

**CONNECTICUT DEPARTMENT OF TRANSPORTATION** 

# DIGITAL DESIGN ENVIRONMENT GUIDE

CONNECT EDITION

# Volume 13 – Contract Plans Production

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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 realworld 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 <u>DIGITAL PROJECT DEVELOPMENT MANUAL</u>, 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
  - o an index of the subsets contained within the project
  - o sheet count totals for all subsets
  - o a list of drawings for the 01\_General Subset
  - o 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
- Highway Plans
- Drainage Plans
- Sedimentation and Erosion Control Plans
- Profile

- Cross Sections
- Site Grading Plans
- Intersection Grading Plans
- Miscellaneous Detail Sheets
- Superelevation Diagrams
- Boring Logs
- Test Pit Data
- Staging Plans includes
  - o **Plans**
  - o profiles
  - o 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 <u>Digital Project Development Manual</u> 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 <u>Digital Project Development Manual</u> 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 <u>Digital Project Development Manual</u> 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 <u>Digital Project Development Manual</u> 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.

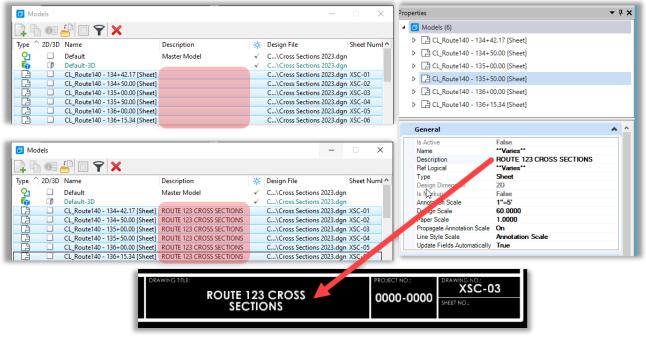


Figure - 3 Drawing Title

#### 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.

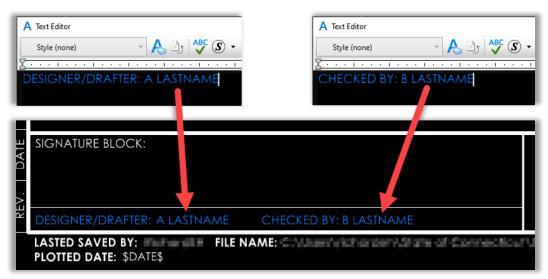


Figure 4 - Title Block Designer / Drafter / Checked By

• 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.

|             |          |  |              |              |  |           | X Pr | operties                       |                          | <b>▼</b> ₽ X |
|-------------|----------|--|--------------|--------------|--|-----------|------|--------------------------------|--------------------------|--------------|
|             |          |  |              |              |  |           |      | 🗇 Models (6)                   |                          | <b>^</b>     |
|             |          |  |              |              |  |           |      | CL_Route140 - 134+42           | 2.17 [Sheet]             | _            |
|             |          |  |              |              |  |           |      | ▷ 🕒 CL_Route140 - 134+50       | ).00 [Sheet]             | -            |
|             |          | NATURE BLOCK:  |              |              |  |           |      | General                        |                          | *            |
| ATE         | JIGI     | NATURE BLOCK.  |              |              |  |           |      | Engineer Name                  |                          | *            |
|             |          |  |              |              |  |           |      | Designer\Drafter<br>Checked By | A LASTNAME<br>B LASTNAME |              |
| EV.         |          |  |              |              |  | _         |      | Sheet                          |                          | *            |
| RE          | DES      | GNER/DRAFTER: A L  | ASTNAME CH   | ECI          | KED BY: B LASTNA                                       | ME        |      | Angle Readout                  |                          | *            |
|             | 1 4 51   | ED SAVED BY:   | EILE NAME    |              | in a state of the second second                        | 100 M     |      | Isometric                      |                          | *            |
|             |          | ITED DATE: \$DATE\$  | THE NAME.    |              | Quality of the latent                                  |           |      | Locks                          |                          | *            |
|             |          |  |              |              |  |           |      | Working Units                  |                          | *            |
| 🗇 Mo        |          |  |              |              | -  |           | ×    | Grid                           |                          | *            |
|             | <u> </u> | 占 🏹 🗙  |              |              |  |           | i    | Cell                           |                          | <b>~</b>     |
| Туре ′      | 2D/3D    | Name   | Description  | *            | Design File  | Sheet Num | nt 🛆 |                                |                          |              |
| P 21        |          | Default  | Master Model | $\checkmark$ | C\Cross Sections 2023.dgr                              |           |      |                                |                          |              |
| - <b>F</b>  | Ĩ        | Default-3D   |              | Ý            | C\Cross Sections 2023.dgr                              |           |      |                                |                          |              |
|             |          | CL_Route140 - 134+42.17 [Sheet]                                    |              |              | C\Cross Sections 2023.dgr                              |           |      |                                |                          |              |
|             |          | CL_Route140 - 134+50.00 [Sheet]                                    |              |              | C\Cross Sections 2023.dgr                              |           |      |                                |                          |              |
| D D D D D D |          | CL_Route140 - 135+00 00 [Sheet]<br>CL_Route140 - 135+50.00 [Sheet] |              |              | C\Cross Sections 2023.dgr                              |           |      |                                |                          |              |
|             |          | CL_Route140 - 135+50.00 [Sheet]<br>CL Route140 - 136+00.00 [Sheet] |              |              | C\Cross Sections 2023.dgr<br>C\Cross Sections 2023.dgr |           |      |                                |                          |              |
|             |          | CL_Route140 - 136+00.00 [Sheet]<br>CL_Route140 - 136+15.34 [Sheet] |              |              | C\Cross Sections 2023.dgr<br>C\Cross Sections 2023.dgr |           |      |                                |                          |              |
| 9           |          |  |              |              |  |           |      |                                |                          |              |

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.

|   | Properties               |                             | <b>→</b> ₽ × |
|---|--------------------------|-----------------------------|--------------|
|   | Models (1)               |                             | <b>^</b>     |
|   | CL Route140 - 134+       | 42 17 [Shoot]               | _            |
|   |                          | 42.17 [Sheet]               | -            |
|   | Items                    |                             |              |
|   |                          |                             |              |
|   | General                  |                             | *            |
|   | Engineer Name            |                             | *            |
|   | Sheet                    |                             | *            |
|   | Show Sheet Boundary      | True                        |              |
|   | Sheet Number             | XSC-01                      |              |
| DRAWING NO.:  | Sequence Number          | 0                           |              |
| XSC-01  | Border Attachment        | (None)                      |              |
|   | Sheet Size               | ANSI D                      |              |
| SHEET NO.;  | Height                   | 22.0000"                    |              |
|   | Width                    | 34.0000"                    |              |
|   | Sheet Unit               | Inches                      |              |
|   | > Origin                 | 0.0000000,0.0000000,        |              |
|   | Rotation                 | 0.000°                      |              |
|   | Sheet Index              | Not In Sheet Index          |              |
|   | Angle Readout            |                             | *            |
| Models  |                          | —                           |              |
| 📮 🕒 💷 🚰 🔲 🌄 🗙   |                          |                             |              |
| Type ^ 2D/3D Name   | Description              | 🔆 Design File               | Sheet Numl 🔨 |
| 💽 🗆 Default   | Master Model             | ✓ C\Cross Sections 2023.dgn |              |
| ♀ □ Default<br>👣  Default-3D  |                          | ✓ C\Cross Sections 2023.dgn |              |
| CL_Route140 - 134+42.17 [Sheet]   | ROUTE 123 CROSS SECTIONS | C\Cross Sections 2023.dgn 2 | XSC-01       |
|   | ROUTE 123 CROSS SECTIONS | C\Cross Sections 2023.dgn   | XSC-02       |
| CL_Route140 - 134+50.00 [Sheet] CL_Route140 - 135+00.00 [Sheet] CL_Route140 - 135+00.00 [Sheet] CL_Route140 - 135+50.00 [Sheet] | ROUTE 123 CROSS SECTIONS | C\Cross Sections 2023.dgn   | XSC-03       |
| CL_Route140 - 135+50.00 [Sheet]   | ROUTE 123 CROSS SECTIONS | C\Cross Sections 2023.dgn   | XSC-04       |
| CL_Route140 - 136+00.00 [Sheet]   | ROUTE 123 CROSS SECTIONS | C\Cross Sections 2023.dgn   |              |
| CL_Route140 - 136+15.34 [Sheet]   | ROUTE 123 CROSS SECTIONS | C\Cross Sections 2023.dgn   | XSC-06       |

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.

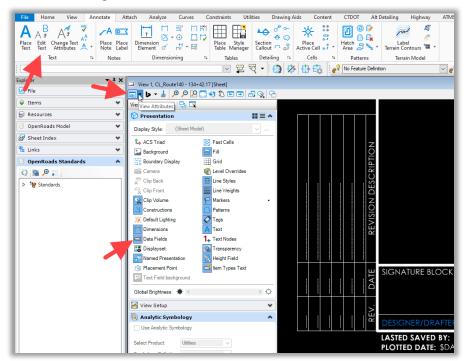


Figure 7 – Revision Block

#### 1.2.5 Last Saved By and File Name

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

| SIGNATURE BLOCK:  | 0                | 5'<br>HORIZONTAL SCALE | 10'       | СТРОТ                         | CON<br>DEPA |
|---|------------------|------------------------|-----------|-------------------------------|-------------|
| DESIGNER/DRAFTER: A LASTNAME CHECKED BY: B LASTNAME   |                  | 1" = 5'                |           |                               | TRANS       |
| LASTED SAVED BY: Inchester III FILE NAME: C. Moun Ulcharden Sitcher of Conne<br>PLOTED DATE: SDATES | icites ADOT CTDO | 1,008 - 030214         | THiphwayo | Contract_Plans/Cross Sections | dgn         |

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.

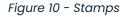


Figure 9 - PDF Plotted Date

- 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

| ROUTE 123 CROSS 0000-00<br>SECTIONS | 000 XSC-01 |
|-------------------------------------|------------|
| SECTIONS                            |            |



#### 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

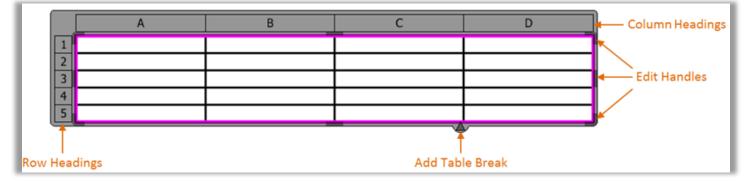


Figure 11 - Tables

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.

| Place Table   |            | -     |   | ×                                       |  | Place Tab            | le      |        | -                |        | ×   |
|---------------|------------|-------|---|---|--|----------------------|---------|--------|------------------|--------|-----|
| [             | III 🔊      | ×     |   |   |  |                      | E       | 1      |                  |        |     |
| Seed:         | None       |       | •   | <u>A</u>                                |  | See                  | ed: N   | one    |                  |        | - 🔺 |
| Text Style:   | CTDOT      | r_120 | •   |   |  | Text Sty             | le: Ϛ   | 🗸 СТІ  | DOT_120          |        | •   |
| Active Angle: | 00°00'00.0 | •     |   | <b>•</b>                                |  | Active Ang           | le: 0   | 0°00'0 | 0.0"             |        | •   |
| Row Count:    | 3          |       |   |   |  | Repo                 | ort: SI | GN IN  | ISTALLAT         | ION CI | •   |
| Column Count: | 4          |       |   |   |  |                      |         | ] Reta | i <u>n</u> Assoc | iation |     |
|               |            | Ac    | lace Tab<br><u>S</u> e<br>tive <u>Ang</u><br>File Nan<br>Workshe<br>Ran | ed: Fro<br>gle: 00<br>ne: De<br>eet: Sh | om Exc<br>*00'00<br>ttailed<br>eet1<br>ttoma<br>Cont<br>Cont | .0"<br>Estimate.xlsx | ×       |        |                  |        |     |

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**.

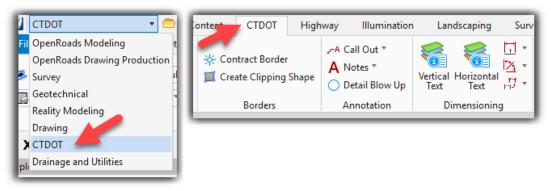


Figure 13 - CTDOT Workflow

1.4.1 Call Outs

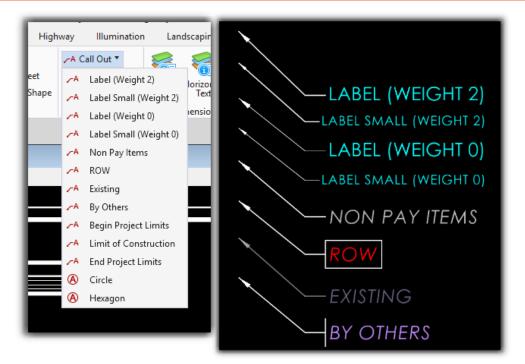


Figure 14 - CTDOT Call Outs

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.

**Paid 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.

**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.).

**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 STA. XX+XX Northing Coordinate Easting Coordinate

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

Limits of Construction CL STA. XX+XX Northing Coordinate Easting Coordinate

**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 STA. XX+XX Northing Coordinate Easting Coordinate

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.

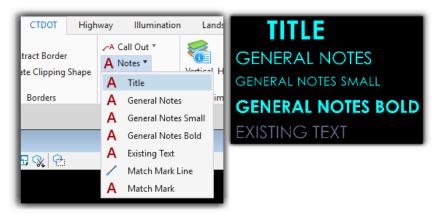


Figure- 15 CTDOT Notes

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.

| 🔏 Place Table         |                |     | $\times$ |
|-----------------------|----------------|-----|----------|
|                       | III 💿 🏝        |     |          |
| <u>S</u> eed:         | 🖗 General Note | s • | A        |
| Active <u>A</u> ngle: | 0.000°         |     | <b>•</b> |
| <u>R</u> ow Count:    | 8              |     |          |
| <u>C</u> olumn Count: | 2              |     |          |

Figure 16 – General Notes Table Dialog Box



Figure 17 - 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.

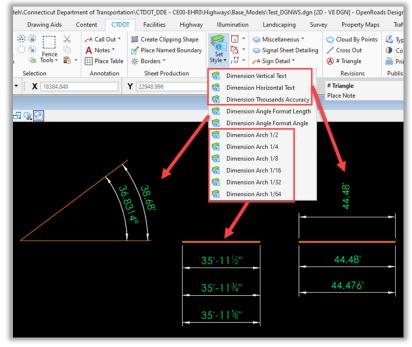


Figure 18 – CTDOT Dimensioning

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.

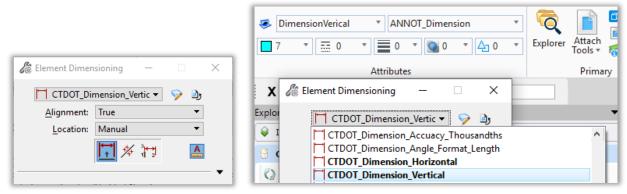


Figure 19 CTDOT Dimensioning Options

#### 1.4.4 Annotation Attribute Pointers

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

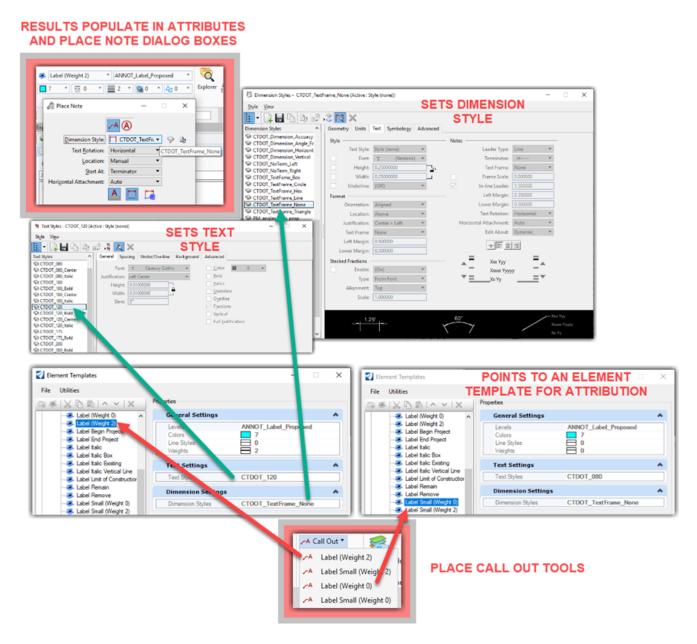


Figure 20 - Annotation Attribute Pointers

## **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

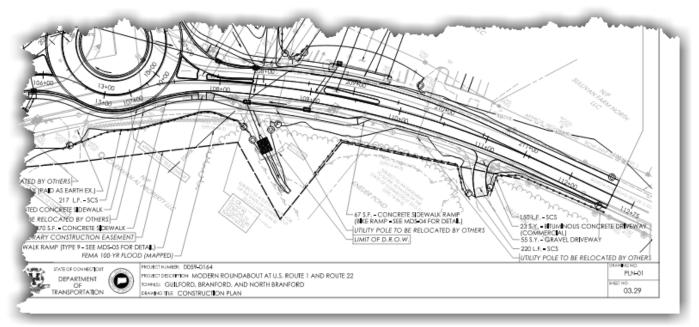


Figure 21 – PDF Plan

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

| Reference   | es (2 of 2 unique, 1 displayed)   | -      |            | ×    |
|-------------|---|--------|------------|------|
| Tools Pro   | perties   |        |            |      |
| 1 - 1       | 🕵 🗅 🌠 🏟 🌮 🖆 🚰 🖏 🐉 📅 🚇 🏷 🛱 💷 🔘 🔧 💆   | Mode:  | Boundaries | •    |
| Slot 🏴      | 🖸 File Name   | Logica | al         |      |
| 3           | SV_D3_0059_0164_Guilford_Roundabout_Route1_at_Route22_ORD_GRN.dgn           | Screen | Ground Su  | rvey |
| 5           | Attachment Properties: sv_d3_0059_0164_guilford_roundabout_route1_at_route2 | 22     | < Drainag  | e    |
|             | File Name: Roundabout_Route1_at_Route22_ORD_GRN.dgn                         | vse    |            |      |
|             | Full Path:\sv_d3_0059_0164_guilford_roundabout_route1_                      |        |            |      |
| <           | Model: Topography -   |        |            | >    |
| Scale 1.000 | Logical Name: Screen Ground Survey  |        |            | -    |
| Offset X 0  | Description: Master Model   |        |            |      |

Figure 22 – Reference Screening

#### 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

# 1.6 Level Display in Plan Sheets

A better understanding of how OpenX Products handles **new levels** and the level display of nested references with **display overrides** is needed to determine how to change the level display in sheet models when the source data is attached as a nested reference. This section will be helpful to review before using the **Place Named Boundary** tools. When the drawing boundary seeds are used to automatically create drawings from data attached as a nested reference, an additional type of level display control is used called **Synchronize View**.

| СТДОТ   | Alt Detailing       | Highway          | ATMS     | Illumi          | nation  | Landscaping   | F |
|---|---------------------|------------------|----------|-----------------|---|---|---|
| 88 ₽<br>□ □ ↓<br>1 ↓<br>1 ↓<br>1 ↓<br>1 ↓<br>1 ↓<br>1 ↓<br>1 ↓<br>1 |                     | Groups S         |          | es ▼<br>e Table | erent of the second of the se | e Clipping Sha<br>Named Bound<br>ers *<br>et Production |   |
|   | Contract Place Name | ed Boundary Cir  | vil Plan |                 | - [   | ×   |   |
| <b>- ⊥</b> ,⊕   | ٩                   | <b>R</b>         | ) 🎟 🔇    | ) 🦯 [           | 1   | I   |   |
| _   | Drawing Se          | ed: (none)       |          |                 |   | -   |   |
| _   | Detail Sc           | ale: Full Size 1 | = 1      |                 |   | •   |   |
| _   | Nar                 | me: Plan 1       |          |                 |   |   |   |
| _   | Descripti           | on:              |          |                 |   |   |   |
| _   | Gro                 | up: (New)        |          |                 |   | •   |   |
| _   | Nar                 | me: Untitled     |          |                 |   |   |   |
| _   | Descripti           | on:              |          |                 |   |   |   |
| _   | Start Locati        | on:              |          |                 |   | ⊲   |   |
| _   | Stop Locati         | on:              |          |                 |   | ▶   |   |
|   | Leng                | th: 1000.0000    | 000      |                 |   | 00<br>[tested   |   |
|   | Left Off            | set: -275.0000   | 00       |                 |   | 00<br>[totted   |   |
|   | Right Off           | set: 275.0000    | 0        |                 |   |   |   |
|   | Over                |                  |          |                 |   | 00  |   |
|   | Boundary Cho        | ·                |          |                 |   |   |   |
|   | beamany entry       |                  | Drawing  |                 |   |   |   |
|   |                     |                  | Dialog   |                 |   |   |   |
|   |                     |                  |          |                 |   |   |   |

Figure 23 - Place Named Boundaries

Sheets can be manually created using reference attachments and when manual reference attachments are made, the default settings for reference attachments allow the level display to be controlled entirely in the **Sheet Model**.

#### **New Level Display Setting**

The display of information on new levels is controlled globally through a configuration variable, MS\_REF\_NEWLEVELDISPLAY. When elements are added to new levels in the source data, those referenced levels will be toggled on for display in the sheets automatically. The automatic turning on of new levels makes it easier for downstream users of referenced design files to be aware of additional design work that has been drawn in a file.

#### **Sheet Container File**

When working in the CTDOT Workspace and using the CTDOT preference seeds, level display in the sheets is most easily controlled from the **Design Model (Assembler)** of the container file. As it is explained below, the Synchronize View setting, for the reference to the source data, is set to display the levels that are turned on in the **Design Model (Assembler)**. Any changes to the displayed levels in the sheets are temporary. This is by design. The level display 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** first.

#### Definitions

- **CP (Contract Plan)** multiple sheet models such as Plans and Profiles can be generated 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 (Assembler) 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 an CP file.
- Drawing Model (Annotation) This model type is the link between the Sheet and Design model in the **CP** file. They house the Saved View of each Named Boundary.
- Sheet Model (Publishing Portal) 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.
- **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.
- Reference / Display Overrides affect nested references only when Synchronize View Setting from Design Model is not used and sets where the level display takes place.
   Because it is important that the level display be able to be controlled from the Sheet Model, the default preference for reference attachments is set and locked to "Always", so that the sheet level display always overrides the source or parent. If it is your intention to control the display of levels in the sheet from the original reference to the source data, you may change the sheet nested reference attachment setting to "Never" after the attachment

has been made. A setting of "Never" makes level display changes in the sheet temporary – they can never permanently override the display of the levels from the source data.

#### 1.6.1 Synchronize View and Adjusting the Level Display

When sheets are automatically created using named boundaries, the drawing-type **model** 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 Default (Design Model (Assembler)) 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.

When level display changes need to be made to just one sheet model, the Synchronize View reference attachment setting in the drawing-type model that is the source for the sheet, can be changed to "Presentation Only" or "Volume Only". "Presentation Only" allows the levels to be controlled from the sheet model, the setting of "Volume Only" allows both the level display and the clipping boundary to be modified in the sheet.

| THE OFFICE THE OFFICE | view settings in brawing models Ancets the sheet model                 |
|-----------------------|--|
| Settings From         | In the sheet model, the clip boundary commands do not function; level  |
| Design Model          | display changes are temporary. Adjustments to level display or named   |
|                       | boundaries must be performed in the design model (Default).            |
| Presentation          | In the sheet model, the clip boundary commands do not function;        |
| Only                  | adjustments to named boundaries must be performed in the design        |
|                       | model (Default). Level display changes that are made in the sheet are  |
|                       | saved. Level display changes in Default do not affect the sheets whose |
|                       | drawing models use Presentation Only.                                  |
| Volume Only           | In the sheet model, the clip boundaries may be reclipped or removed.   |
|                       | Adjustments to named boundaries in Default do not affect the sheets    |
|                       | whose drawing models use Volume Only.                                  |
|                       | Level display changes that are made in the sheet are saved. Level      |
|                       | display changes in Default do not affect the sheets whose drawing      |
|                       | models use Volume Only.  |
| None                  |  |

#### How Synchronize View Settings in Drawing Models Affects the Sheet Model

#### 1.6.2 Synchronize View Set to Presentation Only or Volume Only

The following information is valid only when not using Synchronize View set to Settings From Design Model. "From Design Model" will be used when the sheets are initially created, the drawing Models references can be set post process to Presentation Only or Volume Only

Using a CP (Contract Plan), can reduce the number of direct reference attachments to a plan sheet. Another benefit is that the Reference Attachment Settings provide the ability to choose where to control the level display of the nested base references. The Display Overrides allow you to set which model controls the level display – either the plan sheet itself, or the **Assembler Model**. A default reference attachment setting currently sets the Display Override value to "Always". When the initial reference attachment is made, the levels in the sheet display the same as the levels in the model that is attached as a reference (parent). The setting of "Always" lets you perform level display changes in each individual sheets.

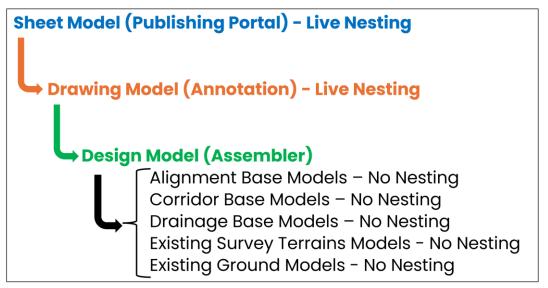


Figure 24 - Hierarchy of Plan Sheet Assembly

#### **Display Overrides**

|        | T   |
|--------|---|
| Allow  | Design Model is allowed to override the Drawing Model or Sheet Model until            |
|        | settings are changed or saved in these parent models. After parent settings           |
|        | are changed or saved, the Parent settings always override the Child Model.            |
| Always | Drawing Model or Sheet Model settings for level display of reference levels           |
|        | ALWAYS override the Design Model.   |
| Never  | Design Model settings for level display of reference levels <b>NEVER OVERRIDE</b> the |
|        | Parents - Design Model rules  |

**Note:** Save Settings (on Exit) – The use of the command **File > Save Settings** in the **Plan Sheet** or setting your workspace preference "**Save Settings on Exit**" effectively reduces the

Display Overrides to just two: Always or Never. After settings are saved in the **Plan Sheet**, Allow acts just like Always.

| Out Comes |  |
|-----------|--|
|-----------|--|

| Allow with Save Settings on Exit / Always   | Never  |
|---|--|
| I want to control the level display from the  | I want to control the level display in all plan                |
| plan sheet file.  | sheets from the Design Model (Assembler).                      |
| If I use a Design Model (Assembler), I will   | I will set the level display up for my plan                    |
| set the level display up for my plan sheets<br>in the CAD Base file before I attach it as a | sheets in the CAD Base file before I attach it as a reference. |
| reference.  |  |
|   | When I need to change level displays in a                      |
| Adjustments to the level display in each  | plan sheet, I open the CAD Base file and                       |
| plan sheet will be performed in the plan  | make the change there.   |
| sheet file on that specific reference   |  |
| attachment.   | The CAD Base file level display will now be                    |
|   | seen in all of the plan sheets.                                |
| If I open the Design Model (Assembler   |  |
| Model) and make level display changes   |  |
| there – those changes will NOT be seen in   |  |
| my plan sheets.   |  |
| Parent Model rules  | Design Model (Assembler Model) rules                           |

#### Changing the Display Overrides

Display Overrides may be changed from **Always** to **Never** on any nested reference attachment(s) to dynamically see level display settings in the CAD Base file. If you wish to keep the new choice, save the settings before exiting the file. Also, be aware that **Never** passes reference display on/off toggles to the Master file and reverting to **Always** does not reset a display toggle change. If a nested reference was toggled off while changing the Display Overrides, you will have to manually toggle it back on. It is because of the reference display toggle behavior that it is recommended to maintain a separate CAD Base file for a plan sheet assembled with a different set of discipline base files, such as a drainage plan.

# 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.
- 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 <i>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 I   | Road Maps    | ;         | Ļ         |           |           |
|----------|--------------|-----------|-----------|-----------|-----------|
| 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 25 - 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.

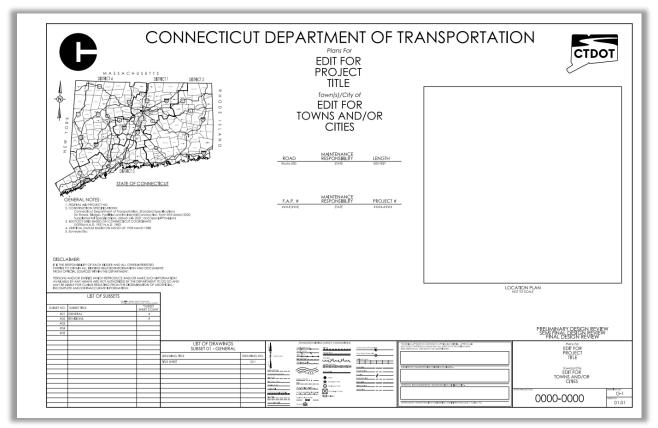


Figure 26 – PDF Blank Title Sheet

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.

VOLUME 13 - Contract Plans Production

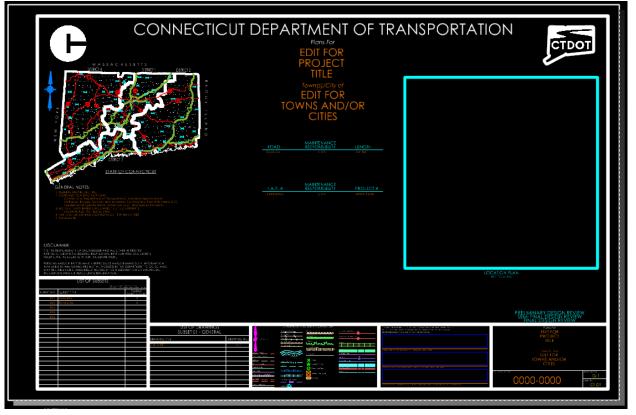


Figure 27 - DGN Blank Title Sheet

- 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
    - $\circ$  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. 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 28 – Location Plan Are

- 6. The town map will be placed under the Maintenance Responsibility note. Reference in the TRU map(s), move and scale to fit the whole town map. Turn Off unneeded levels and annotate as needed.
- 7. To shade Towns, make the MAP\_Town\_Shade level active. Use the **Create Complex Shape** Tool and select the needed town boundary lines.
- 8. Consultant designed projects shall not include the disclaimer located above the signature block. This shall be deleted.
- 9. 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.

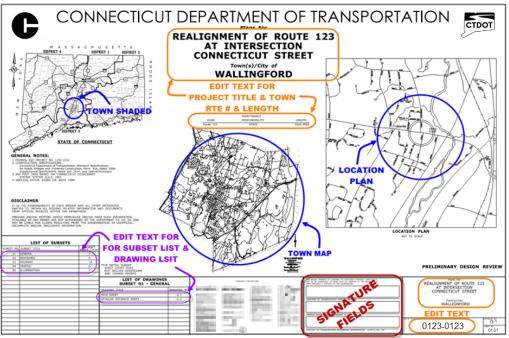


Figure 29 - PDF Title Sheet Overview

#### 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.

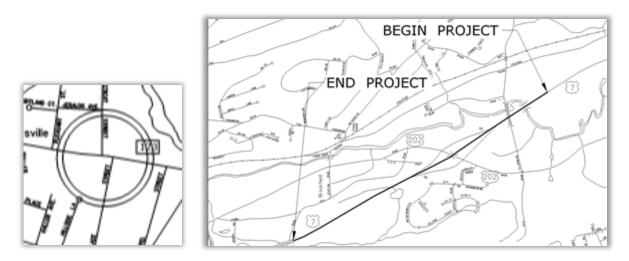


Figure 30 – Title Sheet Annotation

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.

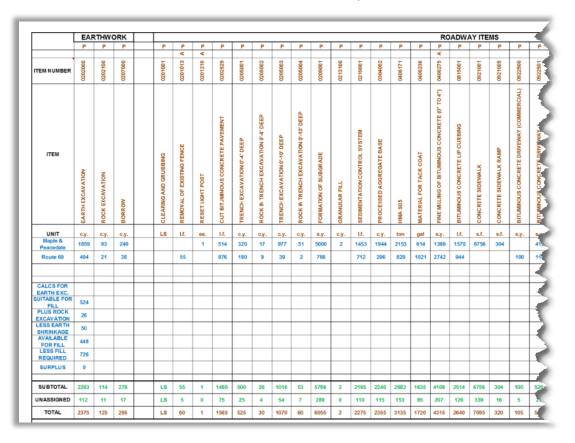


Figure 31 – Detailed Estimate Sheet

- 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: Al to H20. Request that the support units do the same and send you a link to their excel files.
- 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.

| Seed: From Excel   Active Angle: 0.000°   File Name: Detailed Estimate.xlsx   Worksheet: Sheet1   Range: Manual   Manual To:   Image: Image:   Automatic To:   Image: Contains Header Row   Image: OK   Image: Cancel | 🔏 Place Table         |                             | × |              |        |        |   |
|---|-----------------------|-----------------------------|---|--------------|--------|--------|---|
| Active Angle: 0.000° Range: Manual  File Name: Detailed Estimate.xlsx  Worksheet: Sheet1 Range: Automatic Contains Title Row Contains Header Row OK Cancel  | [                     |                             |   | Select Cells |        |        | × |
| File Name:     Detailed Estimate.xlsx        Worksheet:     Sheet1     From:       Range:     Automatic     To:       Contains Title Row     OK     Cancel  | Seed:                 | From Excel 🔹                | A | Worksheet:   | Sheet1 |        | * |
| File Name:     Detailed Estimate.xlsx        Worksheet:     Sheet1     From:       Range:     Automatic     To:       Icontains Title Row     OK     Cancel   | Active <u>A</u> ngle: | 0.000°                      | - | Range:       | Manual |        | - |
| Range:     Automatic       Contains Title Row     I23   | File Name:            | Detailed Estimate.xlsx      |   |              |        |        | _ |
| Contains Title Row  | Worksheet:            | Sheet1                      |   | From:        | A1     |        |   |
| Contains Title Row Contains Header Row OK Cancel  | Range:                | Automatic                   |   | To           | 123    |        |   |
| OK Cancel   |                       | Contains Title Row          |   | 10.          | 120    |        |   |
| Retain Association  |                       | Contains <u>H</u> eader Row |   | OK           |        | Cancel |   |
| - Inclain Association   |                       | Retain Association          |   | UK           |        | Cancer |   |

Figure 32 – 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.

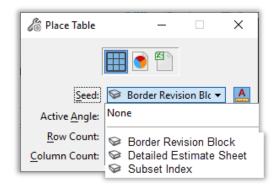


Figure 33 – Table From Seed

**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.
- 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:

I 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.
- If you have filled the sheet create another file new HW\_CP\_1234\_1234\_RevisionsSheet2.dgn and repeat the steps above.

| 40.                  | AND No                     |  |     | 4      | - 1      | Πο         1000 Fea         -0.000 </th <th>9497.4n</th> <th></th>  | 9497.4n  |  |
|----------------------|----------------------------|--|-----|--------|----------|---|--|--|
| A1 1                 |                            | t anna Antari, an<br>1 anna Antari, an     |     | =      | -        | D         GUIDELOP         Look 11         B         DUILE DATE BUILDER         dat         Fit           D         GUIDELOP         Look 11         B         BUILE DATE BUILDER         A1         Fit           D         GUIDELOP         Look 11         B         BUILE DATE BUILDER         A1         Fit   | LUBIDO ES  | 14-11 B BUC 4464 (JA L CA 44/4)<br>14-11 B BUC 4464 (JA L CA 44/4)<br>14-11 B BUC 4464 (JA L CA 44/4)  |
| AC 0<br>AC 0<br>AC 0 |                            | 8 2002 808182,00<br>8 2001 808182,00       |     | =      | 41<br>41 | Image: State State         Image: State  | 1.1 (4 (3)) 10()<br>4.1 (4)(10) 10()<br>1.1 (4)(10) 10() |  |
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|                      |                            |  |     |        |          | B) Origination (1, all)) (1) (2) (2) (2) (2) (2) (2) (2) (2) (2) (2   |  |  |
| REV.<br>No.          | SHEET No.                  | DATE<br>mm/dd/yy                           | NEW | REV.   | DEL.     | DESCRIPTION   | BY   | Image: Section 1       Imag  |
| A1                   | 01.01.003A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.01.004A1                | 01/28/11                                   |     | x      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.01.005A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JE\$   |  |
| A1                   | 01.01.006A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.01.007A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.01.008A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.01.009A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.01.010A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JE\$   |  |
| A1                   | 01.01.011A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  | 2  |
| A1                   | 01.01.012A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  | LEC BLOW NL THE LOCATION CONTACTOR     LEC BLOW NL THE LOCATION CONT   |
| A1                   | 01.01.013A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.01.014A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JES  | Image: State State State State State State         State S |
|                      |                            |  |     |        |          |   |  |  |
| A1                   | 01.02.001A1                | 01/28/11                                   |     | х      |          | ENTIRE SHEET REPLACED   | JE\$   | Ali Ali Ali Ali Ali Ali Ali Ali Ali  |
|                      | 01.03.005A1                |  |     |        | -        |   |  |  |
| A1                   | 01.03.005A1                | 01/28/11                                   |     | X      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   |                            | 01/28/11                                   |     | X      |          | ENTIRE SHEET REPLACED   | JES  |  |
| A1                   | 01.03.043A1<br>01.03.044A1 | 01/28/11                                   |     | X<br>X |          | ENTIRE SHEET REPLACED<br>ENTIRE SHEET REPLACED  | JE\$<br>JE\$   |  |

Figure 34 - 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<br>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                              |  |  |  |  |
| 8OR-01 - 8OR-02                                 | BORING LOGS                    | \$1G-01 - \$1G-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                 | \$TG-15 - \$TG-28 | CROSS SECTION SHEETS - TEMPORARY ROADWAYS         |  |  |  |  |

Figure 35 - Discipline Subset Cover Sheet / Index of Drawings

7. Insert Rows as needed.

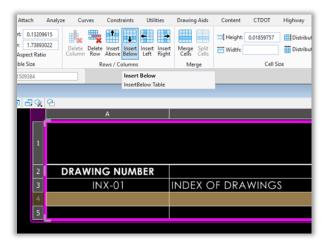


Figure 36 – Insert Rows

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

|               | THE DESIGN APPEARS TO CONFORM TO APPLICABLE CRITERIA.<br>NOT TO BE CONSTRUED TO MEAN THAT ALL ASPECTS OF THE DES<br>BEEN PERSONALLY CHECKED BY THE UNDERSIGNED. |                         |                                      |  |
|---------------|---|-------------------------|--------------------------------------|--|
| DRAWING TILE. | INDEX OF DRAWINGS   | PROJECT NO<br>0000-0000 | DRAWING ND.:<br>INX-01<br>SHEET NO.: |  |
|               |   |                         |                                      |  |

Figure 37 - State Design Cover Sheet Seed Signature Block

|                | DESIGNED BY:<br>CONSULTANT COMPANY NAME |                           |                                      |  |
|----------------|---|---------------------------|--------------------------------------|--|
| DRAWING TITLE; | INDEX OF DRAWINGS                       | PROJECT NO.:<br>0000-0000 | DRAWING NO.:<br>INX-01<br>SHEET NO.: |  |
|                |   |                           |                                      |  |

Figure 38 - 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.

