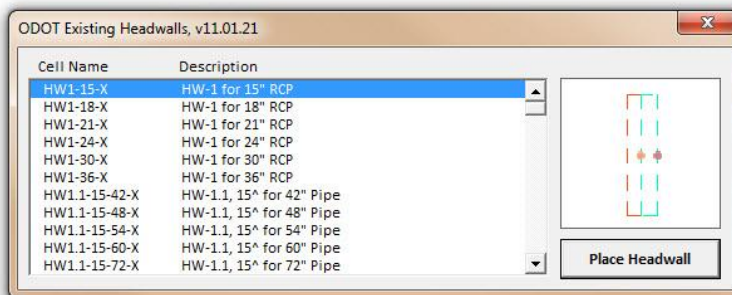
7.0 ODOT_DrainageProfile1.mvba

The ODOT VBA application **ODOT_DrainageProfile1.mvba** is used to draw drainage structures on the profile by reading COGO points tagged with information defining the drainage pipes that terminate within the structure. Use the following key-in command to load and run the application:

> vba load ODOT_DrainageProfile1.mvba;vba run drainageProfileMain

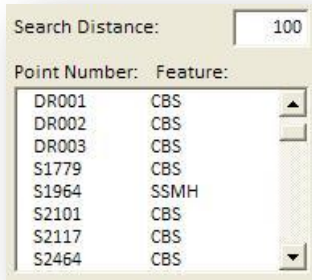When the application is run, the dialog shown below is opened.
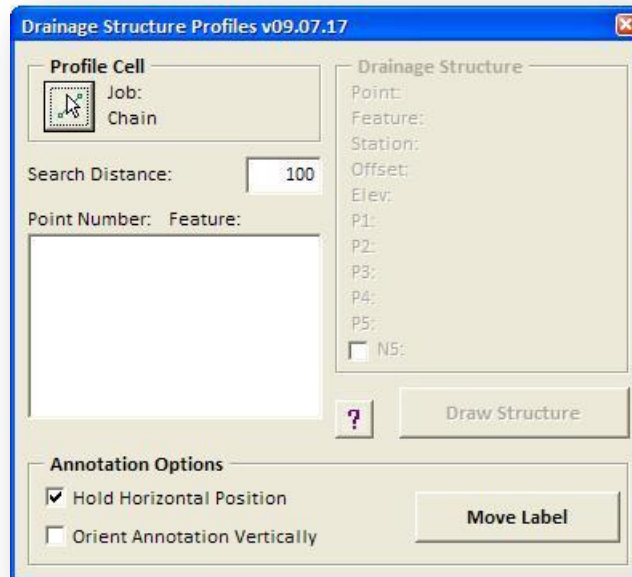
Profile Cell
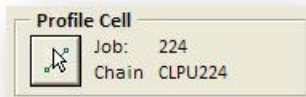
The **Profile Cell** button is used to select a GEOPAK Profile cell that has been previously placed in the design file. Once the profile cell has been selected, the **Job** and the **Chain** name of the selected profile cell are displayed in the dialog.

Search Distance

The **Search Distance** field is used to key in the distance to the left and right of the selected profile cell **Chain** that the application will use to search for drainage points in the selected **Job** file. In the example below, nine points were found within the specified search distance and are listed in the **Point Number** and **Feature** list box.

When one of the COGO points is selected from the list box, the application will automatically window in on the profile and display the drainage structure as shown in the example below. The parameters for the select COGO point are displayed under the **Drainage Structure** heading on the right side of the dialog.

Select the **Draw Structure** button to draw the selected item in the profile.
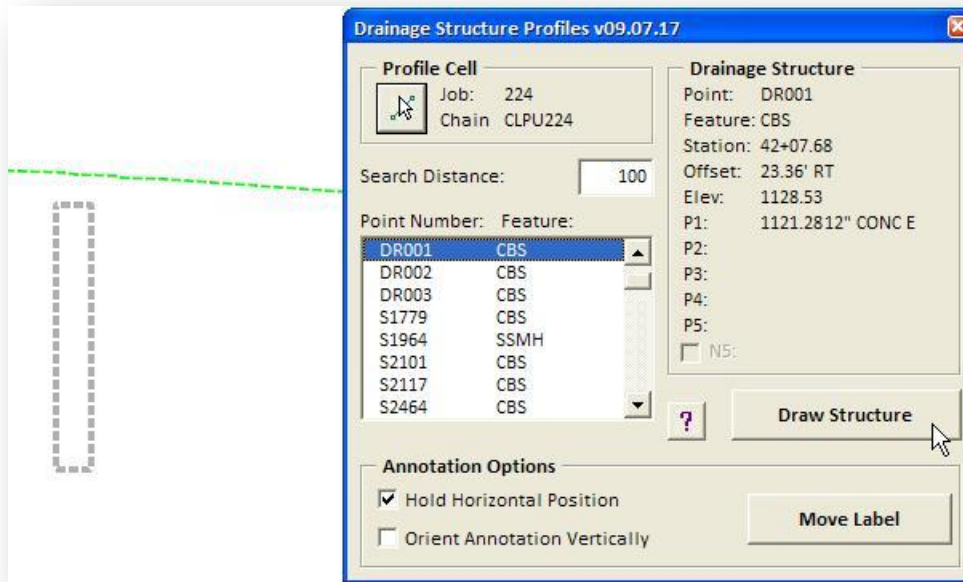
The drainage structure outline is drawn on the level DR_X_Storm_Sewer.

Annotation for the drainage structure is dynamically placed by a data point. After selecting the **Draw Structure** button, enter a data point on screen at the location for the annotation. The annotation is drawn on the level DR_X_Text as shown on the following page. The text is is determined by the MicroStation Model Annotation Scale setting.
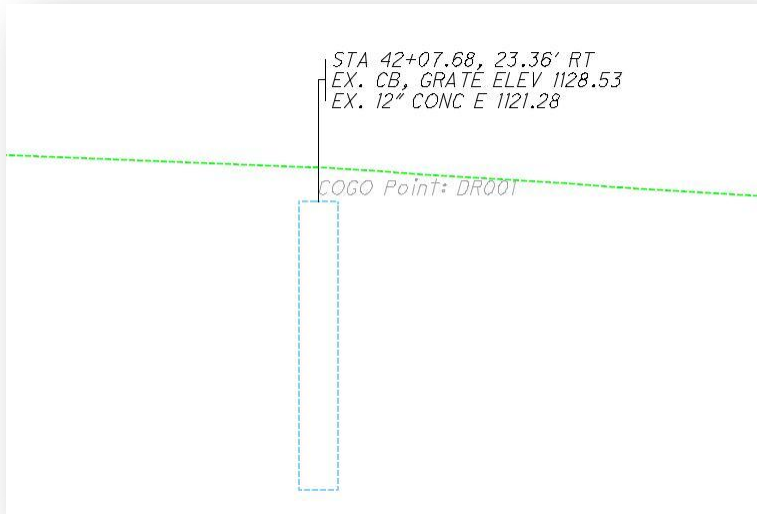
If a note has been entered for the structure by use of the **N5** field, the note will be displayed under the Drainage Structure information on the right side of the dialog and can be plotted in the design file by checking on the **N5** item.

The COGO Point name is drawn on the level SC_Scratch1 for information only and is not intended to be shown on the completed plans.

The drainage structure outline is tagged with a GEOPAK Adhoc attribute that is used by the application to draw the pipes between the structures on the profile. Select the *GEOPAK Application Attribute Viewer* to view the Adhoc attribute information from the *Road Tools* palette as shown at right.

