OpenRoads Survey: Data Processing

Process Overview

This document will provide an overview of the steps to process and edit topo survey data in OpenRoads Designer.

ODOT Feature Definitions

Feature definitions are used to control symbology, annotation, and various other properties that are applied to the geometric elements as the survey information is processed.

A feature definition is assigned to each survey point as the data is collected in the field. The ODOT Standard field code list is available in Adobe PDF format in the OHDOT CADD folder listed below:

...\OHDOT\Standards\Survey Files\Field Codes

The feature definitions are used by the software for the following:

- Define what the surveyed information represents such as curb, centerline, edge of pavement, a mailbox, etc.
- Control symbology in various views, including capability to define differing symbology in plan, profile, and 3D spaces
- Define terrain modeling attributes (spot, break line, void, etc.) for each surveyed point or linear feature
- Define the display characteristics of terrain models

The feature definitions are defined in the following DGN Library:

...\OHDOT\Standards\Dgnlib\Feature Definitions\OHDOT_Feature_Definitions.dgnlib

Point Features

When survey data is processed, each field shot is stored as a **Point Feature** in the current **Field Book** within the active model of the active design file. For example, the field code "PP" is used to designate a power pole. When the survey data is processed, the power pole code is plotted in MicroStation using an ODOT standard cell element as shown below:

Note: OpenRoads Designer does not place any annotation with the survey information. Annotations are added using the **Survey Decorations** or **Element Annotation** commands.

Point Names

Each survey point in the Field Book must have a unique point name. Point names are assigned in the field by the surveyor as the data is collected. There are no specific point name restrictions for OpenRoads Designer Survey processing other than ensuring that each point name is unique.

Section 306.2 of the **ODOT CADD Engineering Standards Manual** details standard GEOPAK COGO Element names for field collected data.

- Survey shots are to be given the two-character prefix "SV" followed by a numeric value. For example: SV1000, SV1001, SV1002, etc.
- Monumentation shots can be given the two-character prefix "MN" followed by a numeric value.

Care should be taken to avoid the use of duplicate point names when collecting data in the field. The OpenRoads Survey product provides options for editing duplicate point names if duplicates are encountered during the import process. See Chapter 8 for more information on duplicate point names.

Linear Features

A series of points representing curvilinear features can be connected as a **Linear Feature**.

Linking Codes, which are special characters that are entered ***after*** the feature name as the data is collected, are used to define the linear features. The following liking codes are configured for ODOT use:

BL* - Begin Line
EL* - End Line
OC* - Point on Curve (begin/end non-tangent curve)
CL* - Close

Important Note!
This is a change from previous older versions of the legacy ODOTcadd Standards.

Previously, the linking code was included after the feature code. In the October 16, 2016 release of the ODOTcadd Standards, the default value for the linking code location was been changed to specify that the linking code is included after the feature name. This change has been made to facilitate drawing the linework on the data collector and in Trimble software.

All field data collected after the October 16, 2016 update shall be collected with the linking code listed after the field code.

When processing old datasets with the OpenRoads Designer Survey tools, it is necessary to reconfigure the Survey Settings for an individual Field Book design file to specify the location of the linking code before the feature code. Instructions on how to make this change are presented later in this chapter.

The mapping codes can also be entered as numeric values. The numeric values are defined in the OHDOT Workspace as shown below:

1 = BL*
2 = EL*
3 = OC*
4 = CL*

To collect a series of 3 points representing a fence line; each point would be coded as follows in the field:

FEN BL*
FEN
FEN EL*

If you elect to use the substitution linking codes, the fence line would be coded as follows:

FEN 1
FEN
FEN 2

Linear Features are named according to the feature code name used to collect the shots that define the chain. In the above example, a Linear Feature named "FEN" will be created in the field book. If a second fence line is collected, the software will increment the name by 1. For example, a second fence line would be named "FEN_1". Subsequent fence lines would be incremented by 1.

Field Attributes

Many of the ODOT field codes allow for the use of attributes to store additional information with a specific survey shot. For example, the feature code "PP", used to specify a Power Pole, has the following attributes:

Material
Owner
Pole#

These attributes are used to build custom annotations that are placed in the file using the **Element Annotation** commands.

See the ODOT Code list for a summary of feature codes and the associated attributes.

Dual Coded Points

Combining two unique feature codes and line descriptions within a single point description is supported. For example, a single field shot could be coded as follows to begin two separate linear features:

EP BL* DR BL*

The above example specifies the beginning of an edge of pavement line (EP BL*) and the beginning of a driveway line (DR BL*).

Since each survey point can only have one field code, two separate points must be stored for dual coded survey shots. Point SV2112 is stored at the location of the shot with the field code EP. An additional point is stored at the same location with the field code DR. The additional point is named with the same point name that was present in the data and appended with "_1". In the example above two points will be stored in the Field Book named "SV2112" and "SV2112_1". This allows the double coded shots to represent two features with different feature codes.

Caution: When dual coding points using feature definitions that include attributes, be aware that the software does not know which attribute goes with which point. Both points will be assigned all the attributes.

Annotation Scale

MicroStation's annotation scale is used to control the display of the following items:

- Text
- Dimensions
- Detailing Symbols
- Cells
- Custom Line Styles

Cells, text, and custom line styles placed by OpenRoads Designer survey processing are drawn according to the current MicroStation annotation scale value.

Think of the annotation scale as a multiplier. The original size of the element is multiplied by the current annotation scale value to determine the display size of the element.

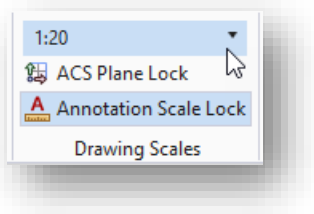
The cells and custom line styles defined in ODOT's CADD Standards are defined in one of two ways:

- "Cosmetic" cells and linestyles are used to represent the location of an item, but not the actual size of the item. These items are placed in the design file using a scale of 1.0. The display of cosmetic cells and linestyles is scaled automatically by ORD using the active Model Annotation Scale value.
    - A mailbox is an example of a cosmetic cell that is used to designate the location of the item, but not the actual size of the item.
    - A fence line is an example of a cosmetic linestyle. The location of the "x" on the fence line is used as a symbolic representation of the line type and does not represent specific post spacing for the fence line.
    - These cells and linestyles will change size when the MicroStation Annotation Scale is changed.

- "Physical" cells and linestyles are used to represent both the location and the size of an item. These items have been drawn at their actual physical dimensions and are placed in the design file, by the user, at a scale of 1.0.
    - A pavement marking right-turn arrow is an example of a physical cell which is always placed at its actual size.
    - A pavement marking line, such as a lane line, is an example of a physical line style that is always placed using the actual dash and gap dimensions of the line.
    - These cells and linestyles will not change size when the ORD Annotation Scale is changed.

Whether an individual cell or line style can be scaled is defined within the cell or linestyle definition.

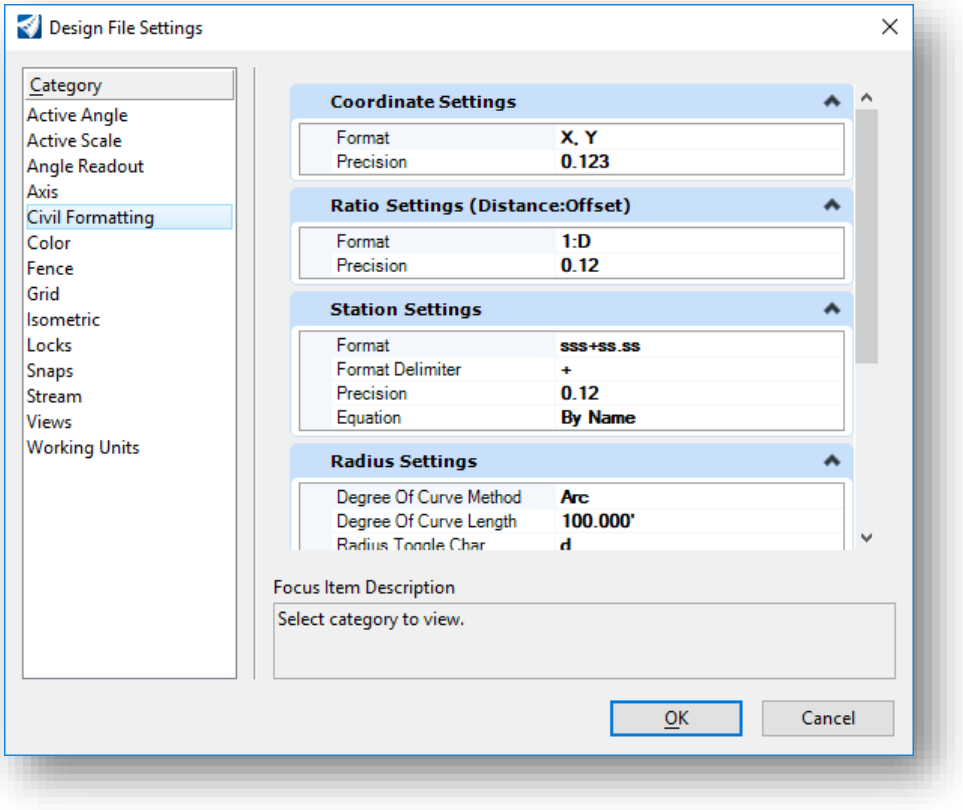
The **Annotation Scale** parameter is available on the **Survey** WorkFlow by selecting the **Drawing** tab.



Changing the **Annotation Scale** value in the Field Book (FB) design file does not affect the way the file appears to other users who may be referencing the file.

Design File Settings

The design file itself also has several settings used by the OpenRoads Designer survey software. To access these settings, select **File > Settings > File > Design File Settings** and then click the **Civil Formatting** item from the list on the left of the dialog.



These settings are initially defined in the OHDOT Seed files and have been configured appropriately for ODOT projects. However, you may wish to change the following settings on a file-by-file basis.

Coordinate Settings

- The **Format** can be set to **X,Y,** or **N,E** as desired.
- The **Precision** setting is used to control the display and precision of coordinates within the various civil and survey dialogs.

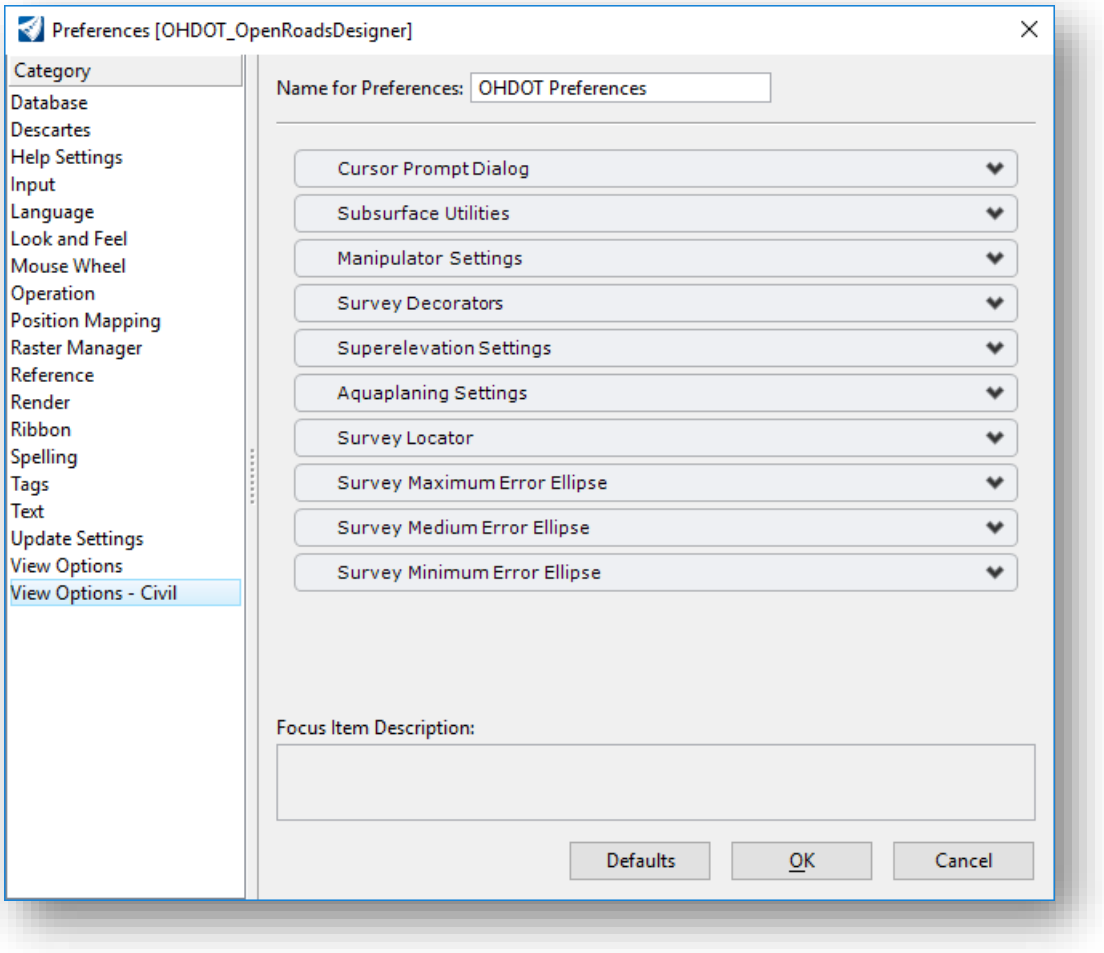
Station Settings

Controls the format, delimiter and precision of the station values to be used and displayed in the various civil dialogs. In addition, there are two options to control how equations are represented within the station values.

- **By Name** - This is the standard legacy InRoads presentation (A100+00, B105+00, etc.)
- **By Index** - This is the standard legacy GEOPAK presentation (100+00 R 1, 105+00 R 2, etc.). The OHDOT Seed files are defined to use this setting.