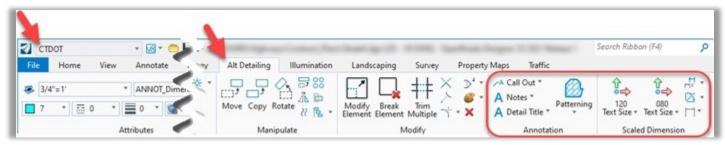


Figure 39 – Alt Detailing

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.

| ē <b>⇒</b><br>120<br>Text Size ▼ Te | 080<br>xt Size ▼   ▼ | ACS              | 1 😘 😨 🎎 🖑 |            |
|-------------------------------------|----------------------|------------------|-----------|------------|
| 🚮 Aux Sca                           | ile 6"=1'            | Name ^           | Scale     | Origin X   |
| 🚮 Aux Sca                           | ile 3"=1'            | View 1 : 3/4"=1' | 1:16      | 0.0000000  |
| l 🚮 🛛 Aux Sca                       | ile 1.5"=1'          | 1"=1'            | 1:12      | 0.00000000 |
| 💊 🚮 🗛 Aux Sca                       | ile 1"=1'            | 1"=5'            | 1:60      | 0.00000000 |
| Aux Sca                             | le 3/4"=1'           | 1"=10'           | 1:120     | 0.00000000 |
|                                     | le 1/2"=1'           | 1"=20'           | 1:240     | 0.00000000 |
|                                     |                      | 1"=30'           | 1:360     | 0.00000000 |
| 005                                 | ile 3/8"=1'          | 1"=40'           | 1:480     | 0.00000000 |
| 🚮 🖓 Aux Sca                         | ile 1/4"=1'          | 1.5"=1'          | 1:8       | 0.00000000 |
| 🚮 Aux Sca                           | ile 3/16"=1"         | 1/2"=1'          | 1:24      | 0.00000000 |
| 🚮 Aux Sca                           | ile 1/8"=1'          | 1/4"=1'          | 1:48      | 0.00000000 |
|                                     | ile 1/16"=1'         | 1/8"=1'          | 1:96      | 0.00000000 |
| L                                   |                      | 1/16"=1'         | 1:192     | 0.00000000 |
| 🚮 Aux Sca                           | ile 1/32"=1'         | 1/32"=1'         | 1:384     | 0.00000000 |
| 🛛 🚮 🛛 Aux Sca                       | ile 1"=5'            | 3"=1'            | 1:4       | 0.00000000 |
| 🚮 Aux Sca                           | le 1"=10'            | 3/4"=1'          | 1:16      | 0.00000000 |
|                                     |                      | 3/8"=1'          | 1:32      | 0.00000000 |
| 0.                                  | ile 1"=20'           | 3/16"=1          | 1:64      | 0.00000000 |
| 🚮 Aux Sca                           | ile 1"=30'           | 6"=1'            | 1:2       | 0.00000000 |
| 🛛 🚮 🛛 Aux Sca                       | ile 1"=40'           | Full             | 1:1       | 0.00000000 |
| 🚮 Aux Sca                           | le Full              | <                |           |            |

Figure 40 – Detailing

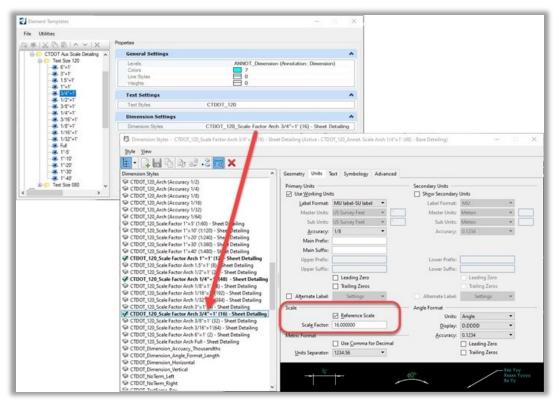


Figure 41 - Detailing

### 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.
- 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 <i con 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 Buildings Sheet-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**.

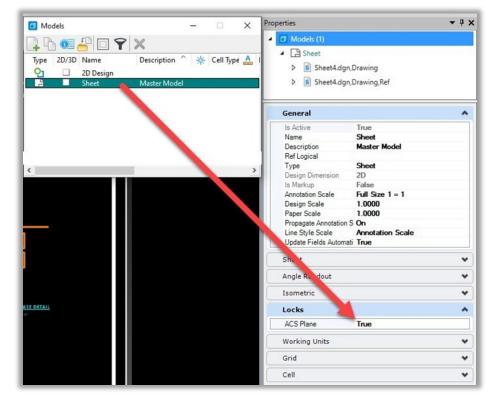


Figure 42 – Alt Detailing

- 4. Select the CTDOT workflow and click on the Alt Detailing tab.
- 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.
- 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.

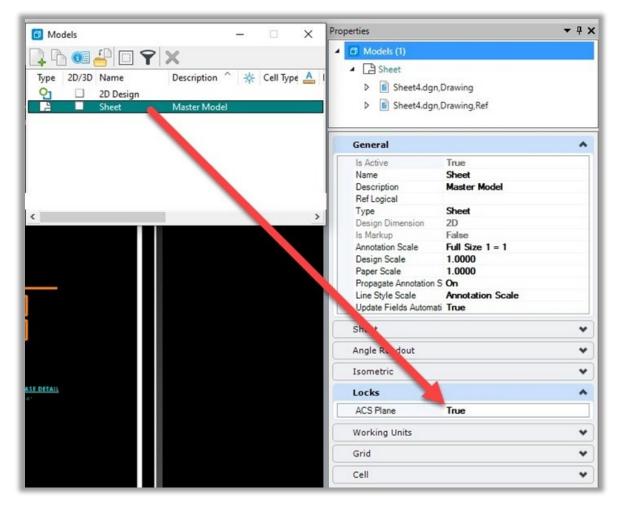


Figure 43 ASC Plane Lock

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**.

| An                    | notate Att                                | ach Analyze                          | Curves (   | Constraints    | Utilities  | Drawing Aids                                       | Content CTI                 |
|-----------------------|---|--------------------------------------|--|----------------|--|--|-----------------------------|
| 85 A <sup>+</sup> → F | A O<br>Place Place<br>Note Label<br>Notes | Dimension<br>Element of<br>Dimension |  | Place<br>Table | A → o <sup>th</sup> o <sup></sup><br>→ ○<br>Section<br>Callout □ 3 <sup>th</sup> | Place<br>Active Cell ** •<br>Cells                 | Hatch<br>Area ar the second |
|                       |   | <b>→</b> I X                         | 1  | ~              | -  | <b>etailing Symbol Sty</b><br>lanage detailing syn |                             |
|                       |   | -                                    | Detailing Sym File Utilities     Utilities Styles     CV Center Style CV Detail CV Sign Detail | a≞ ,S          | L  |  |                             |

Figure 44 – 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.
- 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.

| Full Path:             |                 | hways\Contra | act_Plans | Sheet4.dgn    |         |                |
|------------------------|-----------------|--------------|-----------|---------------|---------|----------------|
|                        | 2D Des          | ign          |           |               |         | •              |
| -                      | Тор             | 17           |           |               |         |                |
| Description:           | Standa          | ard Top      |           |               |         |                |
| Orientation:           |                 |              |           |               |         |                |
| View                   |                 |              | Descripti | ion           |         |                |
| Coincident             |                 |              | -         | with Maste    |         |                |
| Coincident -           |                 |              | Global C  | origin aligne | ed with | n Master File  |
| Top                    | vv5             |              |           |               |         |                |
| Saved Views            |                 |              |           |               |         |                |
| Named Bau              | darias          | (2020)       |           |               |         |                |
| Detail                 | Scale:          | 1/2"=1'-0"   |           |               | •       |                |
| Sc <u>a</u> le (Maste  | r:Ref):         | 1.00000000   | ) : [     | 24.0000000    | 00      |                |
| Named G                | iroup:          |              |           |               |         |                |
| Rev                    | ision:          | j.           |           |               |         |                |
|                        | Le <u>v</u> el: | С.           |           |               | •       |                |
| <u>N</u> ested Attachn | nents:          | No Nesting   |           |               | -       | Nesting Depth: |
| <u>D</u> isplay Over   | rrides:         | Allow        |           |               | •       |                |
| Ne <u>w</u> Level Di   | splay:          | Use MS_REF   | NEWLEV    | ELDISPLAY     | Cor     |                |
| Global LineStyle       | Scale:          | Master       |           |               | •       |                |
| Synchronize            | View:           | Volume Onl   | у         |               |         |                |
| Drawing Bour           | ndan/"          | (New)        | _         |               |         |                |
| ( N                    | lame:           | Base Detail  |           |               |         |                |
| Toggles                | -               |              | _         |               |         |                |

Figure 45 - 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.

| References (1 of 1 unique, 1 displ | ayed)   |
|------------------------------------|---|
| Tools Properties                   |   |
| 🗄 • 陰 🕼 📡 🗅 🛒 🤘                    | 🗞 🦛 🛃 🞦 🞦 🔂 🐔 📅 🔯 🔀 Hilite N                              |
| Hierarchy                          | Slot 🏴 🛅 File Name ^                                      |
|                                    | T / Ballings  |
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|                                    | New Level is Treat Attachment as Element for Manipulation |
|                                    |   |

Figure 46 - 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.

# Section 4 – Roadway Sheets

## 4.1 Overview

All files for contract plans, profiles and cross sections will reside in the Contract\_Plans folder under the disciplines folder; example: project folder/Highways/Contract\_Plans.

### 4.1.1 Named Boundaries

OpenRoads designer uses MicroStation **Named Boundaries** to define plan, profile, and cross section clipping areas. The Named Boundaries tools will create Drawing and Sheet models needed for plan, profiles and cross section contract sheets. Sheets are generated in their own design file. Files can be created using seeds found in the CTDOT DDE Configuration.

Sheets are clipped using **Named Boundary** tools from the **OpenRoads Modeling workflow** on the **Drawing Production** tab.

The top of the dialog contains several icons to select the type of named boundary that you wish to place.



Civil Plan



Civil Profile



**Civil Cross Section** 



Civil Cross Section 2 Points



By Polygon

CTDOT has configured sheet clipping options for plan, profile, and cross section sheets with common scale options. These configurations are stored in DGN Libraries and will appear in the Drawing Seed drop down menus, see below.

| he Place Named B | oundary Civil Plan — 🛛        | × | Place Named Boundary      | r Civil Profile — 🗆   | × |
|------------------|-------------------------------|---|---------------------------|---|---|
|                  | P 🖩 🎕 🖍 🖌 🖬                   | 1 | Drawing Seed:             | A V 🛄 🕅 🖌 🖌 🗐   |   |
| Drawing Seed:    | 40 Scale Contract Plan Sheet  | - | Detail Scale:             | And the second | - |
| Detail Scale:    | Name                          |   | Name:                     | (none)  |   |
| Name:            | (none)                        |   | Description:              | 20 Scale Contract Profile Sheet   |   |
| Description:     | 20 Scale Contract Plan Sheet  |   |                           | 40 Scale Contract Profile Sheet<br>80 Scale Contract Profile Sheet  |   |
|                  | 40 Scale Contract Plan Sheet  |   | Plan Group:               | oo scale Contract Prome sneet   |   |
| Group:           | 80 Scale Contract Plan Sheet  |   |                           | (New)   | 1 |
| Name:            |                               |   |                           | Untitled  | ŕ |
| Description:     |                               |   | Description:              | From Plan Group: CL   |   |
| Start Location:  |                               | ⊲ | Vertical Exaggeration:    | 10.000000   | 1 |
| Stop Location:   |                               |   | Available Profile Height: | 60.000000   |   |
| Length:          | 1000.000000                   |   | Top Clearance:            | 0.500000  | j |
| Left Offset:     | -275.000000                   | - | Bottom Clearance:         | 0.500000  | ] |
|                  |                               | - | Elevation Datum Spacing:  | 10.000000   |   |
| Right Offset:    | 275.000000                    |   | Station Datum Spacing:    | 10.000000   |   |
| Overlap:         | 0.000000                      |   | Profile Shifts:           | Datum Stations 👻  |   |
| Boundary Chords: | 20                            |   |                           | Use Terrains  |   |
|                  | Create Drawing<br>Show Dialog |   |                           | Use Active Vertical Create Drawing Show Dialog  |   |

| de Plac  | e Named Boundary    | y Civil Cross Section -                   | × |
|----------|---------------------|---|---|
|          |                     | AN 🔤 🕥 / 🖌 🗇                              |   |
|          | Drawing Seed:       | 5 Scale Contract XSC Sheet                | * |
|          | Detail Scale:       | Name                                      |   |
|          | Group:              | (none)                                    |   |
|          | Name:               | 5 Scale Contract XSC Sheet                |   |
|          | Description:        | 10 Scale Contract XSC Sheet<br>XS Stacked |   |
|          | Start Location:     |   |   |
|          | Stop Location:      |   | ▶ |
|          | Left Offset:        | -70.000000                                | - |
|          | Right Offset:       | 70.000000                                 |   |
|          | Interval:           | 50.000000                                 | - |
| Ver      | tical Exaggeration: | 1.000000                                  |   |
|          | Top Clearance:      | 5.000000                                  |   |
|          | Bottom Clearance:   | 10.000000                                 |   |
| Elevatio | on Datum Spacing:   | 1.000000                                  |   |
|          | Event Point List:   | (None)                                    | * |
|          |                     | Include Event Points Only                 |   |
|          |                     | Include Control Points                    |   |
|          |                     | Create Drawing                            |   |
|          |                     | Show Dialog                               |   |

Figure 47

A sheet design file is created to house the named boundaries as well as the completed sheets. The various base model design files required to assemble the sheets are attached as reference files to the Design Model in the sheet design file. The named boundaries are placed in the design model relative to a selected alignment, profile, or 3D model for cross sections.

|                | Pro   | pertie       | 5            |                       |              |                |                  |                    |              |              |              |              |   |
|----------------|-------|--------------|--------------|-----------------------|--------------|----------------|------------------|--------------------|--------------|--------------|--------------|--------------|---|
| i -            |       | 4            | 👌 🌿 👒        | o 🌤 🖻 🎦 🗳             | d 🕫 🏛 📴      | 🔘 🗙 Hilite Moo | de: Boundaries 🔻 |                    |              |              |              |              |   |
| Slot           | ٣     | ۵            | File Name    |                       | Model        | Description    | Logical          | Orientation        | Presentation | •            | 2            | k            | 6 |
| 1              |       |              | HW_0000_0000 | _Model.dgn            | Default      | Master Model   |                  | Coincident         | Wireframe    | ×            | $\checkmark$ | $\checkmark$ | _ |
| 2              |       |              | HW_0000_0000 | DrainageModel.dgn     | Default      | Master Model   |                  | Coincident         | Wireframe    | $\mathbf{v}$ | ~            | $\checkmark$ |   |
| 3              |       | $\checkmark$ | HW_0000_0000 | PlanProfileSheets.dgn | Default-3D   |                | Ref              | Coincident - World | Wireframe    |              | Ý            | ¥            |   |
| cale           | 1.000 | 0000         | 00           | : 1.000000000         | Rotation 00* | 00'00" Offset  | <u>K</u> 0.000   | <u>Y</u> 0.000     |              |              |              |              |   |
| S <u>c</u> ale | 1.000 | 0000         | 00           | : 1.000000000         | Rotation 00* | 00'00" Offset  | <u>K</u> 0.000   | <u>Y</u> 0.000     |              |              |              |              |   |

Figure 48

#### 4.1.2 Plan and Profiles

Examples showing four named boundaries placed for the plan and profile sheet production are shown below.

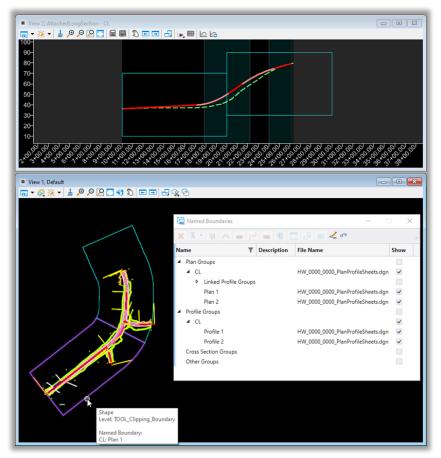
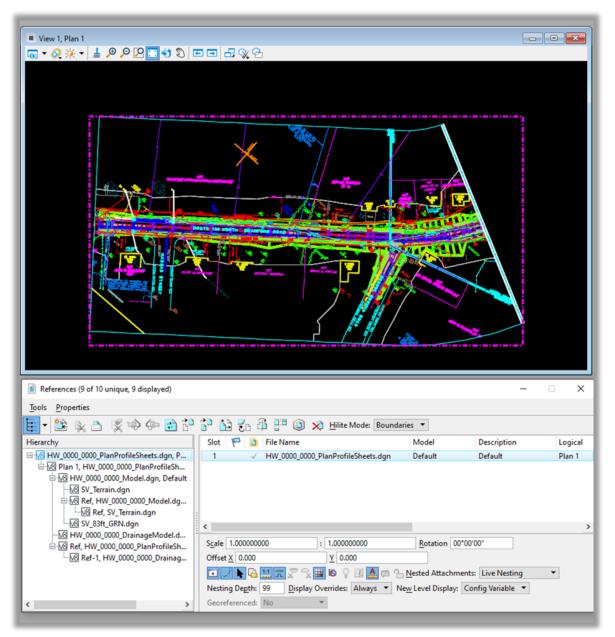


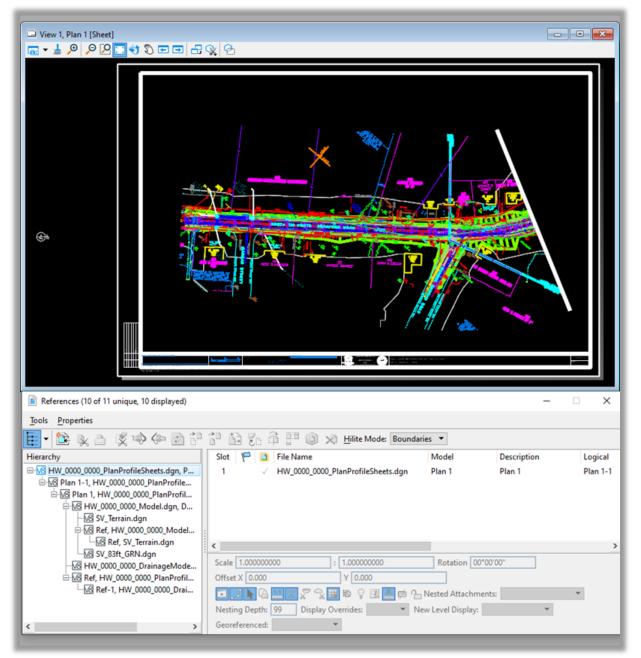
Figure 49

**Tip:** When the file containing the existing ground terrain is attached, setting the terrain active is necessary to display the existing ground profile on the sheets. When the terrain model is set active, a 3D model is created in the active file and attached as a reference to the plan view. The 3D model is typically not needed for plan and profile sheets and the display should normally be turned off in the when the sheets are generated, the software creates a MicroStation drawing model for each named boundary, plan, profile, or cross section. An example of the drawing model for a plan view named boundary is shown below.



#### Figure 50

The drawing models are referenced to a sheet model with a sheet border to assemble the completed sheets for PDF generation as shown in the example below.





The sheet model is intended for PDF generation. Most annotations should be placed in the various drawing models, not in the sheet models.

#### 4.1.3 Cross Sections

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

Before generating the named boundaries, a design file is created to house the crosssection 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.

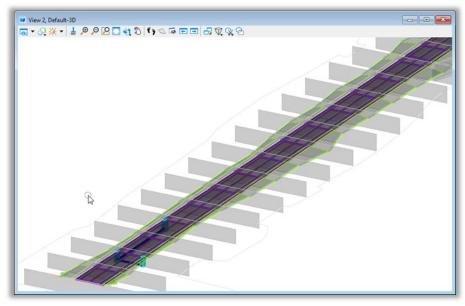
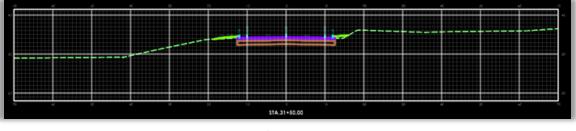


Figure 52

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.





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.



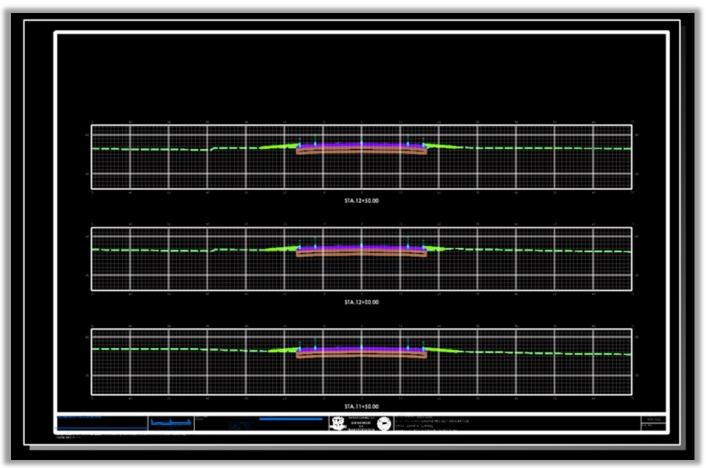


Figure 54

The sheet model is intended for PDF generation. Most annotations should be placed in the various drawing models, not in the sheet models.

### 4.2 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 <i>con on the bottom Windows Screen. Click on the Connection Client Icon and select Open.
- 5. Access OpenRoads through CAD Accounting or the Customized Icon.
- 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**.

## 4.3 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.





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

| 🗇 Models        | _                           | - 0 | $\times$ | General 🔺   |
|-----------------|-----------------------------|-----|----------|---|
| 📭 🖻 📵 💾 🖸 🌱 🕽   | ĸ                           |     |          | Is Active True Name 2D Sheet  |
| Type 2D/3D Name | Description<br>Master Model |     | *        | C Description Master Model<br>Ref Logical   |
|                 | Master Model                |     |          | Type Sheet<br>Design Dimension 2D   |
|                 |                             |     |          | Annotation Scale Full Size 1 = 1  |
|                 |                             |     |          | Paper Scale 1.0000 Paper Scale 1.0000   |
|                 |                             |     |          | Propagate Annotatic On<br>Line Style Scale Annotation Scale<br>Update Fields Autor True |
| <               |                             |     | >        | Sheet A   |

Figure 56

4. Edit the Sheet Name as needed.

| Models    |                         |              | _ | ×   |
|-----------|-------------------------|--------------|---|-----|
|           | 💾 🔲 🍞 🗙                 |              |   |     |
| Type 2D/3 | D Name                  | Description  |   | * C |
|           | Typical Section Sheet 1 | Master Model |   | (   |
|           |                         |              |   |     |

Figure 57

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

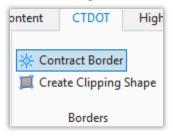


Figure 58

- VOLUME 13 Contract Plans Production
  - In the Properties Dialog Box Edit the Border information. This will update the Border Description: Drawing Title.

Sheet Number: **Drawing No.** 

 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**.

|   | 🗊 Models   |  | _      | $\times$   |
|---|--|--|--------|------------|
|   |  | <b>₽</b> ×                               |        |            |
|   | Type 2D/3D Name  | Description                              |        | <u>ж</u> с |
| 1 | 📑 🗖 Туріс  | al Section Sheet 1 TYPICAL SE            | CTIONS | ¢          |
|   | Create Model   |  | ×      |            |
|   | <u>T</u> ype:<br>Seed Model:<br><u>Name:</u><br><u>D</u> escription:<br>< <u>R</u> ef Logical: | Seed2D - CT Road.dgn, Default            | 2D •   | >          |
|   | Line Style Scale:  |  |        |            |
|   |  | Auto-Update Fields                       |        |            |
|   | Annotation Scale –   | Full Size 1 = 1                          | •      |            |
|   | Cell Properties —<br>Ability to Place:   |  |        |            |
|   | Ability to Place:  | As Annotation Cell                       |        |            |
|   | Cell Type:   |  | -      |            |
|   |  | Create a <u>V</u> iew Group<br><u>OK</u> | Cancel |            |



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.

|      |                  | <u>+</u>      | - | ð |
|------|------------------|---------------|---|---|
|      |                  | display Templ | × | - |
| Ribb | n (1)            |               |   | - |
| r 🖻  | Display Template |               |   |   |



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

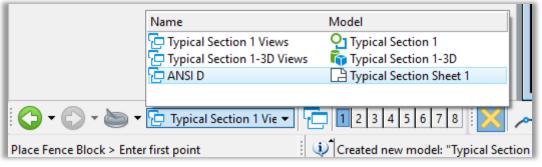


Figure 61

 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.

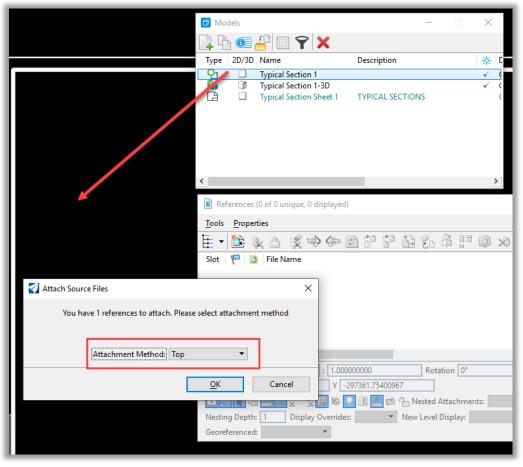


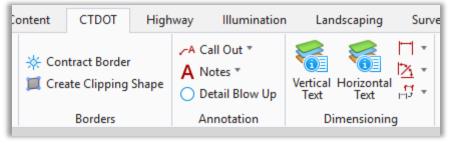
Figure 62

- 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.

| Attachment Proper            | ties: typicals_details_3.dgn X             |  |  |
|------------------------------|--|--|--|
| <u>Fi</u> le Name:           | TYPICALS_DETAILS_3.dgn Browse              |  |  |
| Full Path:                   | \contract_plans\typicals_details_3.dgn     |  |  |
| <u>M</u> odel:               | Typical Section 1                          |  |  |
| Logical Name:                | Тор  |  |  |
| Description:                 | Standard Top                               |  |  |
| Detail Scale:                | 1"=10' 🗸                                   |  |  |
| Sc <u>a</u> le (Master:Ref): | 1.000000000 : 120.000000000                |  |  |
| Named Grou <u>p</u> :        | ▼  |  |  |
| Revision:                    | <b>▼</b>                                   |  |  |
| Le <u>v</u> el:              | ▼  |  |  |
| Nested Attachments:          | No Nesting Depth: 1                        |  |  |
| <u>D</u> isplay Overrides:   | Allow 👻                                    |  |  |
| Ne <u>w</u> Level Display:   | Use MS_REF_NEWLEVELDISPLAY Configuration 😾 |  |  |
| Global LineStyle Scale:      | Master 👻                                   |  |  |
| Synchronize View:            | (No View) (none) 🔻                         |  |  |
| Toggles                      |  |  |  |
| 💶 🗾 📐 🔁 🏭 🎞 🏸 🖓 🎟 🔊 🖓 🙆 📥    |  |  |  |
|                              | <u>O</u> K Cancel                          |  |  |

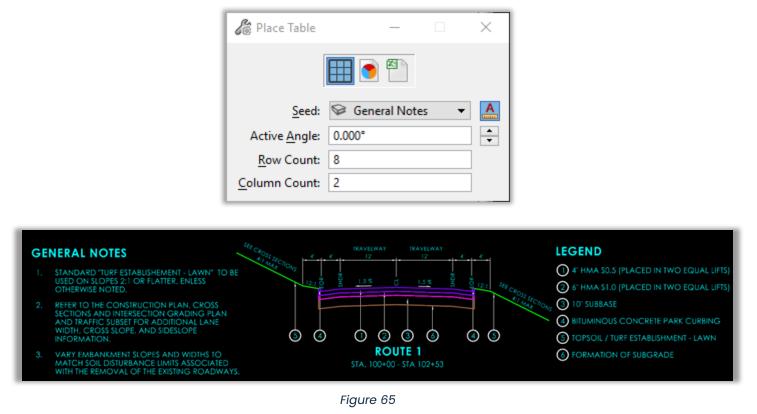
Figure 63

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





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.



- 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.

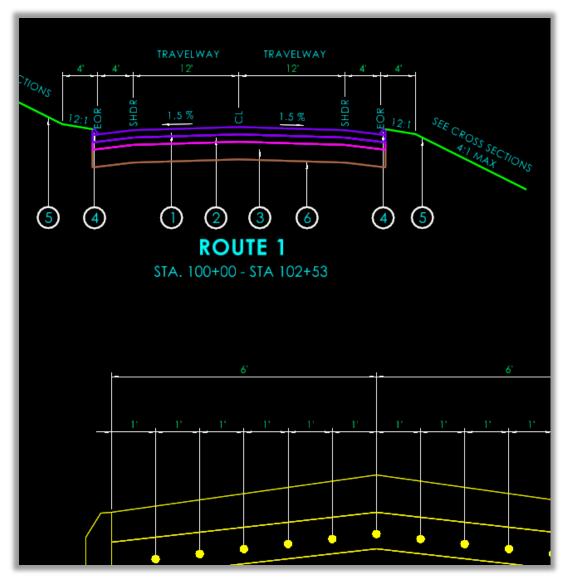


Figure 66

22. Use the Measure Distance tool to measure elements in each detail, notice that it will measure at paper size. In the Reference Dialog Box **Activate** on a Reference and measure, notice you now get the true size. When dimensioning a reference the results will also yield the true element size.

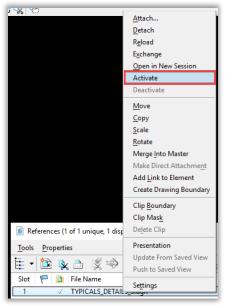


Figure 67

23. To return to editing the Sheet Deactivate the Reference.

### 4.4 Plan and Profile Sheets

### 4.4.1 Create Plan Sheet

 Create a design model that will be used to create the plan and profile sheets for the project.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

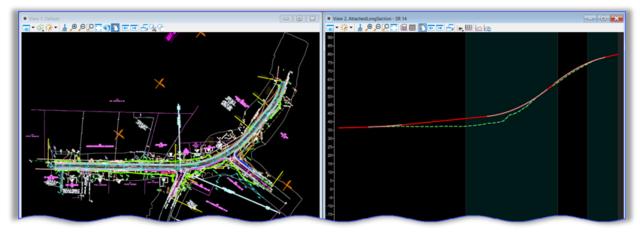
example: HW\_CP\_5678\_5678\_PlanPro\_SR\_14.dgn

using the correct seed file:

...CT\_Configuration | Organization | Seed | Road | Seed2D - CT RoadDesign.dgn

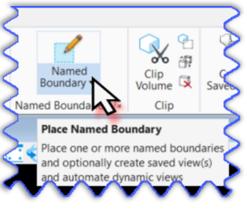
If the survey was done in an old Datum, use the 2D Seed Files in this folder *...CT\_Configuration Organization Seed GCS* 

- 2. Reference in the needed 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 the Alignment Models, the Corridor Models, Drainage Models, the 2D Layout Models, and the Existing Terrain, ROW and Annotation Models.
- 4. Set up the display views to show Default view and profile view. Set the terrain to active and **Save Settings**. Turn off





 Select Drawing Production > Named Boundaries > Named Boundary > Place Named Boundary. A named boundary is a closed element that has a name associated with it. Previously you could create named fences from fences, clip volumes and clipped masks.





6. Select the **Civil Plan** mode. Set Drawing Seed to **40 Scale Contract Plan Sheet**. Set the Detail Scale to 1"=40'. The Set Name will be set to Plan 1.

**TIP:** Including the number 1 at the end of the name keeps the names of the named boundaries and sheets more uniform because the number is included in the first name. Otherwise, the incremented numbering begins with the second name, example: Plan, Plan 1, Plan 2.

|                  | Civil Plan Mode                |                |
|------------------|--------------------------------|----------------|
| 🔏 Place Named B  | o dary Civil Plan — 🗆          | ×              |
|                  | A 🖬 🖿 🌒 🖍 🗹 🗐 🗐                |                |
| Drawing Seed:    | 40 Scale Contract Plan Sheet 🔹 |                |
| Detail Scale:    | 1"=40' 🗸                       |                |
| Name:            | Plan 1                         |                |
| Description:     |                                |                |
| Group:           | (New) 🔻                        |                |
| Name:            | SR 14                          |                |
| Description:     |                                |                |
| Start Location:  | 99+00.00                       | ◀              |
| 5top Location:   | 116+84.92                      | ▶              |
| Length:          | 1000.000000                    | oo             |
| Left Offset:     | -275.000000                    | 00             |
| Right Offset:    | 275.000000                     | 00<br>Taxaaaaa |
| Overlap:         | 0.000000                       | 00             |
| Boundary Chords: | 20                             |                |
|                  | Create Drawing<br>Show Dialog  |                |

Figure 70

- 7. Set the Group to (New). Set the Group Name to match alignment name, usually the Route Number or Street name (This is the lower name field which defines the name of the named boundary group.) Example: SR 14 (for State Route 14). Length (length of alignment on one sheet), Left Offset and Right Offset (offset from the alignment), Overlap should be set to 0 (a sheet overlaps the other), and Boundary Chords have preset values.
- 8. Enable the *Create Drawing* option so that the sheets are created as soon as the named boundaries are created. Enable the *Show Dialog* option. This dialog is used to override settings defined by the Drawing Seed if needed.
- 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.
- Select the desired Start Location. Follow the prompts.C ommand Line: Place Named Boundary Civil Plan > Accept/Reject. Identify Path start point to place boundary. Follow the prompts.

**TIP:** 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.

11. 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.

12. The **Create Drawing** dialog box will appear. Ensure the *Mode*: is set to Plan, Name:

should be populated with the Plan I from Place Named Boundary Civil Plan tool. In the Drawing Model portion of the dialog set the annotation scale to 1'' = 40'. In Sheet Model portion of the dialog, set the Detail Scale to 1'' = 40'.

- Enable the Add to Sheet
   Index option. This option will be discussed later in this module. Enable the Open Model option.
- 14. 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.

| 🞻 Create Drawing  | X   |  |
|-------------------|---|--|
| Mode<br>Name      |   |  |
| One Sheet Per Dgi | n:  |  |
|                   | 10 Scale Contract Plan Sheet 🔹                              |  |
|                   | Civil Plan  |  |
| Discipline: Civil |   |  |
|                   | Plan View   |  |
|                   | orawing Model<br>CV Plan Sheet Definitions.dqnlib, 40 Scale |  |
|                   |   |  |
|                   | (Active File)   |  |
|                   | Plan Annotation   |  |
|                   |   |  |
|                   | heet Model  |  |
|                   | CV_Plan_Sheet_Definitions.dgnlib, 40 Scale                  |  |
|                   | (Active File)   |  |
|                   | New)  |  |
|                   | 10 Scale Contract Plan Sheet                                |  |
|                   | "=40'   |  |
| Detail Scale .    |   |  |
|                   | Add To Sheet Index 🛛 🕼                                      |  |
|                   | Make Sheet Coincident                                       |  |
| 1                 | Open Model  |  |
|                   | OK Cancel   |  |

Figure 71

15. In the view group dialog, you can now see the newly created drawing models and sheet models.



Figure 72

# 4.4.2 Create Profile Sheet

1. Open the Plan and Profile Design Model and display the profile view. If not already open.

**TIP:** If you saved settings after setting up your views (step 2 from create plan sheet section) change the active view group to Multi-Model Views.