The *Application Attribute Viewer* dialog is opened as shown below. Select **Identify GEOPAK Element**, and then identify the drainage structure outline to review the Adhoc attributes assigned to the element.
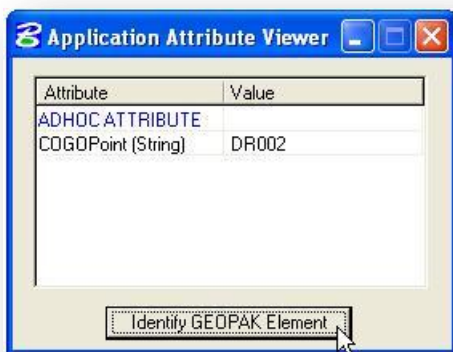

This Adhoc attribute must be present in order for the **ODOT_DrainageProfile1.mvba** application to draw the connecting pipes on the profile.

Annotation Options

As the annotation is placed, you can constrain the annotation to hold its vertical position relative to the drainage structure station, or allow the annotation to float freely on the cursor for placement by use of the **Hold Vertical Position** check box.

Optionally, the text can be oriented vertically, as shown below, by toggling on the **Orient Annotation Vertically** check box.
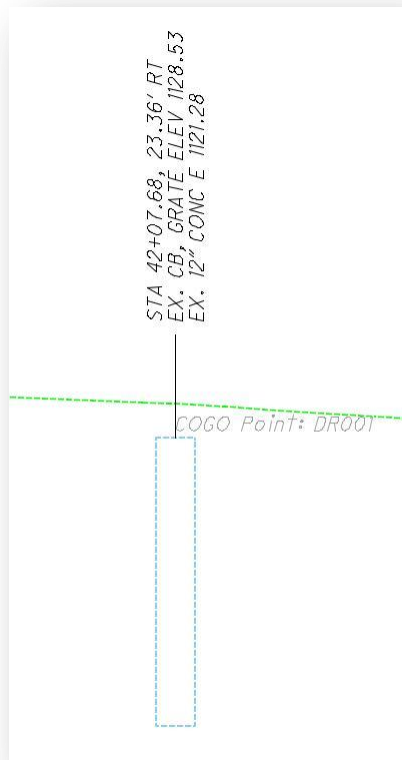

The **Move Label** option is used to move previous placed labels. The label and the leader lines are manipulated as one group using this command.
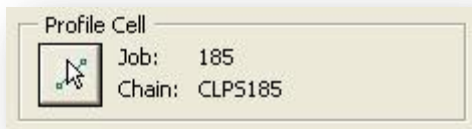
8.0 ODOT_DrainageProfile2.mvba

The **ODOT_DrainageProfile2.mvba** application is used to draw connecting pipes between drainage structures on the profile. The application is loaded with the following command:

vba load ODOT_DrainageProfile2.mvba;vba run drainagePipeProfile

When the application is loaded, the following dialog will appear:
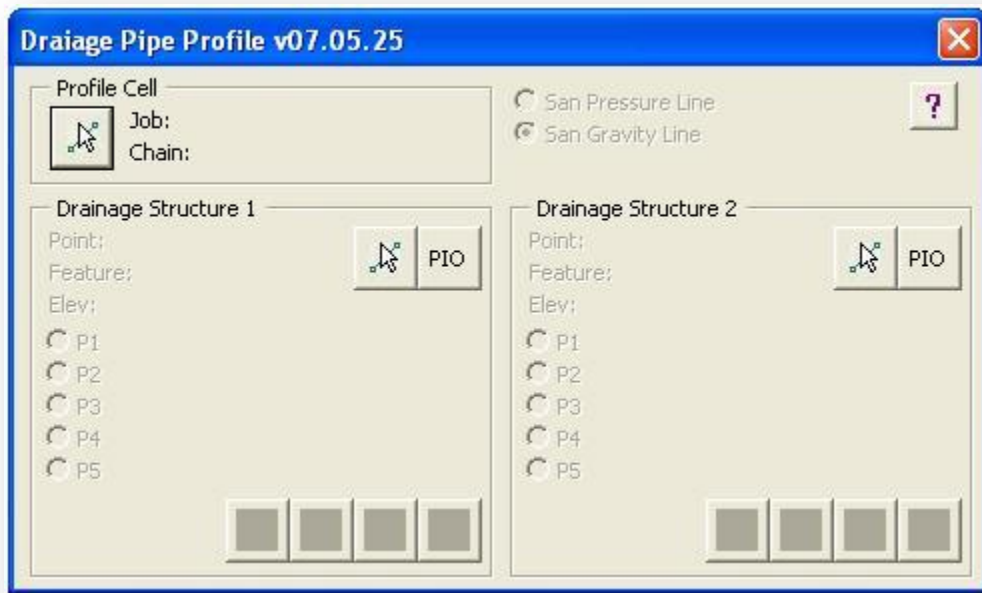
Profile Cell

The **Profile Cell** button is used to select a GEOPAK Profile cell that has been previously placed in the design file. Once the profile cell has been selected, the **Job** and the **Chain** name of the selected profile cell are displayed in the dialog.

Drainage pipes cannot be drawn on the profile until the **Profile Cell** has been selected.

Drainage Structure 1 & 2

  Select Structure 1
Select Structure 2

The **Select Structure 1** and **Select Structure 2** buttons are used to select the drainage structures that you wish to use to draw the connecting pipes. Press the **Select Structure** button, and then select the outline of the drainage structure. The Adhoc attribute that was assigned to the drainage structure outline (see page 33) is read to get the name of the corresponding COGO point used to initially draw the structure. The COGO Point is read from the selected **Job** file and the values of the pipes contained within the structure are read to populate the **Drainage Structure** portion of the dialog.
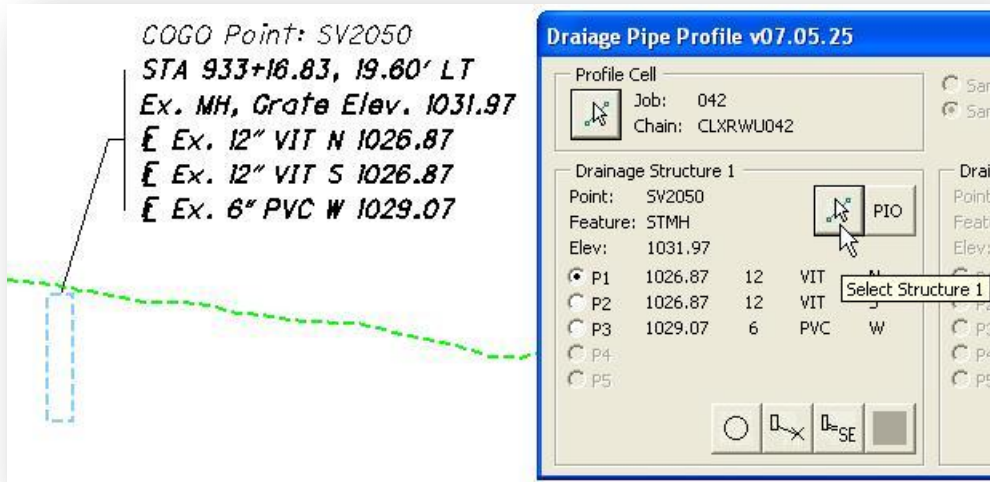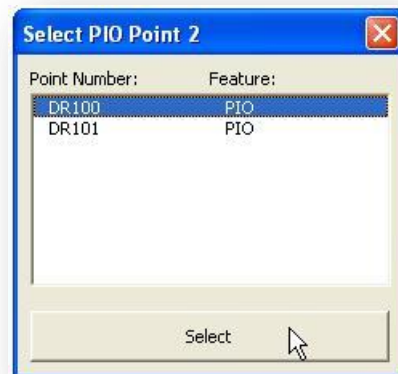

It is important to note that all the information corresponding to the pipes contained in the drainage structure is read from the corresponding COGO Point, not from the profile graphics representing the drainage structure. Editing the graphics does not change the COGO values for the drainage point. All changes to the drainage point and the pipes that terminate within the structure must be edited in COGO and the graphics for the drainage structure must be redrawn on the profile.

