Drawing Production - Creating Plan and Profile Sheets

This course is for the **2021 Release 1** *version of:*

OpenSite Designer CONNECT Edition

OpenRoads Designer CONNECT Edition

OpenRail Designer CONNECT Edition

About this Practice Workbook...

- This workbook is designed for use in Live instructor-led training and for OnDemand self study. OnDemand videos for this course are available on the *LEARNserver* and through *CONNECT Advisor*.

- This PDF file includes bookmarks providing an overview of the document. Click on a bookmark to quickly jump to any section in the file.

- Both Imperial and Metric files are included in the dataset. Throughout this practice workbook Imperial values are specified first and the metric values second with the metric values enclosed in square brackets.
  For example: *12.0' [3.4m]*.

- This course workbook uses the *Training and Examples* WorkSpace and the *Training-Imperial* or *Training-Metric* WorkSet delivered with the software.

- The terms "Left-click", "Click", "Select" and "Data" are used interchangeably to represent pressing the left mouse button. The terms "Right-click" and "Reset" are also used interchangeably to represent pressing the right mouse button. If your mouse buttons are assigned differently, such as for left-handed use, you will need to adjust accordingly.

Have a Question? Need Help?

If you have questions while taking this course, search in *CONNECT Advisor* for related courses and topics. You can also submit questions to the Civil Design Forum on Bentley Communities where peers and Bentley subject matter experts are available to help.

Edition: **03-01**   Course Level: **Fundamental**

Course Overview

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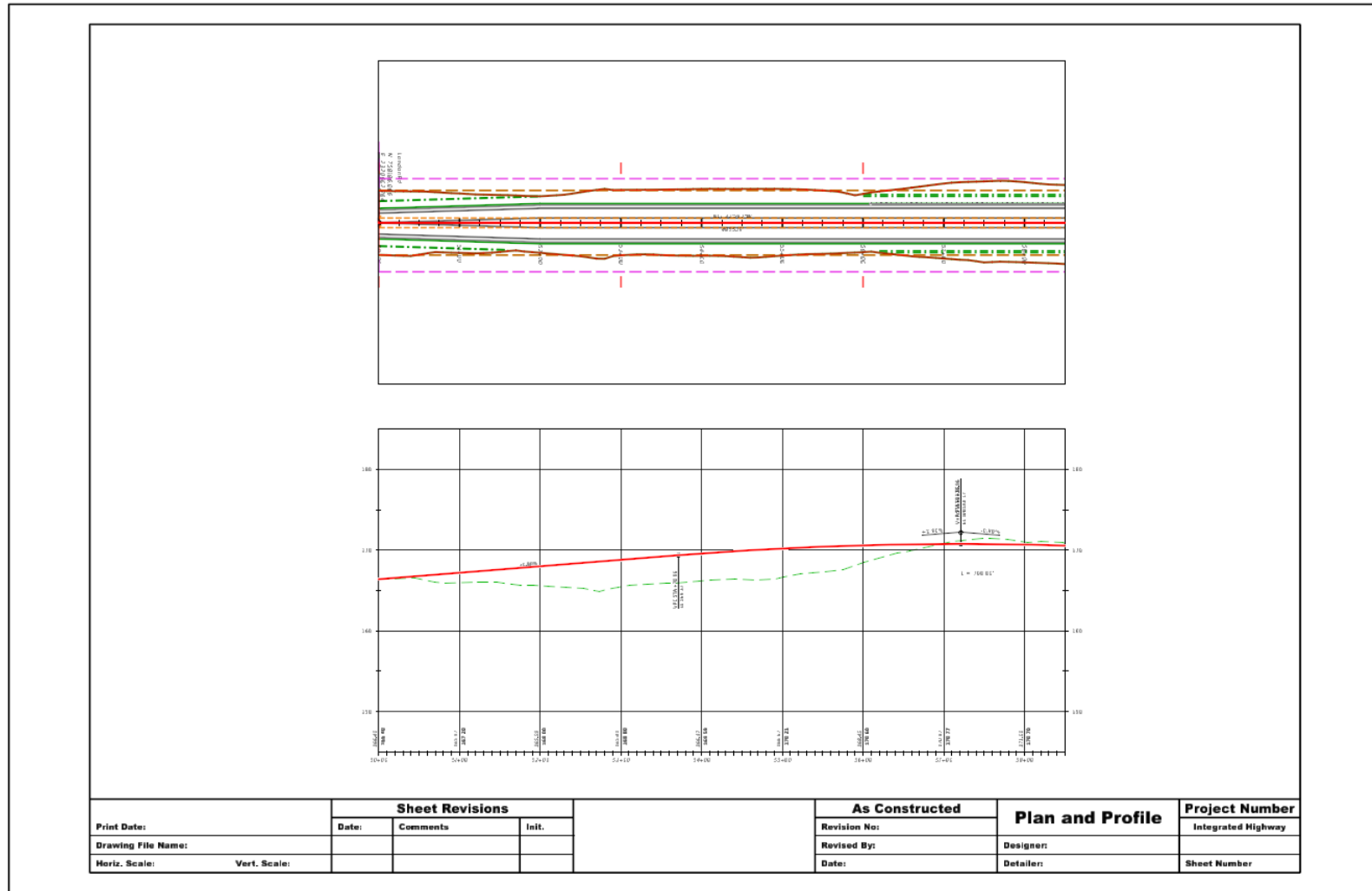
Sheet Creation Process

1. Plan and Profile sheets are live references of the 2D model and 3D model. When the models change, the plan and profile sheets automatically update so they are always showing the most current information.

2. **Named Boundaries** are defined from the 2D design model. The Named Boundary defines the extent of what is displayed on the sheet. The Named Boundary can be a top view (for the plan portion of a sheet) or a slice through a model (for a profile).
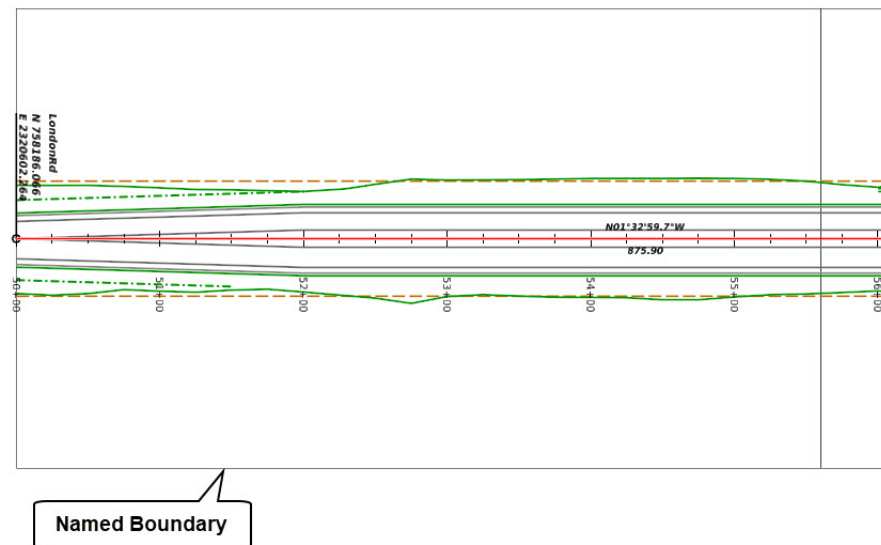
Named Boundary

3. Once the Named Boundaries are defined the Create Drawing tool is used to create **Drawing Models**. One Drawing Model is created for each Named Boundary. The Drawing Model essentially contains a referenced slice of the model in the area defined by the Named Boundary. Depending on the sheet type being created this could be a top down plan view, a profile or a cross section. Being a reference of the model, the contents are automatically updated as the model changes. The drawing model is also where additional annotation such as point, distance, or linear labels, and grid lines for cross sections are added.

4. One or more Drawing Models is then referenced onto a Sheet model. For example a plan and profile sheet might have two drawing model references, one for the plan and one for the profile.

Exercise 1: Plan and Profile Sheets

Description

In this exercise, you will learn to create various types of plan and plan/profile sheets.

Skills Taught

- Create a container file

- Create plan sheets

- Create double plan sheets

- Review named boundaries

- Delete sheets and named boundaries

- Create plan and profile sheets

- Adjust sheet layout

Create a Container File

A container file references the necessary project design files that need to be displayed on the plan and profile sheets. In this section, you will learn how to create the container file and attach the references that will be used for sheet creation.

1. To start with a clean Sheet Index for this class, delete the *C:\ProgramData\Bentley\OpenRoads Designer CE 10.10\Configuration\WorkSpaces\Training and Examples\Worksets/***Training-Imperial.dgnws** *[Training-Metric.dgnws]* file before Start the software.

2. Set the WorkSpace and WorkSet.

    The WorkSpace and WorkSet define standards that are used by the software, and the ones used for this training are installed during the software installation.

    Typically, the WorkSpace contains organizational standards and the WorkSet contains project standards.

    a. Select **Training and Examples** from the *WorkSpace* drop-down menu.

    b. Select **Training-Imperial** *[Training-Metric]* from the *WorkSet* drop-down menu.
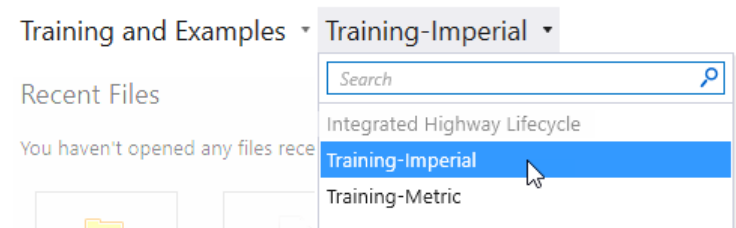
3. Select **Open** and browse to the *c:\Bentley Training\Drawing Production - Creating Plan and Profile Sheets* or other folder where you unzipped the dataset files and open the file **_Reference Container.dgn** *[_Metric-Reference Container.dgn]*.

    This is an empty file that you will use to attach the necessary reference files need for sheet creation (terrain, geometry and corridors).

4. Once the file is open, be sure to set the workflow to OpenRoads Modeling.
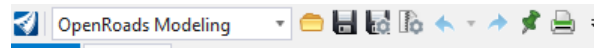
    Note: If you get a message stating "Incompatible Civil Data", this is because the training files are "aligned" to OpenSite Designer. Clicking *Yes* will align the file to the software you are using (OpenRoads Designer or OpenRail Designer). This will have zero impact for training. Note that in production, upgrading the file will make the file read-only in OpenSite Designer. Full information is available at *Bentley Communities - Product Realignment*.

Attach Reference Files

Before creating sheets you will want to first attach the reference files that will be needed for sheet creation. A file containing the horizontal and vertical geometry is required as part of the sheet creation process. In this section, you will be attaching the reference files that we want to have displayed in the plan sheets.

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1. Attach the Geometry.

   a. Select *Home > Primary > Attach Tools >* **References**

   b. From the *References dialog* select *Tools >* **Attach**

   c. When the *Attach References* dialog appears, set the *Attachment Method* to **Interactive** and make sure *Save Relative Path* is checked **on**. Next, locate and select **Geometry.dgn** *[Metric-Geometry.dgn]*
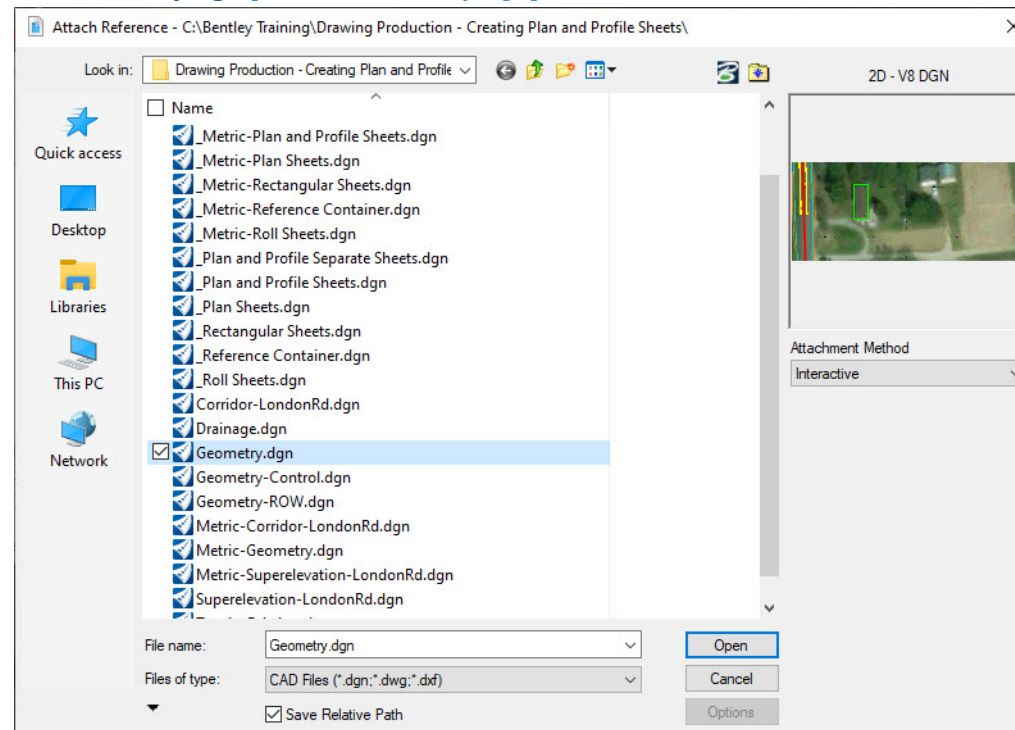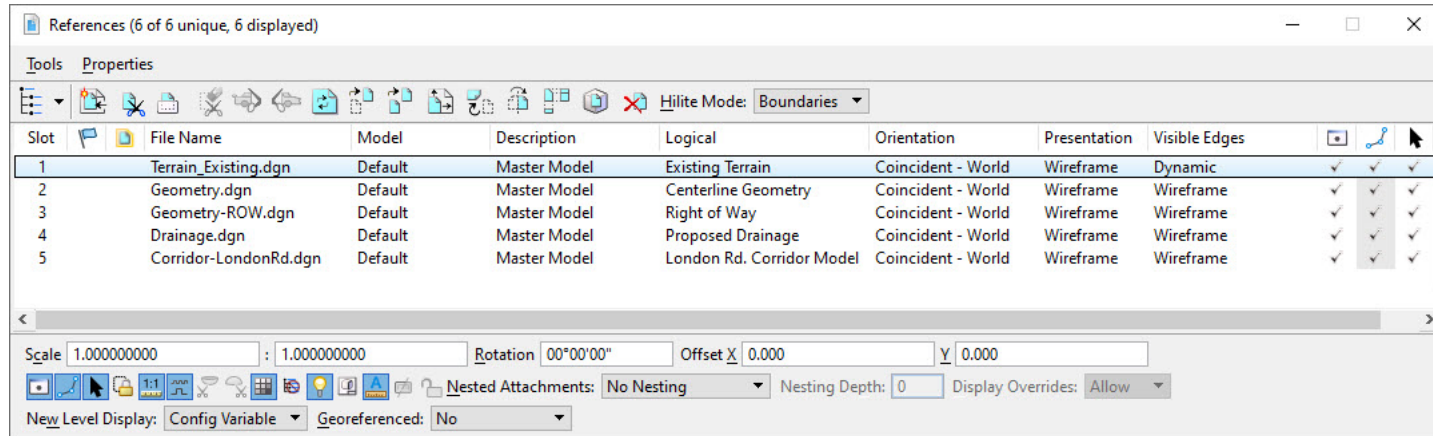

   d. Select *Open*, the *Reference Attachment Properties* dialog will now open.

e. When the *Reference Attachment Properties* dialog appears review the settings.

f. In the *Logical Name* field type in: **Centerline Geometry**

   TIP: It's a good practice to create a logical name for each reference file you attach.

