CONNECTICUT DEPARTMENT OF TRANSPORTATION

DIGITAL DESIGN ENVIRONMENT GUIDE

CONNECT EDITION

Volume 13 – Contract Plans Production

Published Date: January 13, 2026

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Overview

The DDE no longer standardizes on the one model per DGN File sheet production workflow that was used in the SELECTSeries DDE. Each Contract Sheet DGN will contain several Design, Drawing and Sheet Models.

Creating a Sheet Model for publishing a PDF typically involves working with the following components:

- **Design Model(s)** — where the Base Models are referenced in to.
- **Saved Views** — Used to set up views required for the drawing.
- **Border Cell** — Contains the border graphics and title block.
- **Drawing Model** — Contains annotations, dimensions and callouts.
- **Sheet Model** — Contains a Border Cell, Sheet Boundary (plotting shape) and may also have annotations, dimensions and callouts.

Two methods are used to create Sheet models, one that scales the border to enclose the design, or the other that scales the design to fit the border.

With both methods, for 3D work in particular, it is a good idea to have separate files one for design models and another for the drawing and sheet models. This lets users keep the purely drawing information, such as text and dimensioning, separate from the design information. Doing this reduces the likelihood of conflicts where others who wish to reference the same design model.

This process is similar to how the manual draftsperson works. Where it differs, however, is that instead of redrawing the model's geometry for each view, like the manual system requires, users simply attach views of the design model as references. Users attach as references views of their design geometry for each plan, elevation, section, and so on. The power of this system is that any changes made to the design model then is reflected immediately in each affected view in the drawings.

Scaling the Design to Fit the Sheet Border

The sheet border cell is placed at full size and the design information is scaled up or down to fit inside the border, similar to how drawings are created with manual drafting. All text and dimensioning are placed at full size. When you create a Sheet model, you select Full Size for the Annotation Scale.

In this case, with Annotation Scale set to Full Size, the sheet boundary element appears at its real-world size (not scaled). This is a non-printing element that shows you the outer limits of the sheet size that you choose. The CTDOT Cell border will be placed at Full Size (with no scale factor) and dropped onto the sheet boundary.

References of the design are placed at the appropriate scales as required, to fit inside the sheet/border layout. For a 1/2" = 1'-0", or 1:24 scale drawing, the design model references will be

placed in the Sheet model at a scale of 1:24. Similarly, any details that are at different scales are simply referenced at the required scale. For example, a 1/4" = 1'-0", or 1:48 scale detail would be referenced at 1:48 scale.

When attaching a reference (a design or drawing model) into a sheet model, the referenced model's annotation scale is applied as the detail scale, and the Reference Scale (Master:Ref Scale) is calculated from the referenced model's annotation scale and the active model's annotation scale.

Uses:

- Miscellaneous Detail Sheet
- Typical Sections Sheet

Scaling the Sheet Border to Fit the Design

The sheet border cell is scaled up (or down) to cover the required area in the design, all text and dimensioning must be scaled the same amount, also. This is to ensure that when the scaled print is created, text and dimensioning elements are at the correct physical size.

To simplify this process, when users create a Sheet model, they have the option of associating an Annotation Scale to it, as well as a sheet boundary size. Additionally, if required, users can specify the origin of the sheet boundary and its rotation.

When an annotation scale is specified, the Sheet Boundary element also is scaled by that amount. This is a non-printing element that shows the outer limits of the sheet size that was chosen. To this, users then can attach the CTDOT border, to which you apply the same scale factor as that for the Sheet model. Additionally, any text that you place in the Sheet model, with the Annotation Scale lock enabled, automatically will be scaled by the same amount. For example, if you are creating a 1" = 40' scale drawing, any text that you place would have to be 480 times bigger than normal so that it prints at the correct size.

Uses:

- Plan View Sheet
- Profile View Sheet
- Cross Sections View Sheet

Section 1 – Review of Standards

1.1 Contract Plan grouping

Contract plans shall be grouped, by discipline into individual multiple page PDF files called discipline subsets. The PDF order will dictate how the CAD files are organized and how the Title Blocks Cells are annotated. The project manager is tasked with determining the discipline subset numbering and grouping. The first sheet in a discipline subset shall have "01" in the drawing number CAD DGN file.

1.1.1 Drawing Number vs Sheet Numbers

- The **drawing number** is used primarily for sheet to sheet linking, typically in, but not limited to, section details, section cuts, and detail callouts. **Drawing Numbers** are placed in CAD files, they consist of the discipline/sheet type designator followed by a hyphen and a number. Examples of drawing number prefixes can be found in **Volume 16** of the DDE, **Appendix 5**.
- **Sheet numbers** are applied to the discipline subset after the contract plans are published to PDF. Please review the DIGITAL PROJECT DEVELOPMENT MANUAL, Section 6, Document Preparation and Format for detailed instructions.

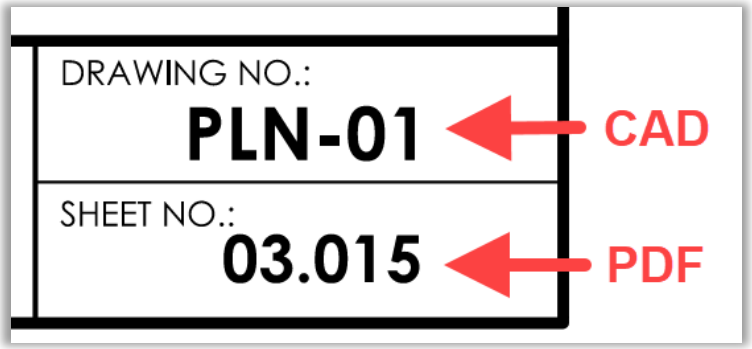


Figure 1 - Title Block Drawing Number and Sheet Number

The first page of each subset shall be a subset cover sheet, this includes FIO subsets. This cover sheet shall contain both; an index of drawings contained within the subset that includes both drawing numbers and drawing titles and the form field place holder(s) which receives the digital signatures. This table must include the subset name and number displayed as a heading.

1.1.2 Examples of the subsets

Please refer to **Volume 16** of the DDE, **Appendix 5** for Drawing Number abbreviation pre-fix list

01-General

- Title Sheet - The first page of the subset 01_General includes
  - an index of the subsets contained within the project
  - sheet count totals for all subsets
  - a list of drawings for the 01_General Subset
  - an area(s) reserved for applying the digital signature(s)
- Additional Location Plans
- Detail Estimate Sheet(S)

02-Revisions

- The Index of Revisions Sheet(s)

03-Highways

- Index of Drawings
- Index of Plans
- Survey Control Data
- Alignment Plans
- Right of Way Plans
- Typical Sections
- Miscellaneous Detail Sheets
- Highway Plans
- Drainage Plans
- Sedimentation and Erosion Control Plans
- Profile
- Cross Sections
- Site Grading Plans
- Intersection Grading Plans
- Superelevation Diagrams
- Boring Logs
- Test Pit Data
- Staging Plans includes
  - Plans
  - Profiles
  - cross sections

04-Structure

- Index of Drawings
- All Structure Sheets - Multiple subsets may be required for multiple Sites Ex: 04_Structure_Br.No.1266

05-Traffic

- Index of Drawings
- Signing Pavement Markings Plans
- MPT Plans
- Traffic Signal Plans Etc.

06-Illumination

- Index of Drawings
- All Environmental Compliance Sheets required

07-Utiltiy

- Index of Drawings
- Utility Design plans.

08-CL&P FIO

- CL & P For Information Only plans are submitted in PDF – **No CAD required.** See the Digital Project Development Manual for instructions for creating this subset.
- 09-AT&T FIO
- AT & T For Information Only plans are submitted in PDF – **No CAD required.** See the Digital Project Development Manual for instructions for creating this subset.

CTDOT Highway STD CTDOT

Highway Design Standard Index and Sheets required are created in Bluebeam – **No CAD required.** See the Digital Project Development Manual for instructions for creating this subset.

CTDOT Traffic STD CTDOT

Traffic Engineering Standard Index and Sheets required are created in Bluebeam – **No CAD required.** See the Digital Project Development Manual for instructions for creating this subset.

1.2 The Contract Border Title Block Integration

1.2.1 WorkSet Project Information

The Project Number, Project Description and Towns will be automatically populated from the WorkSet Properties, there is no need to enter or edit any of this text.

Note: *Older Border Cells placed prior to March 2023 point the CONNECTED Project Properties, moving forward CTDOT will use the CTDOT WorkSet Properties. Previously set up CONNECTED Project Properties will stay in place to accommodate the older border's title block integration.*

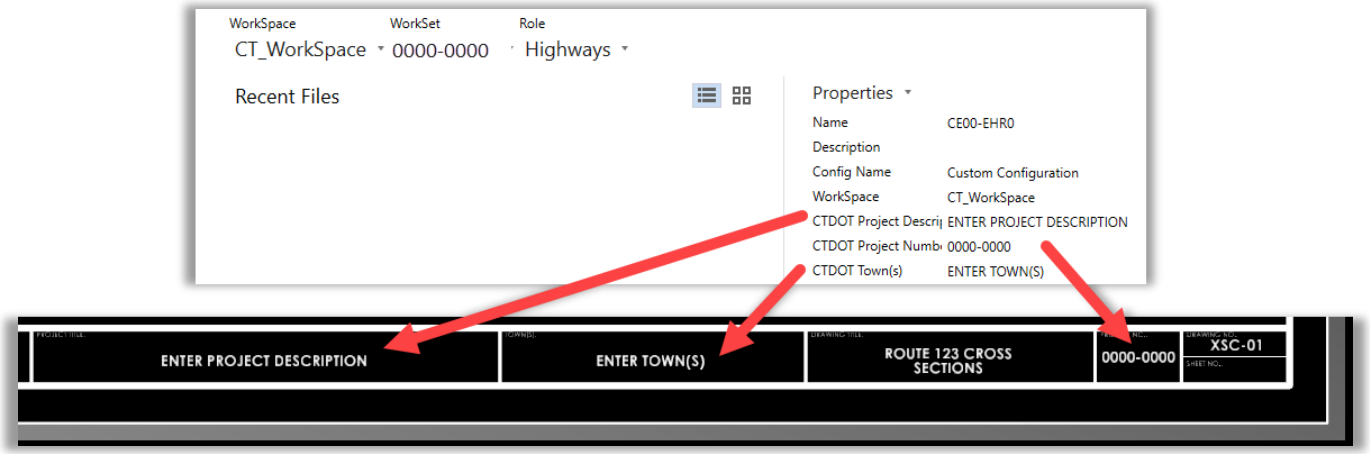


Figure 2 – Title Block

1.2.1 Drawing Title

The Drawing Title will be populated with the text entered in the Modal Description Field.

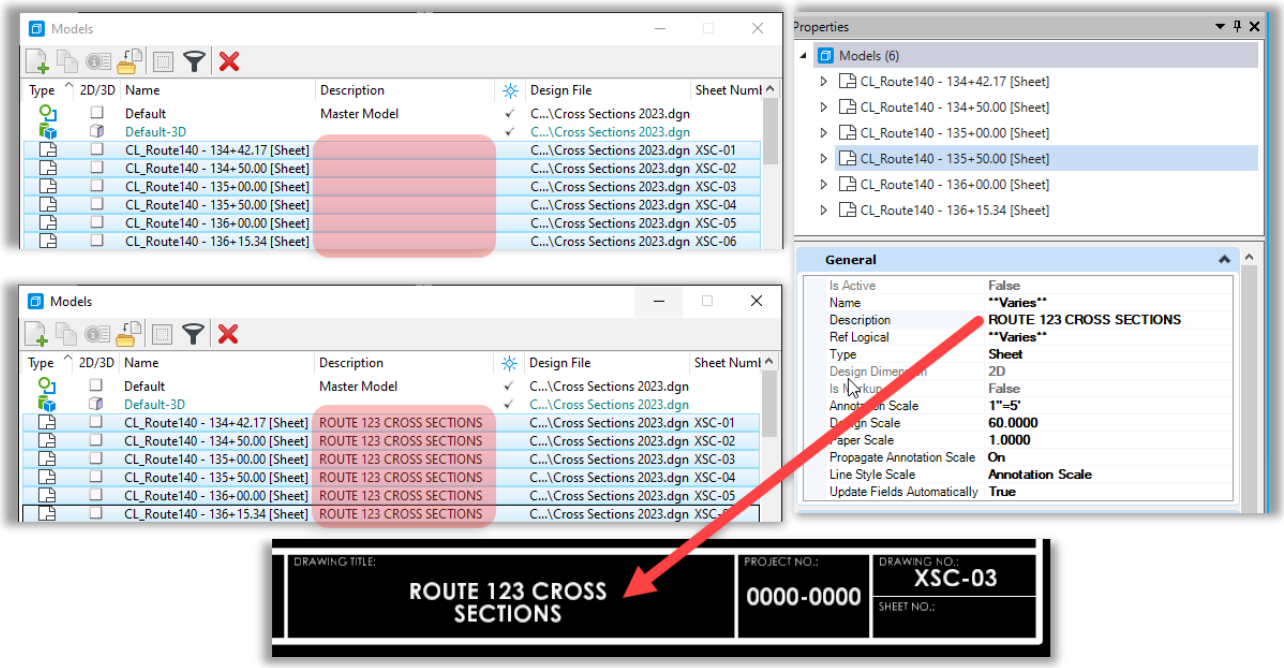


Figure - 3 Drawing Title

1.2.2 Designed and Checked By

There are two options for filling in this information:

Note: *Please refer to your supervisor to determining if Initials or First Initial. Last name will be used.*

- **Manual** - Use the **Text Editor** to enter the Design/Drafter and Check By names. This is generally used when creating a blank sheet model and manually placing the border cell.

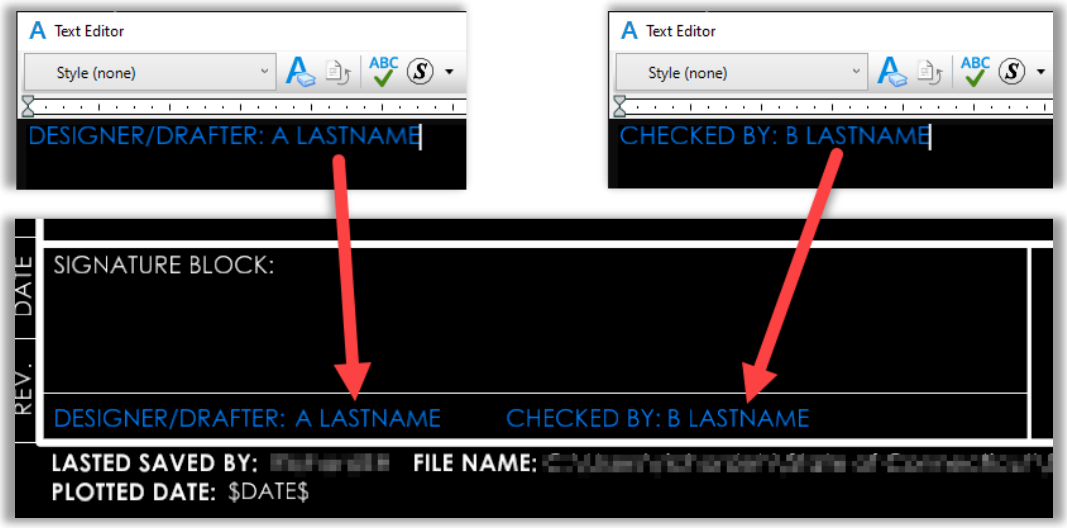


Figure 4 - Title Block Designer / Drafter / Checked By

- **Automated** – Update fields through Item Types. The Engineer Name **Item Type** has been added to all Sheet Seeds. Sheet models created using the sheet production, **Place Named Boundary Tools** and **Detailing Tools** will have this process available. Multiple models can be selected and updated at one time through the **Properties Dialog Box** under **Engineer Name**.

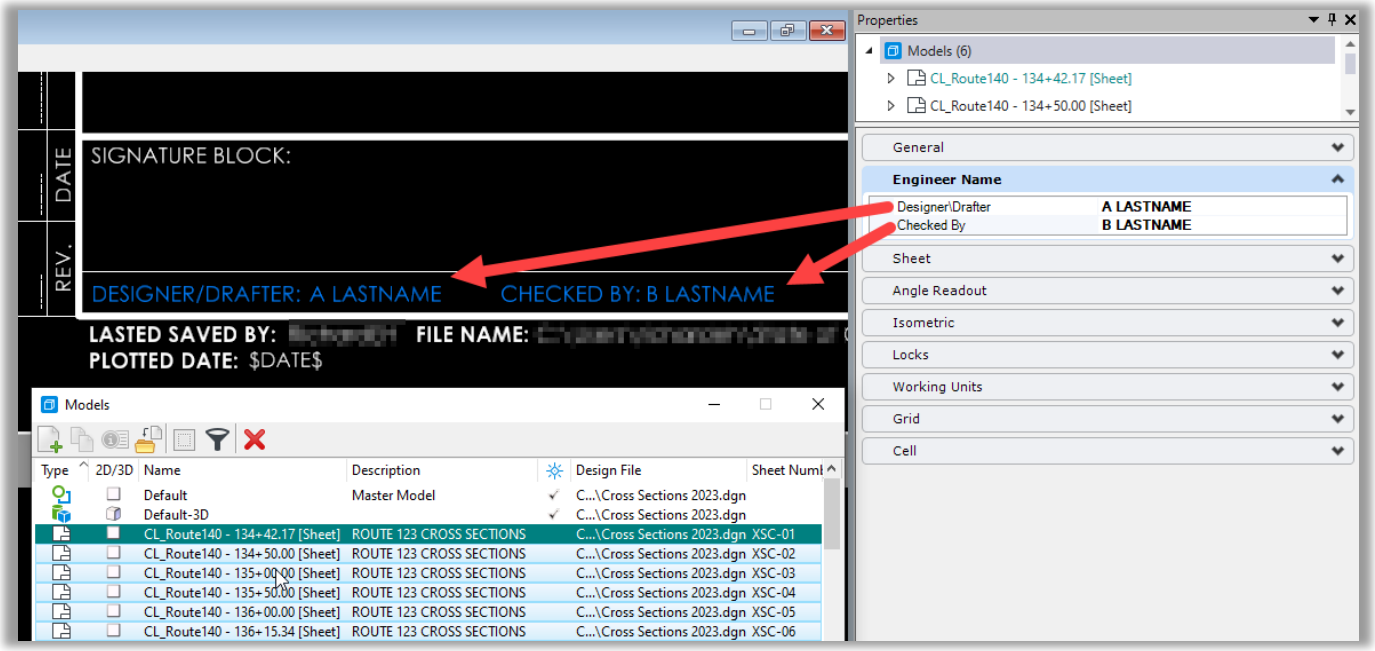


Figure 5 - Title Block Designer / Drafter / Checked By Item Type

1.2.3 Drawing Number

The **DRAWING NO.** box will be populated by filling in the Sheet Number on the Properties Dialog Box.

Note: *The **SHEET NO.** box will remain blank in the CAD file, this will be populated in the discipline subset after the contract plans are published to PDF. Please review the DIGITAL PROJECT DEVELOPMENT MANUAL, Section 4, Contract Plan Drawing and Sheet Numbering for detailed instructions.*

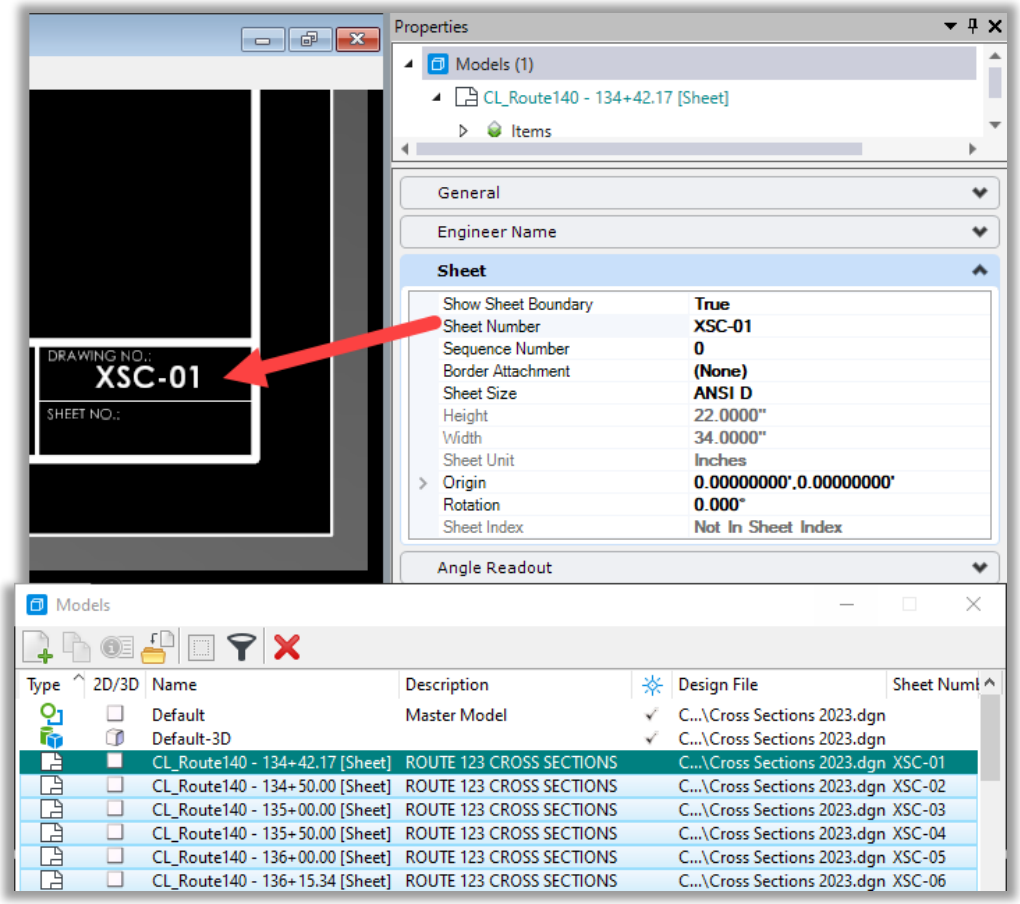


Figure 6 - Sheet Number is Drawing Number

1.2.4 Revision Block

The Revision Block can be filled in by using the Edit Text command and clicking on the Data Fields, this will prompt the Text Editor to open. **Note:** Blank Data Fields can be made visual in the View Attributes dialog box.

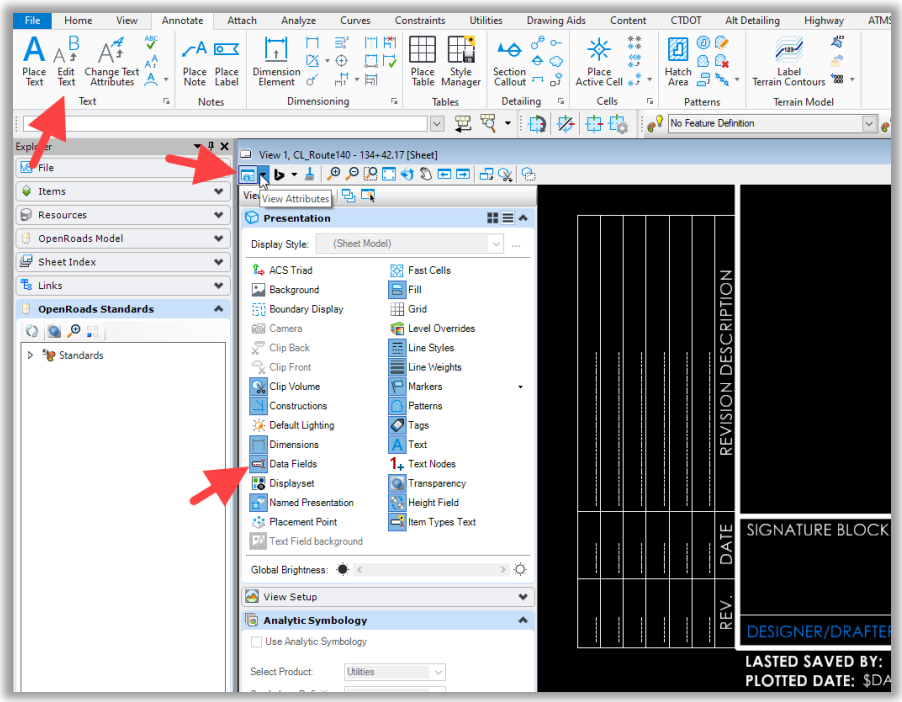


Figure 7 – Revision Block

1.2.5 Last Saved By and File Name

These fields will auto-populate with the username and file path.

Figure 8 - Last Saved By / File Name

1.2.6 PDF Text

Please review the DIGITAL PROJECT DEVELOPMENT MANUAL, Section 6 annotation placed in the PDF plans

The following will be created in the PDF not in the CAD file:

1. The Plotted Date will populate when the PDF is Created.

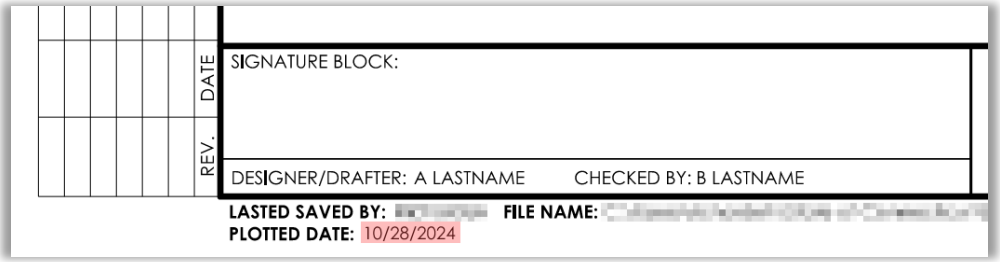


Figure 9 - PDF Plotted Date

2. The Signature Block info will also be placed as a stamp in the PDF.
3. Sheet Numbering
4. The following Stamps are available to be placed in the bottom Right above the Title Block of the PDF as needed:
    - ADDENDUM NO. Y
    - DESIGN INITIATED CHANGE ORDER NO. Y mm/dd/yy
    - NEW SHEET ADDED BY ADDENDUM NO. Y
    - NEW SHEET ADDED BY DESIGN INITIATED CHANGE ORDER NO. Y mm/dd/yy
    - DESIGN REVIEW STAMPS

    Note: *If there is no room above the Title Block these stamps can also be placed in the margin below the Title Block*

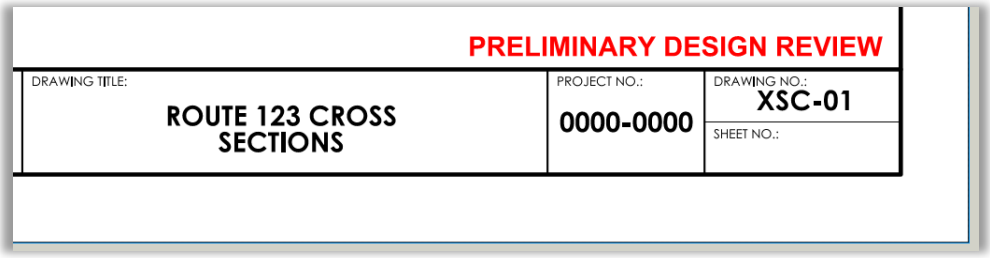


Figure 10 - Stamps

Instructions for downloading the Stamps to the CTDOT Bluebeam User Profile

1. Click on the link below and download the zip file.
   ctdot_bluebeam_user_profile

2. In **File Explorer**, browse to the downloaded location, it will most likely will show up in the **Downloads** folder. Double click on the user profile in the zip folder and the file will automatically install.

1.3 Tables

You can place tables in CONNECT Edition using the Place Table tool. Once placed, you can perform following formatting operations on a table:

- Add and remove rows
- Add title row, header row, first column, last column, and footer row, which can contain different formatting then the body rows
- Break a table
- Change height and width of rows and columns
- Merge and split cells
- Change cell margins
- Set cell fill color
- Add and remove borders
- Set border color, line style, and line weight

You can also perform following operations on the text in the table cells:

- Set text alignment
- Set text direction

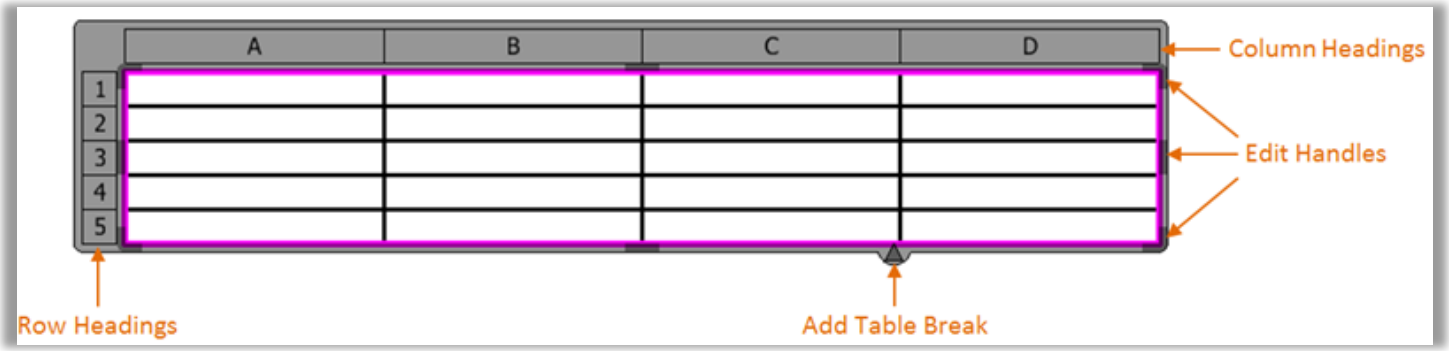


Figure 11 - Tables

You can also place a table using the data in an excel workbook or a .csv file.

If you have a report definition created, the report can be placed as a table in your model. The content in the table is automatically populated from the report definition.

You can also place a sheet index as a table.

1.3.1 Table Seeds

Table seeds are available in the CTDOT DDE to use while placing a table in your model. A table seed can contain properties, formatting, and style settings that are inherited by the table.

1.3.2 Place Table Tool

You can access this tool from the following:

- Ribbon: Drawing > Annotate > Table
- Explorer dialog Sheet Index tab: Place Sheet Index as a table
- Reports dialog: Place as table

Methods:

- Empty table - Lets you place an empty table.
- From report - Lets you place a table from a report definition.
- From file - Lets you place a table using the data in an excel workbook or .csv file.

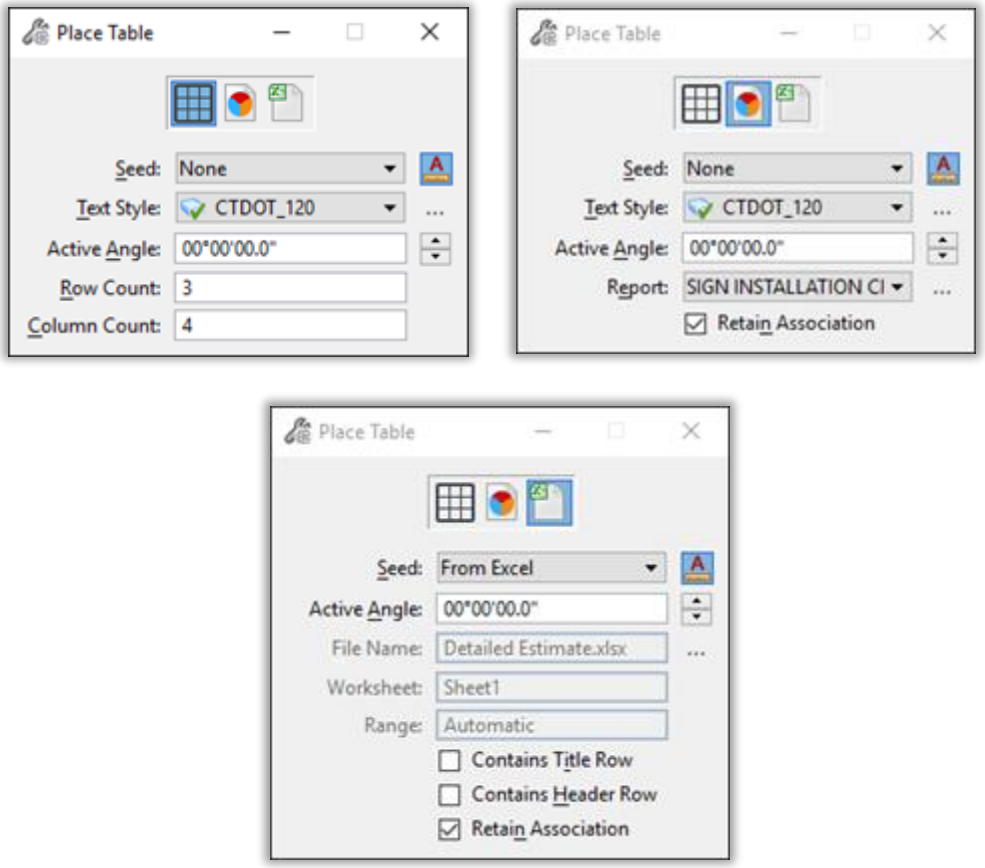


Figure 12 - Place Table Options

Options:

Seed – Lets you select a seed for the table. If you select to place a table from a Microsoft Excel file, you get an option "From Excel" in this drop-down list. If you select it, OpenBuildings Designer attempts to preserve the formatting such as colors, borders, text direction, text justification, fonts, font styles, font sizes, row/column/cell sizes, and cell margins.

Annotation Scale – Sets the Annotation Scale Lock. When this lock is on, the annotation scale is applied to the table and text within the table. By default, the annotation scale is taken from the model's Annotation Scale setting. You can change it only in the model's

properties in the Properties dialog. The exception is when the model's Propagate Annotation Scale property is off. In that case, the annotation scale can be controlled independently for each element via its properties.

Text Style - (Available only when Seed is set to None) Sets the active text style from a list of all available text styles. Clicking Browseopens the Text Styles dialog in which you can create and modify text styles.

Active Angle - Sets the angle, in degrees, at which table is placed.

Row Count - Sets the number of rows in the table.

Column Count - Sets the number of columns in the table.

Report - (Available only when From Report is selected) Places the selected report as a table. Clicking Browseopens the Reports dialog in which you can create and manage reports and report definitions.

File Name - (Available only when From File is selected) Lets you select a file from which you want to place a table. Click Browseto open the File Open dialog and select the desired file from which the table is to be placed. If you select a Microsoft Excel workbook, then the Select Cells dialog opens, in which you can select the worksheet and cell range.

The Select Cells dialog has the following options:

- Worksheet - Lists the worksheets in the selected excel workbook.
- Range - Allows you to select the cell range of the file that will be placed as a table. If set to Automatic, selects the range of cells which Microsoft Excel considers to be the "used area" of the sheet. It is usually a rectangle containing all non-empty cells, or cells which have otherwise been modified by the user, such as by resizing the rows or columns. If set to Manual, allows you to select the range of cells in the From and To fields. Named ranges are also supported.
- From - If Range is set to Manual, allows you to enter the start of the cell range.
- To - If Range is set to Manual, allows you to enter the end of the cell range.

Worksheet - (Available only when you select an excel workbook in the File Name setting) Lists the worksheets in the selected excel workbook.

Range - (Available only when you select an excel workbook in the File Name setting) Displays the cell range of the file that will be placed as a table.

Contains Title Row - (Available only when From File is selected) If on, places the first row as a title row.

Contains Header Row - (Available only when From File is selected) If on, places the second row as a header row.

Retain Association - (Available only when From Report or From File is selected) If on, the association with the report or external file from which the table is placed is retained. In such a case, if there are any changes in the report definition or the file, you can refresh the table to get the changes.

1.3.3 Refresh a Table

If you have a placed a table from a report/external file and the Retain Association option is turned on, any changes made to the report or the source file can be updated in your table using this procedure.

Select the table. The row and column headings display. Do one of the following:

1. Right-click any cell or the row or column headings and select Refresh Table from Data Source.
2. Click the Refresh Table from Data Source icon in the Table Tools contextual tab.

1.4 Annotation Tools

All annotation such as: call outs, labels, notes and dimensions are placed in drawing and/or sheet models. It is important that the proper tools are selected so the annotation is placed using the correct attribution.

Common Annotation Tools can be found in the Ribbon by selecting the **CTDOT Workflow**. Users will find the needed tools in the **Annotation** and **Dimensioning** sections on the **CTDOT Tab**.

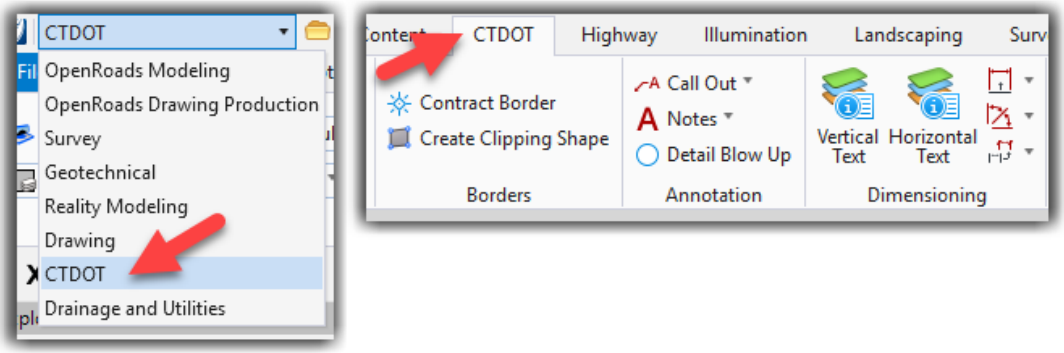


Figure 13 - CTDOT Workflow

1.4.1 Call Outs

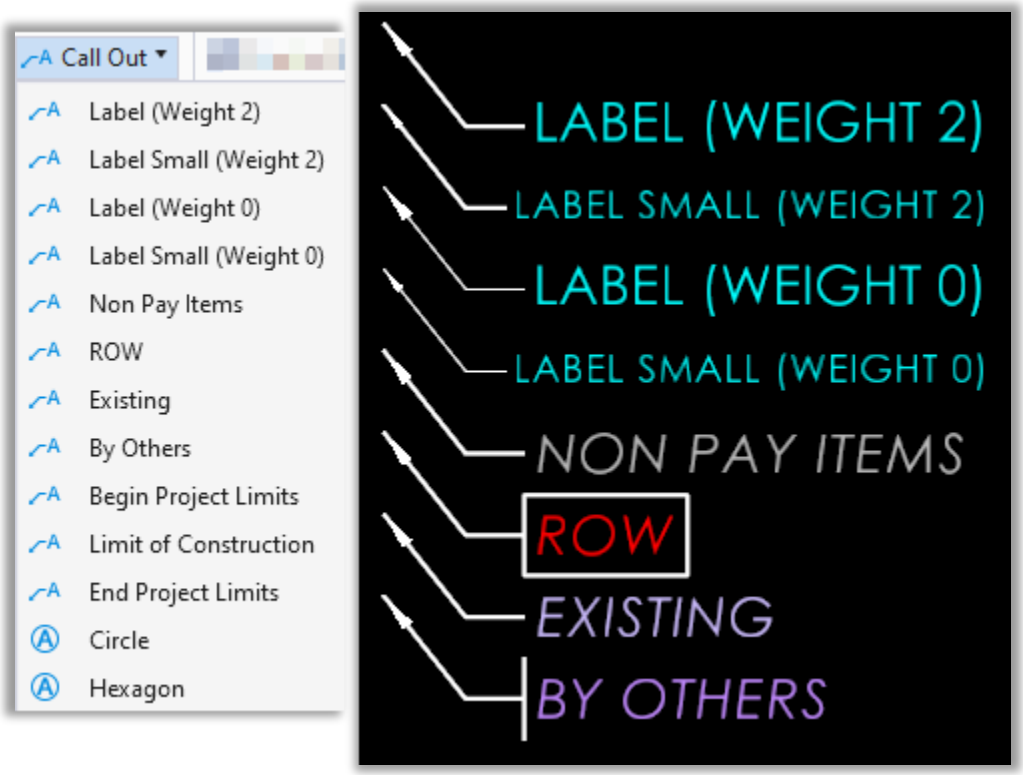


Figure 14 - CTDOT Call Outs

There are several call out options available:

- **Label (Weight 2) -** Used for Plan View Annotation of General Pay Items.
- **Small Label (Weight 2**) - Used for Plan View Annotation of General Pay Items where space maybe limited.
- **Label (Weight 0) -** Used for Detail Annotation.
- **Small Label (Weight 0)** - Used for Detail Annotation where space maybe limited.
- **Non-Pay Item –** Used for items that remain in place, or become the property of the contractor, or to be saved and no associated cost/pay is incurred.
- **ROW –** Used for Right of Way items such as but not limited to Taking Line, Construction Line and Drainage Right of Way (D.R.O.W.).
- **Existing –** Used to identify Existing Features
- **By Others -** Is usually for utility items, such as poles to be removed, replaced or placed by the utility companies. Any work that is not performed by the project contractor will be called out with this item.
- **Begin Project Limits –** Used to define the beginning of project, this note will include the following information:

  BEGIN PROJECT NO. XXXX-XXXX
  F.A.P. NO. XXXX(XXX)
  CL (or BL) STA. XX+XX
  Northing Coordinate
  Easting Coordinate

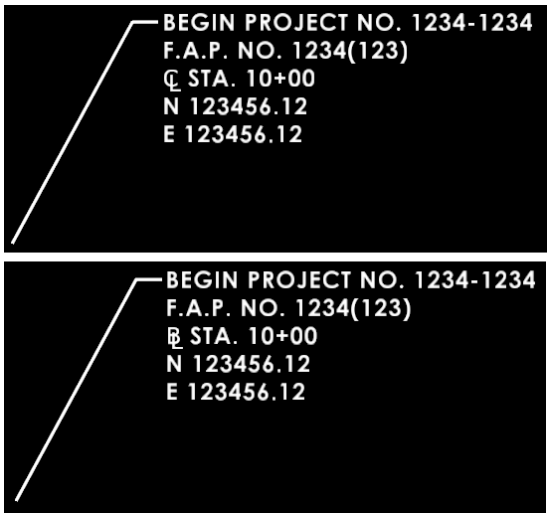


Figure 15 - BOP

- **Limits of Construction** – Used to define the limits of construction on intersecting roadways, this note will include the following information:

  LIMITS OF CONSTRUCTION
  CL (or BL) STA. XX+XX

Figure 16 - Limit of Construction

- **End Project Limits** – Used to define the end of project, this note will include the following information:

  END PROJECT NO. XXXX-XXXX
  F.A.P. NO. XXXX(XXX)
  CL (or BL) STA. XX+XX
  Northing Coordinate
  Easting Coordinate

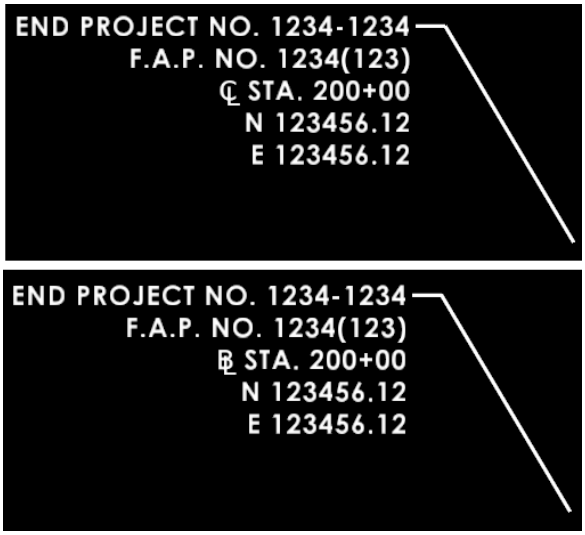


Figure 17 - EOP

- The **Circle** and **Hexagon** call outs can be used as needed to annotate Plans and Details.

1.4.2 Notes

Notes are used to convey information such as right of way and construction sequencing. General Notes are usually found on the first plan view sheet of each subset but can be placed on any sheet as needed. The Notes Tool is also used for Legends on Typical Section Sheets, Notes on Detail Sheets and for Row Legends. Tools to place annotation for Existing Features, Match Mark Lines and Match Mark Text are also located on this Menu.

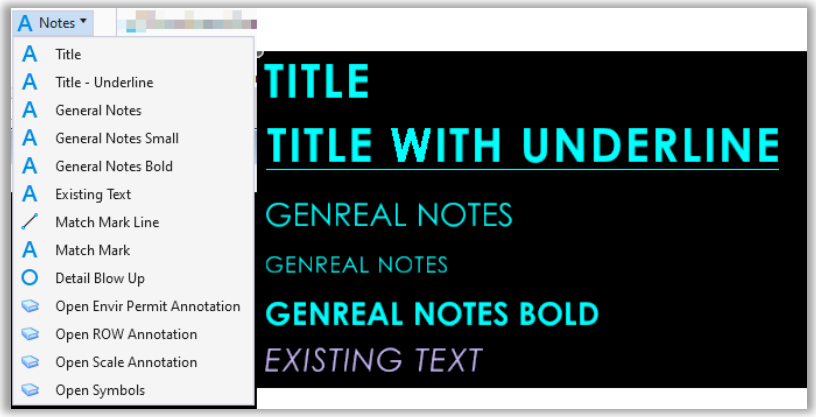


Figure 18 - CTDOT Notes

General Notes can also be placed in a table. A Table Seed for General Notes is provided for this use.Tables will allow auto-return of text when the width is adjusted.

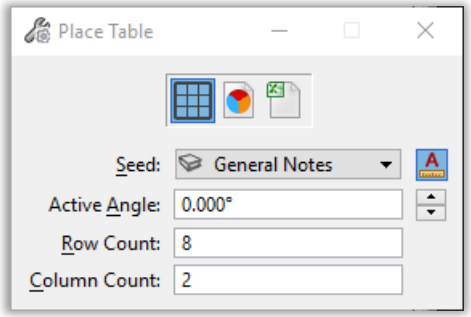


Figure 19 – General Notes Table Dialog Box

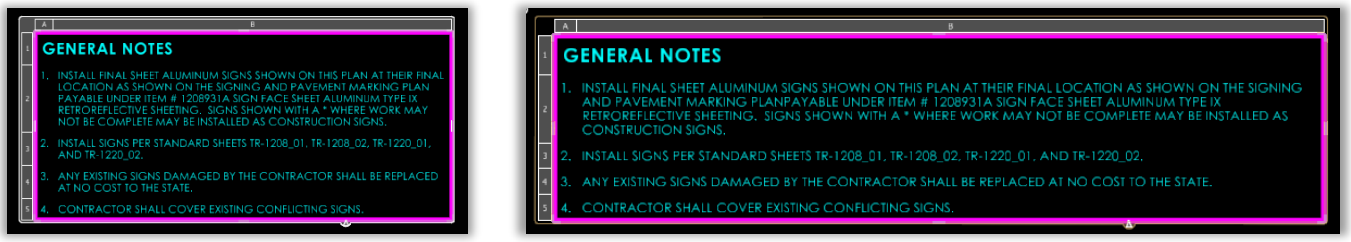


Figure 20 - General Notes Table Editing

1.4.3 Dimensions

The **Set Style** tools in the Dimensioning section will set basic attributes for dimensioning. After choosing one of these options a **Placement Tool** will need to be selected.

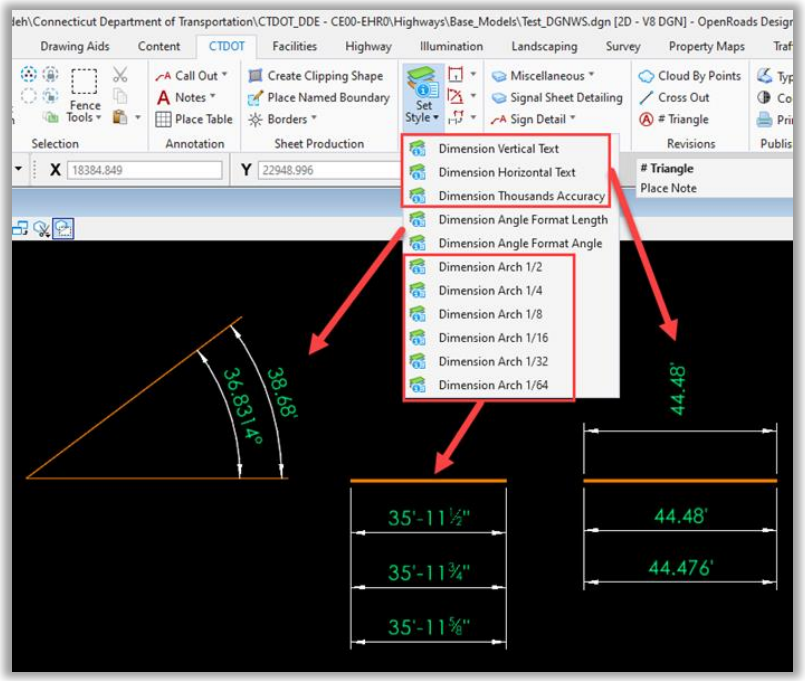


Figure 21 – CTDOT Dimensioning

After a **Placement Tool** is activated a dialog box will appear, users can now select the needed options to get the desired output for the Dimension.

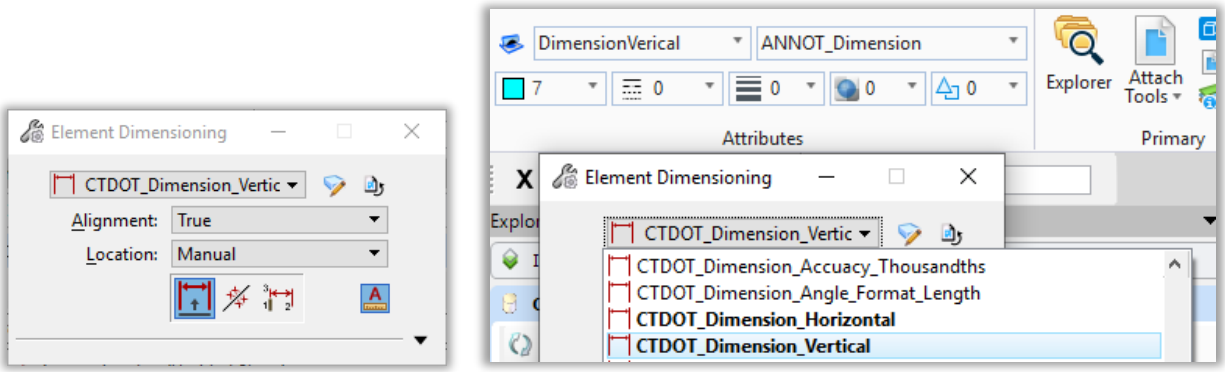


Figure 22 - CTDOT Dimensioning Options

1.4.4 Annotation Attribute Pointers

The example of how an annotation tool calls for the correct Annotation Attributes is detailed below.

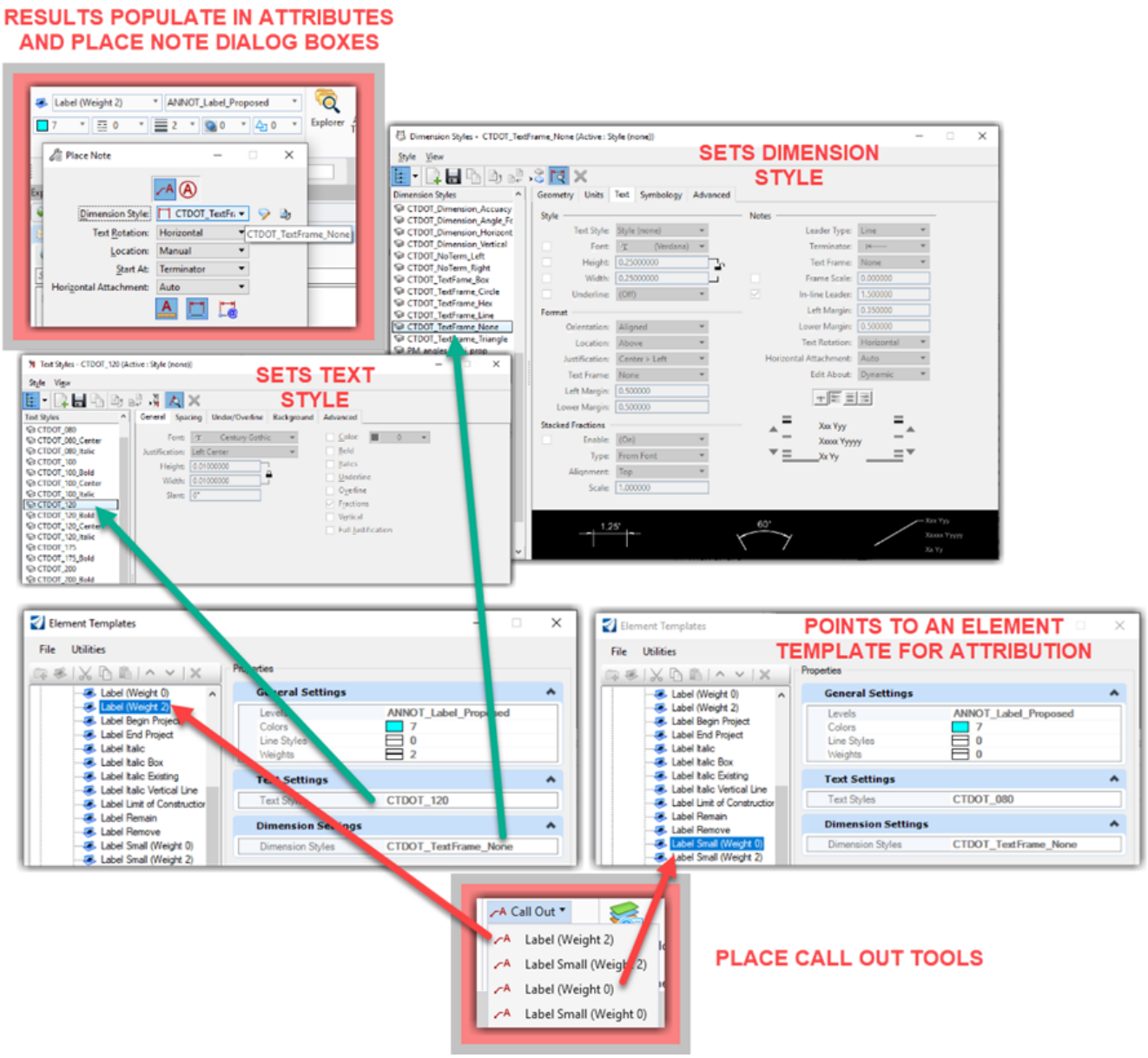


Figure 23 - Annotation Attribute Pointers

1.4.5 Automation

1.4.5.1 Text Editor tools

The CTDOT workspace includes **predefined Text Favorites and Favorite Symbols** to support consistent, standards-based annotation. These are accessed directly from the **Text Editor dialog box** using the **top toolbar**.

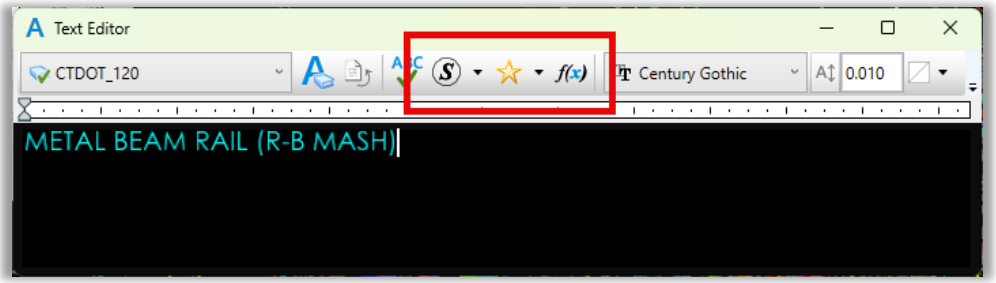


Figure 24 - Test Editor Tools

- **Text Favorites** - intelligent, reusable annotation components made up of predefined text, formatting, and **fields**. They allow labels to automatically populate with model data and update when the design changes.
- **Favorite Symbols** - predefined graphical symbols saved for repeated use
- **Insert Field** - mechanism that links annotation text to live model data. Fields pull information directly from civil objects, alignments, profiles, and elements.

1.4.5.2 Civil Labeler

Available with OpenRoads, OpenRail and OpenBridge. The Civil Label designed to help you place dynamic, data-aware annotations (labels) on your civil design drawings such as station/offset values, elevations, alignment names, intersecting geometry data, and other construction-relevant information **without manually enter text**. Rather than manually placing static text labels, the **Civil Labeler** lets you **automate** and standardize annotation across engineering deliverables. Because the labels are associative (linked to the design features), they help keep plan production accurate when the design evolves.

This too and be accessed from the **OpenRoads Modeling** workflow, **Drawing Production > Labels > Civil Labeler**

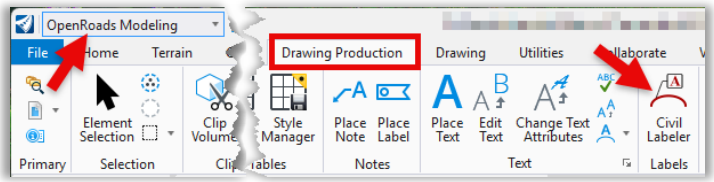


Figure 25 – Civil Labeler

The Civil Labeler contains several categories of pre-configured annotations. Key examples include:

- **Pay Item – Item Type Labels**
  Apply labels to graphical elements that have Item Types assigned. These can be used for **auto-annotation** of pay items directly from the model.
- **Drainage Labels**
  Tools for labeling drainage structures such as inlets, manholes, pipes, and inverts.
- **Centerline and Baseline Annotation**
  Labels for alignments, including stationing, offsets, bearings, coordinates, and other geometry values.

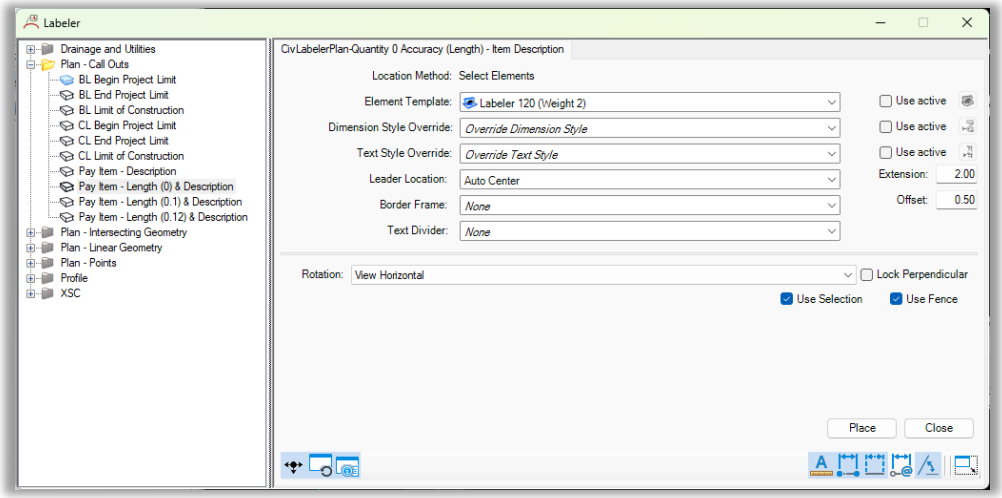


Figure 26 – Civil Labeler

1.5 Screening for PDF Creation

The Pen Tables delivered with the CTDOT CONNECT DDE gives the user the ability to set screening options when PDF files are created. **...CT_Configuration\Organization\Pen_Tables**

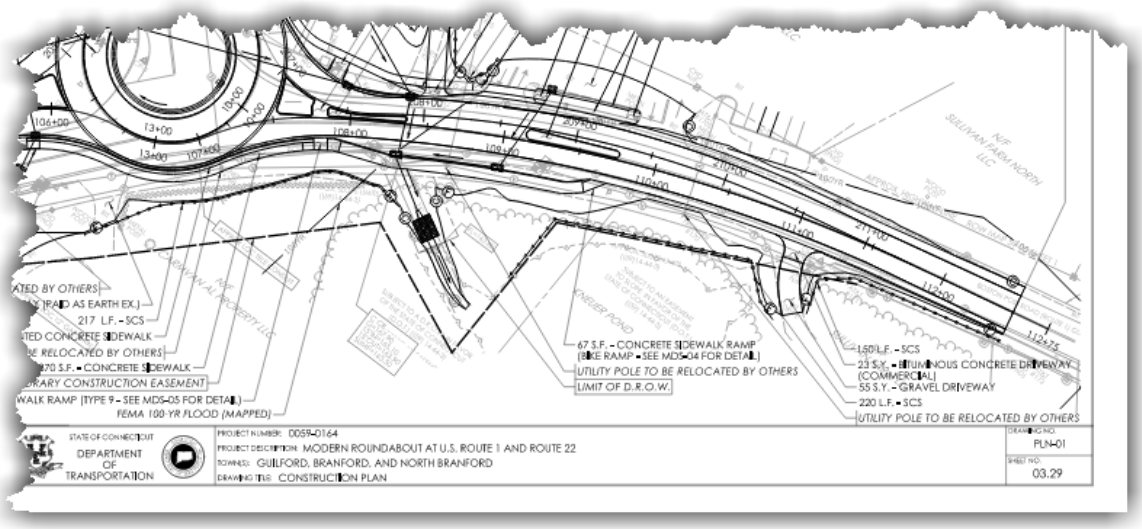


Figure 27 – PDF Plan

Users can direct the PDF to create with certain reference files screened by using a wildcard in the DGN reference file's logical name.

- If the reference logical name begins with "screen" the output weight is 2
- If the reference logical name begins with "one" the output weight is 1
- If the reference logical name begins with "sww" the output weight is unchanged

Wildcard Examples:

Screen – Shows as screened with a default remap line weight of 2 when the PDF is created. Example Logical Name: **Screen Ground Survey**

one - Shows as screened with a default remap line weight of 1 when the PDF is created. Example Logical Name: **one Ground Survey**

sww – Stands for "screen with weights". Shows as screened and will retain the original weights of a particular reference file when the PDF is created. Example Logical Name: **sww Ground Survey**

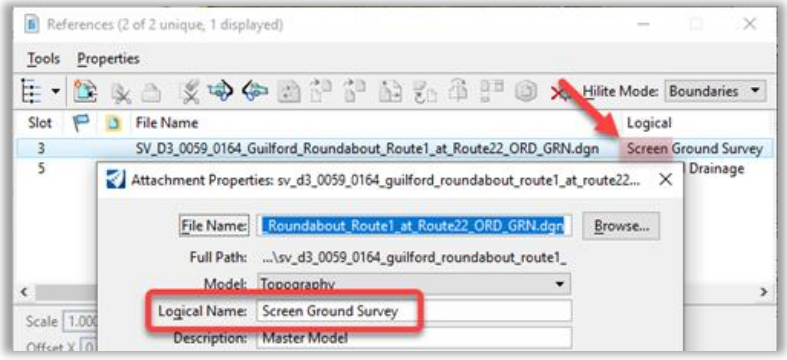


Figure 28 - Reference Screening

1.6 Controlling the Reference Display of Graphical Elements

Managing the display of graphical elements is a critical step in the **plans production process**, ensuring that all design data appears correctly and consistently in contract sheets. This involves setting visual controls that dictate how referenced models (references) appear in the final sheet model.

Two key settings are used when referencing Design Models to control the display of graphical Elements in the Final Sheet:

- **Synchronize View**
- **Display Overrides**

1.6.1 Dialog Boxes that Control the Visual Outcome

The following settings determine the **visual outcome** of referenced elements.

- Level Display
- Level Symbology
- Reference Presentation - Display Style, View Flags, and Clip Volume
- Clip Boundary
- Reference Visibility
- Terrain Display

1.6.1.1 Level Display

Level Display Controls which levels are **on** or **off** in the reference.

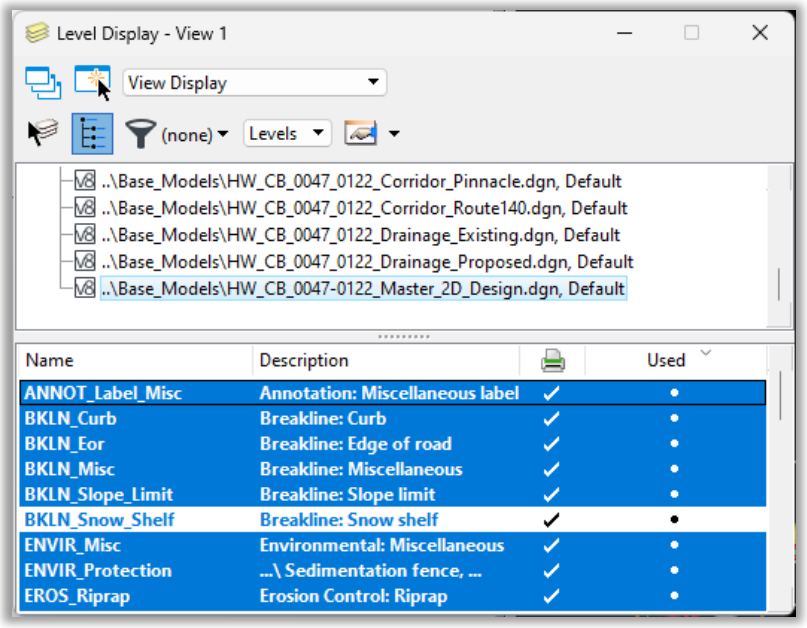


Figure 29 – Level Display

1.6.1.2 Level Symbology

- Manages how elements are displayed in terms of: Colors, Line styles, and Line weights
- These may follow **ByLevel settings** or be explicitly **overridden** for specific visuals.

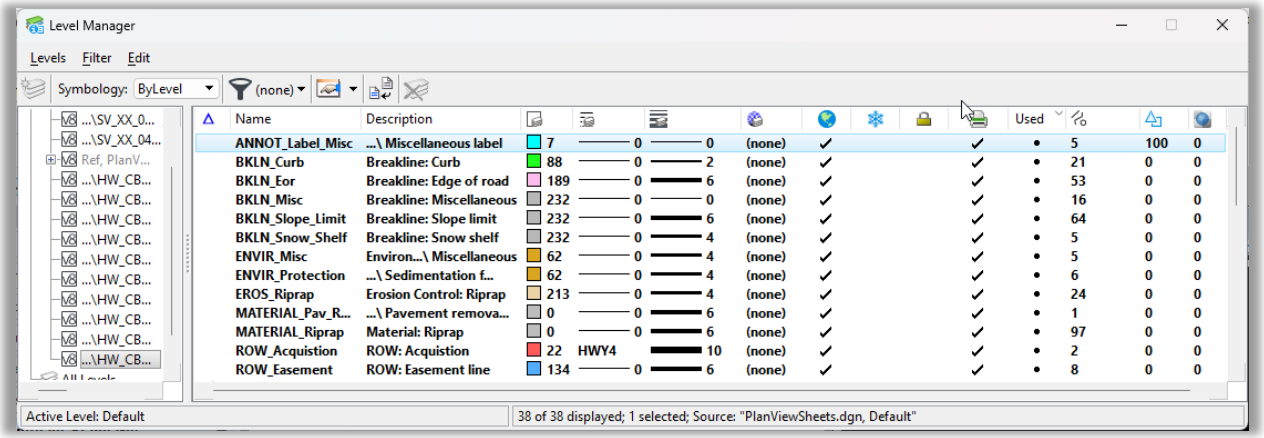


Figure 30 – Level Manager

1.6.1.3 Reference Presentation

The Reference Presentation dialog has three sections:

1. **Display Style –** determines the rendering style of the reference, such as: Wireframe, Smooth, Illustration, Shaded
2. **View Flags –** these settings determine whether parts of a model such as text, fill, line styles, etc. are displayed.

   In order to override the View Attributes of a Reference the **Use View Flags** need to be **On**.
3. **Clip Volume Settings –** Restricts the visible area of the reference to a defined area.

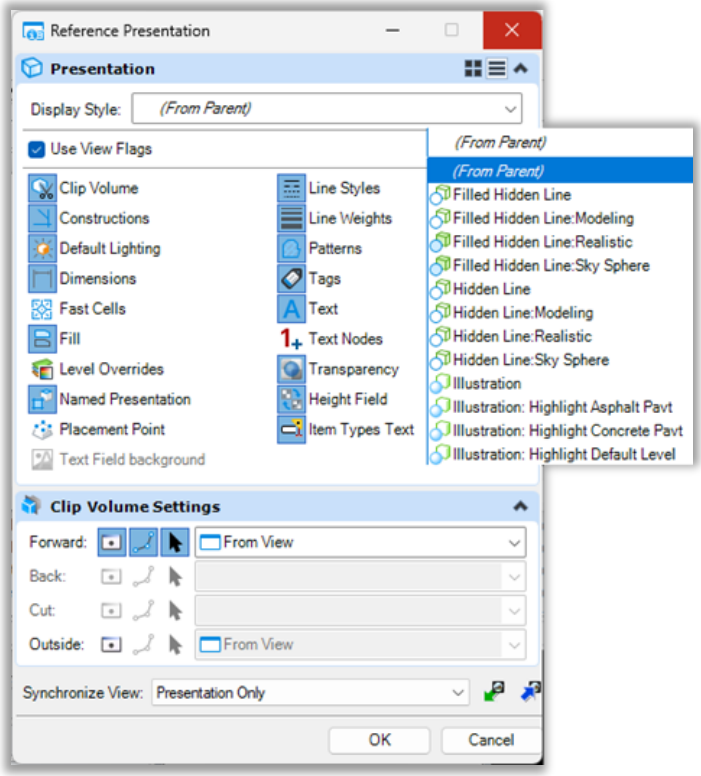


Figure 31 - Reference Presentation

1.6.1.4 Clip Boundary

Restricts the visible area of the reference to a defined shape.

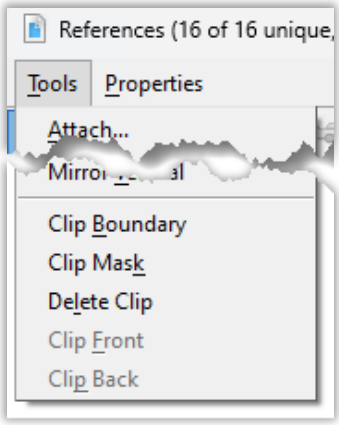


Figure 32 –Clip Boundary

1.6.1.5 Reference Visibility

Controls whether the entire reference is visible on or off in the active model.

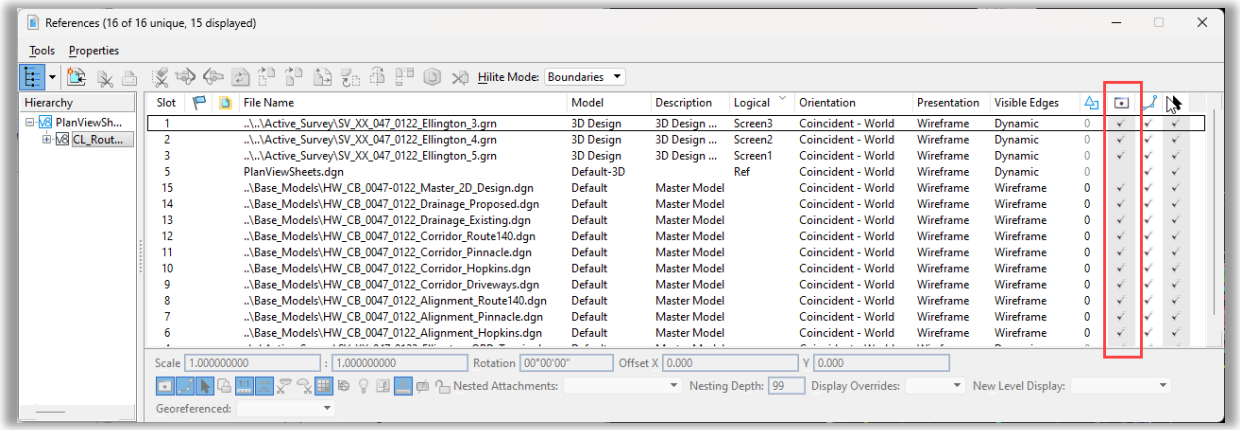


Figure 33 - Reference Display

1.6.1.6 Terrain Display

In the Terrain Properties you can change the Terrain Override Symbology to **Yes**, then you can control what features of the terrain are visible in all the model types: Design, Drawing, and Sheet.

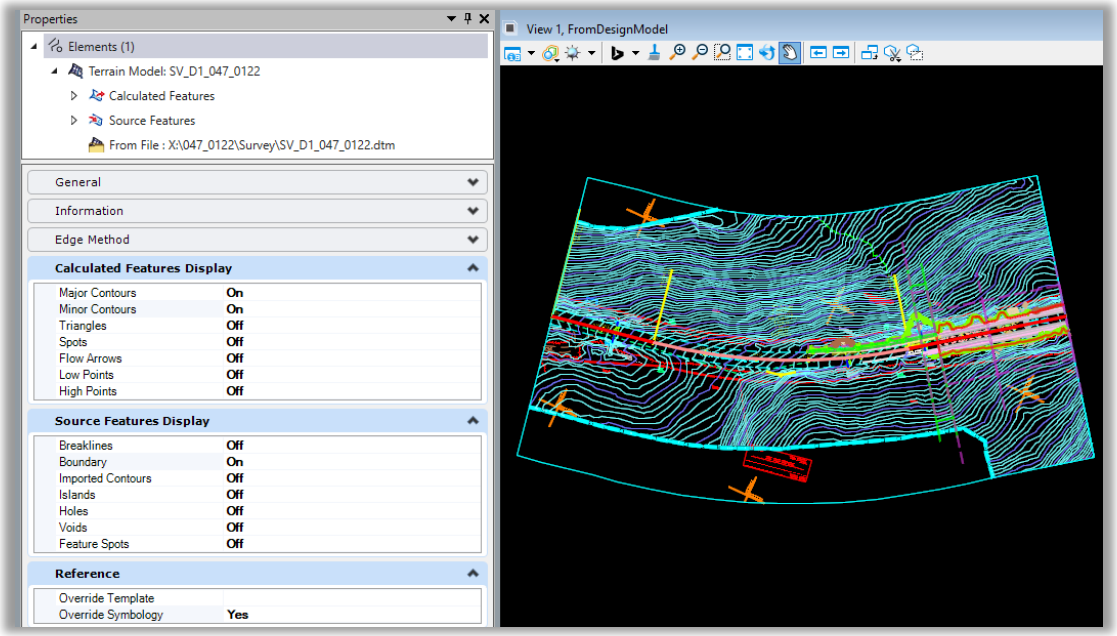


Figure 34 -Terrain Display

1.6.2 Synchronization of Saved Views

In OpenX Products, controlling the display of graphical elements becomes especially nuanced when dealing with:

- **Nested references**: Files attached within a reference file that's then attached to your active model.
- **Drawing Boundary Seeds** and **Named Boundaries**: Automation tools to cut drawings from models using the **Synchronize View** settings.

When using **Place Named Boundary tools**, they rely on Drawing Boundary Seeds and trigger automated sheet creation. This involves reference attachments where: **Synchronize View** is a key mechanism that ensures level display in the Drawing and Sheet Models mirror the settings from the Default Design Model.

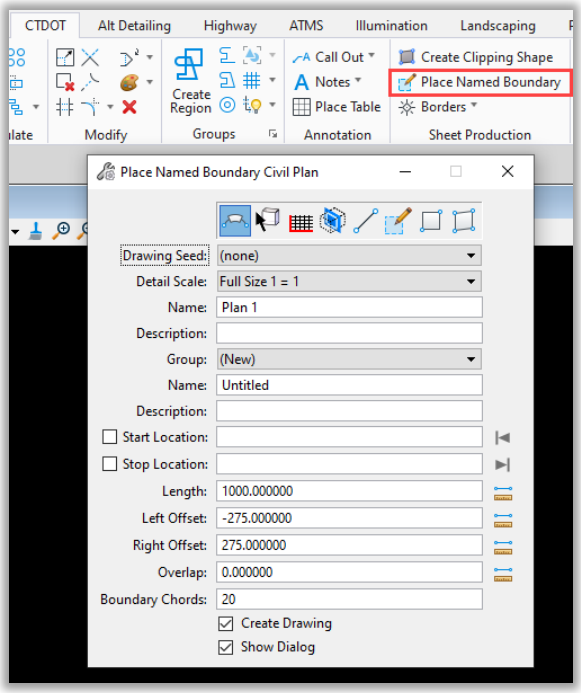


Figure 35 - Place Named Boundaries

Mirroring (option 2 below) the Source Design Model is **beneficial for maintaining consistency**, especially when multiple users or models are involved. **There are times** however where it's **not desirable** to control the display settings from the default design model, so it's critical to understand the other Synchronize View Options as its possible to change this setting after the Drawing Model is created.

Drawing Boundary Seed files are set up by the CAD administrator to use one of the following Synchronize View Options:

1. **All Properties (All Settings) – Auto Sync to Saved View**
   A fully Synchronized View is available only when the Reference Orientation is set to a saved view using **All Properties (All Settings)**. This Synchronizes the **Reference Level**

Display as well as the following Reference (Presentation) view attributes with the source saved view:

Display Style	Fill	Default Lighting
Clip Volume	Level Overrides	Tags
Constructions	Line Styles	Text
Dimensions	Line Weights	Text Nodes
Fast Cells	Patterns	Transparency

2. **Settings From Design Model – Mirrors View 1 of the Design Model**
   If set to Settings from Design Model, the Reference Presentation will take all the View Attribute settings and Level Display from the design model of View 1. This makes it so the Design Model is mirrored instead of the Saved View.
3. **Volume Only – Manual sync to and from Saved View**
4. **Presentation Only – Manual sync to and from Saved View**
5. **None – No Sync**
   If set to None the reference cannot be synchronized with a Saved View.

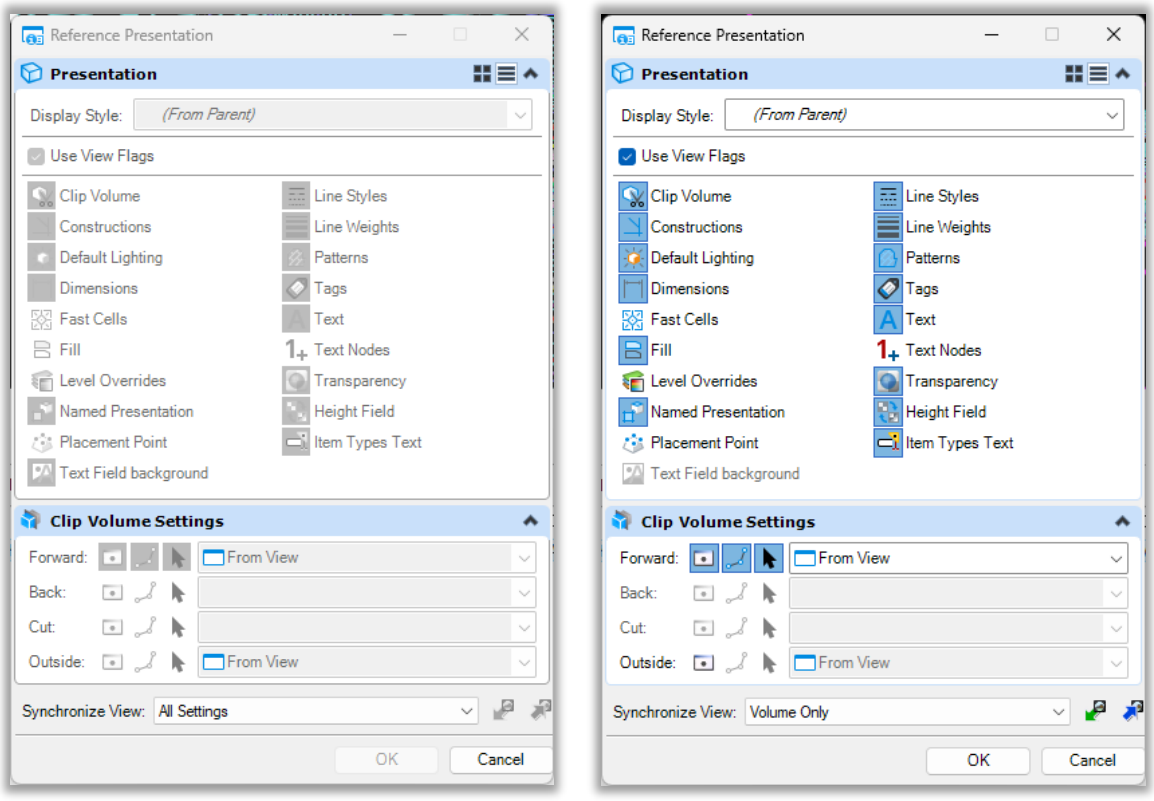


Figure 36 – Available Reference Presentation toggles comparison

1.6.3 File and Model Definitions

These definitions will help users to understand the concepts explained in the subsequent sections:

- **Source Files** – Each source file includes one or more models that contain the placed graphics representing the design or survey
- **CP (Contract Plan) File** – This file contains multiple models (Design, Drawing and Sheet) that make up the hierarchy of the assembly for creating Plans, Profiles and Cross Sections Sheets in a dgn file. The Contract Plan file is a container file. The Default model contains references to source data and named boundaries for production of drawing and sheet type models.
- **Design Model (CP_DGN)** This model contains the direct References to the Contract Base Models, Existing Survey Terrain Models, and Existing Ground Models. This will be the Default model of a **CP** file.
- **Drawing Model (CP_DWG)** This model type is the link between the Sheet and Design model in the **CP** file.
- **Sheet Model (CP_SHT)** This model that contains your assembled sheet is the model that you print from. This sheet type model contains a plotting shape and border cell with the title block information. A Sheet Model is the only model type that includes the ability to Number Models. CTDOT uses the Sheet Number field to fill in the Drawing Number.

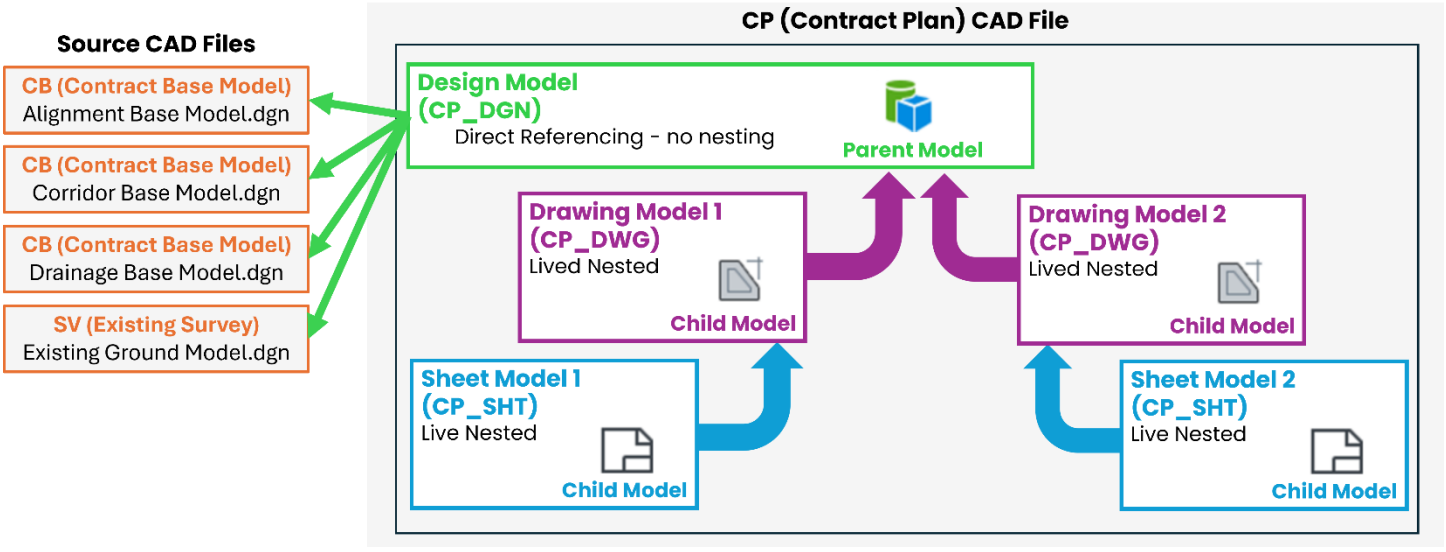


Figure 37 - Hierarchy of Plan Sheet Assembly

1.6.4 Sheet Model Creation Options

In this section we will explore 2 options for Plan View Sheet Model Creation:

a) Automated Attachment via Named Boundaries
b) Manual Attachment - This approach was standard in MicroStation V8i workflows.

More detailed specific instructions are available in other Sections of this volume.

1.6.4.1 Option 1 - Place Named Boundary Tools

This dialog box can be access from the **CTDOT** Workflow, on the **CTDOT** tab, in the **Sheet Production** group by selection **Place Named Boundary**.

Advantages:

- The automated Named Boundary tools create multiple Sheet Models at one time.
- Smart annotations such as Dynamic labels (e.g., stationing, elevations) can be used in the Drawing Models created from the named Boundary tools.

General Workflow

Step 1. Create a file using a 2D Design Model Seed.

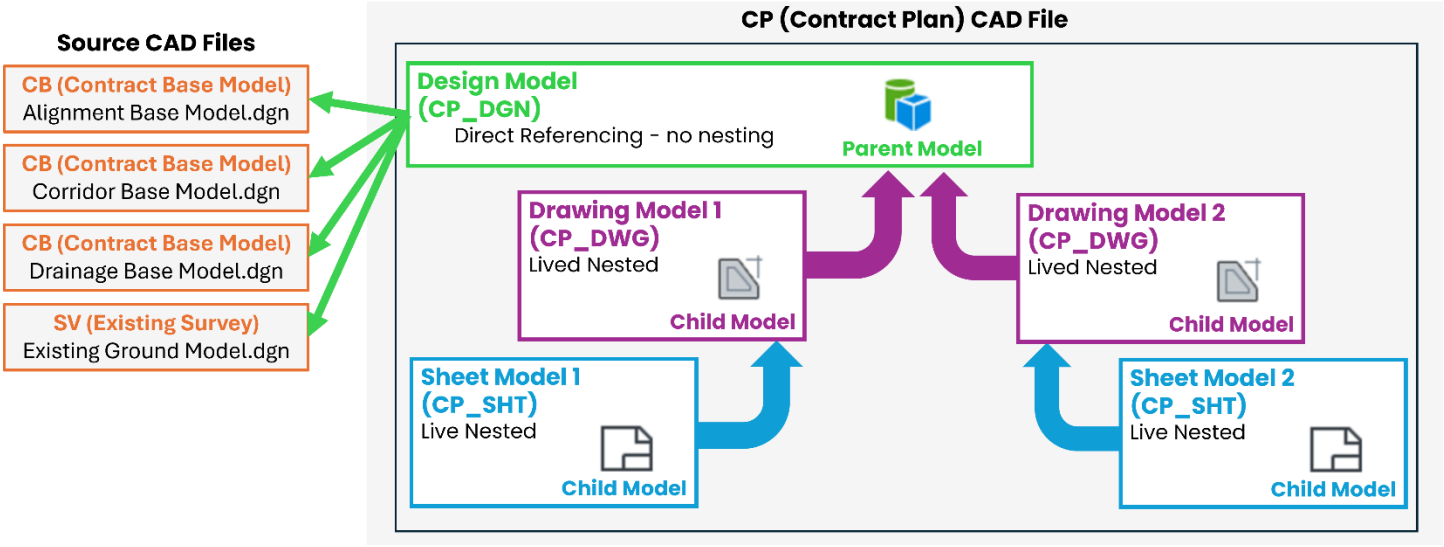


Figure 38 - Hierarchy of Plan Sheet Assembly using Named Boundaries

Step 2. Assure the model is using the correct Geospatial Header, to match the Existing Survey.

Step 3. In the Default Design Model reference in the needed files/models.

Step 4. In the Default Design Model turn On/Off the levels as needed.

Step 5. In the Default Design Model set the View Attributes as needed.

Step 6. For Profiles and Cross Sections activate the Existing Terrain.

Step 7. Save Settings

Step 8. Use the Place Named Boundary tools to automate the creation of Drawing and Sheet Models.

- These models reference the Design Model through nested references.
- The **Synchronize View** option ensures that changes in the Design Model view are reflected in the attached Drawing Models.

Step 9. Review the created Models and determine if display options need to be further adjusted.

Step 10.

a. For Plan View Sheets open the Design **Default** model and turn On\Off Levels as needed.

b. For Cross Sections Sheets open the Design **Default-3D** model directly and turn On\Off Levels as needed. **DO NOT** do this in the Multi-Model View as these changes will not propagate to the Drawing and Sheet Models.
Helpful Bentley Video

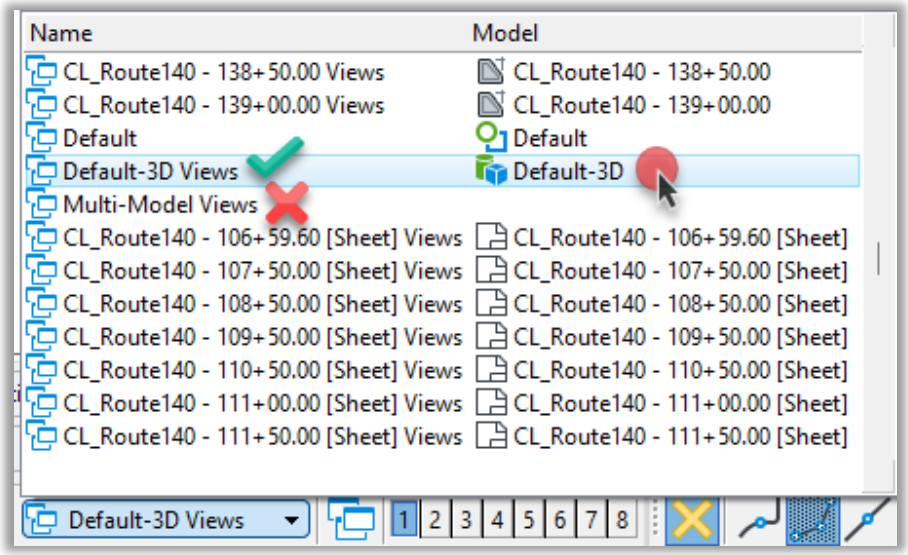


Figure 39 – Update Levels I Default-3D

Step 11. Save Settings and open the Drawing and Sheet Model to see the display changes.

Step 12. Decide if you want to control your levels from the Drawing or Sheet Model essentially breaking them from the **Design Model (CP_DGN)** settings. To use this option, you will need to thoroughly understand the Synchronize View and Display Overrides options (detailed in 1.6.5) and how they work together.

1.6.4.2 Option 2 - Manual Attachment

This workflow is completely manual requiring the user to create each sheet model and then direct reference in the required design models using the **References** dialog box. There is no use of Named Boundaries, Drawing Seeds, or automated processes.

Note: *The Manual method is* ***not*** *an option for* ***Profiles and Cross Sections****, users will need to use Option 1 for these types of Sheets.*

Advantage:

- Provides flexibility and simplicity when managing sheets individually.
- Ideal for static presentation sheets where dynamic annotation and automation are not needed.

Drawback:

- Time-consuming - Manual setup of each sheet, view, and reference attachment.
- No central display control - All settings (levels, symbology, view settings) must be manually adjusted per sheet.
- Smart annotations - Dynamic labels (e.g., stationing, elevations) are not available in Sheet Models.
- No Named Boundaries - Limits integration with downstream workflows such as Infrastructure Cloud.
- Not suitable for Profiles or Cross Sections - These require automated workflows using Named Boundaries and Drawing Models.
- Outdated technique - Considered a legacy workflow; not recommended for modern BIM or digital delivery projects.

General Workflow:

Step 1. Create a file using a 2D Sheet Model Seed.

Step 2. Manually reference all files directly to the Sheet Model.

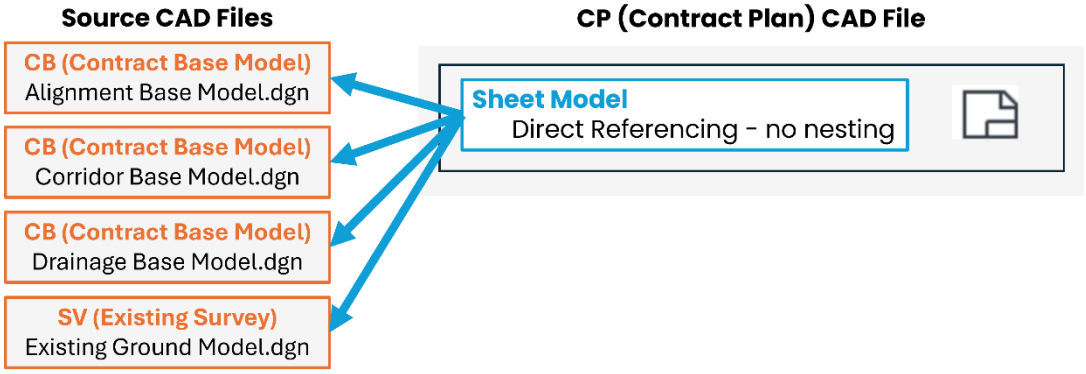


Figure 40 – File Set up for manually creating Sheets

Step 3. Turn on/off levels as needed and set the View Attributes as needed.

Step 4. Rotate the View to how it will be displayed on the sheet

Step 5. Attach the Contract Border Cell over the Desired area of the project

Step 6. Clip the Reference File Boundaries inside the Sheet

Step 7. Move and Rotate the Sheet Boundary to line up with the Border Cell

Step 8. Save Settings

- Level visibility is managed independently in the Sheet Model.
- Users can toggle levels on/off without impacting the source Design File

Step 9. Create a new Sheet Model in the file and manually repeat steps 2-8 for each sheet.

1.6.5 Working with Synchronize View Settings

When working in the CTDOT Workspace to create Roadway Plans, Profiles and Cross sections through the **Place Named Boundary** toolbox, level display in the sheets is set to be controlled On/Off from the **Design Model (CP_DGN)** of the container file. Any changes to the displayed levels in the Drawing Model or Sheet Models are temporary and **Save Settings will not work**. This is by design.

When sheets are created using named boundaries, the **Drawing Model (CP_DWG)** that is created uses a setting on its reference attachment to the parent model, called **Synchronize View** and it is set to "**Settings From Design Model**". This setting prevents level display changes in the sheet from being permanent. To permanently change the level display in the sheet, the level display in the **Design Model (CP_DGN)** model must be changed and those level display settings will propagate through the drawing-type model to the sheet.

> ***Note:*** *When Synchronize View is set to "Settings From Design Model", changes to the level display in the Default model will affect the level display of every sheet created from a named boundary in the Default model.*

These settings can be reset and saved in individual sheets, but the reference attachment settings that synchronize the view will need to be modified in the **Drawing Model (CP_DWG)** first. If you deliberately want local control in the Drawing or Sheet Models it is possible to cut ties with the **Design Model (CP_DGN)**. This however will require certain settings to be adjusted which will be explained in the sections below, it's important to understand each toggle so you get the desired outcome.

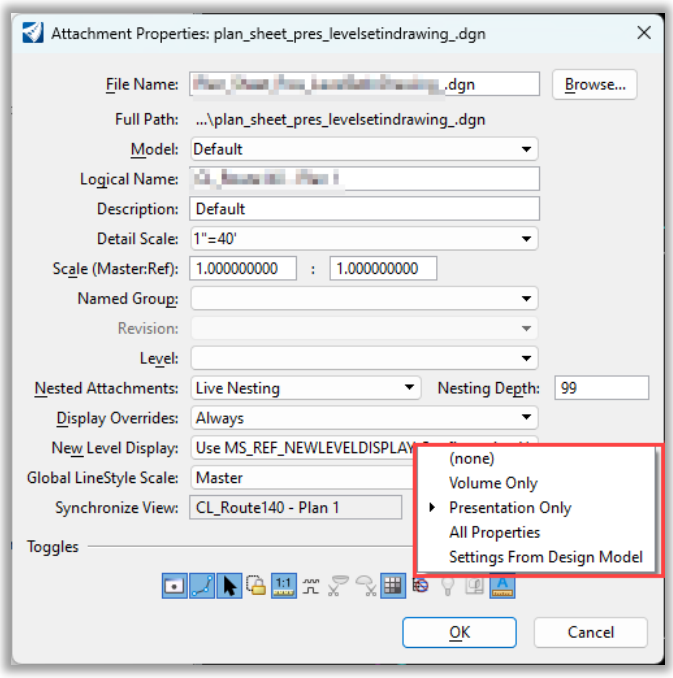


Figure 41 - Synchronize View

1.6.5.1 Display Overrides Options

Display Overrides controls how overrides are used in references. For each reference, overrides allow you to control the settings for:

Reference Display – Is a reference displayed (Yes/No)

Reference Snap – Can a reference graphic be snapped to (Yes/No)

Reference Locate – Can you hover over a reference graphic and get info (Yes/No)

Raster Reference Display - Is a reference raster displayed (Yes/No)

Level Display – is the level displayed (Yes/No)

For most plans the Synchronize View Settings **From Design Model** is used when the sheets are initially created. Which makes Display Overrides null and void.

But… if the Synchronize View Setting is switched to one of the other choices the use of Display override can become relevant.

Level Reference Display:

Allow	**Parent** is **allowed** to override the **child** until settings are changed or saved in the child model. **After** the child settings are changed or saved, the **Child** settings **Always** override the **Parent**.
Always	**Child** settings of the reference **ALWAYS** override the **Parent**.
Never	**Child** settings of the reference **NEVER** overrides the **Parent**.

For Reference Display, Raster Display and Snap and Locate:

Allow	**Child** settings of the reference **Will** override the **Parent, but** if the Parent is updated the **Child** will revert to follow the **Parent**.
Always	**Child** settings of the reference **ALWAYS** override the **Parent**.
Never	**Child** settings of the reference **Will** override the **Parent, but** if the Parent is updated the **Child** will revert to follow the **Parent**.

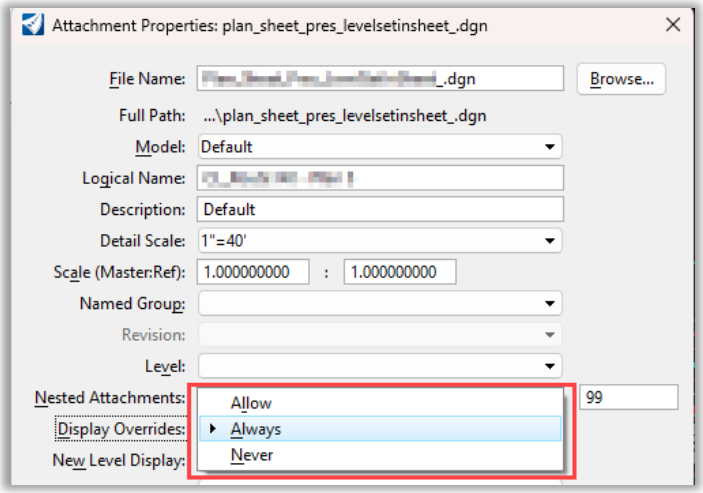


Figure 42 -Attachment Properties Display Overrides

1.6.5.2 Synchronize View: Settings From Design Model

From Design Model - Uses the **Design Model (CP_DGN)** view settings. It does not synchronize with the Saved View.

- **Level Display** changes made directly in the **Drawing Model (CP_DWG)** are only temporary: Adjustments to level display On/Off must be performed in the **Design Model (CP_DGN)**.
- **Reference Display** changes made directly in the **Drawing Model (CP_DWG)** are only temporary: Adjustments to reference display On/Off must be performed in the **Design Model (CP_DGN)**.
- You **cannot** locally adjust Reference Clipping, Display Style, or View Attributes in the **Drawing Model (CP_DWG)**.

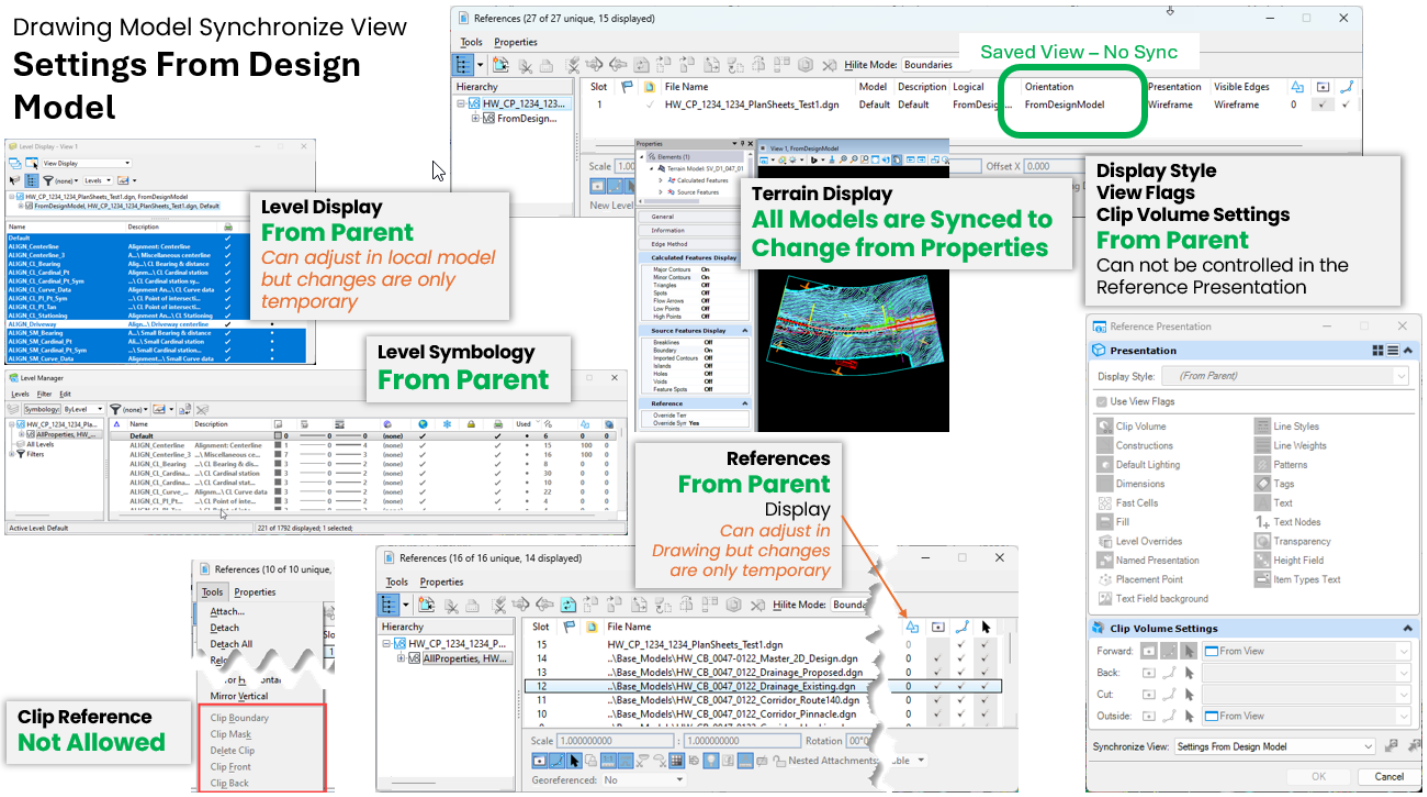


Figure 43 – Display Settings - Synchronize View: Settings From Design Model

1.6.5.3 Synchronize View: All Properties (All Settings)

All Properties (All Settings)

- **Auto Synchronizes** the Saved View which includes:
  - the settings in the Reference Presentation dialog: **Display Style**, **View Attributes** and **Clip Volume**.
  - adjustments to **Level Display** On/Off.
- **Reference Model** On/Off can be saved locally in the **Drawing Model (CP_DWG)**.

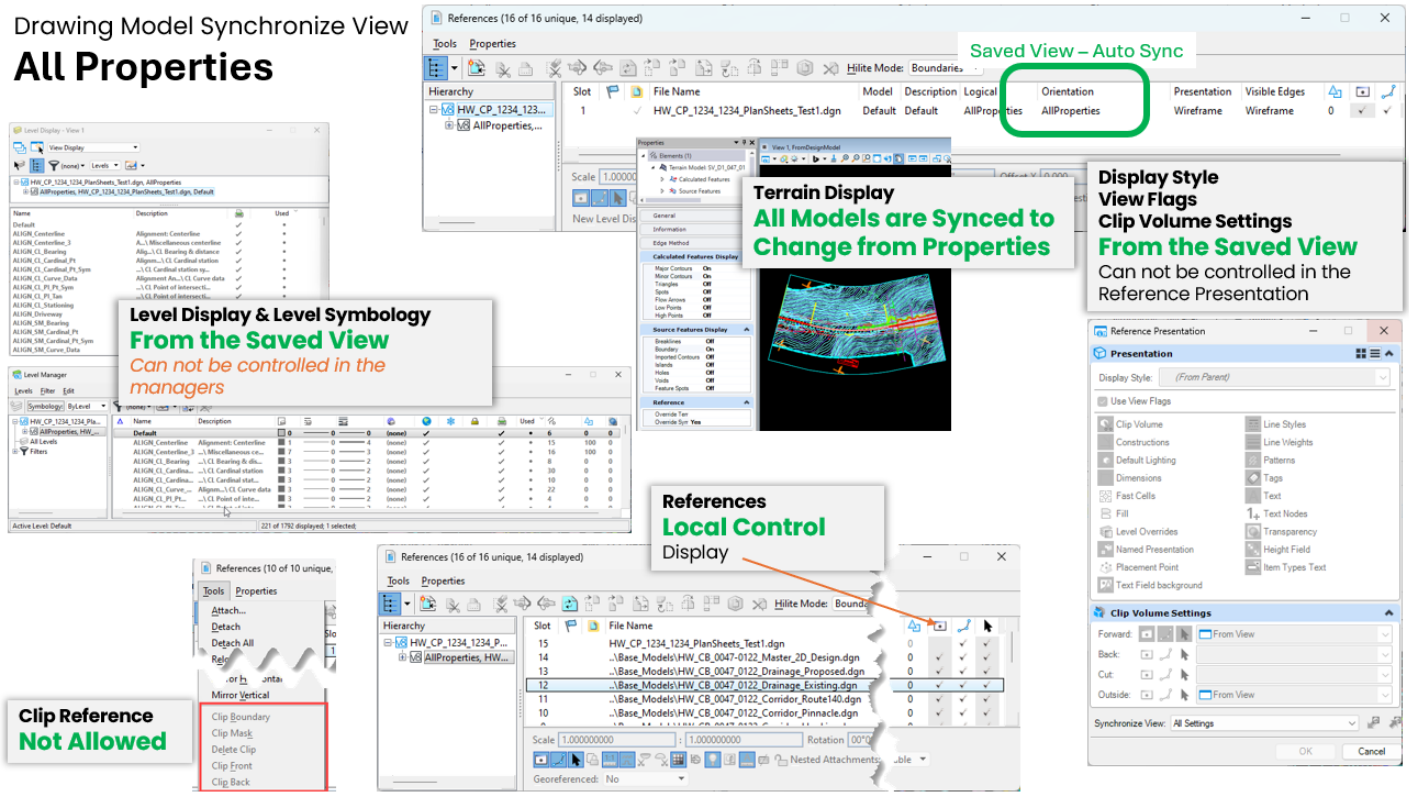


Figure 44 – Display Settings Synchronize View: All Properties (Settings)

1.6.5.4 Synchronize View: Presentation Only

Presentation Only – Has the ability to push **Synchronize** everything in the Reference Presentation dialog: Level Display, Display Style, View Attributes and Clip Volume.

- Allows the level and reference display to be controlled from the **Drawing Model (CP_DWG)** or **Design Model (CP_DGN)**
  - display changes that are made in the **Drawing Model (CP_DWG)** are saved if **Display Overrides** are set **Always**.
  - If set to **Allow the Parent** is **allowed** to override the **child** until settings are changed or saved in these child models. **After** child settings are changed or saved, the **Child** settings **Always** override the **Parent**.
  - display changes that are made in the **Design Model (CP_DGN)** are propagated to the **Drawing Model (CP_DWG)** if **Display Overrides** is set to **Never**.
- Reference Presentation can be saved locally in the **Drawing Model (CP_DWG)**.

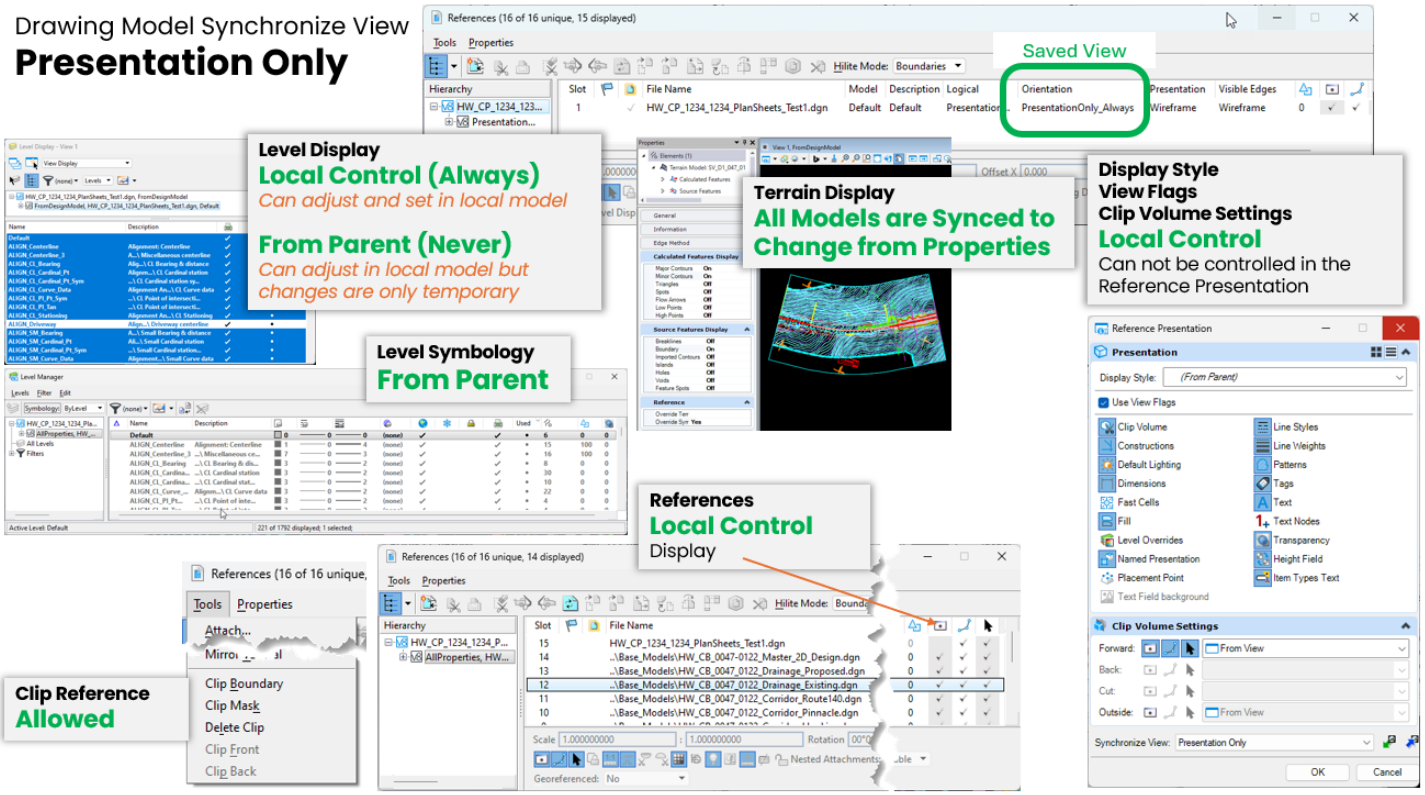


Figure 45 – Display Settings - Synchronize View: Presentation Only

1.6.5.5 Synchronize View: Volume Only (3D) or Clip Only (2D)

Volume Only - Synchronizes the clip volume (section cuts or front/back clipping planes) only with the Saved View.

- Allows the level and reference display to be controlled from the **Drawing Model (CP_DWG)** or **Design Model (CP_DGN)**
  - display changes that are made in the **Drawing Model (CP_DWG)** are saved if **Display Overrides** are set **Always**.
  - If set to **Allow the Parent** is **allowed** to override the **child** until settings are changed or saved in these child models. **After** child settings are changed or saved, the **Child** settings **Always** override the **Parent**.
  - display changes that are made in the **Design Model (CP_DGN)** are propagated to the **Drawing Model (CP_DWG)** if **Display Overrides** is set to **Never**.
- Reference Presentation can be saved locally in the **Drawing Model (CP_DWG)**.

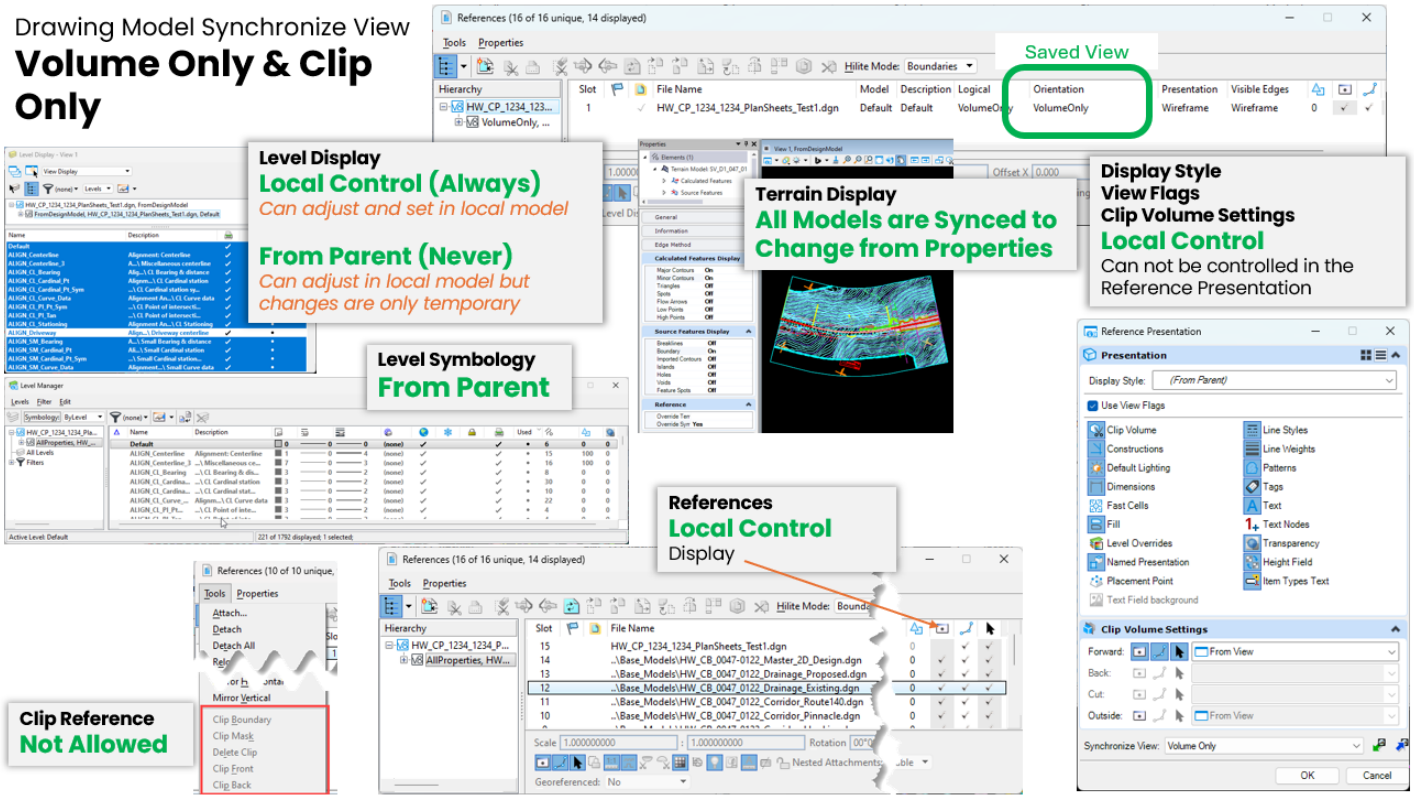


Figure 46 - Synchronize View: Presentation Only - Synchronize View: Volume Only (3D) or Clip Only (2D)

1.6.5.6 Synchronize View: None

None – No synchronization to a Saved View.

- You are free to locally adjust Reference Display Style and View Attributes
- Allows the level and reference display to be controlled from the **Drawing Model (CP_DWG)** or **Design Model (CP_DGN)**
  - display changes that are made in the **Drawing Model (CP_DWG)** are saved if **Display Overrides** are set **Always**.
  - If set to **Allow the Parent** is **allowed** to override the **child** until settings are changed or saved in these child models. **After** child settings are changed or saved, the **Child** settings **Always** override the **Parent**.
  - display changes that are made in the **Design Model (CP_DGN)** are propagated to the **Drawing Model (CP_DWG)** if **Display Overrides** is set to **Never**.
- Reference Presentation can be saved locally in the **Drawing Model (CP_DWG)**.
- Does not support the use of Named Boundaries, must use Clip Boundary in the Reference dialog.

