OpenRoads Designer (ORD) Survey Processing Guidelines

Contents

This document was developed as part of the continuing effort to provide guidance within the South Dakota Department of Transportation in fulfilling its mission to efficiently provide a safe and effective public transportation system through our core values of high ethical standards, stewardship, transparent public service, safety, teamwork, and improvement. This document is not intended to establish policy within the Department, but to provide guidance in adhering to the policies of the Department.

Your comments, suggestions, and ideas for improvements to this document are welcomed.

02/05/2026

Introduction to OpenRoads Survey

OpenRoads Survey provides surveyors with effective tools to import, review and edit survey data collected in the field in a CAD environment. These guidelines have been developed as part of the SDDOT statewide implementation of OpenRoads Designer (ORD). The intent of this document is to provide guidelines and standards for processing survey data in ORD. Updates to this document will be made periodically when minor revisions, additional information, and/or enhancements are needed.

Create a Survey Project
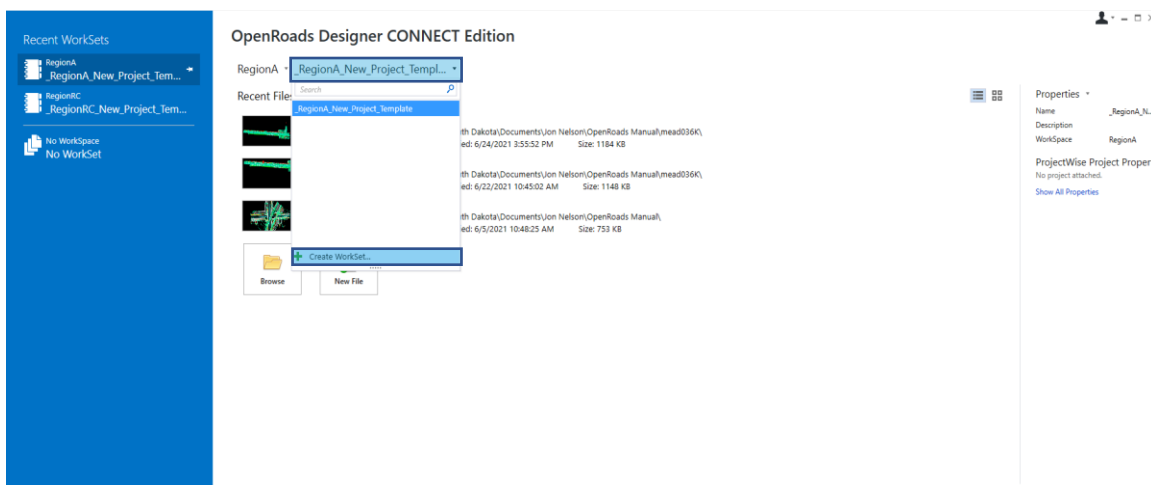
1) Launch **OpenRoads Designer** from the desktop…
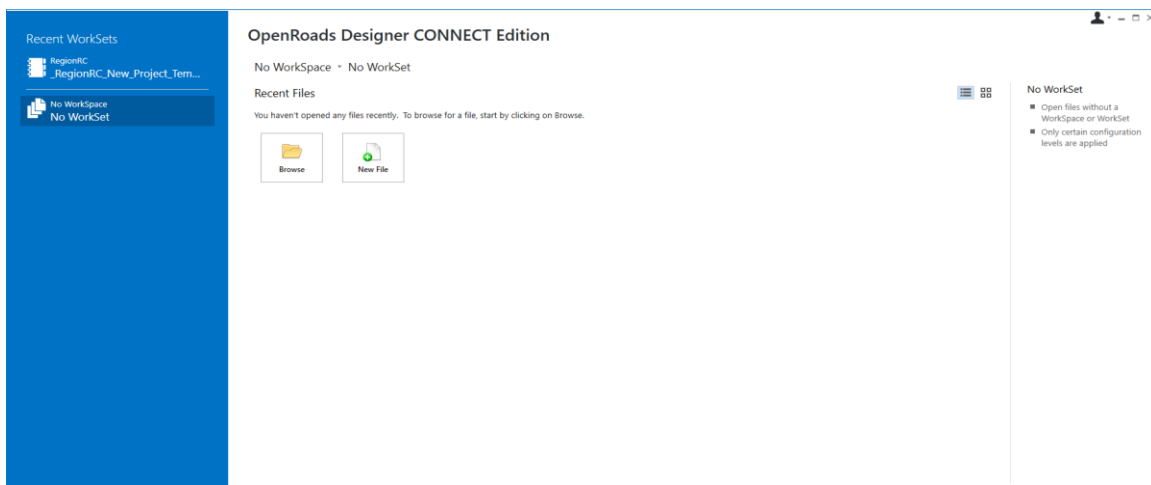
2) From the **WorkSpace** drop-down menu select the appropriate Region (**RegionA**, **RegionM**, **RegionP** or **RegionRC**).
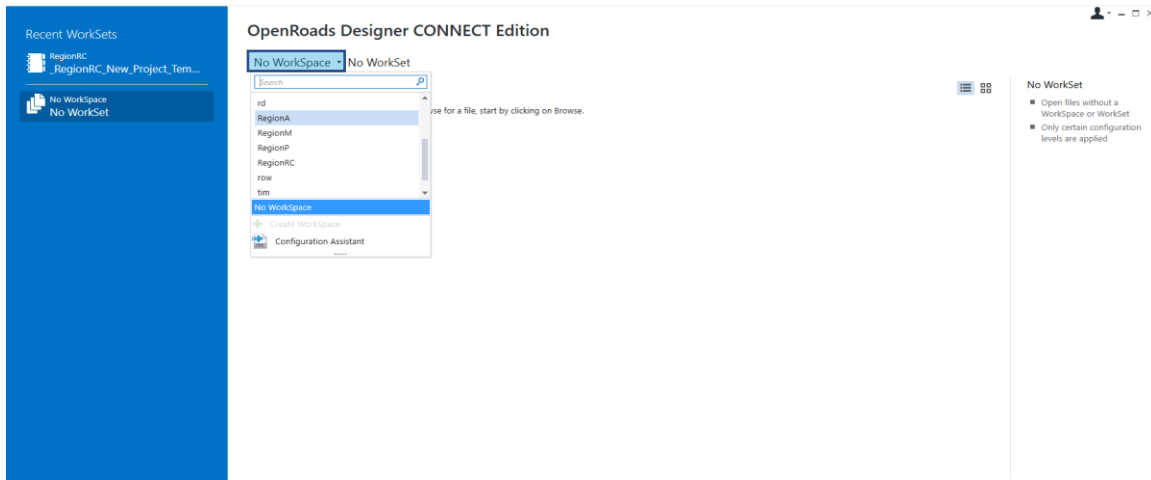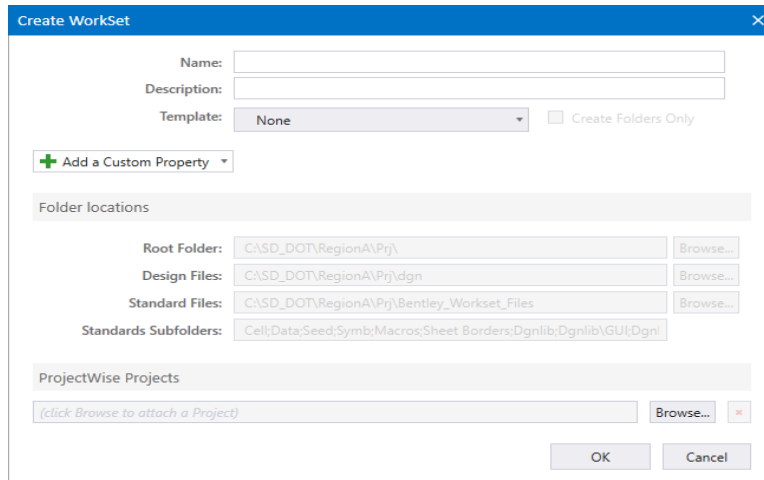
The WorkSpace is a set of files and configuration variables that define the SDDOT settings. Selecting the appropriate Region WorkSpace is important.

3) From the **WorkSet** drop-down menu select **Create Workset**…

The WorkSet sets specific standards, creates subfolders and points to the appropriate project folder within the appropriate Region folder on the U: drive (U:\regionX\prj\cntyPCN#). When a design file (dgn) is created or opened it is associated to the WorkSet that is chosen. Selecting or creating the appropriate WorkSet is important.

The **Create WorkSet** dialog box will appear…

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4) In the **Name:** field type in the appropriate project folder name (**cnytPCN#**)**.** This will create the project folder on the U: drive (U:\regionX\prj\cntyPCN#) along with the desired subfolders where the new survey file will reside.

5) From the **Template:** drop-down menu select the appropriate region template (**_regionX_New_Project_Template**).

Note: If the project folder already exists on the U: drive prior to creating a new **WorkSet** select **None** from the **Template:** drop-down menu.

6) Select the **OK** button located at the bottom of the dialog box.

A new project folder along with subfolders will be created within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#).

Note: If the project folder already exists on the U: drive prior to creating a new **WorkSet** and **None** was selected in step 5 above the subfolders will be created within the existing project folder.
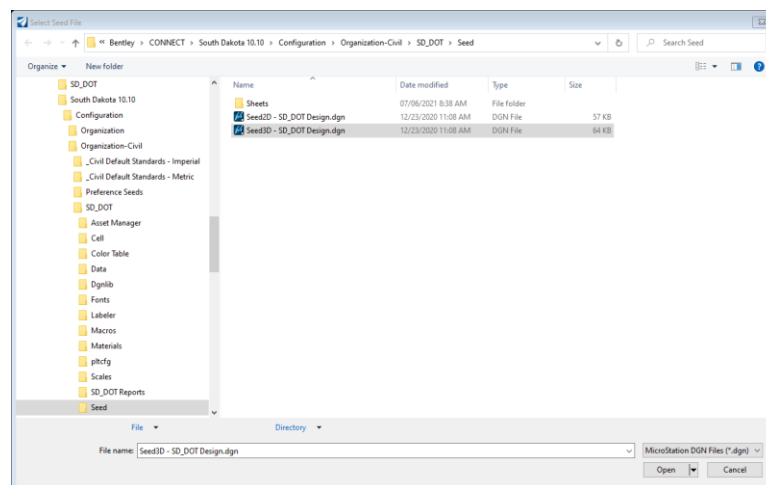
7) Create a 3D Survey dgn file by selecting the **New File** button.
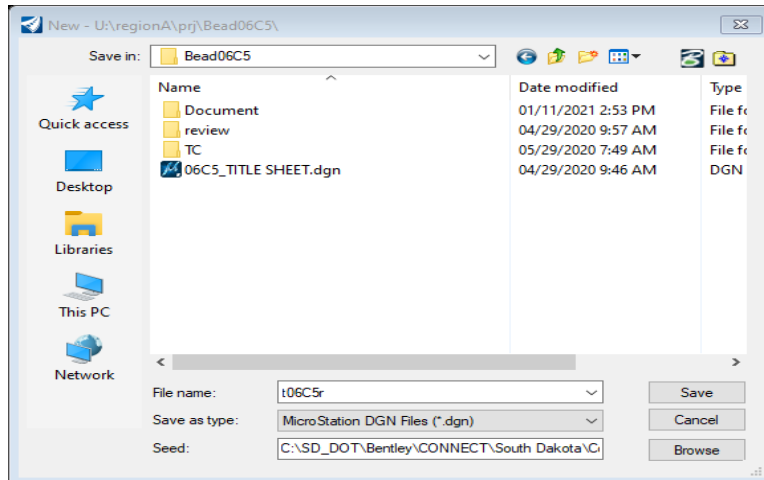
The **New** dialog box will appear…

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8) Navigate to the **dgn** folder within the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#**dgn**) where the new survey file will reside.
    a) In the **File name:** field at the bottom of the dialog box type in the appropriate survey file name (**PCN#_T**).
    b) Ensure the **Save as type:** is set to **Micro Station DGN files (*.dgn)**.
    c) Ensure the **Seed:** field is set to utilize the 3D seed file by selecting the **Browse** button located in the bottom right of the dialog box.

    The **Select Seed File** dialog box will appear…

    d) highlight the **Seed3D – SD_DOT Design.dgn** file.
    e) Select the **Open** button located in the bottom right of the dialog box.

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--Important--

The naming convention for the survey file should follow the SDDOT standard for naming a survey CAD file outlined in **Topography Data Furnished (.dgn file)** Chapter 6 of the SDDOT Survey Manual.

9) Select the **Save** button located in the bottom right of the dialog box. The new survey dgn file will be created and opened.

Ribbon and Workflows

The main section of the interface is the **Ribbon** located along the top of the software and is the primary access to the **Ribbon Tabs** and **Tool Groups**.
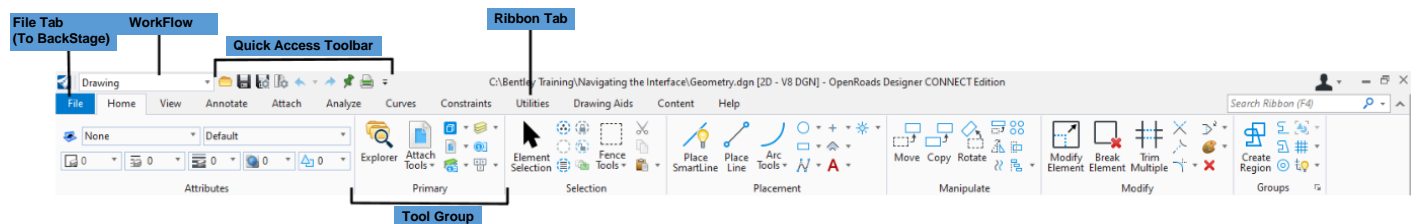

Review each area of the **Ribbon** by selecting each **Tab**. The **Ribbon** functions in a similar manner to the **Ribbon** found in Trimble Business Center and many Microsoft Office products. The **Ribbon Tabs** and **Tool Groups** are dependent on the workflow selected. For example, selecting the **OpenRoads Modeling** workflow will present a new set of **Ribbon Tabs** and **Tool Groups**.

The **Survey** Ribbon Tabs and Tool Groups can be accessed by selecting **Survey** from the **Workflow drop-down** located in the upper left corner of the software. The **Ribbon** will now show the **Ribbon Tabs** and **Tool Groups** associated with the **Survey** workflow.
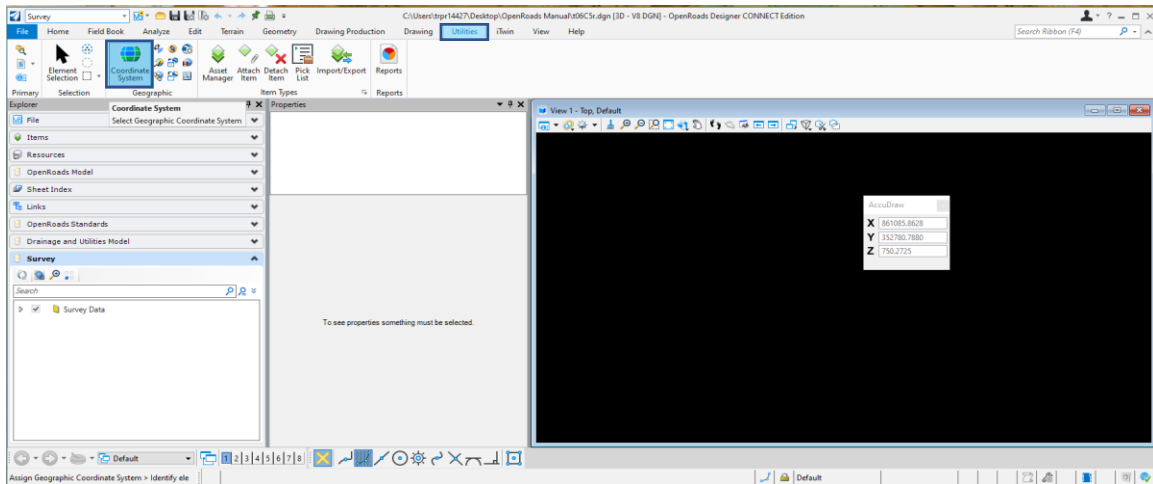
Setting the Geographic Coordinate System

1) Select the **Survey** workflow from the **Workflow** drop-down located in the upper left corner of the software.
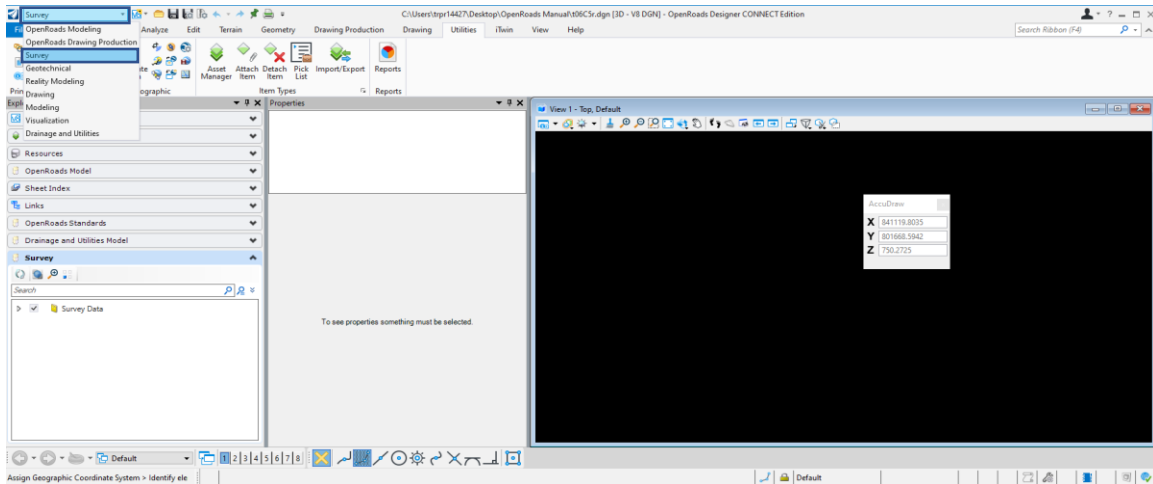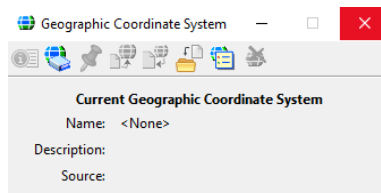
2) Select the **Utilities** tab located along the top row of tabs.

3) Select the **Coordinate System** tool located within the **Geographic** tool group.
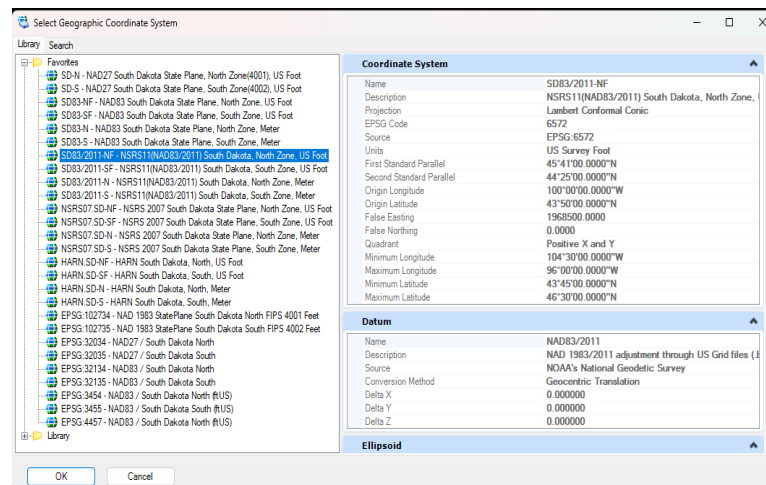

The **Geographic Coordinate System** dialog box will appear…

4) Select the **From Library** tool.

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The **Select Geographical Coordinate System** dialog box will appear…

5) Expand the **Favorites** folder and select the coordinate system used for the field survey and select the **OK** button located in the bottom left of the dialog box.

The Geographic Coordinate System is now attached.

<div align="center">

--Important--

Select the same coordinate system used to setup the job file in the data collector.

</div>

6) Close the dialog by selecting the "**X**" located in the top right of the dialog box.

Setting the Drawing Scale

1) Select the **Drawing Production** tab located along the top row of tabs.
2) Within the **Drawing Scales** tool group set the **Annotation Scale** drop-down to the appropriate scale for the survey file.
   a) Rural – set Annotation Scale to **1" = 200'**
   b) Suburban – set Annotation Scale to **1" = 100'**
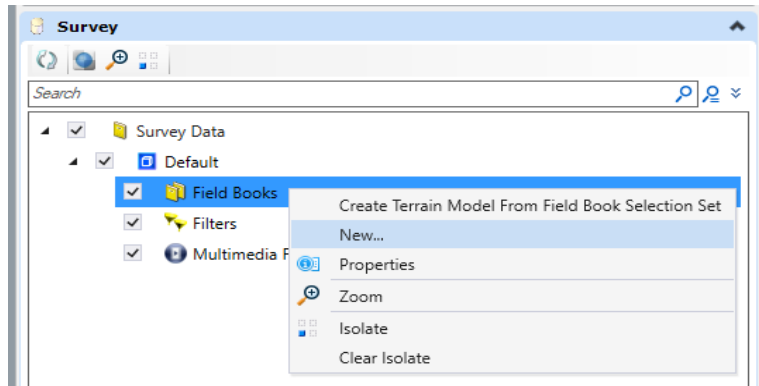   c) Urban – set Annotation Scale to **1" = 40'**
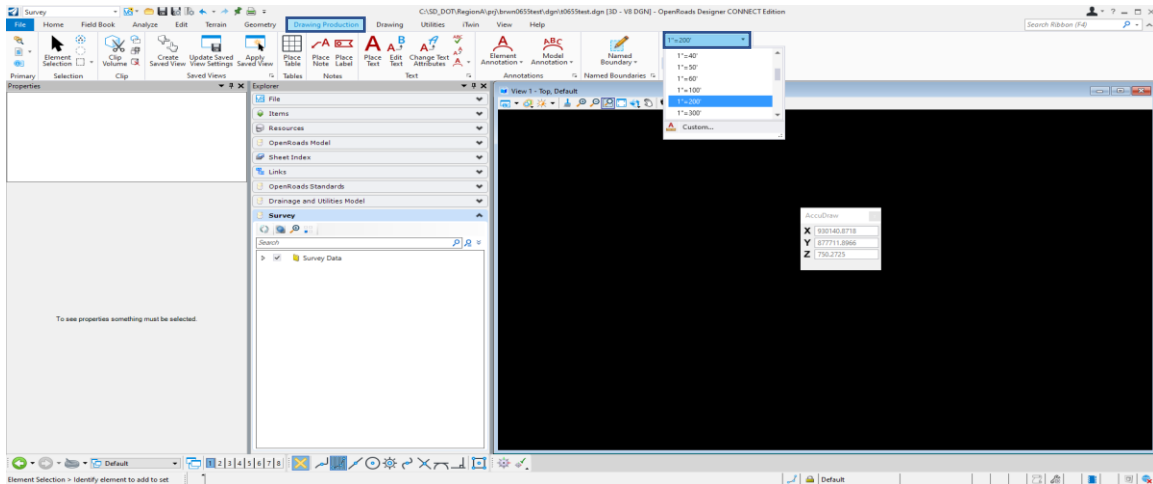
Create Field Book and Import Survey Data

1) From the **Explorer Tab** expand the **Survey** pane if not already expanded.
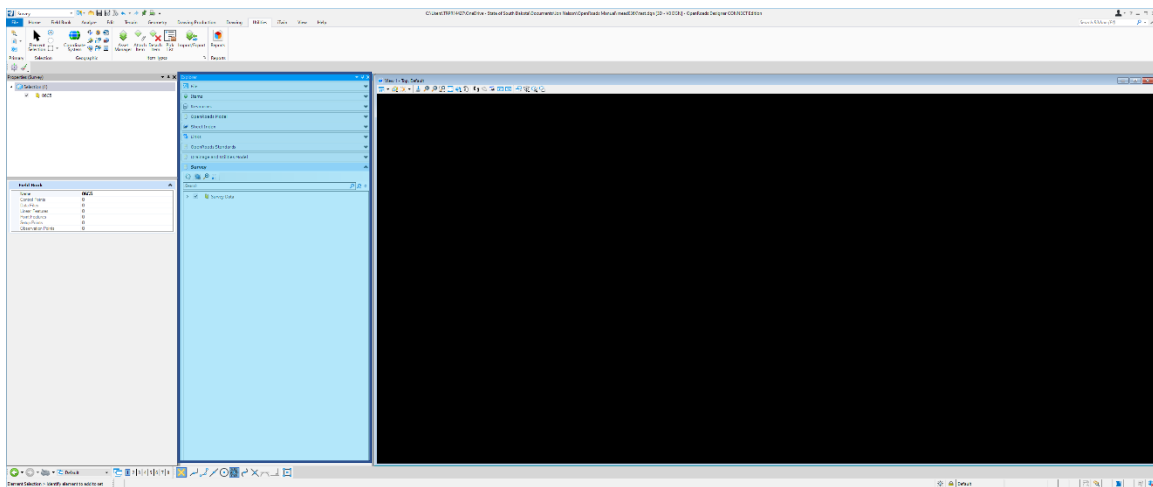
2) Select the drop-down arrow next to **Survey Data**.
3) Select the drop-down arrow next to **Default** to expand the tree to display the default survey data folders.
4) Right click on **Field Books** and select **New**…

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A drop-down arrow will appear next to the **Field Books** folder indicating a new field book has been created.