g. Set the *Orientation View* to **Coincident - World**

h. Be sure *Nested Attachments* is set to **Live Nesting** with a *Nesting Depth = 0*

i. Select **OK**
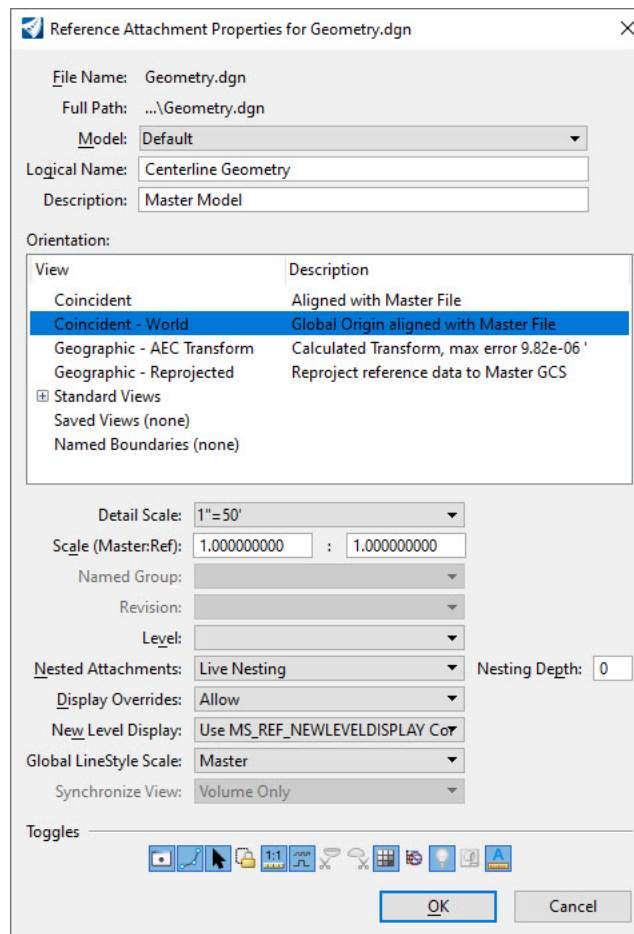
2. Using the same steps described in step **1**, attach the following files:

- **Terrain_Existing.dgn**

- **Geometry-ROW.dgn**

- **Drainage.dgn**

- **Corridor-LondonRd.dgn** *[Metric-Corridor-LondonRd.dgn]*

Slot			File Name	Model	Description	Logical	Orientation	Presentation	Visible Edges			
1			Terrain_Existing.dgn	Default	Master Model	Existing Terrain	Coincident - World	Wireframe	Dynamic	✓	✓	✓
2			Geometry.dgn	Default	Master Model	Centerline Geometry	Coincident - World	Wireframe	Wireframe	✓	✓	✓
3			Geometry-ROW.dgn	Default	Master Model	Right of Way	Coincident - World	Wireframe	Wireframe	✓	✓	✓
4			Drainage.dgn	Default	Master Model	Proposed Drainage	Coincident - World	Wireframe	Wireframe	✓	✓	✓
5			Corridor-LondonRd.dgn	Default	Master Model	London Rd. Corridor Model	Coincident - World	Wireframe	Wireframe	✓	✓	✓

- Getting the container file setup correctly with the necessary reference files is a critical step in the sheet creation process.

3. Close the *References* dialog.

The next step in the process is to create a blank 2D dgn file named **_Plan Sheets.dgn** and reference the **_Container Reference.dgn** *[Metric-_Container Reference.dgn]* with *Live Nesting = 1*. The **_Plan Sheets.dgn** will be used to place *Named Boundaries* and also for sheet creation.

4. Create a new file called **_Plan Sheets.dgn**

   a. Select *File* > **New**

   b. Set the seed file to: **Seed2D - Imperial Training.dgn** *[Metric-Seed2D - Imperial Training.dgn]*

   c. Name the file: **_Plan Sheets.dgn**

5. Attach the **_Reference Container.dgn** *[_Metric-Reference Container.dgn]*

   a. Select *Home > Primary > Attach Tools >* **References**

   b. From the *References dialog* select *Tools >* **Attach**

   c. When the *Attach References* dialog appears, set the *Attachment Method* to **Interactive** and make sure *Save Relative Path* is checked **on**.

   d. Locate and select **_Reference Container.dgn** *[Metric-_Reference Container.dgn]*

   e. When the *Reference Attachment Properties* dialog appears review the settings.

   f. In the *Logical Name* field type in: **Plan and Profile Sheets Container**

      TIP: It's a good practice to create a logical name for each reference file you attach.

   g. Set the *Orientation View* to **Coincident - World**

   h. Be sure *Nested Attachments* is set to **Live Nesting** with a *Nesting Depth = 1*

   i. Select **OK**

TIP: Setting the *Nesting Depth = 1* will allow the reference files to be displayed only 1 level deep. This prevents the display of unnecessary references files that may not be needed.
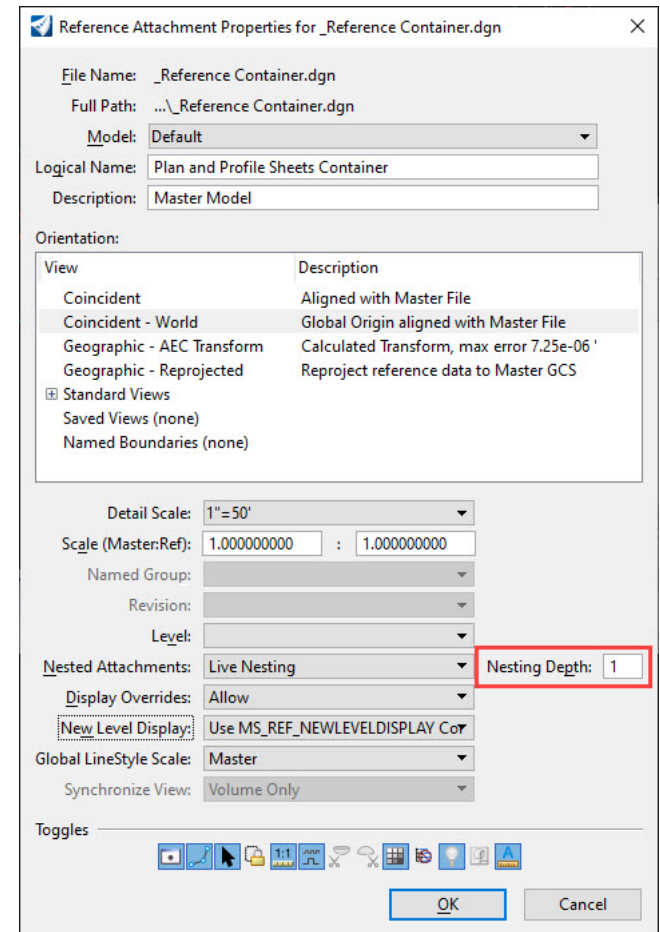
Creating Plan Sheets

In this exercise you will layout a basic set of plan sheets.

1. Create Named Boundaries for the plan sheets.

    a. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

    b. Select the **Civil Plan** mode.

    c. Set *Drawing Seed* to **ANSI D_PLAN** *[A1_PLAN]*.

    The drawing seed defines default values and other parameters required to create sheets. Three drawing seeds for plan drawings are included in the default workspace.

    - *ANSI D_PLAN [A1_PLAN]* - This seed is setup for creating D *[A1]* sized plan sheets.

    - *ANSI D_PLAN PLAN [A1_PLAN PLAN]* - This seed is setup for creating D *[A1]* sized double plan (plan over plan) sheets.

    - *ANSI D_Plan-Profile_PLAN [A1_Plan-Profile_PLAN]* - This seed is setup for creating D *[A1]* sized plan and profile sheets. It is used to define the named boundaries for the plan portion of the sheet and is used in conjunction with the ANSI D_Plan-Profile_PROFILE *[A1_Plan-Profile_PROFILE]* seed for creating the profile named boundaries.

    - *ANSI D_Plan-Profile_PLAN - 20 Scale* - Same as above but setup for 20 scale.

    d. In the 2D view, select the north-south (LondonRd) alignment along which the plan named boundaries will be created.

    e. Set the *Detail Scale* to **1"=50'** *[1:500]*.

    Tip: In general, you shouldn't change the *Detail Scale*. Most agencies set up their sheet seed definitions for each supported scale needed.

f. Set *Name* to **Plan 1** (There are two name fields. This is the top field which defines the <u>root name</u> of each named boundary.)

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 as illustrated in the table.

Name Specified in Dialog	Plan	Plan 1
First Named Boundary	Plan	Plan 1
Second Named Boundary	Plan 1	Plan 2
Third Named Boundary	Plan 2	Plan 3
Fourth Named Boundary	Plan 3	Plan 4

g. Set the *Group* to **(New)**

h. Set *Name* to **LondonRd Plan** (This is the lower name field which defines the name of the named boundary <u>group</u>.)

i. Set the *Start Location* to **50+00** *[5+000]*.

j. Set the *Stop Location* to the end of the project. The named boundaries are displayed interactively as the cursor moves.

k. **Enable** the *Create Drawing* option so that the sheets are created as soon as the named boundaries are created.

l. **Enable** the *Show Dialog* option

This dialog is used to override settings defined by the Drawing Seed. If no settings need to be changed it can be Disabled to immediately create the sheets.

m. The Create Drawing dialog will appear.

n. In *Drawing Model* portion of the dialog set the annotation scale to **1"=50'** *[1:500]*.

o. In *Sheet Model* portion of the dialog, set the *Detail Scale* to **1"=50'** *[1:500]***.**

p. *Follow the prompts* in the lower left corner **left click** to define the named boundaries. *Multiple left clicks may be required*.

q. When the *Create Drawing* dialog appears, enable the **Add to Sheet Index** option.

We will discuss the sheet index and what this option did in a later exercise.

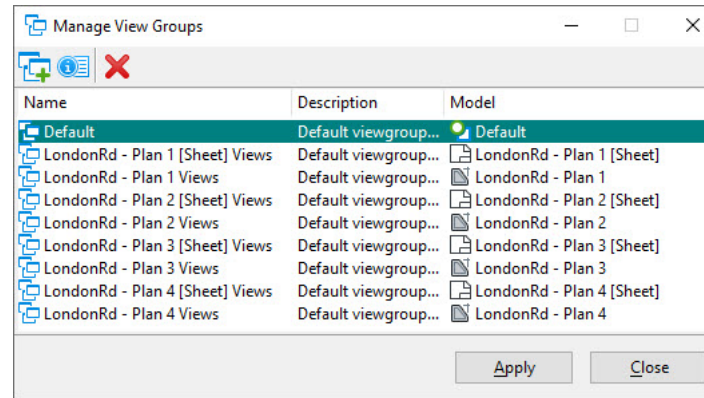r. Click **OK** to create the sheets.

2. Review the Sheets.

a. Select the *View Group* tool to view other sheets.

Each sheet has a Drawing and a Sheet Model. The Drawing Model is a direct reference of the named boundary area and is where additional annotations will be defined. The Drawing Model (or models) are then referenced onto the Sheet Model.
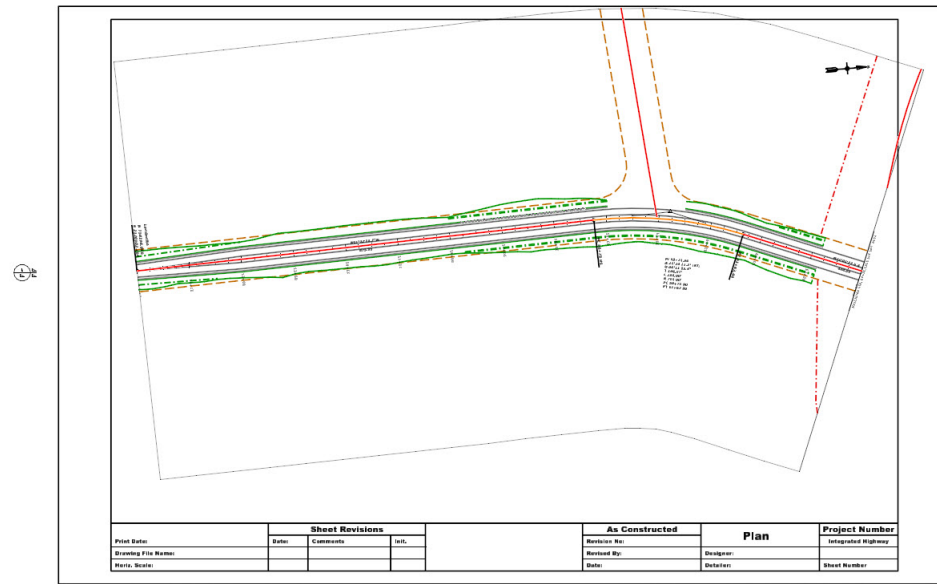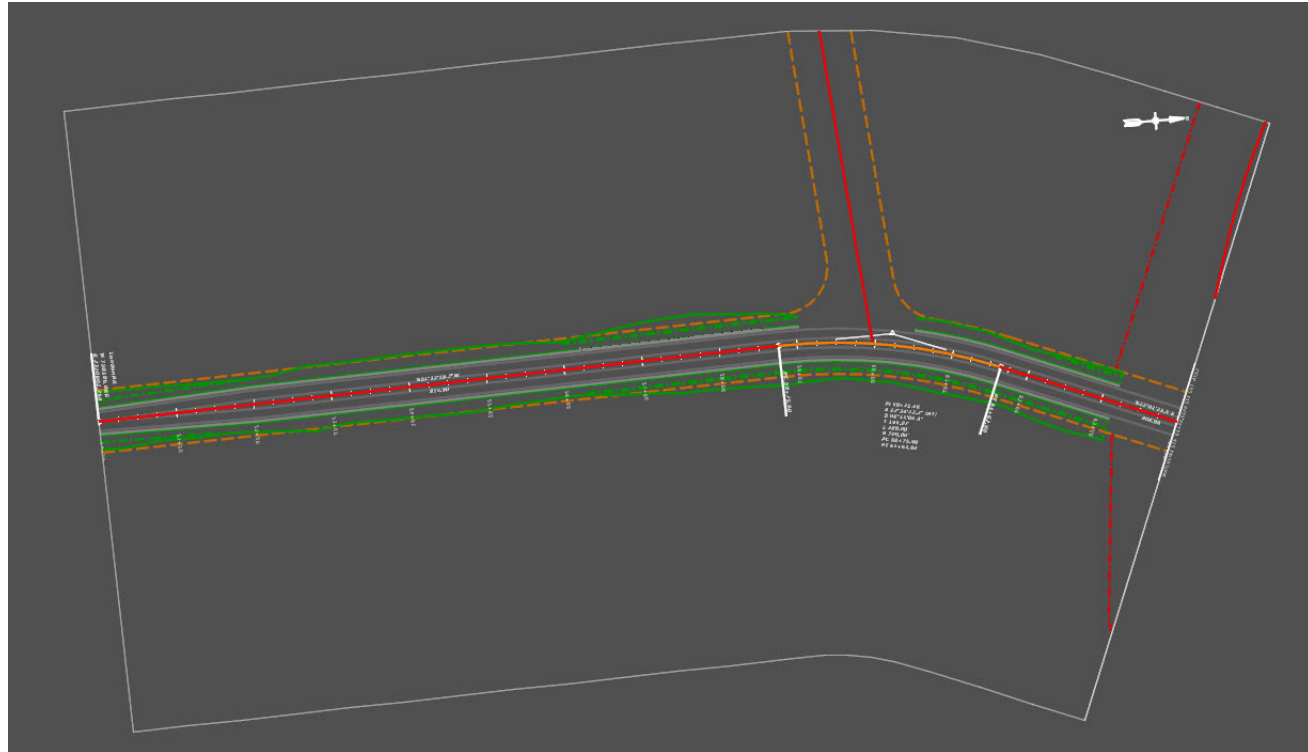
= Drawing Models

= Sheet Models

a. Open and review the Sheet Model [icon] for **LondonRd - Plan 1** by selecting **LondonRd - 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.

b. Open and review the Drawing Model ⬚ for **LondonRd - Plan 1** by selecting it from the list and then selecting **Apply**.

The Drawing Model for **LondonRd - Plan 1** will open. Notice the Named Boundary shape is referenced, the North Arrow and Match Line annotation has been added to the Drawing Model as well. **Generally, plan view annotation should be done in the Drawing Model.**

Note: When sheets are created *Saved Views* are also created.

c. Review the remaining Drawing Models and Sheet Models using the same steps described above.

It's important to know how to navigate between the various drawing and sheet models.

Creating Double Plan Sheets

1. Use the *View Group* tool to return to the **Default** model view.

2. Create Named Boundaries for the double plan sheets.

   a. Select *Drawing Production > Named Boundaries > Named Boundary > **Place Named Boundary***.

   b. Select the **Civil Plan** mode.

   TIP: Clearing the Start Location and Stop Location locks (check boxes) before beginning can make it easier to use this tool.

   - *Drawing Seed* = **ANSI D_PLAN PLAN** *[A1_PLAN PLAN]*

   - In the 2D view, select the north-south (LondonRd) alignment.