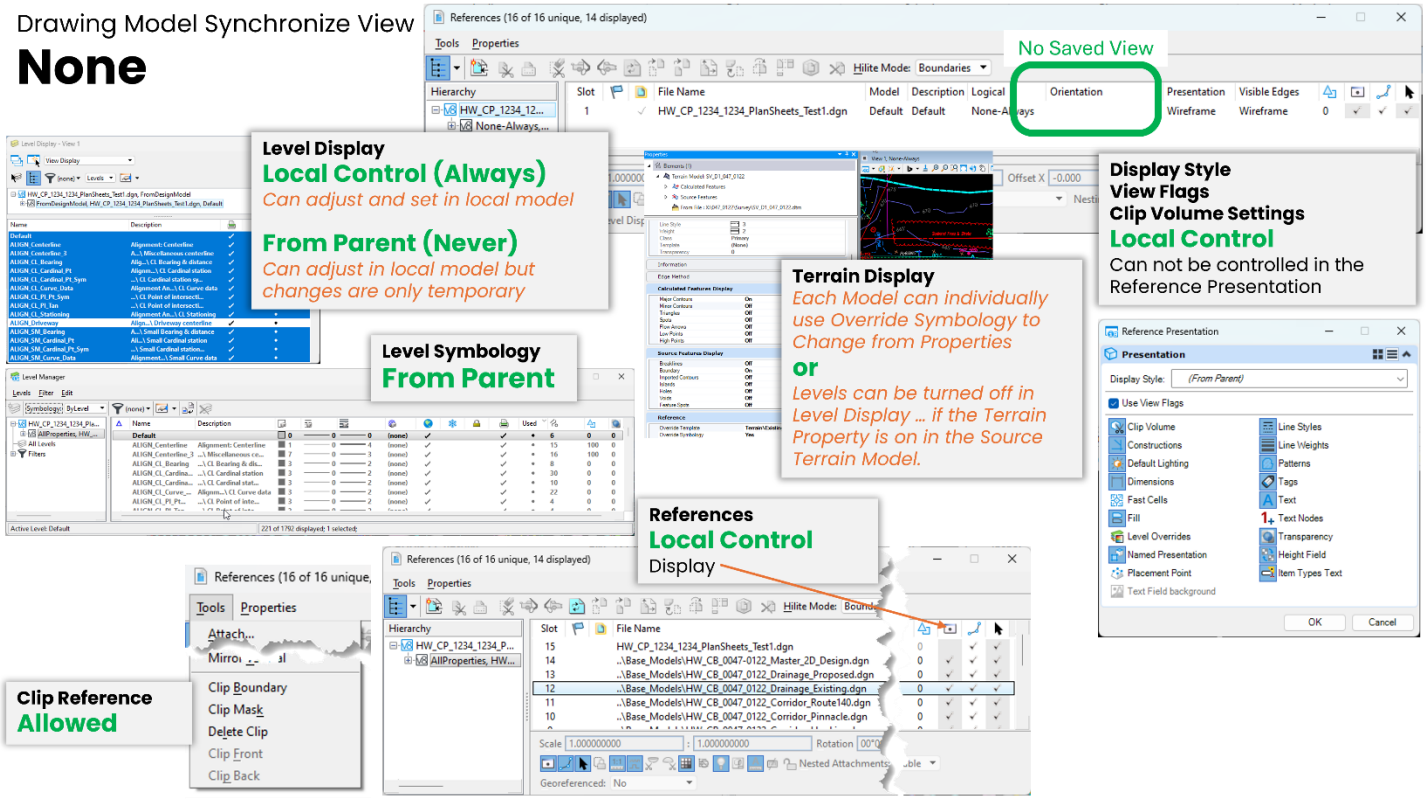


Figure 47 – Display Setting - Synchronize View: None

- The Terrain Elements, such as Contours and Triangles can be turned Property settings. If you have the 2D Default Terrain Model as well as the 3D Default terrain Model referenced.
  - ➢ The **2D Referenced Terrain** Model **should not** be displayed.
  - ➢ The **3D Referenced Terrain** Model **should** be displayed.

  Each Drawing Model that uses None for Synchronize View can individually use "Yes" to Override Symbology and change the display of the terrain Properties.

  Note: *If Override Symbology is set to "No" Levels can be turned off in Level Display … if the Terrain Property is on in the Source Terrain Model.*

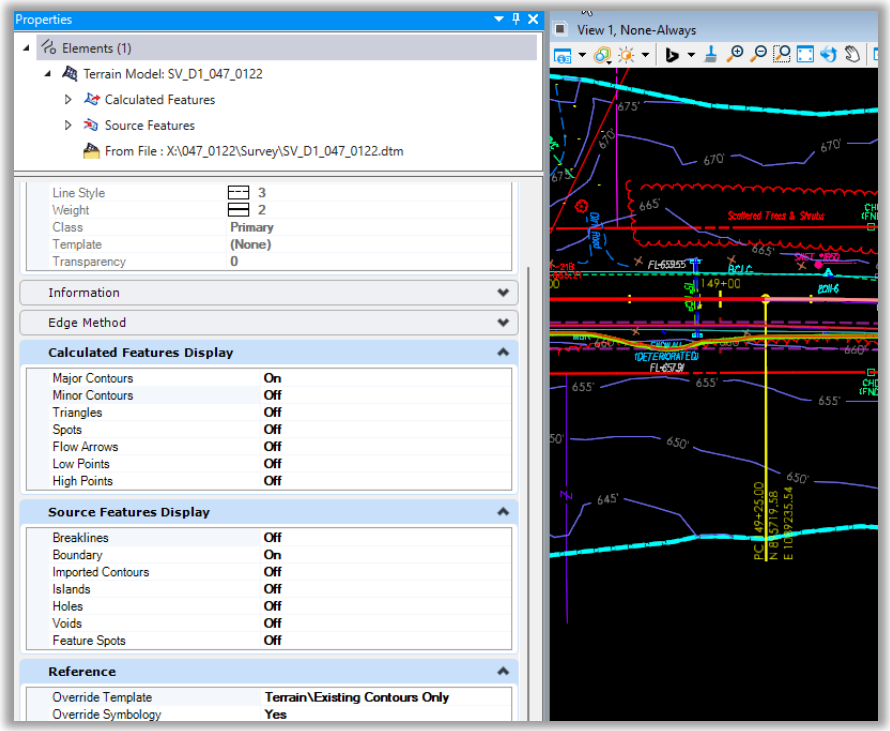


Figure 48 – Override Symbology – Terrain Properties

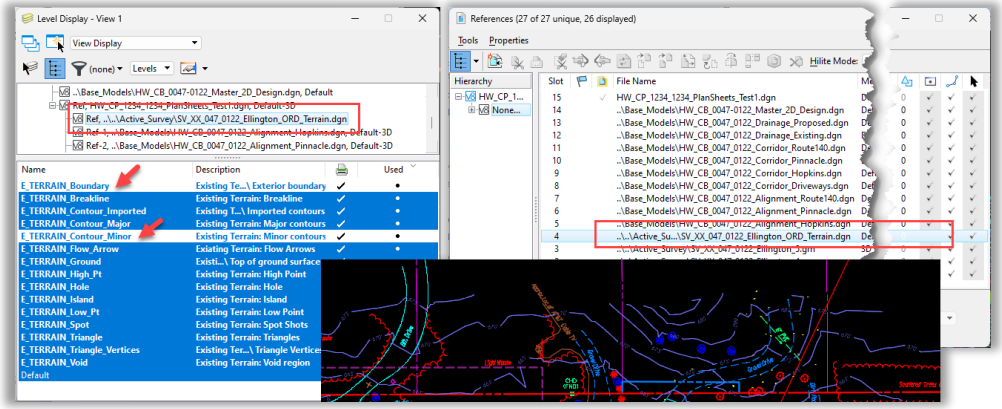


Figure 49 – Dialog Settings to Turn On/Off Terrain Levels

1.6.5.7 Reactivating the Synchronize View Setting after selecting None

If you set the Synchronize View option to "**None**" in the Set Reference Presentation dialog, you will need to Navigate to the drawing model and from the References dialog, choose the applicable Saved View from the Orientation column. This will bring back the Synchronize View drop-down list set and from there you can change it back to the needed option.

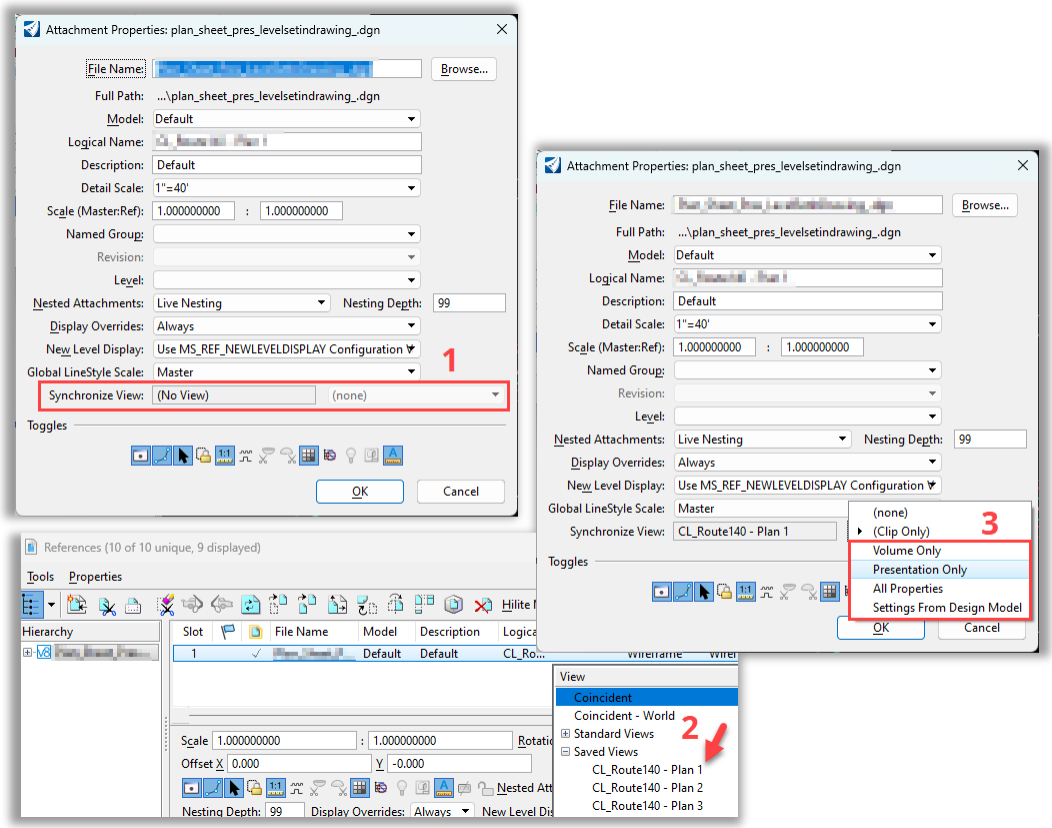


Figure 50 – Reactivating the Synchronize View Setting after selecting None

1.6.6 Quick Lists - Reference Display

1.6.6.1 Drawing Model Reference File Display Options

(Always) or (Never) refers to the Display Override settings for Levels and References

Local Control of **Display**, **Locate** and **Snap** can be overwritten by the Parents if these settings are changed in a Parent Model.

*Can adjust in Local model but changes are only temporary

**Levels must be turned on/off in Level Display. All Terrain Properties need to be on in the Parent Design Model in order to turn Levels on /off in the Drawing Model.

Option	Level Display	Level Symbology	References Dialog				Clip From Named Boundary	Terrain Display
			Display	Display Style	View Attributes	Clip Reference		
Settings From Design Model	*From Parent	From Parent	*From Parent	From Parent	From Parent	Not Allowed	Allowed	All Models are Synced to Change from Properties
All Properties	From Saved View (Always) *From Parent (Never)	From Parent	Local Control	From Saved View	From Saved View	Not Allowed	Allowed	All Models are Synced to Change from Properties
Presentation Only	Local Control (Always) *From Parent (Never)	From Parent	Local Control	Local Control or From Parent	Local Control (Flags On) From Parent (Flags Off)	Allowed	Allowed	All Models are Synced to Change from Properties
Volume Only (3D) **Clip Only (2D)**	Local Control (Always) *From Parent (Never)	From Parent	Local Control	Local Control or From Parent	Local Control (Flags On) From Parent (Flags Off)	Not Allowed	Allowed	All Models are Synced to Change from Properties
None	Local Control (Always) *From Parent (Never)	From Parent	Local Control	Local Control or From Parent	Local Control (Flags On) From Parent (Flags Off)	Allowed	N/A	**Properties do not function in Drawing Model

1.6.6.2 Sheet Model Reference File Display Options

(Always) or **(Never)** refers to the Display Override setting

Local Control of **Display**, **Locate** and **Snap** can be overwritten by the Parents if these settings are changed in a Parent Model.

*Can adjust in the Local model but changes are only temporary

**Levels must be turned on/off in Level Display. All Terrain Properties need to be on in the Parent Design Model in order to turn Levels on /off in the Drawing Model.

When the corresponding Drawing Model is sets to:	**Level Display**	**Level Symbology**	**References Dialog**				**Clip From Named Boundary**	**Terrain Display**
			Display	Display Style	View Attributes	Clip Reference		
Settings From Design Model	*From Parent	From Parent	*From Parent	From Parent	From Parent	Not Allowed	Allowed	All Models are Synced to Change from Properties
All Properties	From Saved View (Always) *From Parent (Never)	From Parent	Local Control	From the Saved View	From the Saved View	Not Allowed	Allowed	All Models are Synced to Change from Properties
Presentation Only	Local Control (Always) *From Parent (Never)	From Parent	Local Control	From Parent	Local Control (Flags On) From Parent (Flags Off)	Allowed	Allowed	All Models are Synced to Change from Properties
Volume Only (3D) **Clip Only (2D)**	Local Control (Always) *From Parent (Never)	From Parent	Local Control	From Parent	Local Control (Flags On) From Parent (Flags Off)	Not Allowed	Allowed	All Models are Synced to Change from Properties
None	Local Control (Always) *From Parent (Never)	From Parent	Local Control	From Parent	Local Control (Flags on) From Parent (Flags Off)	Allowed	N/A	**Properties do not function in Drawing Model

1.6.7 Controlling Levels

1.6.7.1 Controlling Levels in the Drawing Model

Drawing Model Reference level out comes with Presentation Only or Volume Only set

> ***Note:*** *The use of the command* ***File > Save Settings*** *or* ***Save Settings on Exit*** *in the* ***Child Models*** *effectively reduces the Display Overrides to just two: Always or Never. After settings are saved Allow acts just like Always.*

Always	**Never**
I want to control the level display from the **Drawing Model** Adjustments to the level display in each **Drawing Model** will be set for each specific reference attachment If I open the **Design Model** and make level display changes in that model – those changes will **NOT** be seen in my **Drawing Model** **Child Model Rules**	I want to control the level display in all Drawing Models from the **Design Model** I will set the level display up in the **Design Model** before creating Drawing Boundaries. When I need to change level displays in a **Drawing Model**, I open the **Design Model** and make the change there The **Design Model** level display will now be seen in the **Drawing Model** **Parent Model Rules**

1.6.7.2 Controlling Levels in the Sheet Model

Sheet Model Reference level out comes in with:

- Presentation Only or Volume Only set in the Drawing Model
- **Always** for Display Overrides in the **Drawing Model (CP_DWG)**

  Note: *The use of the command* ***File > Save Settings*** *or* ***Save Settings on Exit*** *in the* ***Child Models*** *effectively reduces the Display Overrides to just two: Always or Never. After settings are saved Allow acts just like Always.*

Always	**Never**
I want to control the level display from the **Sheet Model** Adjustments to the level display is set in each **Sheet Model** on a specific reference attachment If I open the **Design Model** or the **Drawing Model** and make level display changes in that model – those changes will **NOT** be seen **Sheet Model**. **Child Model Rules**	I want to control the level display in **Drawing Model** I will set the level display up in each in **Drawing Model** When I need to change level displays in a Sheet Model, I open the in **Drawing Model** and make the change there The **Drawing Model** level display will now be seen in the **Sheet Model** **Parent Model Rules**

1.6.8 Global Display vs Global Freeze

1.6.8.1 Global Display

The purpose of Global Display is to control the visibility of elements without affecting their editability.

- Turning the Display off makes the elements invisible, but they are still selectable and editable (like you can still snap to them or modify them through other commands).
- You can hide or show elements globally, but they remain active in the design.

How to Use Global Display

1. Open the Level Display Dialog
2. Turn Levels On or Off
3. In the dialog, toggle the Display checkbox for any level to show or hide elements on that level.

Useful when you want to temporarily hide clutter or elements to focus on certain parts of your drawing but still might need to work with hidden elements (like snapping or modifying them). Use this when you want to clean up your view but still want to interact with those hidden elements.

1.6.8.2 Global Freeze

The Purpose of Global Freeze is to freeze elements, so they become non-editable and non-selectable.

When you freeze elements globally, those elements are locked across the entire design file, regardless of what level or model you are working in.

- Elements on frozen levels remain visible but cannot be selected, edited, or snapped to.
- This helps protect your reference geometry or other important elements from accidental modification.

How to Use Global Freeze

1. Open the Level Display Dialog
2. In the Level Display dialog, you'll see a list of all levels in your design file.
3. You can freeze a level by clicking the Freeze column checkbox next to the level name.
4. Freezing a level globally freezes all elements on that level across all views and models.

1.6.8.3 Summary

These setting will affect how level come over in Plans Production, so it is important to understand how they react.

Global Freeze is like locking a level from editing but keeping it visible.

Globel Display off is like turning off the light in a room — you don't see the elements, but you can still interact with them if you know they're there.

	Effect on Elements	**Visibility**	**Editability**	**Typical Use Case**
Global Freeze	Locked, non-editable	Visible	Not editable	Protect elements from edits
Global Display	Visible or hidden	Visible or hidden	Editable	Temporarily hide elements

1.6.9 New Levels

MS_REF_NEWLEVELDISPLAY is a variable that controls whether you automatically see additional information on previously unused levels in any reference file – direct attachment or nested reference. In the CTDOT WorkSpace, this variable is set to true. It is critical for new information drawn in a design to automatically be shown in the sheet. When designers update their source data, and use new levels, that information will automatically display in the assembled sheets.

Section 2 - General Workflows

2.1 Startup

Before attempting to open or create DGN files users should make sure the following is in place:

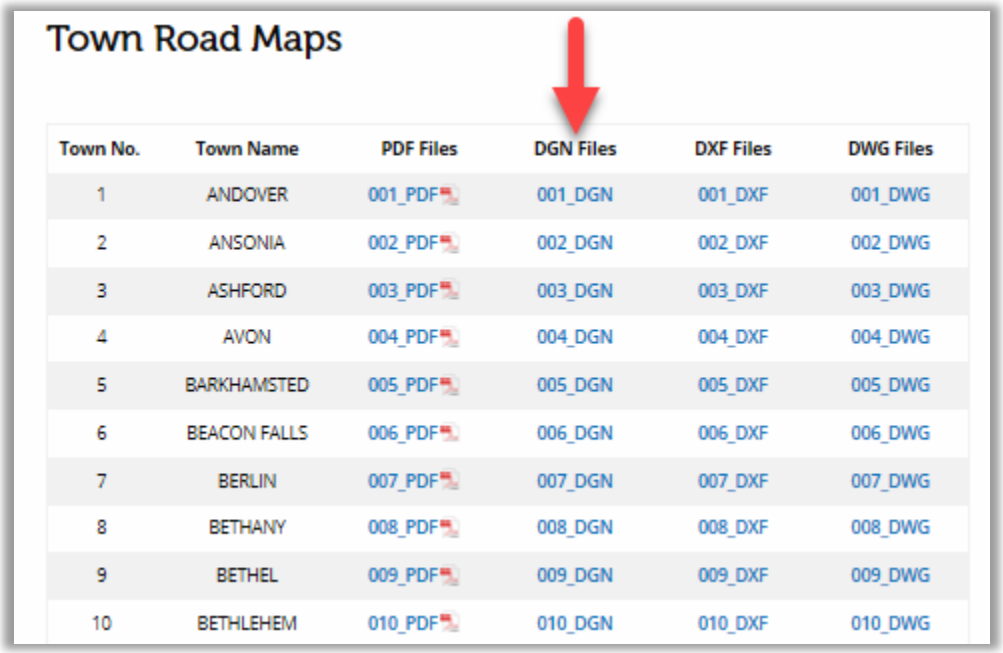
1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**
4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenX Applications through Accounting or the Customized Icon following
6. On the OpenX Splash Screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.

2.2 Assembling the General Subset

2.2.1 Town Road Maps

Before the Project Title Sheet is created, the Town Road (TRU) Map(s) for the town(s) where the project is located needs to be copied into the Project Container (WorkSet folder).

1. These Maps can be found on CTDOT's Website, Town Road Maps Page.
2. Locate the town(s) needed for your project and download the required DGN File(s) to your project directory under ***... \| Share***. All Design and Survey Units have access permission to this folder. This central storage location will prevent multiple copies of the same maps and images in a project container. Any acquired files from Google Maps, Aerial Images, LiDAR Data or other resources should also be stored in this folder.



Town Road Maps

Town No.	Town Name	PDF Files	DGN Files	DXF Files	DWG Files
1	ANDOVER	001_PDF	001_DGN	001_DXF	001_DWG
2	ANSONIA	002_PDF	002_DGN	002_DXF	002_DWG
3	ASHFORD	003_PDF	003_DGN	003_DXF	003_DWG
4	AVON	004_PDF	004_DGN	004_DXF	004_DWG
5	BARKHAMSTED	005_PDF	005_DGN	005_DXF	005_DWG
6	BEACON FALLS	006_PDF	006_DGN	006_DXF	006_DWG
7	BERLIN	007_PDF	007_DGN	007_DXF	007_DWG
8	BETHANY	008_PDF	008_DGN	008_DXF	008_DWG
9	BETHEL	009_PDF	009_DGN	009_DXF	009_DWG
10	BETHLEHEM	010_PDF	010_DGN	010_DXF	010_DWG

Figure 51 - Town Road Maps Web Page

2.2.2 Title Sheet

The Title Sheet is the cover page for all Connecticut Department of Transportation (CTDOT) Capital Projects Plan Sets. The title sheet identifies the subsets of plans, conveys the general type of work planned, and locates the project within the State.

The title sheet includes:

- Project Title
- Town(s) and/or City(s)
- Route Number and Length
- F.A.P. Number
- Project Number
- Connecticut Map & Town Map
- Location Plan
- List of Subsets
- Signature Fields
- Total number of plan sheets

It is important that the Title Sheet is created early in the design process, so it can be attached to concept plan sets, preliminary plan sets and all other required/needed plan sets. The title sheet should be kept up to date at all times. The signature fields are not required until FDP submittal or as required by the Digital Project Development Manual (latest version). The title sheet is standardized, and no modifications should be made other than as described in the steps below.

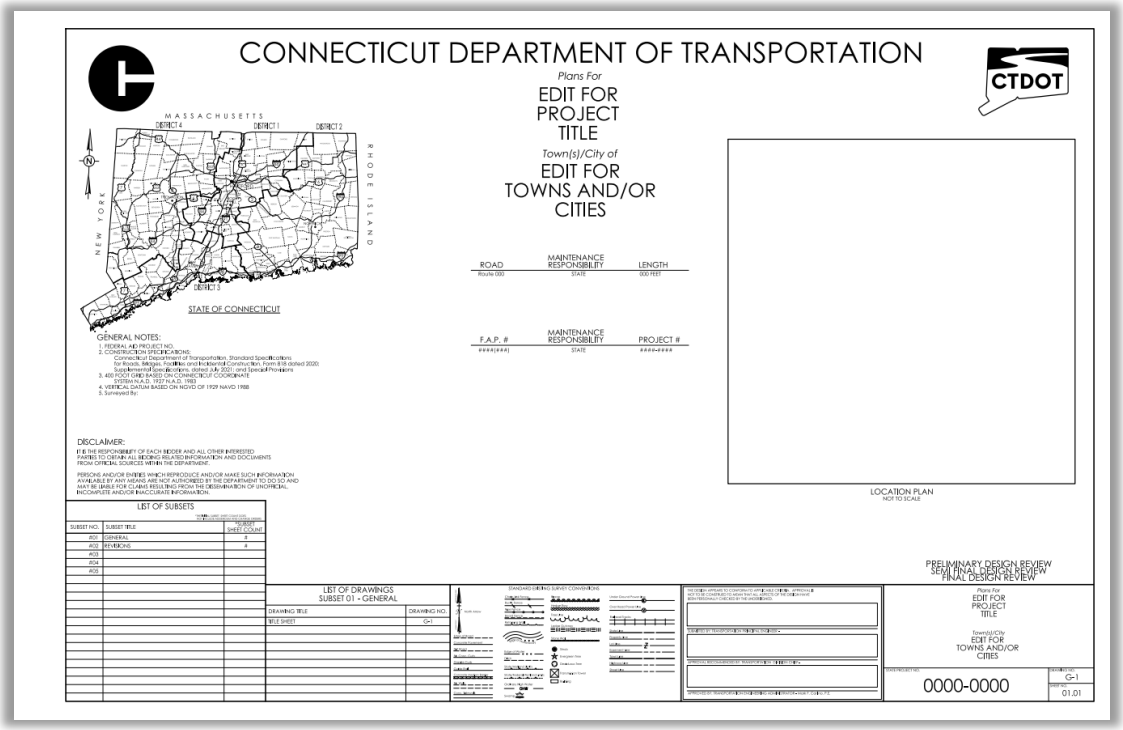


Figure 52 – PDF Blank Title Sheet

The Title Sheet for each project is created by the lead discipline (unit). The lead unit is responsible to create the Title Sheet and assign the Subset numbers for each of the disciplines. Subset numbers 01 & 02 are reserved for General and Revisions respectively. The next subset number 03 is for the lead unit. Other subset numbers follow as needed. The lead discipline's project engineer should notify the other disciplines of the subset numbers assigned.

1. To create a project title sheet, click on the **New File** icon. Click on the **Browse** button to select the CTDOT Title Sheet dgn seed file.

   …\CT_Configuration\Organization\Seed\CTDOT_Title_Sheet_Seed.dgn

2. Browse to the location you would like to save the file to and type in the file name using the DDE file naming convention ***HW_CP_1234_1234_GeneralSubset.dgn***

   Click on **Save**.

3. **Fit View** when the new title sheet file opens.

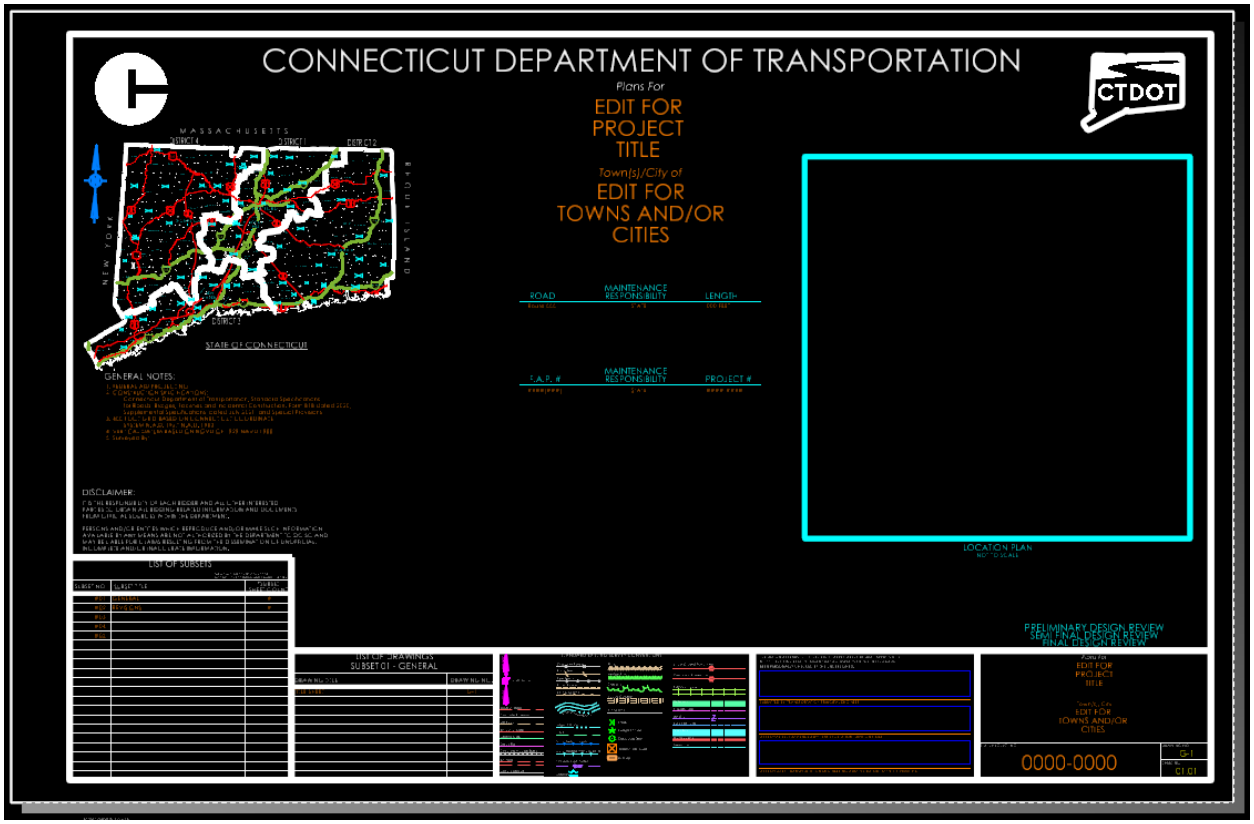


Figure 53 - DGN Blank Title Sheet

4. Use the **Text Edit** command to edit the following Orange text:

   - Project Title
   - Town Name in the center of the sheet and in the bottom right box.
   - General notes

- Add the F.A.P. #
- Update the specification form and supplement year as needed.
- Delete either NAD 1927 or NAD 1983.
- Delete either NGVD 1929 or NAVD 1988.
- For Surveyed by: list the surveyor of record (examples - District 1 or ABC Company)

Turn off the levels for items not needed, such as preliminary or semi-final design review, etc. Levels can be turned off using Off By Element in the Level Display dialog box or can be deleted. The top Maintenance Responsibility notes should be used primarily by Highway the bottom by Traffic.

5. Location Plan
   - The District Maps shown in the Location Plan area are used for Signal projects. They can be turned off in the References dialog box.
   - All other project types will have the TRU Maps in the Location Plan Box.
     - To place the TRU Map first turn off the district maps references and then reference in the TRU map(s) that were copied into your project directory – Shared_Rasters folder.
     - Move, scale, clip to show the location of your project area. Turn off un-needed levels.
     - Clip this Reference file - Use the Location Plan Shape for the clipping Boundary Element. Annotate as needed.
     - The location map should be scaled so road names etc. can be read. Place a circle to mark the project location.

Figure 54 – Location Plan Are

Optional Step - A town map can be placed under the Maintenance Responsibility note as required by the Project Engineer. Reference in the TRU map(s), move and scale to fit the whole town map. Turn Off unneeded levels and annotate as needed.

6. To shade Towns, make the MAP_Town_Shade level active. Use the **Create Complex Shape** Tool and select the needed town boundary lines.

7. Consultant designed projects shall not include the disclaimer located above the signature block. This shall be deleted.

8. Consultants will need to delete the CTDOT signature blocks on the title sheet and place a digital signature placeholder as detailed in the Digital Project Development Manual.

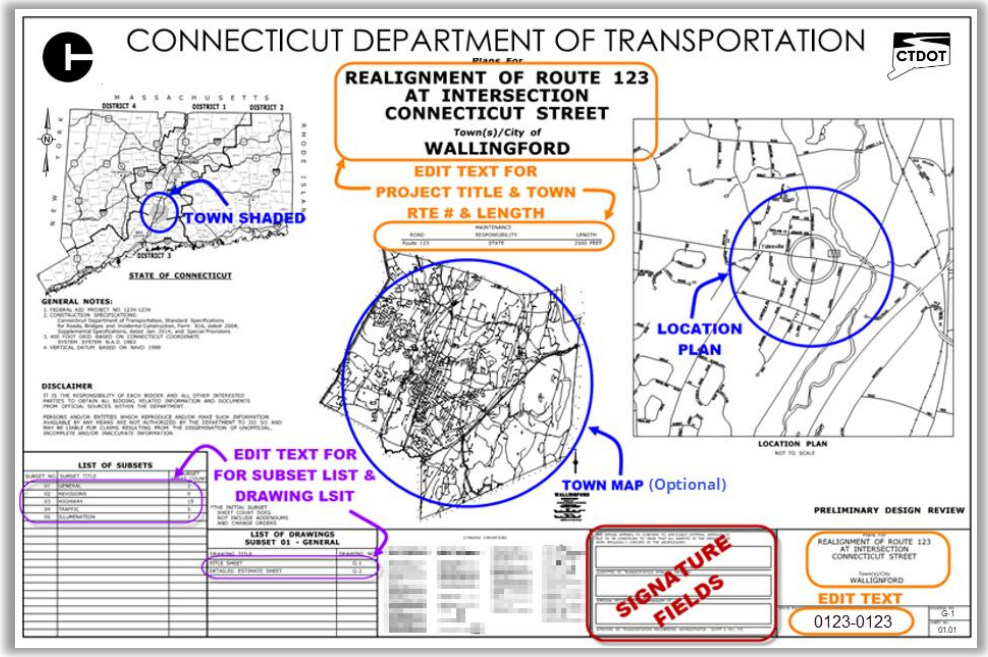


Figure 55 - PDF Title Sheet Overview

2.2.3 Additional Location Plan Sheets

The location plan depicts the approximate area(s) of the project location(s). In most cases the location plan(s) will fit on the title sheet. Additional space will be needed for the Location Plan(s) when a project has multiple locations, towns or is extra-long. The additional location Plans will be placed on contract sheets directly after the Title Sheet as part of the General Subset for the project.

1. To house the needed Location Plans, create additional 2D Sheet Models in the ***General Subset dgn.***
2. Place the regular Contract Border Cell to line up with the transient shape.
3. Reference in the TRU map(s) for the project.
4. Move, scale, clip to show the location of your project area. Turn off un-needed levels. Clip this Reference file and annotate as needed. The location map should be scaled so road names etc. can be read.
5. Place a **Circle** to mark the project location or On the CTDOT Workflow, CTDOT Tab use the **notes Begin** and **End** to show the limits of the project, include a North Arrow to orient the viewer. You can also thicken or draw a line to better show the project limits.
6. Repeat steps 3-5 as needed adding additional location plans or go back to step 1 to add additional contract sheet models.

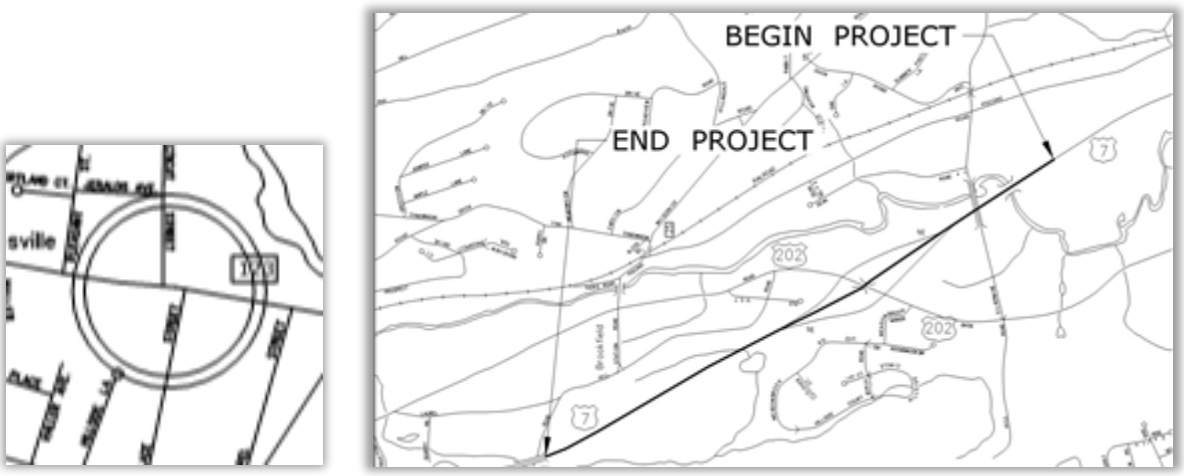
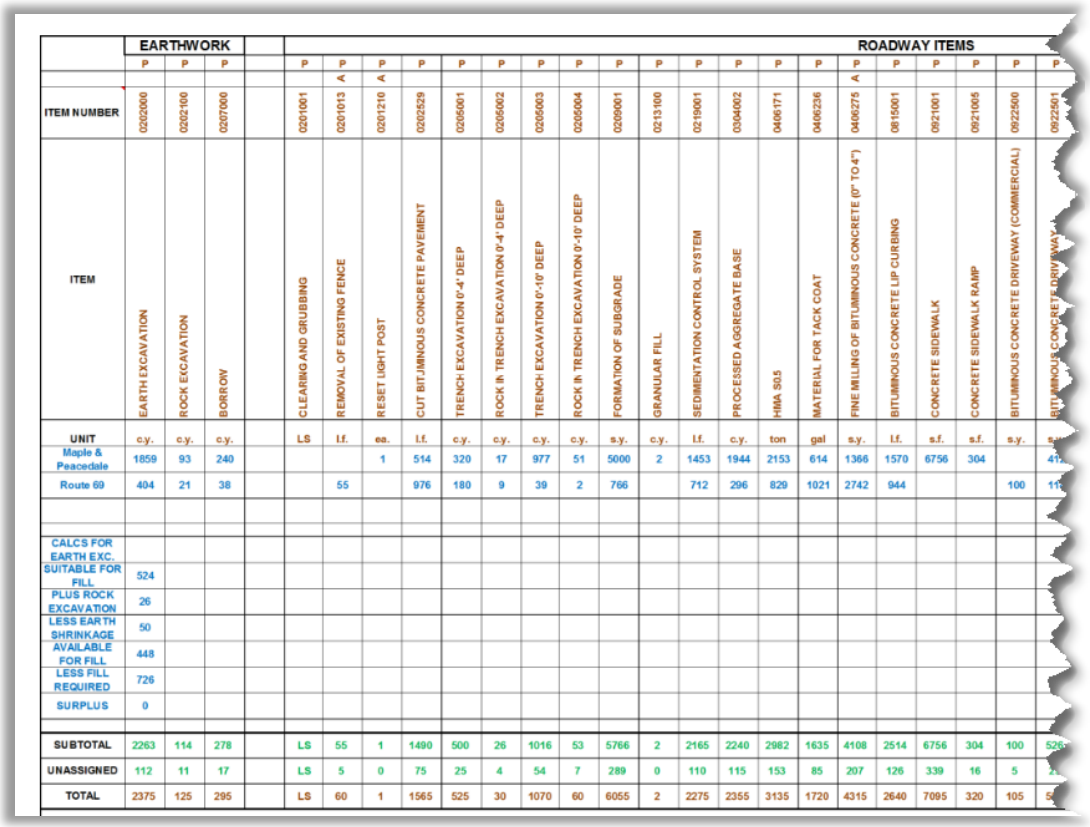


Figure 56 – Title Sheet Annotation

7. **Fill** in the contract border title blocks, use Location Plan as Drawing Title; include these sheets in the general subset under the list of drawings.

2.2.4 Detailed Estimate Sheets

The Detail Estimate Sheets are part of the digital contract plans under the General Subset and it contains all the pay items and quantities associated with the construction cost of a project. The lead designer will create the detail estimate sheet models and will attach or reference in the detail estimates from the other disciplines.



	EARTHWORK			ROADWAY ITEMS																			
	P	P	P	P	A	A	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P
ITEM NUMBER	0202000	0202100	0207000	0201001	0201013	0201210	0202529	0205001	0205002	0205003	0205004	0209001	0213100	0219001	0304002	0406171	0406236	0406275	0615001	0621001	0621005	0922500	0922501
ITEM	EARTH EXCAVATION	ROCK EXCAVATION	BORROW	CLEARING AND GRUBBING	REMOVAL OF EXISTING FENCE	RESET LIGHT POST	CUT BITUMINOUS CONCRETE PAVEMENT	TRENCH EXCAVATION 0'-4' DEEP	ROCK IN TRENCH EXCAVATION 0'-4' DEEP	TRENCH EXCAVATION 0'-10' DEEP	ROCK IN TRENCH EXCAVATION 0'-10' DEEP	FORMATION OF SUBGRADE	GRANULAR FILL	SEDIMENTATION CONTROL SYSTEM	PROCESSED AGGREGATE BASE	HMA S0.5	MATERIAL FOR TACK COAT	FINE MILLING OF BITUMINOUS CONCRETE (0" TO 4")	BITUMINOUS CONCRETE LIP CURBING	CONCRETE SIDEWALK	CONCRETE SIDEWALK RAMP	BITUMINOUS CONCRETE DRIVEWAY (COMMERCIAL)	BITUMINOUS CONCRETE DRIVEWAY
UNIT	c.y.	c.y.	c.y.	LS	l.f.	ea.	l.f.	c.y.	c.y.	c.y.	c.y.	s.y.	c.y.	l.f.	c.y.	ton	gal	s.y.	l.f.	s.f.	s.f.	s.y.	s.
Maple & Peacedale	1859	93	240			1	514	320	17	977	51	5000	2	1453	1944	2153	614	1366	1570	6756	304		41
Route 69	404	21	38		55		976	180	9	39	2	766		712	296	829	1021	2742	944			100	11
CALCS FOR EARTH EXC.																							
SUITABLE FOR FILL	524																						
PLUS ROCK EXCAVATION	26																						
LESS EARTH SHRINKAGE	50																						
AVAILABLE FOR FILL	448																						
LESS FILL REQUIRED	726																						
SURPLUS	0																						
SUBTOTAL	2263	114	278	LS	55	1	1490	500	26	1016	53	5766	2	2165	2240	2982	1635	4108	2514	6756	304	100	526
UNASSIGNED	112	11	17	LS	5	0	75	25	4	54	7	289	0	110	115	153	85	207	126	339	16	5	27
TOTAL	2375	125	295	LS	60	1	1565	525	30	1070	60	6055	2	2275	2355	3135	1720	4315	2640	7095	320	105	553

Figure 57 – Detailed Estimate Sheet

1. Use Excel to enter your detailed estimate information (Pay Items should be listed along the top, Sections on left most column and Totals on the bottom, seethe image above as an example). Make note of the range of information needed to be brought into each DGN model. Example: A1 to H20. Request that the support units do the same and send you a link to their excel files.
2. To house the needed Detailed Estimate Sheets in CAD, create additional 2D Sheet Models in the ***General Subset dgn.*** One for each sheet needed including those from the support disciplines.
3. Place the regular Contract Border Cell to line up with the transient shape.
4. On the **Annotate Tab** select **Place Table**. For Seed choose **From Excel**. Make sure **Retain Association** is toggle on. Browse out the needed excel file. Choose the

correct **Worksheet** and set the **Range** to ***Manual.*** Set the **From/To** ranges and follow the prompts to place the linked table.

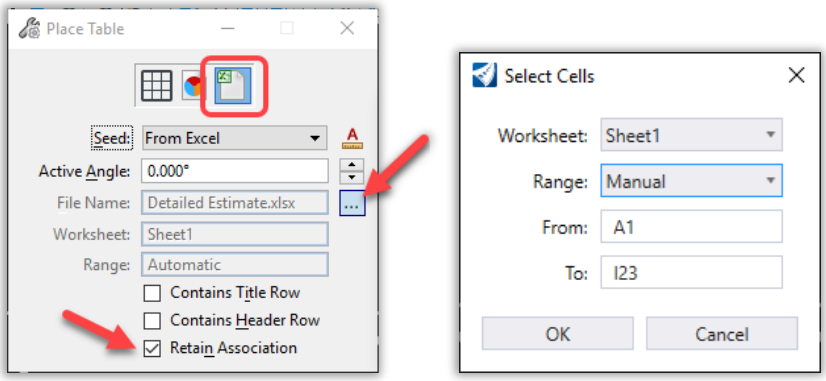


Figure 58 – Attaching an Excel Sheet

5. **Fill** in the contract border title block, use Detailed Estimate as Drawing Title; include these sheets in the general subset under the list of drawings.
6. Repeat for each 2- 5 for each sheet needed.
7. When printing select **Monochrome** as printing color.

Place Table from Table Seed

The CONNECT Edition provided the feature of creating tables in your DGN files. The CTDOT DDE provides standard templates that your tables should follow, users can apply them while placing tables in models. This feature is called Table Seed.

The table seed displays in the Seed drop-down list of the Place Table tool settings window.

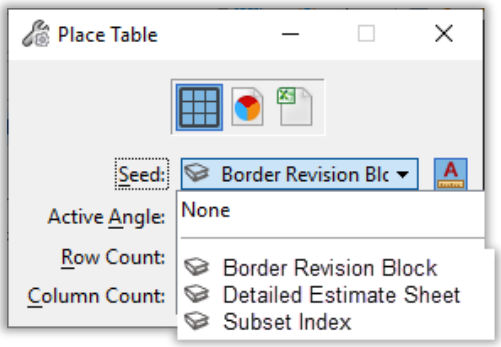


Figure 59 – Table From Seed

Please Note: The Table Seed for the Detailed Estimate Sheet is not yet available in the DDE. This will be added into the next release of the CTDOT CONNECT DDE.

1. Each disciple will create a DGN file to house the Detailed Estimate Tables. Create a Design Model for each table needed and use the Place Table tool in each model. Fill in the Table as needed.
2. These tables will be reference in models in the General Subset dgn. In the General Subset dgn create additional 2D Sheet Models, one for each table needed, including those from the support disciplines. Reference in the tables creating in step 1.
3. Place the regular Contract Border Cell to line up with the transient shape.

2.3 Index of Revisions Sheet

The Index of Revisions sheet(s) for each project is created and maintained by the lead discipline (unit).

1. To create a Revision Index sheet, within OpenRoads, OpenBridge, OpenBuildings, or OpenRail click on the **New File** icon.
2. Click on the **Browse** button to select the Revision Sheet dgn seed file.***...\|CT_Configuration\|Organization\|Seed\| CTDOT_02_Revisions_Sheet_Seed.dgn***
3. Browse to the location you would like to save the file to and type in the file name using the DDE file naming convention. Example: ***HW_CP_1234_1234_RevisionsSheet.dgn***
4. Click on **Save**.
5. Enter the Title Block Information as instructed in the section: Section 1 - Introduction
6. Select the edit text tool and click in the table to add text.Below is a description of each column:

   1\| Enter the Addendum or Design Initiated Change Order Revision #.

   2\| Enter the revised or new sheet number.

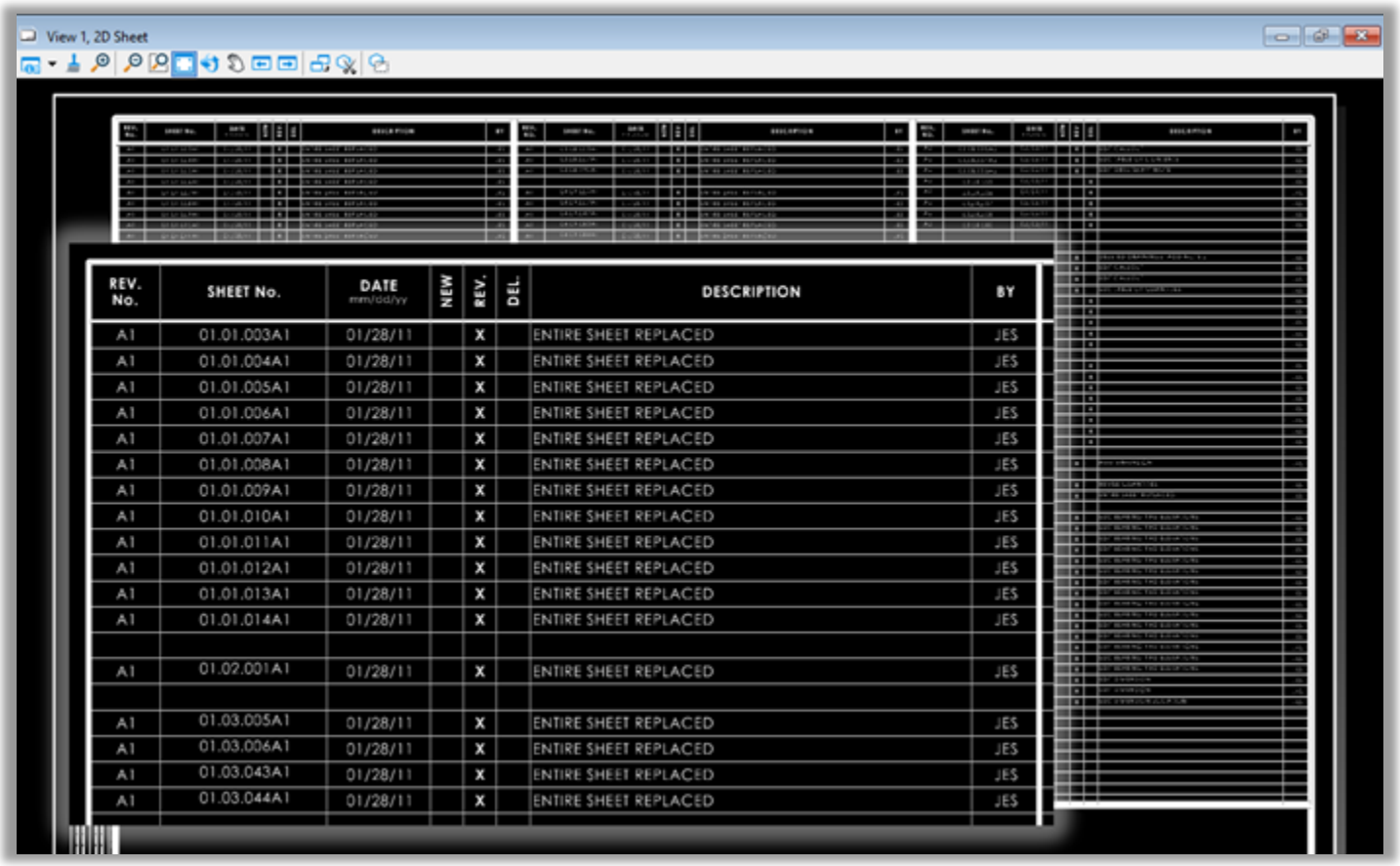
   3\| Enter the Date mm/dd/yy

   4\| 5\| 6\| Enter a Bold Capital **X** in the appropriate box per row to describe the action taken, new sheet, revised sheet, or sheet deleted.

   7\| Enter a brief description that is like the description on the actual sheet being revised.

   Note: The Engineer is not required to input changes numerically by Sheet No. If another changed sheet is added to an Addendum in the eleventh hour, it can be placed at the bottom of the list on the "Index of Revisions Subset".
7. On the **CTDOT** Workflow, **CTDOT** tab in the **Publishing** section, select ***Print\|Browse to Print***.
8. Select the desired location to save the file.When complete move the PDF file to the project's ***Contract Documents / 100 Contract Plans*** folder.
9. Now proceed with Bluebeam tools to:
   - be digitally signed
   - add the Sheet Numbers
   - place the ADP/DICO # stamp
10. Use the same DGN file to add Addendum or Design Initiated Change Order Revision # lines, keeping the old lines intact.

11. If you have filled the sheet create another file new ***HW_CP_1234_1234_RevisionsSheet2.dgn*** and repeat the steps above.



REV. No.	SHEET No.	DATE mm/dd/yy	NEW	REV.	DEL.	DESCRIPTION	BY
A1	01.01.003A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.004A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.005A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.006A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.007A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.008A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.009A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.010A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.011A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.012A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.013A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.01.014A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.02.001A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.03.005A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.03.006A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.03.043A1	01/28/11		X		ENTIRE SHEET REPLACED	JES
A1	01.03.044A1	01/28/11		X		ENTIRE SHEET REPLACED	JES

Figure 60 - Index of Revisions Sheet

2.4 Discipline Subset Cover Sheet / Index of Drawings

1. To create a Subset cover sheet, within OpenX products click on the **New File** icon.
2. Click on the **Browse** button to select the CTDOT Cover Sheet dgn seed file.

   …\|CT_Configuration\|Organization\|Seed\|CTDOT_State_Cover_Sheet_Seed.dgn

   or

   …\|CT_Configuration\|Organization\|Seed\|CTDOT_Consultant_Cover_Sheet_Seed.dgn
3. Browse to the location you would like to save the file to and type in the file name using the DDE file naming convention ***HW_CP_1234_1234_SubsetCoverSheet.dgn***
4. Click on **Save**.
5. The file will open with the Drawing Title and Drawing Number filled in. In the Models Property Dialog Box Sheet Number Field edit the Drawing Number Prefix as needed for the specific disciple.
6. Click on the Index of Drawing Table and fill in the needed information. Edit the Table Title Header with the corresponding Subset Number and Discipline Name. Edit the Index Prefix to match the Drawing Number Prefix if it was changed in the Title Block (step 3).

SUBSET NUMBER - DISCIPLINE
INDEX OF DRAWINGS

DRAWING NUMBER	DRAWING TITLE	DRAWING NUMBER	DRAWING TITLE
INX-01	INDEX OF DRAWINGS	LDS-01 - LDS-02	LANDSCAPE SHEETS
TYP-01 - TYP-03	TYPICAL SECTIONS	PLN-01 - PLN-03	CONSTRUCTION PLAN SHEETS
MDS-01 - MDS-05	MISCELLANEOUS DETAILS	PRO-01 - PRO-03	PROFILE SHEETS
DGS-01 - DGS-10	DRAINAGE GUIDE SHEETS	XSC-01 - XSC-50	CROSS SECTION SHEETS
BOR-01 - BOR-02	BORING LOGS	STG-01 - STG-02	TYPICAL SECTIONS AND DETAILS - TEMPORARY ROADWAYS
ALN-01 - ALN-03	ALIGNMENT / ROW BREAKOUT PLANS	STG-03 - STG-04	ALIGNMENT PLANS - TEMPORARY ROADWAY
IGP-01	INTERSECTION GRADING PLAN	STG-05 - STG-11	PLAN SHEETS - TEMPORARY ROADWAYS
CURB-01	CURBING PLAN	STG-12 - STG14	PROFILE SHEETS - TEMPORARY ROADWAYS
DRG-01 - DRG-03	DRAINAGE PLANS	STG-15 - STG-28	CROSS SECTION SHEETS - TEMPORARY ROADWAYS

Figure 61 - Discipline Subset Cover Sheet / Index of Drawings

7. Insert Rows as needed.

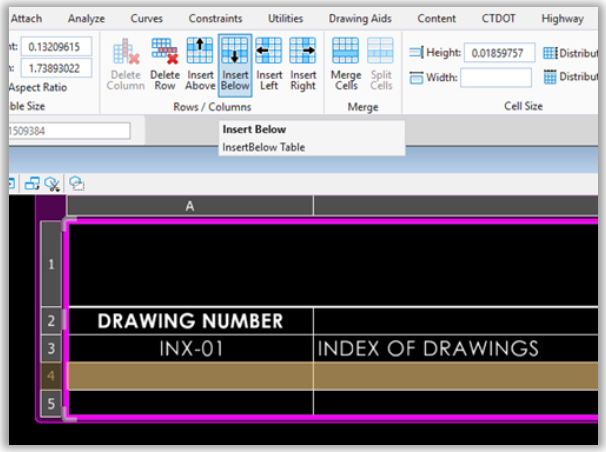


Figure 62 – Insert Rows

8. The Signature Block is located in the bottom right of the sheet and will be signed in the PDF.

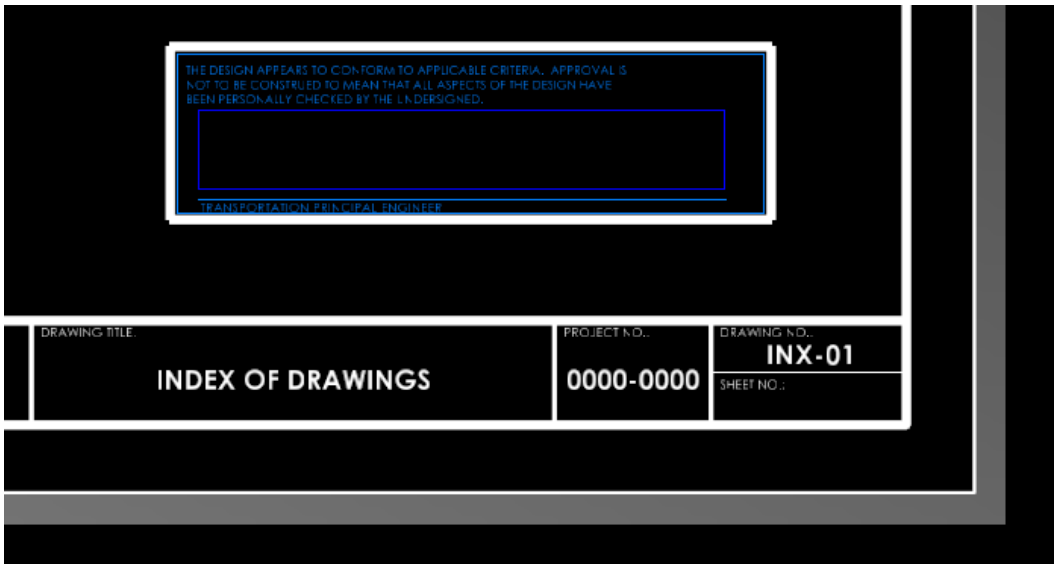


Figure 63 - State Design Cover Sheet Seed Signature Block

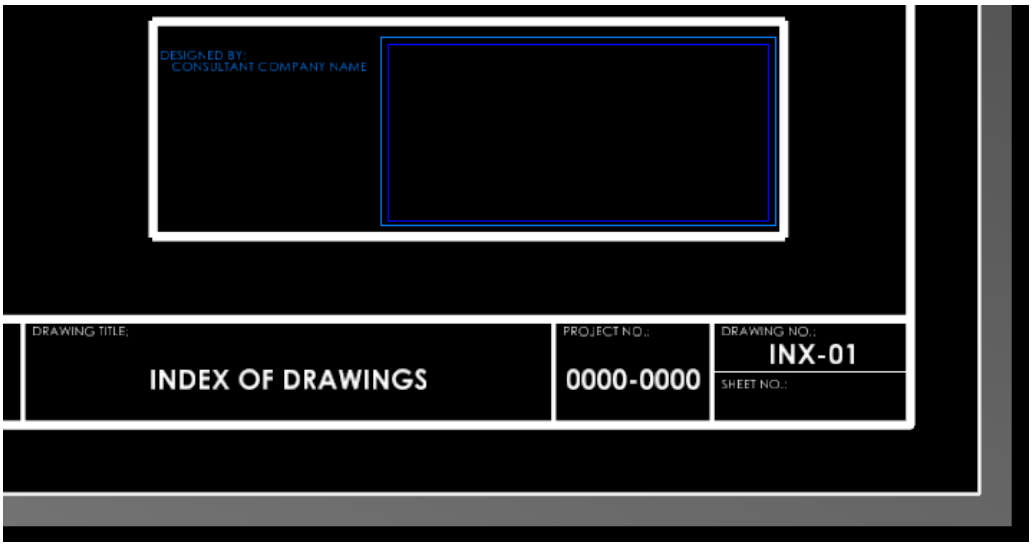


Figure 64 - Consultant Cover Sheet Seed Signature Block

Section 3 - Creating Detail Sheets

Introduction to Productivity Tools

Option 1 – Auxiliary Scale Detailing

Multiple details draw directly on a sheet at different scales.

Use this workflow to have several details drawn directly on a sheet and have each one drawn using its own scale. This will allow users to work in one model when detailing and not have to switch out and manage multiple models.

Users will work in a 2D Sheet Model at full scale and select **Auxiliary Scales** to work on different details. Users will dimension and annotate each detail in the Sheet Model.

Option 2 – Base Graphics Detailing

Reusing base graphics on multiple details at different scales.

Use this workflow to have base graphics re-used in multiple details. This method will have users draw base graphics in a Design Model, then reference those same graphics into a sheet model for different details. The details in the design model can be referenced into the sheet several times using different scales as needed. Users will dimension and annotate each detail in the Sheet Model.

The productivity tools can be found on the CTDOT Workflow, on the Alt Detailing Tab.

The Scaled Dimension section will be used when dimensioning each detail. Pull down menus are provided for dimensions using both 120 and 080 text sizes. Each pull down menu has tools that will set the needed Auxiliary Scale. There are also tools for Call Outs, Notes, Detail Titles and Scales in the Annotation section.

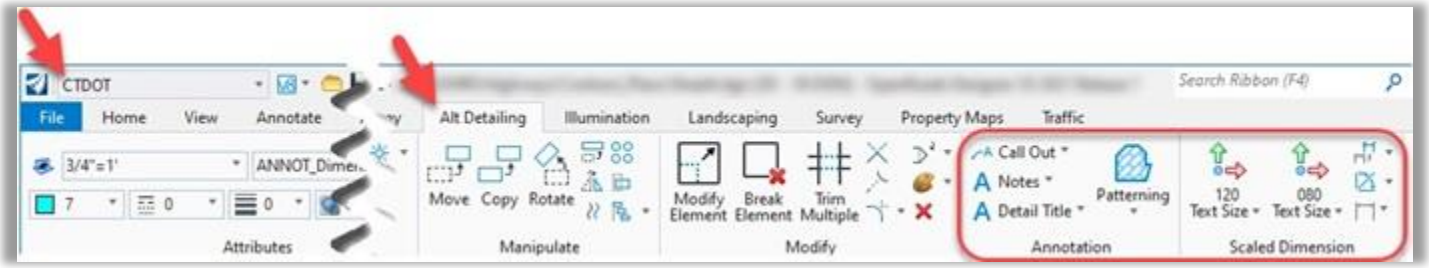


Figure 65 – Alt Detailing

What does each Aux Scale tool trigger?

Selecting the **Scaled Dimension** section **120 Text Size/Aux Scale 3/4" = 1'**, changes the ACS Scale and Element Template, which has an assigned Text Style, Dimension Style and Level.

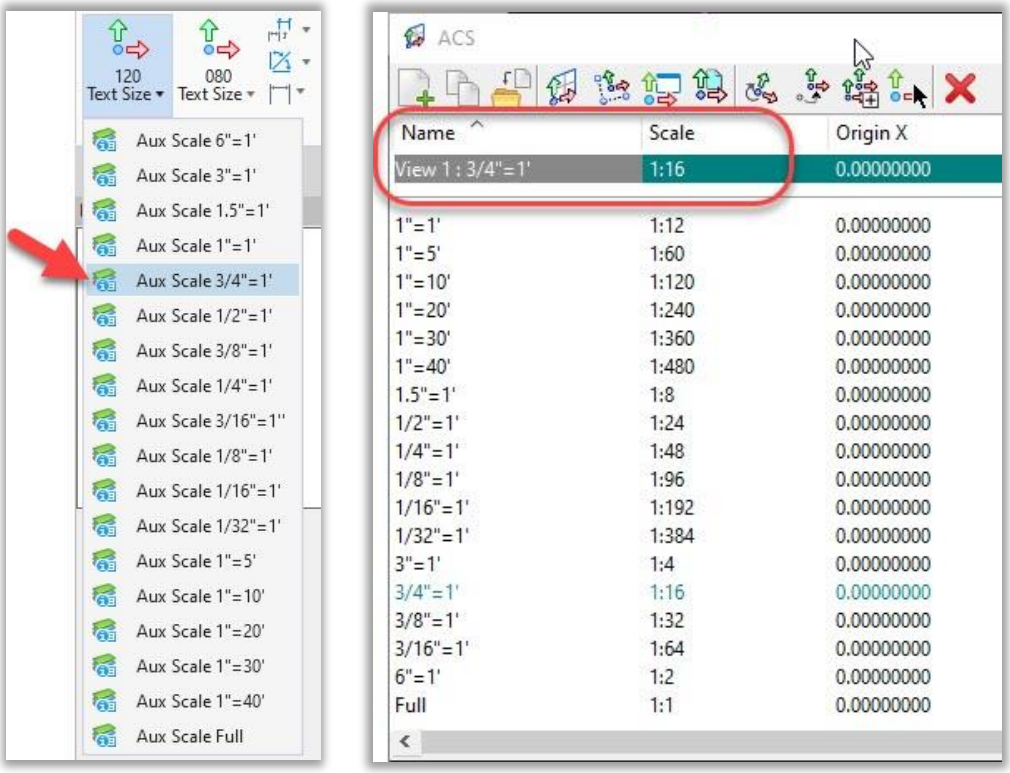


Figure 66 –Detailing

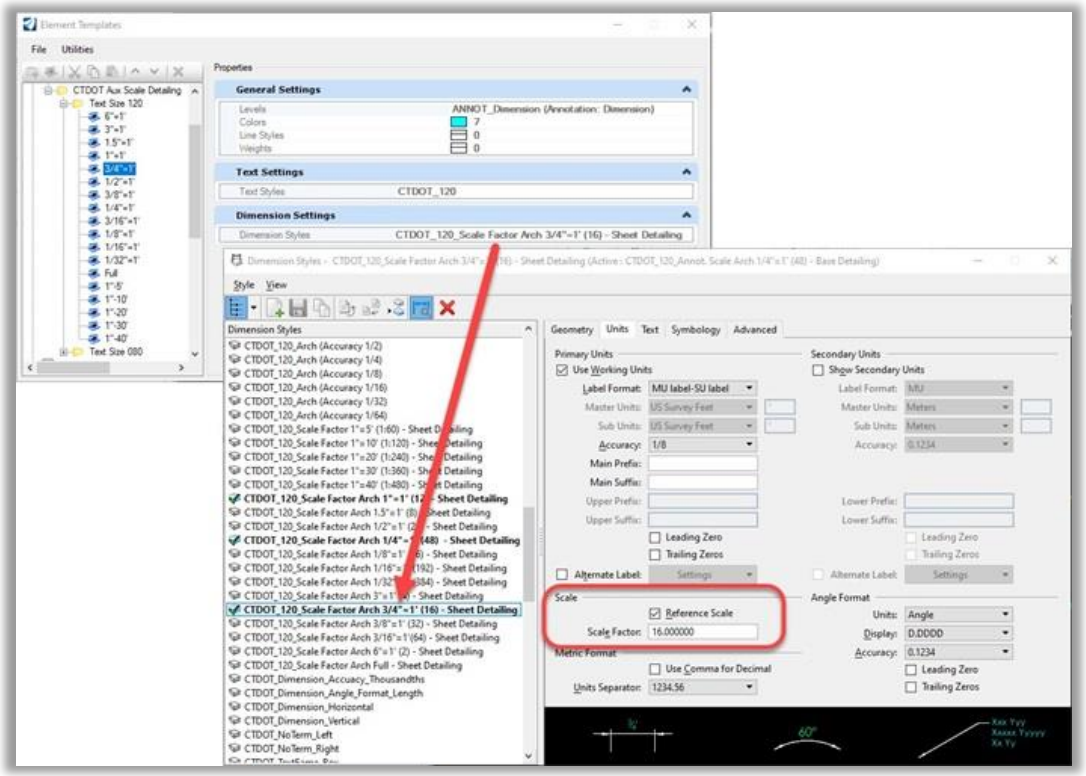


Figure 67 - Detailing

3.1 Startup

Before attempting to open or create DGN files users should make sure the following is in place:

1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**
4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenRoads through Accounting or the Customized Icon following
6. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.

3.2 Auxiliary Scale Detailing Workflow

1. Create a file using the corresponding seed file.
2. **Note:** If there is already a dgn file created for other detail sheets, users should import the Sheet Model from one of the seed files below. There are ACS Scales in these models that will be needed when using the productivity tools.

   OpenRoads
   …\|Organization\|Seed\|Road\|Seed2D - CT RoadSheet-Alt Detailing.dgn
   OpenRail
   …\|Organization\|Seed\|Rail\|Seed2D - CT RoadSheet-Alt Detailing.dgn

   OpenBuildings
   …\|Organization\|Seed\|Buildings\|Seed2D - CT BuildingsSheet-Alt Detailing.dgn

   OpenBridge
   …\|Organization\|Seed\|Bridge\|Seed2D - CT BridgeSheet-Alt Detailing.dgn
3. Click on the **Models** icon and open the Sheet Model. Ensure that the ACS Plane Lock is enabled, on the Models Dialog select and highlight the **Sheet Model** and in the **Properties** dialog box make sure **Locks \ ACS** Plane is set to **True**.

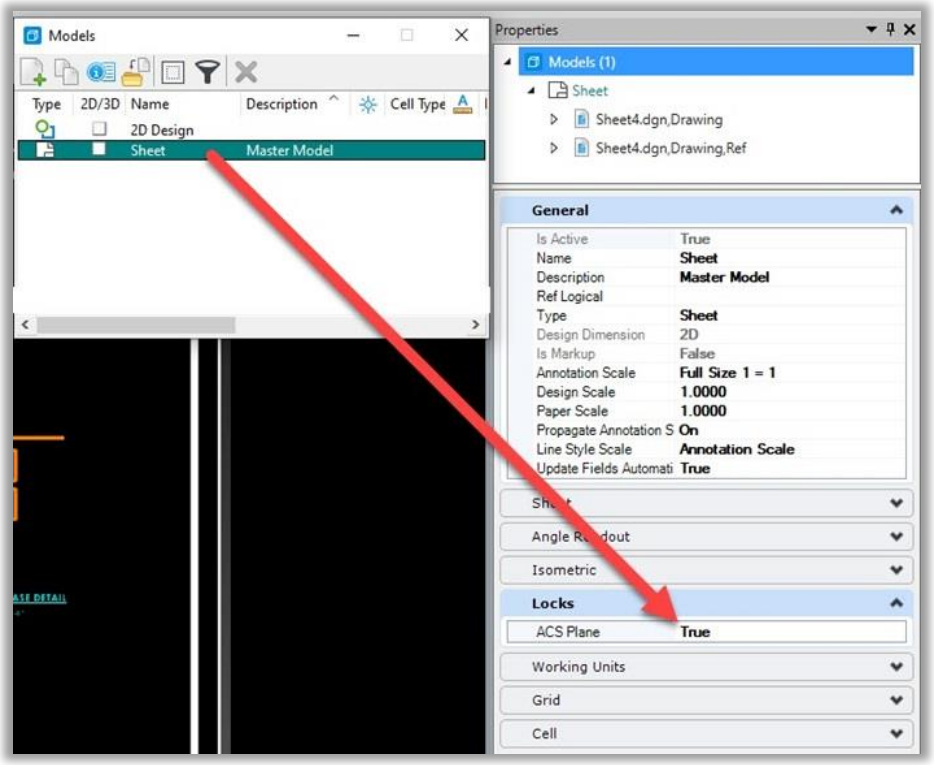


Figure 68 – Alt Detailing

4. Select the **CTDOT** workflow and click on the **Alt Detailing** tab.
5. In the **Annotation** section click on the **Detail Title** pull down and select the desired scale for the detail. Place the Cell inside the sheet border and edit the ***Title*** text as needed.
6. In the **Scaled Dimension** section select either **120 Text Size** or **080 Text Size**, then proceed to pick your **Aux Scale** tool.
7. Inside the sheet draw the detail above the title using the Placement Tools.
8. To Dimension be sure to pick the corresponding **Aux Scale** tool again just to be sure the settings did not get changed while drawing the detail.
9. Use the **Call Out** and **Notes** tools to finish annotating.
10. Repeat 3-9 selecting a different scale, notice the dimensions work properly as they are based of the ACS Scale.
11. Save Settings.

3.3 Base Model Detailing Workflow

1. In the same file created in the Auxiliary Scale Detailing Workflow open the **Design Model**. Proceed to draw the line work for the Detail at full scale.
2. When the line work is complete open the **Sheet Model**. Click on the **Models** icon and open the Sheet Model. Ensure that the ACS Plane Lock is enabled, on the Models Dialog select and highlight the **Sheet Model** and in the **Properties** dialog box make sure **Locks \ ACS** Plane is set to **True**.

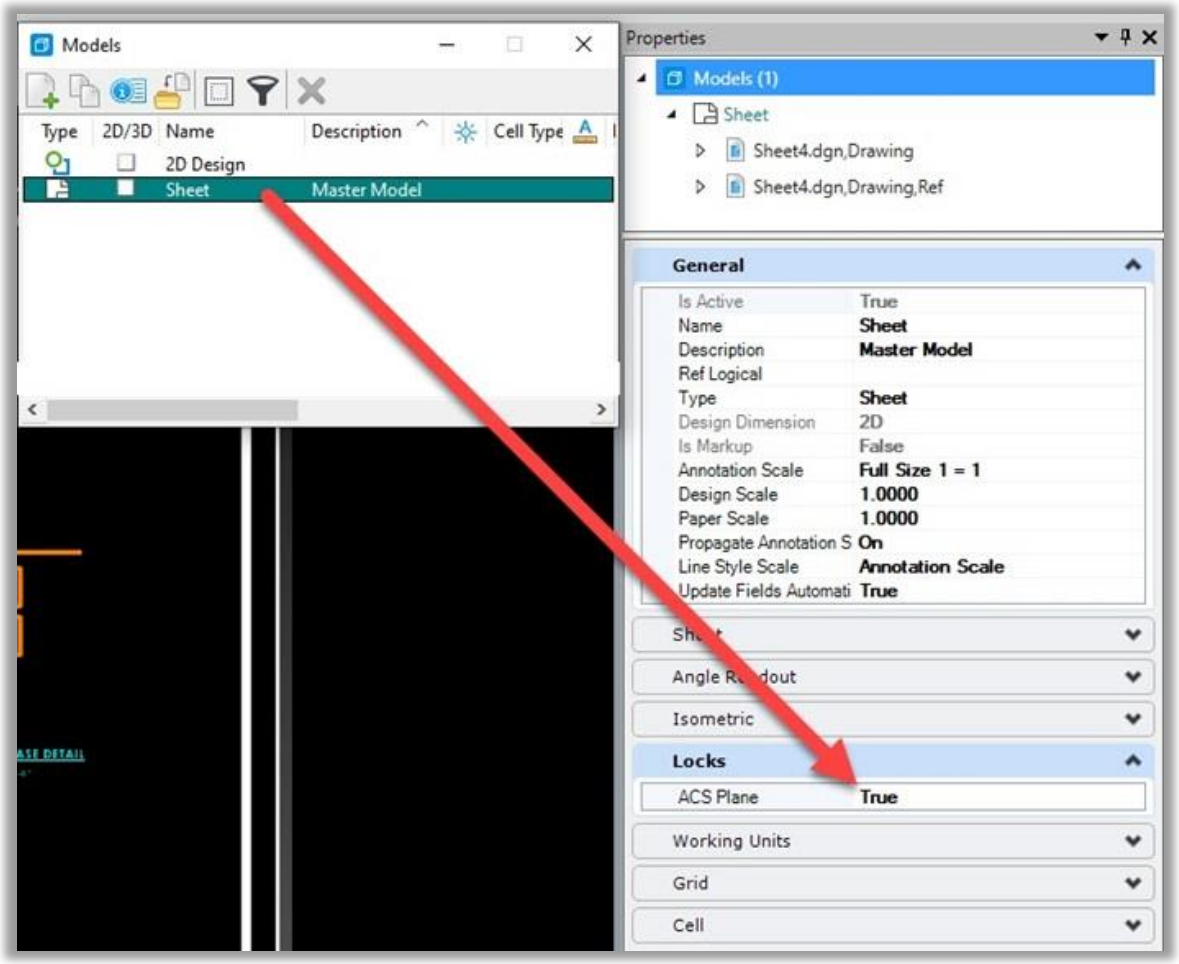


Figure 69 ASC Plane Lock

3. Click on the **Annotate** tab, in the **Detailing** section select to the **Detailing Symbols Styles** dialog box. Right click on the **Center Style** option and select **Activate**.

Figure 70 – Activate Detailing Symbol Style

4. Reference in the **Design Model** using the following settings:
   - Model: Select the Design Model
   - Orientation: Standard Views > Top
   - Detail Scale: Set as needed
   - Name: Name the Detail
5. Select **OK** and place the reference inside the Sheet Border.
6. Clip the Reference file Boundary as needed.
7. To Dimension access the **Scaled Dimension** section, select the desired **Text Size** pull down and pick the **Aux Full Scale** tool.
8. Use the **Call Out** and **Notes** tools to finish annotating.

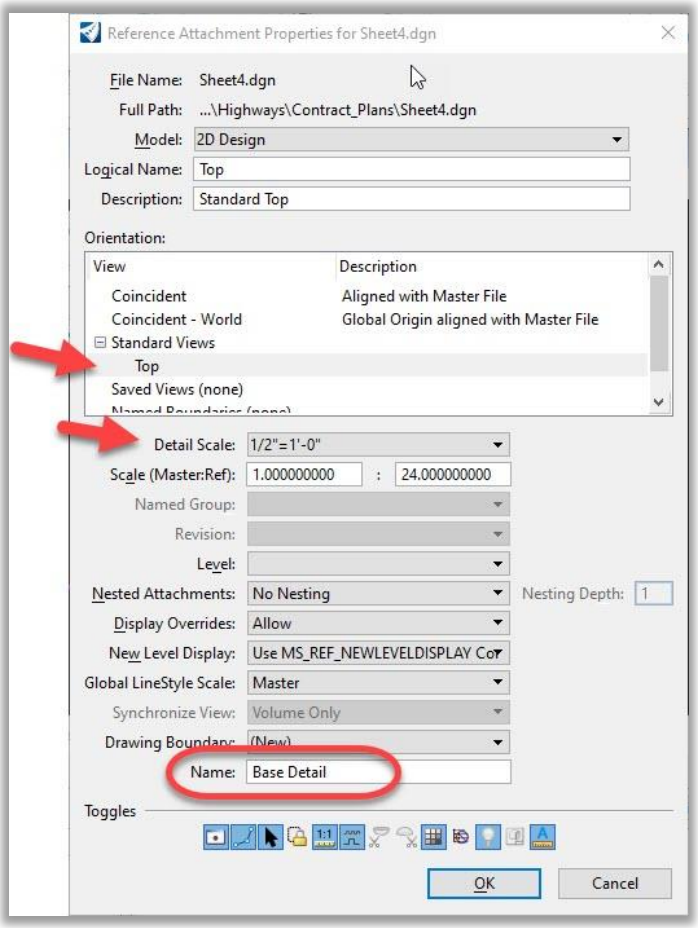


Figure 71 - Referencing

9. Open the **References** dialog box, click on the **Design Model** Reference File make the option for **Treat Attachment as Element for Manipulation** active.

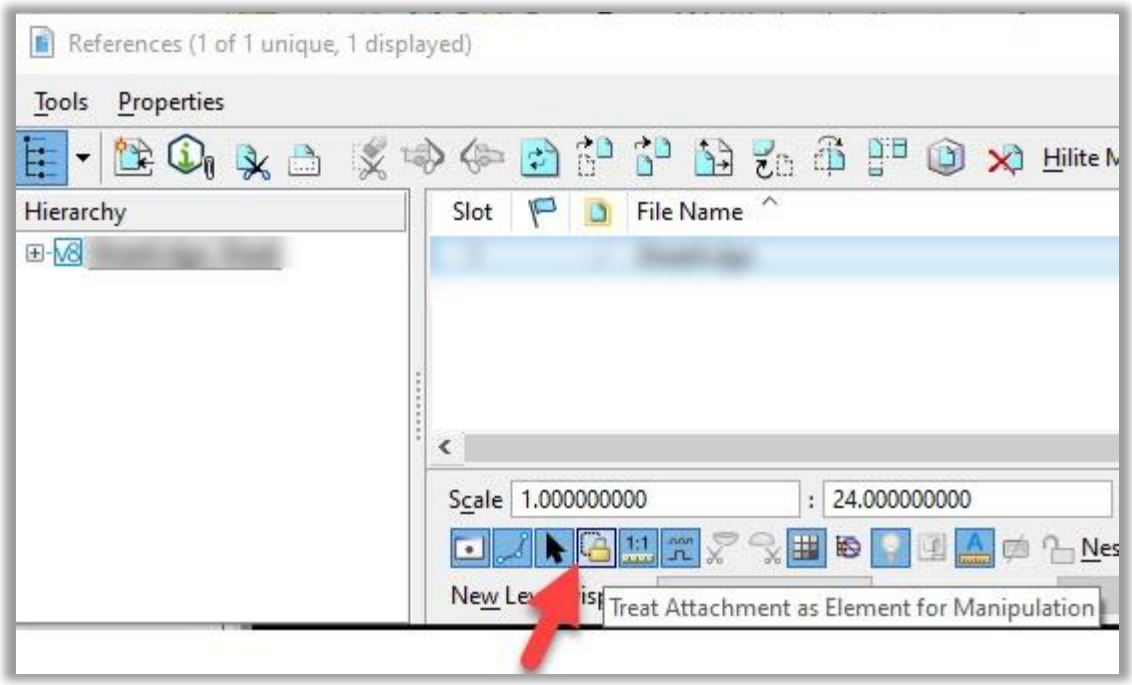


Figure 72 - Referencing

10. Use the **Section** tool to select all the elements of the Detail (Reference File, Annotation and Dimension) and move the Detail inside the sheet border as needed.
11. Repeat steps 4-9 using a different Scale, notice the dimensions work properly as they are based of the Design Model.
12. Save Settings.

3.4 Typical Section Sheets

1. Create a DGN file from the civil sheet seed and save it to the Contract_Plans folder.

   ...CT_Configuration\Organization\Seed\Road\Seed2D - CT RoadSheet.dgn

2. Activate the **CTDOT Workflow**.

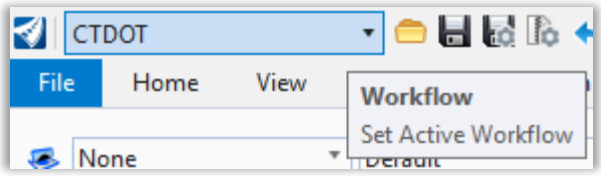


Figure 73

3. In the 2D Sheet Model change the Annotation Scale to **Full Size 1 = 1**.

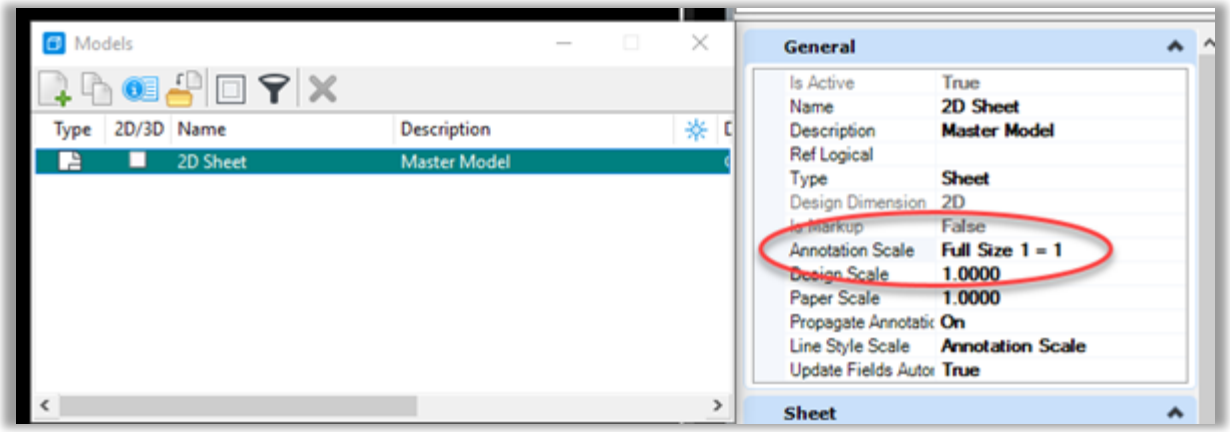


Figure 74

4. Edit the Sheet Name as needed.

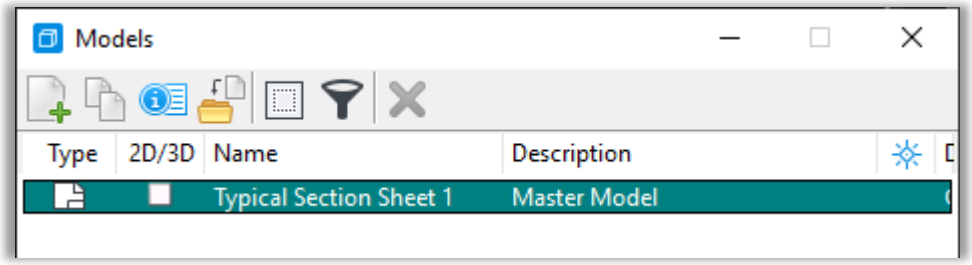


Figure 75

5. Place the CTDOT **Contract Border** Cell using the tool supplied in the Ribbon.

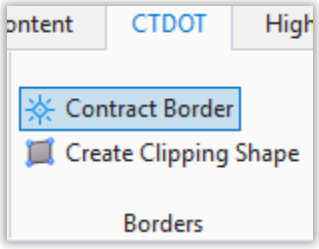


Figure 76

6. In the Properties Dialog Box Edit the Border information. This will update the Border
   Description: ***Drawing Title.***
   Sheet Number: ***Drawing No.***
7. A Design Model will need to be created to hold the Typical Sections and/or Detail graphics. On the Models Dialog Box select the **New File** Icon, in the Create Model Dialog Box select the following:
   Type: ***Design From Seed.***
   Annotation Scale: ***Full Size 1 = 1***.
   Enter a Name for the Model and Click ***OK***.

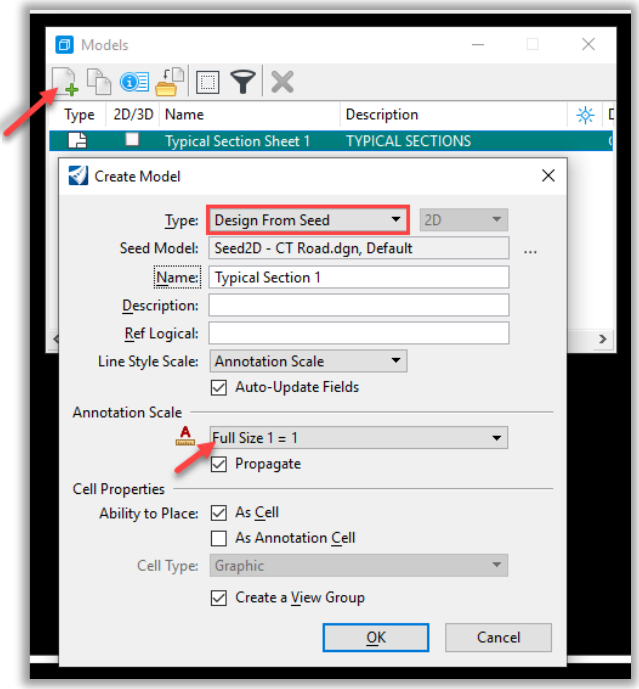


Figure 77

8. To automate the drafting process Typical Sections can be displayed from the Roadway Template Library. In the Design model, use the **Search** command by Typing ***Display Template***. The tool will appear, follow the prompts to place the Desired Roadway Template (if your Roadway Template Library is blank, see procedures in Volume 3.2. The Template will place using the active attributes, users will need to edit as necessary to get the desired look and layout.

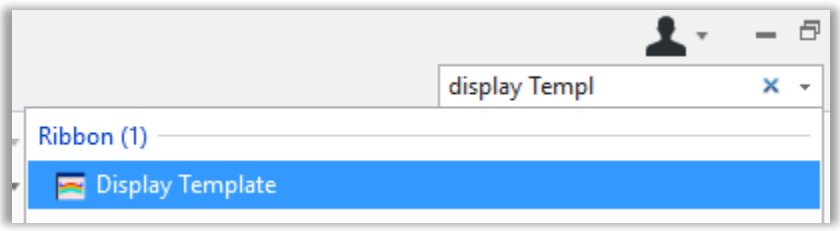


Figure 78

9. On the bottom left locate the **Model Selector** and change back to the ***Sheet Model***.

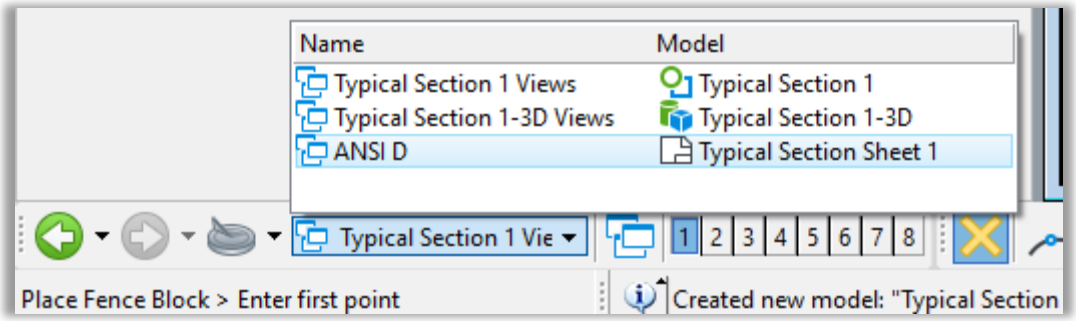


Figure 79

10. Make sure the Models Dialog Box is opened. To reference drag the ***Design Model*** from the Model Dialog Box into a ***View*** in the Sheet Model. In the Attach Source files Dialog Box select the Attachment Method: **Top**.

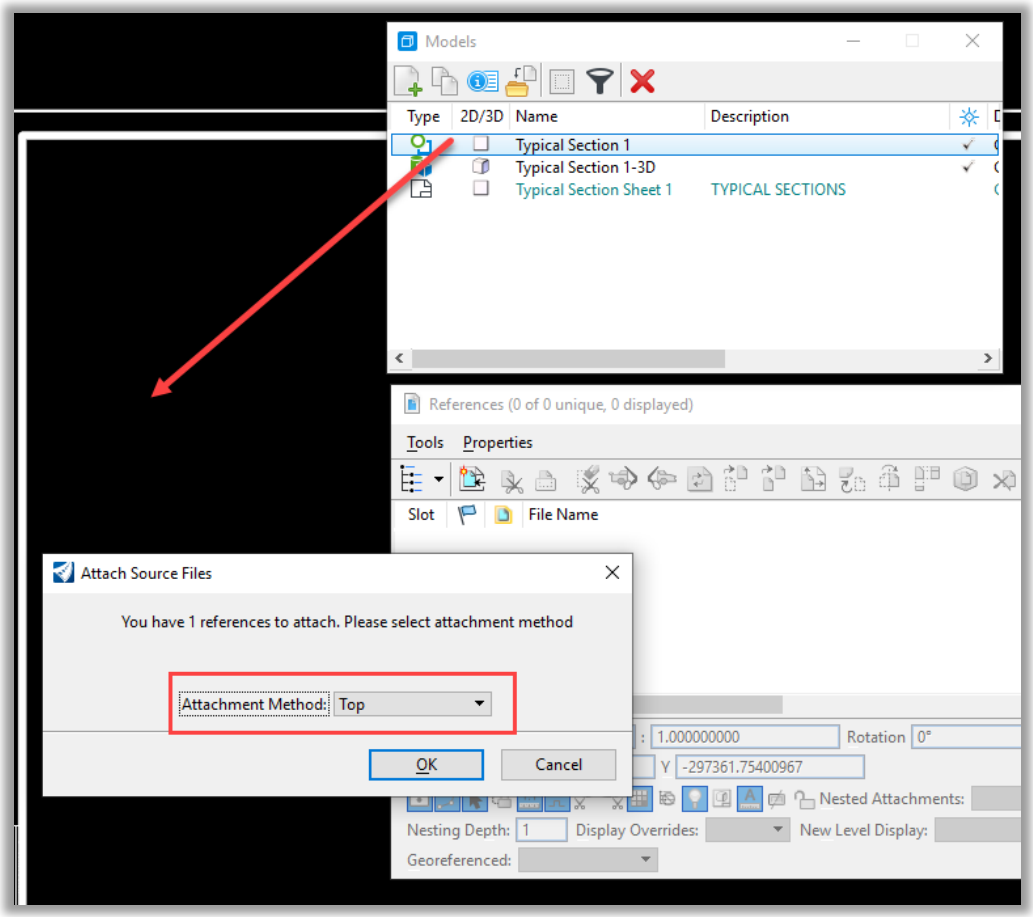


Figure 80

11. Follow the prompts for reference placement, it will come in very large (at full size).
12. In the **References** Dialog Box change the **Detail Scale** as needed and move the Reference File to the desired location on the sheet.

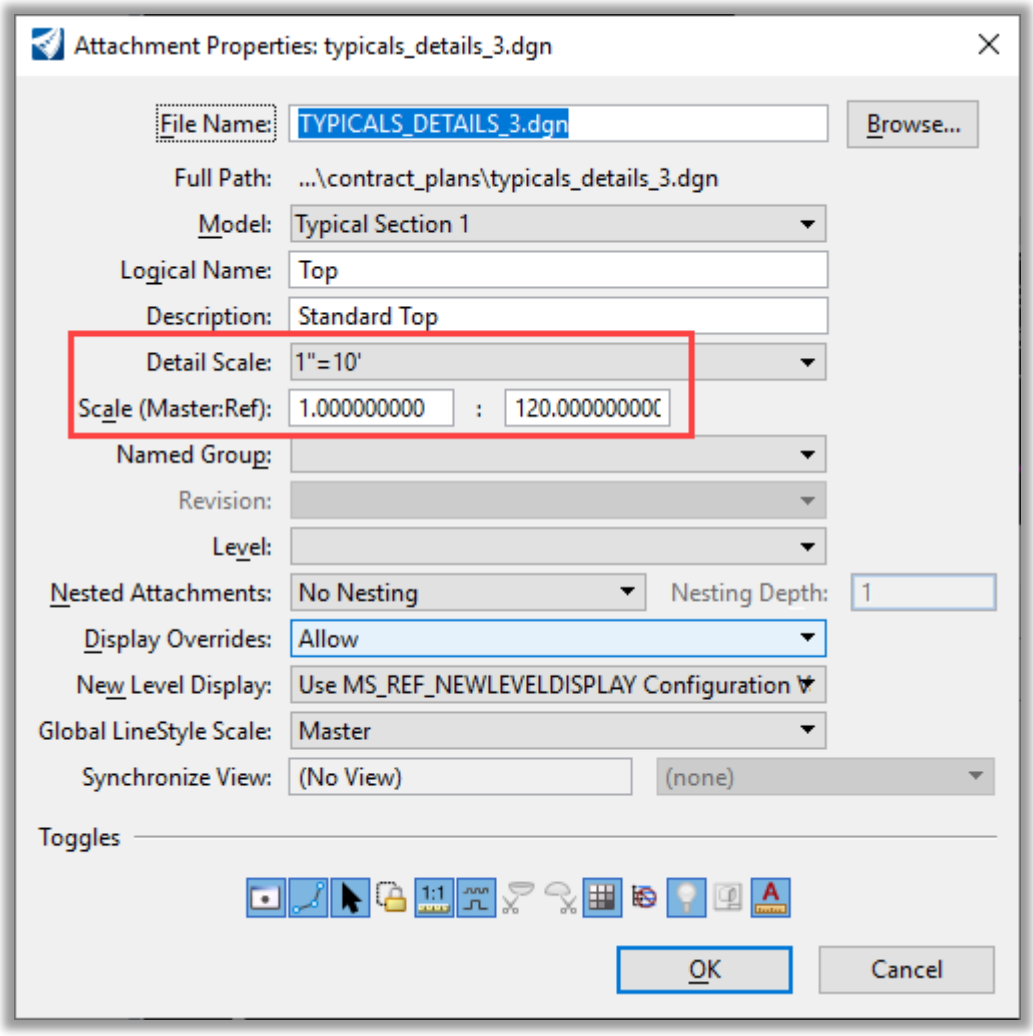


Figure 81

13. Dimension and Annotate as needed using the **CTDOT Annotation** and **Dimensioning** Tools.

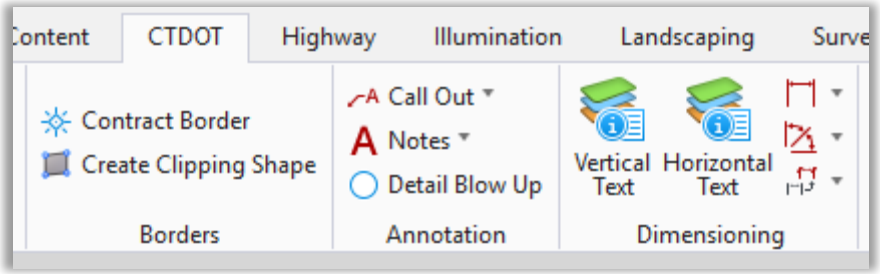


Figure 82

14. Add General Notes and a Legend. There is a table seed for the General Notes available in the Table Tool. In **Search** type **Place *Table***, on the Place Table Dialog Box select Seed: ***General Notes*** and proceed to place the table.

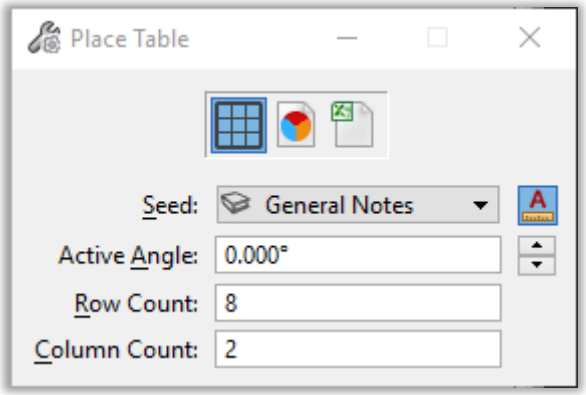


Figure 83 - Create Table

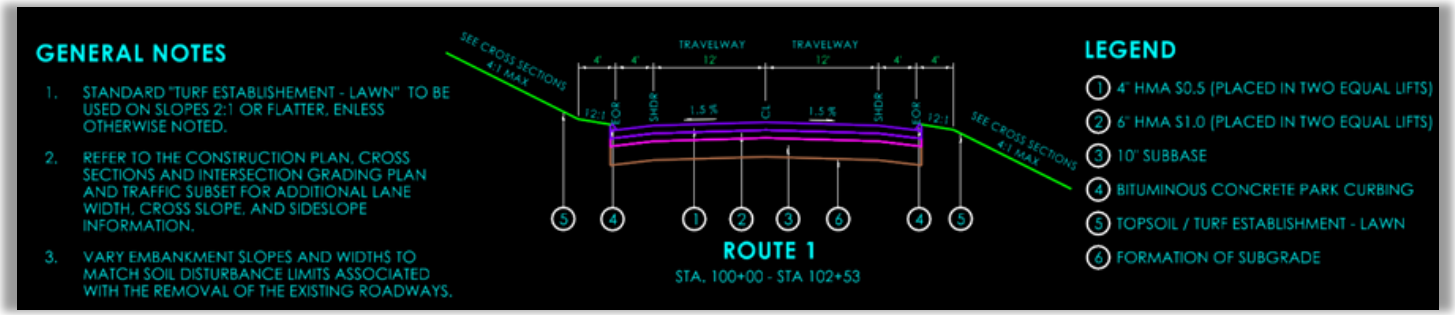


Figure 84 – Typical Section Detail

15. Create another Design Model and place the Line Work for another Detail.
16. Change back to the Sheet Model.
17. Drag the new Design Model into the Sheet Model using the Attachment Method: **Top**.
18. In the References Dialog Box edit the Detail Scale as needed (for demonstration purposes) change it to something other than what was used in step 12.
19. Move the Detail to the desired location on the sheet.
20. Dimension and Annotate as needed.

21. Notice the Text is the same size in both the Typical Section and Detail even though they are placed at two different detail scales.

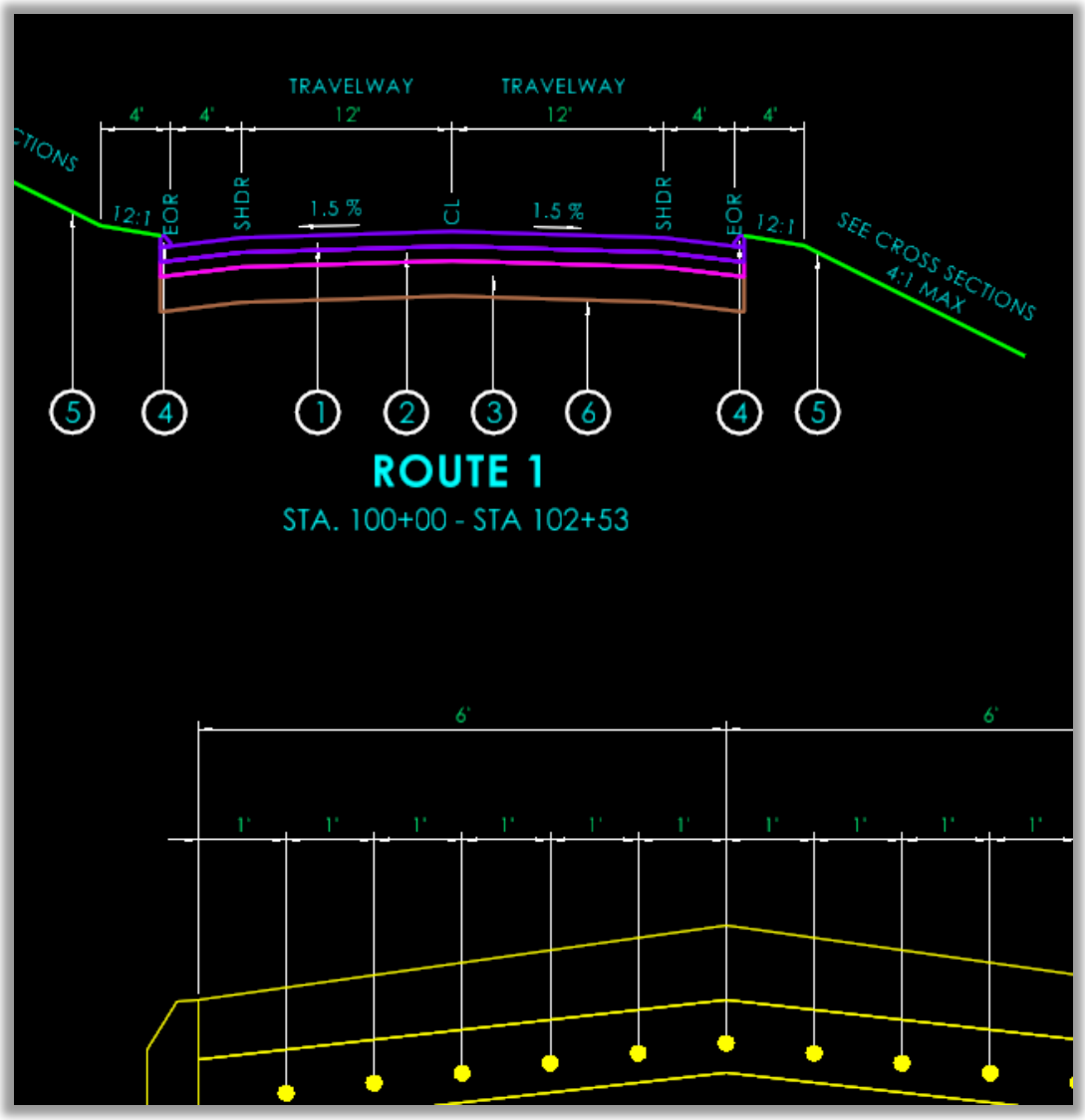


Figure 85 – Detail Annotation

Section 4 – Roadway Sheets

This section covers the primary workflows for creating Plan, Profile, and Cross Section Contract Sheets.

Getting Started

This section outlines best practices developed from support tickets and issues that have been resolved at CTDOT. These practices are based on real-world scenarios and are intended to help users avoid common problems, improve workflows, and ensure consistent application of CAD standards.

For clarification or additional guidance, please contact the AEC team though our **Support Portal**

4.1.1 Best Practices

1		Store All Contract Sheets in the Correct Location
2		Adopt Project Discipline Seed Creation Procedures
3		Use Simple File and Model Naming
4		No Nesting References
5		Use **S**creen **W**ith **W**eights
6		Control Reference Display Properly
7		Streamline Batch Publishing Operations
8		Plan Sheets - Open Models Using the Models Dialog Box
9		Profile Sheet – Vertical Alignment Must be Active
10		Cross Sections - Separate DGN Files per Road Corridor
11		Cross Sections - Never Graphically Edit a Cross Section Named Boundary
12		Cross Sections – Do not Copy graphical elements from any Reference File

4.1.1.1 Storage

All Contract Sheets must be created and stored within the discipline-specific **Contract_Plans** folder.

- Storing sheets in discipline-specific Contract_Plans folders ensures stability, consistency, and compliance throughout the project lifecycle.

Store All Contract Sheets in the Correct Location

- Makes it easier for reviewers
- Ensures every sheet is accounted for in the official project record.

4.1.1.2 Seed Files

Adopt Project Discipline Seed Creation Procedures

a. Confirm and Document the Project Coordinate System
   - **Before creating any DGN files** in the project container, verify the horizontal and vertical datums being used (e.g., NAD 83 / NAVD 88 or NAD 27 / NAVD 29).
   - Check all existing survey data for coordinate system metadata.
   - If uncertain, consult the Central Survey Unit before proceeding.

b. Create a 2D Discipline Seed File
   - Create the 2D Discipline Seed file and store it in the root of the discipline folder (e.g., Highway).
   - Reference all needed existing survey models **directly** using no nesting.

Use this seed file when creating all Contract Plan DGN files.
Note: This may have already been done during Preliminary Design. It is good practice to verify that the seed file has been correctly set up if it was created by someone else.

4.1.1.3 File Naming

ABC **Use Simple File and Model Naming**

a. File Naming
   Use only Letters (A–Z, a–z), Number (0–9) and Underbars (no spaces)
   HW_CP_1234_1234_Highway_Plans.dgn
b. File and Folder Naming
   Avoid:
   - Long Paths - Windows has a character limit for the length of a path and file name
   - Excessively nested Folders

- problematic characters: # % & * ? / \ < > | : " ; , ~ ^ ! @ $`
- Using your name

Issues that may arise from improper File and Folder Naming:

- *File access errors – OpenRoads may fail to open DGN files if the path contains unsupported characters.*
- *Version control conflicts – Systems like SharePoint, or network drives may reject files with certain characters.*
- *Batch processing issues – Scripts, macros, or batch plotting routines can fail if filenames contain unusual characters.*

c. Model Naming

- Stick to letters (A–Z), numbers (0–9), underscores (_), and hyphens (-), Spaces are ok.
- No symbols, or accented characters.
- Start model names with a letter, not a number or symbol.
- Keep names short and descriptive

Issues that may arise from improper model naming
Reference

- *Models with spaces or symbols (# % & *) may fail to attach as references in other DGN files.*
- *Scripts that automatically attach DGN references often cannot parse special characters, causing workflow errors.*
- *Models with leading numbers can sometimes sort incorrectly, causing wrong references to be picked up in batch jobs.*

Display & View Issues

- *OpenRoads may fail to generate views or sheets if the model name has unusual characters.*
- *Plotting routines may skip models or produce errors in PDF/plot output.*

Automation & Scripting Errors

- *Custom VBA, Key-in, or Batch scripts can fail because the script parser cannot handle spaces or symbols.*

4.1.1.4 No Nesting References

No Nesting References

- Use “No Nesting” for All References in the Default Model
- The Default Model of every Contract DGN must reference only the required Survey and Design models **directly**, with no nested references.
- **Benefits of No Nesting:**
  - **Eliminates reference looping:** Prevents circular reference chains that can cause:

- File instability
- Excessive lag when opening files
- Slow panning, zooming, and plotting
- Potential file corruption or crashes

- **Improves performance and reduces load times:** Direct references load faster and perform more consistently across all project workstations.
- **Supports consistent team workflows:** Standardized reference structure simplifies troubleshooting and ensures all disciplines follow a predictable setup.

4.1.1.5 Screening

Use Screen with Weights for Consistent Display and Publishing of Plan View Sheets

- Review the guidance provided in *1.5 Screening for PDF Creation*
- For Plan View sheets, Survey Reference files are typically displayed using screening while preserving their original (delivered) line weights.
  - Apply a logical name wildcard beginning with **"SWW"** to the DGN reference file.
  - The **CTDOT CONNECT DDE** delivered Pen Tables support screening options during PDF creation, ensuring consistent visual output without altering line weight standards.

4.1.1.6 Reference Controls

Control Reference Display Properly

For guidance on managing level display, reference visibility, and view overrides, see **Section 1.6** of this volume. Use Screen with Weights for Consistent Display and Publishing of Plan View Sheets

4.1.1.7 Batch Printing

Streamline Batch Publishing Operations

- Create a **"Blank" DGN file** for use during Batch Publishing and store it in the ***Contract_Plans*** folder.
- **Purpose:** Ensures display settings carry consistently into the Print Organizer (PSET), preventing mismatched graphics or missing levels during printing.

  Open this dgn file when:
  - Setting up the Print Organizer (PSET)
  - Adding sheets to the Print Organizer (PSET)

4.1.1.8 Opening Models

Plan Sheets - Open Models Using the Models Dialog Box

It is not recommended to use the View Group Selector or the Back/Forward Green Buttons to change models, as this may not display levels correctly. Instead, access and switch models through the Models dialog box.

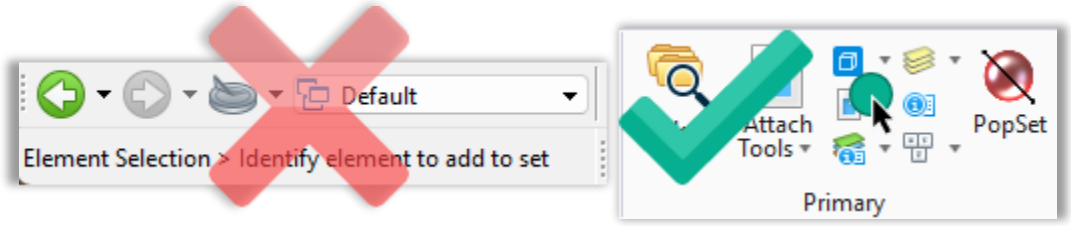


Figure 86 - Proper way to access Models

4.1.1.9 Activate Vertical Alignment

Profile Sheet – Vertical Alignment Must be Active

Profile curve annotations will only display on sheets when the vertical alignment is **set as active** in the **Base Model Alignment file**. Profile curve annotations in OpenRoads are dependent on the active vertical alignment. If the correct vertical alignment is not active at the time annotation is placed or sheets are created, curve labels will not display.

If you create a sheet and the Vertical curve annotation is missing, you will need to:

a. Open the ***Alignment DGN file***
b. Select the correct profile geometry
c. Right-click the vertical alignment and choose **Set Active** Vertical Alignment
d. Re-open the ***Profile Sheet DGN file***
e. Use the following tools to re-annotate, first use the **Remove Drawing Model Annotation** tool then use the **Drawing Model Annotation** tool

4.1.1.10 Create Multiple XSC DGN Files

Cross Sections - Separate DGN Files per Road Corridor

When creating Cross Section Sheets, use a separate DGN file for each road corridor to house its **Named Boundaries**, **Drawing Models**, and **Sheet Mod**els.

This approach keeps files organized and reduces risk:

- If a file becomes corrupted, only that corridor is affected.
- Easier to redo work without impacting other corridors.
- Prevents files from becoming too large and unwieldy.

4.1.1.11 No Edits to XSC Named Boundary

Cross Sections - Never Graphically Edit a Cross Section Named Boundary

Cross Section Named Boundaries are linked directly to the underlying design geometry and sheet generation tools. Graphically modifying them can:

- Break the association with the corresponding Drawing and Sheet Models
- Cause misalignment or incorrect clipping of cross-section views
- Result in lost or invalid smart labels and annotations

Best Practice:

- Always adjust cross-section limits by creating a new Named Boundary.
- Do not drag, resize, or otherwise graphically alter the boundary in the design model.

4.1.1.12 No Copying XSC Reference Elements

Cross Sections – Do not Copy in graphical elements from any Reference File

Cross Sections Are a "Live Cut" of the Design

- In OpenRoads, a cross section is not just a static drawing. It's a dynamic, live representation of the 3D design at a particular station.
- Think of it like slicing through a loaf of bread: the cross section shows exactly what exists in the model at that specific cut.
- Because it's live, if the underlying design (like the roadway corridor) changes—grades, slopes, or widenings—the cross section updates automatically to reflect those changes.

Why You Should Never Copy Polygons That Look Like Solids

Many 3D elements in your corridor—such as pavement, embankments, and curbs—may appear as simple polygons in cross section view. These "polygons" are actually 3D shapes or complex solids with embedded design data, including slopes, thicknesses, and material properties.

Copying them into your cross section can cause problems:

- Breaks the live link to the design, so the cross section no longer updates automatically.
- May bring in the entire 3D shape, causing a distorted display that misrepresents geometry (thickness, slope, or offset). This can lead to errors in grading, quantity calculations, and construction documentation**.**

Best Practices:

- Do as little manual work in cross sections as possible—focus on strengthening your 3D model instead.

- If additional graphics are needed, place them using the **Place Line**, **Place Shape**, or **Place Cell** commands; **never copy elements from a reference**.

4.1.2 File Naming Standards

To maintain an organized and consistent project directory, **Contract Sheet CAD files must follow a standardized naming convention**. As outlined above, all Contract Sheet files must be placed within the appropriate discipline-specific ***Contract_Plans*** folder to ensure a clear and predictable project structure. Keeping **Contract Base Files (CB)** separate from **Contract Plan Files (CP)** reduces the risk of file corruption, enhances performance, and simplifies ongoing updates.

OpenRoads functions best when each file serves a single, **well-defined purpose**. Each sheet type or work area should have its own file containing the corresponding **Default Model, Drawing Models, and Sheet Models**. This structure supports a clean workflow and enables OpenRoads to reliably manage **Named Boundaries** and update sheets as the design evolves.

Do Not:

- **create a separate file for every individual sheet.** Related sheets shoild be grouped within their appropriate sheet container file to maintain an efficient and manageable project environment.
- **use one large DGN file for the entire project.** Consolidating all sheets into a single file lead to performance issues, increases the risk of file corruption, and complicates project management.

General Subset File Naming

DRAWING NUMBER PREFIX	DGN File Name
G	HW_CP_1234_1234_Title_Sheet.dgn
G	HW_CP_1234_1234_Detail_Estimate_Sheets.dgn
G	HW_CP_1234_1234_Revisions_Sheet.dgn

HIGHWAY SUBSET File Naming

DRAWING NUMBER PREFIX	DGN File Name
INX	HW_CP_1234_1234_Index_of_Drawings.dgn
IND	HW_CP_1234_1234_Index_of_Plans.dgn
SVY	HW_CP_1234_1234_Survey_Control_Data.dgn
ALN	HW_CP_1234_1234_Alignment_Plans.dgn
ROW	HW_CP_1234_1234_ROW_Plans.dgn
TYP	HW_CP_1234_1234_Typical_Sections.dgn
MDS	HW_CP_1234_1234_Miscellaneous_Detail_Sheets.dgn
PLN	HW_CP_1234_1234_Highway_Plans.dgn

DRN	HW_CP_1234_1234_Drainage_Plans.dgn
SED	HW_CP_1234_1234_Sed_Erosion_Control_Plans.dgn
PRO	HW_CP_1234_1234_Profiles.dgn
XSC	HW_CP_1234_1234_XSC_Route123.dgn
XSC	HW_CP_1234_1234_XSC_SideRoad1.dgn
XSC	HW_CP_1234_1234_XSC_ SideRoad2.dgn
SGP	HW_CP_1234_1234_Site_Grading_Plans.dgn
IGP	HW_CP_1234_1234_Intersection_Grading_Plans.dgn
SUP	HW_CP_1234_1234_Superelevation_Diagrams.dgn
BOR	HW_CP_1234_1234_Boring_Logs.dgn
PIT	HW_CP_1234_1234_Test_Pit_Data.dgn
STG	HW_CP_1234_1234_Staging_Plans.dgn
STG	HW_CP_1234_1234_Staging_Profiles.dgn
STG	HW_CP_1234_1234_Staging_Cross_Sections.dgn

Other Subsets File Naming

- Permits
- For Information Purposes Only (Utility Relocation)

DRAWING NUMBER PREFIX	DGN File Name
PMT	HW_CP_1234_1234_Permit_Plans.dgn
FIO	HW_CP_1234_1234_FIO.dgn

4.1.3 Setup Requirements

Before attempting to open or create DGN files users should make sure the following is in place:

1. **CTDOT** users should have the **CTDOT CONNECT DDE synced** through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. **Consultants** should have **CTDOT DDE properly installed** or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Log on to the **CONNECTION Client**. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
4. Access OpenRoads through **CAD Accounting (CTDOT)** or the **Customized Icon (Consultants).**
5. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.

If you require detailed steps please access Volume 1 of the DDE.

4.1.4 Named Boundaries Overview

All Contract Plan DGN files must reside in the appropriate discipline-specific Contract_Plans folder. Example: **/Highways/Contract_Plans/**

A **sheet design file** is created to contain both the **Named Boundaries** and the **completed sheet** models. All required base models and survey models used to assemble the sheets are attached as reference files to the **Default Model** of the sheet design file.

Named Boundaries are then placed in the Default Model and associated with the appropriate design element—such as an alignment, profile, or 3D model (for cross sections)—to define the extents and layout of each sheet.

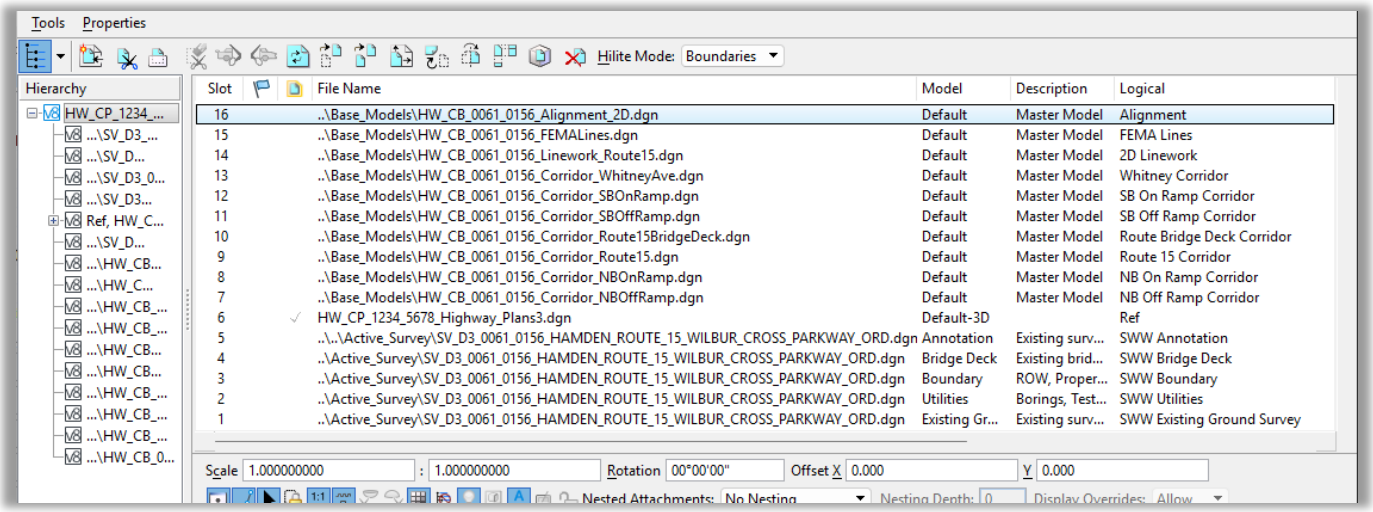


Figure 87 – Sheet Design file Default Model References

4.1.4.1 Tools

OpenRoads Designer uses **Named Boundaries** to define the plan, profile, and cross-section clipping areas. The Named Boundary tools generate the required **Drawing models** and **Sheet models** for plan, profile, and cross-section contract sheets.