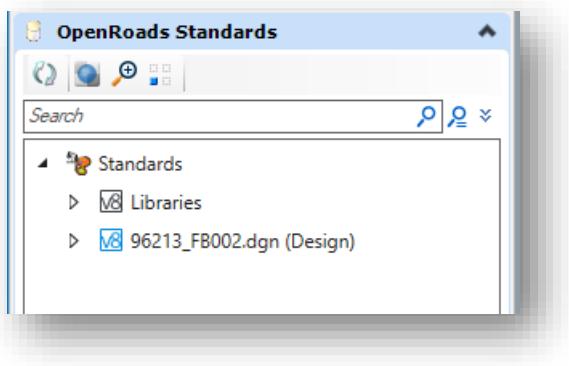
User Preferences

The ORD User Preferences include several options for the civil products. These parameters are accessed by selecting **File > Settings > User > Preferences** as shown below. These options have been configured as necessary in the OHDOT workspace. See the Bentley online help for more information.



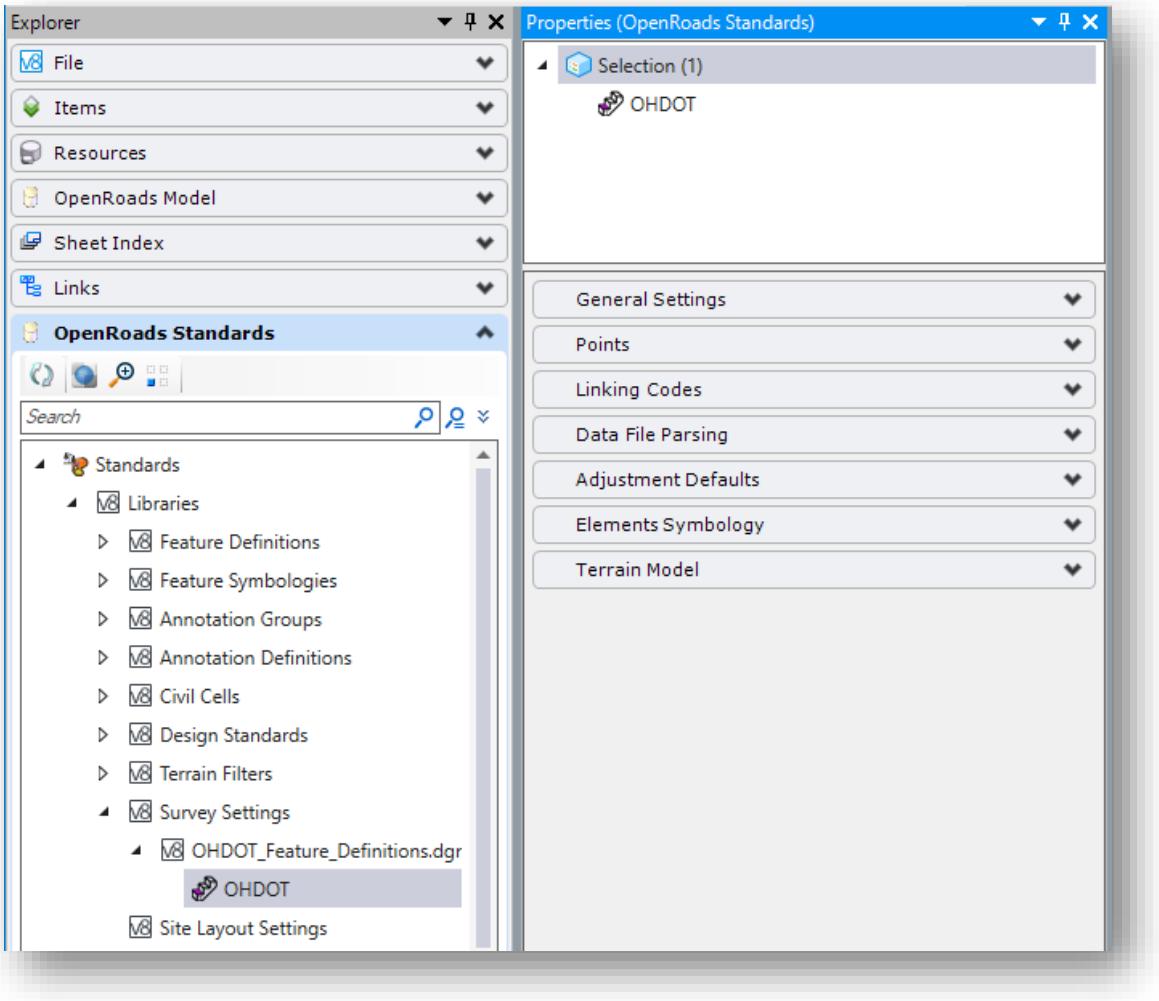
OpenRoads Standards > Survey Settings

The ***Explorer*** dialog's **OpenRoads Standards** tab contains an item for the **Survey Settings**. The **Survey Settings** defines the default project settings for the Survey software. Once a dataset has been processed, these settings are copied to the active design file where they can be edited by the user.

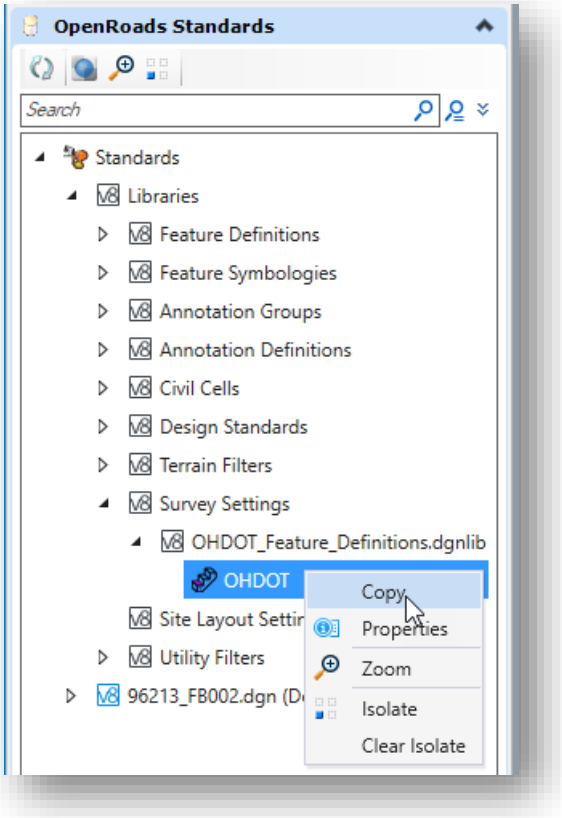


Standards are read from the various Libraries. After you have processed survey data, the relevant standards are copied to the active file, which is listed in the ***Explorer*** dialog's **OpenRoads Standards** tab as shown at left.

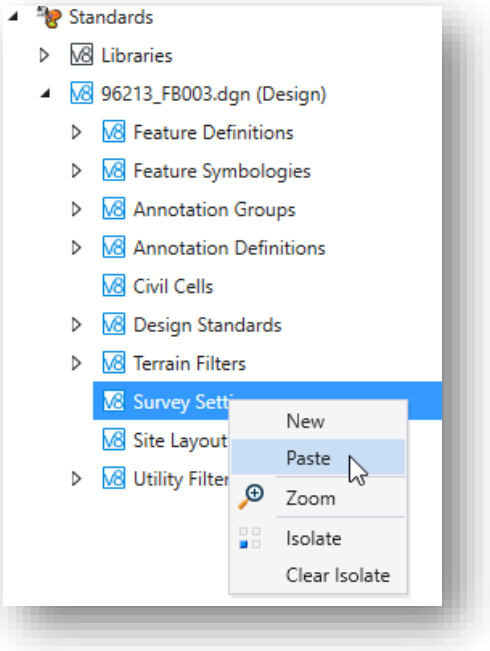
To review the default settings, select the **OHDOT** item in the **Survey Settings** category as show below. The various parameters of the **Survey Settings** are displayed in the ***Properties*** dialog.



These settings are set appropriately for ODOT projects; however, there are occasions where you may wish to change some of the parameters on a per-project basis. The settings cannot be edited from the Library and must be edited from the copy contained in the active file. If you have not processed any survey data, you can copy the Survey Settings from the Libraries to the active file as follows:

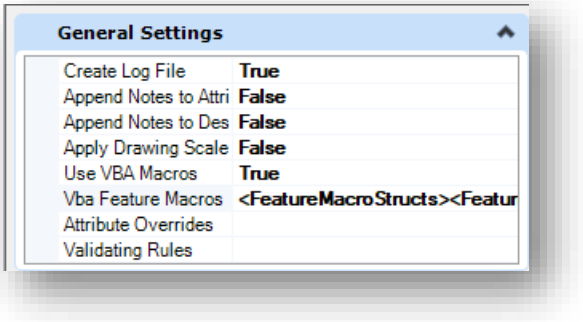


- Browse to the **OHDOT** settings as shown at left
- Right-click on the **OHDOT** Settings and choose the **Copy** option
- Browse to the **Survey Settings** in the active file
- Right-Click the **Survey Settings** and choose the **Paste** option as shown below



Items that you may occasionally need to edit are documented on the following pages. See the online help for information not presented here.

General Settings



Create Log File

A log file of activity can be optionally saved to track changes to the Survey information. In the **General Setting**s tab, set the **Create Log File** option to **True** as shown below.

The log file is placed in the same folder as the DGN file.

The log file is named with a .log extension using the name of the design file model.

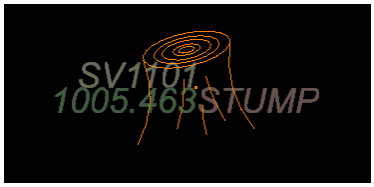
The log file contains the name of the user, the date and time, and a description of the action performed. An example of a portion of the log file is shown below:

ethomas Thursday, January 31, 2019 12:25:05 PM Field Book MRW-314-8.08 Topo Name: from: Field Book 1 to: MRW-314-8.08 Topo
ethomas Thursday, January 31, 2019 12:25:43 PM Load Data C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\96213_D06_Survey\300-Survey\SurveyData\FieldData\RawData\0800\MRW-314-8.08.csv
ethomas Thursday, January 31, 2019 12:28:22 PM New Field Book Field Book 1
ethomas Thursday, January 31, 2019 12:28:37 PM Field Book MRW-314-8.08 Scan Name: from: Field Book 1 to: MRW-314-8.08 Scan
ethomas Thursday, January 31, 2019 12:28:48 PM Load Data C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\96213_D06_Survey\300-Survey\SurveyData\FieldData\RawData\0800\MRW-314-8.08SCAN.csv
ethomas Thursday, January 31, 2019 12:29:55 PM Delete Field Book MRW-314-8.08 Scan
ethomas Thursday, January 31, 2019 12:30:13 PM Field Book MRW-314-8.08 Name: from: MRW-314-8.08 Topo to: MRW-314-8.08
ethomas Thursday, January 31, 2019 12:30:27 PM Load Data C:\Bentley\CONNECT\WorkSpaces\OHDOT\WorkSets\96213_D06_Survey\300-Survey\SurveyData\FieldData\RawData\0800\MRW-314-8.08SCAN.csv
ethomas Thursday, January 31, 2019 12:31:10 PM New Surface MRW-314-8.08

Use VBA Macros

ODOT uses the Visual Basic application OHDOT_Survey.mvba to draw additional annotations in the design file. These annotations are drawn when the survey data is processed. The application is also used to place annotations for drainage items as detailed in Section 400 of the ODOT Survey training material.

The Use VBA Macros parameter is set to a value of True in the OHDOT Standards. The VBA Feature Macros parameter defines the macro that is applied for field codes for point and linear features. With the December 2020 update to the OHDOT CADD Standards, macros have been added to annotate points similar to GEOPAK Survey. An example of the annotation placed by the VBA Macro for a point is shown below.



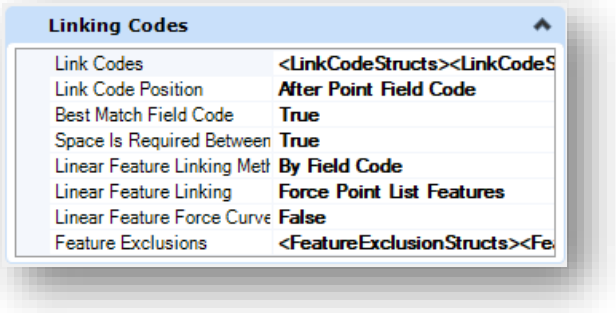
Unlike the **Survey Decorator** annotations, which are not written to the file, these annotations are placed as text elements in file on the levels detailed below.

Annotation	MicroStation Level
Point Name	SV_X_Text_Name
Point Elevation	SV_X_Text_Elevation
Field Code	SV_X_Text_Comment

The display size of the annotations is set by use of the **Annotation Scale** parameter.

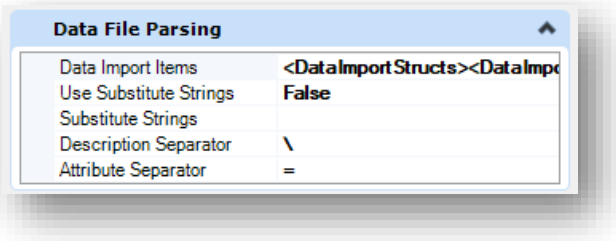
Note: Survey Attribute data is not annotated using the VBA Macros. The OpenRoads Survey commands **Element Annotation** and **Model Annotation** are used to annotate attribute information.

Linking Codes



As previously stated, the **Link Code Position** parameter has been set to **After Point Feature Definition** with the OHDOT Standards. When processing older datasets containing the linking code before the feature name, the survey preferences must be copied into the active file and the value of the **Link Code Position** parameter changed to **Before Point Feature Definition** before processing the data.