   - *Detail Scale* = **1"=20'** *[1:250]*

   - *Name* = **Double Plan 1** (The top field which defines the name of the Named Boundary).

   - *Group* = **(New)**

   - *Name* = **LondonRd Double Plan** (This is the lower name field which defines the name of the named boundary group.)

   TIP: The Name is set to the name of the geometry selected. It is important to select the geometry before changing the Name.

   - *Start Location* = **50+00**

   - *Stop Location* = end of the project.

   - Populate the bottom portion of the dialog - *Length:* **560**, *Left Offset:* **-80**, *Right Offset:* **80**, *Overlap:* **0.0** and *Boundary Chords:* **20**

   - **Enable** the *Create Drawing* option so that the sheets are created as soon as the named boundaries are created.

   - **Enable** the *Show Dialog* option.

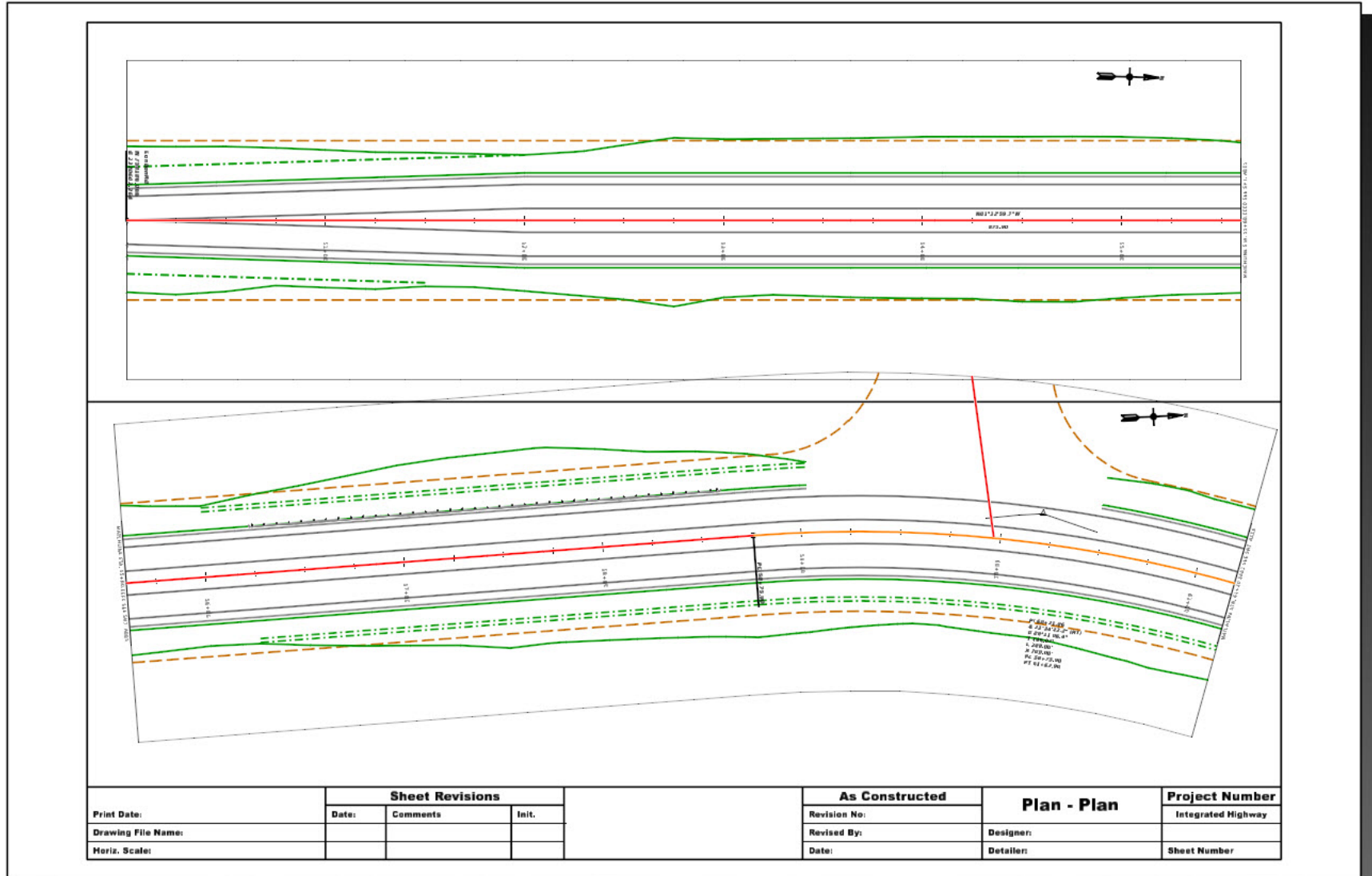   c. *Follow the prompts* in the lower left corner **left click** to accept. *Multiple left clicks are required*.

The *Create Drawing* dialog will now appear.

d. Set the *Drawing Model* scale to **1'=20'** *[1:250]* and be sure the Sheet Model *Detail Scale* is **1"=20'** *[1:250]*

e. Click **OK** to process the sheets.

3. Use the *View Group* tool to review the sheets.

Review Named Boundaries

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

2. Expand **Plan Groups**.

   There are two plan groups, one for the *Plan Sheets* named **LondonRd Plan** and one for the *Double Plan Sheets* named **LondonRd Double Plan**.

3. Expand the **LondonRd Double Plan** group.

   The name of the group and the individual named boundaries come from the values defined on the Place Named Boundary dialog.
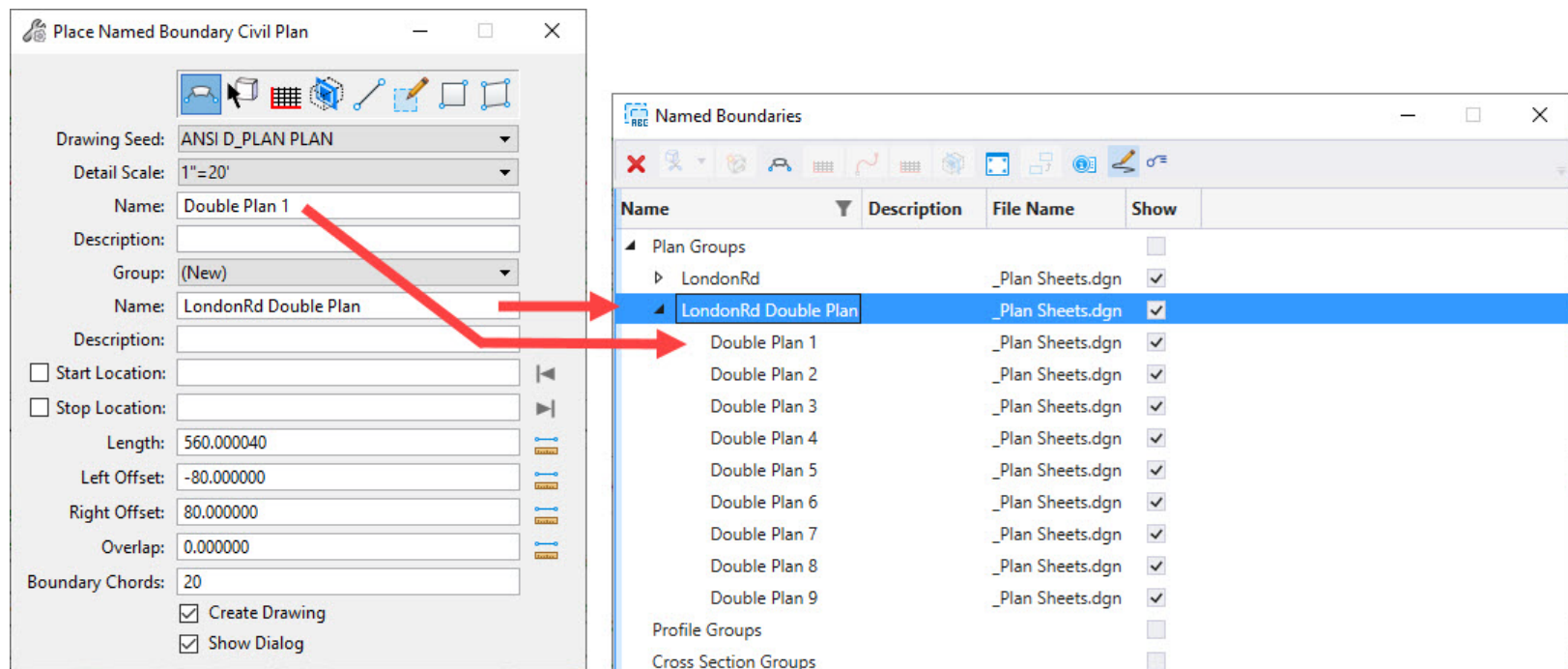
4. Close the *Named Boundaries* dialog.

Deleting Sheets

Sometimes it is necessary to delete sheets. In this section you will learn how to delete sheets. There are multiple parts to a sheet. First is the named boundary that defines the boundaries of what is shown in the plan, profile or cross section. Second are the Drawing Models and Sheet Models. Lastly, the Saved Views that control the views. Since there are multiple parts to a sheet the process to delete the sheets involves a few steps: Delete Drawing Models and Sheet Models, Delete Named Boundaries and Delete Saved Views.

1. Use the *View Group* tool to return to the **Default** model or **Multi-Model Views**.

2. Delete the Drawing and Sheet models for the Double Plan Sheets.

   a. Select *Home > Primary > **Models***.

   b. Select all of the *Drawing* and *Sheet* models for the Double Plan sheets.

   c. Click **Delete Model(s)**.

      NOTE: The sheet models are also deleted from the sheet index if necessary.

   d. Close the *Models* dialog.
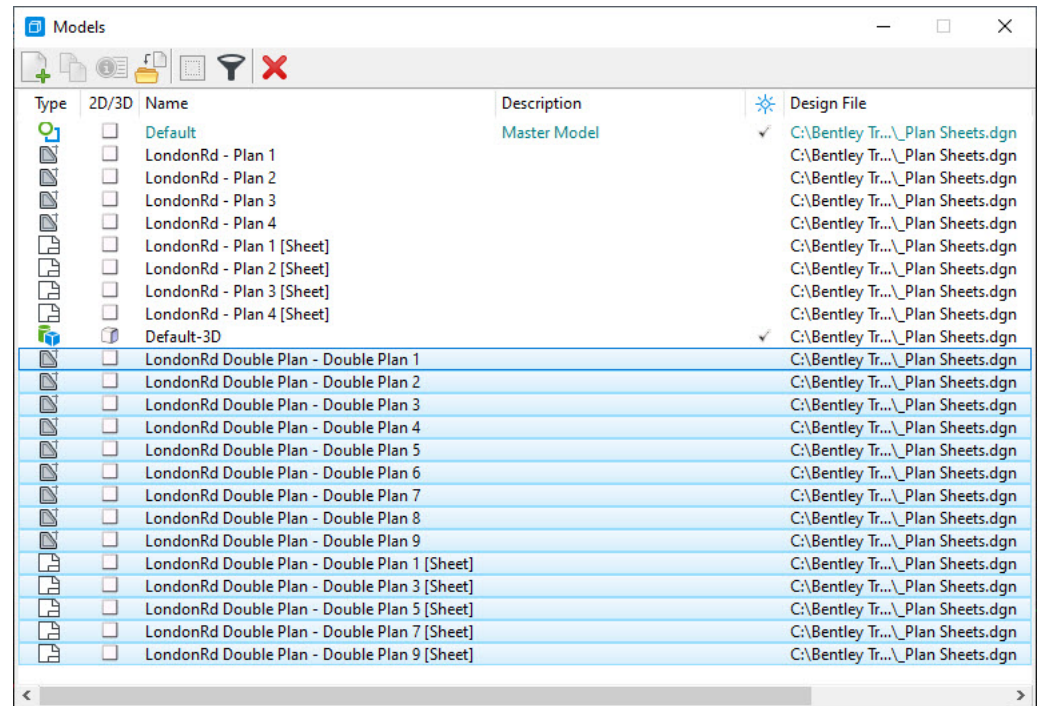
Since the sheet creation process uses Saved Views you will need to delete the Saved Views as well.

3. Delete Saved Views.

a. Select *View > Saved Views* and select the Saved Views button. The Saved Views dialog will open.
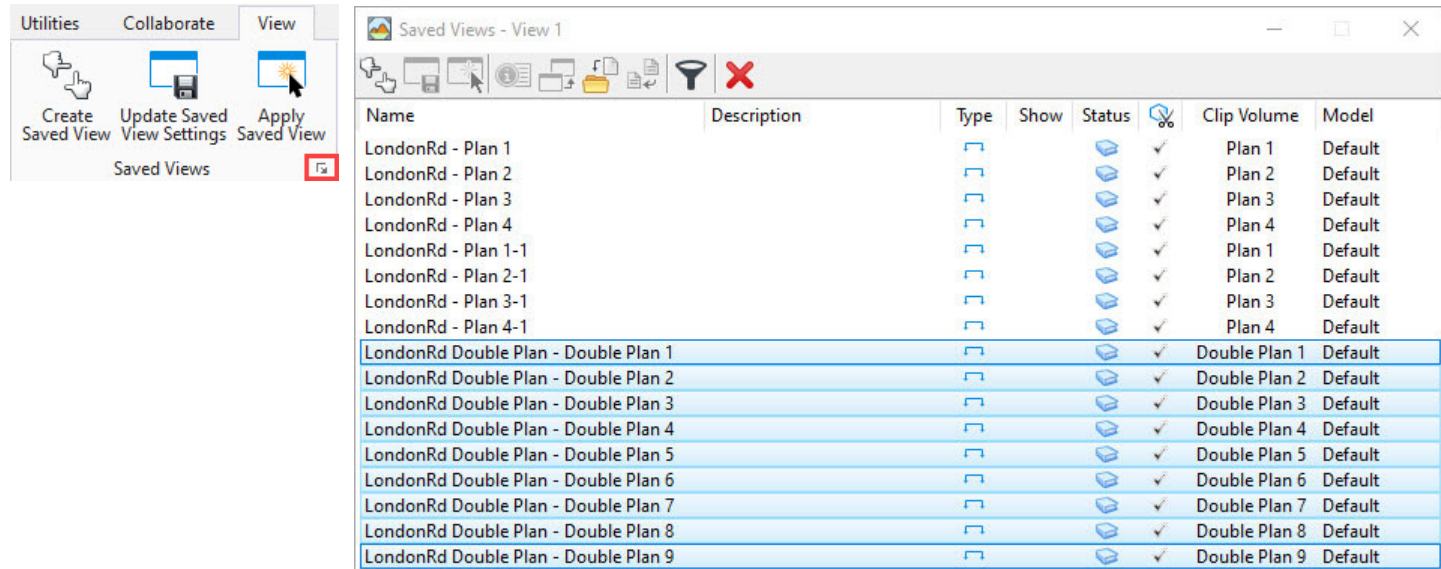
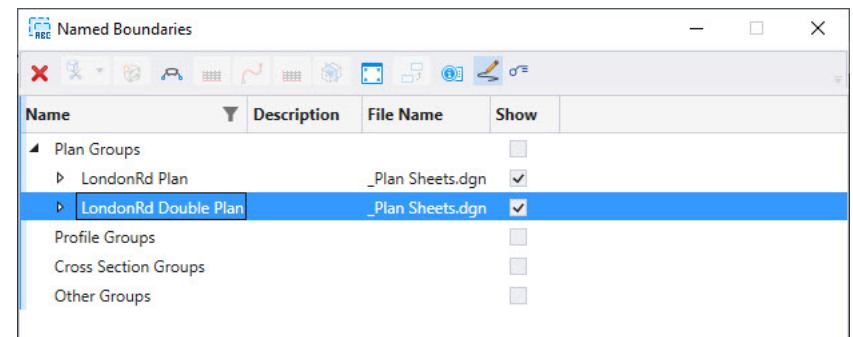b. Select all the London Rd. double plan sheets.

c. Select **Delete**

4. Delete the Named Boundaries for the Double Plan Sheets.

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

b. Expand the **Plan Groups** section.

c. Select the **LondonRd Double Plan** group.

d. Click **Delete Selected Named Boundary or Group**.

Creating Plan and Profile Sheets

1. Select **Open** and browse to the file **_Plan and Profile Sheets.dgn** *[_Metric-Plan and Profile Sheets.dgn]*. This is a blank file setup with the references and views needed for this exercise.