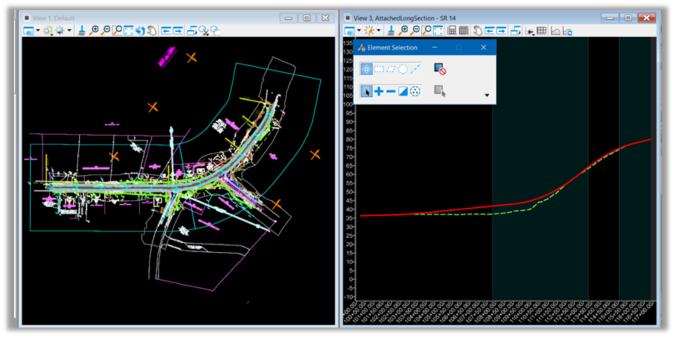


Figure 73

- 2. Select Drawing Production > Named Boundaries > Named Boundary > Place Named Boundary.
- 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 (This is the top name field which defines the name of the named boundary)
  - Method > From Plan Group
- 4. 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 such as for profile only sheets, example: profile sheet for a local road.
  - *Plan Group* > Choose the desired Plan Group if there are multiples in this file. This is the name of the plan group that contains the plan named boundaries that will also define the profile named boundary locations, example: as named Plan sheets: SR 14 or State Route 14.
  - Group > (New)
  - Name > Route Number or Street name, example: SR 14 or State Route 14.

- This is the lower name field which defines the name of the named boundary group for profiles. This is the same group name we used for the plan portion, but they are two different groups, one associated with Plan, the other associated with Profile. More on this later in this module.
- Vertical Exaggeration > 10
- Available Profile Height, Top Clearance (toggled on), Bottom Clearance (toggled on), Elevation Datum Spacing, Station Datum Spacing and Profile Shifts are set by the drawing seed.
- Make sure all are toggled on.
- Use Terrains
- Use Active Vertical
- Create Drawing
- Show Dialog Box

| 🔏 Place N    | lamed Boundary    | Civil Profile — 🗆                 | ×  |
|--------------|-------------------|-----------------------------------|----|
|              |                   | ѫᠹ᠋≣ॣऀॖॖऺॗऀॗॖॖॖॖ                  |    |
|              | Drawing Seed:     | 40 Scale Contract Profile Sheet 🔹 |    |
|              | Detail Scale:     | 1"=40' 🗸                          |    |
|              | Name:             | Profile 1                         |    |
|              | Description:      |                                   | [  |
|              | Method:           | From Plan Group 🔻                 |    |
|              | Plan Group:       | SR 14 🗸                           |    |
|              | Group:            | (New) 🔻                           |    |
|              | Name:             | SR 14                             |    |
|              | Description:      | From Plan Group: SR 14            |    |
| Vertica      | al Exaggeration:  | 10.000000                         | ]  |
| Available    | e Profile Height: | 60.000000                         | 00 |
| $\checkmark$ | Top Clearance:    | 0.500000                          | ]  |
| Bo'          | ttom Clearance:   | 0.500000                          | ]  |
| Elevation    | Datum Spacing:    | 10.000000                         | ]  |
| Station      | Datum Spacing:    | 10.000000                         | ]  |
|              | Profile Shifts:   | Datum Stations 🔹                  | ]  |
|              |                   | Use Terrains                      |    |
|              |                   | Use Active Vertical               |    |
|              |                   | Create Drawing                    |    |
|              |                   | Show Dialog                       |    |

Figure 74

- 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.
- 6. The **Create Drawing** dialog box will appear. Change the Mode to **Profile** and the Name to **Profile 1** (or short Pro 1). Everything else is preset for you.
- 7. Toggle on: Add To Sheet Index and Open Model.
- 8. 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.

| < Create Drawing   | X  |
|--|--|
|  | ode: Profile   Profile 1  Dgn:   |
| Drawing Seed:<br>View Type:<br>Discipline:<br>Purpose:                     | 40 Scale Contract Profile Sheet<br>Civil Profile<br>Civil<br>Elevation View                  |
| Seed Model:<br>Filename:   | Drawing Model CV_Profile_Sheet_Definitions.dgnlib, 40 Scal (Active File) 1"=40' Profile Grid |
| Seed Model:<br>Filename:<br>Sheets:<br>Drawing Boundary:<br>Detail Scale : | 1"=40'   |
|  | Add To Sheet Index<br>Make Sheet Coincident<br>Open Model<br>Cancel                          |

Figure 75

#### 4.4.3 Review Plan and Profile Sheets

There are several ways to review individual sheets. Click on the **View Tab > Within the View Groups tools set** you can select any of the sheets. The same tool is also available in the **Manage View Groups toolbox** if docked on the bottom (it usually is).

| 🔁 Manage View Groups    |                   | —    |               | ×       |      |
|-------------------------|-------------------|------|---------------|---------|------|
| T 🗊 🗙                   |                   |      |               |         |      |
| Name                    | Model             |      |               |         |      |
| 🔁 Default               | <b>O</b> Default  |      |               |         |      |
| Default-3D Views        | 🛜 Default-3D      |      |               |         |      |
| Multi-Model Views       |                   |      |               |         |      |
| Plan 1 [Sheet] Views    | Plan 1 [Sheet]    |      |               |         |      |
| 🔁 Plan 1 Views          | 🔊 Plan 1          |      |               |         |      |
| Plan 2 [Sheet] Views    | Plan 2 [Sheet]    | 1    |               |         |      |
| 🔁 Plan 2 Views          | 🖻 Plan 2          |      |               | ed shee |      |
| Profile 1 [Sheet] Views | Profile 1 [Sheet] | -    | drav          | wing mo | dels |
| Profile 1 Views         | Profile 1         |      |               |         | _    |
| Profile 2 [Sheet] Views | Profile 2 [Sheet] |      |               |         |      |
| Profile 2 Views         | Profile 2         |      |               |         |      |
|                         |                   |      |               |         |      |
|                         |                   | ·    |               |         |      |
|                         | Appl              | ly 🗌 | <u>C</u> lose | 9       |      |

Figure 76

 Select the View Group tool to view the sheets. Each sheet has a Drawing Model and a Sheet 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, it is geospatially correct. The Drawing Model is used to apply annotations, dimensions and callouts to a design, examples: call outs for items such as slope limits and catch basins or dimensions for guiderail offsets. 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 and design model references that are scaled and positioned to create a printable drawing.

**Open and review** the Sheet Model for Plan 1 by selecting Plan 1 [Sheet] Views and then select **Apply**.

TIP: You can also double-click on any model in the list to open it as well.

2. The Sheet Model for Plan 1 will open. Notice the border cell is placed at 0,0 axis, the named boundary shape and all design models are referenced. The project number, description and town name(s) will be automatically populated from the Project, the Drawing Title will be populated with the text entered in the Model Description Field.



Figure 77

3. **Open and review** the Drawing Model for Plan 1 by selecting Plan 1 Views from the list and then selecting **Apply**.

The Drawing Model for Plan 1 will open. Notice the Named Boundary shape is referenced, the Match Mark line and call out has been added to the Drawing Model as well and the model is geospatially correct. Plan view annotation should be done in the drawing model.

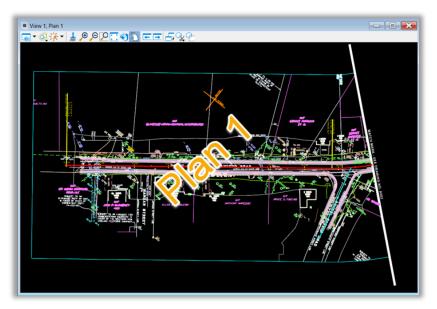


Figure 78

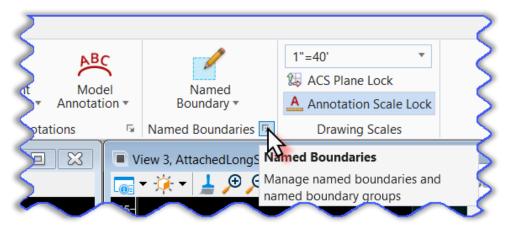
4. Review the remaining Sheet Models by using the same steps described above. Become familiar how to navigate between the various drawing and sheet models.



Figure 79

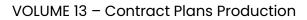
# 4.4.4 Review Named Boundaries

- 1. Select the Multi-Model view again.
- 2. Open the Drawing Production > Named Boundaries > Named Boundaries dialog.





- 3. In the Named Boundaries box, expand *Plan Groups*. There is a plan group for the Plan Sheets named during creation, example: SR 14. The name of the group and the individual named boundaries come from the values defined on the Place Named Boundary dialog. Expanding the *Linked Profile Groups*, shows a linkage to the profile group: example SR 14, that is also named as the plan group.
- 4. By clicking on the individual plan, the named boundary is highlighted in view 1.
- 5. Expand *Profile Groups*. There is a profile group to see the individual profile named boundaries for the Profile Sheets named during creation, example: SR 14.



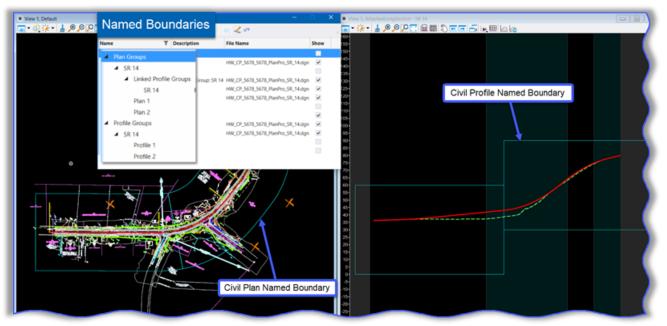


Figure 81

# 4.4.5 Adjust Sheet Layout

- 1. Final adjustments to sheet layouts can be made in the reference attachments.
- Use the View Group tool to select a Plan [Sheet] Views model, example: Plan 2 [Sheet] Views.



Figure 82

 Select Home > Primary > Attach Tools > References. In the References dialog, select the first attachment, this is the Plan Drawing Model, example: (Logical) Plan 2-1, HW\_CP\_5678\_5678\_PlanPro\_SR\_14.

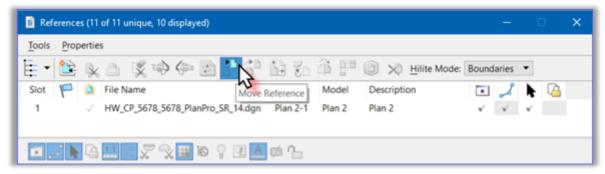


Figure 83

4. Click on the '*Move Reference*' command to activate, then click on the Named Boundary, this will activate the named boundary with all references (should be highlighted) and are "attached" to the cursor, move all for a better fit within the sheet outline.



#### Figure 84

5. *Left click* to accept the new reference location.

Remember, sheets are references of the respective plan, profile, or cross section space. Any elements that are visible in the source drawing will automatically appear on the sheets.

#### 4.4.6 Adjusting Profile Named Boundaries

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

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



Figure 85

- 2. Left click in the *profile view* (example: View 2).
- 3. 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.

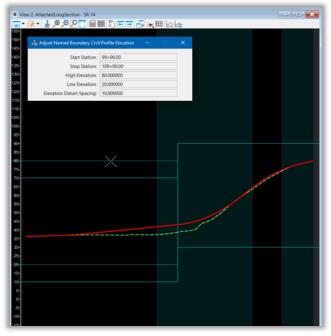


Figure 86

# 4.4.7 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 usually the plan named boundary is linked to the profile named boundary and profiles will need to be deleted also.

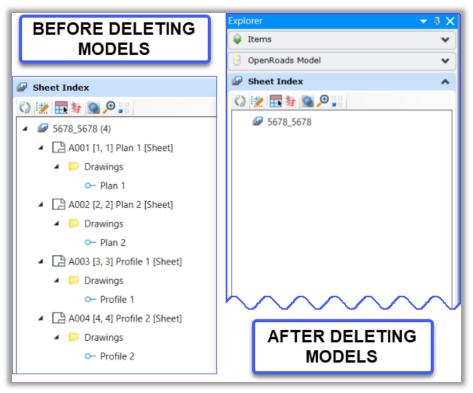
| 🔁 Manage View Groups    | - 0               | ×          |              | 🖆 Manag    | e View Groups |                |             | ×  |
|-------------------------|-------------------|------------|--------------|------------|---------------|----------------|-------------|----|
| TT 01 🗙                 |                   |            |              | T_ 01      | ×             |                |             |    |
| Name Delete View        | v Group           |            |              | Name       |               | Model          |             |    |
| C Default               | <b>O</b> Default  |            |              | 🔁 Default  |               | <b>Default</b> |             |    |
| Default-3D Views        | 🛜 Default-3D      |            |              | 🔁 Default- |               | Toefault-3     | D           |    |
| Multi-Model Views       | _                 |            |              | 든 Multi-M  | odel Views    |                |             |    |
| Plan 1 [Sheet] Views    | Plan 1 [Sheet]    |            |              |            |               |                |             |    |
| Plan 1 Views            | Plan 1            |            |              |            |               |                |             |    |
| Plan 2 [Sheet] Vi       | LETE ONE          | ΑΤ Α       | ТІМЕ         |            |               | AN VIEV        | 15          |    |
| Profile 1 [Sheet] Views | Profile 1 (Sheet) |            |              |            | DE            | LETED          | - 1         |    |
| Profile 1 Views         | Profile 1         |            |              |            |               |                | _           |    |
| Profile 2 [Sheet] Views | Profile 2 [Sheet] |            |              |            |               |                |             |    |
| Profile 2 Views         | Profile 2         |            |              |            |               |                |             |    |
|                         | 🚽 Alert           |            |              |            |               | ×              |             |    |
| <u>A</u>                | Are yo            | ou sure yo | ou want to o | delete Pla | n 1 [Sheet] \ | Views          | <u>C</u> lo | se |
|                         |                   |            |              | <u>0</u>   | < 😼           | Cancel         |             |    |



 Select Home > Primary > Models. Select all of the Drawing and Sheet models for the plan and profile views; example Plan 1 and 2 [Sheet] views and Plan 1 and 2, Profile 1 and 2 [Sheet] views and Profile 1 and 2. Click Delete Model(s). NOTICE: The sheet models are also deleted from the sheet index if necessary. Close the Models dialog.

| 🖸 Models   |                            | Models                                     |
|--|----------------------------|--|
| 📑 🕛 🎯 🚰 🖾 🏲 🚺  |                            | 📮 🗅 🞯 🔐 🖾 🏲 🗙 💦                            |
| Type ^ 2D/3D Name S  | Delete model(s) ign File   | Type ^ 2D/3D Name Sheet Number Design File |
| Default  | D:\CT_CON\HW_              | On Default D:\CT_CON\HW                    |
| 👘 🗊 Default-3D   | D:\CT_CON\HW               | D:\CT_CON\HV                               |
| Plan 1 [Sheet] A   | 4001 D:\CT_CON\HW          |  |
| Plan 2 [Sheet] A   | A002 D:\CT_CON\HW_d        |  |
| Profile 1 [Sheet] A  | 4003 D:\CT_CON\HV          |  |
| Profile 2 [Sheet] A  | A004 D:\CT_CON\HW          | /  |
| Default     Default     Default-3D     Plan 1 [Sheet] A     Plan 2 [Sheet] A     Profile 1 [Sheet] A     Profile 2 [Sheet] A     Plan 1     Plan 2     Profile 1     Profile 2 | SELECT ALL                 |  |
| Plan 2 Profile 1   |                            |  |
| Profile 2  | IODELS TO BE 🦻             | ALL MODELS ARE DELETED                     |
| Pione 2  | DELETED                    |  |
| _  |                            | ¢  |
| <  | 🚽 Alert                    | ×  |
|  | Are you sure you want to o | delete the 8 selected models?              |
|  |                            | Yes No                                     |

Figure 88





 Delete the Named Boundaries for the Plan Sheets and Profile Sheets. Open the Drawing Production > Named Boundaries Named Boundaries dialog.

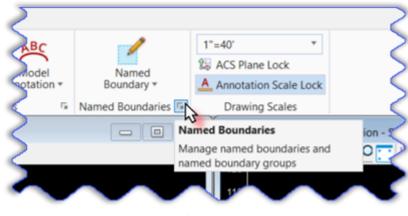


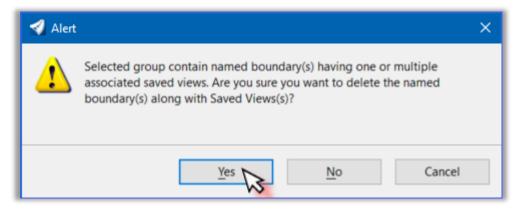
Figure 90

3. Expand the *Plan and Profile Groups* sections. Select the Plan Group, example SR 14.

| )<br>EE 599       |  | View 2, AttachedLongSection - SR 14 |                      |
|-------------------|--|-------------------------------------|----------------------|
| +                 | Named<br>Boundaries                      | 1201                                |                      |
|                   |  | 50-<br>40-<br>30-<br>10-            |                      |
|                   | Named Boundaries                         |                                     | - X                  |
|                   |  | Description                         | File Name            |
| XAR /             | Plan Groups                              | Description                         | - 29                 |
|                   | SR 14                                    |                                     | HW_CP_5678_5678_Plar |
|                   | <ul> <li>Linked Profile Group</li> </ul> | 5                                   | 11W_Cr_50/0_50/0_11a |
|                   | SR 14                                    |                                     | HW_CP_5678_5678_Plar |
|                   | Plan 1                                   |                                     | HW_CP_5678_5678_Plar |
|                   | Plan 2                                   |                                     | HW_CP_5678_5678_Plar |
|                   | <ul> <li>Profile Groups</li> </ul>       |                                     |                      |
|                   | ▲ SR 14                                  |                                     |                      |
|                   | Profile 1                                |                                     | HW_CP_5678_5678_Plar |
|                   | Profile 2<br>Cross Section Groups        |                                     | HW_CP_5678_5678_Plar |
|                   | Other Groups                             |                                     |                      |
|                   | 4  |                                     |                      |
|                   |  |                                     | ,                    |
| 🔚 Named Boun      | daries                                   |                                     |                      |
| N                 | ∧ <b>…</b> ∧ <b>…</b> ⊗                  |                                     |                      |
| N Delete selected | I named boundary or named                | boundary group Nam                  | ne S                 |
| Plan Groups       |  |                                     | <                    |
| 🔺 SR 14           |  | HW_CP_                              | 5678_5F              |
| ▲ Linked          | d Profile Groups                         |                                     |                      |
| SF                | R 14 From Plan (                         | Group: SR 14 HW_CP_S                | 5678_567             |
|                   |  | HW_CP                               |                      |
|                   |  |                                     |                      |

Figure 91

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



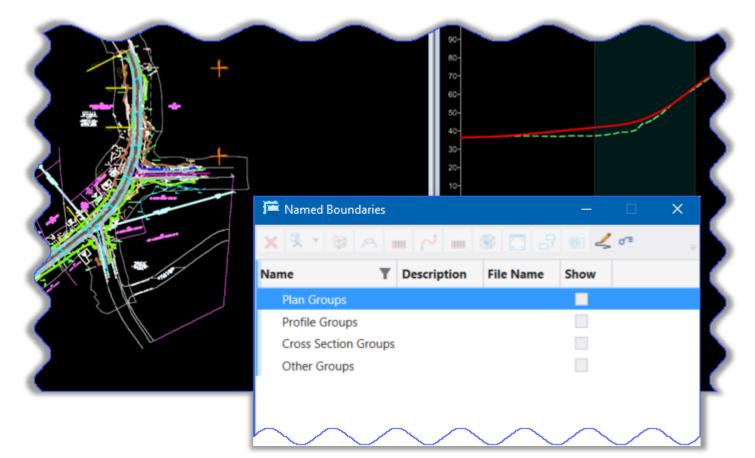


Figure 92

# 4.5 Create Blown Up Detail

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





Figure 93

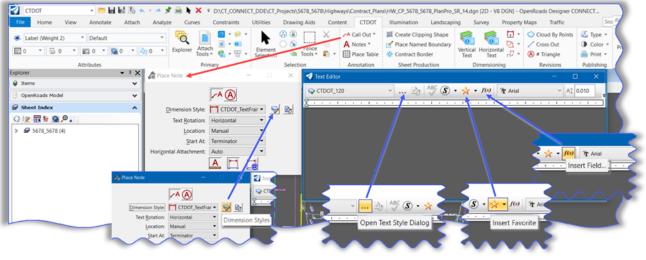
# 4.6 Plan Annotation

The OpenRoads Designer includes the MicroStation Place Label tool which can read civil object data such as curve information for arcs, alignment names, bearings, stations, northing and easting, and offsets. Labels are associated with elements and can update and move as the reference element changes. Reference elements can be located in the active file or in a reference. The Place Label tool is also used for call outs of roadway items.

There are four terms you should become familiar with when placing and editing labels.

• *Text Style* = format of text such as font, font size, spacing, justification etc.

- *Dimension Style* = format of dimensions such as terminator arrow, leader lines, text orientation, symbology (color, line style and weight of dimension & extension lines and terminators).
- Text Favorite = Intelligent reusable label that can be made up of text and fields.
- *Field* = A link or pointer to object information. This could be civil object information such as the delta of a curve, coordinates of a curve PI, name of an alignment, station values or general MicroStation information such as level name, color, weight.





Labels can be placed for plan, profile, and cross-sections objects.

- *Plan view labels* can be placed in Design or Drawing models, but <u>not</u> Sheet models.
- *Labels* that need to be rotated to the sheet, <u>should</u> be created in the Drawing model.
- *General labels* that are not sheet specific and whose rotation does not matter can be placed in a Design model and referenced to all sheets, example: horizontal alignment stationing and curve data.
- Profile and cross section labels <u>must</u> be placed in Drawing models.

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.

a. Annotation Lock - Labels created with this option enabled <u>will scale</u> when the Annotation Scale is adjusted.

- b. Association to Element Labels created with this option enabled but with the Relative Association to Element option disabled <u>will remain</u> at their placement location when the reference element changes. <u>Only</u> the leader line moves.
- c. *Relative Association to Element* Labels created with this option enabled <u>will</u> <u>remain</u> at their relative location to the reference element when that reference element changes.

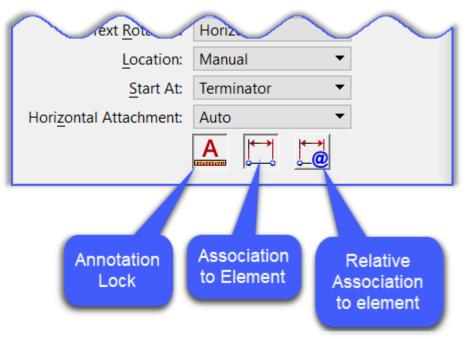


Figure 95

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.

# 4.6.1 Label - Horizontal Alignment

The horizontal Alignment should have stationing, PC's, PI's, PT's, curve data and bearings. This has been automated, the labeling/annotation will be in the design file (alignment dgnfile) and is usually done after the alignment is created. This annotation will be placed in the Alignment Base Model with the Centerline and Base Lines.

# 4.6.2 Label - Profile (Vertical Alignment)

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

- Stationing and Elevations at the grid marks
- Stations and Elevations for PVC's, PVI's and PVT's
- Length of vertical curves with K-factor and Stopping Sight Distance
- Slope of tangent sections

The annotation will be in the profile drawing models (example: Profile 1 views and Profile 2 views for the plan and profile design file HW\_CP\_5678\_5678\_PlanPro\_SR\_14.dgn).

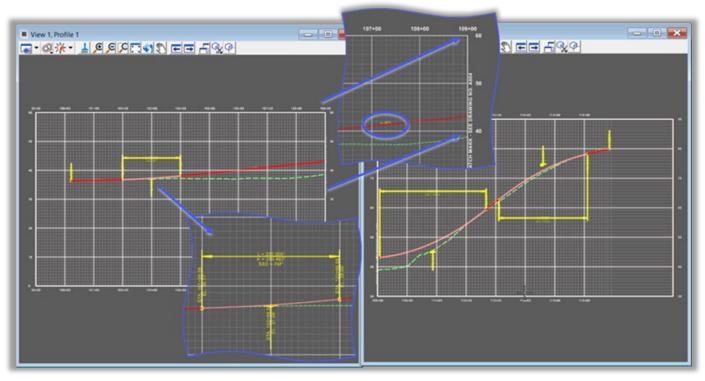


Figure 96

## 4.6.3 CTDOT Annotation Tools

The CT\_CONNECT\_DDE workspace has been set-up to ease the annotation for plan sheets, adjustments and additions are added periodically. Select the CTDOT workflow and click the CTDOT Tab. Here are tools set-up for each discipline and for various subject matters, here we will discuss the annotation tools.

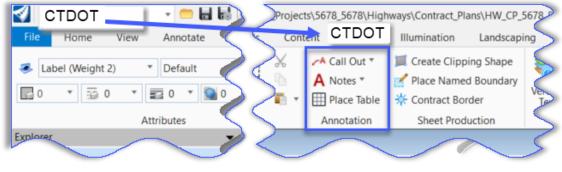


Figure 97

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.

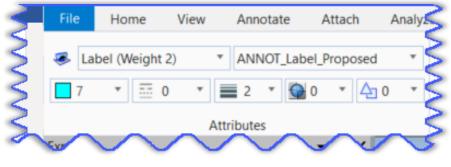


Figure 98

4.6.4 Label the Beginning of Project, End of Project, and Limit of Construction

- Select the *Plan Views* (example Plan 1 Views) Drawing Model. Select the CTDOT workflow and the CTDOT tab.
- 2. Click on the *Begin Project Limits* tool. The Place Note toolbox opens, and the Text Editor box should open. In the editor type in the project number, F.A.P. number, centerline station, Northing and easting coordinates.

## Example:

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

 Follow the prompts. Place Note > Define start point > snap to the beginning, associate point > snap to the next point, > Define NextPoint, or <Reset> to complete. Place the leader and text to fit within the sheet.

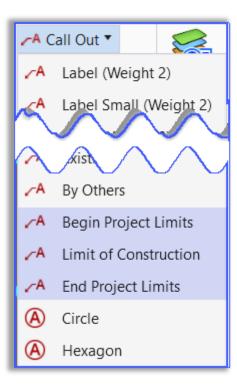




Figure 99

4. Select **Profile Views** (example: Profile 1 Views) and repeat the previous steps to label the beginning and end of the project.

Example:

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

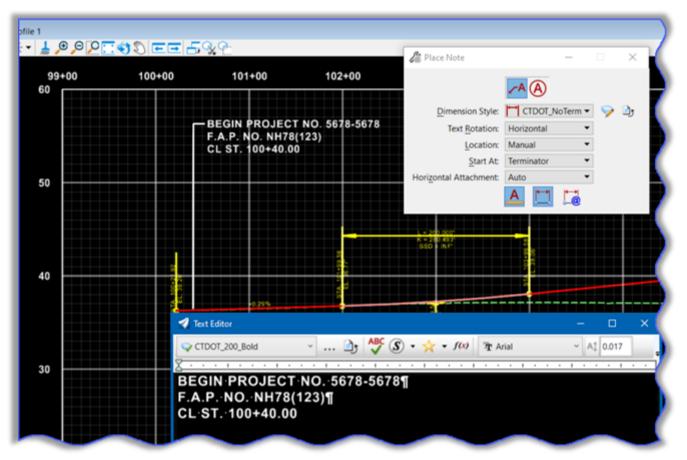


Figure 100

# 4.6.5 Label - Place Call Outs

- Select the *Plan Views* (example Plan 1 Views) Drawing Model.Select the CTDOT workflow and the CTDOT tab.Click on the Call Out tool.
- Click on the Label (Weight 2) tool or anyone of the other Label tools: Label Small (Weight 2) Label (Weight 0) or Label Small (Weight 0). The Place Note toolbox opens, and the Text Editor box should open. In the editor type in the label for the item.
- 3. 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. Place Note > Define start point > snap to the beginning, associate point > snap to the next point, > Define NextPoint, or <Reset> to complete. Place the leader and text to fit within the sheet.

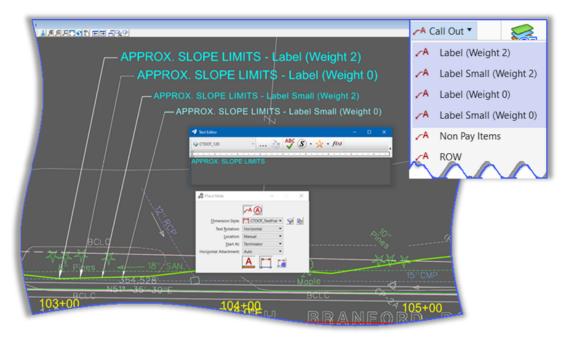


Figure 101

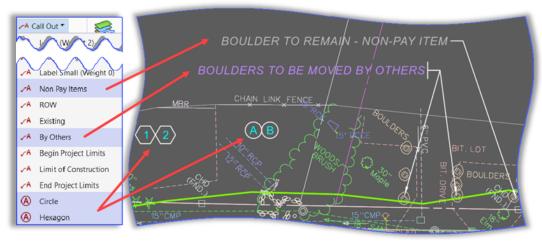


Figure 102

## 4.6.6 Notes

Notes should generally be placed in the **sheet 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.

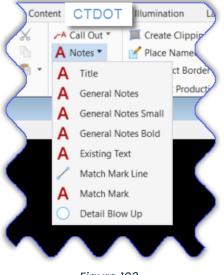


Figure 103

*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.

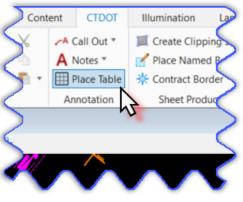


Figure 104

- 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.

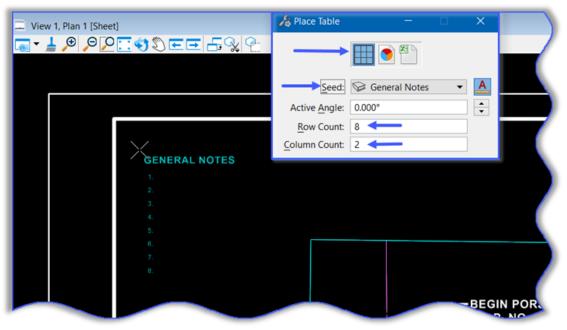


Figure 105

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

**TIP:** To better view the Text Editor, the User Preferences have been changed in the View Optionsthe Black Background -> White.

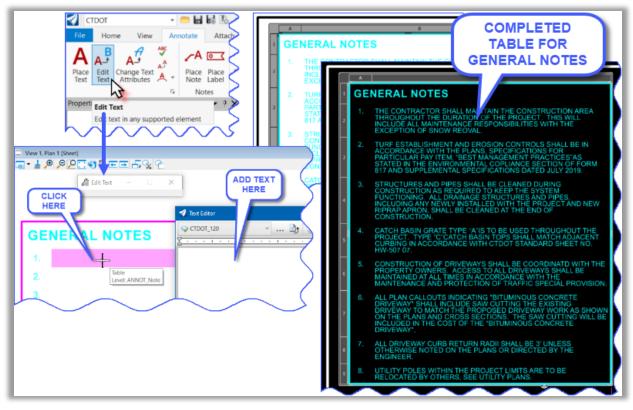
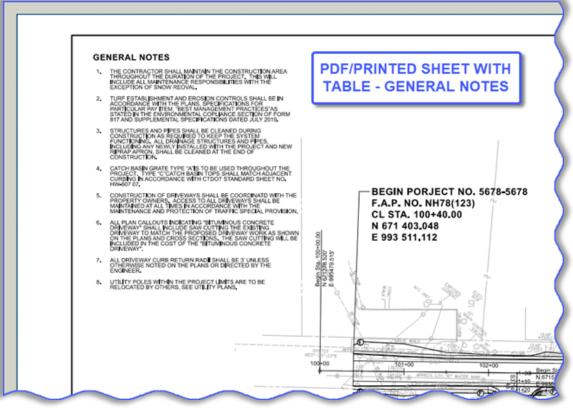


Figure 106



#### Figure 107

# 4.7 Cross-Section Sheets

#### 4.7.1 Create Cross-Section Sheets

All files for project contract plans: plans, profiles and **cross-sections** will reside in the Contract\_Plans folder under the disciplines folder; example: project folder/Highways/Contract\_Plans.

 Create a design model that will be used to create the cross-section sheets for the project. Browse to the Contract\_Plans folder to create a new 2D file using the file naming convention as described in the Volume 16 Appendix 4 – File Naming

Example: HW\_CP\_5678\_5678\_XSC\_SR\_14.dgn created with the Seed2D - CT RoadDesign.dgn seed file

# ...CT\_Configuration | Organization | Seed | Road | 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\* 

- 2. Reference in the needed base model file, they reside in the Highways/Base\_Models folder within the project folder as well as the needed existing survey models. The model is referenced using No Nesting.
- 3. Select the existing terrain boundary and set it active. Then set up the display views to show **View 1, Default** and **View 2, Default-3D**. Save settings, this will also establish the Multi-Model views.

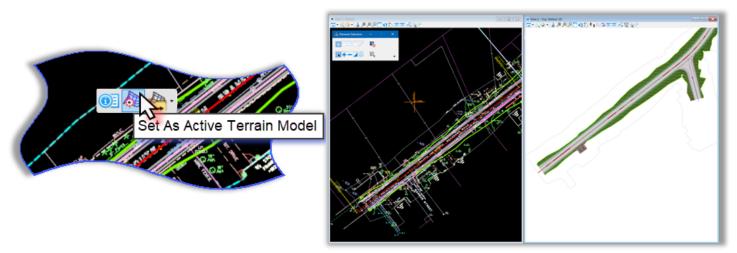


Figure 108

- 4. Select *Drawing Production > Named Boundaries > Named Boundary > Place Named Boundary*. A named boundary is a closed element that has a name associated with it.
- The Place Named Boundary Civil Plan, Profile or Cross-Sections dialog box opens. Select the *Civil Cross-Section* mode. Set Drawing Seed to 5 Scale Contract XSC Sheet, this will also set the Detail Scale to 1" = 5'.

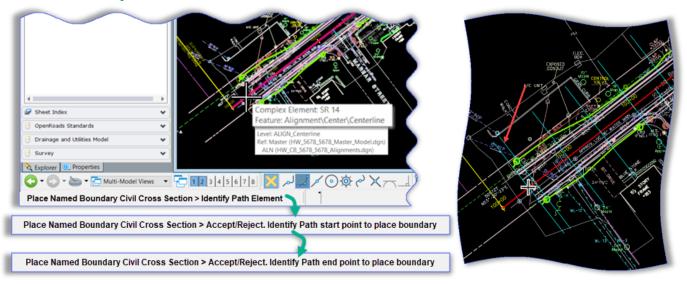
The **drawing seed** defines default values and other important parameters required to create sheets. Selecting the drawing seed should always be the first step when creating named boundaries. The drawing seed has been set-up for the ANSI D size paper (34"x22"), and defaults include:

- Options on **Named Boundary** for left and right offsets, section intervals, vertical exaggeration, and top and bottom clearances between sections (these can be changed if needed).
- Options to **Include Control Points**, these are usually the PC's, PI's, PT's of the horizontal alignment.
- Options to **Include Event Points Only**, this will require the user to establish an Event Point List (drainage crossings as example).

| 🔏 Plac       | e Named Boundary    | Civil Cross Section — 🗆        | ×  |
|--------------|---------------------|--------------------------------|----|
| Civi         | l Cross Sectio      | n Mode 🔔 🕥 🦯 📝 🗔               |    |
|              | Drawing Seed:       | 5 Scale Contract XSC Sheet 🔶 🔹 |    |
|              | Detail Scale:       | 1"=5' 🔶 🗸                      |    |
|              | Group:              | (New) 🔸                        |    |
|              | Name:               | SR 14 🗲                        |    |
|              | Description:        |                                |    |
|              | Start Location:     | 100+40.00                      | ◀  |
|              | Stop Location:      | 116+50.00                      | ▶  |
|              | Left Offset:        | -70.000000                     | 00 |
|              | Right Offset:       | 70.000000                      | 00 |
|              | Interval:           | 50.000000                      | 00 |
| Ver          | tical Exaggeration: | 1.000000                       |    |
| $\checkmark$ | Top Clearance:      | 5.000000                       |    |
| $\checkmark$ | Bottom Clearance:   | 10.000000                      |    |
| Elevatio     | on Datum Spacing:   | 1.000000                       |    |
|              | Event Point List:   | (None)                         |    |
|              |                     | Include Event Points Only      |    |
|              |                     | Include Control Points         |    |
|              |                     | Backward Facing                |    |
|              |                     | Create Drawing                 |    |
|              |                     | Show Dialog                    |    |

Figure 109

- 6. Set the *Group to (New)*. Set the *Name*: to match the alignment name, usually the Route Number or Street name (this name field will define the name of the Named Boundary Group) Example: SR 14 (for State Route 14). Clicking on the horizontal alignment will also populate this name field with the name of the horizontal alignment.
- Enable the *Create Drawing* option, so that the sheets are created as soon as the named boundaries are created. Enable the *Show Dialog* option, this dialog is used to override settings defined by the Drawing Seed if needed.
- 8. 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.
- 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.





- 10. 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.
- The Create Drawing dialog box will appear. Ensure the Mode: is set to Cross-Section, Name: here the cross-section boundaries are named > this will name all drawing models and defaults to the station, example: 100+40.00, but can be named

XSC-1 if desired. In the **Drawing Model portion** of the dialog set the **Annotation Scale** to **1'' = 5'**. In **Sheet Model portion** of the dialog, set the **Annotation Scale** and the **Detail Scale** to **1'' = 5'**.