  Select PIO (Drainage Structure 1)
**Select PIO** (Drainage Structure 2)

The **Select PIO** buttons are used to select a COGO point, coded using the PIO feature code (Pipe Inlet/Outlet), from the GPK file to be used as either **Drainage Structure 1** or **Drainage Structure 2**. When the PIO button is selected, the dialog shown at right will open with a list of all the COGO points in the current GPK file that have been coded using the PIO feature code.

Highlight the desired point and pick the **Select** button. The selected point is read from the GPK file and is assigned as either **Drainage Structure 1** or **Drainage Structure 2**. This option is used to draw pipes from the selected Structure to the selected PIO point.
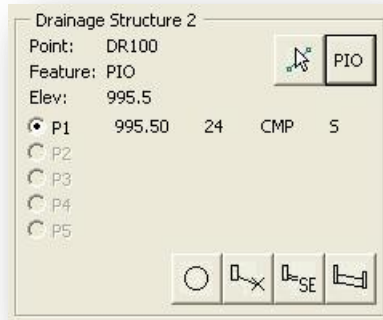
Draw Ellipse in Structure 1
Draw Ellipse in Structure 2
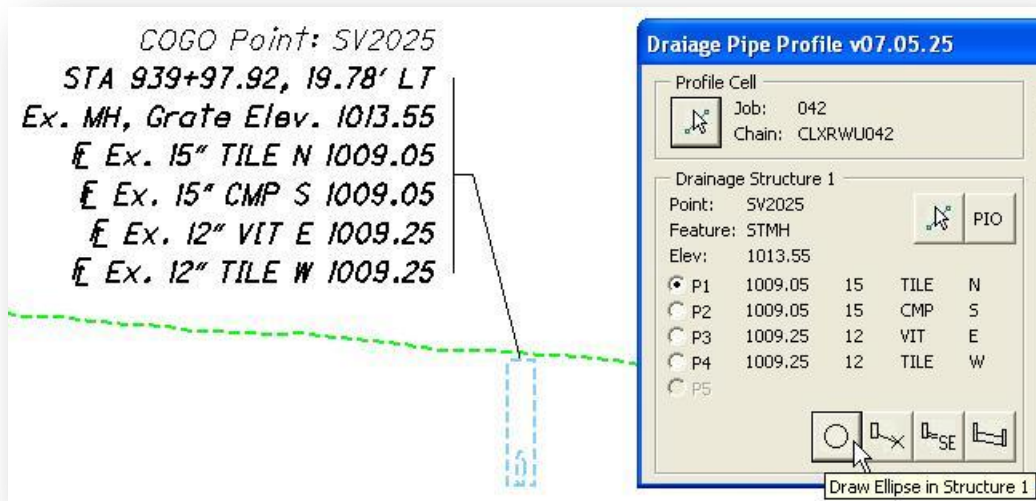
The **Draw Ellipse** button is used to draw an ellipse, representing the selected pipe, in the profile. In the example above, the 15" Tile pipe is drawn in the profile when the **Draw Ellipse** button is selected.

Draw from 1 to DP
Draw from 2 to DP

The **Draw from 1 to DP** and **Draw from 2 to DP** buttons allow you to draw the selected pipe to a location specified manually by entering a data point location in MicroStation.
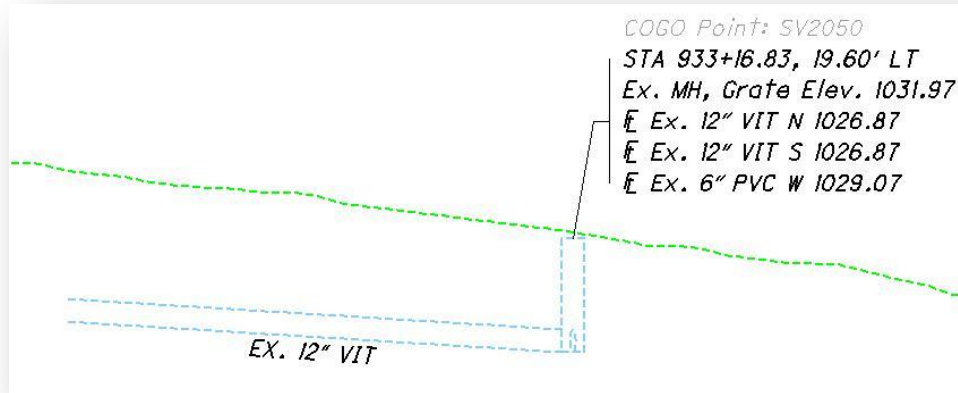
Draw from 1 to Station/Elevation
Draw from 2 to Station/Elevation

The **Draw to Station/Elevation** buttons are used to draw the selected pipe to a specific station and elevation. When the icon is selected, the *Station/Elevation* dialog shown below is opened.


The currently selected pipe is drawn to the Station and Elevation values as shown in the example below.

Draw from 1 to 2

The **Draw from 1 to 2** button is used to draw pipes between the selected drainage structures. In the example below, the 15" CMP is selected in the **Drainage Structure 1** and **Drainage Structure 2** portions of the dialog. When the **Draw from 1 to 2** button is selected, the pipe is drawn in the profile as shown below.
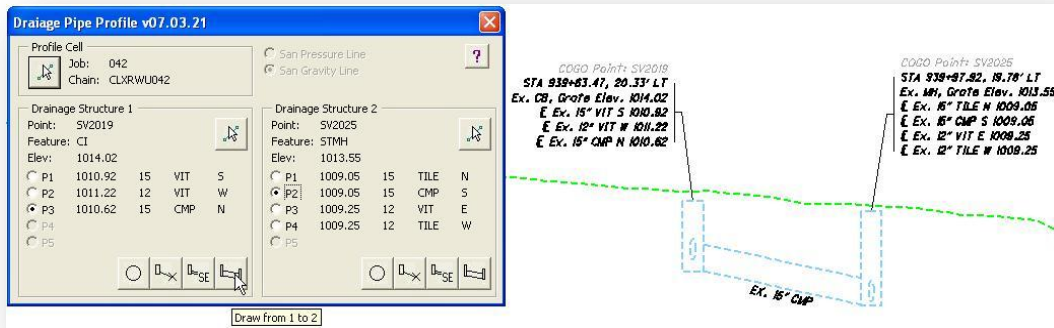
If the structure selected for **Drainage Structure 1** is a sanitary manhole, the option to place the pipe as either a **San Gravity Line** or a **San Pressure line** is available as shown below.
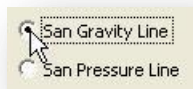
If the **San Gravity Line** option is selected, the pipe will be drawn on the level UT_X_Sanitary_Line.

If the **San Pressure Line** option is selected, the pipe will be drawn on the level UT_X_Sanitary_Pressure_Line.