5) Expand the **Field Books** folder by selecting the drop-down arrow next to the folder to view the newly created field book named **Field Book 1**.
6) Right click on **Field Book 1** and select **Properties**.
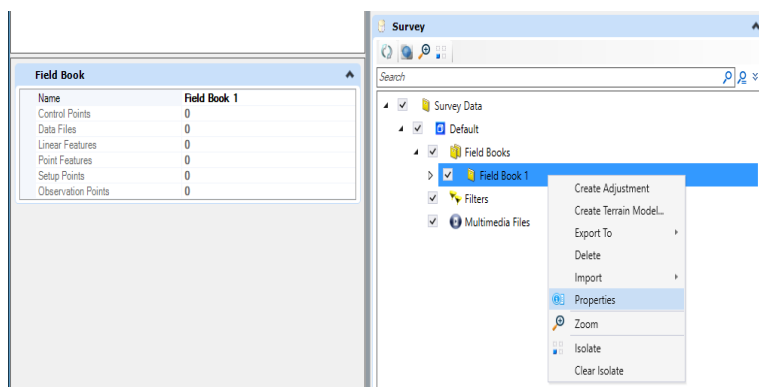
Field Book 1 properties will appear in the **Properties Tab** next to the **Explorer** Tab
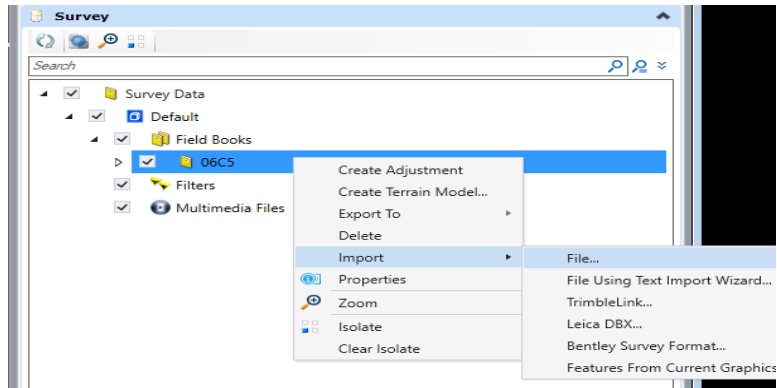
7) In the **Name** field type in the appropriate project field book name (**PCN#**) and select the **enter key** on the keyboard.
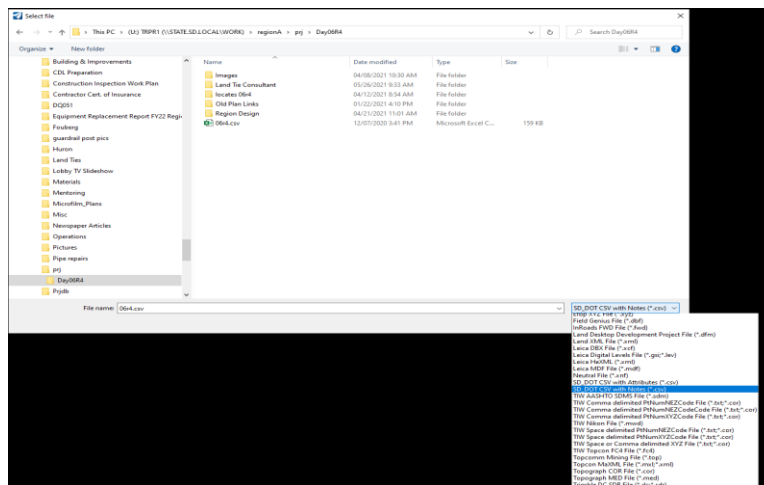

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8) Right click on the newly created project field book in the **Survey** pane and select **Import** > **File…** from the drop-down menu.

The **Select file** dialog box will appear…

9) From the **File type** drop-down menu select **SD_DOT CSV with Notes(*.csv)**
10) Navigate to the location of the **.csv file** containing the field survey.
11) Double click on the **.csv file** to import the field survey data into the projects field book.

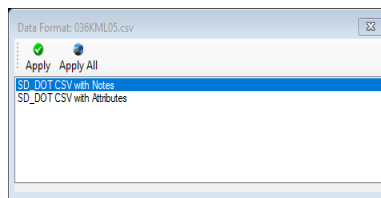Repeat steps 8 through 11 until all **.csv files** have been imported.

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12) Select the **Fit view** tool within the **View Control** toolbar located at the top of the CAD drawing space to graphically display the field survey data.

Importing Multiple Survey Data Files - Drag and Drop Process

To import multiple .csv files into the project field book use the drag and drop process after the project field book has been created in steps 1-7 above.

1) Open windows explorer and navigate to the location of the **.csv files** containing the field survey.
2) Select all the **.csv files** to be imported and drag-and-drop them onto the newly created project field book folder inside the Survey pane.

The **Data Format** dialog box will appear…

3) Select **SD_DOT CSV with Notes** and select the Apply button

The **import window** will reappear for each **.csv file** that was dragged-and-dropped into the field book folder. Simply select the **Apply** button for each file or select the **Apply All** button to import all the **.csv files** at once.

4) Select the **Fit view** tool within the **View Control** toolbar located at the top of the CAD drawing space to graphically display the field survey data.
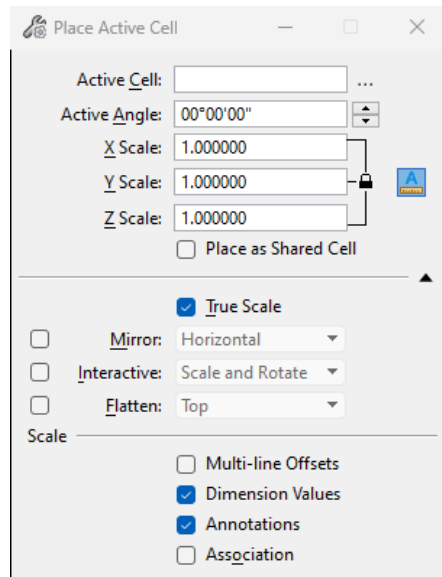
Placing the Datum Note

1) Select the **Drawing** tab located along the top row of tabs.

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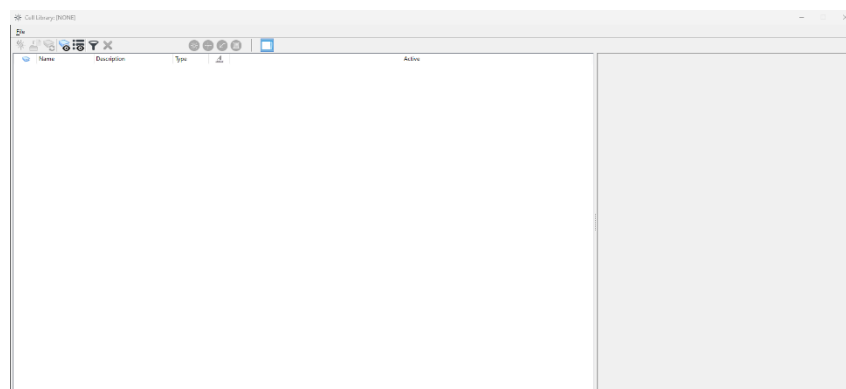2) Within the **Placement** tool group select the drop-down arrow next to the **Cells** tool and select **Place Active Cell**.
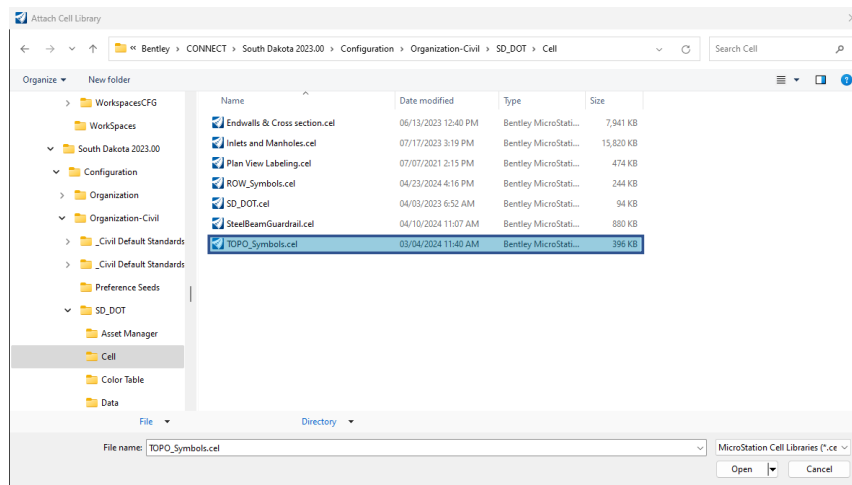
The **Place Active Cell** dialog box will appear…

3) Select the **ellipsis** next to the **Active Cell:** field.

The **Cell Library** dialog box will appear…

4) Select **File** in the top left corner of the dialog box and select **Attach File...** from the drop-down menu.

The **Attach Cell Library** dialog box will appear…

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5) Navigate to the **Cell** folder within the **Bentley** folder on the U: drive (U:\Bentley\CONNECT\South Dakota 2023.00\Configuration\Organization-Civil\SD_DOT\Cell).

6) Highlight the **TOPO_Symbols.cel** and select the **Open** button located in the bottom right of the dialog box.
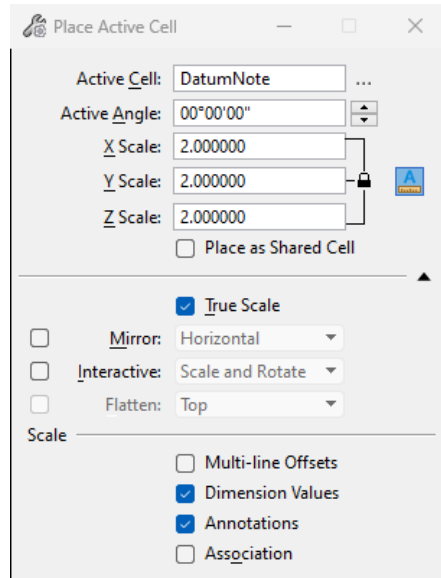
The **Cell Library** dialog box will reappear…
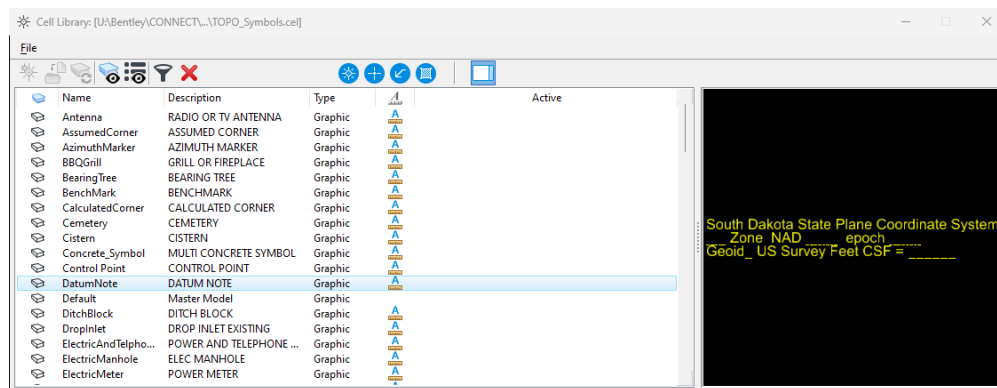
7) Highlight the **DatumNote** cell from the list of cells and select the **Set Active Cell**

 button at the top of the dialog box.

The **DatumNote** cell will populate in the **Active Cell:** field within the **Place Active Cell** dialog box.

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8) In the **X Scale:** field type in an appropriate scale value for the survey file and select the tab key on the keyboard to accept the value.
    a. Rural = 2
    b. Suburban = 4
    c. Urban = 10

9) Drag the cursor into the CAD drawing space and place the **DatumNote** cell in the vicinity of the topo survey.

10) Double click on the datum note with the **Select Element** ![Element Selection] tool.

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The **Text Editor** dialog box will appear…
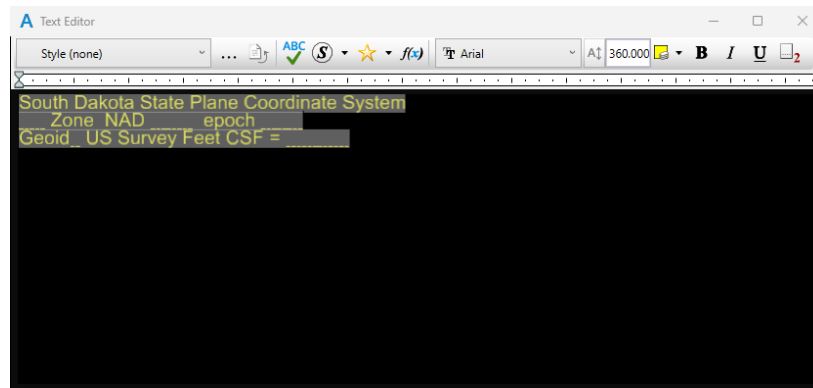
11) Edit the data fields within the note with the datum information used for the field survey and click in the CAD drawing space to accept the changes and update the datum note displayed in the CAD drawing.

Displaying the Background Map

One feature of OpenRoads Designer that is useful when processing survey data is the background map feature. This feature is a good check to insure the correct Geographical Coordinate System was set.

1) Select the drop-down arrow next to the **Select Background Map** tool within the **View Control** toolbar located at the top of the CAD drawing space.
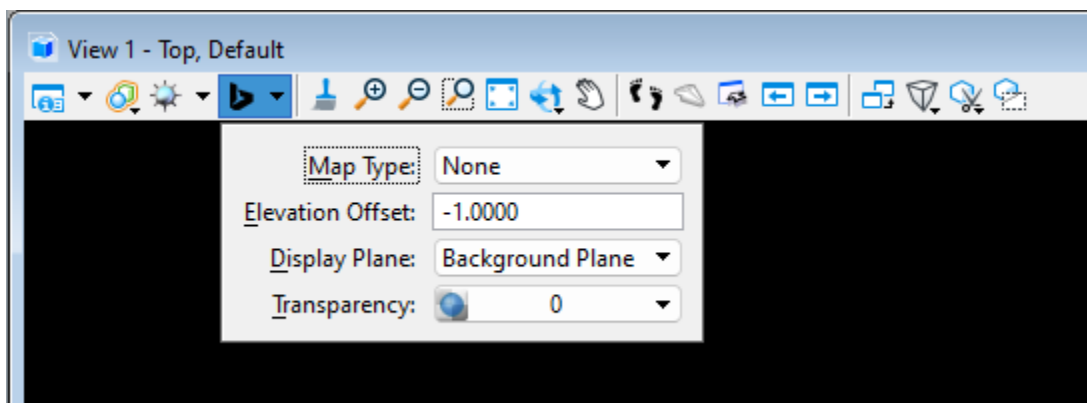
2) Set the **Map Type:** to **Aerial**.

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The aerial image will display in the CAD drawing space. Setting the **Map Type:** back to **None** will turn off the background map.
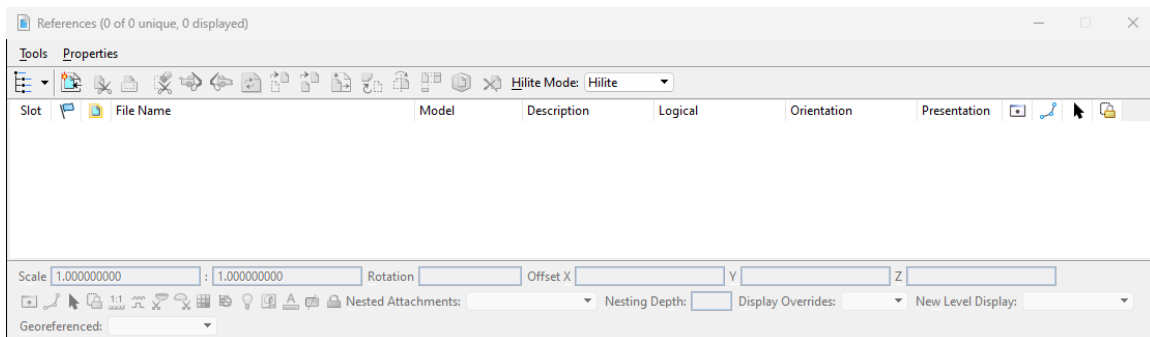
A Farm Service Agency (FSA) County aerial imagery can also be attached as a background map if desired.

1) Select the **Home** tab located along the top row of tabs.

2) Within the **Primary** tool group select the drop-down arrow next to **Attach Tools** and select **References**.
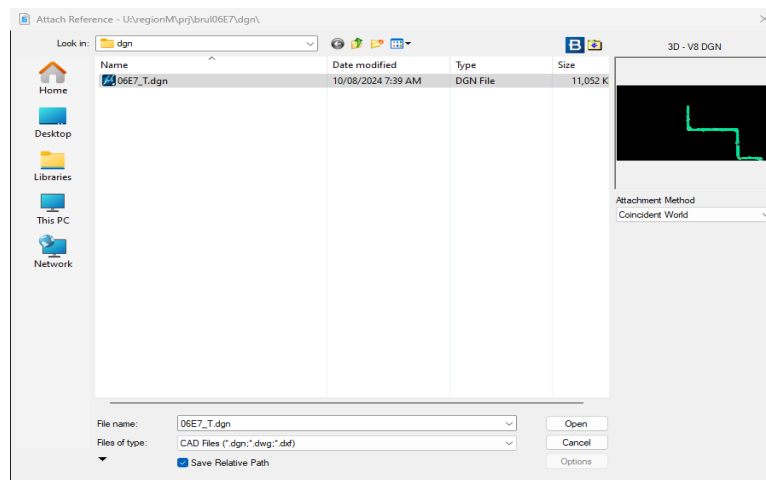
The **References** dialog box will appear…

3) From the top left of the dialog box select **Tools** and **Attach…** from the drop-down.

The **Attach Reference** dialog box will appear…

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4) From the **Look in:** drop-down at the top of the dialog box navigate to the FSA folder on the U: drive (U:\rd\Misc\Maps\FSA\2022) and select the appropriate county dgn.
5) Set the Attachment Method to **Geographic – Reprojected** from the drop-down menu on the right side of the dialog box and select the **Open** button at the bottom of the dialog box to display the county aerial image in the CAD drawing space.

The FSA County aerial imagery can be clipped to only show the aerial imagery at the project location.
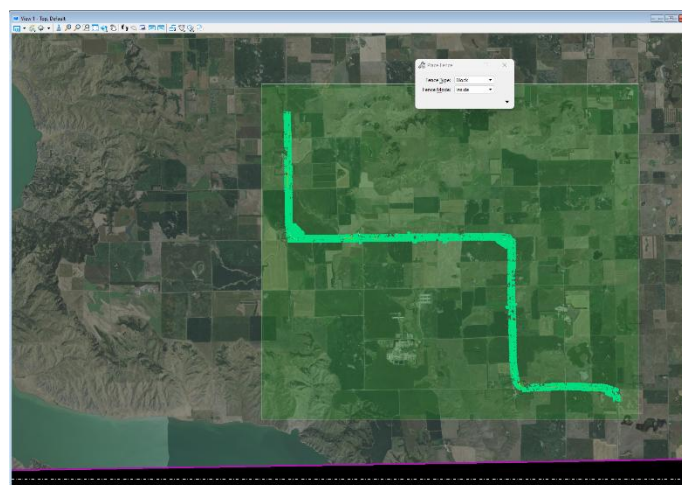
6) Select the **Drawing** tab located along the top row of tabs.

7) Within the **Selection** tool group select the drop-down next to **Fence Tools** and select **Place Fence**.
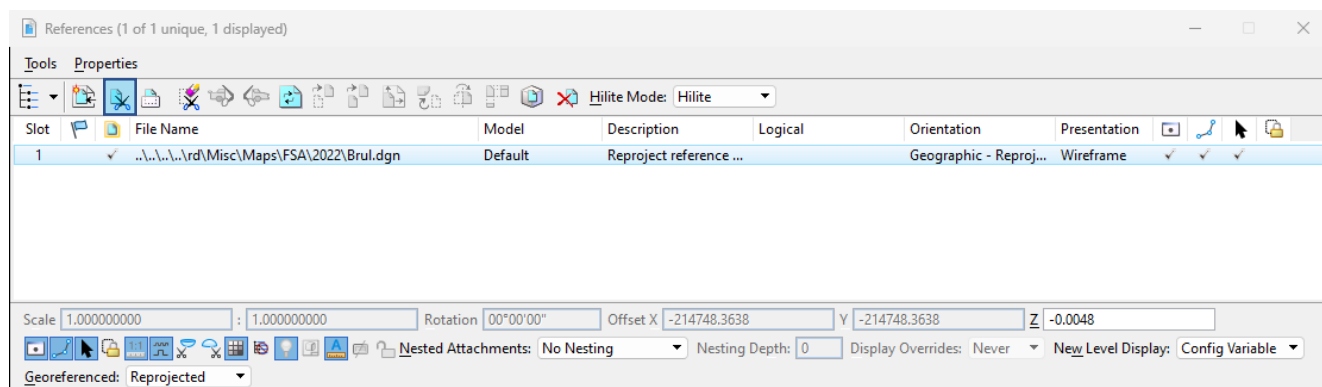
The **Place Fence** dialog box will appear…
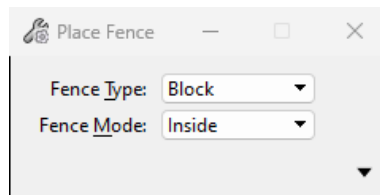
8) Set the **Fence Type:** to **Block** and the **Fence Mode:** to **Inside** using the drop-down menus.
9) In the CAD drawing space place the **Fence Block** around the topo survey.

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10) From the Reference dialog box ensure the reference to be clipped is highlighted and select the **Clip Reference** tool.

11) Accept the clip reference command by clicking inside the Fence Block within the CAD drawing space.

12) Dismiss the Fence Block command by selecting the **Select Element** tool and click in the CAD drawing space.

The FSA County aerial image can be turned off and on by selecting the **display toggle** within the References dialog box.
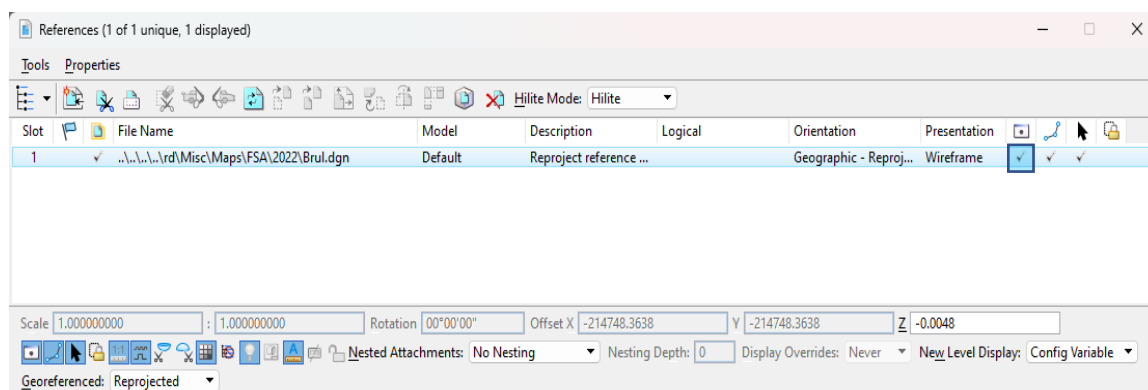
Reviewing and Editing Survey Data

Point numbers, **Field Codes**, **Elevations**, **Descriptions,** and **Icons** known as decorations in ORD can be turned on and off by using the **Decorations** tool group located under the **Analyze** tab.

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1) Select the **Analyze** tab located along the top row of tabs.
2) Within the **Decorations** tool group select the **Names** decoration and the **Field Code** decoration to display the point names and field codes in the CAD drawing space.
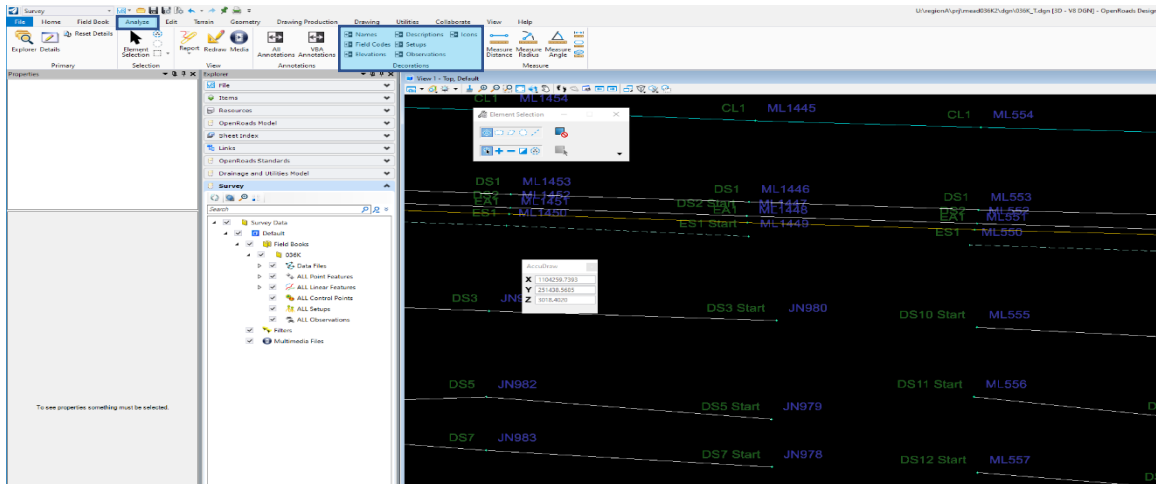

Coding errors can be searched for and edited.

1) From the **Explorer** Tab select the **Survey** pane if not already selected.
2) Expand the following folders within the **Survey** pane by selecting the drop-down arrow next to each folder.

Survey Data>**Default**>**Field Books**>(**PCN#**)>**ALL Point Features**

3) All incorrect field codes within the field book will display in red.

4) Select the red code errors and then select the **Details** tool located within the **Primary** tool group.