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

| Create Dra        | wing ×                                     |
|-------------------|--|
| Mc                | ode: Cross Section                         |
| Na                | <sup>me:</sup> 100+40.00                   |
| One Sheet Per D   | lgn:                                       |
|                   |  |
|                   | 5 Scale Contract XSC Sheet                 |
| View Type:        | Civil Cross Section                        |
| Discipline:       | Civil                                      |
| Purpose:          | Section View                               |
|                   | Drawing Model                              |
| Seed Model:       | CV_CrossSection_Sheet_Definitions_5Scale.c |
| Filename:         | (Active File)                              |
| A                 | 1°=5' 💌                                    |
| Annotation Group: | Cross Section                              |
|                   | Sheet Model                                |
| Seed Model:       | CV_CrossSection_Sheet_Definitions_5Scale.c |
| Filename:         | (Active File)                              |
| Sheets:           | (New)                                      |
|                   | 1"=5' 👻                                    |
| Drawing Boundary: | 5 Scale Contract XSC Sheet 👻               |
| Detail Scale :    |  |
|                   | Add To Sheet Index                         |

#### Figure 111

13. 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.

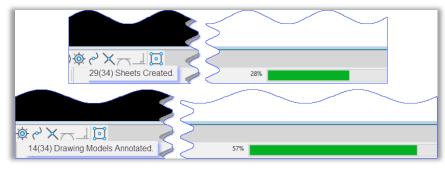


Figure 112

#### 4.7.2 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
- Click on the View Tab > Within the View Groups tools set and select any of the sheet models or drawing models. 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.

| Dpenf        | Roads De | esigner ( | CONNEC | T Editio                     | on   |  |  |        |   |  | Search |
|--------------|----------|-----------|--------|------------------------------|--|--|--|--------|---|--|--------|
| View<br>Size | Prev     | Next      | All    | _                            |  | 4 5  |  |        | _ |  | $\geq$ |
|              |          |           | Vie    | ଟ ଦ ଦ ଦ <mark>ଦ ଦ ଦ ଦ</mark> | 100+<br>100+<br>101+<br>101+<br>101+<br>102+ | +40.00  <br>+40.00 \<br>+50.00 \<br>+00.00 \<br>+50.00 \<br>+00.00 \<br>+50.00 \ | /iews<br>/iews<br>/iews<br>Sheet<br>/iews<br>/iews | ] View |   | 100+40.00<br>100+40.00<br>100+50.00<br>101+00.00<br>101+50.00<br>101+50.00<br>102+00.00<br>102+50.00 | Î      |
| 6            |          |           |        | Ū                            |  |  | •  |        |   | •  |        |

Figure 113

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.

For more information see OpenRoads Designer CONNECT Edition Help Menu.

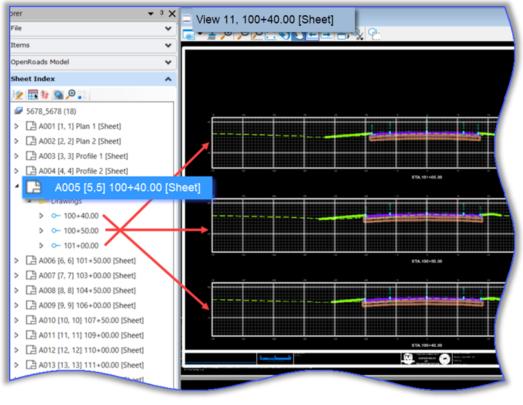


Figure 114

**NOTICE:** There is a correlation between the Sheet Index, Manage View Groups, Named Boundaries and Models

| Sheet Index  | hanage View                                | Groups ———                     | 🐳 Named Bo                             | oundaries   |         | els                                    |              |
|--|--|--------------------------------|--|-------------|---------|--|--------------|
| <ul> <li>2 2 5678_5678 (18)</li> </ul>   | - 🔁 💿 🗙                                    |                                | X 🛠 * 😒 🔿                              |             |         | II 🌱 🖾 🎽                               |              |
| <ul> <li>Gove (16)</li> <li>A001 [1, 1] Plan 1 [Sheet]</li> </ul>                            | Name                                       | Model                          | Name                                   | T File Name | Type 2D | /3D Name<br>Default                    | Sheet        |
| P AUVZ [2, 2] Plan 2 [Snep]  | 100+40.00 [Sheet] Views                    | 100+40.00 [Sheet]              |  |             | L 👗 🗸   | Default-3D                             |              |
| A003 [3, 3] Profile [Sheet]  | 100+40.00 Views<br>100+50.00 Views         | 100+40.00<br>100+50.00         | Profile Groups<br>Cross Section Groups |             |         | 100+40.00 [Sheet]                      | A005         |
| N P A004 M Profile 2 (Sheet)   | 101+00.00 Views                            | 101+00.00                      | SR 14                                  | HW_CP_5(78  | i di i  | 103+00.00 [Sheet]                      | A007         |
| A005 [5, 5] 100+40.00 [Sheet]  | 101+50.00 Views                            | 101+50.00                      | 100+40.00 -                            |             |         | 104+50.00 [Sheet]                      | A008         |
| 🔺 📁 Drawings 💒   | 102+00.00 Views                            | 102+00.00 102+50.00            | 100+50.00                              | W CP 5      |         | 106+00.00 [Sheet]<br>107+50.00 [Sheet] | A009<br>A010 |
| ▷ ○- 100+40.00   | 103+00.00 [Sheet] Views                    | 103+00.00 [Shee                | 101+00.00                              | HW_CP_50    |         | 109+00.00 [Sheet]                      | A011         |
| ▷ ○- 100+50.00   | 103+00.00 Views                            | 103+00.00 103+50.00            | 102+00.00                              | HW_CP_5678  |         | 110+00.00 [Sheet]<br>111+00.00 [Sheet] | A012<br>A013 |
| > o- 101+00.00   | 104+00.00 Views                            | 104+00.00                      | 102+50.00                              | HW_CP_5678  |         | 112+00.00 [Sheet]                      | A014         |
| A007 [7, 7] 103+00.00 [Sheet]  | 104+50.00 [Sheet] Views                    | 104+50.00 [Sheet]              | 103+00.00                              |             |         | 113+00.00 [Sheet]<br>114+00.00 [Sheet] | A015<br>A016 |
| A008 [8, 8] 104+50.00 [Sheet]  | 105+00.00 Views                            | 105+00.00                      | 103+50.00<br>104+00.00                 |             |         | 115+00.00 [Sheet]                      | A017         |
| A009 [9, 9] 106+00.00 [Sheet]  | 105+50.00 Views<br>106+00.00 [Sheet] Views | 105+50.00<br>106+00.00 [Sheet] | 104+50.00                              |             |         | 116+00.00 [Sheet]                      | A018         |
| <ul> <li>A010 [10, 10] 107+50.00 [Sheet]</li> <li>A011 [11, 11] 109+00.00 [Sheet]</li> </ul> | 106+00.00 Views                            | 106+00.00                      | 105+00.00                              |             |         | 100+50.00                              |              |
| <ul> <li>A012 [12, 12] 110+00.00 [Sheet]</li> <li>A012 [12, 12] 110+00.00 [Sheet]</li> </ul> | 106+50.00 Views                            | 106+50.00 107+00.00            | 105+50.00                              |             |         | 101+00.00                              |              |
| 21 111+00.00 [Sheet]   | Course Course                              | 5                              | 106+00.00                              | HW_CP_5678  |         |  |              |

#### Figure 115

2. **Open and review** a **Sheet Model** by selecting **XX+XX.XX** [Sheet] Views (example: 101+50.00 [Sheet] Views) and then select **Apply**.

TIP: You can also double-click on any model in the list to open it as well.

The Sheet Model for the sections will open. 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 CONNECTED Project, the Drawing Title will be populated with the text entered in the Model Description Field.

| iew 1, 101+50.00 [Sheet]<br>▲ ᠉ ᠉ 》 | Q P                       |                        |         |
|-------------------------------------|---------------------------|------------------------|---------|
|                                     | 🔚 Manage View Groups      | -                      |         |
|                                     | <b>(</b>                  |                        |         |
|                                     | Name<br>101+50.00 [Sheet] | Views A101+50.00       | [Cheet] |
| 102+50                              | 🔁 101+50.00 Views         | 101+50.00              | [Sneet] |
|                                     | 102+00.00 Views           | 102+00.00              |         |
| ·                                   | 102+50.00 Views           | 102+50.00              |         |
| • <b>102+00</b>                     | 103+00.00 Views           | 103+50.00<br>103+50.00 | (       |
|                                     |                           | Apply                  | Close   |
|                                     |                           |                        |         |
|                                     |                           |                        |         |

Figure 116

3. **Open and review** the **Drawing Models** for cross-section sheet by selecting the drawing views for the cross-section sheet (example: for 101+50.00 [Sheet] Views select 101+50 Views) and then selecting **Apply**. (Or double click on the view)

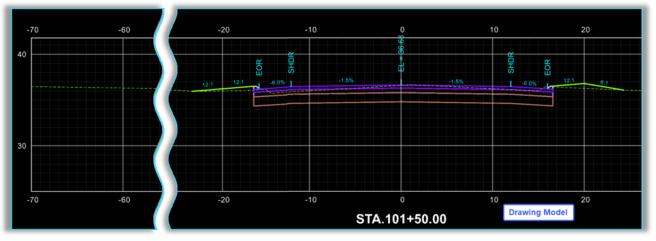


Figure 117

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.

Review the remaining Sheet Models by using the same steps described above. Become familiar how to navigate between the various drawing and sheet models.

# 4.7.3 Adjust Sheet Layout - Add Single Cross-Section

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.

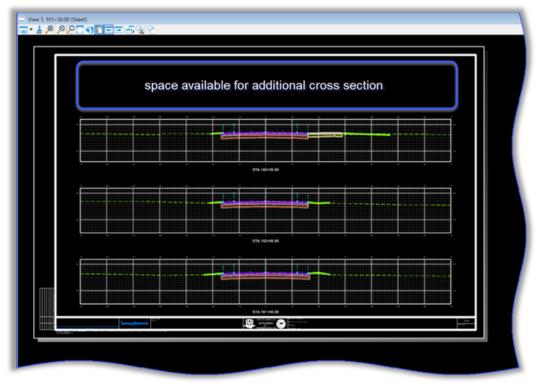


Figure 118

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

- 1. Use the *View Group* tool to select the cross-section sheet view (sheet model) to add the additional section drawing model, example: 101+50.00 [Sheet] Views.
- Select Home > Primary > Attach Tools > References. In the References dialog there are references for each cross-section drawing model, select the drawing model attachment for the section that will be moved, example: (Logical) 102+50-1, for the dgn-file: HW\_CP\_5678\_5678\_XSC\_SR\_14.dgn, see the dash-dot outline around the crosssection.

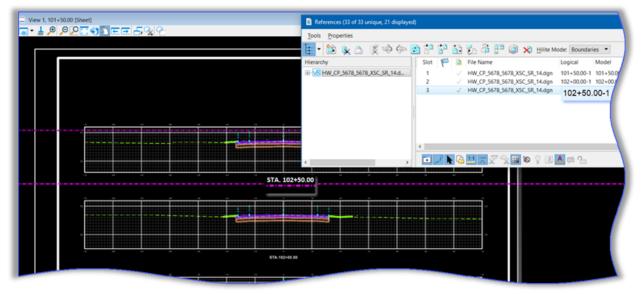


Figure 119

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.

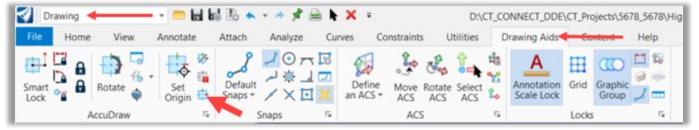
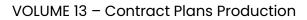


Figure 120



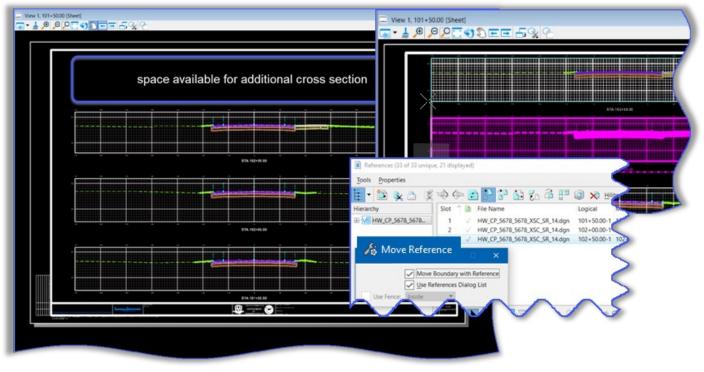


Figure 121

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

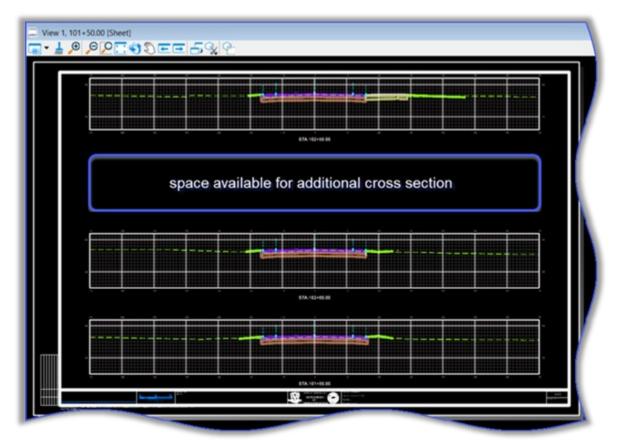
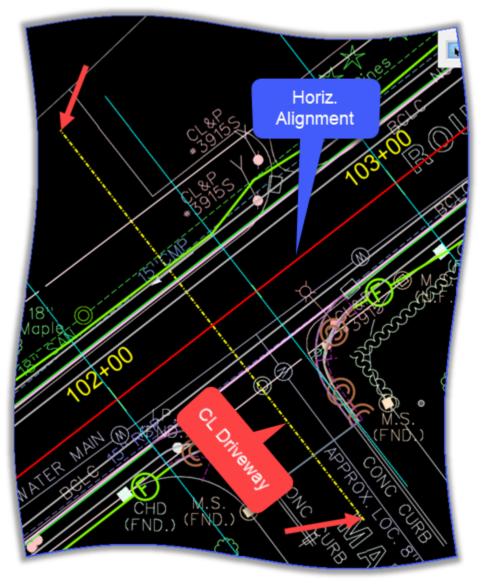


Figure 122

 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 at Sta.102+34.00 about the same length as the named boundaries lines of the other sections.



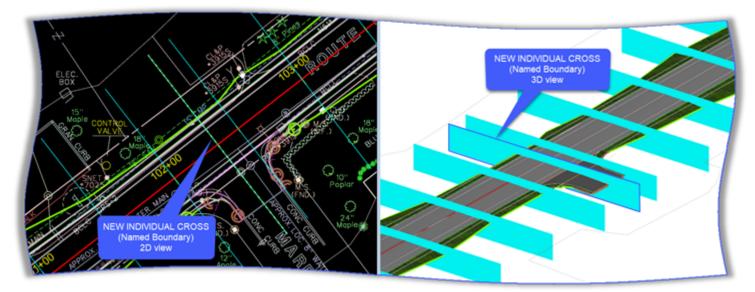
#### Figure 123

- 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 the Drawing Seed to 5 Scale Contract XSC Sheet. Select the Group from the previous groups (example: SR 14). Check ON the Create Drawing option and the Show Dialog option.

| <i>№</i> PI  | Place Named Boundary Civil Cross Section 2 Points |                              |  |  |  |  |
|--------------|---|------------------------------|--|--|--|--|
|              |   | A 🖓 🎟 🕲 🦯 🖊 🎞 🗖              |  |  |  |  |
| _            | Drawing Seed:                                     | 5 Scale Contract XSC Sheet 🔹 |  |  |  |  |
|              | Group:  | SR 14 🗸                      |  |  |  |  |
| Ve           | ertical Exaggeration:                             | 1.000000                     |  |  |  |  |
| $\checkmark$ | Top Clearance:                                    | 5.000000                     |  |  |  |  |
| ~            | Bottom Clearance:                                 | 10.000000                    |  |  |  |  |
| Elevat       | tion Datum Spacing:                               | 1.000000                     |  |  |  |  |
|              | Backward Facing                                   |                              |  |  |  |  |
|              | •   | Create Drawing               |  |  |  |  |
|              | •   | 🛃 Show Dialog                |  |  |  |  |

#### Figure 124

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 125

 The Create Drawing box comes up, set the following: Mode: Cross-Section; Name: automatically fills in (example: 102+34.00); Drawing Seed: 5 Scale Contract XSC Sheet; all Scales should be 1" = 5'; Check ON Open Model, but check OFF Add To Sheet Index; Click Ok.

| 🚽 Create Drawing                              | ×  |
|---|--|
|   | ode:     Cross Section       me:     102+34.00       Ogn:     Image: |
| View Type:<br>Discipline:                     | 5 Scale Contract XSC Sheet  Civil Cross Section Civil Section View   |
| Seed Model:<br>Filename:<br>Annotation Group: | Drawing Model CV_CrossSection_Sheet_Definitions_5Scale.c (Active File) 1"=5" Cross Section   |
| Filename:<br>Sheets:                          | Sheet Model CV_CrossSection_Sheet_Definitions_5Scale.c (Active File) (New) 1"=5' 5 Scale Contract XSC Sheet 1"=5'  |
|   | Add To Sheet Index<br>Make Sheet Coincident<br>Open Model<br><u>OK</u> Cancel  |

Figure 126

10. The new single cross-section sheet will open, with the single cross-section drawing model referenced in. Open the references dialog to review the sheet and drawing models, example View 1, 102+34.00 [Sheet] and referenced drawing model 102+34.00.

| View 1, 102+34.00 [Sheet] | - <u>동</u> 및 연                               |
|---------------------------|--|
|                           |  |
|                           | References (11 of 11 unique, 7 displayed)    |
|                           | Tools Properties                             |
|                           | E - 🔯 😣 🖄 🔶 🗇 🗇 🖄 🔂 🖧 🗗 🔍 🛪 🛶                |
|                           | Slot 🔨 File Name Model Logical Description 💽 |
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|                           |  |
|                           | STA 102+34.00                                |
|                           |  |
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|                           |  |
|                           |  |

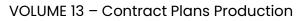
#### Figure 127

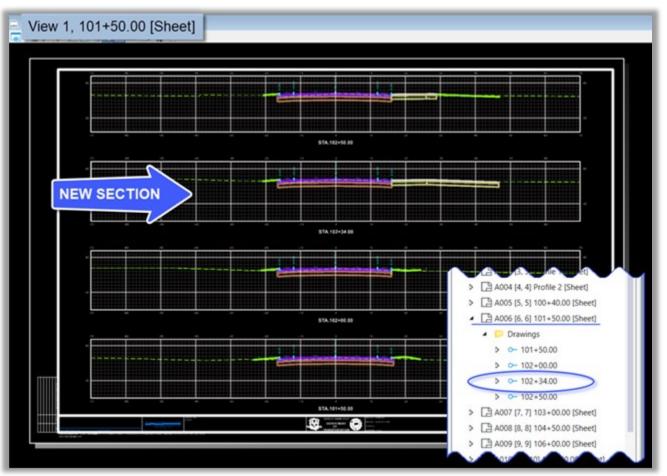
- 11. This drawing model must now be referenced into the *prepared sheet model*. Open the prepared sheet model, example: View 1101+50.00 [Sheet]. Open the references dialog. Attach the drawing model by referencing into the contract plans cross-section file, example: HW\_CP\_5678\_5678\_XSC\_SR\_14.dgn. Reference Attachment Properties settings as follows (should be the same settings as the other cross-section drawing models for this sheet): cross-section drawing models for this sheet):
  - Model: pick the added cross-section (102+34.00)
  - Logical Name: should populate to added cross-section (102+34.00)
  - Orientation: Coincident Aligned with Master File
  - **Detail Scale:** 1" = 5"
  - Nested Attachments: Live Nesting
  - Nesting Depth: 99

| 🚽 Reference Attachme       | nt Properties for HW_CP_5678_5678_XSC_S | SR_14.dgn X       |  |  |  |
|----------------------------|---|-------------------|--|--|--|
|                            | 4.00                                    | XSC_SR_14.dgn     |  |  |  |
| Orientation:               |   |                   |  |  |  |
| View                       | Description                             | ^                 |  |  |  |
| Coincident                 | Aligned with Master File                |                   |  |  |  |
| Coincident - World         | Global Origin aligned wit               | th Master File    |  |  |  |
| Detail Scale:              | 1°=5' 👻                                 |                   |  |  |  |
| Scale (Master:Ref):        | 1.000000000 : 1.000000000               |                   |  |  |  |
| Named Grou <u>p</u> :      | -                                       |                   |  |  |  |
| Revision:                  | -                                       |                   |  |  |  |
| Le <u>v</u> el:            | -                                       |                   |  |  |  |
| Nested Attachments:        | Live Nesting                            | Nesting Depth: 99 |  |  |  |
| Display Overrides:         | Allow 👻                                 |                   |  |  |  |
| Ne <u>w</u> Level Display: | Use MS_REF_NEWLEVELDISPLAY Config       |                   |  |  |  |
| Global LineStyle Scale:    | Master 👻                                |                   |  |  |  |
| Synchronize View:          | Volume Only 👻                           |                   |  |  |  |
| Drawing Boundary:          | (New) 👻                                 |                   |  |  |  |
| Name:                      | 102+34.00                               |                   |  |  |  |
| Toggles                    | Toggles                                 |                   |  |  |  |
|                            |   |                   |  |  |  |

Figure 128

12. Click **Ok**. The drawing model is attached, it may be necessary to move the drawing model into the right position.





#### Figure 129

- 13. For the drawing model to be shown in the sheet index, refresh the sheet index.
- 14. Click on the Models icon to open the dialog. Here the **sheet model** for the added crosssection needs to be deleted. Select the sheet model (example: 102+34.00 [Sheet]), click on the Delete model(s) button.

| 🗇 Mod | els   |                   |                 | -                          |
|-------|-------|-------------------|-----------------|----------------------------|
|       | ) 🛈 e | 🚰 🔲 🌪 🕽           |                 |                            |
| Туре  | 2D/3D | Name ^            | No. Number      | Design File                |
|       |       | 100+40.00         | Delete model(s) | D:\CT_C\HW_CP_5678_5678_XS |
| G     |       | 100+40.00 [Sheet] | A005            | D:\CT_C\HW_CP_5678_5678    |
|       |       | 100+50.00         |                 | D:\CT_C\HW_CP_5678_567     |
|       |       | 101+00.00         |                 | D:\CT_C\HW_CP_5678_5678_   |
|       |       | 101+50.00         |                 | D:\CT_C\HW_CP_5678_5678_XS |
|       |       | 101+50.00 [Sheet] | A006            | D:\CT_C\HW_CP_5678_5678_X  |
|       |       | 102+00.00         |                 | D:\CT_C\HW_CP_5678_567     |
|       |       | 102+34.00         |                 | D:\CT_C\HW_CP_5678_5678    |
|       |       | 102+34.00 [Sheet] | 102+34.00       | D:\CT_C\HW_CP_5678_5678_X  |
|       |       | 102+50.00         |                 | D:\CT_C\HW_CP_5678_5678_X  |
|       |       | 103+00.00         |                 | D:\CT_C\HW_CP_5678_5678    |
|       |       | 103+00-00 [Sheet] | A007            | D:\CT_C\HV4 52 5678_567    |
|       |       |                   |                 | 0:\CL 28 5679              |
|       |       |                   | Figure 130      |                            |

### 4.7.4 Deleting Cross-Section 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 crosssections
- The Drawing Models for annotation and dimensioning
- The **Sheet Models** with the electronic drawing sheets printed sheets

To completely delete the sheets, 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 the cross-section sheets from the sheet index.

Select Home > Primary > Models. Select all of the Drawing and Sheet models for the cross-section views; example: 100+40.00 and 100+40.00 [Sheet], 100+50.00 and 100+50.00 [Sheet], 101+00.00 and 101+00.00 [Sheet], and so on (click on the first model, hold down the shift key and scroll to the last model, but leaving Default and Default-3D). Click Delete Model(s). An Alert box may open, Click Yes. Close the Models dialog.

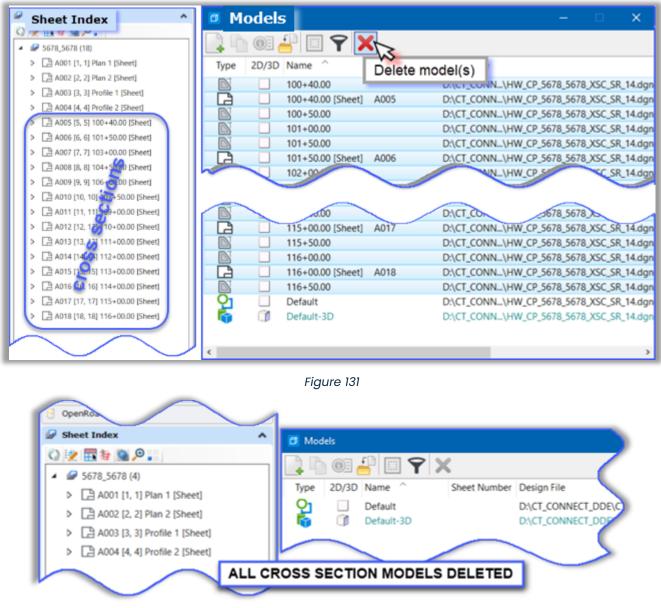


Figure 132

NOTICE: The sheet models are also deleted from the sheet index.

- Delete the Named Boundaries for all Cross-Section Sheets. Open the Drawing Production > Named Boundaries Named Boundaries dialog.
- Expand the Cross-Section Groups folder. Click on the Cross-Section group, example: SR 14. In the Default-3D view all cross-section named boundaries should be highlighted. Click on the delete icon.

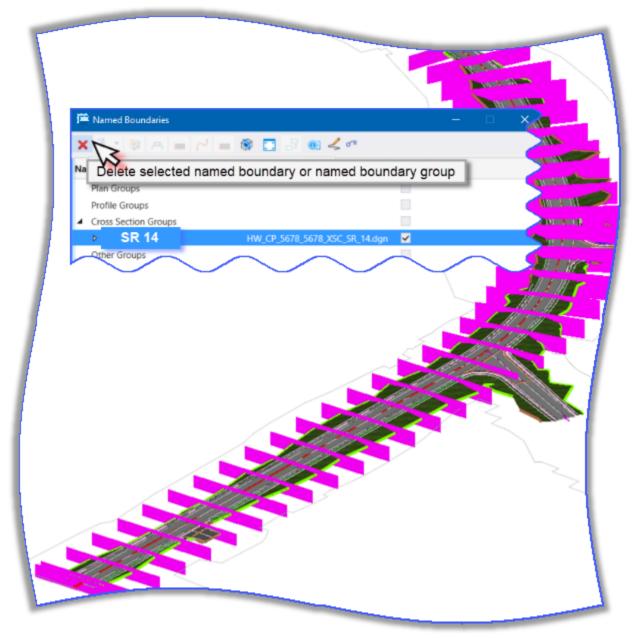


Figure 133

4. An Alert appears confirming the Named Boundaries and their associated saved views will be deleted. Click on **Yes**. Every boundary is deleted, review the Default and Default-3D views, if boundaries still visible, refresh the view.

### 4.7.5 Place Labels (Annotation)

As explained previously OpenRoads Designer includes the MicroStation Place Label tool which can read civil object data. Labels are associated with elements and can update and move as the reference element changes. Reference elements can be located in the active file or in a reference. The Place Label tool is used for call-outs.

There are <u>four terms</u>: **Text Style**, **Dimension Style**, **Text Favorite** and **Field**; that you should become familiar with when placing and editing labels.

Labels can be placed for plan, profile, and **cross-sections** objects.

- Cross-Section labels <u>must</u> be placed in Drawing models.
- General Notes for cross-sections should be placed in the sheet model.

Along the bottom of the Place Note or Place Label toolbox are three icons that define how the label behaves: Annotation Lock - Association to Element - Relative Association to Element

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

This module will cover some of the labeling tools, but not all. For more detailed descriptions and instructions go to the Bentley ORD Help Menu.

### 4.7.6 CTDOT Annotation Tools

The CT\_CONNECT\_DDE workspace has been set-up to ease the annotation for crosssection sheets, adjustments and additions are added periodically to the workspace.

Select the CTDOT workflow and click the CTDOT Tab. Here are tools set-up for each discipline and for various subject matters. 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.

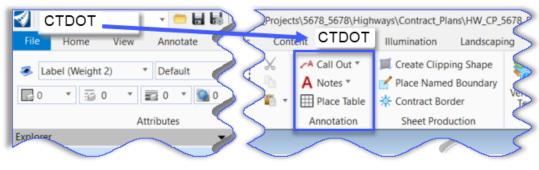


Figure 134

### 4.7.7 Labeling and Annotation for Cross-Sections

For cross-section annotation a lot of automation has been set up for the user. When creating the cross-sections drawing models the following annotation will be placed:

- Station
- Breakpoints: Edge Of Road, Shoulder, Elevation (centerline or baseline)
- Slopes within roadway in %
- Slopes of cut and fill in H:V

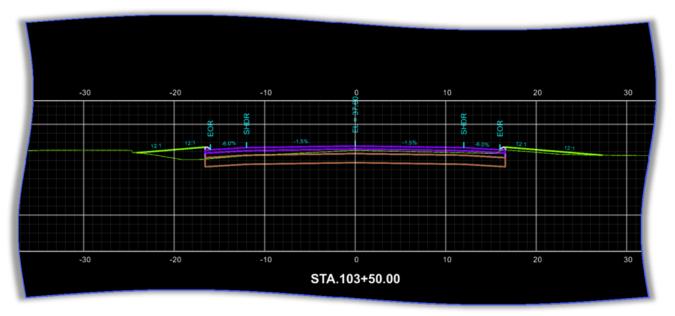


Figure 135

### 4.7.8 Adjust the Existing Ground Dashed Line Display Settings

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.

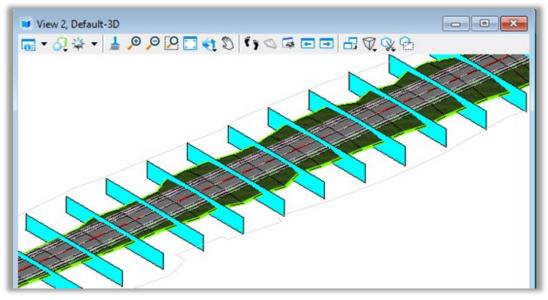


Figure 136

 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.

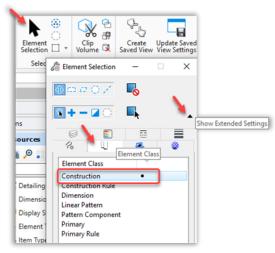


Figure 137

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

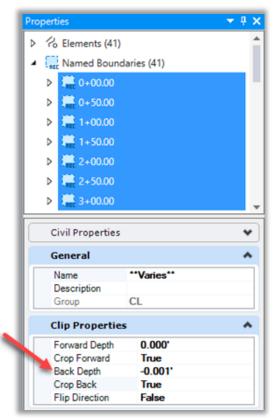


Figure 138

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.

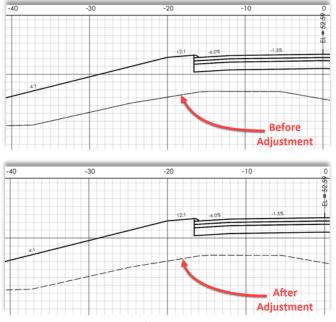


Figure 139

# 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 <i con 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.
- 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 reproject your design file's Geospatial Header.

# 5.2 Set up the Default Model

- 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.

| VOLUME 13 - | <b>Contract Plans</b> | Production |
|-------------|-----------------------|------------|
|-------------|-----------------------|------------|

| References (3 of 3 u            | nique, 3 displayed)  |                           |                     |  | – 🗆 X                        |   |  |  |
|---------------------------------|--|---------------------------|---------------------|--|------------------------------|---|--|--|
| Tools Properties                |  |                           |                     |  |                              |   |  |  |
| 🔃 🗸 🖄 🎉 🔿 🧽 🛃 🚏 🎦 🏂 🐔 📅 ன 🖓 👘 🖓 |  |                           |                     |  |                              |   |  |  |
| Hierarchy                       | Slot 🏴 这 File Name   | N                         | fodel               | Description ^                                    | Logical                      |   |  |  |
|                                 |  |                           | D Design            |  | BOLD Ground Survey           |   |  |  |
|                                 | 2 SV_D1_1234_1234_GRN.dgr  |                           | D Design<br>)efault |  | SWW Ground Survey            |   |  |  |
|                                 | 1 TR_CB_0148_1234_Signal_1   | 46_218.dgn D              | rauit               | Master Model                                     | Signal Base Model            |   |  |  |
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|                                 | Nesting Depth: 1 Display Overrides:  | Allow <b>* Ne<u>w</u></b> | Level Display: Co   | onfig Variable 🔻                                 |                              |   |  |  |
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| <u>File Name</u> :              | SV_D1_1234_1234_GRN.dgn  | Browse                    |                     |  |                              |   |  |  |
| Full Path:                      | \active_survey\sv_d1_1234_1234_grn.dgn   |                           |                     | <u></u>  |                              | ×                                       |  |  |
| Model:                          | 3D Design 👻  | 1                         | 🛃 Update            |  |                              | ^                                       |  |  |
| Logical Name:                   | BOLD Ground Survey   |                           | $\sim$              | ~ ⊻  |                              |   |  |  |
| Description:                    | 3D Design Seed   |                           | Slot File           | Name   | Model                        | Logical Name                            |  |  |
| Detail Scale:                   | 1"=40'   |                           |                     | 01_1234_1234_GRN.dgn                             | 3D Design                    | SWW Ground Survey                       |  |  |
| Sc <u>a</u> le (Master:Ref):    | 1.000000000 : 1.000000000  |                           |                     | 01_1234_1234_GRN.dgn<br>CB_0148_1234_Signal_148_ | 3D Design<br>218.dgn Default | BOLD Ground Survey<br>Signal Base Model |  |  |
| Named Group:                    |  |                           |                     | CP_1234_1234_Signal_148-                         |                              | Active Design File                      |  |  |
| Revision:                       | · · · · · · · · · · · · · · · · · · ·  |                           |                     |  |                              |   |  |  |
| Le <u>v</u> el:                 | -  |                           |                     |  |                              |   |  |  |
| Nested Attachments:             | No Nesting Vesting Depti   | h: [1]                    |                     |  |                              |   |  |  |
| Display Overrides:              |  |                           | <                   |  |                              | >                                       |  |  |
| Global LineStyle Scale:         | Use MS_REF_NEWLEVELDISPLAY Configuration ¥<br>Master   |                           |                     |  |                              |   |  |  |
| Synchronize View:               | (No View) (none)   |                           |                     | Def  | ault <u>O</u> K              | Cancel                                  |  |  |
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|                                 | OK   | Cancel                    |                     |  |                              |   |  |  |
|                                 | <u> </u>   | Cancer                    |                     |  |                              |   |  |  |

Figure 140

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.

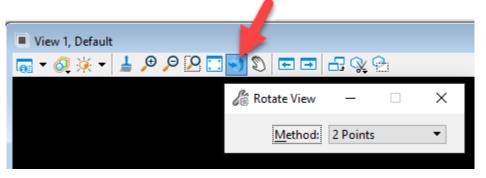


Figure 141

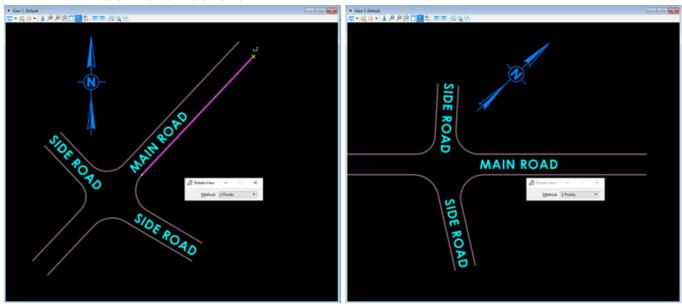


Figure 142

14. Select Save Settings.

# 5.3 Use Place Name Boundary to Create a Sheet Model

 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.

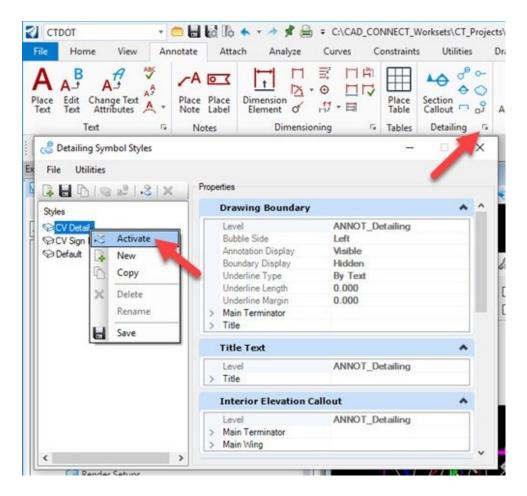


Figure 143

 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.