2. Create Named Boundaries for the **plan** portion of the sheets.

    a. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

    b. Select the **Civil Plan** mode.

    - Clear the *Start Location* and *Stop Location* locks if they are enabled.

    - *Drawing Seed* = **ANSI D_Plan-Profile PLAN** *[A1_Plan-Profile PLAN]*

    - In the 2D view, select the north-south (LondonRd) alignment.

    - *Detail Scale* = **1"=50'** *[1:500]*

    - *Name* = **PP 1** (There are two name fields. This is the top field which defines the name of the named boundary.)

        TIP: The name Plan 1 was already used for the plan sheets. Using a different name here for these sheets minimizes confusion.

    - *Group* = **(New)**

    - *Name* = **LondonRd Plan and Profile** (This is the lower name field which defines the name of the named boundary <u>group</u>.)

    - *Start Location* = **50+00** *[5+000]*

    - *Stop Location* = end of the project.

    - **Disable** the *Create Drawing* option so that the sheets are not created yet.

        IMPORTANT: The drawing and sheet models cannot be created until after the profile named boundaries are created. If this option was enabled a set of plan only sheets would be created.

    c. *Follow the prompts* in the lower left corner **left click** to define the named boundaries. *Multiple left clicks are required.*

3. Create Named Boundaries for the **profile** portion of the sheets.

   a. Open **View 4** which already has the profile for London Rd. displayed.

   b. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

   c. Select the **Civil Profile** mode. Set the dialog fields as follows:

   - *Drawing Seed* = **ANSI D_Plan-Profile PROFILE** *[A1_Plan-Profile PROFILE]*

     Additional drawing seeds are provided for profile only and double profile sheets.

   - In the *profile* view, select the profile.

   - *Detail Scale* = **1"=50'** *[1:500]*

     TIP: In general, you shouldn't change the *Detail Scale*. Most agencies set up their sheet seed definitions for each supported scale needed.

   - *Name* = **Profile 1** (There are two name fields. This is the top field which defines the name of the named boundary.)

   - *Method* = **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 such as for profile only sheets,

   - *Plan Group* = **LondonRd Plan and Profile**

     This is the name of the plan group that contains the plan named boundaries that will define the profile named boundary locations.

   - *Group* = **(New)**

   - *Name* = **LondonRd Plan and Profile**

     This is the lower name field which defines the name of the named boundary group. This is the same group name we used for the plan portion but they are actually two different groups, one associated with Plan and the other associated with Profile. This will become more evident when we review the Named Boundaries in the following steps.

   - *Vertical Exaggeration* = **10**

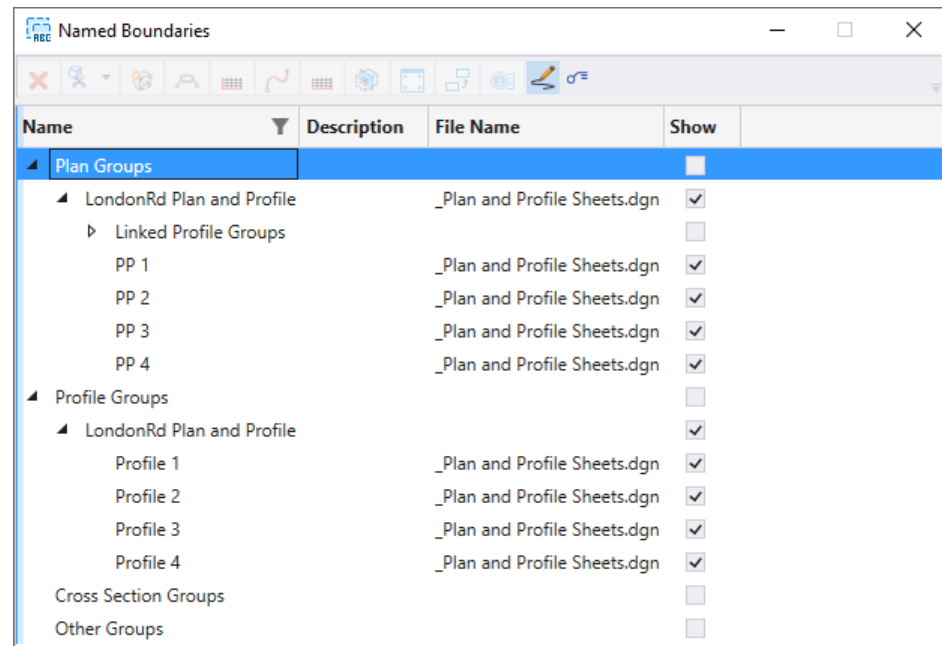   - **Disable** the *Create Drawing* option so that the sheets are not created yet.

TIP: Technically this option can be enabled at this stage to immediately create the sheets but it is generally a better practice to review the named boundaries and launch the sheet create from the Named Boundaries dialog.

    d. *Follow the prompts* in the lower left corner **left click** in View 4 to define the named boundaries. More than one click is required.

4. Review the named boundaries.

    a. Left click in *View 1*.

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

    c. Expand **Plan Groups**.

    d. Expand the **LondonRd Plan and Profile** group to see the individual plan named boundaries.

      Observe that this group is linked to a profile group. Expanding the link shows a linkage to a profile group that is also named LondonRd Plan and Profile.

    e. Expand **Profile Groups**.

    f. Expand the **LondonRd Plan and Profile** group to see the individual profile named boundaries.

Named Boundaries			
Name	**Description**	**File Name**	**Show**
▲ Plan Groups			☐
▲ LondonRd Plan and Profile		_Plan and Profile Sheets.dgn	☑
▷ Linked Profile Groups			☐
PP 1		_Plan and Profile Sheets.dgn	☑
PP 2		_Plan and Profile Sheets.dgn	☑
PP 3		_Plan and Profile Sheets.dgn	☑
PP 4		_Plan and Profile Sheets.dgn	☑
▲ Profile Groups			☐
▲ LondonRd Plan and Profile			☑
Profile 1		_Plan and Profile Sheets.dgn	☑
Profile 2		_Plan and Profile Sheets.dgn	☑
Profile 3		_Plan and Profile Sheets.dgn	☑
Profile 4		_Plan and Profile Sheets.dgn	☑
Cross Section Groups			☐
Other Groups			☐

5. Create the Plan and Profile sheets.

   a. Select the **LondonRd Plan and Profile** group from either the Plan or Profile area. Since the two are linked, the sheet creation can be launched from either.

      TIP: Both the 2D view with the plan named boundaries and the profile view with the profile boundaries must be open before the plan and profile sheets can be created.

   b. Enable the **Show the Create Drawing Dialog** icon at the top of the *Named Boundary* dialog.

      When enabled the background is slightly darker.

   c. Disable the **Annotate Plan Drawing Models** icon at the top of the *Named Boundary* dialog.

      When enabled the background is slightly darker.

      This option will automatically run the Annotate Model tool in each drawing model. Annotating individual sheets with this option may be desirable if you want to be able to edit and adjust annotations on individual sheets.

   d. Select the **Create Plan/Profile Drawing** icon at the top of the dialog (or right click and select Create Plan/Profile Drawing).

      The Create Drawing will appear.

e. Enable the **Add to Sheet Index** option on the *Create Drawing* dialog.

   When enabled sheet models are automatically added to the project sheet index which allows centralized management of all sheets on a project. We will learn more about the sheet index in the next exercise.

   The rest of the settings were defined by the drawing seeds used when creating the named boundaries and do not need to be changed.

f. Click **OK** to create the sheets.

   The last plan and profile sheet is displayed.

g. Use the *View Group* tool to review the other sheets if desired.

TIP: The same named boundaries can be used to create additional sheets.

- Individual sheets or subsets of sheets can be created by expanding the group and selecting one or more named boundaries instead of selecting the group name.

- Plan only or profile only sheets can be created by selecting *Create Plan Drawing* or *Create Profile Drawing* instead of *Create Plan/ Profile Drawing*.

- Alternating Plan and Profile sheets where the plan is shown on the first, third, fifth, etc. sheets and the profiles are shown on the second, fourth, sixth, etc. sheets are created by selecting *Create Alternate Plan Profile Drawing*. However, it is probably desirable to create a new set of named boundaries for the alternating plan and profile sheets such that the plan and profile boundaries each fill the entire sheet, not just the top or bottom half of the sheet.

- **Metric Only:** Optionally use the *[A1_PROFILE_FRAME_ANNOTATION] Drawing Seed* for frame based profile annotation.

Metric Only - Creating Plan and Profile Sheets with Frame Annotation

1. Select **Open** and browse to the file *[_Metric-Plan and Profile Sheets with Frame Annotation.dgn]*. This is a blank file setup with the references and views needed for this exercise.

   *** *If you are working in the Imperial WorkSpace, please skip to the next exercise.*

2. Create Named Boundaries for the **plan** portion of the sheets.

   a. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

   b. Select the **Civil Plan** mode.

   - Clear the *Start Location* and *Stop Location* locks if they are enabled.

   - *Drawing Seed* = *[A1_PLAN]*

   - In the 2D view, select the north-south (LondonRd) alignment along which the plan named boundaries will be created.

   - *Detail Scale* = *[1:500]*

   - *Name* = **PP 1** (There are two name fields. This is the top field which defines the name of the named boundary.)

   - *Group* = **(New)**

   - *Name* = **LondonRd Plan and Profile** (This is the lower name field which defines the name of the named boundary group.)

   - *Start Location* = *[5+000]*

   - *Stop Location* = end of the project.

   - **Disable** the *Create Drawing* option so that the sheets are not created yet.

   c. *Follow the prompts* in the lower left corner **left click** to define the named boundaries. *Multiple left clicks may be required*.

   A total of two clicks are required to (1) accept the Start Location, (2) accept the Stop Location, and (3) create the Named Boundaries. However, if the Start or Stop Location are selected graphically one or more of these clicks has already been completed.

3. Create Named Boundaries for the **profile** portion of the sheets.

   a. Open **View 4** which already has the profile for London Rd. displayed.

b. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

c. Select the **Civil Profile** mode.

- *Drawing Seed* = *[A1_PROFILE_FRAME_ANNOTATION]*

   Additional drawing seeds are provided for profile only and double profile sheets.

- In the *profile* view, select the profile along which the named boundaries will be created.

- *Detail Scale* = *[1:500]*

- *Name* = **Profile 1** (There are two name fields. This is the top field which defines the name of the named boundary.)

- *Method* = **From Plan Group**

- *Plan Group* = **LondonRd Plan and Profile**

- *Group* = **(New)**

- *Name* = **LondonRd Plan and Profile**

- *Vertical Exaggeration* = **10**

- **Disable** the *Create Drawing* option so that the sheets are not created yet.

d. *Follow the prompts* in the lower left corner **left click** in View 4 to define the named boundaries. More than one click may be required.

4. Create Plan and Profile sheets.

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

b. Select the **LondonRd Plan and Profile** group from either the Plan or Profile area.

c. Right click and select the **Create Alternate Plan Profile Drawing**.

d. Click **OK** to create the sheets.

Adjust Sheet Layout

Final adjustments to sheet layouts can be made in the reference attachments.

1. Continue in the **_Plan and Profile Sheets.dgn** *[_Metric-Plan and Profile Sheets.dgn]*

2. Use the *View Group* tool to select the **PP 1** *sheet* model.

3. Select *Home > Primary > Attach Tools >* **References**.

4. In the References dialog, select the first attachment, this is PP1 drawing model.

   One of the references is for the Plan view drawing model and the other for the Profile view drawing model.

5. Select **Move Reference**.

6. Left click on anywhere on the left portion of the sheet.

7. Move the cursor to the right to move the references to a new position on the sheet.

8. 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.
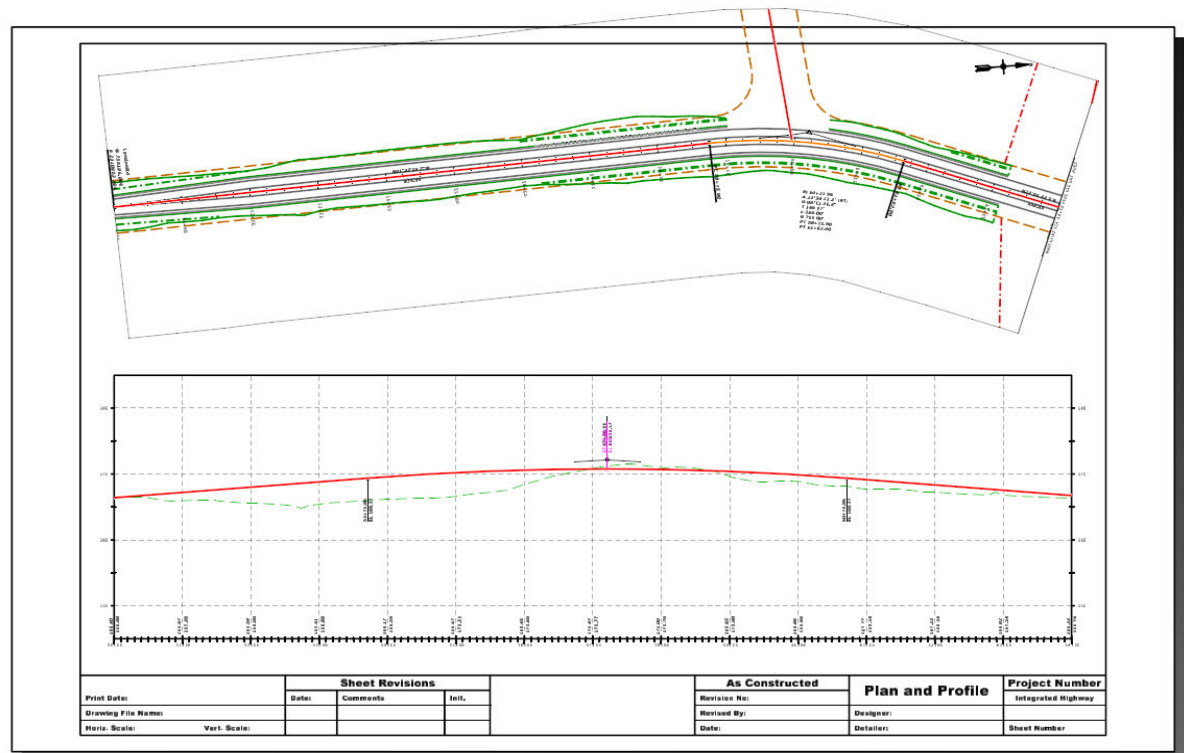
Adjusting Level Display

Sometimes you may need to turn levels on/off after you have created sheets. The best way to do this is to return to the main multi-model view and turn them on/off there. A new option was added in 2021 R1 that allows level changes to propagate to all the sheets you have already created. The reference file option (*Synchronize View* > **Settings from Design Model**) allows the levels and view options displayed in sheet models to be controlled from a container file.

1. Turn off the center turn lane geometry elements.

    a. If not already open, open the **_Plan and Profile Sheets.dgn** *[_Metric-Plan and Profile Sheets.dgn]*

    b. Use the *View Group* tool to return to the **Default** model or **Multi-Model Views**.

    c. Right click and hold until the pop-up menu appears.

    d. Select **Level Off** and then select the center turn lane geometry element **LL_A_R**
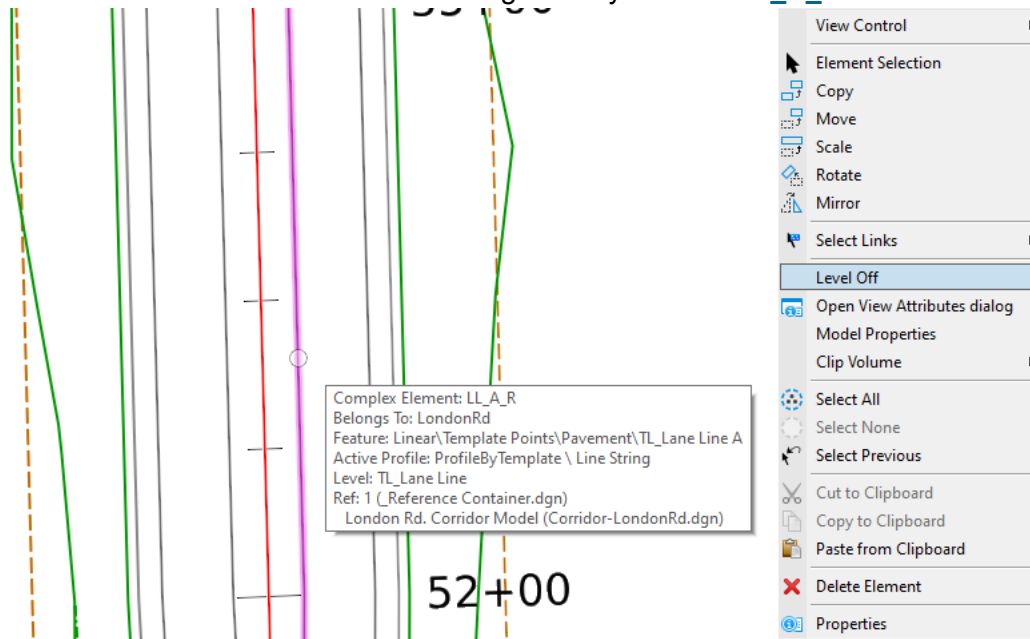
    e. Select **Save Settings** to save the level changes.

    f. Review the Drawing Models and Sheet Models. The turn lane geometry should now be turned off in all the sheets.