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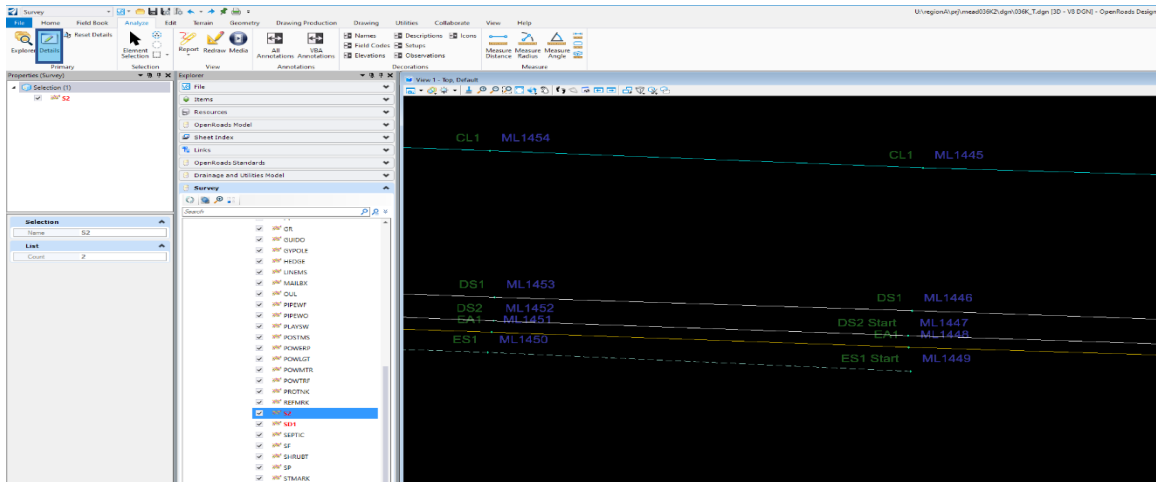
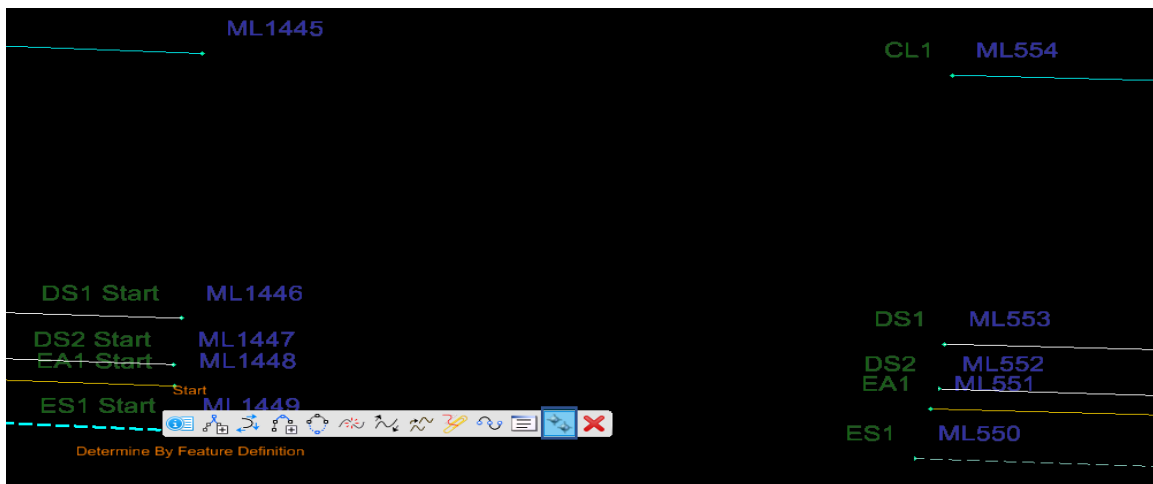5) The **Survey Details** dialog box will appear showing the field code errors.
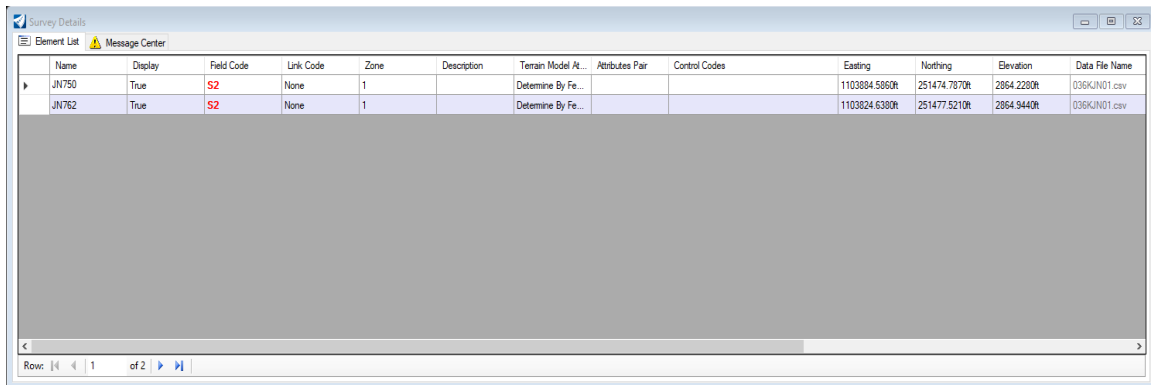
6) Click in the first column with the arrowhead to zoom to the point in the CAD drawing space.
7) Click in the **Field Code** column and fix the field code errors selecting the tab key on the keyboard after each correction.
8) Close out of the Survey Details dialog box by selecting the "**X**" in the upper right of the dialog box.
9) Repeat steps 4 through 8 for each incorrect field code shown in the **All Point Features** list within the **Survey** pane.

Join Point (**JPT**) is a control code that connects a linear feature (line segment) from the point the control code is associated with to a point number specified following the **Join Point** control code.

1) Select one of the linear features (line segments) within the CAD drawing space to highlight the linear feature.
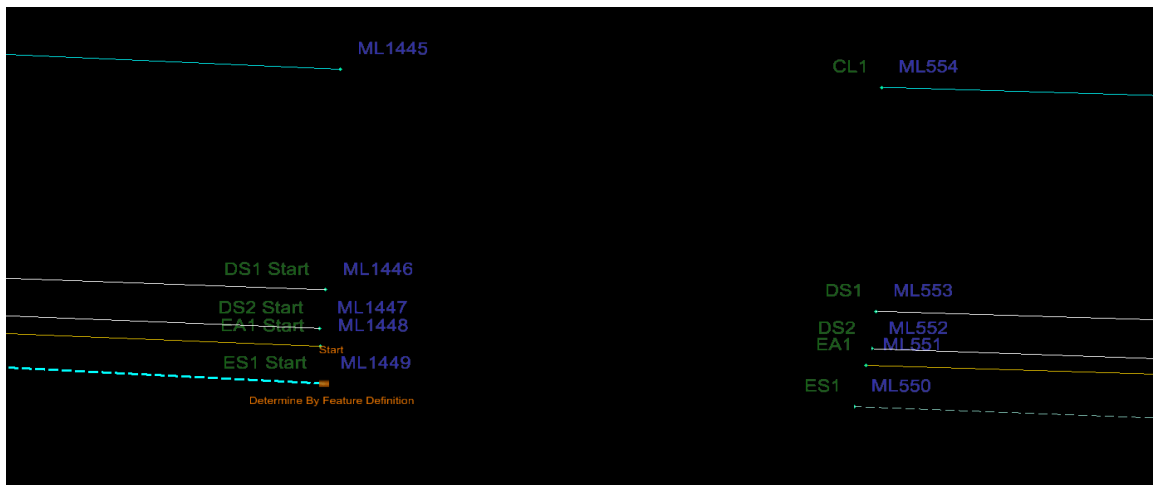
2) Hover over the selected linear feature (line segment) to display the **Civil Context Menu**.

3) Select the **Edit Point Features** tool.
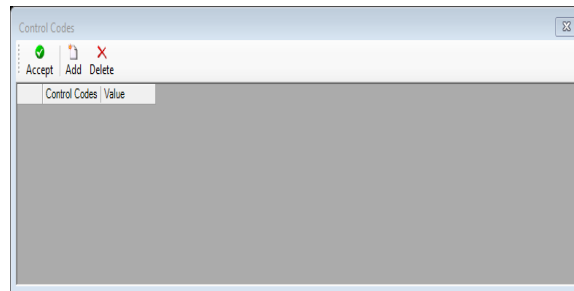
The **Survey Details** dialog box will appear….

4) Click in the **Control Codes** field of the point to be edited to display the Control Code ellipsis.

5) Select the **ellipsis** to display the **Control Codes** dialog box.

6) Select the **Add** icon located at the top of the **Control Codes** dialog box.

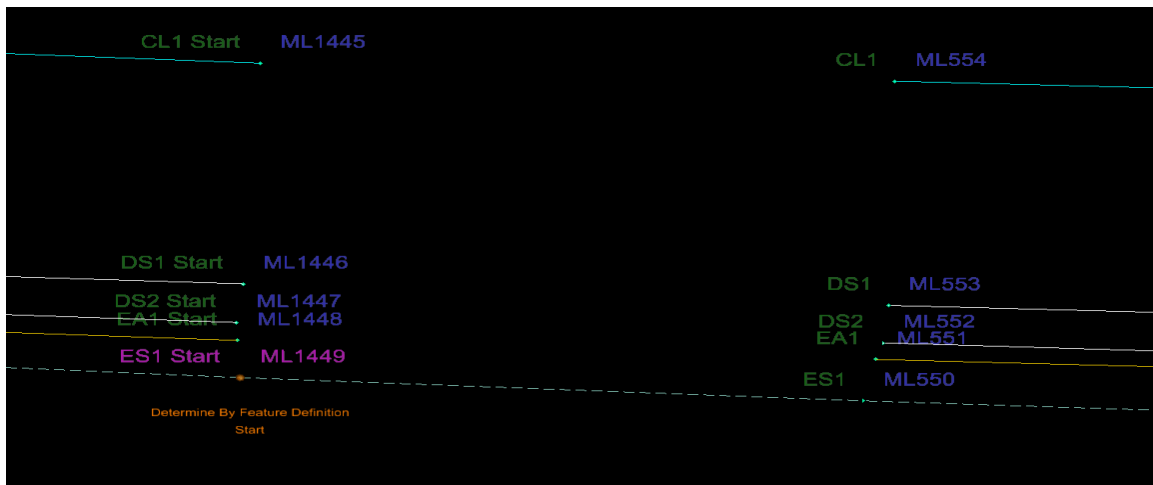7) From the **Control Codes** drop-down menu select the **JoinPoint** Control Code.
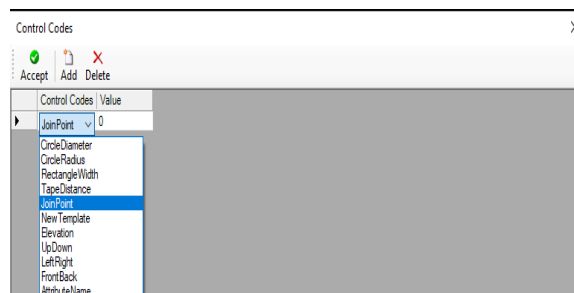
8) In the **Value** field type in the point number to join to and select the tab key on the keyboard to accept the point number.

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9) Select the **Accept** [Accept] icon located at the top of the **Control Codes** dialog box to complete the command and update the graphics within the CAD drawing space.

10) Repeat steps 3 through 9 until all linear features (lines segments) have been joined.

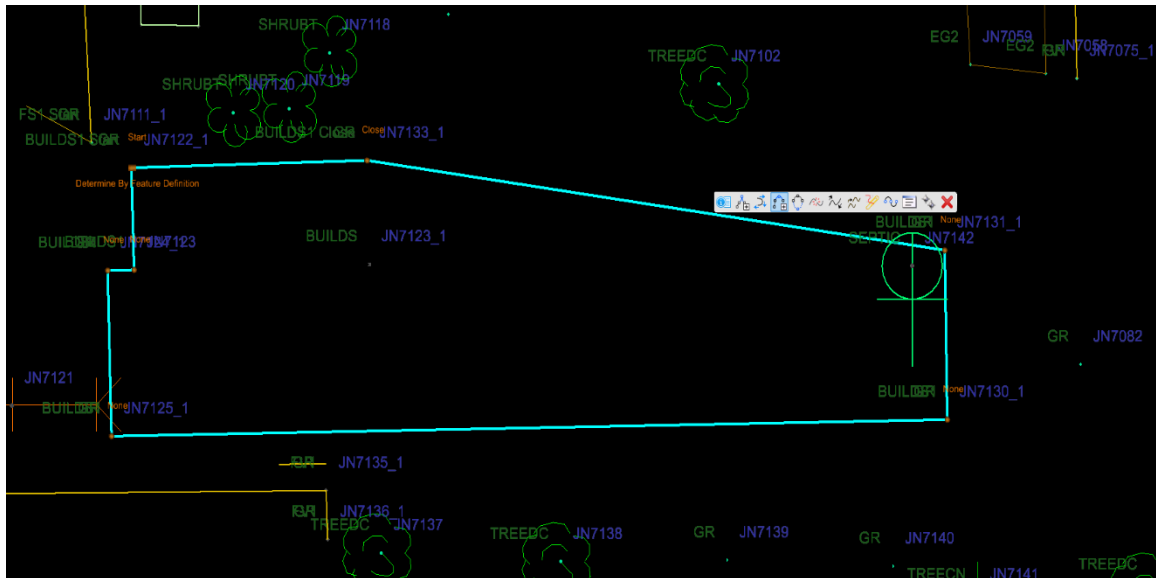**Insert Point in Linear Feature** is a tool found within the **Civil Context Menu** that enables a point to be added into a linear feature (line segment).

1) Select the linear feature (line segment) with the **Select Element** [Element Selection] tool. Hover over the highlighted linear feature (line segment) to display the **Civil Context Menu** and select the **Insert Point in Linear Feature** [icon] tool.

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The **Insert Point in Linear Feature** dialog box will appear…
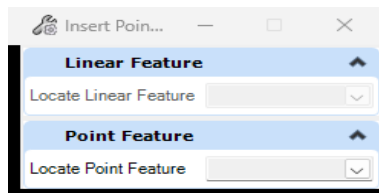
Follow the heads-up display on the cursor by…

2) Selecting the linear feature (line segment) then select the point to add to the highlighted linear feature.
3) Move the cursor between the points along the highlighted linear feature (line segment) to show the proposed linear feature (line segment) change.

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4) Left click to accept the proposed change to the highlighted linear feature and add the selected point.

5) Repeat steps 1 through 4 until all points have been added.

Join Linear Features is a tool found within the **Civil Context Menu** that enables two linear features (line segments) to be joined together into on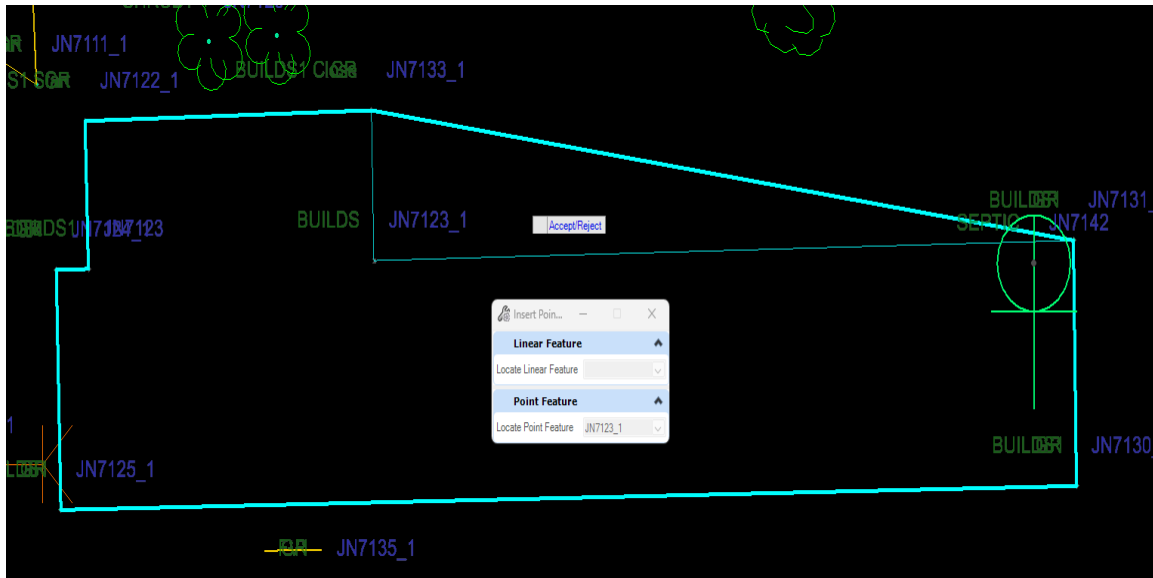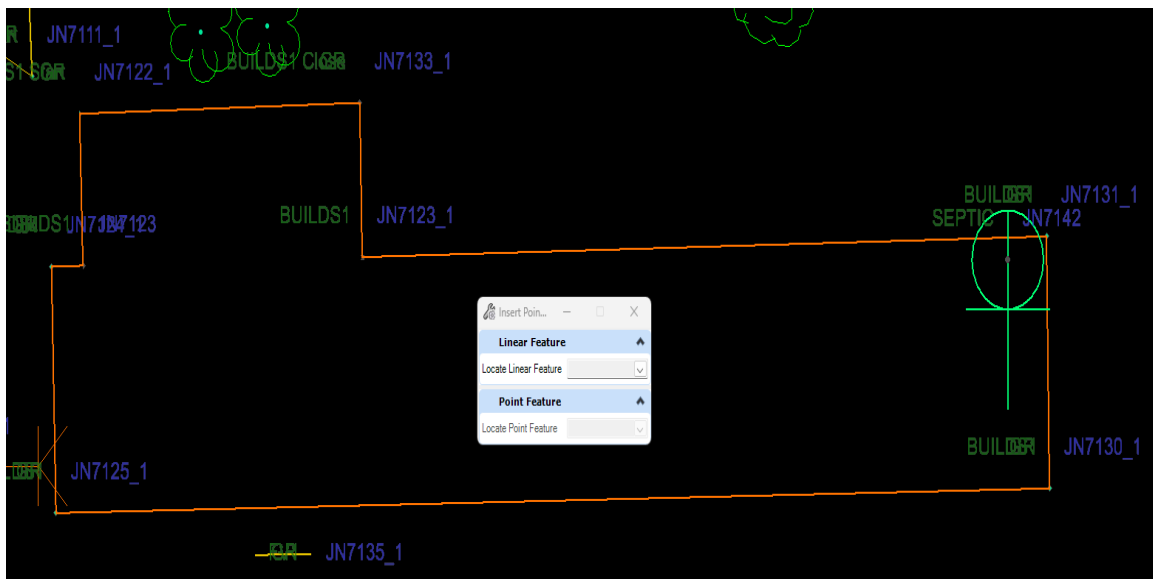e continuous linear feature (line segment). To be able to use the **Join Linear Features** tool the two linear features (line segments) will first need to be converted to **Point List Linear Features** and then joined together using the **Join Linear Features** tool.

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1) Select one of the linear features (line segments) to be joined within the CAD drawing space. Hover over the selected linear feature (line segment) to display the **Civil Context Menu** and select the **Convert to Point List Linear Feature** tool.

2) Repeat step 1 for the second linear feature (line segment) to be joined together.
3) Select one of the newly converted linear features (line segments) to be joined within the CAD drawing space to highlight the linear feature (line segment). Hover over the highlighted linear feature (line segment) to display the **Civil Context Menu** and select the **Join Linear Features** tool.

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4) Select the second linear feature (line segment) to be joined and left click to accept.
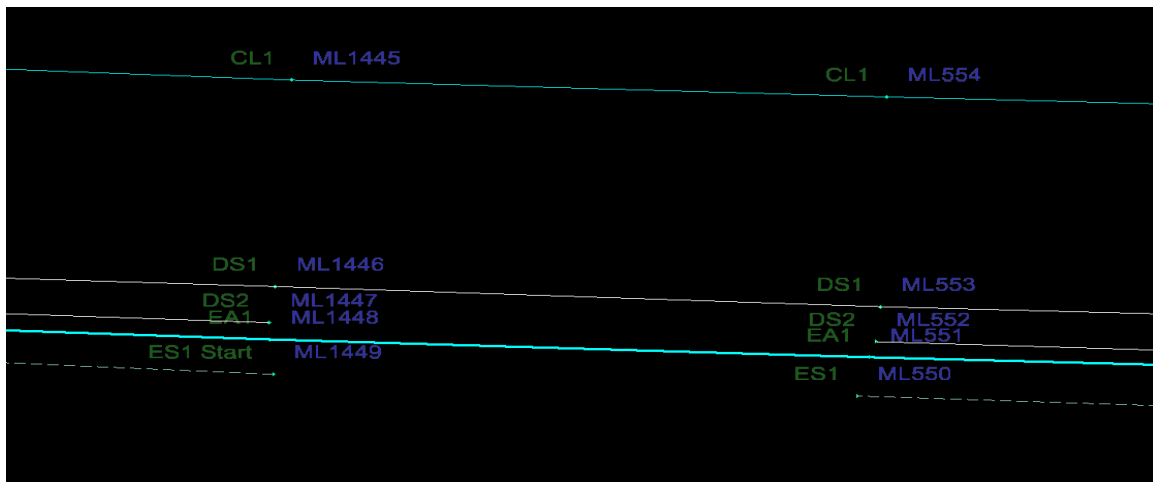
The two linear features (line segments) are now joined together.

5) Repeat steps 1 through 4 until all lines have been joined.

Once all editing of the survey data has been completed check the **Survey Details Message Center** to ensure all errors have been fixed.

1) Select the **Analyze** tab located along the top row of tabs.

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2) Within the **Primary** tool group select the **Details** Details tool.

The **Survey Details** dialog box will appear….
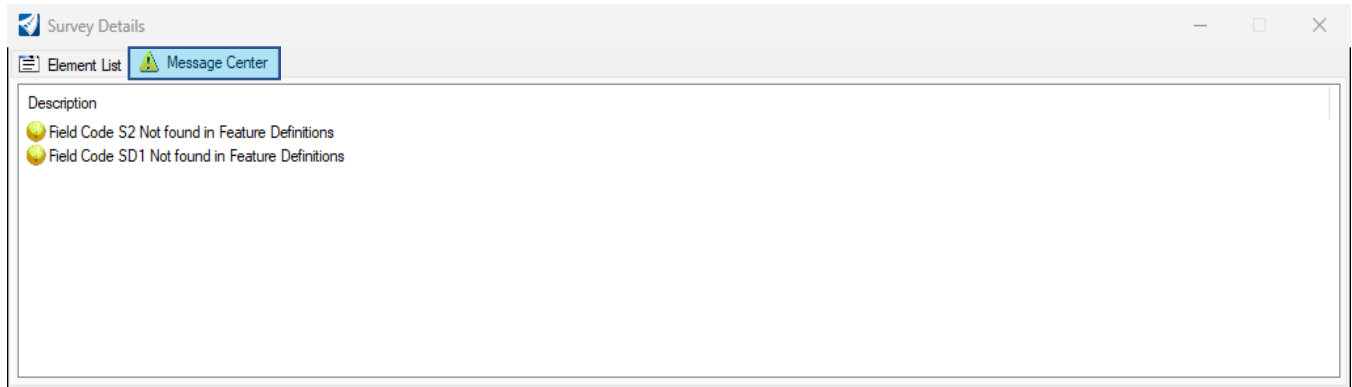
3) Select the **Message Center** tab to display any remaining error messages within the **Description** window.

Note: if no error messages display in the **Description** window all error have been fixed. Precede to the **Creating and Editing Terrain Model** section.
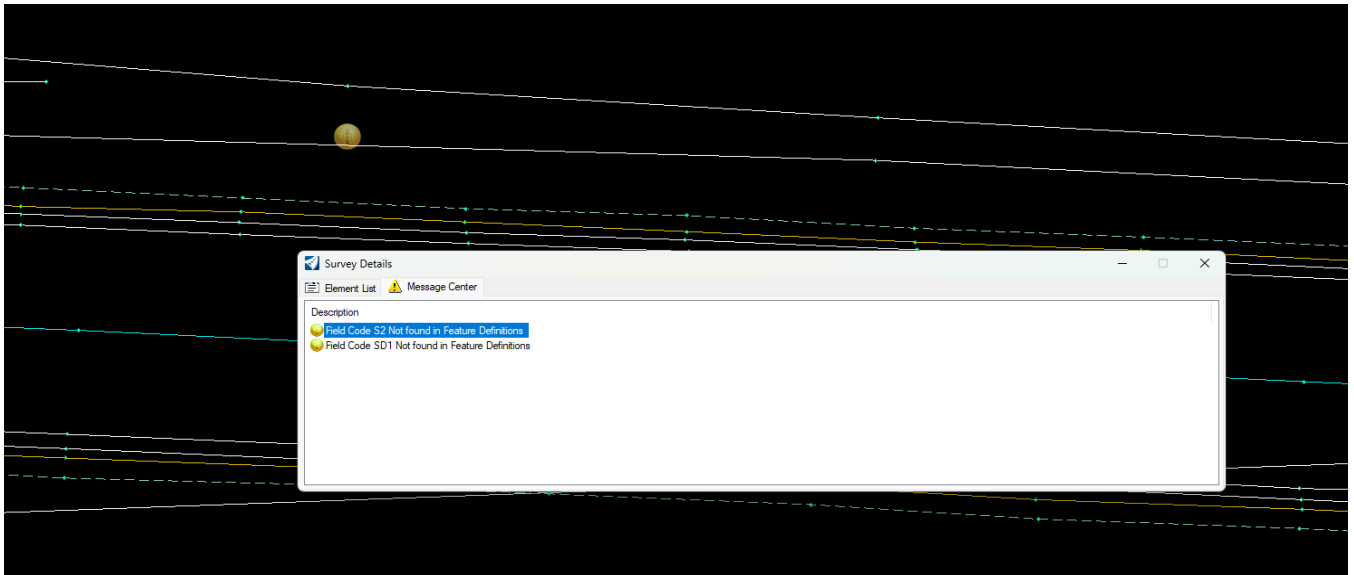
4) Toggle on the Icons decoration by right clicking on the first error message and select **Show Message Icons**.
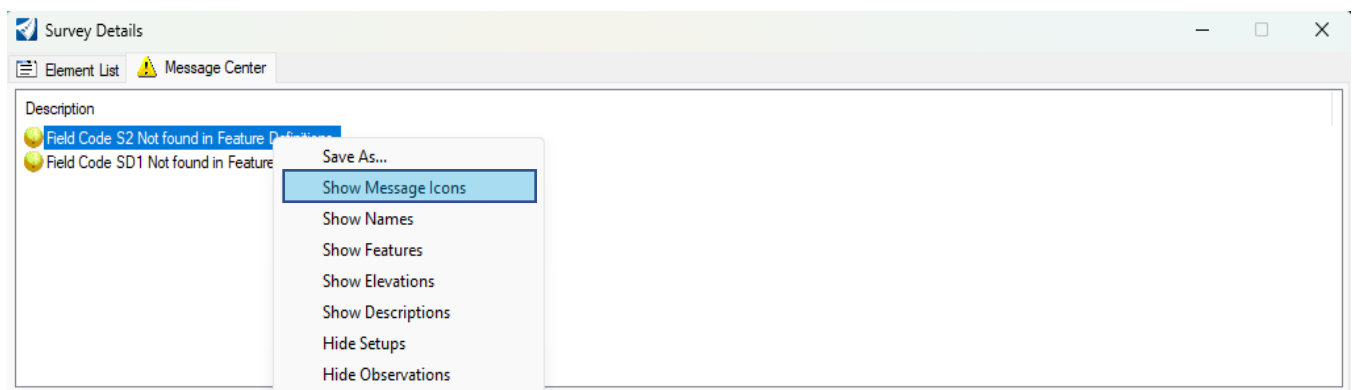
The **Message Icons** will appear in the CAD drawing space…

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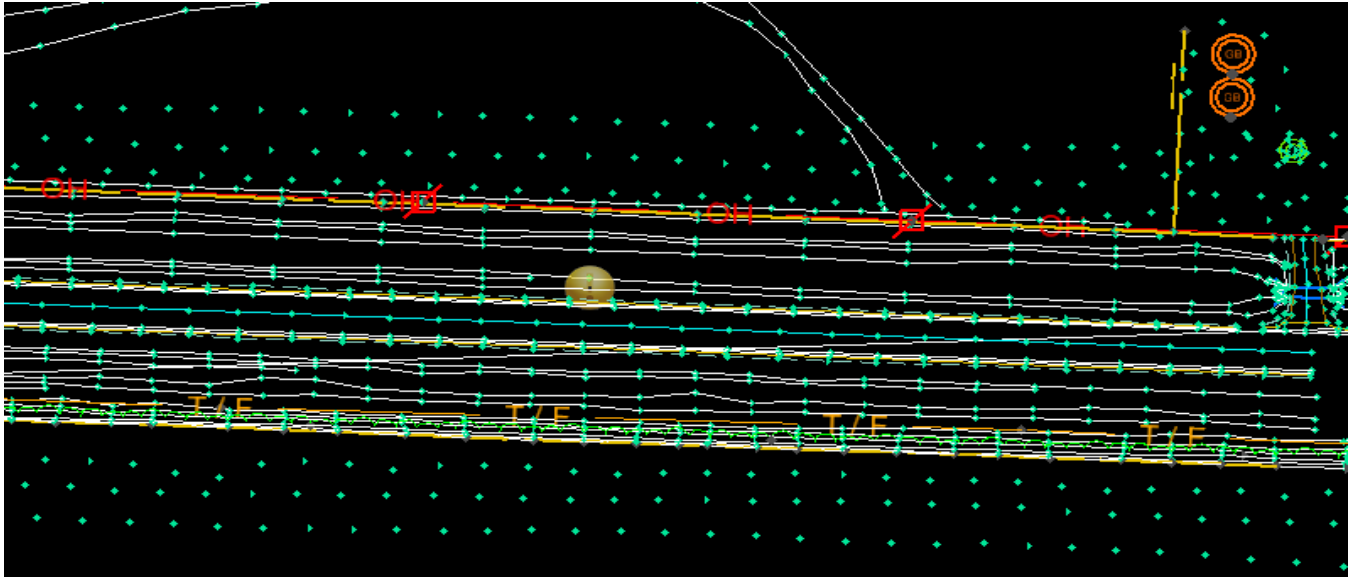
5) Zoom into one of the **Message Icons** displayed in the CAD drawing space.
6) Click on an error message in the **Survey Details Message Center** to center the error icon in the CAD drawing space.