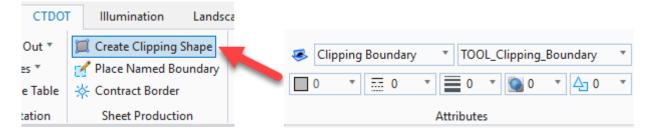
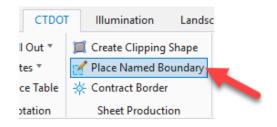
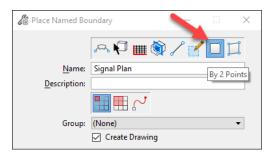


Figure 144

 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.

| Create Drawing    |   | ×      |
|-------------------|---|--------|
| Name:             | Signal Plan                                 |        |
| Drawing Seed:     | Signal Plan 👻                               |        |
| View Type:        | Detail                                      |        |
| Discipline:       | Civil                                       |        |
| Purpose:          | Plan View                                   |        |
|                   | Create Drawing Model                        |        |
| Seed Model:       | CV_Signals_Sheet_Definitions.dgnlib, Signal |        |
| Filename:         | (Active File)                               | 💼 📮    |
| A                 | 1"=40' 🗸                                    |        |
|                   | Create Sheet Model                          |        |
| Seed Model:       | CV_Signals_Sheet_Definitions.dgnlib, Signal |        |
| Filename:         | (Active File)                               | • B    |
| Sheets:           | (New) 👻                                     |        |
| A                 | Full Size 1 = 1                             |        |
| Drawing Boundary: | (New) 👻                                     |        |
| Detail Scale :    | 1"=40' 🗸                                    |        |
|                   | Add To Sheet Index                          | P      |
|                   | Make Sheet Coincident                       |        |
|                   | Replicate Drawing in Sheet File             |        |
|                   | 🗹 Open Model                                |        |
|                   | <u>O</u> K                                  | Cancel |

Figure 145

# **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.

|   | × Pro | perties                | ▼ ₽ 2                   |
|---|-------|------------------------|-------------------------|
|   |       | Models (1)             |                         |
|   |       | 📑 Signal F             | Plan [Sheet]            |
|   |       | General                | *                       |
| Models - X  |       | Is Active              | True                    |
|   |       | Name                   | Signal Plan [Sheet]     |
|   |       | Description            | TRAFFIC SIGNAL CO       |
| Type 🔷 2D/3D Name Description 🔆 Design Sheet Number         |       | Ref Logical<br>Type    | Sheet                   |
| O1 □ Default Master Model 🗸\                                |       | Design Dimen           |                         |
| 📄 ڬ Signal Plan [Sheet] TRAFFIC SIGNAL CONTROL PLAN\ TCS-01 |       | Is Markup              | False                   |
| 🗈 🗆 Signal Plan\  |       |                        | ale Full Size 1 = 1     |
|   |       | Design Scale           | 1.0000                  |
|   |       | Paper Scale            | 1.0000                  |
|   |       | Propagate An           |                         |
|   |       |                        | le Annotation Scale     |
|   |       | Update Fields          | AL True                 |
|   |       | Sheet                  | ^                       |
|   |       | Show Sheet B           | True                    |
| MAINT LEVEL SERVICE POLE                                    |       | Sheet Number           | TCS-01                  |
| METERED OR UNMETERED SERVICE                                |       | Sequence Nur           |                         |
|   |       | Border Attach          | · ·                     |
| ENTER INTERSECTION DESCRIPTION                              |       | Sheet Size             | ANSI D                  |
|   |       | Height                 | 22.0000"                |
| IDWINISI. ENTER TOWN NAME(S) SIGNAL PLAN                    |       | Width                  | 34.0000"                |
|   |       | Sheet Unit<br>> Origin | Inches<br>0.000'.0.000' |
|   |       | Rotation               | 0.000 ,0.000            |
|   |       | Sheet Index            | Not In Sheet Index      |
|   |       | onoot muck             | Hot in onoot index      |

Figure 146

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

 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.

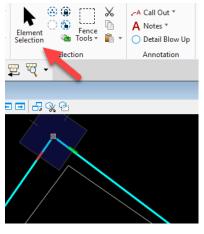
| Attachment Propert           | ies: tr_cp_1234_1234_signal.dgn X          |
|------------------------------|--|
| <u>F</u> ile Name:           | TR_CP_1234_1234_Signal.dgn Browse          |
| Full Path:                   | \contract_plans\tr_cp_1234_1234_signal.dgn |
| <u>M</u> odel:               | Signal Plan 👻                              |
| Lo <u>q</u> ical Name:       | Signal Plan-1                              |
| Description:                 | Signal Plan                                |
| Detail Scale:                | 1"=40' 👻                                   |
| Sc <u>a</u> le (Master:Ref): | 1.000000000 : 480.00000000C                |
| Named Group:                 | <b>.</b>                                   |
| Revision:                    | · · · · · · · · · · · · · · · · · · ·      |
| Le <u>v</u> el:              | ▼  |
| Nested Attachments:          | Live Nesting Vesting Depth: 99             |
| Display Overrides:           | Allow 👻                                    |
| Ne <u>w</u> Level Display:   | Use MS_REF_NEWLEVELDISPLAY Configuration 😾 |
| Global LineStyle Scale:      | Master 👻                                   |
| Synchronize View:            | (No View) (none) 🔻                         |
| Toggles                      |  |
|                              | 🗾 📐 🚰 🎞 ズ 🖓 🎟 🗞 💡 💷 📥                      |
|                              | <u>O</u> K Cancel                          |

Figure 147

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.





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





 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.

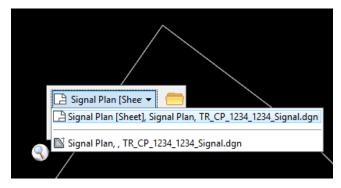


Figure 150

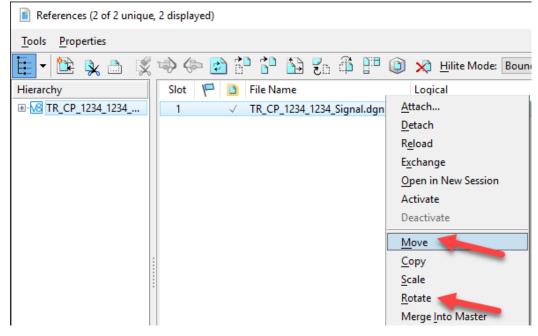
6. Models can also be opened using the **View Group** drop down tool located at the bottom left of the screen.

| U OpenRoads Model        | Name  | Model                                       |
|--------------------------|---|---|
| 🕼 Sheet Index            | 🔁 Default   | O Default                                   |
| V                        | 🔁 Match Mark 4 Views                              | 🔊 Match Mark 4                              |
| Drainage and Utiliti     | Signing and Pavement Marking Plan [Sheet] Views   | 🔚 Signing and Pavement Marking Plan [Sheet] |
| 🕘 Survey                 | 🔁 Signing and Pavement Marking Plan Views         | Signing and Pavement Marking Plan           |
| <b>() - () - ()</b>      | 🔁 Signing and Pavemε 🕶 🚺 2 3 4 5 6                | 🖌 🗠 🔅 🔿 🔪 لىم 🔀 8                           |
| lement Selection > Ident | ify element to add to s 🛛 🐺 Deleted 4 of 4 models |   |
|                          | Figure 151  |   |

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 reposition the reference file within the border.
- 3. Follow the prompts to execute the move command.





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.
- 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.

| References (5 of                 | f 5 unique, 5 displayed)  | -                 | $\times$     |
|----------------------------------|---|-------------------|--------------|
| <u>T</u> ools <u>P</u> roperties |   |                   |              |
| 🗄 - 陸 😣                          | 🛅 🌠 🖘 🦛 🖻 🎦 🎦 🏠 🛃 🗗 🛱 🛄 😣 🕺 📩   | Boundaries        | •            |
| Hierarchy                        | Slot 🏴 🗋 File Name Model  | Description       | ^            |
| ⊞- <mark>188</mark> TR_CP_12     | 1 V TR_CP_1234_1234_Signal_148-123.dgn Signal Plan  | Signal Plan       |              |
|                                  | . <   |                   | >            |
|                                  | Scale 1.000000000 : 480.00000000 Rotation 0°  |                   |              |
| r                                | Offset X -2069.77566742 Y -1398.70980277  |                   |              |
|                                  |   |                   |              |
|                                  | Nested Attachments: Scale Line Styles By Reference Scale h: 99<br>Display Overrides: A cov - New Level Display I ontro Variable - |                   |              |
| <                                | Georeferenced: No 🔻   |                   |              |
| T SNES                           | Georeferenced: No   | $\mathcal{K}_{T}$ | REE          |
|                                  |   | 21/               | 2 ST<br>FRAM |
| $\sim$                           | W.G.O   | ***               | *8           |

Figure 153

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



Figure 154

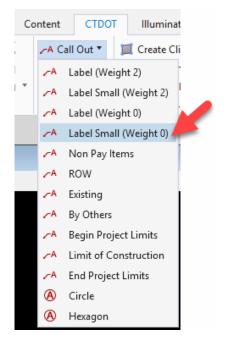
# 5.8 Create Match Marked Areas

- 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.
- 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.





 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.

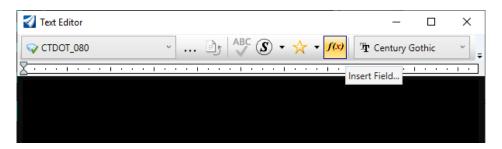


Figure 156

3. For Field Type select Element Properties and OK.

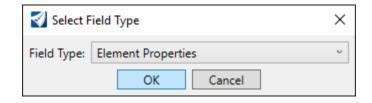


Figure 157

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.

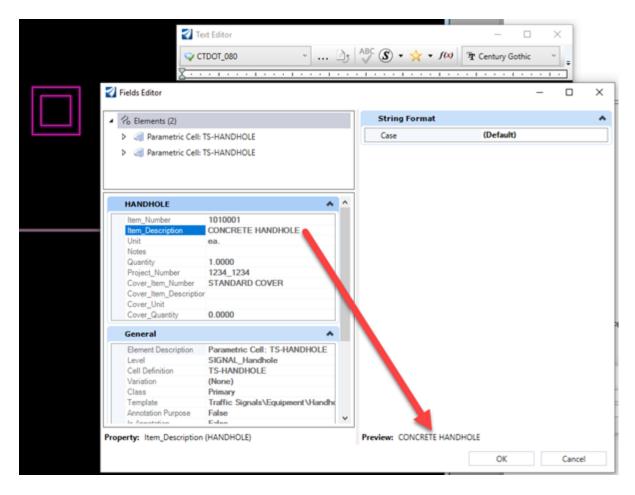
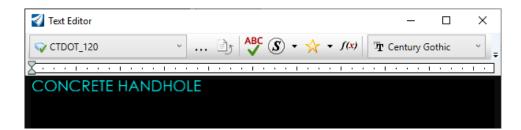


Figure 158

5. Follow the prompts to place the call out.



#### Figure 159





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

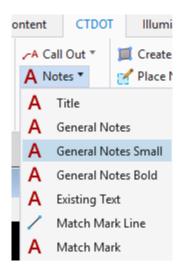


Figure 161

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.

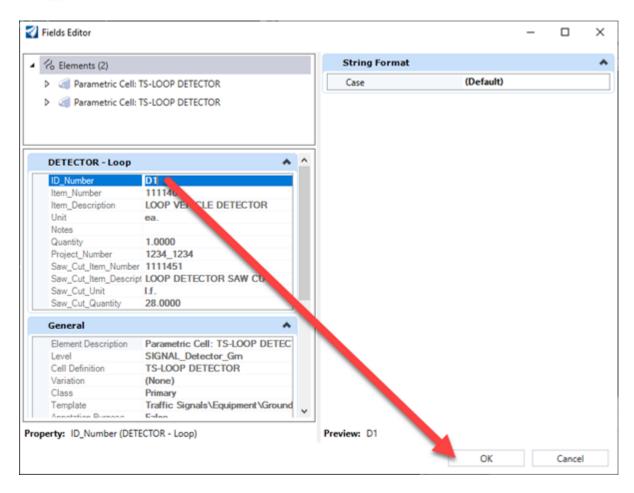


Figure 162

8. Follow the prompts to place the note.



Figure 163

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

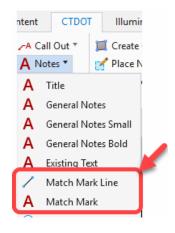


Figure 164

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.

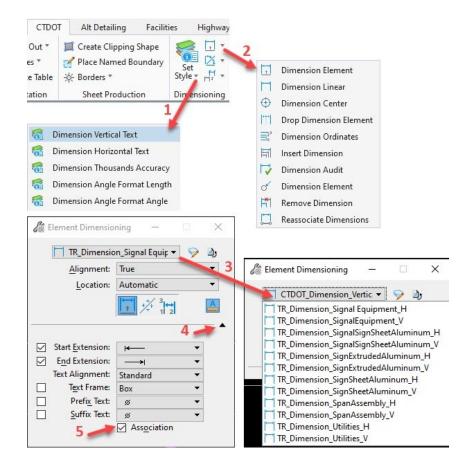


Figure 165

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.

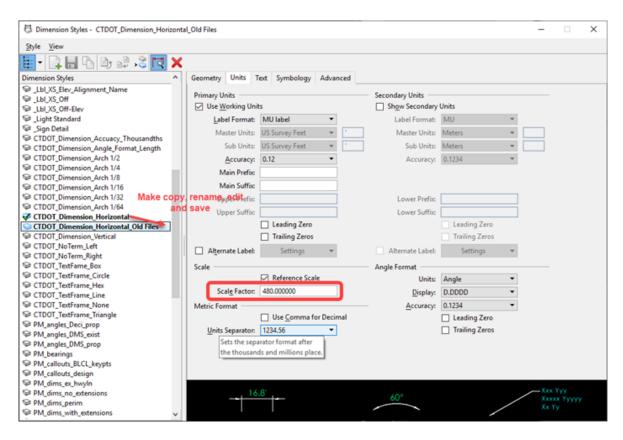


Figure 166

# 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.

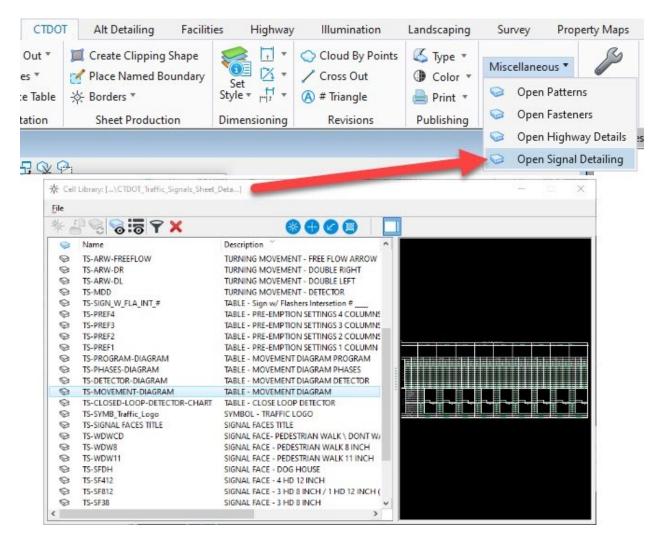


Figure 167

5.10.2 Tables

- 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.

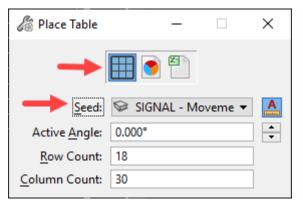
Preconfigured Custom CTDOT Table Seeds are available for placement. In this exercise we will place both empty tables and table populated from a report.

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

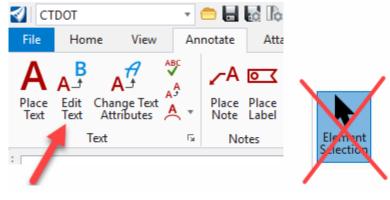
Tables from Reports will place with all the needed information already filled in. Examples:

- Mast Arm Information
- Span Pole Information
- 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 lefthand corner of the sheet.
- 4. Select the **SIGNAL Movement Diagram Bottom** and snap to the bottom left corner of the top movement diagram.





 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.





 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.

| Properties       |                       | 🗕 🛨 🕇 🗙 |
|------------------|-----------------------|---------|
| ▲ 🖧 Elements (1) |                       |         |
| ▲ 🌐 Table        |                       |         |
| Rows             |                       |         |
| Columns          |                       |         |
| General          |                       | *       |
| Geometry         |                       | *       |
| Extended         |                       | *       |
| Model            | Signal Plan-1 [Sheet] |         |
| Last Modified    | 10/6/2020 2:58:12 PM  |         |
| Snappable        | Snappable             |         |
| Modified         | Modified              |         |
| New              | New                   |         |
| Locked           | Locked                | $\sim$  |
| Display Style    | Unlocked              |         |
| Raw Data 🥏       |                       | )       |



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:

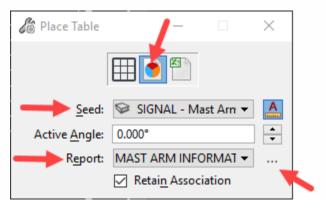
#### Seed

#### Report

- SIGNAL Mast Arm Information
- SIGNAL Combination Mast Arm Information
- SIGNAL Span Pole Information

SIGNAL – Combination Span Pole Information

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





 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.

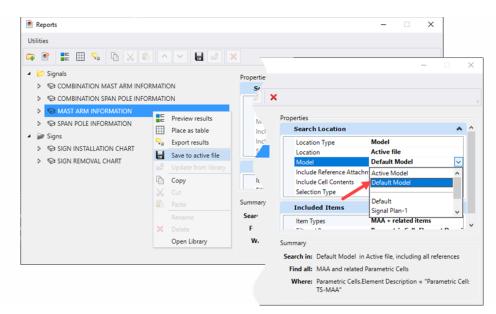


Figure 172

COMBINATION SPAN POLE INFORMATION

COMBINATION MAST ARM INFORMATION

MAST ARM INFORMATION

SPAN POLE INFORMATION

5.10.3 Notes

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

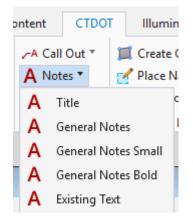


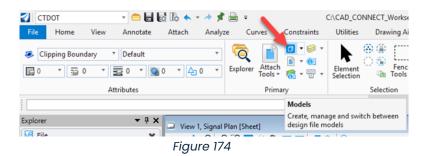
Figure 173

### 5.11 Create a Signal Face Detail

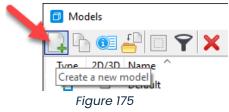
- 1. Go back into the Design model and Place another Named Boundary, but this time only around the Signal Faces.
- Select the CTDOT workflow and on the CTDOT tab locate the Sheet Production section and select the Create Clipping Boundary tool. This will update the Element Template to the correct level.
- 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.



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



- 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.

| 🜍 Create Model       |                               | $\times$ |
|----------------------|-------------------------------|----------|
| <u>T</u> ype:        | Design From Seed 🔹 2D 💌       |          |
| Seed Model:          | Seed2D - CT Road.dgn, Default |          |
| <u>N</u> ame:        | Mast Arm Detail               |          |
| Description:         |                               |          |
| <u>R</u> ef Logical: |                               |          |
| Line Style Scale:    | Annotation Scale 🔻            |          |
|                      | Auto-Update Fields            |          |
| Annotation Scale     |                               |          |
| A                    | 3/16"=1'-0" 👻                 |          |
|                      | Propagate                     |          |
| Cell Properties -    |                               |          |
| Ability to Place:    | As <u>C</u> ell               |          |
|                      | As Annotation <u>C</u> ell    |          |
| Cell Type:           | Graphic 💌                     |          |
|                      | Create a View Group           |          |
|                      | <u>O</u> K Cance              | el       |

Figure 176

- 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.
- 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**.

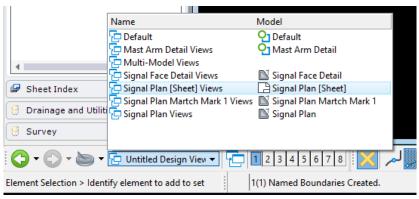


Figure 177

- 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"

| Reference Att          | achment Propert                   | ies for TR_CP_                                    | 1234_1234_Sigr   | nalExample.dgn |      |
|------------------------|-----------------------------------|---|------------------|----------------|------|
| File Name:             | TR_CP_1234_1234_SignalExample.dgn |   |                  |                |      |
| Full Path:             | \Contract_Plan                    | \Contract_Plans\TR_CP_1234_1234_SignalExample.dgn |                  |                |      |
| Model: N               | Mast Arm Detail                   |   |                  | •              |      |
| Logical Name:          | Mast Arm Detail                   |   |                  |                |      |
| Description:           | Named Fence Att                   | tachment  |                  |                |      |
| Orientation:           |                                   |   |                  |                |      |
| View                   |                                   | Descriptio  | n                |                |      |
| Coincident -           | World                             | Global Ori  | igin aligned wit | h Master File  |      |
| 🗄 Standard View        |                                   |   |                  |                |      |
| Saved Views (          |                                   |   |                  |                |      |
| Named Boun<br>Mast Arm |                                   |   |                  |                |      |
|                        |                                   |   |                  |                |      |
| Detail S               | Scale: 3/16"=1'-                  | 0"  | •                |                |      |
| Sc <u>a</u> le (Master | :Ref): 1.000000                   | . 6   | 4.00000000       |                |      |
| Named G                | roup:                             |   | -                |                |      |
| Revi                   | ision:                            |   | -                |                |      |
| L                      | Le <u>v</u> el:                   |   | -                |                |      |
| Nested Attachm         | nents: No Nestin                  | ng  | •                | Nesting Depth: | 1    |
| <u>D</u> isplay Over   | rides: Allow                      |   | •                |                |      |
| Ne <u>w</u> Level Dis  | splay: Use MS_R                   | EF_NEWLEVE  | LDISPLAY Cor     |                |      |
| Global LineStyle S     | Scale: Master                     |   | •                |                |      |
| Synchronize            | View: Volume O                    | nly   | *                |                |      |
| Drawing Boun           | ndary: (New)                      |   | •                |                |      |
| N                      | lame: Mast Arm                    | ı Detail  |                  | ]              |      |
| Toggles                |                                   |   |                  |                |      |
|                        |                                   | à <u>1:1 m</u> 🖉                                  | ° 🔩 🏢 🔊 🚺        |                |      |
|                        |                                   |   |                  |                |      |
|                        |                                   |   |                  | OK             | Canc |

Figure 178

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.
- 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 <i con 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**.
- Select the New File icon. In the New dialog box browse to the Traffic/Contract\_Plans folder.
- 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 reproject your design file's Geospatial Header

### 6.2 Set up the Default Model

- Select the CTDOT workflow and click on the Attach Tab, in the References Section click on Attach Reference.
- 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.
- 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.

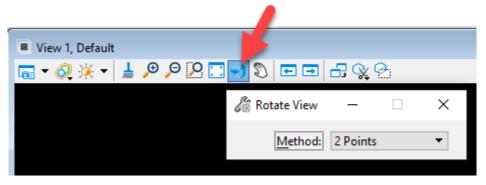


Figure 179

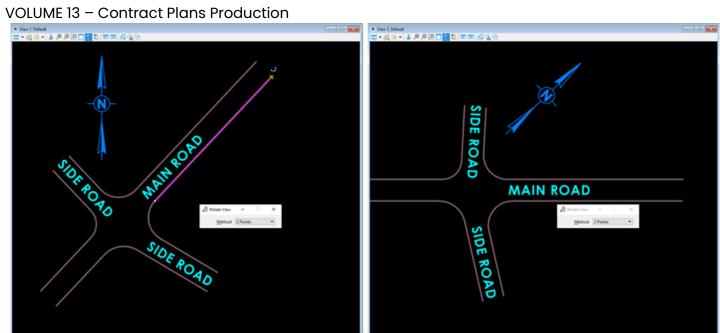


Figure 180

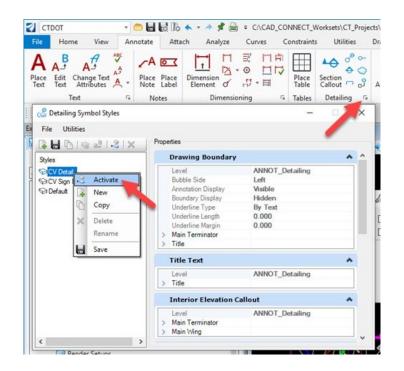
9. Select Save Settings.

### 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.

 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.





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.

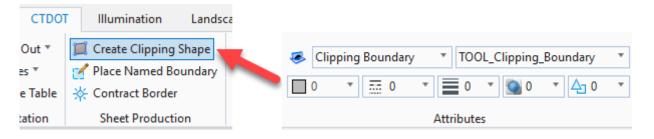
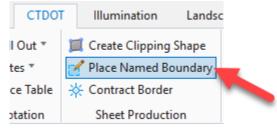


Figure 182

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:
  - Method (icon): By 2 Points
  - Name: Signing and Pavement Marking Plan
  - Mode (icon): Place Single Named Boundary
  - Create Drawing: Enabled

| C Place Named Bou             | indary — 🗆 X                      |
|-------------------------------|-----------------------------------|
|                               | A 🖓 🏢 🎕 🖍 🗹 🗖 🎞                   |
| <u>N</u> ame:<br>Description: | Signing and Pavement Marking Plan |
| <u></u>                       |                                   |
| Group:                        | (None) 👻                          |
|                               | Create Drawing                    |



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'

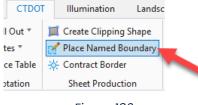
### **Sheet Model Section**

- 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.

| Create Drawing    |  | 9      |
|-------------------|--|--------|
| Name:             | Signing and Pavement Marking Plan          |        |
| Drawing Seed:     | 40 Scale Contract Plan Sheet 🔹             |        |
| View Type:        | Detail                                     |        |
| Discipline:       | Civil                                      |        |
| Purpose:          | Plan View                                  |        |
|                   | Create Drawing Model                       |        |
| Seed Model:       | CV_2Point_40Scale_Sheet_Definitions.dgnlib |        |
| Filename:         | (Active File)                              | • B    |
| A                 | 1"=40' 👻                                   |        |
|                   | Create Sheet Model                         |        |
| Seed Model:       |  |        |
| Filename:         | (Active File)                              |        |
| Sheets:           | (New)                                      |        |
| A                 | 1"=40'                                     |        |
| Drawing Boundary: | (New)                                      |        |
| Detail Scale :    | 1"=40'                                     |        |
|                   | Add To Sheet Index                         | æ      |
|                   | Make Sheet Coincident                      |        |
|                   | Replicate Drawing in Sheet File            |        |
|                   | ✓ Open Model                               |        |
|                   | ОК   | Cancel |

Figure 185

- 6.3.2 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. Select the Place Named Boundary tool and the Place Named Boundary Dialog box will appear.





- 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

| A Place Named Bo | -                              |   |
|------------------|--------------------------------|---|
|                  | P ■ Ŷ / I I                    |   |
| Drawing Seed:    | 40 Scale Contract Plan Sheet 👻 |   |
| Detail Scale:    | 1"=40' 🗸                       |   |
| Name:            | Plan 1                         |   |
| Description:     |                                |   |
| Group:           | (New) 👻                        |   |
| Name:            | Untitled                       |   |
| Description:     |                                |   |
| Start Location:  |                                | ◀ |
| Stop Location:   |                                | ▶ |
| Length:          | 1000.000000                    |   |
| Left Offset:     | -275.000000                    |   |
| Right Offset:    | 275.000000                     |   |
| Overlap:         | 0.000000                       |   |
| Boundary Chords: | 20                             |   |
|                  | Create Drawing Show Dialog     |   |

Figure 187

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.

| <li>Contraction of the second second</li> | reate Drawing     |  |      | > |
|--|-------------------|--|------|---|
|  | Mode              | e: Plan                                  | •    |   |
|  | Name              | e: Plan 1                                |      |   |
|  | One Sheet Per Dgi | n:                                       |      | 6 |
|  | Drawing Seed:     | 40 Scale Contract Plan Sheet 🔹           |      |   |
|  | View Type:        | Civil Plan                               |      |   |
|  | Discipline:       | Civil                                    |      |   |
|  | Purpose:          | Plan View                                |      |   |
|  |                   | Drawing Model                            |      |   |
|  | Seed Model:       | CV_40Scale_Plan_Sheet_Definitions.dgnlil |      |   |
|  | Filename:         | (Active File)                            |      | 4 |
|  | A                 | 1"=40' 🗸                                 |      |   |
|  | Annotation Group: | Plan Annotation                          |      |   |
|  |                   | Sheet Model                              |      |   |
|  | Seed Model:       | CV_40Scale_Plan_Sheet_Definitions.dgnlil |      |   |
|  | Filename:         | (Active File)                            |      |   |
|  | Sheets:           | (New) 👻                                  |      |   |
|  | A                 | 1"=40' 🗸                                 |      |   |
| 1  | Drawing Boundary: | 40 Scale Contract Plan Sheet 👻           |      |   |
|  | Detail Scale :    | 1"=40' (By Named Boundary) 🔹             |      |   |
|  |                   | 🗌 Add To Sheet Index 🛛 🕼                 |      |   |
|  |                   | Make Sheet Coincident                    |      |   |
|  |                   | 🗹 Open Model                             |      |   |
|  |                   | <u>O</u> K Ca                            | ncel |   |

Figure 188

### 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.

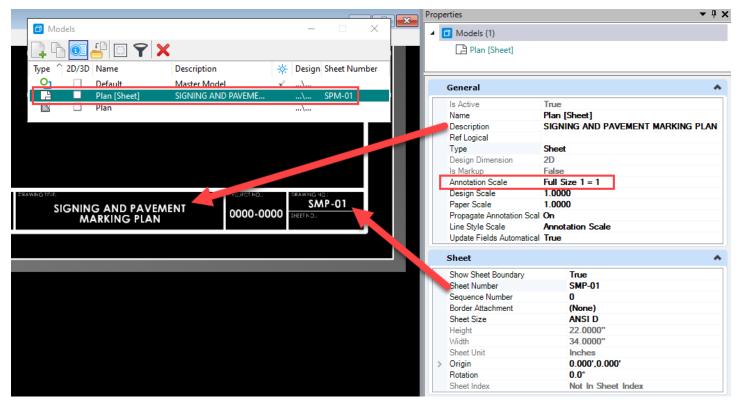
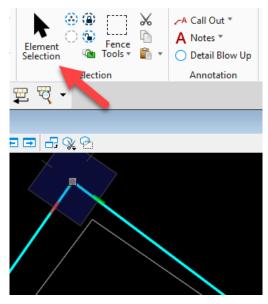


Figure 189

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.





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





 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.

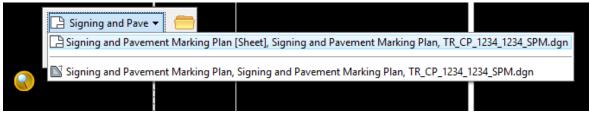


Figure 192

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

| OpenRoads Model                       | Name  | Model                                     |
|---------------------------------------|---|---|
| 🕼 Sheet Index                         | 🔁 Default   | O Default                                 |
| · · · · · · · · · · · · · · · · · · · | 🔁 Match Mark 4 Views                              | Match Mark 4                              |
| Drainage and Utilities                | Signing and Pavement Marking Plan [Sheet] Views   | Signing and Pavement Marking Plan [Sheet] |
| 🖯 Survey                              | 🔁 Signing and Pavement Marking Plan Views         | Signing and Pavement Marking Plan         |
| <b>() - () - ()</b>                   | C Signing and Pavemε - 1 2 3 4 5 6                | ۷ لىم 🔅 💽 🖌 📜 لىم 🔀 🛚                     |
| lement Selection > Ident              | ify element to add to s 🕴 🐺 Deleted 4 of 4 models |   |
|                                       | Figure 193  |   |

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 reposition the reference file within the border.
- 3. follow the prompts to execute the move command.

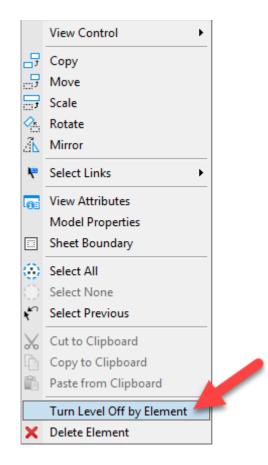
| 👔 References (4 of 4 unique | , 4 displayed)      |                             |
|-----------------------------|---------------------|-----------------------------|
| Tools Properties            |                     |                             |
| 🗄 • 陰 💺 🗅 🕺                 | 🐟 🦛 🖻 🗗 🚰 🚮 💤 🍈 🖤 🚇 | 🗙 Hilite Mode: Boundaries 🔻 |
| Hierarchy                   | Slot 🏴 🚺 File Name  | Logical Mo                  |
|                             | 1                   | Si <u>A</u> ttach ligi      |
|                             |                     | <u>D</u> etach              |
|                             |                     | R <u>e</u> load             |
|                             |                     | E <u>x</u> change           |
|                             |                     | Open in New Session         |
|                             |                     | Activate                    |
|                             |                     | Deactivate                  |
|                             |                     | Move                        |
|                             |                     | Copy                        |
|                             |                     |                             |



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

- 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.
- 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.



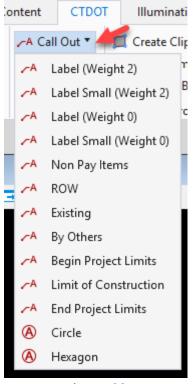


Figure 195

## **6.10 Annotate the Drawing Models**

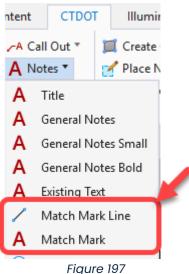
Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- 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 196

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



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.

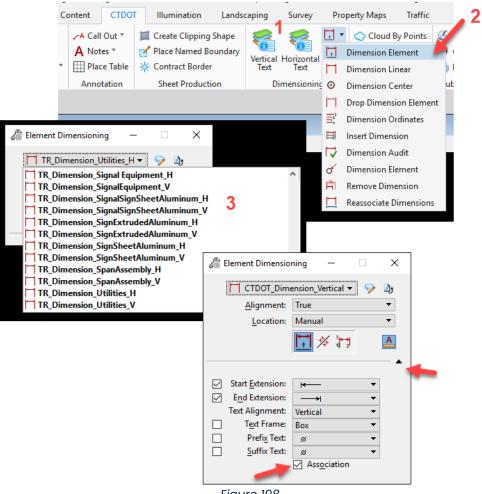


Figure 198

6.10.1 Annotate a Sign Detail

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

| CTDO                         | Illumination   | Landscaping      | Survey             | Prop  | erty Maps                | Traff  |
|------------------------------|--|------------------|--------------------|---|--------------------------|--------|
| l Out *<br>tes *<br>ce Table | Create Clipping<br>Place Named Bo<br>& Contract Border | oundary Vertical | Horizontal<br>Text | H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H<br>H | <mark>,~A</mark> Sign De | tail * |
| otation                      | Sheet Producti   | on D             | imensioning        | 9   | Detailin                 | g      |



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.

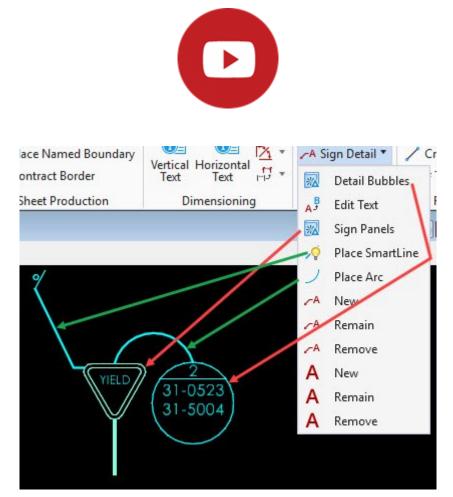


Figure 200

# 6.11 Annotate Pavement Markings

Coming Soon

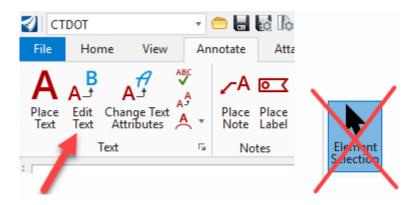
### **6.12 Annotate the Sheet Models**

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

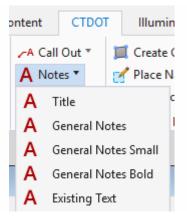
- Call outs and Dimensions should be placed in the Drawing Models. Placing the Call Outs and Dimensions in the Drawing Model will make it easier to move each detail inside the Sheet Model's Border as the Features and Annotation will all move together.
- Notes that pertain to the whole sheet can be placed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

| 🔏 Place Table         | - 🗆 X                                       |
|-----------------------|---|
|                       |   |
| Seed:                 | None 👻 📥                                    |
| <u>T</u> ext Style:   | None  |
| Active <u>A</u> ngle: | SIGNAL - Movement Diagram                   |
| Row Count:            | SIGNAL - Closed Loop Detector Chart         |
| <u>C</u> olumn Count: | SIGNAL - Detectors<br>SIGNAL - Phase Splits |
|                       | SIGNAL - System Loc                         |
|                       | SIGNAL - Pre-emtion Settings                |
|                       | SIGNAL - Combonation Mast Arm Info          |
|                       | SIGNAL - Mast Arm Info                      |
|                       | SIGNAL - Span Pole Info                     |
|                       | SIGNAL - Sign with Flashers                 |
|                       | ☞ Border Revision Block<br>☞ General Notes  |

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 <i con 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.
- 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 reproject your design file's Geospatial Header.

### 7.2 Set up the Default Model

- Select the CTDOT workflow and click on the Attach Tab, in the References Section click on Attach Reference.
- 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.
- 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.

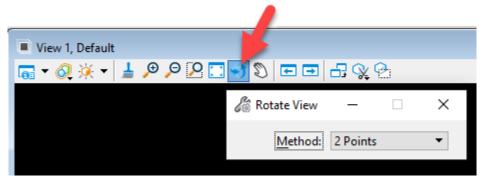


Figure 201

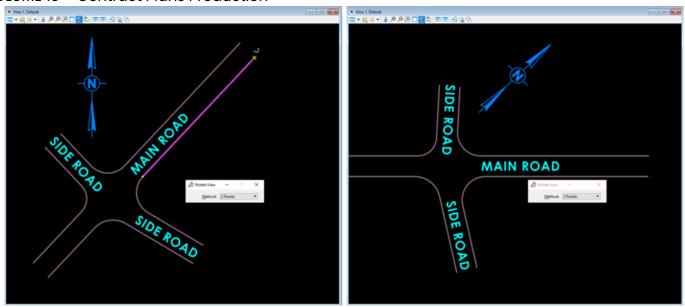


Figure 202

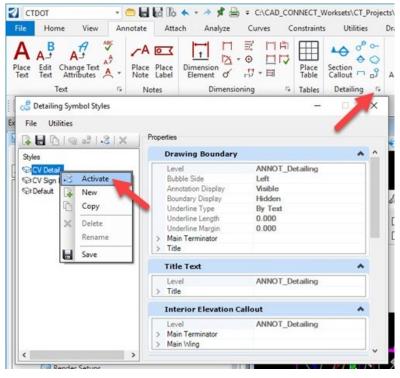
9. Select Save Settings.