Exercise 2: Sheet Index

Description

The *Sheet Index* is a centralized and structured collection of sheets in your project. The *Sheet Index* can be useful in creating a construction document set (also called a sheet set or construction set) that contains all the sheets of your project.

You may link any sheet model from any design file of your project into the *Sheet Index*. Sheets may also be organized hierarchically in folders, with the ability to override sheet numbering rules for sheets in each folder.

You can then manage the properties of all the sheet models within the *Sheet Index* collectively. The *Sheet index* may also be added to print organizer print sets for printing.

In this exercise, you will learn how to use the *Sheet Index* to manage, organize and print your sheets.

Skills Taught

- Manage the Sheet Index

- Adjust Sheet Numbers

- Organize Sheets into Folders
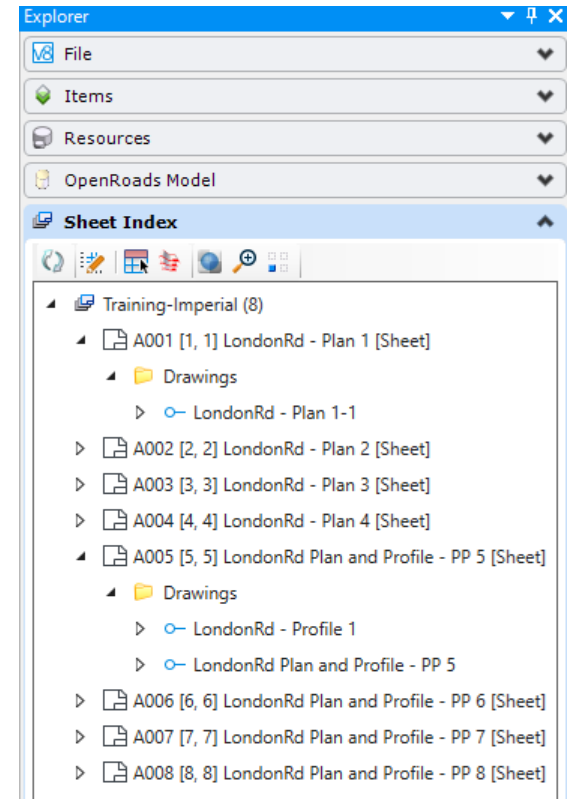
Using the Sheet Index

1. Select *Home > Primary > ***Explorer**.

2. Select the **Sheet Index** tab in the *Explorer*.

   The *Sheet Index* show the name of the active WorkSet which is equivalent to a project. In this training environment the WorkSet (project) is named *Training-Imperial [Training-Metric]*.

   The *Sheet Index* is **NOT** stored in the active dgn file. It is stored in a **dgnws** file as part of the active *WorkSet*. The **dgnws** includes all sheets in a *WorkSet* (project) even when they are distributed across multiple dgn files as is common in production work.

3. Expand the *Sheet Index* and review the sheets.

   The plan sheets and plan and profile sheets are all listed even though they were created in two separate dgn files.

   The names in the sheet index match the names of the named boundaries. The sheet index shows the importance of how named boundaries are named. In this course we have created 2 sets of sheets that were added to the sheet index.

   - *Plan* - Plan only sheets

   - *PP* - Plan and Profile sheets.

4. Expand the sheet names to review the specific named boundaries.

   Notice the Plan sheets have only one named boundary while the Plan and Profile sheets have multiple named boundaries.
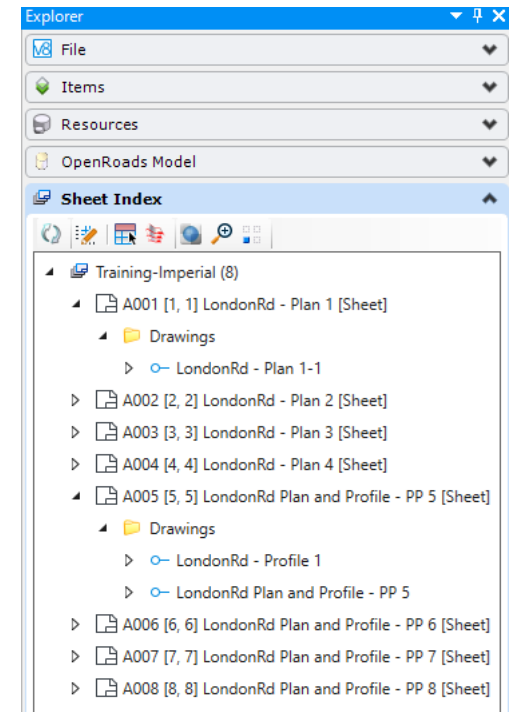
5. Set Sheet Index to Write mode.

Remember the sheet index is not in the active dgn, it is stored in a dgnws file that is part of the active WorkSet (project). The WorkSet, including the sheet index, is shared by everyone on the project and thus we need to request write access to the sheet index before it can be edited.

a. Select **Open Sheet Index for Edit** from the *Explorer* dialog.

Additional icons appear to manage the sheet index, create folders, add and delete sheets.

6. Adjust Sheet Numbering Rules

The index is a structured collection of sheets that can be used to create a construction document set. Sheet numbering rules define how sheets are numbered. The sheet name is made up of a prefix, a number, and a suffix. For example sheet A001 has a prefix of A, a number 001, and no suffix.

The numbers in square brackets such as [1, 1] indicate the sheets incremented number and sequence number. Sheets can be organized into folders and the increment number restarts for the first sheet in each folder. The sequence number is continuous across all folders.
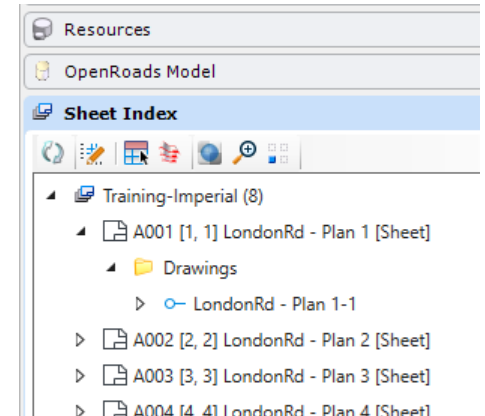
a. Select **Manage Sheet Index** to adjust the sheet numbering rules.

b. Select the **Folder** tab. The settings under the **Folder** tab are used when sheets are organized into folders. The settings on the Index tab are used for sheets not organized into folders.

c. Set the *Number of Digits* to **2**.
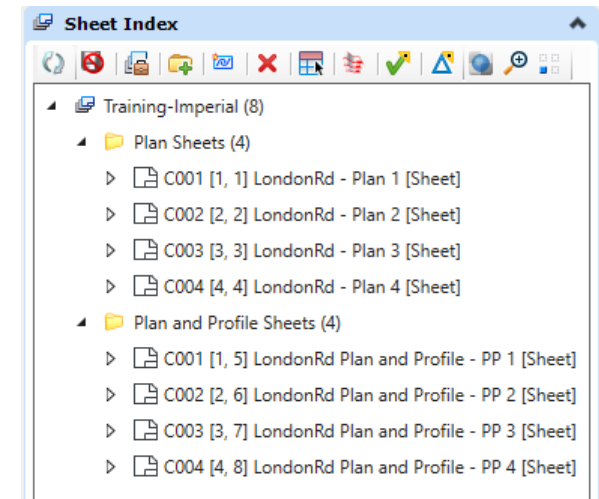
d. Set the *Sheet Number Prefix* to **C**.

e. Click **OK**.
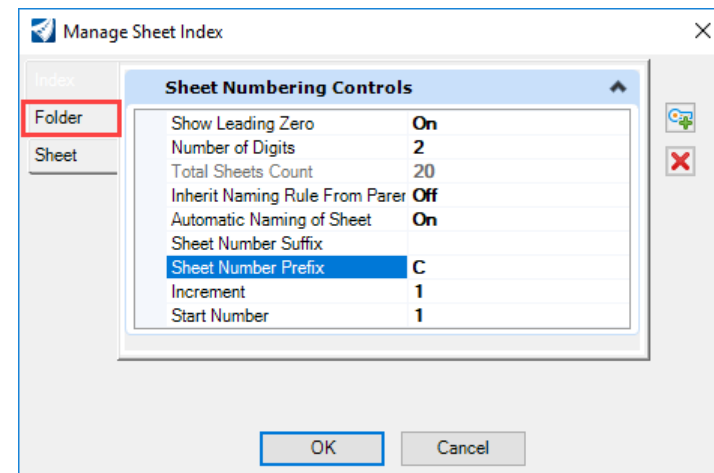
7. Organize the sheets into Folders

   a. Select the sheet index name **Training-Imperial** *[Training-Metric]* at the top of the list.

   b. Select **Create Folder** and create a new folder named **Plan Sheets**.

   c. Create one more folder named **Plan and Profile Sheets**.

   d. Select and drag the **Plan** sheets (**Plan 1-Plan 4**) into the *Plan Sheets* folder.

   e. Select and drag the **Plan and Profile** sheets (**PP1-PP4**) into the **Plan and Profile Sheets** folder.

   The sheets are now up to date. Notice the prefix name is now updated as well.

Sheet Index

▲ Training-Imperial (8)
    ▲ 📁 Plan Sheets (4)
        ▷ 📄 C001 [1, 1] LondonRd - Plan 1 [Sheet]
        ▷ 📄 C002 [2, 2] LondonRd - Plan 2 [Sheet]
        ▷ 📄 C003 [3, 3] LondonRd - Plan 3 [Sheet]
        ▷ 📄 C004 [4, 4] LondonRd - Plan 4 [Sheet]
    ▲ 📁 Plan and Profile Sheets (4)
        ▷ 📄 C001 [1, 5] LondonRd Plan and Profile - PP 1 [Sheet]
        ▷ 📄 C002 [2, 6] LondonRd Plan and Profile - PP 2 [Sheet]
        ▷ 📄 C003 [3, 7] LondonRd Plan and Profile - PP 3 [Sheet]
        ▷ 📄 C004 [4, 8] LondonRd Plan and Profile - PP 4 [Sheet]

8. Navigate to the first plan sheet.

    a. Double click on the first sheet named **C01.**

        The first plan sheet will open and be active.

        The Sheet Index can be used to navigate between sheets even if the sheets were created in other DGN files.

    b. Double click on **C01** in the *Plan and Profile Sheets* folder to return to the Plan and Profile sheets.

9. Close the Explorer dialog.
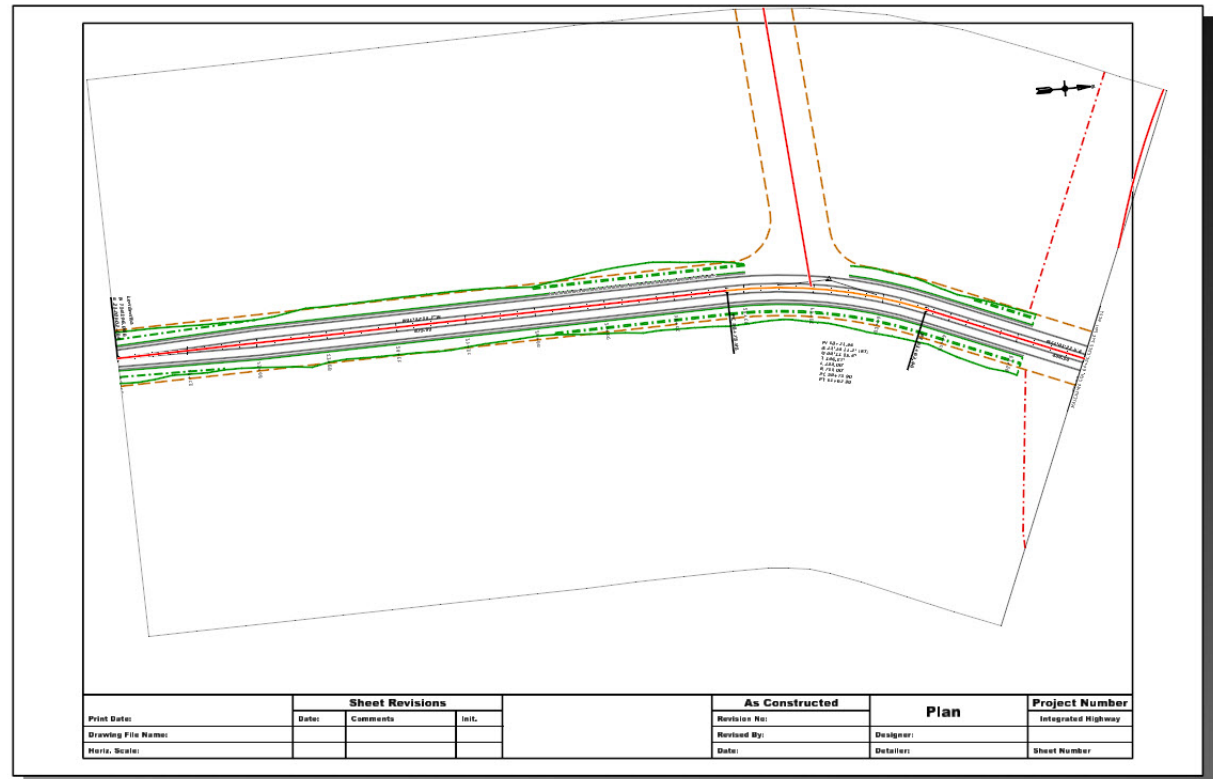
Other capabilities of the sheet index are shown below. These topics are not be covered in this course.

- Change the order the sheets should be included in the sheet set by dragging them to the correct order.

- Create a report or table of the sheet index using the **Place Sheet Index as Table** tool. The format of the sheet index table can be customized with the **Reports** tool found on the Analyze tab of the Drawing workflow.

- Define custom properties can be attached to sheets, folders, or the sheet index itself. Custom properties can be used to define project specific information such as project number. Custom properties are defined using the **Manage Sheet Index** tool.

- Insert sheet index properties, sheet properties, and custom properties as text fields on sheets. This is done with the *Insert Field* option on the **Place Text** **A** tool.

- Print entire sheet sets using the **Print Organizer** .

Exercise 3: Additional Sheet Creation Methods

Description

In this exercise you will learn additional techniques to customize plan and profile sheets.

Skills Taught

- Create separate plan and profile sheets

- Create rectangular plan sheets

- Create custom length plan sheets

- Adjust elevations shown in profile sheets

- Create long "roll" plan and profile sheets

Creating Separate Plan and Profile Sheets

Some agencies prefer to create sheets in separate dgn files rather than putting them all in one file. In this section you will learn how to create one Plan and Profile sheet per dgn.

1. Select **Open** and browse to the file **_Plan and Profile Separate Sheets.dgn** *[_Metric-Plan and Profile Separate Sheets.dgn]*.

2. Create Named Boundaries for the **plan** portion of the sheets.

   a. Select *Drawing Production > Named Boundaries > Named Boundary > **Place Named Boundary***.

   b. Select the **Civil Plan** mode.

   - Clear the *Start Location* and *Stop Location* locks if they are enabled.

   - *Drawing Seed* = **ANSI D_Plan-Profile PLAN** *[A1_Plan-Profile PLAN]*

   - In the 2D view, select the north-south (LondonRd) alignment.

   - *Detail Scale* = **1"=50'** *[1:500]*

   - *Name* = **PP 1** (There are two name fields. This is the top field which defines the name of the named boundary.)

   - *Group* = **(New)**

   - *Name* = **LondonRd Plan and Profile** (This is the lower name field which defines the name of the named boundary <u>group</u>.)