7) Fix the error to remove the error message from the list in the **Description** window.

Repeat steps 6 and 7 until all error messages are fixed and remove from the **Description** window.

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Creating Primary Control Report

Create a report of the primary control for the project to be used by the designer to create a Control Data sheet for construction plans.
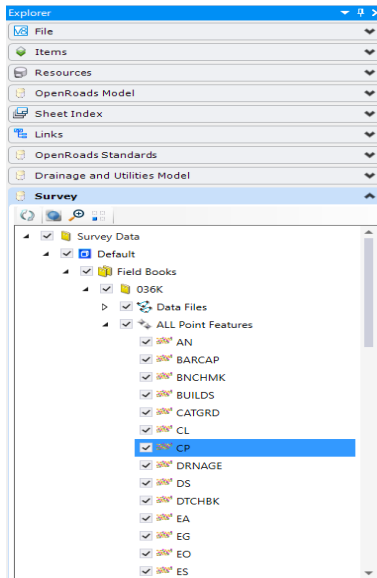
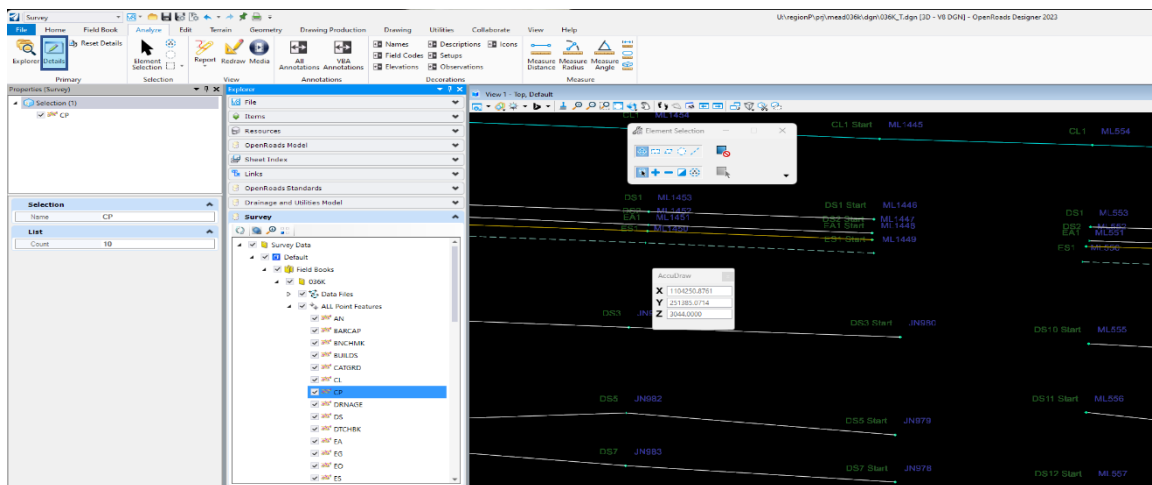1) From the **Explorer** Tab select the **Survey** pane if not already selected.
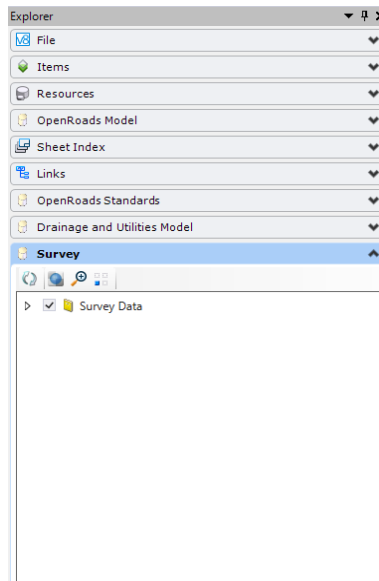
2) Expand the following folders within the **Survey** pane by selecting the drop-down arrow next to each folder.

Survey Data>**Default**>**Field Books**>(**PCN#**)>**ALL Point Features**

3) Left click on the **CP** point feature to highlight the control point code.

4) Select the **Details** tool located within the **Primary** tool group.

5) The **Survey Details** dialog box will appear showing the control points.

6) Review the notes in the **Descriptions** column and make any necessary edits.
7) Left click in the blank box to the left of the **Name** column to select all control points shown within the Survey Details dialog box.

8) Right click in the box to the left of the first control point shown within the Survey

Details dialog and select **Report on selected items**.

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The Bentley Civil Report Browser will appear…

9) Expand the **SD_DOT Reports** folder within the list of folders shown on the left side of the **Bentley Civil Report Browser** by selecting the drop-down arrow next to the **SD_DOT Reports** folder and select the **SD_DOT ControlData.xsl** report to display the **Control Data Report** within the **Bentley Civil Report Browser**.

Bentley Civil Report Browser - C:\Users\TRPR14427\AppData\Local\Temp\RPTyjdyfq13.xml

File   Tools

CivilSurvey tree with reports listed, and the following data table displayed:

Point Name	Description
AB9214	Brass Cap set in Concrete stamped SDOT 34-48.0 MRM 48.2 - 72.5' Left
CP02	Rebar and Cap stamped SDDOT Control Point MRM 45.1 - 73.4' Left
CP03	Rebar and Cap stamped SDDOT Control Point MRM 47.08 - 72.5' Right
AB9216	Brass Cap set in Concrete stamped SDOT 34-45.99 MRM 46.03 - 73.2' Right
AB9222	Brass Cap set in Concrete stamped SDOT 34-40.0 MRM 40.12 - 69.2' Right
AB9221	Brass Cap set in Concrete stamped SDOT 34-41.0 MRM 41.06 - 69.2' Left
AB9219	Brass Cap set in Concrete stamped SDOT 34-43.0 MRM 42.8 - 72.5' Right
AB9218	Galvanized steel Pipe in Sleeve stamped NGS 34-44.0 1995 MRM 44.1 - 75.5 Left
AB9217	Brass Cap set in Concrete stamped SDOT 34-45.0 MRM 46.2 - 162.7' Left
PU1497	Brass Cap set in Concrete stamped Coast and Geodetic Survey F 418 1963 MRM 39.3 - 60.4' Right

10) Select **File**>**Save As**>**Web Page (*.html)** in the top left of the **Bentley Civil Report Browser**.

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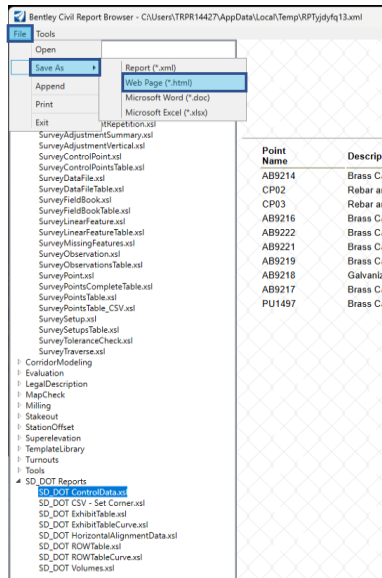
The **Save As** dialog box will appear…
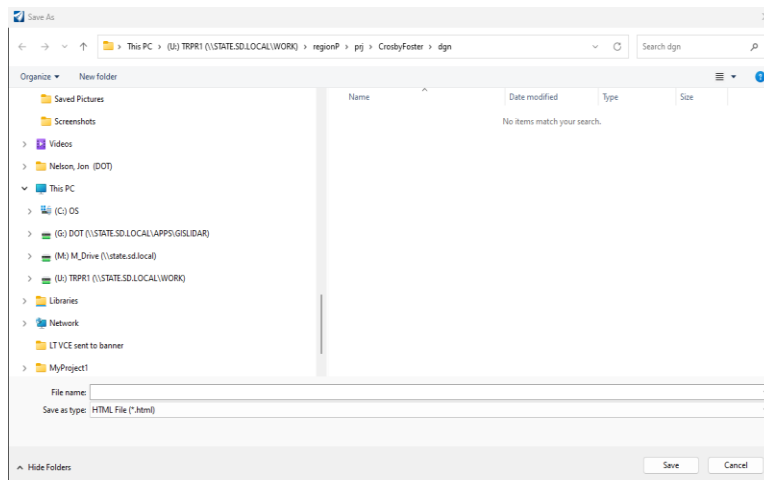
11) Navigate to the **control** folder within the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#**control**) where the **Control Data Report** will reside.
   a. In the **File name:** field at the bottom of the dialog box type in the appropriate **PCN#** followed by **control** (**PCN#control**).
   b. Ensure the **Save as type:** is set to **HTML File (*.html)**
   c. Select the **Save** button located in the bottom right of the dialog box.
   d. Close out of the **Bentley Civil Report Browser** by selecting the "**X**" located in the top right of the browser.

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The **Control Data Report** has now been saved within the **control** folder within the project folder and is ready for use by the designers, contractors and surveyors.

Creating and Editing Terrain Model

Before creating the terrain model, it is best to **Compress** the dgn file to reduce the size of the file and remove unused element types from the dgn.

1) Select the **File** tab located along the top row of tabs to access the **BackStage**.
2) Select **Tools** from the list along the left side of the BackStage to display the **Tools** options.
3) Select **Compress File** from the **Tools** option list to compress the dgn file.

Note: This process may take several minutes to complete.

Once the **Compress File** process is complete the message **File Compressed** will display in the **Message Center** at the bottom of the software.

After compressing the dgn file the Terrain Model can now be created.

1) From the **Explorer Tab** expand the **Survey** pane if not already expanded.
2) Right click on the project field book in the **Survey** pane and select **Create Terrain Model…** from the drop-down menu to create the terrain model.

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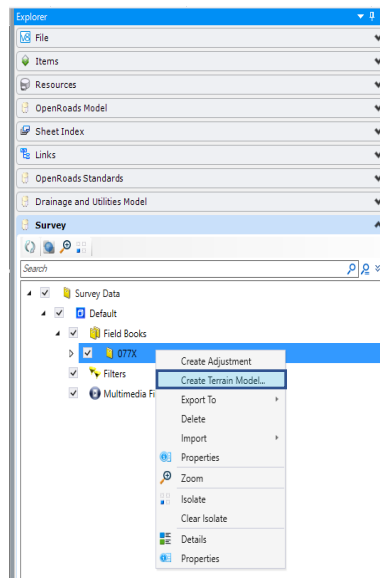
The triangles can be displayed by changing the **Feature Definition** in the Terrain Model

Properties by selecting the terrain model's boundary using the **Select Element**
tool. Hover over the highlighted terrain model boundary to display the **Civil Context
Menu.**
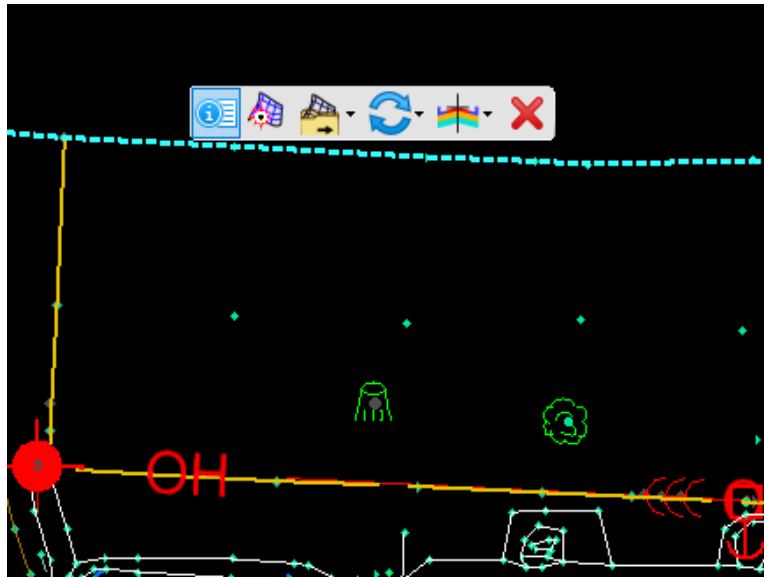
Select the **Properties** tool within the **Civil Context Menu** to display the **Terrain
Model Properties** dialog box…

Name	Terrain Model: 036K
Number of Points	6,471
Number of Point Featu	418
Number of Islands	0
Number of Voids	1
Number of Features	1,021
Number of Contours	0
Number of Breaklines	348
Number of Triangles	12,649
Edge Method	**Max Edge Length**
Length	**120.0000ft**
Major Contours	**Off**
Minor Contours	**Off**
Triangles	**Off**
Spots	**Off**
Flow Arrows	**Off**
Low Points	**Off**
High Points	**Off**
Breaklines	**Off**
Boundary	**Off**
Imported Contours	**Off**
Islands	**Off**
Holes	**Off**
Voids	**Off**
Feature Spots	**Off**
Feature Definition	**Existing**
Feature Name	**036K**

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The terrain triangles can be displayed by selecting **Existing Triangles** from the **Feature Definition** drop-down menu. Changing the feature definition to **Existing Triangles** will keep the terrain boundary and triangles displayed while editing, modifying, and adjusting the terrain using the terrain edit tools.

1) Select the **Terrain** tab located along the top row of tabs.

2) Within the **Edit** tool group select the **Edit Model** [Edit Model] tool.
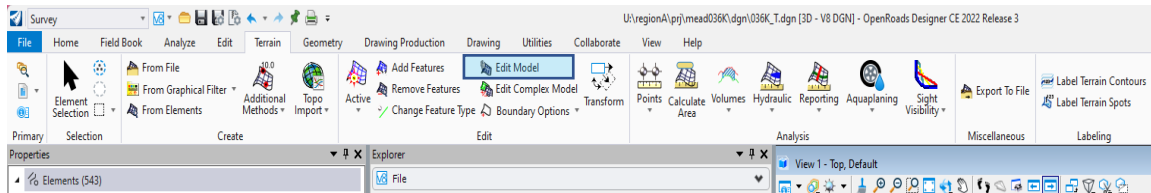
The **Terrain Editor** dialog box will appear…
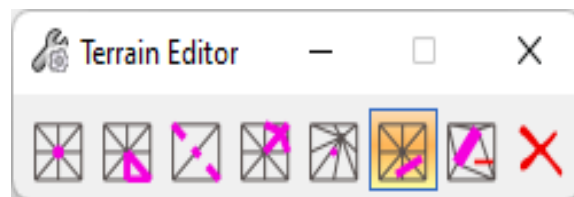
3) Select the terrain model's edge and use the **Terrain Editor** tools to edit the terrain model's boundary and triangles:

Delete Vertex	use to delete an existing vertex of the terrain model's boundary
Delete Triangle	use to delete an existing triangle
Swap Line	use to swap direction of triangle
Insert Vertex	use to insert a single vertex of the terrain model's boundary
Move Vertex	use to move an existing vertex of the terrain model's boundary to a new location
Delete Triangles By Line	use to delete triangles using a line
Delete Feature	use to delete a feature from the terrain model
Delete Edit	use to undo terrain model edits

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Review and Editing Crossing Features

Report Crossing Features is a tool found in the **Reporting** drop-down menu within the **Analysis** tool group under the **Terrain** tab. The **Report Crossing Features** tool provides a list of all crossing linear features (line segments) within the survey. Using the report, zoom to the crossing point of the linear features (line segments) to edit and resolve the crossing linear features (line segments).

1) Select the **Terrain** tab located along the top row of tabs.

2) Select **Report Crossing Features** from the **Reporting** tool drop-down menu located in the **Analysis** tool group.
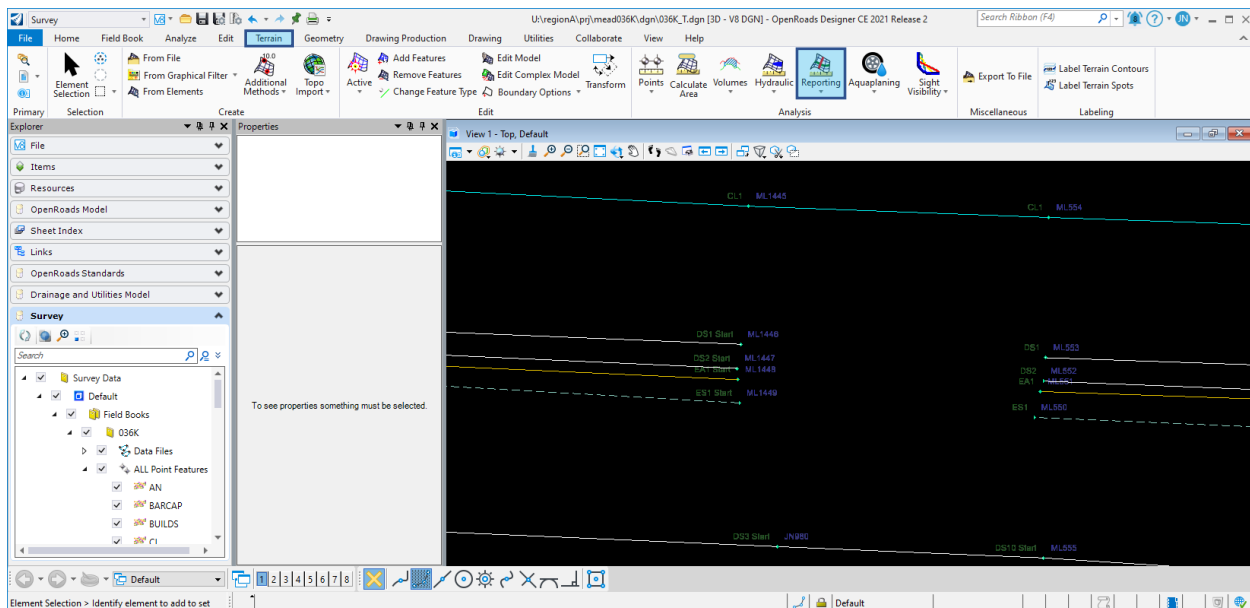
The **Terrain Model Crossing Features** dialog box will appear…
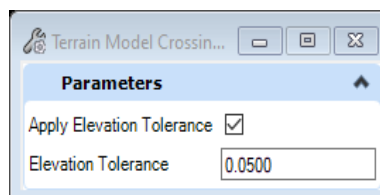
3) Ensure the **Apply Elevation Tolerance** is checked.
4) Enter in a tolerance value into the **Elevation Tolerance** field and select the enter key on your keyboard.

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5) Select the terrain model's edge and left click through the on-screen heads-up prompts attached to the cursor to display the **Terrain Crossing Features Report**.

6) Highlight one of the **Intersection Points** within the report dialog box and select the **Zoom To** button at the top of the report box to zoom to the intersection of the crossing linear features (line segments).
7) Edit the linear features (line segments) as needed to fix the crossing.
8) Repeat steps 6 and 7 until all crossing linear features have been resolved.

Annotate Notes

1) Select the **Drawing Production** tab located along the top row of tabs.

2) Within the **Annotations** tool group select the **Element Annotation** tool.

The **Annotate Elements** dialog box will appear…
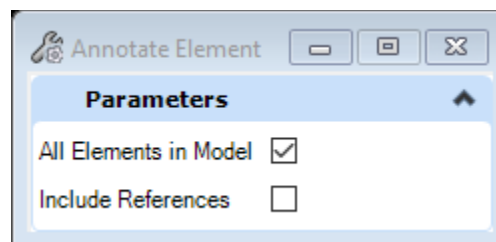
3) Check the box next to **All Elements in Model**.
4) Move the cursor into the CAD drawing space and left click to annotate all elements in model.

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Note: this process may take 30 minutes or longer to complete depending on the file size.

Once the Annotate Elements process is complete the field notes will display in the CAD drawing space.

Finalizing OpenRoads Survey File

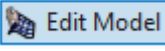Set the terrain model's feature definition to **Existing Boundary** in the Terrain Model

Properties by selecting the terrain model's boundary using the **Select Element**
tool. Hover over the highlighted terrain model boundary to display the **Civil Context Menu.**

Select the **Properties** tool within the **Civil Context Menu** to display the **Terrain Model Properties** dialog box…

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Name	Terrain Model: 036K
Number of Points	6,471
Number of Point Featu	418
Number of Islands	0
Number of Voids	1
Number of Features	1,021
Number of Contours	0
Number of Breaklines	348
Number of Triangles	12,649
Edge Method	Max Edge Length
Length	120.0000ft
Major Contours	Off
Minor Contours	Off
Triangles	Off
Spots	Off
Flow Arrows	Off
Low Points	Off
High Points	Off
Breaklines	Off
Boundary	Off
Imported Contours	Off
Islands	Off
Holes	Off
Voids	Off
Feature Spots	Off
Feature Definition	Existing
Feature Name	036K

Select **Existing Boundary** from the **Feature Definition** drop-down menu.

Turn off the Ground shots, Do not contour shots, and breakline levels by toggling them off in the level display dialog.

1) Select the **Home** tab located along the top row of tabs.
2) Within the **Attributes** tool group expand the levels and select **Display…**
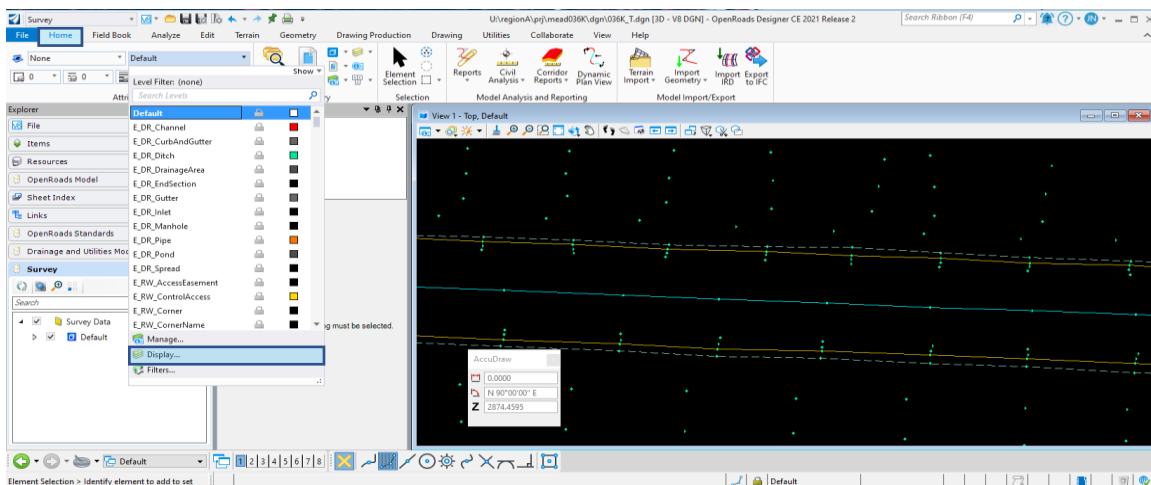
The **Level Display** dialog box will appear…
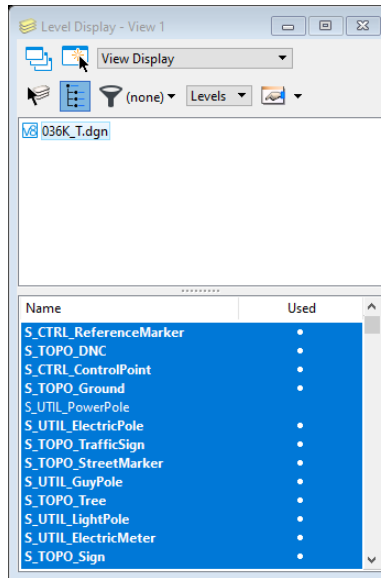
3) Turn off the following levels by selecting the white dot in the **Used** column.
   a. **S_TOPO_Ground**
   b. **S_TOPO_DNC**
   c. **S_TOPO_Discon**
4) Close the **Level Display** dialog box by selecting the "**X**" in the top right corner of the dialog box.
5) Select the **File** tab located along the top row of tabs to access the **BackStage** and select **Save Settings** to save the levels displayed within the CAD drawing space.

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After importing, editing, and processing all field book data and all modifications have been made to the Terrain model in ORD. The OpenRoads Designer file can be converted to be used for design in MicroStation SS4 and InRoads SS2.

Note: Before converting the OpenRoads Designer file check to ensure the correct **Annotation Scale** was set in the **Setting the Drawing Scale** section of the OpenRoads Designer Survey Processing Guidelines.