The **Place Named Boundary** tools are accessed through the **CTDOT** workflow, located on the **CTDOT** tab within the **Sheet Production** tool group.

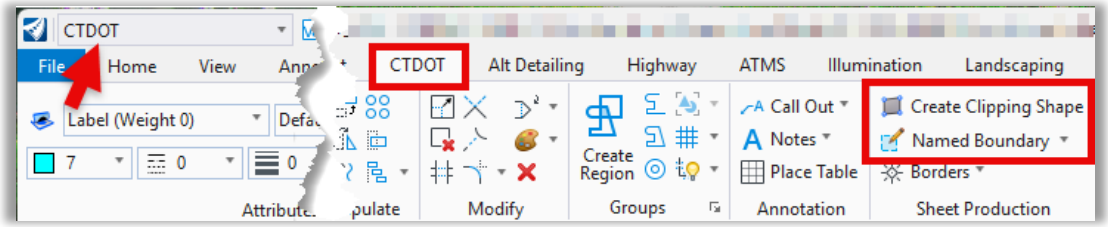


Figure 88 – Sheet Production Tool Group

The top of the **Place Named Boundary** dialog includes a set of icons that let you choose the **type of Named Boundary** you want to place. Each icon represents a different boundary purpose used during sheet production.

					
Civil Plan	Civil Profile	Civil Cross Section	Civil Cross Section 2 Points	By 2 Points	By Polygon

CTDOT has configured standardized **sheet clipping options for plan, profile, and cross section sheets**, including commonly used scale options. These predefined configurations are stored in **DGN Libraries** and are automatically made available to users.

When placing a Named Boundary, these CTDOT configurations will appear in the **Drawing Seed** drop-down menus of the **Place Named Boundary dialog**, as shown below. This ensures consistent sheet extents, scales, and layout behavior across all contract plans.

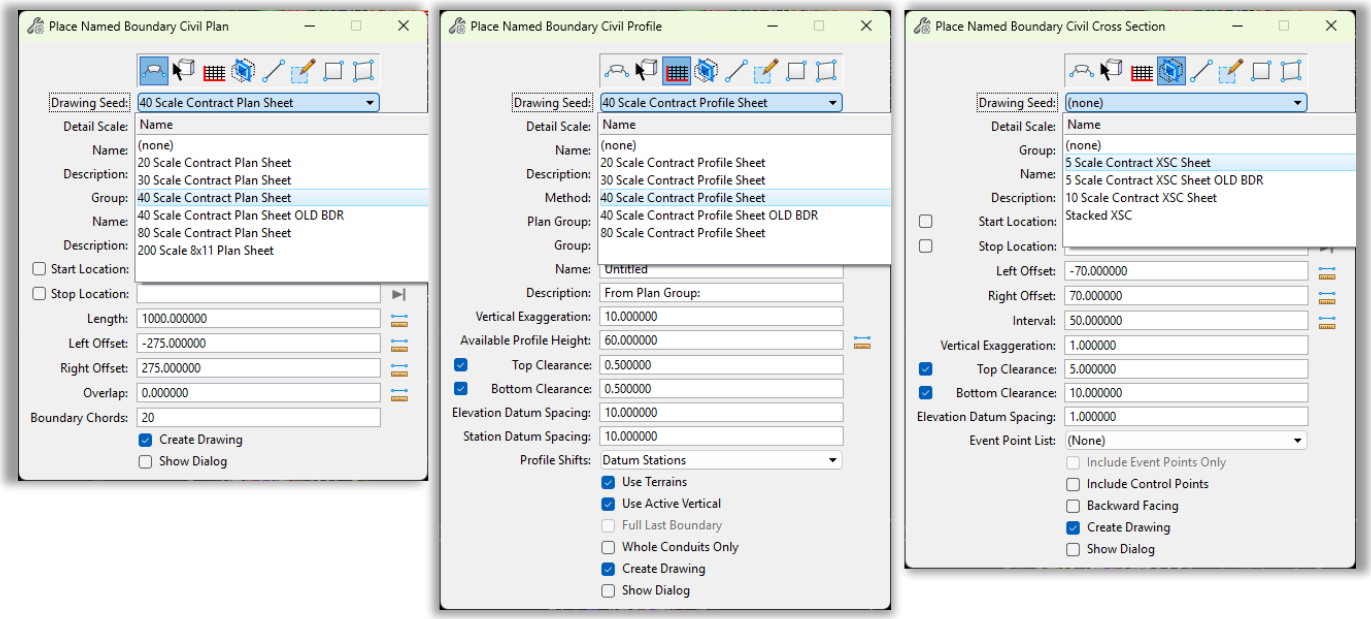


Figure 89 – Place Named Boundary Civil Plan, Profile and Cross Section Dialog Boxes

4.1.4.2 By-Products Named Boundaries

It is important to understand, what the Named Boundaries toolset creates (and why), how each by-product is intended to be used, how they relate to one another, and a short list of best practices and troubleshooting tips you can apply immediately.

1. **Named Boundary**

   What it is:

   A Named Boundary is a named clipping/polygon definition placed in a Design (Default) model that defines the geometric extents you want to extract for sheets — e.g., plan view extents, profile clipping limits, or cross-section clipping zones.

What it provides:
A persistent, editable geometry (name + shape) that is the single source of truth for the area that should appear on contract sheets.

2. **Drawing Model**
   What it is:
   A Drawing Model is a model created by the Named Boundary tool that contains the extracted geometry clipped to the Named Boundary extent. It is the working model where users place callouts, labels, and annotation that must remain "intelligent."4

   Typical contents:
   - Clipped references of the design (plan, alignment, corridor, surfaces).
   - Callouts, notes, dimensioning, Smart labels (northing/easting, station, elevation).
     Note: *Title block cell is never in the Drawing Model (that belongs to the Sheet Model).*

3. **Sheet Model**
   A Sheet Model is the final printable model and is used for output and publishing. It contains the following:
   - Sheet border and title block
   - A defined Sheet Boundary, which is used when publishing PDFs
   - A placed reference to the corresponding Drawing Model

   The Sheet Model controls the final sheet layout and print extents, while the Drawing Model provides the design content and annotations displayed within the sheet.

4.1.4.3 Plan output

What the Named Boundaries tool produces for Plan:

- A Drawing Model clipped to plan extents (plan geometry such as road centerline, corridor plan features, annotations).
- A Sheet Model with border/title block and a reference to the Plan Drawing Model to assemble the completed sheets for PDF generation.

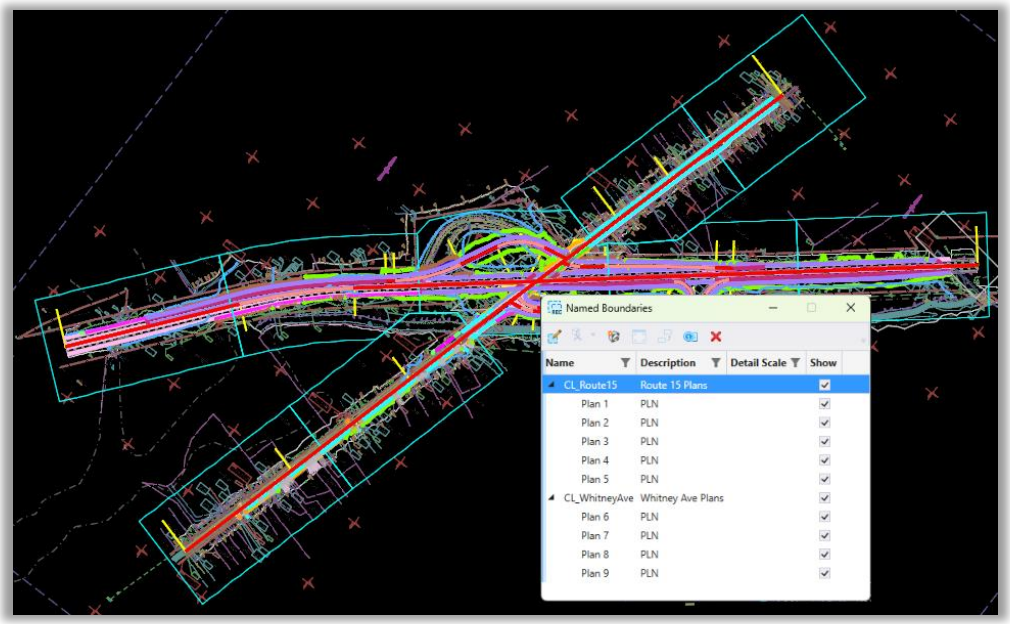


Figure 90 – Default Design Model with Named boundaries

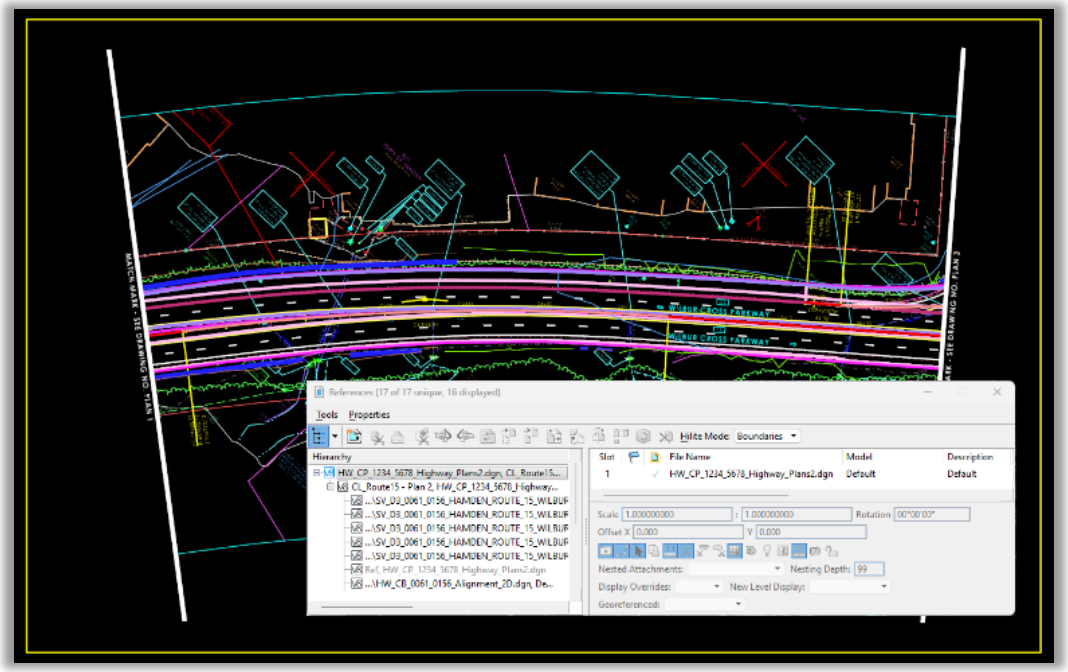


Figure 91 - Drawing Model

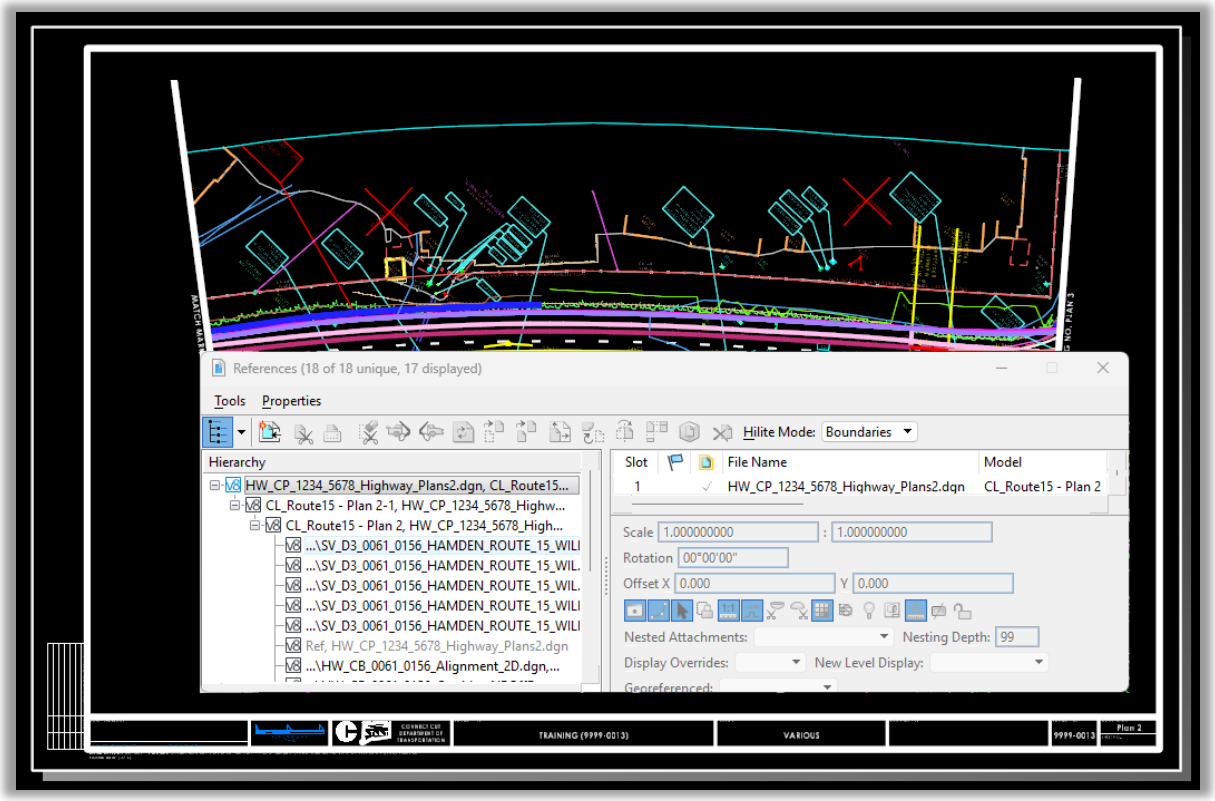


Figure 92 - Sheet Model

4.1.4.4 Profiles output

What the tool produces:

- A Drawing Model that contains the profile view (elevation vs station) clipped to the Named Boundary's profile extents.
- A Sheet Model that places the profile Drawing Model inside the profile sheet border.

Specific considerations:

- Profile Drawing Models often include profile grids, alignment labels, drainage and utilities, and profile geometry.
- Profile Named Boundaries typically define vertical extents and plan extents for the station range.
- Use the profile Drawing Model for profile-specific callouts (grade, existing vs proposed) — not the Sheet Model.

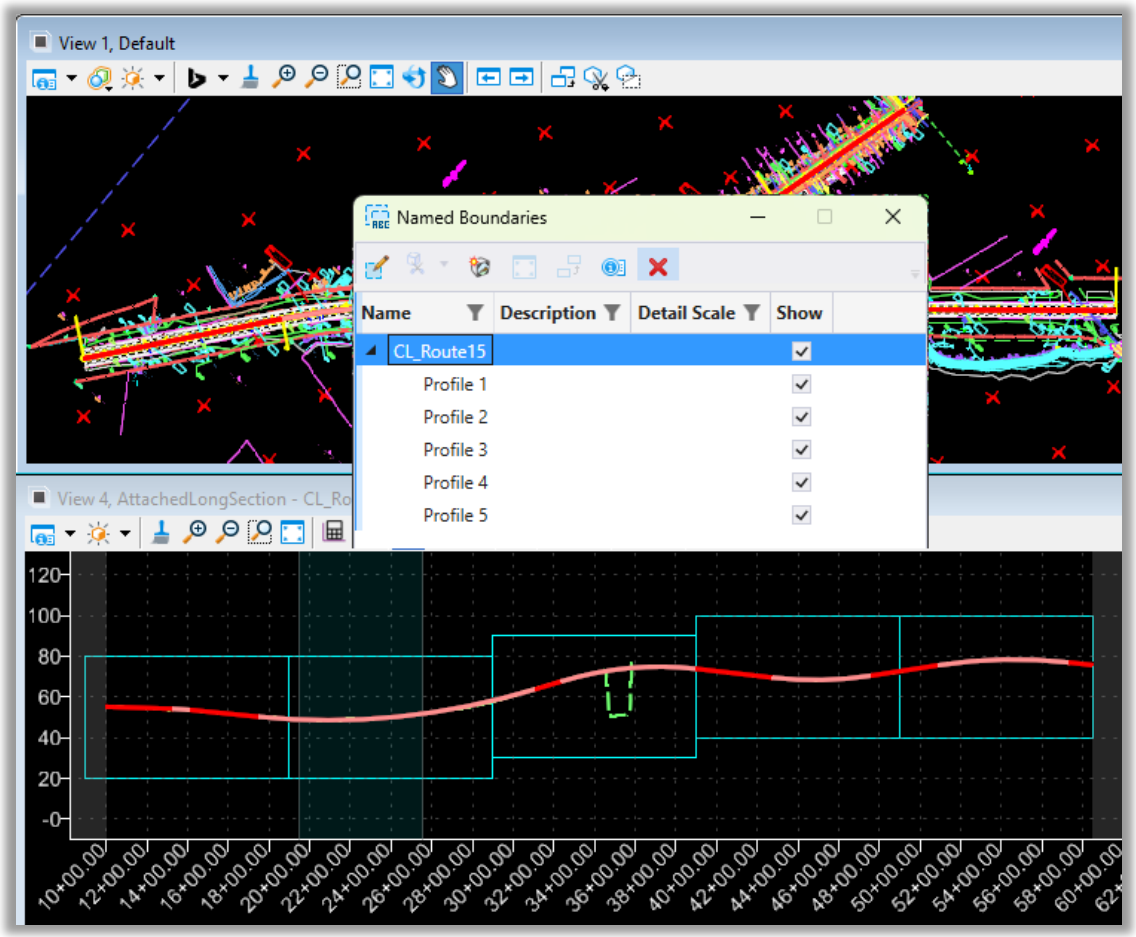


Figure 93 – Multi-Model View with Named boundaries

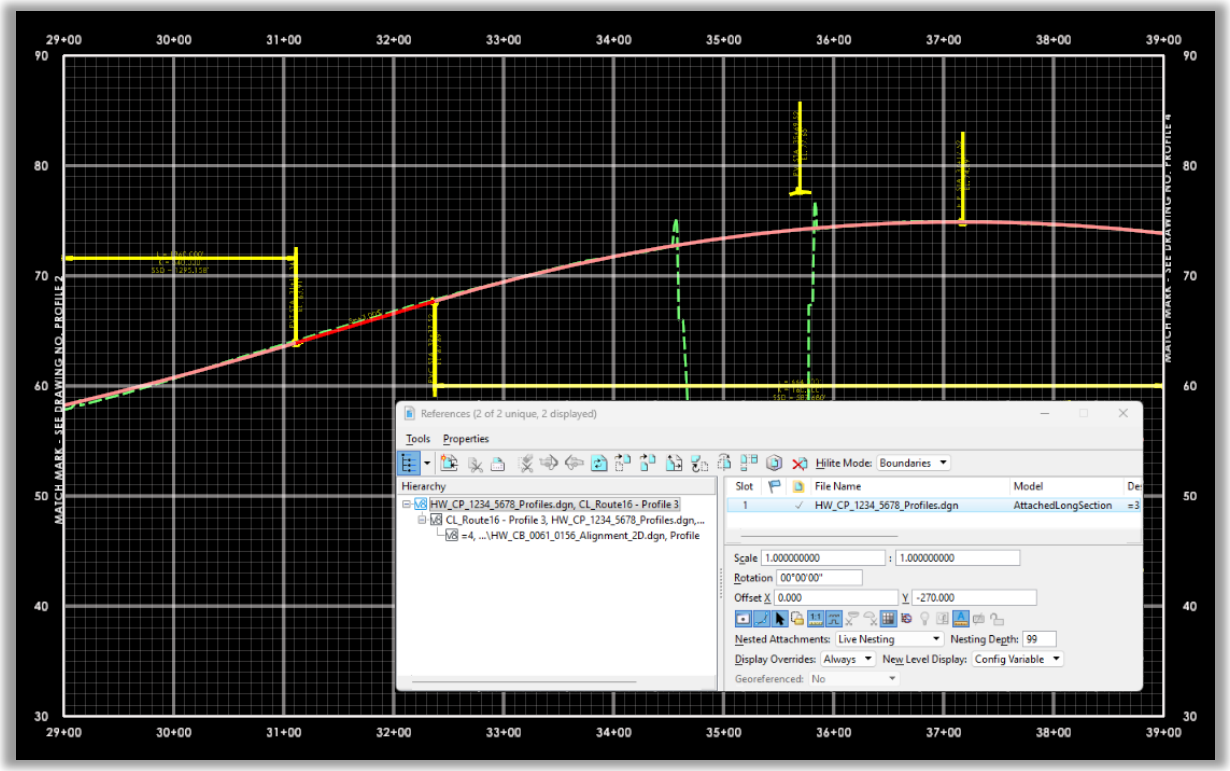


Figure 94 – Drawing Model

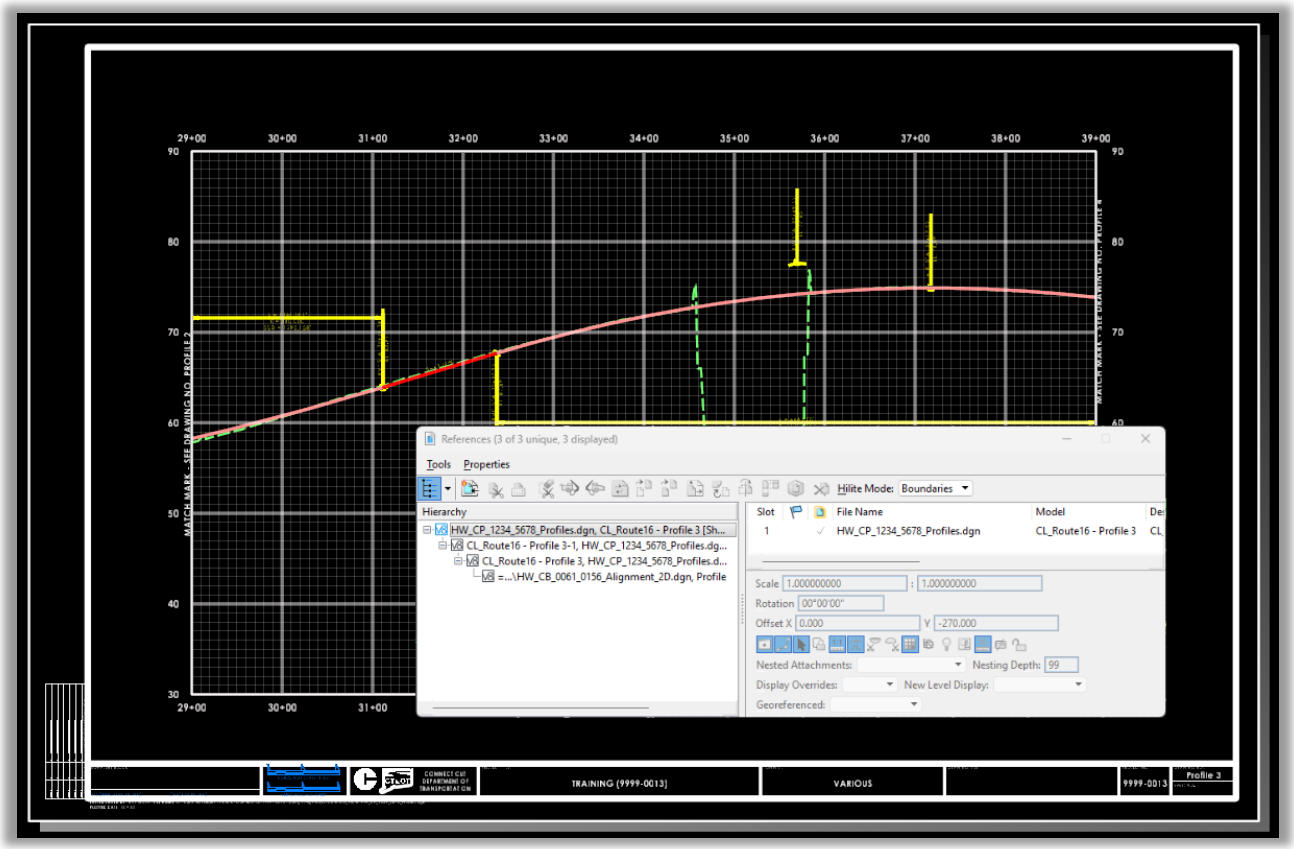


Figure 95 – Sheet Model

4.1.4.5 Cross Sections output

Cross-section sheets are generated in their own design file. Within this file, OpenRoads designer uses Named Boundaries to define cross-section clipping locations.

What the tool produces:

- A Drawing Model for each cross section clipped to each cross-section extents.
- Sheet Models where each cross section Drawing Model is placed for printing.

Specific considerations:

- Use a different dgn file to house each road corridor's Named Boundaries, Drawing and Sheets Models
- Before generating the named boundaries, a design file is created to house the cross-section sheets. The various base model design files required to assemble the cross sections are attached as reference files to the Design Model in the design file.
- The 3D model must be displayed. The cross section is cut from the 3D model. In the example below, the geometry, survey, and corridor model base models are attached to the plan view with the 3D model displayed. The named boundaries are placed in the 3D model relative to a selected alignment like the example below.

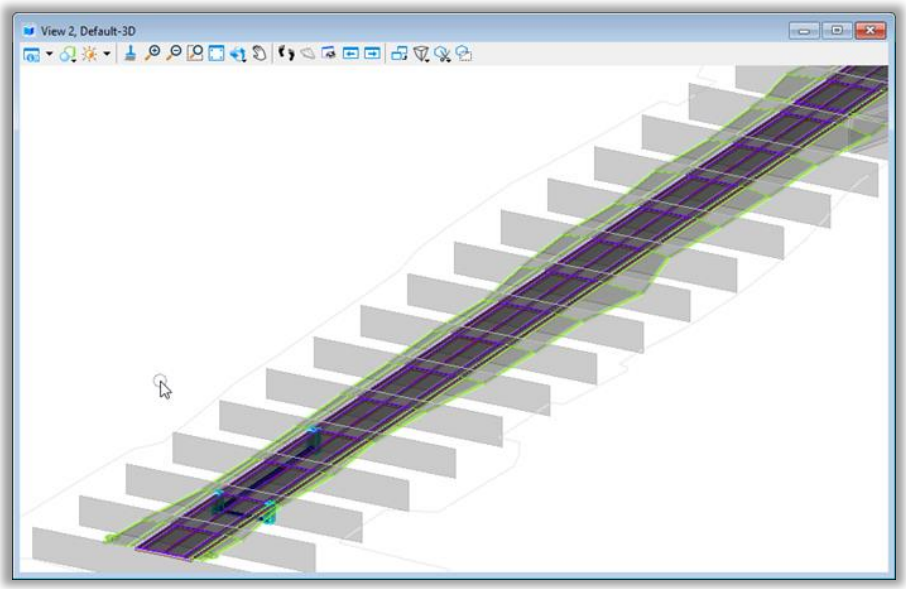


Figure 96 – Named Boundaries - in 3D Model

When the sheets are generated, the software creates a MicroStation drawing model for each named boundary. An example of the drawing model for a cross-section is shown below.

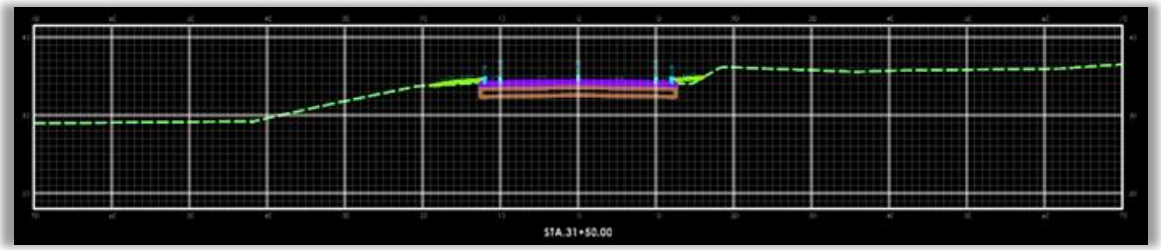


Figure 97 – Drawing Model

The drawing models are referenced to a sheet model with a sheet border to assemble the completed cross-section as shown in the example below.

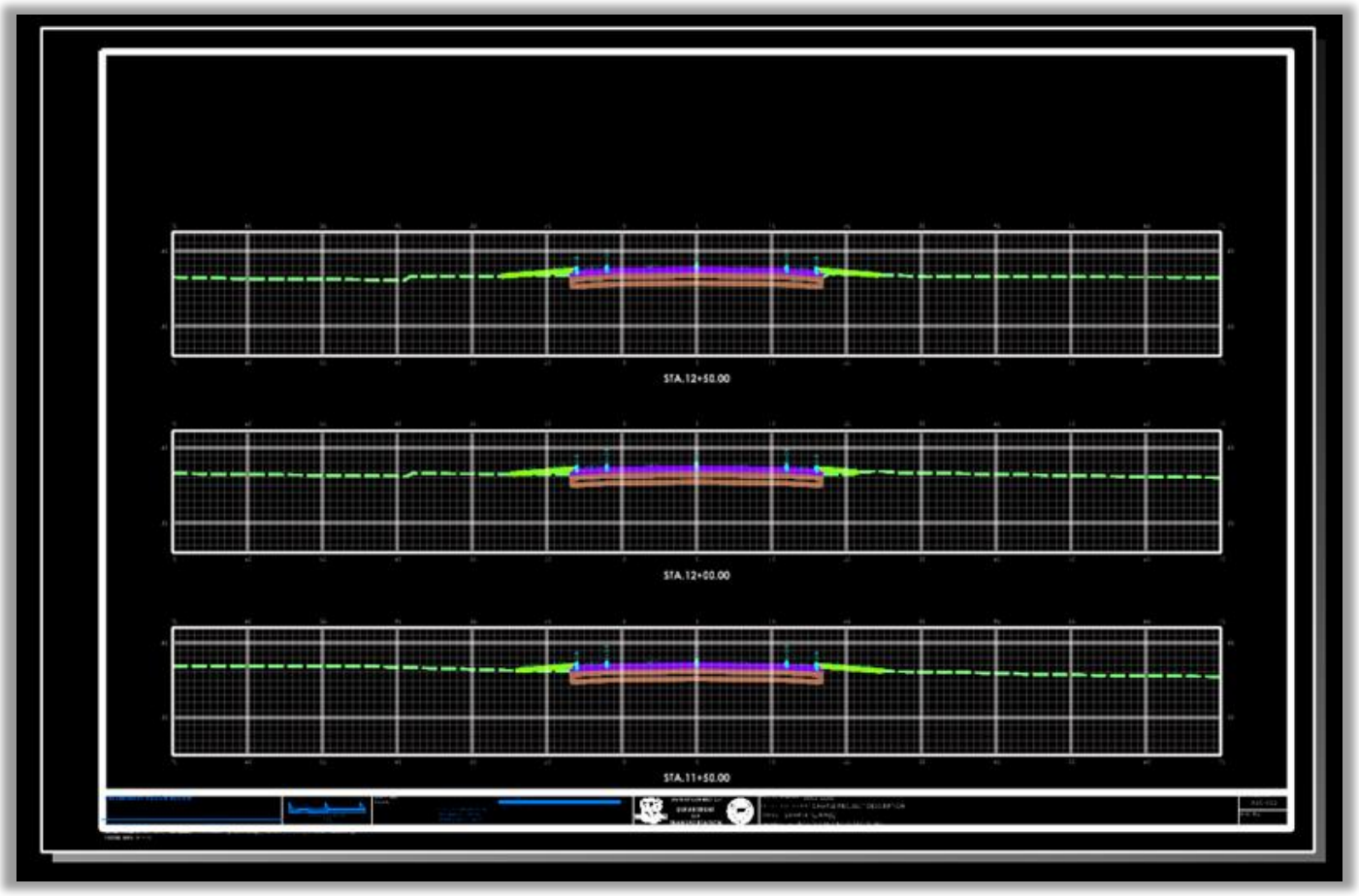


Figure 98

4.2 Plan Sheets

In this section, you will learn how to create and annotate plan and profile sheets. Topics include creating Named Boundaries used to generate plan and profile sheets, understanding the drawing and sheet models involved in the sheet creation process, and adding individual annotations to label specific location coordinates, station–offset values, and other key information.

4.2.1 Create DGN File

1. Create a New File.
   a. Select the **New File** icon.
   b. Browse to the ***Contract_Plans*** folder and create a new 2D design file following the file naming convention outlined in Volume 16, Appendix 4 – File Naming Examples.
      Example file name: ***HW_CP_1234_5678_Highway_Plans.dgn***
2. Select a Seed File.
   a. In the New dialog box, select the **Browse** button to select a seed file.
   b. Choose the **2D Project Highway Seed** previously set up for your project: ***Highway\|HW_2D_ProjectSeed.dgn***

      Note – *This seed file already includes existing survey models as direct references (no nesting).*
   c. Alternative Seed Files - If you do not want to use the project seed, you can use seed files from the general CAD Workspace. Ensure you select the correct Survey Datum for your project:

      Road Design Seed:
      …CT_Configuration\|Organization\|Seed\|Road\|Seed2D - CT RoadDesign.dgn

3. Click **Save**. The file will get created and auto-open.

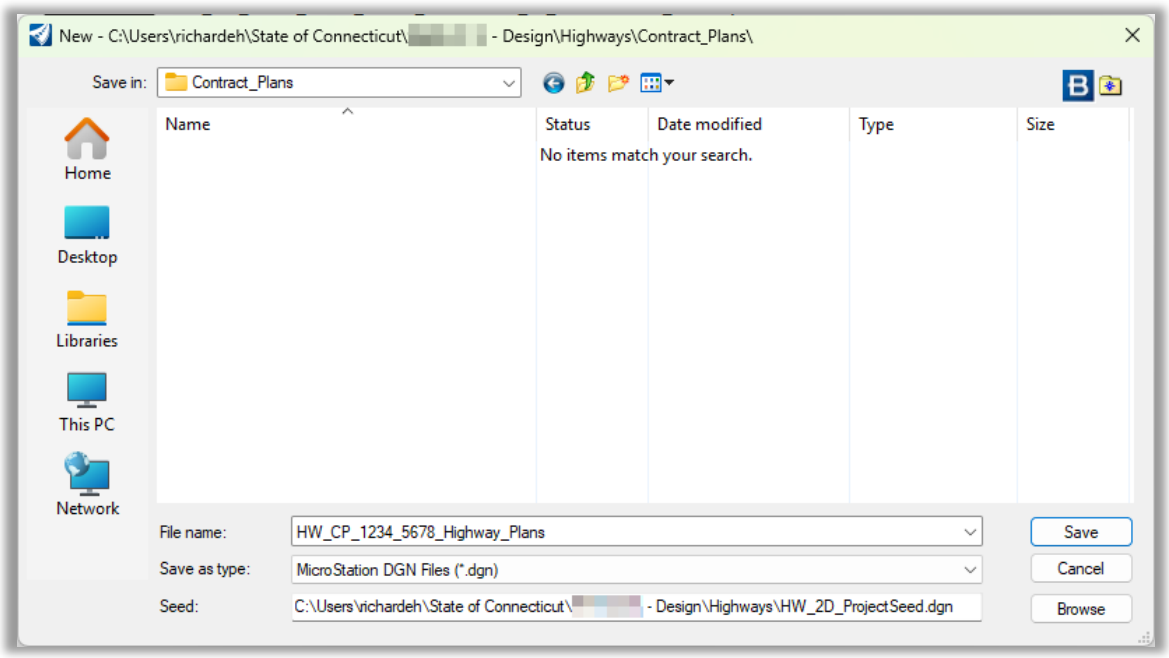


Figure 99 – Create New File

4. Use the **Geographic Coordinate System** dialog box to match the Survey Seed. Use ***From File*** and select the Survey File and Model you wish to match.
5. If you start with a Workspace seed instead of the project seed, you must manually reference all existing survey models. Make sure to use direct references for each model. Do not use nested references.
6. Reference in the needed **design base model files**, they reside in the Highways/Base_Models folder within the project folder. The models will be referenced using **No Nesting**. This will include but not limited to the Alignment Models, the Corridor Models, Drainage Models, and the 2D Layout Models.
   Tip: *Reference the Models you want to show up behind others first and the Top Layer last.*
7. In View 1 **Turn off/on Levels** as needed and **turn off** the **Default-3D Reference File.**

   Notes: *Having a Multi-Model View is not recommended in this files as it as this makes it difficult to manage Level Display after cutting the sheets.*
8. **Save Settings**

4.2.2 Create Plan Sheets

1. In the ***Highway_Plans.dgn*** select the **CTDOT Tab**, in the **Sheet Production Area** select **Create Clipping Shape**. This will set the needed Level active.
2. In the same section select **Named Boundary**. The Place Name Boundary Civil Plan dialog box will appear.

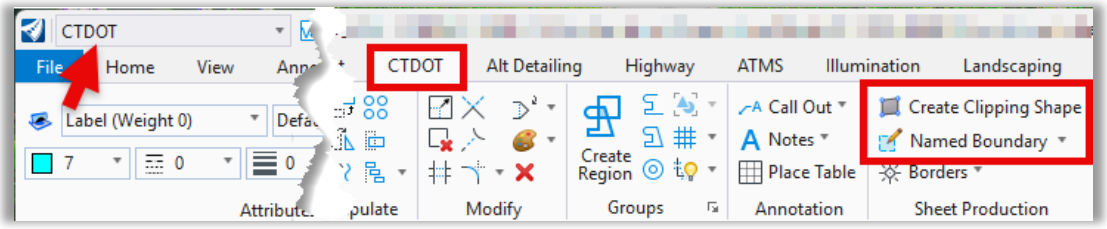


Figure 100 – Place Named Boundary Tool Access

3. Select the **Civil Plan** mode.
4. In the 2D view (default plan view), select the alignment along which the plan named boundaries will be created. The command line (lower left corner) will read**: "Place Named Boundary Civil Plan > Identify Path Element"**. With the cursor **select the alignment**.
5. In the dialog box the second "**Name:**" down will update to match the name of the CL.
6. In the dialog box set the following:
   - Drawing Seed: ***40 Scale Contract Plan Sheet***
   - Detail Scale: ***1"=40'***
   - Name: ***Plan 1***
     Note: *always include the number "**1**", this will avoid irregular increments. Without it, subsequent models may be named inconsistently, e.g., Plan, Plan 1, Plan 2.*
   - Description: **Enter Group Description**
   - Group: ***(New)***
   - Name: ***This will auto-fill when you select the alignment***
   - Description: ***Enter Named Boundary Description***

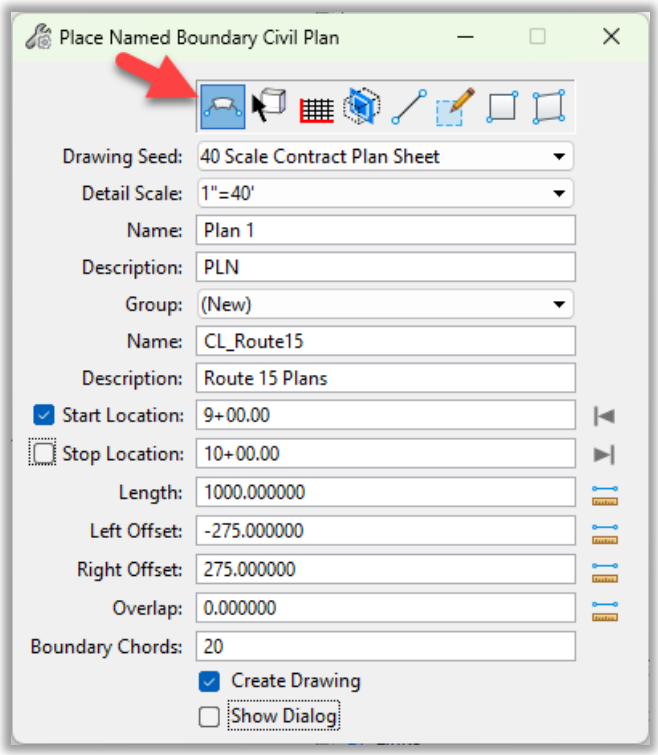


Figure 101 – Place Named Boundary Civil Plan

Adjust the following as needed:

   - Length: ***(length of alignment on one sheet)***
   - Left Offset and Right Offsets: ***(offset from the alignment)***
   - Overlap: ***0***
   - Boundary Chords: ***20***
   - Enable or Disable the ***Create Drawing*** option so that you can control when the sheets are created, for:

- **Simple layouts** it is best to have it ***Enabled*** so the Drawing and Sheet Models get created on the fly. The Plan Match Marks will be auto created with this method.
- **Complex layouts** it is best to have it ***Disabled*** so you can play with the layout before the Drawing and Sheet Models are created. You will need to manually place the Plan Match Marks with the method.

- Enable the ***Show Dialog*** option. This dialog is used to override settings defined by the Drawing Seed if needed.

9. Select the **Start Location:**
   a. Follow the prompts. Command Line**: "Place Named Boundary Civil Plan > Accept/Reject. Identify Path start point to place boundary"**, **Follow the prompts**.
   b. This station can be keyed into the dialog box or graphically selected.
   c. To Add extra to the left of the start of your Stationing, you can manually adjust the start station by enter a value less than the start, this will move the named boundary to the left of the start of alignment. Bring your cursor back into the dialog box, enter the Start Station, click the Tab button, back in the view left click to **Accept**.
8. Select the **Stop Location:**
   a. Command Line: **"Place Named Boundary Civil Plan > Identify Path end point to place boundary"**. The named boundaries are displayed interactively as the cursor moves.
   b. This station can be keyed into the dialog box or graphically selected.
   c. Accept the endpoint location for the named boundary. Command Line: **"Place Named Boundary Civil Plan > Accept/Reject. Datapoint point in Plan View to place boundary", Identify Path end point to place boundary**.
   d. The Name Boundaries will now get created.

9. If the ***Create Drawing*** option was Enabled the **Create Drawing** dialog box will appear. Set:
   - Mode: ***Plan***
   - Name: should be populated with the Plan 1 from Place Named Boundary Civil Plan tool.
   - Under Drawing Model Annotation Scale: ***1" = 40'***.
   - Under Sheet Model Detail Scale to ***1" = 40'***.
   - Enable or Disable the ***Add to Sheet* Index** option. This option will be discussed later in this module.
   - Enable the ***Open Model*** option.
9. Click **OK** to create the sheets. Follow the prompts in the lower left corner left click to define the named boundaries. Multiple left clicks may be required.

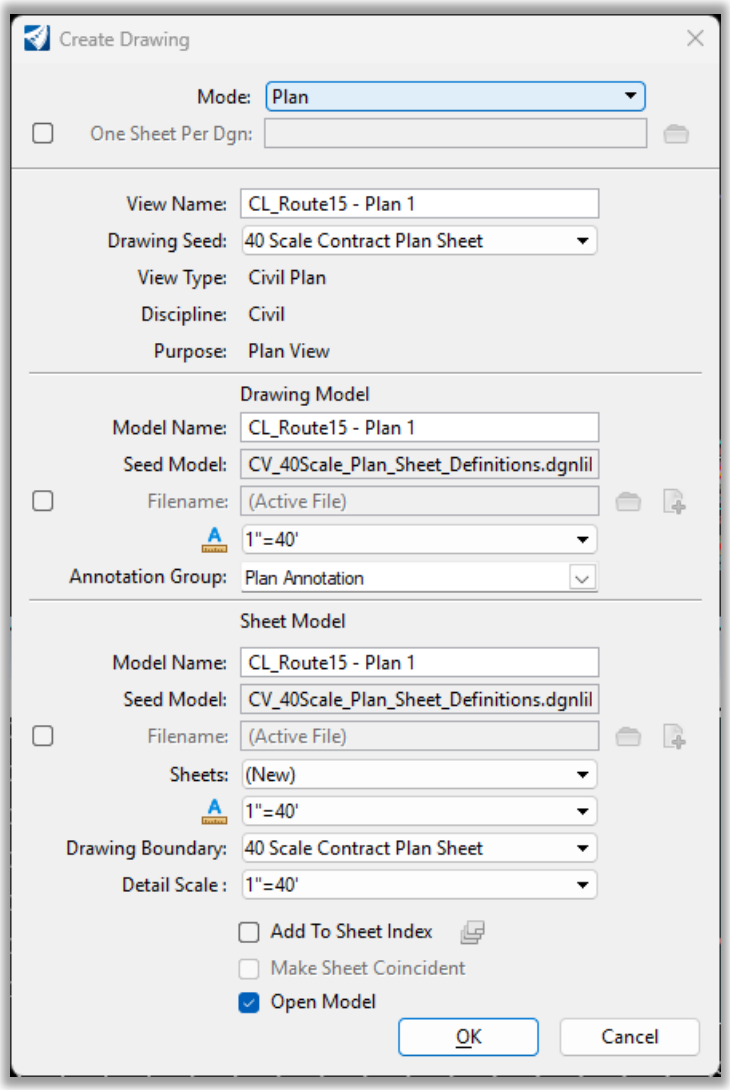


Figure 102 – Create Drawing

4.2.3 Adjust Plan Named Boundaries

If the **Create Drawing** option is disabled, the **Create Drawing** dialog box will not open after placing the Named Boundaries. In this case, the Named Boundaries are placed in the **Default Model** and are listed in the **Named Boundaries** dialog box; however, **no Drawing Models or Sheet Models are created at this stage**.

a. Use the White Space Cell for Sheet Layout Assistance

Users are encouraged to use the White Space cell to assist with complex sheet layouts. Navigate to **CTDOT > Annotation > Borders > White Space**, then **place, move, and rotate** the cell as needed to help determine the appropriate placement of intersecting roadway match marks. It also might be helpful to place the match marks lines as a guide as shown below.

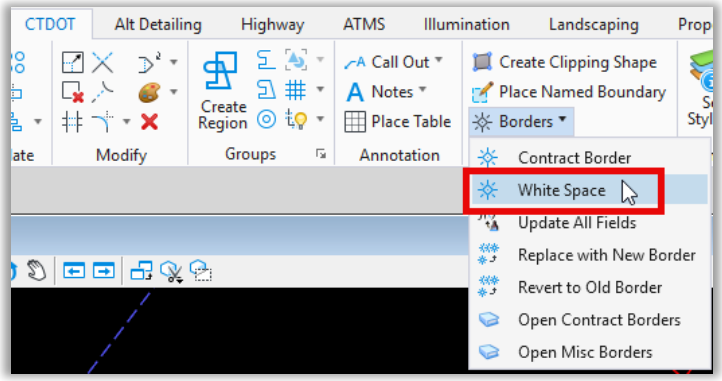


Figure 103 - White Space Tool

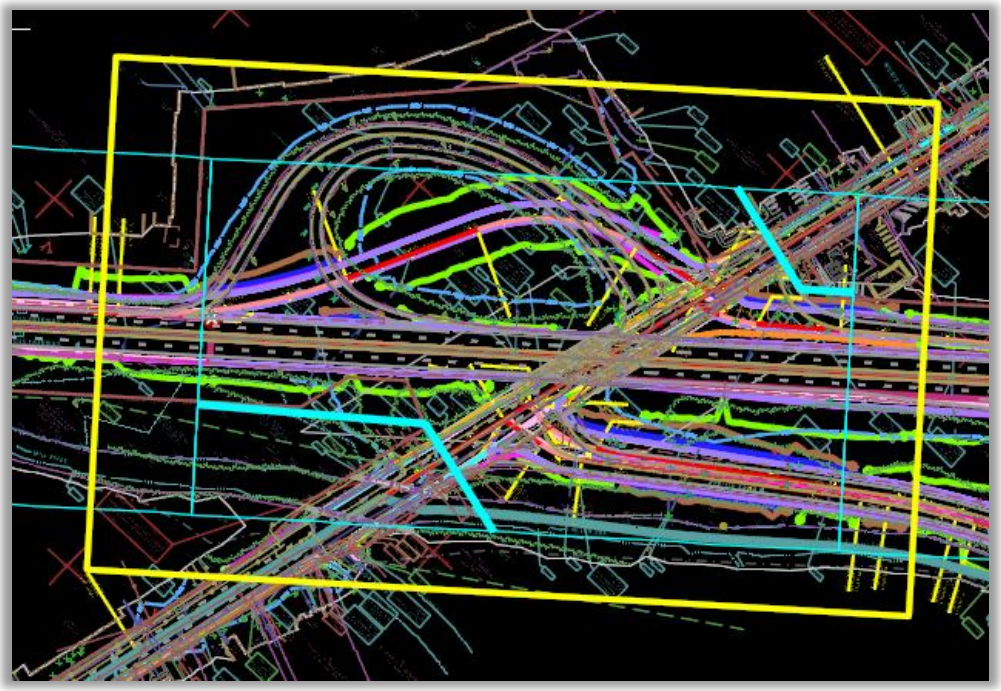


Figure 104 – Named Boundaries Initial Run with use of White Space Cell

b. Create Additional Named Boundaries

You may now continue creating additional **Named Boundaries** for any other areas required. The images below illustrate **the intersecting roadway boundaries** that were created on both **sides of the mainline**.

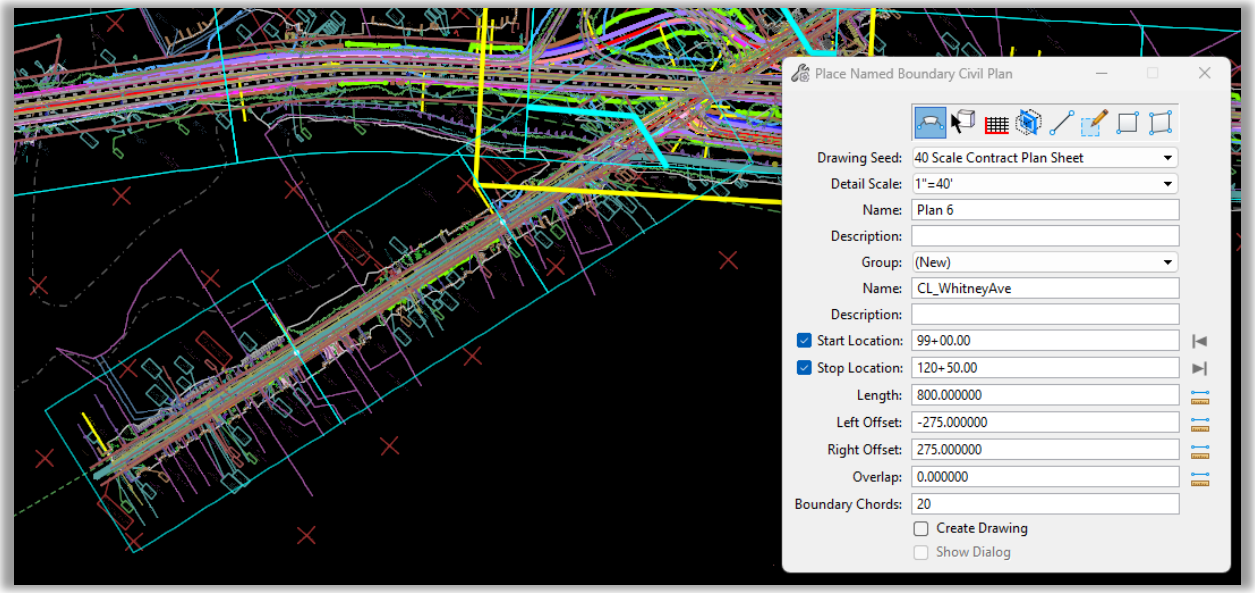


Figure 105 – Additional named Boundaries to the South

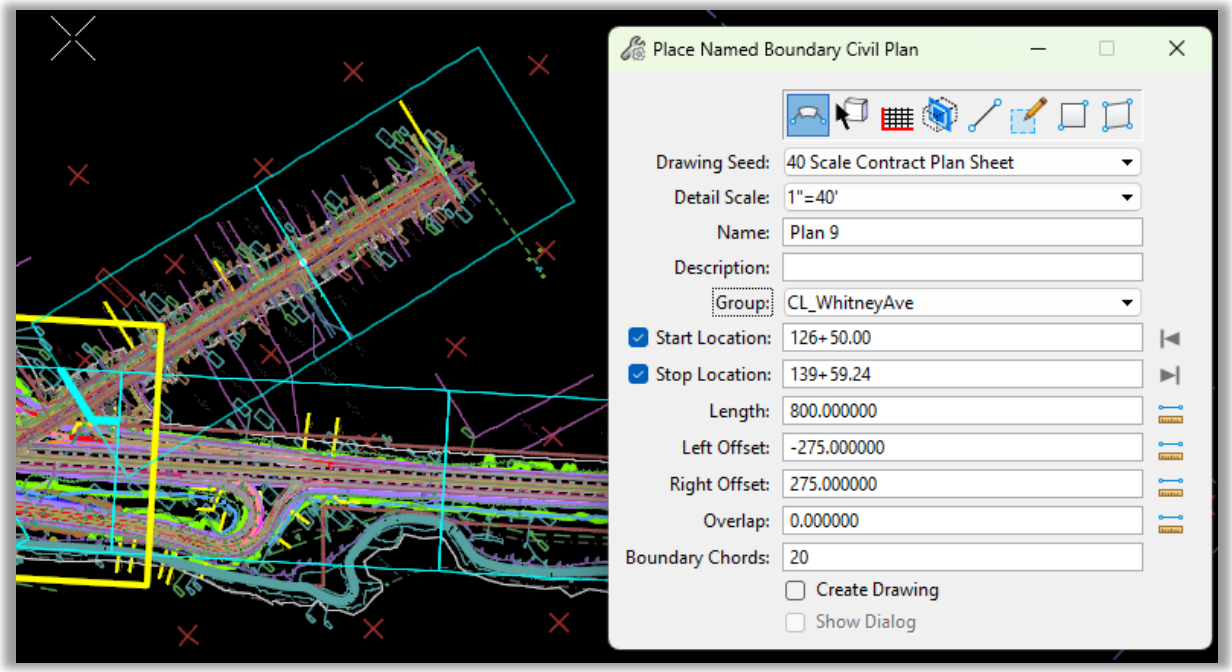


Figure 106 - Additional named Boundaries to the North

3. Review Named Boundaries in the Named Boundaries Manager
   In the Named Boundaries Manager, review the Named Boundaries that have been created. Switch the workflow to **OpenRoads Drawing Production**, select the **Drawing Production** tab in the **Named Boundaries** section click the small button in the lower-right corner to open the **Named Boundaries Manager**.

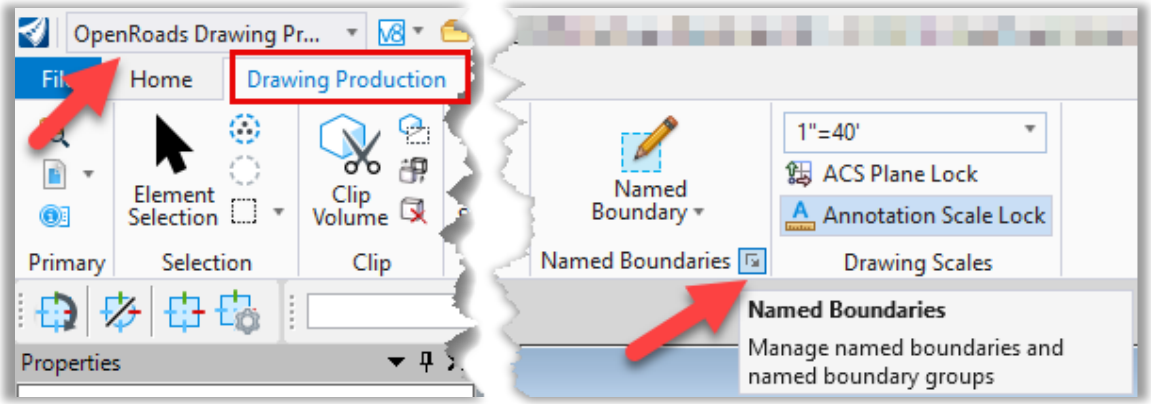


Figure 107 - Named Boundaries Manager Access

4. Click on one of the definitions and review the settings. Notice the ***Start and Stop Stationing***. If the stations need to be adjusted, you should delete the Boundary and recreate it. **Do not** adjust the **Start and Stop Station Graphically**.

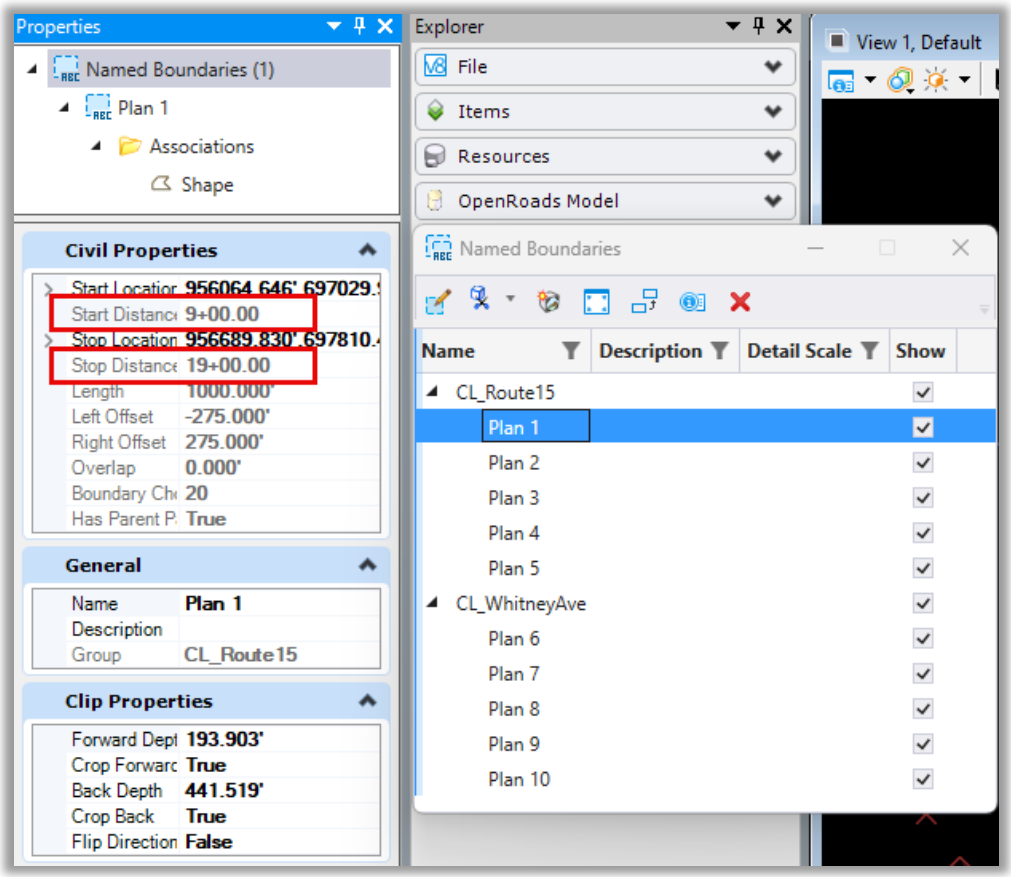


Figure 108 - Named Boundaries Manager

5. Modify Named Boundaries as Needed
   In the example shown below, **Plan 8** was recreated so that the **stop station** aligns with the intended match mark. You may now use the Modify tools to graphically adjust the Named Boundaries to better define the extents of the offset areas.
   As noted above, **do not graphically adjust the start or stop stations**.

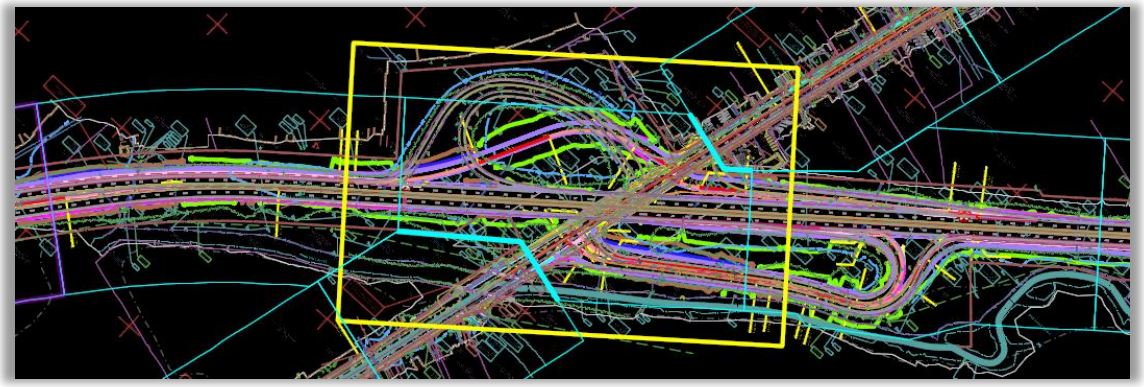


Figure 109

6. Adjust the Drawing Model Reference Location
   If the Named Boundary shape was modified in the Default Model **after** the Drawing Model was created, the Drawing Model reference may shift due to a known OpenRoads issue.
   To correct this:
   a. Open the affected **Drawing Model**.
   b. Open the **References** dialog.
   c. Locate the reference to the **Default** (Design) Model.
   d. Reset the reference location to:
   e. Offset X: ***0***
   f. Offset Y: ***0***

   This will realign the Drawing Model with the updated Named Boundary.

   Note: This is a known OpenRoads glitch. The issue has been reported to Bentley Support, and a fix is expected in a future product release.

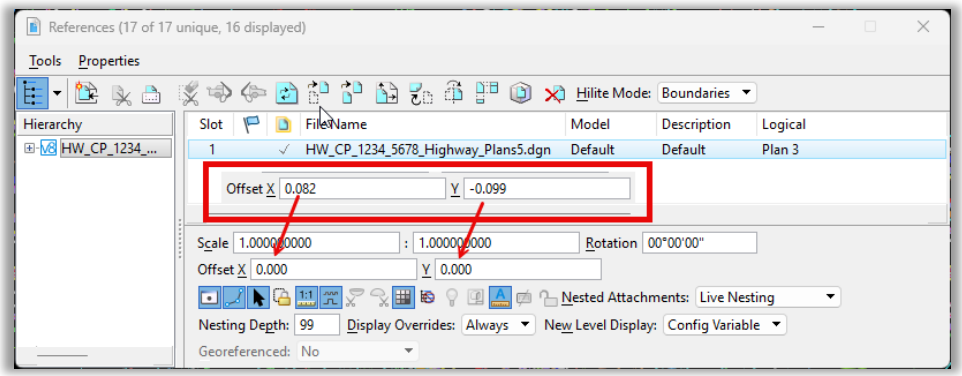


Figure 110

4.2.4 Create Plan Sheets from Named Boundaries Manager

1. If you have not previously done so you can create Sheets Models from the Named Boundaries dialog box. When the editing of the Named Boundaries is complete **Right Click** over each group and Select **Create Drawing**.

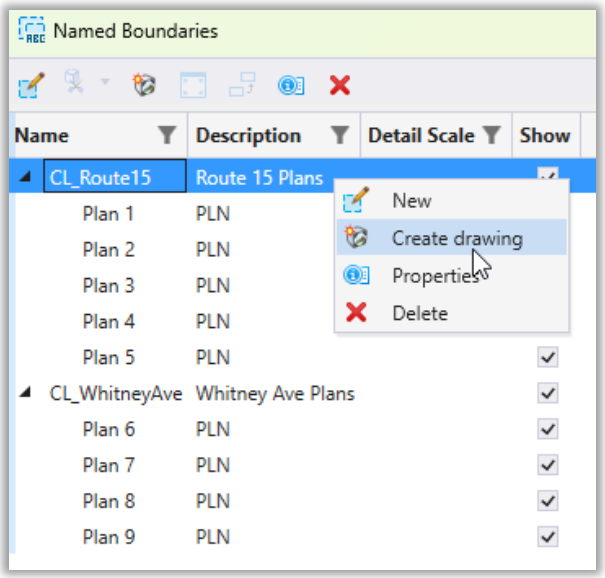


Figure 111 – Named Boundaries Manager

2. Pay attention to the Detail Scale settings and adjust as needed. Click **OK** to create the Drawing and Sheet Model.

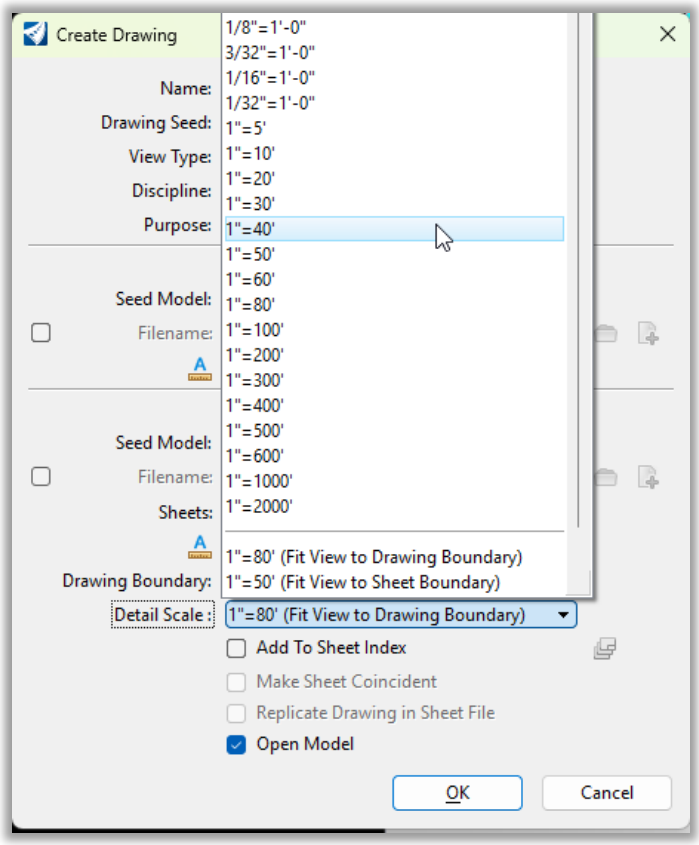


Figure 112 - Create Drawing Detail Scale

3. Using the Models Dialog box double click to open and review the Drawing and Sheet Models that where created. Make note of any Levels you need to turn on or off. Open the **Default Model** and:
   a. **Delete** and of the **White Space Cells** and **Match Mark lines** that were created for the initial setup.
   b. Turn on or off the levels noted after reviewing the Sheet Models
   c. **Save Settings**

4.2.5 Add White Space Shape to Drawing Models

All callouts, annotations, and notes must be placed in the **Drawing Model**. This ensures proper behavior of annotations and supports smart labeling functionality. For example, placing labels in the Drawing Model allows you to dynamically label point information such as Northing/Easting coordinates and have those values remain intelligent and update correctly.

1. Use the Models Dialog to open the Drawing Models. In the Drawing model place the White Space Cell. Navigate to **CTDOT > Annotation > Borders > White Space**, then **place** the cell as needed. This will help you determine the space you have on the sheet for Call Out and Notes.

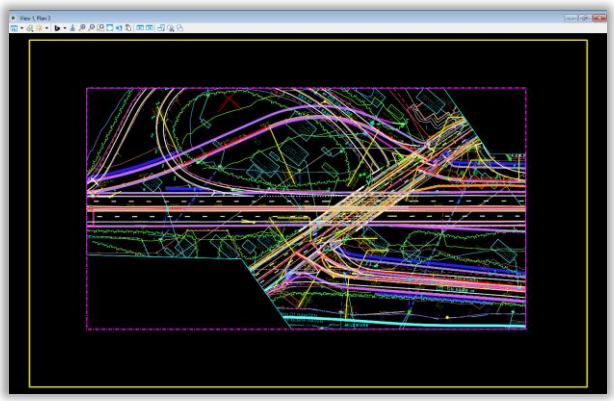


Figure 113 – Place White Space Cell

2. Adjust the Location of the Drawing Model in the Sheet Model
   Open the corresponding **Sheet Model** and align the **Drawing Model** reference to the **Border Cell**. This ensures the drawing is properly positioned within the sheet layout and prints correctly.

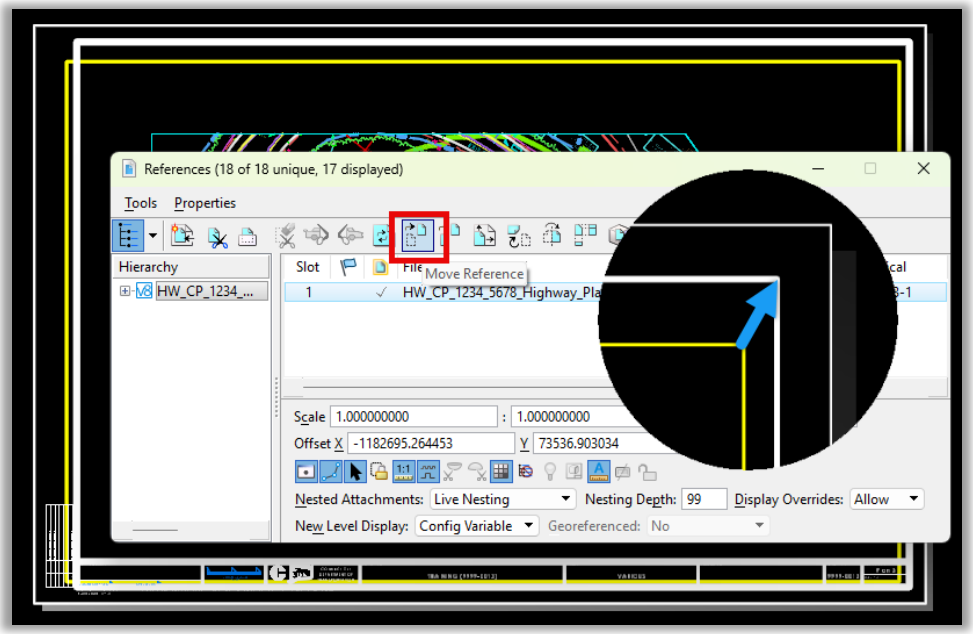


Figure 114 - Adjust the Location of the Drawing Model in the Sheet Model

4.2.6 Create Blown Up Detail

This video demonstrates how to place a 1″ = 20′ detail on an existing 1″ = 40′ contract sheet. This done to **communicate critical design information more clearly without creating additional sheets**. Specifically, it allows you to:

- **Show added detail where needed**
  Certain areas (tie-ins, curb returns, drainage structures, signal equipment, utilities, ADA elements, etc.) require more clarity than a 40-scale plan can provide.
- **Maintain context while improving readability**
  The 40-scale plan shows the overall corridor, while the 20-scale detail zooms in on a specific location so dimensions, labels, and features are legible.
- **Improve constructability**
  Contractors rely on enlarged details to understand complex geometry, grades, and relationships that may be unclear at smaller scales.

4.3 Profile Sheets

4.3.1 Create a DGN File

1. Create a New File.
   a. Select the **New File** icon or select **File > New** from the ribbon.
   b. Browse to the ***Contract_Plans*** folder and create a new 2D design file following the file naming convention outlined in Volume 16, Appendix 4 – File Naming Examples.
      Example file name: ***HW_CP_1234_5678_Profiles.dgn***
2. Select a Seed File.
   a. In the New dialog box, select the **Browse** button to select a seed file.
   b. Choose the **2D Project Highway Seed** previously set up for your project: ***Highway\|HW_2D_ProjectSeed.dgn***

      Note - *This seed file already includes existing survey models as direct references (no nesting).*
   c. Alternative Seed Files - If you do not want to use the project seed, you can use seed files from the general CAD Workspace. Ensure you select the correct Survey Datum for your project:

      Road Design Seed:
      ...CT_Configuration\|Organization\|Seed\|Road\|Seed2D - CT RoadDesign.dgn
3. Click **Save**. The file will get created and auto-open.
4. Use the **Geographic Coordinate System** dialog box to match the Survey Seed. Use ***From File*** and select the Survey File and Model you wish to match.
5. If you start with a Workspace seed instead of the project seed, you must manually reference all existing survey models. Make sure to use direct references for each model. Do not use nested references.
6. Reference in the needed Alignment Files as well as the ***Highway_Plans.dgn***.

   Note: *Referencing in the Highway plans will make it easy to see the station limits so you can match up the sheets.*
7. In View 1 set the **Terrain Active**.
8. In View 1 **Right Click**, in the Pop-up select **View Control > 2 View Plan/Profile,** follow the prompts to select the mainline.

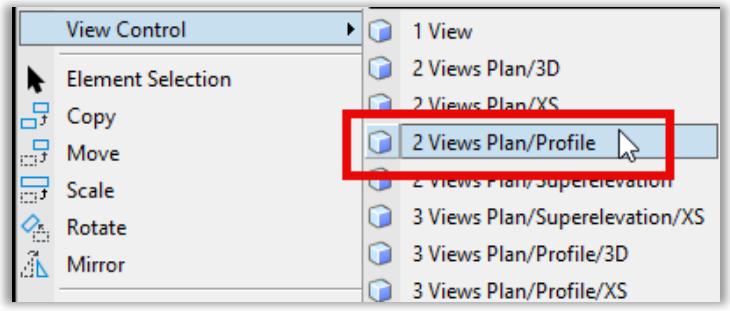


Figure 115 View Control Plan/Profile

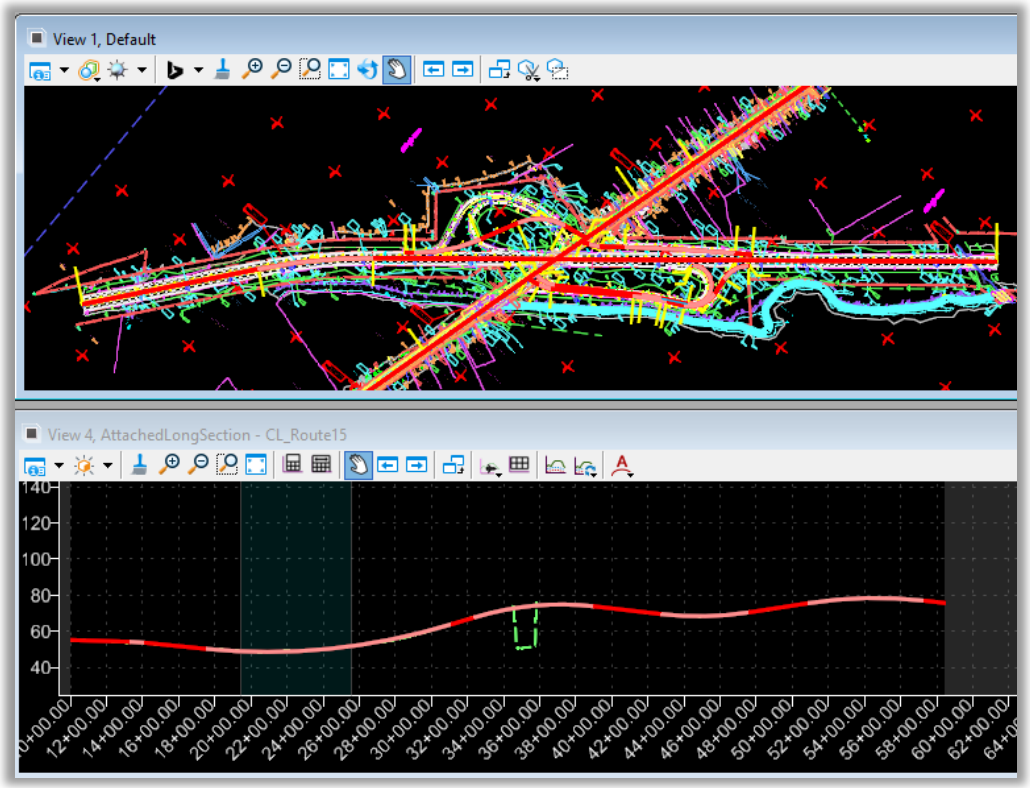


Figure 116 - Plan / Profile View

9. **Save Settings**.

4.3.2 Create Profile Sheets

1. Select the **CTDOT Tab**, in the **Sheet Production Area** select **Create Clipping Shape**. This will set the needed level active.
2. In the same section Select **Place Named Boundary**. The Place Name Boundary Civil Plan dialog box will appear.
3. Select the **Civil Profile** mode.
   Set the dialog fields as follows:
   - Drawing Seed: ***40 Scale Contract Profile Sheet***
   - Detail Scale: ***1"=40'***
   - Name: ***Profile 1***
   - Method: ***Station Limits***
   - Name: ***This will auto-populate when you select the alignment to set the station limits.***
4. Follow the prompts in the lower left corner left, Command Line: **Place Named Boundary Civil Profile > Identify Profile View** click in the **Profile View**
5. Follow the prompts **Place Named Boundary Civil Profile > Accept/Reject. Identify Profile start point to place boundary,** set the **Start Location** graphically in the Profile View or the dialog box.
6. The middle settings come from the Drawing Seed and can be adjusted as needed.
   - Vertical Exaggeration: ***10***
   - Available Profile Height: ***60***
   - Top Clearance: ***(toggled on) .5***
   - Bottom Clearance: ***(toggled on) .5***
   - Elevation Datum Spacing: ***10***
   - Station Datum Spacing:***10***
   - Profile Shifts: ***Where Needed***
7. The bottom settings come from your user profile.
   - Use Terrains: ***(toggled on)***
   - Use Active Vertical: ***(toggled on)***
   - Create Drawing: ***(toggled on)***.
8. Follow the prompts, **Place Named Boundary Civil Profile > Identify end point to place boundary,** set the **Stop Location** graphically in the Profile View or the dialog box.

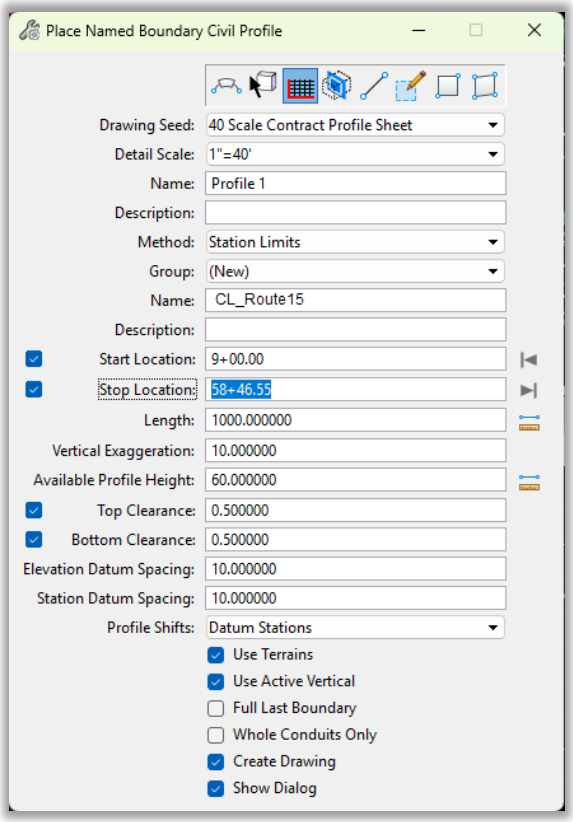


Figure 117 - Profile Named Boundaries dialog box

9. Follow the prompts, **Place Neamed Boundary Civil Profile > Accept/Reject. Data point in Profile View to place Boundary.** Click in the Profile View to **Accept the results**.

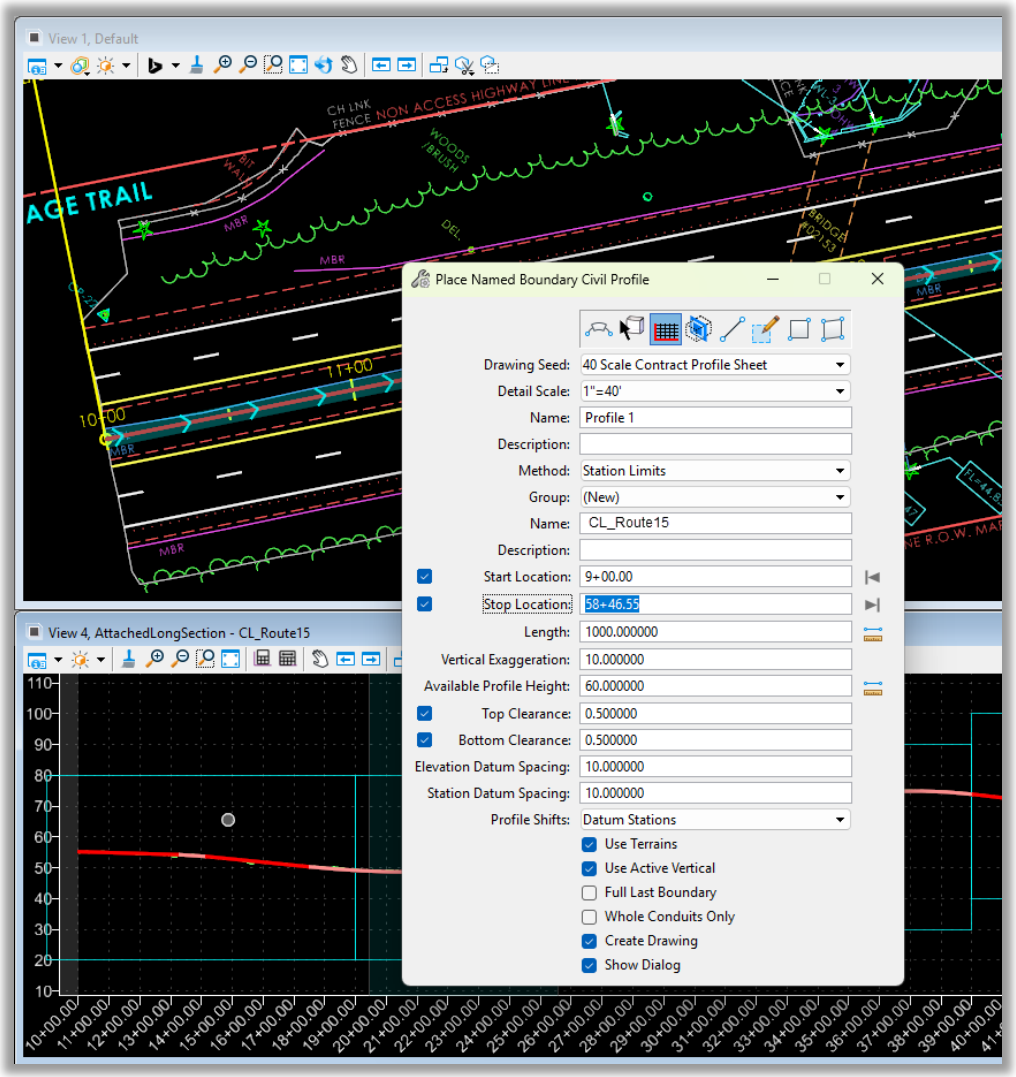


Figure 118 - Profile Named Boundaries with Accepted Results

10. The **Create Drawing** dialog box will appear. The Mode should be set to **Profile.**
11. Set the following ***as desired***, everything else is preset for you.
    - View Name:
    - Drawing Model - Model Name:
    - Sheet Model - Model Name:
12. If desired toggle on: **Add To Sheet Index** and ***Open Model***.
13. Click **OK** to create the sheets. Follow the prompts in the lower left corner left click to define the named boundaries. Multiple left clicks may be required.
14. The **Named Boundaries**, **Drawing Models**, and **Sheet Models** will now get created.
15. Proceed to generate additional profile **Named Boundaries** and the associated **Drawing and Sheet Models** for each remaining roadway.

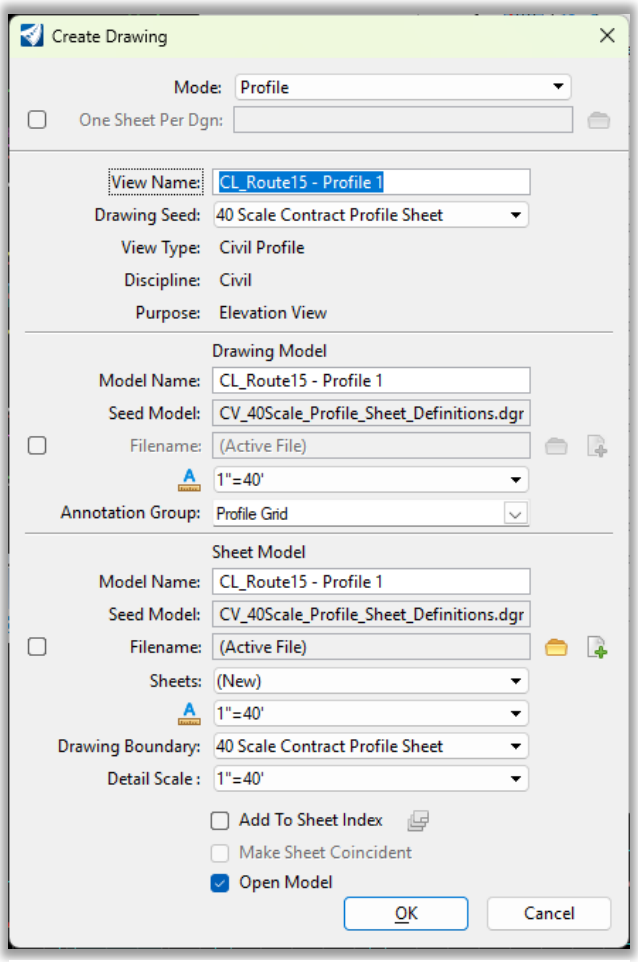


Figure 119 - Create Drawing

4.3.3 Review and Adjust Named Boundaries

1. In the Active View Group, select to open **Multi-Model Views**.

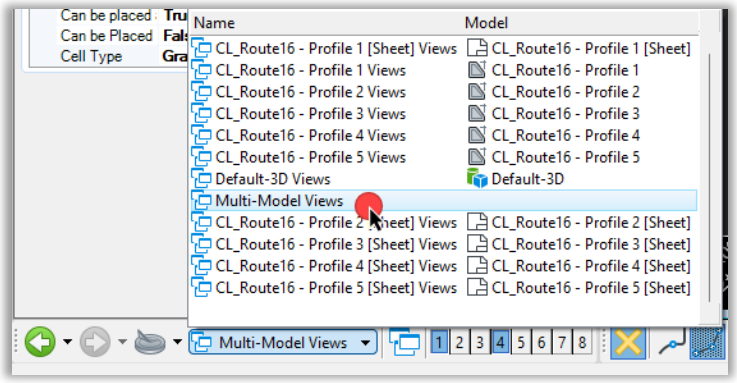


Figure 120 – Active View Group

2. In the Named Boundaries Manager, review the Named Boundaries that have been created. Switch the workflow to **OpenRoads Drawing Production**, select the **Drawing Production** tab in the **Named Boundaries** section click the small button in the lower-right corner to open the **Named Boundaries Manager**.

4. Click on one of the definitions and review the settings. Notice the ***Start and Stop Stationing***. Check it against the Plan Sheets. If the stations need to be adjusted, you should delete the Boundary, Drawing Model, and Sheet Model. and recreate it. **Do not** adjust the **Start and Stop Station Graphically**.

5. If necessary, the vertical position of a profile named boundary can be adjusted. Open the Multi-Model Views.

   a. Select **Drawing Production > Named Boundaries > Named Boundary > Adjust Profile Named Boundary**.

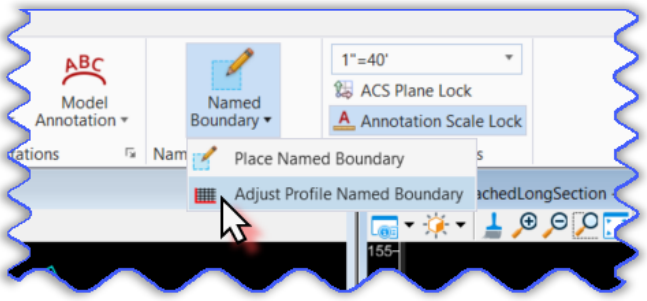


Figure 121 – Adjust Profile Named Boundary

   b. Left click in the **profile view**.

   c. Left click on one of the **profile named boundaries**. The name boundary moves vertically with the cursor allowing you to adjust the exact position of the boundary. Notice that the boundary moves in increments defined by the Elevation;

Datum Spacing, in this example 10'. The Elevation Datum Spacing was one of the parameters that could be set when the named boundaries were created.

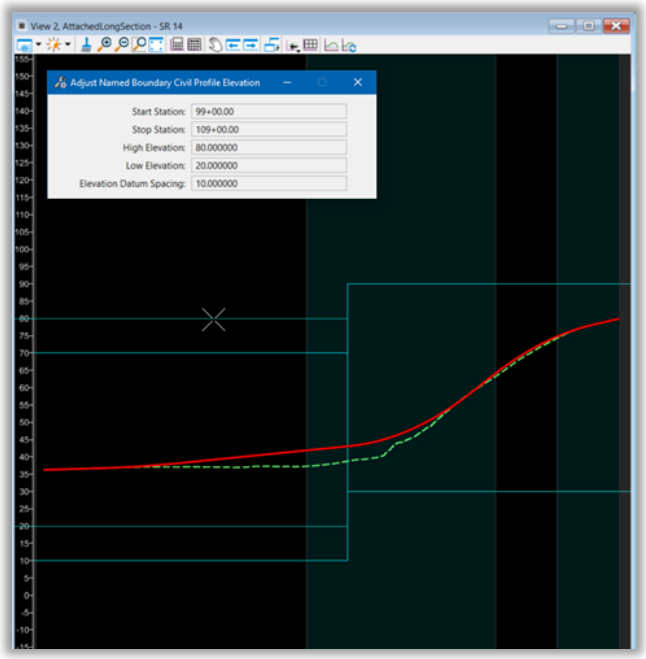


Figure 122 - Adjust the Named Boundary Civil Profile Elevation

4.4 Plan and Profile Annotation

There are several ways in **OpenRoads** to annotate graphical information. It is important to understand **what** is being annotated and **how** each element type is annotated.

Basic MicroStation Tools	OpenRoads-Specific Tools
• Place Note • Place Label • Dimensioning	• Civil Labeler • Element Annotation • Drawing Annotation

These tools provide the ability to place **smart, data-driven annotations** that read civil object information such as alignment names, bearings, stations, northings and eastings, and offsets. Labels remain associated with their reference elements and will update or move as those elements change. Reference elements may reside in the active file (e.g. Alignment Annotation) or within a referenced DGN. The **Place Label** tool is also commonly used for roadway callouts.

Key Terms for Labeling in OpenRoads

- **Text Style** - Defines text formatting such as font, size, spacing, and justification.
- **Dimension Style** - Defines dimension formatting including arrowheads, leader lines, text orientation, and symbology (color, line style, and weight).
- **Text Favorite** - An intelligent, reusable label component made up of text and fields.
- **Field** - A dynamic link to object information. Fields can reference civil object properties (e.g., curve delta, PI coordinates, alignment name, station values) or general MicroStation properties (Item Types).

The CTDOT workspace includes basic MicroStation annotation tools located on the CTDOT Ribbon. These tools automatically apply the correct styles for the specific items you are annotating.

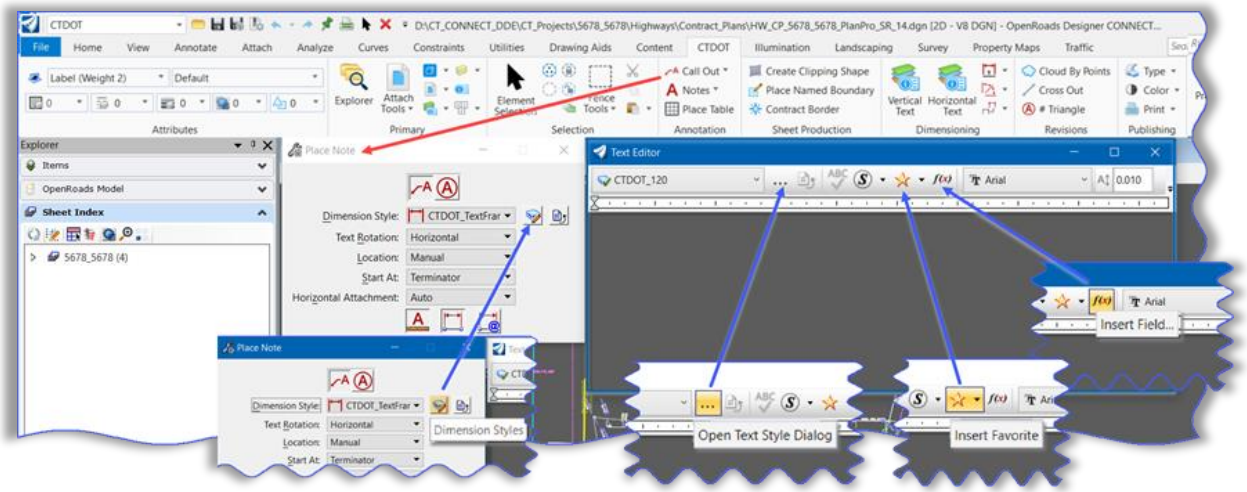


Figure 123 – CTDOT Annotation Ribbon

Most annotation will be placed in the Contract Plans (CP) drawing model with the exception of the **Horizontal Centerline Annotation**, those will reside in an **Alignment.dgn** Base Model (CB).

There are three icons along the bottom of the Place Note or Place Label toolbox that define how the label behaves when the drawing scale is changed or when the referenced element changes.

- **Annotation Lock** - Labels created with this option enabled will scale when the Annotation Scale is adjusted.
- **Association to Element** - Labels created with this option enabled but with the Relative Association to Element option disabled will remain at their placement location when the reference element changes. Only the leader line moves.
- **Relative Association to Element** - Labels created with this option enabled will remain at their relative location to the reference element when that reference element changes.

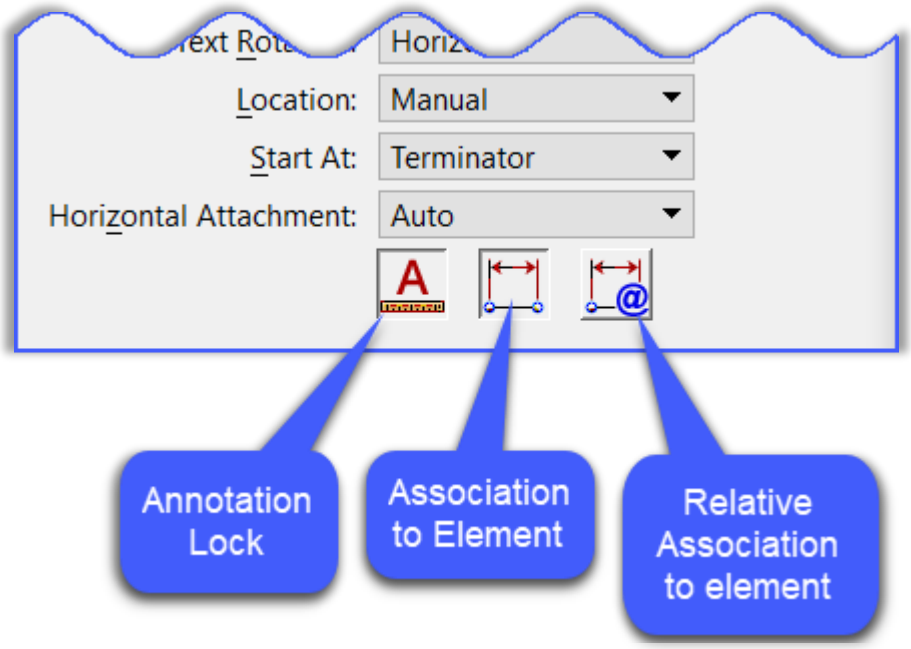


Figure 124

Labels created in OpenRoads have three parts (Leader, Text, and Anchor Point). Labels created in MicroStation only have the first two parts.

- **Leader** - Optional line and arrow connecting between the Text and the Anchor Point.
- **Text** - The label content which is made up of text, text fields, and graphics.
- **Anchor Point** - The point that is used to compute values in the fields.

Element Annotation - Horizontal Alignment

The horizontal alignment should include stationing, PC's, PI's, PT's, curve data, and bearings. This annotation process has been automated and is typically performed after the alignment is created. All labeling and annotation are placed in the Alignment.dgn Base Model (CB), alongside the centerline and base lines.

The **Profile (vertical alignment) annotation** has been automated to display:

- **Stationing and elevations** at the grid marks
- **Stations and elevations** for PVC's, PVI's, and PVT's
- **Vertical curve information**, including length, K-factor, and stopping sight distance
- **Slope of tangent sections**

Once created, the vertical alignment annotation **automatically populates** in the profile drawing models.

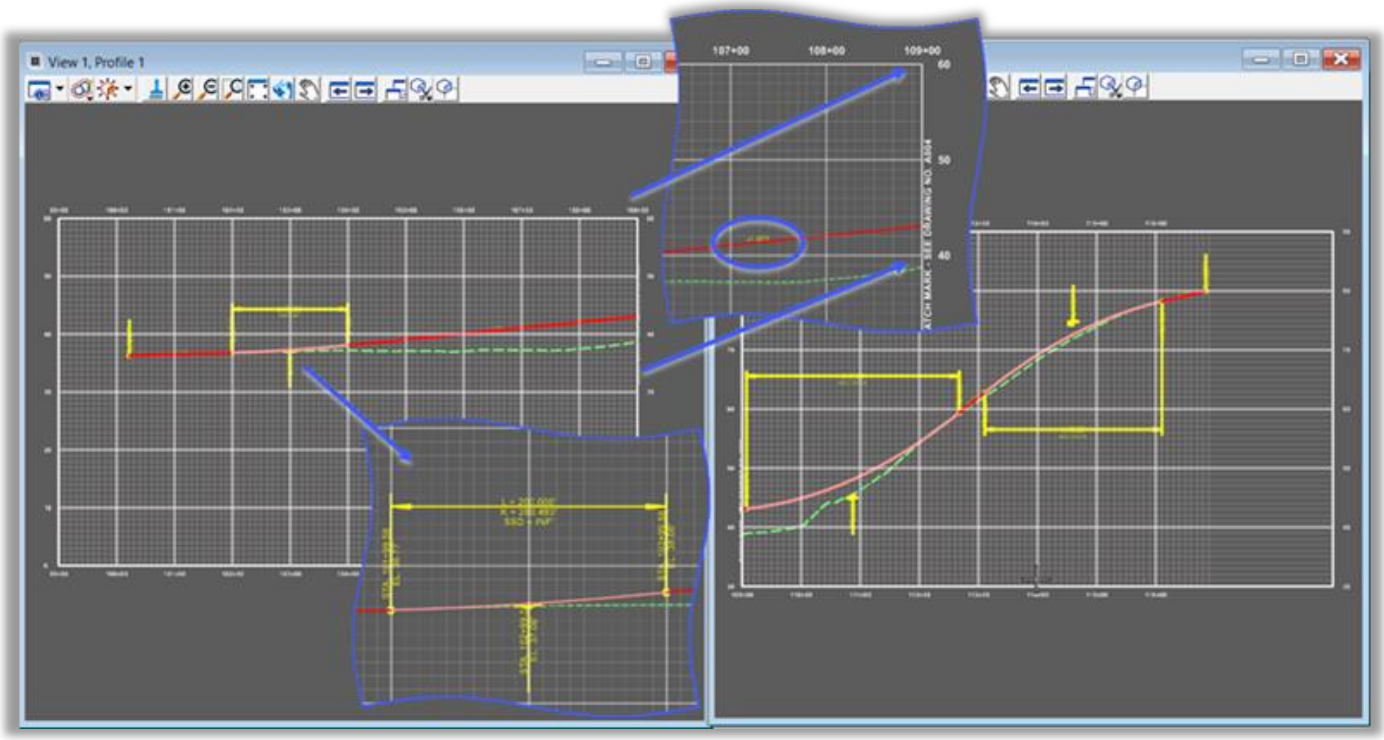


Figure 125 – Vertical Annotation

4.4.1 Place Label and Note Tools

The CT_CONNECT_DDE workspace has been configured to streamline annotation for plan sheets. Adjustments and updates are added periodically. To access the tools, select the **CTDOT workflow** and click the **CTDOT Tab**.

The workspace provides tools for each discipline and various subject areas; in this section, we will focus on the annotation tools.

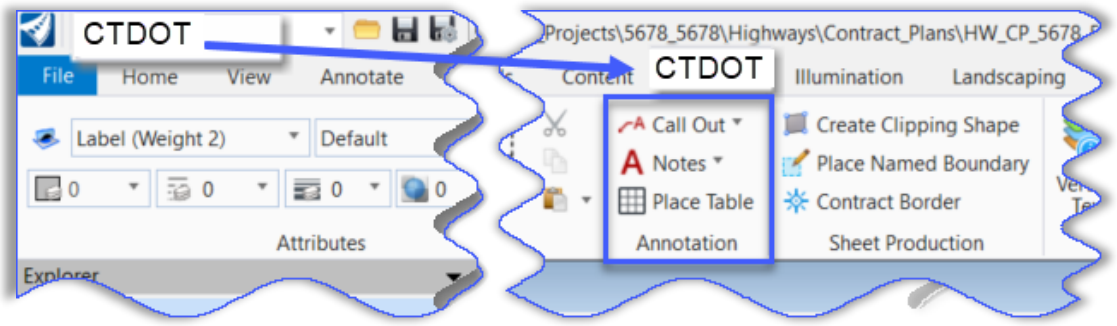


Figure 126 – CTDOT Annotation Tools

These annotation tools have been set-up with appropriate attributes (level, color, line style, text style, dimension style) these should not be changed by the user.

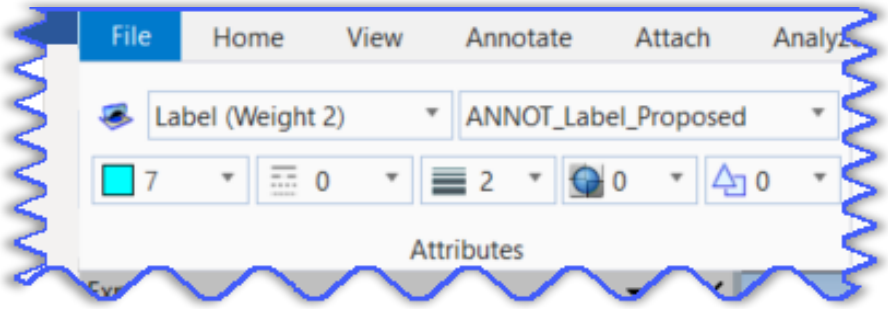


Figure 127 – Graphical Attributes

4.4.1.1 Place Call Outs

1. Open a **Contract Plan Drawing Model**.
2. Select the **CTDOT workflow**, then go to the **CTDOT Tab > Sheet Production > Call Out**
3. Click on the **Label (Weight 2)** tool or anyone of the other Label tools.
   - **Label Small (Weight 2)**
   - **Label (Weight 0)**
   - **Label Small (Weight 0)**
4. The Place Note toolbox opens, and the Text Editor box should open. In the editor type in the label for the item.
5. Example: "**APPROX. SLOPE LIMITS**". The difference of the Weight 2 or 0 is the line weight of the leader line. The weight is chosen according to the complexity of the call outs.

   Follow the prompts to place the leader and text to fit within the white Space Cell.

   a. Define start point: **snap to the graphic**

   b. associate point: **left click to select the label placement Point**

c. Define NextPoint, or <Reset> to complete: **Right Click to place the note**

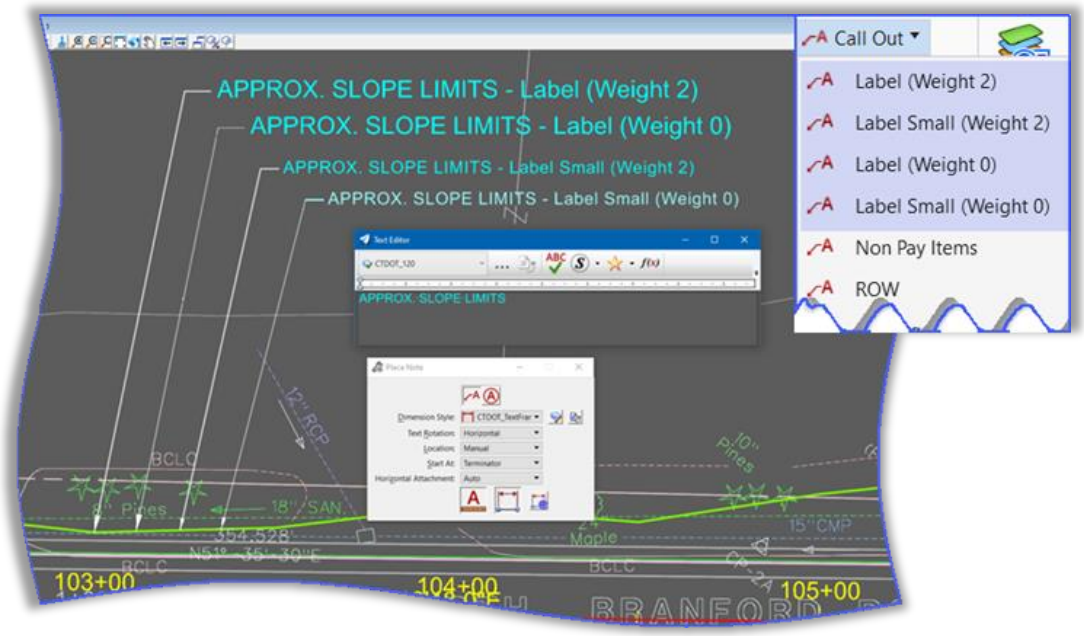


Figure 128 – CTDOT Call Out Tools

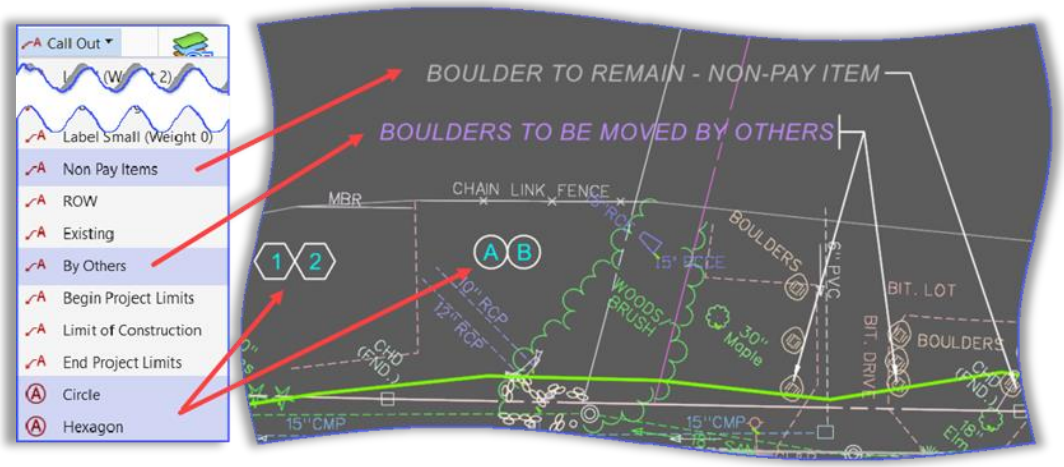


Figure 129 – CTDOT Call Out Tools

4.4.1.2 Place Notes

Notes should generally be placed in the **drawing model**. Notes are used to convey information such as right of way, general construction notes, drainage notes and construction sequencing. There are several Note tools available.

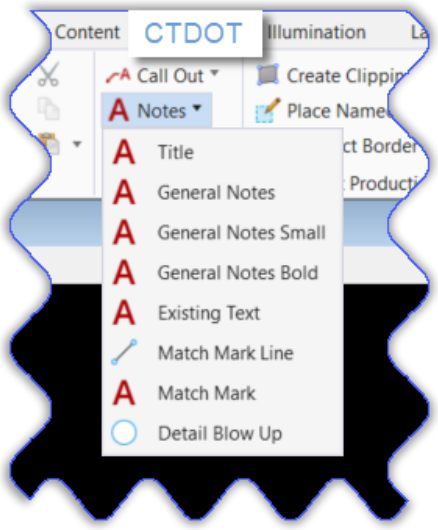


Figure 130 – CTDOT Place Note Tools

- **Title** - used for the title of a detail blow up or as the label for construction sequences on one sheet.
- **General Notes**, **General Notes Small** and **General Notes Bold** - are used for notes pertaining to the project, example: All highway markers to be protected during construction.
- **Existing Text** - is for an existing item to be labeled, such as a mailbox to remain.
- **Match Mark Line** and **Match Mark** - are used to mark and annotate the match mark between two sheets, this is automated when using the Plan and Profile Production tool.
- **Detail Blow Up** - sets the attributes for the blow-up circle or box.
- **Place Table tool** - is used to place a table for the General Notes. It is formatted and can be filled in; for a more detailed description using tables see Bentley Help - Place Table.

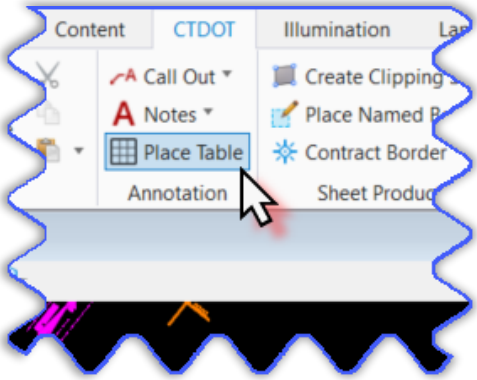


Figure 131 – CTODT Place Table Tool

1. Select the **Place Table** command. In the Place Table toolbox select the first icon.
2. Click on Seed: find the table for ***General Notes***, select how many rows and columns are needed (this can be edited later if needed). Now the table will be visible on the cursor, place the table on the sheet as needed.

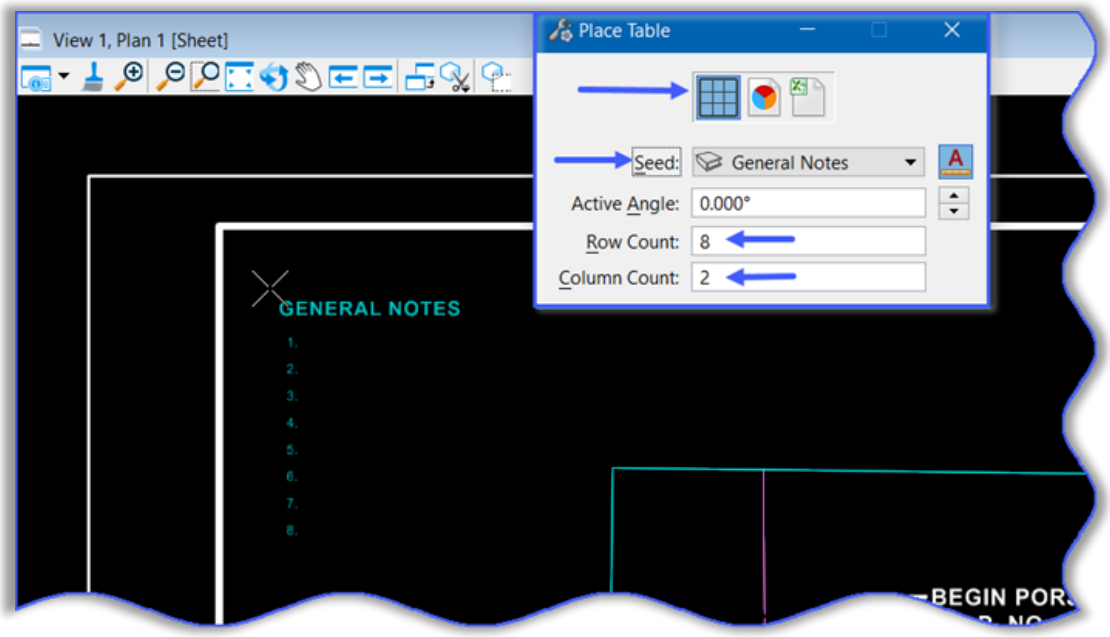


Figure 132 – Place Table Dialog Box

3. To add/fill in the table select the **Annotate** tab and choose the **Edit Text** tool.
   Note: Avoid using the Element Selection tool to edit the table as this will lock up the file.

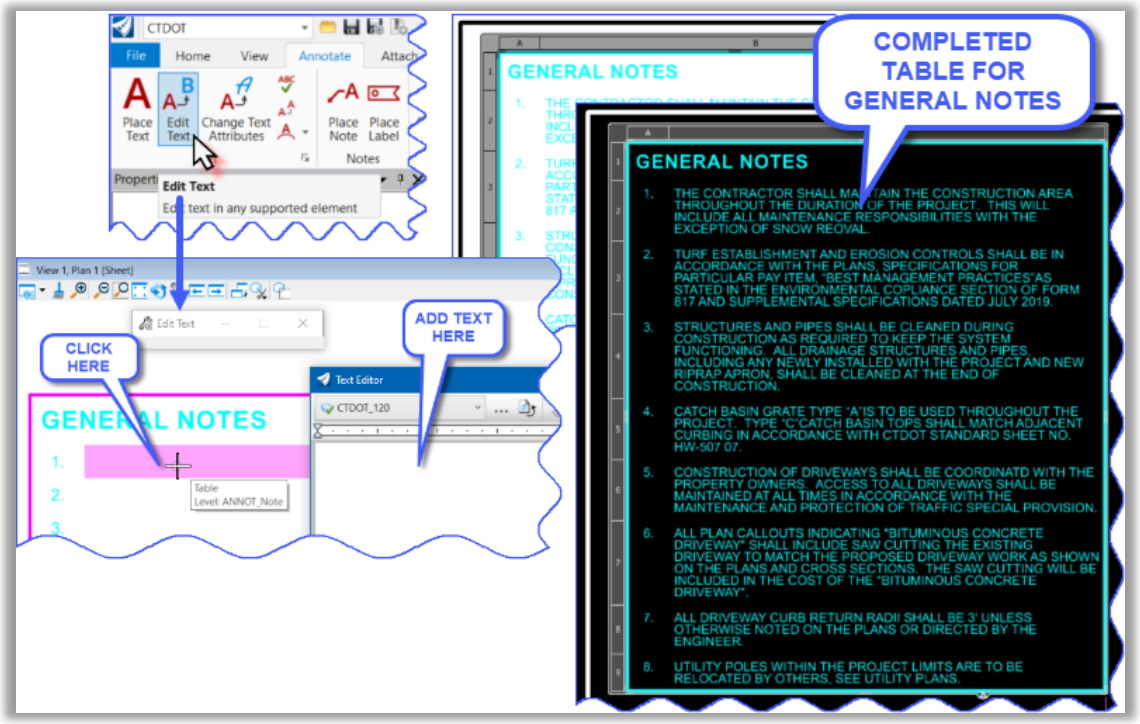


Figure 133 – General Notes in DGN

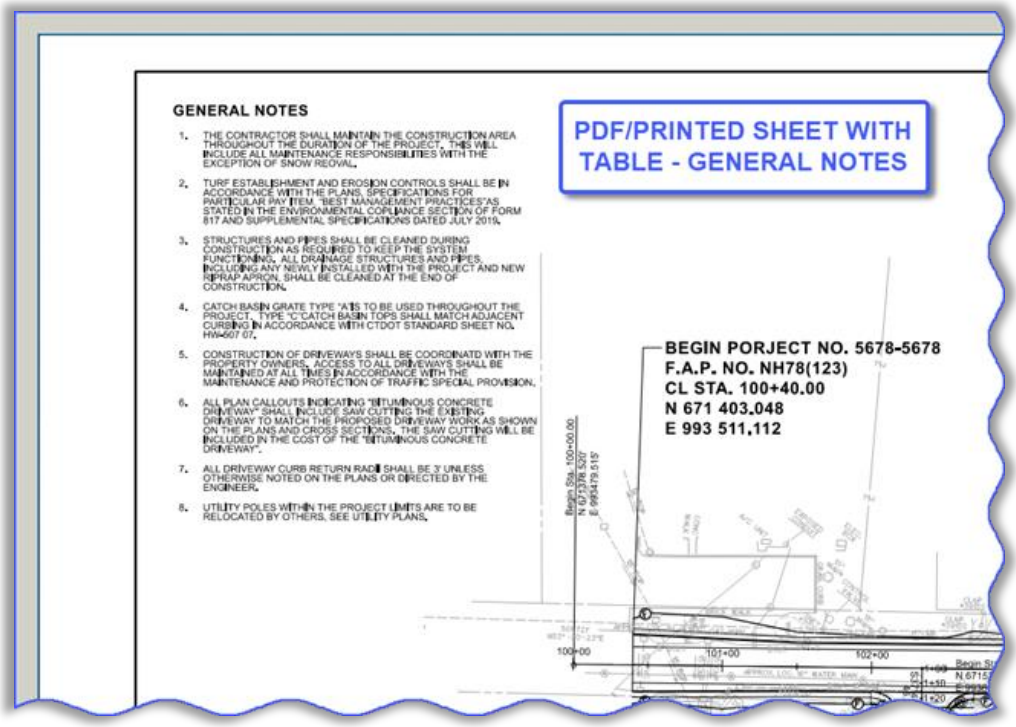


Figure 134 – General Notes in PDF

4.4.2 Civil Labeler

The Civil Label designed to help you place dynamic, data-aware annotations (labels) on your civil design drawings such as station/offset values, elevations, alignment names,

intersecting geometry data, and other construction-relevant information **without manually enter text**. Rather than manually placing static text labels, the **Civil Labeler** lets you **automate** and standardize annotation across engineering deliverables. Because the labels are associative (linked to the design features), they help keep plan production accurate when the design evolves.