9.0 ODOT_DrainageXS1.mvba

The ODOT VBA application **ODOT_DrainageXS1.mvba** is used to draw drainage structures on the cross sections by reading COGO points tagged with information defining each drainage structure and the drainage pipes that terminate within the structure. Use the following key-in command to load and run the application:

vba load ODOT_DrainageXS1.mvba;vba run drainageXSMain

When the application is run, the dialog shown below will appear.
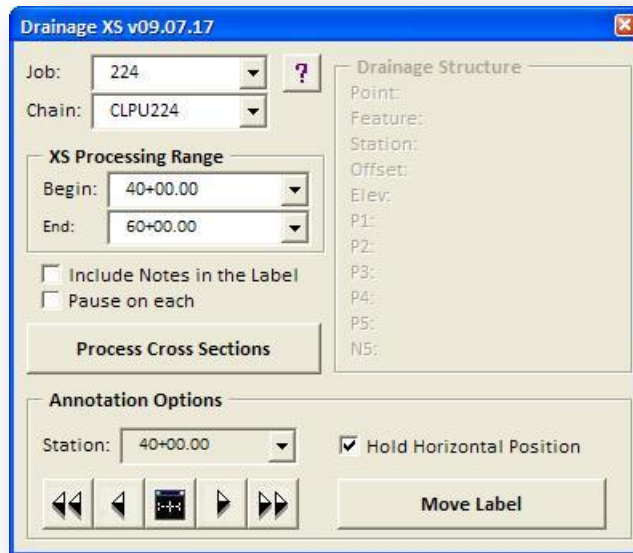
Job Number
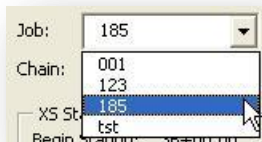
The **Job Number** menu, shown above, is used to select the GEOPAK Coordinate Geometry database to store the points. The **Job Number** menu will list all of the .gpk files found in the current GEOPAK Working directory.

Chain

The **Chain** drop down menu contains a listing of all the chains in the currently selected **Job Number**. When a **Chain** is selected, the application will scan the design file for cross sections matching the selected chain. If cross sections are found for the **Chain**, the application will automatically window-in on the first cross section and the beginning and ending cross section station is displayed in the **XS Processing Range** portion of the dialog as shown in the example below:
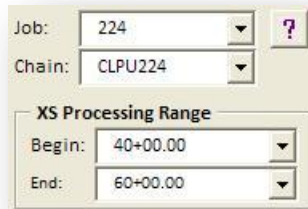

If no cross sections are found, the following message is sent to the user.

Process Cross Sections

Select the **Process Cross Sections** button to initiate the process.

If the **Pause on Each Structure** option is toggled on, the application will stop processing at each **Drainage Structure**. The information for the **Drainage Structure** is read by searching for COGO Points defining drainage structures in the currently selected **Job Number**. The user is presented with the option to draw each structure by selecting **Yes**, skip a structure by selecting **No**, or terminate the process by selecting the **Cancel** button.
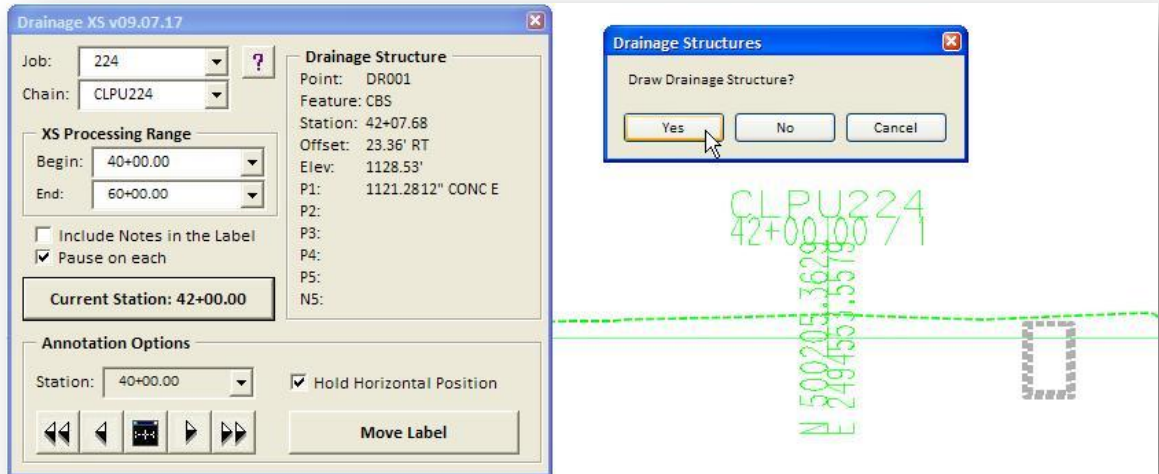
If **Pause on Each Structure** is toggled off, the application will draw all of the drainage structures that fall within the limits of the cross sections without giving you the opportunity to select whether to draw individual structures.

Note that drainage structures that do not fall at the same station as a cross section are projected to the nearest cross section.

An example of the graphics plotted for a Catch Basis is shown below. The outline of the structure is drawn on the level DR_X_Storm_Sewer. The annotation is drawn on the level DR_X_Text. The text size is baed on the active MicroStation Model Annotation Scale value. The Point Name is drawn for reference only on the level SC_Scratch1 and should not be included on the completed plans.

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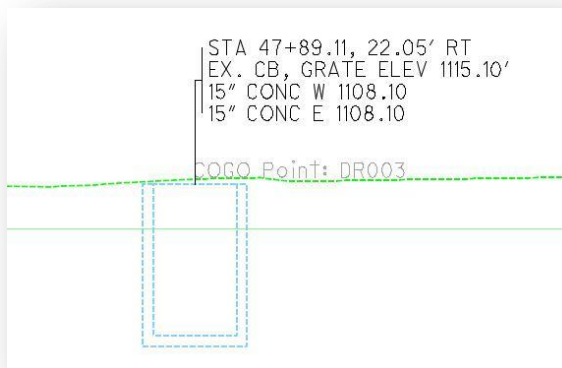
The drainage structure outline is tagged with a GEOPAK Adhoc attribute that is used by the **ODOT_DrainageXS2.mvba** application to draw the pipes between the structures on the cross section. Select the *GEOPAK Application Attribute Viewer* to view the Adhoc attribute information.


The *Application Attribute Viewer* dialog is opened as shown below. Select **Identify GEOPAK Element**, and then identify the drainage structure outline to review the Adhoc attributes assigned to the element.

This Adhoc attribute must be present in order for the **ODOT_DrainageXS2.mvba** application to draw the connecting pipes on the cross sections.