1) Select the terrain model's boundary using the **Select Element** ![Element Selection] tool. Hover over an element of the terrain model to display the **Civil Context Menu**.
2) From the **Export Terrain Model** drop-down select **InRoads DTM**.
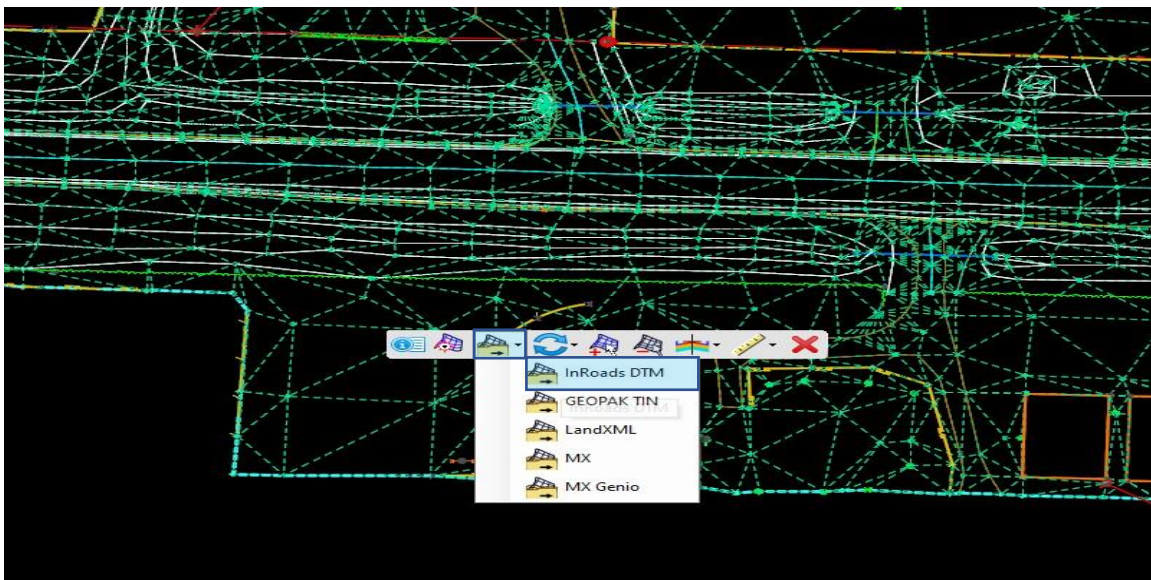
The **Export Terrain** dialog box will appear…
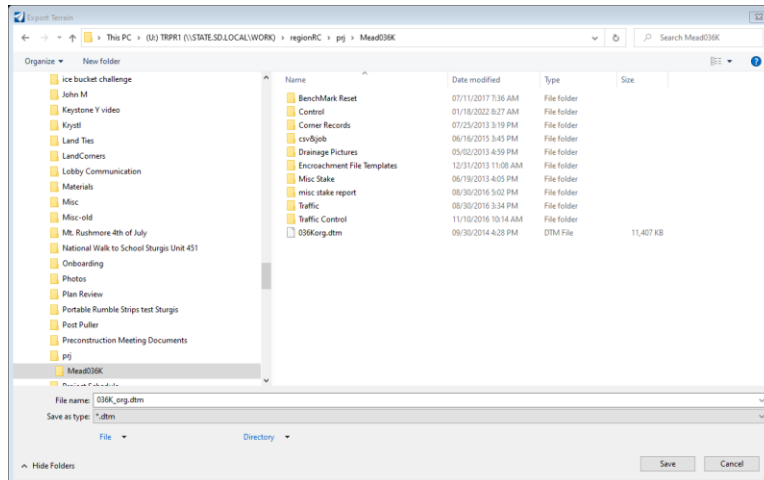
3) Navigate to the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj**cntyPCN#**) where the InRoads surface model file will reside.
4) In the **File name:** field at the bottom of the dialog box type in the appropriate surface model name (**PCN#_org**).

Note: Use the under bar (_) in the file name between **PCN#** and **org** to signify the file was created in OpenRoads Designer.

--Important--

The naming convention for the surface model should follow the SDDOT standard for naming the surface model file outlined in **Surface Data Furnished (.dtm file)** Chapter 6 of the SDDOT Survey Manual.

5) Select the **Save** button located in the bottom right of the dialog box to save the exported DTM.

Turn on all levels by toggling them on in the **Level Display** dialog.

6) Select the **Home** tab located along the top row of tabs.
7) Within the **Attributes** tool group expand the levels and select **Display…**
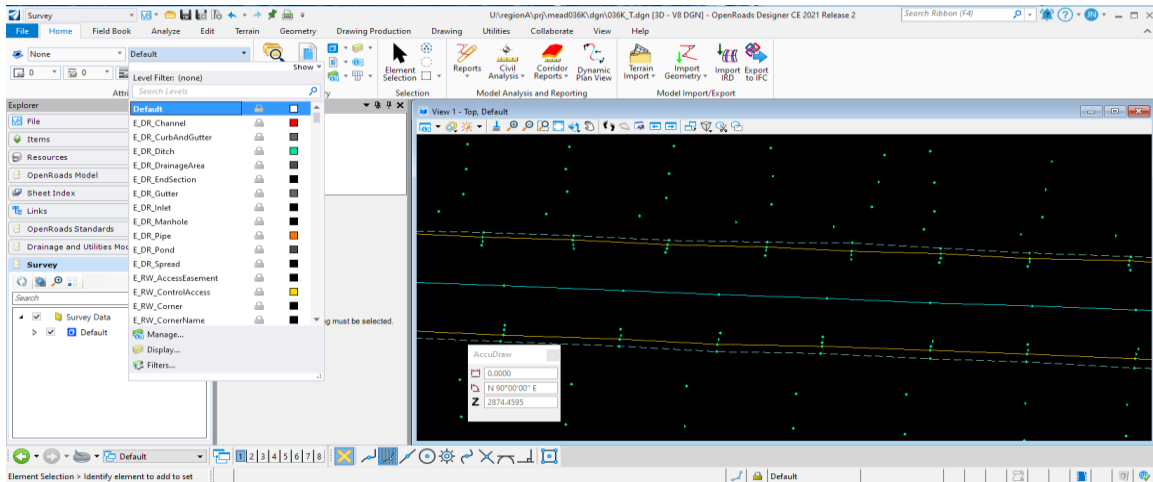
The **Level Display** dialog box will appear…
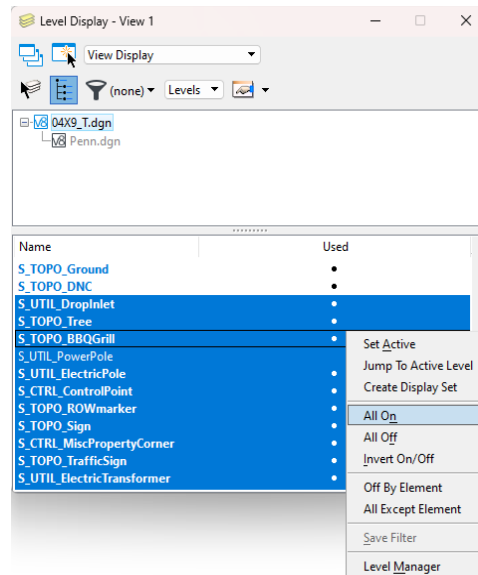
8) Turn on all the levels by right clicking within the **Used** column and selecting **All On**.
9) Close the **Level Display** dialog by selecting the "**X**" in the top right corner of the dialog box.

Ensure all survey data is visible within the CAD drawing space.

10) From the **Explorer Tab** select the **Survey Pane** if not already selected.

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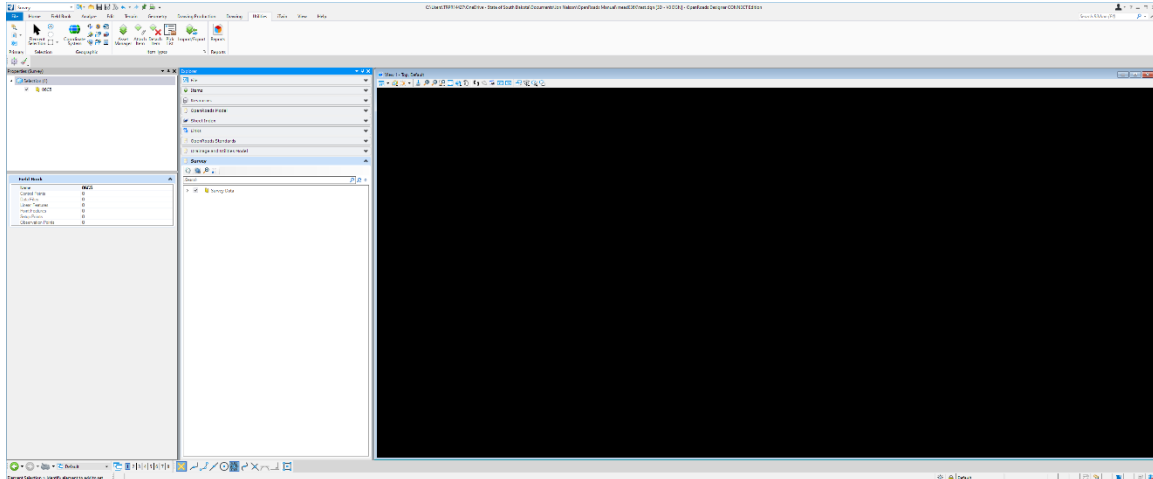
11) Expand the following folders within the **Survey** pane by selecting the drop-down arrow next to each folder.

Survey Data>**Default**>**Field Books**

12) **Uncheck** and **recheck** the box next to the project field book (**PCN#**) to ensure all survey data is visible.

13) Right click on the project field book (**PCN#**) and select **Export To** > **DGN Graphics…** from the drop-down menu.
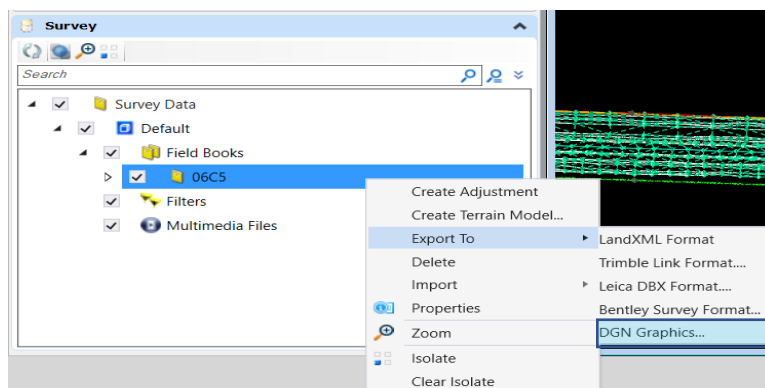
The **Save visible survey data** dialog box will appear…
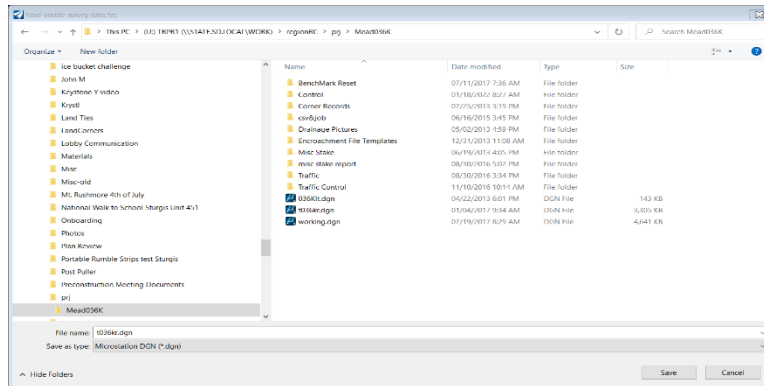
14) Navigate to the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#) where the MicroStation DGN Graphics file will reside.

15) In the **File name:** field at the bottom of the dialog box type in the appropriate MicroStation DGN Graphics file name (**tPCN#_*.dgn**).

_ signifies the file was created in OpenRoads Designer

* represents one of the three design file scales and is always lowercase:

  r = Rural Scale (Ensure Annotation Scale is set to 1" = 200')
  s = Suburban Scale (Ensure Annotation Scale is set to 1" = 100')
  u = Urban Scale (Ensure Annotation Scale is set to 1" = 40')

Note: replace the * shown in the MicroStation DGN Graphics file name with one of the three design file scales letter (**r**, **s,** or **u**)

--Important--

The naming convention for the DGN Graphics file should follow the SDDOT standard for naming the DGN Graphics file outlined in **Topography Data Furnished (.dgn file)** Chapter 6 of the SDDOT Survey Manual.

16) Select the **Save** button located in the bottom right of the dialog box.

17) The newly created MicroStation SS4 file (**tPCN#_*.dgn**) will automatically open in OpenRoads Designer.

Note: This may take several minutes to completely load.

18)Close the newly created MicroStation SS4 file (**tPCN#_*.dgn**) by selecting **Close** within the **File** tab along the top row of tabs to exist out of the newly created MicroStation SS4 file (**tPCN#_*.dgn**).

The exported MicroStation DGN Graphics file can be viewed by referencing into a MicroStation SS4 file or older MicroStation versions.

Import InRoads FWD and DTM Files into OpenRoads Designer

1) Create an ORD Survey dgn file following the process outlined in the **Create a Survey Project** section of the OpenRoads Designer Survey Processing Guidelines.
2) Set the **geographic coordinate system**, **set the drawing scale**, and **create a field book** following the ORD Survey Processing Guidelines.
3) Make a copy of **PCN#.fwd** file place it into the dgn folder where the new ORD dgn file resides and rename **PCN#_T.fwd**.
4) Open newly renamed **PCN#_T.fwd** file in Microsoft Word.
5) Select the **Home** tab located along the top row of tabs.
6) Select the **Replace** ᵍᶜ Replace tool located within the **Editing** tool group.

The **Find and Replace** dialog box will appear….
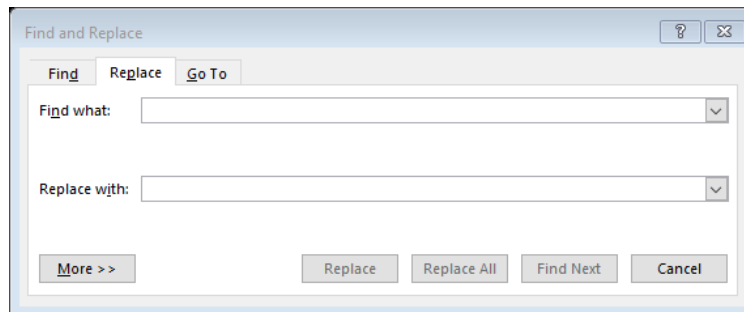
7) Find and replace the following codes:
   a. **PT PC** replace with **CC**
   b. **PT CLOSE** replace with **CLOSE**
   c. **ST PC** replace with **SC**
   d. **CLSRECT** replace with **CS**
   e. **REFMRK** replace with **CP**
   f. **NOTE: This is an Edited Record** replace with nothing
      (3 spaces between **NOTE:** and **This**)
8) Close the **Find and Replace** dialog by selecting the "**x**" in the top right corner of the dialog box.
9) Select the **File** tab located along the top row of tabs to display the backstage.
10) From the backstage menu select **Save** to save the changes to the **PCN#_T.fwd** file.
11) Import the **PCN#_T.fwd** file into ORD by right clicking on the newly created project field book in the **Survey Pane** and select **Import > File…** from the drop-down menu.
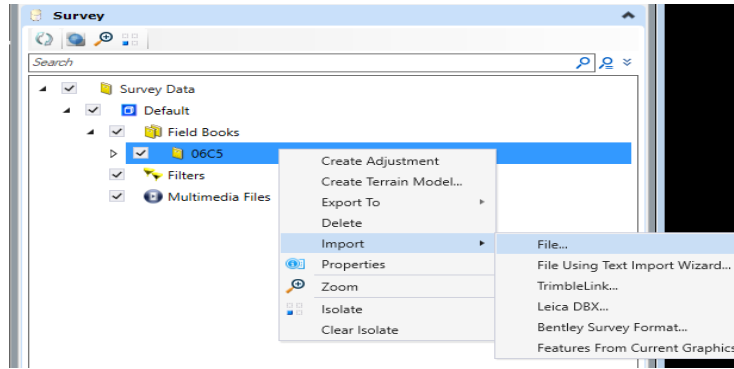
The **Select file** dialog box will appear…
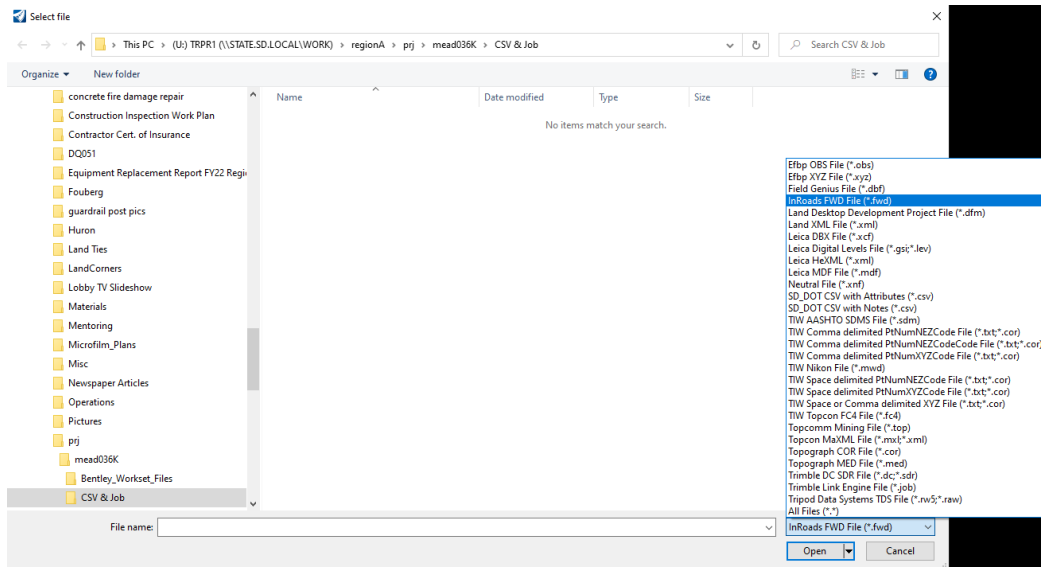
12) From the **File type** pull-down menu select **InRoads FWD File(*.fwd)**.
13) Navigate to the location of the **PCN#_T.fwd file** containing the field survey.
14) Double click on the **PCN#_T.fwd file** or select the **Open** button in the bottom right of the dialog box to import the field survey data into the projects field book.

15) Select the **Fit view** tool within the **View Control** toolbar located at the top of the CAD drawing space to graphically display the field survey data.
16) Review and edit the imported survey data following the process outlined in the **Review and Editing Survey Data** section of the ORD Processing Guidelines.

After all edits to the survey data have been completed the InRoads .dtm file can now be imported.

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1) Select the **Terrain** tab located along the top row of tabs.

2) Within the **Create** tool group select the **From File** tool.

The **From File** dialog box will appear…
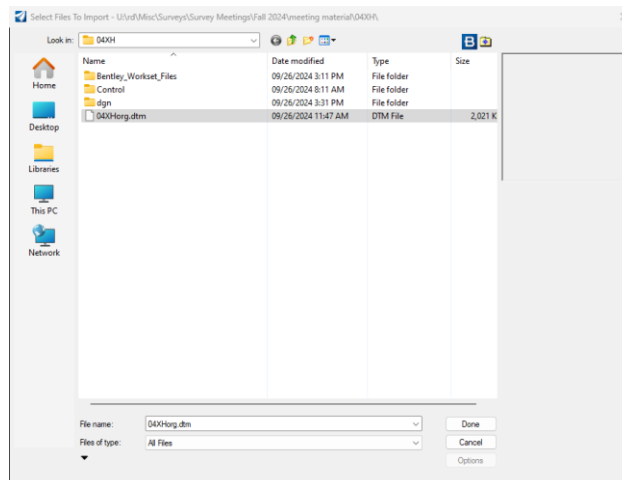
3) Navigate to the location of the InRoads **PCN#org.dtm** to be imported into ORD.
4) Double click on the **PCN#org.dtm** file.

The **Import Terrain Model** dialog box will appear…
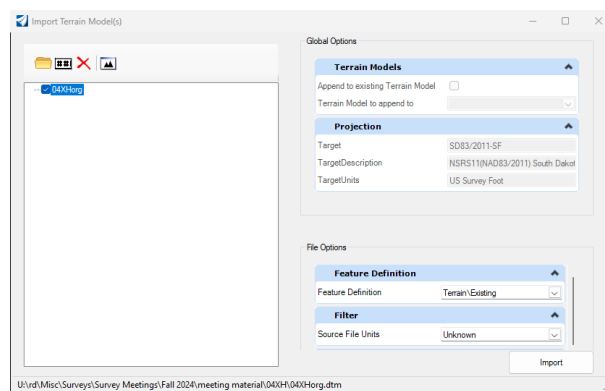
5) Ensure the correct datum is displayed under the **Projection** tab.
6) From the **Feature Definition** tab select the **Feature Definition** drop-down, expand the **Terrain folder** (if not already expanded) and select **Existing.**
7) From the **Filter** tab select the **Source File Units** drop-down and select **US Survey Feet**.

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8) From the **Triangulation Options** tab select the **Import Options** drop-down and select **Import Terrain Only**.
9) From the **Geographical Coordinate Systems** tab select the ellipsis for **Source**.

The **Image Projection** dialog box will appear…
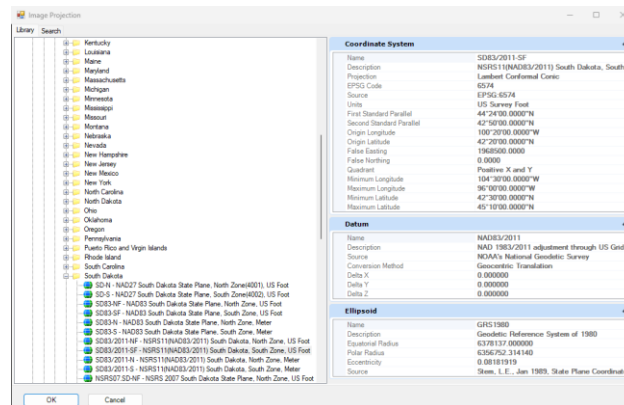
10) Select the **+** icon next to the **Library** folder and navigate to the following folder…
    Projected ((northing, easting…) > North America > United States of America > South Dakota.
11) Select the coordinate system used for the field survey and select the **OK** button located in the bottom left of the dialog box.

The **Import Terrain Model** dialog box will appear…
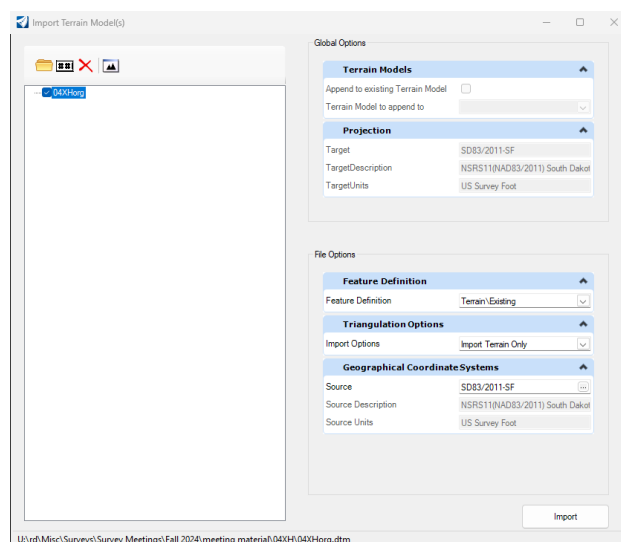
12) Select the **Import** button located in the bottom right of the dialog box.
13) Once the InRoads .dtm file is imported into ORD close the **Import Terrain Model** dialog box by selecting the "**X**" in the top right corner of the dialog box.

Additional edits can be made to the imported terrain model following the **Creating and Editing Terrain Model** section of the ORD Processing Guidelines if needed.

14) Annotate the notes and finalize the survey following the **Annotate Notes** and **Finalizing OpenRoads Survey File** sections of the ORD Processing Guidelines.

Export 2D Topo File into 3D Topo File

This guideline details the process for converting a 2D OpenRoads Designer (ORD) preliminary survey file into a 3D OpenRoads Designer (ORD) preliminary survey file.

Export Survey from 2D file

1) Open the 2D preliminary survey file to be exported to 3D in OpenRoads Designer.
2) Ensure the **Survey** workflow is selected from the **Workflow** drop-down located in the upper left corner of the software.
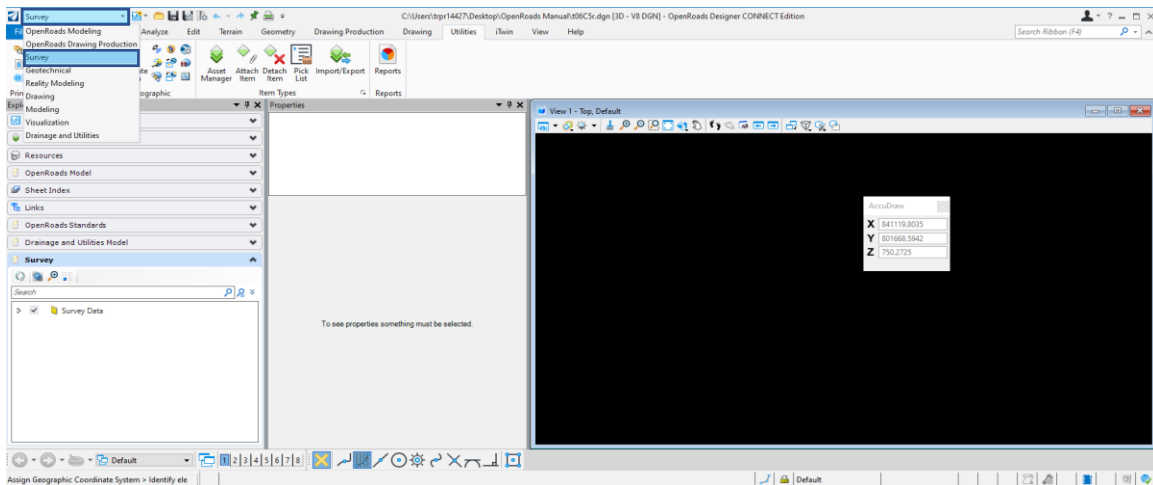
3) Select the **Field Book** tab located along the top row of tabs.
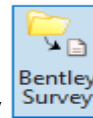
4) Within the **Export** tool group select the **Bentley Survey** tool.
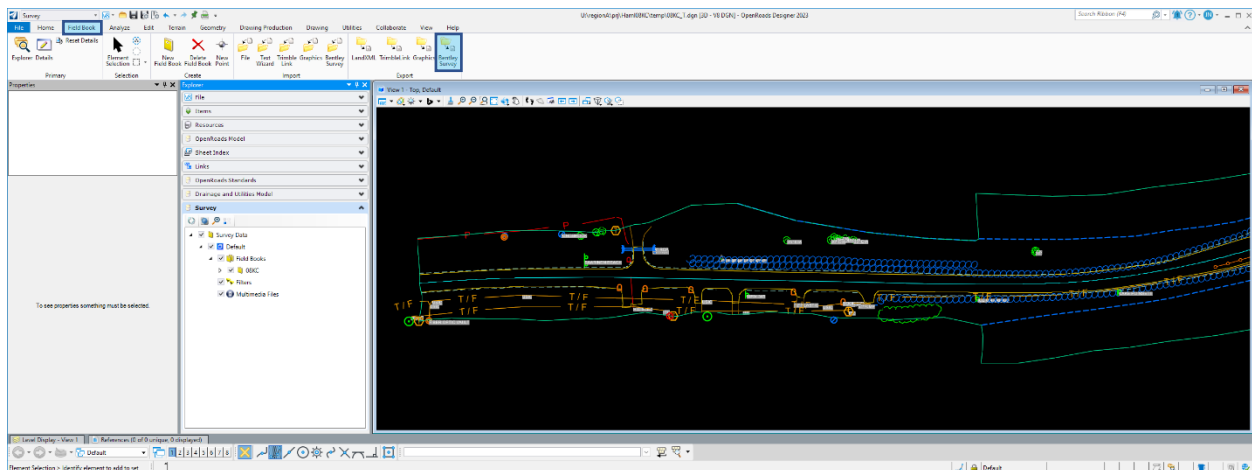
The **Export** dialog box will appear…
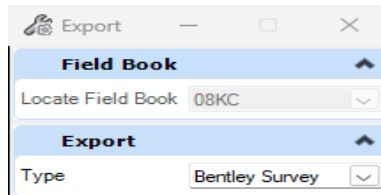
Follow the heads-up display on the cursor by…

5) Selecting any feature of the survey within the CAD drawing space to display the field book name within the **Locate Field Book** drop-down.
   a. Ensure the **Export Type** drop-down menu is set to **Bentley Survey**.
   b. Move the cursor into the CAD drawing space and **left click** through the heads-up prompts attached to the cursor verifying the **Field book** and **Export Type**.