1. Select the **OpenRoads Modeling** workflow, then go to the **Drawing Production > Labels > Civil Labeler**

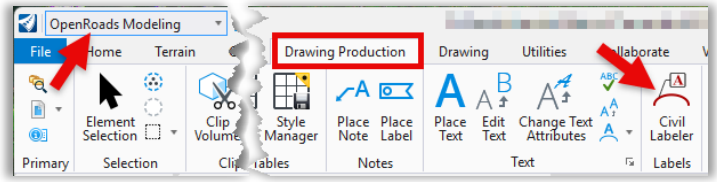


Figure 135 – Civil Labeler

2. Browse through the folders and get familiar with the available labels.
   The Civil Labeler contains several categories of pre-configured annotations. Key examples include:
   - **Pay Item – Item Type Labels**
     Apply labels to graphical elements that have Item Types assigned. These can be used for **auto-annotation** of pay items directly from the model.
   - **Drainage Labels**
     Tools for labeling drainage structures such as inlets, manholes, pipes, and inverts.
   - **Centerline and Baseline Annotation**
     Labels for alignments, including stationing, offsets, bearings, coordinates, and other geometry values.

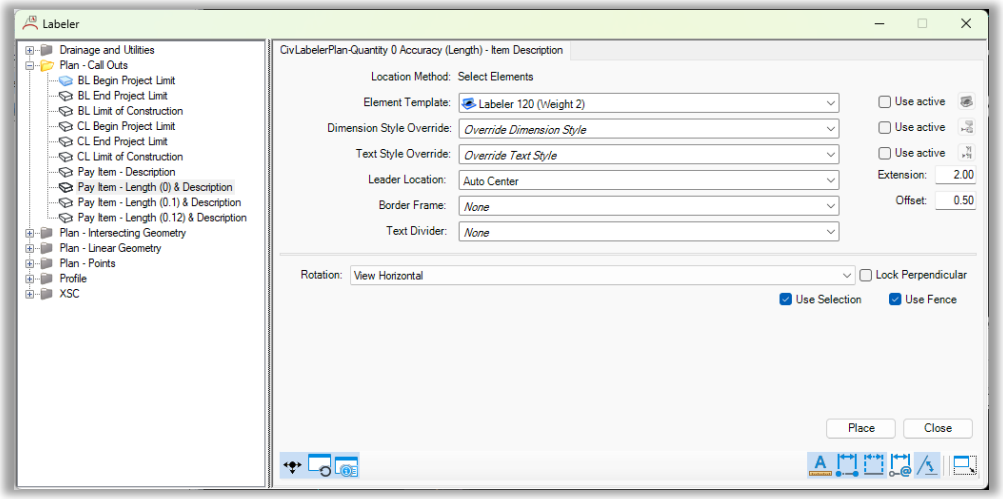


Figure 136 – Civil Labeler

4.4.3 BOP & EOP

Labeling the BOP, EOP, and LOC is essential for plan clarity and construction accuracy. These labels:

- Define the project extents on the plan sheets for all stakeholders.
- Communicate construction limits to contractors, ensuring work stays within authorized boundaries.
- Assist in referencing for stationing, alignment, and grading throughout the project.
- Provide consistency across plan sheets, especially when multiple drawing models or sheets are used.

In short, these labels make it immediately clear where the project begins, ends, and what areas are included in construction limits.

Figure 137 - CTDOT Call Out Tools

This annotation can be placed using the **Place Note** command on the CTDOT Ribbon or the **Civil Labeler**.

1. Open the appropriate ***Contract Drawing Model***.

   Option 1 - Civil Label

   a. Select the **OpenRoads Modeling** workflow, then go to the **Drawing Production > Labels > Civil Labeler**

   b. The Civil Laber will open select ***Plan – Call outs | CL Begin Project Limit***

   c. Follow the prompts to place the leader and text to fit within the white space shape. The Text will auto-populate.

   d. Select the placed text and manual edit the **F.A.P. NO**.

   e. Manually move the **top leader** line to the middle of the text top line.

   Note: *CTDOT has submitted a request to Bentley for this to annotate correctly at placement. However, Bentley does not consider it a current priority, so this additional step is still required.*

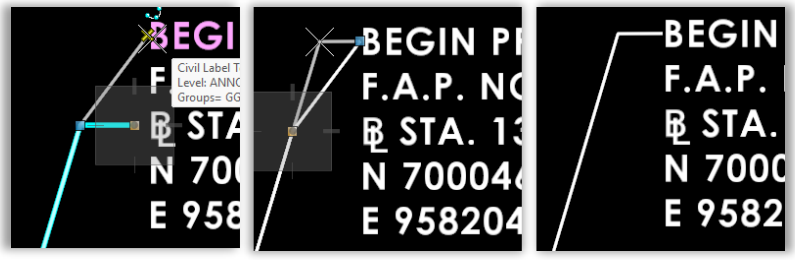


Figure 138 - Adjust the Top Leader

Option 2 - Place Note

a. Select the **CTDOT** workflow, then go to the **CTDOT** Tab **> Sheet Production > Call Out > Begin Project Limits** tool.

b. The **Place Note** toolbox will open, and the **Text Editor** should appear. In the editor, select the **Text Favorite** pull down: ***CivLabelerPlan-CL Begining of Project***. Text will appear in the text editor.

c. Manually edit to edit the following:

- F.A.P. NO.
- Centerline Station
- Northing
- Easting

Result

BEGIN PROJECT NO. 5678-5678
F.A.P. NO. NH78(123)
℄ STA. 100+40.00
N 671 403.048
E 993 511.112

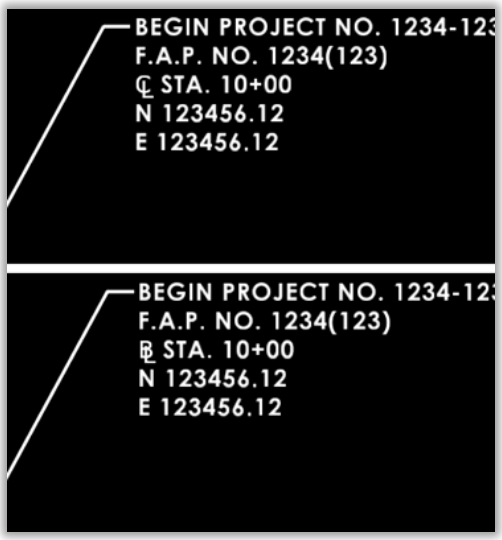


Figure 139 - BOP Label

d. Follow the prompts to place the leader and text to fit within the white space shape:

- Define start point: **snap to the beginning**
- Associate Point: **left click to select the label placement Point**
- Define NextPoint, or <Reset> to complete: **Right Click to place the note**

2. Open the appropriate ***Contract Plan Drawing Model*** and repeat the previous steps to label the end of the project.

END PROJECT NO. 5678-5678
F.A.P. NO. NH78(123)
℄ STA. 100+40.00
N 671 403.048
E 993 511.112

3. Open the appropriate ***Contract Profile Drawing Models*** and repeat the previous steps to label the beginning and end of the project in the Profile Drawing Model.

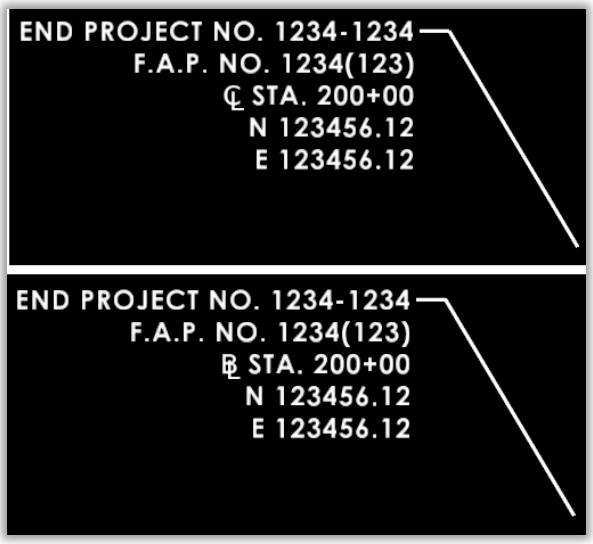


Figure 140 – EOP Label

4.5 Cross Section Sheets

In this section, you will learn how to create and annotate cross section sheets. You will learn how to create Named Boundaries that will be used to generate various cross section sheets. You will also learn about drawing models and sheet models that are used during the sheet creation process. And lastly, you will learn how to add individual annotations to label specific location coordinates, station-offset values, elevations, and more.

4.5.1 Create DGN File

All files for project cross-sections contract plans will reside in the **Contract_Plans** folder under the disciplines folder; example: project folder***/Highways/Contract_Plans***.

Create a 2D design model that will be used to create a set of Cross Section sheets.

1. Browse to the Contract_Plans folder to create a new 2D design file using the file naming convention as described in the Volume 16 Appendix 4 - File Naming
   example: ***HW_CP_1234_1234_XSC_Route123.dgn***
2. Select the 2D Project Highway **Seed** that was previously set up in your project

   Highway\|HW_2D_ProjectSeed.dgn

   This file will have the existing survey models already referenced in, please note that these models are direct refences with **no nesting**.

   If you do not want to use the project seed, you can use the seed files located the general CAD Workspace. Be sure you are using the correct Survey Datums as this can vary per project.
   …CT_Configuration\|Organization\|Seed\|Road\|Seed2D - CT RoadDesign.dgn
3. Use the **Geographic Coordinate System** dialog box to match the Survey Seed. Use ***From File*** and select the Survey File and Model you wish to match.
4. If you start with a Workspace seed instead of the project seed, you must manually reference all existing survey models. Make sure to use direct references for each model. Do not use nested references.
5. Reference in the needed **design base model files**, they reside in the Highways/Base_Models folder within the project folder. The models will be referenced using **No Nesting**. This will include but not limited to the Alignment, Corridor, ROW, Existing Cross Section Features, and Drainage Models.
6. Select the existing terrain boundary and set it **Active**.
7. Set up the display views to show **View 1, Default** and **View 2, Default-3D**.
8. In the 3D Model Turn off the Level ***E_TERRIAN_Ruled_Boundary***, in all the references files.

9. **Save Settings**.

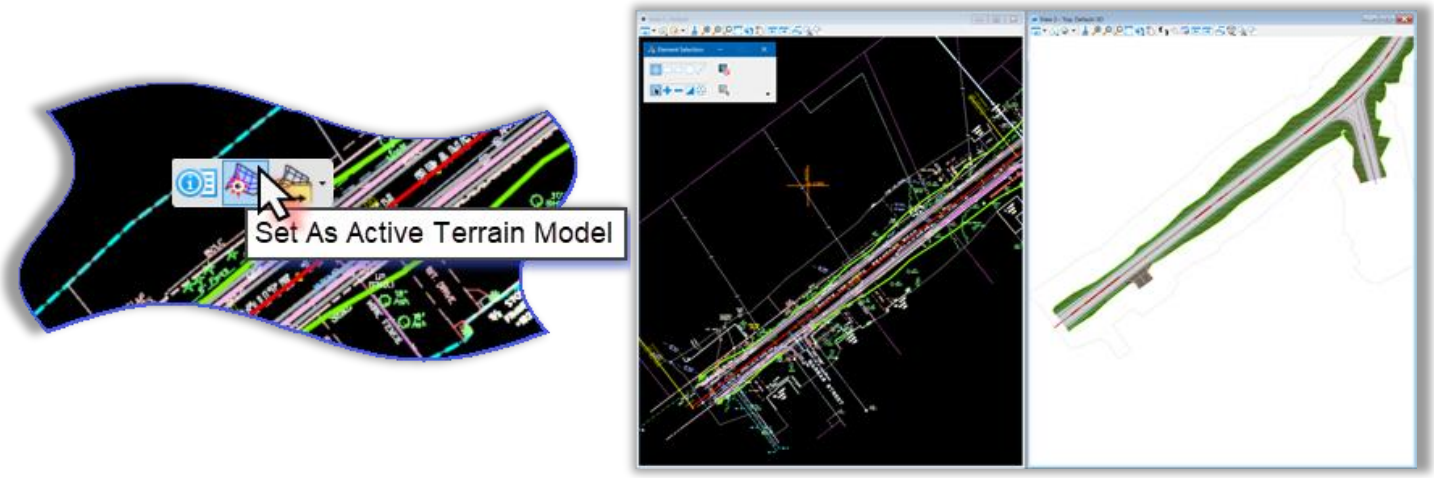


Figure 141 – Set Terrian Active / View 2, Default-3D

4.5.2 Create Cross Section Sheets

1. Select ***CTDOT > Sheet Production > Named Boundary***

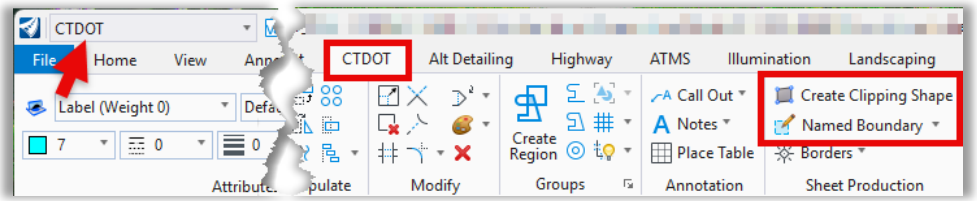


Figure 142 – CTDOT Sheet Production Tools

2. The **Place Named Boundary Civil Plan, Profile or Cross-Sections** dialog box will open. Select the ***Civil Cross-Section*** mode.

3. Set the following:
   a. Drawing Seed: ***5 Scale Contract XSC Sheet***, this will also set the ***Detail Scale to 1" = 5'***.

      The **drawing seed** defines default values and other important parameters required to create sheets. Selecting the drawing seed should always be the first step when creating named boundaries. The drawing seed has been set-up for the ANSI D size paper (34"x22"), and defaults include:

   b. Options on **Named Boundary** (these can be changed if needed):
      - left and right offsets
      - section intervals
      - vertical exaggeration
      - top and bottom clearances between sections

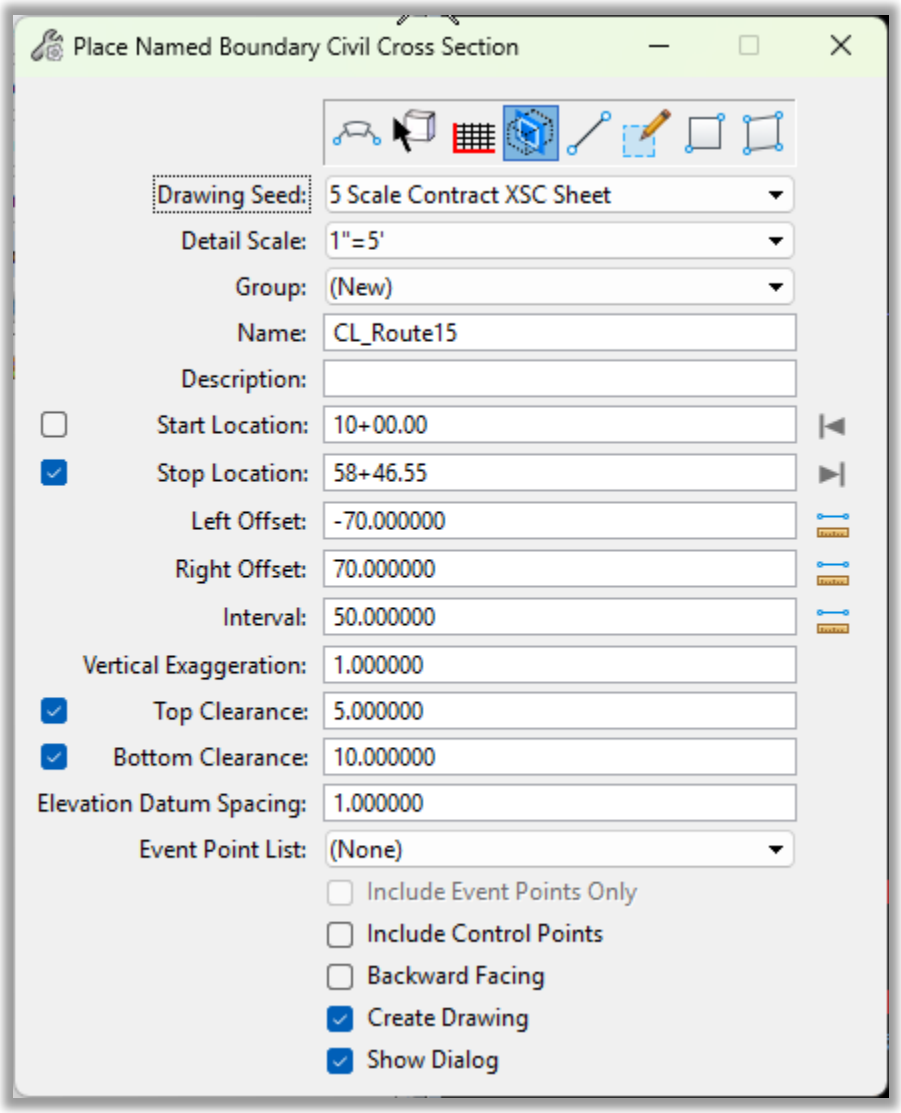


Figure 143 – Place Named Boundary Civil Cross Section

c. Group: ***(New)***

d. Name: ***match the alignment name***
This name field will define the name of the Named Boundary Group). Clicking on the horizontal alignment will populate this name field with the name of the horizontal alignment.

e. Include Event Points Only: ***Enable or Disable***
This will require the user to establish an Event Point List (drainage crossings as example).

f. Include Control Points: ***Enable or Disable***
These are usually the PC's, PI's, PT's of the horizontal alignment.

g. Create Drawing: ***Enable or Disable***
This will dictate if sheets are created as soon as the named boundaries are created.

h. Show Dialog: ***Enable or Disable***
This dialog is used to override settings defined by the Drawing Seed if needed.

4. In the 2D view (default plan view), select the alignment along which the named boundaries will be created. The command line (lower left corner) will read: **Place Named Boundary Civil Cross-Section > Identify Path Element**. With the cursor **select the horizontal alignment**. Now a light blue line should be visible on the cursor. This allows the user to pick the start and stop locations of the named boundaries for cross-sections.

5. Select the desired Start Location. Follow the prompts. **Place Named Boundary Civil Cross-Section > Accept/Reject. Identify Path start point to Place Named Boundary**.

Figure 144 – Place Named Boundaries Prompts

6. Next select the Stop Location. Follow the propmts: **Place Named Boundary Civil Cross-Section > Identify Path end point to place boundary**. The named boundaries are displayed interactively as the cursor moves. Accept the endpoint location for the named boundary.

7. Follow the Prompts: **Accept/Reject. Data Point in Pan View to Place Named Boundary**. 3D Shapes created by Named Boundaries will appear in View 2 (Default-3D). Each 3D shape represents an individual slice of the model and corresponds to a single cross section (XSC) location. These 3D shapes define the extents used during cross section extraction and sheet creation, ensuring that each section accurately represents the model geometry at that station.

8. The **Create Drawing** dialog box will appear. Minor adjustments to the setting maybe necessary:
   a. Annotation Group: In most cases use ***Cross Section,*** but this can be modified if requires as other option have been configured.

b. In **Sheet Model** portion of the dialog, you may elect to turn off ***Create Sheet Model***

   This will allow the user to set up all the Named Boundaries first, adding in needed cuts after the initial run at odd stations or creating sections with different Left/Right Off sets.

c. Enable the ***Add to Sheet Index*** option. This option will be discussed later in this module.

d. Enable the ***Open Model*** option.

e. Click **OK** to create the sheets. At the bottom of the view windows, a gage will appear showing the progress of Sheets Created and then the progress of Drawing Models Annotated. When all is completed the last cross-section sheet will be open.

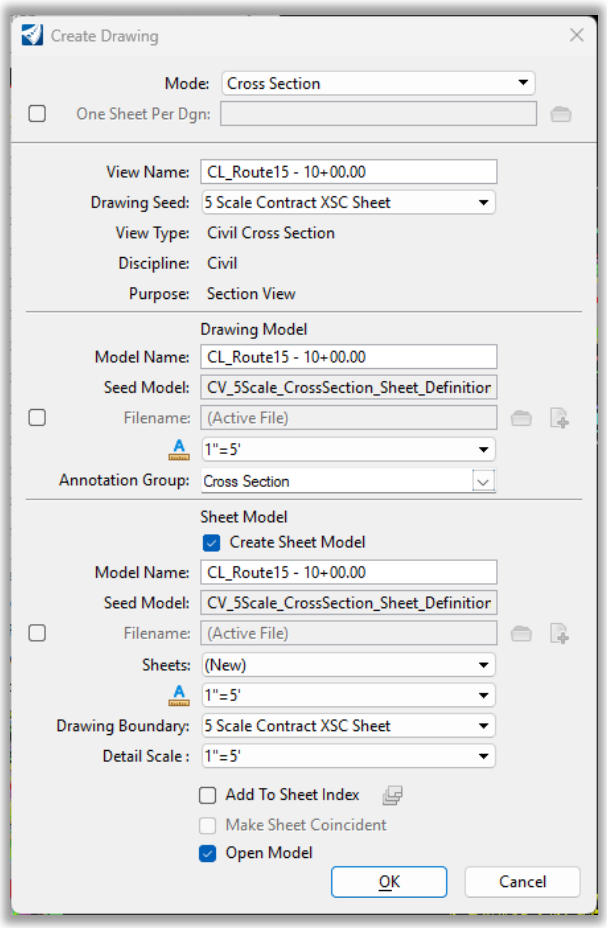


Figure 145 – Create Drawing

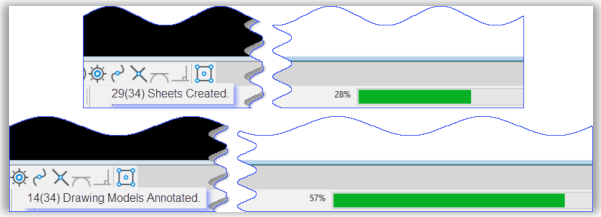


Figure 146 – Status Bar

4.5.3 Review Cross Sections

There are several ways to review individual sheet models or drawing models.

- Manage View Group dialog
- Named Boundaries dialog
- Models dialog
- Sheet Index

1. Click on the **View** tab, in the **View Groups** tool group, select any of a sheet model or drawing model. The same tool is also available in the **Manage View Groups** toolbox if docked on the bottom (it usually is). Each sheet model has drawing models for each section on the sheet model.

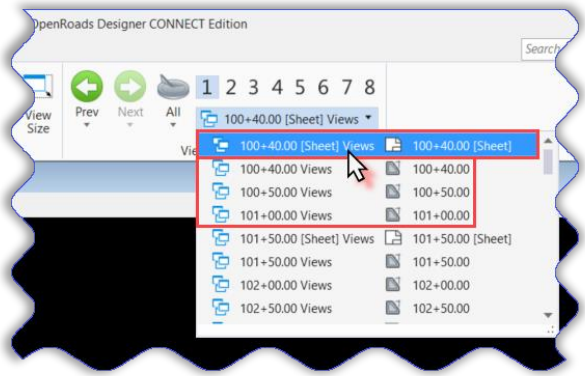


Figure 147 – View Groups

2. Open and review a **Sheet Model**, notice the border cell is placed at 0,0 axis, the named boundary shape and all design models are referenced. The project number, project description and town name(s) will be automatically populated from the WorkSet Properties. The Drawing Title will be populated with the text entered in the Model Description Field.

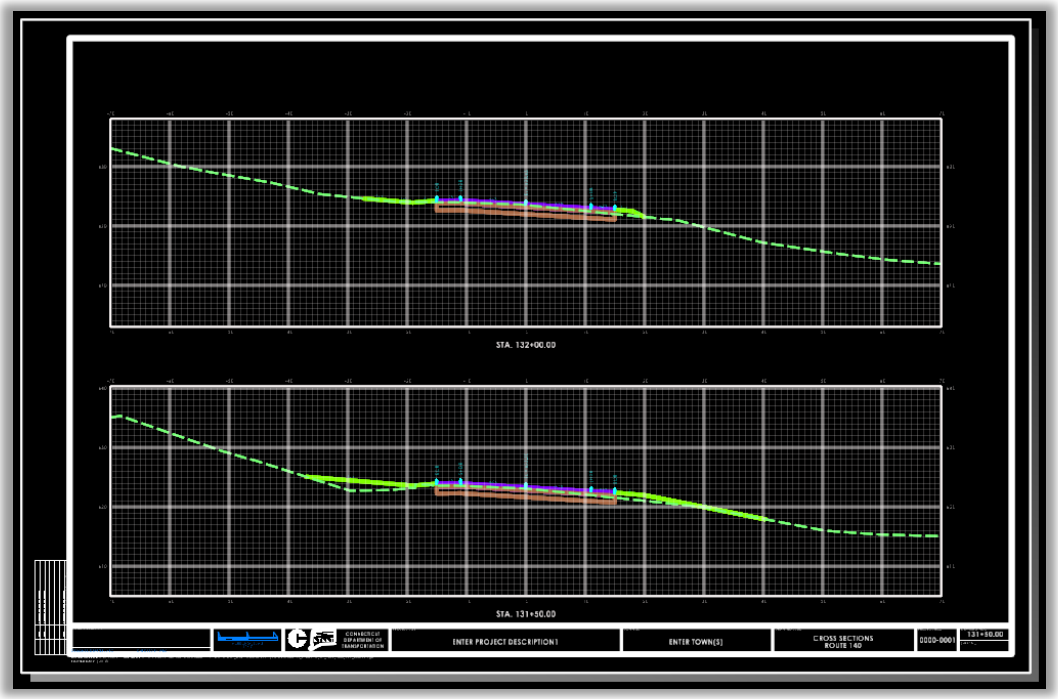


Figure 148 - Cross Section Model

3. Open and review a **Drawing Model** for cross-section sheet by selecting the drawing views for the cross-section sheet. The Drawing Model for the cross-section will open. Notice there is only one cross-section in the drawing model, it shows a grid with elevation and offsets, it shows the existing terrain and proposed design, and has annotation for station, slopes and call outs for Edge Of Road and Center Line. Cross-Section annotation should be done in the drawing model.

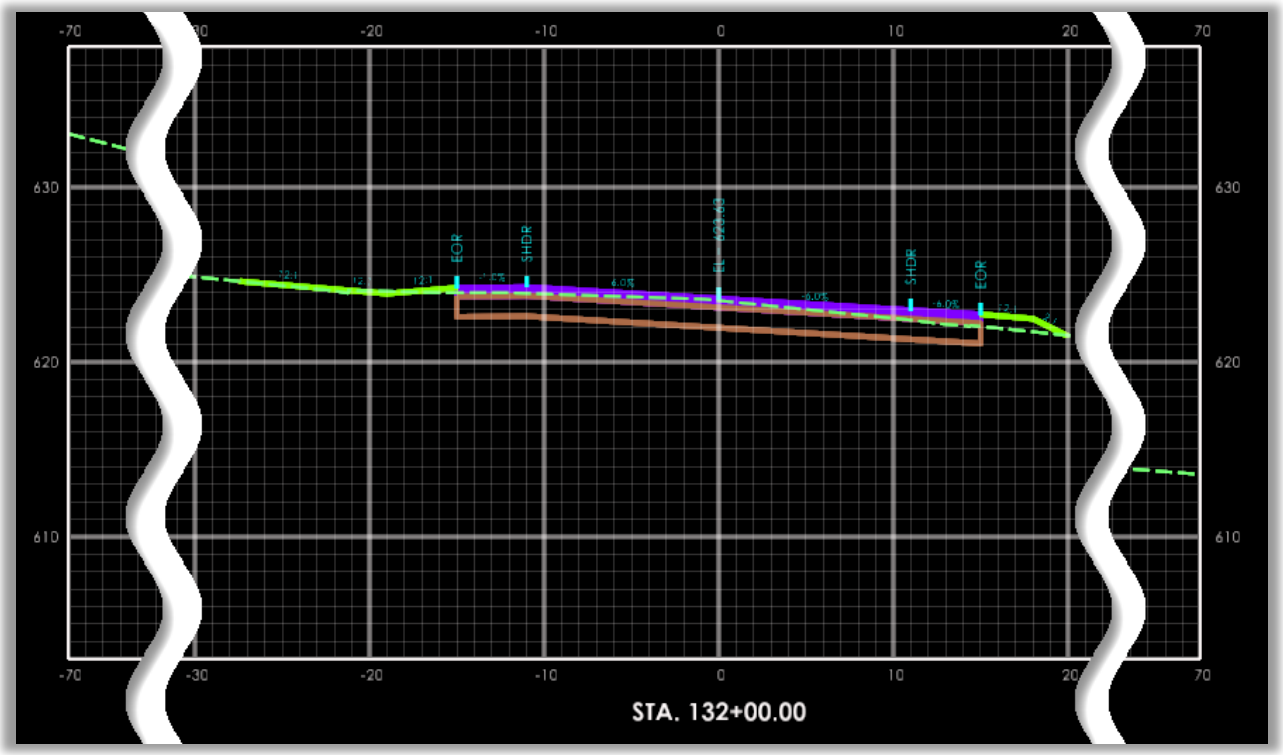


Figure 149 – Drawing Model

The **Drawing Model** is always 2D, is a subset of a 2D or 3D design model and is a direct reference of the named boundary area. The Drawing Model is used to apply annotations, dimensions and callouts to a design, examples: annotation for slopes, Edge of Road or Centerline elevations. The Drawing Model is then referenced into the Sheet Model.

The **Sheet Model** is always 2D, serves as an electronic drawing sheet (printed sheet), typically has drawing model references that are scaled and positioned to create a printable drawing.

4. Get familiar with the correlation between the Sheet Index, Manage View Groups, Named Boundaries and Models

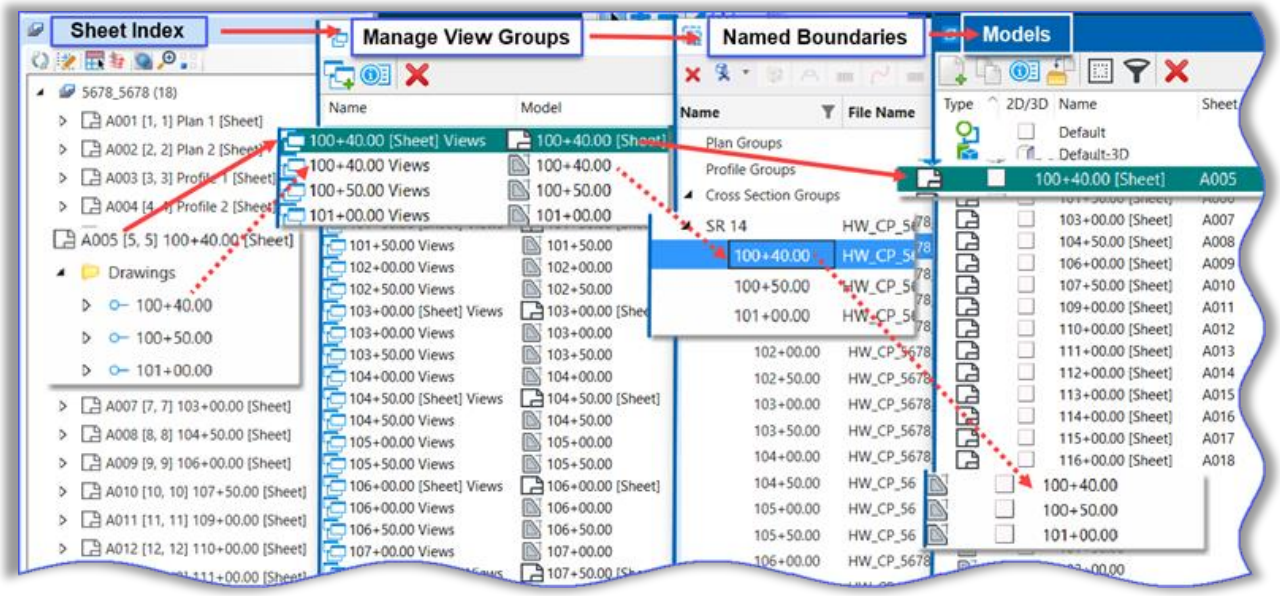


Figure 150 - Correlation between the Sheet Index, Manage View Groups, Named Boundaries & Models

4.5.4 Add a single Cross Section to a Sheet

Sometimes it becomes necessary to add a cross-section at one particular station that does not fall on the interval stations of the cross-section creation, this can be done if necessary.

As an example: A driveway was not on the original survey (Terrain) and added later. The design model (corridor) was updated to include the driveway, but the cross-section drawing models and sheet models do not include this added driveway. The particular cross-section sheet model for the project has room to add the driveway cross-section.

NOTE: This should only be done if necessary and the drawing models can be adjusted to allow for the additional drawing model onto the sheet model. If more additional cross-sections are needed, it may be necessary to redo the cross-section plan production and add an event point list.

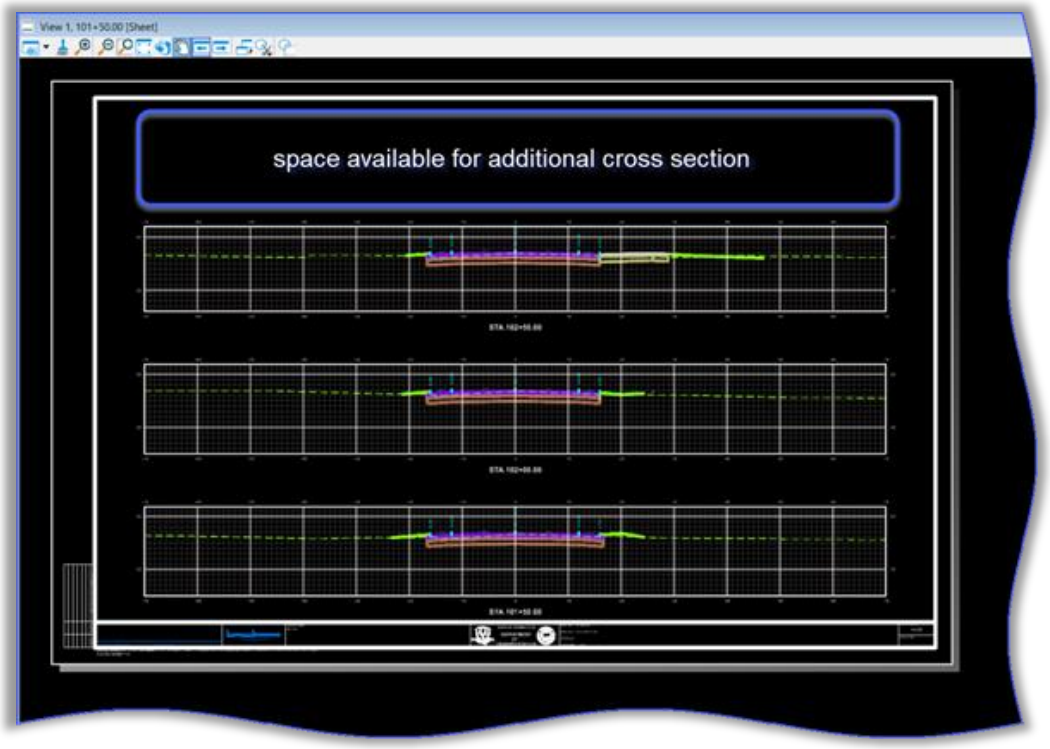


Figure 151 – XSC Sheet Space Available

Adjustments to the sheet layout are made in the reference attachments.

1. Select to open a **Sheet Model** to add the additional section drawing model.
2. Select **Home > Primary > Attach Tools > References**. In the References dialog there are references for each cross-section drawing model, select the drawing model(s) attachment for the section that will be moved.

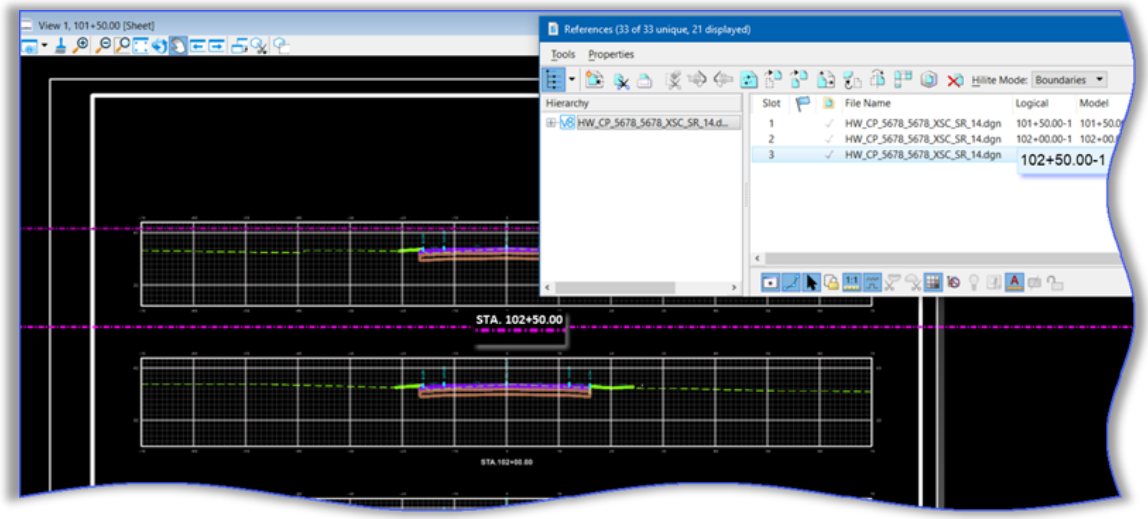


Figure 152 – Selecting References

3. Click on the ***Move Reference*** command to activate, then click on the Named Boundary (cross-section drawing model), this will allow the reference to be moved (should be highlighted) and are "attached" to the cursor, move to the desired location within the sheet outline.
   TIP: *It helps to activate Accudraw for this command, first deactivate Civil Accudraw if active.*

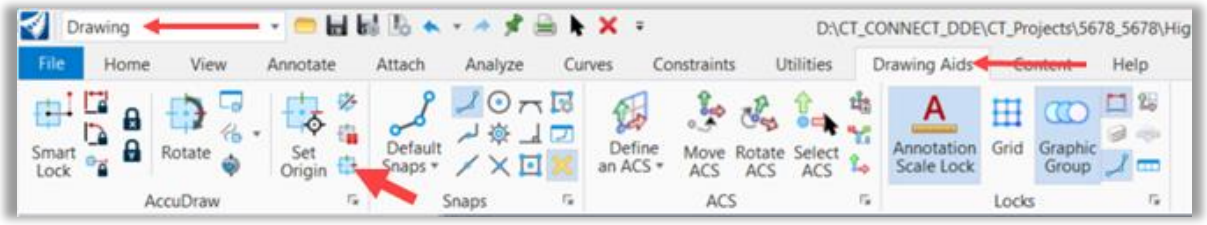


Figure 153 – CTDOT Ribbon

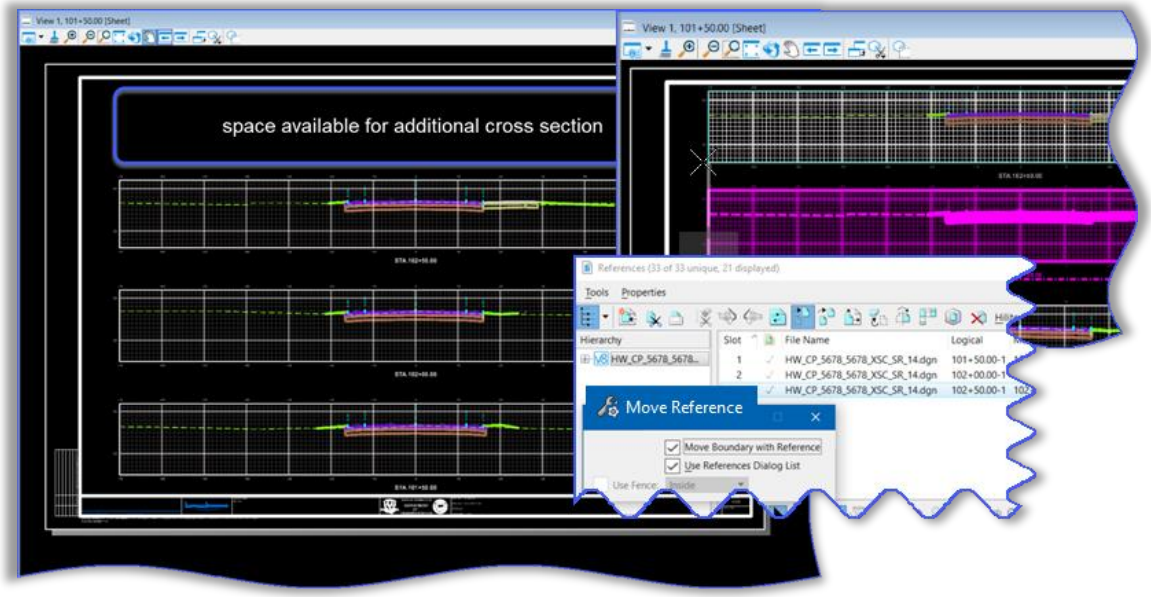


Figure 154 – Moving References

4. **Left click** to accept the new reference location. Turn off Accudraw, if activated.

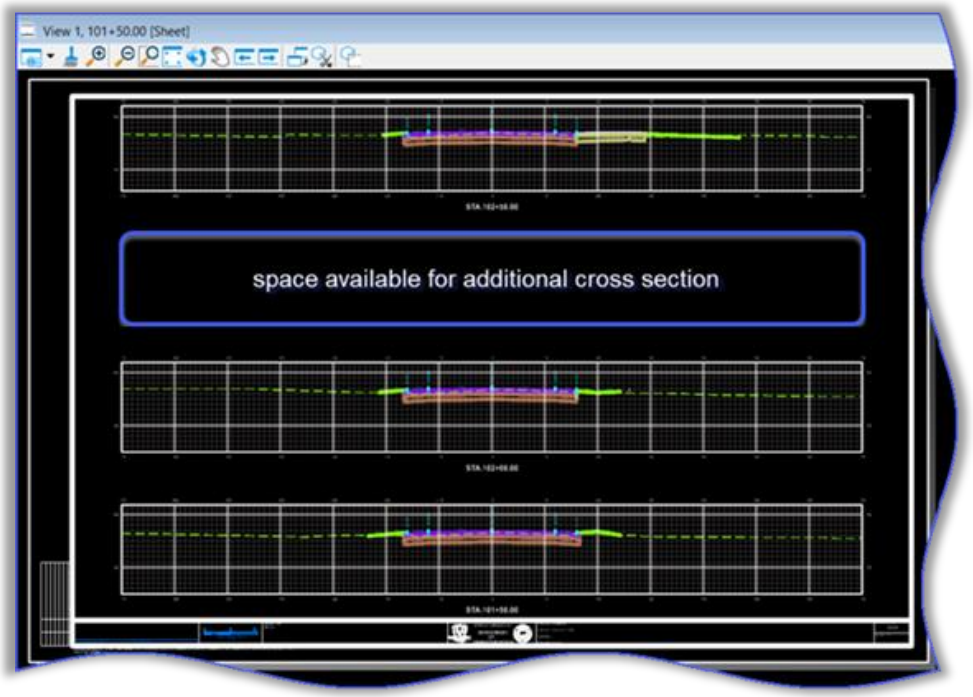


Figure 155 - New Space for Reference

5. Set the **View Group** to **Multi-Model Views**, once more. Using drawing tools create a line across the alignment where the cross-section is to be cut. Example: centerline of driveway about the same length as the named boundaries lines of the other sections.

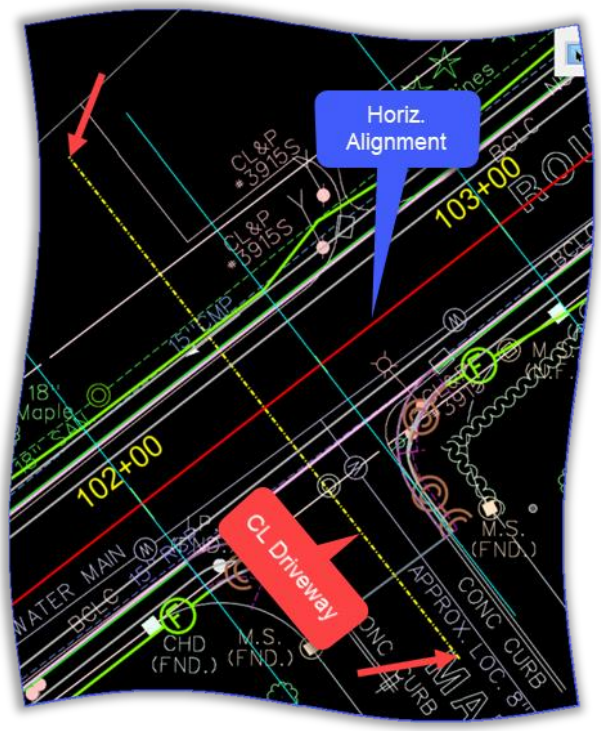


Figure 156 – Adding Named Boundaries

6. Create a single **Cross-Section Drawing Model**. Select **Drawing Production > Named Boundaries > Named Boundary > Place Named Boundary**.
7. In the **Place Named Boundary Civil Cross-Section** dialog, select ***Civil Cross-Section 2 Points***. This command will create a cross-section along a path (alignment) from a line crossing the alignment. Set:
   - Drawing Seed: ***5 Scale Contract XSC Sheet***.
   - **Group:** from the previous groups
   - Check ***ON*** the ***Create Drawing*** option and the ***Show Dialog*** option.

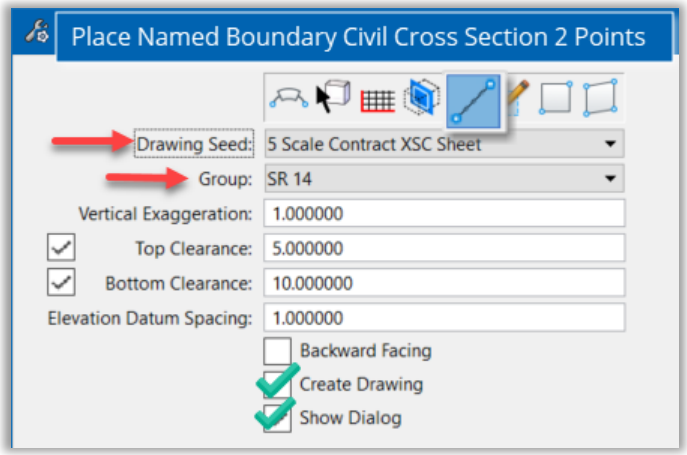


Figure 157 - Civil Cross-Section 2 Points

8. Follow the prompts: **Place Named Boundary Civil Cross-Section 2 Points > Identify Path Element** (this is the horizontal alignment, example: SR 14);
   - ***Enter first point*** (click on the first point of the line, should be to the left of the alignment);
   - ***Enter second point*** (click to the end point of the line to the right of the alignment)
   - ***Accept/Reject. Data point in Plan View to place boundary***. The single cross-section boundary is placed in the 2D view and 3D view.

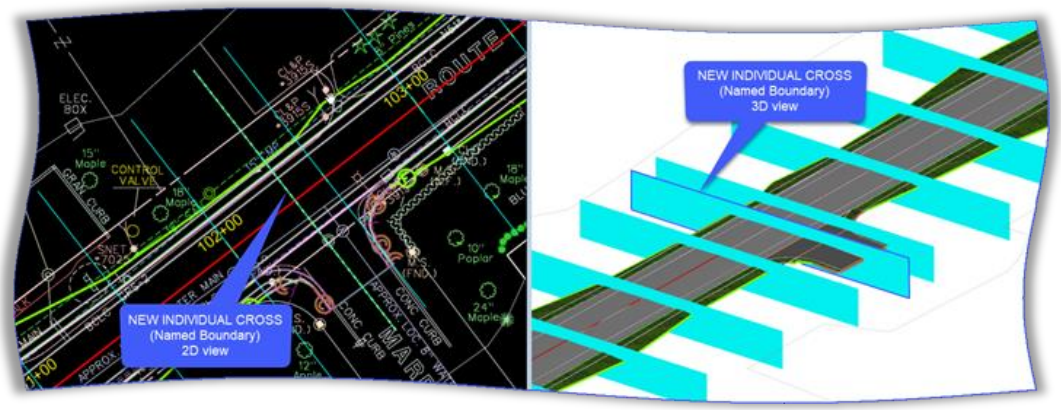


Figure 158 – Added Named Boundary

9. The **Create Drawing** box comes up, set the following:
    - Mode: ***Cross-Section***
    - Name: automatically fills in (example: 102+34.00)
    - Sheets: Select the Sheet it should be added to
    - Check ***ON*** Open Model
    - but check ***OFF*** Add To Sheet Index
    - Click **Ok**.
10. Open the Sheet Model and move the reference file to the open Space.

4.5.5 Create Sheets from Drawing Models

This tools in this workflow will be available soon, as CTDOT will be moving to OpenRoads 2025.

1. Open the ***Alignment DGN*** file and create an **Event Point List** for Driveways and Drainage Stations. You may need to reference the models including the Driveways and Drainage DGNs.

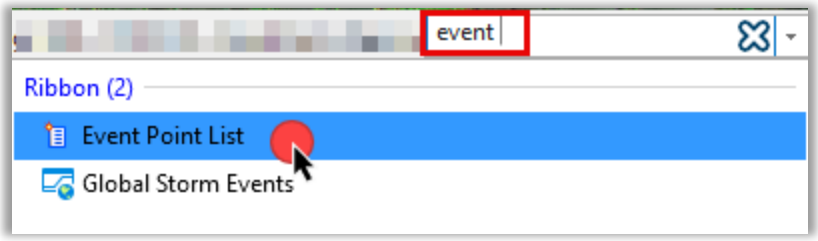


Figure 159 - Event Point List Search

2. Create a new list called ***Driveways and Drainage*** and use the ***Add By Station Offset*** tool to add the entries.

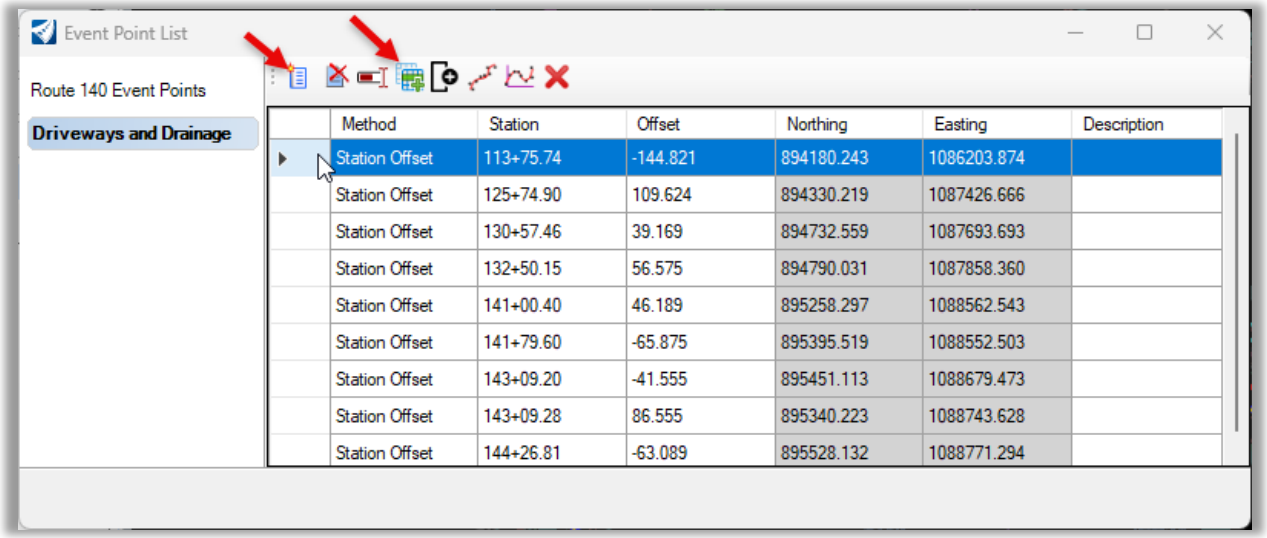


Figure 160 - Event Point List

3. Open or create a ***CP XSC Sheet DGN*** file.
4. Open the Multi-Model View or right click navigate to **View Control > 2 Views Plan/3D**.

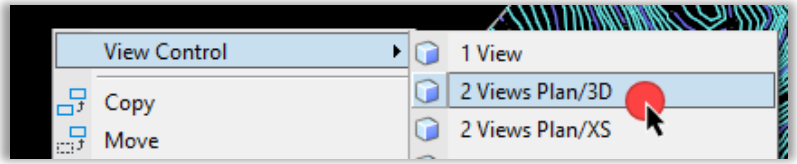


Figure 161 - View Control

5. Open the **Named Boundary** tool to create Drawing Models.
    a. In the dialog box click ***Named Boundary Civil Cross Section*** mode.
    b. In the Place Named Boundary dialog set
        - Drawing Seed: ***5 Scale Contract XSC Sheet***
        - Data Point in **View 1** and then select the **Centerline**
        - Event Point List: ***Select the entry from Step 1***
        - Create Drawing: ***On***
        - Follow the prompts and **Click and Drag to station range** as necessary.

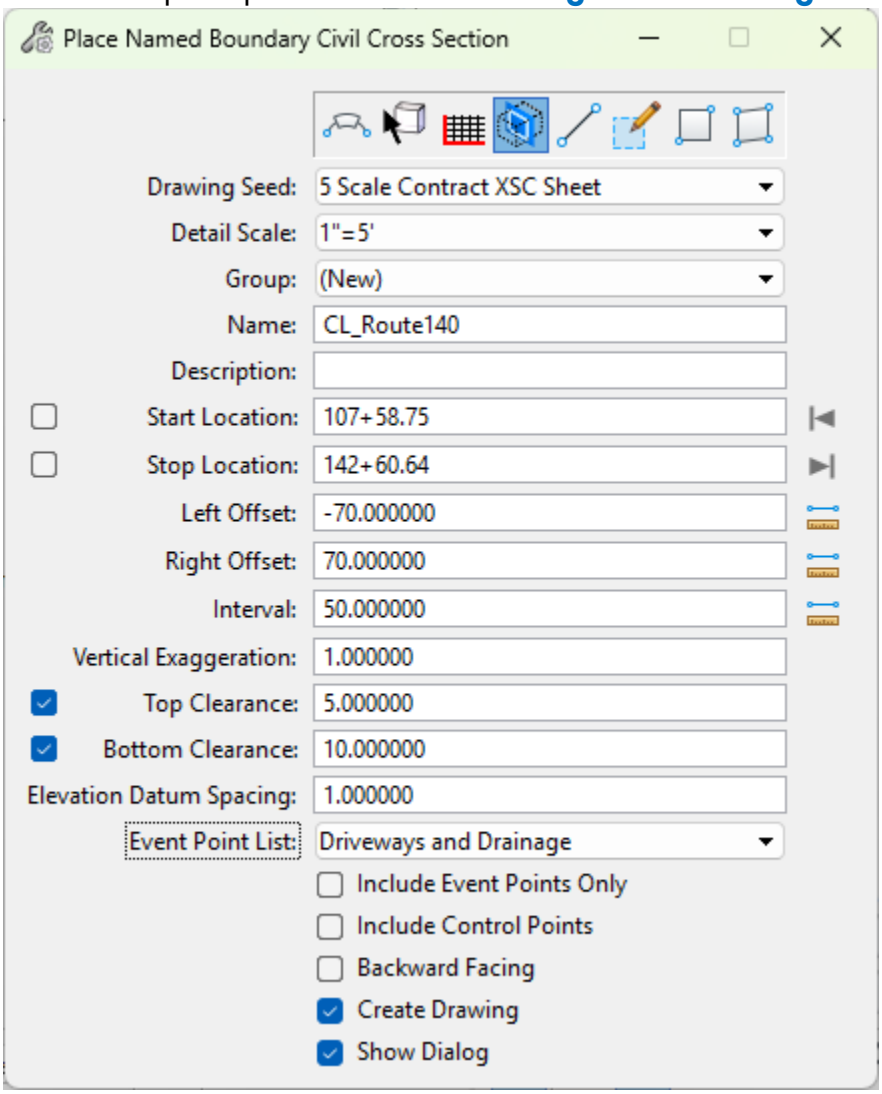


Figure 162 - Place Named Boundary

6. The Create Drawing dialog box will open. In the Sheet Model Section toggle ***Off*** Create Sheet Model.

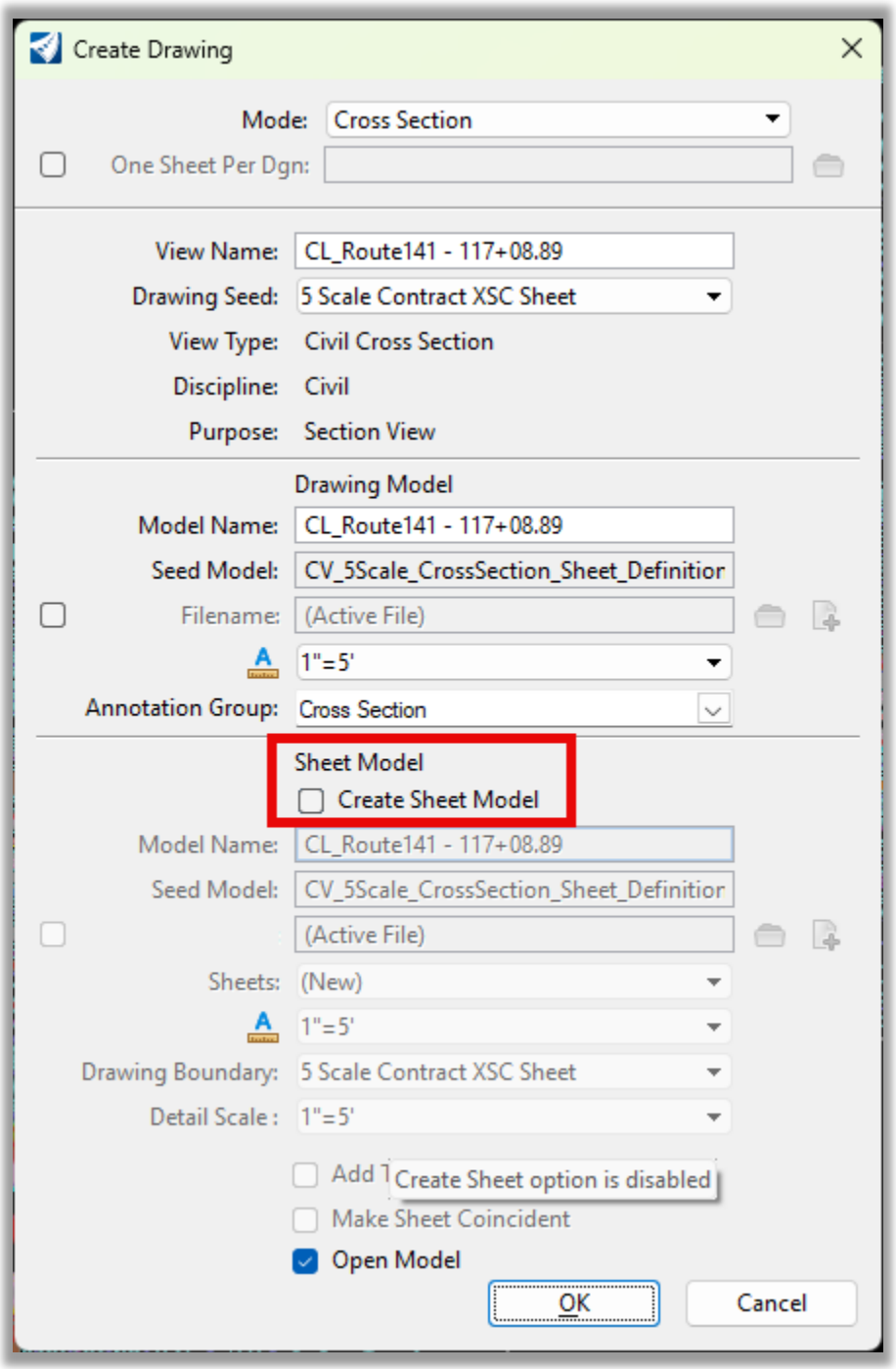


Figure 163 - Create Drawing

7. Now add any skewed Named Boundary Sections you would like to include this could be for skewed Drainage Structures or Driveways. (The new named boundary needs to be added to the existing cross section named boundary group).

   a. Select the **Place Named Boundary** tool.

b. Select the ***Civil Cross Section 2 Points*** mode. This will bring up the Place Named Boundary Civil Cross Section 2 Points dialog. Select:

- Drawing Seed: ***5 Scale Contract XSC Sheet***
- Group: ***Select an existing group to add this entry to***
- Create Drawing: ***ON***

c. Follow the prompts at the bottom lower left of the screen.

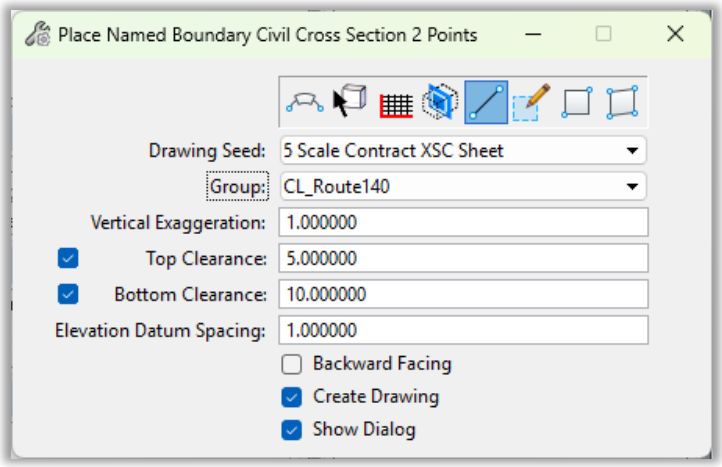


Figure 164 - Place Named Boundary Civil Cross Section 2 Points

d. This Station will be added to the Named Boundary Manager and a Drawing Model will be created.

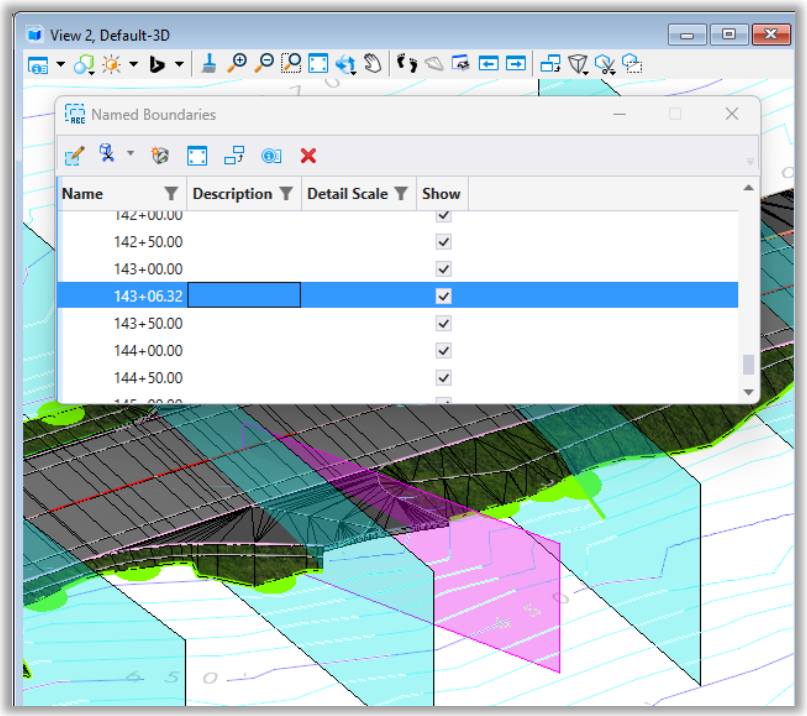


Figure 165 - New Skewed Name Boundary

8. Create the Sheets. Data point to make **View 2** the active View. In the Named Boundary Manger right click on the ***Group*** and select ***Create Cross Sections from Drawings***. All the Named Boundaries should appear selected in the View.

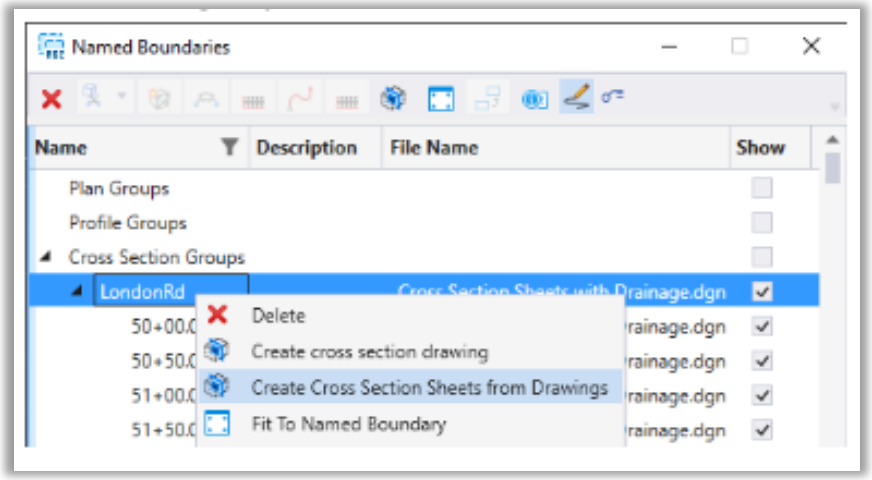


Figure 166 - Create Cross Sections From Drawings

9. The Create Sheets from Drawing dialog will appear.

   Set:

   - Detail Scale: ***1"=5'***
   - Select **OK** to create the sheets

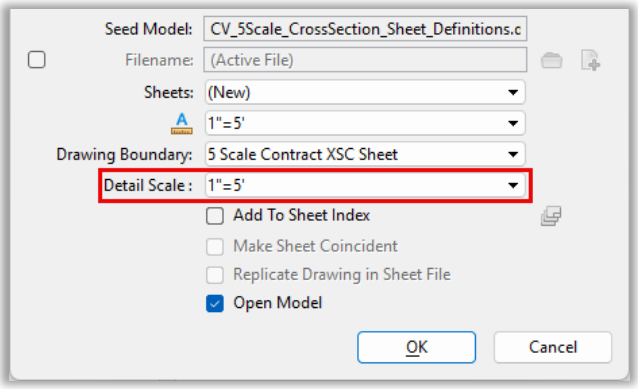


Figure 167 - Create Drawing

4.5.6 Adjust the Existing Ground Dashed Line Display Settings

This workflow reflects an older process. Bentley has since addressed this issue in newer releases. This section is retained for reference in case similar issues arise in the future.

It is CTDOT's standards to show the existing ground display as a dashed green line on the cross-section sheets. There is a setting that needs to be adjusted after the sheets are created so the dashed line shows up properly on the Cross-Section Sheets.

Please Note: *This will be done after the Place Named Boundary Civil Cross-Section tool is used to cut and create the cross-section sheets.*

1. Open the 3D Model that houses the Cross-Section's Named Boundaries.

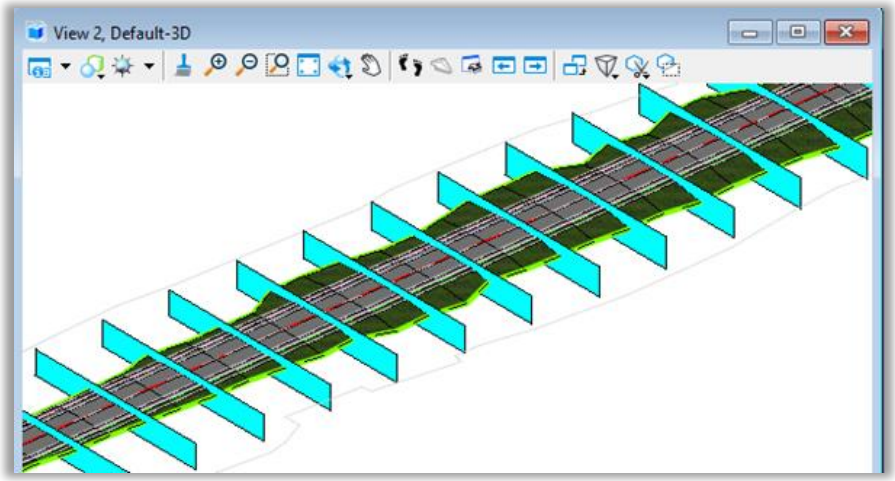


Figure 168 – Cross Section named Boundaries

2. Click on the **Element Selection** Icon. In the Element Selection dialog box choose the **Down Arrow** to Show Extended Settings. Click on the **Element Class** tab and select the Element Class **Construction**.

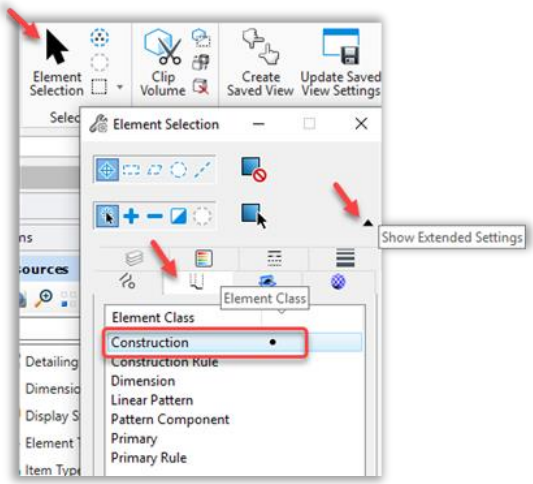


Figure 169 – Element Selection

3. In the Properties dialog box select all the **Named Boundaries** at once. Change the ***Back Depth to -.001***.

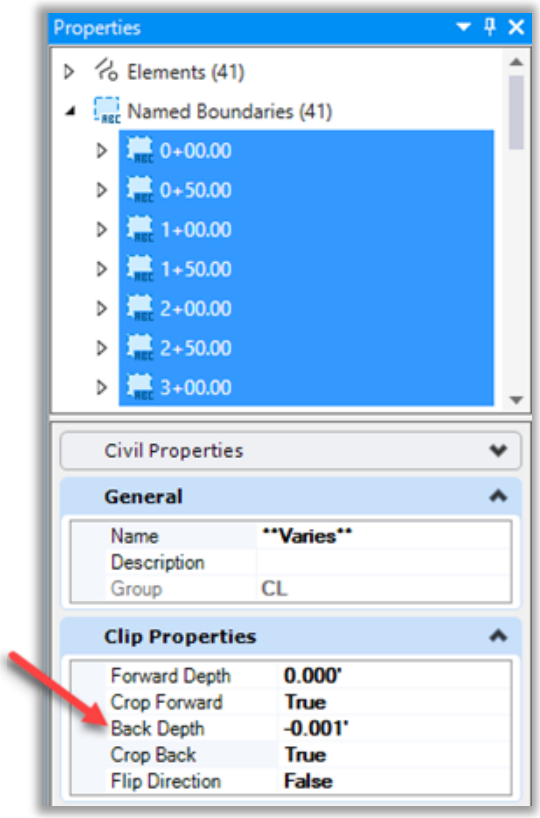


Figure 170 – Clip Properties

4. Open several Cross-Sections Sheet Models to view the correction made to the existing ground dashed lines. Below is a screen shot of a pdf showing the before and aftereffects of applying the adjustment.

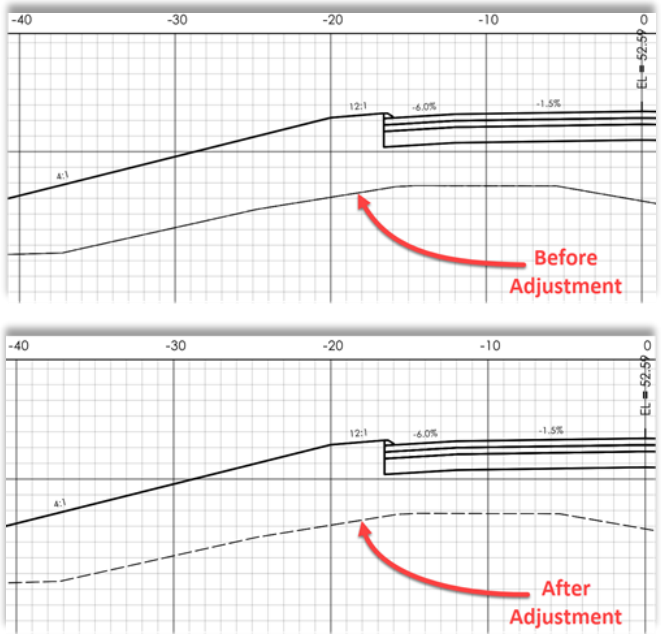


Figure 171 – PDF View of Cross Section Sheet

4.6 Cross Section Annotation

As explained previously in this volume there are several ways in **OpenRoads** to annotate graphical information. It is important to understand **what** is being annotated and **how** each element type is annotated.

The OpenRoads annotation tools provide the ability to place **smart, data-driven annotations** that read civil object information such as alignments, stations, Crossing breakline points, and offsets. Labels remain associated with their reference elements and will update or move as those elements change. Annotated elements will reside the referenced DGN and the annotation in the Drawing Model.

Cross Sections use an **Annotation Group** that has been predefined in the workspace. This ensures that all annotations font, size, color, weight) are placed according to the established standards. The following are predefined in the annotation group:

- Grid Elevations and Offset
- Station
- Crossing Breakline points:
  - Centerline (CL) Elevation
  - Edge of Road (EOR)
  - Shoulder Labels
- Other Point Controls, such as Right-of-Way (ROW) and Waterline Labels
- Cross Slopes within roadway in %
- Cross Slopes of cut and fill in H:V

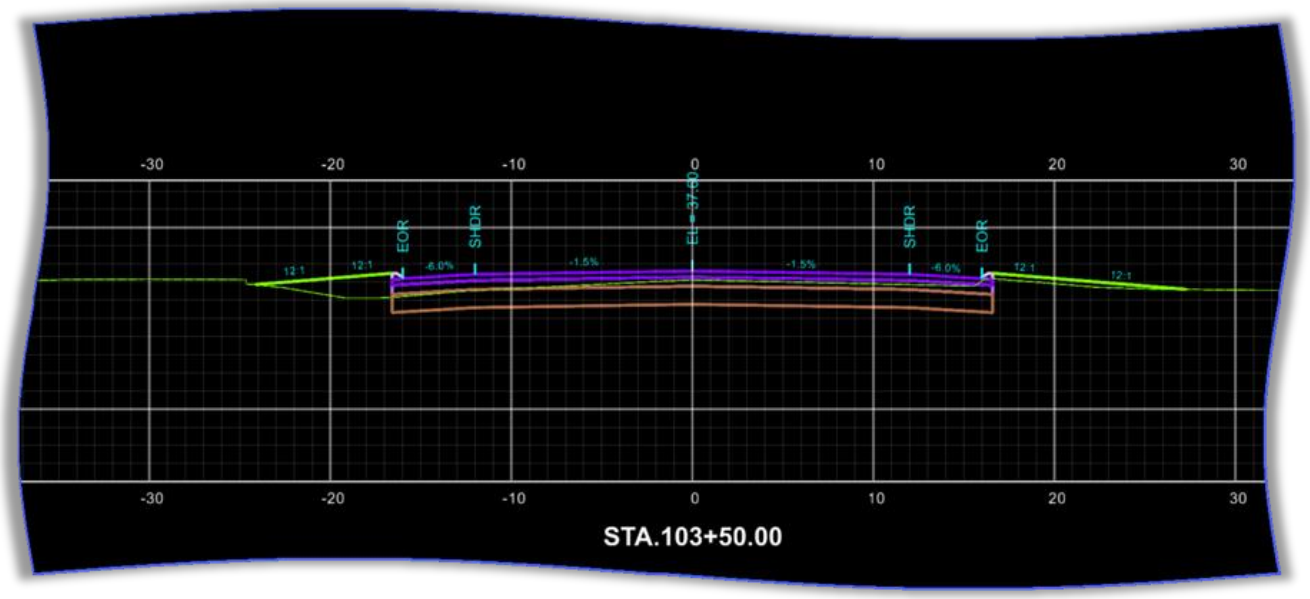


Figure 172 – Pre-defined Annotation

Sometimes, extra annotation is needed in cross sections. Standard have been configured in the workspace to enable you to use several different **Annotation tools.** These tools can be used to place annotation the following:

- Drainage
- Utilities
- Other features

4.6.1.1 Place Label and Note Tools

The CT_CONNECT_DDE workspace has been configured to streamline annotation for plan sheets. Adjustments and updates are added periodically. To access the tools, select the **CTDOT workflow** and click the **CTDOT Tab**.

The workspace provides tools for each discipline and various subject areas; in this section, we will focus on the annotation tools. These annotation tools have been set-up with appropriate attributes (level, color, line style, text style, dimension style) and should not be changed by the user.

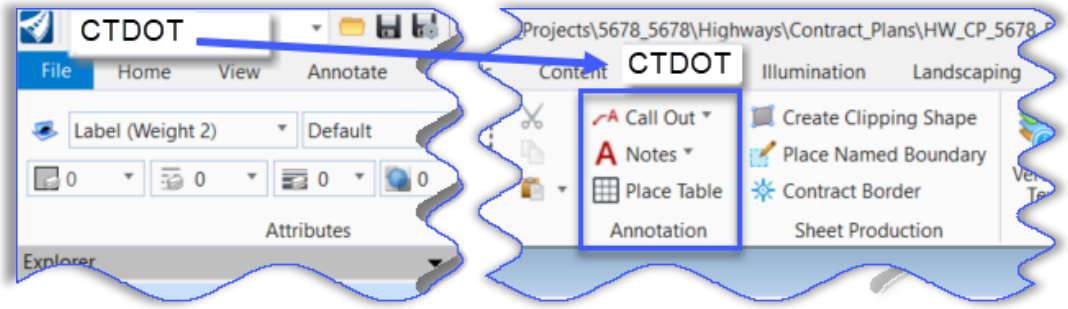


Figure 173 - CTDOT Annotation Tools

4.6.1.2 Civil Labeler

The Civil Label designed to help you place dynamic, data-aware annotations (labels) on your civil design drawings such as station/offset values, elevations, alignment names, intersecting geometry data, and other construction-relevant information **without manually enter text**. Rather than manually placing static text labels, the **Civil Labeler** lets you **automate** and standardize annotation across engineering deliverables. Because the labels are associative (linked to the design features), they help keep plan production accurate when the design evolves.

1. Select the **OpenRoads Modeling** workflow, then go to the **Drawing Production > Labels > Civil Labeler**

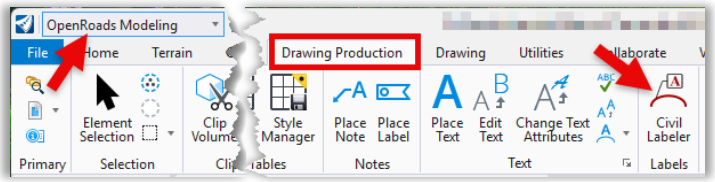


Figure 174 – Civil Labeler

2. Browse through the ***Drainage and Utilities*** and the ***XSC*** folders and get familiar with the available labels.

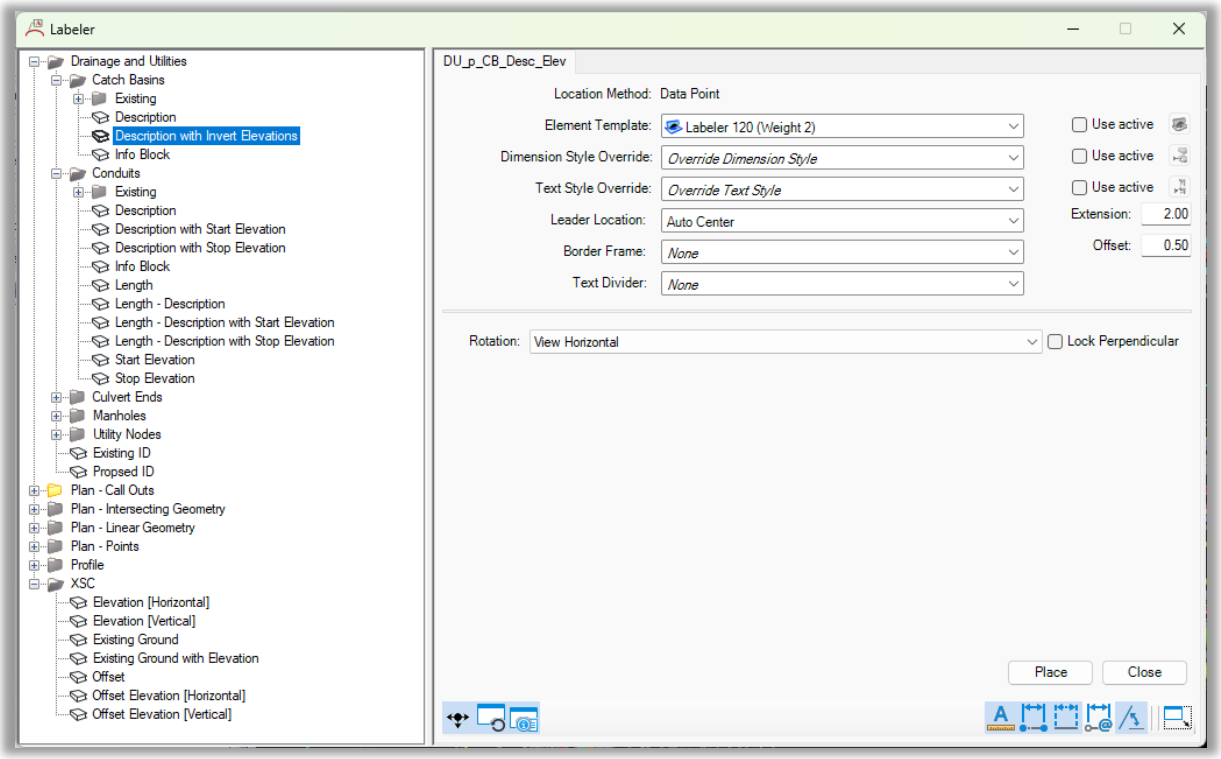


Figure 175 – Civil Labeler

4.7 Deleting Sheets

Sometimes it is necessary to delete sheets. There are multiple parts to a sheet.

- The named boundary that defines the boundaries of what is shown in the plan or profile.
- The Drawing Models for annotation and dimensioning.
- The Sheet Models with the electronic drawing sheets.

To completely delete the sheet these all need to be deleted.

TIP: *When it becomes necessary to delete sheets depending on the number of sheets for your project, it may be easier to create a new design model and start over and only delete from the sheet index. This is because sometimes the plan named boundary is linked to the profile named boundary and profiles will need to be deleted also.*

1. Delete View Groups
   On the bottom left of the select the **Manage View Group**s icon.

Figure 176 - Manage View Groups

2. In the Manage **View Group** dialog box select each line individually and select the ***Delete*** icon.

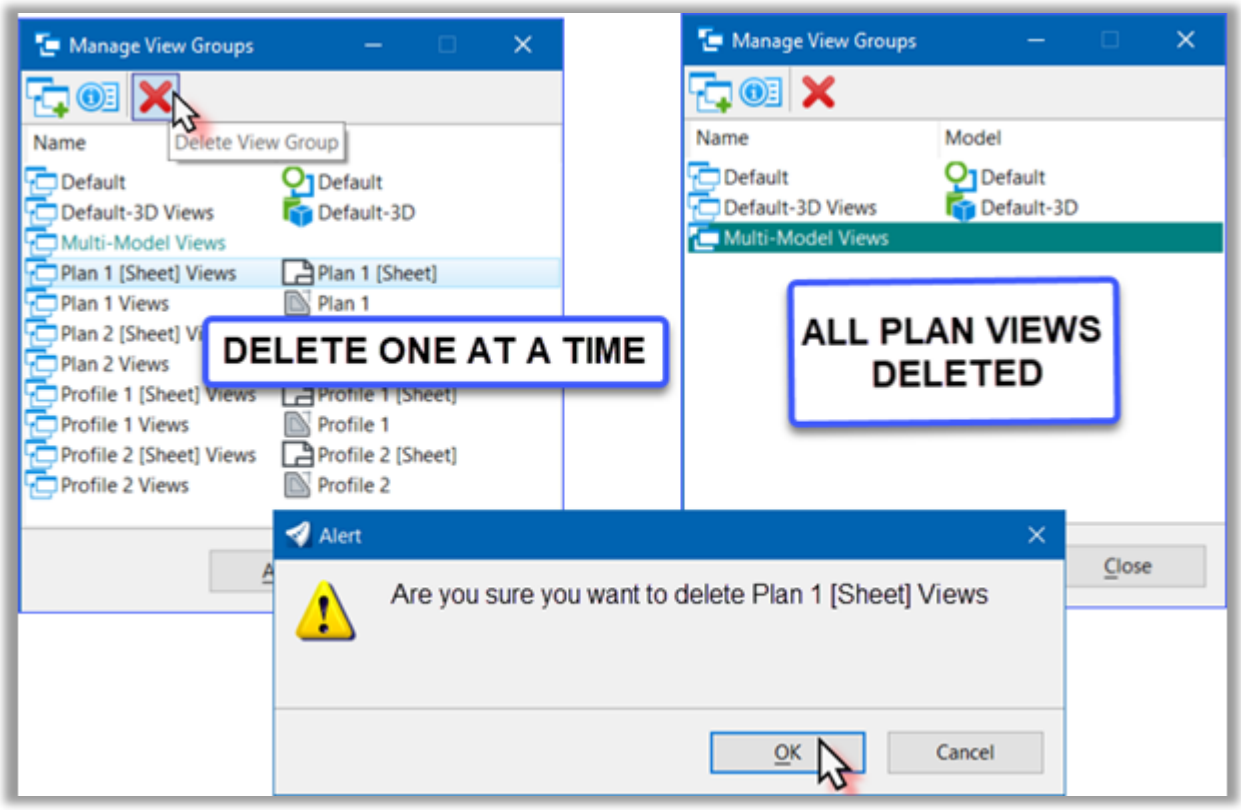


Figure 177 – Delete View Groups

3. Delete Models

   Select **Home › Primary › Models**. Select the Drawing and Sheet models you want to delete; click ***Delete Model(s)***. NOTICE: The sheet models are also deleted from the sheet index if necessary. Close the Models dialog.

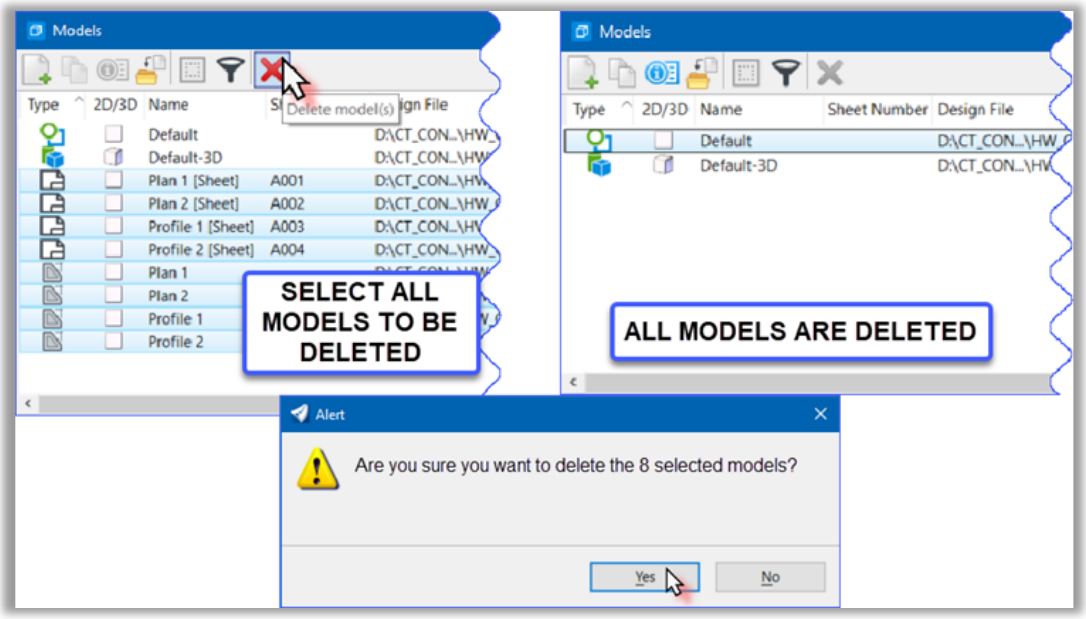


Figure 178 – Delete Models

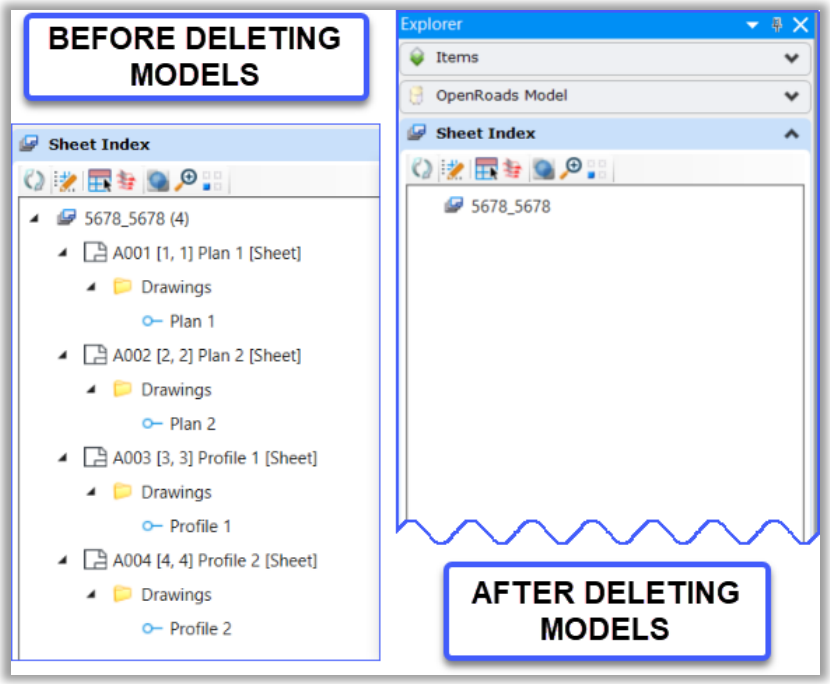


Figure 179 – Deleted Sheet Index Entries

4. Delete the Named Boundaries

   Open the **Drawing Production > Named Boundaries Named Boundaries** dialog.

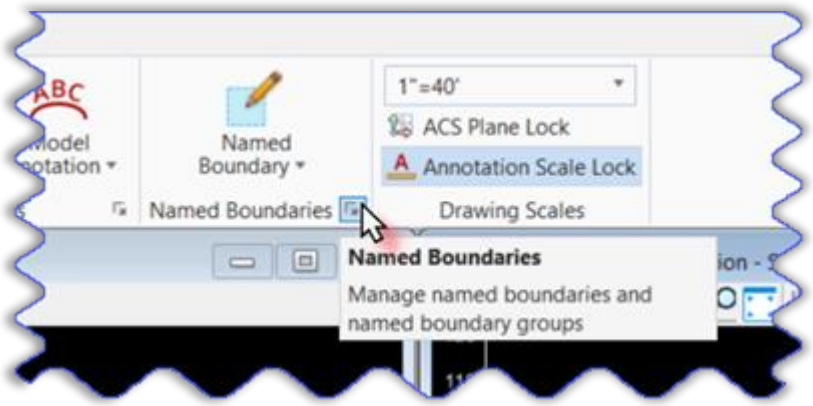


Figure 180 – Named Boundary Manager

5. Expand the ***Groups*** sections. Select the Groups or Boundaries you want to delete and select the ***Delete*** icon.

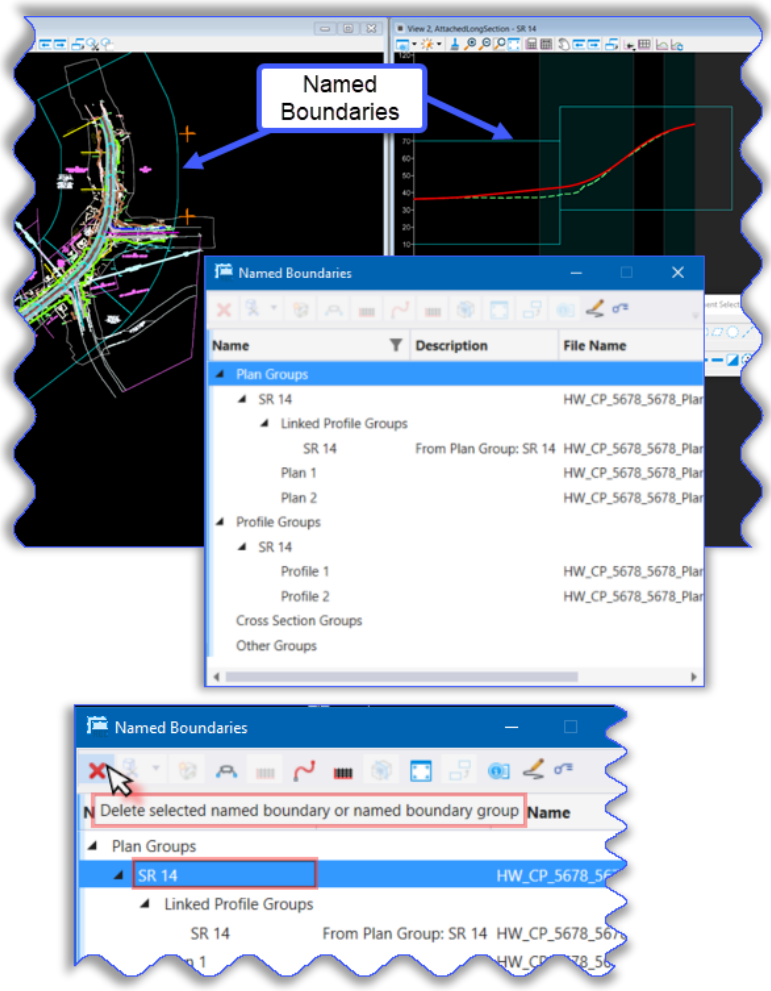


Figure 181 – Delete Named Boundaries

6. An **Alert appears** confirming the Named Boundaries and their associated saved views will be deleted. Click on **Yes** and every boundary will be deleted.

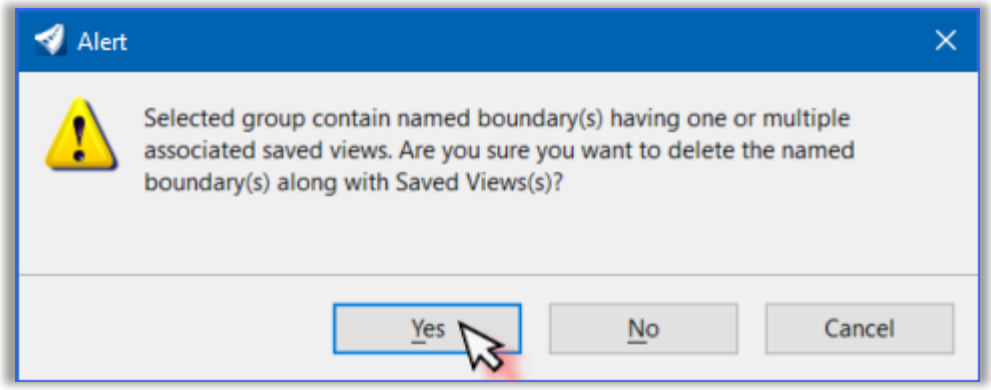


Figure 182 – Alert Saved View will be deleted with Named Boundaries

Section 5 – Traffic Signal Sheets

5.1 Create New File

Before attempting to open or create DGN files users should make sure the following is in place:

1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**
4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenRoads through Accounting or the Customized Icon following
6. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.
7. Select the **New File** icon. In the New dialog box browse to the ***Traffic/Contract_Plans*** folder.
8. The Seed file should be set to ***Seed2D - CT RoadDesign.dgn***. If this is not the case, click on the **Browse** button. Browse to **...CT_Configuration \ Organization \ Seed \ Road** and select **Seed2D - CT RoadDesign.dgn**

   If the survey was done in an old Datum, use the 2D Seed Files in this folder ***...CT_Configuration|Organization|Seed|GCS|***
9. In the ***File name*** field enter a name for your file using the CTDOT file naming structure.

   Example: ***TR_CP_1234_1234_Signal_123_123.dgn***
10. Select **Save** and the new file will open.
11. If it has been determined the provided survey is in NAD 27/NAVD 29 you will need to re-project your design file's Geospatial Header.

5.2 Set up the Default Model

1. Select the **CTDOT** workflow and click on the **Attach** tab, in the ***References Section*** click on **Attach Reference**.
    - Reference the needed Proposed Base Model dgn files including but not limited to:
    - Signal
    - Signing and Pavement Markings
    - Alignment
    - Highway
    - Drainage
    - Bridge/Structures
    - Illumination
2. In the Attach Reference Box browse and select the desired file and click **Open**. In the Reference Attachment Dialog Box choose:

    Model: Most likely it's "***Default***" but this could vary depending how the file has been set up.
    Nested Attachments: *No Nesting*
    Global LineStyle Scale: *Master*
3. Click **OK** finish the Attachment process.
4. Repeat Steps 1 - 3 for all Proposed Base Models
5. Select **Level Display** and turn off or on the desired levels.
6. Reference the Existing Survey dgn files. Select the **CTDOT** workflow and click on the **Attach** tab, in the ***References Section*** click on **Attach Reference**.
7. In the Attach Reference Box browse the ***Active Survey Folder*** and select the desired Existing Survey DGN file and click **Open**. In the Reference Attachment Dialog Box choose:

    Model: Most likely it's "***Default***" but this could vary depending how the file has been set up.
    Nested Attachments: *No Nesting*
    Global LineStyle Scale: *Master*
8. Click **OK** finish the attachment process.
9. If the Survey does not line up with the Proposed Design File it is most likely an older Survey File that was created with V8i. Older files will need to be referenced in with certain settings to get them to line up in the correct geospatial location.

    Select the **Home** Tab, in the **Primary Section** select the **Attach Tool** drop down and choose **References**. This will open the References Dialog box.

    Turn **True Scale** off and set the Scale to ***1:1***.

10. Each existing Survey File may need to be referenced twice so some levels can be **BOLD** and other levels SCREENED when creating the PDF plans.

    This can be done by using a specific Logical Name in the Reference Attachment Properties:

    BOLD Ground Survey – Will leave all levels in this reference unscreened when the PDF is created.

    Common features to be bold:

    - Edge of Road
    - Right of Way Lines
    - Utility Poles and other Above Ground Utilities
    - Sidewalks
    - Catch Basins
    - Rock Walls
    - Fences

    SWW Ground Survey – Will leave all levels in the reference screened with the displayed line weights when the PDF is created.

    Common features to be screened:

    - Trees
    - Underground Utilities and Storm Water Pipes
    - Pavement Markings

11. Select **Level Display** and turn off or on the desired levels for each referenced Ground Survey.

    Note: *For signal revisions with no proposed roadway work (realignments or widening) it is common in the BOLD Ground Survey reference to turn off all the levels except for the existing edge of road, drainage structures, right of way, guiderail, utility poles and related text Levels. These levels will not be screened in this reference file. All the other levels will be screened in the SWW reference file. In this case the SSW Ground Survey reference would have the Bold levels off and all the others needed levels displayed on.*

12. Use the Update Sequence dialog box to reorder Reference attachments (appear behind or in front of other references) or active file elements In the Reference dialog box, go to **Settings > Update Sequence**. In the Update Sequence dialog box select the Reference (or active file) and then click the up or down arrow buttons to move the file up or down. The order listed is how the updated data appears in the view - lower files/elements appear above higher elements.

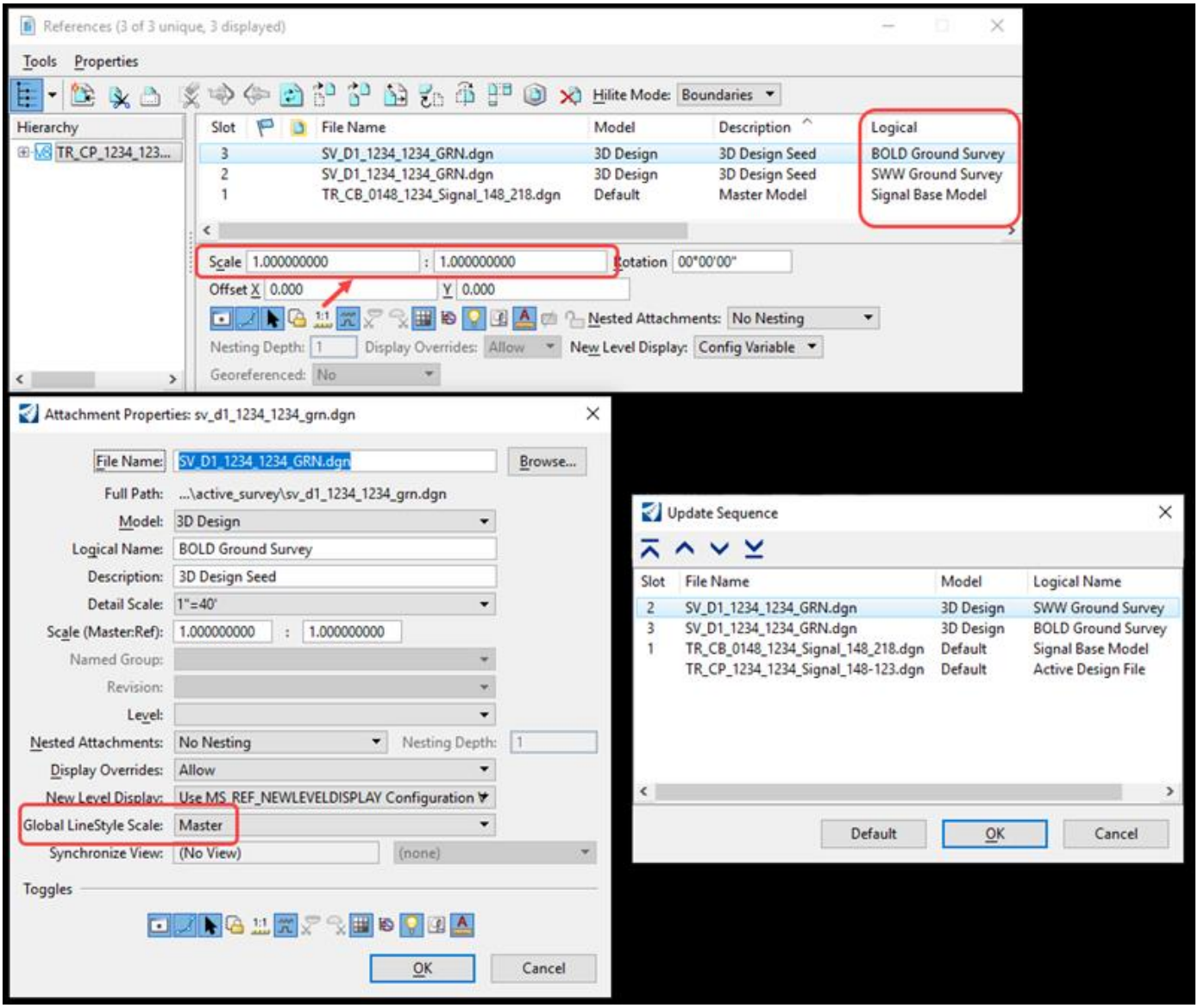


Figure 183

13. Rotate the view so that the main road is parallel to the screen. On the **View Window** select the **Rotate View** tool. Use the **2 Points** Method. Follow the prompts to rotate the view.

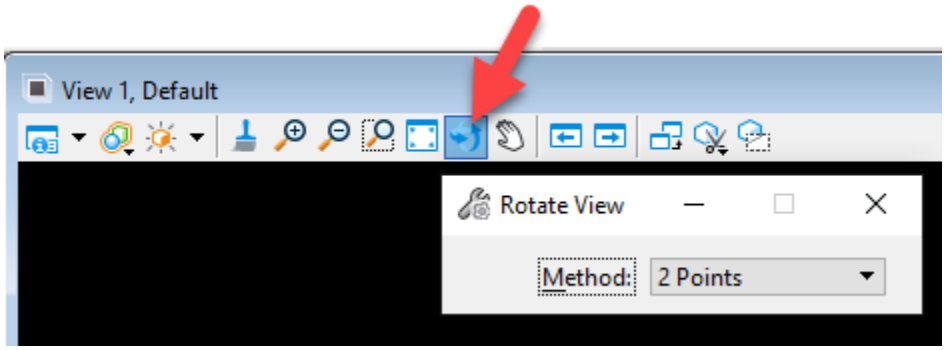


Figure 184

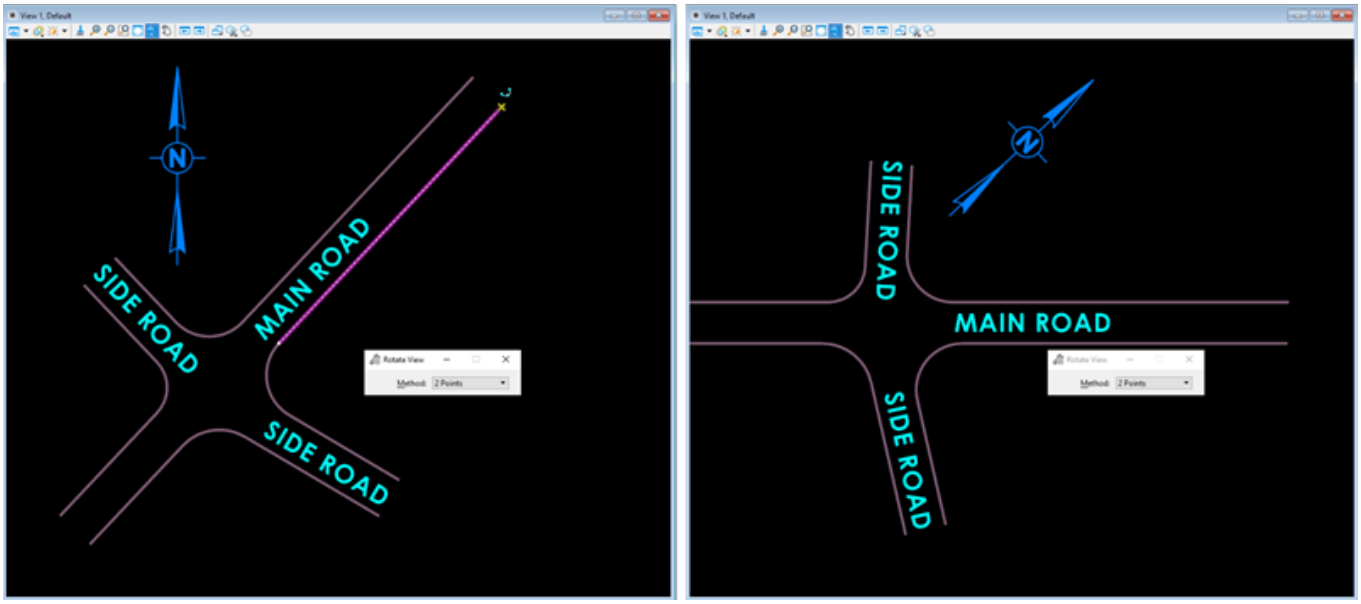


Figure 185

14. Select **Save Settings**.

5.3 Use Place Name Boundary to Create a Sheet Model

1. Select the **CTDOT** workflow and on the **Annotate** tab locate the **Detailing** section and select the bottom right **Styles button**. In the Detailing Symbol Styles dialog right click on ***CV_Detail*** and select **Activate**.

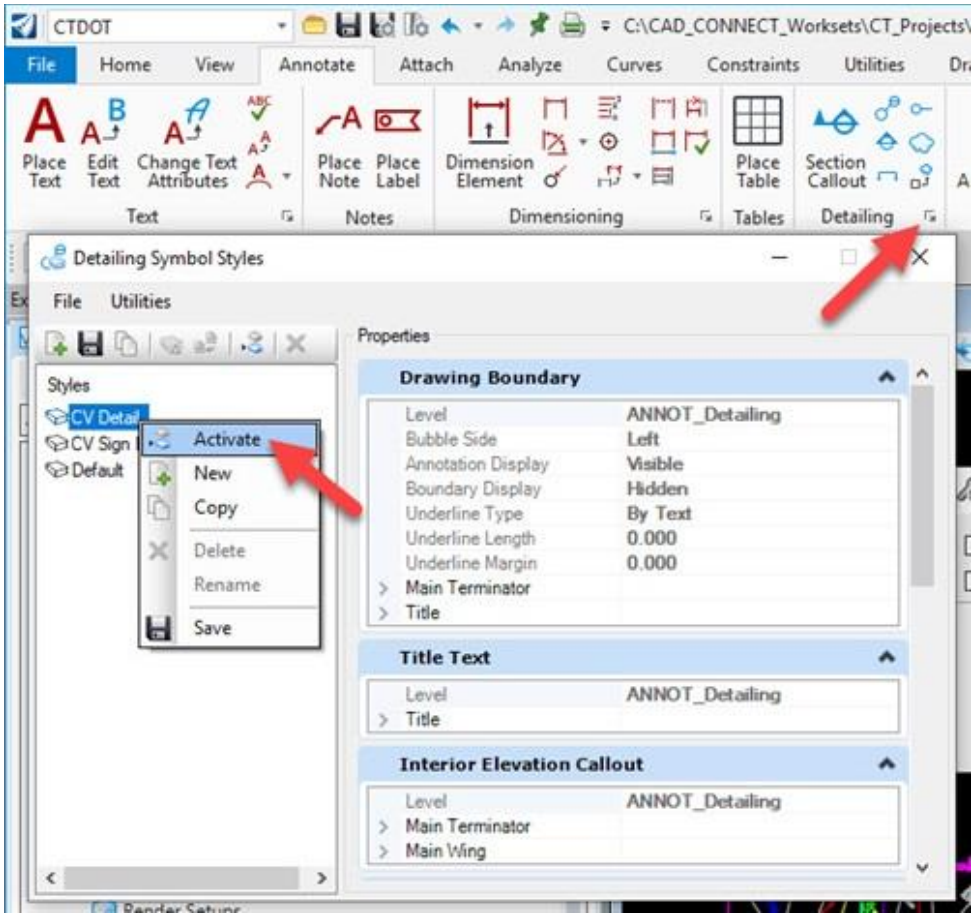


Figure 186

2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

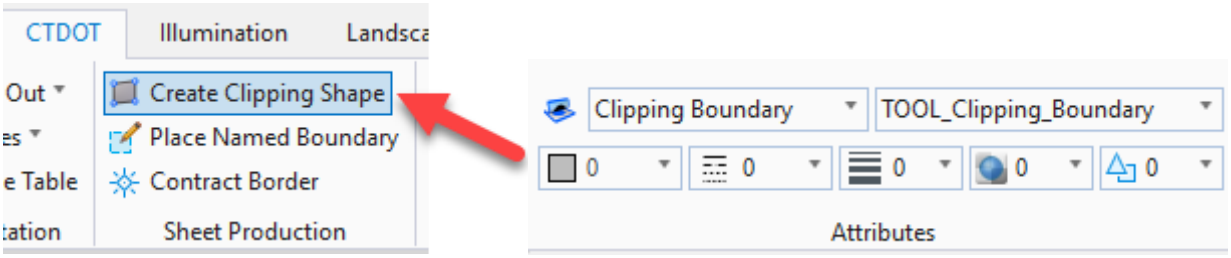
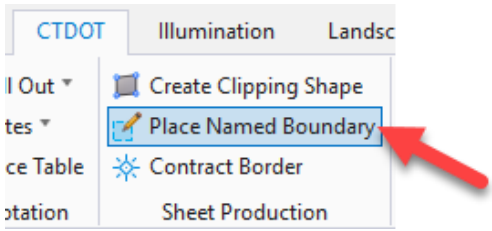
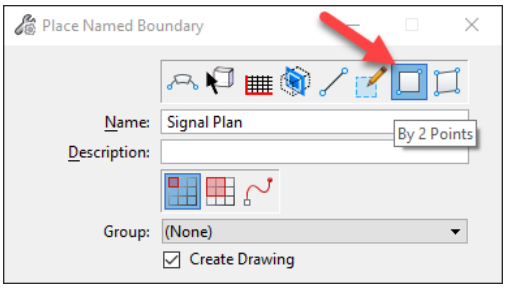


Figure 187

3. Select the **Place Named Boundary** tool and the Place Named Boundary Dialog box will appear.



4. In the Place Named Boundary dialog box. set the following options in the tool's settings window:
5. **Method (icon): By 2 Points**
6. ***Name:* Signal Plan**
7. ***Mode (icon):* Place Single Named Boundary**
8. ***Create Drawing:* Enabled**



9. Follow the prompts to place a Named Boundary (Clipping Boundary) around the design. Data point first in the lower left and ending in the upper right. This element can be edited later to refine the shape and add additional points.
10. After accepting the placement of the named boundary the Create Drawing dialog box will appear. Ensure the following options are set:
    - Name: **Signal Plan**
    - Drawing Seed: **Signal Plan**
    - Create Drawing Model: **Enabled**
    - Annotation Scale: **Full Size 1" = 40'**
    - Create Sheet Model: Enabled
    - Sheets: **New**
    - Annotation Scale: **Full Size 1 = 1**
    - Drawing Boundary: **New**
    - Detail Scale**: 1"=40'**
    - Add to Sheet Index: **Disabled**
    - Open Model: **Enabled**

11. Click **OK**. The newly created sheet model will open with the Named Boundary referenced and centered onto the sheet.

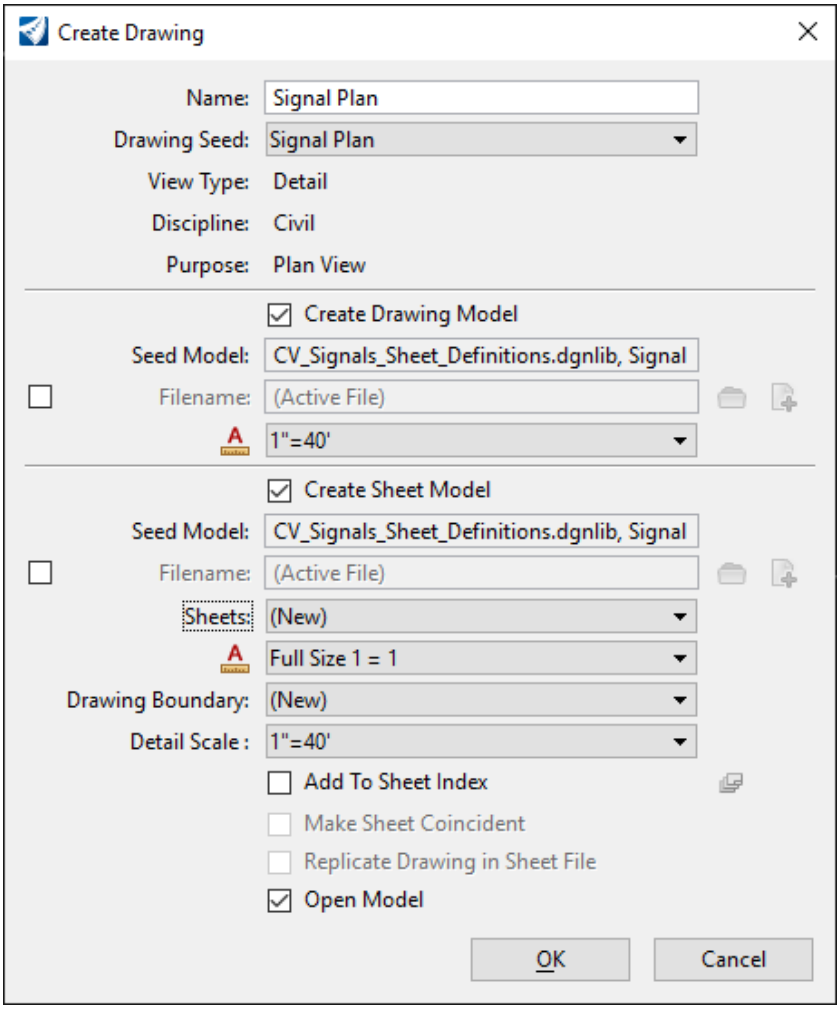


Figure 188

5.4 Edit the Title Block

1. From the Ribbon click on the **Models** icon and select to open the ***Sheet Model***.
2. View the **Properties** of the model. Notice the Sheet Model's Annotation Scale is ***Full Size 1 = 1***.
3. In the **Properties** dialog box edit or fill in the following fields:

- Description: ***TRAFFIC SIGNAL CONTROL PLAN***
- Sheet Number: ***TR-01***

Notice the ***Drawing Number*** in the Title Block will be updated to match the Properties.