Annotation Options
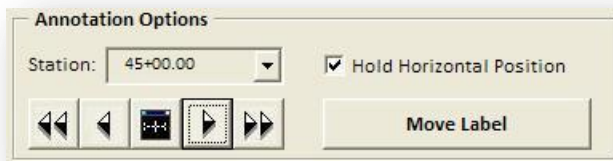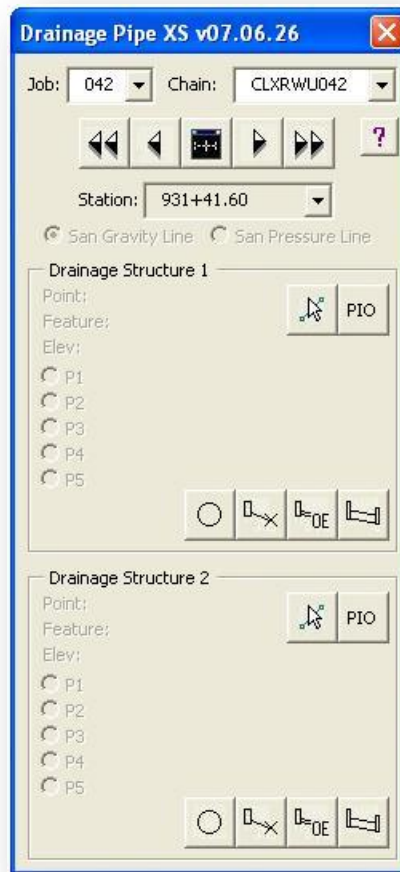

The **Annotation Options** contain tools to navigate the cross sections and then move the labels. Select the **Move Label** button to initiate the process. The labels and the leader lines are moved as one group using this option. Additionally, the label position can be constrained to maintain the horizontal position as the label is moved using the **Hold Vertical Position** option.
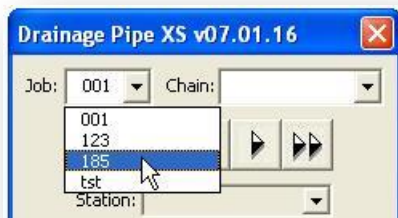
10.0 ODOT_DrainageXS2.mvba

The **ODOT_DrainageXS2.mvba** application is used to draw connecting pipes between drainage structures on the cross section. The application is loaded with the following command:

vba load ODOT_DrainageXS2.mvba;vba run drainagePipeXS

When the application is loaded, the following dialog will appear:
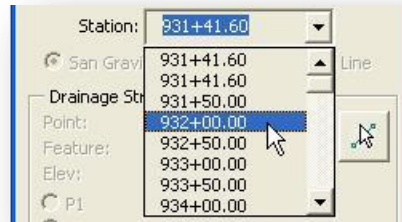

Job

The **Job** menu, shown above, is used to select the GEOPAK Coordinate Geometry database for the project. The **Job** menu will list all of the .gpk files found in the current GEOPAK Working directory.

Chain

The **Chain** drop down menu contains a listing of all the chains in the currently selected **Job**. When a **Chain** is selected, the application will scan the design file for cross sections matching the selected chain. If cross sections are found for the **Chain**, the application will automatically window-in on the first cross section. The station for each cross section in the design file is displayed in the **Station** drop down menu as shown in the example below:
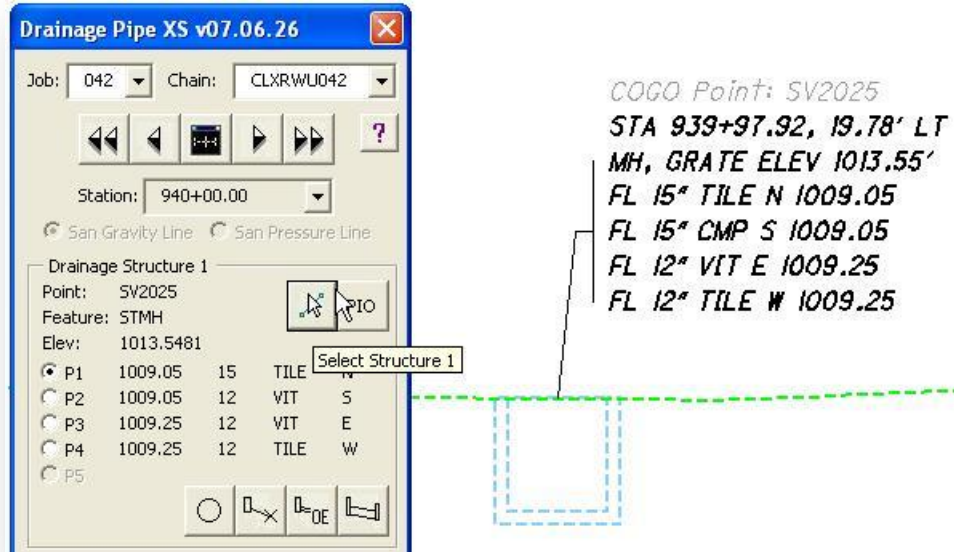

Select the desired **Station** from the drop down list to display the station on screen. Use the navigation buttons directly above the **Station** list to scroll through the cross sections.

Drainage Structure 1 & 2

Select Structure 1
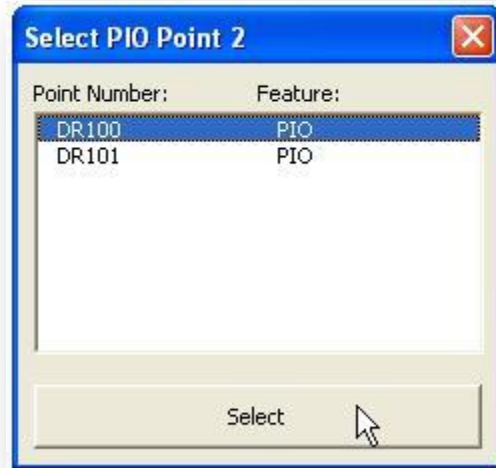**Select Structure 2**

The **Select Structure** button is used to select the first drainage structure that you wish to use to draw the connecting pipes. Press the **Select Structure** button, and then select the outline of the drainage structure. The Adhoc attribute that was assigned to the drainage structure outline (see page 42) is read to get the name of the corresponding COGO point used to initially draw the structure. The COGO Point is read from the selected **Job** file and the values of the pipes contained within the structure are read to populate the **Drainage Structure** portion of the dialog.

It is important to note that all the information about the pipes contained in the drainage structure is read from the corresponding COGO Point, not from the cross section graphics representing the drainage structure. Editing the graphics does not change the COGO values for the drainage point. All changes to the drainage point and the pipes that terminate within the structure must be edited in COGO and the graphics for the drainage structure must be redrawn on the cross sections.

PIO	**Select PIO** (Drainage Structure 1) **Select PIO** (Drainage Structure 2)

The **Select PIO** buttons are used to select a COGO point, coded using the PIO feature code (Pipe Inlet/Outlet), from the GPK file to be used as either **Drainage Structure 1** or **Drainage Structure 2**. When the PIO button is selected, the dialog shown on the following page will open with a list of all the COGO points in the current GPK file that have been coded using the PIO feature code.


Highlight the desired point and pick the **Select** button. The selected point is read from the GPK file and is assigned as either **Drainage Structure 1** or **Drainage Structure 2**. This option is used to draw pipes from the selected Structure to the selected PIO point.