### 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.

 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.





 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.

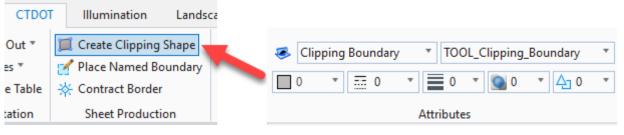
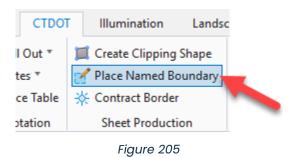


Figure 204

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

| C Place Named Bo | undary – 🗆 X      |
|------------------|-------------------|
|                  | A 🖓 🏢 🕲 🖊 🛃 🎞     |
| Name:            | Illumination Plan |
| Description:     |                   |
|                  |                   |
| Group:           | (None) 👻          |
|                  | Create Drawing    |

Figure 206

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.

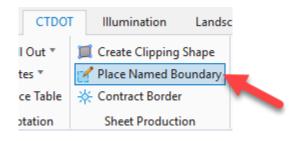
| 🔇 Create Drawing  |  | 3      |  |  |
|-------------------|--|--------|--|--|
| Name:             | Illumination Plan                          |        |  |  |
| Drawing Seed:     | 40 Scale Contract Plan Sheet 👻             |        |  |  |
| View Type:        | Detail                                     |        |  |  |
| Discipline:       | Civil                                      |        |  |  |
| Purpose:          | Plan View                                  |        |  |  |
|                   | Create Drawing Model                       |        |  |  |
| Seed Model:       | CV_2Point_40Scale_Sheet_Definitions.dgnlib |        |  |  |
| Filename:         | (Active File)                              | • B    |  |  |
| A                 | 1"=40' 👻                                   |        |  |  |
|                   | Create Sheet Model                         |        |  |  |
| Seed Model:       | CV_2Point_40Scale_Sheet_Definitions.dgnlib |        |  |  |
| Filename:         | (Active File)                              | • B    |  |  |
| Sheets:           | (New) 👻                                    |        |  |  |
| A                 | 1"=40' 👻                                   |        |  |  |
| Drawing Boundary: | (New) 👻                                    |        |  |  |
| Detail Scale :    | 1"=40' 👻                                   |        |  |  |
|                   | Add To Sheet Index                         | æ      |  |  |
|                   | Make Sheet Coincident                      |        |  |  |
|                   | Replicate Drawing in Sheet File            |        |  |  |
|                   | 🔽 Open Model                               |        |  |  |
|                   | ОК   | Cancel |  |  |

Figure 207

#### 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.





- 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

| Place Named Boundary Civil Plan |                             |          |    | ×             |
|---------------------------------|-----------------------------|----------|----|---------------|
|                                 | P 🖓 🏢 🆓 🦯                   | <b>1</b> | IJ |               |
| Drawing Seed:                   | 40 Scale Contract Plan Shee | t        | •  |               |
| Detail Scale:                   | 1"=40'                      |          | •  |               |
| Name:                           | Plan 1                      |          |    |               |
| Description:                    |                             |          |    |               |
| Group:                          | (New)                       |          | •  |               |
| Name:                           | Untitled                    |          |    |               |
| Description:                    |                             |          |    |               |
| Start Location:                 |                             |          |    | ◀             |
| Stop Location:                  |                             |          |    | ▶             |
| Length:                         | 1000.000000                 |          |    | 00<br>[11111] |
| Left Offset:                    | -275.000000                 |          |    | 00<br>[111111 |
| Right Offset:                   | 275.000000                  |          |    | 00<br>[10100] |
| Overlap:                        | 0.000000                    |          |    | oo            |
| Boundary Chords:                | 20                          |          |    |               |
|                                 | Create Drawing              |          |    |               |
|                                 | Show Dialog                 |          |    |               |

Figure 209

- 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.

|      | Mode              | e: Plan                                  | • |   |
|------|-------------------|--|---|---|
|      | Name              | e: Plan 1                                |   |   |
|      | )ne Sheet Per Dgi | n:                                       |   | 0 |
|      | Drawing Seed:     | 40 Scale Contract Plan Sheet 🔹           |   |   |
|      | View Type:        | Civil Plan                               |   |   |
|      | Discipline:       | Civil                                    |   |   |
|      | Purpose:          | Plan View                                |   |   |
|      |                   | Drawing Model                            |   |   |
|      | Seed Model:       | CV_40Scale_Plan_Sheet_Definitions.dgnlil |   |   |
|      | Filename:         | (Active File)                            |   | 4 |
|      | A                 | 1"=40' 🗸                                 |   |   |
| Anr  | notation Group:   | Plan Annotation                          |   |   |
|      |                   | Sheet Model                              |   |   |
|      | Seed Model:       | CV_40Scale_Plan_Sheet_Definitions.dgnlil |   |   |
|      | Filename:         | (Active File)                            |   | - |
|      | Sheets:           | (New) 👻                                  |   |   |
|      | A                 | 1"=40' 👻                                 |   |   |
| Drav | wing Boundary:    | 40 Scale Contract Plan Sheet 👻           |   |   |
|      | Detail Scale :    | 1"=40' 🗸                                 |   |   |
|      | [                 | 🗌 Add To Sheet Index 🛛 🕼                 |   |   |
|      |                   | Make Sheet Coincident                    |   |   |

Figure 210

### 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.

|                                |                       | 7 ×          | Prope | rties   |                      | <b>▼</b> ₽× |
|--------------------------------|-----------------------|--------------|-------|---|----------------------|-------------|
|                                |                       |              | 4     | Models (1)                                    |                      |             |
|                                |                       | e a ser a la |       | Plan [Sheet]                                  |                      |             |
|                                |                       |              |       | E Fian (Sneet)                                |                      |             |
| Models                         | - 🗆 X                 |              |       |   |                      |             |
|                                | - ^                   |              |       | General                                       |                      | *           |
| 📭 🗗 💷 🚣 🖂 🏲 🗙                  |                       |              |       |   | -                    |             |
| Type ^ 2D/3D Name Description  | 🔆 Design Sheet Number |              |       | Is Active<br>Name                             | True<br>Plan [Sheet] |             |
|                                |                       |              |       | Description                                   | ILLUMINATION PLAN    |             |
| O1 Default Master Model        | ✓\                    |              |       | Ref Logical                                   |                      |             |
| Plan [Sheet] ILLUMINATION PLAN | \ ILL-01              |              |       | Туре  | Sheet                |             |
| 🖾 🗆 Plan                       | \                     |              |       | Design Dimension                              | 2D                   |             |
|                                |                       |              |       | le Markup                                     | Fales                |             |
|                                |                       |              |       | Annotation Scale                              | Full Size 1 = 1      |             |
|                                |                       |              |       | Design Scale                                  | 1.0000               |             |
| DRAWING TITLE:                 | D.: URAWING NC.:      |              |       | Paper Scale                                   | 1.0000               |             |
|                                | ILL-01                |              |       | Propagate Annotation Scal                     |                      |             |
| ILLUMINATION PLAN 0000-        | 0000 SHEET NO.:       |              |       | Line Style Scale<br>Update Fields Automatical | Annotation Scale     |             |
|                                |                       |              |       | Opdate Fields Automatical                     | True                 |             |
|                                |                       |              |       | Sheet   |                      | *           |
|                                |                       |              |       | Show Sheet Boundary                           | True                 |             |
|                                |                       |              |       | Sheet Number                                  | ILL-01               |             |
|                                |                       |              | _     | Sequence Number                               | 0                    |             |
|                                |                       |              |       | Border Attachment                             | (None)               |             |
|                                |                       |              |       | Sheet Size                                    | ANSI D               |             |
|                                |                       |              |       | Height  | 22.0000"             |             |
|                                |                       |              |       | Width   | 34.0000"             |             |
|                                |                       |              |       | Sheet Unit                                    | Inches               |             |
|                                |                       |              | >     | Origin  | 0.000'.0.000'        |             |
|                                |                       |              |       | Rotation                                      | 0.0°                 |             |
|                                |                       |              |       | Sheet Index                                   | Not In Sheet Index   |             |



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.

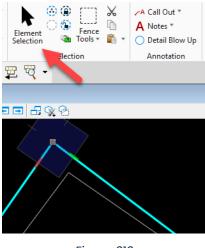


Figure 212

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



Figure 213

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.

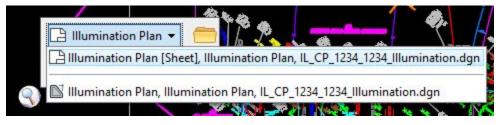


Figure 214

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

| 🕼 Sheet Index             | Name                              | Model                      |
|---------------------------|-----------------------------------|----------------------------|
|                           | 🔁 Default                         | O Default                  |
| 🖯 Drainage and Utilit     | 🔁 Illumination Plan [Sheet] Views | BIllumination Plan [Sheet] |
| Survey                    | 🔁 Illumination Plan Views         | 🕅 Illumination Plan        |
| <b>() • () • () •</b>     | 🔁 Default 🔹 🗖                     | 1 2 3 4 5 6 7 8            |
| Element Selection > Ident | ify element to add to s 🕴 🔱 De    | leted 6 of 6 models        |

Figure 215

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 reposition the reference file within the border.
- 3. Follow the prompts to execute the move command.

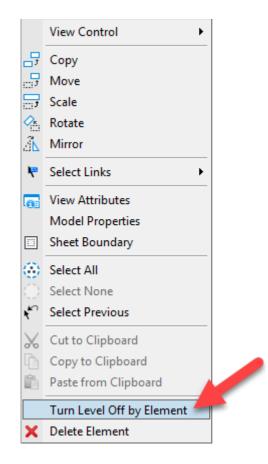
| 👔 References (4 of 4 unique, | 4 displayed)                         |   |         |
|------------------------------|--------------------------------------|---|---------|
| Tools Properties             |                                      |   |         |
| 🗄 • 陸 🕵 🗅 🛒                  | 🗇 🖤 🔁 🚰 🔂 😓 🍜 🖤 🕲                    | 🔀 <u>H</u> ilite Mode: Boundaries   | 5 🔻     |
| Hierarchy                    | Slot 🏴 🚺 File Name                   | Logical   | Model   |
|                              | 1 √ IL_CP_1234_1234_Illumination.dgn | Illu       Attach         Detach       Reload         Exchange       Open in New Session         Activate       Deactivate         Move       Copy         Scale       Rotate         Nove       Nove | uminati |

Figure 216

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.



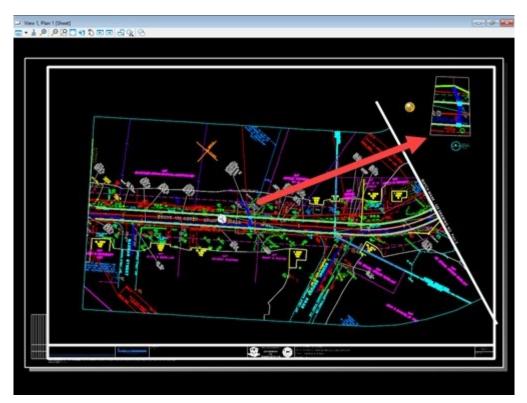
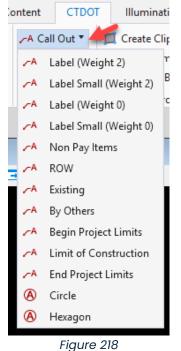


Figure 217

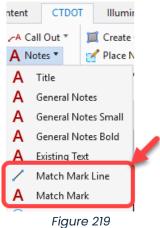
# 7.10 Annotate the Drawing Models

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**.



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



 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 I                              | Property Maps     | Traffic            |
|-----------------------------------|--|---------------------------|---------------------------------------|-------------------|--------------------|
| Out *<br>:s *<br>e Table<br>ation | <ul> <li>Create Clipping Sł</li> <li>Place Named Bou</li> <li>Contract Border</li> <li>Sheet Production</li> </ul> | ndary<br>Vertical<br>Text | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |                   | ut () C<br>le 🔒 Pi |
|                                   |  | Ele                       | ement Dimensio                        | ning —            | - ×                |
|                                   |  | ľ                         | CTDOT_Dim                             | ension_Vertical 🔻 | 🥪 👌                |
|                                   |  |                           | Alignment:                            | True              | -                  |
|                                   |  |                           | Location:                             | Manual            | -                  |
| 0                                 |  |                           |                                       | 🖬 🛠 🎦             |                    |
|                                   |  |                           | Start <u>E</u> xtension:              | <del>4</del>      | -                  |
|                                   |  |                           | End Extension:                        |                   | -                  |
|                                   |  | Т                         | ext Alignment:                        | Vertical          | *                  |
|                                   |  |                           | Text Frame:                           | Box               | •                  |
| =:=:=:                            |  |                           | Prefix Text:                          | ø                 | -                  |
|                                   |  |                           | Suffix Text:                          | ø                 | •                  |
|                                   |  |                           | 3                                     | Association       |                    |

Figure 220

- 4. Light Standard Annotation.
- 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.

|          |                                      | 🜍 ст               | DOT                                   | - 10 - 😑 🖶 🛃 🏷 🔦 - 🧈 📌 🚔 🗄   | 7 =                   |
|----------|--------------------------------------|--------------------|---------------------------------------|--|-----------------------|
|          |                                      | File               | Home View                             | Annotate Attach Analyze Curves   |                       |
|          |                                      | A<br>Place<br>Text | A A A A A A A A A A A A A A A A A A A | $\begin{array}{c c} & & & & & & & & \\ \hline & & & & & \\ \hline & & & \\ \hline \\ \hline$ | רו ו≓<br>ביו ו≓<br>הו |
|          |                                      |                    | Text                                  | 🖙 Notes Dimensioning   |                       |
| ropertie | S                                    |                    |                                       |  |                       |
| 4 /2 E   | lements (1)                          |                    | 🔏 Place Label Settin                  | gs — 🍋 🗙   |                       |
|          |                                      |                    |                                       |  |                       |
| ⊰        | 샦 Cell: ILL-LUM_12K_LED_35'_TB       |                    |                                       |  |                       |
| 0        | > 📦 Items                            |                    | Туре:                                 | Text Favorite v  |                       |
|          |                                      |                    | Favorite Name:                        | S_Illumination Light Stanc   |                       |
| Ger      | neral                                |                    | Dimension Style:                      |  |                       |
| Ge       | ometry                               |                    | Label Rotation:                       | 42_Indimination cable  |                       |
|          |                                      |                    | _                                     | ⊲≥_iiiumination Conduit  |                       |
| Ext      | ended                                |                    | Start At:                             | S _Illumination Item Description   |                       |
| PA       | Y ITEM - Light Standard              |                    | Horizontal Attachment:                | SIllumination Light Standard Base Bottom   |                       |
| De       | scription                            | PROP               | 4                                     | Illumination Light Standard Base Top   |                       |
| То       | wn_Number                            | 132                |                                       | Sandard Base lop   |                       |
| Pol      | le_Number                            | 012                |                                       |  |                       |
| Cir      | rcuit_Number                         | 1                  |                                       | 32-013 🖊 🛛 10A-1AB   | 3                     |
| Pha      | ase                                  | AB                 |                                       |  |                       |
|          | stribution                           | 2                  |                                       | $\bigcirc$   |                       |
|          | fset                                 | Α                  |                                       | $\mathbf{Y}$ ( )   |                       |
|          | YITEM                                |                    |                                       |  |                       |
| ~        | PAY ITEM[0]                          |                    |                                       |  |                       |
|          | SEARCH                               |                    | 254 LIGHT STANE                       | 35' MOUN   |                       |
|          | Item_Description                     |                    | F STANDARD (10                        |  |                       |
|          | Item_Number                          | 10032              | 254                                   |  |                       |
|          | Unit                                 | ea.                | 1.                                    | 122 012  |                       |
|          | Complete_Quantity_Override           | No                 |                                       | A-1AB 132-012  |                       |
|          | Manually_Added_Quantity              | 0.000              | +                                     |  |                       |
|          | Quantity                             | 1.000              | 0                                     |  |                       |
|          | Notes<br>Lumen_K                     |                    |                                       |  |                       |
|          | Bracket_Length_1                     | 10                 |                                       |  |                       |
| _        | Bracket_Length_1<br>Bracket_Length_2 | 0                  |                                       |  |                       |
|          | Height                               | 35                 |                                       |  |                       |
|          | rieigin                              | 33                 |                                       |  |                       |

# 7.11 Annotate the Sheet Models

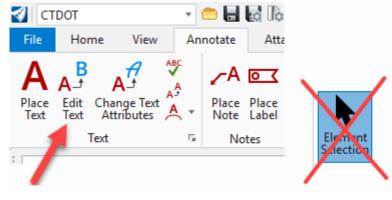
Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- 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.

| 🔏 Place Table         |  | _   |   | ×                  |          |
|-----------------------|--|---|---|--------------------|----------|
|                       |  | X   |   |                    |          |
| Seed:                 | None   |   | -   | A                  |          |
| <u>T</u> ext Style:   | None   |   |   |                    |          |
| Active <u>A</u> ngle: | SIGNAI   | - Mov   | ement Di  | iagram             |          |
| Row Count:            | 🛇 SIGNAI   | Clos  | ed Loop l   | Detecto            | r Chart  |
| <u>C</u> olumn Count: | 💝 SIGNAI<br>💝 SIGNAI   |   |   |                    |          |
|                       | <ul> <li>SIGNAI</li> <li>Genera</li> </ul> | - Pre-<br>- Com<br>- Mas<br>- Spar<br>- Sign<br>Revisio | emtion S<br>nbonatior<br>t Arm Info<br>n Pole Info<br>with Flas<br>on Block | n Mast /<br>o<br>o | Arm Info |



2. To add information to the table select the **Annotate** tab and choose **Edit Text**. Note: <u>Avoid</u> 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.

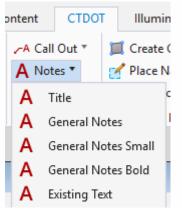


Figure 223

# 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**.
- Select the New File icon. In the New dialog box browse to the Landscape/Contract\_Plans folder.
- 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

- Select the CTDOT workflow and click on the Attach Tab, in the References Section click on Attach Reference.
- 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.
- 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.

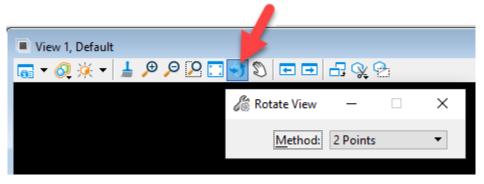


Figure 224

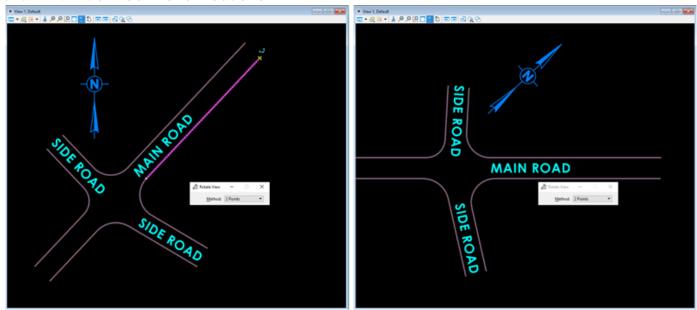


Figure 225

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.

 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.

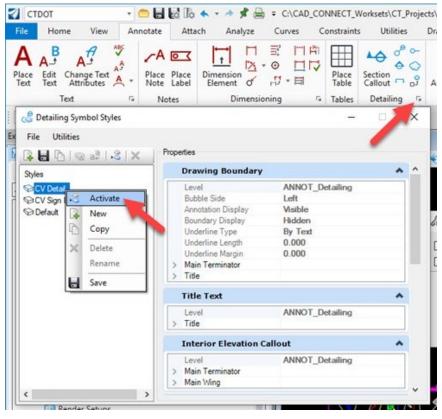


Figure 226

 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.

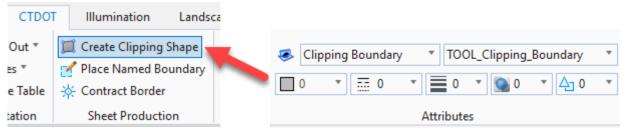
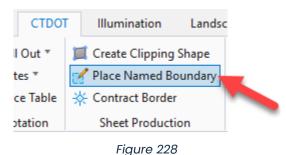


Figure 227

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

| 🔏 Place Named Bo     | undary – 🗆 X            |
|----------------------|-------------------------|
| Name:                | Andscaping              |
| <u>D</u> escription: |                         |
| Group:               | (None)   Create Drawing |



- 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.

| Crea | te Drawing     |  | 2      |
|------|----------------|--|--------|
|      | Name:          | Landscaping                                |        |
|      | Drawing Seed:  | 40 Scale Contract Plan Sheet 👻             |        |
|      | View Type:     | Detail                                     |        |
|      | Discipline:    | Civil                                      |        |
|      | Purpose:       | Plan View                                  |        |
|      |                | Create Drawing Model                       |        |
|      | Seed Model:    | CV_2Point_40Scale_Sheet_Definitions.dgnlib |        |
|      | Filename:      | (Active File)                              | • B    |
|      | A              | 1"=40' 👻                                   |        |
|      |                | Create Sheet Model                         |        |
|      | Seed Model:    |  |        |
|      | Filename:      | (Active File)                              | •      |
|      | Sheets:        | (New) 🗸                                    |        |
|      | A              | 1"=40' 🗸                                   |        |
| Dra  | wing Boundary: | (New) 👻                                    |        |
|      | Detail Scale : | 1"=40' -                                   |        |
|      | ······         | Add To Sheet Index                         | æ      |
|      |                | Make Sheet Coincident                      |        |
|      |                | Replicate Drawing in Sheet File            |        |
|      |                | 🗹 Open Model                               |        |
|      |                | ОК   | Cancel |

Figure 230

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.

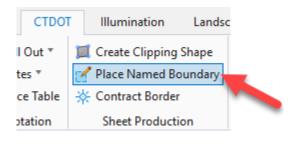


Figure 231

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

| Method (icon): <i>Civil Plan</i>           | Place Named Bo        | oundary Civil Plan 🛛 — 🗌                                    | ×            |
|--|-----------------------|---|--------------|
| Drawing Seed: 40 Scale Contract Plan Sheet |                       | <b>₽</b> ₽ <b>₩</b> 🕸 / 🖌 🗆 💢                               |              |
| Detail Scale: <b>1" - 40'</b>              | Drawing Seed:         | 40 Scale Contract Plan Sheet 👻                              |              |
| Name: <b>Plan 1</b>                        | Detail Scale:         | 1"=40' 🗸  |              |
| Group: New                                 | Name:                 | Plan 1  |              |
| Length: <b>1000</b>                        | Description:          |   |              |
| Right Offset: -275                         | Group:                | (New) 👻   |              |
| Left offset: 275                           | Name:<br>Description: | Untitled  |              |
| Overlap: 0                                 | Start Location:       |   | ◀            |
| Boundary Cord: 20                          | Stop Location:        |   | ▶            |
| Create Drawing: <b>Enabled</b>             | Length:               | 1000.000000   | oo<br>Itatac |
| 0  | Left Offset:          | -275.000000   | oo<br>Isata  |
| Show Dialog: <b>Enabled</b>                | Right Offset:         | 275.000000  | oo<br>Isata  |
|  | Overlap:              | 0.000000  | oo<br>Itatac |
|  | Boundary Chords:      |   |              |
|  |                       | <ul> <li>✓ Create Drawing</li> <li>✓ Show Dialog</li> </ul> |              |

Figure 232

- 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

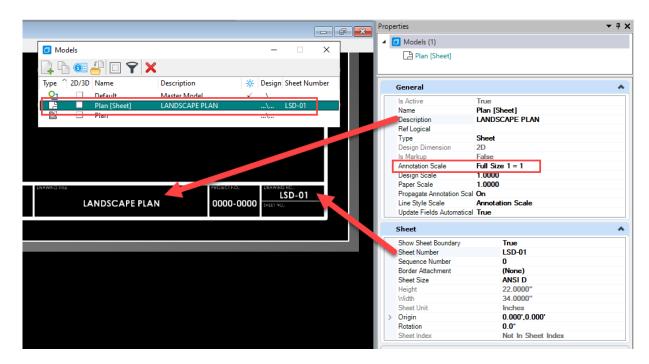
- Sheets: New
- Annotation Scale: 1" = 40"
- Detail Scale: 1" = 40'
- Add to Sheet Index: Disabled
- Open Model: Enabled
- 5. Click **OK**. The Drawing Models and Sheet Models will be created.

|   | Mod               | e:  | Plan                                    | • |   |
|---|-------------------|-----|---|---|---|
|   | Nam               | e:  | Plan 1                                  |   |   |
|   | One Sheet Per Dg  | n:  |   |   | 0 |
|   | Drawing Seed:     | 40  | Scale Contract Plan Sheet 🔹             |   |   |
|   | View Type:        | Ci  | iv <mark>il</mark> Plan                 |   |   |
|   | Discipline:       | Ci  | ivil                                    |   |   |
|   | Purpose:          | PI  | an View                                 |   |   |
|   |                   | Dra | awing Model                             |   |   |
|   | Seed Model:       | C   | V_40Scale_Plan_Sheet_Definitions.dgnlil |   |   |
|   | Filename:         | (A  | Active File)                            |   | 4 |
|   | A                 | 1"  | =40' 🗸                                  |   |   |
| 4 | Annotation Group: | Pla | an Annotation                           |   |   |
|   |                   | She | eet Model                               |   |   |
|   | Seed Model:       | C   | V_40Scale_Plan_Sheet_Definitions.dgnlil |   |   |
|   | Filename:         | (A  | Active File)                            |   |   |
|   | Sheets:           | (N  | lew) 🔻                                  |   |   |
|   | A                 | 1": | =40' 🗸                                  |   |   |
| D | rawing Boundary:  | 40  | Scale Contract Plan Sheet 🔹             |   |   |
|   | Detail Scale :    | 1"  | =40' (By Named Boundary) 🔹              |   |   |
|   |                   |     | Add To Sheet Index 🛛 🕼                  |   |   |
|   |                   |     | Make Sheet Coincident                   |   |   |

Figure 233

# 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.

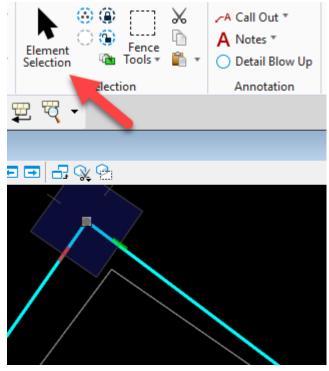




5. Select Save Settings.

# 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.

|   | ≥, .           | <b>α</b> Σ    | 1 |
|---|----------------|---------------|---|
|   | $\mathbb{D}^2$ | Insert Vertex |   |
| * | ]*             | Delete Vertex |   |

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.



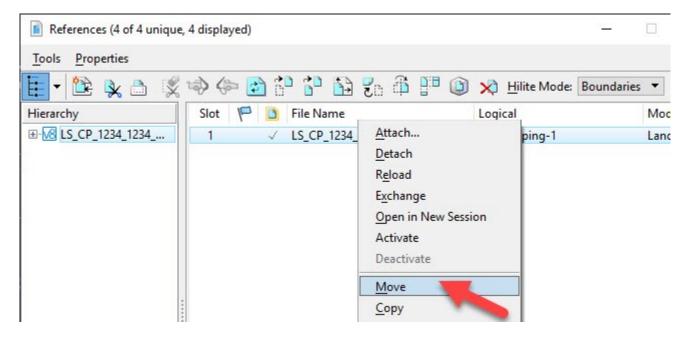
5. Models can also be opened using the **View Group** drop down tool located at the bottom left of the screen.

| 🕼 Sheet Index       | Name                            | Model                              |
|---------------------|---------------------------------|------------------------------------|
|                     | 🔁 Default                       | <b>O</b> l Default                 |
| 🖯 Drainage and Util | iti C Landscaping [Sheet] Views | 🕒 Landscaping [Sheet]              |
| 3 Survey            | 🔁 Landscaping Views             | Landscaping                        |
| <b>() - ()</b> - () | - 🔁 Landscaping [Sheet] -       | 12345678                           |
| New Node            |                                 | Opened Link: LS_CP_1234_1234_Lands |

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 reposition the reference file within the border.
- 3. Follow the prompts to execute the move command.

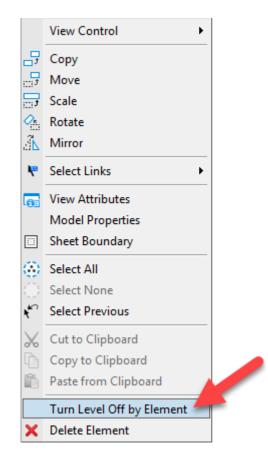




4. Select Save Settings.

# 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.



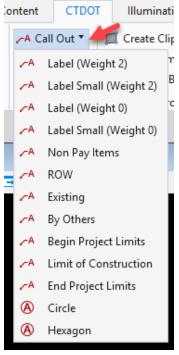


Figure 236

# 8.10 Annotate the Drawing Models

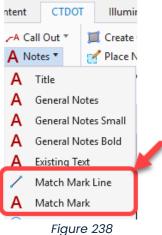
Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- 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 237

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



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.

| CTDOT                             | Illumination   | Landscaping                | Survey                                 | Property Maps     | Traffic            |
|-----------------------------------|--|----------------------------|--|-------------------|--------------------|
| Out ▼<br>:s ▼<br>≥ Table<br>ation | <ul> <li>Create Clipping</li> <li>Place Named Bo</li> <li>Contract Border</li> <li>Sheet Producti</li> </ul> | oundary<br>Vertica<br>Text | 1 Korizontal<br>Text<br>Dimensioning 2 | Cross O           | out 🕕 C<br>gle 🚔 P |
|                                   |  | 🔏 EI                       | ement Dimensio                         | oning —           | • ×                |
|                                   |  |                            | CTDOT Dim                              | ension_Vertical • | • 🥪 👌              |
|                                   |  |                            | Location:                              | Manual            | •                  |
| 0                                 |  |                            |  | <b>1</b> * 13     |                    |
|                                   |  |                            | Start <u>Extension</u> :               | ₩                 | •                  |
|                                   |  |                            | End Extension:                         |                   | -                  |
|                                   |  |                            | Text Alignment:                        | Vertical          | •                  |
|                                   |  |                            | Text Frame:                            | Box               | -                  |
| =:=:=:                            |  |                            | Prefix Text:                           | ø                 | <b>•</b>           |
|                                   |  |                            | Suffix Text:                           | ø                 | <b>~</b>           |
|                                   |  |                            | 3                                      | Association       |                    |

Figure 239

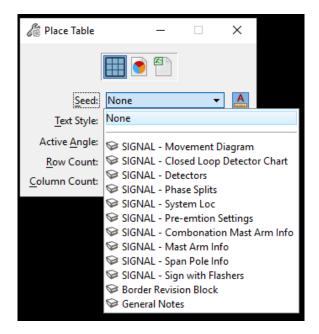
# 8.11 Item Annotation using fields

Coming Soon

# 8.12 Annotate the Sheet Models

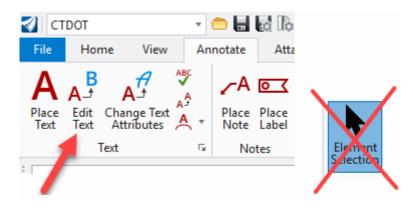
Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- 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.





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**.

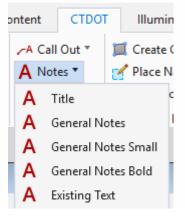


Figure 242

# 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 <i con 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**.
- Select the New File icon. In the New dialog box browse to the F\_Civil Contract\_Plans folder.
- 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 reproject 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

- Select the CTDOT workflow and click on the Attach tab, in the References Section click on Attach Reference.
- 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.
- 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.
- 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.
- 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.

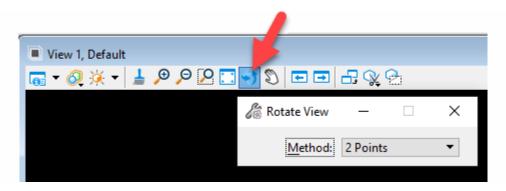


Figure 243

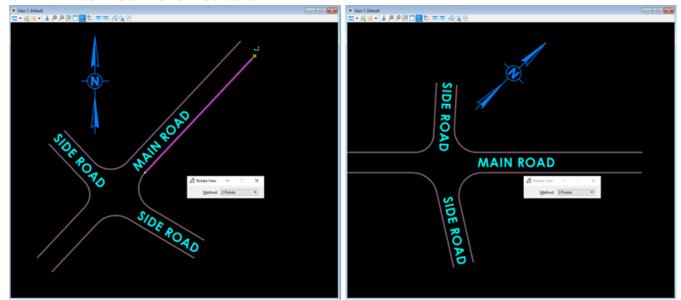


Figure 244

9. Select Save Settings.

# 9.3 Create the Drawing and Sheet Models

- 1. Select Level Display and turn off the desired levels.
- 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.

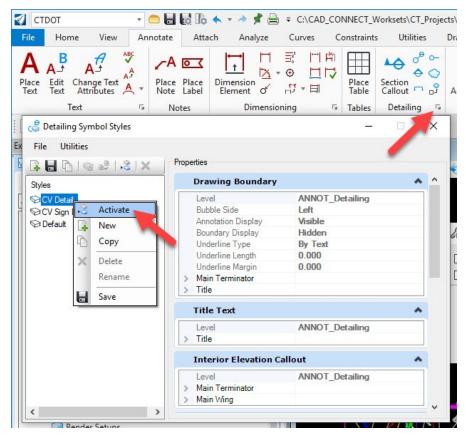


Figure 245

 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.

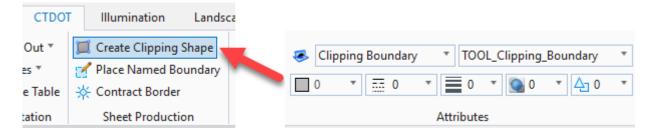
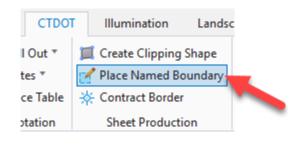


Figure 246

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





- 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

| <u>.</u>             |                      |
|----------------------|----------------------|
| C Place Named Bo     | undary – 🗆 X         |
|                      | A 🖓 🏢 🥎 🖊 💅 🛄 💢      |
| <u>N</u> ame:        | Demolition Site Plan |
| <u>D</u> escription: |                      |
|                      |                      |
| Group:               | (None) 👻             |
|                      | Create Drawing       |



- 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

| Create Drawing    |   | ×      |
|-------------------|---|--------|
| Name:             | Demolition Site Plan                                      |        |
| Drawing Seed:     | Misc Plan 👻   |        |
| View Type:        | Detail  |        |
| Discipline:       | Civil   |        |
| Purpose:          | Plan View   |        |
|                   | Create Drawing Model                                      |        |
| Seed Model:       | CV_2Point_Misc_Sheet_Definitions.dgnlib, N                |        |
| Filename:         | (Active File)   | 🗎 📮    |
| A                 | 1"=30' 🗸  |        |
|                   | Create Sheet Model  |        |
| Seed Model:       | $CV\_2Point\_Misc\_Sheet\_Definitions.dgnlib, \mathbb{N}$ |        |
| Filename:         | (Active File)   | 🗎 📮    |
| Sheets:           | (New) 👻   |        |
| A                 | Full Size 1 = 1   |        |
| Drawing Boundary: | (New) 🔻   |        |
| Detail Scale :    | 1"=30' (Fit View to Sheet Boundary) 🔹                     |        |
|                   | Add To Sheet Index  | P      |
|                   | Make Sheet Coincident                                     |        |
|                   | Replicate Drawing in Sheet File                           |        |
|                   | 🗹 Open Model  |        |
|                   | <u>0</u> K  | Cancel |

Figure 249

- 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.

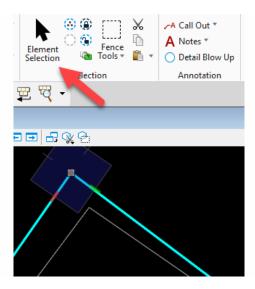
|   | Properties                        | <b>▼</b> ₽× |
|---|-----------------------------------|-------------|
|   | Models (1)                        |             |
|   | Plan [Sheet]                      |             |
|   |                                   |             |
| 🗇 Models - 🗆 🗙                                      |                                   |             |
| 📮 🗅 💷 🚭 🖸 🍸 🗙                                       | General                           | *           |
| Type 🗅 2D/3D Name Description 🔆 Design Sheet Number | Is Active True                    |             |
|   | Name Plan [Sheet]                 |             |
|   | Description SITE GRADING PLAN     |             |
|   | Ref Logical                       |             |
|   | Type Sheet                        |             |
|   | Design Dimension 2D               |             |
|   | le Markup Ealee                   |             |
|   | Annotation Scale Full Size 1 = 1  |             |
|   | Design Scale 1.0000               |             |
| DRAWING HILE: PROJECTINO,: URAWING NC.:             | Paper Scale 1.0000                |             |
| SGP-01  | Propagate Annotation Scale On     |             |
| SITE GRADING PLAN 0000-0000 SHEET VUC               | Line Style Scale Annotation Scale |             |
|   | Update Fields Automatically True  |             |
|   | Sheet                             | *           |
|   | Show Sheet Boundary True          |             |
|   | Sheet Number SGP-01               |             |
|   | Sequence Number 0                 |             |
|   | Border Attachment (None)          |             |
|   | Sheet Size ANSI D                 |             |
|   | Height 22.0000"                   |             |
|   | Width 34.0000"                    |             |
|   | Sheet Unit Inches                 |             |
|   | > Origin 0.000',0.000'            |             |
|   | Rotation 0.0°                     |             |
|   | Sheet Index Not In Sheet Index    |             |

Figure 250

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.