The **Save As** dialog box will appear…
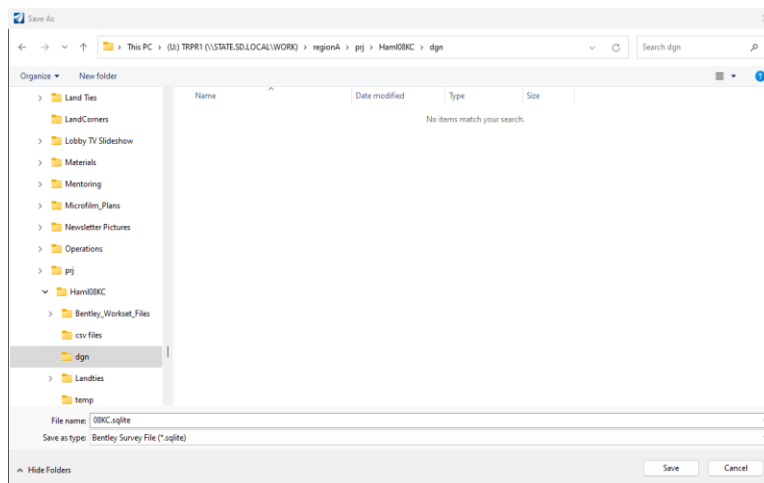
6) Navigate to the **dgn** folder within the appropriate project folder with the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#**dgn**).
7) Ensure the **File name:** field is set to the correct PCN# (**PCN#.sqlite**) and select the **Save** button located in the bottom right corner of the dialog box.
8) Close out of the 2D file by selecting **Close** within the **File** tab along the top row of tabs to exit out of the 2D preliminary survey file.

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Rename the 2D file

Open **File Explorer** and navigate to the **dgn** folder with the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#**dgn**) where the 2D preliminary survey file resides.

Rename the 2D preliminary survey file from **PCN#_T.dgn** to **PCN#_T2D** and close out of **File Explorer** by selecting the "**X**" in the top right corner of the dialog box.

Create the 3D File

Launch **OpenRoads** Designer from the desktop…

9) Ensure the correct **WorkSpace** and **Workset** are selected for the preliminary survey being converted from 2D to 3D.

10) Create a 3D dgn file by selecting the **New File** ⬚ button.

The **New** dialog box will appear…
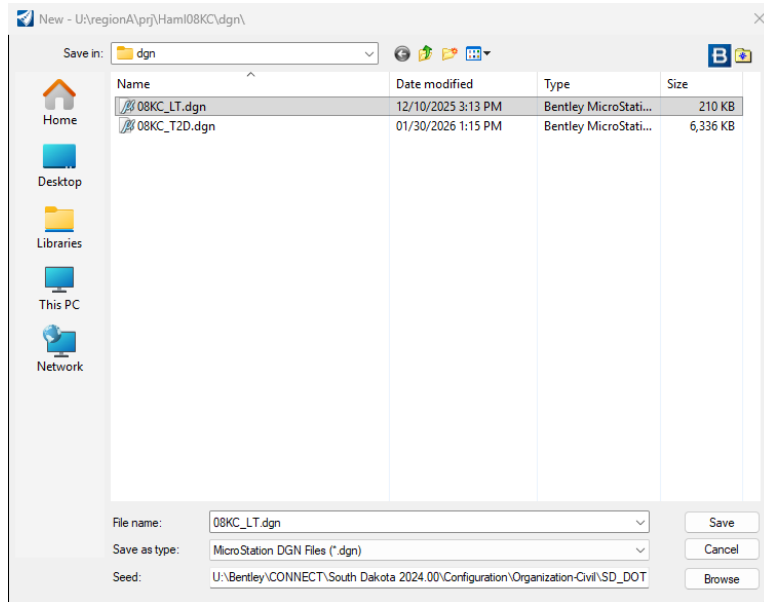
11) Navigate to the **dgn** folder within the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#**dgn**) where the new preliminary survey file will reside.
   a. In the **File name:** field at the bottom of the dialog box type in the appropriate survey file name (**PCN#_T**).
   b. Ensure the **Save as type:** is set to **Micro Station DGN files (*.dgn)**.
   c. Ensure the **Seed:** field is set to utilize the **3D seed file** by selecting the **Browse** button located in the bottom right of the dialog box.

   The **Select Seed File** dialog box will appear…

C4
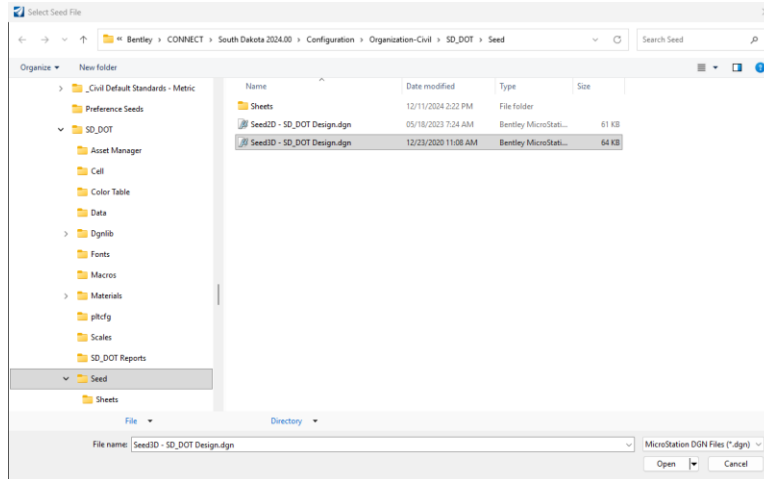
12) Highlight the **Seed3D – SD_DOT Design.dgn** file.

13) Select the **Open** button located in the bottom right of the dialog box.

14) Select the **Save** button located in the bottom right of the dialog box.

The new 3D preliminary survey file (**PCN#_T.dgn**) will be created and opened.

Import Survey and Finalize

15) Set the **geographic coordinate system** and the **drawing scale** following the ORD Survey Processing Guidelines (pages 6 – 8 of these guidelines).

Once the 3D preliminary survey file has been created and the **geographic coordinate system** and **drawing scale** have been set to the appropriate coordinate system and scale.

The exported Bentley Survey file (**PCN#.sqlite**) can be imported into the newly created 3D file.

16) Select the **Field Book** tab located along the top row of tabs.
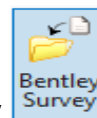
17) Within the **Import** tool group select the **Bentley Survey** tool.
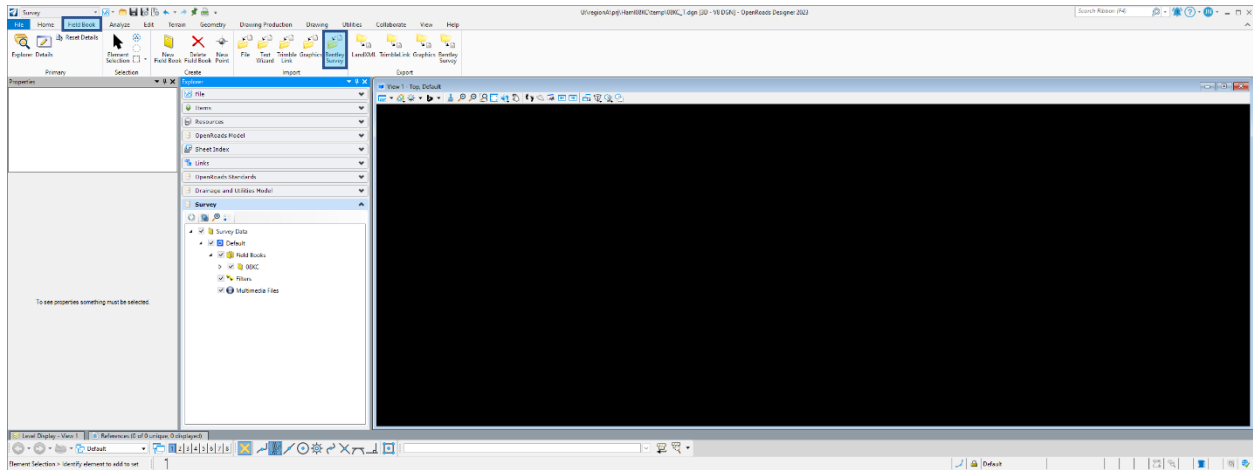
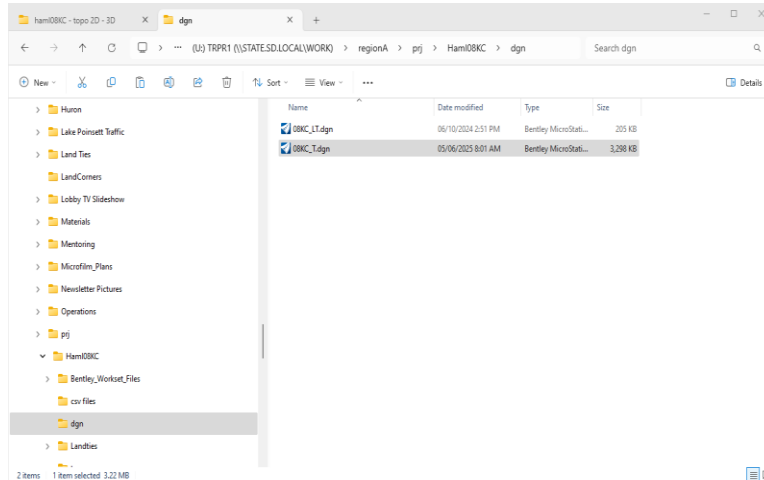The **Select file** dialog box will appear…
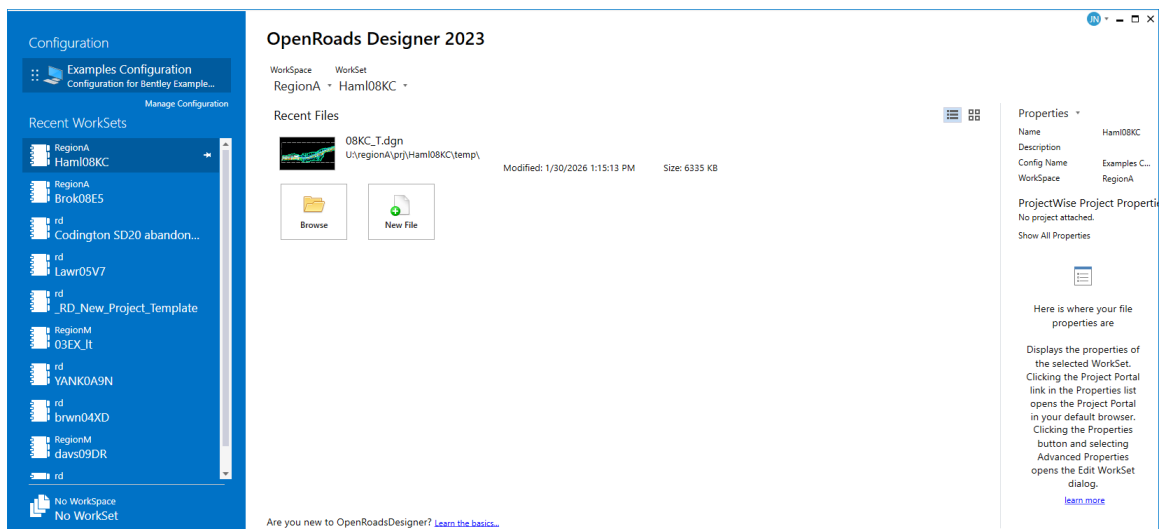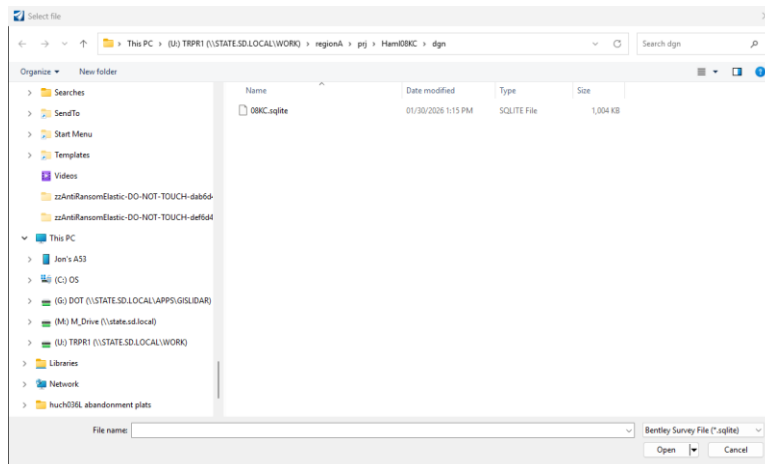

18) Navigate to the **dgn** folder within the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#**dgn**) where the exported Bentley Survey file (**PCN#.sqlite**) resides.
19) Select the Bentley Survey file (**PCN#.sqlite**) and select the **Open** button located in the bottom right of the dialog box.

The **Bentley Survey File** dialog box will appear…

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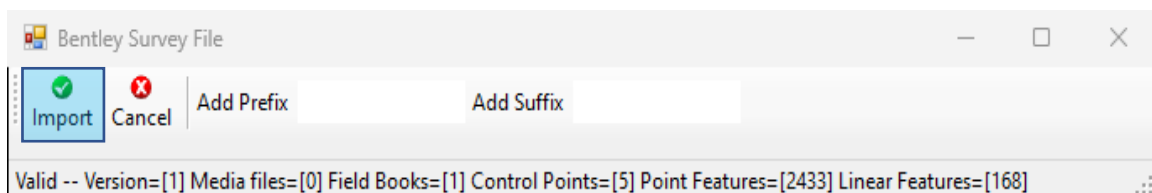
20) Select the **Import** ![Import] button to import the Bentley Survey file into the newly created 3D preliminary survey file.

Note: This process may take several minutes to complete depending on the size of the Survey file being imported. The time it takes to import depends on the size and complexity of the survey file being processed. Larger survey files will naturally take longer to import.

21) Select the **Fit view** ![icon] tool within the **View Control** toolbar located at the top of the CAD drawing space to graphically display the imported survey file.

22) From the **Explorer Tab** expand the **Survey** pane if not already expanded.
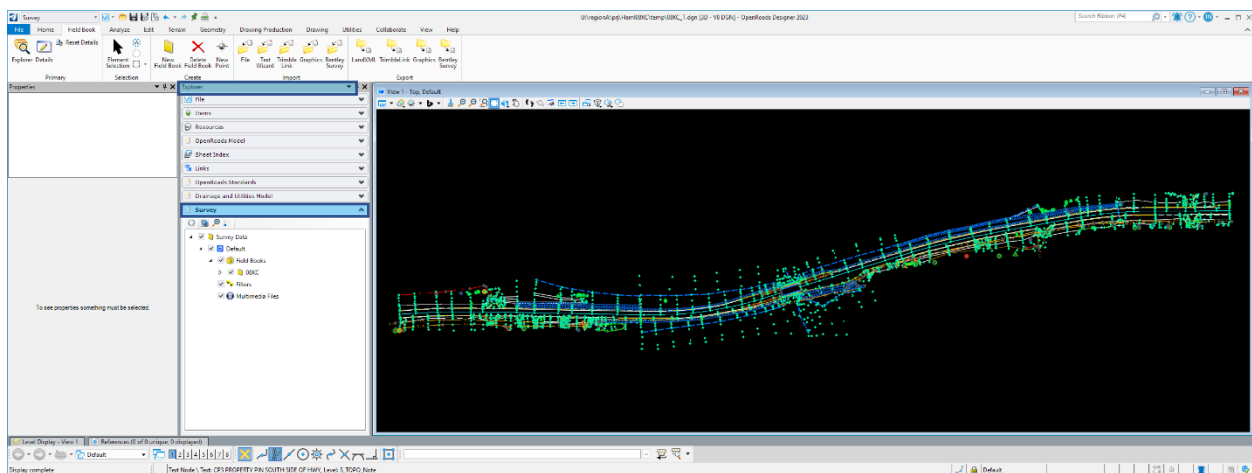
23) Expand the following folders within the **Survey** pane by selecting the drop-down arrow next to each folder.

> **Survey Data**>**Default**>**Field Books**

24) Right click on **Field Book 1** and select **Properties**.
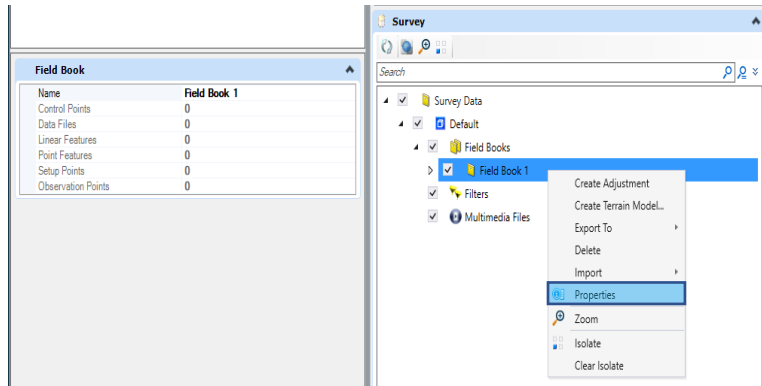
Field Book 1 properties will appear in the **Properties Tab** next to the **Explorer**.

25) In the **Name** field type in the appropriate project field book name (**PCN#**) and select the **enter key** on the keyboard.

26) Select the **File** tab located along the top row of tabs to access the **BackStage** and select **Save Settings**.

The **PCN#_T2D.dgn** file and the **PCN#.sqlite** file can now be deleted from the **dgn** folder within the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj\cntyPCN#**dgn**).

Additional edits can be made, and the terrain model created following the **Reviewing and Editing Survey Data**, **Creating and Editing Terrain Model**, **Review and Editing Crossing Features**, **Annotate Notes**, and **Finalizing OpenRoads Survey File** sections of the ORD Processing Guidelines to complete and finalize the 3D preliminary survey file.

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Import Wetlands Survey

This guideline details the process of incorporating a designer-provided aquatic resources delineation (wetlands shapefile) into the project's topography file within the OpenRoads Designer (ORD) environment.

The designer will forward the aquatic resources delineation and preliminary aquatic resources impact analysis e-mail with attached zipped wetlands shapefile (**PCN#_Wetlands.zip**) to the Area Surveyor to incorporate into the **PCN#_T.dgn** file.

The shapefiles are provided in a compressed (**.zip**) format for easy email transfer; they must be unzipped into the appropriate project folder before OpenRoads Designer (ORD) can read the individual components (.cpg, .dbf, .prj, .sbn, etc.) of the shapefile.

File Management and Extraction

1) Open **File Explorer** and navigate to the appropriate project folder within the appropriate region folder on the U: drive (U:\regionX\prj**cntyPCN#**)
2) Drag the **PCN#_Wetlands.zip** file from the email into the project folder.
3) Right click on the **PCN#_Wetlands.zip** file within the project folder and select **Extract All…** from the drop-down menu.
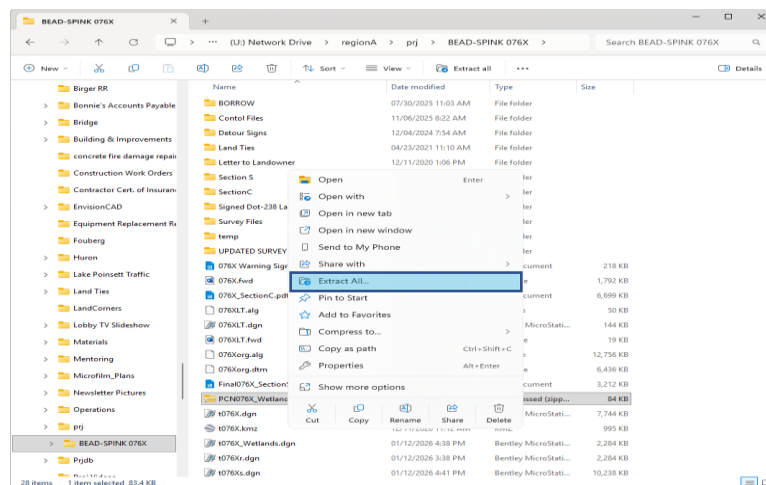
The **Extract Files** dialog box will appear…

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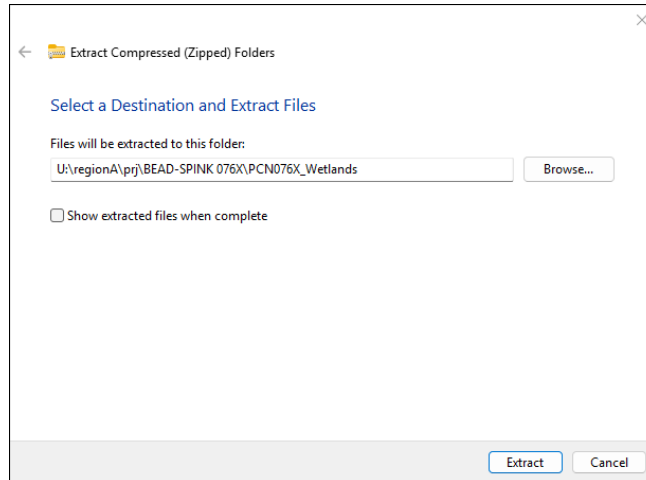
4) Ensure the **Files will be extracted to this folder:** field is set to the correct project folder (U:\regionX\prj\cntyPCN#**PCN#_Wetlands**) and select the **Extract** button located in the bottom right corner of the dialog box.
5) Ensure the **PCN#_Wetlands** folder was created within the project folder and the **PCN#_Wetlands.shp** file is located within the newly created **PCN#_Wetlands** folder along with other file types (.cpg, .dbf, .prj, .sbn, etc.).
6) Close **File Explorer** by selecting the "**X**" located in the top right of the dialog box.

Importing the Shapefile

Open the **PCN#_T.dgn** file to be updated with the wetlands survey in OpenRoads Designer (ORD).

7) Select the **File** tab located along the top row of tabs to access the **BackStage** and select **Import**.
8) Select **Common File Types** from the **Import File Data** field and select **Shapefile (*.shp)** .

A **Shapefile (*.shp)** is the industry standard geospatial vector data format used for sharing spatial information such as these wetland delineations.

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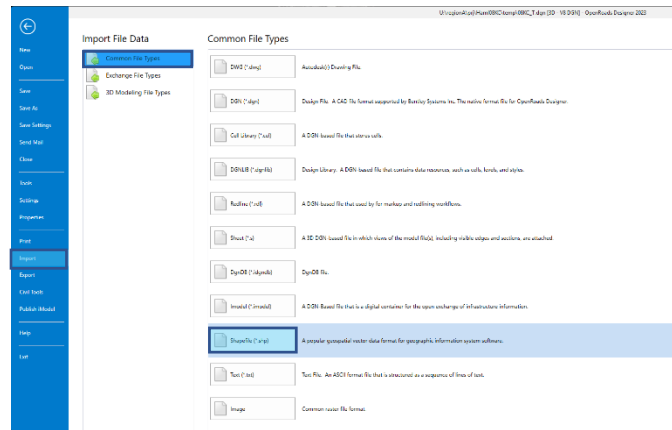
The **Import** dialog box will appear…

9) Navigate to the **PCN#_Wetlands** folder within the appropriate project folder with the appropriate region folder on the U: drive
(U:\regionX\prj\cntyPCN#**PCN#_Wetlands**).

10) Select the **PCN#_Wetlands.shp** file and select the **Open** button located in the bottom right corner of the dialog box.

Note: This process may take several minutes to complete depending on the size of the shapefile being imported. The time it takes to import depen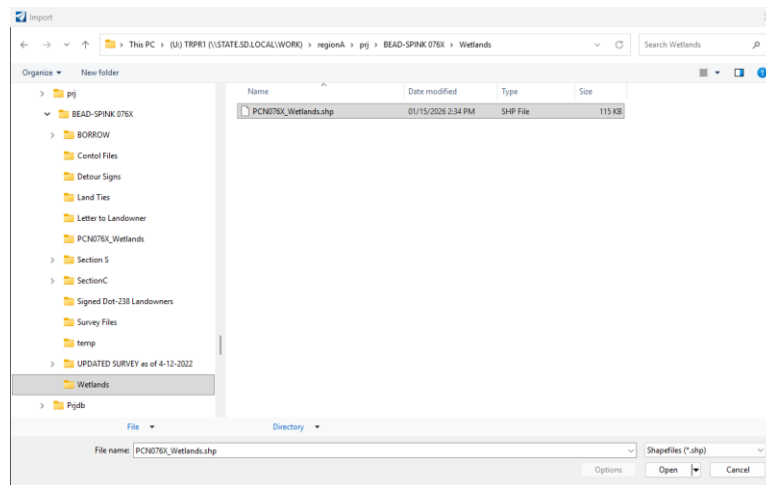ds on the size and complexity of the shapefile data being processed. Larger delineation boundaries will naturally take longer to import.

The wetland shapes will be imported on level **PCN#_Wetlands**, color 0 (white), Style 0 and Weight 0.