Data File Parsing

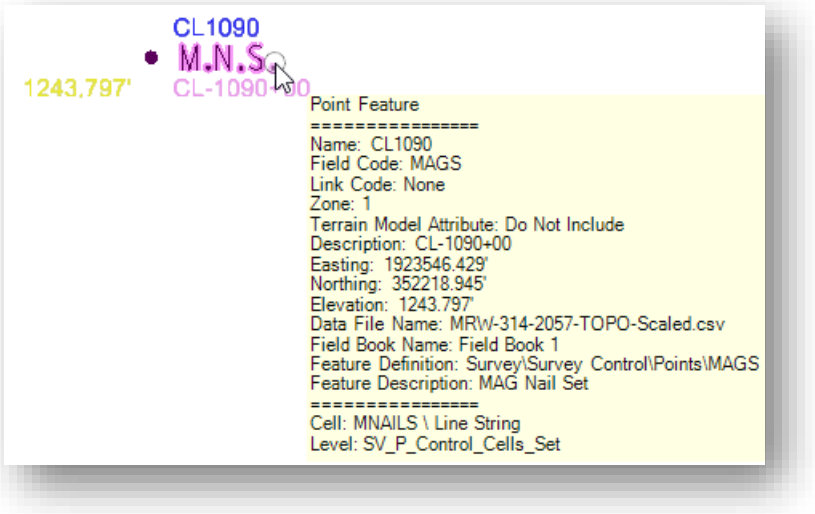


The **Description Separator** has been set to the backslash character in the OHDOT standards and can be changed from the **Data File Parsing** tab as shown above.

Descriptions can be added by use of entering a backslash character after the Field Code name as the data is collected in the field. An example of one of the CMON points in the CSV file is shown below:

CMON\REF-108+50

The description is written to the point attributes and can be displayed in the design file using the Survey Decorations as shown below.



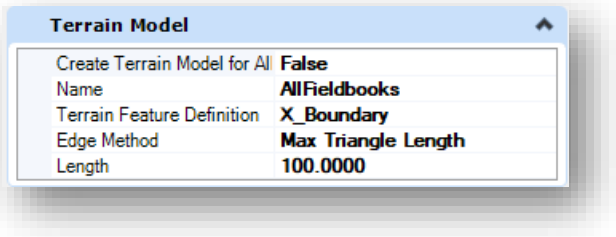
Adjustment Defaults

Various adjustments and blunder detection may be applied to survey raw data. The adjustments and adjustment settings apply to the entire field book.

Most of these settings are device-dependent. For example, the Add-on for Distance constant value is dependent on the device used to measure distances.

The Adjustment Defaults defined in the OHDOT workspace have not been changed from the Bentley default values.

Terrain Model



The initial settings for terrain models are defined in the OHDOT workspace as shown above. These values can be changed before processing survey data or after the fact by editing the terrain model properties.

Exercise 1: Importing Survey Data from a CSV file

In this exercise we import field survey data from a CSV file. The sample project is in Morrow County.

The process to import the ground survey data is summarized below:

1. Create a 3D Field Book (FB) design file to import the survey information
2. Create a new Field book
3. Import survey data files
4. Review and edit survey information as necessary

Creating the Field Book (FB) design file

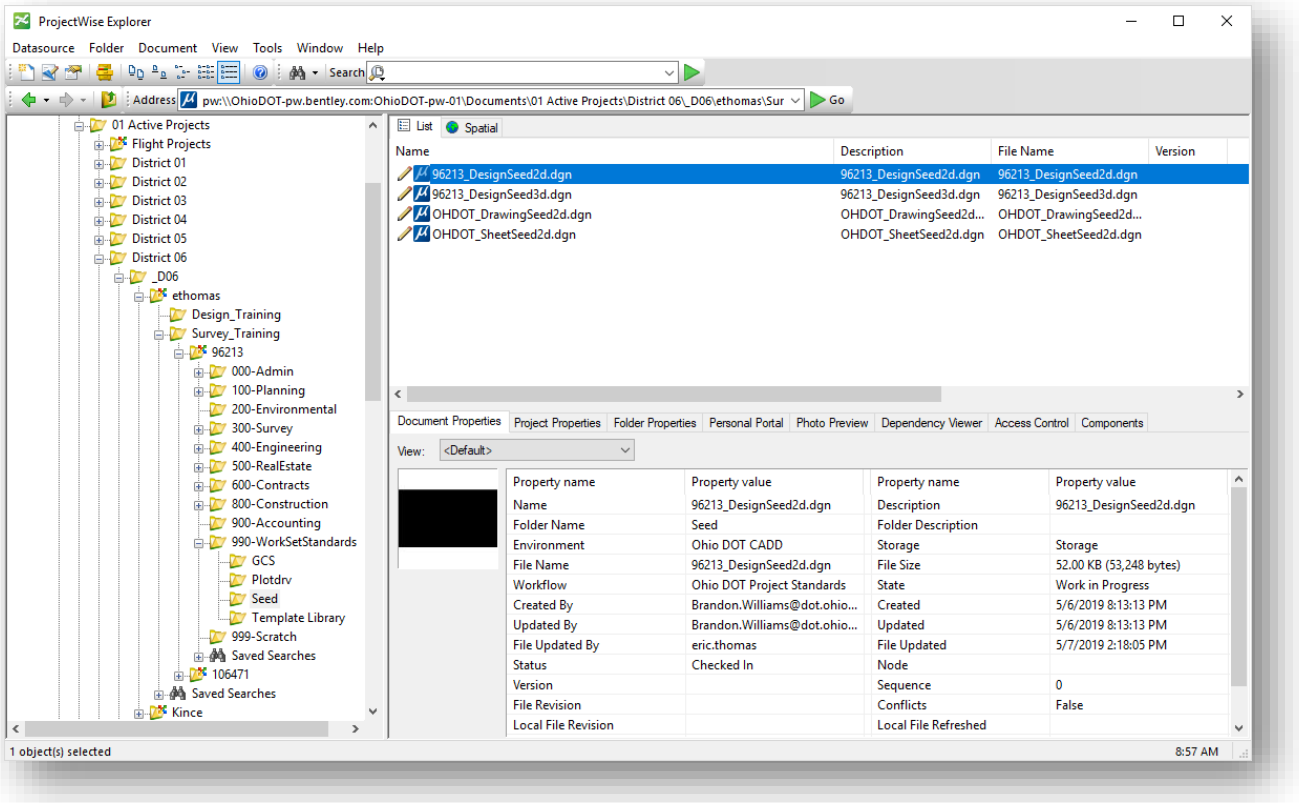
ODOT projects that have been created outside of the ProjectWise environment using the OHDOT template contain the file **400-Engineering\Startup.dgn**. This file is used as the launching point for opening ORD to create new DGN files for the WorkSet. The Startup.dgn file can be ignored once the initial design files for the project are created.

Inside the ProjectWise environment, the Startup DGN file is not used. One of the seed files is used as the initial launching point to create new design files for the WorkSet.

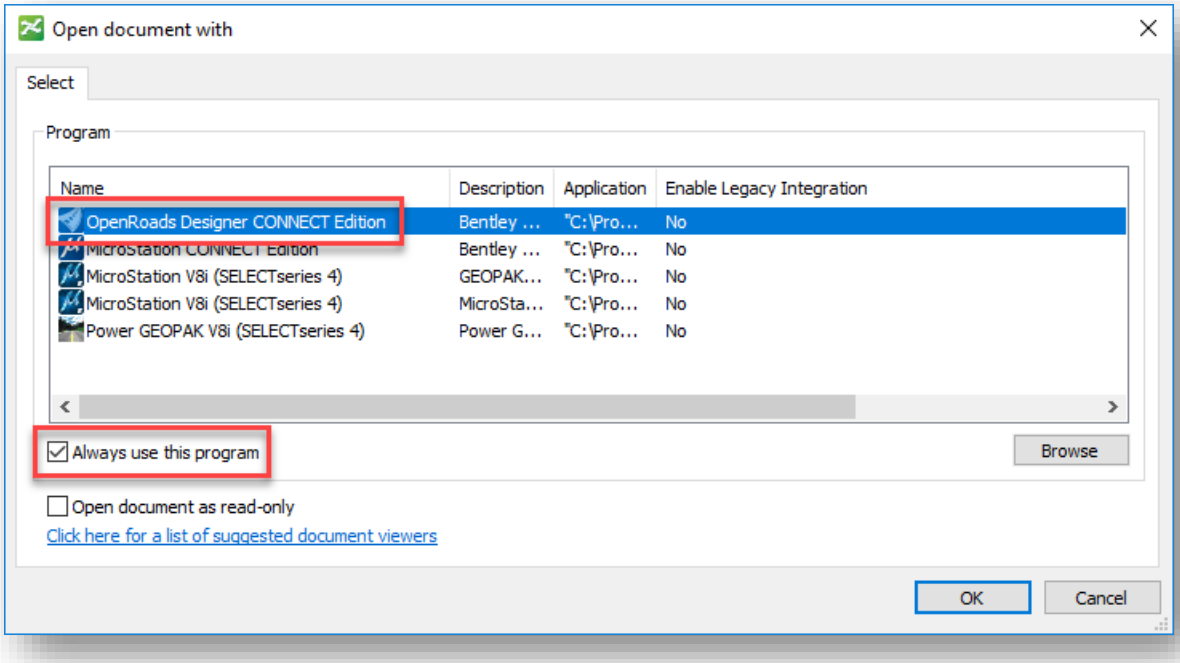
Take the following steps to open **96213_DesignSeed2d.dgn** and create a new FB design file for the project.

- Open **ProjectWise Explorer**

- Browse to the folder shown below, using your home District and your use name.

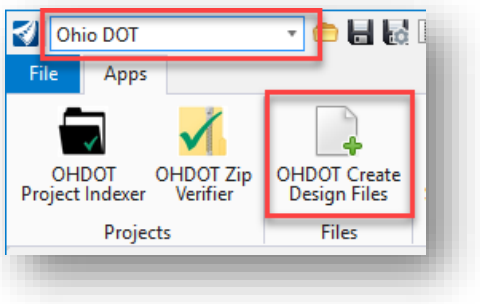


- Right-Click on the file **96213_DesignSeed2d.dgn** and choose the **Open With…** option to open the file with OpenRoads Designer CONNECT Edition. Toggle the **Always use the program** option **ON**

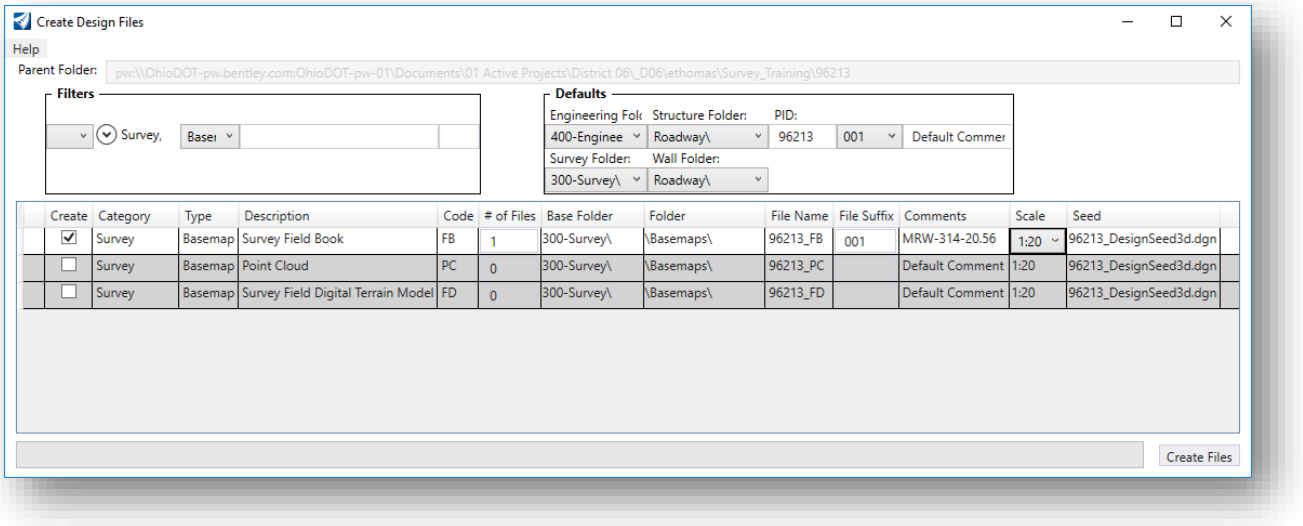


- Select **OK** to open the file.

- Select the **Ohio DOT** WorkFlow from the top left of the ORD interface.
- From the **Apps** tab, select the **OHDOT Create Design Files** icon



The application is opened as shown below



- Create the following DGN file:
  - Survey Field Book (FB)

    Which Seed File is used to create the FB design file? _____

    Which folder is the file crated in? _____

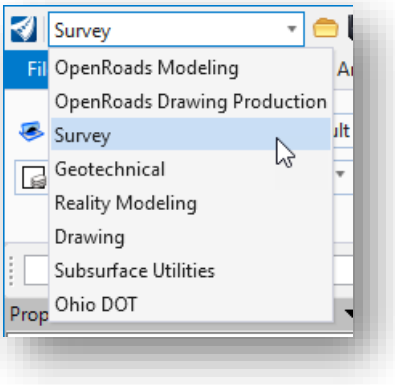
- After creating the Field Book (FB) design file, close the DGN file
- Open the newly created FB design file with OpenRoads Designer.

Importing a CSV file

Importing topo survey data can be accomplished using the ***Explorer*** dialog, or by selecting commands from the ribbon menu.

In this example, we will import the survey data using the commands from the ***Explorer*** dialog.