   - *Start Location* = **50+00** *[5+000]*

   - *Stop Location* = end of the project.

   - **Disable** the *Create Drawing* option so that the sheets are not created yet.

   c. *Follow the prompts* in the lower left corner **left click** to define the named boundaries. *Multiple left clicks are required*.

3. Create Named Boundaries for the **profile** portion of the sheets.

a. Open **View 4** which already has the profile for London Rd. displayed.

b. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

c. Select the **Civil Profile** mode. Set the dialog fields as follows:

■ *Drawing Seed* = **ANSI D_Plan-Profile PROFILE** *[A1_Plan-Profile PROFILE]*

■ In the *profile* view, select the profile.

■ *Detail Scale* = **1"=50'** *[1:500]*

■ *Name* = **Profile 1**

■ *Method* = **From Plan Group**

■ *Plan Group* = **LondonRd Plan and Profile**

■ *Group* = **(New)**

■ *Name* = **LondonRd Plan and Profile**

■ *Vertical Exaggeration* = **10**

■ **Enable** the *Create Drawing* option.

■ **Enable** the *Show Drawing* option.

d. **Left click** in *View 4* to define the named boundaries.

Place Named Boundary Civil Profile	— □ X
Drawing Seed:	ANSI D_Plan-Profile PROFILE
Detail Scale:	1"=50'
Name:	Profile 1
Description:	
Method:	From Plan Group
Plan Group:	LondonRd Plan and Profile
Group:	(New)
Name:	LondonRd Plan and Profile
Description:	From Plan Group: LondonRd Plan and Profi
Vertical Exaggeration:	10.000000
Available Profile Height:	40.000000
☑ Top Clearance:	0.500000
☐ Bottom Clearance:	2.000000
Elevation Datum Spacing:	5.000000
Station Datum Spacing:	50.000000
Profile Shifts:	Datum Stations
	☑ Use Terrains
	☑ Use Active Vertical
	☐ Whole Conduits Only
	☑ Create Drawing
	☑ Show Dialog
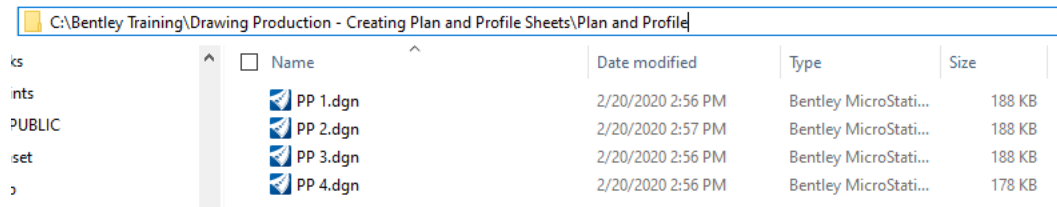
The *Create Drawing* dialog will appear.
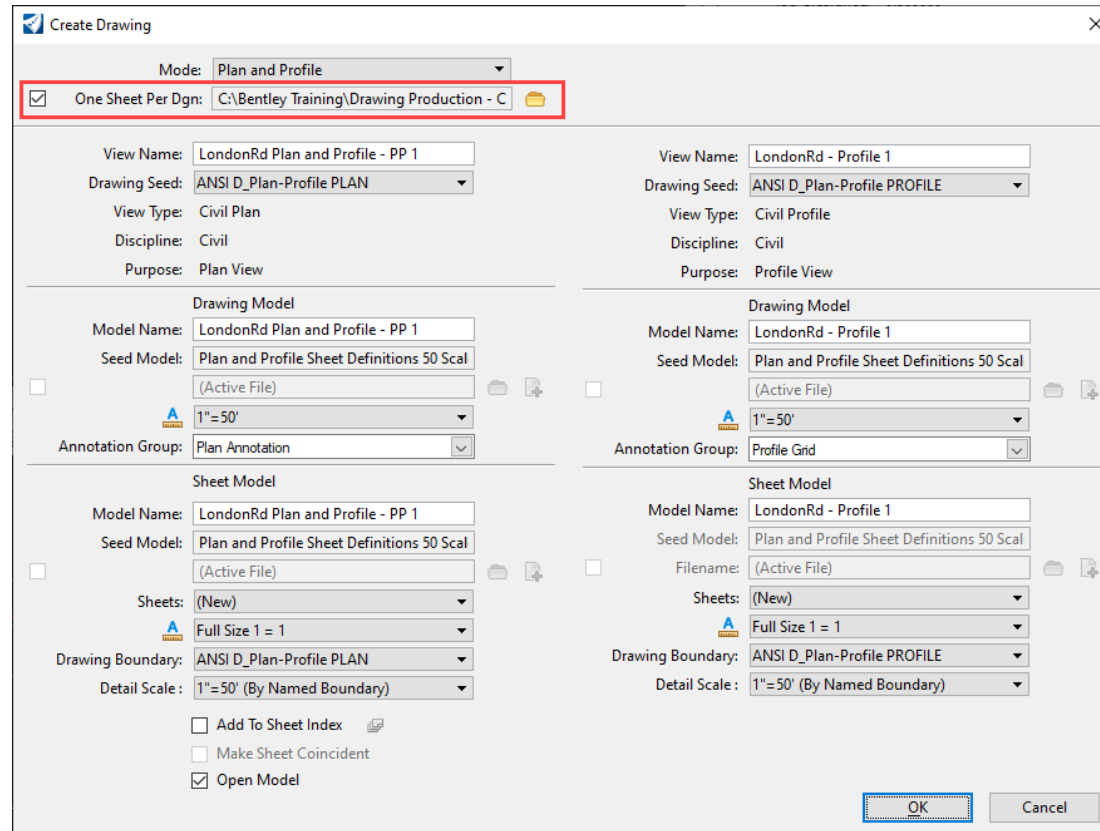
e. Toggle *ON* **One Sheet Per Dgn**

f. Select the browse button and select the **Plan and Profile** folder.

g. Be sure to turn *OFF* **Add To Sheet Index**.

h. Click **OK**. The sheets will now be created as separate dgn's in the **Plan and Profile** folder.

Creating Rectangular and Custom Length Sheets

The named boundaries created before followed the curvature of the geometry. Now we will create a rectangular named boundary.

---

1. Create a rectangular plan Named Boundary for the <u>first</u> sheet.

    a. Select **Open** and browse to the file **_Rectangular Sheets.dgn** *[_Metric-Rectangular Sheets.dgn]*.

    b. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

    c. Select the **Civil Plan** mode.

    - Clear the *Start Location* and *Stop Location* locks if they are enabled.

    - *Drawing Seed* = **ANSI D_Plan-Profile PLAN** *[A1_Plan-Profile PLAN]*

    - In the 2D view, select the north-south (LondonRd) alignment.

    - *Detail Scale* = **1"=50'** *[1:500]*

    - *Name* = **PP 1**

    - *Group* = **(New)**

    - *Name* = **LondonRd Plan and Profile**

    - *Start Location* = move the cursor south of the south end of the project and **left click** to select the starting station of **50+00**.

    - *Stop Location* = move the cursor north so that only one named boundary is displayed but **DO NOT CLICK YET!**

    The named boundary is following the curvature of the geometry.

    d. Set the *Boundary Chords* to **0**.

    The named boundary is now rectangular. However, it is tight to include the intersection on this sheet so lets adjust the length of the sheet to put the intersection on the next sheet.

    e. Set the *Length* to **850** *[250]*. The sheet is shortened to stop short of the intersection.

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f. Position the cursor so that only one named boundary is displayed and **left click** to define the stop location.

   We are only creating a single sheet which will be shorter than the standard sheet length used on the rest of the project.

g. **Disable** the *Create Drawing* option so that the sheets are not created yet.

   The remaining plan named boundaries and the profile named boundaries need to be created before the drawings can be created.

h. **Left click** to accept and create the named boundary.

2. Create rectangular plan Named Boundaries for the rest of the sheets.

a. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

b. Select the **Civil Plan** mode.

   ▪ Clear the *Start Location* and *Stop Location* locks if they are enabled.

   ▪ *Drawing Seed* = **ANSI D_Plan-Profile PLAN** *[A1_Plan-Profile PLAN]* (Selecting the seed file again resets the values on the dialog back to their default values.)

   ▪ In the 2D view, select the north-south (LondonRd) alignment.

   ▪ *Detail Scale* = **1"=50'** *[1:500]*

   ▪ *Name* = **PP 2** (Sheet PP1 was created in the previous steps)

   ▪ *Group* = **LondonRd Plan and Profile** (The new named boundaries will be added to the same group as the first sheet.)

   ▪ *Start Location* = Intersect snap to the north end of the first named boundary at the centerline and **left click**.

   ▪ *Length* = **1400** *[350]* and *Boundary Chords* = **0**

   ▪ *Overlap* = **100** *[30]*

   ▪ *Stop Location* = move the cursor north until named boundaries are shown along the entire project and **left click** to define the stop location.

c. **Left click** to accept and create the named boundaries.
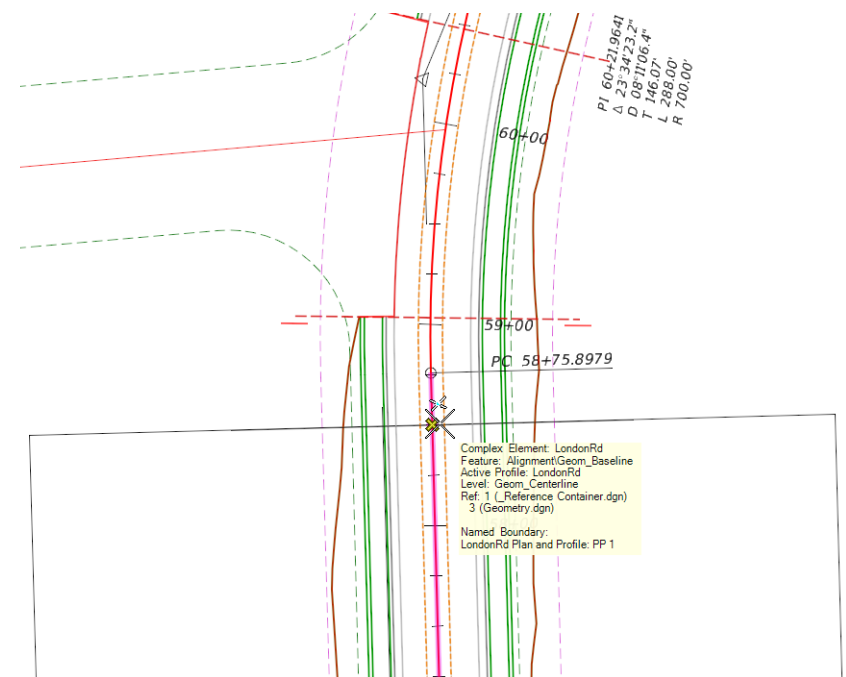
3. Create Named Boundaries for the **profile** portion of the sheets.

   a. Open **View 4** which already has the profile for London Rd. displayed.

   b. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

   c. Select the **Civil Profile** mode.

   - *Drawing Seed* = **ANSI D_Plan-Profile PROFILE** *[A1_Plan-Profile PROFILE]*

   - In the *profile* view, select the profile along which the named boundaries will be created.

   - *Detail Scale* = **1"=50'** *[1:500]*

   - *Name* = **Profile 1**

   - *Method* = **From Plan Group**

     Notice that the first profile boundary is shorter than the rest, matching the length of the plan boundaries.
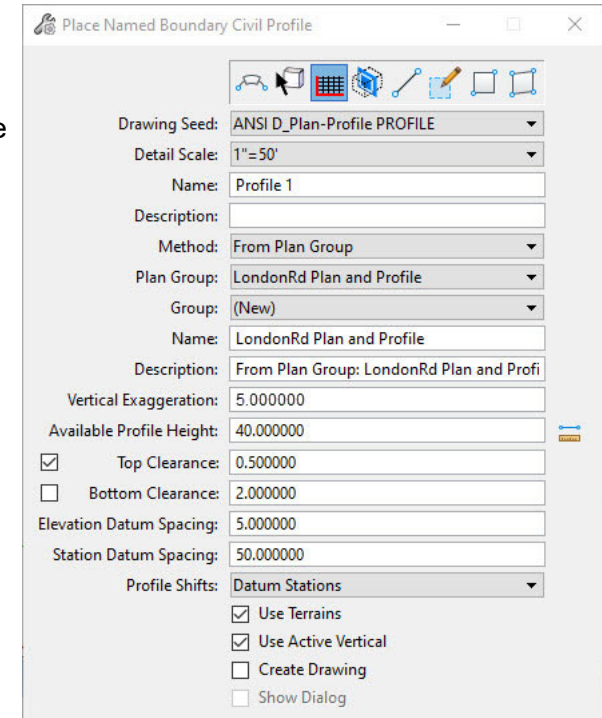
   - *Plan Group* = **LondonRd Plan and Profile**

     This is the name of the plan group that contains the plan named boundaries that will define the profile named boundary locations.

   - *Group* = **(New)**

   - *Name* = **LondonRd Plan and Profile**

     This is the lower name field which defines the name of the named boundary group. This is the same group name we used for the plan portion but they are actually two different groups, one associated with Plan and the other associated with Profile. This will become more evident when we review the Named Boundaries in the following steps.

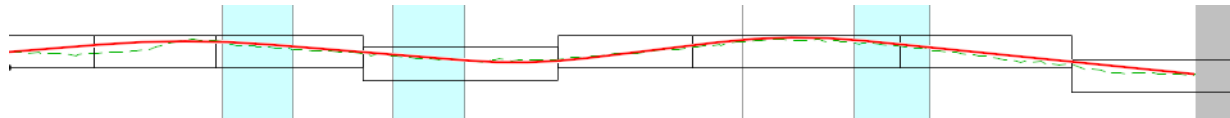   d. Set the *Vertical Exaggeration* to **5** and move the cursor into the profile view.

Notice the hight of the named boundaries. There is considerable white space above and below the profile that can be used for annotations.

e. Set the *Vertical Exaggeration* to **30** and move the cursor into the profile view.

Notice the hight of the named boundaries. There is much less white space above and below the profile and there are also more boundaries. With the vertical exaggeration set to 5 there was a single profile boundary for each plan boundary. However with the vertical exaggeration set to 30 profile shifting or stepping is needed to show the profile across the length of the plan boundary.

The additional named boundaries required for profile shifting are automatically computed. The *Top Clearance* and *Bottom Clearance* parameters define additional clearance above and below the active vertical and terrain and are factored into profile shifting. In addition, the *Profile Shifts* setting determines if shifts are allowed and where they are allowed, at any station or only on even stations defined by the *Station Datum Spacing*.
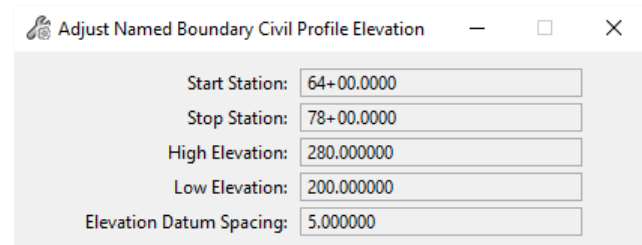

f. Set the *Vertical Exaggeration* to **10** and move the cursor into the profile view.

g. **Disable** the *Create Drawing* option so that the sheets are not created yet.

h. **Left click** in *View 4* to define the named boundaries.
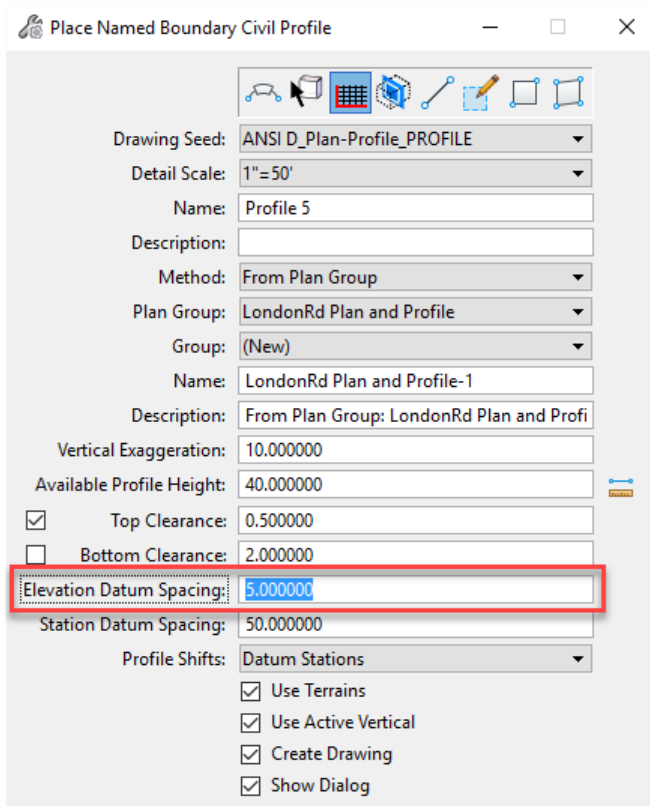
Adjusting Profile Named Boundaries

If necessary, the vertical position of a profile named boundary can be adjusted.