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.

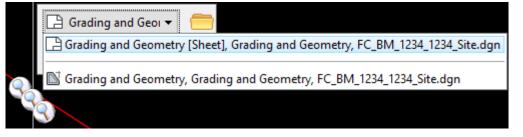


Figure 253

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

|                                     | Name                                 | Model                          |
|-------------------------------------|--------------------------------------|--------------------------------|
|                                     | 🔁 Default                            | 🞦 Default                      |
|                                     | 🔁 Detail Views                       | 🔊 Detail                       |
|                                     | 🔁 Grading and Geometry Views         | Srading and Geometry           |
|                                     | 🔁 Site and Drainage Views            | 🔊 Site and Drainage            |
|                                     | 🔁 Site Demo Views                    | 🔊 Site Demo                    |
|                                     | 🔁 Untitled Design Views              | 👣 Untitled Design              |
| 🖯 🖯 OpenRoads Standa                | 🔁 Grading and Geometry [Sheet] Views | 🕒 Grading and Geometry [Sheet] |
|                                     | 🔁 Site and Drainage [Sheet] Views    | 🕒 Site and Drainage [Sheet]    |
| Drainage and Utilit                 | Site Demo [Sheet] Views              | 🖹 Site Demo [Sheet]            |
| 🕑 Survey                            |                                      |                                |
| <b>()</b> • <b>()</b> • <b>()</b> • | 🔁 Default 🔹 🗖 1 2                    | 3 4 5 6 7 8 🔀 🔎                |
| Element Selection > Ident           | tify element to add to set           | 1(1) Named Bou                 |

Figure 254

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.

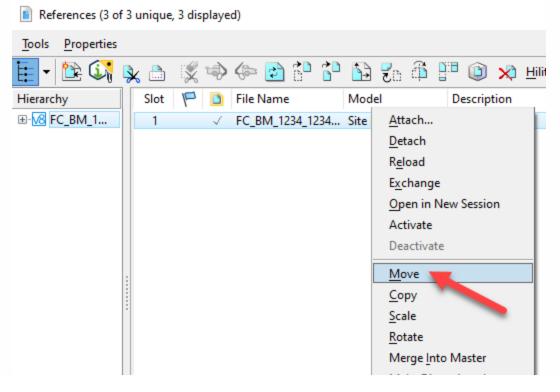


Figure 255

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**.

|                  | View Control              |  |
|------------------|---------------------------|--|
| -7               | Сору                      |  |
|                  | Move                      |  |
| <b></b> ,        | Scale                     |  |
| <u></u>          | Rotate                    |  |
| 3 <mark>8</mark> | Mirror                    |  |
| ۳                | Select Links              |  |
| 65               | View Attributes           |  |
|                  | Model Properties          |  |
|                  | Sheet Boundary            |  |
| ٢                | Select All                |  |
| $\bigcirc$       | Select None               |  |
| *                | Select Previous           |  |
| Ж                | Cut to Clipboard          |  |
| D                | Copy to Clipboard         |  |
| ĥ                | Paste from Clipboard      |  |
|                  | Turn Level Off by Element |  |
| ×                | Delete 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. 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**.

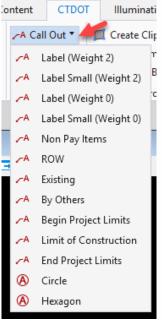


Figure 257

 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            |
|-----------------------------------|--|-----------------------------|--------------------------|---------------------|--------------------|
| Out *<br>:s *<br>e Table<br>ation | Create Clipping<br>Place Named Bo<br>Contract Border<br>Sheet Producti | oundary<br>Vertical<br>Text | Horizontal<br>Text       | a succession of the | ut 🕕 C<br>ple 🚔 Pi |
|                                   |  | Se Ele                      | ement Dimensio           | oning —             | • ×                |
|                                   |  |                             | CTDOT_Dim                | ension_Vertical 🔻   |                    |
|                                   |  |                             | <u>A</u> lignment:       | True                |                    |
|                                   |  |                             | Location:                | Manual              | •                  |
| 0                                 |  |                             |                          | <b>1</b> * 13       |                    |
| )                                 |  |                             | Start <u>Extension</u> : | <b>+</b>            | •                  |
|                                   |  |                             | End Extension:           | <b>→</b>            | <b>•</b>           |
|                                   |  | Г                           | ext Alignment:           | Vertical            | -                  |
|                                   |  |                             | Text Frame:              | Box                 | -                  |
| =:=:=:                            |  |                             | Prefi <u>x</u> Text:     | ø                   | -                  |
|                                   |  |                             | Suffix Text:             | ø                   | -                  |
|                                   |  |                             | 3                        | Association         |                    |

Figure 258

## 9.9 Annotate the Sheet Models

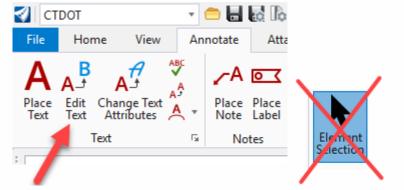
Note: Annotation will be placed in both the Drawing Models and the Sheet Model.

- 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.

| C Place Table         | _  |          | ×        |          |
|-----------------------|--|----------|----------|----------|
|                       |  |          |          |          |
| Seed:                 | None   | •        | <b>A</b> |          |
| <u>T</u> ext Style:   | None   |          |          |          |
| Active <u>A</u> ngle: | SIGNAL - Move  | ement Di | agram    |          |
| Row Count:            | SIGNAL - Close   |          | Detecto  | r Chart  |
| <u>C</u> olumn Count: | SIGNAL - Detection |          |          |          |
|                       | 🛇 SIGNAL - Syste   |          |          |          |
|                       | SIGNAL - Pre-e   |          | _        |          |
|                       | SIGNAL - Com   |          |          | Arm Info |
|                       | SIGNAL - Mast  |          |          |          |
|                       | SIGNAL - Span  |          |          |          |
|                       | SIGNAL - Sign  |          | ners     |          |
|                       | General Notes  | DIOCK    |          |          |

Figure 259

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.

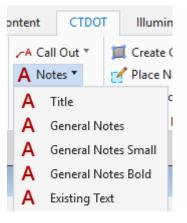


Figure 261

# 9.10 Detail Sheets from 2D Drawings

 Continue using the DGN file created in this Module. Create a new Sheet Model, using the Seed2D – CT RoadSheet.dgn, 2D Sheet seed file.

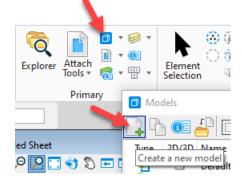


Figure 262

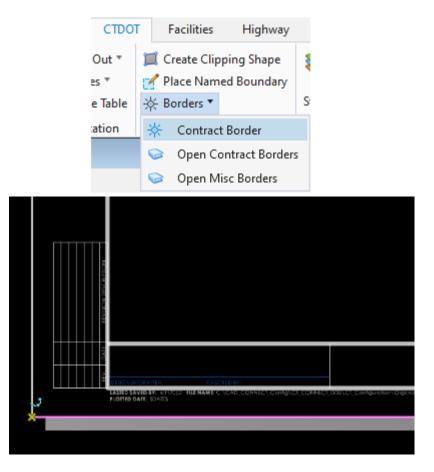
In the Create Model dialog box enter the following:

- Name: Miscellaneous Details
- Description: Miscellaneous Details
- Sheet Number: C-005
- Annotation Scale: Full Size 1 = 1

| Create Model       |                                     | ×  |
|--------------------|-------------------------------------|----|
| <u>T</u> ype:      | Sheet From Seed 🔻 2D 👻              |    |
| Seed Model:        | Seed2D - CT RoadSheet.dgn, 2D Sheet |    |
| Name:              | Miscellaneous Details               |    |
| Description:       | MISCELLANEOUS DETAILS               |    |
| Ref Logical:       |                                     |    |
| Line Style Scale:  | Annotation Scale 🔹                  |    |
|                    | Auto-Update Fields                  |    |
| Annotation Scale — |                                     |    |
| <b>A</b>           | 1"=40' 🗸                            |    |
|                    | Propagate                           |    |
| Sheet Properties   |                                     |    |
|                    | Add To Sheet Index                  | F  |
| Sheet Number:      | C-005                               |    |
| Sequence Number:   | 0                                   |    |
|                    | Show Sheet Boundary                 |    |
| Border Attachment: | (none) 🔻                            |    |
| Size:              | ANSI D 🗸                            |    |
| Origin:            | X: 0.000000 Y: 0.000000             |    |
| Rotation:          | 0°0'0"                              |    |
| Cell Properties    |                                     |    |
| Ability to Place:  | As <u>C</u> ell                     |    |
| 0.117              | As Annotation <u>C</u> ell          |    |
| Cell Type:         |                                     |    |
|                    | Create a <u>V</u> iew Group         |    |
|                    | <u>O</u> K Canc                     | el |
|                    |                                     |    |

Figure 263

 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.





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 265

4. Create a new 2D Design Model, using the Seed2D - CT RoadDesign.dgn, Default seed file.

| 😴 Create Model       |                                     | $\times$ |
|----------------------|-------------------------------------|----------|
| <u>T</u> ype:        | Design From Seed 🔻 2D 👻             |          |
| Seed Model:          | Seed2D - CT RoadDesign.dgn, Default |          |
| <u>N</u> ame:        | 2D Details                          |          |
| Description:         |                                     |          |
| <u>R</u> ef Logical: |                                     |          |
| Line Style Scale:    | Annotation Scale 🔻                  |          |
|                      | Auto-Update Fields                  |          |
| Annotation Scale —   |                                     |          |
| A                    | Full Size 1 = 1                     |          |
|                      | Propagate                           |          |
| Cell Properties      |                                     |          |
| Ability to Place:    | As <u>C</u> ell                     |          |
|                      | As Annotation <u>C</u> ell          |          |
| Cell Type:           | Graphic 👻                           |          |
|                      | Create a <u>V</u> iew Group         |          |
|                      | <u>O</u> K Cance                    | el       |



- 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.
- In search type *Detailing Symbol Styles*, select the result and the dialog box will open. Right click on *CV DETAIL* and select *Activate*.
- 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.
- 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

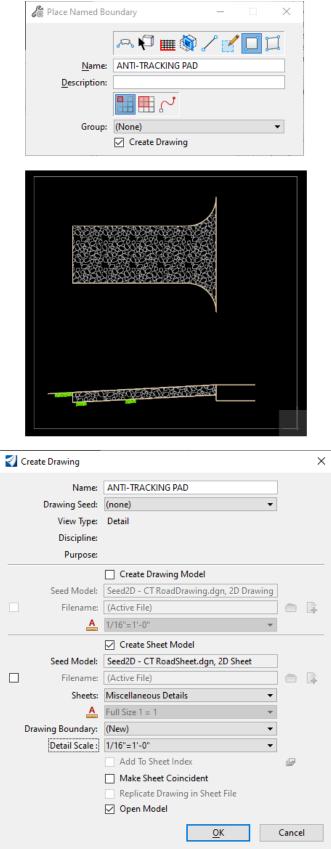


Figure 267

- 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.
- 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.
- 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.

| B Place Named Bo | undary — 🗆 🗙                        |
|------------------|-------------------------------------|
|                  | A 🖓 🏢 🥎 🖊 🌈 🔲 🎞                     |
| <u>N</u> ame:    | ANTI-TRACKING PAD – Different Scale |
| Description:     |                                     |
|                  |                                     |
| Group:           | (None) 👻                            |
|                  | Create Drawing                      |

Figure 268

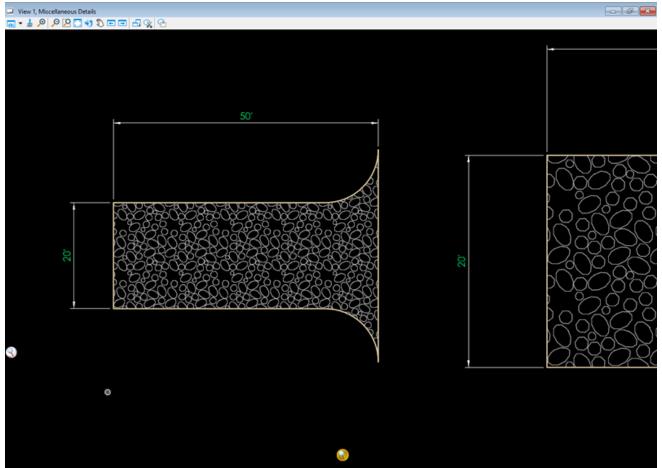
### On the Create Drawing dialog box set:

- 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

| Create Drawing    |   | ×      |
|-------------------|---|--------|
| Name:             | ANTI-TRACKING PAD – Different Scale     |        |
| Drawing Seed:     | (none) 🔻                                |        |
| View Type:        | Detail                                  |        |
| Discipline:       |   |        |
| Purpose:          |   |        |
|                   | Create Drawing Model                    |        |
| Seed Model:       | Seed2D - CT RoadDrawing.dgn, 2D Drawing |        |
| Filename:         | (Active File)                           | 🗇 📮    |
| A                 | Full Size 1 = 1                         |        |
|                   | Create Sheet Model                      |        |
| Seed Model:       | Seed2D - CT RoadSheet.dgn, 2D Sheet     |        |
| Filename:         | (Active File)                           | 🖨 📮    |
| Sheets:           | Miscellaneous Details 🔹                 |        |
| A                 | Full Size 1 = 1                         |        |
| Drawing Boundary: | (New) 🔻                                 |        |
| Detail Scale :    | 1/8"=1'-0" 🔻                            |        |
|                   | Add To Sheet Index                      | P      |
|                   | Make Sheet Coincident                   |        |
|                   | Replicate Drawing in Sheet File         |        |
|                   | 🗹 Open Model                            |        |
|                   | <u>O</u> K                              | Cancel |

Figure 269

- 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.





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 271

# 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.
- 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 dropdown 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

- 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

 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.

| VOLUME 13 - Co | ontract Plans | Production |
|----------------|---------------|------------|
|----------------|---------------|------------|

| References (4 of 4 un<br>References (4 of 4 un | nique, 2 displayed)  |                    |  | – 🗆 🗙             |                    |
|--|--|--------------------|--|-------------------|--------------------|
| Tools Properties                               |  |                    |  |                   |                    |
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| Hierarchy                                      | Slot ا 🔁 File Name   | Model              | Description  | Logical           |                    |
| ⊕ MS SB_CP_015                                 | 1\Base_Models\SB_CB_0158_0206_Bridge00069.dgn  | Design             | Global Origin aligned.                             |                   |                    |
|  | <ol> <li>\\Active_Survey\SV_0158-0206_GroundTOPO.dgr</li> </ol>  |                    | 3D Design Seed                                     | SWW Ground Survey |                    |
|  | <ol> <li>Active_Survey\SV_0158_0206_BridgeTerrain.dgr</li> <li>Active_Survey\SV_0158_0206_GroundTerrain.dgr</li> </ol> |                    | Master Model<br>Master Model                       |                   |                    |
|  | 4  | in Deroore         | mastermoder  |                   |                    |
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|  | Scale 1.00000000 : 1.00000000 Rota   | tion 0*            |  |                   |                    |
|  | Offset X 0.000 Y 0.000 Z   | 0.000              |  |                   |                    |
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| <  | Display Overses: Allow Vew Level Display: Config Variable  | Georeferenced      | No 🔻   |                   |                    |
|  |  |                    |  |                   |                    |
| Attachment Proper                              | ties: sv_0158-0206_groundtopo.dgn X  | Update Sequ        | uence  |                   | ×                  |
| File Name:                                     | \Active_Survey\SV_0158-0206_GroundTOPO.dgn Browse  | $\sim \sim \sim$   | ¥  |                   |                    |
| Full Path:                                     | \active_survey\sv_0158-0206_groundtopo.dgn   | Slot File Nam      | e  | Model             | Logical Name       |
| Model:   | 3D Design  |                    | e\SV_0158-0206_Ground                              |                   | SWW Ground Survey  |
| Logical Name:                                  | SWW Ground Survey  |                    | e\SV_0158_0206_BridgeT                             |                   |                    |
| Description:                                   | 3D Design Seed   |                    | \SV_0158_0206_GroundTo<br>\SB_CB_0158_0206_Bridge0 |                   |                    |
| Detail Scale:                                  | Full Size 1 = 1  |                    | 158_0206_Bridge00069.dgn                           |                   | Active Design File |
| Scale (Master:Ref):                            | 1.00000000 : 1.00000000  |                    |  |                   |                    |
| Named Group:                                   |  |                    |  |                   |                    |
| Revision:                                      |  |                    |  |                   |                    |
| Level:   |  | <                  |  |                   | >                  |
| Nested Attachments:                            | No Nesting Nesting Depth: 1  |                    |  | Default           | OK Cancel          |
| Display Overrides:                             | Allow  |                    |  |                   |                    |
| New Level Display:                             | Use MS_REF_NEWLEVELDISPLAY Configuration ¥   |                    |  |                   |                    |
| Global LineStyle Scale:                        | Master   |                    |  |                   |                    |
| Synchronize View:                              |  |                    |  |                   |                    |
|  | (no nen) (none)  |                    |  |                   |                    |
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|  |  |                    |  |                   |                    |
|  | <u>O</u> K Cancel  |                    |  |                   |                    |
|  |  |                    |  |                   |                    |

Figure 272

12. Right click in View 1 and select 2 Views Plan/3D.

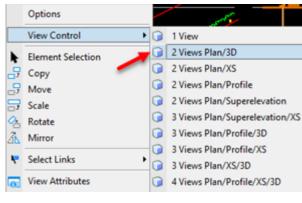


Figure 273

- 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

 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**

 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.

| Models             |                      |                             |             |        |                | -  |        | × |
|--------------------|----------------------|-----------------------------|-------------|--------|----------------|----|--------|---|
| 📮 h 🛯 台 🗖 🏹        | 7 ×                  |                             |             |        |                |    |        |   |
| Create a new model | Des                  | cription                    | 🔆 Design F  |        |                |    | Number |   |
| 👘 🗊 Design         |                      |                             | ✓ D:\Users' | ri\OBM | _SheetModel6.d | i. |        |   |
|                    | Create Model         |                             |             | ×      | ]              |    |        |   |
|                    | Туре:                | Design From Seed            | 3D 👻        |        |                |    |        |   |
|                    | Seed Model:          | Seed3D - CT BridgeDesign.dg | ın, Design  |        |                |    |        |   |
|                    | Name:                | Untitled Design             |             | Char   | nge Seed Model | )  |        |   |
|                    | Description:         |                             |             |        |                |    |        |   |
|                    | <u>R</u> ef Logical: |                             |             |        |                |    |        |   |
|                    | Line Style Scale:    | Annotation Scale            | ,           |        |                |    |        |   |
|                    |                      | Auto-Update Fields          |             |        |                |    |        |   |
|                    | Annotation Scale     |                             |             |        |                |    |        |   |
|                    |                      | Full Size 1 = 1             | -           |        | -              |    |        |   |
| <                  |                      | Propagate                   |             |        | v vesign seea  | _  |        | > |
|                    | Cell Properties -    |                             |             |        |                |    |        |   |
|                    | Ability to Place:    | As <u>C</u> ell             |             |        |                |    |        |   |
|                    |                      | As Annotation <u>C</u> ell  |             |        |                |    |        |   |
|                    | Cell Type:           | Graphic                     | ~           |        |                |    |        |   |
|                    |                      | Create a View Group         |             |        |                |    |        |   |
|                    |                      | <u>о</u> к                  | Car         | cel    |                |    |        |   |

Figure 274

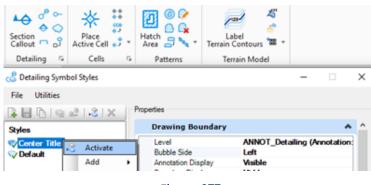


3. Name the Model **2D Design** and click **OK**.

| Create Model      |   | ×     |
|-------------------|---|-------|
| Type:             | Design From Seed    2D                  | *     |
| Seed Model:       | Seed2D - CT BridgeDesign.dgn, 2D Design |       |
| <u>N</u> ame:     | 2D Design                               |       |
| Description:      |   |       |
| Ref Logical:      |   |       |
| Line Style Scale: | Annotation Scale 👻                      |       |
|                   | Auto-Update Fields                      |       |
| Annotation Scale  |   | _     |
| <u>A</u>          | Full Size 1 = 1                         | •     |
|                   | Propagate                               |       |
| Cell Properties - |   |       |
| Ability to Place: |   |       |
|                   | As Annotation <u>C</u> ell              | _     |
| Cell Type:        | Graphic                                 | *     |
|                   | Create a View Group                     |       |
|                   | <u>о</u> к с                            | ancel |

Figure 276

- 4. Reference in the 3D Model Created in the section above using a Nested Depth of 1. Fit View 1.
- In Search type Detailing Symbol Styles and select the result. In the Detailing Symbol Styles dialog box activate the Center Title Detailing Style.





- 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.
- 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.

| 📶 CTDOT 👥 🔹 💀 🐨 🖉  | 🔶 📌 🚔 🗢 🛛 C:\Users\r       | ct17002\Connecticut Department of Tra | ansportation\CTDOT | DDE - CE00-EHR0\Bridge\Co                            |
|--|----------------------------|---------------------------------------|--------------------|--|
| File Home View Annotate Attach Analyz  | e Curves Constraint        | Utilities Drawing Aids C              | Content CTDOT      | Facilities Highway                                   |
| <ul> <li>Clipping Boundary ▼ TOOL_Clipping_Boundary (To *)</li> <li>0 * Ξ 0 * Ξ 0 * Ξ 0 * 0 *</li> </ul> | Explorer Attach<br>Tools * | Lement Selection                      | -                  | Create Clipping Shape Place Named Boundary Borders * |
| Attributes   | Primary                    | Selection                             | Annotation         | Sheet Production                                     |



- VOLUME 13 Contract Plans Production
  - 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

| Place Named Bo | undary 🦳 — 🗆 🗙                     |
|----------------|------------------------------------|
|                | ∧♥■ŵ/ <u>∕</u> ♥ <mark>□</mark> ¤∧ |
| <u>N</u> ame:  | General Plan                       |
| Description:   | General Plan                       |
|                |                                    |
| Group:         | (None) 👻                           |
|                | Create Drawing                     |

Figure 279

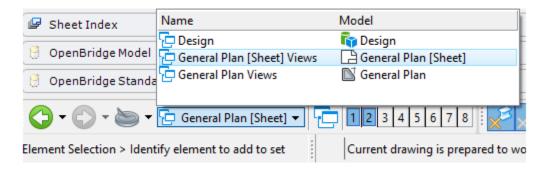
- 10. Follow the prompts to place a Named Boundary (Clipping Boundary) around the design. Data point first in the upper right and ending in the lower left. This element can be edited later to refine the shape and add additional points.
- 11. After accepting the placement of the named boundary the **Create 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.

| 🖉 Create Drawing  |  | $\times$ |
|-------------------|--|----------|
| Name:             | General Plan                                       |          |
| Drawing Seed:     | Plan (Named Boundary) 🗸                            |          |
| View Type:        | Detail   |          |
| Discipline:       | General  |          |
| Purpose:          | Plan View  |          |
|                   | Create Drawing Model                               |          |
| Seed Model:       | ${\sf BD\_MasterDrawingSeed\_Detailing\_Symbols}.$ |          |
| Filename:         | (Active File)                                      | <b>a</b> |
| A                 | 1"=30' 🗸   |          |
|                   | Create Sheet Model                                 |          |
| Seed Model:       | ${\sf BD\_MasterDrawingSeed\_Detailing\_Symbols}.$ |          |
| Filename:         | (Active File)                                      | 🗇 📮      |
| Sheets:           | (New) 👻  |          |
| A                 | Full Size 1 = 1                                    |          |
| Drawing Boundary: | (New) 👻  |          |
| Detail Scale :    | 1"=30' (Fit View to Sheet Boundary) 🔹              |          |
|                   | Add To Sheet Index                                 | Ð        |
|                   | Make Sheet Coincident                              |          |
|                   | Replicate Drawing in Sheet File                    |          |
|                   | 🗹 Open Model                                       |          |
|                   | <u>0</u> K   | Cancel   |

Figure 280

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.





- 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.

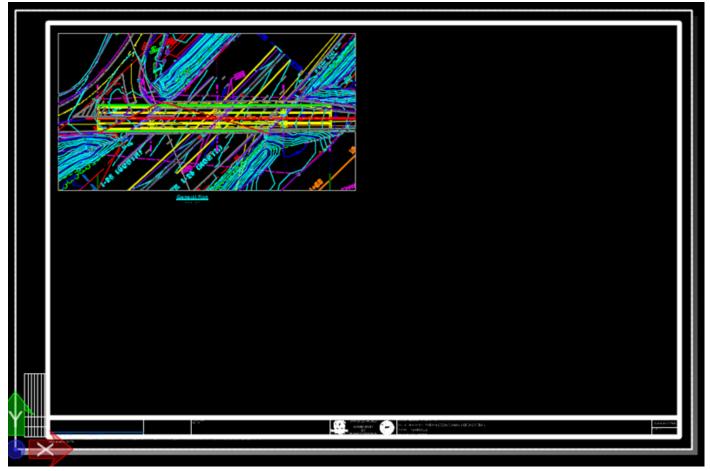


Figure 282

### 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.

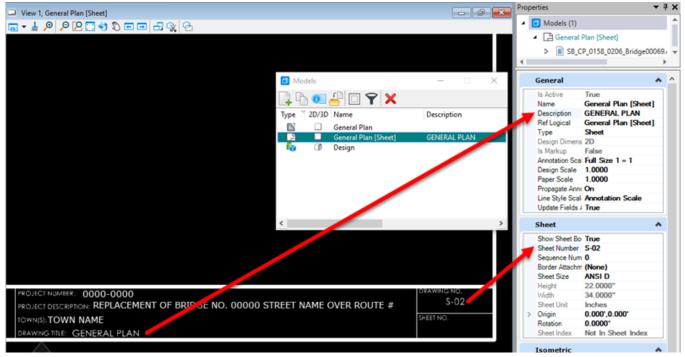
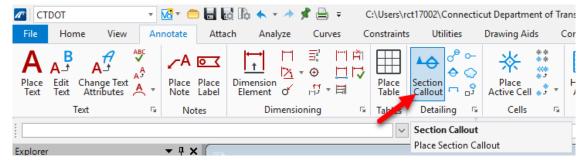


Figure 283

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**.





- 3. In the Place Section Callout dialog box select the following:
  - Drawing Seed: Section Centered
  - Height: From Model
  - Toggle on Create Drawing

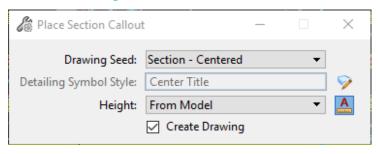
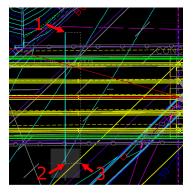


Figure 285

4. Follow the prompts to place a section cut.





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.

| Create Drawing    |  | ×      |
|-------------------|--|--------|
| Name:             | Section  |        |
| Drawing Seed:     | Section - Centered 👻                               |        |
| View Type:        | Section  |        |
| Discipline:       | General  |        |
| Purpose:          | Section View                                       |        |
|                   | Create Drawing Model                               |        |
| Seed Model:       | ${\tt BD\_MasterDrawingSeed\_Detailing\_Symbols.}$ |        |
| Filename:         | (Active File)                                      | 💼 📮    |
| A                 | 1/8"=1'-0"   |        |
| Visible Edges:    | Dynamic 🗸  |        |
|                   | ✓ Create Sheet Model                               |        |
| Seed Model:       | ${\tt BD\_MasterDrawingSeed\_Detailing\_Symbols.}$ | >      |
| Filename:         | (Active File)                                      | • B    |
| Sheets:           | General Plan [Sheet]                               |        |
| A                 | Full Size 1 = 1                                    |        |
| Drawing Boundary: | (New) -  |        |
| Detail Scale :    | 1/8"=1'-0"   |        |
|                   | Add To Sheet Index                                 | P      |
|                   | Make Sheet Coincident                              |        |
|                   | Replicate Drawing in Sheet File                    |        |
|                   | 🗹 Open Model                                       |        |
|                   | <u>о</u> к   | Cancel |

Figure 287

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.

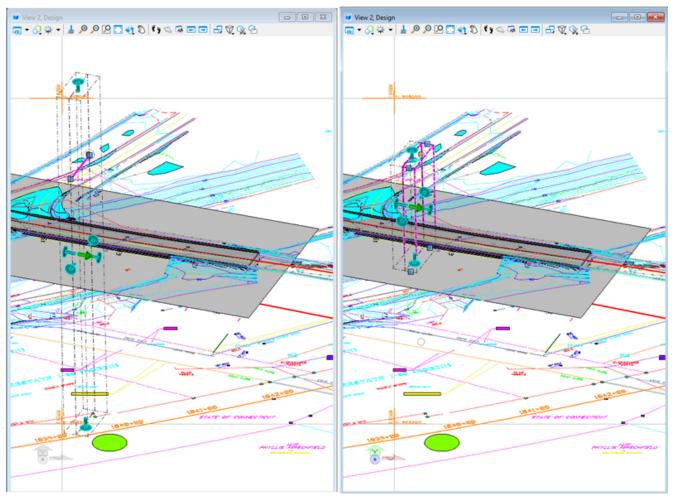


Figure 288

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 289

- 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.

| 📶 СТДОТ                               | - 🔀 -    | = 🖥 🗟  | là 🛧 = 🔶 📌 | t 🚔 🗧 🛛 C | :\Users\re     | ct17002\Connectio | ut Department of 1            | Fransportatio |
|---------------------------------------|----------|--------|------------|-----------|----------------|-------------------|-------------------------------|---------------|
| File Home View                        | Annotate | Attach | Analyze    | Curves Co | onstraints     | Utilities         | Drawing Aids                  | Content       |
| A A A A A A A A A A A A A A A A A A A | Place    |        |            |           | Place<br>Table | Section<br>Callo  | Place                         | Hatch<br>Area |
| Text                                  | 5 N      | otes   | Dimension  | ing 🕞     | Tables         | 🛛 etailing 👘 🗔    | Cells 5                       | Patte         |
|                                       |          |        |            |           | ~              | <b>+</b>          | on Callout<br>evation Callout | Ē             |
| Explorer                              | 🔷 🔻 🕂    | X      | 1.0.1      |           |                | Place El          | evation Callout               |               |

Figure 290

10. In the **Place Elevation Callout** dialog box select the following:

- Drawing Seed: Elevation Centered
- Height: From Model
- Toggle on Create Drawing

| Contraction Callo       | ut —                 |   | ×           |
|-------------------------|----------------------|---|-------------|
|                         | $\diamond$           |   |             |
| Drawing Seed:           | Elevation - Centered | • |             |
| Detailing Symbol Style: | Center Title         |   | <b>&gt;</b> |
| Height:                 | From Model           | - | A           |
|                         | Create Drawing       |   |             |

Figure 291

11. Follow the prompts to place a cut.

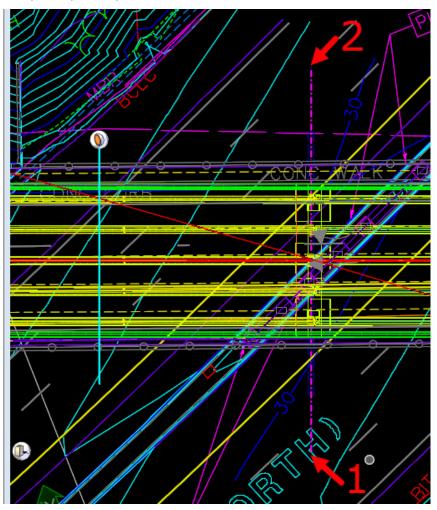


Figure 292

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.

| 🖉 Create Drawing  |   | ×      |
|-------------------|---|--------|
| Name:             | Elevation                               |        |
| Drawing Seed:     | Elevation - Centered 🔹                  |        |
| View Type:        | Elevation                               |        |
| Discipline:       | General                                 |        |
| Purpose:          | Elevation View                          |        |
|                   | ✓ Create Drawing Model                  |        |
| Seed Model:       | BD_MasterDrawingSeed_Detailing_Symbols. |        |
| Filename:         | (Active File)                           | 🖨 📮    |
| A                 | 1"=30' 🗸                                |        |
| Visible Edges:    | Dynamic 🗸                               |        |
|                   | ✓ Create Sheet Model                    |        |
| Seed Model:       | BD_MasterDrawingSeed_Detailing_Symbols. |        |
| Filename:         | (Active File)                           | 🖨 📮    |
| Sheets:           | General Plan [Sheet]                    |        |
| A                 | Full Size 1 = 1 👻                       |        |
| Drawing Boundary: | (New) 🗸                                 |        |
| Detail Scale :    | 1"=30' -                                |        |
|                   | Add To Sheet Index                      | F      |
|                   | Make Sheet Coincident                   |        |
|                   | Replicate Drawing in Sheet File         |        |
|                   | 🗹 Open Model                            |        |
|                   | <u>O</u> K                              | Cancel |

- 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.

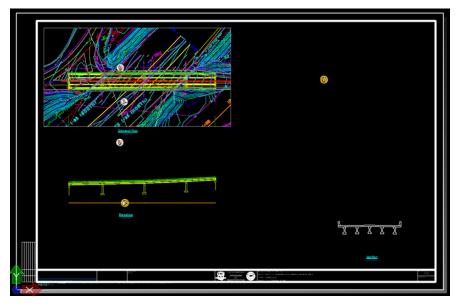
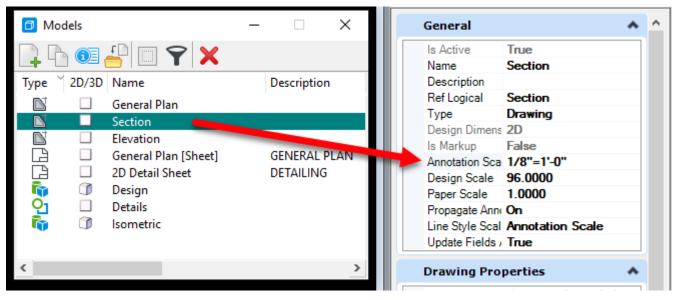


Figure 293

10.1.6 Place a Blow-up Detail

- 1. Open the **Section** Drawing Model.
- In the Models dialog select the Section Drawing Model. In Properties change the Annotation Scale to 1/8" = 1'-0".





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.

| 📶 СТДОТ 🔹                             | 😼 - 😑 🖥 🖡    | 🖥 🕼 🐟 🔹 🖈 🛸 🖶 💷   | C:\Users\r     | ct17002\Connectio | ut Department of                | Transportatic |
|---------------------------------------|--------------|---|----------------|-------------------|---------------------------------|---------------|
| File Home View A                      | nnotate Atta | ich Analyze Curves  | Constraints    | s Utilities       | Drawing Aids                    | Content       |
| A A A A A A A A A A A A A A A A A A A | A OC         | $\begin{array}{c c} & & & \\ \hline \\ \hline \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\$ | Place<br>Table | Section Callout   | Place                           | Hatch e       |
| Text 5                                | Notes        | Dimensioning  | 5 Tables       | Detailing 🛛 🖬     | Cells 5                         | Patte         |
| Explorer                              | <b>→</b> ₽ X |   | ~              | Detail C          | a <b>llout</b><br>etail Callout |               |



- 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).