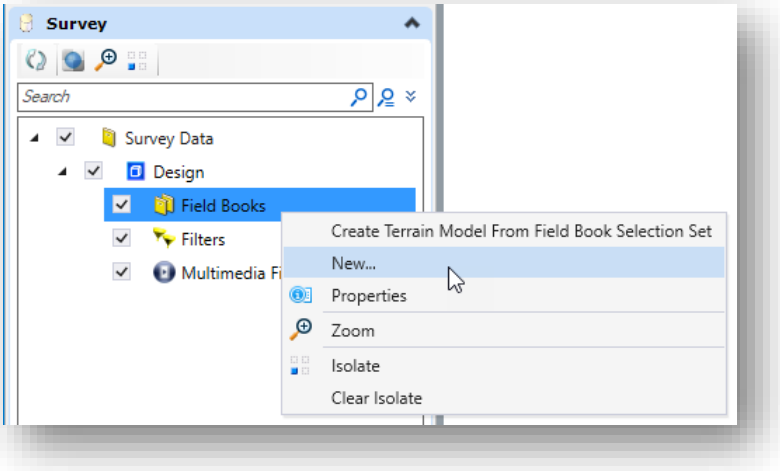
- After opening the FB design file, select the **Survey** WorkFlow from the upper left pull-down menu.



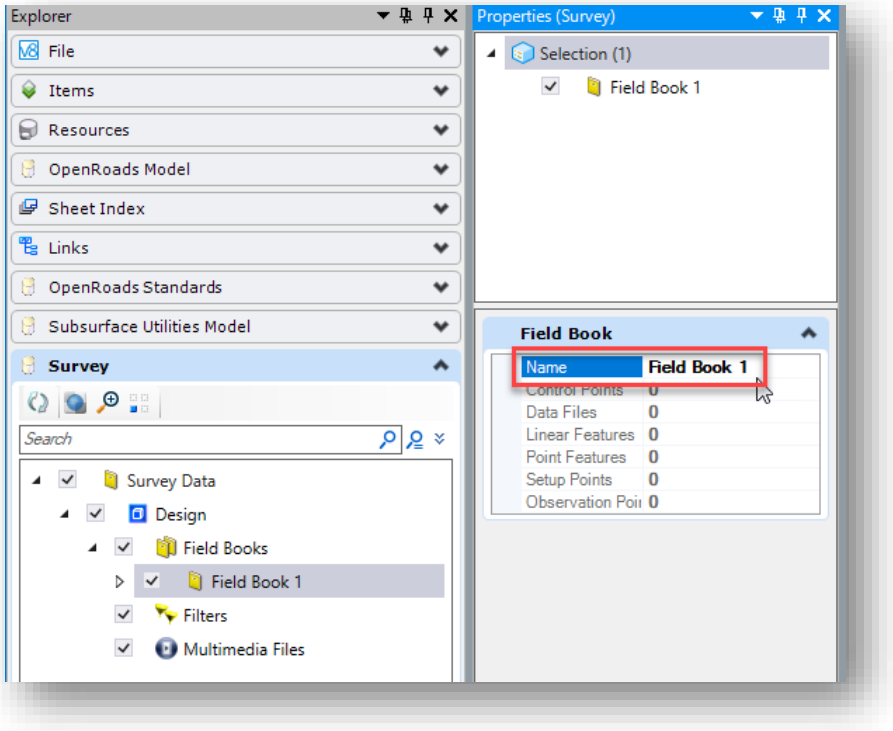
- From the ***Explorer*** dialog, open the **Survey** group

  If the ***Explorer*** dialog is not displayed, open it by selecting **Explorer** on the **Home** tab of the **Survey** WorkFlow

- Right-click on the **Field Books** option in the ***Explorer*** dialog's **Survey** group to create a new **Field Book** as shown below.



The field book is created with the default name "Field Book 1". The name can be changed by selecting the field book in the ***Explorer*** dialog and entering the new name in the ***Properties*** dialog.



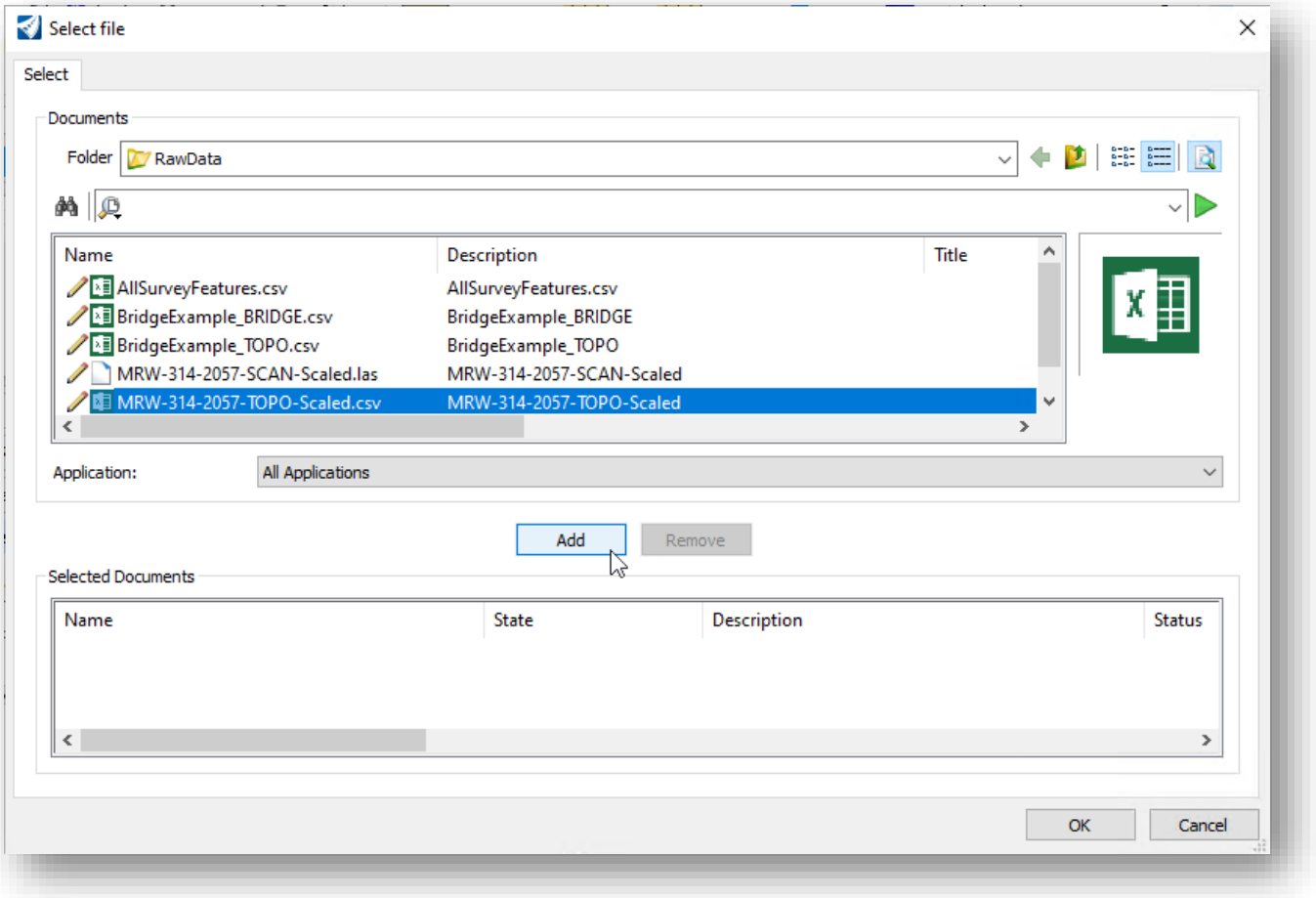
- Import the topo survey information by right-clicking on the field book name in the ***Explorer*** dialog and choosing **Import > File using Text Import Wizard**

    - Browse to the following folder to select the CSV file containing the topo survey data
      300-Survey\SurveyData\FieldData\RawData\

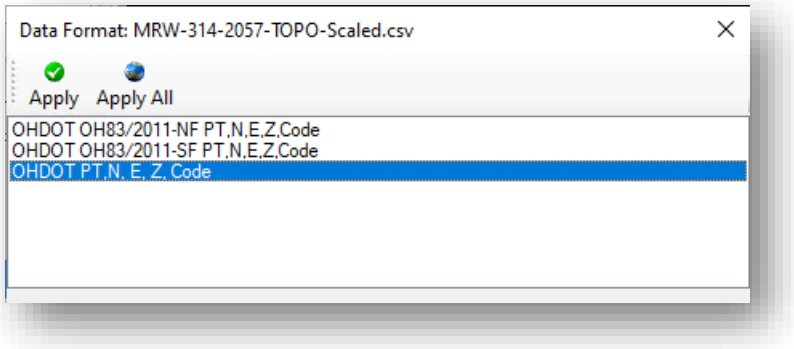
    - Select the file **MRW-314-2057-TOPO-Scaled.csv**

    - Choose the **Add** button to add the file to the **Selected Documents** list

    - Select the **OK** button



- After selecting the **OK** button, the ***Data Format*** dialog is opened as shown below.



These files are preconfigured **Text Import Wizard** files that are configured for comma separated values (CSV) files in the following format:

Column 1 Format	= Point Name
Column 2 Format	= Northing
Column 3 Format	= Easting
Column 4 Format	= Elevation
Column 5 Format	= Code

Column 6 Format = Attribute Name
Column 7 Format = Attribute Value
Column 8 Format = Attribute Name
Column 9 Format = Attribute Value
Column 10 Format = Attribute Name
Column 11 Format = Attribute Value
Column 12 Format = Attribute Name
Column 13 Format = Attribute Value
Column 14 Format = Attribute Name
Column 15 Format = Attribute Value
Column 16 Format = Attribute Name
Column 17 Format = Attribute Value

The **OHDOT PT,N,E,Z,Code** option is used to import survey data without any coordinate transformations applied as part of the import process.

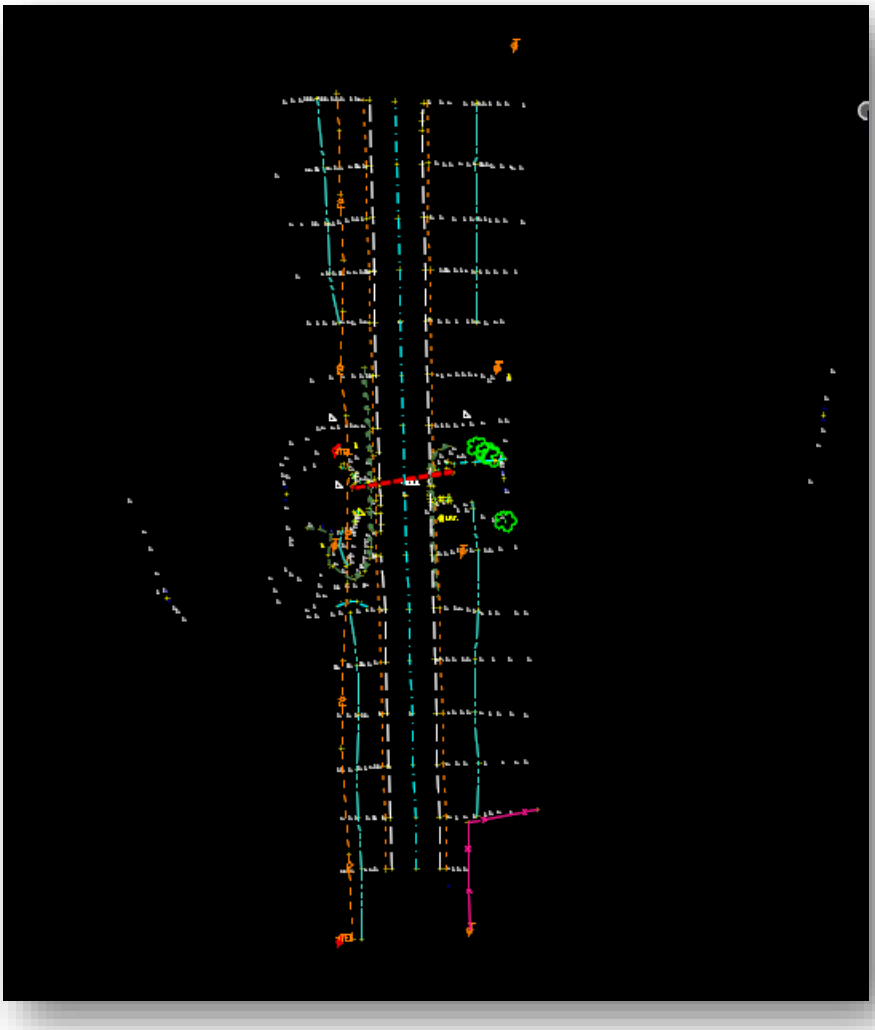
The **OHDOT OH83/2011-NF PT,N,E,Z,Code** and **OHDOT OH83/2011-SF PT,N,E,Z,Code** options contain additional parameters for the Projection Input and Projection Output, but only the Projection Input value is defined.

Projection Input = OH83/2011-NF
Projection Output

The options are used to import data that is in State Plane coordinates. Since there is not a Projection Output value defined, the data is transformed to the active Geographic Coordinate System (GCS) defined in the design file. If the GCS is undefined, no transformation is applied.

In most cases, coordinate transformations will be applied using the survey software before the CSV file is generated. Typically the CSV file will be processed using the **OHDOT PT,N,E,Z,Code** option.

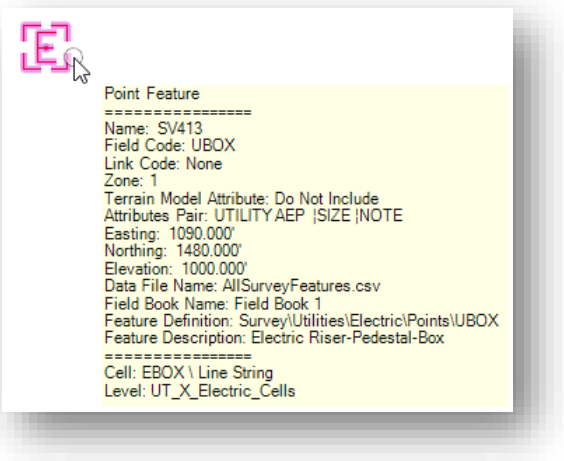
- Select the **OHDOT PT,N,E,Z,Code** format from the list. Select **Apply** to initiate the process. The CSV file is imported like the example below



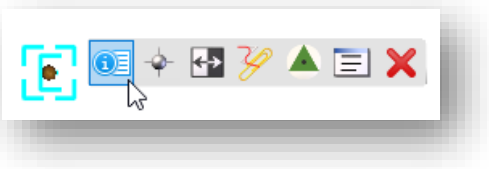
Reviewing and Editing Survey Data

Reviewing and Editing Points

To review a single survey point, simply float the cursor over the point. A pop-up menu with information about the point will appear like the example below.