Draw Ellipse in Structure 1
Draw Ellipse in Structure 2
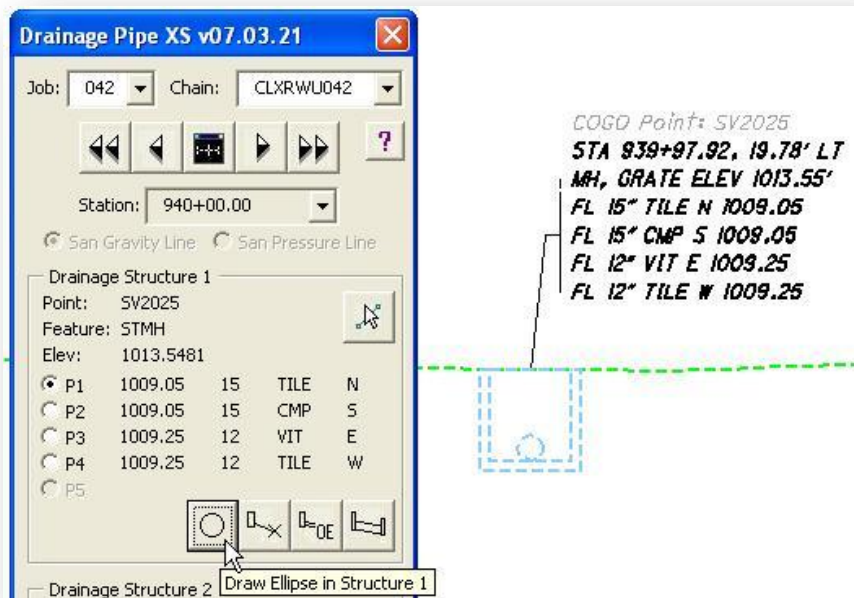
The **Draw Ellipse** button is used to draw an ellipse, representing the selected pipe, in the cross section. In the example above, the 15" TILE pipe was is selected and was drawn in the cross section when the **Draw Ellipse** button was selected.
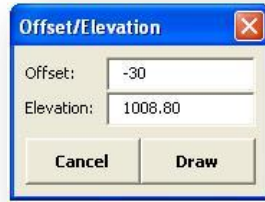
Draw from 1 to DP
Draw from 2 to DP
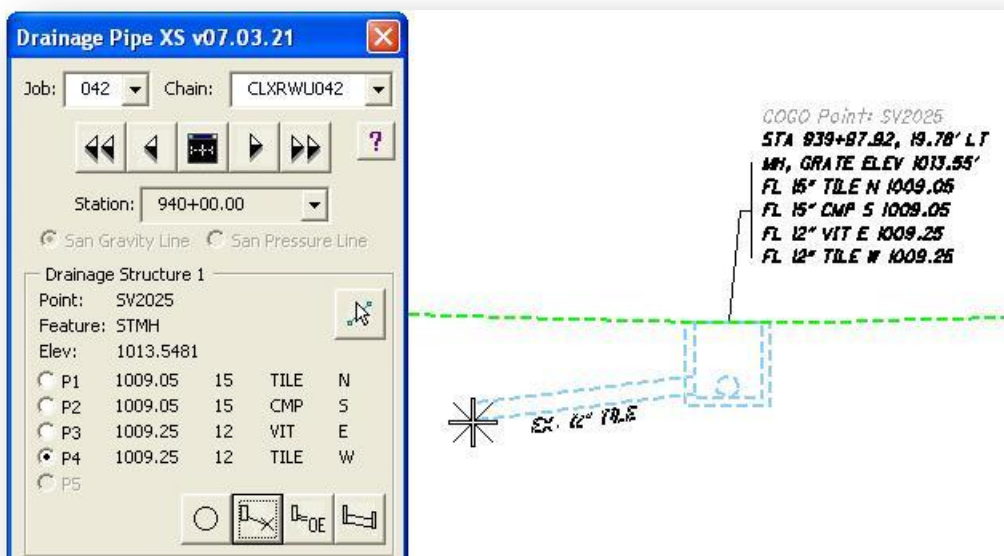
The **Draw to DP** buttons are used to draw the selected pipe to a data point location as shown in the example above.

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Draw from 1 to Offset Elevation
Draw from 2 to Offset Elevation

The **Draw to Offset/Elevation** button is used to draw the selected pipe to a specific offset and elevation in the cross section.   When the button is selected, the dialog shown below is opened. The **Offset** is measured from the centerline of the cross section.

Draw Pipe from 1 to 2
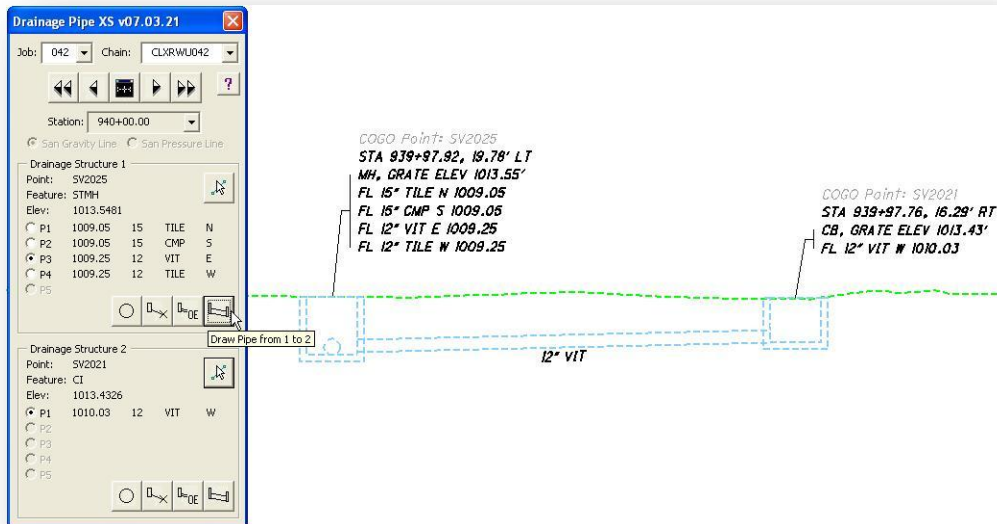
The **Draw from 1 to 2** button is used to draw pipes between the selected drainage structures. In the example above, the 12" VIT pipe is selected in the **Drainage Structure 1** and **Drainage Structure 2** portions of the dialog. When the **Draw from 1 to 2** button is selected, the pipe is drawn in the cross section as shown above.

If the structure selected for **Drainage Structure 1** is a Sanitary manhole, the option to place the pipe as either a **San Gravity Line** or a **San Pressure line** is available as shown below.

If the **San Gravity Line** option is selected, the pipe will be drawn on the level UT_X_Sanitary_Line.

If the **San Pressure Line** option is selected, the pipe will be drawn on the level UT_X_Sanitary_Pressure_Line.
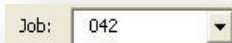
11.0 ODOT_DrainageXS3.mvba

The ODOT VBA application **ODOT_DrainageXS3.mvba** is used to an ellipse, representing a drainage pipe, at the location where the pipe interests the cross section. The application is loaded with the following command:

> vba load ODOT_DrainageXS3.mvba;vba run drainagePipeXSInt

When the application is loaded, the following dialog will appear:
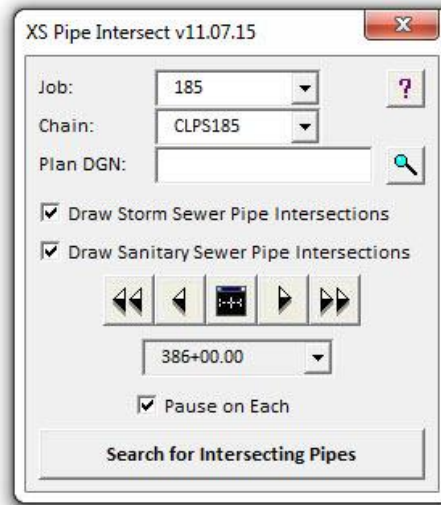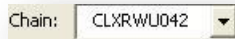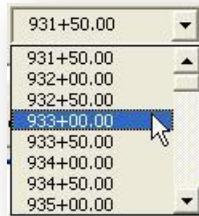

Job Number

The **Job** menu, shown above, is used to select the GEOPAK Coordinate Geometry database for the project. The **Job** menu will list all of the .gpk files found in the current GEOPAK Working directory.