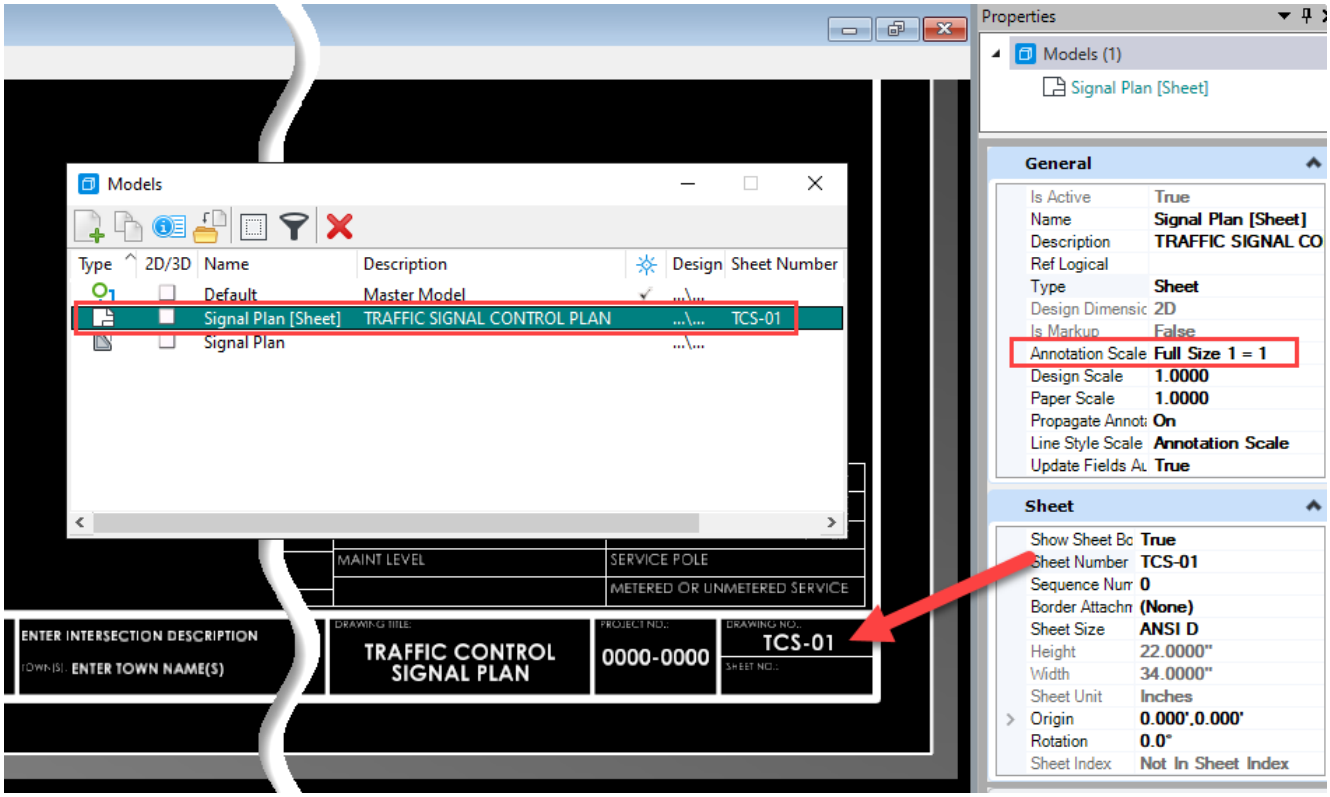


Figure 189

4. Use the **Edit Text** tool to update the ***ENTER INTERSECTIO DESCRIPTION*** **and ENTER TOWN NAME(S)**.

5. Open the **References** Dialog box and double click on the file to view the **Attachment Properties** of the reference. The Drawing Model will be referenced in at a ***1" = 40'*** Detail Scale.

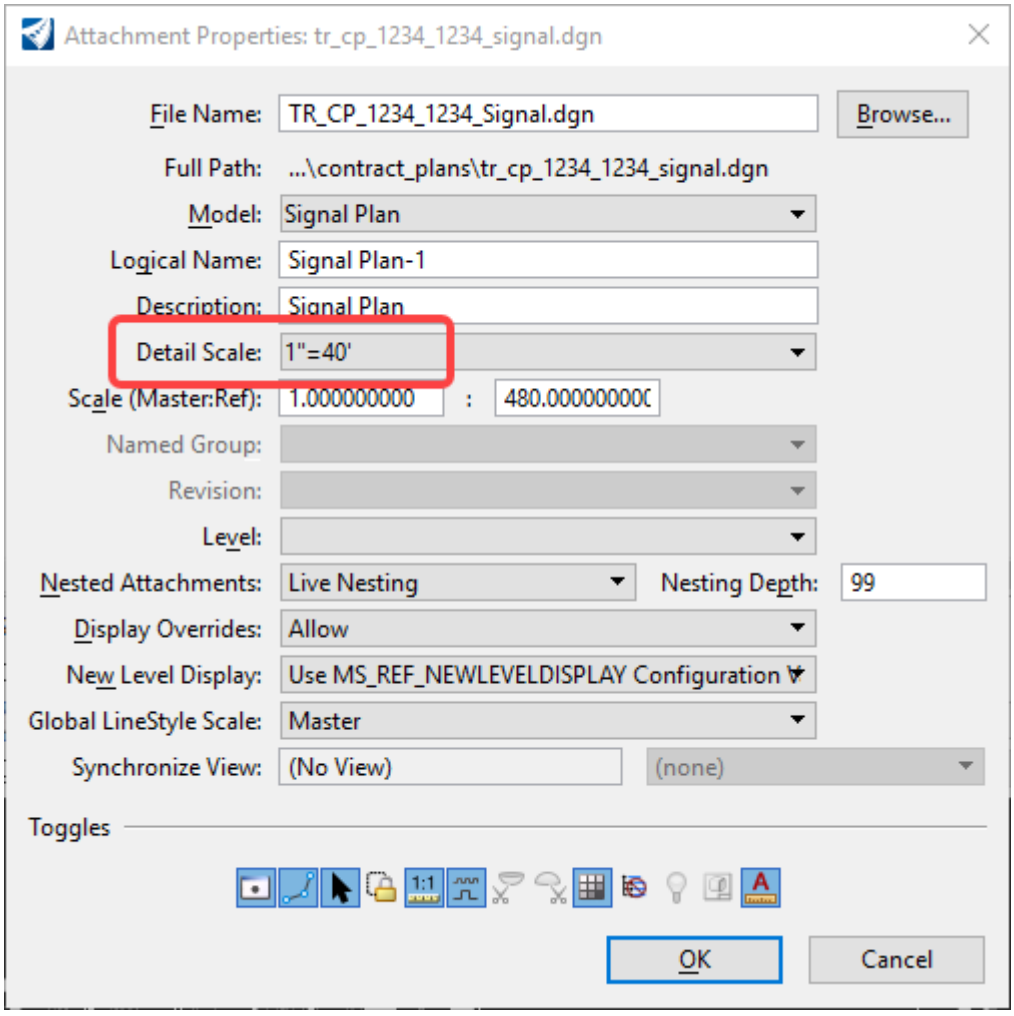


Figure 190

6. Select **Save Settings**.

5.5 Adjust the Named Boundary

1. From the Ribbon click on the **Models** icon and select to open the Default Design Model.
2. On the Ribbon select **Home > Selection** and make the **Element Selection** tool active.
3. Select the Named Boundary shape and adjust by dragging the handles to the desired location.

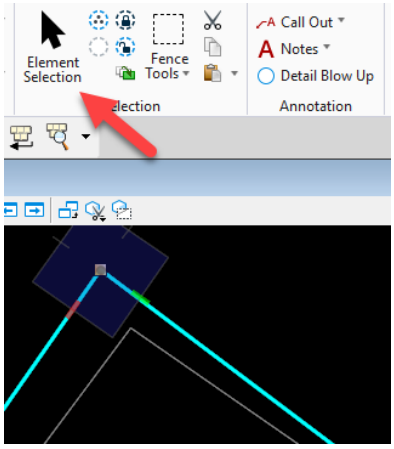


Figure 191

4. The **Insert Vertex** or **Delete Vertex** tools can also be used to edit the shape.

Figure 192

5. Return to the sheet model by hovering the cursor over the Marker and click the **Signal Sheet** and select the folder Icon (Open Target Tool). This action returns you back to the sheet model. Notice that by changing the boundary in the design model, this has propagated to the sheet.

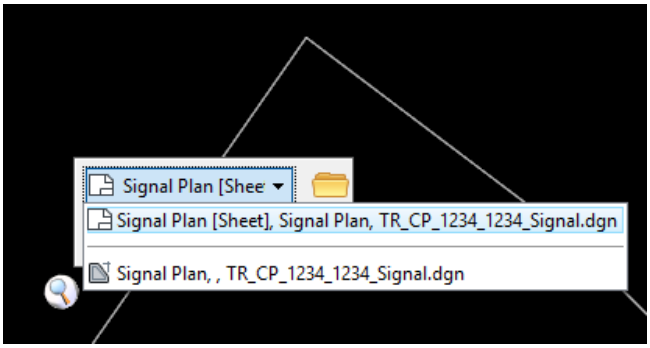


Figure 193

6. Models can also be opened using the **View Group** drop down tool located at the bottom left of the screen.

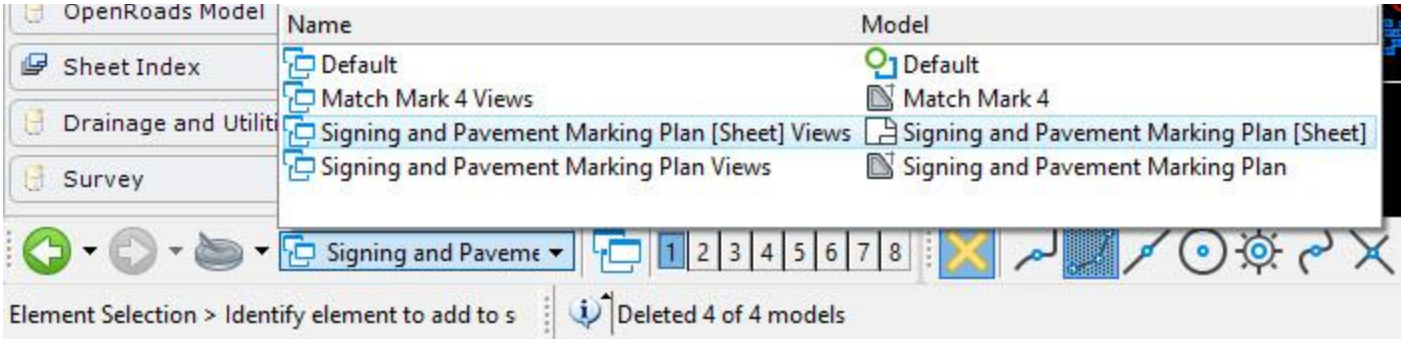


Figure 194

7. Select **Save Settings**.

5.6 Move the Name Boundary Inside the Sheet Border

1. From the Ribbon click on the **Models** icon and select to open the ***Sheet Model***.
2. Select the **References** Icon, in the dialog box right click on the file, select move to re-position the reference file within the border.
3. Follow the prompts to execute the move command.

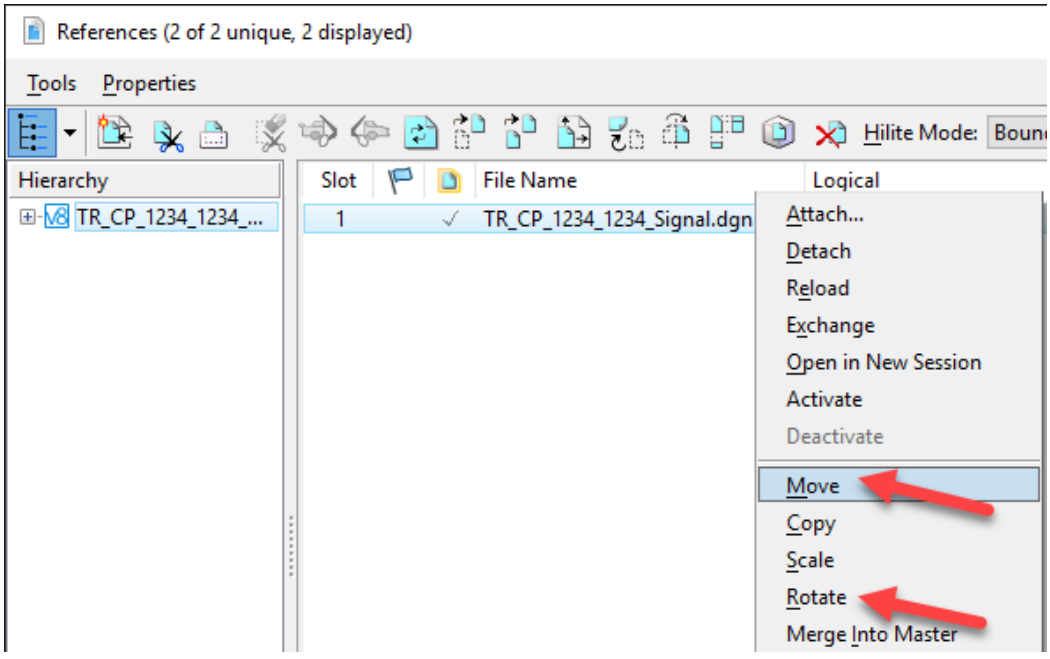


Figure 195

4. Select **Save Settings**.

5.7 Additional Reference Settings in the Sheet Model

1. From the Ribbon click on the **Models** icon and select to open the Sheet Model.
2. Open the References dialog box and select the reference file, toggle the **Scale Line Styles By Reference Scale** so the lines appear to be the correct size.

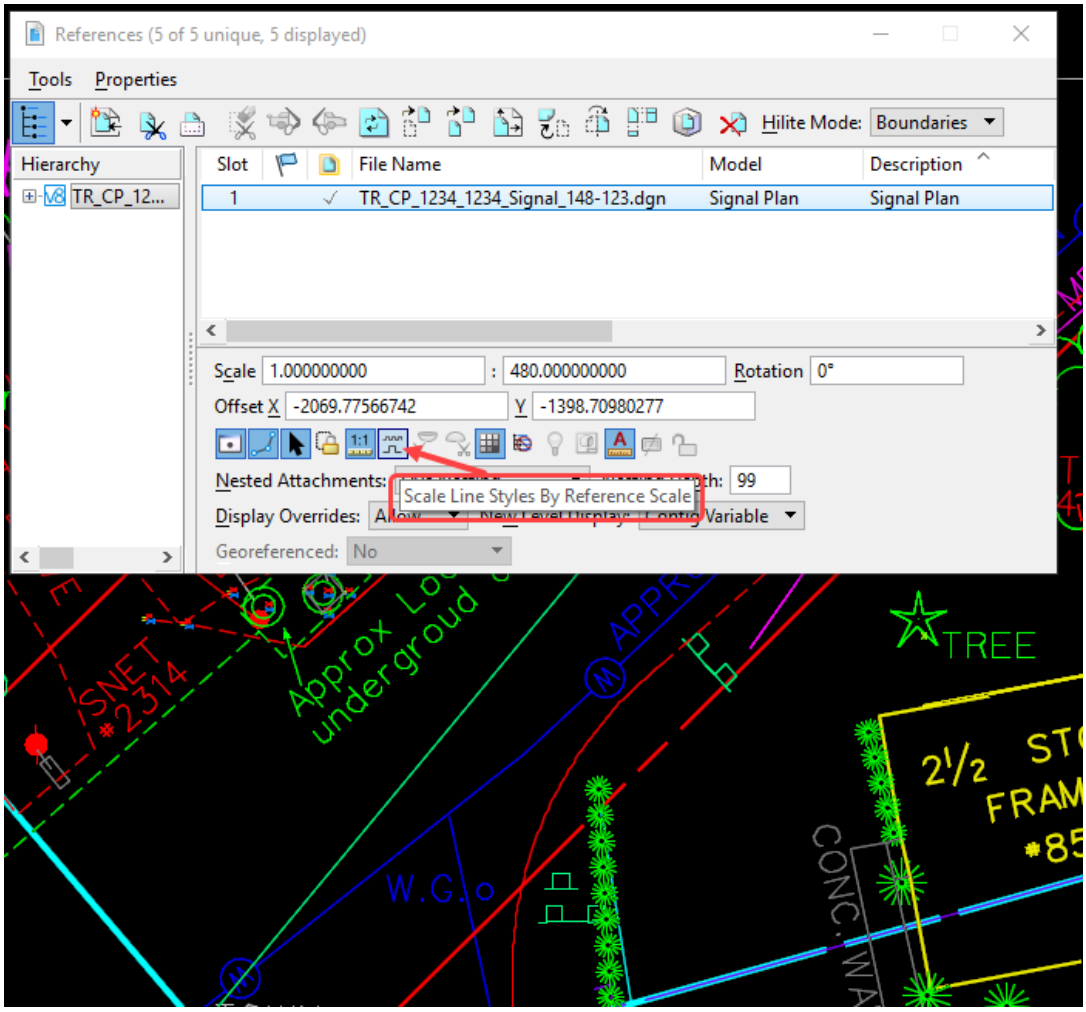


Figure 196

3. If the user would like the Levels that are on and off in the Default Design Model to auto-match in the Sheet Model select **Never** in the **Display Overrides**.

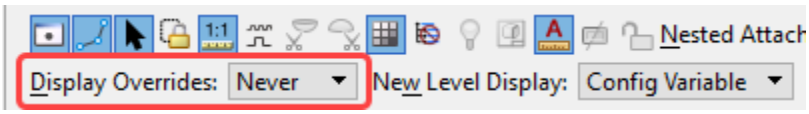


Figure 197

5.8 Create Match Marked Areas

1. If the design is too large for the sheet, Match Marks will be required and additional Named Boundaries will need to be created.
2. Go back into the Design Model and place another Named Boundary adjacent to the original named boundary. This will be the Match Mark.
3. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.
4. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear, set the following options:
   - Method (icon): ***By 2 Points***
   - Name: ***Signal Plan Match Mark 1***
   - Mode (icon): ***Place Single Named Boundary***
   - Create Drawing: ***Enabled***
5. Follow the prompts to create a named boundary of the around the additional area.
6. After accepting the placement of the named boundary the Create Drawing dialog will appear. Ensure the following options are set:
   - *Name*: ***Signal Plan Match Mark 1***
   - *Drawing Seed*: ***Signal Plan***
   - *Create Drawing Model*: ***Enabled***
   - *Annotation Scale*: ***Full Size 1" = 40'***
   - *Create Sheet Model*: ***Enabled***
   - *Sheets*: ***Signal Plan [Sheet]***
   - *Drawing Boundary*: ***New***
   - *Detail Scale*: ***1" = 40'***
   - *Add to Sheet Index*: ***Disabled***
   - *Open Model*: ***Enabled***
7. The existing Sheet Model will open, move the reference to the desired location on the sheet.
8. Select **Save Settings**.

5.9 Annotate the Drawing Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call-outs and Dimensions should be placed in the Drawing Models. Placing the Call-Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the Sheet Models.

1. Open a Drawing Model and use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Call Outs**. Select **Label Small (Weight 0)** and follow the prompts for placement.

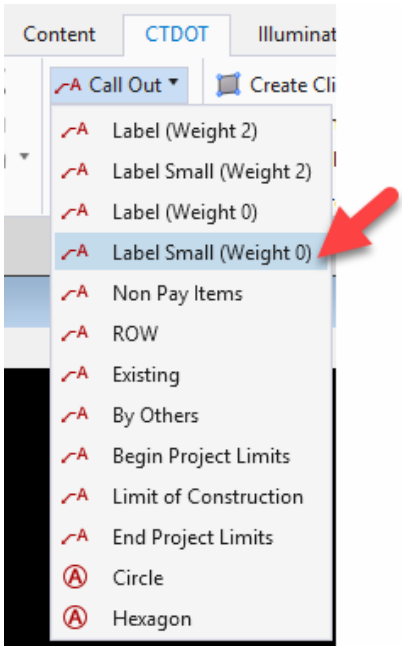


Figure 198

2. Any Property of an Element can be targeted for annotation automation by using the **Insert Field** tool. Select the **Label Small (Weight 0**) tool. In the **Text Editor** dialog box select the **Insert Field** icon.

Figure 199

3. For Field Type select **Element Properties** and **OK**.

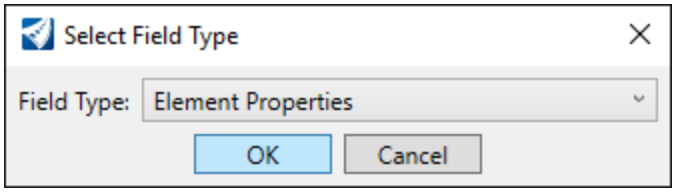


Figure 200

4. Click on the element you would like to annotate, and the Fields Editor will pop up. Select the **desired field** and click **OK**. In this example a cell with an Item Type was selected and the Item_Description field will be annotated.

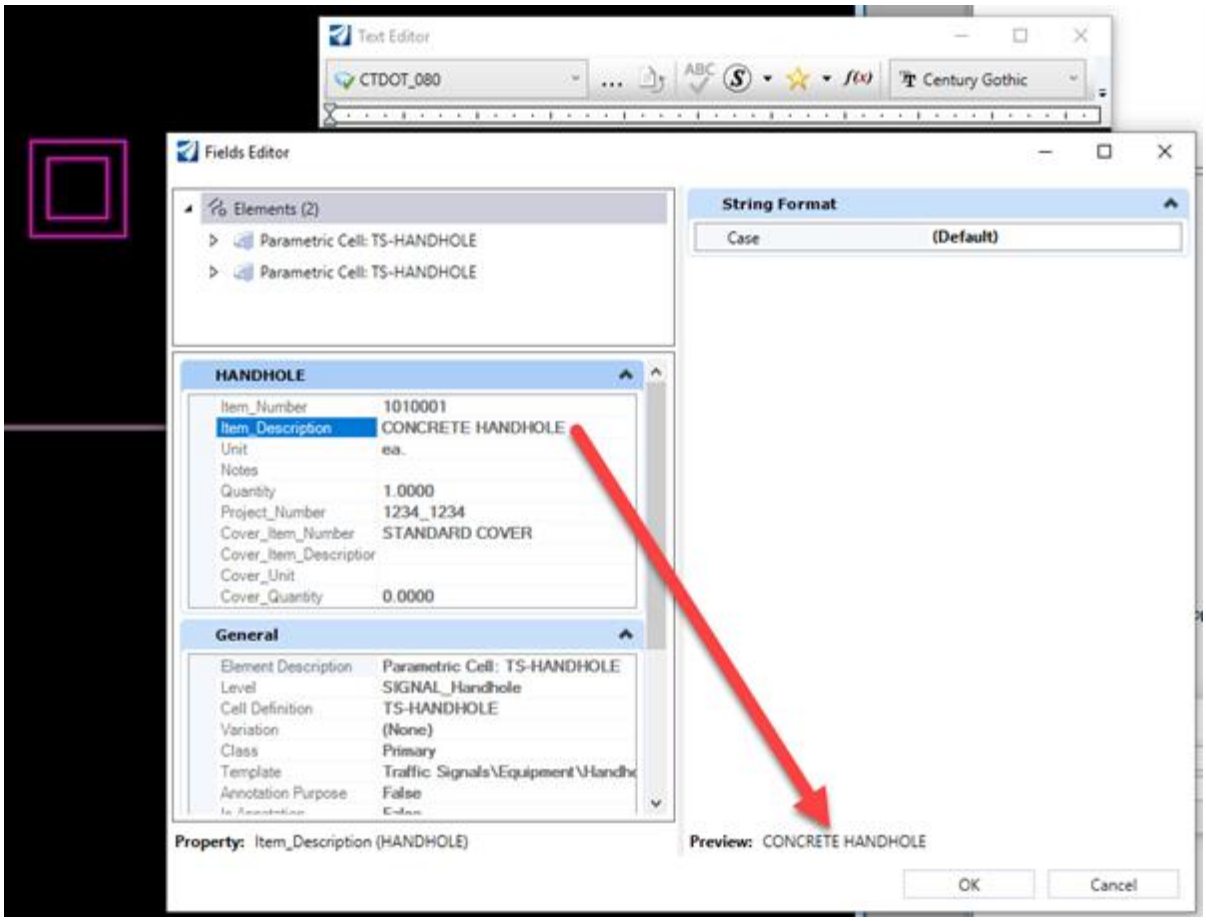


Figure 201

5. Follow the prompts to place the call out.

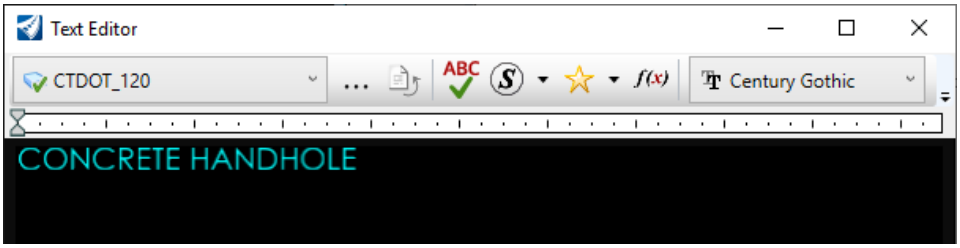


Figure 202

Figure 203

6. Use the **Note** pull down menu's, **General Note Small** tool. In the Text Editor dialog box select the **Insert Field**.

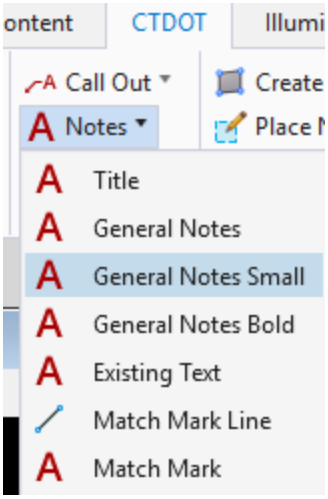


Figure 204

7. Click on the element you would like to annotate, and the Fields Editor will pop up. Select the **desired field** and click **OK**. In this example a cell with an Item Type was selected and the **ID_Number** field will be annotated.

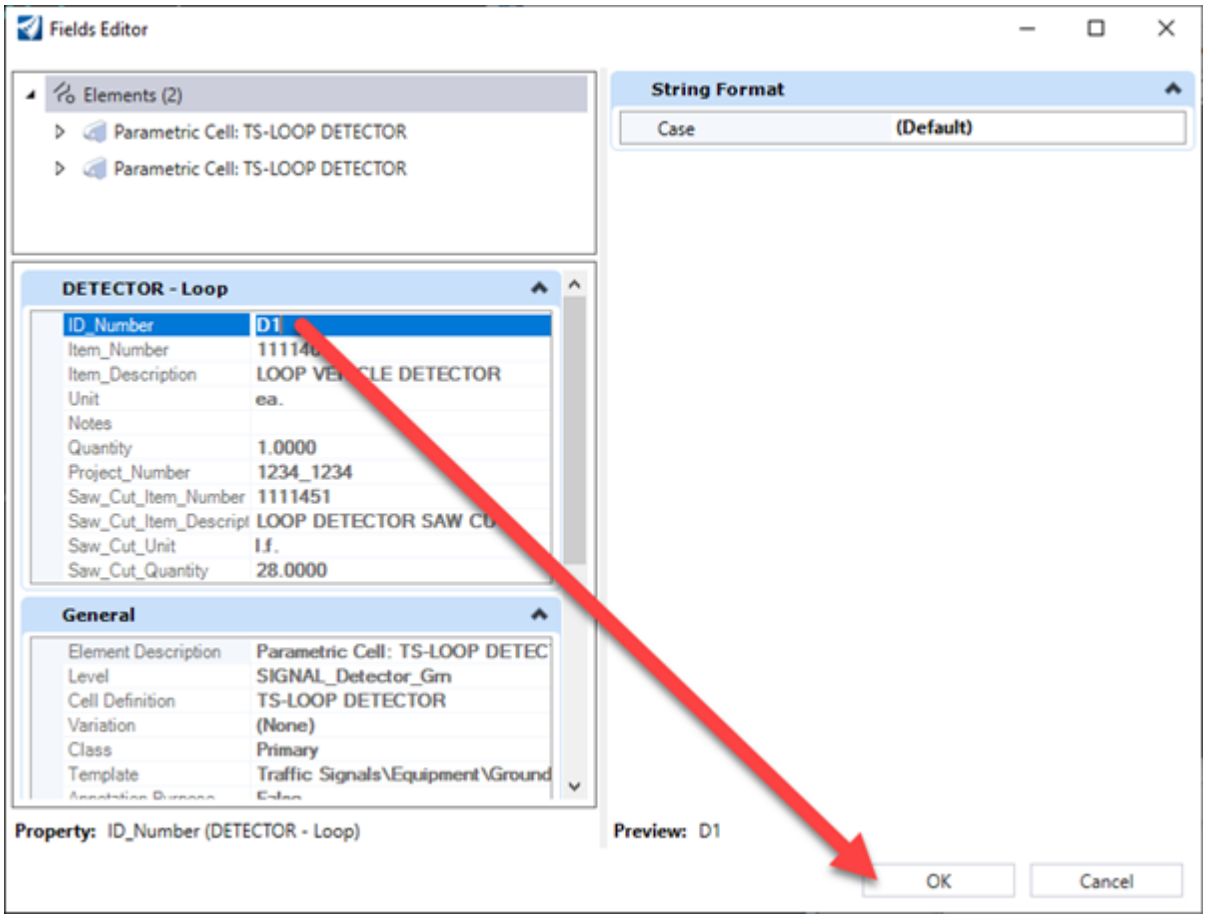


Figure 205

8. Follow the prompts to place the note.

Figure 206

9. Match Marks are to be placed in the Drawing Model using the tools in the **Notes** pull down menu.

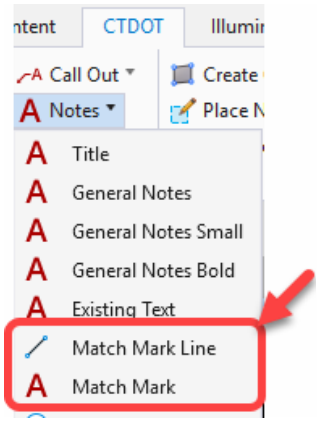


Figure 207

10. Place Dimensions in the Drawing Model. To place a Dimension, select either the **Vertical** or **Horizontal** Text Tool on the **CTDOT** ribbon, then select one of the desired **Dimensioning** tools. The Element Dimensioning dialog box will appear, select the desired **Dimension Style** and enable **Association**.

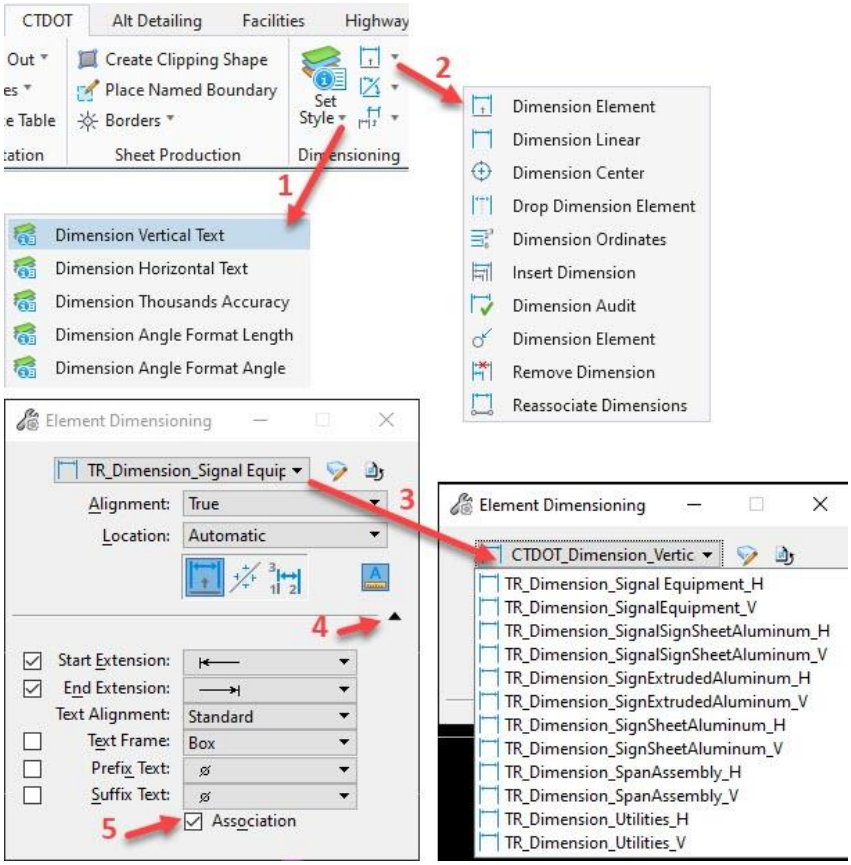


Figure 208

11. *Note: To correctly dimension elements being referenced from in old survey files it is suggested to make copies of the delivered dimension styles and in the Units tab add a scale Factor of 480.*

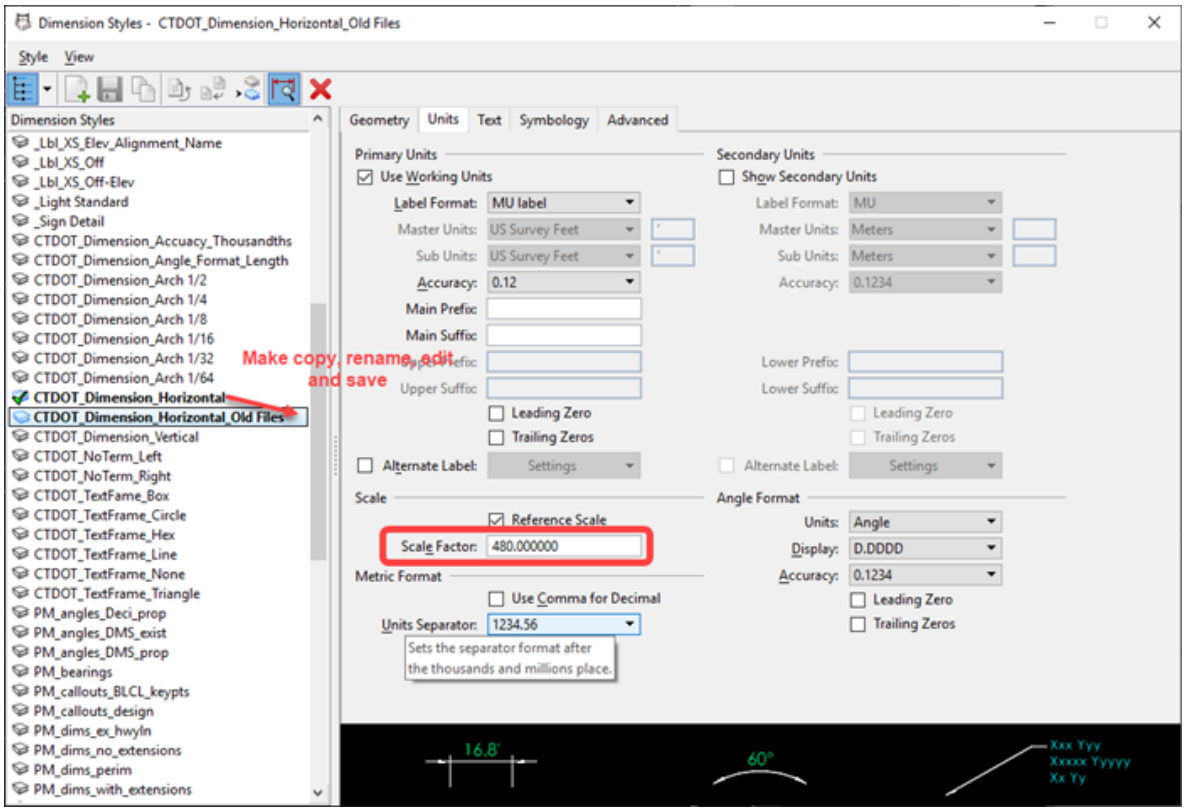


Figure 209

5.10 Annotate the Sheet Model

Note: *Annotation will be placed in both the Drawing Models and the Sheet Model.*

- *Call-outs and Dimensions should be placed in the Drawing Models. Placing the Call-Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.*
- *Notes that pertain to the whole sheet can be placed in the sheet models.*

5.10.1 Detailing Cell Library

Choose the **CTDOT** workflow and select the **CTDOT** tab. In the **Detailing** section select **Miscellaneous > Open Signal Detailing**. A cell library will open, this cell library contains Tables, Turning Movements and Signal Face Details. Double click to activate the needed cell and follow the prompts for placement.

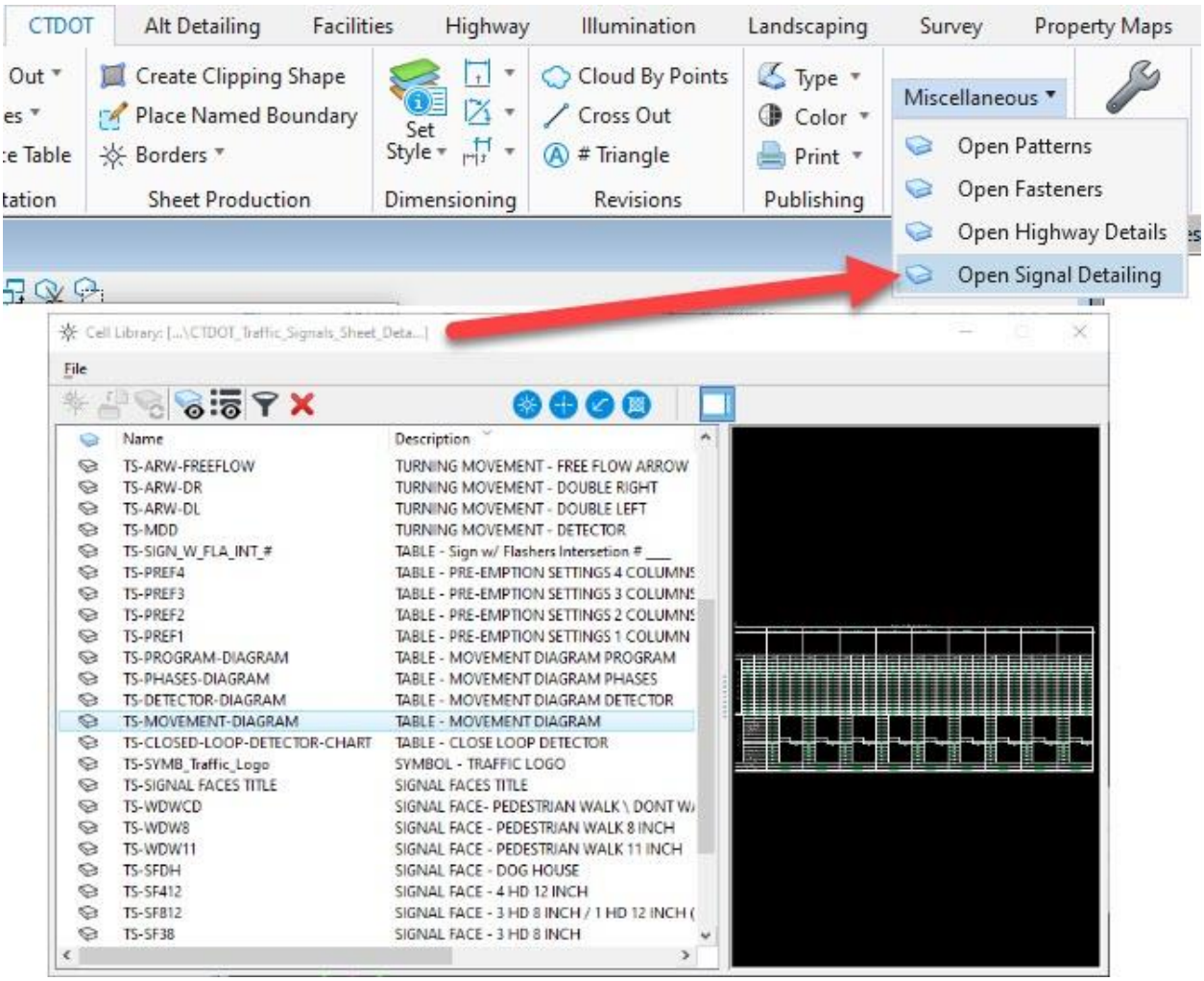


Figure 210

5.10.2 Tables

1. Several tables have been created and can be used instead of the Cells in the Detailing Cell Library. From the Ribbon click on the **Models** icon and select to open the Sheet Model.
2. On the **CTDOT** Ribbon select the **Annotate** Tab and click on the **Place Table** icon.

   Preconfigured Custom CTDOT Table Seeds are available for placement. In this exercise we will place both empty tables and table populated from a report.

   Empty Tables will come with prepopulated with Title and Header Information and blank body cells to be filled out by the user. Examples:
   - Movement Diagram Top
   - Movement Diagram Bottom

   Tables from Reports will place with all the needed information already filled in. Examples:
   - Mast Arm Information
   - Span Pole Information
3. On the Place Table dialog box select the **Empty Table** Icon. Select the ***SIGNAL – Movement Diagram - Top*** seed and follow the prompts for placement in the upper left-hand corner of the sheet.
4. Select the ***SIGNAL – Movement Diagram – Bottom*** and snap to the bottom left corner of the top movement diagram.

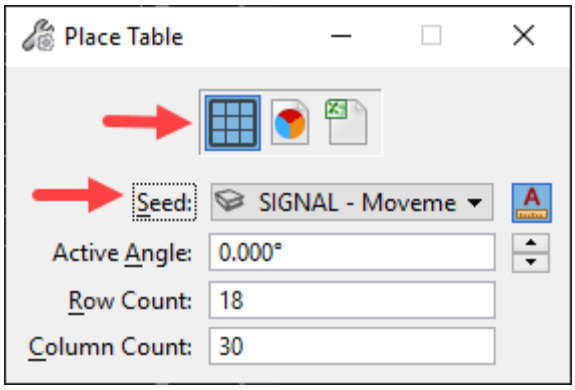


Figure 211

5. To add information to the table select the **Annotate** tab and choose **Edit Text**. ***Note:*** *Avoid using the Element Selection tool to edit the table as this will lock up the file.*

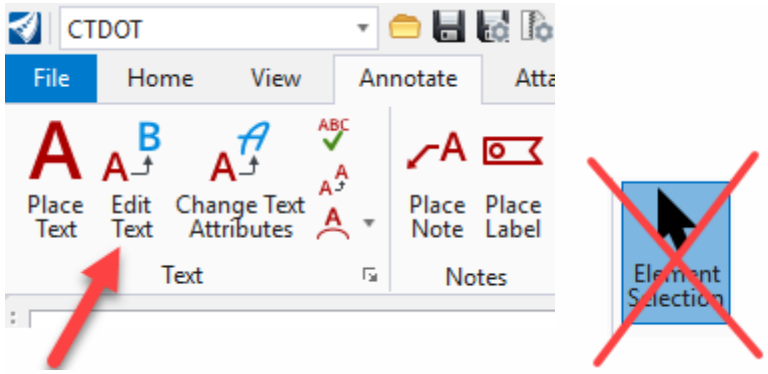


Figure 212

6. After the Text and Number entries are complete in the tables, Cells will need to be placed on top of the Table. The Table should be locked before the cells are placed. To lock a table, select the table in the View Window and in the **Extended Section** of the **Properties** dialog box select **Locked**.

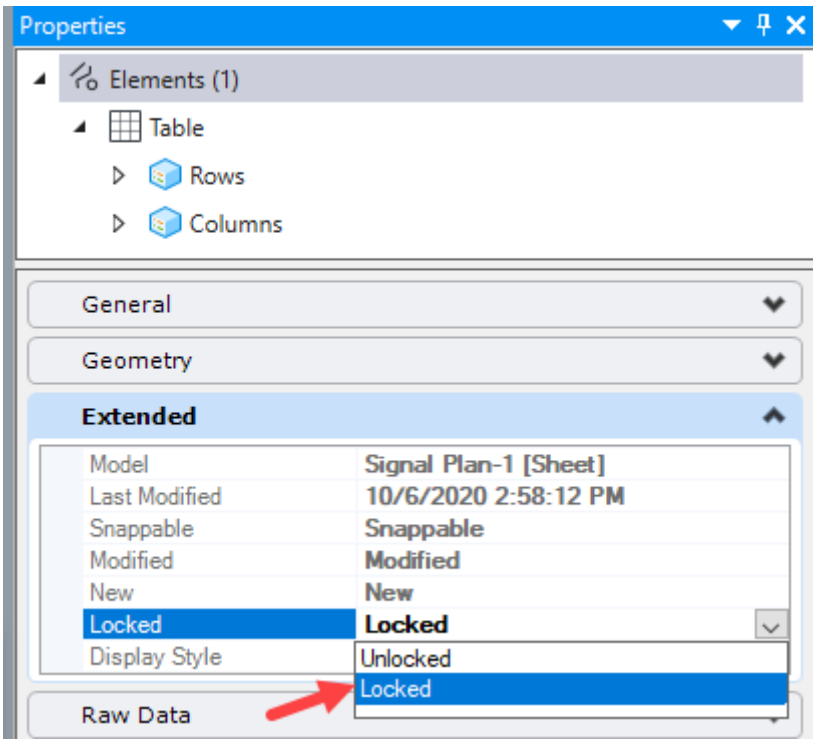


Figure 213

7. The Cells needed to complete the Movement Diagram can be accessed choosing the **CTDOT** workflow and selecting the **CTDOT** tab. In the **Detailing** section select **Miscellaneous > Open Signal Detailing**. A cell library will open, double click to activate the one of the ***TURNING MOVEMENT*** cells and follow the prompts for placement.

8. On the Place Table dialog box select the **From Report** Icon. Select the desired **Seed** and **Report**. **Retain Association** should be toggled on. Selections for Mast Arm and Span Poles:

Seed	Report
SIGNAL – Mast Arm Information	MAST ARM INFORMATION
SIGNAL – Combination Mast Arm Information	COMBINATION MAST ARM INFORMATION
SIGNAL – Span Pole Information	SPAN POLE INFORMATION
SIGNAL – Combination Span Pole Information	COMBINATION SPAN POLE INFORMATION

9. Select the **Browse** button next to report.

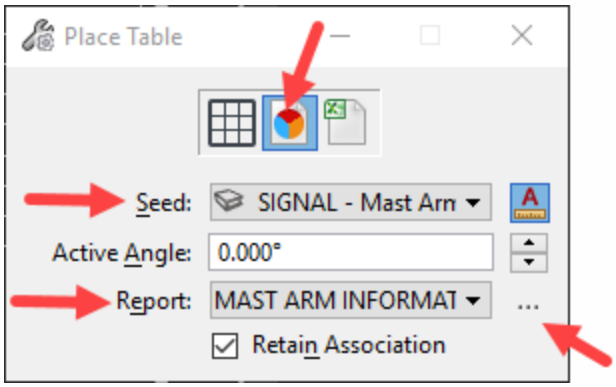


Figure 214

10. On the Reports dialog box right click on the desired report and select **Save to active file**. Now move to the right part of the dialog box and for **Model** assure that the **Default Model** is selected. Follow the prompts for placement.

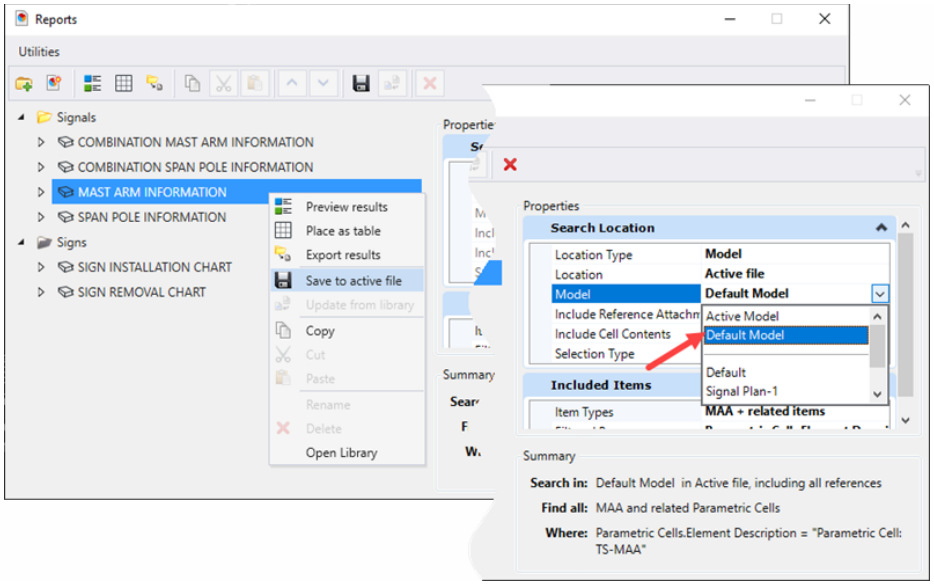


Figure 215

5.10.3 Notes

Use the tools on the **CTDOT** Ribbon's, **Annotation** section to place **Notes**.

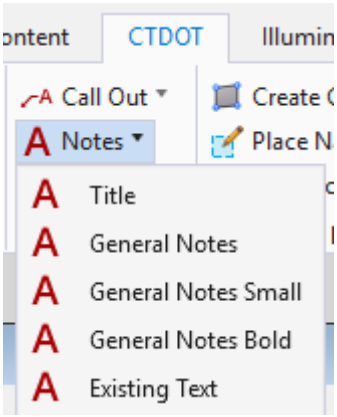


Figure 216

5.11 Create a Signal Face Detail

1. Go back into the Design model and Place another Named Boundary, but this time only around the Signal Faces.
2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.
3. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear, set the following options:
   - Method (icon): ***By 2 Points***
   - Name: ***Signal Faces***
   - Mode (icon): ***Place Single Named Boundary***
   - Create Drawing: ***Enabled***
4. Follow the prompts to create a named boundary around the Signal Faces.
5. After accepting the placement of the named boundary the Create Drawing dialog will appear. Ensure the following options are set:
   - *Name*: ***Sign Face Detail***
   - *Drawing Seed*: ***Signal Plan***
   - *Create Drawing Model*: ***Enabled***
   - *Annotation Scale*: ***Full Size 1" = 20'***
   - *Create Sheet Model*: **Enabled**
   - *Sheets*: Signal Plan [Sheet]
   - *Drawing Boundary*: **New**
   - *Detail Scale*: ***1" = 20'***
   - *Add to Sheet Index*: ***Disabled***
   - *Open Model*: **Enabled**
6. The existing Sheet Model will open, move the reference to the desired location on the sheet.
7. In the Drawing Model annotate the detail.
8. Select **Save Settings**.

5.12 Create a Mast Arm Detail

1. In the Contract Plan DGN file create a new 2D Design Model. From the Ribbon open the **Models** dialog box.

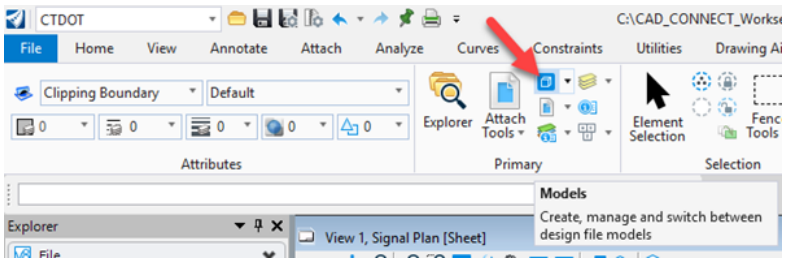


Figure 217

2. On the Models dialog box select the **Create a new model** icon.

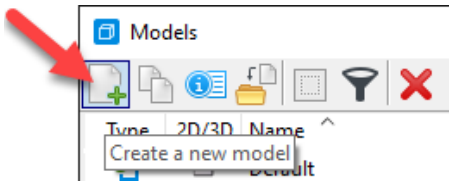


Figure 218

3. In the Create Model dialog box, ensure the following options are set:
   - *Type*: ***Design From Seed***
   - *Seed Model*: ***Seed2D – CT Road.dgn, Default***
   - *Name*: ***Mast Arm Detail***
   - *Annotation Scale*: **3/16"=1'-0"**
   - *Propagate*: **Enable**
4. Click **OK**.

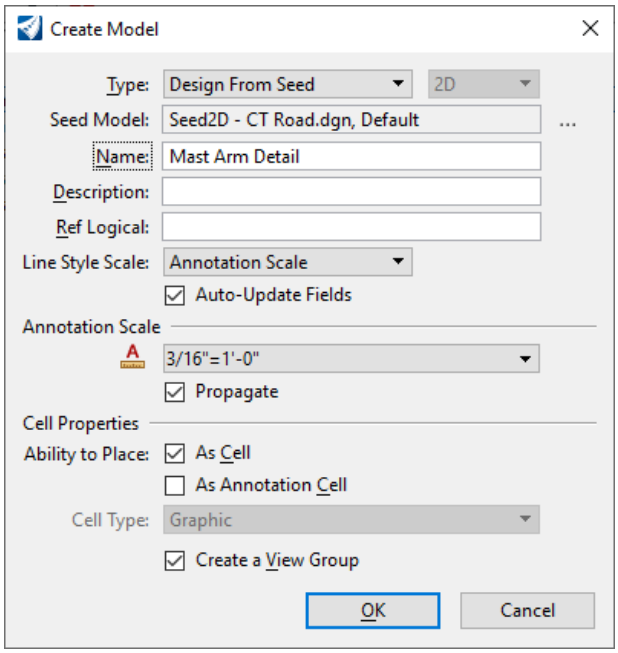


Figure 219

5. In the new model draw the elevation view of the mast arm. Annotate and dimension the detail. **Note:** This detail can be annotated and dimensioned in this same model as it is not a Geospatial Base Model.
6. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.
7. Using the **Place Named Boundary** tool, place a Named Boundary around the detail. Ensure the following options are set:
   - Method (icon): ***By 2 Points***
   - Name: ***Mast Arm Detail***
   - Mode: ***Place Single Named Boundary***
   - Create Drawing: ***Disabled***
8. Open the ***Signal Plan*** Sheet Model. This can be done using the **View Group** drop down tool located at the bottom left of the screen. Select **Signal Plan (Sheet) Views**.

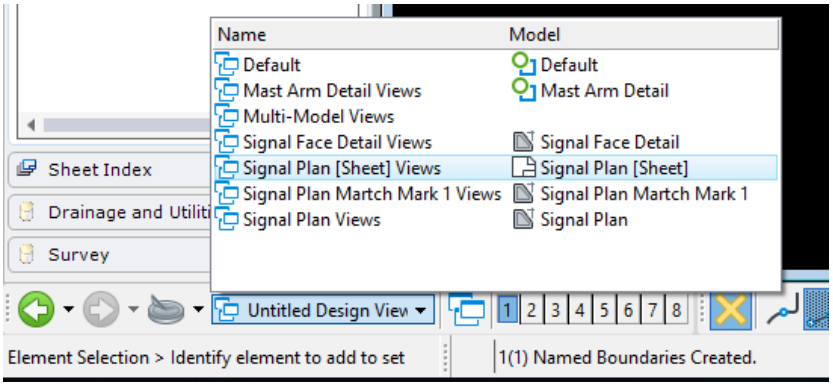


Figure 220

9. Reference in the Mast Arm Detail. In the Reference Attachment Properties ensure the following options are set:
   - *Model*: ***Mast Arm Detail***
   - *Orientation*: ***Named Boundaries / Mast Arm Detail***
   - *Detail Scale*: ***3/16" = 1'-0"***

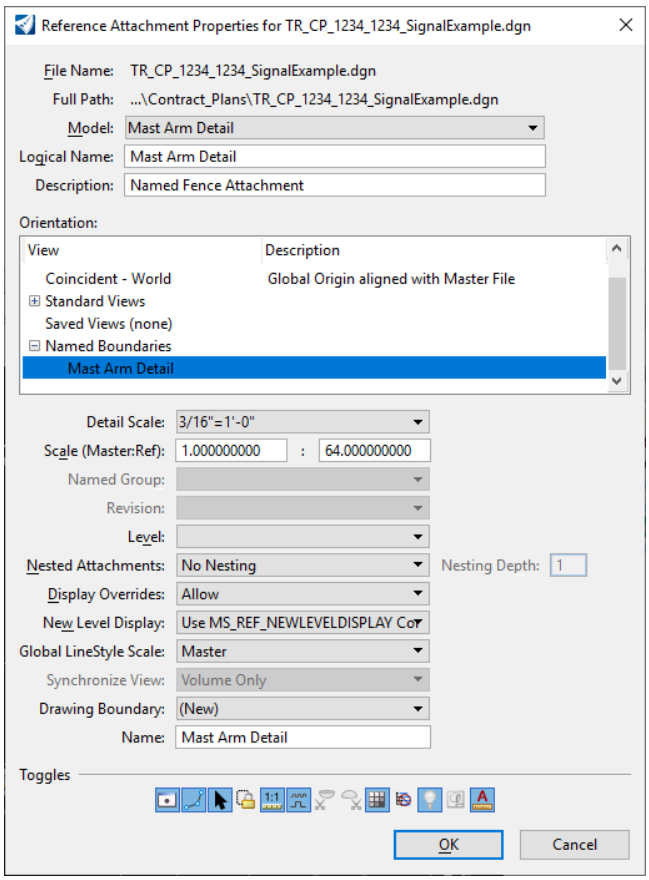


Figure 221

10. Click **OK** and follow the prompts for placement in an empty location inside the Sheet Border. Select **Save Settings**.

Section 6 – Signing & Pavement Marking Sheets

6.1 Create New File

Before attempting to open or create DGN files users should make sure the following is in place:

1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**
4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenRoads through Accounting or the Customized Icon following
6. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.
7. 4. Select the **New File** icon. In the New dialog box browse to the ***Traffic/Contract_Plans*** folder.
8. The Seed file should be set to ***Seed2D - CT RoadDesign.dgn***. If this is not the case, click on the **Browse** button. Browse to ***...CT_Configuration\|Organization\|Seed\|Road*** and select **Seed2D - CT RoadDesign.dgn**

   If the survey was done in an old Datum, use the 2D Seed Files in this folder ***...CT_Configuration\|Organization\|Seed\|GCS\|***

9. In the ***File name*** field enter a name for your file using the CTDOT file naming structure. Example: ***TR_CP_1234_1234_SPM.dgn***
10. Select **Save** and the new file will open.
11. If it has been determined the provided survey is in NAD 27/NAVD 29 you will need to re-project your design file's Geospatial Header

6.2 Set up the Default Model

1. Select the **CTDOT** workflow and click on the **Attach** Tab, in the **References Section** click on **Attach Reference**.
2. Navigate to the ***Traffic|Base_Models*** folder and reference the Master Base Model file. Choose the needed Model (most likely its "Default") and use **Live Nesting** at a **Nesting Depth of 2**.
3. Select the **Home** Tab, in the **Primary Section** select the **Attach Tool** drop down and choose **References**. This will open the References Dialog box.
4. Review the Attachments. If all the needed files did not propagate to reference with Live Nesting in the above step, you will need to reference the files directly. If there is no Existing Survey users can attach Raster Images or use a Background Map, these workflows can be found in Volume 2 – Module 2 - Attaching Imagery and LiDAR Data.
5. To reference the Survey navigate to the ***Active_Survey*** folder and reference the Survey *.dgn file. **Note:** Older DGN Files will need to be referenced in with certain settings to get them to line up in the correct Geospatial location.
6. For older reference files turn **True Scale** off and set the Scale to ***1:1***. **Note:** Always do a check by clicking on the Survey's Northing and Easting Grid Marks to compare the files read out. If they do not match you did not properly align the file Geospatially.
7. Select **Level Display** and turn off the desired levels.
8. Rotate the view so that the main road is parallel to the screen. On the **View Window** select the **Rotate View** tool. Use the **2 Points** Method. Follow the prompts to rotate the view.

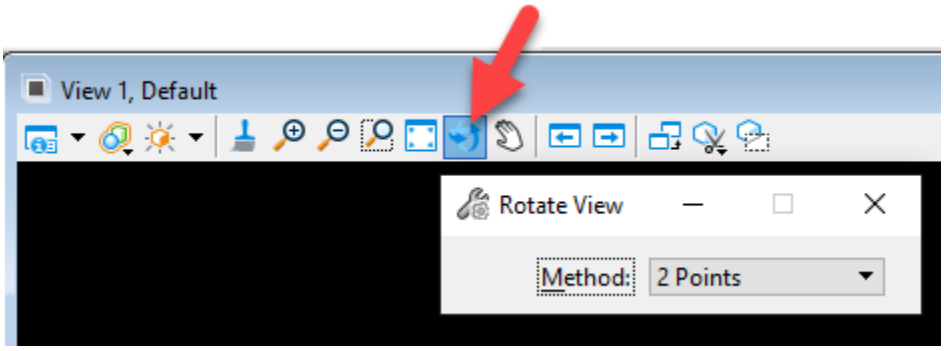


Figure 222

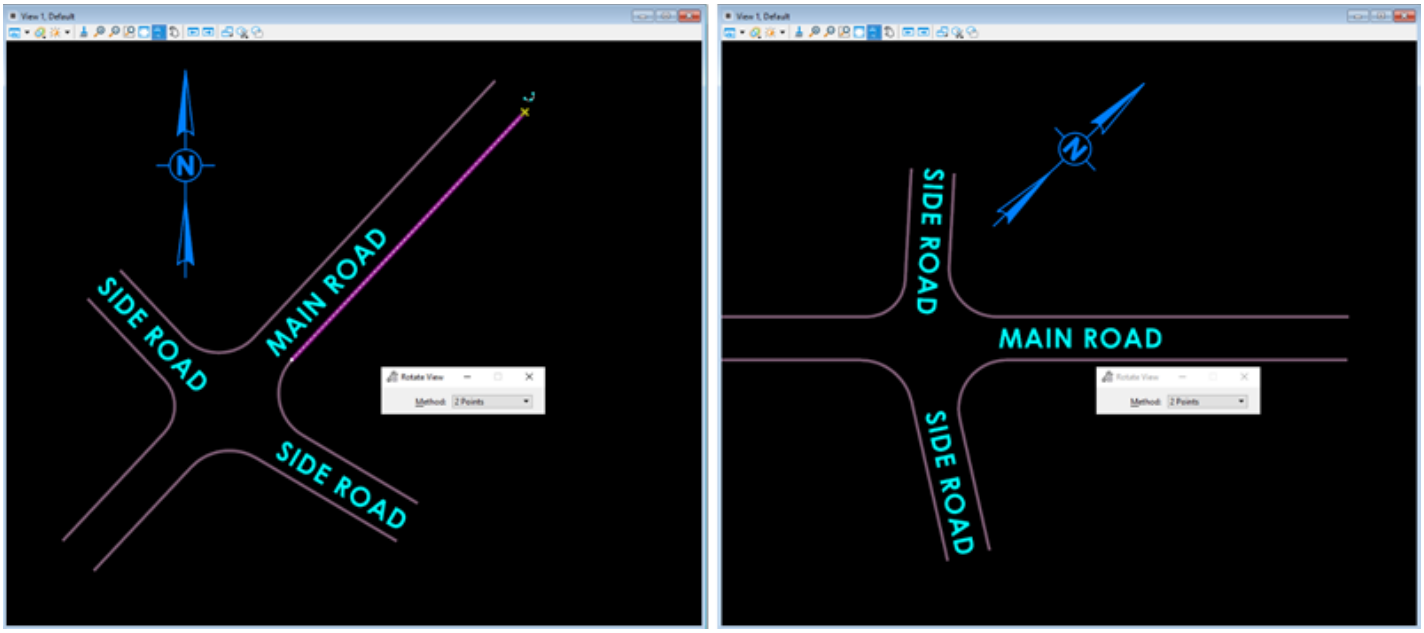


Figure 223

9. Select **Save Settings**.

6.3 Place Named Boundaries

6.3.1 By 2 Point Method

Place Named Boundary By 2 Points - used when only one sheet is needed with several details on the sheet.

1. Select the **CTDOT** workflow and on the **Annotate** tab locate the **Detailing** section and select the bottom right **Styles button**. In the Detailing Symbol Styles dialog right click on ***CV_Detail*** and select **Activate**.

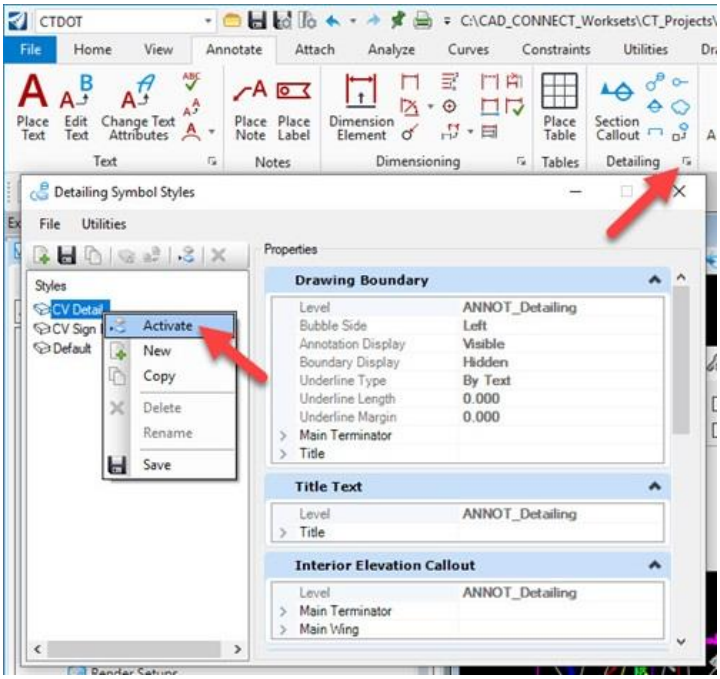


Figure 224

2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

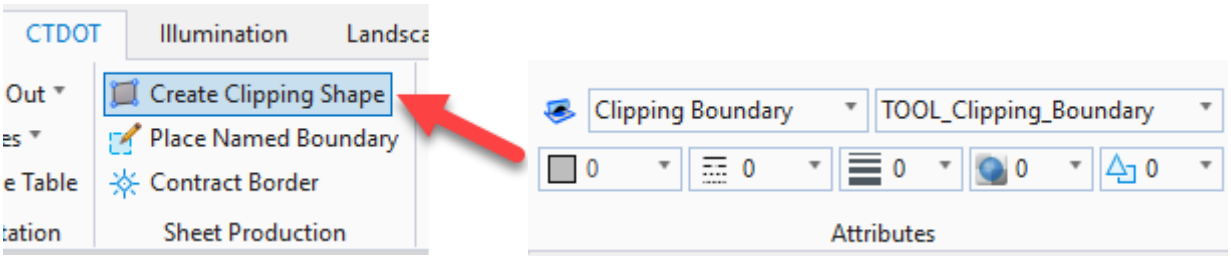


Figure 225

3. Select the **Place Named Boundary** tool and the Place Named Boundary Dialog box will appear.

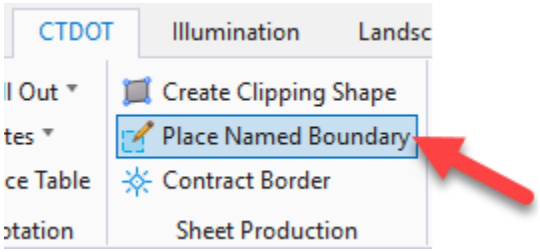


Figure 226

4. In the Place Named Boundary dialog box, set the following options in the tool's settings window:
   - Method (icon): ***By 2 Points***
   - Name: ***Signing and Pavement Marking Plan***
   - *Mode (icon)*: ***Place Single Named Boundary***
   - *Create Drawing*: ***Enabled***

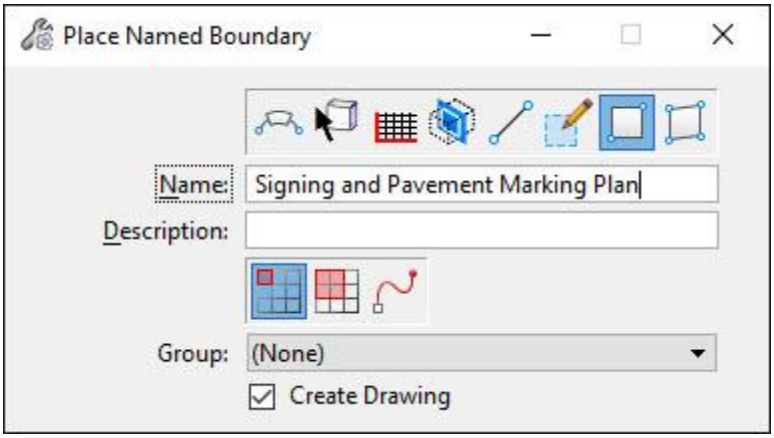


Figure 227

5. Follow the prompts to place a Named Boundary (Clipping Boundary) around the design. Data point first in the lower left and ending in the upper right. This element can be edited later to refine the shape and add additional points.

6. After accepting the placement of the named boundary, the Create Drawing dialog box will appear. Ensure the following options are set:

   Top Section

   - Name: ***Signing and Pavement Marking Plan***
   - Drawing Seed: ***40 Scale Contract Plan Sheet***

   Drawing Model Section

   - Create Drawing Model: ***Enabled***
   - Annotation Scale: ***Full Size 1" = 40'***

   Sheet Model Section

   - Create Sheet Model: ***Enabled***
   - Sheets: ***New***
   - Annotation Scale: ***Full Size 1" = 40'***
   - Drawing Boundary: ***New***
   - Detail Scale: ***1"=40'***
   - Add to Sheet Index: ***Disabled***
   - Open Model: ***Enabled***

7. Click **OK**.

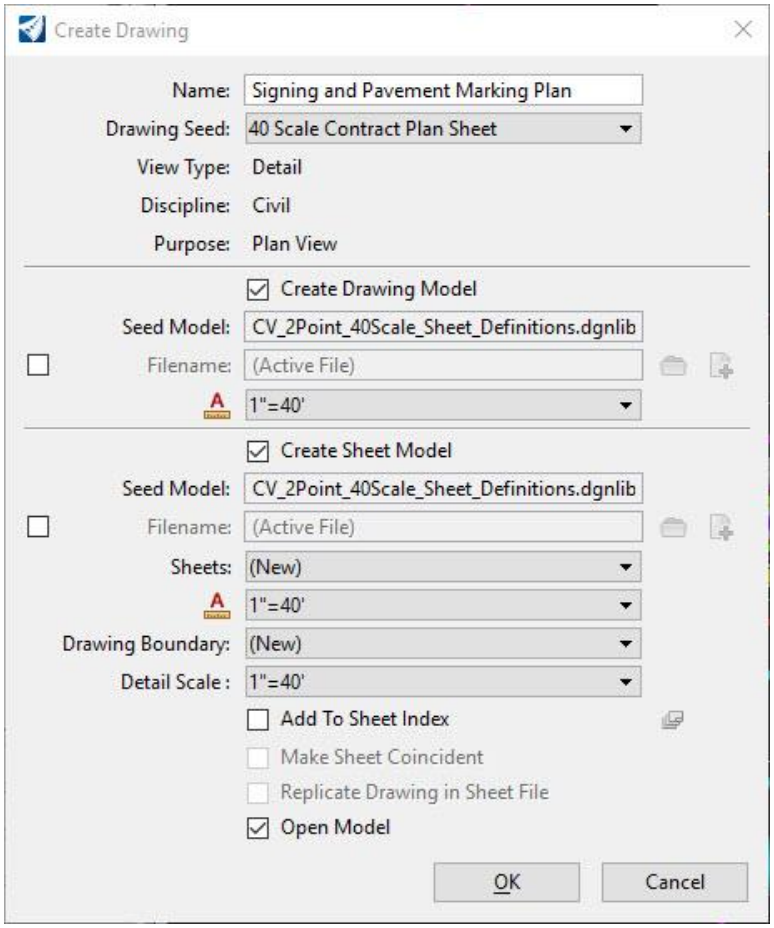


Figure 228

6.3.2 Civil Plan Method

1. Place Named Boundary Civil Plan - used when multiple sheets are needed along a corridor. To use this method a centerline needs to be present in one of the Design Models References. Select the **Place Named Boundary** tool and the Place Named Boundary Dialog box will appear.

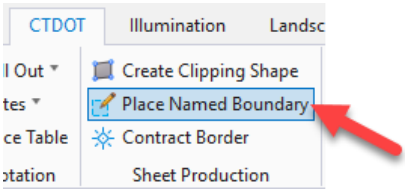


Figure 229

2. In the Place Named Boundary Civil Plan dialog box, ensure the following options are set in the tool's settings window:
   - Method (icon): ***Civil Plan***
   - Drawing Seed: ***40 Scale Contract Plan Sheet***
   - Detail Scale: ***1"= 40'***
   - Name: ***Plan 1***
   - Group: ***New***
   - Length: ***1000***
   - Right Offset: ***-275***
   - Left offset: ***275***
   - Overlap: ***0***
   - Boundary Cord: ***20***
   - Create Drawing: ***Enabled***
   - Show Dialog: ***Enabled***

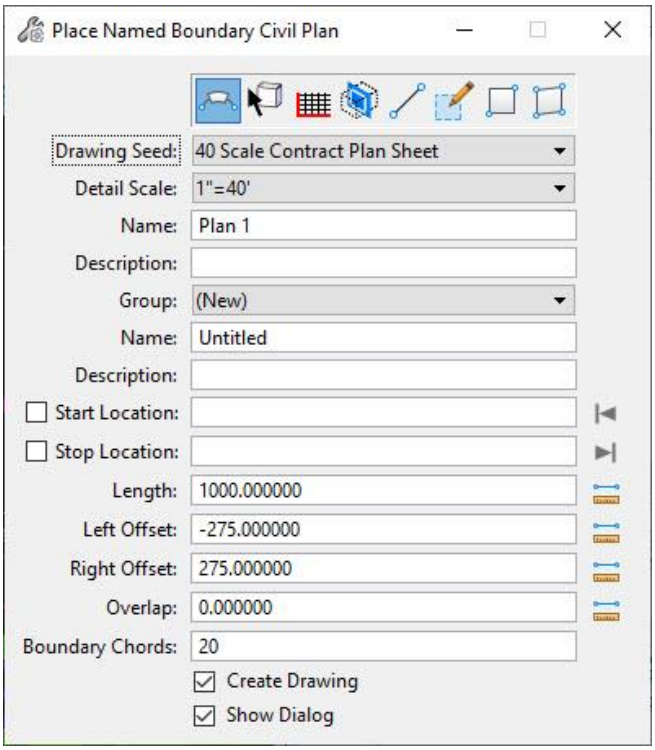


Figure 230

3. Follow the prompts to create a named boundary along the Centerline.

   After accepting the placement of the named boundaries the Create Drawing dialog will appear. Ensure the following options are set:

   Drawing Model Section

   - Annotation Scale: ***Full Size 1" = 40'***

   Sheet Model Section

   - Sheets: ***New***
   - Annotation Scale: ***Full Size 1" = 40'***
   - Detail Scale: ***1" = 40'***
   - Add to Sheet Index: ***Disabled***
   - Open Model: ***Enabled***

4. Click **OK**. The Drawing Models and Sheet Models will be created.

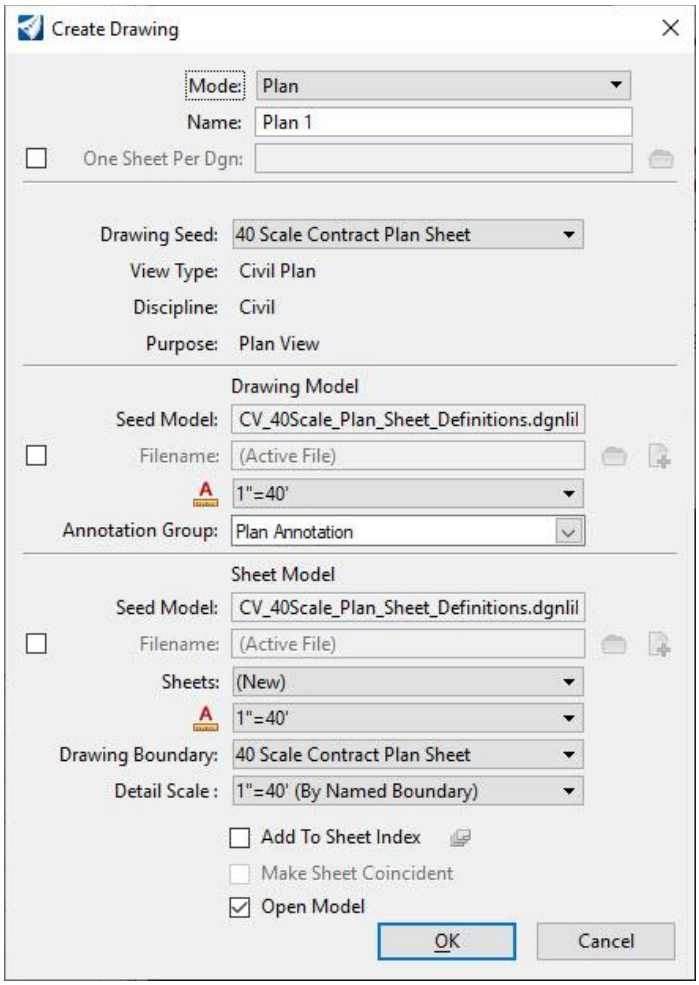


Figure 231

6.4 Edit the Title Block

1. The newly created sheet model will open with the Named Boundary referenced and centered onto the sheet. From the Ribbon open the **Models** dialog box.
2. View the **Properties** of the model. Notice the Sheet Model's Annotation Scale is ***Full Size 1 = 1***.
3. In the **Properties** dialog box edit or fill in the following fields:
   - *Description*: ***SIGNING AND PAVEMENT MARKING PLAN***
   - *Sheet Number*: ***SPM -01***

   Notice the **Drawing Title** and **Drawing Number** in the Title Block will be updated to match the Properties. The Project Number, Project Description and Town should match the WorkSet Properties.

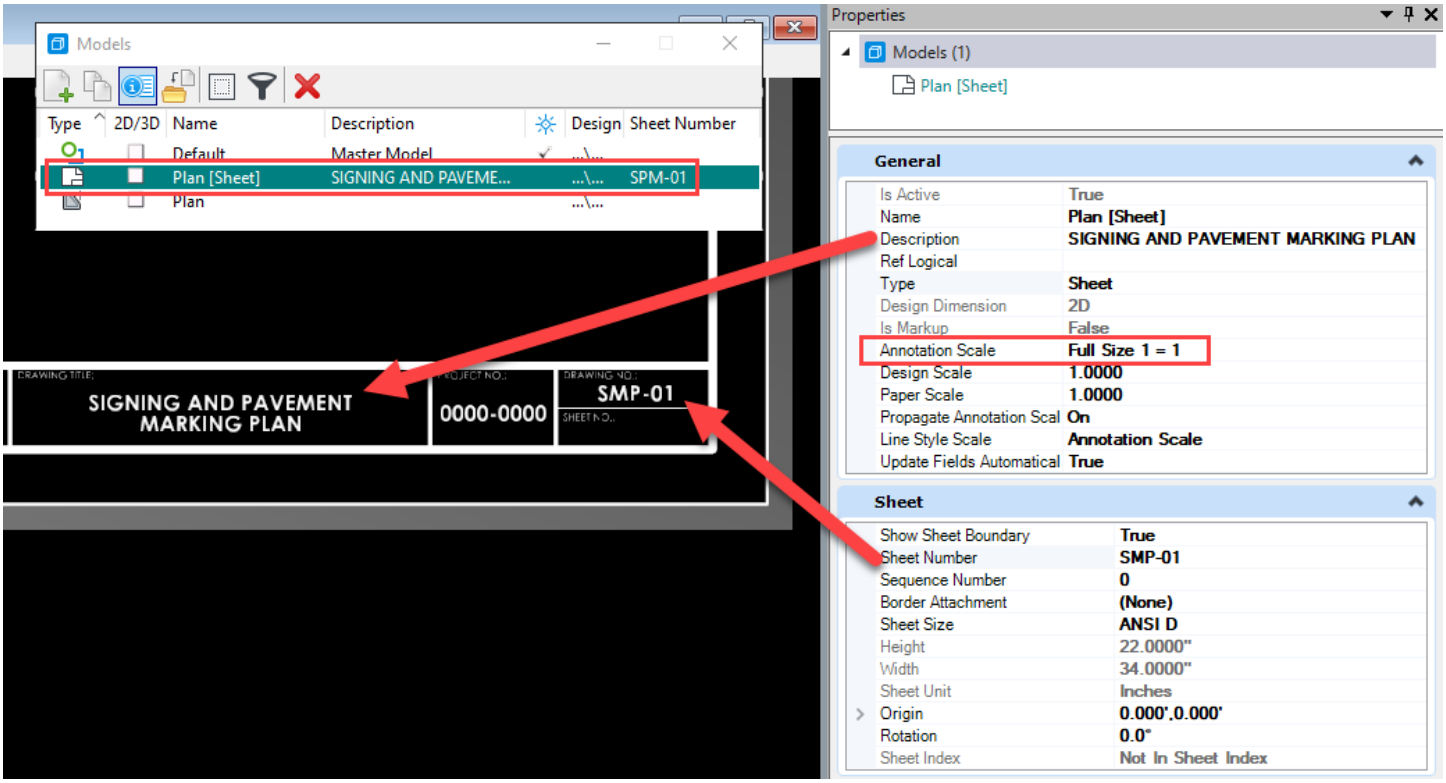


Figure 232

4. Select **Save Settings**.

6.5 Adjust the Named Boundary

1. On the Ribbon select **Home > Selection** and make the **Element Selection** tool active.
2. Select the Named Boundary shape and adjust by dragging the handles to the desired location.

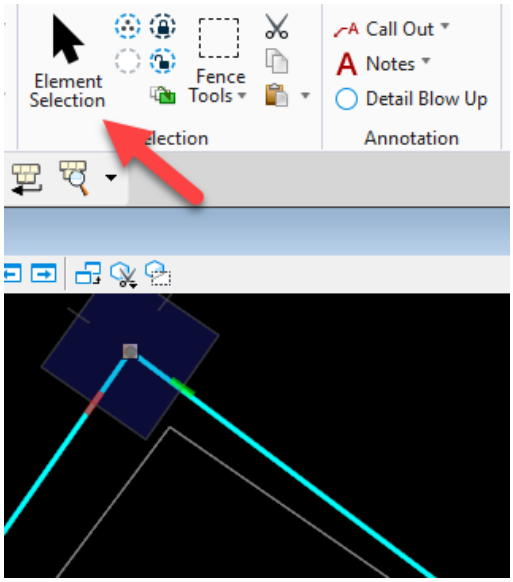


Figure 233

3. The **Insert Vertex** or **Delete Vertex** tools can also be used to edit the shape.

Figure 234

4. Return to the sheet model by hovering the cursor over the Marker and click the **Sheet** and select the folder Icon (Open Target Tool). This action returns you back to the sheet model. Notice that by changing the boundary in the design model, this has propagated to the sheet.

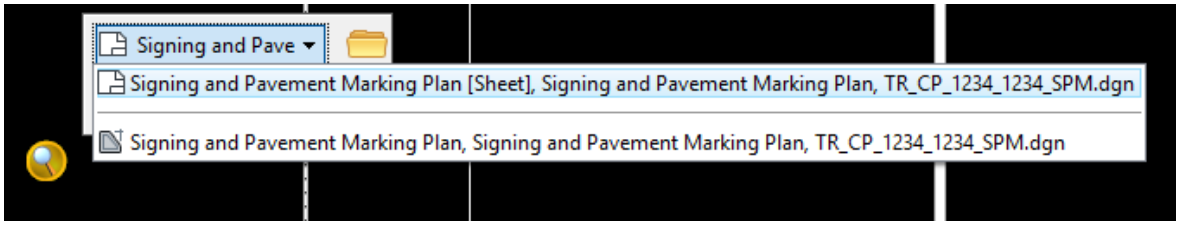


Figure 235

5. Models can also be opened using the **View Group** drop down tool located at the bottom left of the screen.

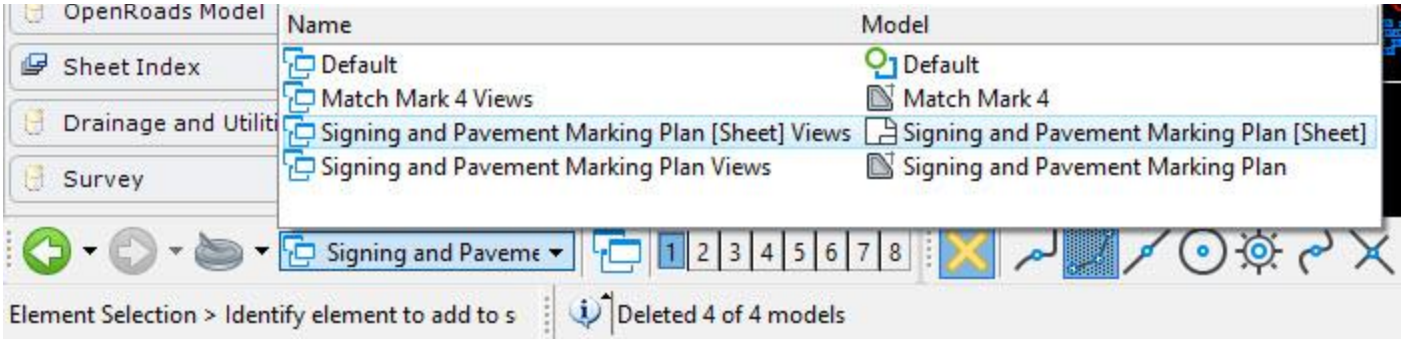


Figure 236

6. Select **Save Settings**.

6.6 Move the Name Boundary inside the Sheet Border

1. From the Ribbon click on the **Models** icon and select to open the ***Sheet Model***.
2. Select the **References** Icon, in the dialog box right click on the file, select **Move** to re-position the reference file within the border.
3. follow the prompts to execute the move command.

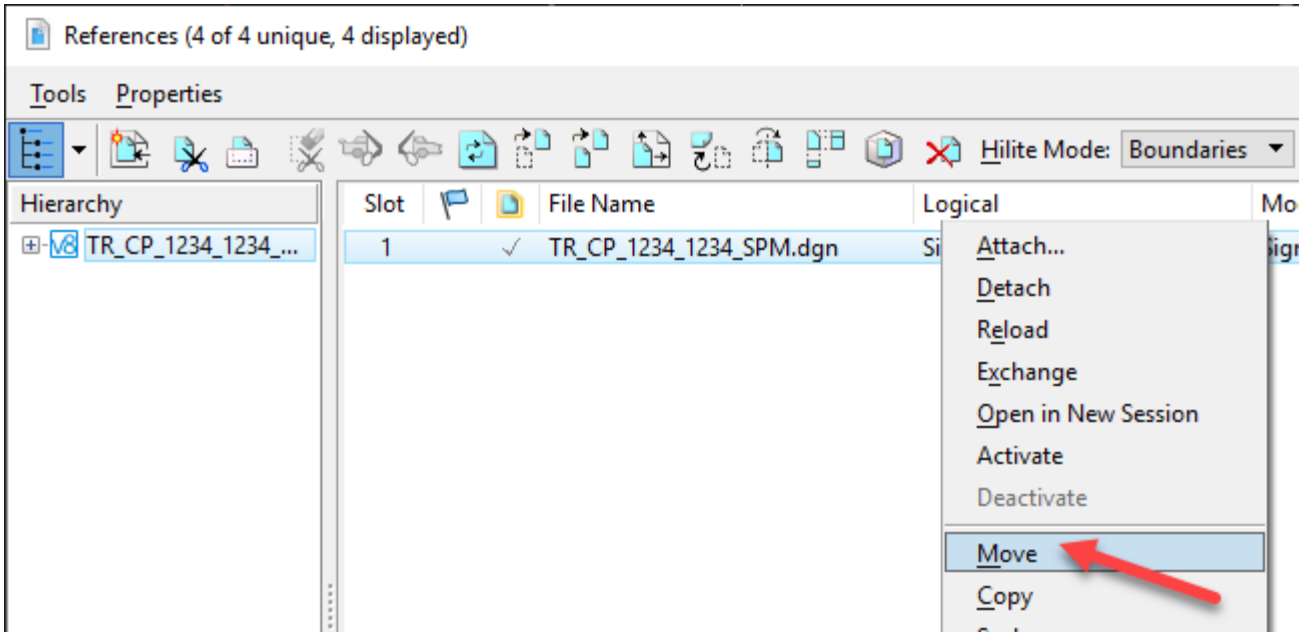
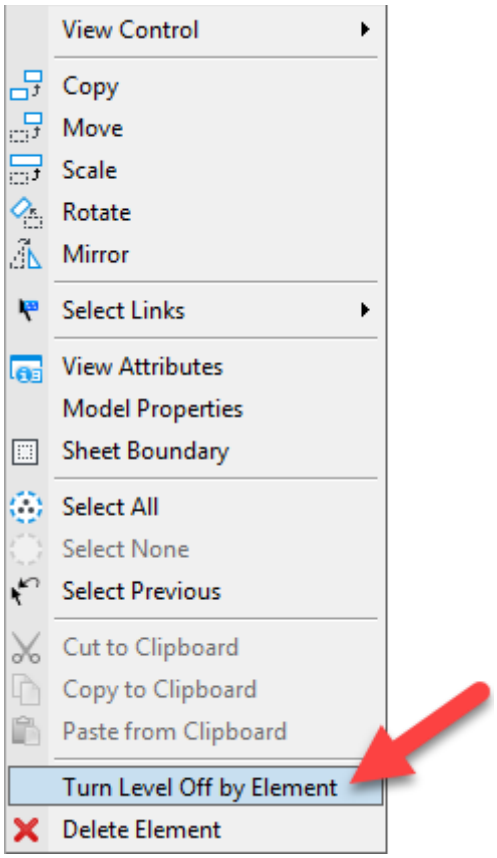


Figure 237

4. Select **Save Settings**.

6.7 Turn off Levels

1. Right-press and hold to bring up the contextual menu. From here, select **Turn Level Off by Element**.



2. Issue a Data Point on the Named Boundary, hence turning off the level. Data Point on other elements for levels you would like turned off.
3. Select **Save Settings**.

6.8 Create Match Marked Areas

1. If the design is too large for the sheet, Match Marks will be required, and additional Named Boundaries will need to be created. This will be used to include side roads that extend past the original clipping boundary or if the main line is slightly too long to fit within the original clipping boundary.
2. Go back into the Design model and place another Named Boundary adjacent to the original named boundary. This will be the Match Mark.
3. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.
4. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear, set the following options:
   - Method (icon): ***By 2 Points***
   - Name: ***Match Mark 1***
   - Mode (icon): ***Place Single Named Boundary***
   - Create Drawing: ***Enabled***
5. follow the prompts to create a named boundary of the around the additional area.
6. After accepting the placement of the named boundary the Create Drawing dialog will appear. Ensure the following options are set:
   - *Name*: ***Match Mark 1***
   - *Drawing Seed*: ***40 Scale Contract Plan Sheet***
   - *Create Drawing Model*: ***Enabled***
   - *Annotation Scale*: ***Full Size 1" = 40'***
   - *Create Sheet Model*: ***Enabled***
   - *Sheets*: ***Signing and Pavement Marking Plan [Sheet]***
   - *Drawing Boundary*: ***New***
   - *Detail Scale*: ***1" = 40'***
   - *Add to Sheet Index*: ***Disabled***
   - *Open Model*: ***Enabled***
7. The existing Sheet Model will open, move the reference to the desired location on the sheet.
8. Select **Save Settings**.

6.9 Create Blown Up Detail

This video demonstrates how to place a 20 Scale Detail on an existing 40 Scale Sheet.

Figure 238

6.10 Annotate the Drawing Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the Sheet Models.

1. Open a Drawing Model and use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Call Outs**.

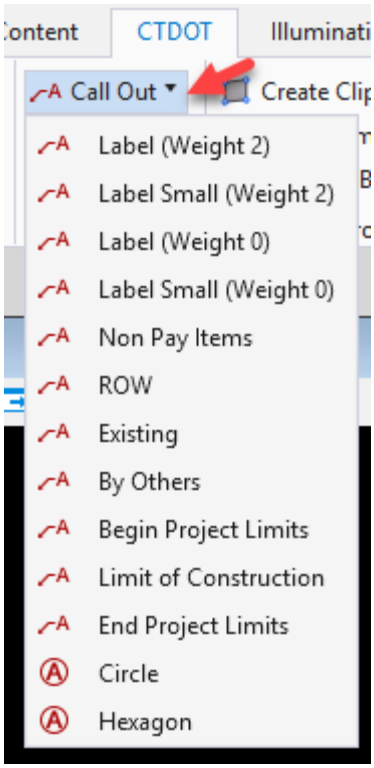


Figure 239

2. Match Marks are to be placed in the Drawing Model using the tools in the **Notes** pull down menu.

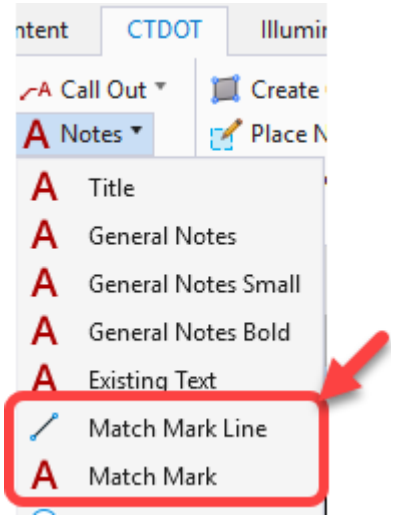


Figure 240

3. Place Dimensions in the Drawing Model. To place a Dimension, select either the **Vertical** or **Horizontal** Text Tool on the **CTDOT** ribbon, then select one of the desired **Dimensioning** tools. The Element Dimensioning dialog box will appear. Select the desired **Dimension Style** and enable **Association** and follow the prompts for placement.

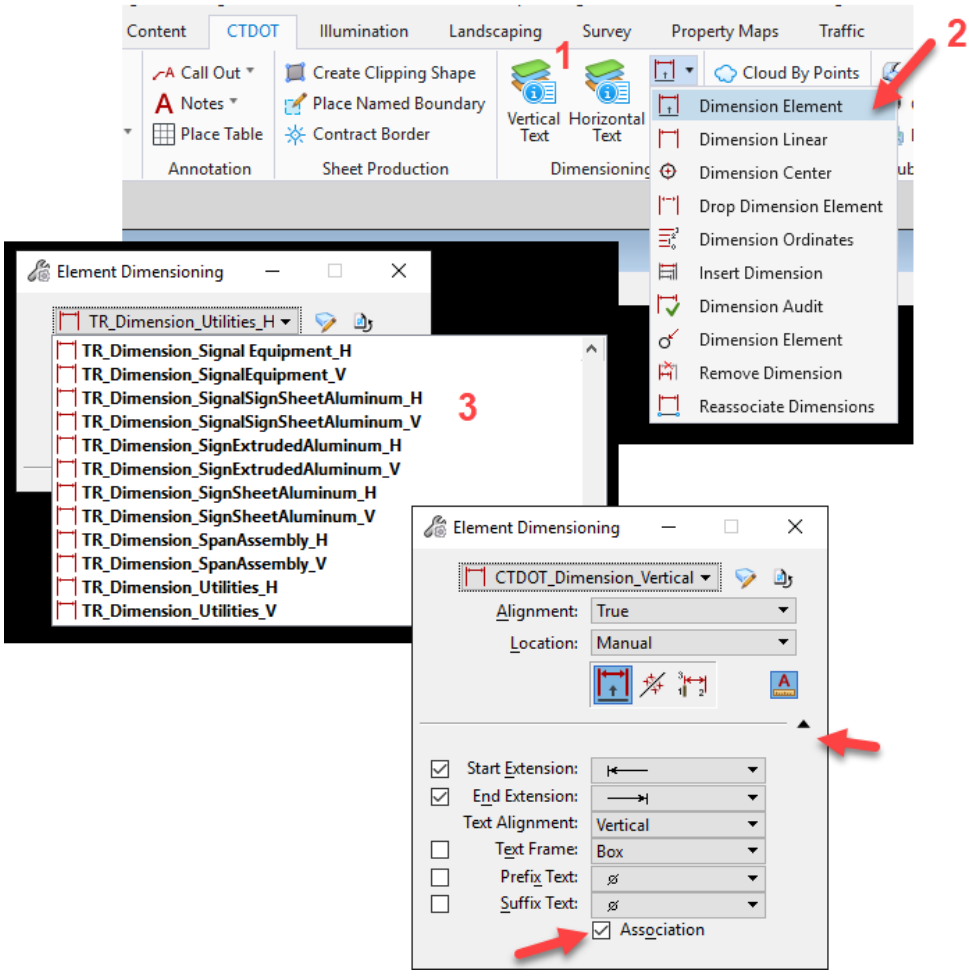


Figure 241

6.10.1 Annotate a Sign Detail

In the Drawing Model use the tools on the **CT DOT** Ribbon's, **Detailing** section.

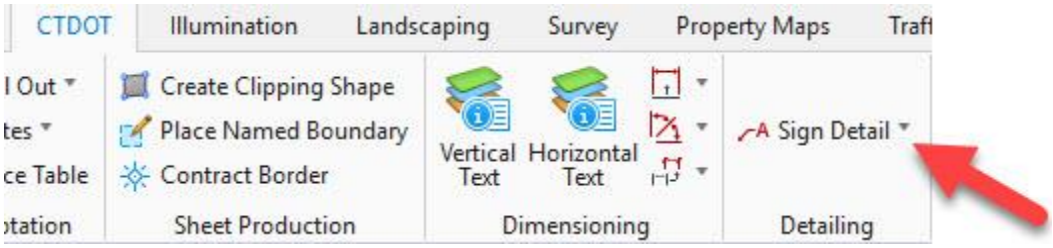


Figure 242

Use the tools in the **Sign Detail** pull down to complete the annotation. This video shows how to harvest the Item Type Properties to fill in the Detail Bubbles.

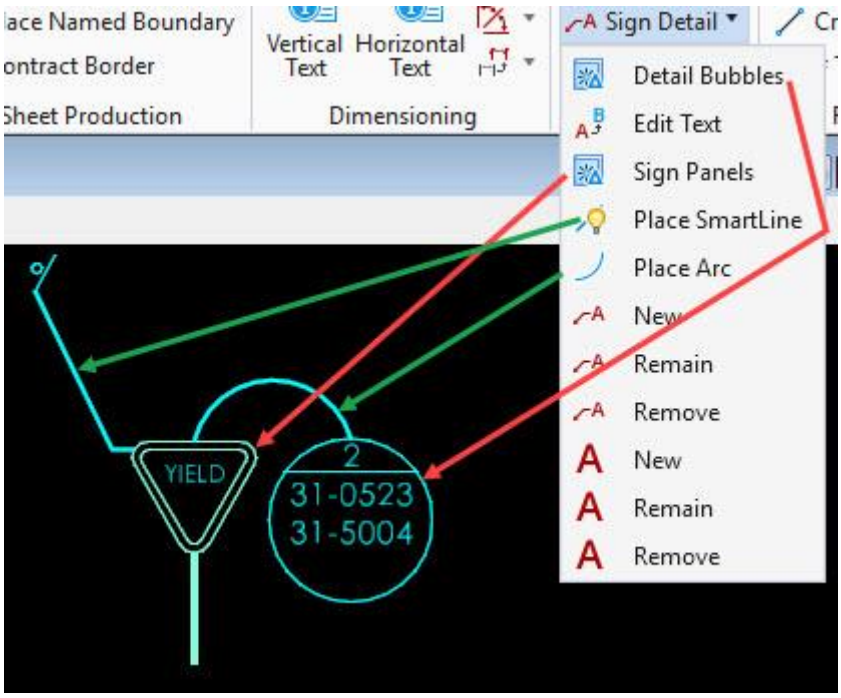


Figure 243

6.11 Annotate Pavement Markings

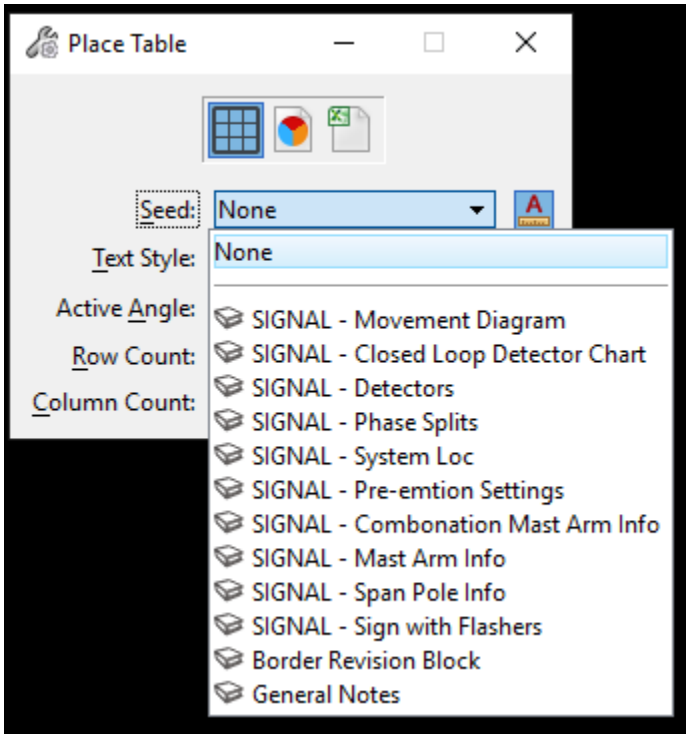
Coming Soon

6.12 Annotate the Sheet Models

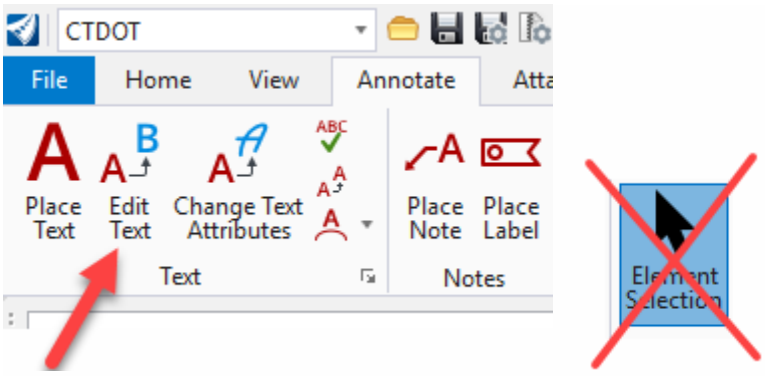
Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the sheet models.

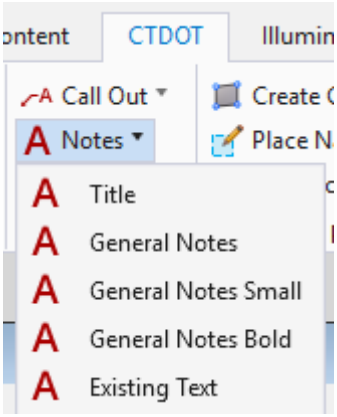
1. Use the **Place Table** tool on the CT DOT Ribbon to place preconfigured Tables. Select the **General Notes** table and follow the prompts for placement.



2. To add information to the table select the **Annotate** tab and choose **Edit Text**. **Note:** Avoid using the Element Selection tool to edit the table as this will lock up the file.



3. Use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Notes**.



Section 7 – Roadway Illumination Sheets

7.1 Create New File

Before attempting to open or create DGN files users should make sure the following is in place:

1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**
4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenRoads through Accounting or the Customized Icon following
6. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.
7. Select the **New File** icon. In the New dialog box browse to the ***Illumination/Contract_Plans*** folder.
8. The Seed file should be set to ***Seed2D - CT RoadDesign.dgn***. If this is not the case, click on the **Browse** button. Browse to ***...CT_Configuration\|Organization\|Seed\|Road*** and select **Seed2D - CT RoadDesign.dgn**

   If the survey was done in an old Datum, use the 2D Seed Files in this folder ***...CT_Configuration\|Organization\|Seed\|GCS\|***
9. In the ***File name*** field enter a name for your file using the CTDOT file naming structure. Example: ***IL_CP_1234_1234_Illumination.dgn***
10. Select **Save** and the new file will open.
11. If it has been determined the provided survey is in NAD 27/NAVD 29 you will need to re-project your design file's Geospatial Header.

7.2 Set up the Default Model

1. Select the **CTDOT** workflow and click on the **Attach** Tab, in the **References Section** click on **Attach Reference**.
2. Navigate to the ***Illumination\Base_Models*** folder and reference the Master Base Model file. Choose the needed Model (most likely its "Default") and use **Live Nesting** at a **Nesting Depth of 2**.
3. Select the **Home** Tab, in the **Primary Section** select the **Attach Tool** drop down and choose **References**. This will open the References Dialog box.
4. Review the Attachments. If all the needed files did not propagate to reference with Live Nesting in the above step, you will need to reference the files directly. If there are no Existing Survey users can attach Raster Images or use a Background Map, these workflows can be found in Volume 2 – Module 2 - Attaching Imagery and LiDAR Data.
5. To reference the Survey navigate to the ***Active_Survey*** folder and reference the Survey *.dgn file. **Note:** Older DGN Files will need to be referenced in with certain settings to get them to line up in the correct Geospatial location.
6. For older reference files turn **True Scale** off and set the Scale to ***1:1***. **Note:** Always do a check by clicking on the Survey's Northing and Easting Grid Marks to compare the files read out. If they do not match you did not properly align the file Geospatially.
7. Select **Level Display** and turn off the desired levels.
8. Rotate the view so that the main road is parallel to the screen. On the **View Window** select the **Rotate View** tool. Use the **2 Points** Method. Follow the prompts to rotate the view.

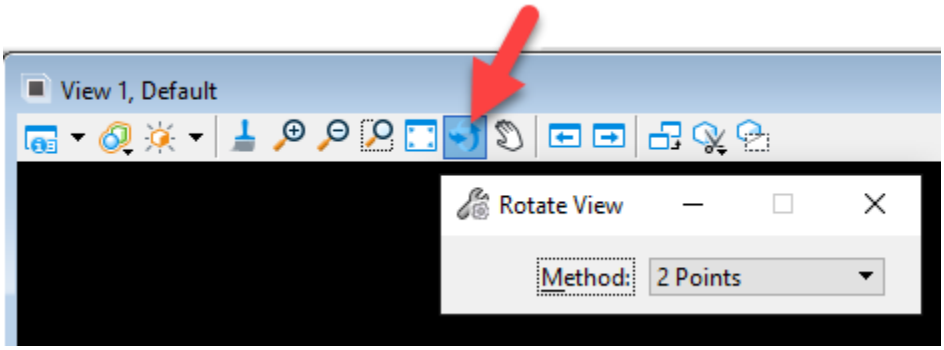


Figure 244

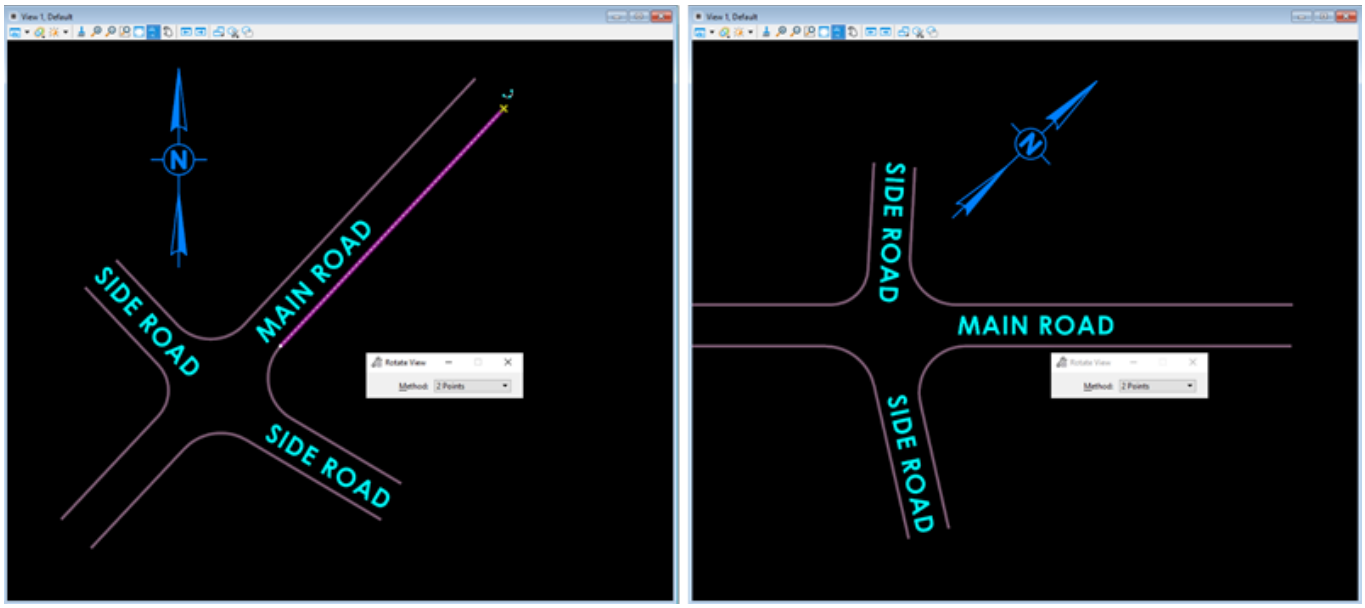


Figure 245

9. Select **Save Settings**.

7.3 Place Named Boundaries

7.3.1 By 2 Point Method

Place Named Boundary By 2 Points - used when only one sheet is needed with several details on the sheet.

1. Select the **CTDOT** workflow and on the **Annotate** tab locate the **Detailing** section and select the bottom right **Styles button**. In the Detailing Symbol Styles dialog right click on ***CV_Detail*** and select **Activate**.

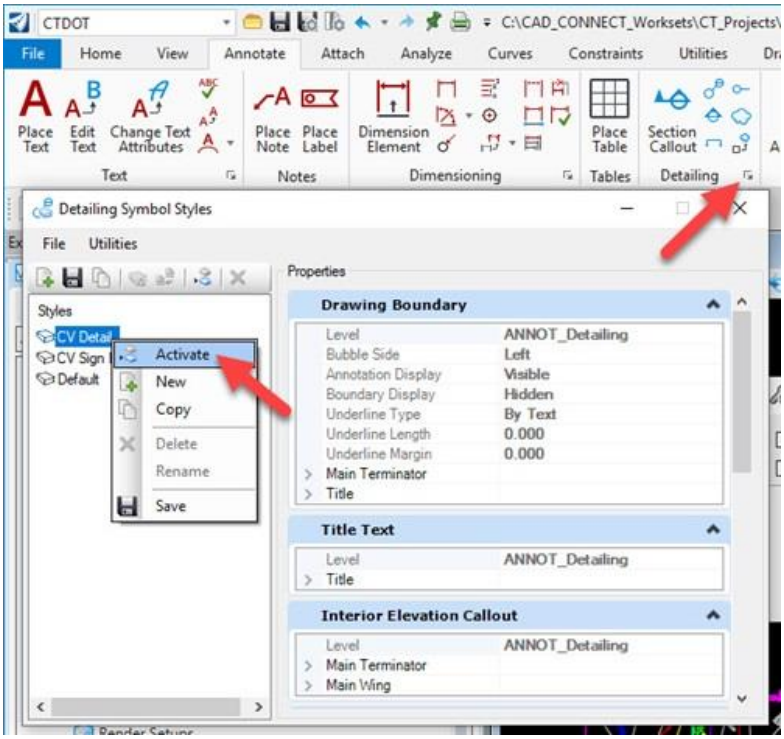


Figure 246

2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

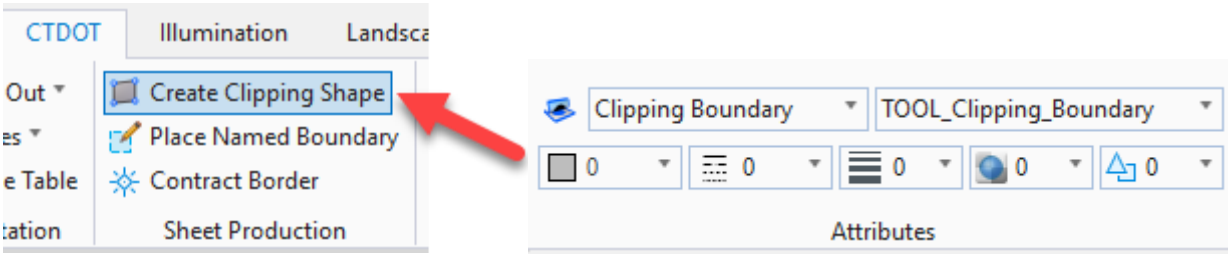


Figure 247

3. Select the **Place Named Boundary** tool and the Place Named Boundary Dialog box will appear.

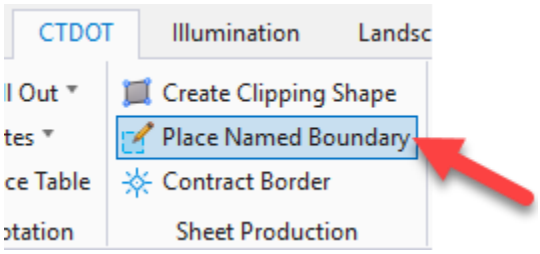


Figure 248

4. In the Place Named Boundary dialog box, set the following options in the tool's settings window:
   - Method (icon): ***By 2 Points***
   - *Name*: ***Illumination Plan***
   - *Mode (icon)*: ***Place Single Named Boundary***
   - *Create Drawing*: ***Enabled***

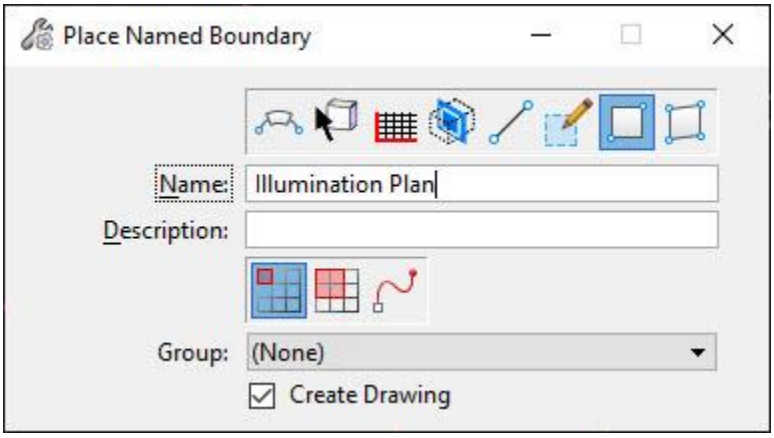


Figure 249

5. Follow the prompts to place a Named Boundary (Clipping Boundary) around the design. Data point first in the lower left and end in the upper right. This element can be edited later to refine the shape and add additional points.

6. After accepting the placement of the named boundary the Create Drawing dialog box will appear. Ensure the following options are set:

Top Section

- Name: ***Illumination Plan***
- Drawing Seed: ***40 Scale Contract Plan Sheet***

Drawing Model Section

- Create Drawing Model: ***Enabled***
- Annotation Scale: ***Full Size 1" = 40'***

Sheet Model Section

- Create Sheet Model: ***Enabled***
- Sheets: ***New***
- Annotation Scale: ***1" = 40'***
- Drawing Boundary: ***New***
- Detail Scale: ***1" = 40'***
- Add to Sheet Index: ***Disabled***
- Open Model: ***Enabled***

7. Click **OK**.

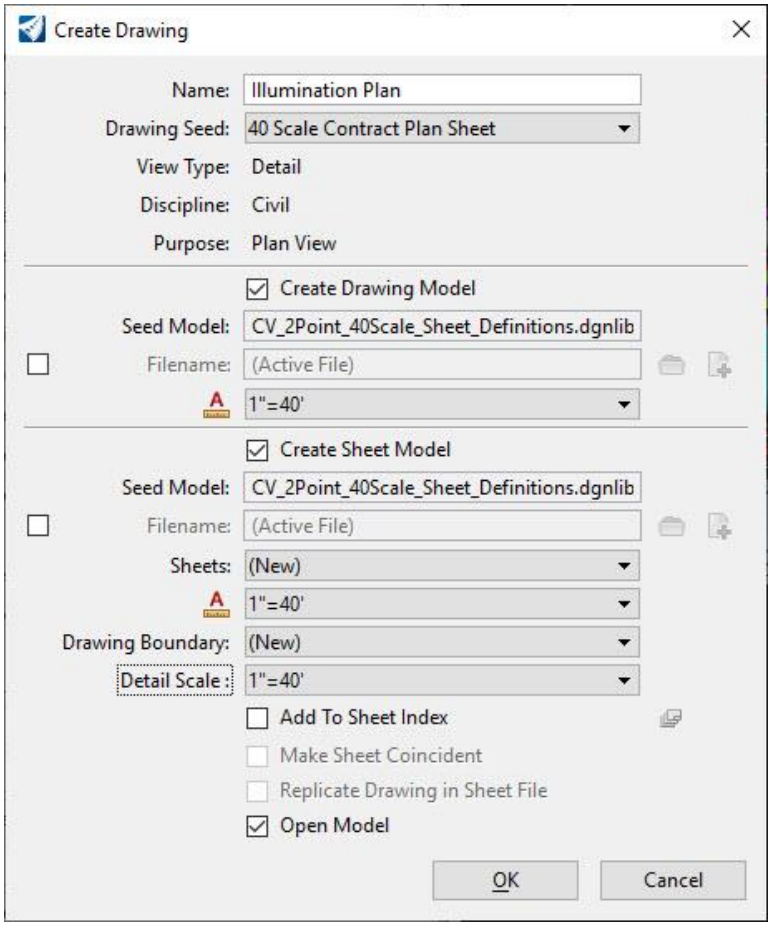


Figure 250

7.3.2 Civil Plan Method

Place Named Boundary Civil Plan - used when multiple sheets are needed along a corridor. To use this method a centerline needs to be present in one of the Design Models References.