The **Element Selection** command can be used to review or edit various properties of a selected point. When a point is selected, a menu of commands will appear onscreen as shown below.

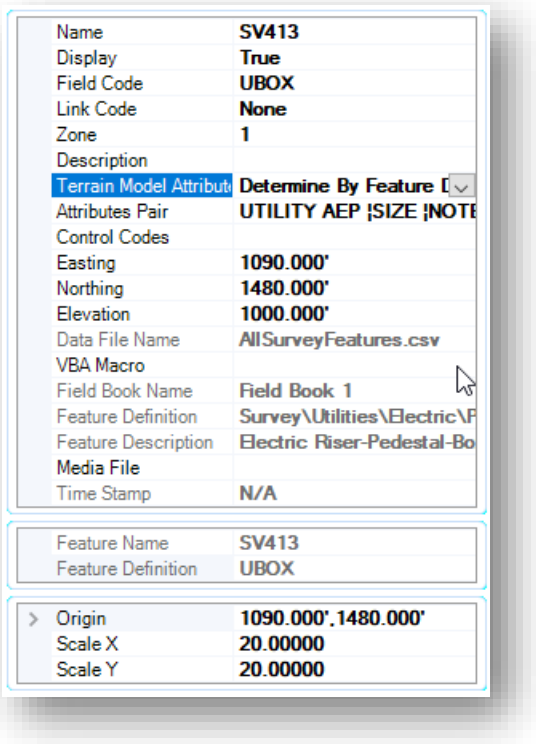


The following commands are available:

- Properties
- New Point Feature
- Turn on/off All Annotations
- Report
- Create Control Point
- Edit Observations
- Delete

Point Properties

Select **Properties** to access the menu shown below.



This is the easiest way to edit the attributes of a point. Nearly every field in the dialog is editable.

Note: The **Scale** fields represent the current MicroStation **Annotation Scale** setting and should not be edited.

The properties of the selected element can also be edited in the ***Explorer*** dialog.

Moving Points

Occasionally it may be necessary to graphically move a point to a new location. When a survey point is selected using the **Element Selection** tool, the origin of the point is highlighted with a circle as shown in the example below.

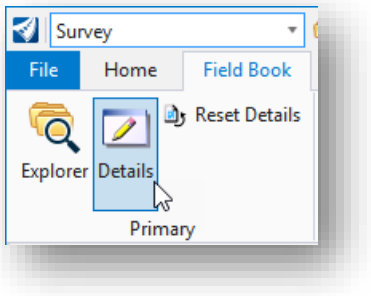
Using the **Element Selection** tool, the circle can be selected to move the point.

To move a point to known coordinates, edit the coordinate values in the **Point Properties** dialog shown above.

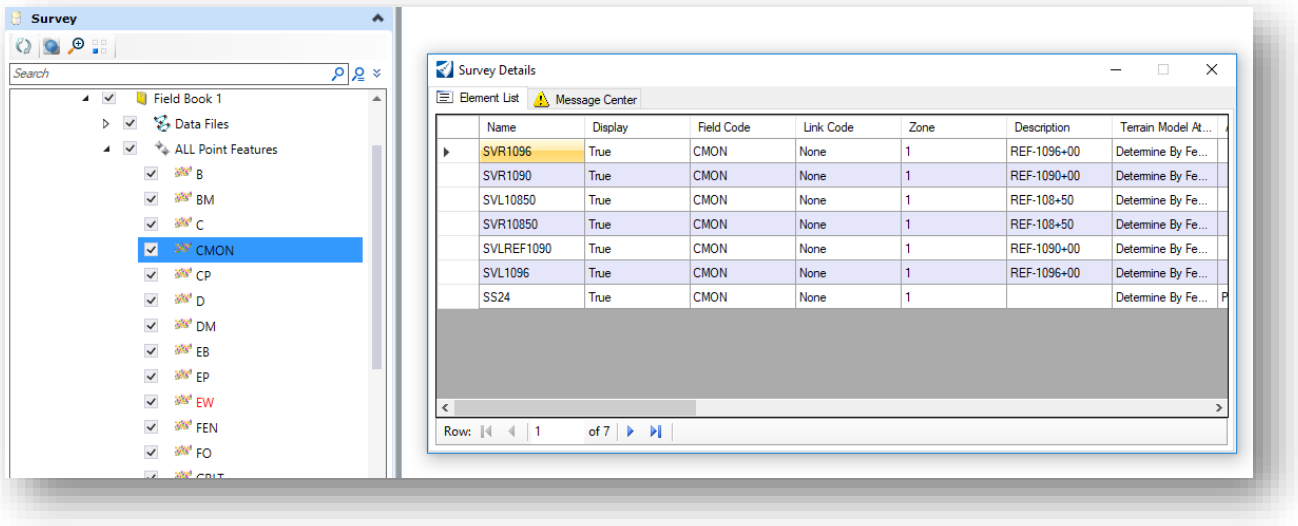
Caution: Depending on the value of the **Terrain Model Attribute** parameter, moving a point will also edit the associated terrain model.

Survey Details

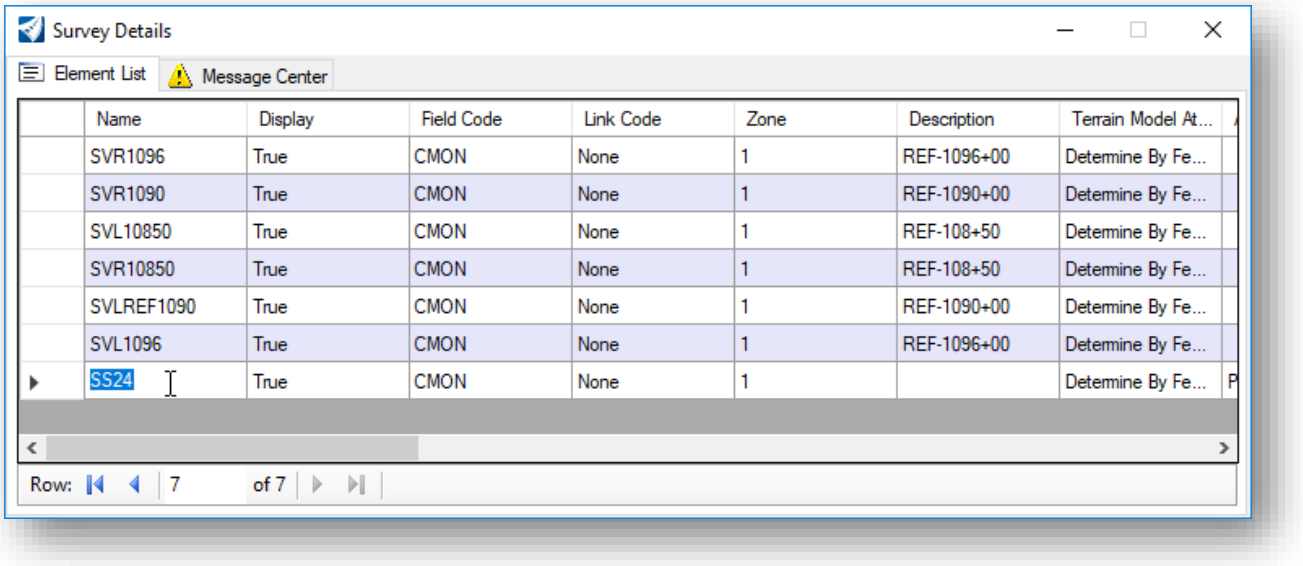
The ***Survey Details*** dialog is used to review and edit survey information. The dialog is opened by selecting the **Survey Details i**con from the **Survey** WorkFlow **Field Book** tab as shown below.



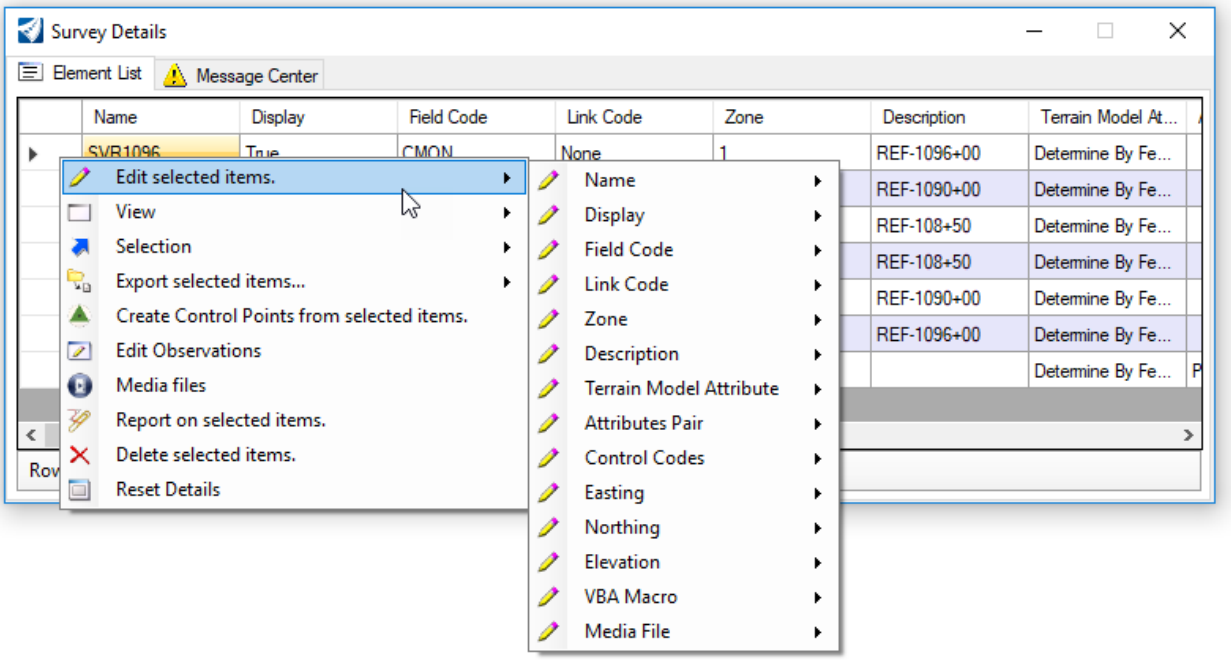
The content of the dialog is determined by the selected item in the ***Explorer*** dialog's **Survey** tab. In the example below, the Survey points that have the CMON feature definition assigned are displayed.



Many of the fields in the **Survey Details** dialog can be edited by selecting the field, and then by clicking in the selected field. An example editing the **Name** field is shown below.



Individual points or a group of selected points can be edited in the Survey Details dialog by right-clicking on the area to the left of the selected point(s). The editing options shown below are available.



Changes made to the data are dynamic and are applied instantly. For example, if a point is deleted the graphics are removed from the file, the terrain model is updated (if applicable) and any linear features that contain the point are updated.

If you make an edit that you did not intend to make, simply select the **Undo** command. The last action is reverted.

Reviewing and Editing Linear Features

There are three types of linear feature definitions in OpenRoads Survey:

Dynamic Linear Features

- Dynamic linear features are composed of points of the same feature
- The chains are generated dynamically using the feature name and the linking codes
- These chains will dynamically update on the fly if changes are made to the linking codes or to the feature associated with a point(s) in the field book
- The order of the point list cannot be changed; points are connected in the order that they were numbered in the field

Point List Linear Features

- Point list linear features are comprised of a list of survey points
- The order of the points is used to determine the linear feature geometry
- Linking codes are also used to define the shape of the linear feature
- Points can be included in the chain list in any order
- The points that make up a point list linear feature can have different feature codes
- These linear features are just like survey chains in GEOPAK Survey

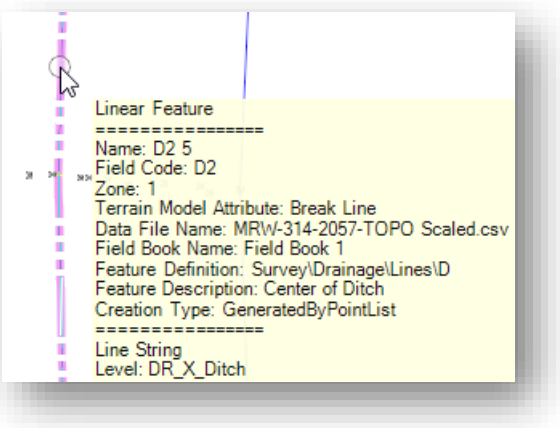
Graphic Linear Features

- Graphic linear features are drawn one at a time as a MicroStation graphic, ether by converting a point list linear feature to a graphic linear feature or by importing a 3D MicroStation graphic line
- If you convert a point list linear feature to a graphic linear feature any subsequent edits to the points that originally defined the chain will not update the graphic linear feature. This allows users to make edits to the graphic chain using MicroStation commands.
- Graphic linear features can be include in the terrain model

These linear feature types are hierarchical. A **Dynamic Linear Feature** can be converted to a **Point List**. A **Point List** type can be converted to a **Graphic** type.

The OHDOT **Survey Settings** have been configured to generate **Point List Linear Features** as the default.

To review a single linear feature, simply float the cursor over the element to reveal a pop-up menu like the example below.



The **Element Selection** command can be used to review or edit various properties of a selected linear feature.