Chain

The **Chain** drop down menu contains a listing of all the chains in the currently selected **Job**. When a **Chain** is selected, the application will scan the design file for cross sections matching the selected chain. If cross sections are found for the **Chain**, the application will automatically window-in on the first cross section.

The station for each cross section in the design file is displayed in the **Station** drop down menu as shown in the example below:
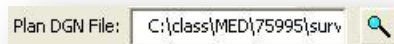

Select the desired **Station** from the drop down list to display the station on screen.

Use the navigation buttons directly above the **Station** list to scroll through the cross sections.

Plan DGN File

The **Plan DGN File** option is used to identify the plan view MicroStation design file containing the graphics for the existing drainage pipes.

Pause on each section
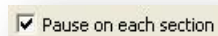
With **Pause on each** section toggled off, all the cross sections for the selected **Chain** are processed when the **Search for Intersection Pipes** button is selected.

With **Pause on each** section toggled on, only the selected cross section is processed when the **Search for Intersection Pipes** button is selected.

Search for Intersecting Pipes

Select the **Search for Intersecting Pipes** option to initiate the process.

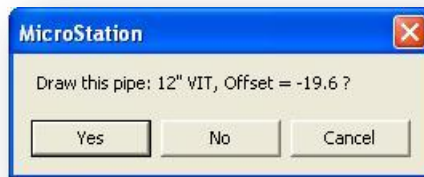If **Pause on each section** is toggled on, the application will search for an intersecting pipe for the currently selected cross section. If no intersection is found, the message shown below is displayed:

If an intersecting pipe is found, the user is prompted whether to draw the pipe as shown in the example below.

After the pipe is drawn, the application will continue searching for more intersecting pipes. When all the pipes intersecting the selected cross section have been processed, the message shown below is displayed:

If **Pause on each section** is toggled off, the application will search for an intersecting pipe for each cross section. When the process is completed, a message is displayed with the total number of intersecting pipes as shown below.

Processing Notes:

Pattern Lines

The GEOPAK Visual Basic object library does not contain any methods for selecting a set of GEOPAK Pattern Lines. Therefore, there is no way to identify the pattern lines that were originally used to generate the cross sections. This application generates a "virtual" pattern line in memory for each cross section. The virtual pattern line for each cross section is used to search for intersections with drainage pipes in the selected **Plan DGN File**. The virtual pattern line is created with the following parameters:

- The left and right offset width of the cross section cell is used to determine the left and right offset limits of the virtual pattern line.

- The virtual pattern line is created by projecting a perpendicular line from the Chain that was used to generate the cross sections at the station of the cross section. An example is shown below:
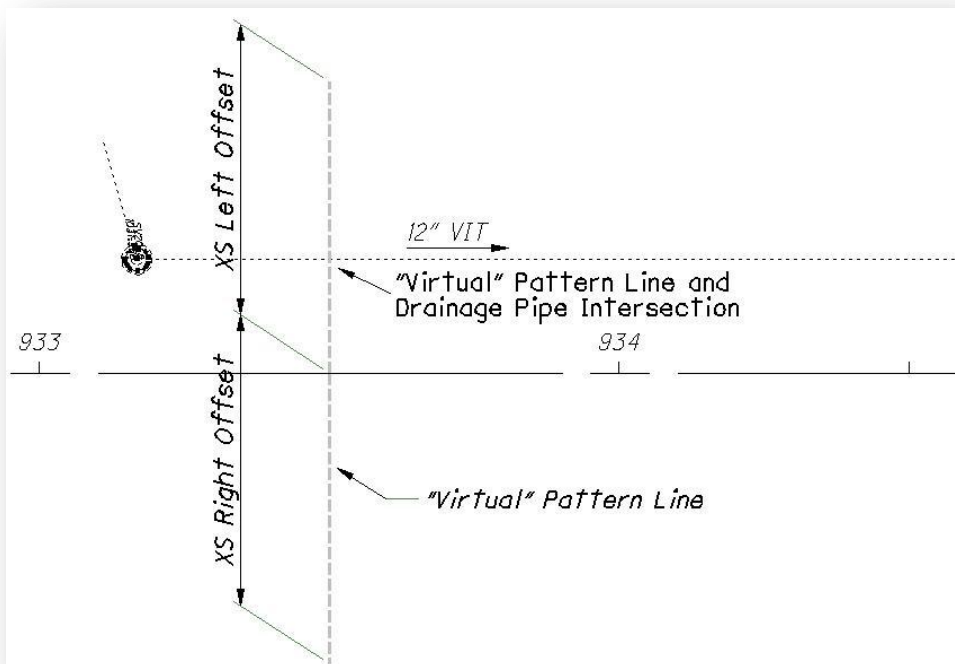
Note: If a Cross Section was generated using a "kinked" line string, or if the original pattern line was drawn at a skew angle, the results of this application will not be accurate. It is assumed that the original pattern line was drawn as a single line at a 90 degree angle relative to the centerline.

AdHoc Attributes

Once an intersection of the virtual pattern line and a drainage pipe has been identified, the application will read the AdHoc attributes assigned to the drainage pipe by the **ODOT_DrainagePlan2.mvba** application to determine the elevation at each end of the pipe. The elevations are used to compute the elevation of the pipe at the intersection with the virtual pattern line. The AdHoc attributes for the pipe size and type are also read to determine the size of the ellipse drawn on the cross section and the contents of the label. An example is shown on the following page.
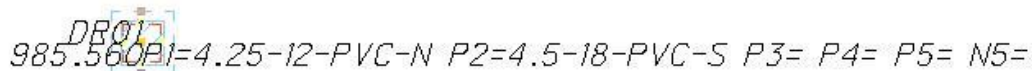
Note: The Offset and Elevation label is placed on the level **SC_Scratch1** for information only.

12.0 Field Data Collection Process

12.1 Entering the Pipe Information in the Field

Survey personnel can enter information for the drainage pipes contained within each drainage structure while the survey data is collected in the field. When one of the drainage structure feature codes listed on page four is entered in the data collector, the user will be prompted one at a time to enter values for the five attributes: **P1**, **P2**, **P3**, **P4**, **P5**, and **N5**. If you wish to take field notes and enter the attribute data in the office, just cancel out of the attributes. If you wish to enter the data as you survey the drainage structures, enter the data for each pipe using the format detailed on page five of this document.

When the survey data is processed, the attribute information will be plotted in the design file similar to the example shown below:

In the example above, two attributes defining a 12" PVC pipe, and an 18" PVC pipe were entered for point DR01. No notes were entered.

When prompted to enter the data for attribute **P1**, the user entered the following information:

4.25-12-PVC-N

When prompted to enter the data for attribute **P2**, the user entered the following information:

4.5-18-PVC-S

No information was entered for the remaining attributes.

Note: GEOPAK will only display the first 50 characters of the attributes when plotted in the design file.

Note that the pipes are drawn in the MicroStation design file when the survey data is processed. The application **ODOT_DrainagePlan2.mvba** will be used to draw the pipes into MicroStation as detailed in this document.

## 12.2 Entering the Pipe Information in the Office from Field Notes

If no information for the pipe attributes is entered in the field, the attributes will be displayed as shown in the example below when the survey data is visualized in the design file.