1. Select the **Place Named Boundary** tool and the Place Named Boundary Dialog box will appear.

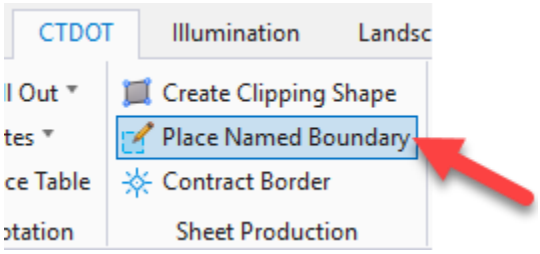


Figure 251

2. In the Place Named Boundary Civil Plan dialog box, ensure the following options are set in the tool's settings window:

- Method (icon): ***Civil Plan***
- Drawing Seed: ***40 Scale Contract Plan Sheet***
- Detail Scale: ***1" – 40'***
- Name: ***Plan 1***
- Group: ***New***
- Length: ***1000***
- Right Offset: ***-275***
- Left offset: ***275***
- Overlap: ***0***
- Boundary Cord: ***20***
- Create Drawing: ***Enabled***
- Show Dialog: ***Enabled***

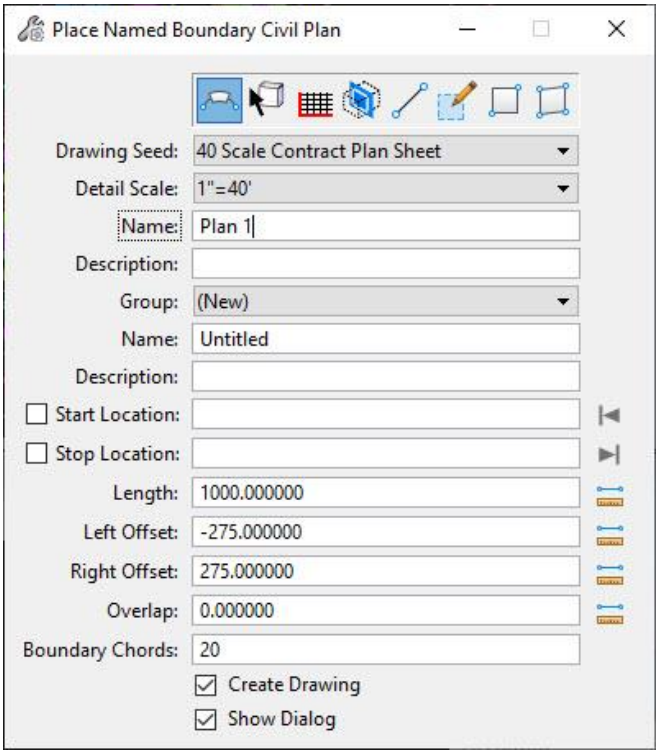


Figure 252

3. Follow the prompts to create a named boundary along the Centerline.
4. After accepting the placement of the named boundaries the Create Drawing dialog will appear. Ensure the following options are set:

   Drawing Model Section
   - Annotation Scale**:** ***Full Size 1" = 40'***

   Sheet Model Section
   - Sheets: ***New***
   - Annotation Scale: ***1" = 40'***
   - Detail Scale: ***1" = 40'***
   - Add to Sheet Index: ***Disabled***
   - Open Model**: Enabled**
5. Click **OK**. The Drawing Models and Sheet Models will be created.

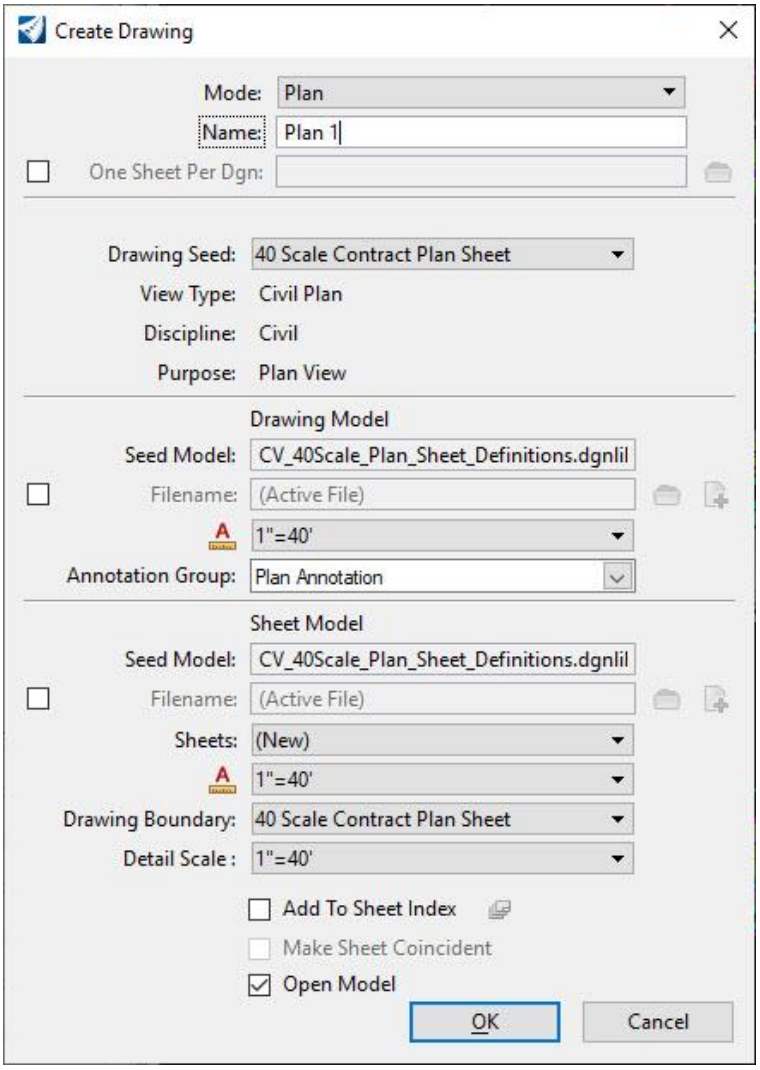


Figure 253

7.4 Edit the Title Block

1. The newly created sheet model will open with the Named Boundary referenced and centered onto the sheet. From the Ribbon open the **Models** dialog box.
2. View the **Properties** of the model. Notice the Sheet Model's Annotation Scale is ***Full Size 1 = 1***.
3. In the **Properties** dialog box edit or fill in the following fields:
   - *Description*: ***ILLUMINATION PLAN***
   - *Sheet Number*: ***IL-01***
4. Notice the **Drawing Title** and **Drawing Number** in the Title Block will be updated to match the Properties. The Project Number, Project Description and Town should match the WorkSet Properties.

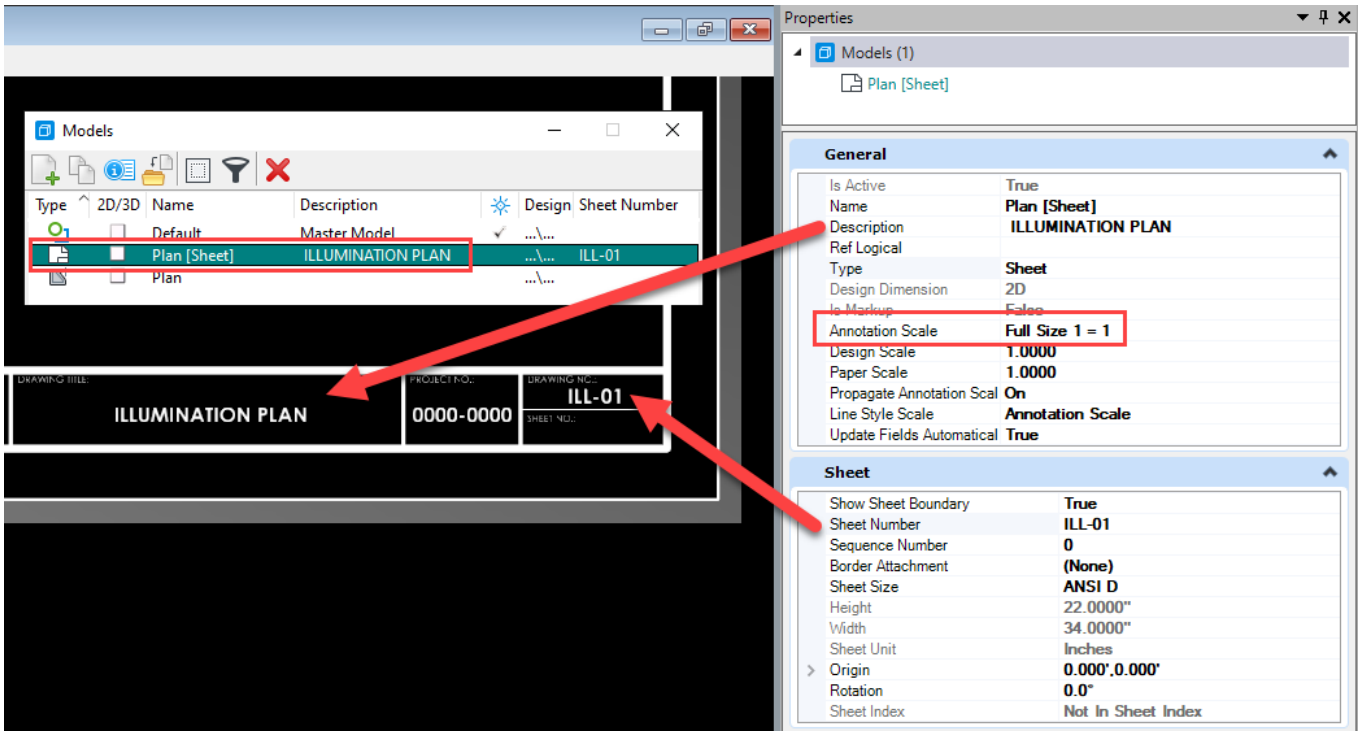


Figure 254

5. Select **Save Settings**.

7.5 Adjust the Named Boundary

1. On the Ribbon select **Home > Selection** and make the **Element Selection** tool active.
2. Select the Named Boundary shape and adjust by dragging the handles to the desired location.

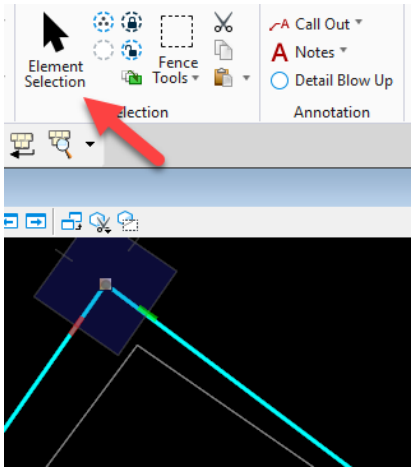


Figure 255

3. The **Insert Vertex** or **Delete Vertex** tools can also be used to edit the shape.

Figure 256

4. Return to the sheet model by hovering the cursor over the Marker and click the **Signal Sheet** and select the folder Icon (Open Target Tool). This action returns you back to the sheet model. Notice that by changing the boundary in the design model, this has propagated to the sheet.

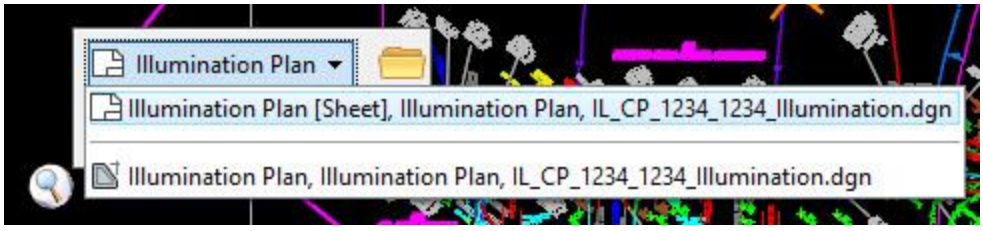


Figure 257

5. Models can also be opened using the **View Group** drop down tool located at the bottom left of the screen.

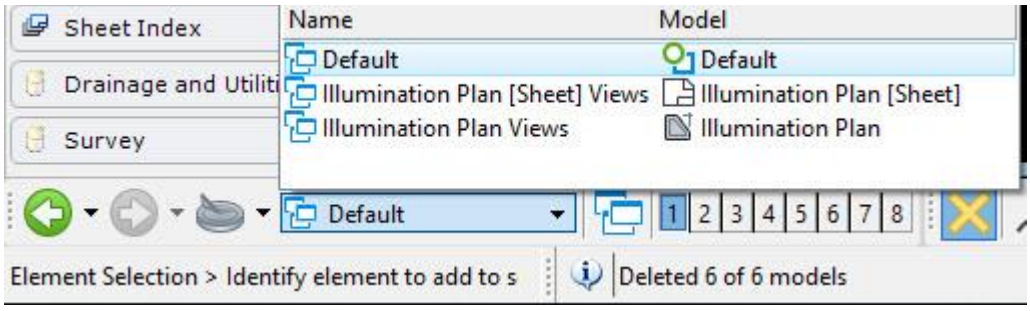


Figure 258

6. Select **Save Settings**.

7.6 Move the Name Boundary inside the Sheet Border

1. From the Ribbon click on the **Models** icon and select to open the ***Sheet Model***.
2. Select the **References** Icon, in the dialog box right click on the file, select **Move** to re-position the reference file within the border.
3. Follow the prompts to execute the move command.

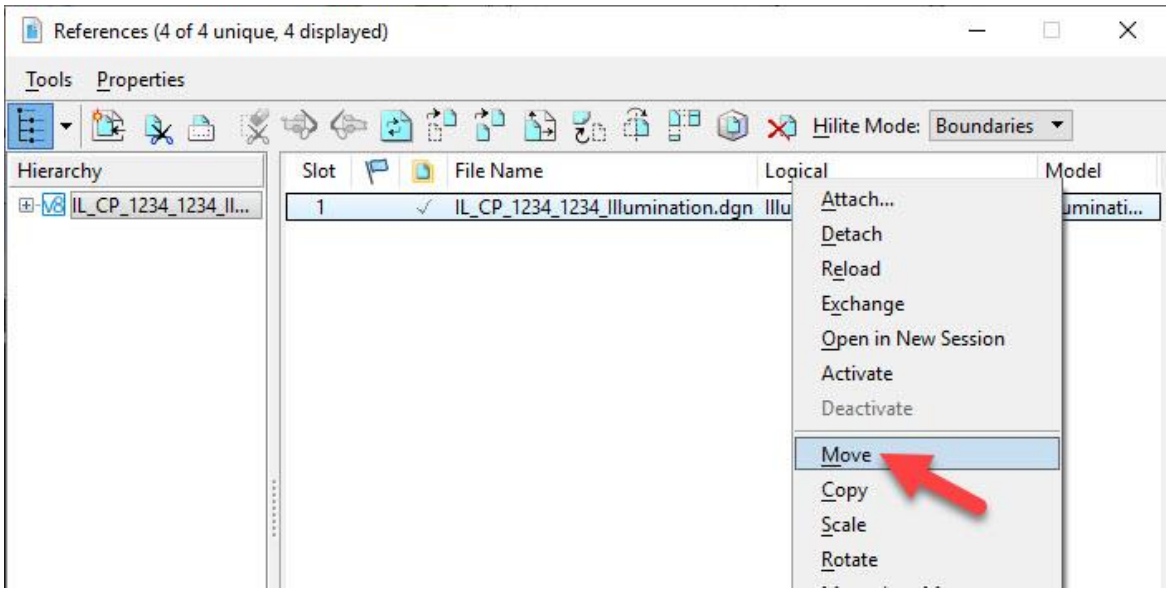
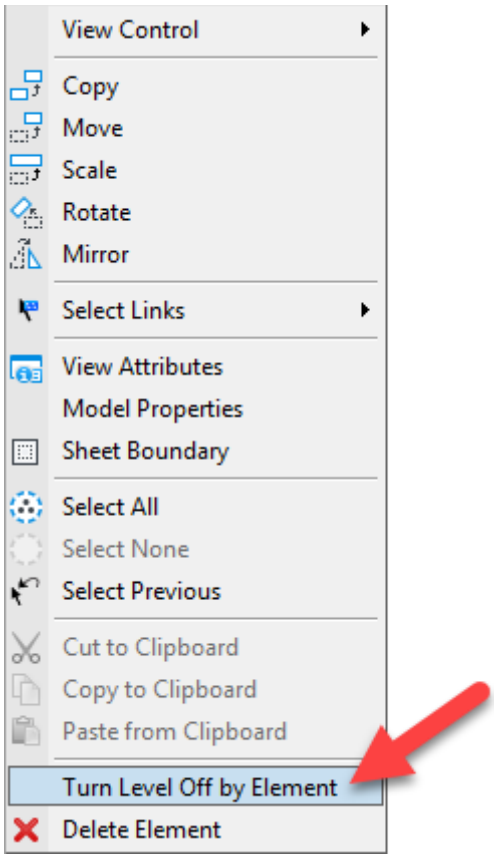


Figure 259

4. Select **Save Settings**.

7.7 Turn off Levels

1. Right-press and hold to bring up the contextual menu. From here, select **Turn Level Off by Element**.



2. Issue a Data Point on the Named Boundary, hence turning off the level. Data Point on other elements for levels you would like turned off.
3. Select **Save Settings**.

7.8 Create Match Marked Areas

If the design is too large for the sheet, Match Marks will be required, and additional Named Boundaries will need to be created. This will be used to include side roads that extend past the original clipping boundary or if the main line is slightly too long to fit within the original clipping boundary.

1. Go back into the Design model and place another Named Boundary adjacent to the original named boundary. This will be the Match Mark.

2. Select the **CTDOT** workflow and in the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

3. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear, set the following options:

- Method (icon): ***By 2 Points***
- Name: ***Match Mark 1***
- Mode (icon): ***Place Single Named Boundary***
- Create Drawing: ***Enabled***

4. Follow the prompts to create a named boundary of the around the additional area.

5. After accepting the placement of the named boundary the Create Drawing dialog will appear. Ensure the following options are set:

Top Section

- *Name*: ***Match Mark 1***
- *Drawing Seed*: ***40 Scale Contract Plan Sheet***

Drawing Model Section

- Create Drawing Model: ***Enabled***
- Annotation Scale: ***Full Size 1" = 40'***

Sheet Model Section

- Create Sheet Model: ***Enabled***
- Sheets: ***Illumination Plan [Sheet]***
- Drawing Boundary: ***New***
- Detail Scale: ***1" = 40'***
- Add to Sheet Index: ***Disabled***
- Open Model: ***Enabled***

6. The existing Sheet Model will open, move the reference to the desired location on the sheet.

7. Select **Save Settings**.

7.9 Create Blown Up Detail

This video demonstrates how to place a 20 Scale Detail on an existing 40 Scale Sheet.

Figure 260

7.10 Annotate the Drawing Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the Sheet Models.

1. Open a Drawing Model and use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Call Outs**.

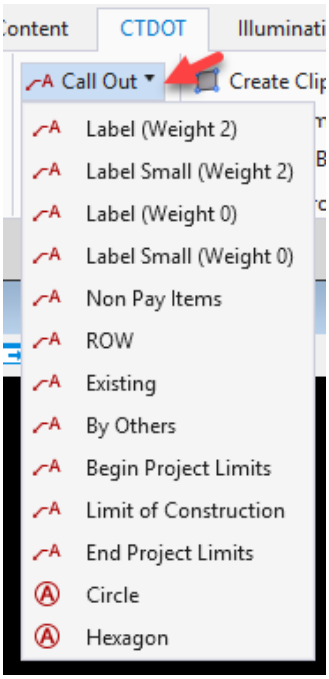


Figure 261

2. Match Marks are to be placed in the Drawing Model using the tools in the **Notes** pull down menu.

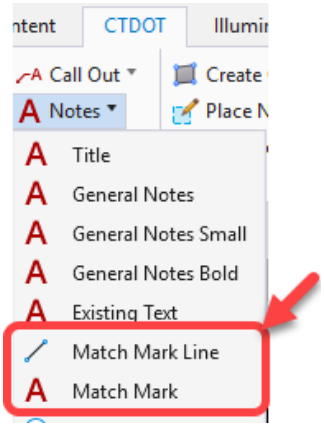


Figure 262

3. Place Dimensions in the Drawing Model. To place a Dimension, select either the **Vertical** or **Horizontal** Text Tool on the **CTDOT** ribbon, then select one of the desired **Dimensioning** tools. The Element Dimensioning dialog box will appear. Enable **Association** and follow the prompts to place the dimension.

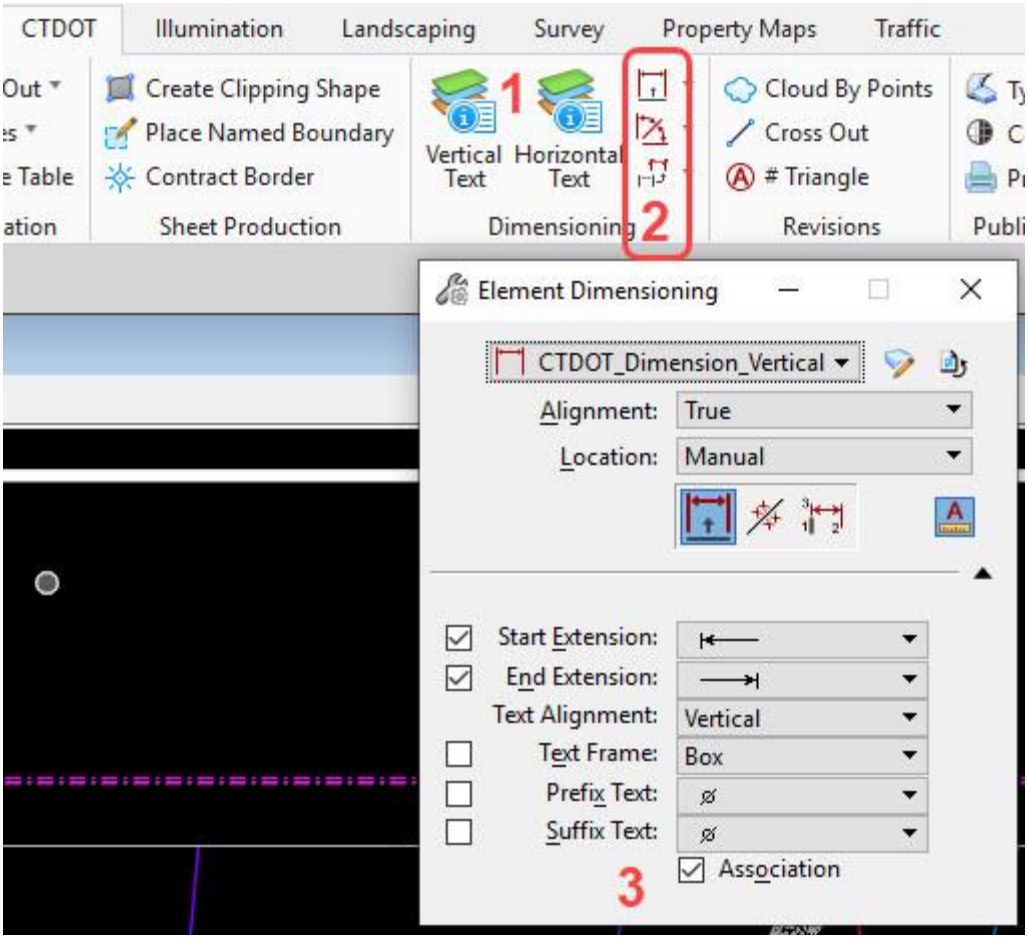


Figure 263

4. Light Standard Annotation.

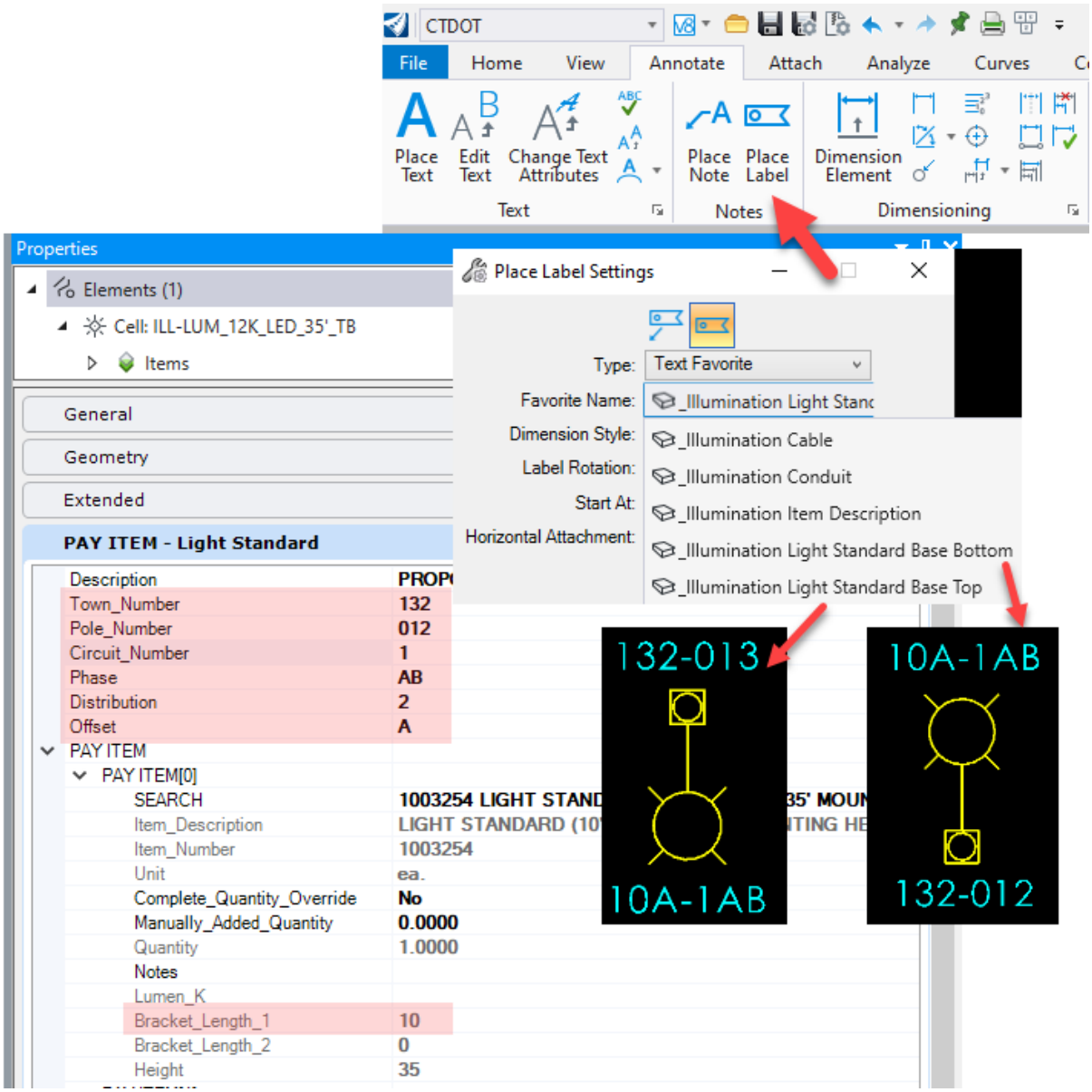
5. Custom labels have been created for annotating a Light Standard. This information is pulled from the Item Type fields. Select the **Annotation** Tab, in the **Notes** section select **Place Label**. On the Place Label Settings dialog box, select the second Icon **Place Label without a Leader**.

   Select:

   Type: ***Text Favorite***

   Favorite Name: ***_Illumination Light Standard Base Bottom*** or ***_Illumination Light Standard Base Top***

6. Select the Light Standard cell and follow the prompts to place the annotation. You may have to move the text to line up it up properly after placement.



7.11 Annotate the Sheet Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call-outs and Dimensions should be placed in the Drawing Models. Placing the Call-Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the sheet models.

1. Use the **Place Table** tool on the CT DOT Ribbon to place preconfigured Tables. Select the **General Notes** table and follow the prompts for placement.

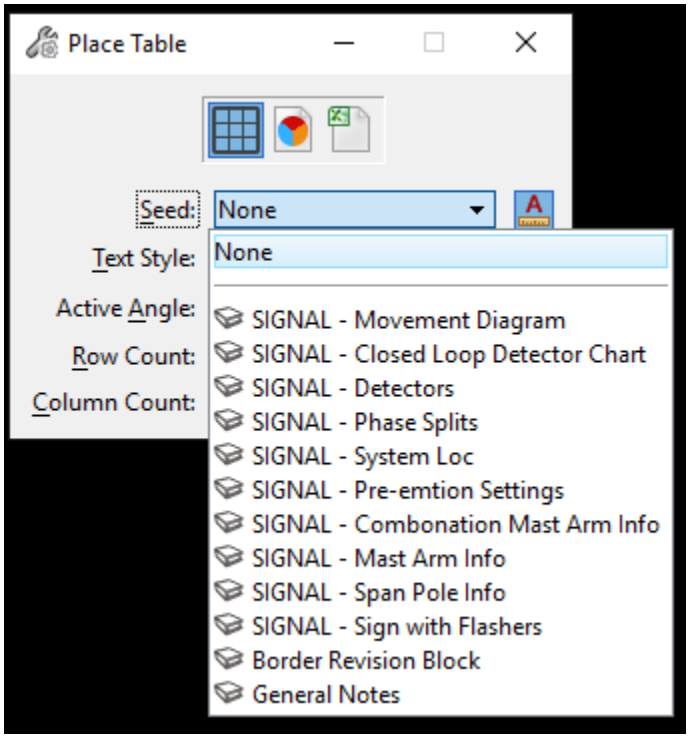


Figure 264

2. To add information to the table select the **Annotate** tab and choose **Edit Text**. Note: Avoid using the Element Selection tool to edit the table as this will lock up the file.

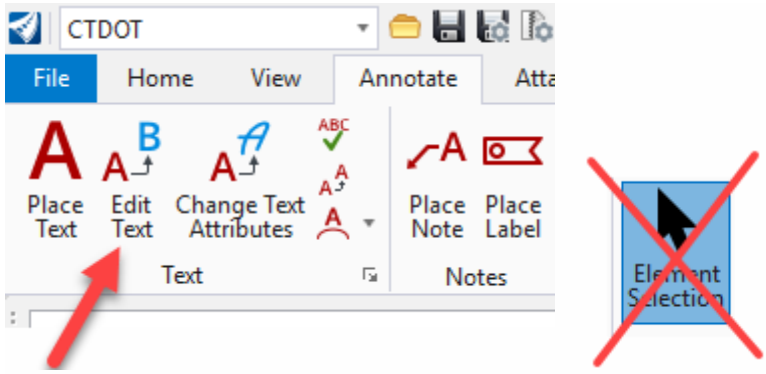


Figure 265

3. Use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Notes**.

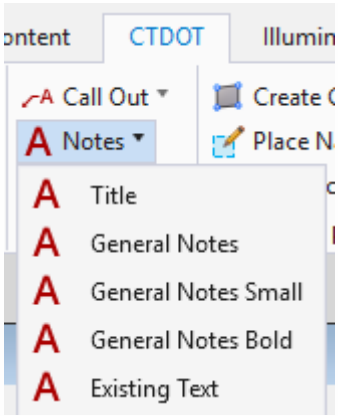


Figure 266

Section 8 – Landscape Sheets

8.1 Create New File

Before attempting to open or create DGN files users should make sure the following is in place:

1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**
4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenRoads through Accounting or the Customized Icon following
6. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.
7. Select the **New File** icon. In the New dialog box browse to the ***Landscape/Contract_Plans*** folder.
8. The Seed file should be set to ***Seed2D - CT RoadDesign.dgn***. If this is not the case, click on the **Browse** button. Browse to ***...CT_Configuration\|Organization\|Seed\|Road*** and select **Seed2D - CT RoadDesign.dgn**

   If the survey was done in an old Datum, use the 2D Seed Files in this folder ***...CT_Configuration\|Organization\|Seed\|GCS\|***
9. In the ***File name*** field enter a name for your file using the CTDOT file naming structure Example: ***LS_CP_1234_1234_Landscape.dgn***
10. Select **Save** and the new file will open.

8.2 Set up the Default Model

1. Select the **CTDOT** workflow and click on the **Attach** Tab, in the **References Section** click on **Attach Reference**.
2. Navigate to the Landscape ***Landscape\|Base_Models*** folder and reference the Master Base Model file. Choose the needed Model (most likely its "Default") and use **Live Nesting** at a **Nesting Depth of 2**.
3. Select the **Home** Tab, in the **Primary Section** select the **Attach Tool** drop down and choose **References**. This will open the References Dialog box.
4. Review the Attachments. If all the needed files did not propagate to reference with Live Nesting in the above step, you will need to reference the files directly. If there are no Existing Survey users can attach Raster Images or use a Background Map, these workflows can be found in Volume 2 – Module 2 - Attaching Imagery and LiDAR Data.
5. To reference the Survey navigate to the ***Active_Survey*** folder and reference the Survey *.dgn file. **Note:** Older DGN Files will need to be referenced in with certain settings to get them to line up in the correct Geospatial location.
6. For older reference files turn **True Scale** off and set the Scale to ***1:1***. **Note:** Always do a check by clicking on the Survey's Northing and Easting Grid Marks to compare the files read out. If they do not match you did not properly align the file Geospatially.
7. Select **Level Display** and turn off the desired levels.
8. Rotate the view so that the main road is parallel to the screen. On the **View Window** select the **Rotate View** tool. Use the **2 Points** Method. Follow the prompts to rotate the view.

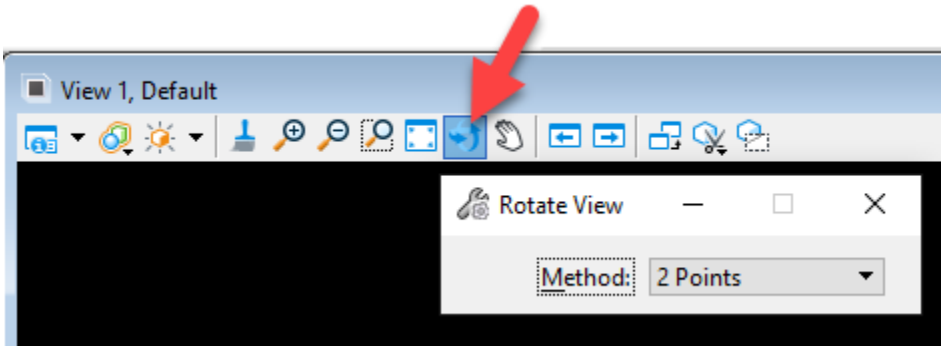


Figure 267

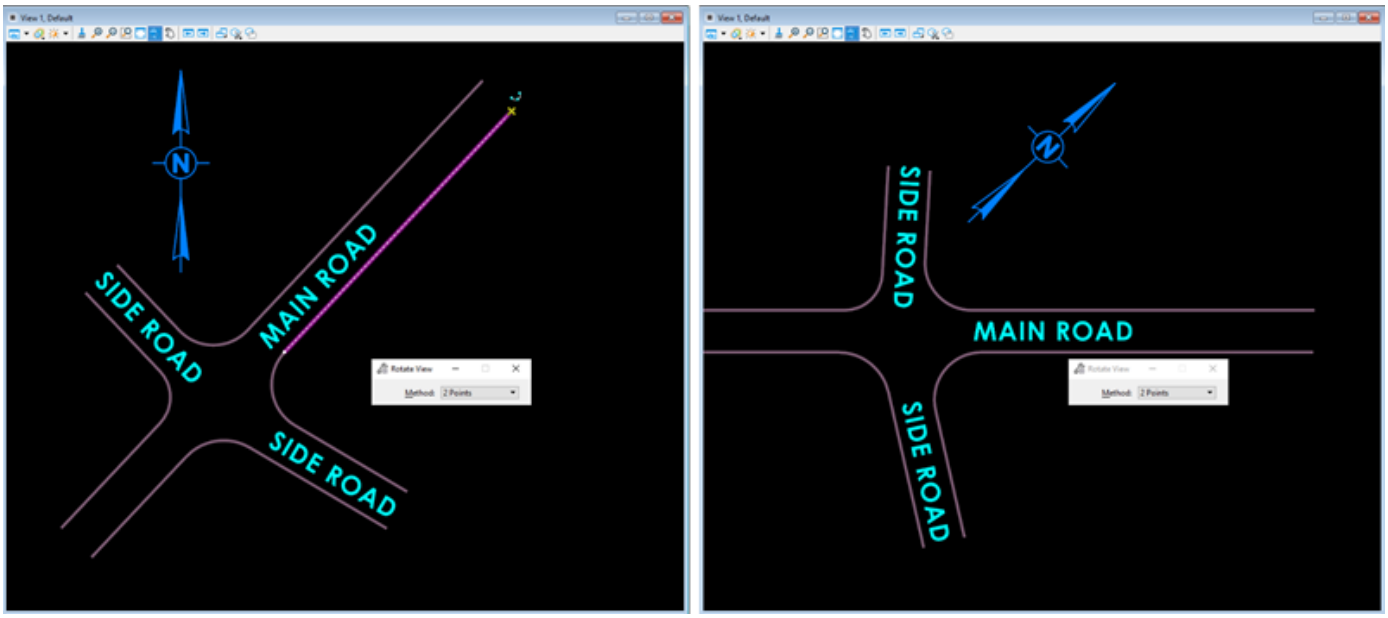


Figure 268

9. Select **Save Settings**.

8.3 Place Named Boundaries

8.3.1 By 2 Point Method

Place Named Boundary By 2 Points - used when only one sheet is needed with several details on the sheet.

1. Select the **CTDOT** workflow and on the **Annotate** tab locate the **Detailing** section and select the bottom right **Styles button**. In the Detailing Symbol Styles dialog right click on ***CV_Detail*** and select **Activate**.

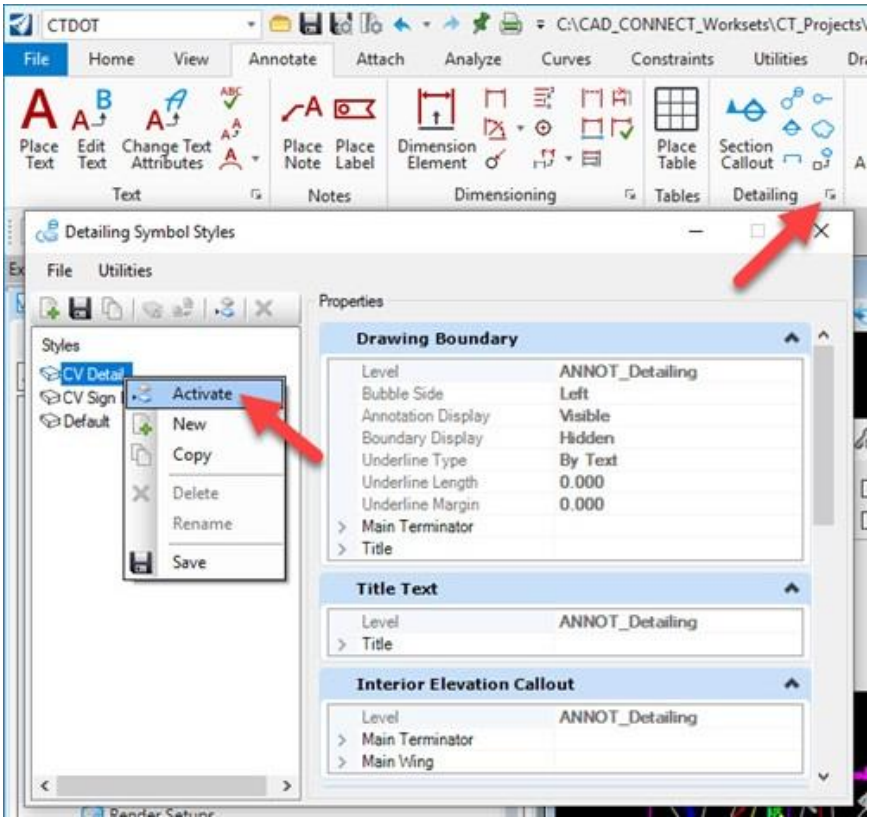


Figure 269

2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

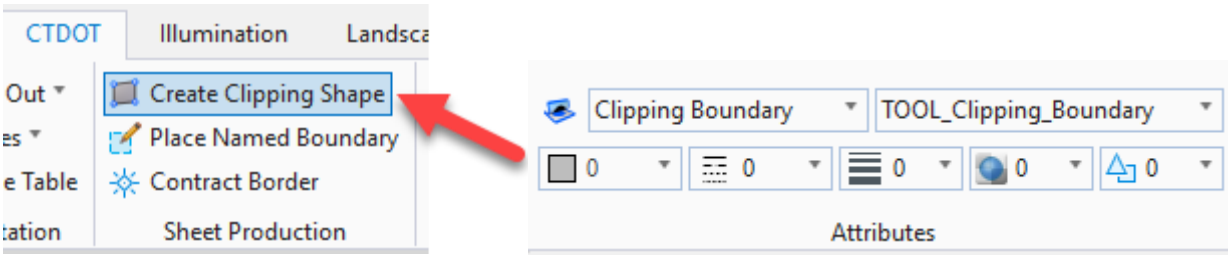


Figure 270

3. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear.

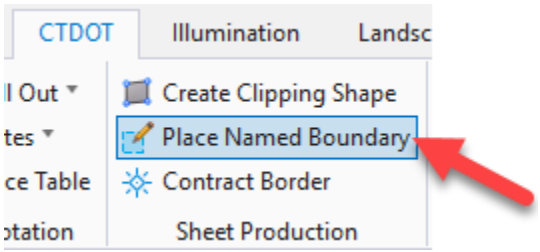


Figure 271

4. In the Place Named Boundary dialog box, set the following options in the tool's settings window:

- Method (icon): **By 2 Points**
- *Name*: **Landscape Plan**
- *Mode (icon)*: **Place Single Named Boundary**
- *Create Drawing*: **Enabled**

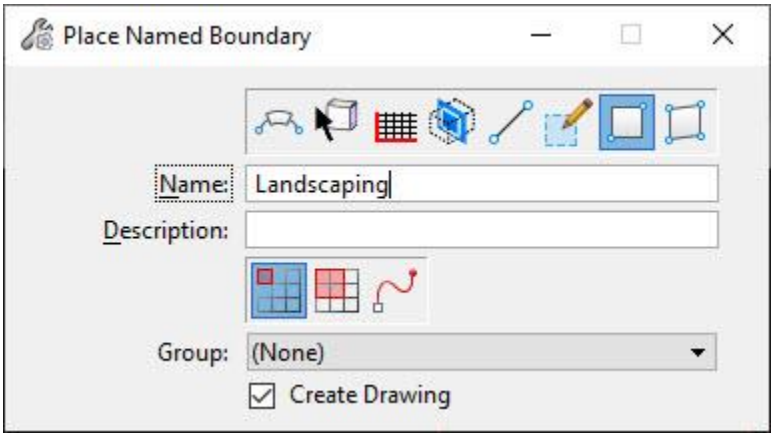


Figure 272

5. Follow the prompts to place a Named Boundary (Clipping Boundary) around the design. Data point first in the lower left and ending in the upper right. This element can be edited later to refine the shape and add additional points.
6. After accepting the placement of the named boundary the Create Drawing dialog box will appear. Ensure the following options are set:

Top Section

- Name: ***Landscape Plan***
- Drawing Seed: ***40 Scale Contract Plan Sheet***

Drawing Model Section

- Create Drawing Model: ***Enabled***
- Annotation Scale: ***Full Size 1" = 40'***

Sheet Model Section

- Create Sheet Model: ***Enabled***
- Sheets: ***New***
- Annotation Scale: ***1" = 40'***
- Drawing Boundary: ***New***
- Detail Scale: ***1" = 40'***
- Add to Sheet Index: ***Disabled***
- Open Model: ***Enabled***

7. Click **OK**.

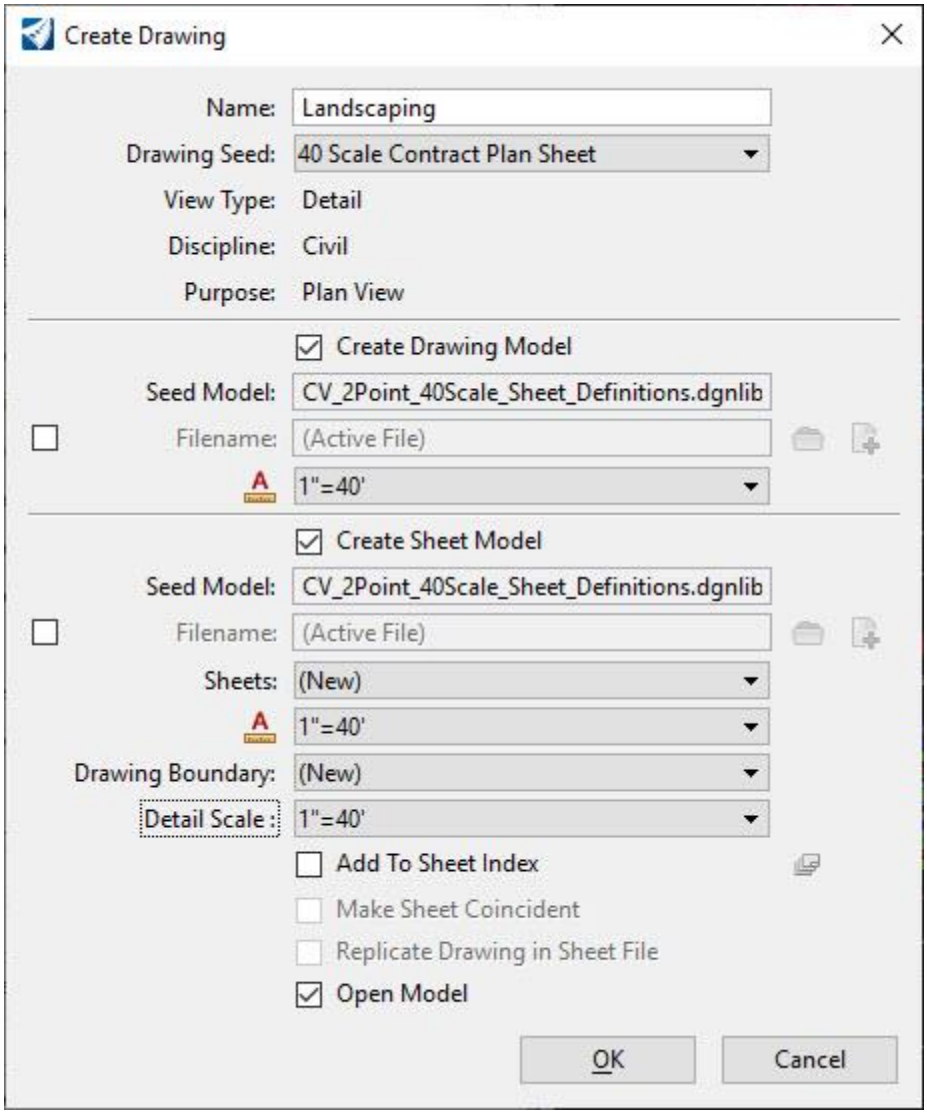


Figure 273

8.3.2 Civil Plan Method

Place Named Boundary Civil Plan - used when multiple sheets are needed along a corridor. To use this method a centerline needs to be present in one of the Design Models References.

1. Select the **Place Named Boundary** tool and the Place Named Boundary Dialog box will appear.

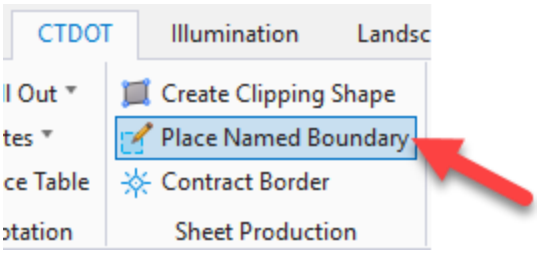


Figure 274

2. In the Place Named Boundary Civil Plan dialog box, ensure the following options are set in the tool's settings window:

Method (icon): ***Civil Plan***
Drawing Seed: ***40 Scale Contract Plan Sheet***
Detail Scale: ***1" - 40'***
Name: ***Plan 1***
Group: ***New***
Length: ***1000***
Right Offset: ***-275***
Left offset: ***275***
Overlap: ***0***
Boundary Cord: ***20***
Create Drawing: ***Enabled***
Show Dialog: ***Enabled***

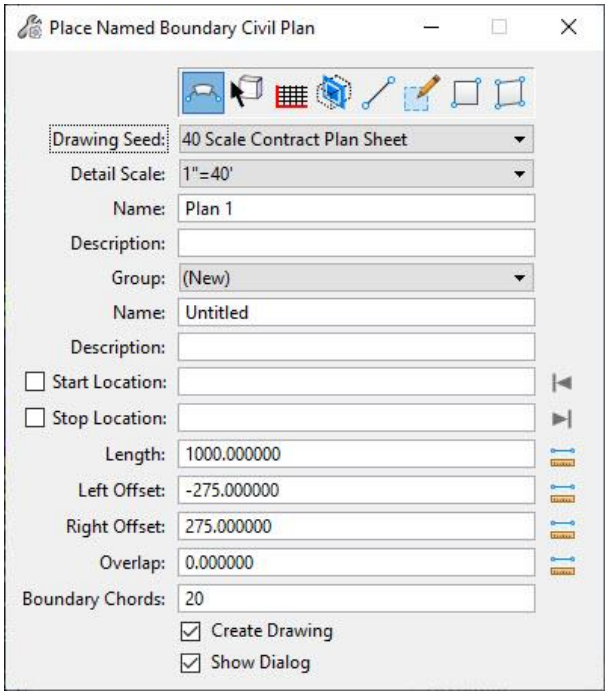


Figure 275

3. Follow the prompts to create a named boundary along the Centerline.
4. After accepting the placement of the named boundaries the Create Drawing dialog will appear. Ensure the following options are set:

   Drawing Model Section
   - Annotation Scale: **Full Size 1" = 40'**

   Sheet Model Section
   - Sheets: **New**
   - Annotation Scale: **1" = 40"**
   - Detail Scale**:** **1" = 40'**
   - Add to Sheet Index: **Disabled**
   - Open Model: **Enabled**
5. Click **OK**. The Drawing Models and Sheet Models will be created.

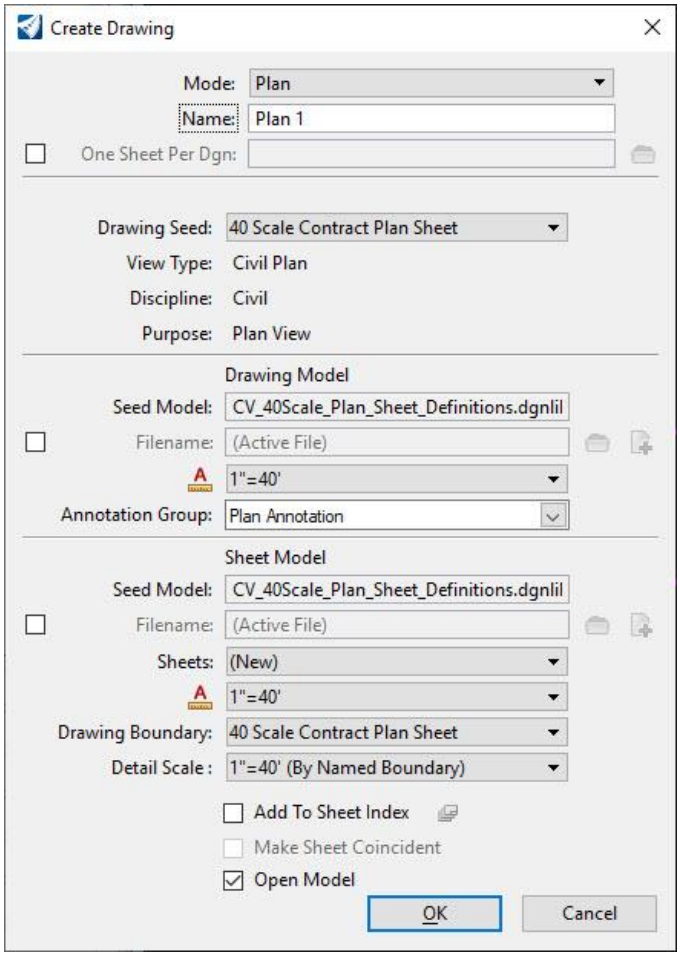


Figure 276

8.4 Edit the Title Block

1. The newly created sheet model will open with the Named Boundary referenced and centered onto the sheet. From the Ribbon open the **Models** dialog box.
2. View the **Properties** of the model. Notice the Sheet Model's Annotation Scale is ***Full Size 1 = 1***.
3. In the **Properties** dialog box edit or fill in the following fields:
   - *Description*: ***LANDSCAPE PLAN***
   - *Sheet Number*: ***LSD-01***
4. Notice the **Drawing Title** and **Drawing Number** in the Title Block will be updated to match the Properties. The Project Number, Project Description and Town should match the WorkSet Properties.

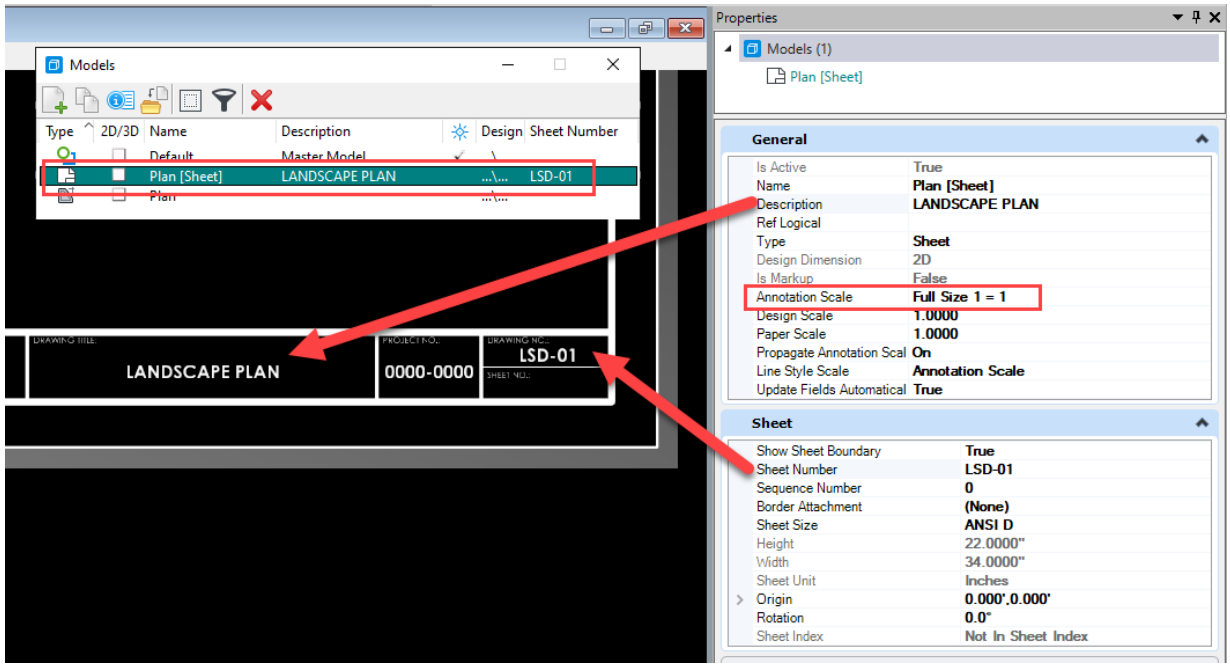
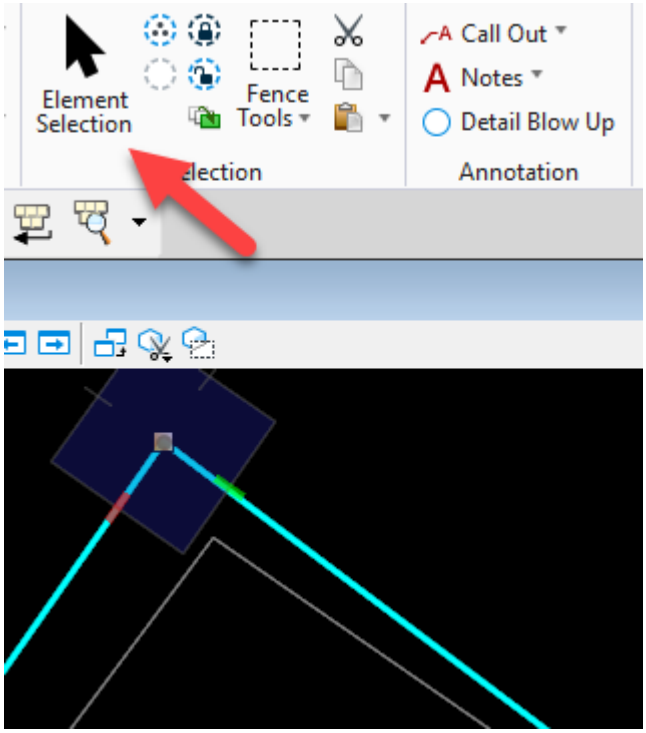


Figure 277

5. Select **Save Settings**.

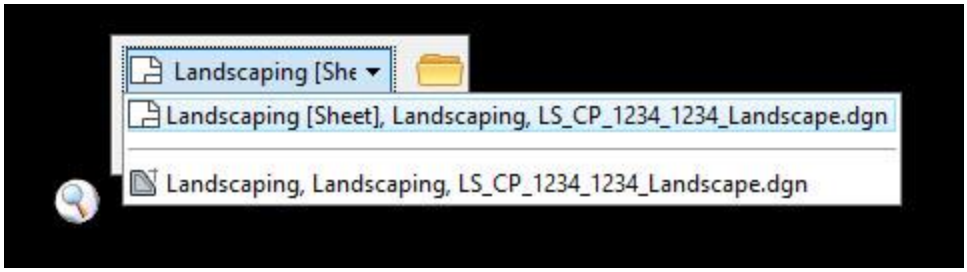
8.5 Adjust the Named Boundary

1. On the Ribbon select **Home > Selection** and make the **Element Selection** tool active.
2. Select the Named Boundary shape and adjust by dragging the handles to the desired location.

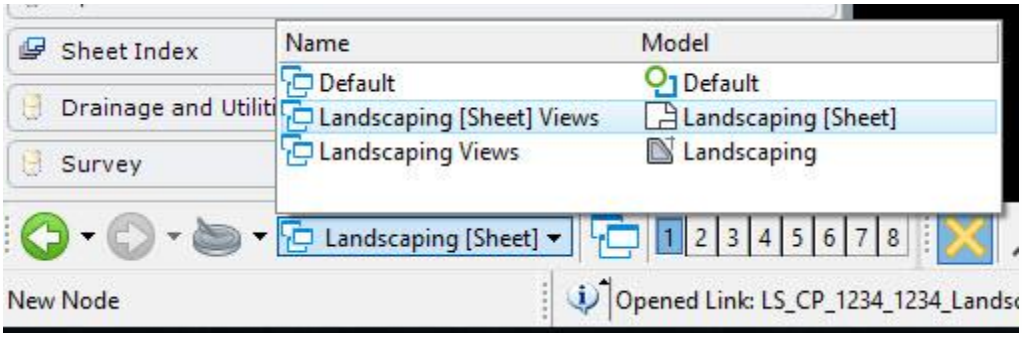


3. The **Insert Vertex** or **Delete Vertex** tools can also be used to edit the shape.

4. Return to the sheet model by hovering the cursor over the Marker and click the **Signal Sheet** and select the folder Icon (Open Target Tool). This action returns you back to the sheet model. Notice that by changing the boundary in the design model, this has propagated to the sheet.



5. Models can also be opened using the **View Group** drop down tool located at the bottom left of the screen.



6. Select **Save Settings**.

8.6 Move the Name Boundary inside the Sheet Border

1. From the Ribbon click on the **Models** icon and select to open the ***Sheet Model***.
2. Select the **References** Icon, in the dialog box right click on the file, select **Move** to re-position the reference file within the border.
3. Follow the prompts to execute the move command.

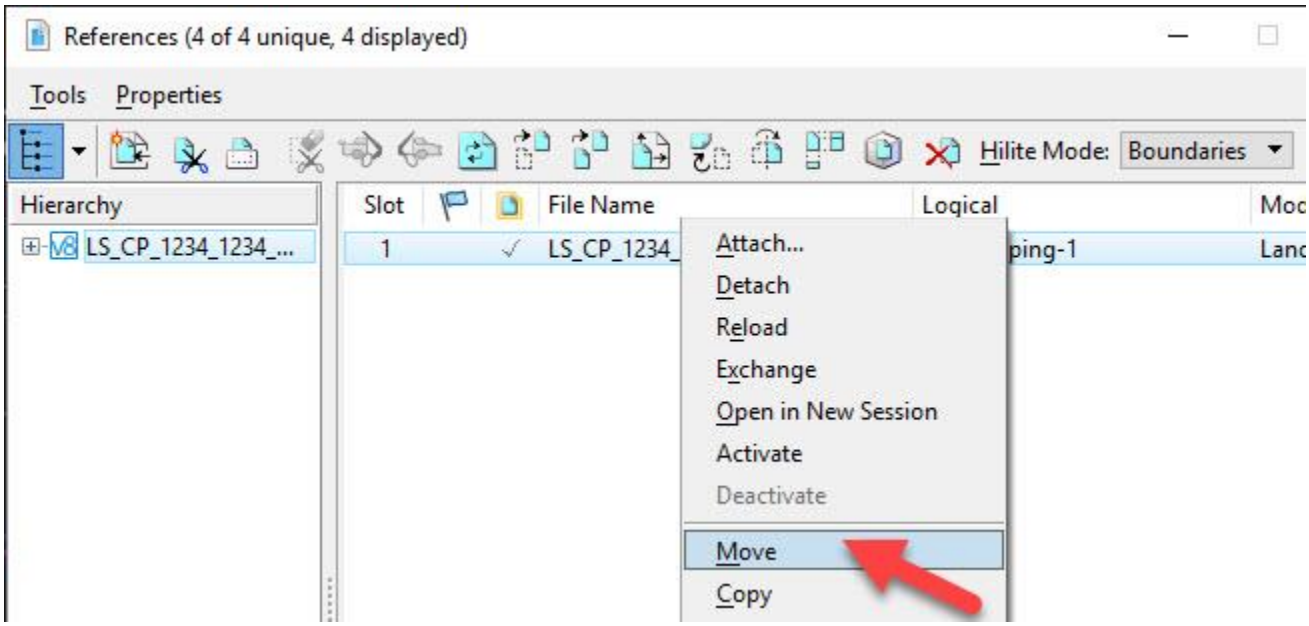
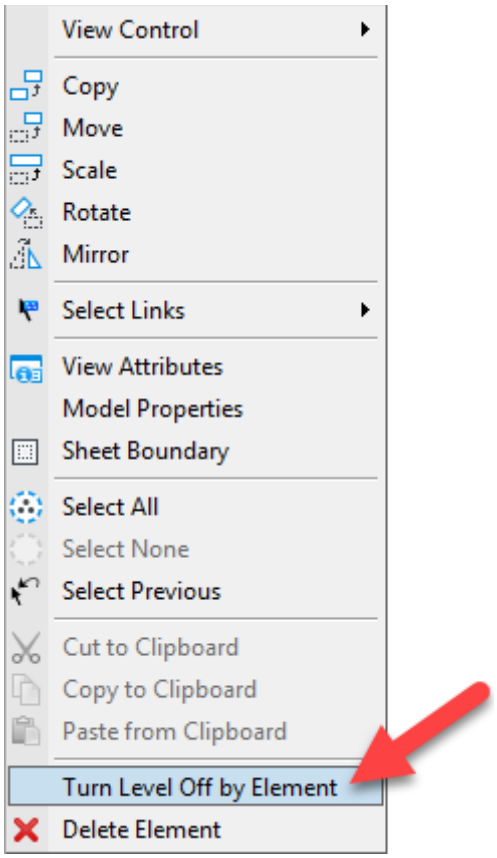


Figure 278

4. Select **Save Settings**.

8.7 Turn off Levels

1. Right-press and hold to bring up the contextual menu. From here, select **Turn Level Off by Element**.



2. Issue a Data Point on the Named Boundary, hence turning off the level. Data Point on other elements for levels you would like turned off.
3. Select **Save Settings**.

8.8 Create Match Marked Areas

If the design is too large for the sheet, Match Marks will be required, and additional Named Boundaries will need to be created. This will be used to include side roads that extend past the original clipping boundary or if the main line is slightly too long to fit within the original clipping boundary.

1. Go back into the Design model and place another Named Boundary adjacent to the original named boundary. This will be the Match Mark.

2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

3. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear, set the following options:

- Method (icon): ***By 2 Points***
- Name: ***Match Mark 1***
- Mode (icon): ***Place Single Named Boundary***
- Create Drawing: ***Enabled***

4. Follow the prompts to create a named boundary of the around the additional area.

5. After accepting the placement of the named boundary the Create Drawing dialog will appear. Ensure the following options are set:

Top Section

- *Name*: Match ***Mark 1***
- *Drawing Seed*: ***40 Scale Contract Plan Sheet***

Drawing Model Section

- Create Drawing Model: ***Enabled***
- Annotation Scale: ***Full Size 1" = 40'***

Sheet Model Section

- Create Sheet Model: ***Enabled***
- Sheets: ***Illumination Plan [Sheet]***
- Drawing Boundary: ***New***
- Detail Scale: ***1" = 40'***
- Add to Sheet Index: ***Disabled***
- Open Model: **Enabled**

6. The existing Sheet Model will open, move the reference to the desired location on the sheet.

7. Select **Save Settings**.

8.9 Create Blown Up Detail

This video demonstrates how to place a 20 Scale Detail on an existing 40 Scale Sheet.

Figure 279

8.10 Annotate the Drawing Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the Sheet Models.

1. Open a Drawing Model and use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Call Outs**.

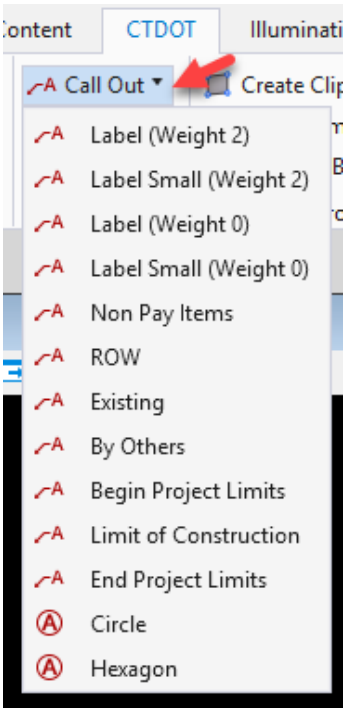


Figure 280

2. Match Marks are to be placed in the Drawing Model using the tools in the **Notes** pull down menu.

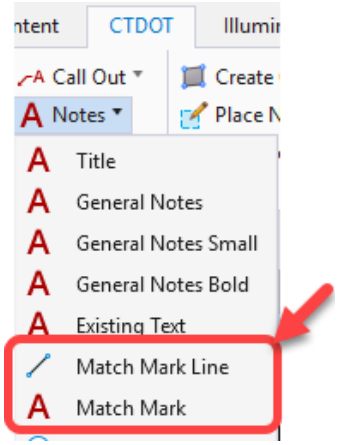


Figure 281

3. Place Dimensions in the Drawing Model. To place a Dimension, select either the **Vertical** or **Horizontal** Text Tool on the **CTDOT** ribbon, then select one of the desired **Dimensioning** tools. The Element Dimensioning dialog box will appear. Enable **Association** and follow the prompts to place the dimension.

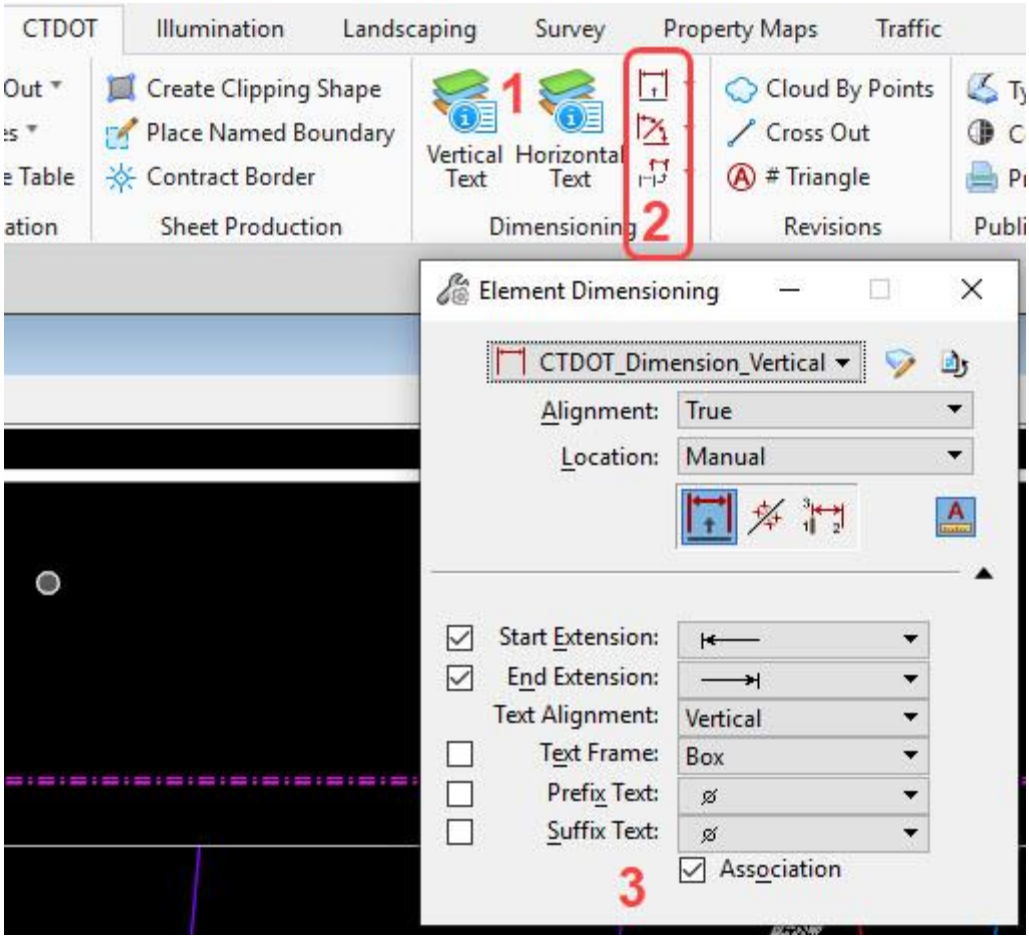


Figure 282

8.11 Item Annotation using fields

Coming Soon

8.12 Annotate the Sheet Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the sheet models.

1. Use the **Place Table** tool on the CT DOT Ribbon to place preconfigured Tables. Select the **General Notes** table and follow the prompts for placement.

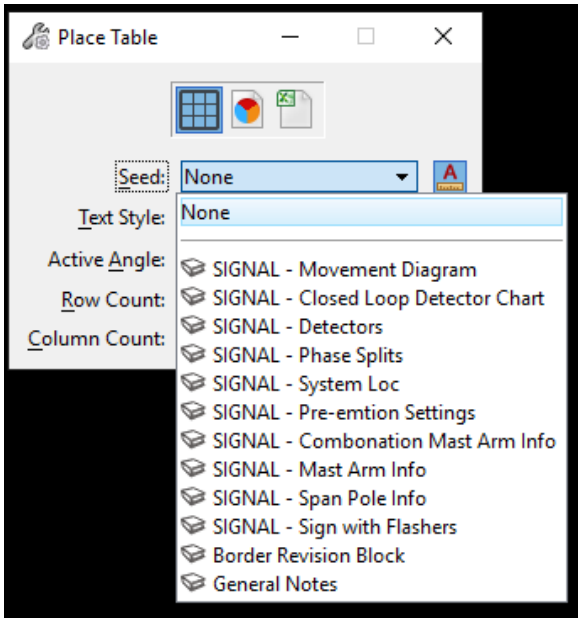


Figure 283

2. To add information to the table select the **Annotate** tab and choose **Edit Text**. Note: Avoid using the Element Selection tool to edit the table as this will lock up the file.

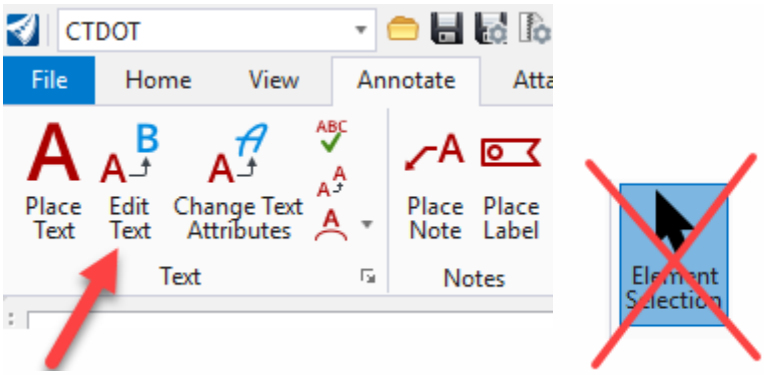


Figure 284

3. Use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Notes**.

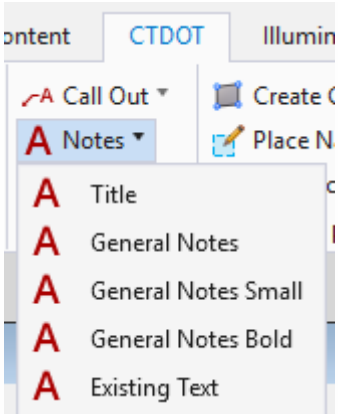


Figure 285

8.13 Adding Planting Key

Coming soon

Section 9 – Site Design Sheets

9.1 Create New File

Before attempting to open or create DGN files users should make sure the following is in place:

1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**
4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ^ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenRoads through Accounting or the Customized Icon following
6. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.
7. Select the **New File** icon. In the New dialog box browse to the ***F_Civil|Contract_Plans*** folder.
8. The Seed file should be set to ***Seed2D - CT RoadDesign.dgn***. If this is not the case, click on the **Browse** button. Browse to ***...CT_Configuration|Organization|Seed|Road*** and select **Seed2D - CT RoadDesign.dgn**

   If the survey was done in an old Datum, use the 2D Seed Files in this folder ***...CT_Configuration|Organization|Seed|GCS|***
9. In the ***File name*** field enter a name for your file using the CTDOT file naming structure. Example: ***FC_CP_1234_1234_Site.dgn***
10. Select **Save** and the new file will open.
11. If it has been determined the provided survey is in NAD 27/NAVD 29 you will need to re-project your design file's Geospatial Header, follow Volume 2 – Module 1 - Working with Geographic Coordinate Systems to complete this task.

9.2 Set up the Default Model

1. Select the **CTDOT** workflow and click on the **Attach** tab, in the **References Section** click on **Attach Reference**.
2. Navigate to the Landscape ***F_Civil\Base_Models*** folder and reference the Master Base Model file. Choose the needed Model (most likely its "Default") and use **Live Nesting** at a **Nesting Depth of 2**.
3. Select the **Home** Tab, in the **Primary Section** select the **Attach Tool** drop down and choose **References**. This will open the References dialog box.
4. Review the Attachments. If all the needed files did not propagate to reference with Live Nesting in the above step, you will need to reference the files directly. If there are no Existing Survey users can attach Raster Images or use a Background Map, these workflows can be found in Volume 2 – Module 2 - Attaching Imagery and LiDAR Data.
5. To reference the Survey navigate to the ***Active_Survey*** folder and reference the Survey *.dgn file. **Note:** Older DGN Files will need to be referenced in with certain settings to get them to line up in the correct Geospatial location.
6. For older reference files turn **True Scale** off and set the Scale to ***1:1***. **Note:** Always do a check by clicking on the Survey's Northing and Easting Grid Marks to compare the files read out. If they do not match you did not properly align the file Geospatially.
7. Select **Level Display** and turn off the desired levels.
8. Rotate the view if desired. On the **View Window** select the **Rotate View** tool. Use the **2 Points** Method. Follow the prompts to rotate the view.

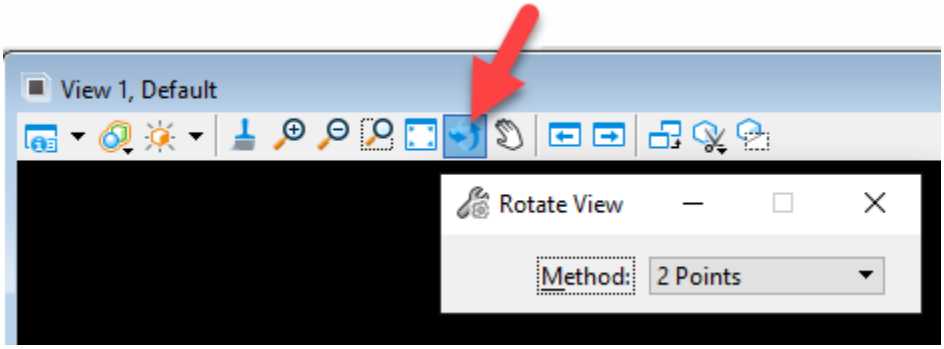


Figure 286

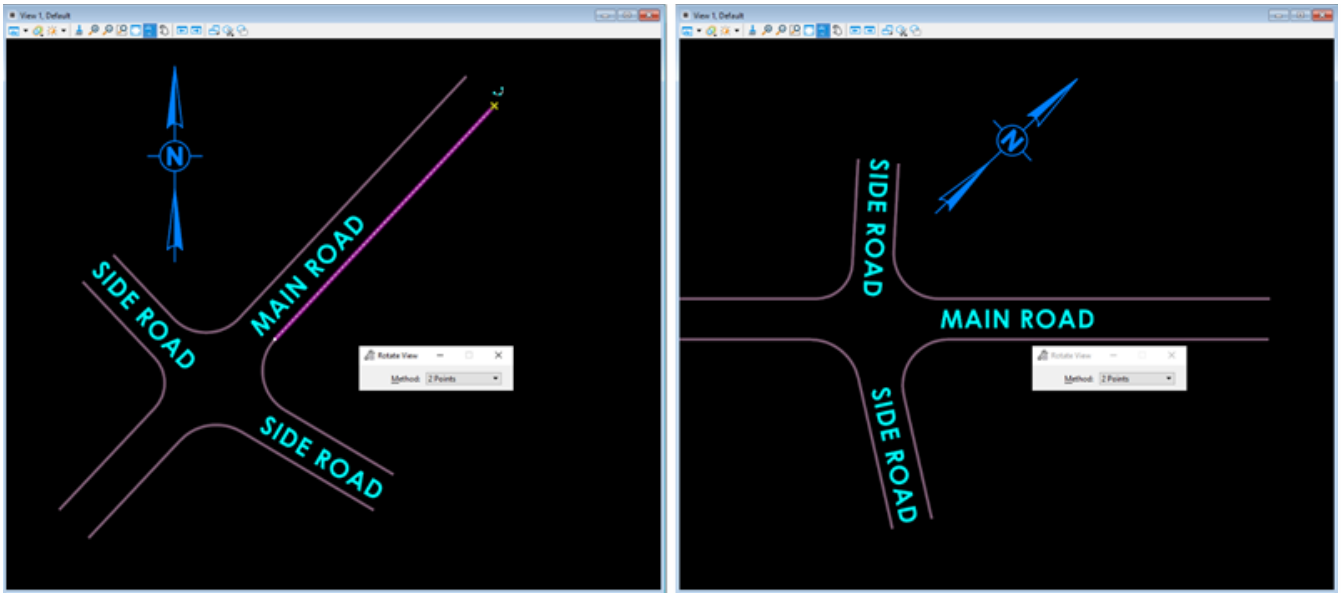


Figure 287

9. Select **Save Settings**.

9.3 Create the Drawing and Sheet Models

1. Select **Level Display** and turn off the desired levels.
2. Select the **CTDOT** workflow and on the **Annotate** tab locate the **Detailing** section and select the bottom right **Styles button**. In the Detailing Symbol Styles dialog right click on ***CV_Detail*** and select **Activate**.

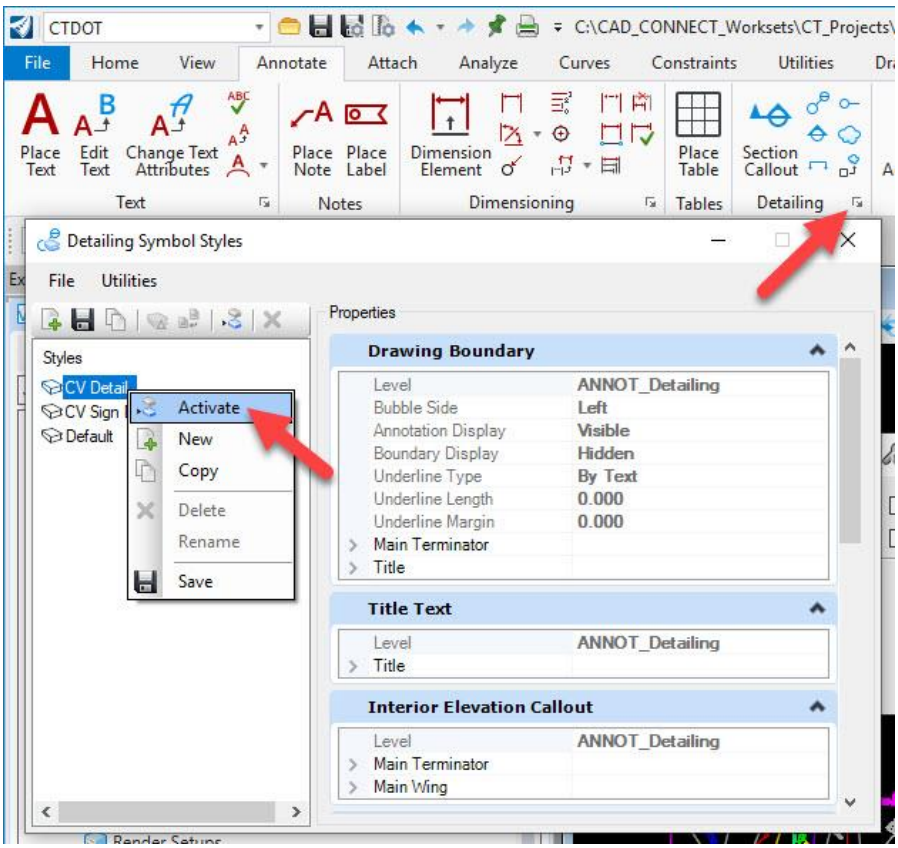


Figure 288

3. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

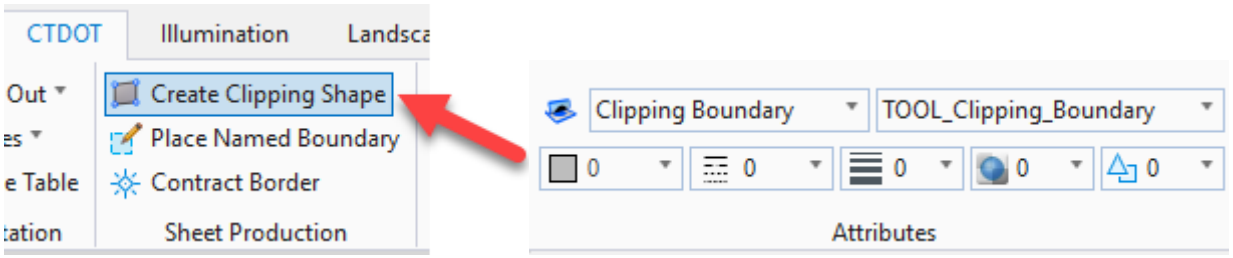


Figure 289

4. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear.

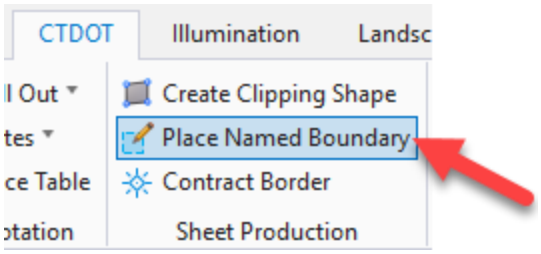


Figure 290

5. In the Place Named Boundary dialog box, set the following options in the tool's settings window:
   - Method (icon): ***By 2 Points***
   - *Name*: ***Demolition Site Plan***
   - *Mode (icon)*: ***Place Single Named Boundary***
   - *Create Drawing*: ***Enabled***

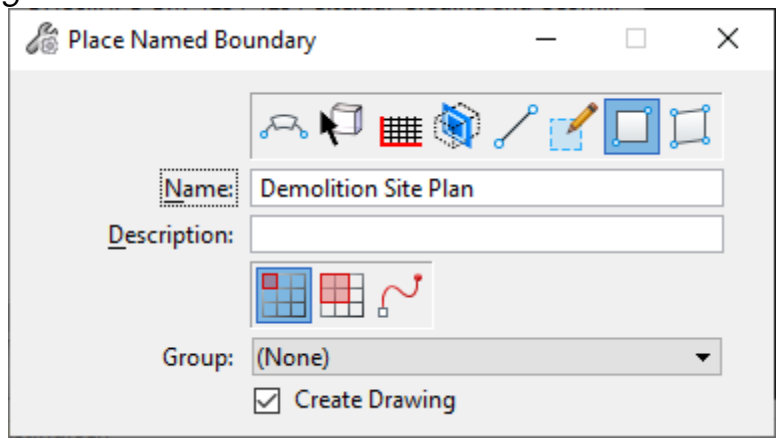


Figure 291

6. Follow the prompts to place a Named Boundary (Clipping Boundary) around the design. Data point first in the lower left and ending in the upper right. This element can be edited later to refine the shape and add additional points.

7. After accepting the placement of the named boundary the Create Drawing dialog box will appear. Ensure the following options are set:

   Top Section
   - *Name*: ***Demolition Site Plan***
   - *Drawing Seed*: **Misc Plan**

   Drawing Model Section
   - *Create Drawing Model*: ***Enabled***
   - *Annotation Scale*: ***Full Size 1" = ??' (Match Detail Scale below)***

Sheet Model Section

- *Create Sheet Model*: ***Enabled***
- *Sheets*: ***New***
- *Annotation Scale*: ***1 = 1***
- *Drawing Boundary*: **New**
- *Detail Scale*: ***1" = ??' (Fit View to Sheet Boundary)***
- *Add to Sheet Index*: **Disabled**
- *Open Model*: ***Enabled***

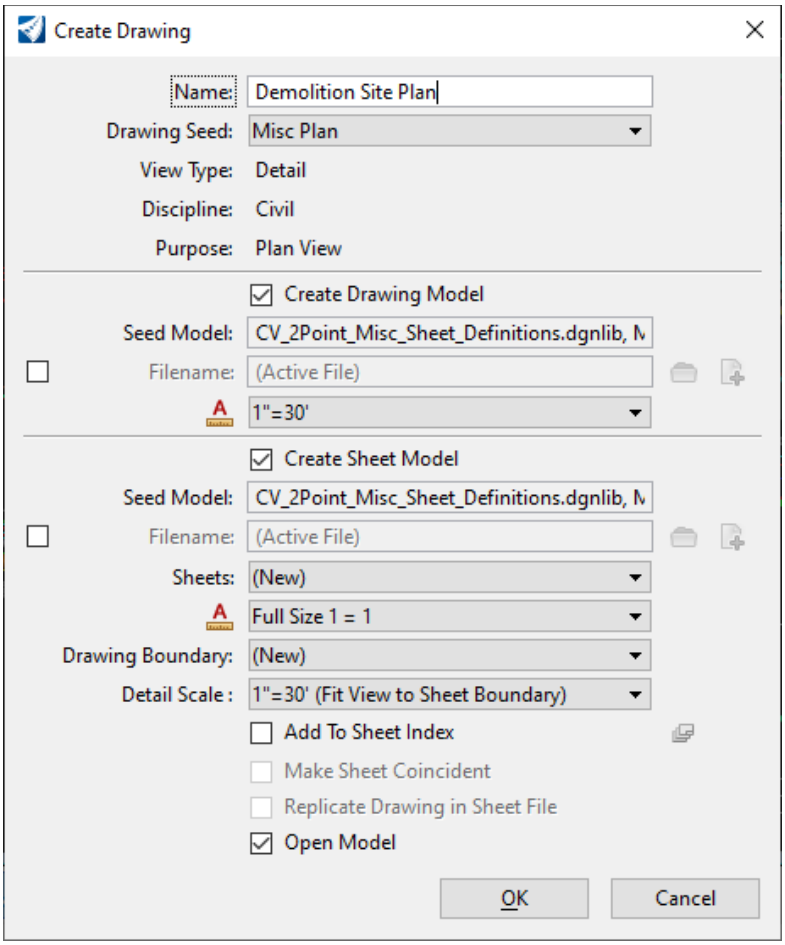


Figure 292

8. Click **OK**.
9. Open the Default Design Model and repeat steps 1-5 for creating the Site / Drainage Plan and Grading / Geometry Plan.

9.4 Edit the Title Block

1. From the Ribbon open the **Models** dialog box open each newly created sheet models.
2. In the **Properties** dialog box edit or fill in the following fields:

- Description: ***SITE GRADING PLAN***
- Sheet Number: ***SGP-01***

3. Notice the **Drawing Title** and **Drawing Number** in the Title Block will be updated to match the Properties. The Project Number, Project Description and Town should match the WorkSet Properties.

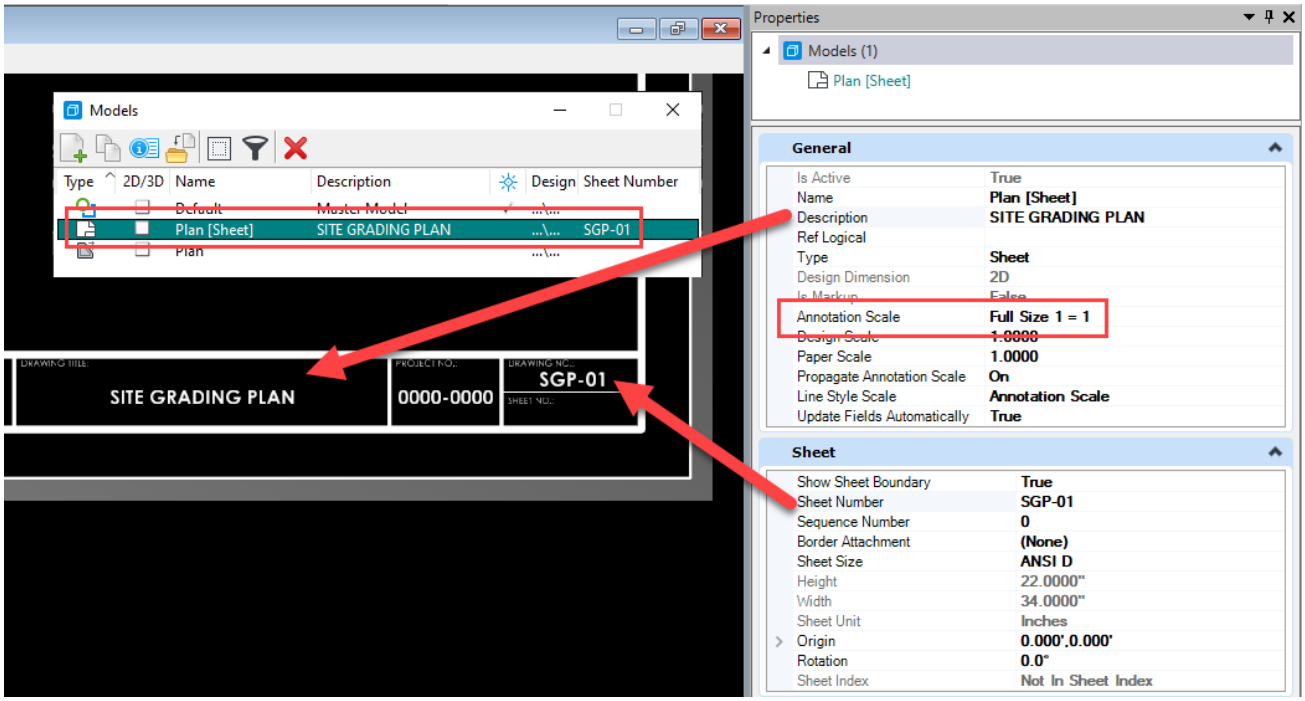


Figure 293

4. Select **Save Settings**.

9.5 Adjust the Named Boundary

1. Open the Default Design Model to edit the Named Boundaries as needed. On the Ribbon select **Home > Selection** and make the **Element Selection** tool active.
2. Select the Named Boundary shape and adjust by dragging the handles to the desired location.

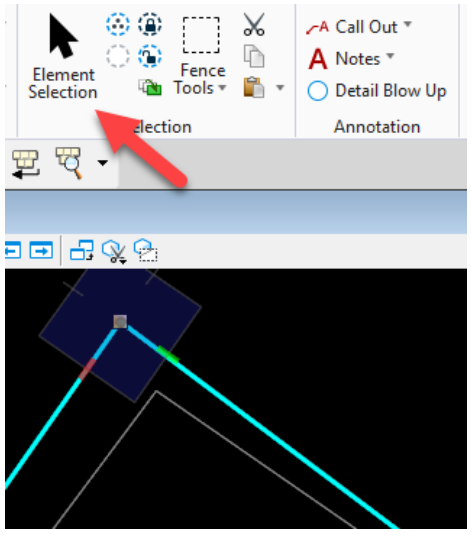


Figure 294

3. The **Insert Vertex** or **Delete Vertex** tools can also be used to edit the shape.

Figure 295

4. Return to the sheet model by hovering the cursor over the Marker and click the **Signal Sheet** and select the folder Icon (Open Target Tool). This action returns you back to the sheet model. Notice that by changing the boundary in the design model, this has propagated to the sheet.

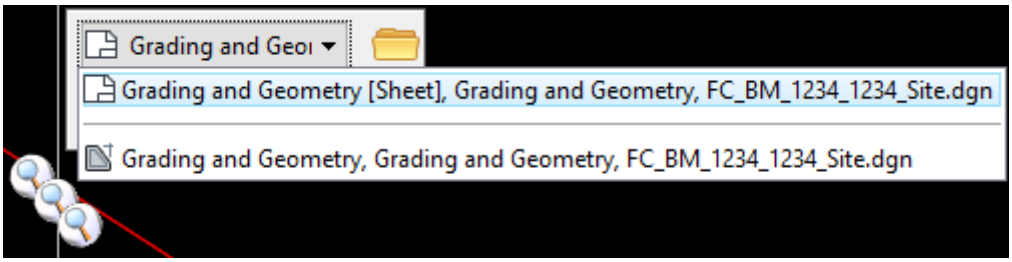


Figure 296

5. Models can also be opened using the **View Group** drop down tool located at the bottom left of the screen.

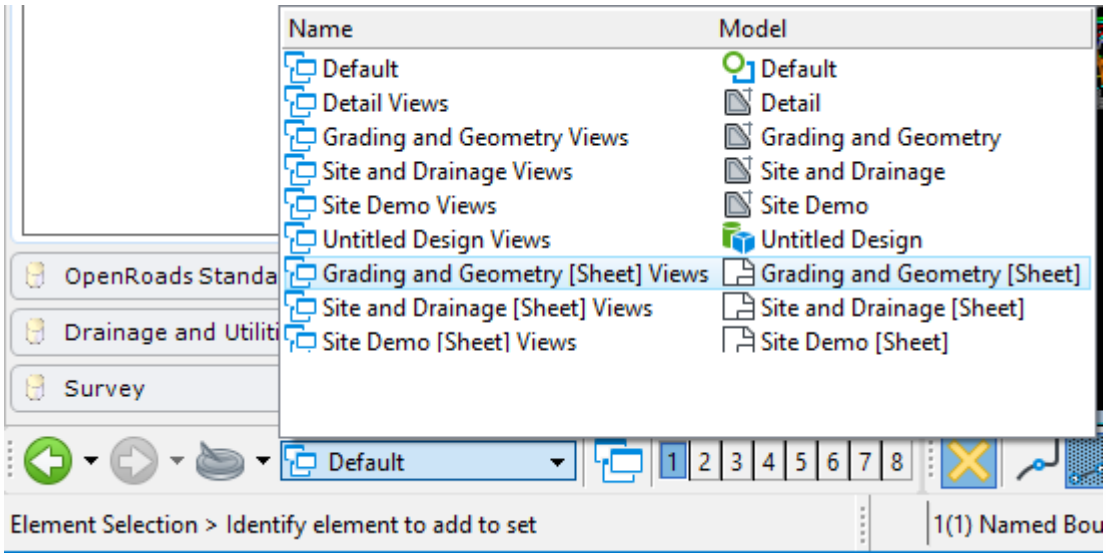


Figure 297

6. Select **Save Settings**.

9.6 Edit the Sheets

9.6.1 Move the Name Boundary inside the Sheet Border

1. Open the desired sheet model and select the **References** Icon, in the dialog box right click on the file, select **Move** to re-position the reference file within the border.

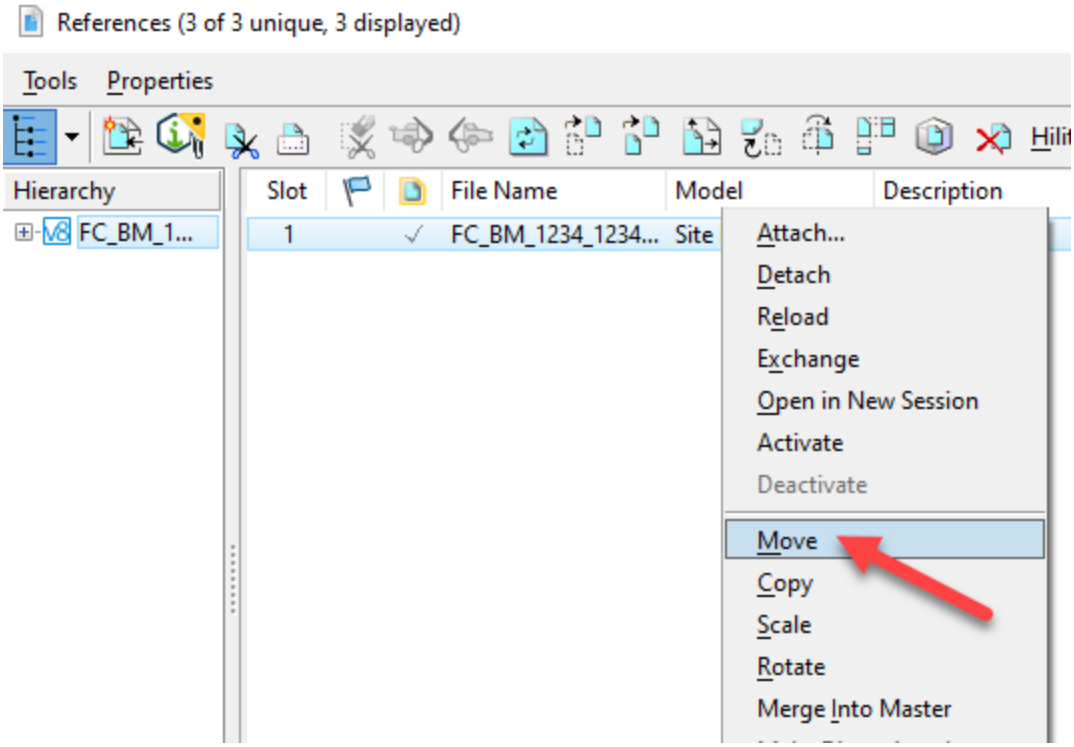


Figure 298

2. Follow the prompts to execute the move command. Select **Save Settings**.

9.6.2 Turn off levels

1. Open the desired sheet model and right-press and hold to bring up the contextual menu. From here, select **Turn Level Off by Element**.

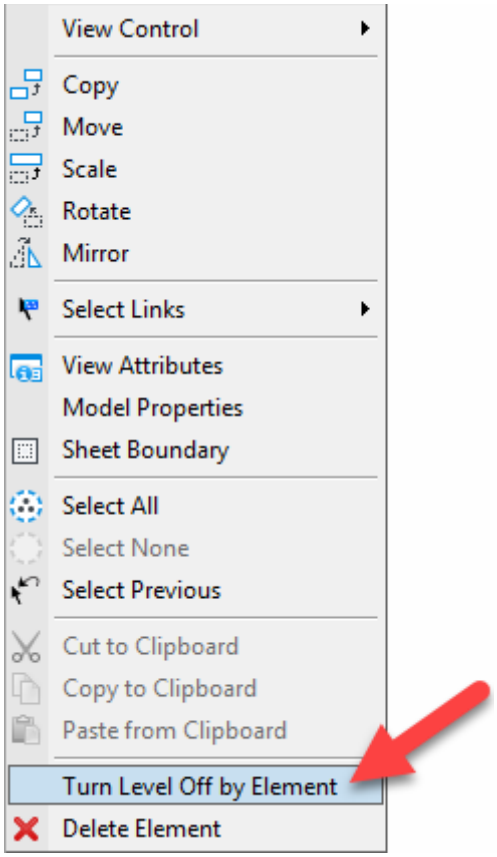


Figure 299

2. Issue a Data Point on the Named Boundary, hence turning off the level. Data Point on other elements for levels you would like turned off. Select **Save Settings**.

9.7 Create Blown Up Detail

1. Open the Default Design Model.
2. Use the Place Named Boundary tool and give your Detail a Name.
3. Place a Named Boundary around the area you would like to detail, follow the prompts.
4. On the Create Drawing dialog box Ensure the following options are set:

   Top Section
   - *Name*: ***Detail***
   - *Drawing Seed*: ***Misc Plan***

   Drawing Model Section
   - *Create Drawing Model*: ***Enabled***
   - *Annotation Scale*: ***Full Size 1" = ??' (Match Detail Scale below)***

   Sheet Model Section
   - *Create Sheet Model*: ***Enabled***
   - *Sheets*: ***Select the desired sheet that has already be created***
   - *Drawing Boundary*: ***New***
   - *Detail Scale*: 1" = ***??' enter the desired scale***
   - *Add to Sheet Index*: ***Disabled***
   - *Open Model*: ***Enabled***
5. In the Sheet Model, move the Referenced detail to the desired location.

9.8 Annotate the Drawing Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the Sheet Models.

1. Open a Drawing Model and use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Call Outs**.

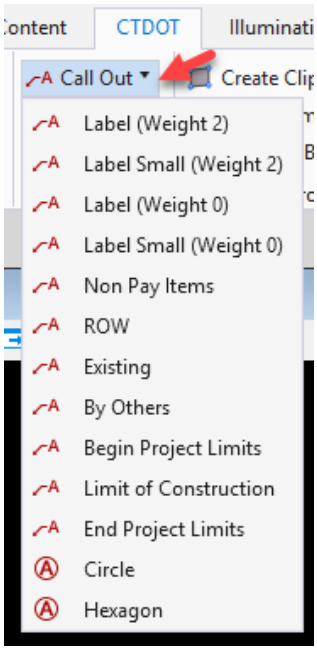


Figure 300

2. Place Dimensions in the Drawing Model. To place a Dimension, select either the **Vertical** or **Horizontal** Text Tool on the **CTDOT** ribbon, then select one of the desired **Dimensioning** tools. The Element Dimensioning dialog box will appear. Enable **Association** and follow the prompts to place the dimension.

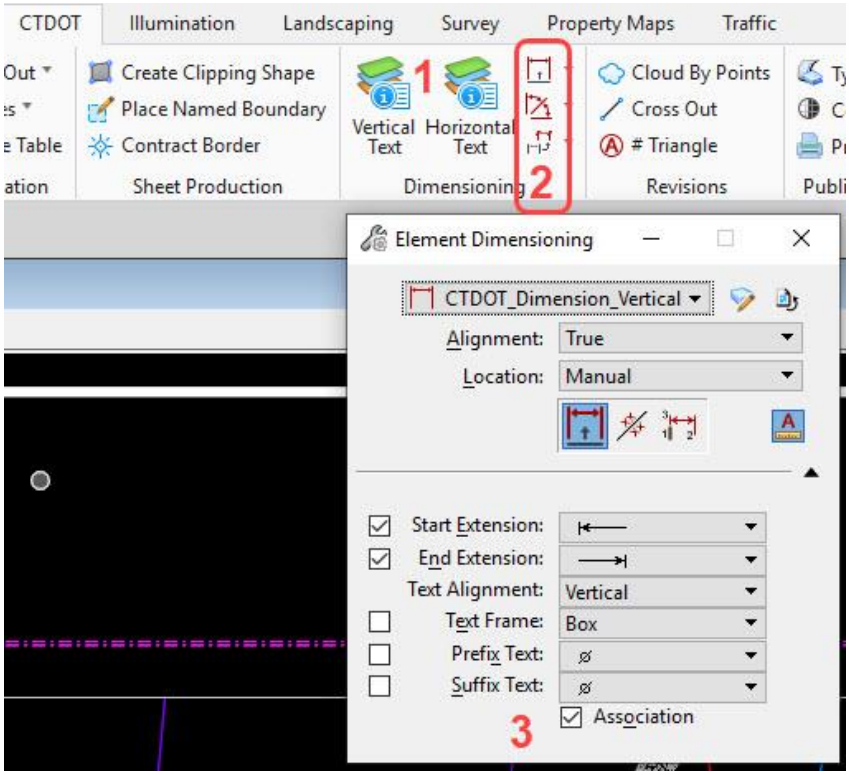

CTDOT
Illumination
Landscaping
Survey
Property Maps
Traffic
Create Clipping Shape
Place Named Boundary
Contract Border
Sheet Production
Vertical Text
Horizontal Text
1
2
Dimensioning
Cloud By Points
Cross Out
Triangle
Revisions
Element Dimensioning
CTDOT_Dimension_Vertical
Alignment: True
Location: Manual
Start Extension:
End Extension:
Text Alignment: Vertical
Text Frame: Box
Prefix Text:
Suffix Text:
Association
3

Figure 301

9.9 Annotate the Sheet Models

Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed in the sheet models.

1. Use the **Place Table** tool on the CT DOT Ribbon to place preconfigured Tables. Select the **General Notes** table and follow the prompts for placement.

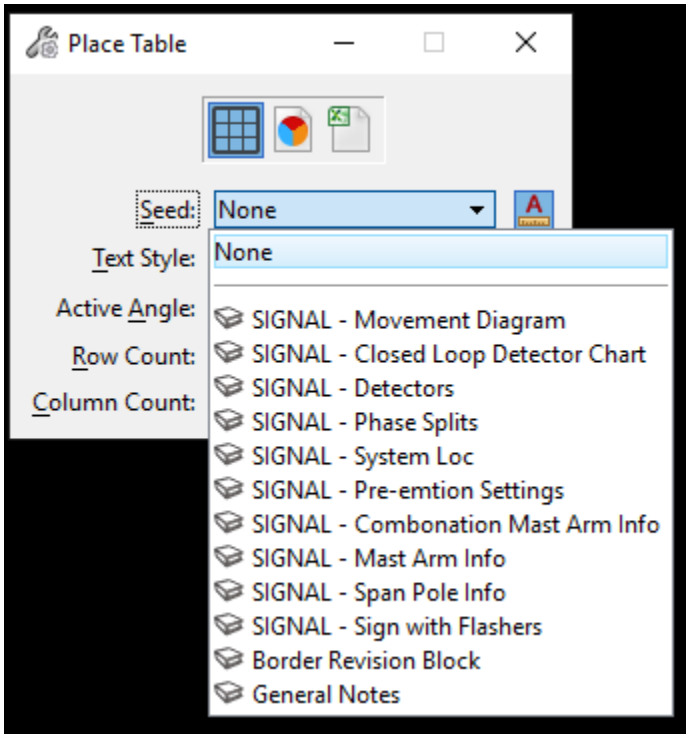


Figure 302

2. To add information to the table select the **Annotate** tab and choose **Edit Text**. Note: Avoid using the Element Selection tool to edit the table as this will lock up the file.

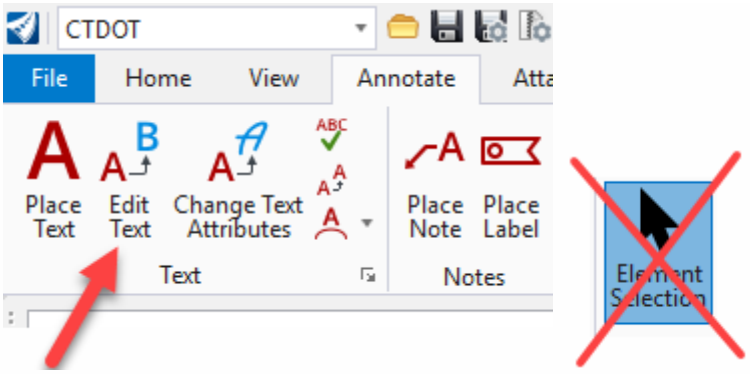


Figure 303

3. Use the tools on the **CT DOT** Ribbon's, **Annotation** section to place **Notes**.

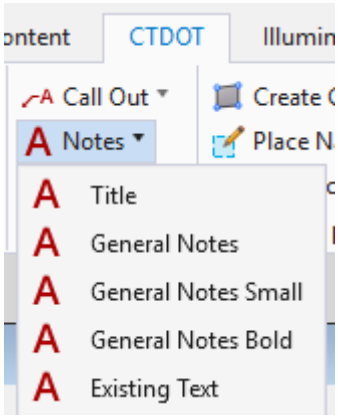


Figure 304

9.10 Detail Sheets from 2D Drawings

1. Continue using the DGN file created in this Module. Create a new Sheet Model, using the ***Seed2D – CT RoadSheet.dgn, 2D Sheet*** seed file.

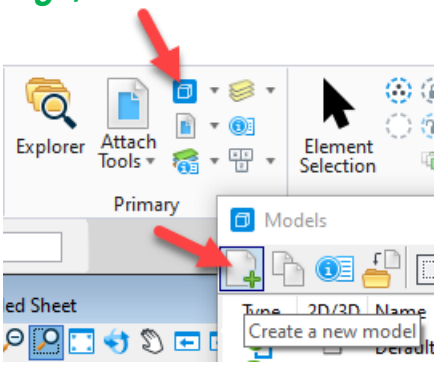


Figure 305

In the Create Model dialog box enter the following:

- Name: Miscellaneous Details
- Description: Miscellaneous Details
- Sheet Number: C-005
- Annotation Scale: Full Size 1 = 1

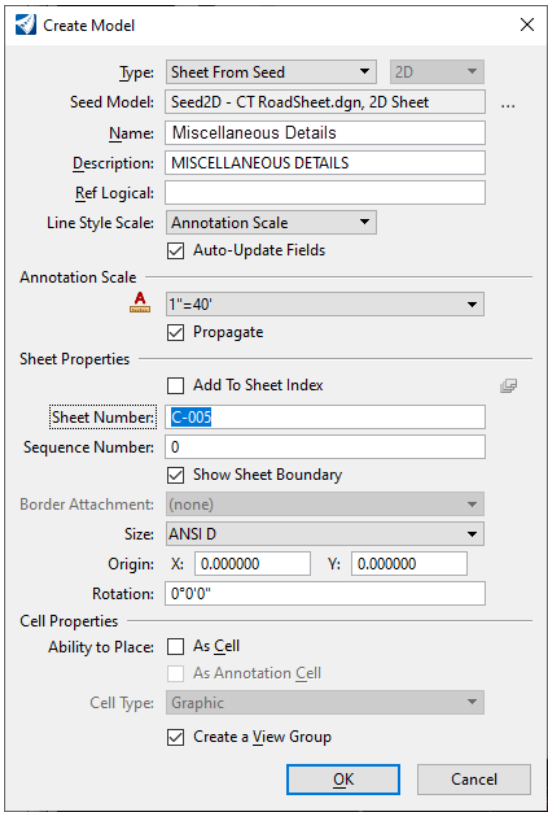


Figure 306

2. Activate the **CTDOT Workflow,** on the **CTDOT** tab, **Sheet Production** area select the **Borders** drop down and choose **Contract Border.** Attach the Contract Border to the Sheet Boundary.

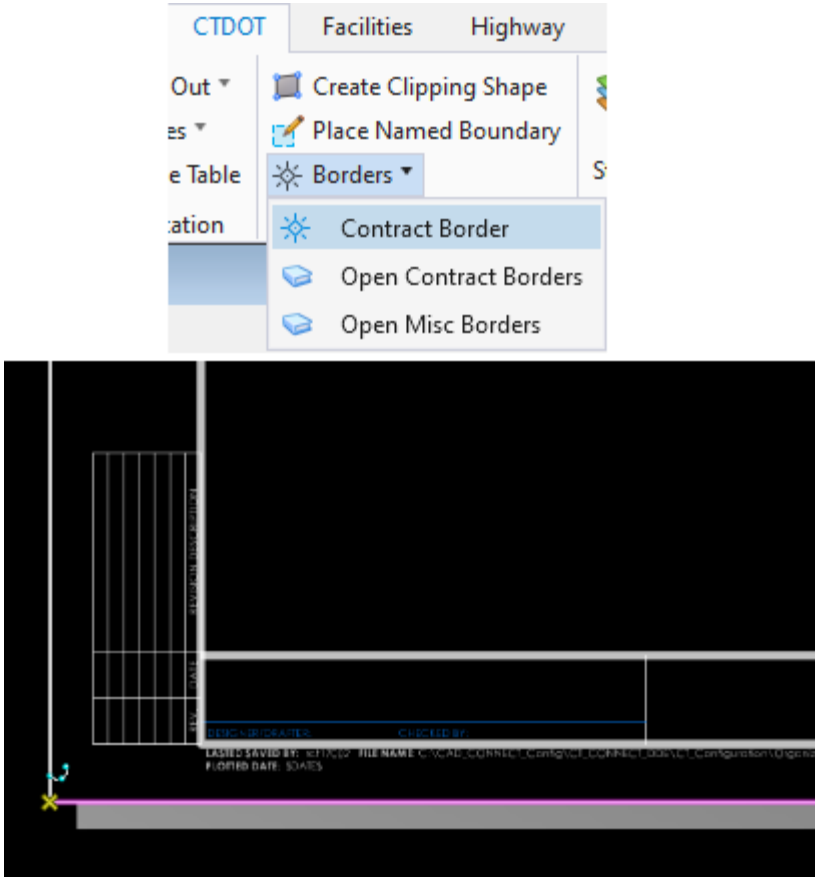


Figure 307

3. In Search type ***Update All Fields***, select the result and the **Drawing Title** and **Drawing Number** will propagate to what was entered when the sheet was created.

Figure 308

4. Create a new 2D Design Model, using the ***Seed2D – CT RoadDesign.dgn, Default*** seed file.

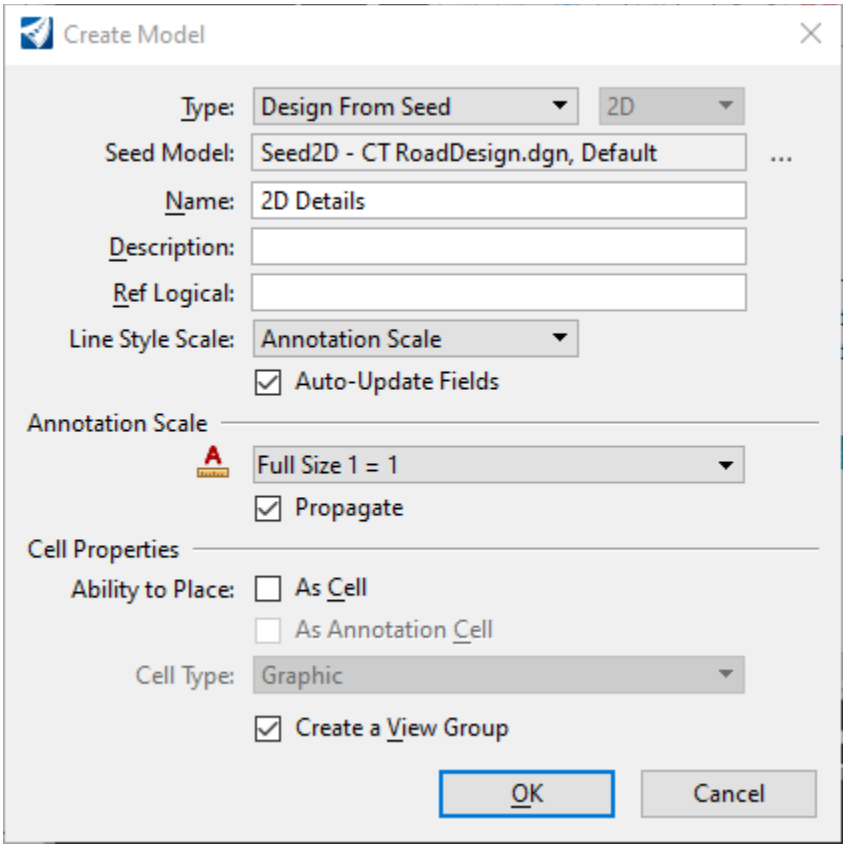


Figure 309

5. In the new 2D Design Model activate the **CTDOT Workflow**. On the **Home** tab, use the Placement, Manipulate and Modify tools to draft the line work for the Details. Multiple details can be placed in this design model as these will all be placed at their true size 1:1. There will be no dimensioning or text placed in this model, all annotation will be in the Sheet Model that will reference the 2D design model's line work.
6. In search type ***Detailing Symbol Styles***, select the result and the dialog box will open. Right click on ***CV DETAIL*** and select ***Activate***.
7. On the **CTDOT** Tab, **Sheet Production** section select **Create Clipping Shape,** this will set the correct level for the clipping shape. In the same section select the **Place Named Boundary** tool.
8. On the Place Named Boundary dialog box select the **By Two Point** icon, Name the Detail (***ANTI-TRACKING PAD***) and make sure **Create Drawing** is on. Follow the prompts and place a shape around one of the details.