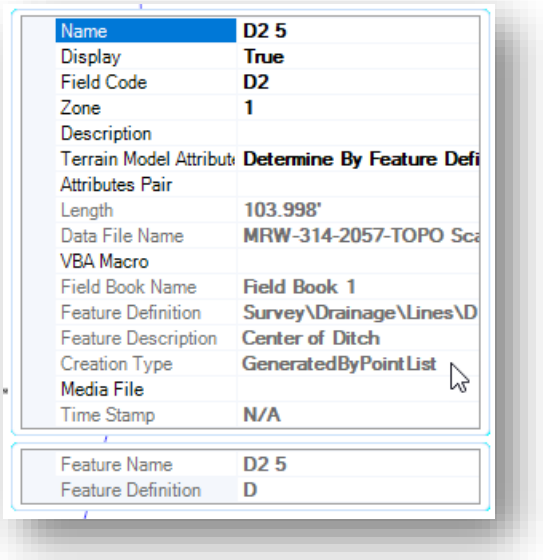
When a **Point List Linear Feature** is selected, a menu of commands as shown below will appear onscreen.

The following commands are available if the selected linear feature is a **Point List Linear Feature**:

- Properties
- Append Point in Linear Feature
- Remove Point from Linear Feature
- Join Linear Features
- Move Point Along Linear Feature
- Insert Point in Linear Feature
- Close Linear Feature
- Break Linear Feature
- Transpose Linear Feature
- Move Linear Feature
- Report
- Convert to Graphic Linear Feature
- Manage Point List
- Edit Point Features
- Delete

See the online documentation for information on each command.

Select the **Properties** item to access the dialog show below. The properties of a point list linear feature are shown below.



Many of the fields in the **Properties** dialog can be edited directly in this dialog.

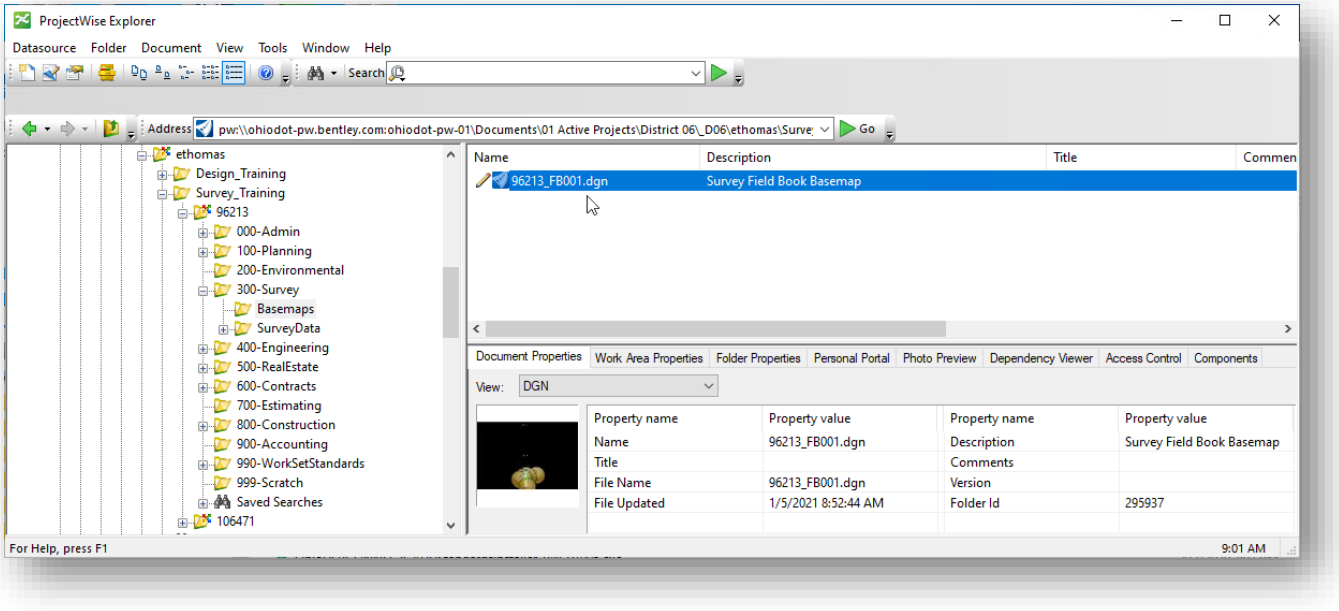
Linear features can also be edited using the **Survey Details** dialog as described above for points.

Exercise 2: Survey Annotation Example

In this exercise we will process a CSV file that contains point and linear features for every ODOT field code. This dataset is used for testing and review of the ODOT code list and OpenRoads Feature Definitions for Survey. The dataset is a good example for how each of the survey codes will be annotated using the attribute data that can be entered for each point.

- Open **ProjectWise Explorer**

- Open the **96213_FB001.dgn** file using your home District and your user name (use D06 for Central Office employees).



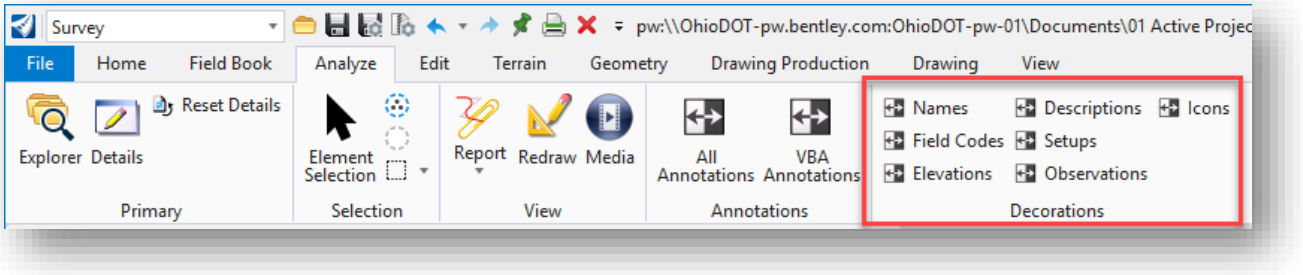
- Select the **Ohio DOT** WorkFlow from the top left of the ORD interface.
- From the **Apps** tab, select the **OHDOT Create Design Files** icon
- Create another Field Book (FB) design file for this exercise
- Open the newly created Field Book (FB) design file
- Create a new **Field Book** to import the data.
- Import the following CSV file:

300-Survey\SurveyData\FieldData\RawData\AllSurveyFeatures.csv

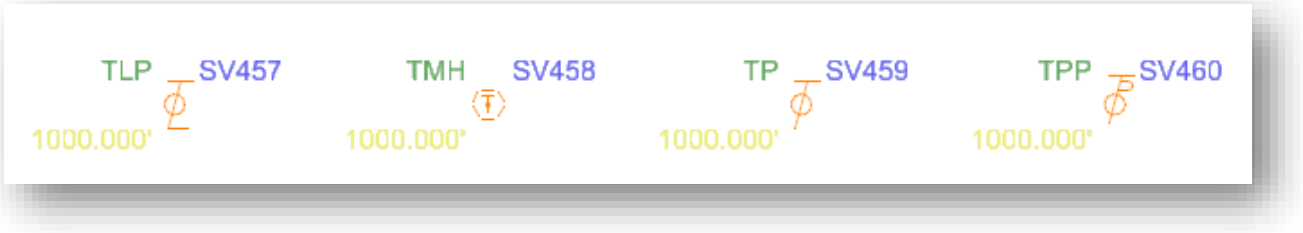
Survey Decorations

Survey decorations are temporary annotations displayed in the design file containing the field book. These annotations replace many of the annotations that were placed in the design file with the legacy GEOPAK Survey software.

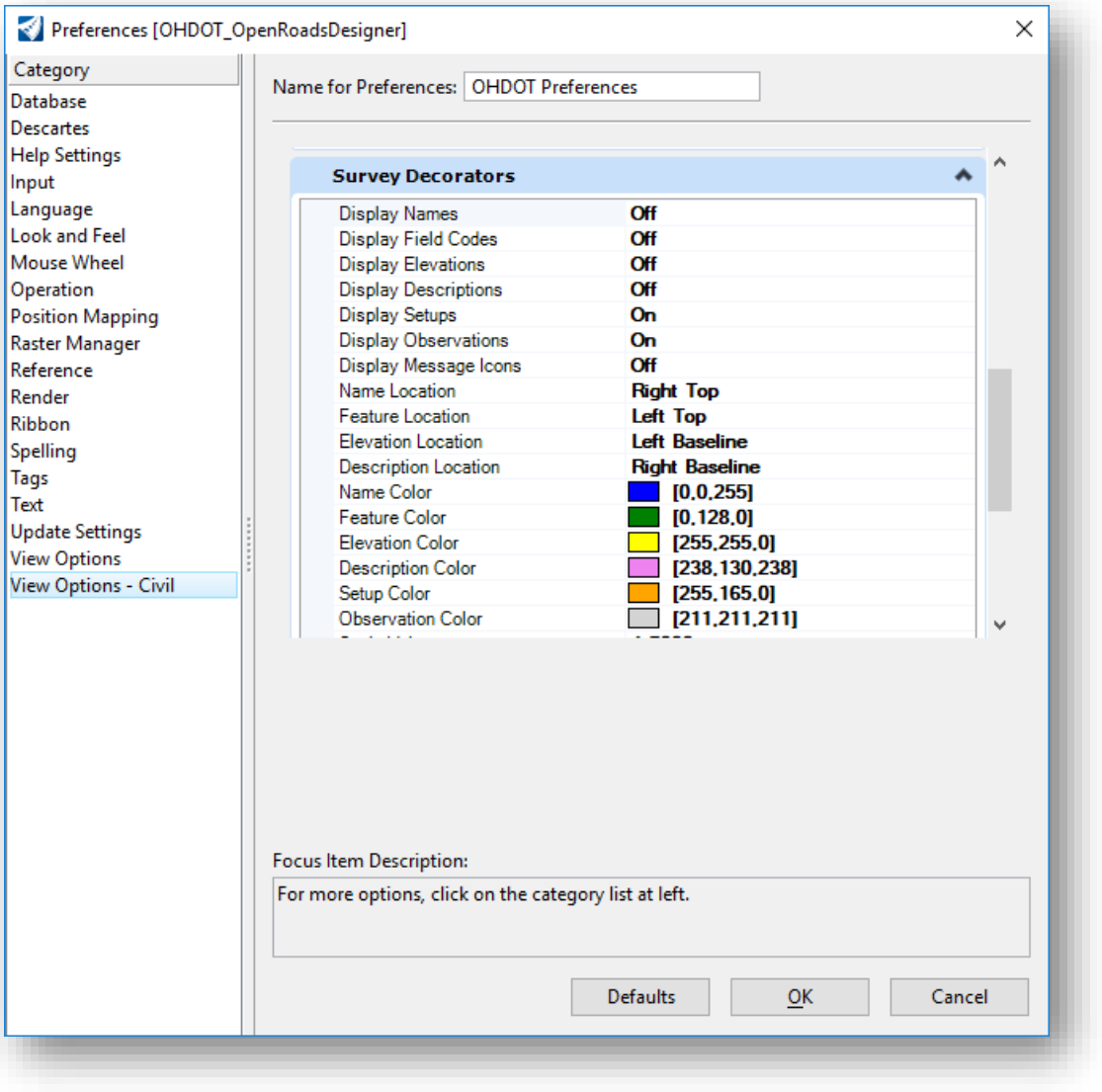
Survey decorators are toggled on/off on demand. These on/off commands are found by selecting the **Survey** workflow **Analyze** tab as shown below.



In the example below, the Name, Field Codes, and Elevations decorations are toggled on.



The display parameters for Survey Decorations are defined by the User Preferences. Select **File > Settings > User > Preferences** to access the **View Options – Civil** parameters as shown below.

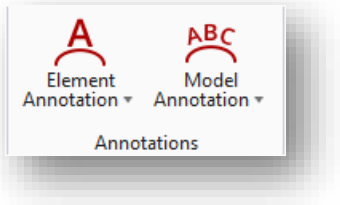


Note that Survey Decorators can only be displayed in the design file that contains the field book. The decorations cannot be displayed from a reference file attachment.

Survey Annotation

Survey elements can be annotated individually, by a selection set, or by an entire Model.

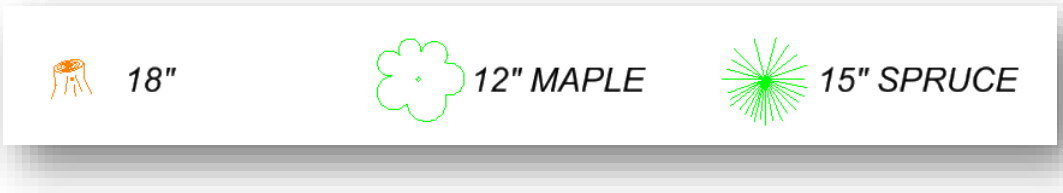
- In the **Survey** WorkFlow, select the **Drawing Production** tab
- From the **Drawing Production** tab, select **Element Annotation**.



The **Element Annotation** command is used to annotate individual or multiple elements. When the command is selected, you are prompted to select the survey element(s) that you wish to annotate as shown below.

- Choose the element(s) you wish to annotate. Reset when complete. The selected elements are annotated based on the Feature Definition of the element.
- Adjust the **Annotation Scale** value (**Survey > Drawing > Drawing Scales > Annotation Scale**) as desired to view the annotations.

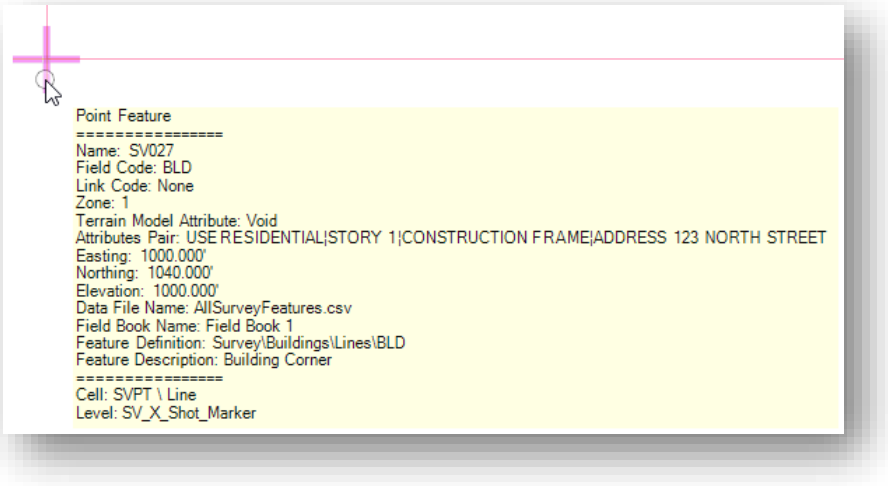
  In the example below, three elements were selected to be annotated.