The GEOPAK Survey Point Editor is used to edit the attributed data for survey points. Select **Geometry > Points > Edit** from the GEOPAK Survey dialog as shown below.
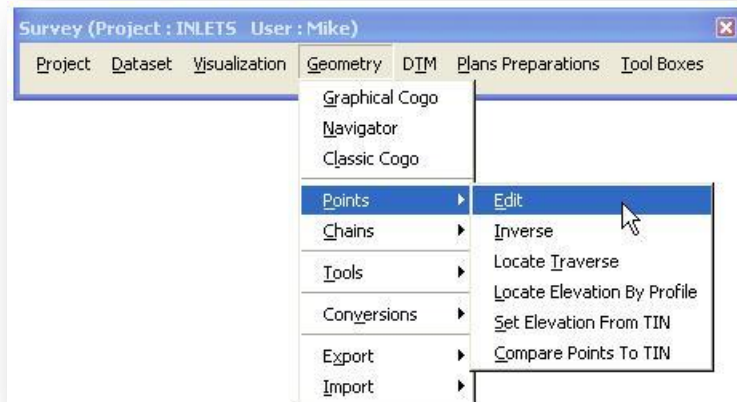

The *Point Edit* dialog is opened, shown below.
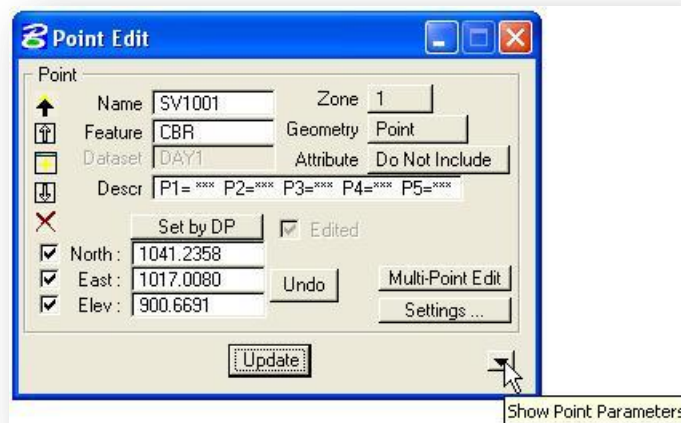
Type in the **Name** of the point that you wish to edit. Notice that the **Description** field contains the parameter values for the attributes. Do not edit the **Description**. Instead, select the **Show Point Parameters** button to edit the individual attribute values as shown on the following page.

Select the **Parameter** P1 to edit the information for the first pipe contained in the structure. Type in the **Value** for parameter P1 in the lower right key-in field as shown in the example below. Select the **Modify a Parameter** button to complete the operation.

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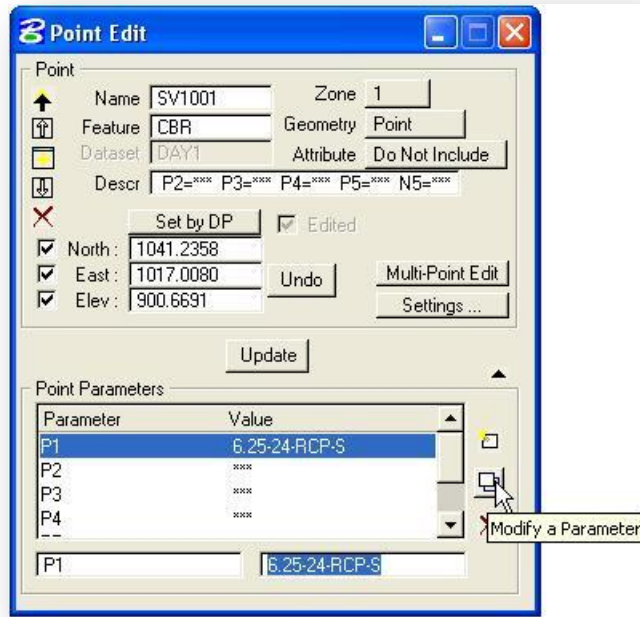
Continue editing the parameters for all the pipes contained in the structure. Remember that filed notes for the structure can be entered using the N5 parameter.

As you edit the parameter values, the point **Description** is automatically updated to reflect the changes made to the parameters. See the example on the following page
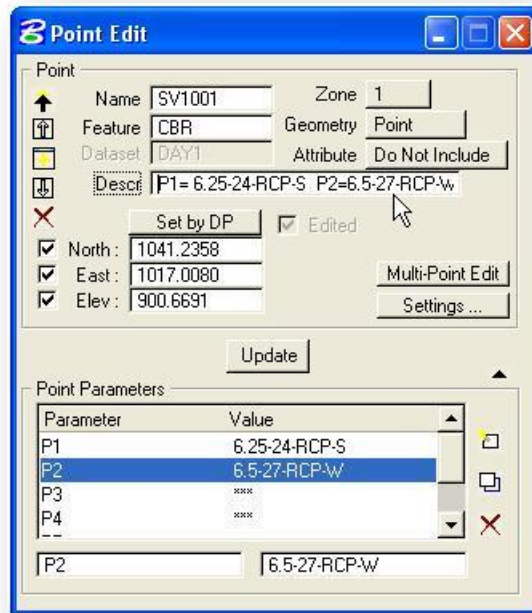
After you have completed editing the **Parameters**, you must select the **Update** button to save the changes to the point. If you do not select the **Update** button, your changes will not be saved.
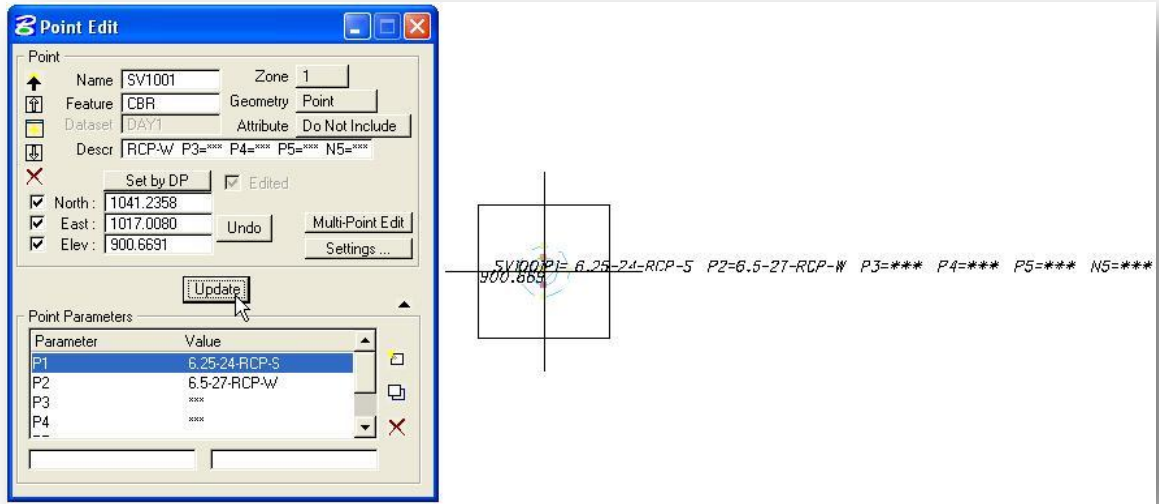
When the point is updated, the pipe information is displayed in the design file as shown in the example above.

Remember that GEOPAK will only display the first 50 characters of the point description in the design file.

Contacts

If you have any questions, suggestions, or problems please contact the ODOT Office of CADD and Mapping Services CADD Support team or use the following form on the ODOT web site at:

http://www.dot.state.oh.us/Divisions/Engineering/CADDMapping/CADD/Pages/suggestions.aspx