   On the Place Named Boundary dialog box set:
   Drawing Seed: ***Place Sheet Only (Named Boundary)***
   Sheets: ***Select the Sheet Model created in step 1 of this section***
   Detail Scale: ***As needed***

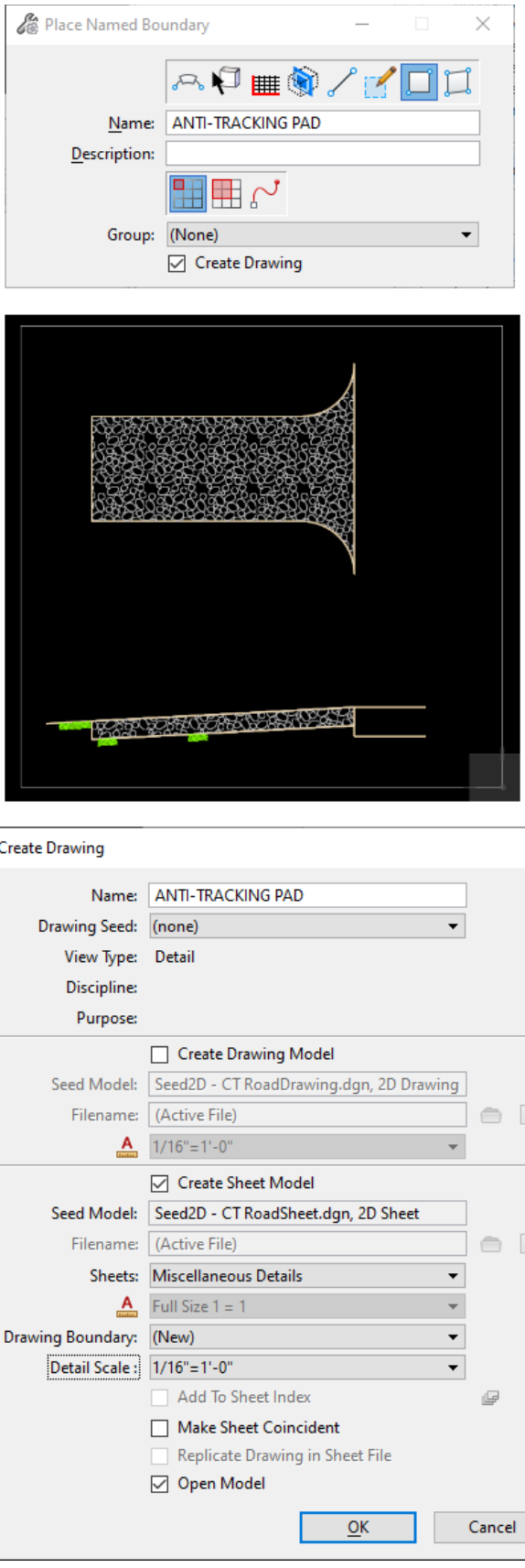

Place Named Boundary
Name: ANTI-TRACKING PAD
Description:
Group: (None)
Create Drawing
Create Drawing
Name: ANTI-TRACKING PAD
Drawing Seed: (none)
View Type: Detail
Discipline:
Purpose:
Create Drawing Model
Seed Model: Seed2D - CT RoadDrawing.dgn, 2D Drawing
Filename: (Active File)
1/16"=1'-0"
Create Sheet Model
Seed Model: Seed2D - CT RoadSheet.dgn, 2D Sheet
Filename: (Active File)
Sheets: Miscellaneous Details
Full Size 1 = 1
Drawing Boundary: (New)
Detail Scale: 1/16"=1'-0"
Add To Sheet Index
Make Sheet Coincident
Replicate Drawing in Sheet File
Open Model
OK
Cancel

Figure 310

9. The sheet Model will open, move the referenced detail to the desired location inside the sheet.
10. Open the 2D Design Model to create another Named Boundary around the same detail.
11. In search type ***Detailing Symbol Styles***. Select the result and the dialog box will open. Right click on ***CV Center Style*** and select ***Activate***.
12. On the **CTDOT** Tab, **Sheet Production** section select **Create Clipping Shape,** this will set the correct level for the clipping shape. In the same section select the **Place Named Boundary** tool.
13. On the Place named Boundary dialog box select the **By Two Point** icon, Name the Detail (***ANTI-TRACKING PAD – Different Scale***) and make sure **Create Drawing** is on. Follow the prompts and place a shape around the detail.

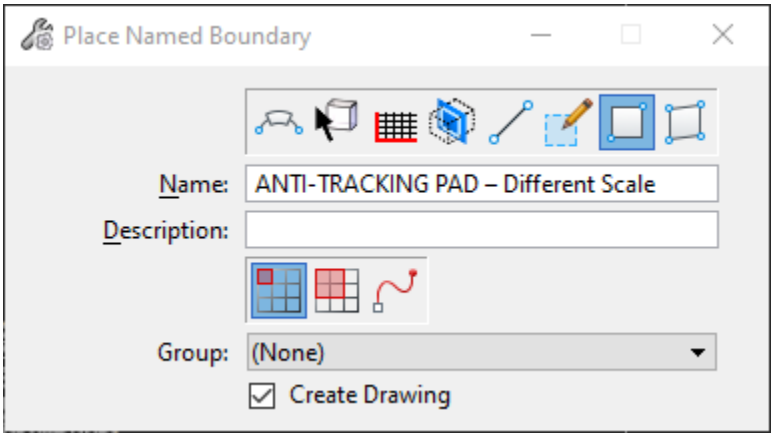


Figure 311

On the Create Drawing dialog box set:

- Drawing Seed: ***Place Sheet Only (Named Boundary)***
- Sheets: ***Select the Sheet Model created in step 1 of this section***
- Detail Scale: ***Different than used in Step 8***

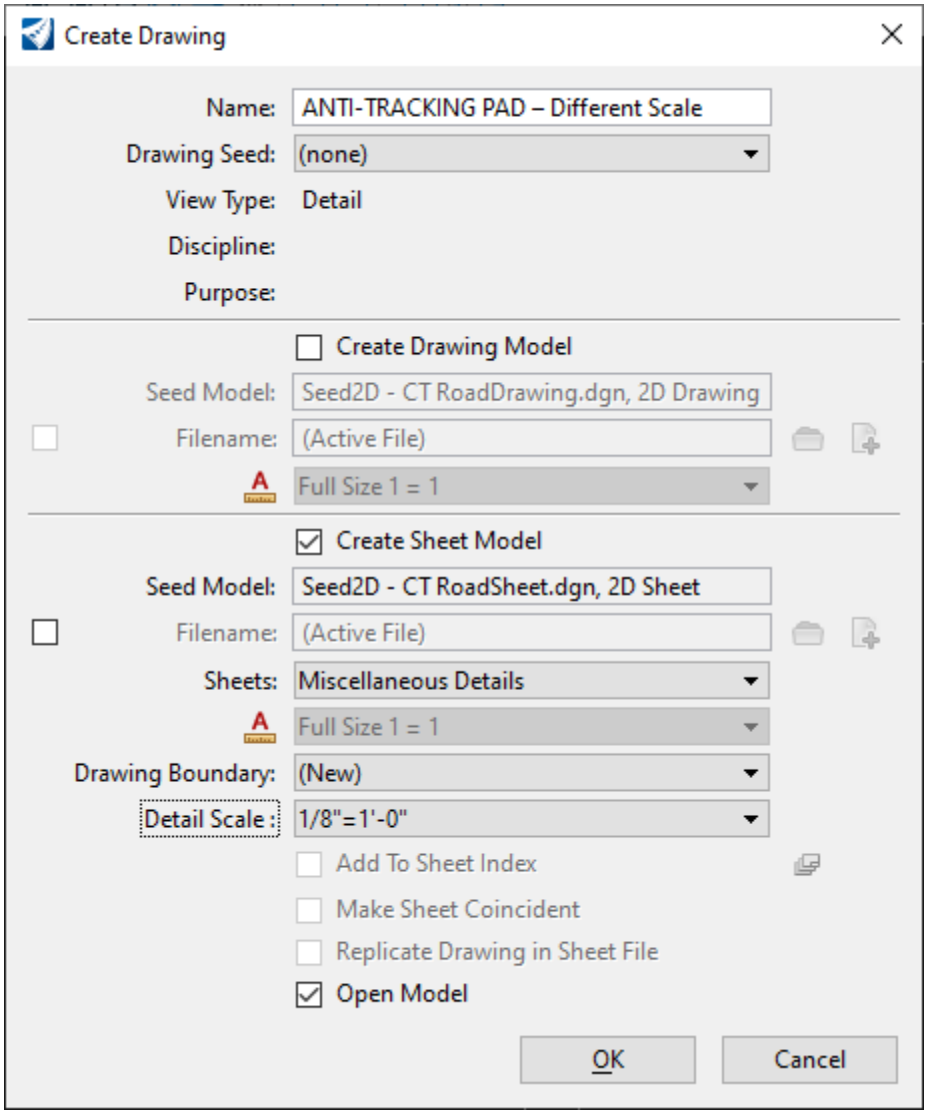


Figure 312

15. The Sheet Model will open, move the referenced detail to the desired location inside the sheet.
16. In the Sheet Model place dimensions on both details, notice they both dimension correctly even though they are two different sizes on the sheet.

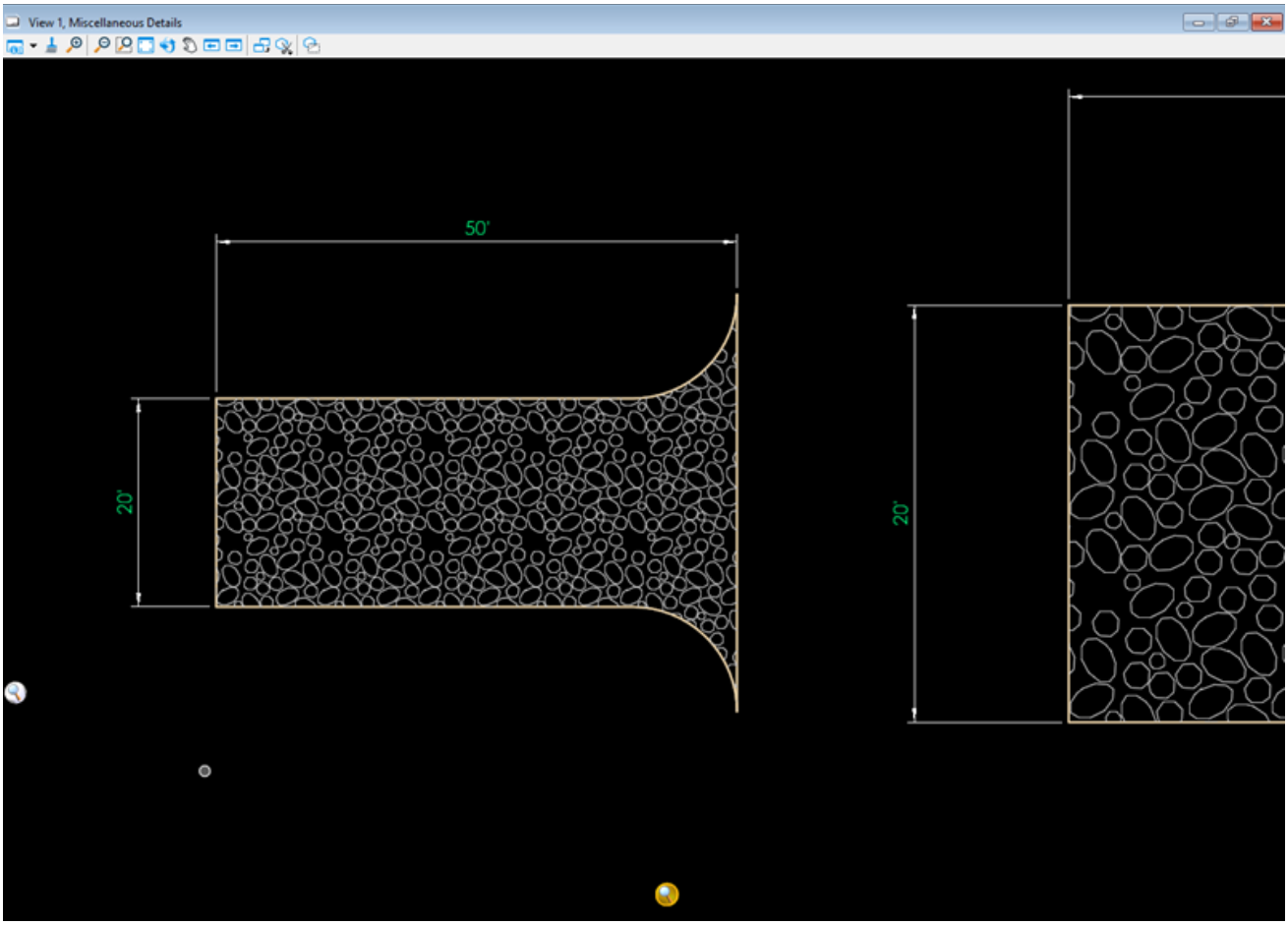


Figure 313

16. Review the titles of each detail and the Detailing Symbol Styles that were used. The first one used the ***CV DETAIL*** and the second ***CV Center Style***. ***CV DETAIL*** should be used if there is a need to call out this detail on another sheet.

Figure 314

Section 10 – Bridge Sheets

10.1 General Plan Sheet

This module will instruct users on how to create contract sheets using the Named Boundaries and Detailing Call Out tools. Users will create a DGN file that will be composed of different models to create the Sheet Model. This workflow is written to create detail sheets for a bridge created using OpenBridge Modeler. Similar detailing methods can be used for other 3D Structures created by using the Solids tools such as:

- Retaining Walls
- Tunnels
- Sign Supports
- Traffic Signal Support/Span Poles
- Drainage Structures/Box Culverts

Contract Sheet files will be stored in the Contract Plans folder. A DGN file will be created with the structure's Base Model referenced in, this file will house all the Sheet Models for the Structure.

When this file gets created it will only have a Design Model. The following Base Model DGN files will need to be referenced in:

- Bridge Base Model
- Survey files (ground topo and terrain)
- Other Design unit's Base Models (Highway, Traffic, Illumination and Landscape)
- The Named Boundary and Callout tools will be used to create additional models in this DGN file which will be a combination of Drawing and Sheet Models.

10.1.1 Create a New file

Before attempting to open or create DGN files users should make sure the following is in place:

1. CTDOT users should have the CTDOT CONNECT DDE synced through SharePoint with the COMPASS Project Synced along with the CAD Configuration.
2. Consultants should have CTDOT DDE properly installed or be syncing to the CTDOT DDE SharePoint/COMPASS system.
3. Make note of the **Coordinate System** you will be working in. If you have existing survey data, you will need to find out what system is being used **(NAD 83/NAVD 88 or NAD 27/NAVD 29).**

4. Log on to the CONNECTION Client. Bentley CONNECT licensing requires users to log into their Bentley account to secure a software license. CTDOT users should log in using your CTDOT email address and Bentley password. If you do not see the dialog box, select the ∧ icon on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
5. Access OpenRoads through Accounting or the Customized Icon following
6. On the OpenRoads open screen select **Custom Configuration**, using the small drop-down arrows select the Workspace **CT_Workspace**, the needed **WorkSet** and **Role**.
7. Select the **New File** Icon. In the New dialog box browse to the ***Bridge|Contract_Plans*** folder.
8. The Seed file should be set to:

   …CT_Configuration|Organization|Seed|Bridge|Seed3D - CT BridgeDesign.dgn
9. In the ***File name*** field enter a name for your file using the CTDOT File Naming structure.

   Example: **SB_CP_1234_1234_Bridge#.dgn**
10. Select **Save** and the new file will open.
11. If you need the Geospatial Header in a different Datum, please follow instruction in Volume 2.

10.1.2 Set up the Design Model

1. Select the **CTDOT** workflow and click on the **Attach** tab, in the ***References Section*** click on **Attach Reference**.

   Reference the needed Proposed Base Model dgn files including but not limited to:

   - Bridge/Structures
   - Signal
   - Signing and Pavement Markings
   - Roadway Alignment
   - Highway
   - Drainage
   - Illumination
2. In the Attach Reference Box browse and select the desired file and click **Open**. In the Reference Attachment Dialog Box choose:

   - Model: Most likely it's "***Default***" but this could vary depending how the file has been set up.
   - Nested Attachments: ***No Nesting***
   - Global LineStyle Scale: ***Master***

3. Click **OK** to finish the attachment process.
4. Repeat Steps 1 - 3 for all Proposed Base Models
5. Reference the Existing Survey dgn files. Select the **CTDOT** workflow and click on the **Attach** tab, in the ***References Section*** click on **Attach Reference**.
6. In the Attach Reference Box browse to the ***Active Survey Folder*** and select the desired Existing Survey DGN file and click **Open**. In the Reference Attachment Dialog Box choose:
   - Model: Most likely it's "***Default***" but this could vary depending on how the file has been set up.
   - Nested Attachments: ***No Nesting***
   - Global LineStyle Scale: ***Master***
7. Click **OK** to finish the attachment process.
8. If the Survey does not line up with the Proposed Design File it is most likely an older Survey File that was created with V8i. Older files will need to be referenced in with certain settings to get them to line up in the correct geospatial location.
9. Select the **Home** Tab, in the **Primary Section** select the **Attach Tool** drop down and choose **References**. This will open the References Dialog box.
10. Turn **True Scale** off and set the Scale to ***1:1***.
11. The Existing Survey File reference will need its levels set to SCREENED for when the PDF plans are created. This can be done by using a specific **Logical Name** in the Reference Attachment Properties. ***SWW Ground Survey*** will leave all levels in the reference screened with the displayed line weights when the PDF is created.

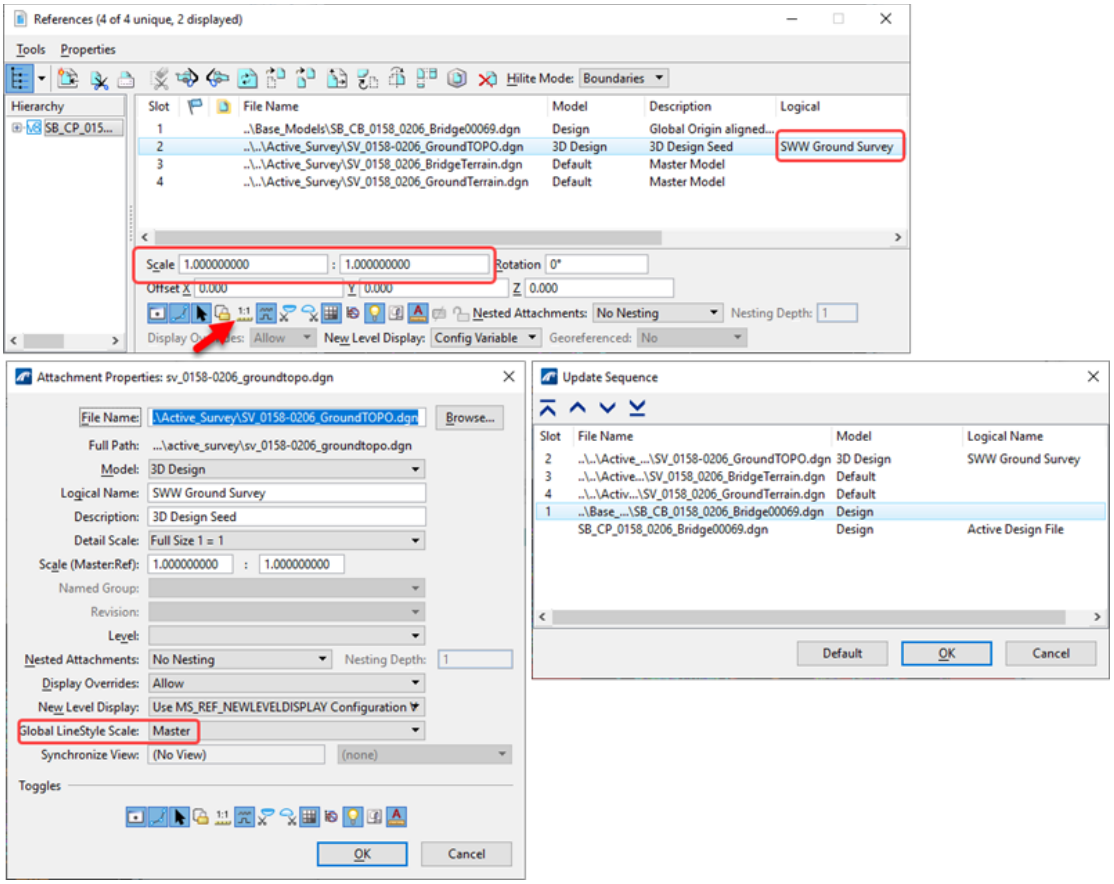


Figure 315

12. Right click in View 1 and select **2 Views Plan/3D**.

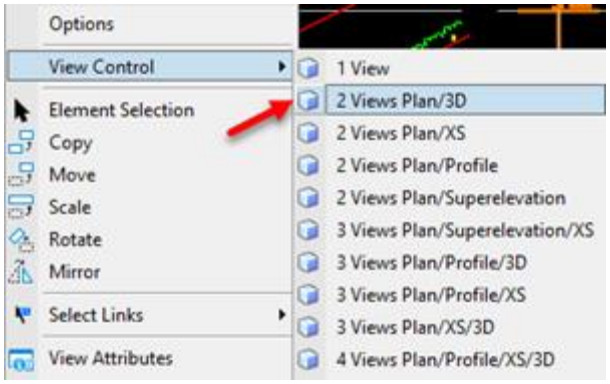


Figure 316

13. Select **Level Display** and turn off or on the desired levels in each Reference for Views 1 and 2.
14. Select **Save Settings**.

10.1.3 Create the General Plan

1. In the DGN file created in the section above, create a new 2D Design Model. In **Search** type ***Models*** and select the result. In the Models dialog box click on the **Create a new model** icon. On the Create Model dialog box select:

   Type: ***Design from Seed***

2. Change the Seed Model by clicking on the button next to **Seed Model**. On the Select File Containing Seed Model dialog box select ***Seed2d_CT Bridge.dgn***. Click the **Open** button. On the Select Models dialog select ***2D Design*** and **OK**.

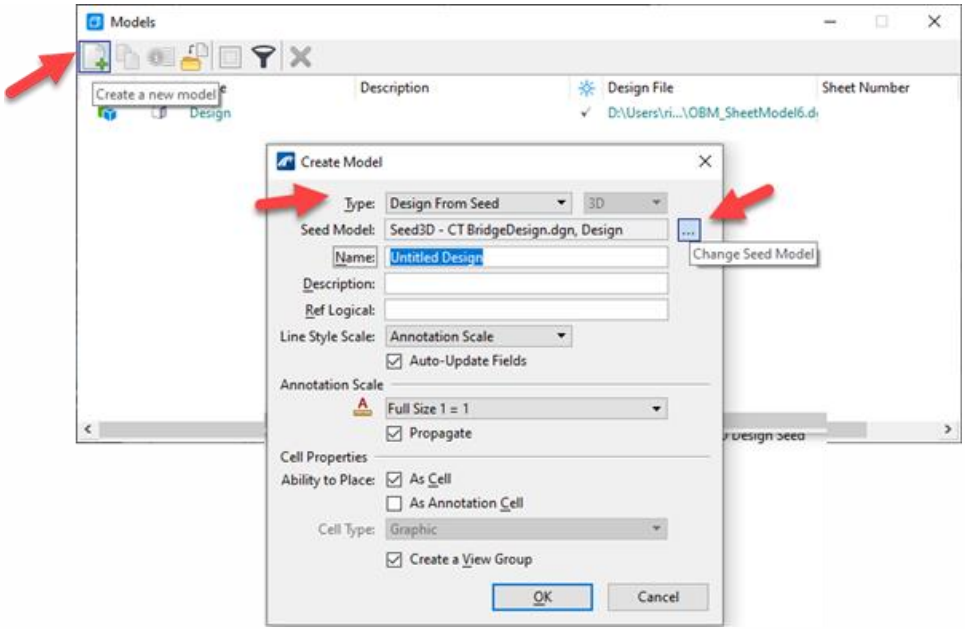


Figure 317

Figure 318

3. Name the Model ***2D Design*** and click **OK**.

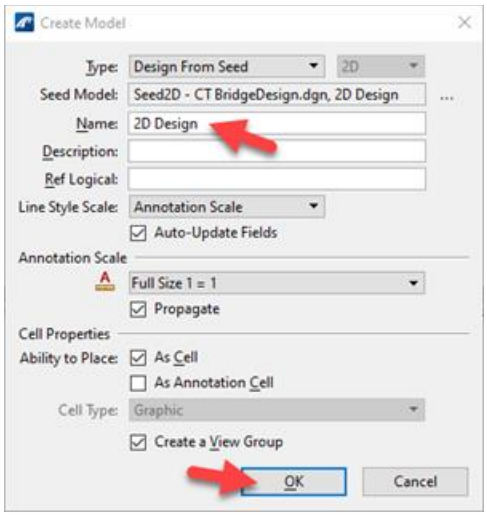


Figure 319

4. Reference in the 3D Model Created in the section above using a Nested Depth of 1. Fit View 1.
5. In **Search** type ***Detailing Symbol Styles*** and select the result. In the **Detailing Symbol Styles** dialog box activate the **Center Title Detailing Style**.

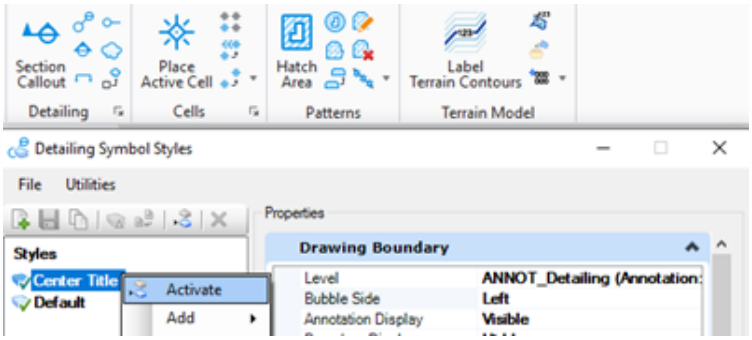


Figure 320

6. Rotate View 1 so the Bridge is Square with the view. In the Key-in enter ***rotate view element*** and follow the prompts to select a longitudinal line on the bridge. ***Note:*** *If the Key-in is not docked on the screen type Key-in in search to open the tool.*
7. Select **Save Settings**.
8. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Create Clipping Boundary** tool. This will update the Element Template to the correct level.

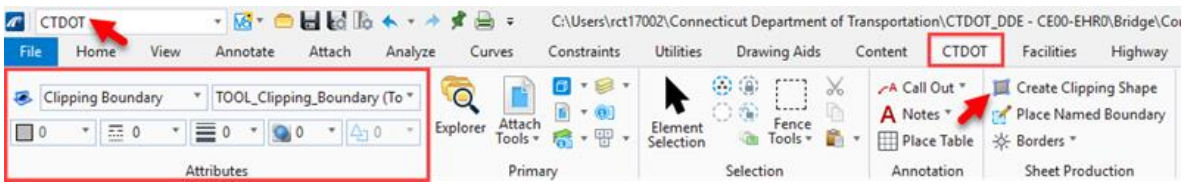


Figure 321

9. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear. In the Place Named Boundary dialog box set the following options:
    - Method (icon): ***By 2 Points***
    - Name: ***General Plan***
    - Mode (icon): ***Place Single Named Boundary***
    - Create Drawing: ***Enabled***

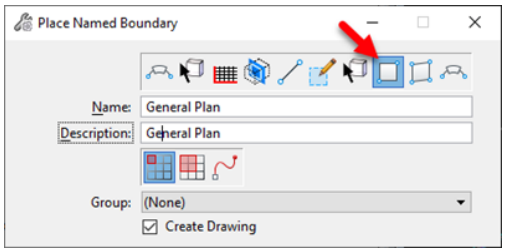


Figure 322

10. Follow the prompts to place a Named Boundary (Clipping Boundary) around the design. Data point first in the upper right and ending in the lower left. This element can be edited later to refine the shape and add additional points.
11. After accepting the placement of the named boundary the **Create Drawing** dialog box will appear. Ensure the following options are set:
    - Name: ***General Plan***
    - Drawing Seed: ***Plan (Named Boundary)***
    - Create Drawing Model: ***Enabled***
    - Annotation Scale: ***Match the Detail Scale in the Sheet Section***
    - Create Sheet Model: ***Enabled***
    - Sheets: ***New***
    - Annotation Scale: ***Full Size 1 = 1***
    - Drawing Boundary: ***New***
    - Detail Scale: ***1" = 30' (or as Desired)***
    - Add to Sheet Index: ***Disabled***
    - Open Model: ***Enabled***
12. Click **OK** to continue.

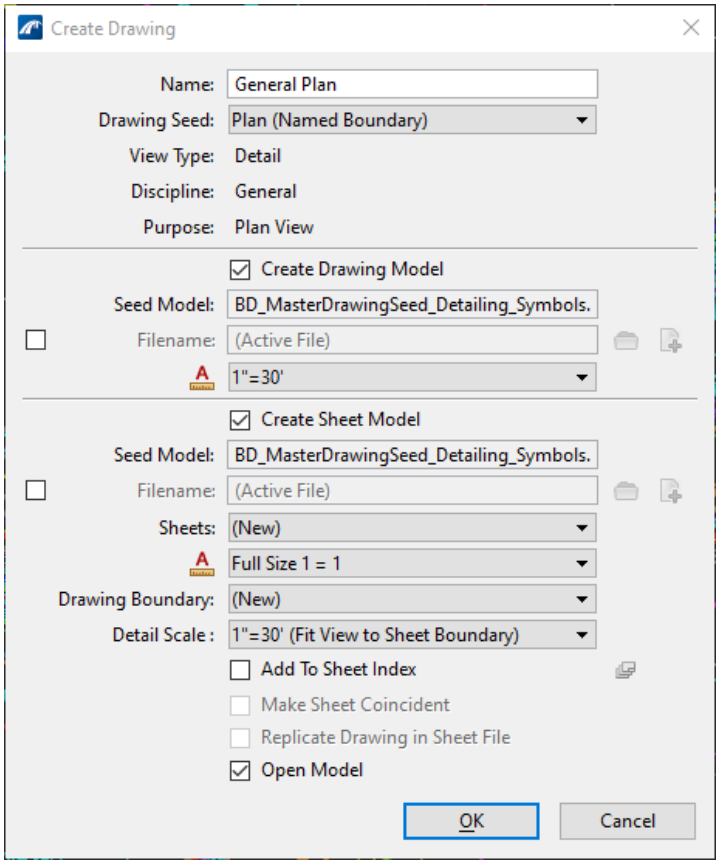


Figure 323

13. A Drawing Model and Sheet Model will be created. In the bottom left of the application select and view the three models that are now in the file.

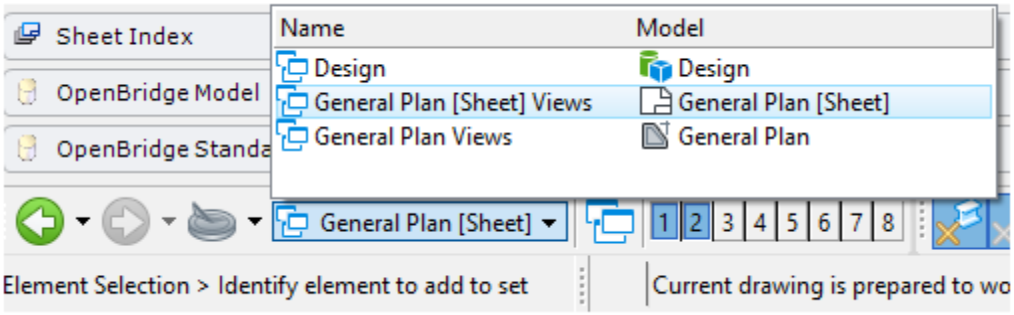


Figure 324

14. Open the Design Model and adjust the Named Boundary as needed.
15. Open the Sheet Model and move the **Referenced Plan View** of the Bridge to the Left Top of the sheet. Use the **Selection** tool to move the **Detail Title** as needed.

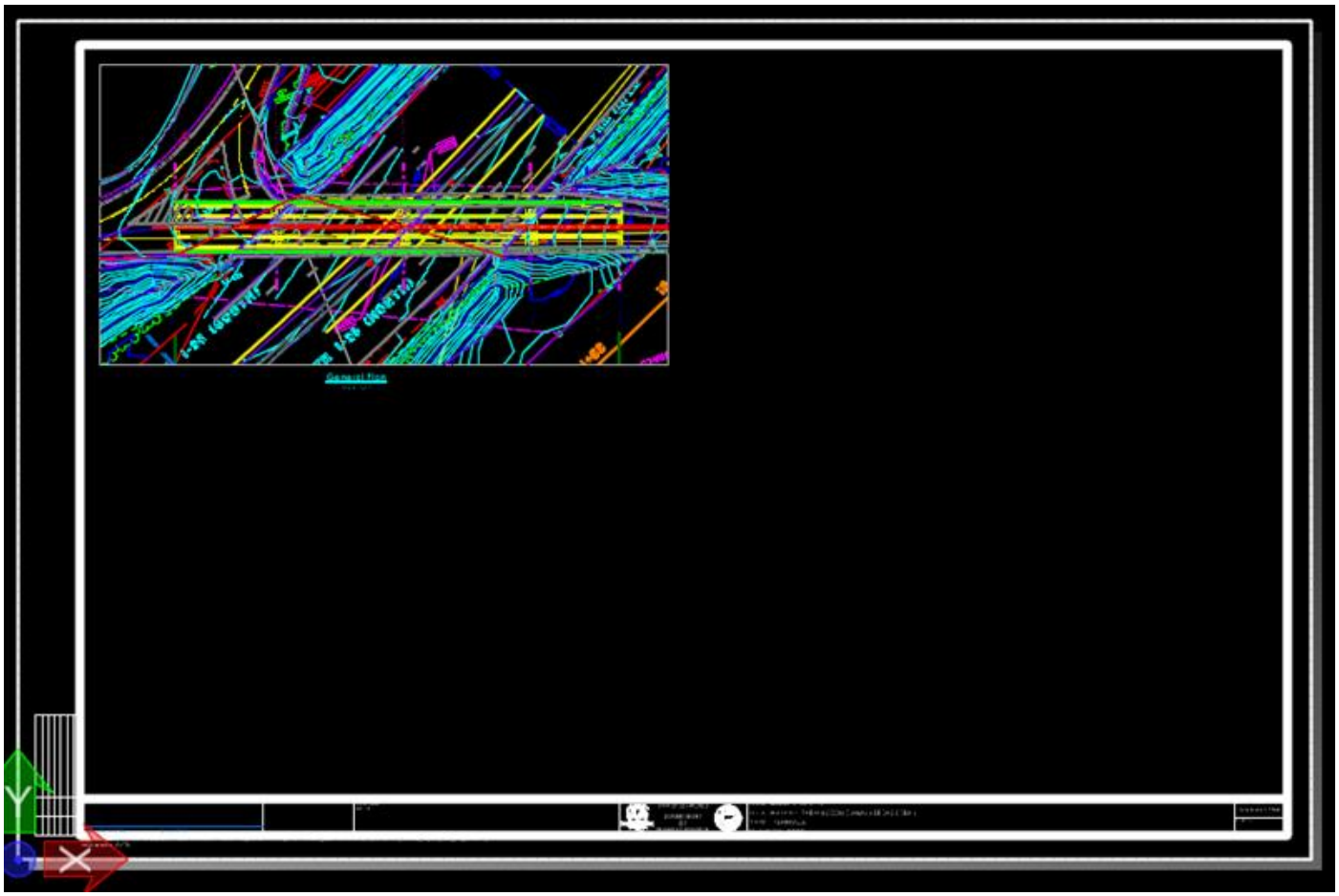


Figure 325

10.1.4 Edit the Title Block

In this section we will edit the title block information. In the Models Dialog select the Sheet Model and in the **Properties** dialog box enter the **"Drawing Title"** ***Description*** and **"Drawing Number"** ***Sheet Number***,

Note: *The Project Number, Project Description and Town(s) will be auto populated by the WorkSet Properties.*

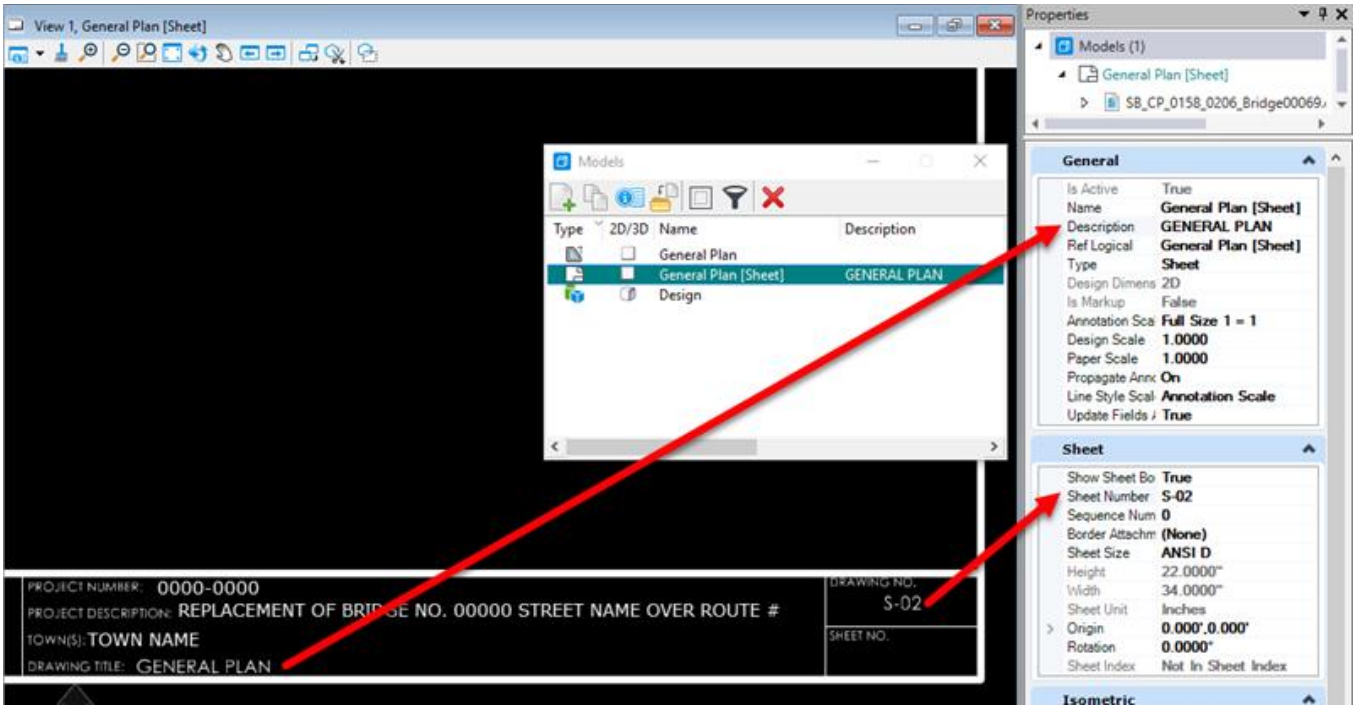


Figure 326

10.1.5 Add Additional Details to the Sheet

In this section we will add the following details to this sheet.

- Cross Section
- Elevation View
- Blow up Detail
- Isometric View

1. In the same dgn file created in the section above open the 3D Design Model.
2. Use the **CTDOT** workflow and click on the **Annotate** tab. In the **Detailing** section select **Section Callout**.

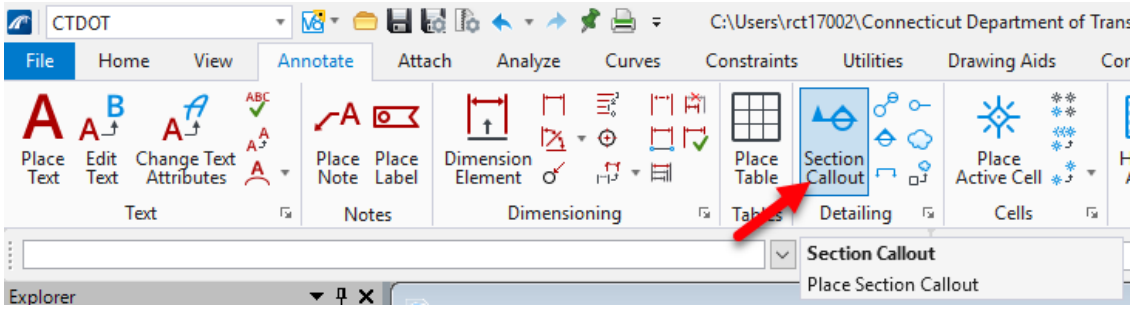


Figure 327

3. In the **Place Section Callout** dialog box select the following:

- **Drawing Seed: *Section - Centered***

- **Height: *From Model***
- **Toggle on *Create Drawing***

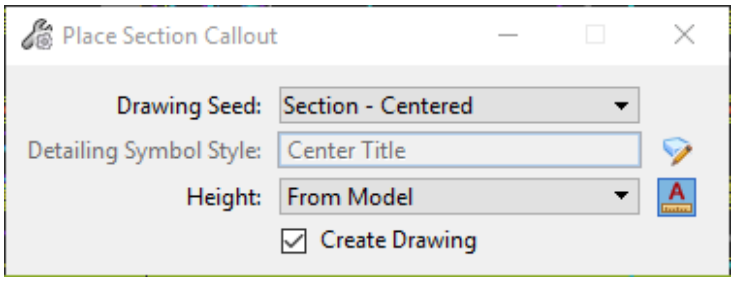


Figure 328

4. Follow the prompts to place a section cut.

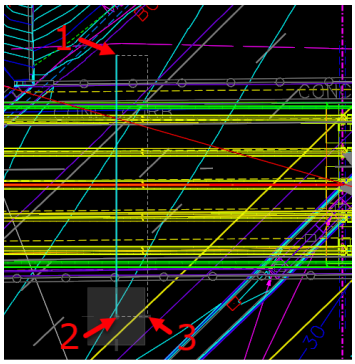


Figure 329

5. In the **Create Drawing** dialog box change **Sheets:** to ***General Plan [Sheet]***, this will place the Section in the previously created Sheet Model (General Plan). In the Sheet Model section select a ***Detail Scale*** and match the Drawing Model's ***Annotation Scale*** to that Detail Scale.

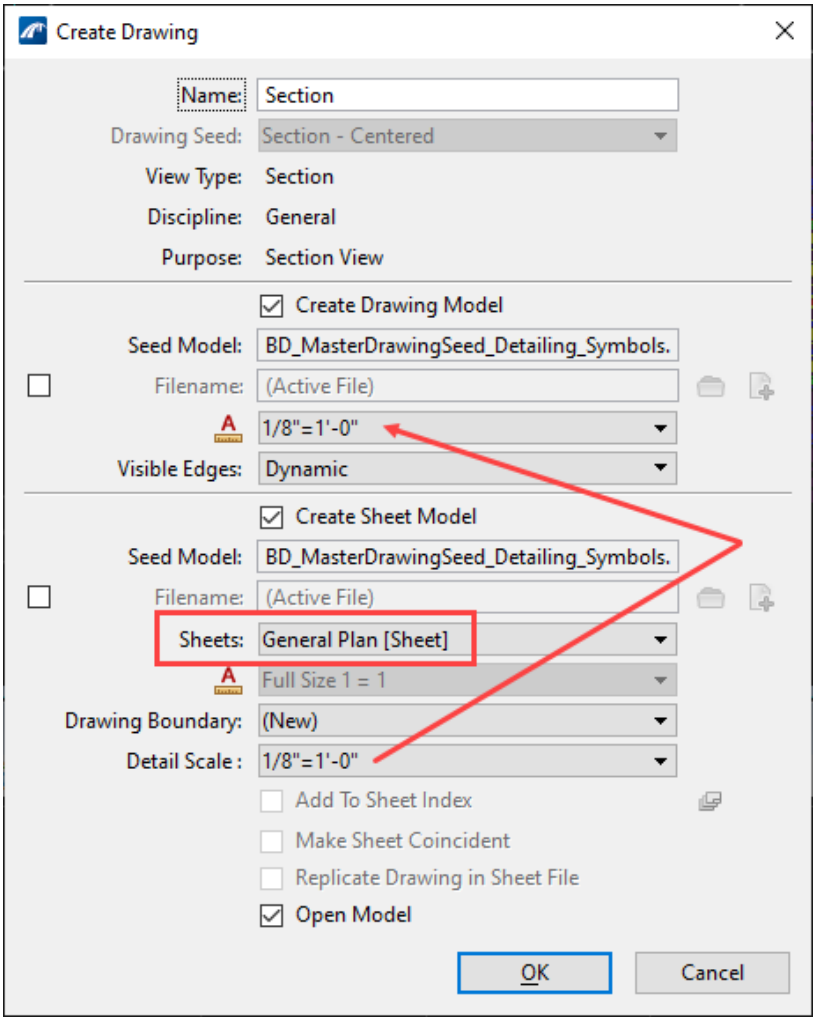


Figure 330

6. Open the Sheet Model and notice it may need to be clipped to show less of the elevation. Open the Design Model, in View 2 move the Clipping Shape limit closer to the deck.

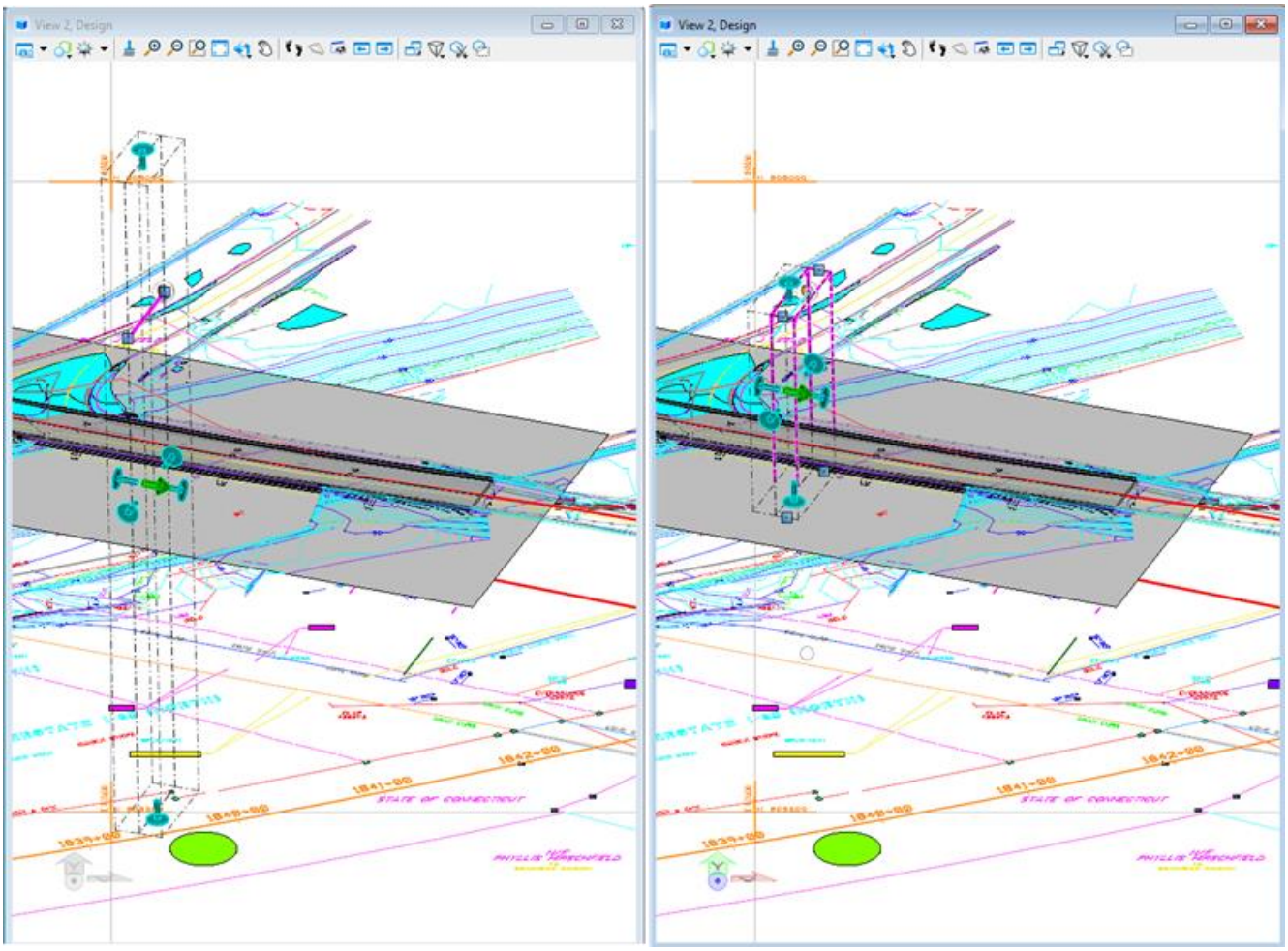


Figure 331

7. Open the Sheet Model and move the ***referenced Section*** to the **bottom right corner** of the sheet, notice the new clip is reflected. Move the Detail Symbol so it lines up in the center under the detail. Turn off the existing ground files and other referenced files that are not needed. For Reference files that have been kept on turn off the unneeded levels. **Save Settings**.

Figure 332

8. Return to the 3D Design Model
9. On the **CTDOT** workflow click on the **Annotate** tab. In the **Detailing** Section select **Elevation Call** out.

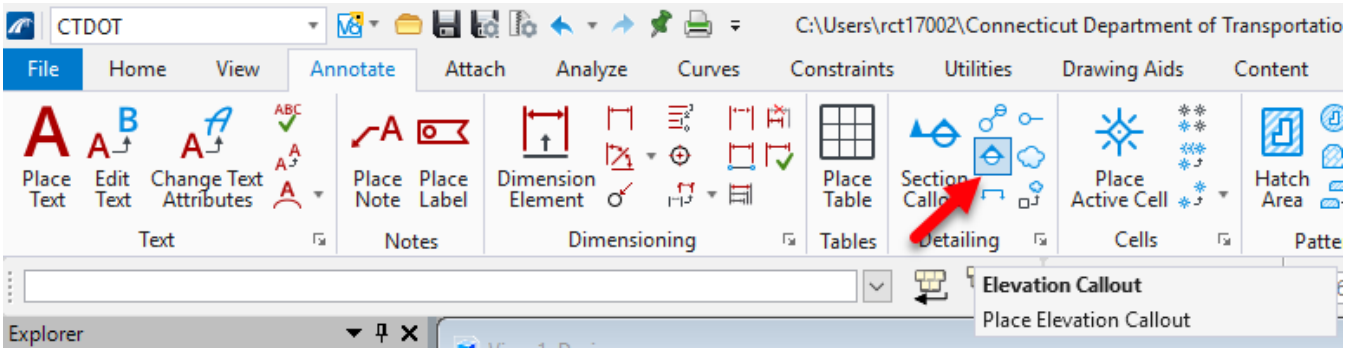


Figure 333

10. In the **Place Elevation Callout** dialog box select the following:

- **Drawing Seed: *Elevation - Centered***
- **Height: *From Model***
- **Toggle on *Create Drawing***

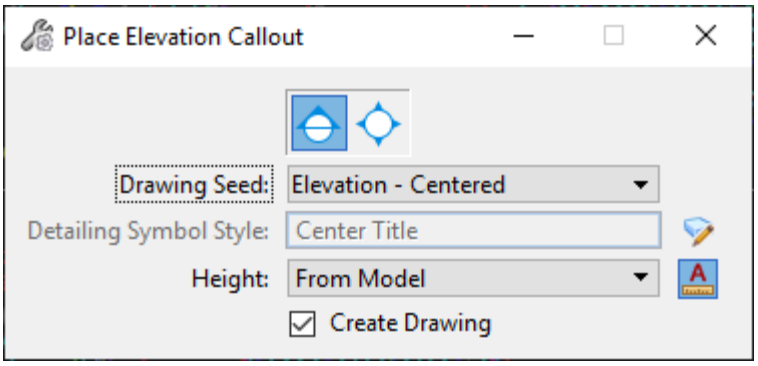


Figure 334

11. Follow the prompts to place a cut.

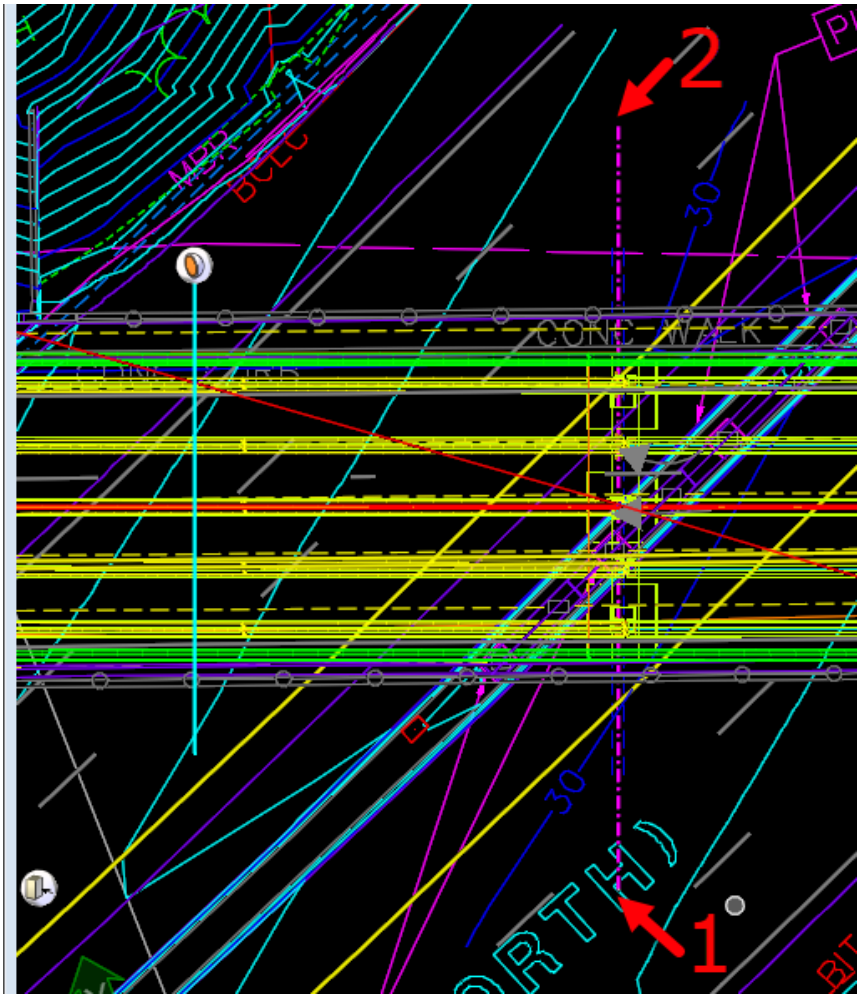
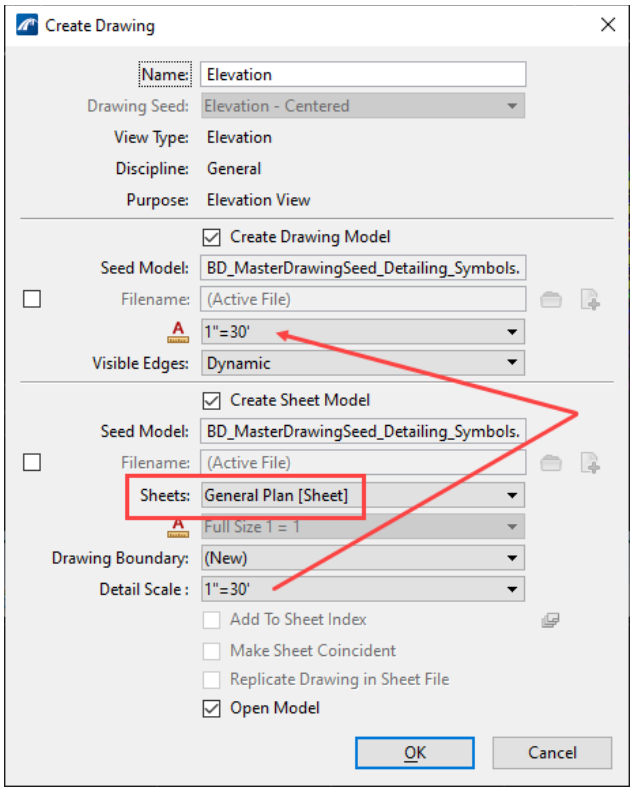


Figure 335

12. In the **Create Drawing** dialog box change **Sheets:** to ***General Plan [Sheet]***, this will place the Section in the previously created Sheet Model (General Plan). Set the **Detail Scale** to ***match the General Plan's Scale***. Match the Drawing Model's ***Annotation Scale*** to the Detail Scale.



13. In the 3D Model adjust the clipping as needed.
14. In the Sheet Model turn off the unneeded Reference files and Levels. **Save Settings**.

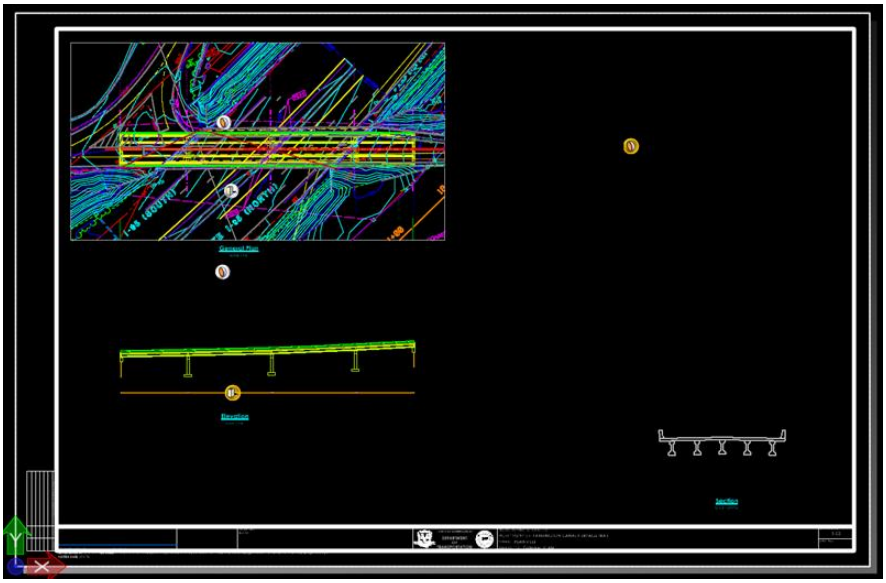


Figure 336

10.1.6 Place a Blow-up Detail

1. Open the **Section** Drawing Model.
2. In the **Models** dialog select the ***Section*** Drawing Model. In **Properties** change the **Annotation Scale** to ***1/8" = 1'-0"***.

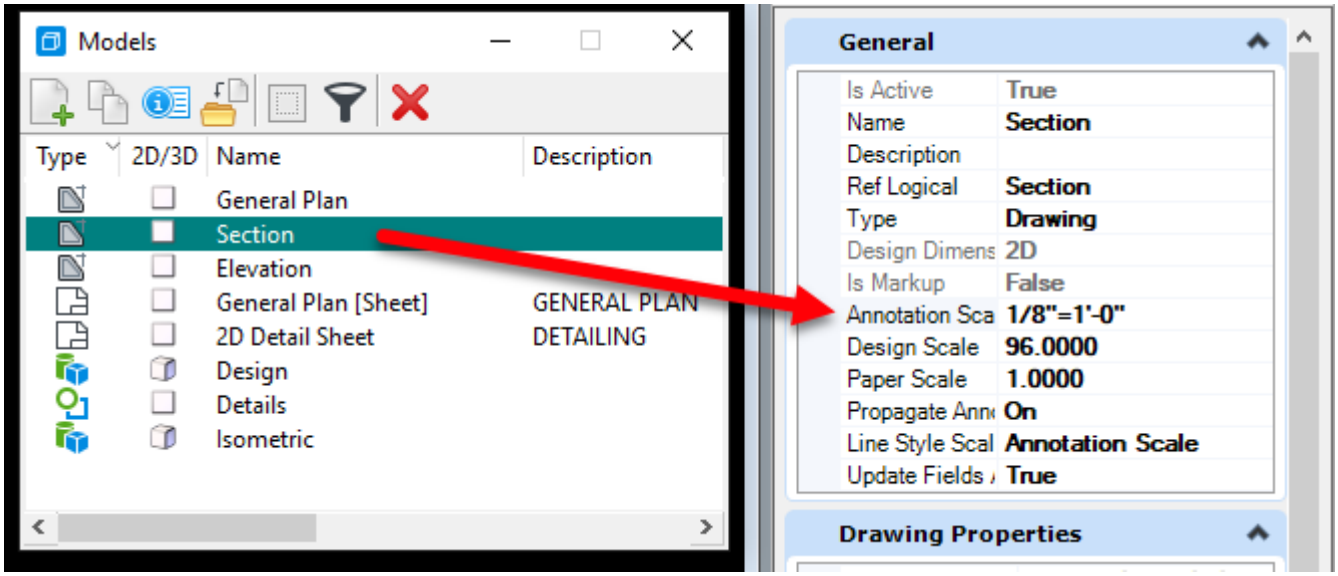


Figure 337

3. Use the **Place Detail Callout** tool, follow the prompts and place a circle around the area of the detail you need to blow-up.

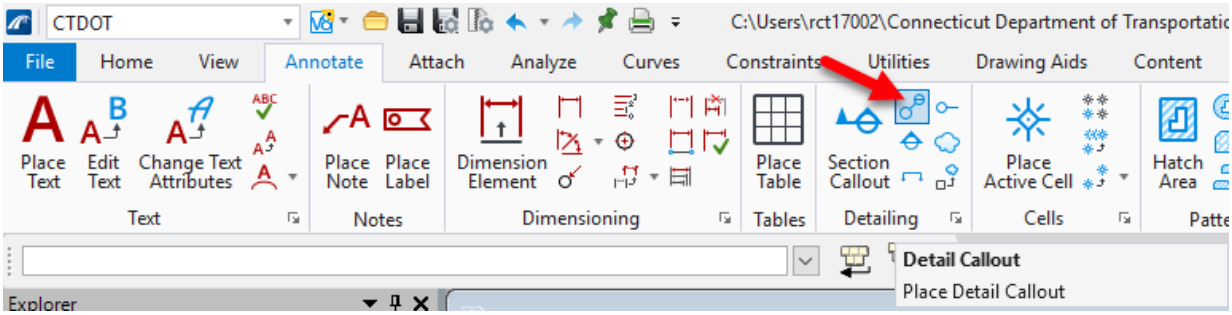


Figure 338

4. In the Place Detail Callout dialog box select the following:

   - **Drawing Seed: *Detail***
   - **Toggle on *Create Drawing***

   Select the desired **Placement Shape/Method** Icon (Circle, Oval, Rectangle or Existing Boundary).

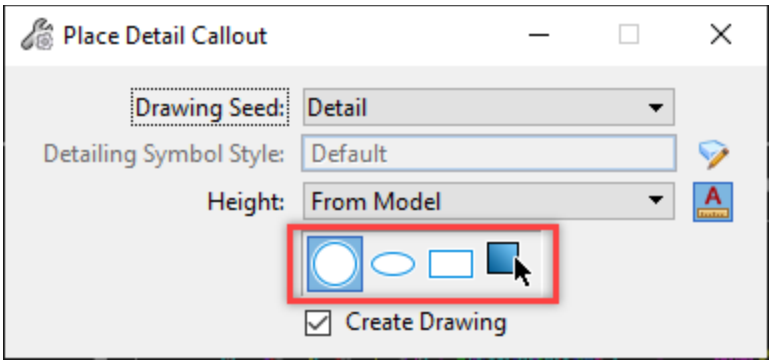


Figure 339

5. Follow the prompts.

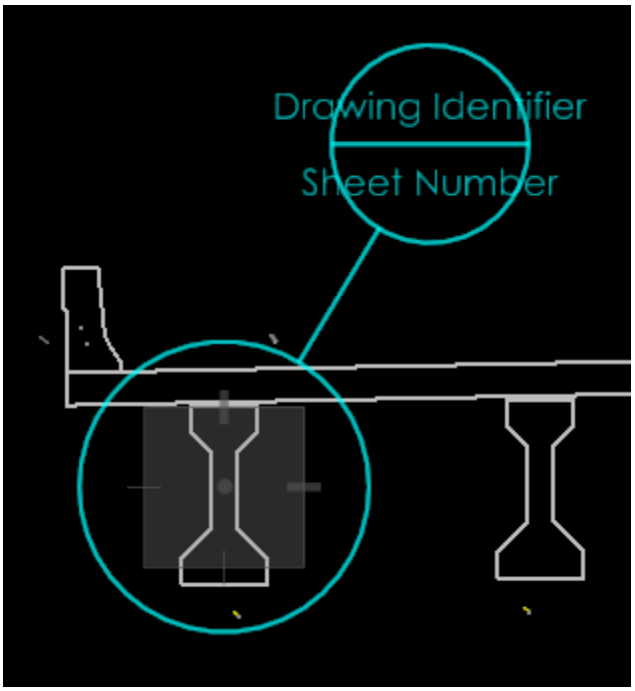


Figure 340

6. Give the Detail a ***Name*** and change **Sheets**: to ***General Plan***. Set the Detail Scale to match the Drawing Model's Annotation Scale that was set above in Step 2. Match the Drawing Model's ***Annotation Scale*** to the Detail Scale.

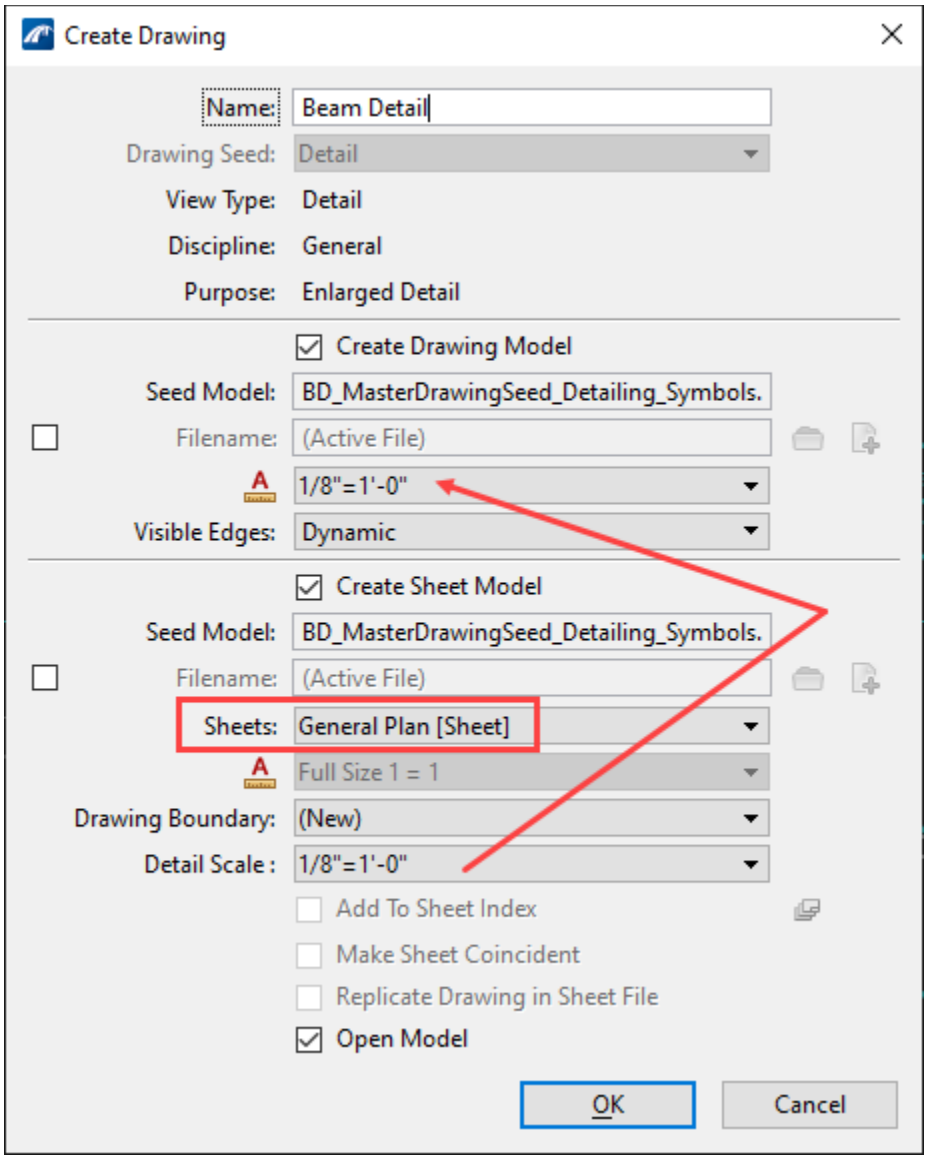


Figure 341

7. The General Plan Sheet will open. Move and Scale the Referenced Beam Detail as needed. Turn off un-needed levels and nested references. **Save Settings**.

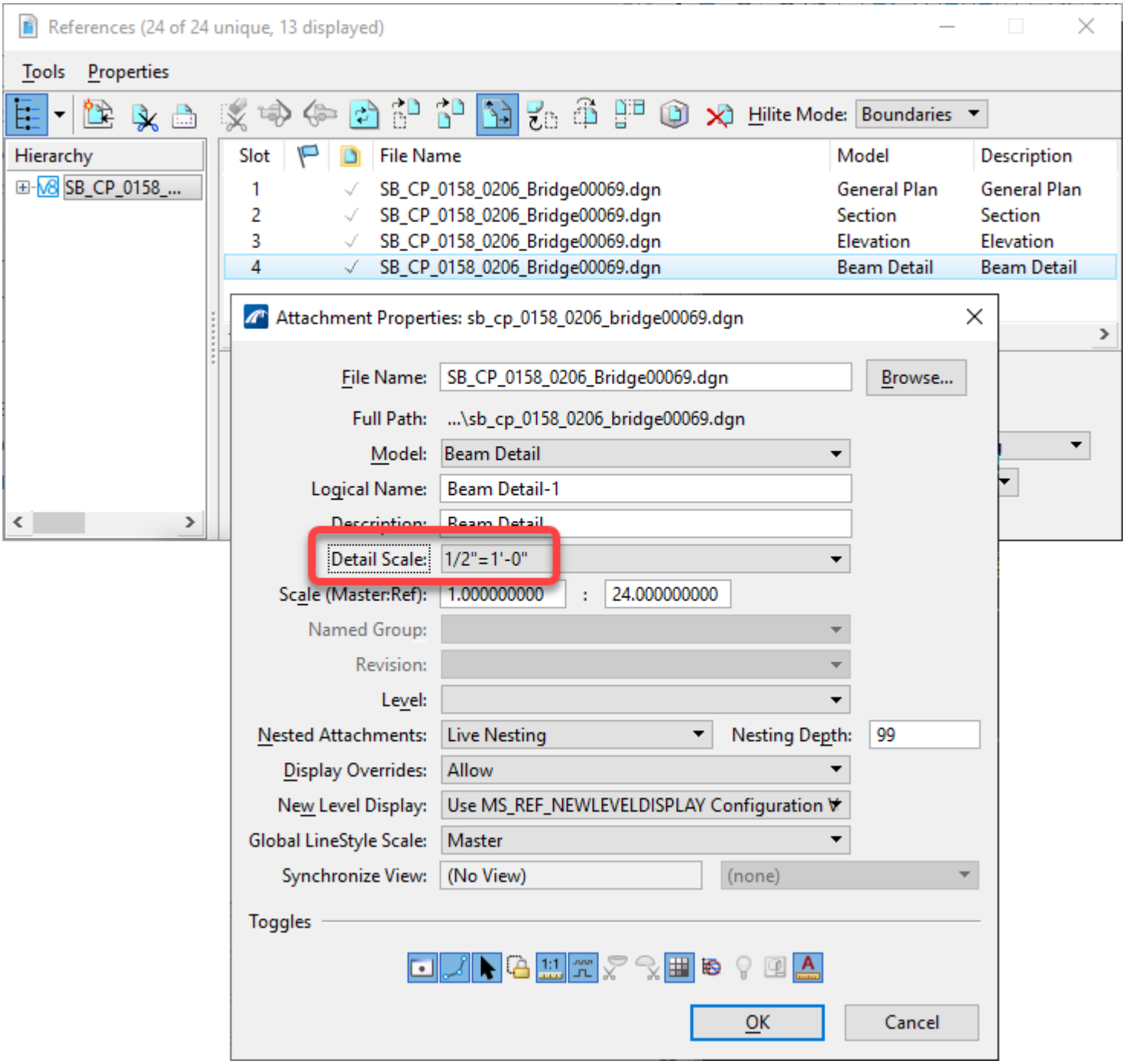


Figure 342

8. Click on the **Magnifying Glass** located on the Section Detail and click **Show Callouts**.

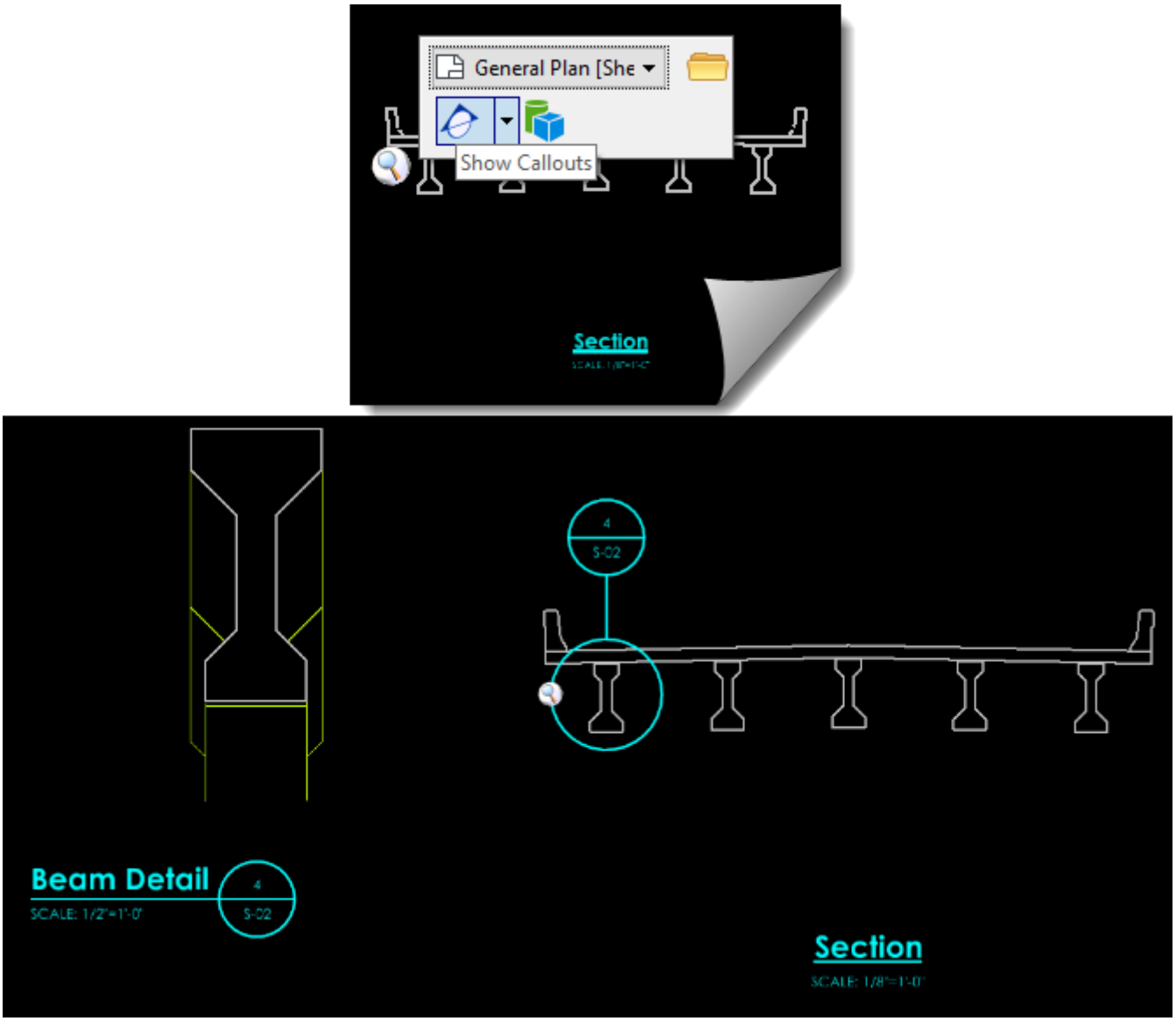


Figure 343

10.1.7 Place an Isometric View to the Sheet

1. Create a new 3D Design Model called ***Isometric View***. Edit the preset Ref Logical Name of General Plan as needed.

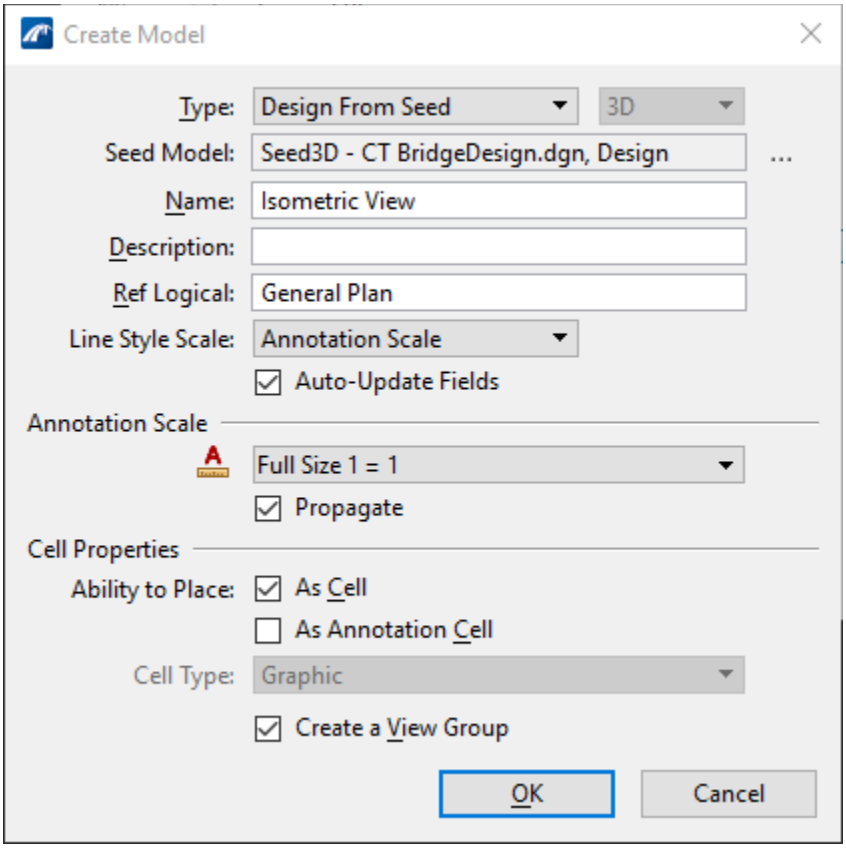


Figure 344

2. Reference in the original 3D Model named **Design** using a **Nested Depth** of ***1***. Turn off unneeded levels and reference files.
3. On the View Window select the **View Attributes** icon, choose a **Display Style**. Rotate the view as needed. **Save Settings**.

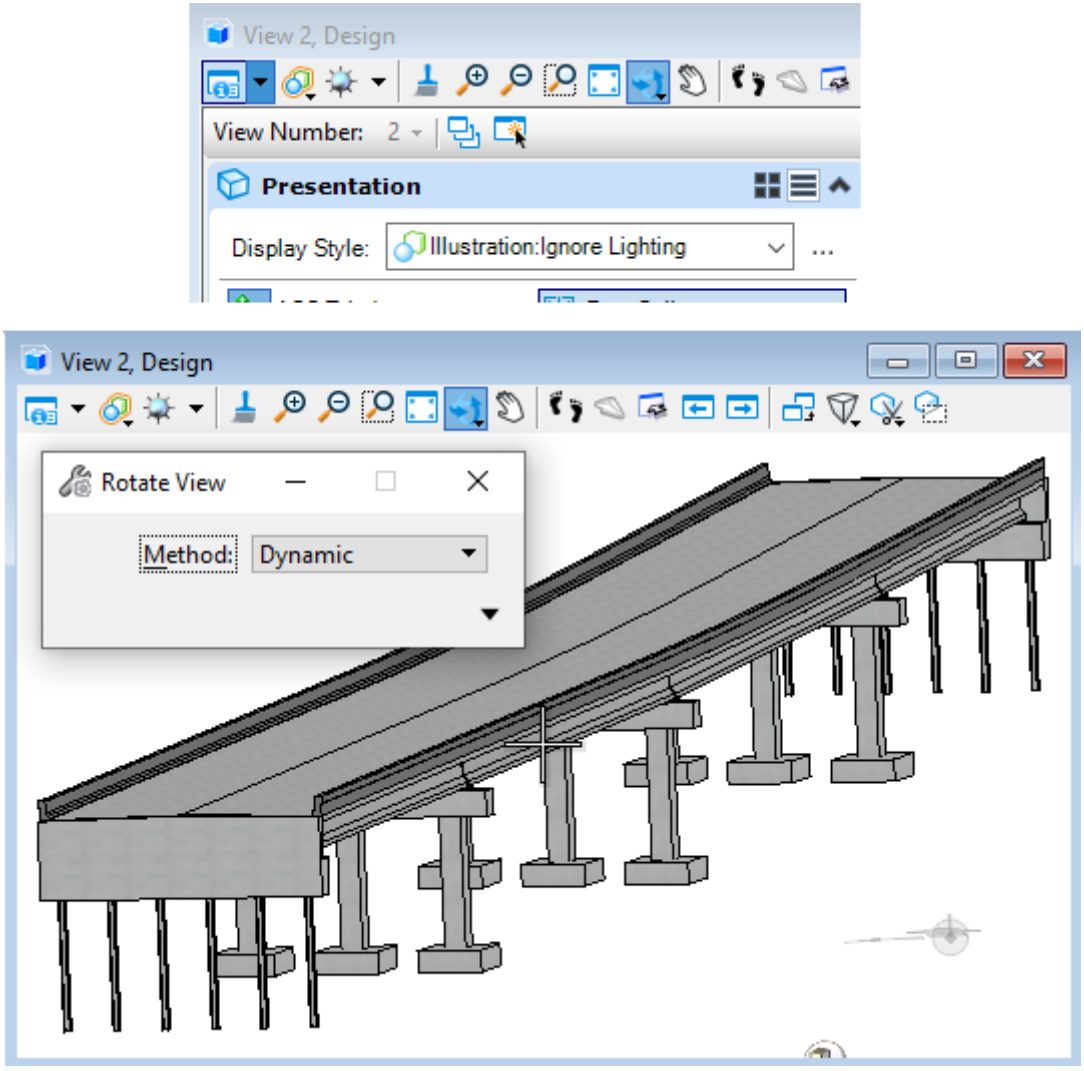


Figure 345

4. In **Search** type ***Saved Views*** and select the result. In the **Saved Views** dialog box click on the **Create Saved View** icon. Give your view a ***name*** and follow the prompts to create a Saved View.

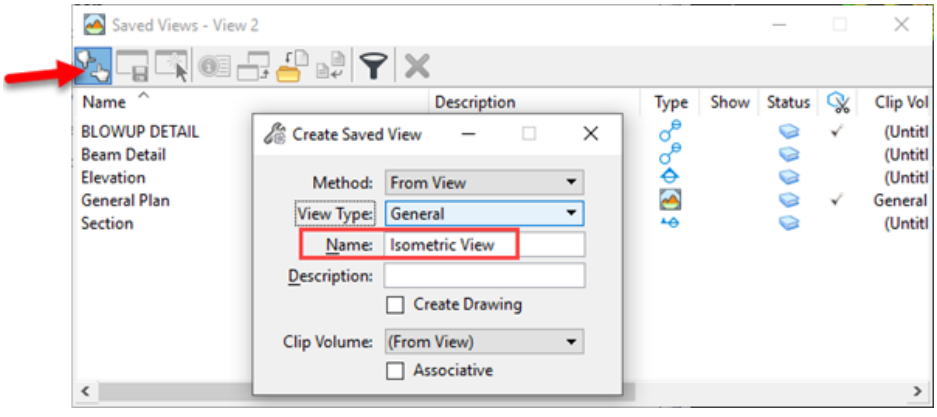


Figure 346

5. Open the General Plan Sheet Model.
6. In **Search** type ***Detailing Symbol Styles*** and select the result. In the **Detailing Symbol Styles** dialog box activate the **Center Title Detailing Style**.

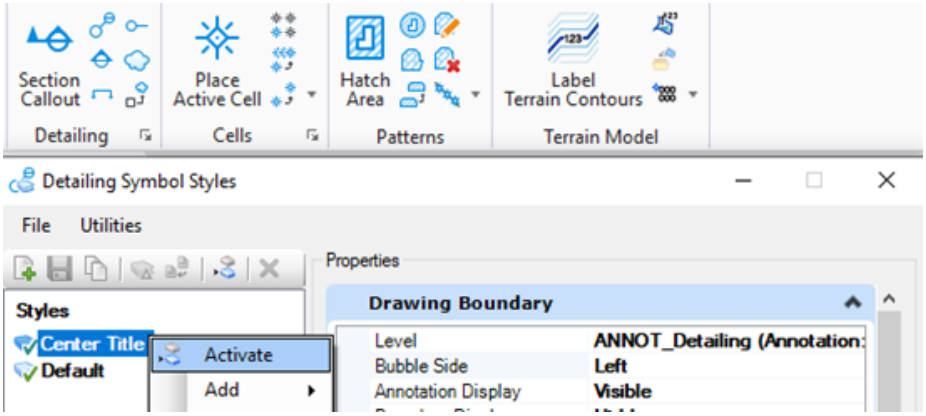


Figure 347

7. Reference the Saved View using the following settings:

- **Model: *Isometric View***
- **Orientation: *Isometric View***
- **Detail Scale: *1/16" = 1'-0"***
- **Nesting Attachments: *Live Nesting***
- **Nesting Depth: *2***

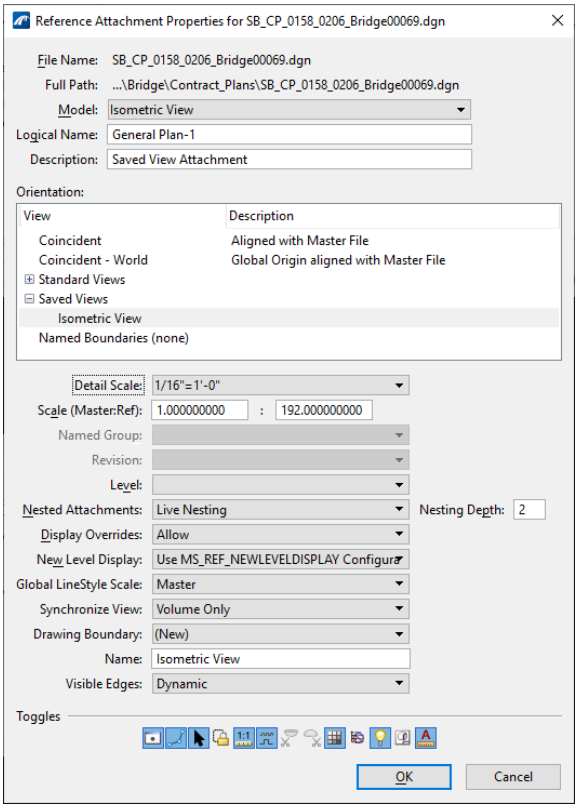


Figure 348

8. Move the Reference in the sheet as needed. **Save Settings**.

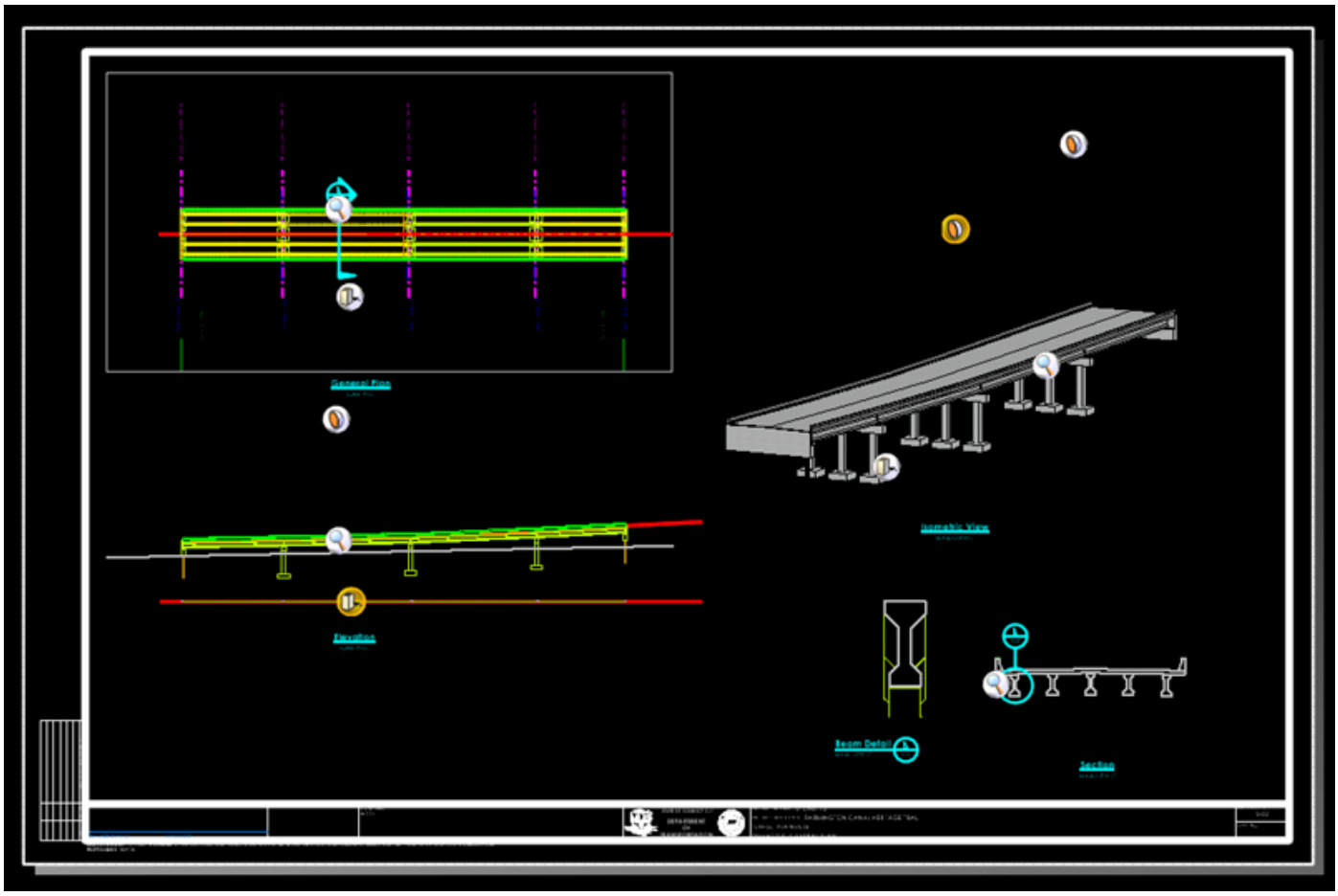


Figure 349

10.1.8 Annotate the Models

Most annotations for a detail should occur in the drawing model if there is one. The only annotation on the sheet model will be things like general notes, sheet border annotation, table of quantities, etc.

1. Open the desired Drawing or Sheet Model. Select the **CTDOT** Workflow and choose the **CTDOT** tab. In the **Dimensioning** section start by selecting the **Horizontal Text** icon and select the desired accuracy. This will set the proper dimension style and Level.
2. Second select the needed **Dimensioning Tool**.
3. Follow the prompts to place a dimension.

Figure 350

4. Select the **CTDOT** Workflow and choose the **CTDOT** tab. In the **Annotation** section select **Place Table**. There is a table seed for the General Notes available in the Table Tool. On the Place Table Dialog Box select **Seed: *General Notes*** and proceed to place the table.

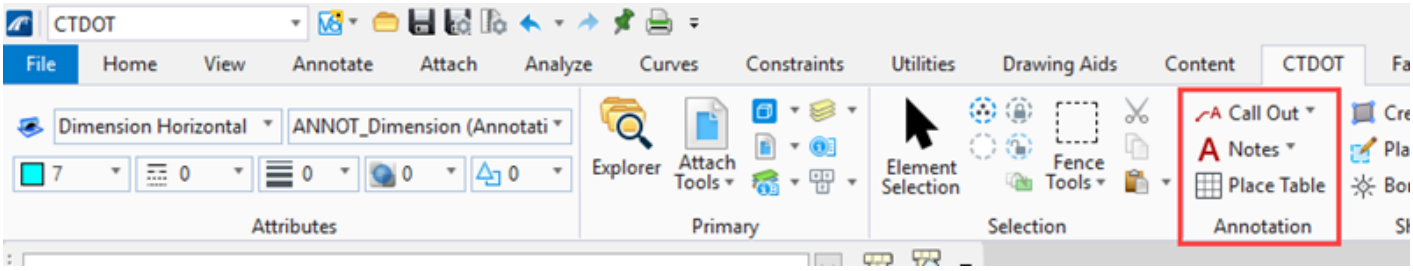


Figure 351

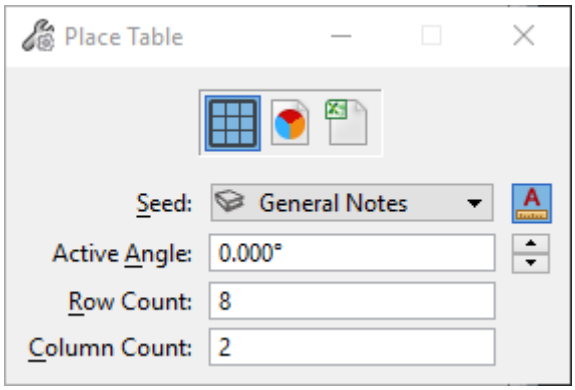


Figure 352

5. In the same **Annotation** section select the pull-down menus for **Call Outs** and **Notes** to place the needed annotation.
6. To place a call out with an inserted symbol use the following procedure. In the Annotation Section of the CTDOT tab select the Call Out Tool **Label Small (Weight 0)**

   Note: *Selecting the (Weight 0) options places the leader at a line weight of 0 and selecting the (Weight 2) options places the leader at a line weight of 2.*
7. In the Text box type the following: ***SYMMETRICAL ABOUT CL FIELD SPLICE***
8. In the Text box select only the ***CL*** text, select the **Insert Text Favorite** tool and scroll down to ***Symbol CL – Small***. The CL text will be replaced with the required Symbol.

   Note: Use the Text Favorite ***Symbol CL – Small*** in conjunction with Text Style **CTDOT_080** and ***Symbol CL*** for Text Style ***CTDOT_120***.
9. Follow the prompts to place your call out.

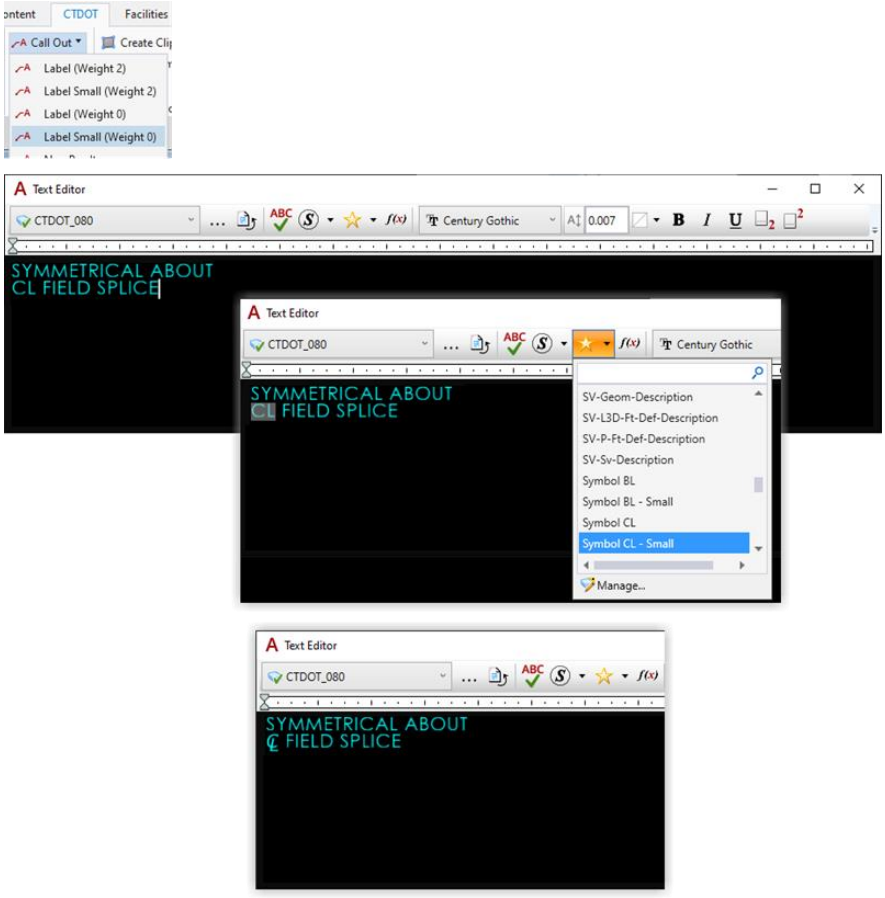


Figure 353

10.2 Civil Plans

10.2.1 View Set Up

Continue using the DGN file created in Volume 13 - M.4.1 General Plan Sheet and open the Design Model. We will use a referenced roadway alignment Base Model to create Plan, Profile and Cross Section Sheets. The (referenced) Alignment Base Model should have a horizontal alignment placed along with an active vertical alignment set. For more on creating alignment base models visit Volume 3 - Module 2 - Creating Alignments

1. The Referenced Existing Terrain should be set to active. In View 1 turn on the Reference with the needed terrain, select the terrain's boundary and on the pop-up tool select **Set As Active Terrain Model**.

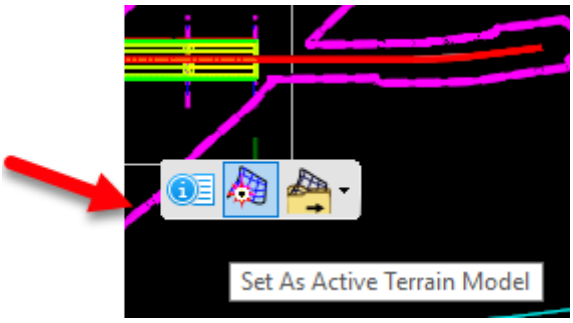


Figure 354

2. Open the Design Model, **Right click** in a View and Select **3 Views Plan/Profile/3D**.

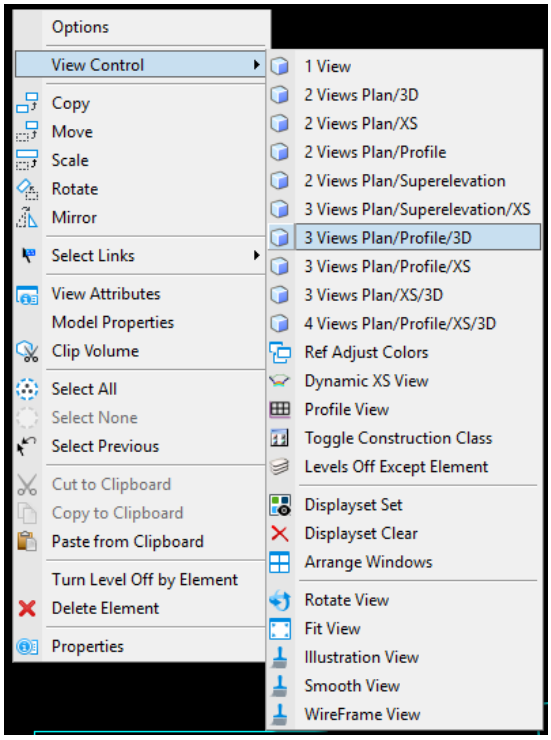


Figure 355

3. Follow the prompts to View the Profile. **Save Settings**.

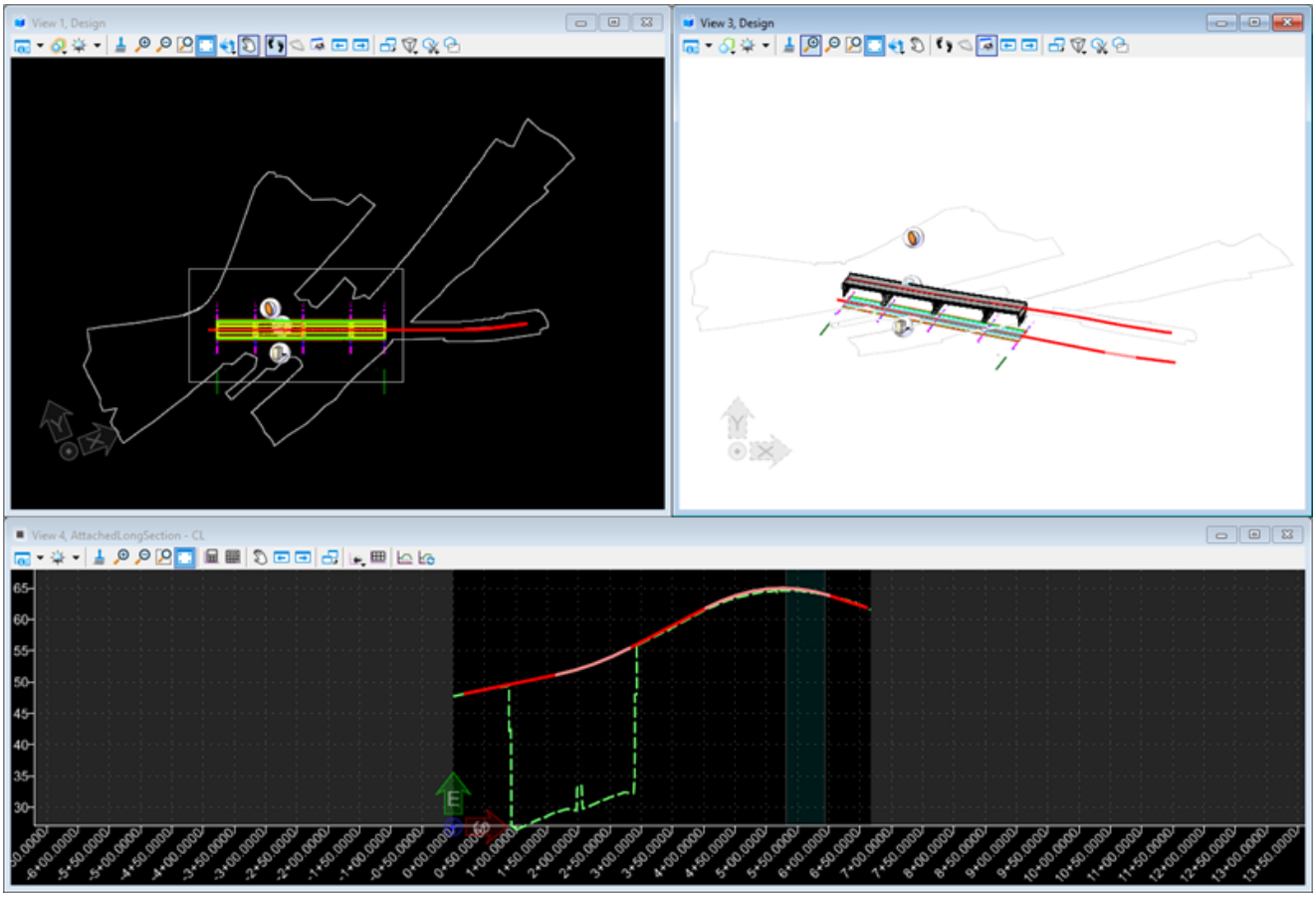


Figure 356

4. In View Group notice a ***Multi-Model View*** has been created.

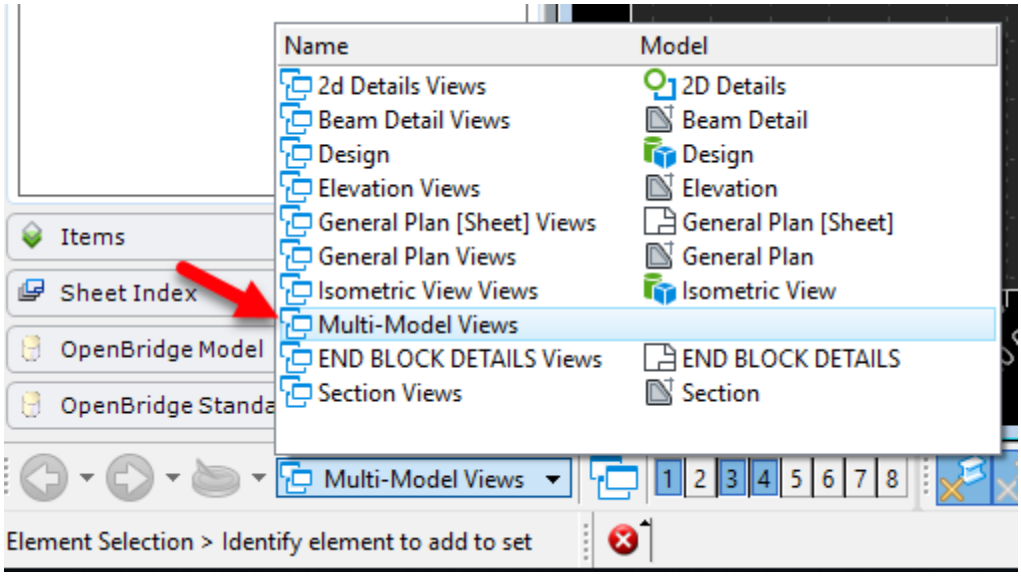


Figure 357

10.2.2 Create Civil Plan Sheet

1. In View Group select the **Multi-Model View**.

2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section. Select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear. In the Place Named Boundary dialog box set the following options:
   - **Method (icon):** ***Place Named Boundary Civil Plan***
   - **Drawing Seed:** ***Select the desired scale***
   - **Name:** ***Plan 1***
   - **Group:** ***(New)***
   - **Name:** ***Match alignment name*** (Clicking on the horizontal alignment will also populate this name field with the name of the horizontal alignment.)
   - **Length:** ***Use Default Value or adjust as needed*** (length of alignment on one sheet).
   - **Left Offset:** ***Use Default Value or adjust as needed*** (offset from the alignment).
   - **Right Offset:** ***Use Default Value or adjust as needed*** (offset from the alignment).
   - **Overlap:** ***0*** (value of sheet overlapping the other)
   - **Boundary Chords:** ***Use Default Value or adjust as needed.***
   - **Create Drawing:** ***Enabled*** (so that the sheets are created as soon as the named boundaries are created)
   - **Show Dialog:** ***Enabled*** (used to override settings defined by the Drawing Seed if needed)
3. In the Plan view select the alignment along which the plan named boundaries will be created. The command line (lower left corner) will read: ***Place Named Boundary Civil Plan > Identify Path Element***. With the cursor, select the alignment.
4. Select the desired Start Location. Follow the prompts. Command Line: ***Place Named Boundary Civil Plan > Accept/Reject. Identify Path start point to place boundary***. Follow the prompts.
5. ***Note:*** *Add extra to the left of the start of your Stationing, example: Beginning Station is 100+00, at Start Location type in 99+00, this will move the named boundary to the left of the start of alignment. Bring your cursor back into the dialog box, enter the Start Station, click the Tab button, back in the view left click to Accept.*
6. Next select the ***Stop Location***. Command Line: ***Place Named Boundary Civil Plan > Identify Path end point to place boundary***. The named boundaries are displayed interactively as the cursor moves. Accept the endpoint location for the named boundary. Command Line: ***Place Named Boundary Civil Plan > Accept/Reject. Datapoint point in Plan View to place boundary. Identify Path end point to place boundary.***

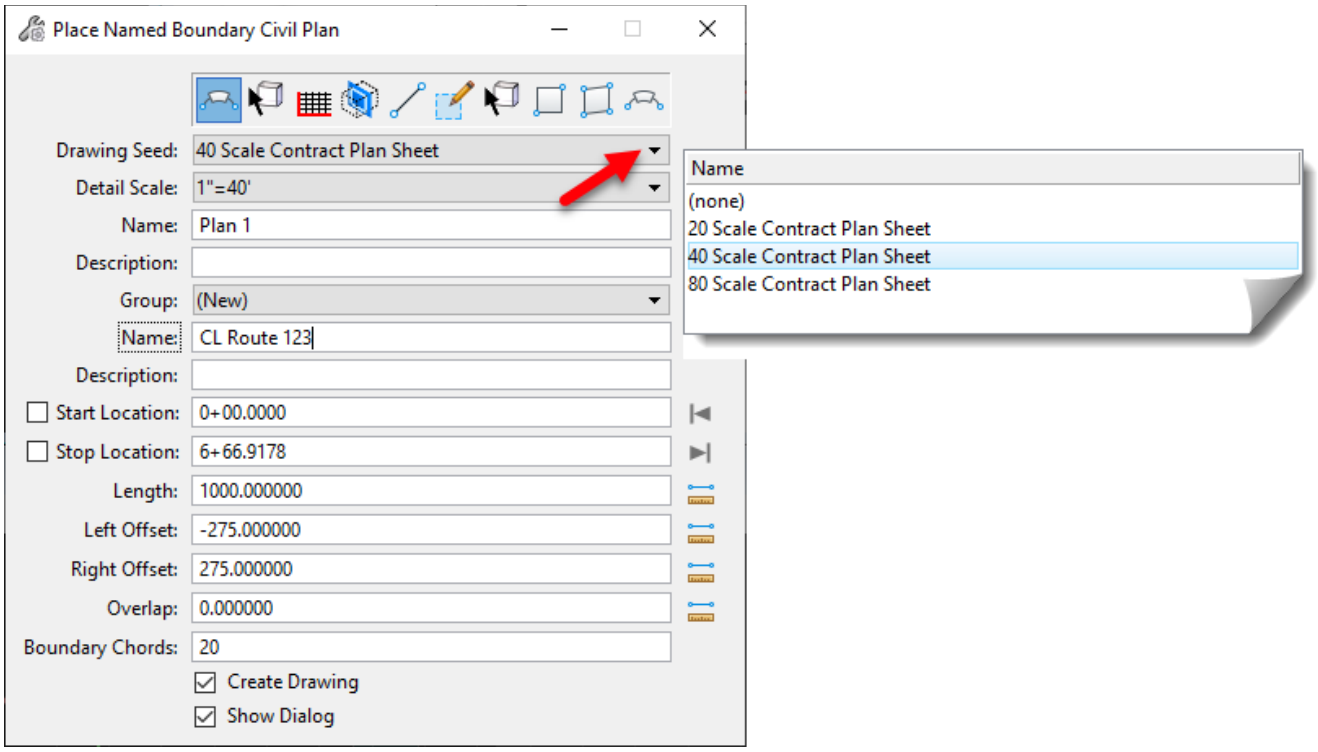
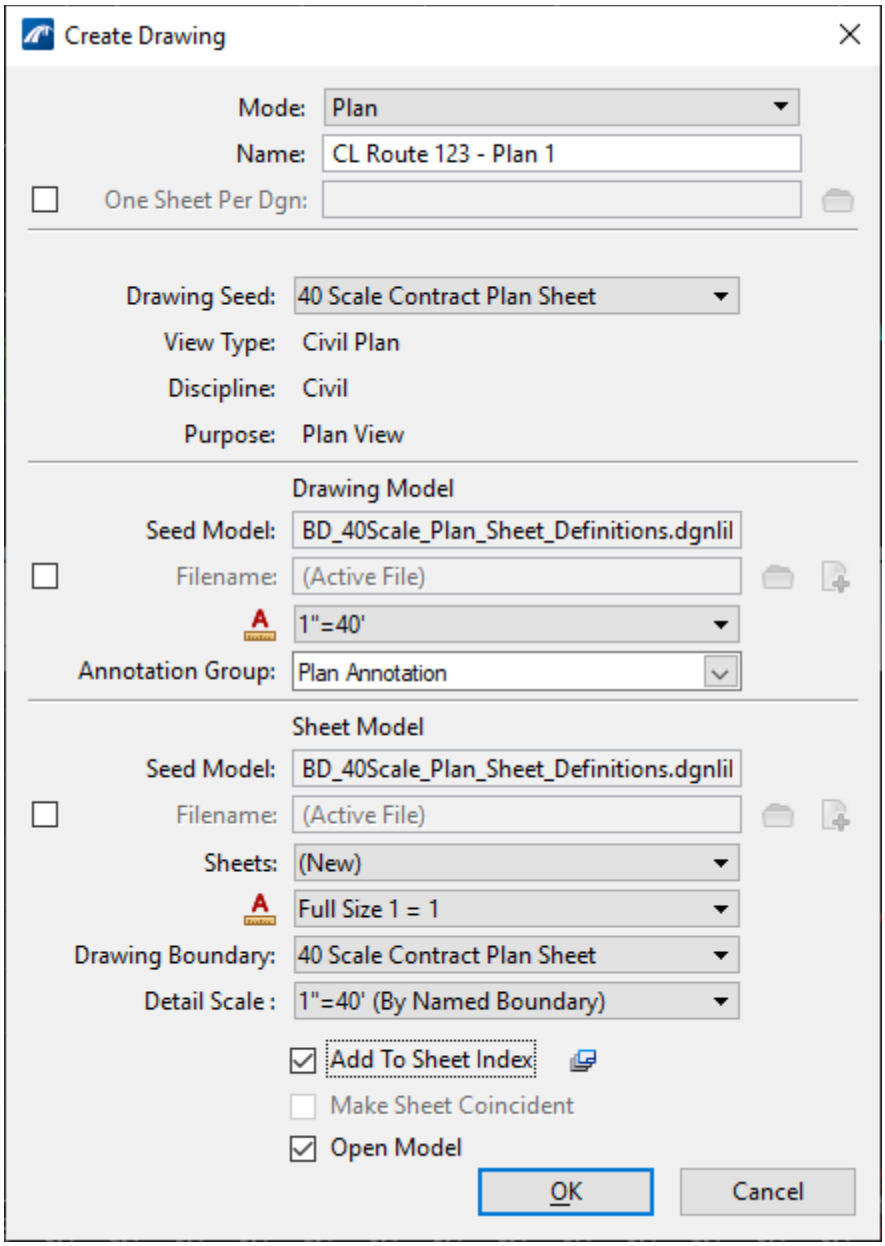


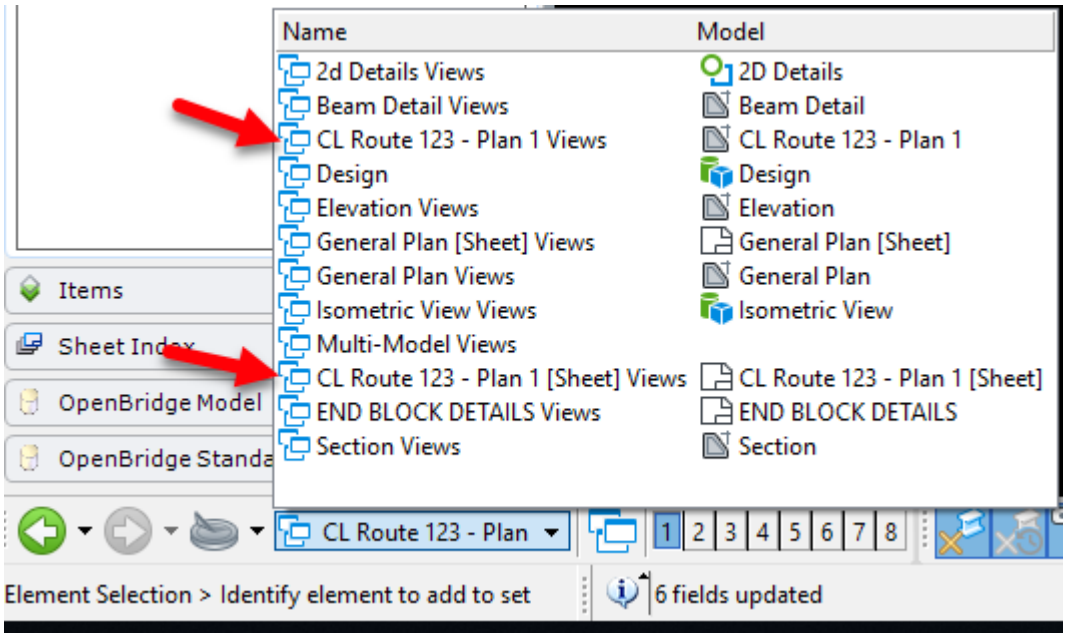
Figure 358

7. The **Create Drawing** dialog box will appear. Leave all the top settings as is.
8. Enable the ***Add to Sheet Index*** and the ***Open Model*** options.
9. Click **OK** to create the sheets. Follow the prompts in the lower left corner left click to define the named boundaries. Multiple left clicks may be required.

10. 

11. *Figure 359*

12. In the View Group dialog, you can now see the newly created drawing model(s) and sheet model(s).

13. 

14. *Figure 360*

10.2.3 Create Civil Profile Sheet

1. In View Group select the **Multi-Model View**.
2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the **Place Named Boundary** tool and the Place Named Boundary dialog box will appear. In the Place Named Boundary dialog box set the following options:
   - **Method (icon):** ***Place Named Boundary Civil Profile.***
   - **Drawing Seed:** ***Select the desired scale.***
   - **Name:** ***Profile 1***
   - **Method:** ***Choose Station Limits*** or ***From Plan Group*** (The From Plan Group method matches the profile named boundaries to the plan named boundaries. The Station Limits method is used to defined profile named boundaries that are not matched to plan boundaries.)
   - **Group:** ***(New)***
   - **Name:** ***Match alignment name*** (Clicking on the horizontal alignment will also populate this name field with the name of the horizontal alignment.).
   - **Length:** ***Use Default Value or adjust as needed.***
   - **Vertical Exaggeration:** ***10***
   - **Available Profile Height:** ***Use Default Value or adjust as needed.***
   - **Top Clearance:** ***(toggled on) Use Default Value or adjust as needed.***
   - **Bottom Clearance:** ***(toggled on) Use Default Value or adjust as needed.***
   - **Elevation Datum:** ***Use Default Value or adjust as needed.***
   - **Station Datum:** ***Use Default Value or adjust as needed.***
   - **Use Terrains:** ***Enabled***

- **Use Active Vertical:** ***Enabled***
- **Create Drawing:** ***Enabled***
- **Show Dialog:** ***Enabled***

Follow the prompts in the lower left corner left, Command Line: ***Place Named Boundary Civil Profile > Identify Profile View*** click in the Profile View to define the named boundaries. More than one click is required.