---

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

2. Left click in the profile view (*View 4*).

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 *5' [2m]*. The Elevation Datum Spacing was one of the parameters that could be set when the named boundaries were created.

Create a Single Plan and Single Profile "Roll" Sheets

1. Select **Open** and browse to the file **_Roll Sheets.dgn** *[_Metric-Roll Sheets.dgn]*.

2. Create Named Boundaries for the roll **plan** sheet.

   a. Select *Drawing Production > Named Boundaries > Named Boundary > **Place Named Boundary***.

   b. Select the **Civil Plan** mode.

      - Clear the *Start Location* and *Stop Location* locks if they are enabled.

      - *Drawing Seed* = **ANSI D_PLAN** *[A1_PLAN]*

      - In the 2D view, select the north-south (LondonRd) alignment.

      - *Detail Scale* = **1"=100'** *[1:1000]*

      - *Name* = **Roll Plan** (There are two name fields. This is the top field which defines the name of the named boundary).

      - *Group* = **(New)**

      - *Name* = **LondonRd Roll Plan** (This is the lower name field which defines the name of the named boundary <u>group</u>).

      - *Start Location* = **Lock to Beginning**

      - *Stop Location* = **Lock to End**

      - *Length* = **5000** *[1500]* (Adjust the length to meet your project length)

      - *Boundary Chords* = **0**

      - **Enable** the *Create Drawing* option so that the sheets are created as soon as the named boundaries are created.

      - **Enable** the *Show Dialog* option.

   c. *Follow the prompts* in the lower left corner **left click** to define the named boundaries. *Multiple left clicks are required.*

d. When the *Create Drawing* dialog appears, **disable** *One Sheet Per Dgn* and be sure to **disable** the check boxes next to both of the *Filename* fields so that the roll sheet gets created in the active file, not an external file.

e. Change the *Drawing Model* annotation scale to **1"=100'** *[1:500]*

f. **Disable** the *Add To Sheet* Index option.

g. Click **OK** to create the sheet.

The sheet border appears because we used the *ANSI D_PLAN [A1_PLAN]* seed file which is setup to include a sheet border. If you regularly create roll plots a new seed file can be setup, or you can manually adjust the sheet.

3. Delete the sheet border.

   a. Select *Drawing > Modify >* **Delete** and delete the sheet border.
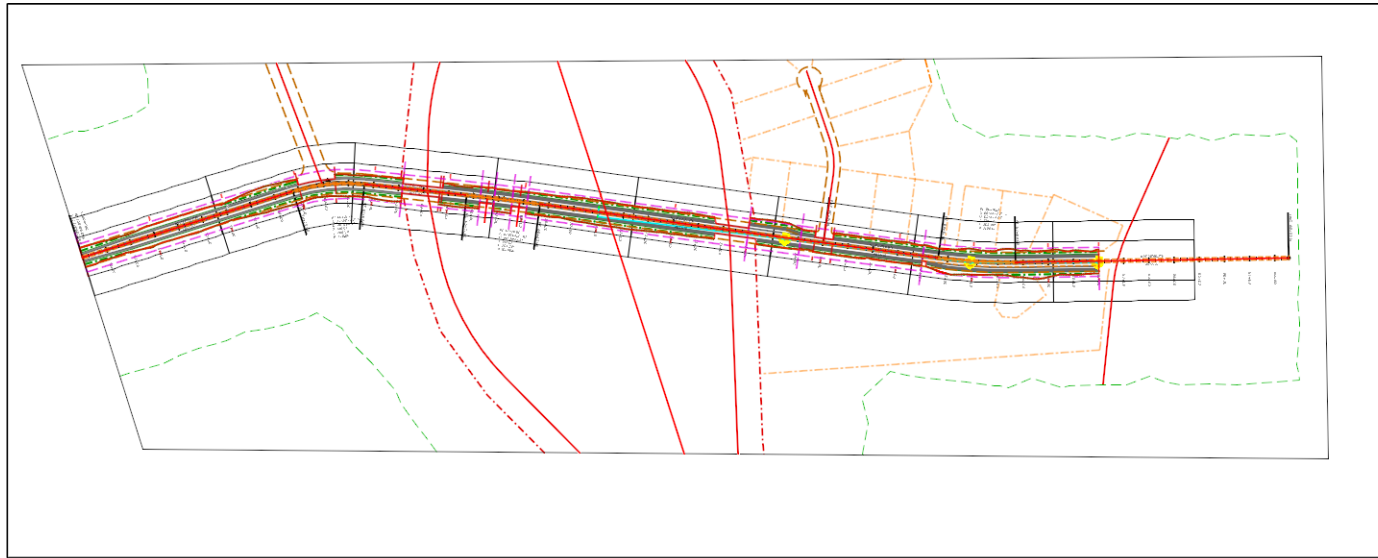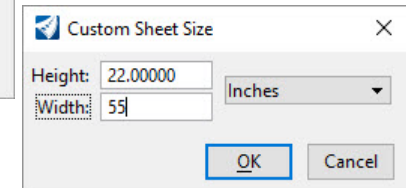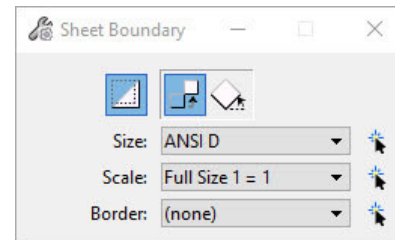
4. Adjust the Sheet Size.

   a. Select *Drawing Production > Sheet Boundary >* **Sheet Boundary**.

   b. Set the *Size* to **Custom**.

   c. Set the *Height* to **22"** *[594mm]*.

   d. Set the *Width* to **55"** *[1600mm]*.

   e. Click **OK**.

5. Create Named Boundaries for the roll **profile** sheet.

a. Use the *View Group* tool to return to the **Multi-Model Views** or the **Default Model**.

b. Open *View 4*.

c. Select *Drawing Production > Named Boundaries > Named Boundary >* **Place Named Boundary**.

d. Select the **Civil Profile** mode.

- *Drawing Seed* = **ANSI D_PROFILE** *[A1_PROFILE]*

- In the *profile* view, select the profile along which the named boundaries will be created.

- *Detail Scale* = **1"=100'** *[1:500]*

- *Name* = **Roll Profile** (There are two name fields. This is the top field which defines the name of the named boundary.)

- *Method* = **Station Limits**

- *Group* = **(New)**

- *Name* = **LondonRd Roll Profile**

- *Start Location* = **Lock to Beginning**

- *Stop Location* = **Lock to End**

- *Length* = **5000** *[1500]*

- *Vertical Exaggeration* = **10**

- **Enable** the *Create Drawing* option so that the sheets are created as soon as the named boundaries are created.

- **Enable** the *Show Dialog* option.

e. *Follow the prompts* in the lower left corner **left click** in *View 4*. More than one click is required.

f. When the Create Drawing dialog appears set the *Drawing Model* annotation scale to **1"=100'** *[1:500]*

g. Click **OK**.

The sheet border appears because we used the *ANSI D_PROFILE [A1_PROFILE]* seed file which is setup to include a sheet border. The sheet border and sheet size can be adjusted as described in the previous steps for the horizontal roll plot. If you regularly create roll plots a new seed file can be setup, or you can manually adjust the sheet using the same steps described above for the roll plan sheet.
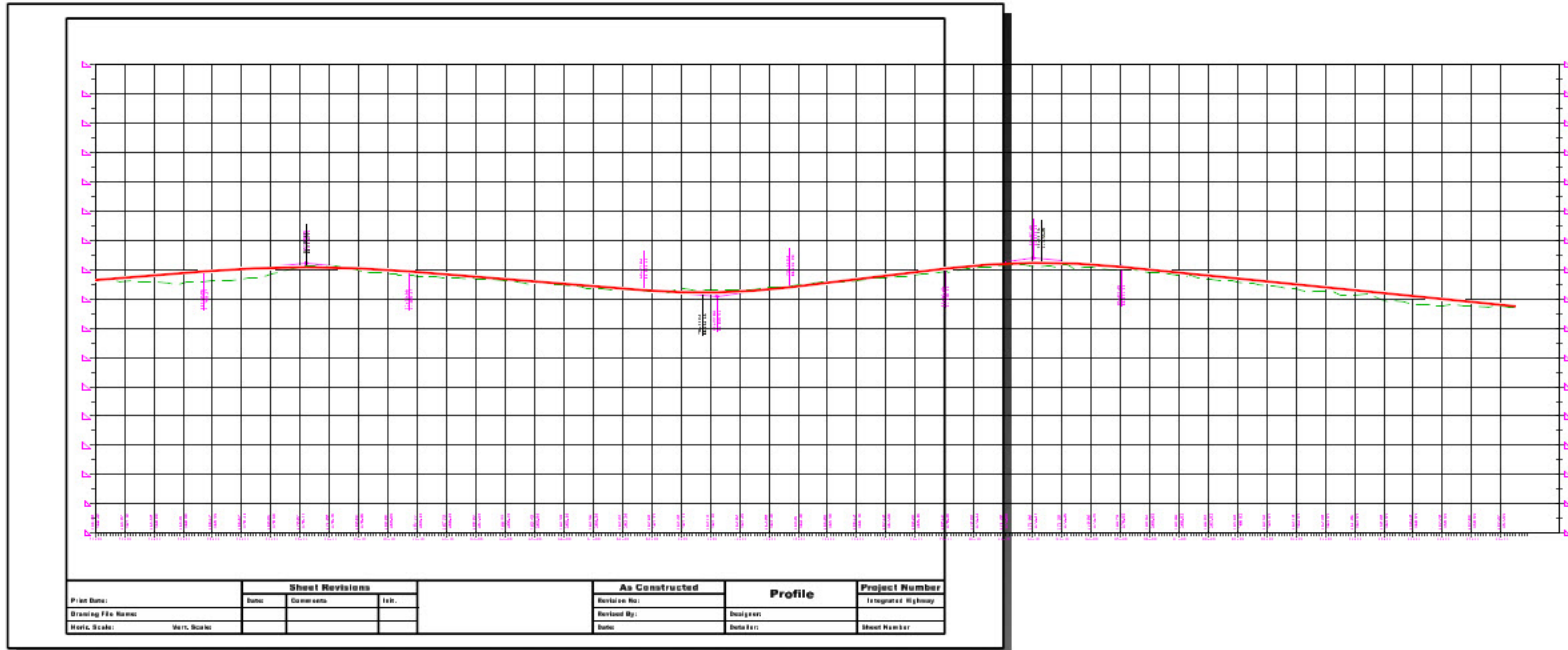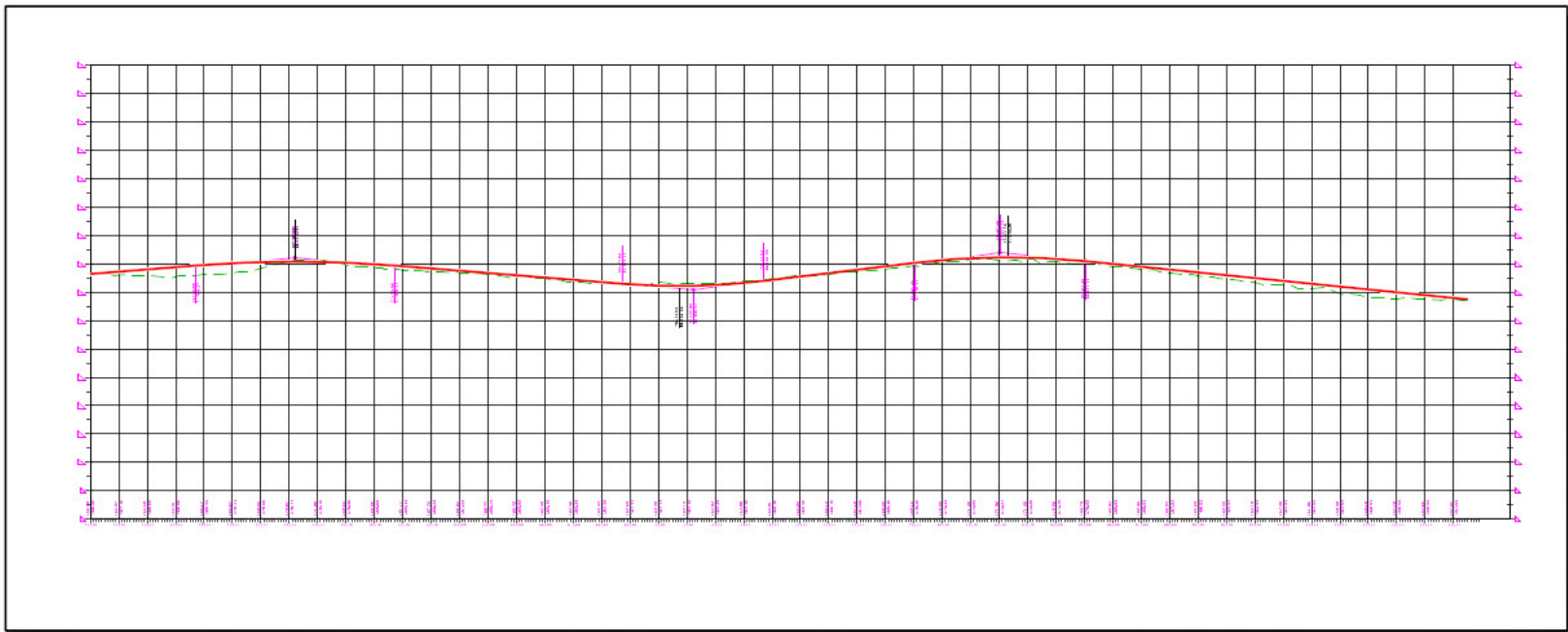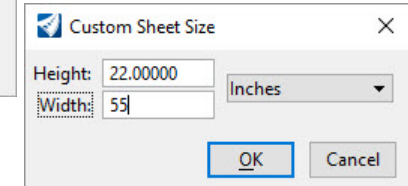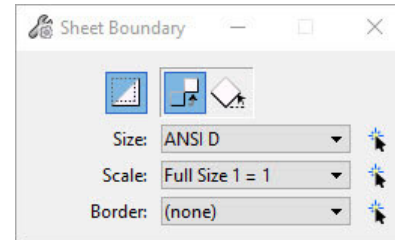

6. Delete the sheet border.

a. Select *Drawing > Modify > ***Delete** and delete the sheet border.

7. Adjust the Sheet Size.

    a. Select *Drawing Production > Sheet Boundary > **Sheet Boundary***.

    b. Set the *Size* to **Custom**.

    c. Set the *Height* to **22"** *[594mm]*.

    d. Set the *Width* to **55"** *[1600mm]*.

    e. Click **OK**.

Exercise 4: Civil Annotation Labels

Description

In this exercise, you will learn how to annotate and place intelligent civil annotation labels in your drawings. You will learn how to place labels using the *Place Label* tool and you will also learn how to place labels with the *Civil Labeler* tool.

Skills Taught

- Place intelligent plan labels

- Adjust and edit labels

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Place Label Tool

The software includes an enhanced version of the MicroStation Place Label tool which can read civil object data such as curve information for arcs and spirals, alignment names, bearings, stations, 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.

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

- *Text Style* = format of the text (font, size, spacing, etc.)

- *Dimension Style* = format of the dimension (terminator arrow, leader lines, text orientation, etc.)

- *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 not *Sheet* models.

- Labels that need to be rotated to the sheet should 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.

- Profile and cross section labels must be placed in *Drawing* models.

1. Label the **London Rd.** alignment name.

   a. Open **_Plan and Profile Sheets.dgn** *[_Metric-Plan and Profile Sheets.dgn]*

   b. Use the *View Group* tool to select the **London Rd Plan and Profile - PP 1** *Drawing* model.

   c. Select *Drawing Production > Notes >* **Place Label**.

   d. Select the **Place a Label with a Leader** icon on the top of the *Place Label Settings* dialog.

   e. Set *Type* to **Cell**.