D3

11) Select the **Edit** tab located along the top row of tabs.
12) Within the **Modify** tool group select the drop-down arrow next to the **Element Attributes** tool and select **Match Element Attributes**.

The **Match Element Attributes** dialog box will appear…
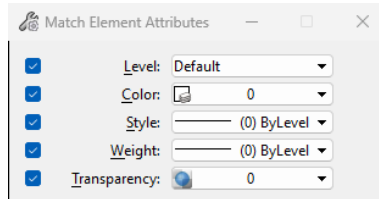
13) Move the cursor into the CAD drawing space and select one of the newly imported wetland shapes to set the active level to **PCN#_Wetlands**.
14) Select the **Home** tab located along the top row of tabs and verify the active level is set to **PCN#_Wetlands** within the **Attributes** tool group.
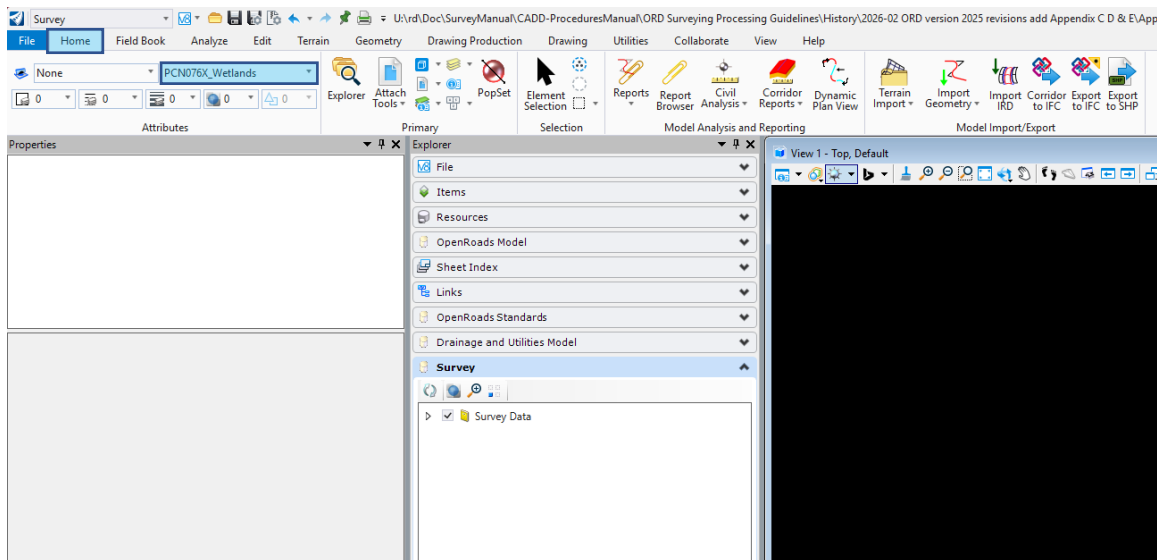
15) Within the same **Attributes** tool group expand the levels and select **Display…** from the drop-down menu.
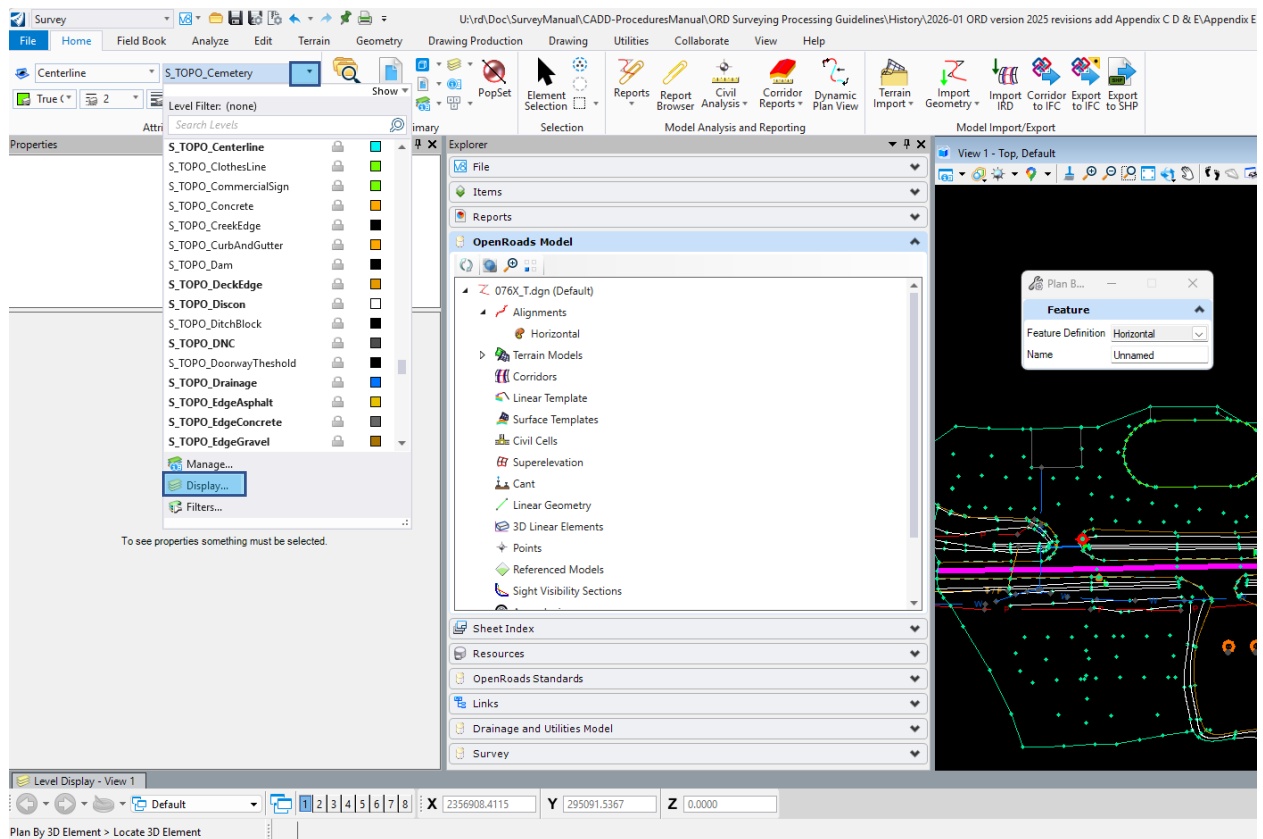
The **Level Display** dialog box will appear…
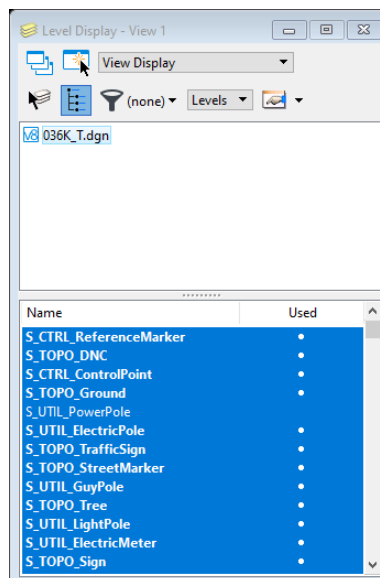
16) Turn off all levels by **right clicking** in the **Used** column and selecting **All Off** from the drop-down menu.

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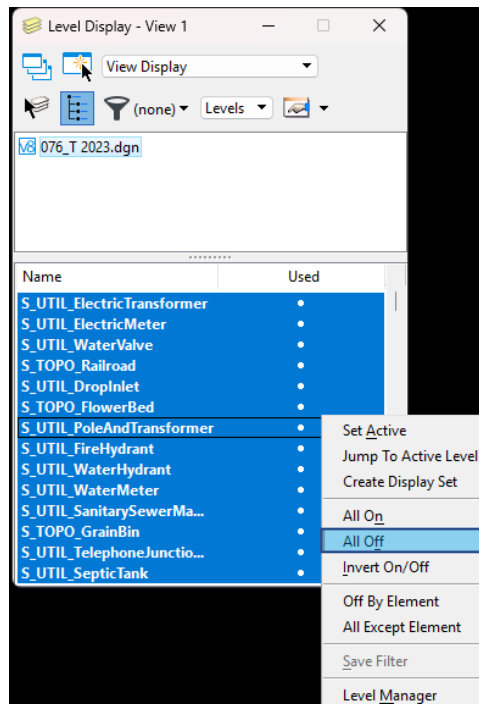
17) Close the **Level Display** dialog by selecting the "**X**" in the top right corner of the dialog box.

18) Select the **Fit view** [icon] tool within the **View Control** toolbar located at the top of the CAD drawing space to graphically display all the imported wetland shapes.

Note: all levels should now be off except for the PCN#_Wetlands level with the newly imported wetland shapes displayed within the CAD drawing space.

19) Select all imported wetland shapes with the **Select Element** [icon] tool.
20) Select the **Edit** tab located along the top row of tabs.
21) Within the **Modify** tool group select the drop-down arrow next to the **Element Attributes** [icon] tool and select [icon] Change Element Attributes.

The **Match Element Attributes** dialog box will appear…
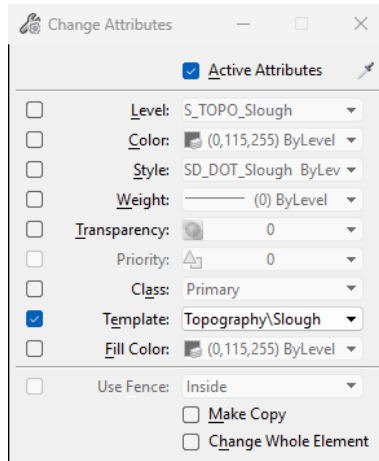
22) Toggle off all **Attributes** except **Template**.
23) From the **Template** drop-down menu select **Topography\Slough**.
24) Move the cursor into the CAD drawing space and **left click** to accept.
25) **Left click** in the CAD drawing space a second time to deselect the wetland shapes.

The imported wetland shapes will disappear from the CAD drawing space because the shapes have been moved to the **S_TOPO_Slough** level, which is currently turned off in the display settings.

Selecting the **Topography\Slough** Template from the drop-down menu ensures the imported wetland linework is automatically assigned the correct feature symbology, level, and properties as defined by the standards library.

26) Select the **Home** tab located along the top row of tabs.
27) Within the **Attributes** tool group expand the levels by selecting the drop-down arrow and select **Display…**

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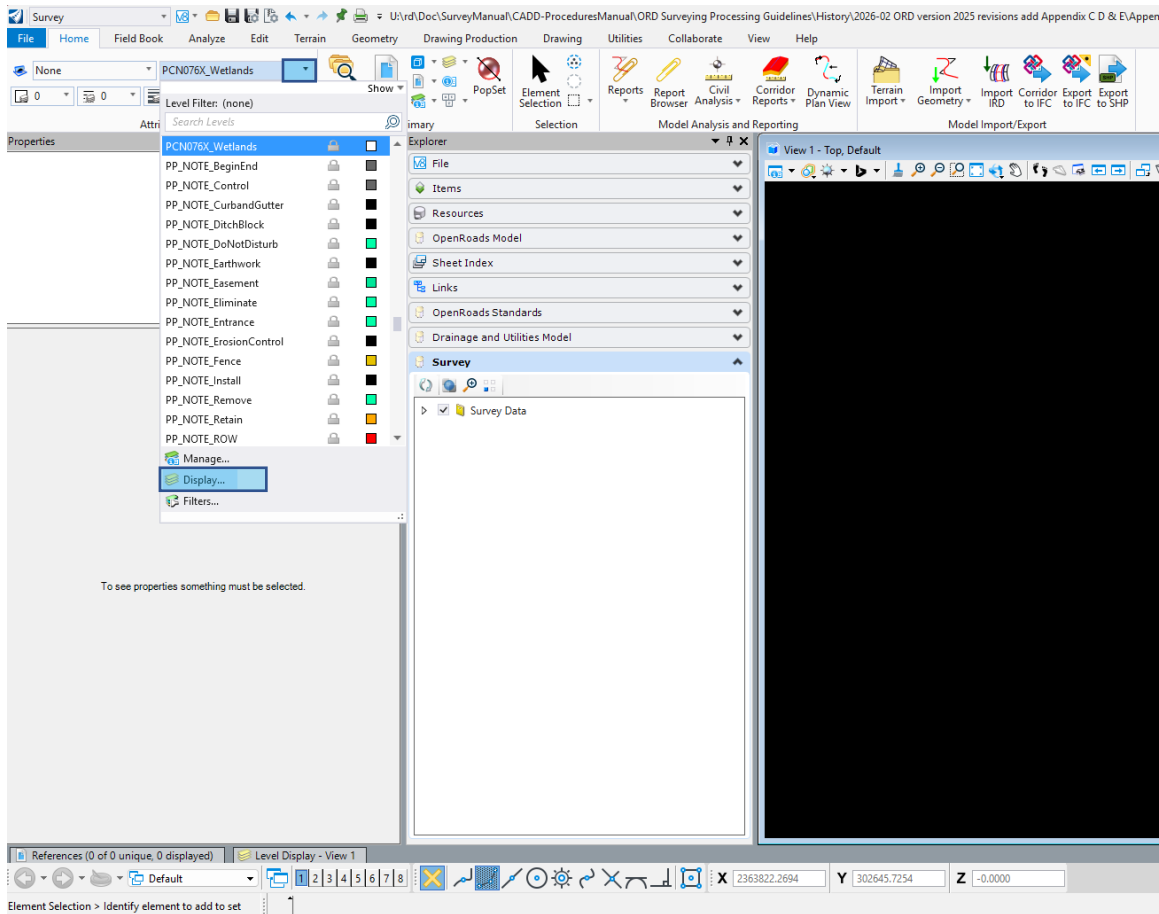
The **Level Display** dialog box will appear…
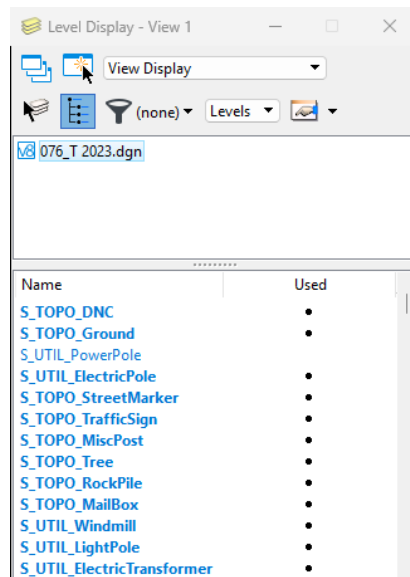
28) Turn on all levels by **right clicking** within the **Used** column and selecting **All On** from the drop-down menu.
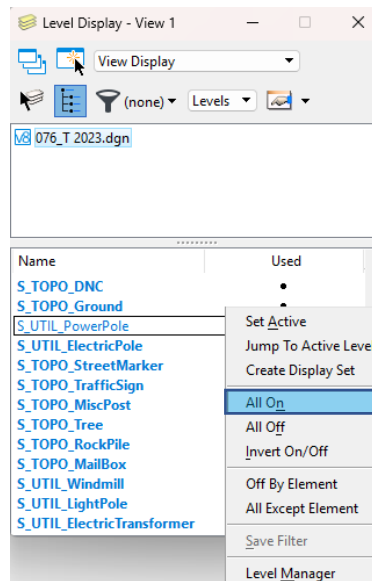
The imported wetland shapes will now display on level **S_TOPO_Slough**, color **blue** and line style **Slough**.

Edit and Save

29) Additional edits may need to be made to combine the previously surveyed wetland linework with the newly imported wetland linework. Additional edits may involve deleting, trimming or extending the previously surveyed slough linework to match the newly imported slough shapes.
30) When all edits to the wetland linework have been completed select the **Home** tab located along the top row of tabs.
31) Within the **Attributes** tool group expand the levels and select **Display…**

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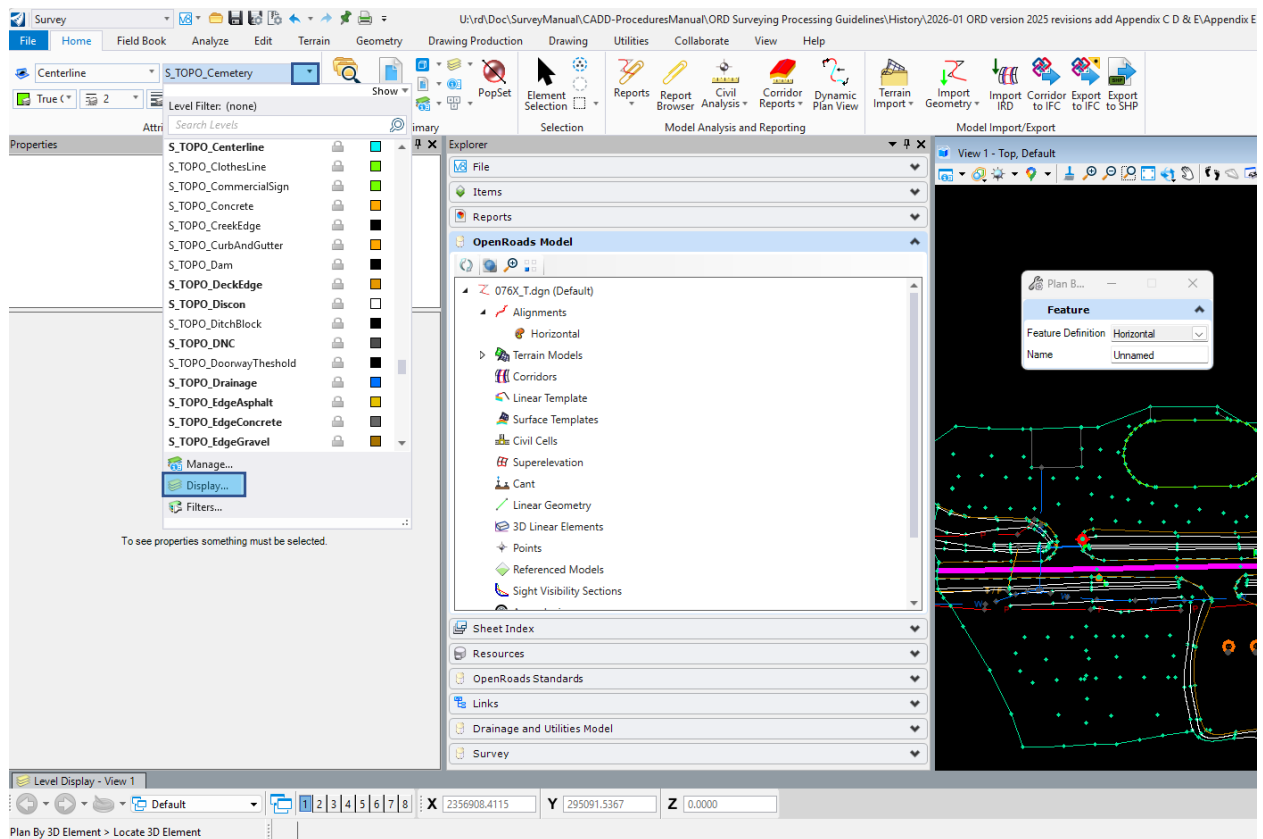
The **Level Display** dialog box will appear…
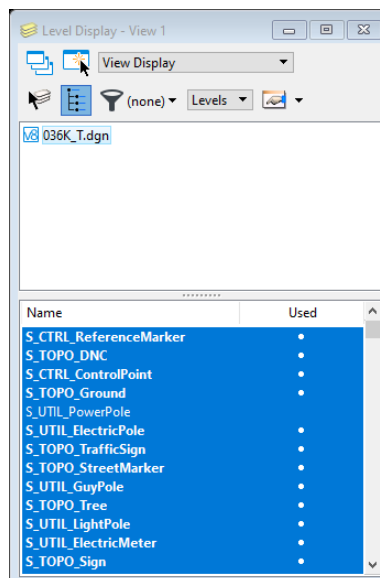
32) Turn off the following levels by selecting the white dot in the **Used** column.
   a. **S_TOPO_Discon**

b. **S_TOPO_DNC**
  c. **S_TOPO_Ground**
33) Close the **Level Display** dialog box by selecting the "**X**" in the top right corner of the dialog box.
34) Select the **File** tab located along the top row of tabs to access the **BackStage** and select **Save Settings** to save the levels displayed within the CAD drawing space.

Close out of ORD and **reply All** to Designer's e-mail (Cc: Area Engineering Supervisor & Road Design Engineering Supervisor) informing designer and supervisors the topo file has been updated with the new wetlands survey.

Alignment from Centerline Topo

Open the **PCN#_T.dgn** file containing the surveyed centerline to create the **Centerline Topo** alignment.

1) From the **Search Ribbon** in the top right corner of the software start typing **Plan By 3D Element** and select the **Plan By 3D Element** from the drop-down menu.
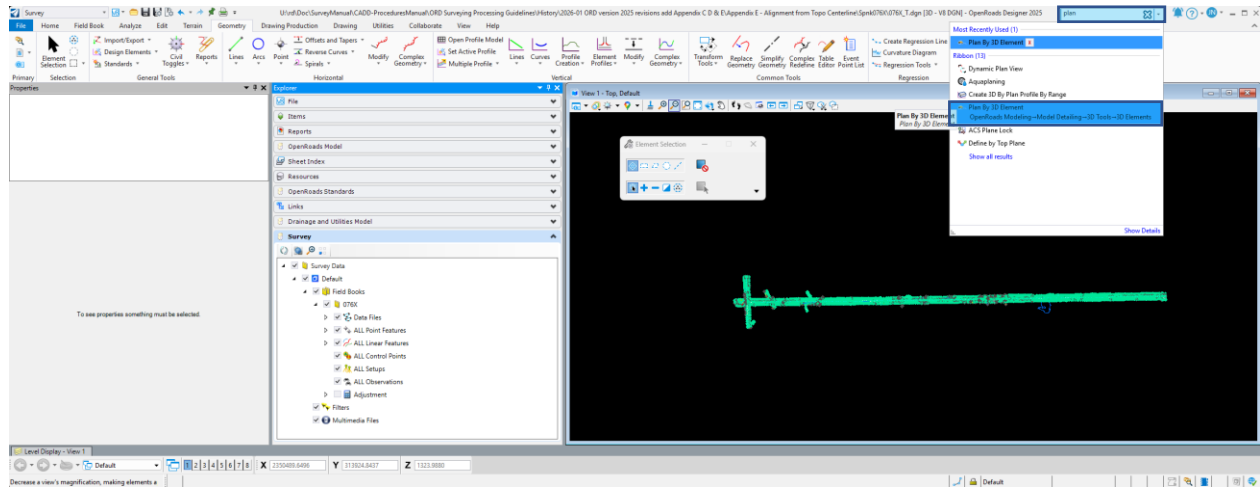
The **Plan By 3D Element** dialog box will appear…
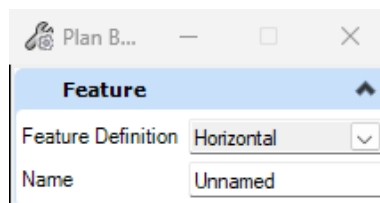
2) From the **Feature Definition** pull-down menu expand the **Alignment** folder and select **Horizontal**.
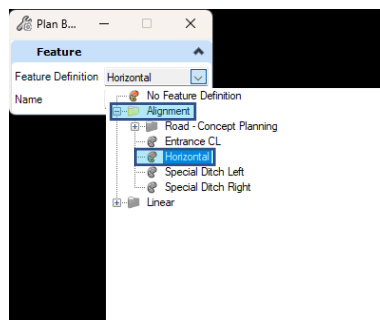
3) Move the cursor into the CAD drawing space and follow the heads-up prompt attached to the cursor by selecting the **first** centerline 3D element to be included in the **Centerline Topo** alignment.
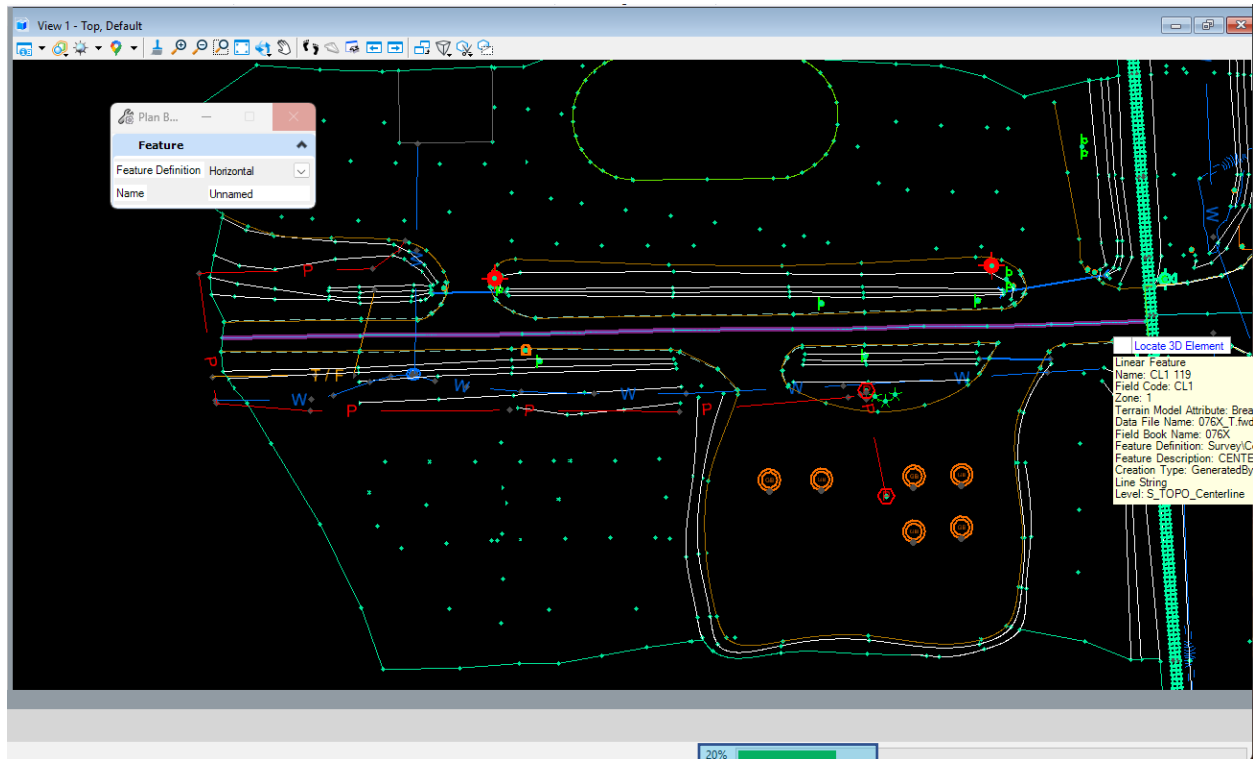
Note: This process could take several minutes to complete. The green status bar located in the bottom right of the software will show the progress.