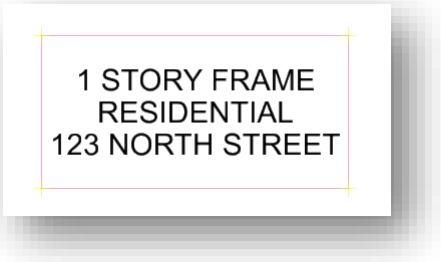
Some of the feature definitions are defined to place text on a level that the designer may elect to use in the plan sheets. In the example above, the annotation for the stump and the trees was placed on the level **VG_X_Text**.

Other annotations are placed in the file for information, but not intended to be shown on the plans. This text is placed on the level **SV_X_Text** with a transparency value of 70.

The example below shows the annotation for a building feature (Field Code BLD). The points are annotated with the attributes that were assigned to each point. In this example, the attributes were entered for only the first point of the building as shown below.



If the building is annotated, using the **Annotate Element** command, the text is constructed from the attribute data and placed on the level **BD_X_Text** like the example below.



- Choose the **Annotate Model** command to annotate all the survey elements in the current model. The example below shows the annotations that are placed for both the building and the points that were surveyed for the building.

The point annotation is not intended to be shown on the plan and is placed on the **SV_X_Text** level.

Note: In this example the attributes were entered for only the first point on the building.

Notes:

Every survey element is not annotated. Some of the ODOT Feature Definitions are not configured to place annotation in the file.

Annotations are dynamically updated. If you edit a survey point to change the attribute information, previously placed annotations are updated accordingly.

Annotations can be moved and edited as need, however, if you reannotate an element or a model the annotations are returned to their default location and value.

Annotations are placed using the current Annotation Scale value and will be resized if the annotation scale value is changed.

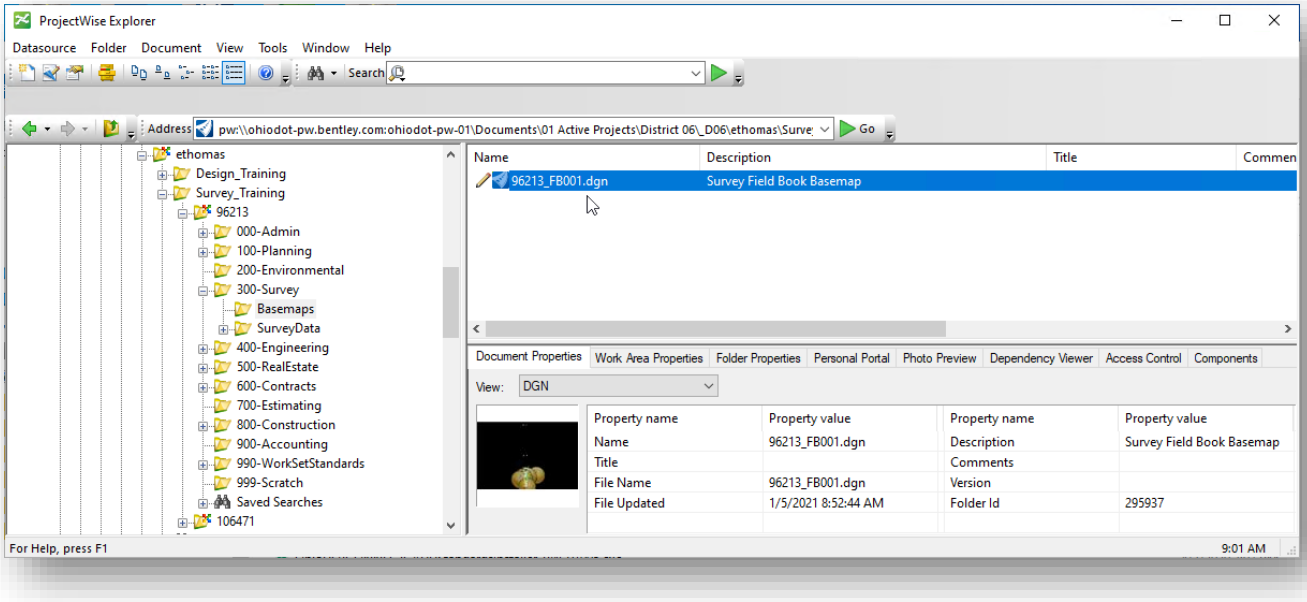
Exercise 3: ODOT Monument Report

The **ODOT Monument Report application** is used to assist the surveyor with the task of filling out the monuments sheet of the required Survey Master excel file. The application is accessed from the Ohio DOT WorkFlow as shown below.

Take the following steps to generate the monument report for the project:

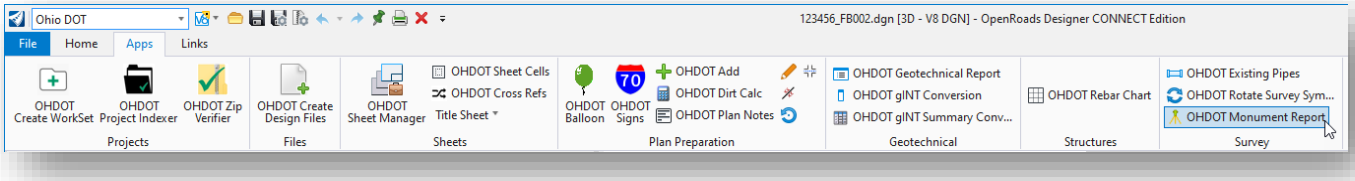
- Open **ProjectWise Explorer**

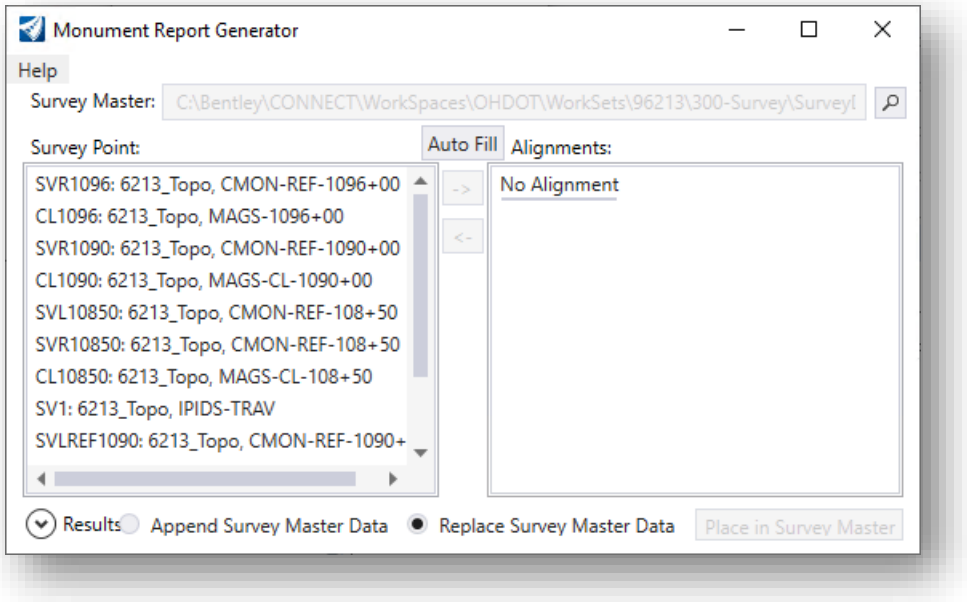
- Open the **96213_FB001.dgn** file using your home District and your user name (use D06 for Central Office employees).



- Select the **Ohio DOT** WorkFlow from the top left of the ORD interface

- Choose the **OHDOT Monument Report** icon to open the **Monument Report Generator** dialog as shown below.



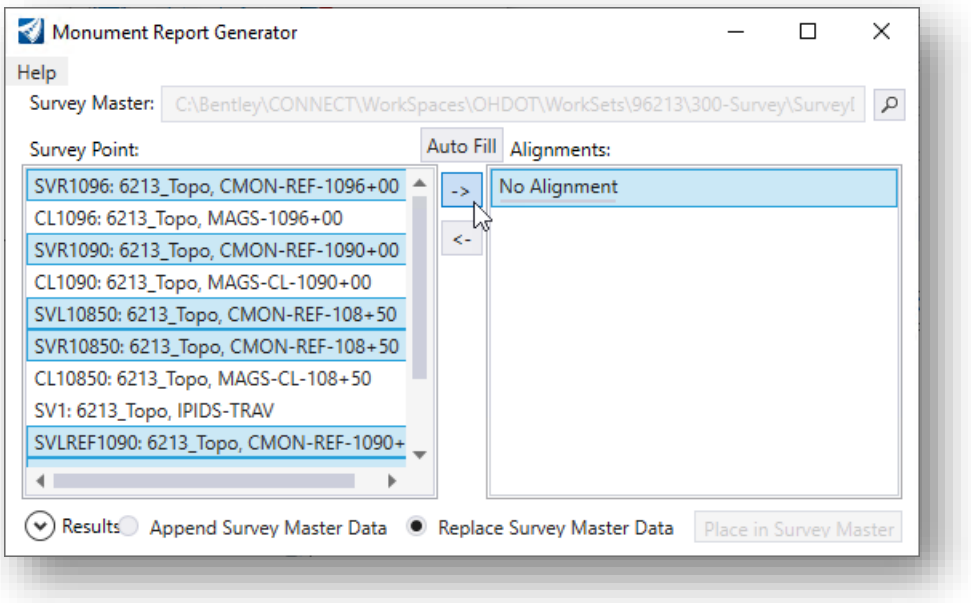


- Select the Survey Maser file. The file is located in the following folder:

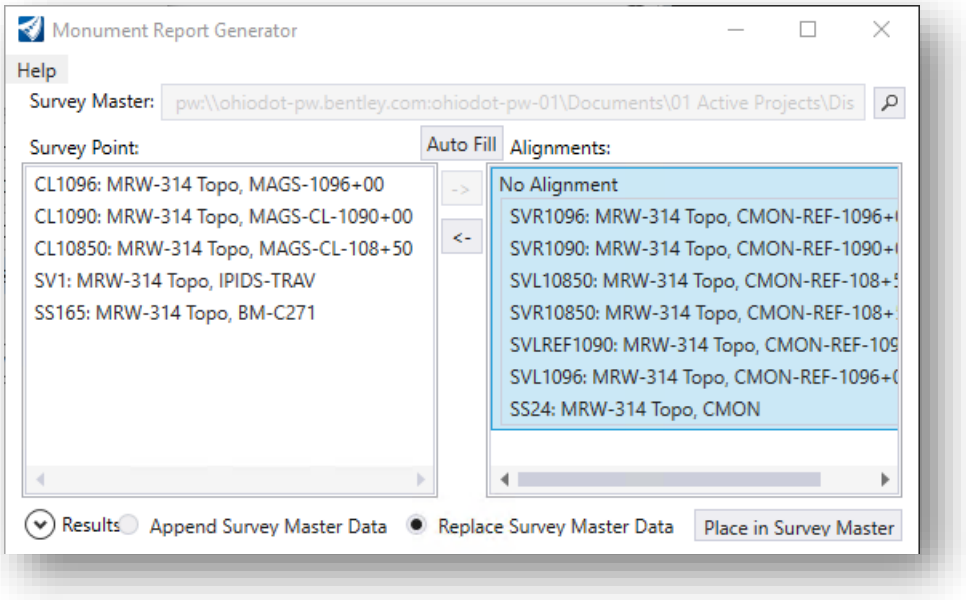
  ..\300-Survey\SurveyData\Reports\96213_SurveyMaster.xlsx

Monuments points found in the current design file are listed to the left under the **Survey Point** heading.

OpenRoads alignments, located in reference attachments, are listed under the **Alignments** heading.



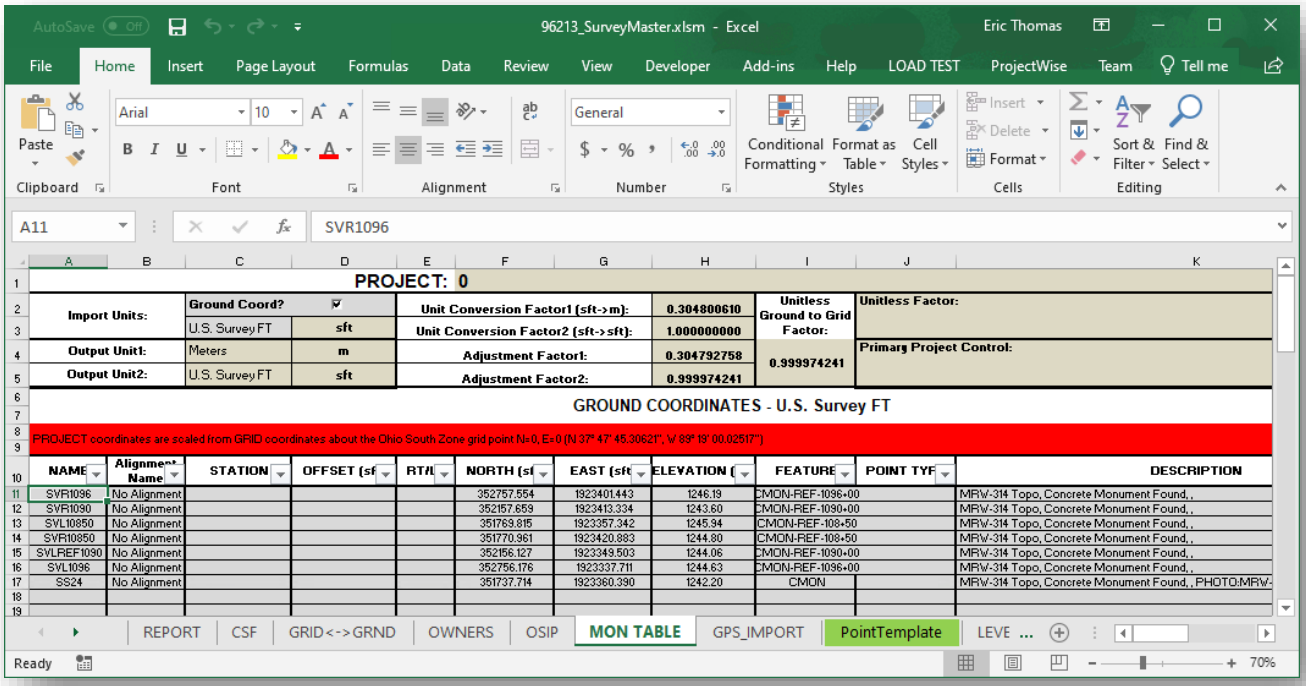
- Select the **Survey Points** that you wish to add to the selected **Alignment**. If there are not any alignments found, select the **No Alignment** option. The selected alignment is used to compute the station and offset for each point placed under the alignment.