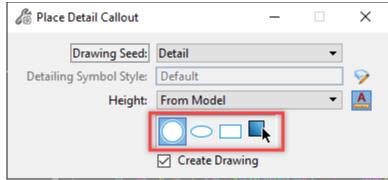
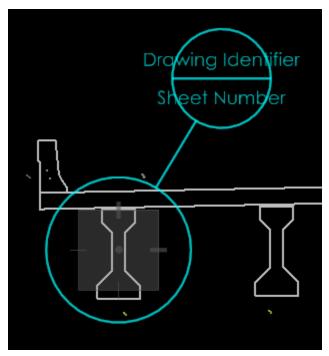


Figure 296

5. Follow the prompts.





 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.

| Create Drawing    |  | ×      |
|-------------------|--|--------|
| Name:             | Beam Detail  |        |
| Drawing Seed:     | Detail 👻   |        |
| View Type:        | Detail   |        |
| Discipline:       | General  |        |
| Purpose:          | Enlarged Detail                                    |        |
|                   | Create Drawing Model                               |        |
| Seed Model:       | ${\sf BD\_MasterDrawingSeed\_Detailing\_Symbols}.$ |        |
| Filename:         | (Active File)                                      | 🗇 📮    |
| A                 | 1/8"=1'-0"   |        |
| Visible Edges:    | Dynamic 🗸  |        |
|                   | ✓ Create Sheet Model                               |        |
| Seed Model:       | BD_MasterDrawingSeed_Detailing_Symbols.            | /      |
| Filename:         | (Active File)                                      | 🖨 📮    |
| Sheets:           | General Plan [Sheet]                               |        |
| A                 | Full Size 1 = 1                                    |        |
| Drawing Boundary: | (New) 🗸  |        |
| Detail Scale :    | 1/8"=1'-0"   |        |
|                   | Add To Sheet Index                                 | P      |
|                   | Make Sheet Coincident                              |        |
|                   | Replicate Drawing in Sheet File                    |        |
|                   | 🗹 Open Model                                       |        |
|                   | <u>0</u> K   | Cancel |

Figure 298

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**.

| References (24 of 24 un | nique, 13 displayed)       |  | _                    |                      |
|-------------------------|----------------------------|--|----------------------|----------------------|
| Tools Properties        |                            |  |                      |                      |
| 🔃 • 隆 🕵 🗂               | 🕺 🗇 🧇 🔁 î <sup>n</sup> 1   | 🗘 🔂 🐔 🛱 🗊 🕲 🗙 <u>H</u> ilite                           | Mode: Boundaries     | •                    |
| Hierarchy               | Slot 🏴 🗈 File Nar          | me   | Model                | Description          |
|                         |                            | 0158_0206_Bridge00069.dgn                              | General Plan         | General Plan         |
|                         |                            | 0158_0206_Bridge00069.dgn<br>0158_0206_Bridge00069.dgn | Section<br>Elevation | Section<br>Elevation |
|                         |                            | 0158_0206_Bridge00069.dgn                              | Beam Detail          | Beam Detail          |
|                         | Attachment Propert         | ies: sb_cp_0158_0206_bridge00069.dgn                   |                      | ×                    |
|                         |                            | SB_CP_0158_0206_Bridge00069.dgn                        | Browse               | ]                    |
|                         | Full Path:                 | \sb_cp_0158_0206_bridge00069.dgn                       |                      |                      |
|                         | Model:                     | Beam Detail  | •                    | <b>•</b>             |
|                         | Logical Name:              | Beam Detail-1  |                      | •                    |
| < >                     | Description                | Ream Detail  |                      |                      |
|                         | Detail Scale:              | 1/2"=1'-0"   | -                    |                      |
|                         | Scale (Master:Ref):        | 1.000000000 : 24.00000000                              |                      |                      |
|                         | Named Group:               |  | *                    |                      |
|                         | Revision:                  |  | *                    |                      |
|                         | Le <u>v</u> el:            |  | -                    |                      |
|                         | Nested Attachments:        | Live Nesting    Nesting                                | De <u>p</u> th: 99   |                      |
|                         | Display Overrides:         | Allow  | •                    |                      |
|                         | Ne <u>w</u> Level Display: | Use MS_REF_NEWLEVELDISPLAY Configurate                 | tion 😾               |                      |
|                         | Global LineStyle Scale:    | Master   | -                    |                      |
|                         | Synchronize View:          | (No View) (none)                                       |                      | *                    |
|                         | Toggles                    |  |                      |                      |
|                         |                            | 🗾 🕨 🕒 🎞 🎞 🏹 🦓 🎹 🗞 💡 🗹                                  | A                    |                      |
|                         |                            | <u>O</u> K   | Cancel               |                      |

Figure 299

8. Click on the Magnifying Glass located on the Section Detail and click Show Callouts.

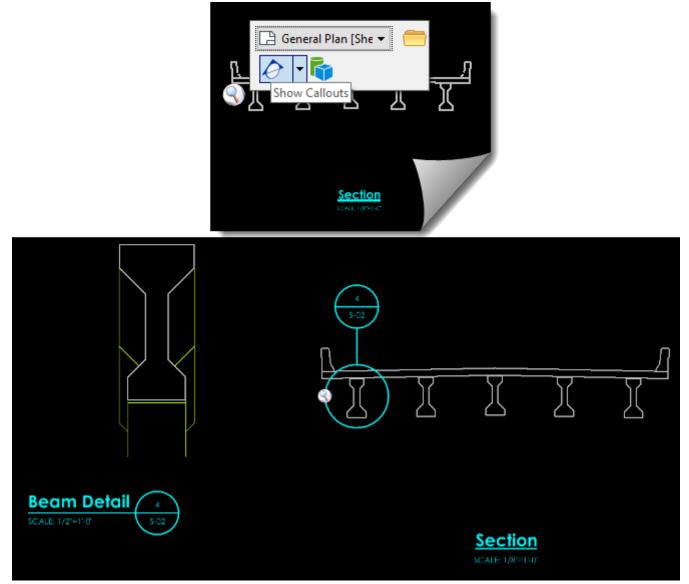


Figure 300

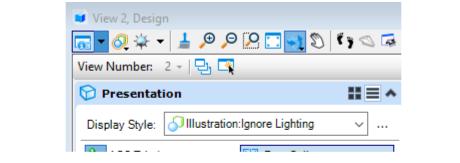
10.1.7 Place an Isometric View to the Sheet

1. Create a new 3D Design Model called *Isometric View*. Edit the preset Ref Logical Name of General Plan as needed.

| 🖉 Create Model       |                                      | × |
|----------------------|--------------------------------------|---|
| <u>T</u> ype:        | Design From Seed 🔻 3D 👻              |   |
| Seed Model:          | Seed3D - CT BridgeDesign.dgn, Design |   |
| <u>N</u> ame:        | Isometric View                       |   |
| Description:         |                                      |   |
| <u>R</u> ef Logical: | General Plan                         |   |
| Line Style Scale:    | Annotation Scale 🔻                   |   |
|                      | Auto-Update Fields                   |   |
| Annotation Scale —   |                                      | - |
| <u>A</u>             | Full Size 1 = 1                      |   |
|                      | Propagate                            |   |
| Cell Properties      |                                      | - |
| Ability to Place:    | As <u>C</u> ell                      |   |
|                      | As Annotation <u>C</u> ell           |   |
| Cell Type:           | Graphic 👻                            |   |
|                      | ✓ Create a View Group                |   |
|                      | <u>O</u> K Cancel                    |   |

Figure 301

- 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**.



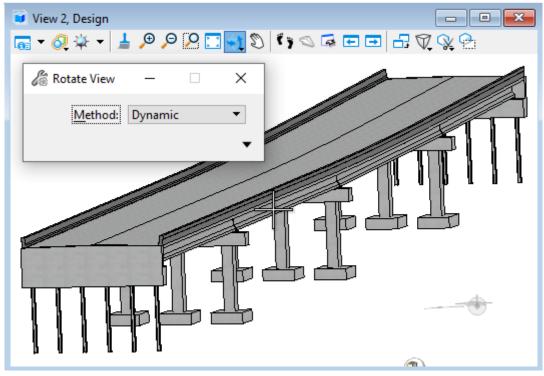


Figure 302

 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.

| 🦲 Saved Views - Vie          | w 2                        |                |      | _      |                | $\times$           |
|------------------------------|----------------------------|----------------|------|--------|----------------|--------------------|
|                              |                            |                |      |        |                |                    |
| Name ^                       | Description                | Туре           | Show | Status | <del>°</del> % | Clip Vol           |
| BLOWUP DETAIL<br>Beam Detail | 🖉 Create Saved View − 🗆 🗙  | o <sup>e</sup> |      | 6      | Ý              | (Untitl<br>(Untitl |
| Elevation                    | Method: From View          |                |      |        |                | (Untitl            |
| General Plan<br>Section      | View Type: General 🔻       | 2              |      |        | ~              | General<br>(Untitl |
| Section                      | Name: Isometric View       |                |      |        |                | (oncia             |
|                              | Description:               |                |      |        |                |                    |
|                              | Create Drawing             |                |      |        |                |                    |
|                              | Clip Volume: (From View) 🔻 |                |      |        |                |                    |
|                              | Associative                |                |      |        |                |                    |
| <                            |                            |                |      |        |                | >                  |

Figure 303

- 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**.

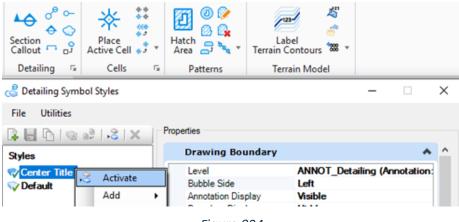


Figure 304

- 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

| _                     |  |                        |                   |                  |
|-----------------------|--|------------------------|-------------------|------------------|
| Reference Atta        | chment Prop  | perties for SB_CP_0158 | _0206_Bridge0006  | 59.dgn           |
| File Name: S          | B_CP_0158_0  | 206_Bridge00069.dgn    |                   |                  |
| Full Path: .          | \Bridge\Contract_Plans\SB_CP_0158_0206_Bridge00069.dgn |                        |                   |                  |
| Model: Is             | ometric Viev   | v                      |                   | •                |
| Logical Name: 0       | General Plan-  | 1                      |                   |                  |
| Description: S        | aved View A  | ttachment              |                   |                  |
| Orientation:          |  |                        |                   |                  |
| View                  |  | Description            |                   |                  |
| Coincident            |  | Aligned with N         | Aaster File       |                  |
| Coincident - \        |  | Global Origin a        | aligned with Mast | ter File         |
| Standard View         | /5   |                        |                   |                  |
| Saved Views           | c  |                        |                   |                  |
| Isometric Named Bound |  |                        |                   |                  |
| Named Bound           | aaries (none)  |                        |                   |                  |
| Detail S              | cale: 1/16"=   | -1'-0"                 | -                 |                  |
| Scale (Master:        |  |                        | 0000000           |                  |
| Named Gr              |  |                        |                   |                  |
| Revi                  | sion:  |                        |                   |                  |
| L                     | evel:  |                        | •                 |                  |
| Nested Attachm        | ents: Live N   | lesting                | -                 | Nesting Depth: 2 |
| Display Overr         | ides: Allow  |                        | •                 |                  |
| Ne <u>w</u> Level Dis | play: Use N  | 1S_REF_NEWLEVELDISF    | PLAY Configura    |                  |
| Global LineStyle S    | cale: Maste  | er                     | -                 |                  |
| Synchronize V         | /iew: Volum  | ne Only                | •                 |                  |
| Drawing Bound         | dary: (New)  |                        | •                 |                  |
| Na                    | ame: Isome   | etric View             |                   |                  |
| Visible Ec            | lges: Dynar  | mic                    | -                 |                  |
| Terrelar              |  |                        |                   |                  |
| Toggles               |  |                        |                   | Δ                |
|                       | • 1  | NG 🛄 🗂 🏸 🤤             | x 🖿 🔊 🗛 🖪         | i tanta          |
|                       |  |                        | O                 | ( Cancel         |
|                       |  |                        |                   |                  |

Figure 305

8. Move the Reference in the sheet as needed. Save Settings.

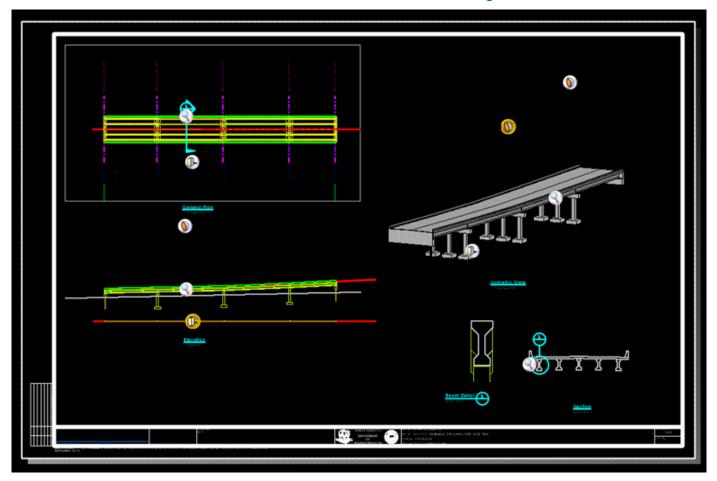


Figure 306

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.

- 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.





 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.

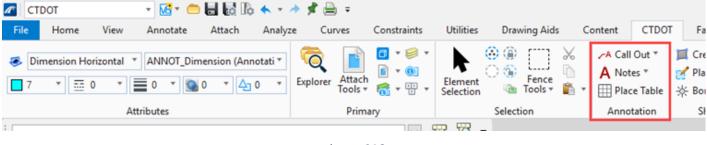


Figure 308

| 🔏 Place Table         | _           |       | ×          |
|-----------------------|-------------|-------|------------|
|                       | III 🌖 🏝     |       |            |
| <u>S</u> eed:         | 💝 General N | Notes | <b>▼</b> A |
| Active <u>A</u> ngle: | 0.000°      |       | *<br>*     |
| <u>R</u> ow Count:    | 8           |       |            |
| <u>C</u> olumn Count: | 2           |       |            |

Figure 309

- 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
- 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.

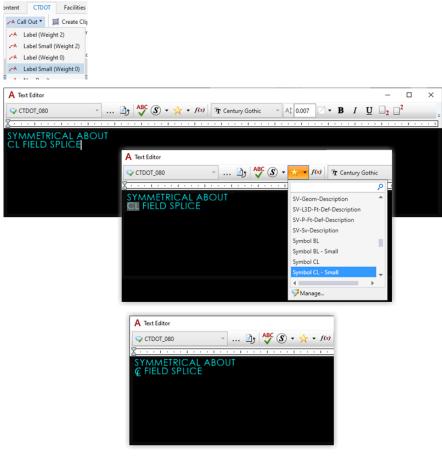
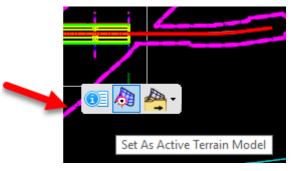


Figure 310

# 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**.





2. Open the Design Model, **Right click** in a View and Select **3 Views Plan/Profile/3D**.

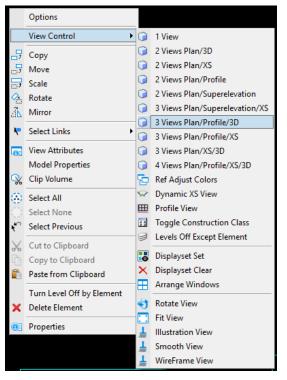


Figure 312

3. Follow the prompts to View the Profile. Save Settings.

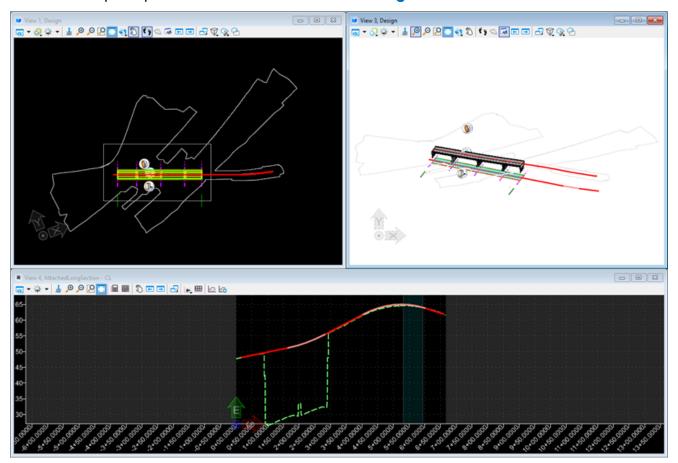


Figure 313

4. In View Group notice a *Multi-Model View* has been created.

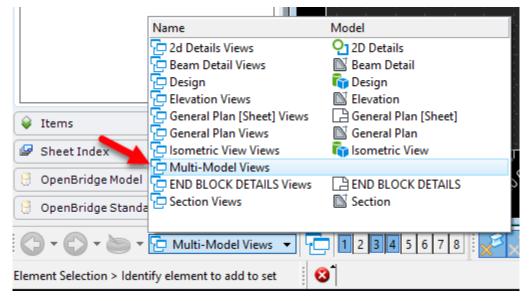


Figure 314

### 10.2.2 Create Civil Plan Sheet

- 1. In View Group select the Multi-Model View.
- 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)
- 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.
- 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.

| Contract Place Named B | oundary Civil Plan           | - ( | ×                |
|------------------------|------------------------------|-----|------------------|
|                        | P 🖓 🏢 🌒 🖉 🛃                  |     | 2                |
| Drawing Seed:          | 40 Scale Contract Plan Sheet |     | Nam              |
| Detail Scale:          |                              |     | (none)           |
| Name:                  | Plan 1                       |     | 20 Sci           |
| Description:           |                              |     | 40 Sca<br>80 Sca |
| Group:                 | (New)                        |     | ▼ 00 3Cl         |
| Name:                  | CL Route 123                 |     |                  |
| Description:           |                              |     |                  |
| Start Location:        | 0+00.0000                    |     | 4                |
| Stop Location:         | 6+66.9178                    |     | ▶                |
| Length:                | 1000.000000                  |     | •••<br>[10100]   |
| Left Offset:           | -275.000000                  |     | •••<br>[100100]  |
| Right Offset:          | 275.000000                   |     | •••<br>[tutter   |
| Overlap:               | 0.000000                     |     | •••<br>[tester   |
| Boundary Chords:       | 20                           |     |                  |
|                        | Create Drawing               |     |                  |
|                        | 🗹 Show Dialog                |     |                  |

Figure 315

- 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.

|     | 🕂 Create Drawing   |   | ×     |
|-----|--|---|-------|
|     | Mod<br>Nam   | e: CL Route 123 - Plan 1  |       |
|     | Drawing Seed:<br>View Type:<br>Discipline:<br>Purpose:                     | 40 Scale Contract Plan Sheet<br>⊂ivil Plan<br>Civil<br>Plan View  |       |
|     | Seed Model:<br>Filename:   | Drawing Model BD_40Scale_Plan_Sheet_Definitions.dgnlil (Active File) 1"=40' Plan Annotation   | 4     |
|     | Seed Model:<br>Filename:<br>Sheets:<br>Drawing Boundary:<br>Detail Scale : | Sheet Model BD_40Scale_Plan_Sheet_Definitions.dgnlil (Active File) (New) Full Size 1 = 1 40 Scale Contract Plan Sheet 1"=40' (By Named Boundary) Add To Sheet Index Add To Sheet Index Make Sheet Coincident Open Model | 1. A. |
| 10. |  | <u>O</u> K Cancel   |       |

11. Figure 316

12. In the View Group dialog, you can now see the newly created drawing model(s) and sheet model(s).

|     |                           | Name                                  | Model                         |
|-----|---------------------------|---------------------------------------|-------------------------------|
|     |                           | 🔁 2d Details Views                    | 2D Details                    |
|     |                           | 🔁 Beam Detail Views                   | 🔊 Beam Detail                 |
|     |                           | 🔁 CL Route 123 - Plan 1 Views         | 🔊 CL Route 123 - Plan 1       |
|     |                           | 🔁 Design                              | 👣 Design                      |
|     |                           | 🔁 Elevation Views                     | 🔊 Elevation                   |
|     |                           | 🔁 General Plan [Sheet] Views          | 🕒 General Plan [Sheet]        |
|     | 📦 Items                   | 🔁 General Plan Views                  | 🔊 General Plan                |
|     | ¥ 1.0000                  | 🔁 Isometric View Views                | 👣 Isometric View              |
|     | 🕼 Sheet Index             | 🔁 Multi-Model Views                   |                               |
|     |                           | 🔁 CL Route 123 - Plan 1 [Sheet] Views | CL Route 123 - Plan 1 [Sheet] |
|     | 🖯 OpenBridge Model        | END BLOCK DETAILS Views               | BIOCK DETAILS                 |
|     | 🔋 OpenBridge Standa       | C Section Views                       | Section                       |
|     | 🗘 • 🕑 • 🐚 •               | 🔁 CL Route 123 - Plan 👻 🛄 1           | 2 3 4 5 6 7 8                 |
| 13. | Element Selection > Ident | ify element to add to set 🛛 🐺 6 fi    | elds updated                  |
| 10. |                           |                                       |                               |

14. Figure 317

# 10.2.3 Create Civil Profile Sheet

- 1. In View Group select the Multi-Model View.
- 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.

| Annotation 5  | neet Production Dimensioning               | Detailing  |
|---|--|--|
| Place Named Bour  | dary Civil Profile —                       | ×  |
|   | ^ <b>₽<u>≡</u>≬⁄⁄√₽</b> □⊥^                | · · · · · · · · · · · · · · · · · · ·                              |
| Drawing Se  | eed: 40 Scale Contract Profile Sheet 🛛 🚽 🔻 |  |
| Detail Sc   | ale: 1"=40' 🗸                              | Name   |
| Na  | me: Profile 1                              | (none)   |
| Descript  | ion:                                       | 20 Scale Contract Profile Sheet<br>40 Scale Contract Profile Sheet |
| Meth  | od: Station Limits 👻                       |  |
| Detail Sc<br>Na<br>Descript<br>Meth<br>Gro<br>Na<br>Descript<br>☑ Start Locat | up: (New) 👻                                |  |
| Na  | me: CL                                     |  |
| Descript  | ion:                                       |  |
| Start Locat   | ion: 0+00.0000                             |  |
| Stop Locat  | ion: 4+18.5138                             |  |
| Len   | pth: 700.000000                            |  |
| Vertical Exaggerat  | on: 10.000000                              |  |
| Available Profile Hei   |  |  |
| Top Clearan   | nce: 0.500000                              |  |
| Bottom Cleara   | nce: 0.500000                              | <b>1</b>   |
| Elevation Datum Spac  | ng: 20.000000                              | ī <mark>.</mark>   |
| Station Datum Space   | ng: 10.000000                              | ī  |
| Profile Sh  | ifts: Datum Stations 🗸                     | Ĩ l  |
|   | ✓ Use Terrains                             |  |
|   | Use Active Vertical                        |  |
|   | Whole Conduits Only                        |  |
|   | Create Drawing                             |  |
|   | Show Dialog                                |  |
|   | Figure 3                                   | 18   |

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.

| Create Drawing   |  | ×      |  |
|--|--|--------|--|
| Mod<br>Nam   | e: CL - Profile 1-1  | -      |  |
| Drawing Seed:<br>View Type:<br>Discipline:<br>Purpose: | 40 Scale Contract Profile Sheet  Civil Profile Civil Elevation View  |        |  |
| Seed Model:<br>Filename:                               | Drawing Model BD_40Scale_Profile_Sheet_Definitions.dgr (Active File) 1"=40' Profile Grid                     | •      |  |
| Seed Model:  | Sheet Model BD_40Scale_Profile_Sheet_Definitions.dgr (Active File) (New)                                     | (New)  |  |
| Drawing Boundary:<br>Detail Scale :                    | Full Size 1 = 1     ▼       40 Scale Contract Profile Sheet     ▼       1"=40'     ▼                         |        | an [Sheet]<br>:K DETAILS<br>123 - Plan 1 [Sheet] |
|  | <ul> <li>✓ Add To Sheet Index </li> <li>✓ Make Sheet Coincident</li> <li>✓ Open Model</li> <li>OK</li> </ul> | Cancel |  |

Figure 319

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

**Deleting Sheets** 

Label - Horizontal Alignment

Label – Profile (Vertical Alignment)

# 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.
- 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).
- 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.

- 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.

| в Р          | lace Named Boundary    | / Civil Cross Section -    | - 🗆 | ×   |
|--------------|------------------------|----------------------------|-----|---|
|              |                        | A 🖓 🎟 🛐 🗸 🗹 🎝 🗆            | IДА | 6   |
|              | Drawing Seed:          | 5 Scale Contract XSC Sheet | •   | •   |
|              | Detail Scale:          | 1"=5'                      |     | •   |
|              | Group:                 | (New)                      |     | Name  |
|              | Name:                  | CL Route #123              |     | (none)  |
|              | Description:           |                            |     | 5 Scale Contract XSC Sheet<br>10 Scale Contract XSC Sheet |
|              | Start Location:        | 0+00.0000                  |     |   |
|              | Stop Location:         | 6+61.4490                  |     |   |
|              | Left Offset:           | -70.000000                 |     |   |
|              | Right Offset:          | 70.000000                  |     |   |
|              | Interval:              | 50.000000                  |     |   |
| ١            | Vertical Exaggeration: | 1.000000                   |     |   |
| $\checkmark$ | Top Clearance:         | 5.000000                   |     |   |
| $\checkmark$ | Bottom Clearance:      | 10.000000                  |     |   |
| Eleva        | tion Datum Spacing:    | 1.000000                   |     |   |
|              | Event Point List:      | (None)                     | •   | •   |
|              |                        | Include Event Points Only  |     |   |
|              |                        | Include Control Points     |     |   |
|              |                        | Backward Facing            |     |   |
|              |                        | Create Drawing             |     |   |
|              |                        | Show Dialog                |     |   |

Figure 320

- 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   | ×   |  |
|--|---|--|
| Moo<br>Nam<br>One Sheet Per Do   | ne: CL Route #123 - 0+00.0000   |  |
| Drawing Seed:<br>View Type:<br>Discipline:<br>Purpose:   | Civil Cross Section<br>Civil  |  |
| Seed Model:<br>Filename:   | Drawing Model BD_5Scale_CrossSection_Sheet_Definition (Active File)  1"=5'  Cross Section                             |  |
| Sheet Model         Seed Model:       BD_5Scale_CrossSection_Sheet_Definition         Filename:       (Active File)         Sheets:       (New)         Full Size 1 = 1          Drawing Boundary:       5 Scale Contract XSC Sheet         Detail Scale :       1"=5' (By Named Boundary) |   |  |
|  | <ul> <li>Add To Sheet Index</li> <li>Make Sheet Coincident</li> <li>Open Model</li> <li>OK</li> <li>Cancel</li> </ul> |  |

Figure 321

# 10.3 Detail Sheets from 2D Drawings

 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.

| Create Model         |                                    | ×  |
|----------------------|------------------------------------|----|
| Type:                | Sheet From Seed   2D               |    |
| Seed Model:          | Seed2D - CT BridgeSheet.dgn, Sheet |    |
|                      | END BLOCK DETAILS                  |    |
| Name:                | END BLOCK DETAILS                  |    |
| <u>D</u> escription: |                                    |    |
| <u>R</u> ef Logical: | General Plan                       |    |
| Line Style Scale:    | Annotation Scale 🔹                 |    |
|                      | Auto-Update Fields                 |    |
| Annotation Scale —   |                                    |    |
| A                    | Full Size 1 = 1                    |    |
|                      | Propagate                          |    |
| Sheet Properties     |                                    |    |
|                      | Add To Sheet Index                 | P  |
| Sheet Number:        | S-03                               |    |
| Sequence Number:     | 0                                  |    |
|                      | Show Sheet Boundary                |    |
| Border Attachment:   | (none) 💌                           |    |
| Size:                | ANSI D 👻                           |    |
| Origin:              | X: 0.000000 Y: 0.000000            |    |
| Rotation:            | 0°                                 |    |
| Cell Properties      |                                    |    |
| Ability to Place:    | As <u>C</u> ell                    |    |
|                      | As Annotation Cell                 |    |
| Cell Type:           | Graphic 👻                          |    |
|                      | Create a View Group                |    |
|                      | <u>O</u> K Canc                    | el |

Figure 322

 Create a new 2D Design Model, using the Seed2D – CT BridgeDesign.dgn, 2D Design seed file.

| Models            |                      |                               |           | _         |         | $\times$             |
|-------------------|----------------------|-------------------------------|-----------|-----------|---------|----------------------|
|                   | YX                   |                               |           |           |         |                      |
| Type 🛛 2D/3D Name |                      | Description                   | *         | Design Fi | e       |                      |
| Gener             | Create Model         |                               |           | ×         | 0158_02 |                      |
| 🖻 🗌 Elevat        | <u>T</u> ype:        | Design From Seed 🔹            | 2D        | •         | 0158_02 | 06_Bride             |
| 📄 🗌 Gener         | Seed Model:          | Seed2D - CT BridgeDesign.dgn, | 2D Design |           |         | 06_Bride<br>06_Bride |
|                   | Name:                | 2D Details                    |           |           | 150_02  | oo_onaş              |
|                   | Description:         |                               |           |           |         |                      |
|                   | <u>R</u> ef Logical: |                               |           |           |         |                      |
|                   | Line Style Scale:    | Annotation Scale 🔹            |           |           |         |                      |
|                   |                      | Auto-Update Fields            |           |           |         |                      |
|                   | Annotation Scale     |                               |           |           |         |                      |
|                   | A                    | Full Size 1 = 1               |           | •         |         |                      |
|                   |                      | Propagate                     |           |           |         |                      |
|                   | Cell Properties -    |                               |           |           |         |                      |
| <                 | Ability to Place:    | As <u>C</u> ell               |           |           | L       |                      |
|                   |                      | As Annotation <u>C</u> ell    |           |           |         |                      |
|                   | Cell Type:           | Graphic                       |           | <b>~</b>  |         | 1995 B               |
|                   |                      | Create a <u>V</u> iew Group   |           |           |         |                      |
|                   |                      | <u>о</u> к                    | Ca        | ncel      |         | _                    |

Figure 323

- 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*.
- 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.

| CTDOT   |                        | Facilities   | Highway    |
|---------|------------------------|--------------|------------|
| Out *   | ŗ                      | Create Clipp | oing Shape |
| es *    | 💅 Place Named Boundary |              | d Boundary |
| e Table | ∻                      | Eorders *    |            |
| tation  |                        | Sheet Prod   | luction    |

Figure 324

 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.

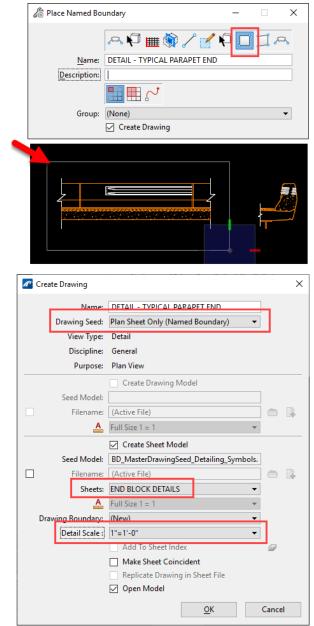


Figure 325

- 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.
- 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.
- 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.

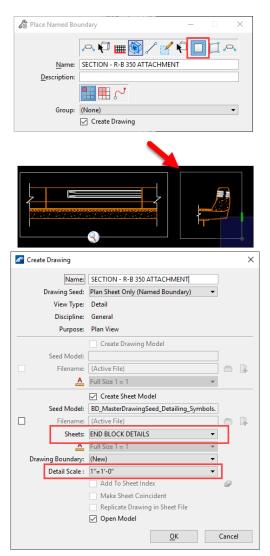


Figure 326

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.

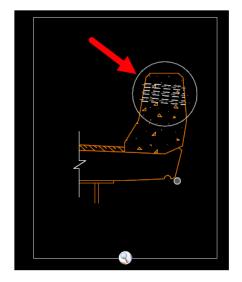
On the Place Named Boundary dialog box set:

Drawing Seed: Place Sheet Only (Named Boundary).

Sheets: Select the Sheet Model created in step 1 of this section.

Detail Scale: As needed.

| 🔏 Place Named Bo     | undary —   |    | ×        |
|----------------------|--|----|----------|
|                      | ~~ \$ in the second s | 1. | <b>C</b> |
| <u>N</u> ame:        | BOLT DETAIL  |    |          |
| <u>D</u> escription: |  |    |          |
|                      |  |    |          |
| Group:               | (None)   |    | -        |
|                      | Create Drawing   |    |          |



| Create Drawing    | ×                                       |
|-------------------|---|
| Name              | BOLT DETAIL                             |
| Drawing Seed      | Plan Sheet Only (Named Boundary) 🔹      |
| View Type         | Detail                                  |
| Discipline        | General                                 |
| Purpose           | Plan View                               |
|                   | Create Drawing Model                    |
| Seed Model        |   |
| Filename          | : (Active File) 💼 🖡                     |
| A                 | Full Size 1 = 1                         |
|                   | Create Sheet Model                      |
| Seed Model        | BD_MasterDrawingSeed_Detailing_Symbols. |
| Filename          | : (Active File)                         |
| Sheets            | END BLOCK DETAILS                       |
| A                 | Full Size 1 = 1 💌                       |
| Drawing Boundary: | (New) 👻                                 |
| Detail Scale      | 3"=1'-0" 🔻                              |
|                   | Add To Sheet Index                      |
|                   | Make Sheet Coincident                   |
|                   | Replicate Drawing in Sheet File         |
|                   | Open Model                              |
|                   | <u>O</u> K Cancel                       |

Figure 327

14. In the Sheet Model place dimensions on both details (the full detail and the blownup detail, notice they both dimension correctly even though they are two different sizes on the sheet.

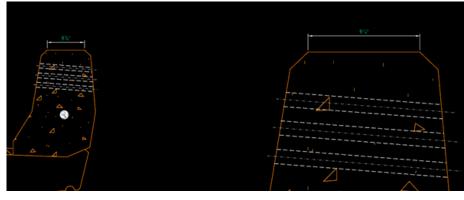


Figure 328

- 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.

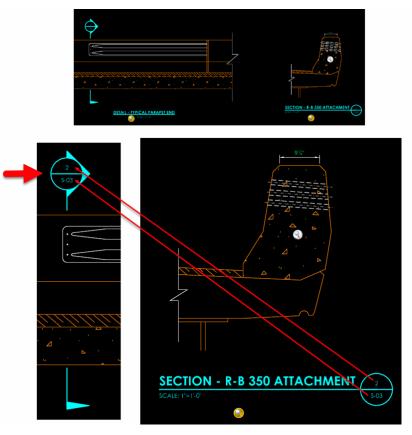


Figure 329

# **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.

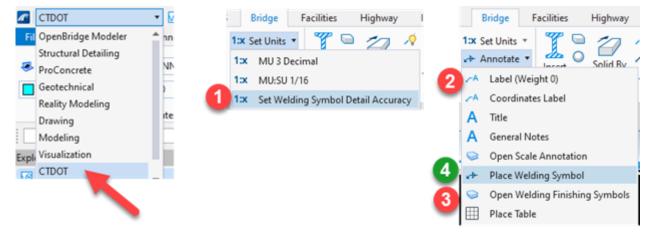


Figure 330

Master Unit: Inches

### Steps:

1. Open the DGN File that will be used to place Welding Symbols.

Label: in

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** 

| C Design File Settings | ×   |
|------------------------|---|
| Category               | Linear Units                                  |
| Active Angle           | <u>Format:</u> <u>MU</u>                      |
| Active Scale           | <u>Master Unit:</u> <u>Inches</u>             |
| Angle Readout          | <u>Sub Unit:</u> <u>Inches</u>                |
| Axis                   | <u>Label:</u> in                              |
| Civil Formatting       | <u>Accuracy:</u> <u>1/16</u>                  |
| Color                  | <u>Custom</u>                                 |
| Fence                  | Advanced Settings                             |
| Grid                   | Resolution: 10000 per Distance US Survey Foot |
| Isometric              | Working Area: 1.70591E+08 Miles               |
| Locks                  | Solids Area: 10 Miles                         |
| Snaps                  | Solids Accuracy: 5.27999E-07 US Survey Feet   |
| Stream                 | <u>Edit</u>                                   |
| Views                  | Focus Item Description                        |
| Working Units          | Select category to view.                      |



- 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.

| Weld Styles   | X                    |
|---|----------------------|
| Insert Weld style display Sort  |                      |
| Weld style  | <del>م</del> ور<br>م |
| Level ANNOT_Label_Proposed ~  |                      |
| Welding thickness top side 0 1/4<br>Welding thickness bottom side 0 3/8   |                      |
| Symbol Scale 1.0000<br>Weld Seam Scale 1.0000   |                      |
|   |                      |
|   |                      |
| Image: Second |                      |

Figure 332

- 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.
- 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.

| 🚺 Welding Symbol Properties   |  | ×   |
|---|--|---|
| General Data     Style     Layout     Fraction style     Partlist Data     Topside Parameter     Downside Parameter | <ul> <li>Thickness</li> <li>Prefix</li> <li>Length</li> <li>Gap</li> <li>Comment</li> <li>Additional length</li> <li>Welding Symbols</li> <li>Toward Position</li> </ul> | 0 1/4 2 0 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| <ul><li>✓ X</li></ul>   |  | <b>*</b>                                    |

Figure 333

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.
- 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.

|     | $\frac{\frac{1}{2}}{\frac{3}{4}}$ $\frac{1}{3}$ $\frac{(2)}{(4)}$ Comr | nent  |
|-----|--|-------|
|     | Cell Library: [C:\\CTDO] Weld_Finishing_Symbols.cel]                   | - • × |
|     | * 🖁 🗟 🗟 🗖 🗙 💦 🔕 🕀 🕥 🕕  |       |
|     | Name V   |       |
|     | WELD - Top Rotated - Flush WELD - Top Rotated - Conve                  |       |
|     | S WELD - Top Rotated - Concave   |       |
|     | WELD - Top - Convex  |       |
|     | WELD - Top - Concave WELD - Flush                                      |       |
|     | WELD - Bottom Rotated - Flush  |       |
|     | S WELD - Bottom Rotated - Convex                                       |       |
|     | S WELD - Bottom Rotated - Concave                                      |       |
|     | WELD - Bottom - Convex   |       |
|     | S WELD - Bottom - Concave  |       |
|     |  |       |
|     |  |       |
| har |  |       |

Figure 334

 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.

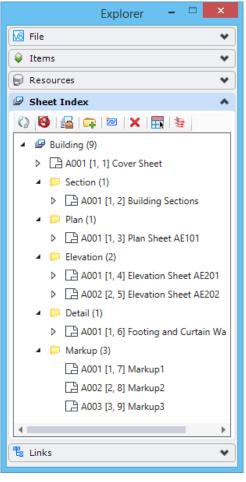


Figure 335

**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 Revisions**

# **Revision List**

# 4/12/2024

| Volume | Section/Module | Description  |
|--------|----------------|--|
| 13     | Section 1      | Modified the Contract Border Title Block integration - Designed By /<br>Checked By |
| 13     | Module 2.3     | New Module - Revision Index Sheet  |
| 13     | Module 4.4     | New Module - Place Welding Symbol  |