Once the conversion of the first centerline 3D element is complete a magenta complex element will display over the centerline 3D element in the CAD drawing space.

4) Select any additional centerline 3D elements to include in the **Centerline Topo** alignment.

Note: Select the centerline elements in the order and in the direction the alignment will run. All centerline elements selected should be connected to one another without gaps.

Once all centerline 3D elements have been selected and converted to complex elements (magenta lines) the topo centerline level can be turned off.

5) Select the **Home** tab located along the top row of tabs.

6) Within the **Attributes** tool group expand the levels and select **Display…**

The **Level Display** dialog box will appear…

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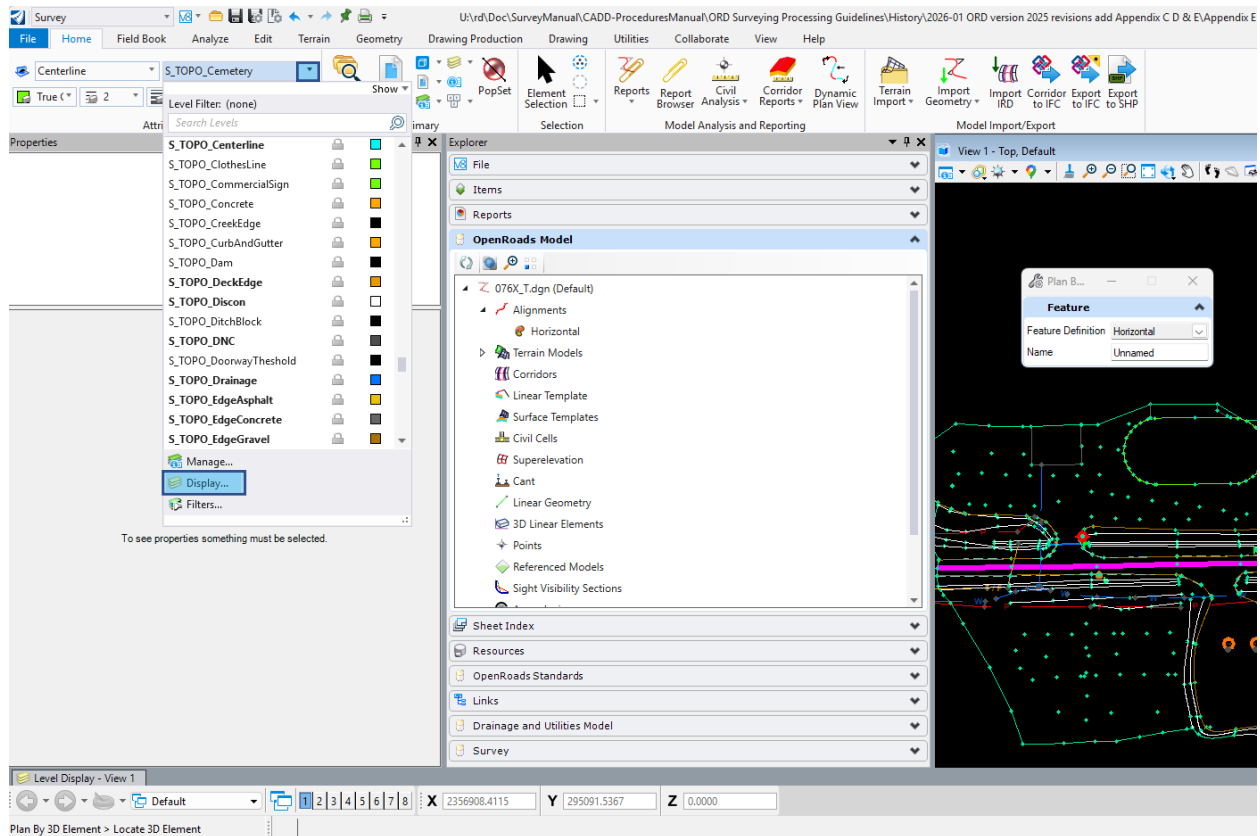
7) Turn off the **S_TOPO_Centerline** level by selecting the white dot in the **Used** column.
8) Close the **Level Display** dialog by selecting the "**X**" in the top right corner of the dialog box.

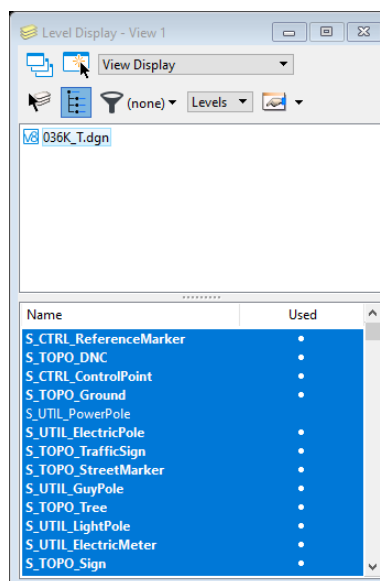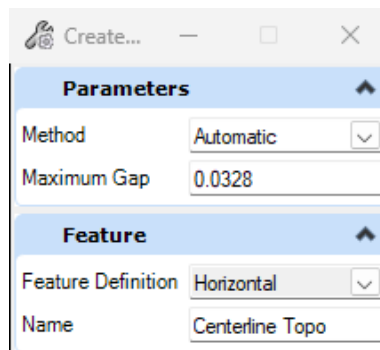Convert the complex elements (magenta lines) to an alignment.

9) Select the **Geometry** tab located along the top row of tabs.
10) Within the **Horizontal** tool group select the drop-down arrow next to the **Complex Geometry** ![Complex Geometry icon] tool and select **Complex By Element** from the drop-down menu.

The **Create Complex Element** dialog box will appear…

11) Ensure the **Method:** field is set to **Automatic**.
12) From the **Feature Definition** pull-down menu expand the **Alignment** folder and select **Horizontal**.
13) In the **Name** field type **Centerline Topo** and select the **tab** key on the keyboard.
14) Move the cursor into the CAD drawing space and follow the heads-up prompt attached to the cursor by selecting the first magenta **centerline complex element** to be included in the **Centerline Topo** alignment.
15) Move the cursor off the **centerline complex element** and **left click** to create the **Centerline Topo** alignment.
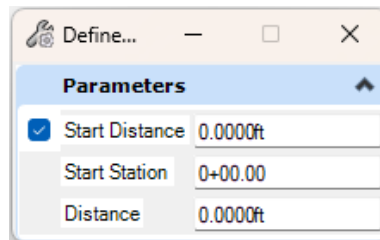
Once the **Centerline Topo** alignment has been created stationing can be assigned along the alignment.

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16) Within the **Horizontal** tool group select the drop-down arrow next to the **Modify**

tool and select **Start Station** from the drop-sown menu.

The **Define Starting Station** dialog box will appear…

17) In the **Start Distance** field type in the desired start distance. Typically, this distance will be set to **0.00** to start the stationing from the end of the alignment.
18) In the **Start Station** field type in the desired start stationing for the alignment. Typically, this stationing will be set to **0+00.00**
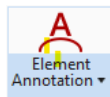19) Move the cursor into the CAD drawing space and follow the heads-up prompt attached to the cursor by selecting the newly created **Centerline Topo** alignment.
20) **Left click** through the heads-up prompts verifying the **Start Distance** and **Start Stationing** to create the stationing for the **Centerline Topo** alignment.

The stationing can be annotated to display the stationing along the **Centerline Topo** alignment in the CAD drawing space.
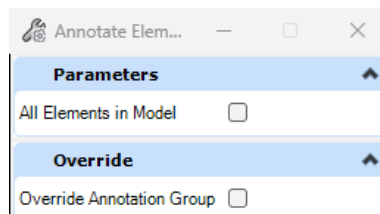
21) Select the **Drawing Production** tab located along the top row of tabs.
22) Within the **Annotations** tool group select the drop-down arrow next to the **Element**

Annotation tool and select **Annotate Element** from drop-down menu.

The **Annotate Element** dialog box will appear…

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23) Toggle off **All Elements in Model** and select the **Centerline Topo** alignment in the CAD drawing space.
24) Move the cursor off the alignment and **right click** to display the alignment stationing.

The newly created **Centerline Topo** alignment can be exported to **LandXML** format and uploaded into a data collector to be used in the field.

25) Select the **Geometry** tab located along the top row of tabs.
26) Within the **General Tools** tool group select the drop-down arrow next to the **Import/Export** Import/Export tool and select **Export Geometry** from drop-down menu.
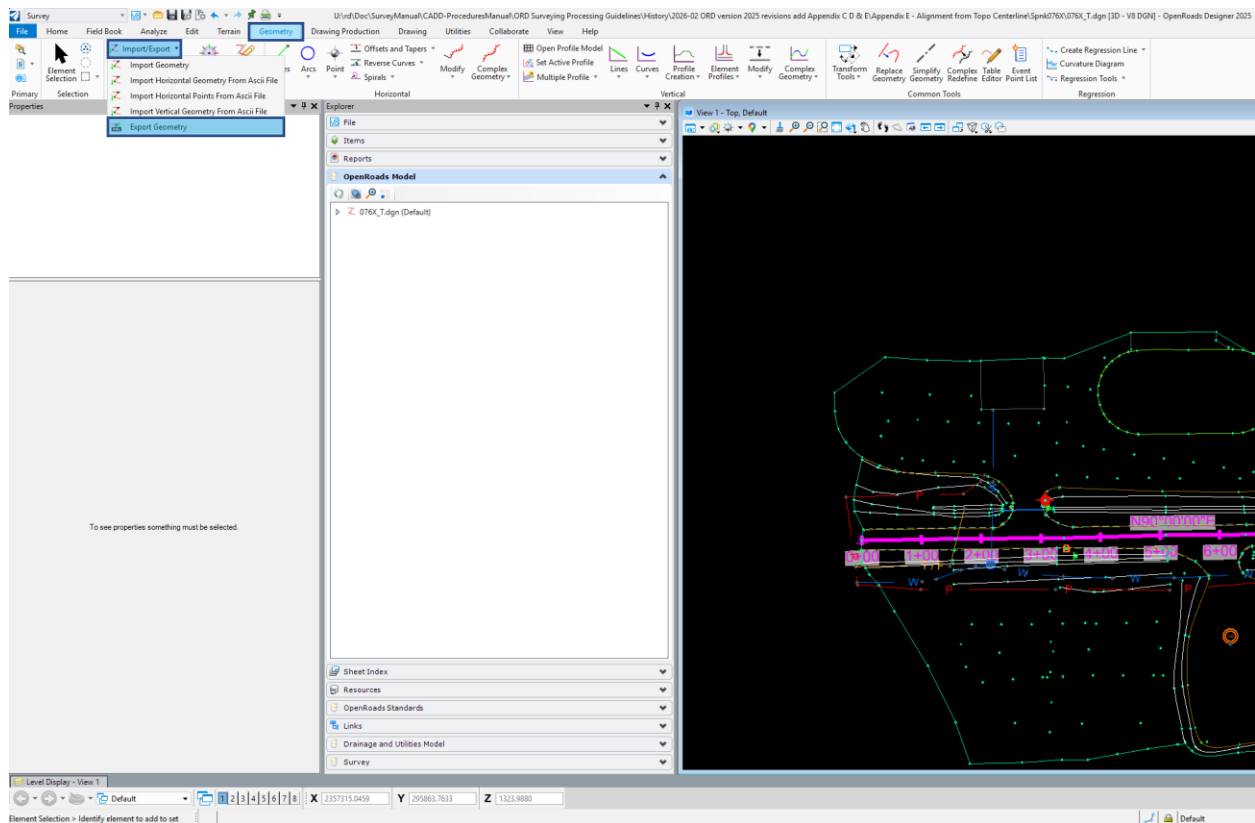

The **Export Geometry** dialog box will appear…
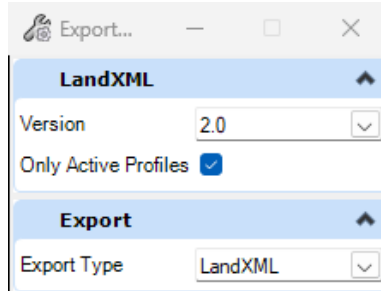
27) From the **Version** pull-down menu select **2.0**.
28) From the **Export Type** pull-down select **LandXML**.
29) Move the cursor into the CAD drawing space and follow the heads-up prompt attached to the cursor by selecting the **Centerline Topo** alignment.
30) Move the cursor off the alignment and **right click** to complete the selection.
31) **Left click** through the heads-up prompts verifying the **LandXML Version** and **Only Active Profiles**.

The **Export to LandXML** dialog box will appear…
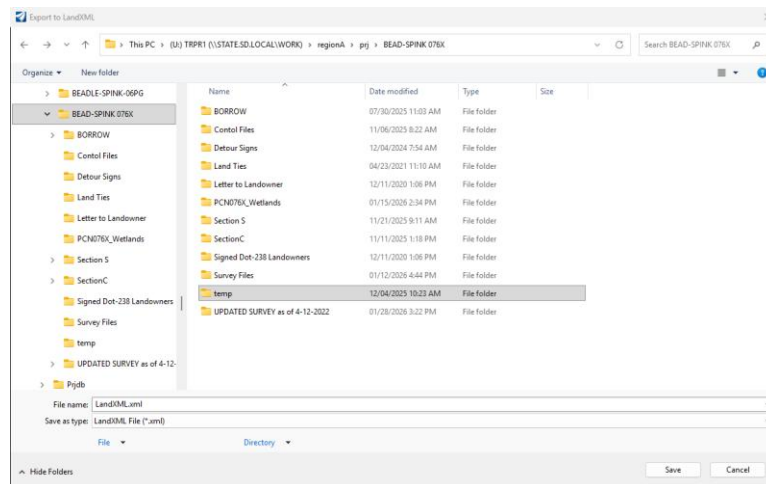
32) Navigate to the appropriate project folder within the appropriate region folder on the U: drive (U:**regionX**\prj**cntyPCN#**) where the newly created **Centerline Topo** XML file will reside.
   a. In the **File name:** field at the bottom of the dialog box type in the appropriate survey alignment name (**PCN#_Centerline Topo**).
   b. Ensure the **Save as Type:** is set to **LandXML File (*.xml)**.
   c. Select the **Save** button located in the bottom right of the dialog box.
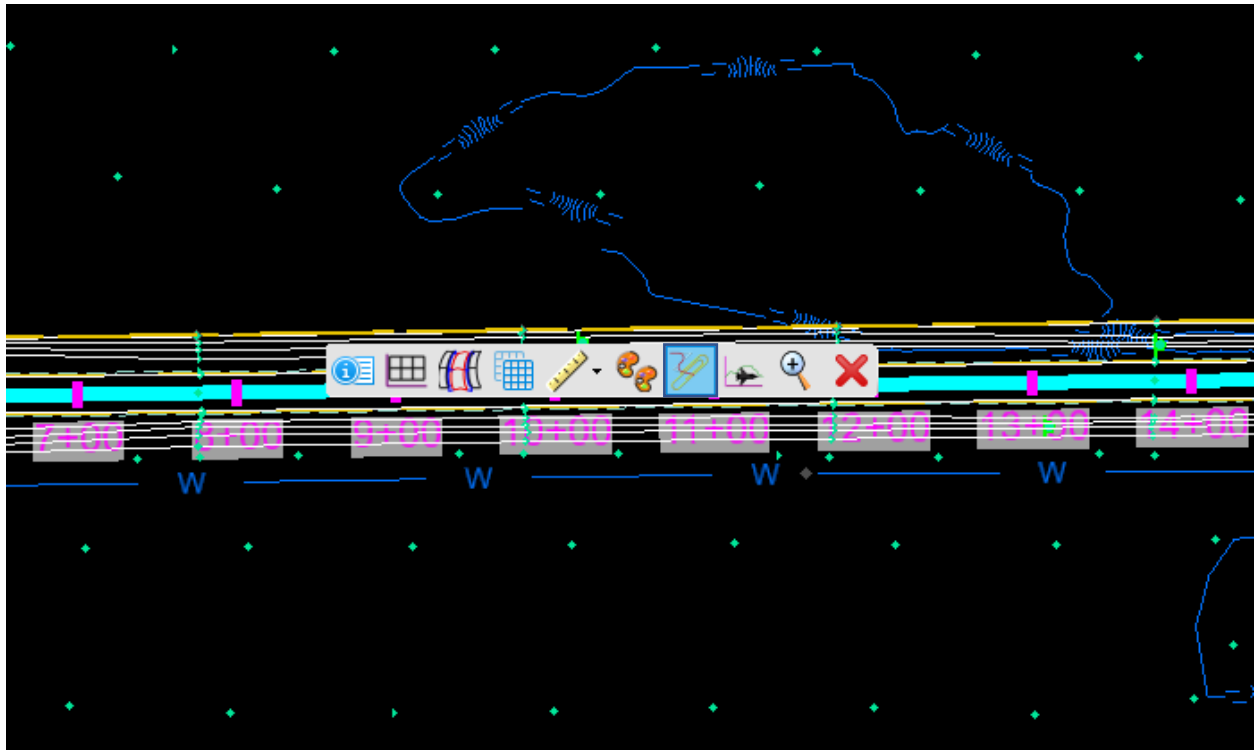
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The newly created **PCN#_Centerline Topo.xml** file has now been saved within the appropriate project folder and is ready to be uploaded into a data collector for use in the field.

A **Horizontal Alignment Report** can be run and printed out to be used as a check on the **PCN#_Centerline Topo.xml** file once imported into a data collector.
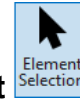
33) Within the **Selection** tool group select the **Select Element** ![Element Selection] tool and select the **Centerline Topo** alignment.

34) Hover over the highlighted alignment to display the **Civil Context Menu**.

35) Select the **Horizontal Geometry Report** ![tool icon] tool.

The **Bentley Civil Report Browser** will appear...

36) Expand the **SD_DOT Reports** folder within the list of folders on the left side of the **Bentley Civil Report Browser** by selecting the drop-down arrow next to the **SD_DOT Reports** folder and select the **SD_DOT HorizontalAlignmentData.xsl** report to display the Horizontal Alignment Data within the **Bentley Civil Report Browser**.

Geometry Report for Horizontal Alignment Data

Report Created: Thursday, January 29, 2026
Time: 4:55:34 PM

Project: Default
Description:
File Name: U:\rd\Doc\SurveyManual\CADD-ProceduresManual\ORD Surveying Processing Guidelines\History\2026-02 ORD version 2025 revisions add Appendix C D & E\Appendix E - Alignment from Topo Centerline\Spnk076X\076X_T.dgn
Last Revised: 1/29/2026 16:18:16
Input Grid Factor:

Note: All units in this report are in feet unless specified otherwise.

Alignment Name: Centerline_Topo
Alignment Description:
Alignment Style: Alignment\Horizontal

Type	Station			Northing	Easting
POB	-200.000			295256.524	2358004.892
		TL= 18.554	N84.343°E		
PI	-181.446			295258.353	2358023.356
		TL= 81.712	N87.913°E		
PI	-99.733			295261.328	2358105.014
		TL= 142.173	S89.586°E		
PI	42.439			295260.301	2358247.183
		TL= 171.154	S89.410°E		
PI	213.593			295258.538	2358418.328
		TL= 198.450	S88.929°E		
PI	412.043			295254.829	2358616.743
		TL= 142.775	N89.841°E		
PI	554.818			295255.226	2358759.517
		TL= 221.594	N89.144°E		
PI	776.411			295258.537	2358981.086
		TL= 203.618	N89.169°E		
PI	980.030			295261.490	2359184.683
		TL= 194.986	N89.365°E		
PI	1175.016			295263.650	2359379.657
		TL= 201.884	N89.355°E		
PI	1376.899			295265.922	2359581.528
		TL= 201.294	N89.288°E		
PI	1578.193			295268.424	2359782.806
		TL= 157.415	N89.440°E		
PI	1735.608			295269.963	2359940.213
		TL= 198.750	N89.292°E		
PI	1934.358			295272.420	2360138.948
		TL= 200.022	N89.182°E		
PI	2134.380			295275.276	2360338.950
		TL= 147.472	N89.584°E		
PI	2281.852			295276.346	2360486.418
		TL= 60.814	N88.851°E		
PI	2342.666			295277.565	2360547.220
		TL= 58.048	N89.309°E		
PI	2400.714			295278.265	2360605.264
		TL= 128.498	N89.560°E		
PI	2529.212			295279.251	2360733.758
		TL= 204.231	N89.345°E		
PI	2733.444			295281.585	2360937.976
		TL= 193.897	N89.289°E		
PI	2927.340			295283.991	2361131.858
		TL= 202.204	N89.164°E		
PI	3129.544			295286.940	2361334.040
		TL= 167.930	N89.305°E		

37) Select **File**>**Save As**>**Web Page (*.html)** located in the top left of the **Bentley Civil Report Browser**.

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Bentley Civil Report Browser - C:\Users\TRPR14427\AppData\Local\Temp\RPTzxep004s.xml

File Tools

Open	
Save As ▶	Report (*.xml)
Append	Web Page (*.html)
Print	Microsoft Word (*.doc)
Exit	Microsoft Excel (*.xlsx)
	ASCII/Text (*.txt)

Project: Default
Description:
File Name: U:\rd\Doc\SurveyManual\CADD-ProceduresManual\ORD Centerline\Spnk076X\076X_T.dgn
Last Revised: 1/29/2026 16:18:16
Input Grid Factor:

HorizontalAlignment...
HorizontalAlignmentCheckIntegrity.xsl
HorizontalAlignmentCheckIntegrityColorCoding.xsl
HorizontalAlignmentControlLineDataTable.xsl
HorizontalAlignmentCurveDataTable.xsl
HorizontalAlignmentCurveSetElementReview.xsl
HorizontalAlignmentCurveSetReview.xsl
HorizontalAlignmentEventPointList.xsl
HorizontalAlignmentIntervalXYZ.xsl
HorizontalAlignmentLength.xsl
HorizontalAlignmentReview.xsl
HorizontalAlignmentReviewASCII.xsl
HorizontalAlignmentReviewWithPI.xsl
HorizontalAlignmentStationEquations.xsl
HorizontalAlignmentToTIW.xsl
HorizontalAndVerticalAlignmentReview.xsl
HorizontalElementsTable.xsl
HorizontalElementsTableSimplified.xsl
HorizontalElementsXYZ.xsl
RegressionHorizontalPointsNSlews.xsl
RegressionHorizontalPointsReview.xsl
RegressionHorizontalPointsReviewWCant.xsl
RegressionInterpolatedSlews.xsl
RegressionInterpolatedSlewsWCant.xsl
RegressionSlewNLiftReview .xsl
RegressionValidation.xsl
RegressionVerticalLiftsNLowers.xsl
RegressionVerticalPointsReview.xsl
RegressionVerticalPointsReviewWCant.xsl
SelectedVerticalAlignmentIntervalStationElevationGra
SettingOutTable.xsl
SettingOutTableDeflection.xsl
Traverse.xsl
TraverseCurveASCII.xsl
TraverseCurveASCII2.xsl
TraverseCurveASCII3.xsl
TraverseEditASCII.xsl
TraversePoints.xsl
VerticalAlignmentCheckIntegrity.xsl
VerticalAlignmentCheckIntegrityColorCoding.xsl
VerticalAlignmentIntervalStationElevationGrade.xsl
VerticalAlignmentIntervalStationElevationGradeASCII
VerticalAlignmentPointsXY.xsl
VerticalAlignmentReview.xsl
VerticalAlignmentReviewASCII.xsl
VerticalAlignmentReviewXY.xsl
VerticalAlignmentSightDistanceReview.xsl
VerticalAlignmentToTIW.xsl
▷ CivilSurvey
▷ CorridorModeling
▷ Evaluation
▷ LegalDescription
▷ MapCheck
▷ Milling
▷ Stakeout
▷ StationOffset
▷ Superelevation
▷ TemplateLibrary
▷ Turnouts
▷ Tools
▲ SD_DOT Reports
  SD_DOT ControlData.xsl
  SD_DOT CSV - Set Corner.xsl
  SD_DOT ExhibitTable.xsl
  SD_DOT ExhibitTableCurve.xsl
  SD_DOT HorizontalAlignmentData.xsl
  SD_DOT ROWTable.xsl
  SD_DOT ROWTableCurve.xsl
  SD_DOT Volumes.xsl

Alignment Name: Centerline_Topo
Alignment Description:
Alignment Style: Alignment\Horizontal

Type	Station
POB	-200.000
PI	-181.446
PI	-99.733
PI	42.439
PI	213.593
PI	412.043
PI	554.818
PI	776.411
PI	980.030
PI	1175.016
PI	1376.899
PI	1578.193
PI	1735.608
PI	1934.358
PI	2134.380
PI	2281.852
PI	2342.666
PI	2400.714
PI	2529.212
PI	2733.444

38)The **Save As** dialog box will appear…
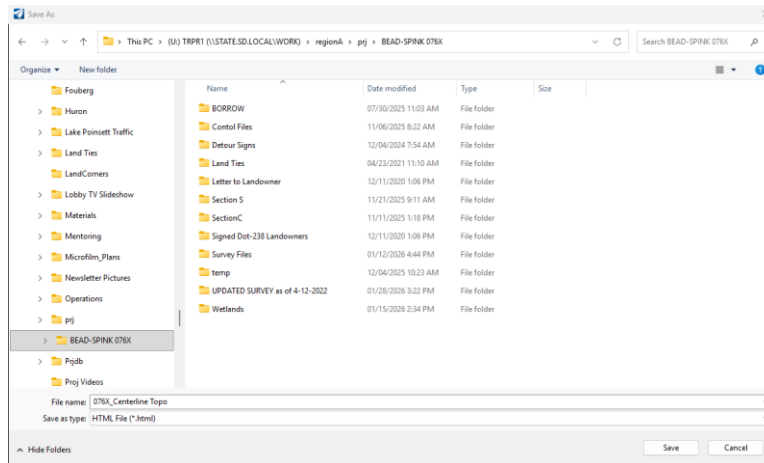
39) Navigate to the appropriate project folder within the appropriate region folder on the U: drive (U:**regionX**\\prj**cntyPCN#**) where the Horizontal Alignment Data report will reside.

   a. In the **File name:** field at the bottom of the dialog box type in the appropriate survey alignment name (**PCN#_Centerline Topo**).
   b. Ensure the **Save as Type:** is set to **HTML File (*.html)**.
   c. Select the **Save** button located in the bottom right of the dialog box.

The newly created **PCN#_Centerline Topo.html** report has now been saved within the appropriate project folder.

Prior to using the alignment in the field, print this report and perform a check of the **PCN#_Centerline Topo.xml** alignment uploaded to the data collector. Ensure the alignment data in the data collector matches the printed report.

Adjust the alignment parameters in the data collector to match the report if necessary.

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