After adding the selected **Survey Points** to the **Alignments** list, the **Place in Survey Master** icon is enabled.

- Select **Place in Survey Master** to add the selected points to the **Survey Master** Excel file. The selected points can be either append or replace data in the selected Survey Master file by choosing the appropriate option before placing the data in the survey master file.

The selected Survey Master Excel file is opened like the example below. Select the **MON TABLE** tab to review the imported information.



- After reviewing the survey master information, exit Excel. When prompted, select the **Check In** option to check the excel file back into ProjectWise.

- Exit OpenRoads Designer. This completes Exercise 3.

Media Files

The photos from data collectors with a camera can be attached as a photo attribute to a survey point. With the ODOT configuration, Trimble data collectors will prompt the surveyor to take a photo. If the data collector does not prompt for a photo, after taking a photo with the data collector the photo can be assigned to a specific point.

The example below shows a portion of a .csv file with photo attributes defined.

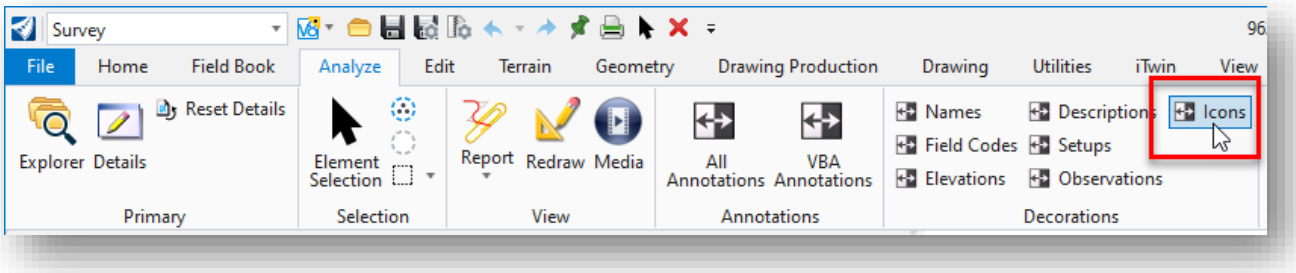
	A	B	C	D	E	F	G	H	I	J	K	L
22	SS11	351756.3	1923368	1246.458	DM							
23	SS12	351753.7	1923358	1245.732	PP	Material	Wood					
24	SS13	351753.1	1923359	1245.693	TLM	Photo	MRW-314-20.01229.jpg					
25	SS14	351770.3	1923363	1246.017	FO							
26	SS15	351791.4	1923360	1245.869	FO							
27	SS16	351820	1923362	1245.36	FO							
28	SS17	351844.1	1923362	1245.517	FO							
29	SS18	351875.7	1923361	1245.085	FO							
30	SS19	351905.7	1923360	1244.799	FO							
31	SS20	351923.6	1923359	1244.758	FO EL*							
32	SS21	351747.2	1923333	1246.312	X							
33	SS22	351742.1	1923333	1245.751	X							
34	SS23	351738.5	1923334	1244.44	X							
35	SS24	351737.7	1923360	1242.196	CMON	Photo	MRW-314-20.01230.jpg					
36	SS25	351736.3	1923335	1240.104	EW							
37	SS26	351730.6	1923335	1240.501	EW							
38	SS27	351733	1923335	1239.995	D							

ORD version 10.09.00.91 adds the configuration variable CIVIL_SURVEY_PHOTOS_FOLDER that is used to define the location of the photo files. This variable is defined in the WorkSet configuration file as follows:

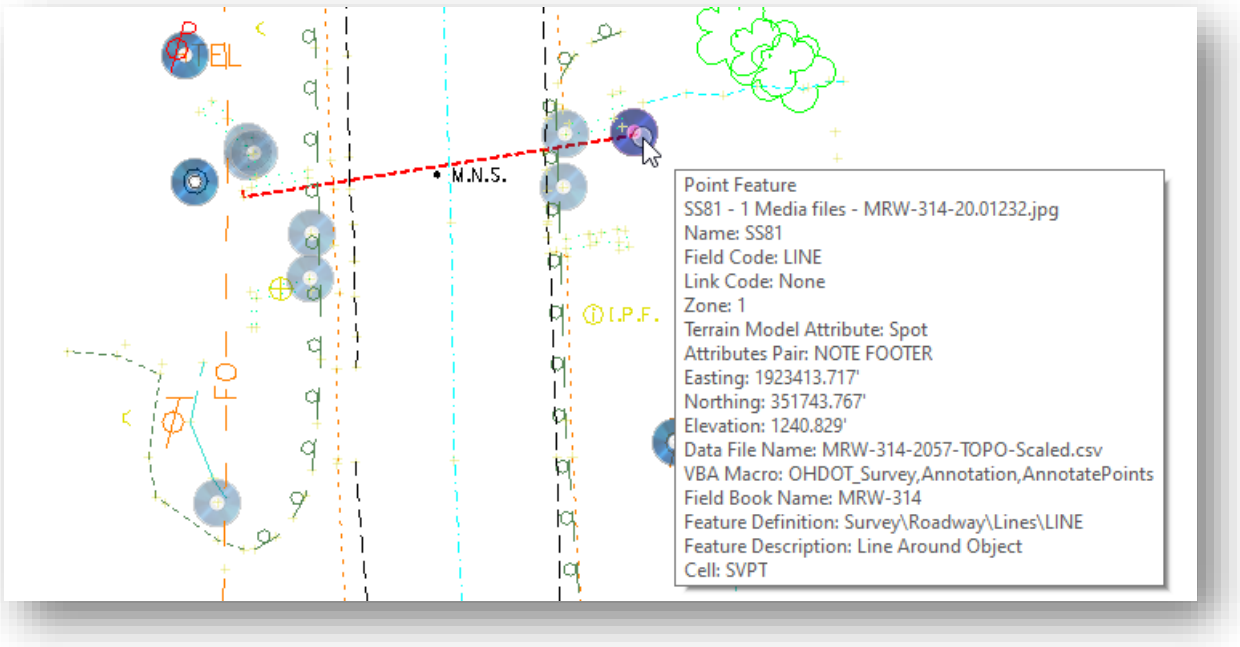
CIVIL_SURVEY_PHOTOS_FOLDER = $(_USTN_WORKSETROOT)300-Survey/SurveyData/Images/Field/

Note: Media files cannot be viewed across reference file attachments. You must be in the design file containing the Survey Field Book to view media files.

The **Icons** decorator may be used to display an icon for points that have a photo attached.

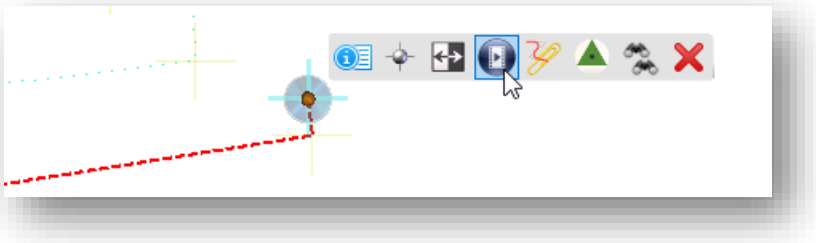


When the Icons decorator is toggled on, a circle is displayed over the points that have a photo attributes defined as shown below.



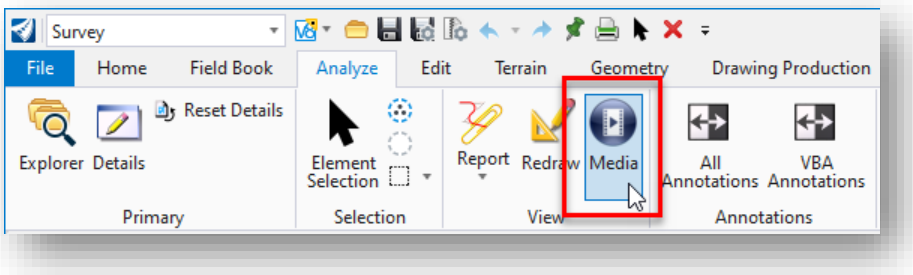
Reviewing the point properties will list the name of the attached **Media File** as shown above.

To view the associated media file, select the element using the **Element Selection** tool. Allow the mouse to hover over the selected point until the pop-up menu is displayed as shown below. Choose the **Media** command.

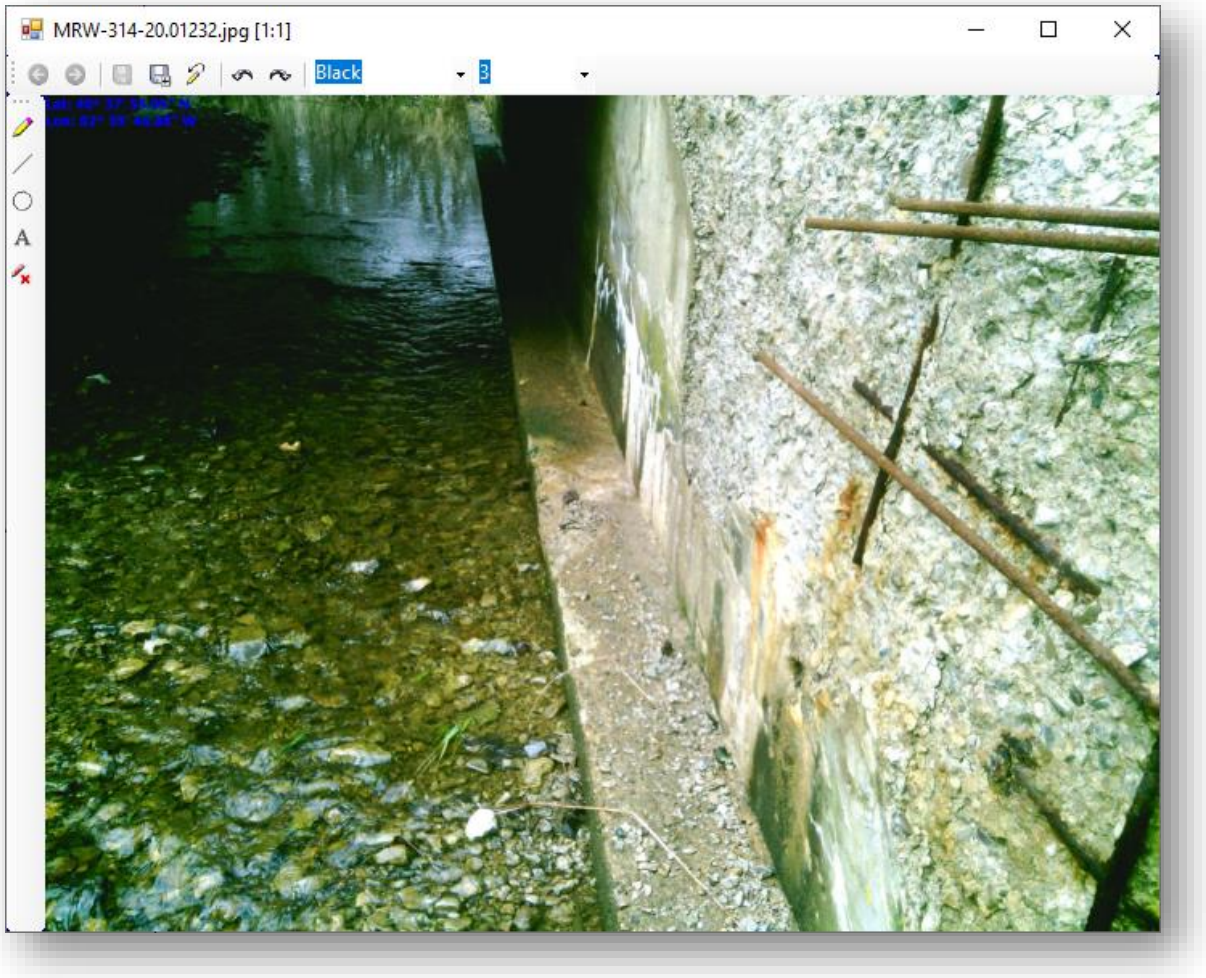


The associated media file is displayed.

The command can also be selected from the ribbon as shown below.



The media is displayed in the file like the example below.



The media window contains tools to mark up and edit the photo.

OpenRoads Software Version

This document was prepared using the following software version:

OpenRoads Designer CONNECT Edition – 2020 Release 2 Update 8 – Version 10.08.00.88

Contacts

For any questions, suggestions, or problems with this document please contact the ODOT Office of CADD and Mapping Services by use of the following form on the ODOT website:

https://odot.formstack.com/forms/cadd_servicerequest