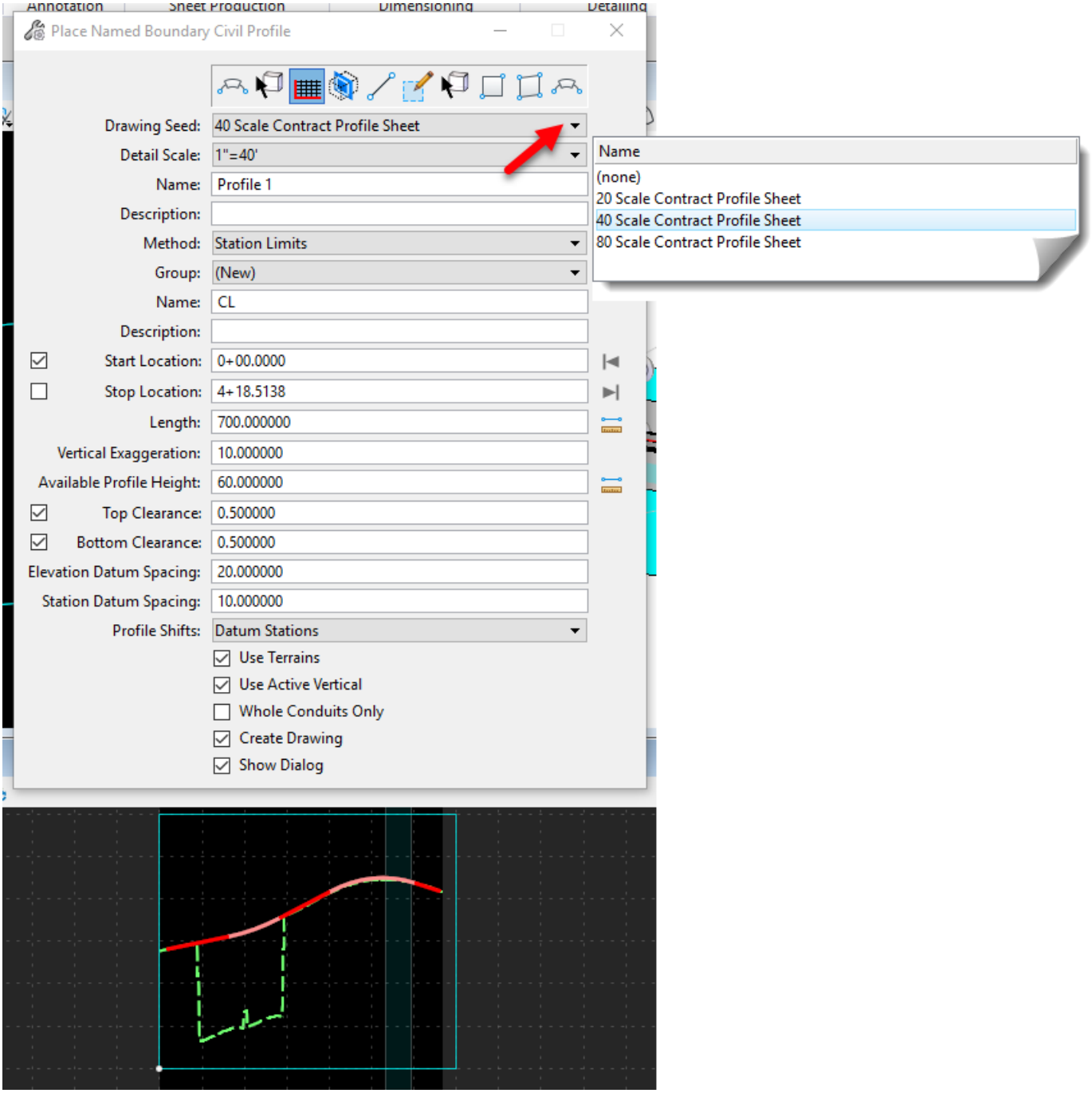


Figure 361

3. The **Create Drawing** dialog box will appear.

4. For **Sheets:** ***select a new sheet or chose to put the profile on a sheet that has already been created*****.**
5. Click **OK** to create the sheets. Follow the prompts in the lower left corner left click to define the named boundaries. Multiple left clicks may be required.

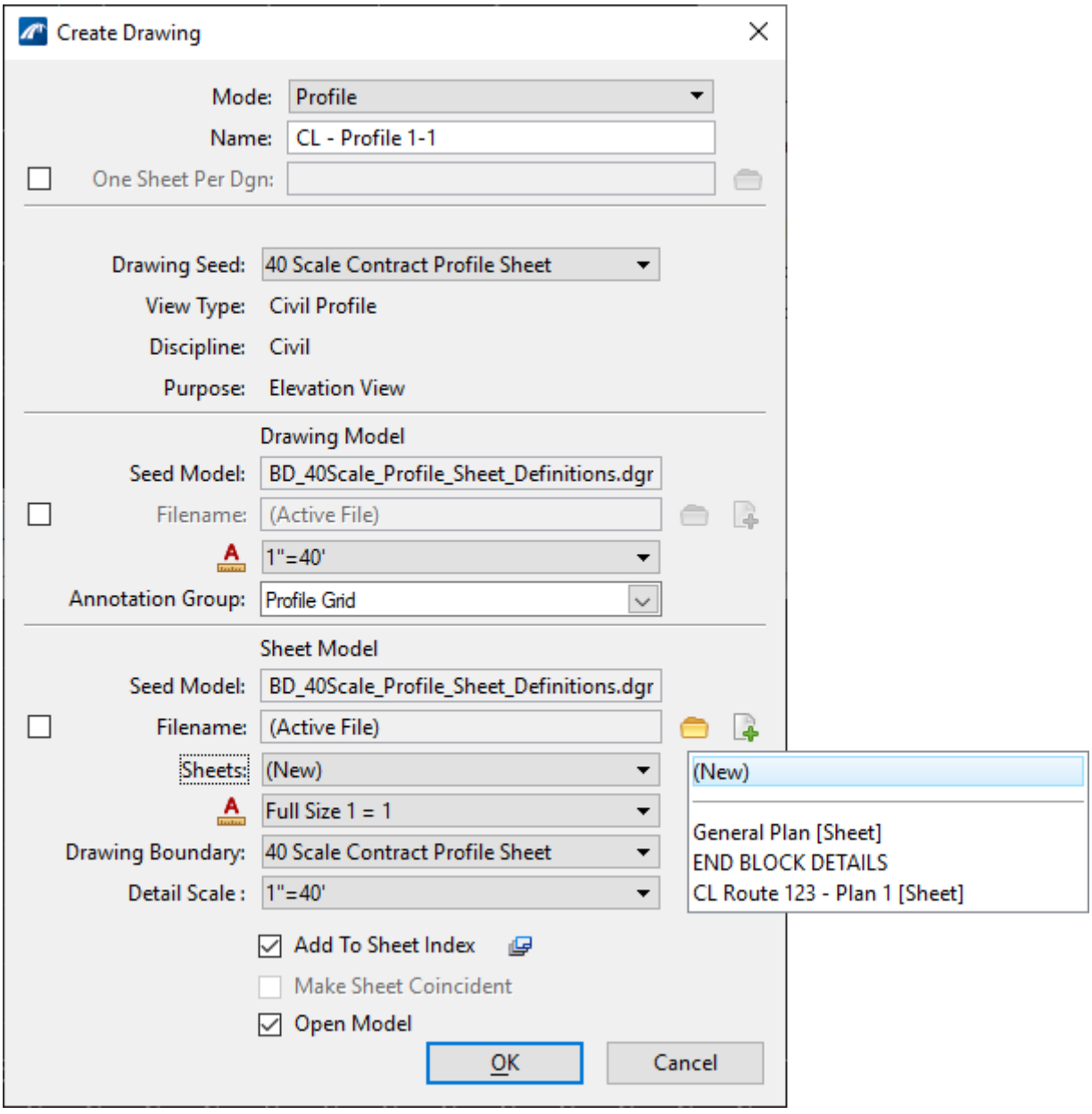


Figure 362

Please visit modules in OpenRoads Drawing Production for further instruction on the following items:

Review Plan and Profile Sheets

Review Named Boundaries

Adjust Sheet Layout

10.2.4 Create Civil Cross Section Sheets

We will use the Referenced Roadway/Bridge Alignment Base Model to create Profile Sheets. The (referenced) Alignment Base Model should have a horizontal alignment placed along with an active vertical alignment set.

1. In View Group select the **Multi-Model View**.
2. Select the **CTDOT** workflow and on the **CTDOT** tab locate the **Sheet Production** section and select the ***Place Named Boundary*** *tool*. In the Place Named Boundary dialog box set the following options:
   - **Method (icon): *Place Named Boundary Civil Cross Section.***
   - **Drawing Seed: *Select the desired scale.***
   - **Group: *(New)***
   - **Name: *Match the alignment name*** (Clicking on the horizontal alignment will also populate this name field with the name of the horizontal alignment.).
   - **Create Drawing: *Enabled***
   - **Show Dialog: *Enabled***

     The drawing seed has been set-up for the ANSI D size paper (34"x22"), and defaults include:
   - **Named Boundary**, for left and right offsets, section intervals, vertical exaggeration, and top and bottom clearances between sections (these can be changed if needed).
   - **Include Control Points**, these are usually the PC's, PI's, PT's of the horizontal alignment.
   - **Include Event Points Only**, this will require the user to establish an Event Point List (drainage crossings as example).

3. In the 2D view (default plan view), select the alignment along which the named boundaries (sheets) will be created. The command line (lower left corner) will read: ***Place Named Boundary Civil Cross Section > Identify Path Element***. With the cursor select the horizontal alignment. Now a light blue line should be visible on the

cursor. This allows the user to pick the start and stop locations of the named boundaries for cross sections.

4. Select the desired Start Location. Follow the prompts. Command Line: ***Place Named Boundary Civil Cross Section > Accept/Reject. Identify Path start point to place boundary***.

5. Next select the ***Stop Location***. Command Line: ***Place Named Boundary Civil Cross Section > Identify Path end point to place boundary***. The named boundaries are displayed interactively as the cursor moves. Accept the endpoint location for the named boundary. Command Line: ***Place Named Boundary Civil Cross Section > Accept/Reject. Datapoint point in Plan View to place boundary. Identify Path end point to place boundary.***

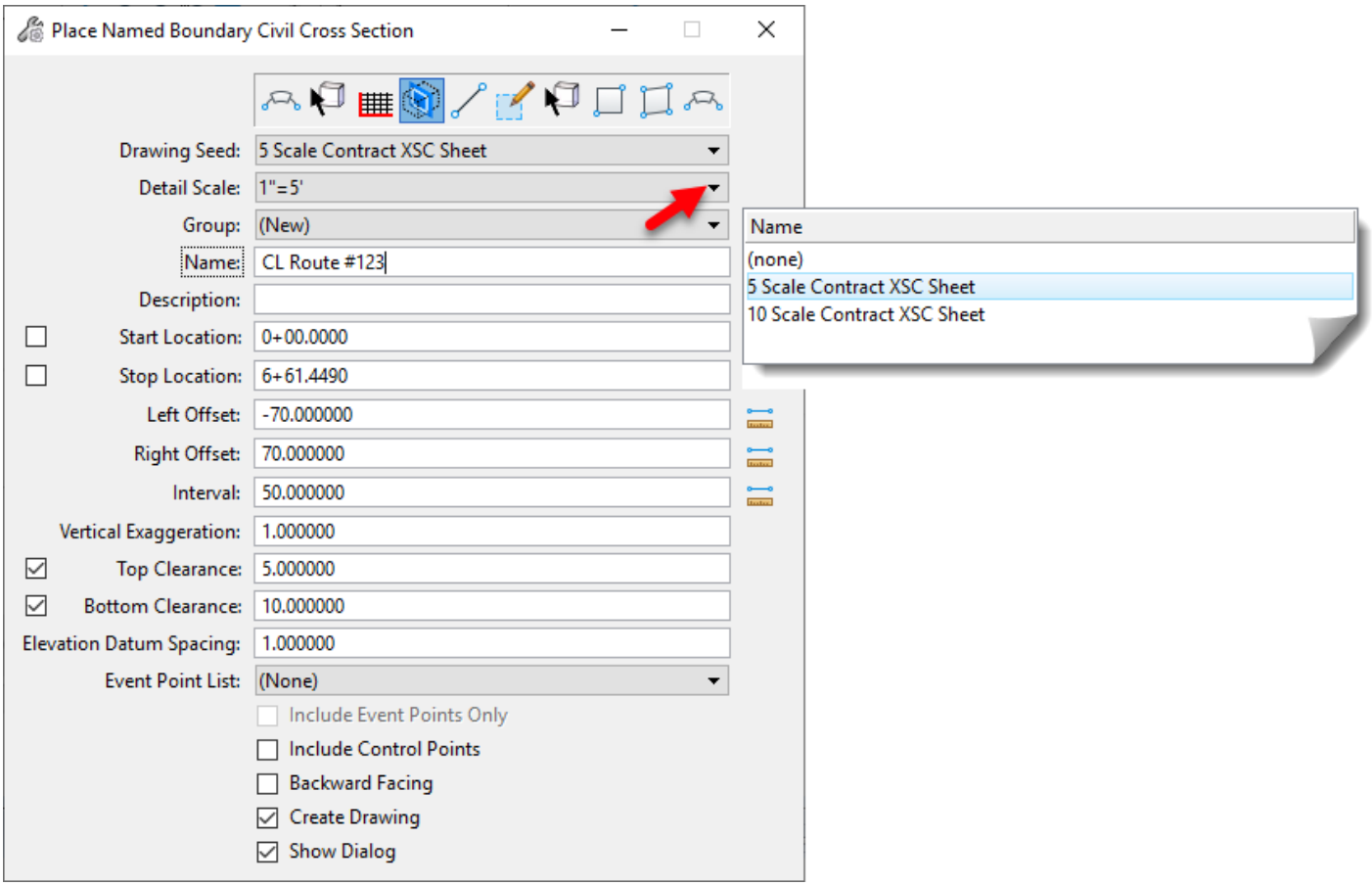


Figure 363

6. The **Create Drawing** dialog box will appear.

7. Click **OK** to create the sheets. At the bottom of the view windows, a gage will appear showing the progress of Sheets Created and then the progress of Drawing Models Annotated. When all is completed the last cross section sheet will be open.

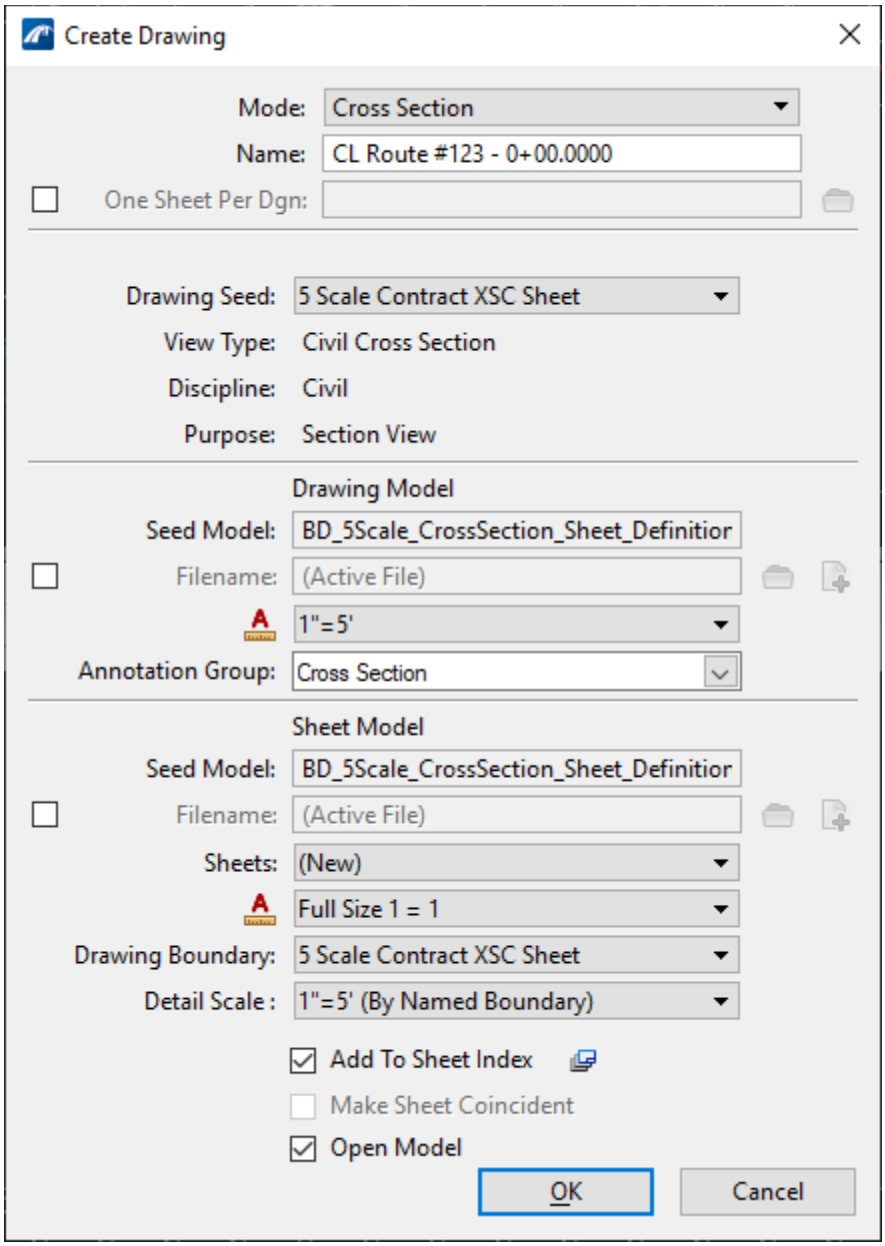

Create Drawing
Mode:
Cross Section
Name:
CL Route #123 - 0+00.0000
One Sheet Per Dgn:
Drawing Seed:
5 Scale Contract XSC Sheet
View Type:
Civil Cross Section
Discipline:
Civil
Purpose:
Section View
Drawing Model
Seed Model:
BD_5Scale_CrossSection_Sheet_Definitior
Filename:
(Active File)
1"=5'
Annotation Group:
Cross Section
Sheet Model
Seed Model:
BD_5Scale_CrossSection_Sheet_Definitior
Filename:
(Active File)
Sheets:
(New)
Full Size 1 = 1
Drawing Boundary:
5 Scale Contract XSC Sheet
Detail Scale :
1"=5' (By Named Boundary)
Add To Sheet Index
Make Sheet Coincident
Open Model
OK
Cancel

Figure 364

10.3 Detail Sheets from 2D Drawings

1. Continue using the DGN file created in Volume 13 - M.4.1 General Plan Sheet. Create a new Sheet Model, using the ***Seed2D – CT BridgeSheet.dgn, Sheet*** seed file.

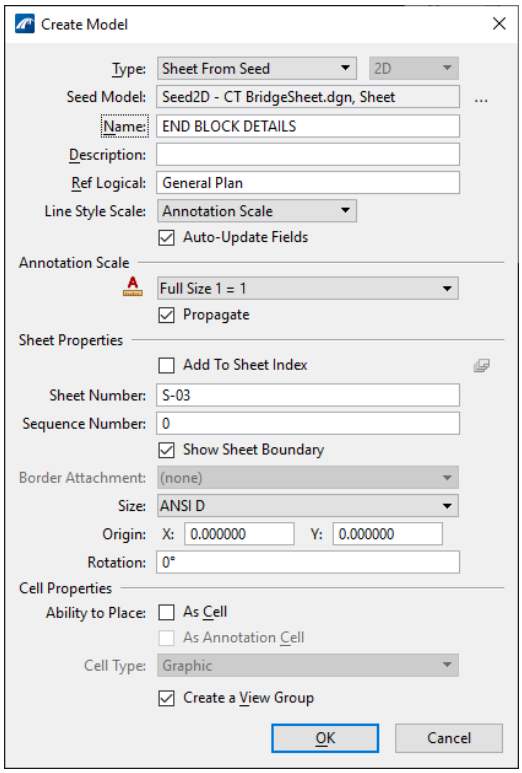


Figure 365

2. Create a new 2D Design Model, using the ***Seed2D – CT BridgeDesign.dgn, 2D Design*** seed file.

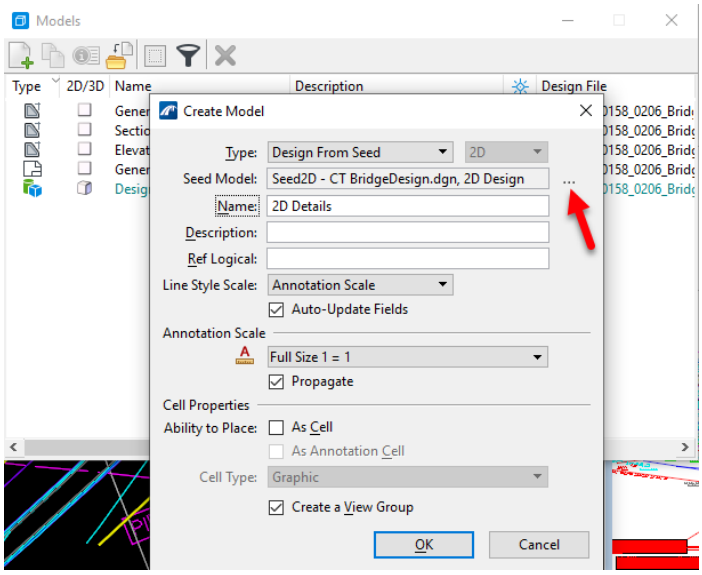


Figure 366

3. In the new 2D Design Model activate the **CTDOT Workflow**. On the **Home** tab, use the Placement, Manipulate and Modify tools to draft the line work for the Details. Multiple details can be placed in this design model as these will all be placed at their true size 1:1. For this exercise you will need to create at least 2 details. There will be no dimensioning or text placed in this model, all annotation will be in the Sheet Model that will reference the 2D design model's line work.
4. In search type ***Detailing Symbol Styles***. Select the result and the dialog box will open. Right click on ***Center Style*** and select ***Activate***.
5. On the **CTDOT** Tab, **Sheet Production** section select **Create Clipping Shape,** this will set the correct level for the clipping shape. In the same section select the **Place Named Boundary** tool.

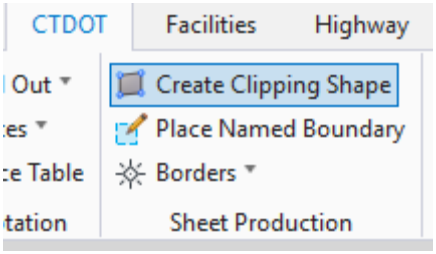


Figure 367

6. On the Place Named Boundary dialog box select the **By Two Point** icon, Name the Detail (***DETAIL - TYPICAL PARAPET END***) and make sure **Create Drawing** is on. Follow the prompts and place a shape around one of the details.

   On the Place Named Boundary dialog box set:

   Drawing Seed: ***Place Sheet Only (Named Boundary).***

   Sheets: ***Select the Sheet Model created in step 1 of this section.***

   Detail Scale: ***As needed.***

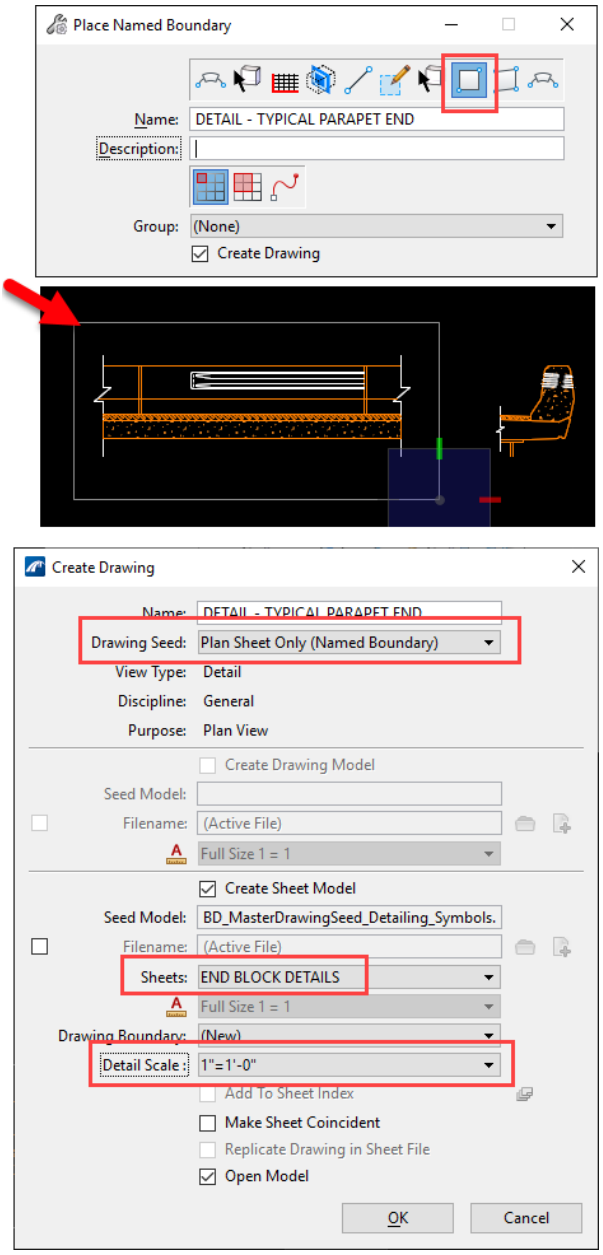


Figure 368

7. The sheet Model will open, move the referenced detail to the desired location inside the sheet.
8. Open the 2D Design Model to create another Named Boundary.
9. Activate the ***Default*** Detailing Symbol Style.
10. On the **CTDOT** Tab, **Sheet Production** section select **Create Clipping Shape,** this will set the correct level for the clipping shape. In the same section select the **Place Named Boundary** tool.
11. On the Place named Boundary dialog box select the **By Two Point** icon, Name the Detail (***SECTION – R-B 350 ATTACHMENT***) and make sure **Create Drawing** is on. Follow the prompts and place a shape around another detail.

    On the Place Named Boundary dialog box set:

    Drawing Seed: *Place Sheet Only (Named Boundary).*

    Sheets: *Select the Sheet Model created in step 1 of this section.*

    Detail Scale: *As needed.*

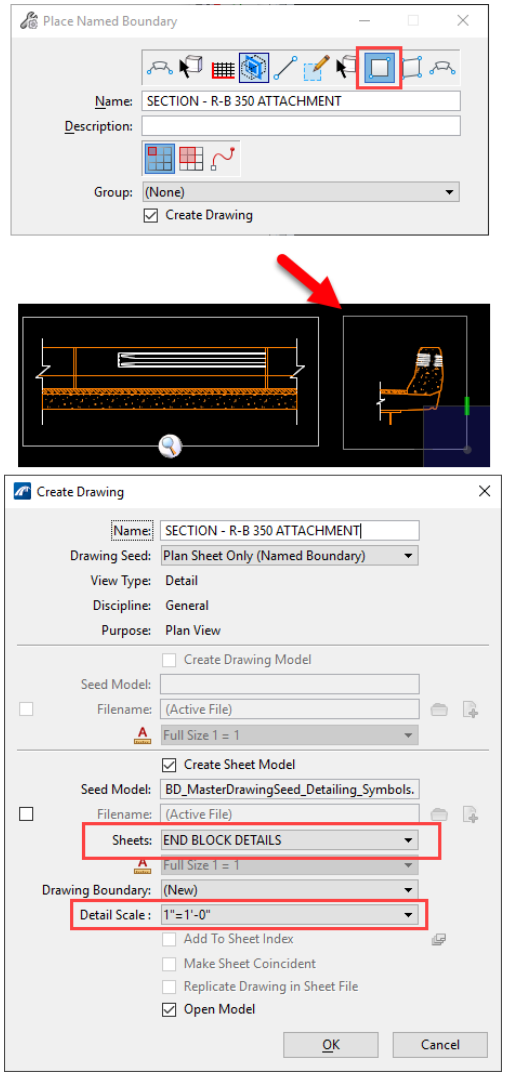


Figure 369

12. The Sheet Model will open, move the referenced detail to the desired location inside the sheet.

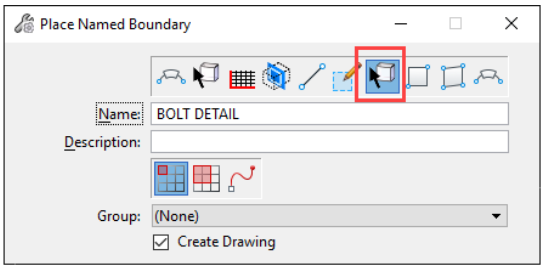
13. Open the 2D Design Model to create another Named Boundary, assure the Named Boundary Element Template is active. Zoom in and place a circle around a portion of a detail. On the Place Named Boundary dialog box select the **By Element** icon. Give the detail a name (***BOLT DETAIL***). Use a Detail Scale to enlarge the size on the Sheet.

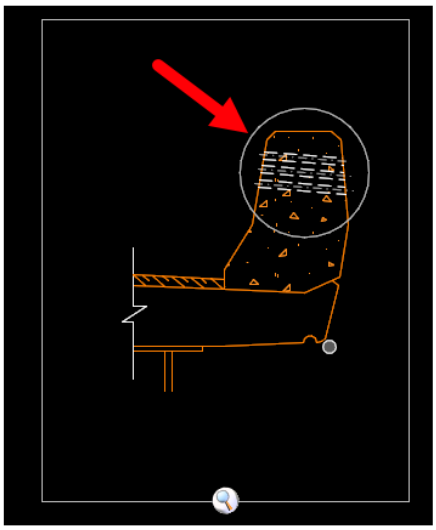
    On the Place Named Boundary dialog box set:

    Drawing Seed: ***Place Sheet Only (Named Boundary).***

    Sheets: ***Select the Sheet Model created in step 1 of this section.***

    Detail Scale: ***As needed.***





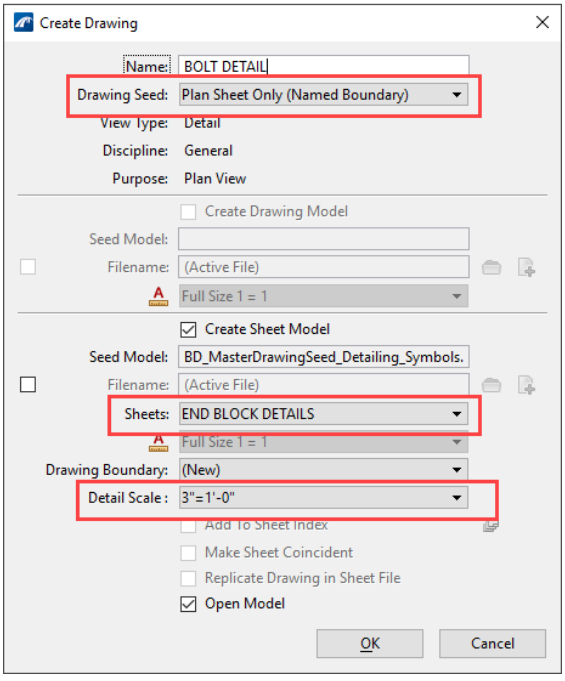


Figure 370

14. In the Sheet Model place dimensions on both details (the full detail and the blown-up detail, notice they both dimension correctly even though they are two different sizes on the sheet.

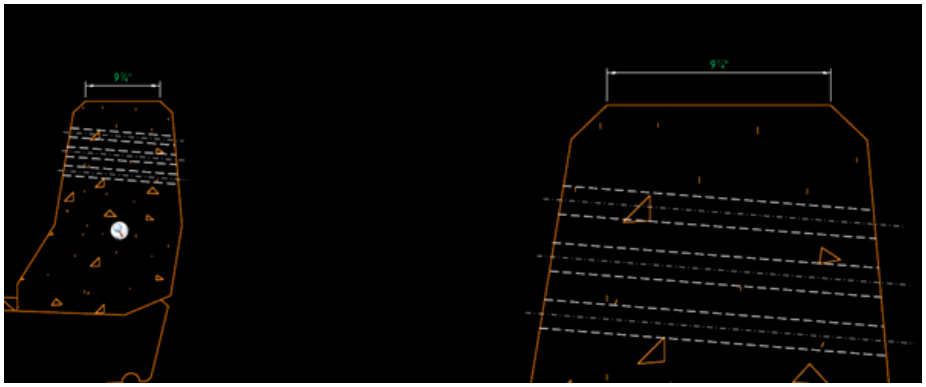


Figure 371

15. Use the **Section Call Out** tool and place a Detailing Symbol to indicate cut section. Edit the text in the Bubble to indicate the Detail it is referring to.

16. To Create a Step or a Gap in a Section or Plan Callout do one of the following:

    Right-click the callout and select **Create Step** from the pop-up menu or **Right-click** the callout and select **Create Gap** from the pop-up menu.

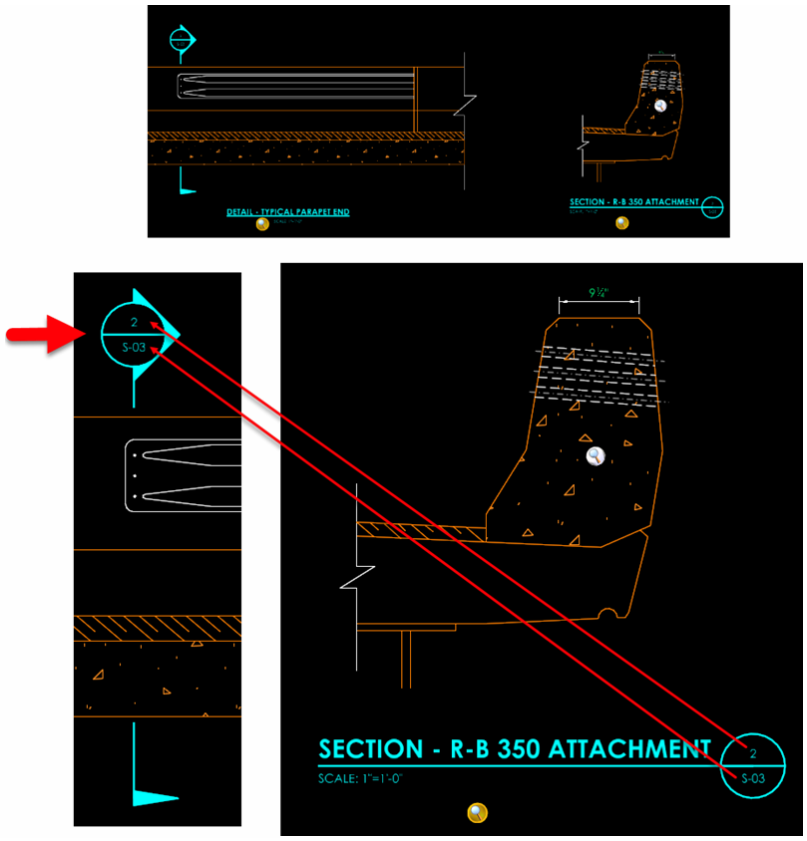


Figure 372

10.4 Place Welding Symbol

The tool **Place Welding Symbol** can be accessed through OpenBridge Designer that comes with the ProStructures component. It's important to note that users that only have OpenBridge Modeler and OpenRoads Designer installed will not be able to access this tool. This is how Bentley has decided to program and license this tool and it is no longer available as the "Detailer" MDL Application that ran on the MicroStation V8i platform. CTDOT put in a request to Bentley for a rewrite of this MDL Application to work across all their CONNECT Edition CAD programs, but they have decided to only offer it through OpenBridge Designer/ProStructures. CTDOT spent a considerable amount of time trying to get the Place Welding Symbol tool to work as well as the old MDL Detailer Application. We came up with this workflow to outline the workarounds needed until Bentley addresses the issues.

Three tools have been created on the **CTDOT** Workflow; **Bridge** Tab too address the workarounds settings for the Welding Symbol placement.

1. Set Welding Symbol Detail Accuracy
2. Label (Weight 0)
3. Open Welding Finishing Symbols

We have also placed access to the 4 Place Welding Symbol tool on the **CTDOT** workflow.

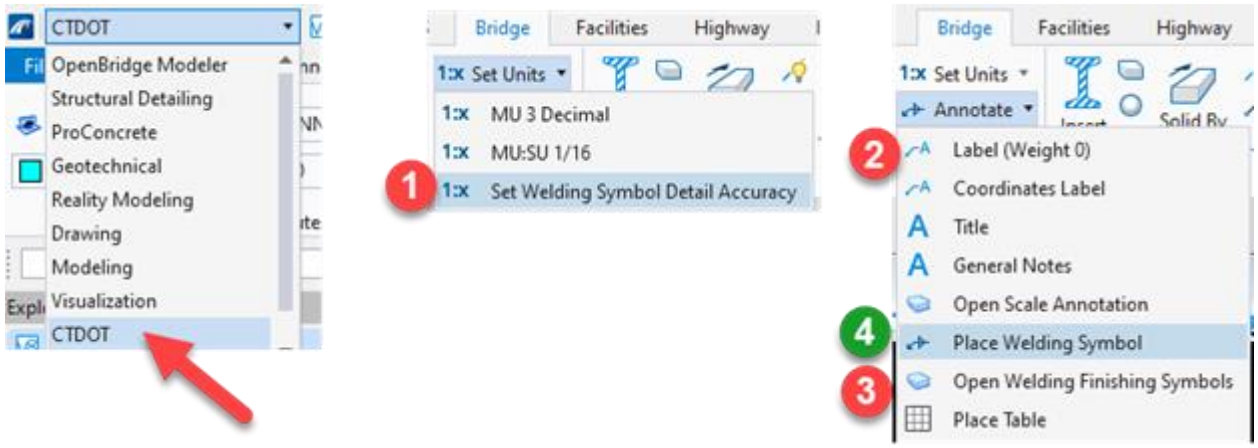


Figure 373

Steps:

1. Open the DGN File that will be used to place Welding Symbols.
2. Select the **CTDOT** Workflow, **Bridge** tab.In the **Detail** section select the **Set Units** pull down and choose **Set Welding Detail Accuracy**. This will set the Working Units to what is needed to have the numbers show correctly in the Welding Symbol.

   These are the settings that will be auto updated by the Set Welding Detail Accuracy tool:
   Format: ***MU***
   Master Unit: ***Inches*** Label: ***in***
   Sub Unit: ***Inches*** Label: ***in***

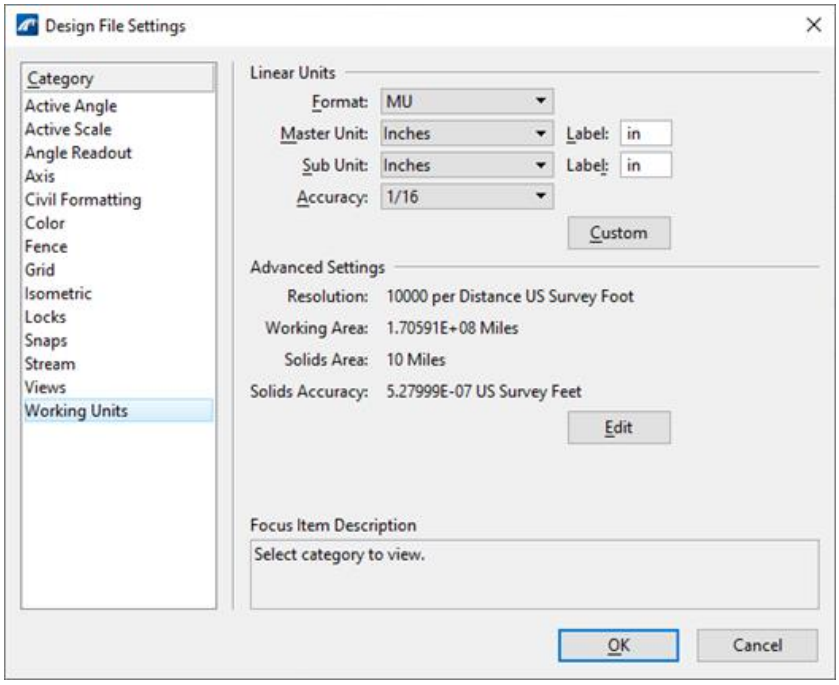


Figure 374

3. Remain on the **CTDOT** workflow **Bridge** tab, **Detail** section and select: ***Annotate > Label (Weight 0),*** this will set the needed Text Style.
4. To add a welding symbol, remain on the **CTDOT** workflow **Bridge** tab, **Detail** section and select: ***Annotate > Place Welding Symbol***
5. Select the  **Help** button at the bottom of the dialog box to access Bentley's online help. This will cover in detail the use of the Weld Styles Dialog Box.
6. Under **Level** select ***ANNOT_Label_Proposed***.

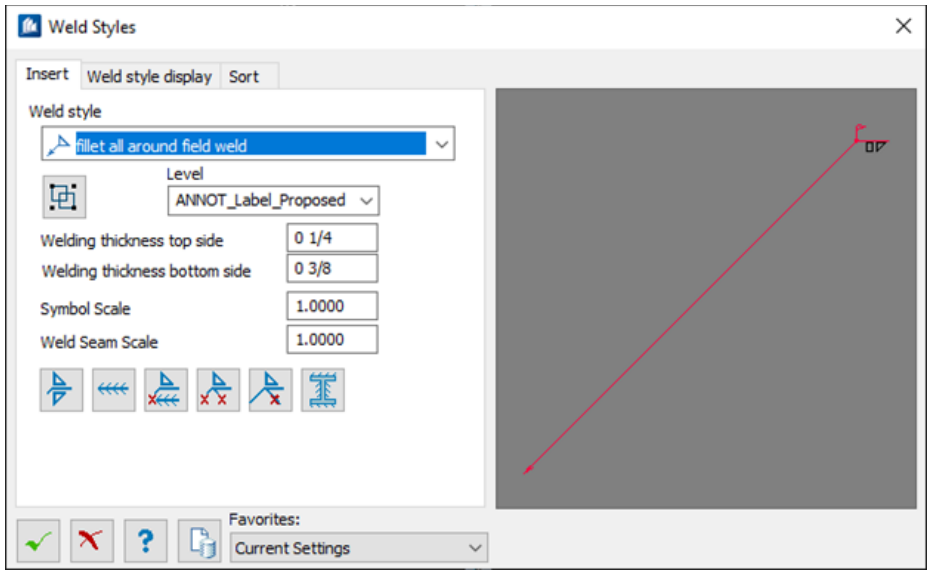


Figure 375

7. Select and fill in the following:
   - **Weld Style**, note: if the style needed is not listed just pick the closest one and this can be edited after placing the initial note.
   - **Welding Thickness** (add top side and bottom side if they are both needed)
   - **Weld Group Settings**
8. Select **Add Welding Symbol** and follow the prompts to place the symbol.
9. After placement the Symbol can be easily edited by double clicking on the symbol in the DGN. Edit as needed in the Welding Symbol Properties, when complete select the **Green OK check box**.

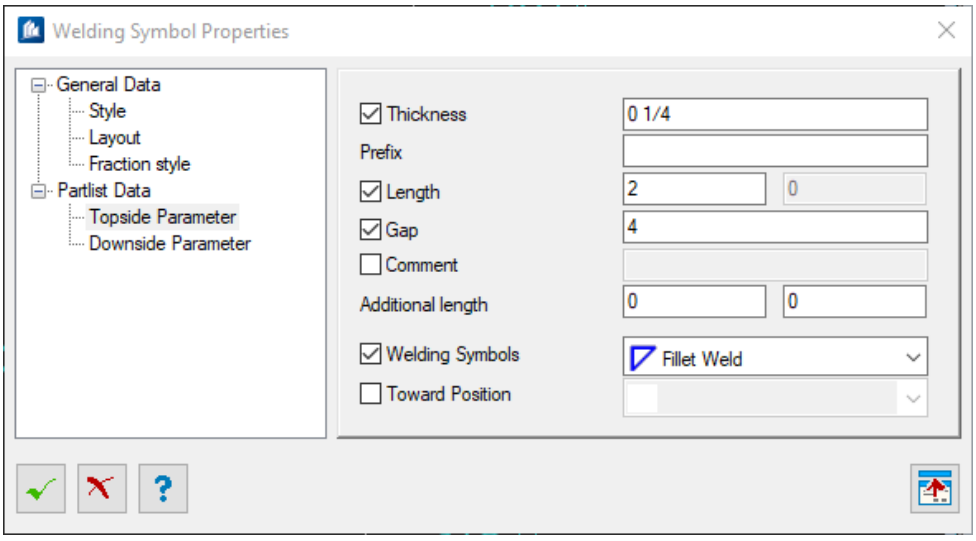


Figure 376

Please Note:

- The **Towards Position** button and options do not work to CTDOT standards so do not toggle this on, Finishing Symbols will be added using cells from a cell library (see step 10).
- The Fraction style can also be customized to use either Horizontal or Diagonal Stacking.

10. To add finishing symbols, remain on the **CTDOT** workflow **Bridge** tab, **Detail** section and select: ***Annotate > Open Welding Finishing Symbols***

    A Cell Library will open, select as needed and follow the prompts to place the cell near the welding Symbol.

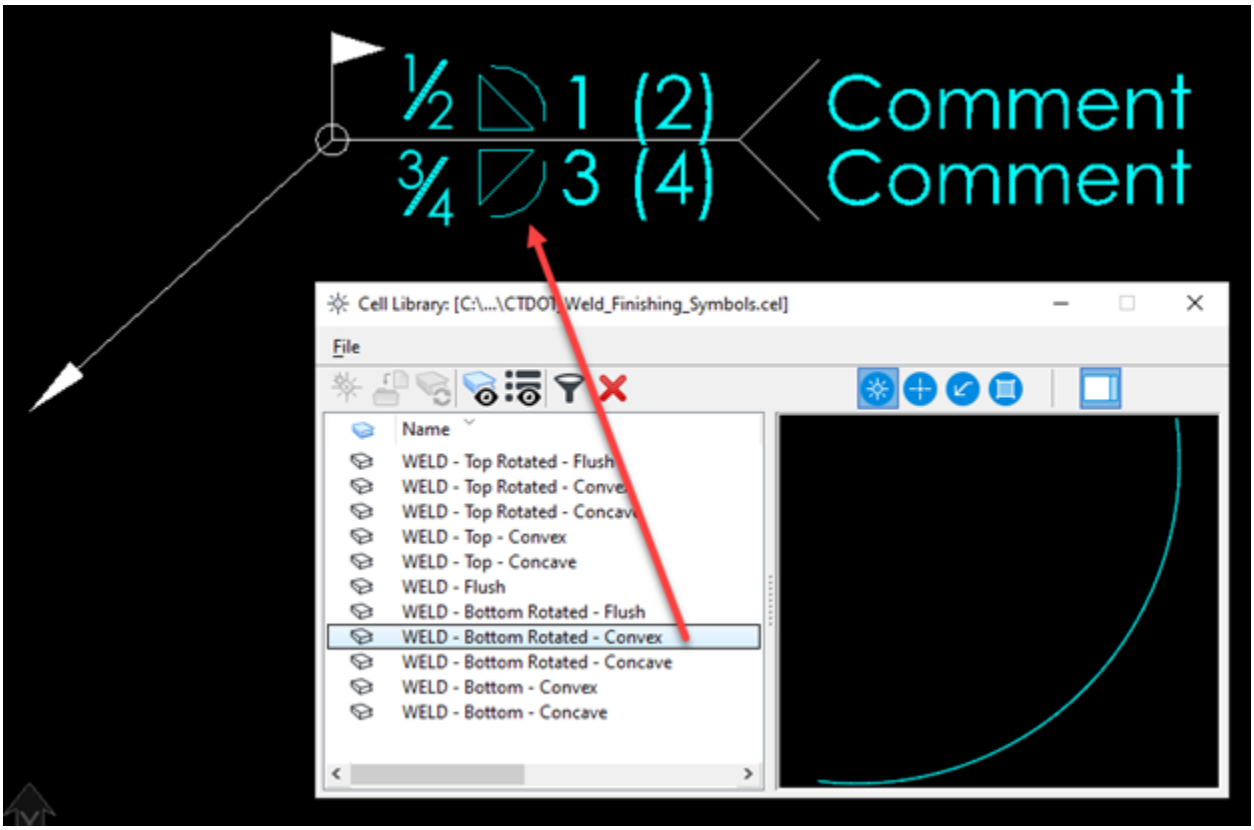


Figure 377

11. When you are done placing Welding Symbols select **Save Settings** to hold the Design Files settings for the next time you open the file or select other Design Files settings, working Units options as needed for other call outs.

Section 11 – Sheet Indexing

The Explorer Dialog Sheet Index Tab contains controls to manage sheet indexing.

A sheet index is an organized and named collection of sheet models from one or more design files. You may link any sheet model from any design file into a sheet index. You can then manage the properties of all the sheet models within the sheet index collectively. Sheet indexes may also be added to print organizer print sets for printing.

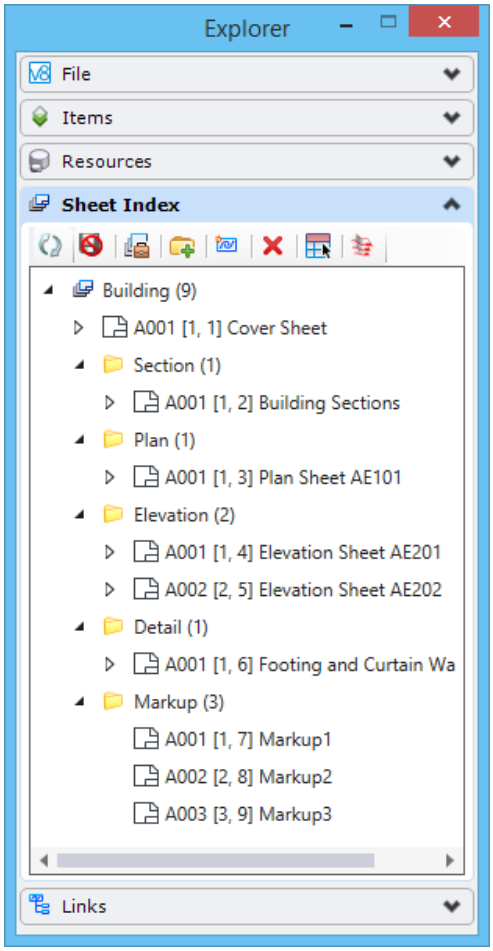


Figure 378

Refresh – Refreshes the content of the sheet index. Though the sheet index automatically refreshes when you make any changes, in some cases, you may need to refresh it manually by clicking this icon.

Open Sheet Index for Edit – Allows you to make changes to the sheet index. When you click this icon, other users cannot make changes to the sheet index.

Make Sheet Index Read Only – Turns off editing options on the sheet index. When you click this icon, the changes made to the sheet index are saved and other users can make changes to the sheet index.

Manage Sheet Index - Opens the Manage Sheet Index dialog in which you can manage the sheet index and its properties.

- Create Folder - Creates a new folder in the sheet index.
- Add Sheet - Opens the Add Sheet dialog from where you can select the file from which you want to add sheet links.
- Delete - Deletes the selected folder or sheet link from the sheet index. If the folder contains links or other folders, they are deleted as well.
- Place as Table - Starts the Place Table tool to place the index sheet. An index sheet contains properties of all the sheets in the sheet index that is placed as a table. Once placed, a report definition of the index sheet is also created in the Reports dialog.
- Open Print Organizer - Opens the Select Print Style dialog. Selecting the desired print style in the Select Print Style dialog and clicking OK opens the Print Organizer. The Sheet Index displays in the Print Organizer. You can compose a new print set file using the sheet index.

Reset pop-up menu for sheet index - Right-clicking the sheet index opens a pop-up menu with following options:

- Validate - Verifies that all the targets in the sheet index still exist in the locations to which the links point. If any targets do not exist, the sheet names turn red. They remain red until you revalidate and confirm that all targets in the folder exist in the specified locations.
- Add Sheet - Opens the Add Sheet dialog from where you can select the file from which you want to add sheet links.
- Update Sheet Model Properties - If you make changes to the properties in the sheet index, selecting this option updates those properties in the sheet model.
- Details - Opens the Details dialog displaying the properties of the sheet index.
- Properties - Opens the Properties dialog displaying the properties of the sheet index.

Reset pop-up menu for folders - Right-clicking a folder opens a pop-up menu with following options:

- Validate - Verifies that all the targets in the folder still exist in the locations to which the links point. If any targets do not exist, the sheet names turn red. They remain red until you revalidate and confirm that all targets in the folder exist in the specified locations.
- Add Sheet - Opens the Add Sheet dialog from where you can select the file from which you want to add sheet links.
- Update Sheet Model Properties - If you make changes to the properties in the sheet index, selecting this option updates those properties in the sheet model.
- Rename - Allows you to key in a new name for the selected folder.

- Details - Opens the Details dialog displaying the properties of the folder.
- Properties - Opens the Properties dialog displaying the properties of the folder.

Reset pop-up menu for sheet links - Right-clicking a sheet opens a pop-up menu with following options:

- Validate - Verifies that the target sheet still exists in the locations to which the links point. If any targets do not exist, the sheet names turn red. They remain red until you revalidate and confirm that all targets in the folder exist in the specified locations.
- Update Sheet Model Properties - If you make changes to the properties in the sheet index, selecting this option updates those properties in the sheet model.
- Open - Opens the selected sheet.
- Add Link to Element - Adds the sheet link to the selected element in the open DGN file.
- Details - Opens the Details dialog displaying the properties of the sheet link.

Properties - Opens the Properties dialog displaying the properties of the sheet link.

Section 12 – Roll Plan Sheets

DOTs are transitioning from traditional 22″ × 34″ contract sheets to roll (continuous) contract plans to better support modern, digital-first design and delivery workflows. Fixed sheet sizes require artificial breaks, match lines, and repeated annotations that increase production time and rework when designs change. Roll Plans allow design content to flow continuously along stationing or alignments, enabling designers to focus on engineering intent rather than page management, and improving consistency with corridor-based and model-driven design practices.

This shift also reflects how contract plans are reviewed, distributed, and used today. Roll plans are easier to review on-screen, preserve context across longer project extents, and reduce errors associated with sheet transitions. While standards for scale, annotation, and metadata remain in place, roll sheets provide greater flexibility and efficiency while maintaining the ability to generate traditional sheets when required.

CTDOT is currently in the discovery phase of implementing Roll Plan Sheets. Teams interested in using this format on a project should contact the CAD Support Team. The CAD Support Team can assist in evaluating whether a project is suitable for piloting this new contract plan format and help guide implementation.

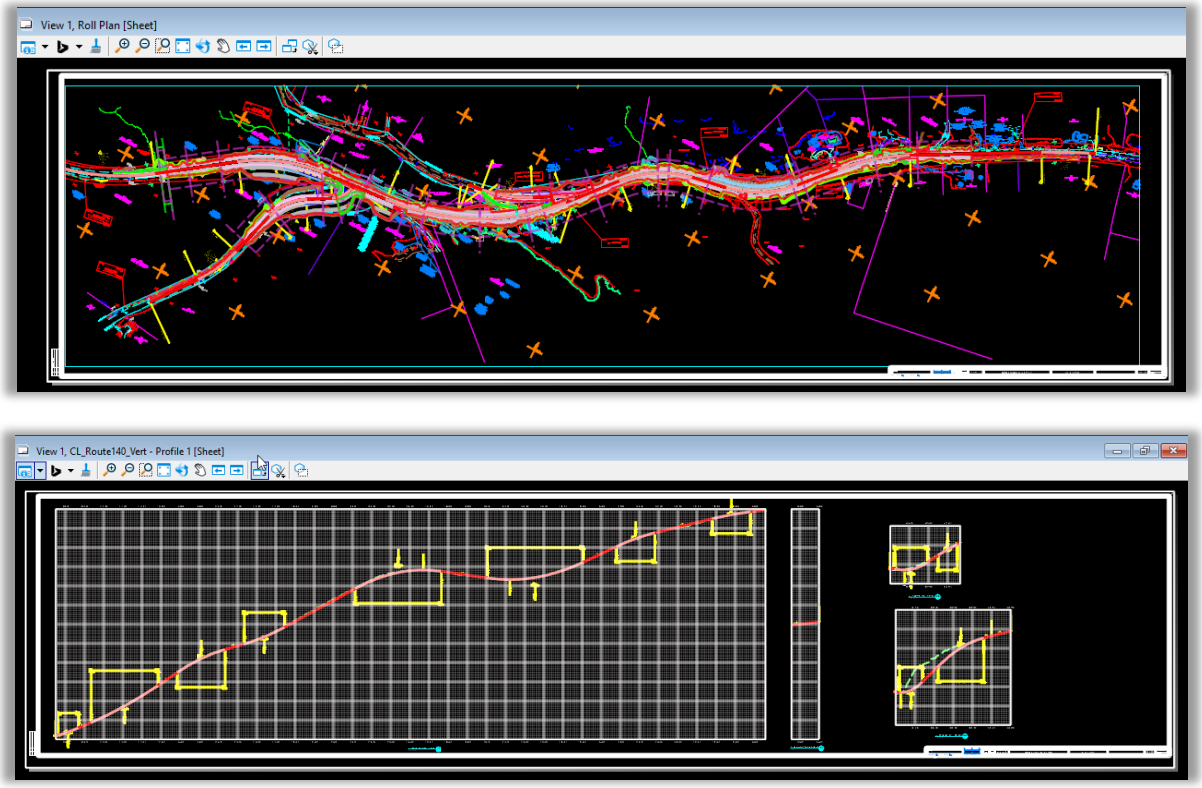


Figure 379 – Above Roll Plan Sheet / Below Roll Profile Sheet

12.1 Overview

A Roll Plan Sheet will contain the data and information that has been historically presented on 22 × 34 (ANSI D size) plan and profile sheets. For most projects there will be **one** roll plan for each type of sheet. On large projects that will not fit on at 40 Scale on a 36 inch roll more than one roll plot can be created for each sheet type.

12.1.1 File Naming

The table below shows the DGN file naming conventions.

Plan Type	File Name
Survey Control Data	HW_CP_1234_1234_Roll_Survey_Control_Data.dgn
Test Pit Data	HW_CP_1234_1234_Roll_Test_Pit_Data.dgn
Alignment Plans	HW_CP_1234_1234_Roll_Alignment_Plan.dgn
ROW Plans	HW_CP_1234_1234_Roll_ROW_Plan.dgn
Highway Plan	HW_CP_1234_1234_Roll_Highway_Plan.dgn
Superelevation Diagrams	HW_CP_1234_1234_Roll_Superelevation_Diagrams.dgn
Roadway Profiles	HW_CP_1234_1234_Roll_Highway_Profiles.dgn
Drainage Plan & Pipe Profiles	HW_CP_1234_1234_Roll_Drainage_Plan.dgn
Sed Erosion Control Plans	HW_CP_1234_1234_Roll_Sed_Erosion_Control_Plan.dgn
Staging Plan and Profiles	HW_CP_1234_1234_Roll_Staging_Plan.dgn

Optionally, the following plan types can also be created as Roll Plans:

- Boring Logs
- Typical Sections
- Miscellaneous Detail Sheets
- Grading Plans
- FIO

The remaining sheets will be developed and formatted for 22" x 34" sheets (ANSI D size):

- Title Sheet
- Detail Estimate Sheets
- Revisions Sheet
- Index of Drawings
- Index of Plans
- Cross Sections
- Permit Plans

12.1.2 Roll Plan Sheet Use

Roll plans are simply very large plan sheets. Only minor changes are required for file management and setup within the CAD environment.

Changes:

- **Title Block Information:** With Roll Plan sheets, the border information is divided into several components rather than contained within a single cell. This approach allows flexibility in roll plan layout while maintaining consistency with CTDOT standards. These components are pre-placed in the Seed Files for use with the Plan Production Tools.

  The elements include:
  - Title Block Cell
  - Revision Block Cell
  - Scale Cell
  - Roll Plan Interior Border Shape — provided as a shape rather than part of a cell so users can adjust the size as needed
  - Designer/Drafter: & Checked By: Text

- **Printing to PDF:** A sheet Model will be created for Roll Plans as done with traditional 22 X 34 plan sheets. The PDF drivers are programed to look for the Long Format Sheet Defined Shape.

- **Consolidating Essential Information:** Highway roll plans typically leave empty white space throughout the print area. These areas can be viewed as an opportunity to consolidate pertinent information that would typically be segregated on other drawings. A few examples are locating typical sections and miscellaneous details on the general plan roll plan, and locating drainage table information on the drainage roll plan This consolidation of information further streamlines plan production and puts the essential information where you need it. A balance should be considered as too much information can be overwhelming and detract from the overall product. It is also recommended to discuss this with the project team on a project-by-project basis and agree upon the information to be included.

  Another aspect to consider when making use of the available white space is the repetition of certain information such as scale bars, legends, north arrows, etc. On longer roll plans having this information repeated strategically prevents having to navigate away from your current viewshed to find the information. The interval should ultimately be determined by the designer; however a good rule of thumb is every 3 feet of roll plan length.

Same Requirements:

Roll plan sheets represent a portion of the overall contract plans; therefore, the following requirements still apply:

- **Index of Drawings:** Roll plan sheets receive both a Drawing and a Sheet number, just like traditional 22 × 34 plan sheets, and will be included in the Index of Drawings on the appropriate discipline cover sheet.
- **PS&E Submittal:** Because roll plan sheets are part of the contract plans, they must be prepared and included in the discipline PDF subset when submitting your PS&E package for processing.

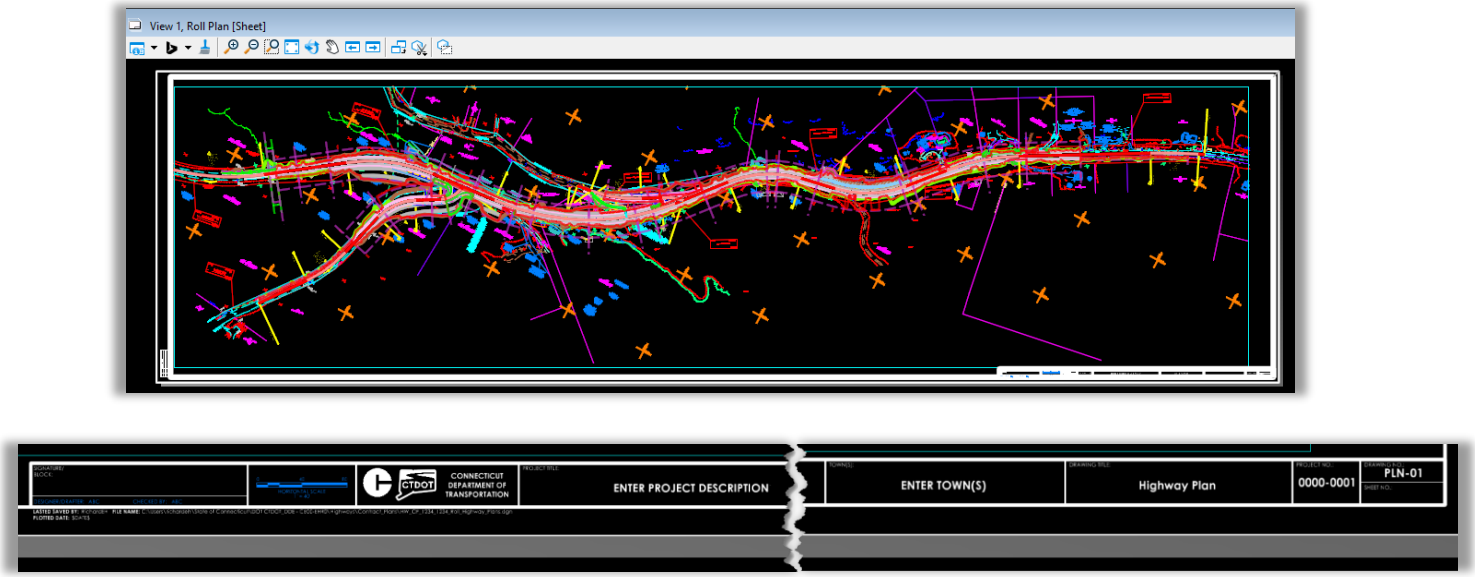


Figure 380 - Title Block

12.1.3 Bluebeam Multiple Viewing Portals

When viewing roll plan and profile sheets digitally, there are a couple of ways to make the experience more efficient. In Bluebeam users can split their view either horizontally or vertically which enables independent view ports. This is extremely beneficial for digitally viewing plans along with details, tables, typical sections, etc. simultaneously.

The split screen function is located under “View” within the main ribbon, or a shortcut can be accessed in the lower left corner of the application. Both horizontal and vertical split options are available

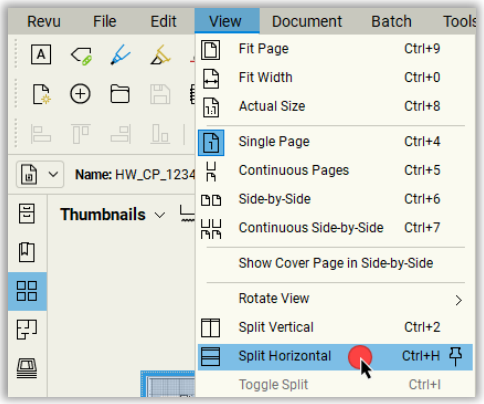


Figure 381 – Bluebeam Split Horizontal Tool

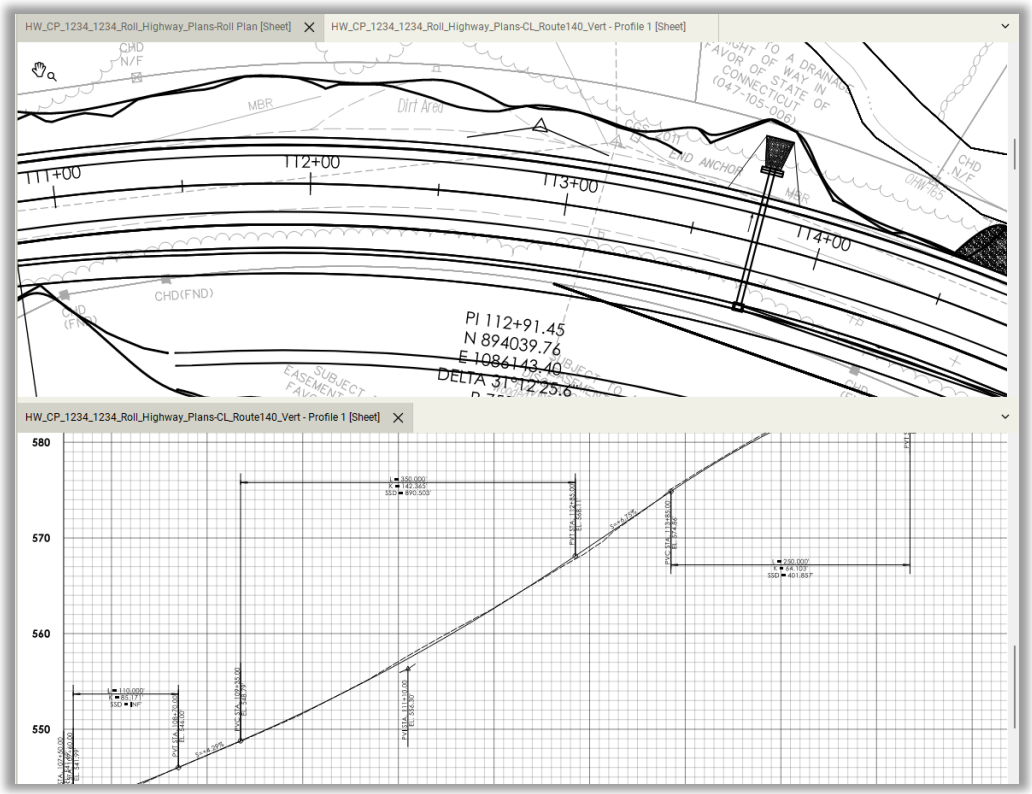


Figure 382 - Bluebeam Split Horizontal View

12.2 Roll Plan

The CTDOT ORD workspace has been configured to produce Roll Plan Sheets. The following outline provides a step-by-step process.

12.2.1 Create the DGN File

1. Create a New File.
   a. Select the **New File** icon.
   b. Browse to the ***Contract_Plans*** folder and create a new 2D design file following the file naming convention outlined in Volume 16, Appendix 4 – File Naming Examples.
      Example file name: ***HW_CP_1234_5678_Roll_Highway_Plans.dgn***
2. Select a Seed File.
   a. In the New dialog box, select the **Browse** button to select a seed file.
   b. Choose the **2D Project Highway Seed** previously set up for your project: ***Highway\HW_2D_ProjectSeed.dgn***

      Note - *This seed file already includes existing survey models as direct references (no nesting).*
   c. Alternative Seed Files - If you do not want to use the project seed, you can use seed files from the general CAD Workspace. Ensure you select the correct Survey Datum for your project:

      Road Design Seed:
      …CT_Configuration\Organization\Seed\Road\Seed2D - CT RoadDesign.dgn

      Older Datum Seed (if survey used an old datum):
      …CT_Configuration\Organization\Seed\GCS\

      Note: *If you start with a Workspace seed instead of the project seed, you must manually reference all existing survey models. Make sure to use* ***direct references*** *for each model.* ***Do not use nested references****.*
3. Click **Save**. The file will get created and auto-open.

12.2.2 Set up the Default Model

1. Reference in the needed **design base model files**, they reside in the Highways/Base_Models folder within the project folder. The models will be referenced using **No Nesting**. This will include but not limited to the Alignment Models, the Corridor Models, Drainage Models, and the 2D Layout Models.
   Tip: *Reference the Models you want to show up behind others first and the Top Layer last.*
2. In View 1 **Turn off/on Levels** as needed and **turn off** the **Default-3D Reference File.**

3. Orientate the drawing. **Rotate the View** to efficiently make use of the roll plan while avoiding north arrows pointing diagonally down or to the left.

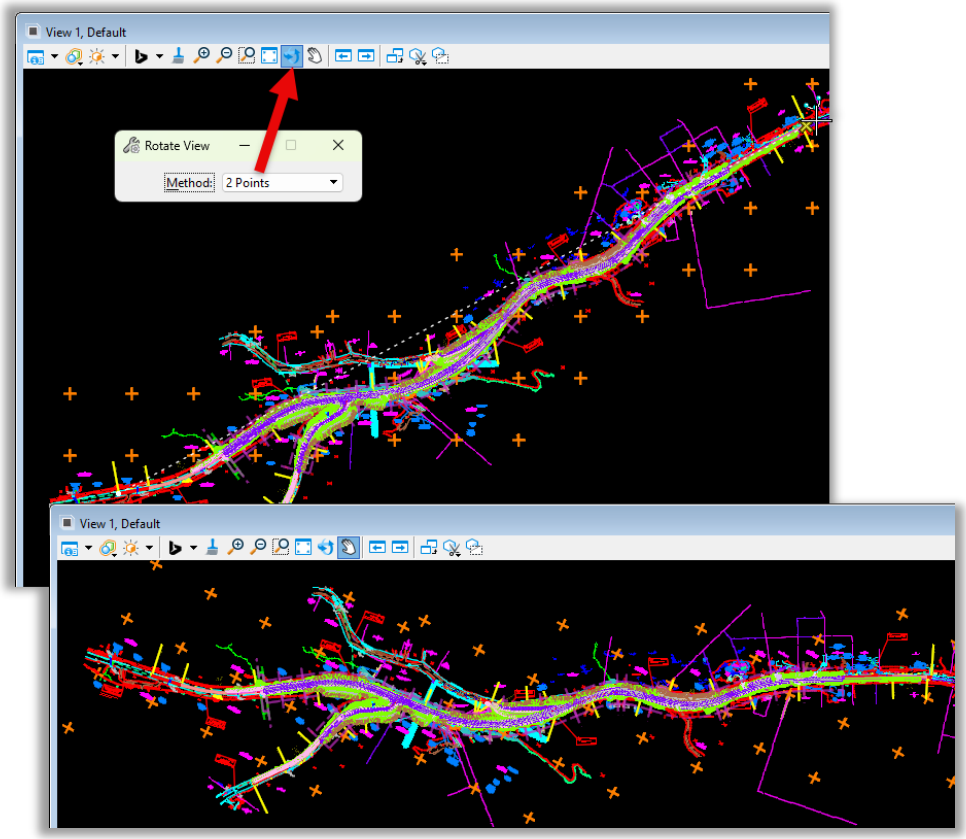


Figure 383 – Rotate View

4. From the CTDOT ribbon select **Borders > Roll Plot Shape**.

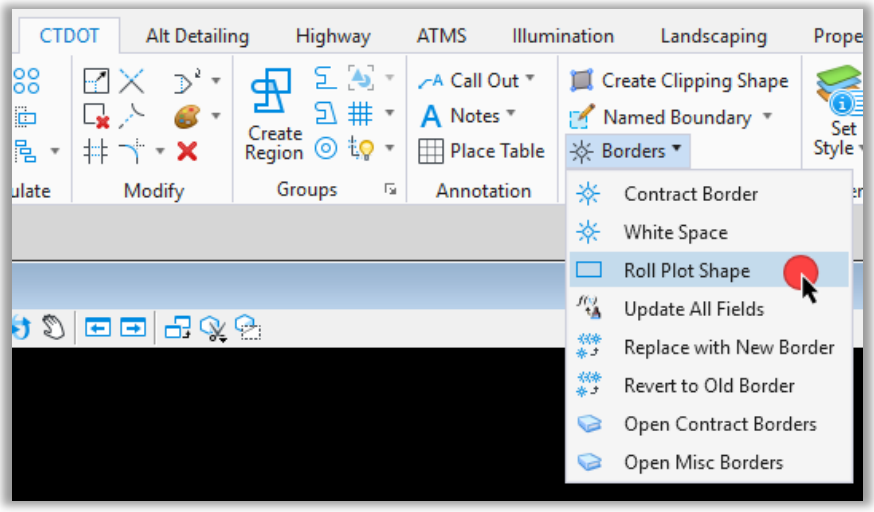


Figure 384 – Roll Plot Shape Tool

4. Place a rectangular box around the project limits using the chart below as a guide. These dimensions are designed to work with the Roll Plan border. For a 40-scale Roll Plan, use a **width** of **1,300 feet**, and ensure that the overall **length** of the shape does not exceed **69,120 feet**.

Plot Shape Dimensions for Common Paper Sizes and Design Scales Design Scale		
Design Scale	**36" Plot Shape Height**	**Maximum Plot Shape Length (12')**
1" = 20'	640'	34,560'
1" = 30'	975'	51,840'
1" = 40'	**1,300'**	**69,120'**
1" = 50'	1620'	86,400'
1" = 60'	1950'	103,680'
1" = 80'	2600'	138,240'
1" = 100'	3250'	172,800'

In the Place Block dialog set:

- Edge 2: Toggle ***Off***
- Edge 2: Toggle ***On*** and enter ***1300***

Follow the prompts the place the shape. Ensure the length is not over the maximum for your selected scale.

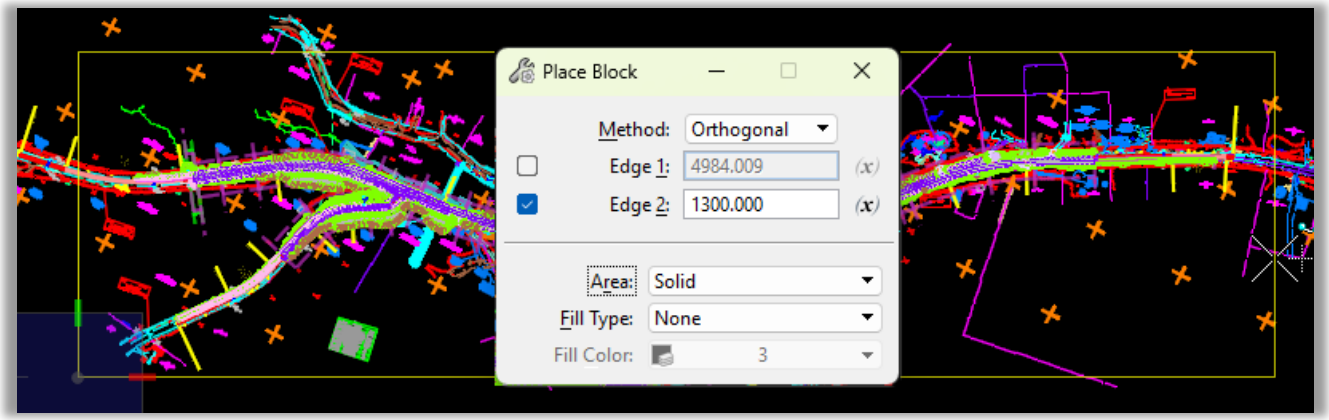


Figure 385 – Place Roll Plot Shape

12.2.3 Create a Named Boundary

1. Select **Create Clipping Shape**, this will activate the Clipping Boundary Level
2. Select **Place Named Boundary**

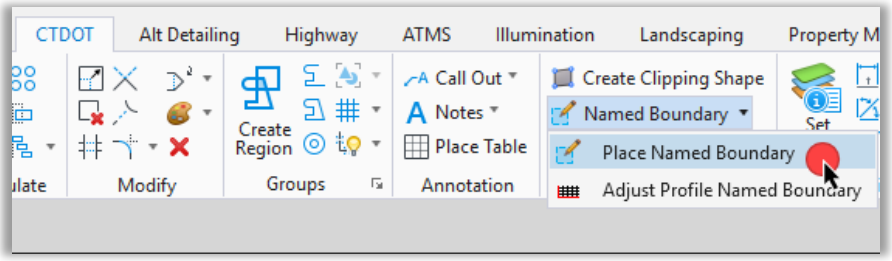


Figure 386 – Place named Boundary Tool

3. On the Place Named Boundary Dialog ***Select By 2 Points,*** Enter a Name and Description. Ensure ***Place Single Named Boundary*** is selected, and ***Create Drawing*** is toggled on is selected. Click and follow the prompts to select the extend of the shape placed in the previous section.

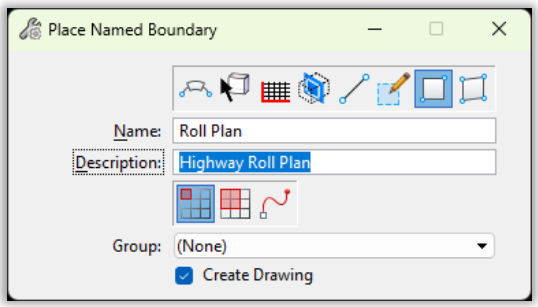


Figure 387 – By 2 Points

4. The Create Drawing Dialog will appear Select:
   Drawing Seed: ***Roll Plot Contract Plan Sheet***
   Create Drawing Model: ***On***
   A: ***1”=40’***
   Create Sheet Model: ***On***
   A: ***Full Size 1 = 1***
   Detail Scale: ***1”=40’***

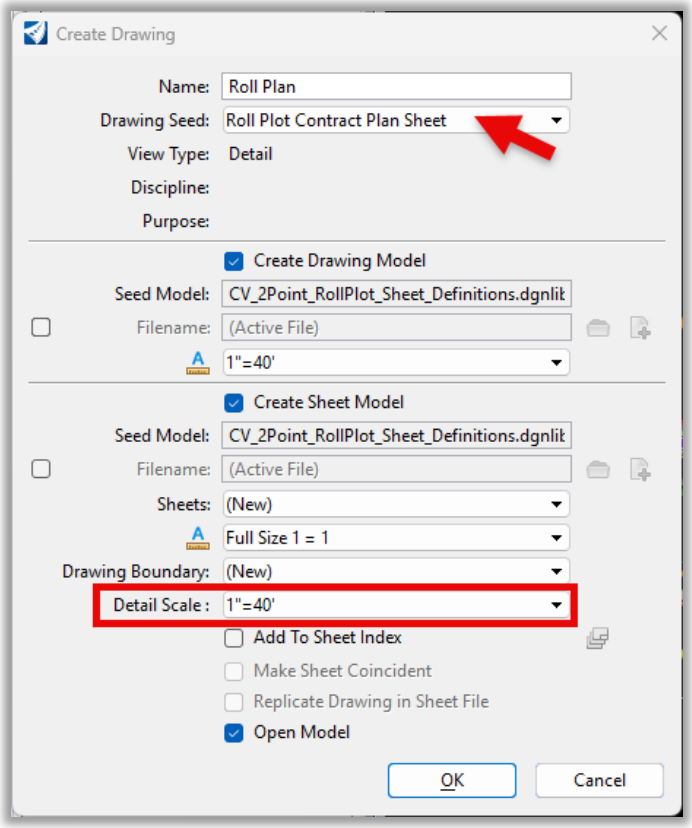


Figure 388 – Create Drawing

12.2.4 Adjust the Border

1. Open the **Sheet Model** and move the Reference to line up inside the border.

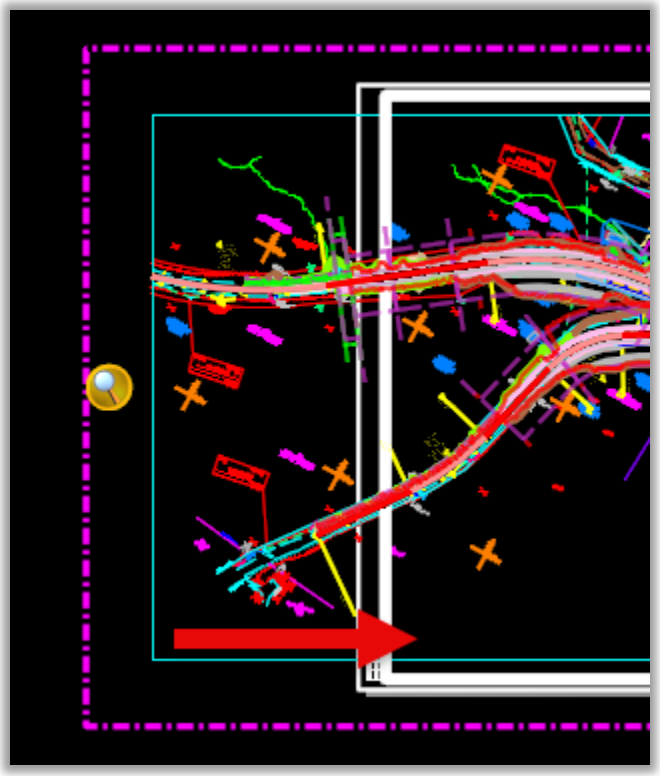


Figure 389 – Move Reference

2. Adjust the Sheet Size to the needed Length. Open the Models dialog and select ***Define Sheet Boundary***. Select Size: ***from the list*** or ***Change Size Interactive.*** Follow the prompts to adjust the **length only**.

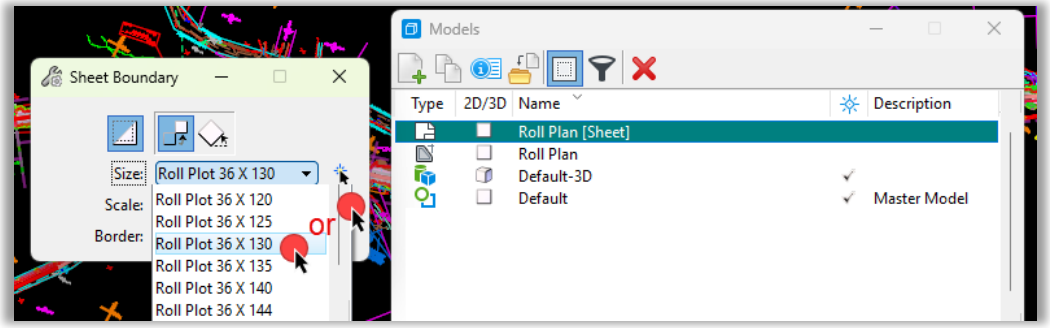


Figure 390 – Adjust Sheet Boundary Size

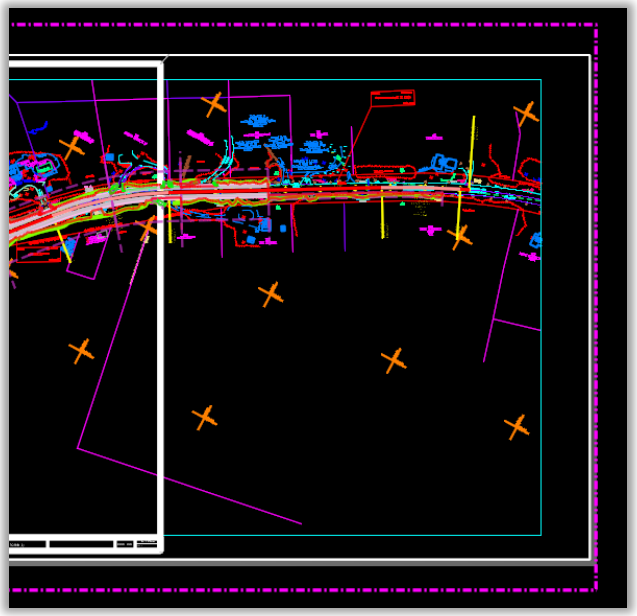


Figure 391 Adjust Sheet Boundary Size Results

3. Now move the Gray margin space holder to the updated upper right location and then adjust the size to the inner border shape to match the margin space holder.

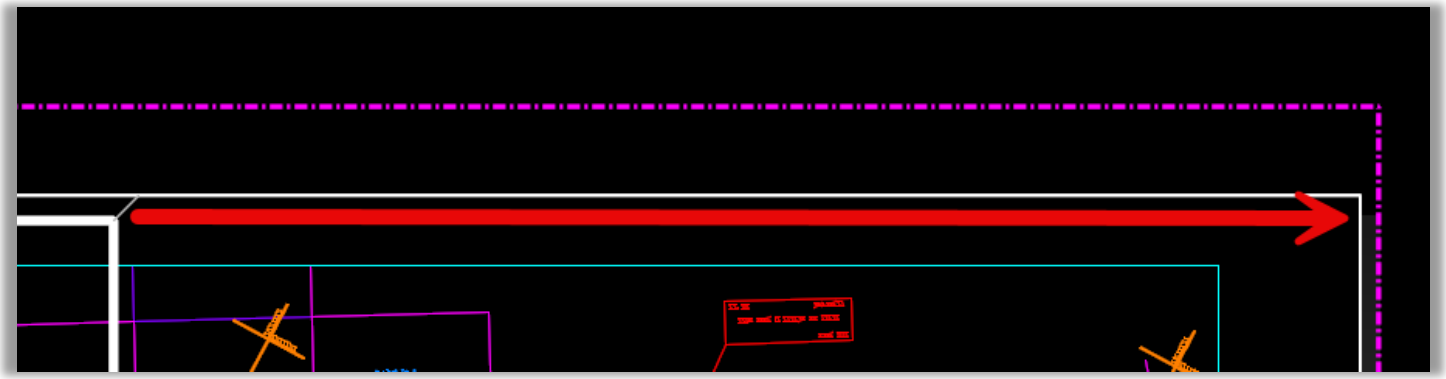


Figure 392 – Adjust Interior Sheet Border

4. Use **the Element Selection** tool and select the Title Block. Move the Title Block to match with the right Border. Make sure you have the following selected:
    - The Title Block Cell
    - The Scale Cell
    - Engineer of Record Text

Figure 393 – Move Title Block

The Final results are to have the title block information all the way to the right of the roll plot.

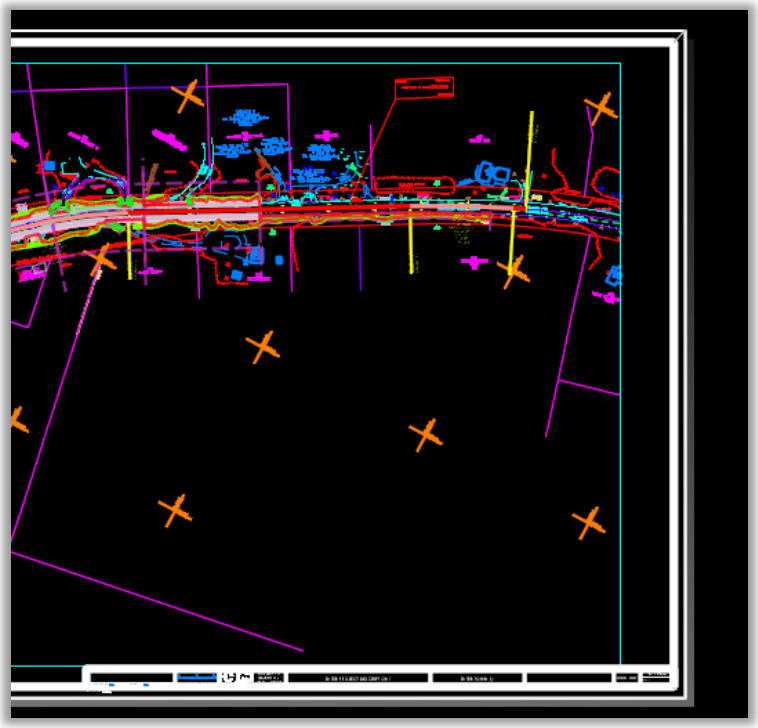


Figure 394 – Final Results

5. If you used a scale **other than 40:1, delete** the **existing scale cell** and place the **appropriate scale cell** for your selected plan scale.

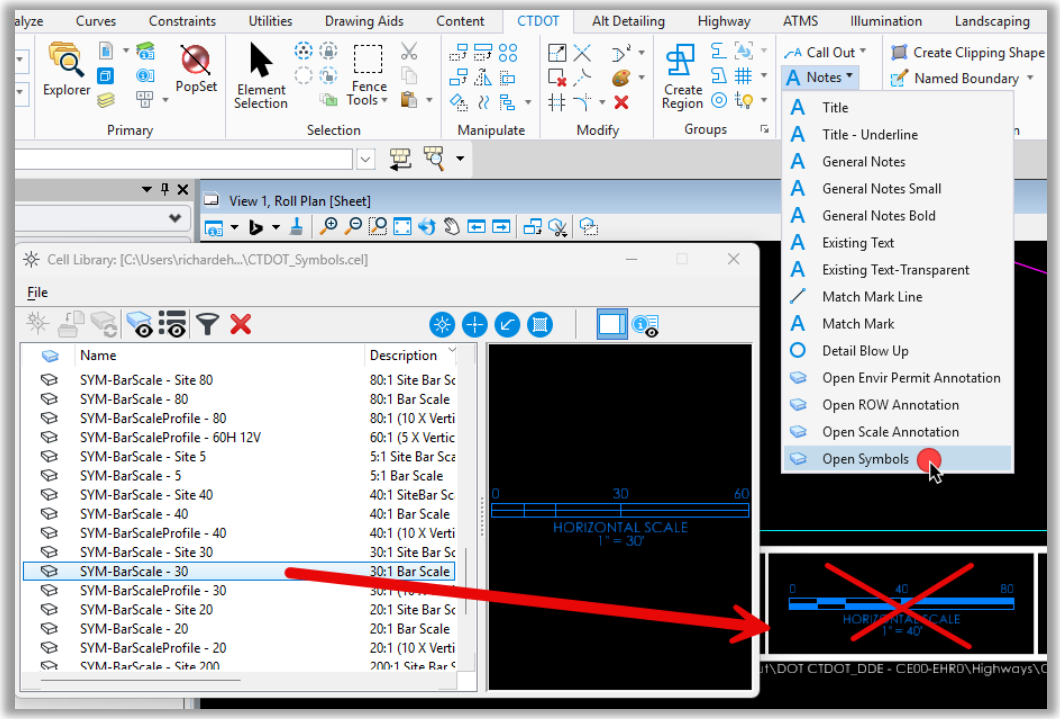


Figure 395 – Replace Scale Cell

6. Open the Drawing Model and place all your notes and annotation.

12.3 Roll Profiles

12.3.1 Create a DGN File

1. Create a New File.
   a. Select the **New File** icon or select **File > New** from the ribbon.
   b. Browse to the ***Contract_Plans*** folder and create a new 2D design file following the file naming convention outlined in Volume 16, Appendix 4 – File Naming Examples.
      Example file name: ***HW_CP_1234_5678_Roll_Profiles.dgn***
2. Select a Seed File.
   a. In the New dialog box, select the **Browse** button to select a seed file.
   b. Choose the **2D Project Highway Seed** previously set up for your project: ***Highway\HW_2D_ProjectSeed.dgn***

      Note - *This seed file already includes existing survey models as direct references (no nesting).*
   c. Alternative Seed Files - If you do not want to use the project seed, you can use seed files from the general CAD Workspace. Ensure you select the correct Survey Datum for your project:

      Road Design Seed:
      …CT_Configuration\Organization\Seed\Road\Seed2D - CT RoadDesign.dgn

      Older Datum Seed (if survey used an old datum):
      …CT_Configuration\Organization\Seed\GCS\

      Note: *If you start with a Workspace seed instead of the project seed, you must manually reference all existing survey models. Make sure to use* ***direct references*** *for each model.* ***Do not use nested references****.*
3. Click **Save**. The file will get created and auto-open.
4. Reference in the needed Alignment Files as well as the ***Highway_Plans.dgn***.

   Note: *Referencing in the Highway plans will make it easy to see the station limits so you can match up the sheets.*
5. In View 1 set the **Terrain Active**.
6. In View 1 **Right Click**, in the Pop-up select **View Control > 2 View Plan/Profile,** follow the prompts to select the mainline.

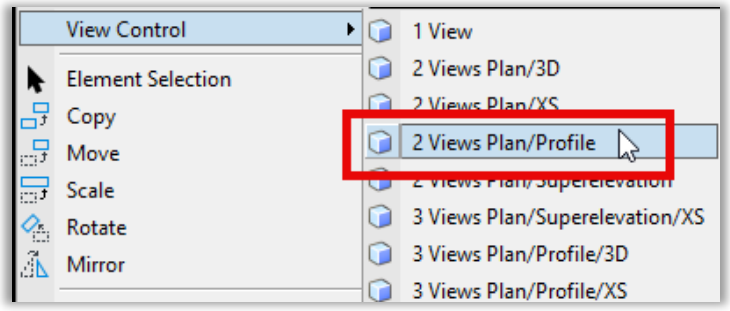


Figure 396 View Control Plan/Profile

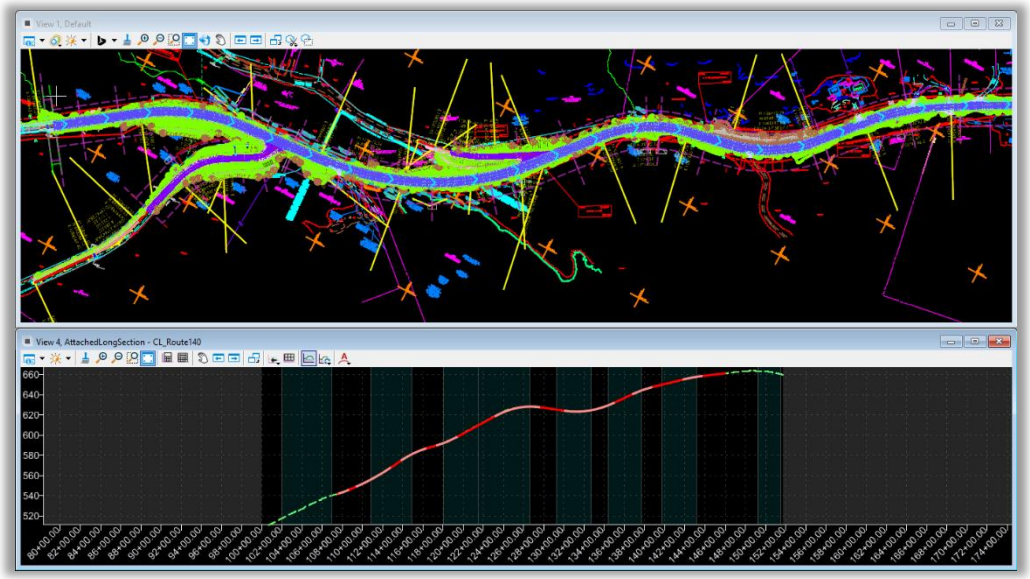


Figure 397 - Plan / Profile View

7. **Save Settings**.

12.3.2 Create Profile Sheets

1. Select the **CTDOT Tab**, in the **Sheet Production Area** select **Create Clipping Shape**. This will set the needed level active.
2. In the same section Select **Place Named Boundary**. The Place Name Boundary Civil Plan dialog box will appear.
3. Select the **Civil Profile** mode.
   Set the dialog fields as follows:
   - Drawing Seed: ***Roll Plot Contract Profile Sheet***
   - Detail Scale: ***1"=40'***
   - Name: ***Profile 1***
   - Method: ***Station Limits***
   - Name: ***This will auto-populate when you select the alignment to set the station limits.***
4. Follow the prompts in the lower left corner left, Command Line: **Place Named Boundary Civil Profile > Identify Profile View** click in the **Profile View**
5. Follow the prompts **Place Named Boundary Civil Profile > Accept/Reject. Identify Profile start point to place boundary,** set the **Start Location** graphically in the Profile View or the dialog box.
6. The middle settings come from the Drawing Seed and can be adjusted as needed.
   - Vertical Exaggeration: ***10***
   - Available Profile Height: ***120***
   - Top Clearance: ***(toggled on) .5***
   - Bottom Clearance: ***(toggled on) .5***
   - Elevation Datum Spacing: ***10***
   - Station Datum Spacing: ***10***
   - Profile Shifts: ***Where Needed***
7. The bottom settings come from your user profile.
   - Use Terrains: ***(toggled on)***
   - Use Active Vertical: ***(toggled on)***
   - Create Drawing: ***(toggled on)***.
8. Follow the prompts, **Place Named Boundary Civil Profile > Identify end point to place boundary,** set the **Stop Location** graphically in the Profile View or the dialog box.

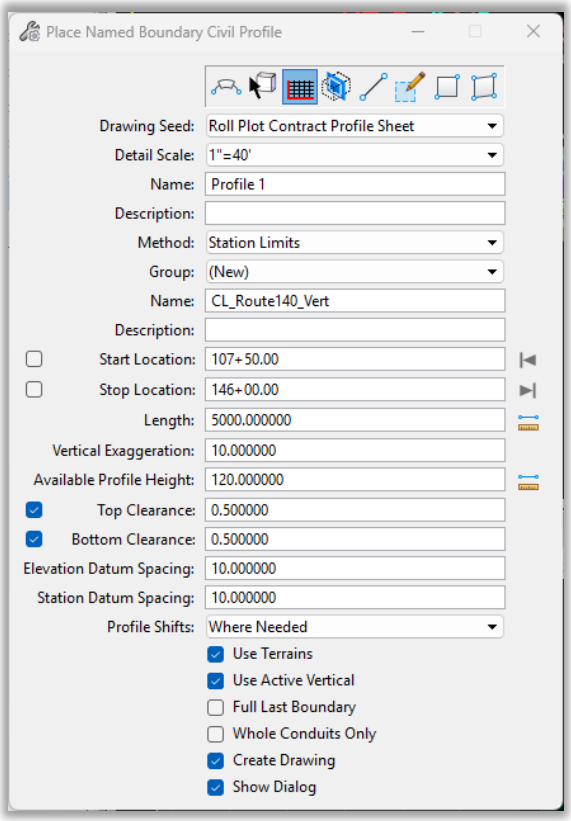


Figure 398 - Profile Named Boundaries dialog box

9. Follow the prompts, **Place Neamed Boundary Civil Profile > Accept/Reject. Data point in Profile View to place Boundary.** Click in the Profile View to **Accept the results**.

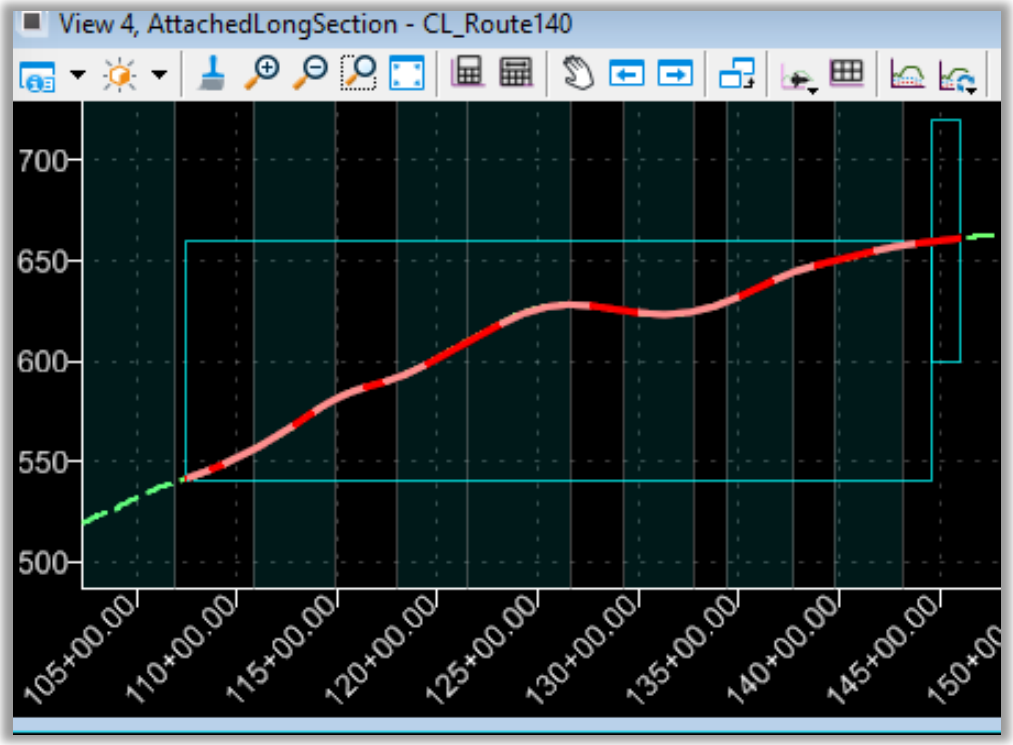


Figure 399 - Profile Named Boundaries with Accepted Results

10. The **Create Drawing** dialog box will appear. The Mode: should be set to **Profile.**

    Set the following ***as desired***, everything else is preset for you.

    - View Name:
    - Drawing Model - Model Name:
    - Sheet Model - Model Name:

    If desired toggle on: **Add To Sheet Index** and ***Open Model***.

11. Click **OK** to create the sheets. Follow the prompts in the lower left corner left click to define the named boundaries. Multiple left clicks may be required.

12. The **Named Boundaries**, **Drawing Models**, and **Sheet Models** will now get created.

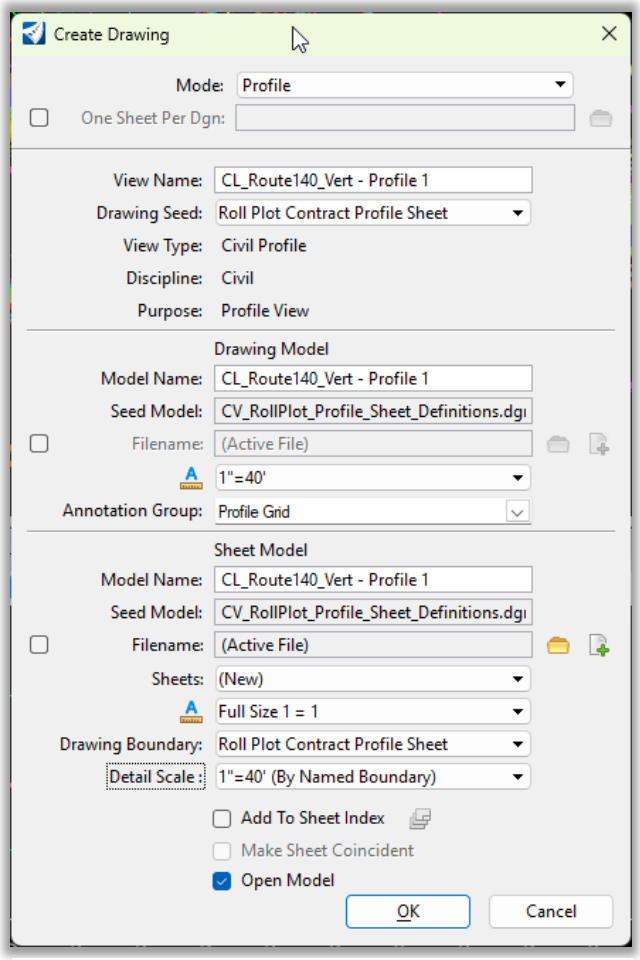


Figure 400 - Create Drawing

12.3.3 Side Road Profiles

Repeat the section above for all the side roads.

1. In the **Place Named Boundaries** dialog reduce the ***Available Profile Height:*** as needed.

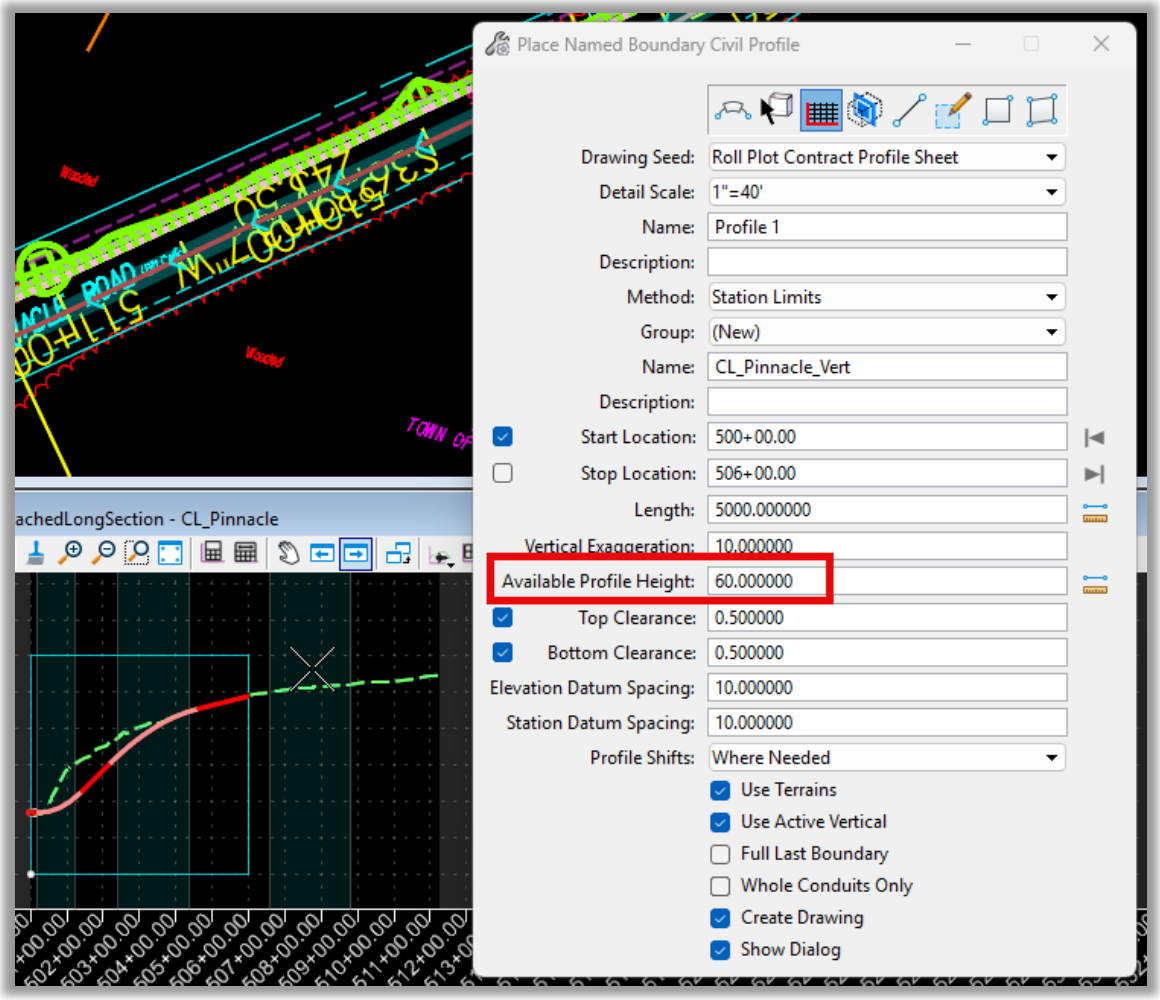


Figure 401 – Adjust Profile Height

2. On the **Create Drawing** dialog, in the Sheet Model section, change Sheets: to the ***sheet model created in the section above***.

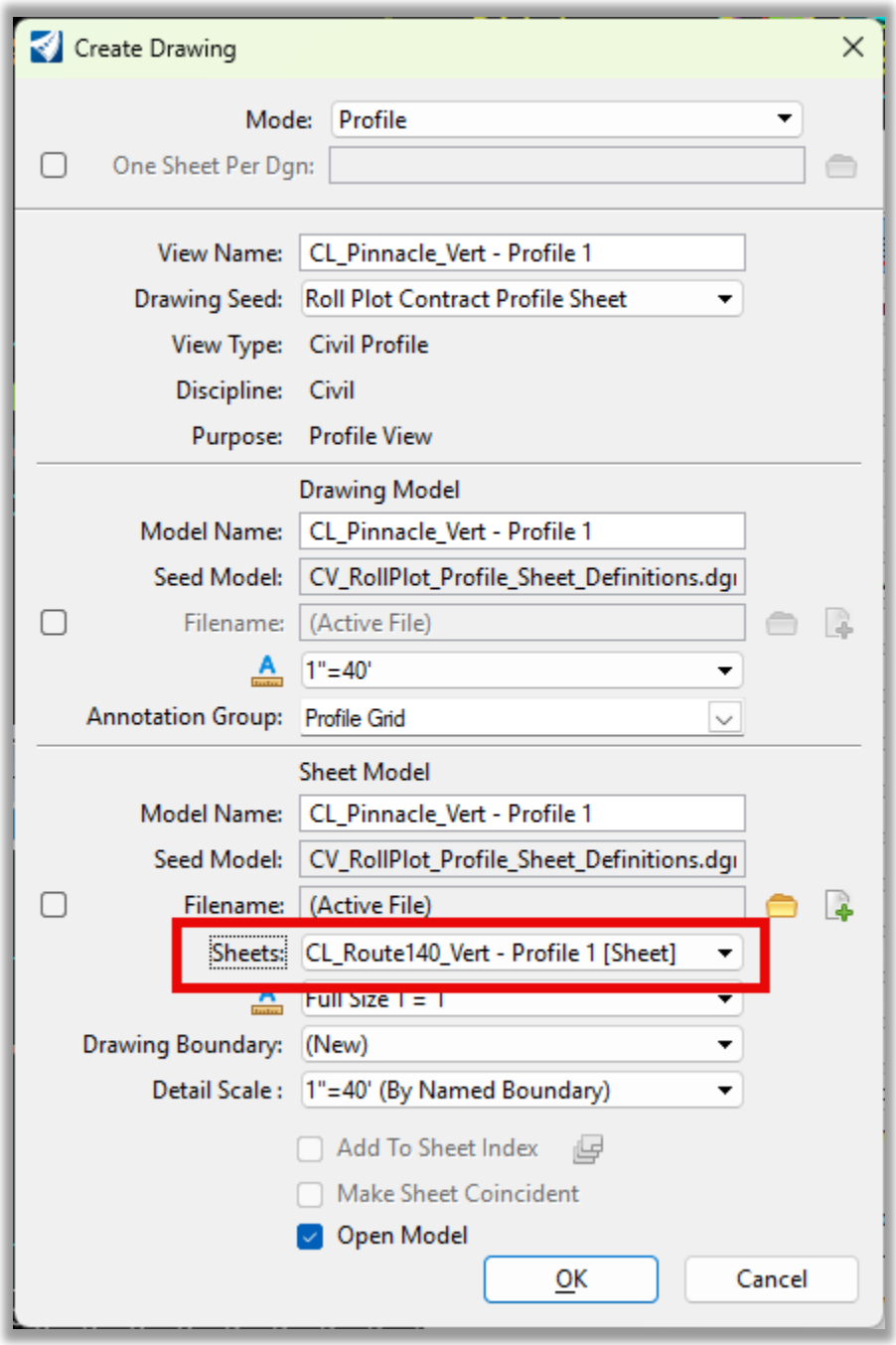


Figure 402 – Add to All Ready Created Roll Plot Sheet

12.3.4 Adjust the Border and Profiles Reference Location

1. Open the **Profile Sheet Model**.
2. Move the **shifted** and **side road profile references** to a **blank space** on the roll plan.

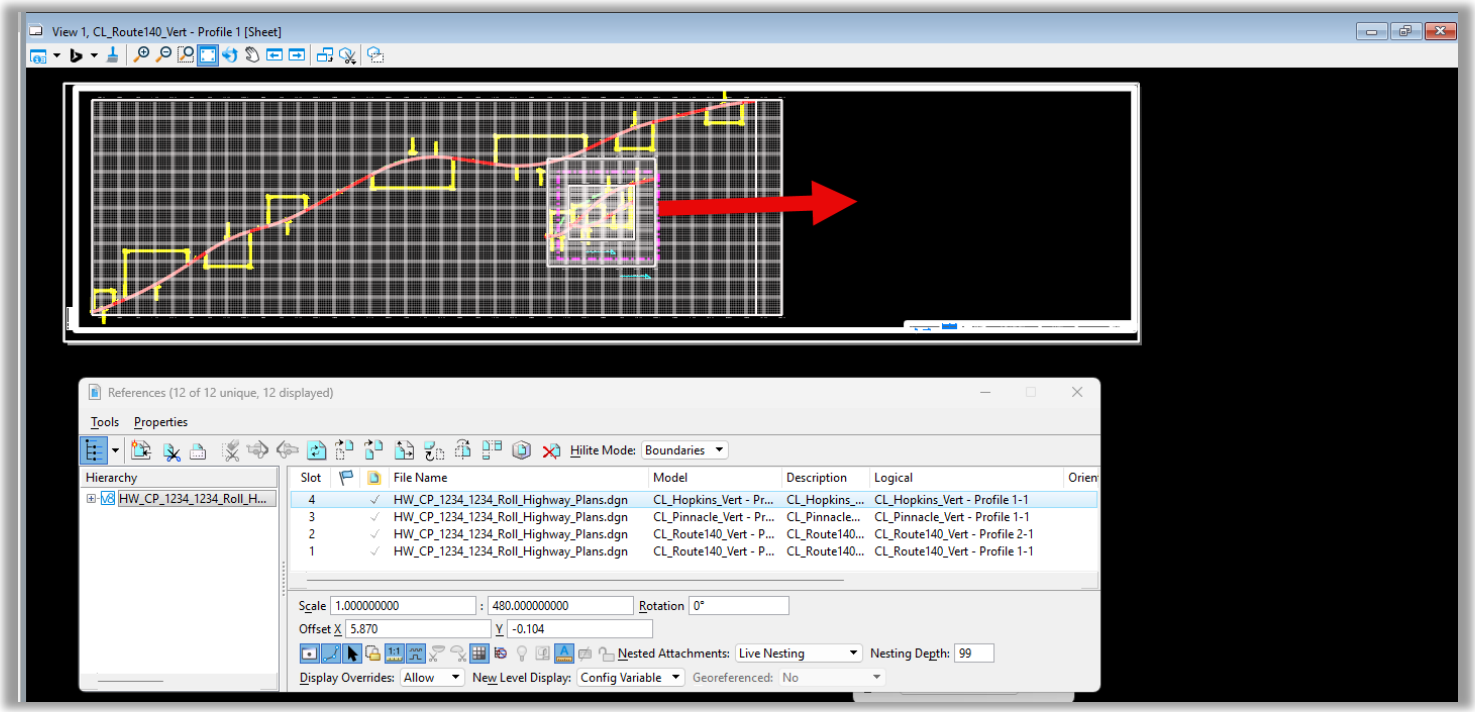


Figure 403 – Move reference Files

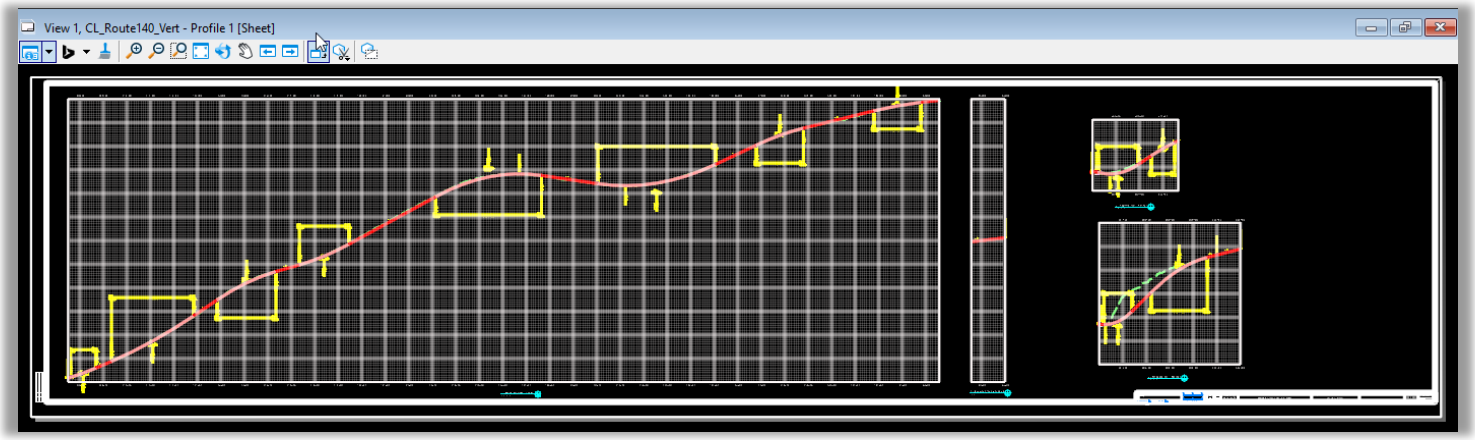


Figure 404 – Results of Moved Reference Files

3. Adjust the sheet size to the needed length. Open the Models dialog and select ***Define Sheet Boundary***. Select Size: ***from the list*** or ***Change Size Interactive.*** Follow the prompts to adjust the **length only**.

12.4 Roll Drainage Plans

12.4.1 Plan Layout

Coming Soon

12.4.2 Pipe Profiles

Coming Soon