   Labels can be placed using Text Favorites or Cells. Generally you should always use the cell method. It allows the label to be predefined and stored in a cell library. It also allows labels to include graphics such as a frame box.

   f. Set the *Cell Name* to **_Lbl_Pln_Alignment_Name**.

   The label cells included in the delivered workspace all begin with _Lbl to so they are easy to find it the list. The next characters indicate if the label is for use on Plan, Profile, or Cross sections.

   If a Dimension Style with the same name as the cell exists it is automatically loaded.

   The *Label Rotation*, *Start At* and *Horizontal Attachment* options define how the label is rotated and placed.

   g. **Left click** on the *London Rd.* centerline geometry to identify the reference element.

   h. **Left click** to define the location of the terminator OR label depending on how the *Start At* option is set.

   When set to *Terminator*, this first click defines the location of the arrow end of the leader. When set to *Placement*, this first click defines the location of the label.

   i. **Left click** to place the label.

   Additional labels can be placed with more data points but they will all use the same reference element for the computed fields. Reset to select a new reference element.

The three icons along the bottom of the dialog 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 will scale when the Annotation Scale is adjusted.

▪ *Association to Element* - Labels created with this option enabled AND the *Relative Association to Element* option disabled will remain at their placement location when the reference element changes, only the leader line moves.

▪ *Relative Association to Element* - Labels created with this option enabled will remain at their relative location to the reference element when that reference element changes.

2. Label the Station and Offset for the edge of pavement geometry on the left and right side of the centerline at station **52+00**.

a. Select *Drawing Production > Notes > Place Label*.

▪ Select the **Place a Label with a Leader** icon.

▪ *Type* = **Cell**

▪ *Cell Name* = **_Lbl_Pln_Sta-Off**
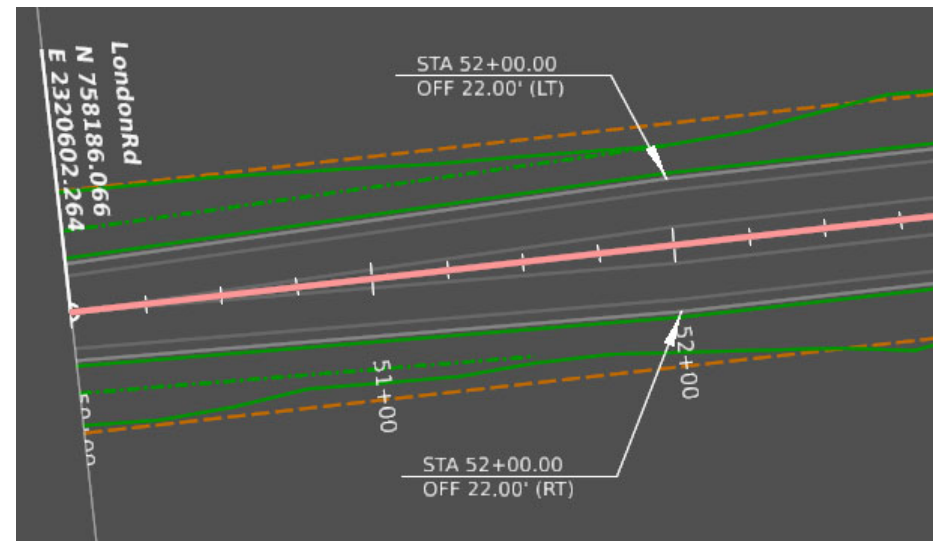
▪ *Label Rotation* = **Horizontal**

▪ *Start At* = **Terminator**

▪ *Horizontal Attachment* = **Auto**

▪ *Annotation Lock* = **Enabled**

▪ *Association to Element* = **Enabled**

▪ *Relative Association to Element* = **Enabled**

3. Label the Station and Offsets on the building located near station **52+00** on the right side of **London Rd.**

a. Select *Drawing Production > Notes >* **Place Label**.

- Select the **Place a Label with a Leader** icon.

- *Type* = **Cell**

- *Cell Name* = **_Lbl_Pln_Sta-Off**

- *Label Rotation* = **Horizontal**

- *Start At* = **Terminator**

- *Horizontal Attachment* = **Auto**

- *Annotation Lock* = **Enabled**

- *Association to Element* = **Enabled**

- *Relative Association to Element* = **Enabled**
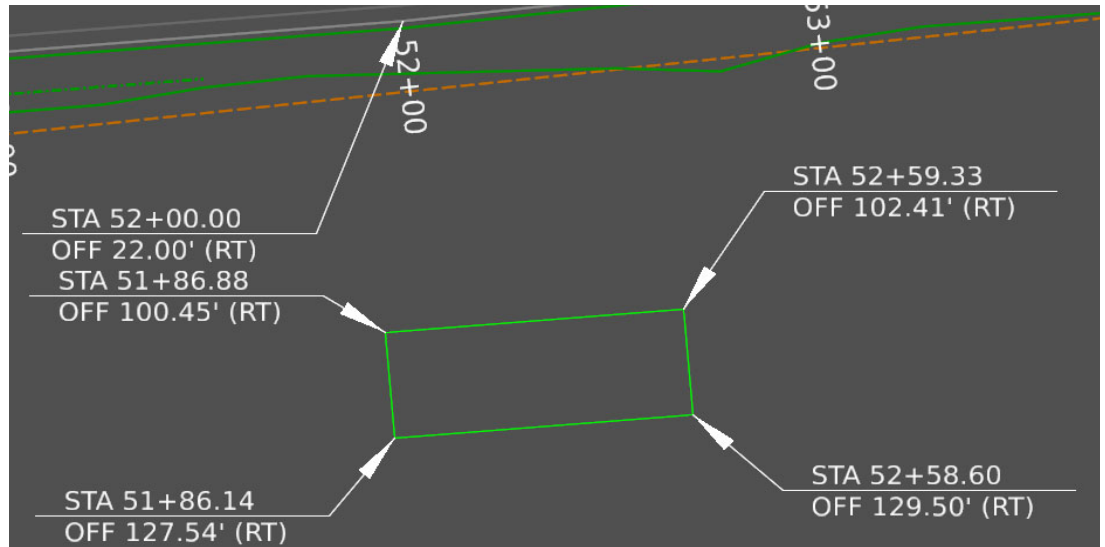
b. **Left click** on the *London Rd.* centerline geometry to identify the reference element.

c. **Snap** and **left click** on the north-west (assume north is up) corner of the green shape building above London Rd.

d. **Left click** to place the label.

4. Continue placing labels at the remaining corners of the building.

a. **Snap** and **left click** on the north-east corner of the green shape building above London Rd.

b. **Left click** to place the label.

c. **Snap** and **left click** on the south-west corner of the green shape building above London Rd.

d. **Left click** to place the label.

e. **Snap** and **left click** on the south-east corner of the green shape building above London Rd.

f. **Left click** to place the label.

Notice that additional labels can be placed in sequence as long as they use the same reference element for the computed fields. You must restart the command to select a new reference element.

5. Place Profile Elevations on the profile.

    a. Open the *Profile 1* Drawing Model.

    b. Using the *Place Label* tool, place one or two station/profile elevations on the profile. Use the *Cell Name:* **_Lbl_Prof_Sta-Elev** to place the labels.
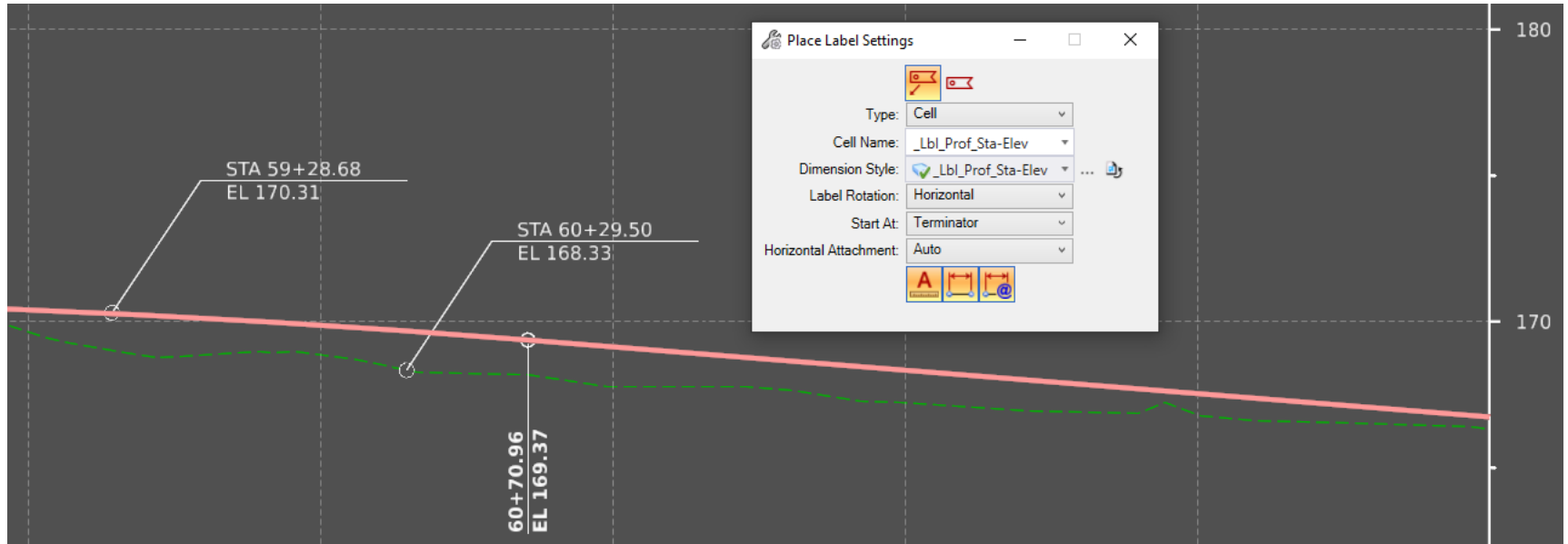

    c. Navigate back to the **PP 1** Sheet Model to review the plan and profile sheet.

Additional Information about Labels

Labels created in the civil products have three parts (*Leader*, *Text* and *Anchor Point*). Labels created in MicroStation only have the first two parts. The three parts of the labels are shown below.
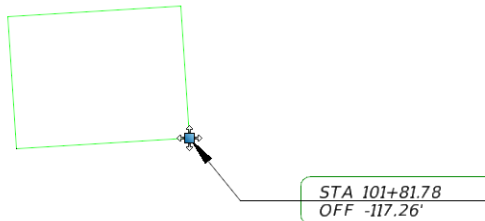
- *Leader* - Optional line and arrow connecting between the Text and the Anchor Point.
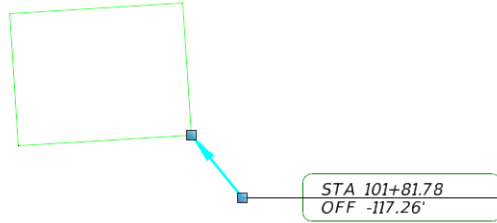

- *Text* - The label content which is made up of text, text fields, and graphics.
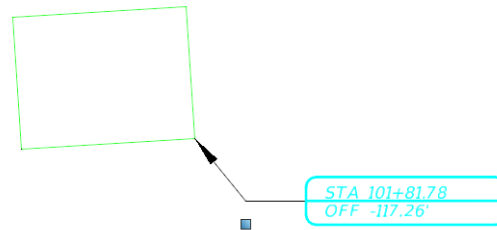
- *Anchor Point* - The point that is used to compute values in the fields.

**TIP**: Be careful because the end of the Leader and the Anchor Point are not connected. You can select and move each independently which may create a confusing label. In the following example the leader is pointed to the mid point of the building edge and the anchor point is at the north-east point. The result is the text in the label is for the north-east point, not the location the label is pointed to.
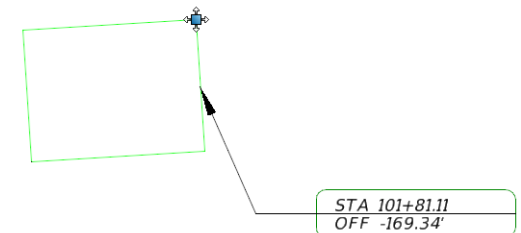
Civil Labeler Tool (Technology Preview)

The Civil Labeler tool provides extensive labeling capabilities made specifically for labeling civil data. The tool creates dynamic and intelligent labels that are easy to customize and can handle almost any label you would need. Label types are stored and managed in a user customizable **.xml** file.
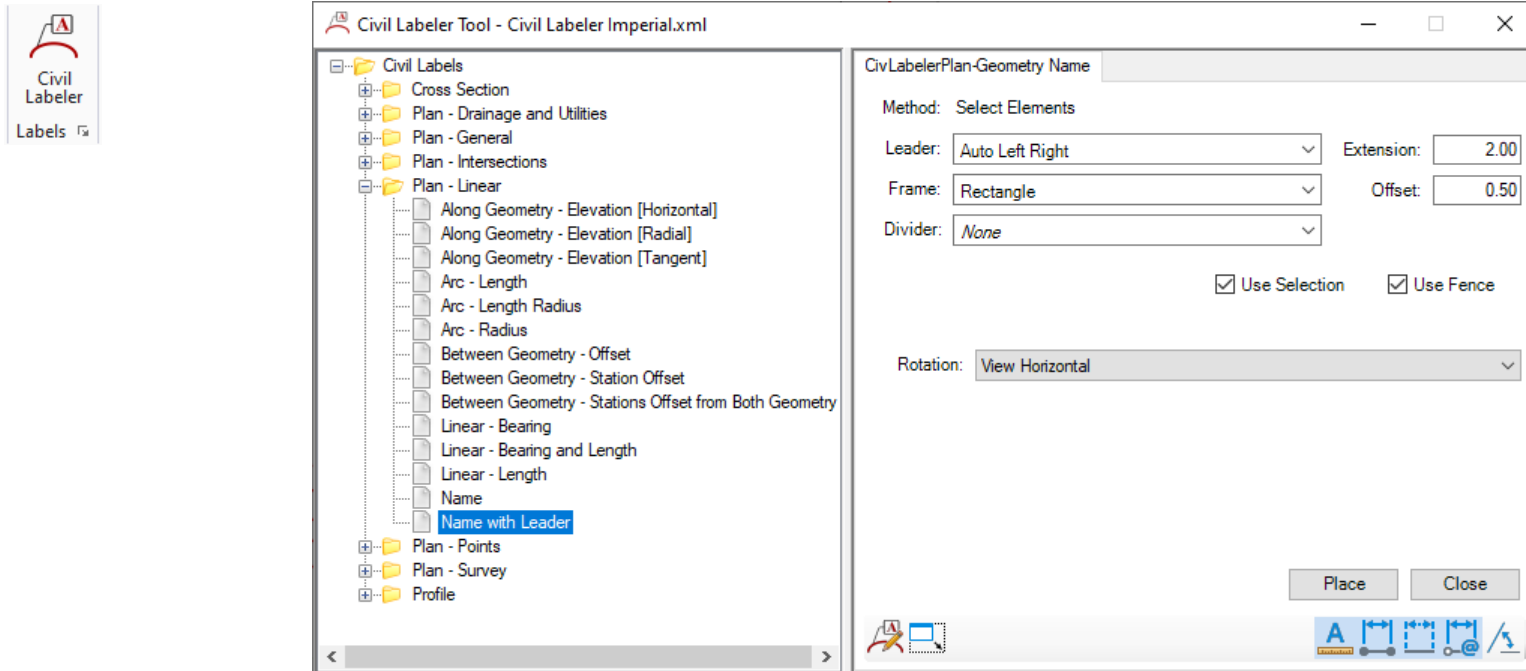
The panel on the left side of dialog contains folders with various types of Plan, Profile and Cross Section labels. The panel on the right side of the dialog contains the settings for each label.

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Place Labels with the Civil Labeler Tool

In this section, you will learn how to place labels using the civil labeler tool. It is a best practice to place labels in the Drawing Models after sheets have been created.

1. Label the **Church Rd.** alignment name.

   a. Use the *View Group* tool to select the **London Rd Plan and Profile - PP 1** *Drawing* model

   b. Select *Drawing Production > Labels >* **Civil Labeler**

   c. Expand the Civil Labels folder to *Civil Labels > Plan - Linear*

   d. Select the called **Name with Leader**. This label will place the name of the alignment with a rectangular frame and leader line.
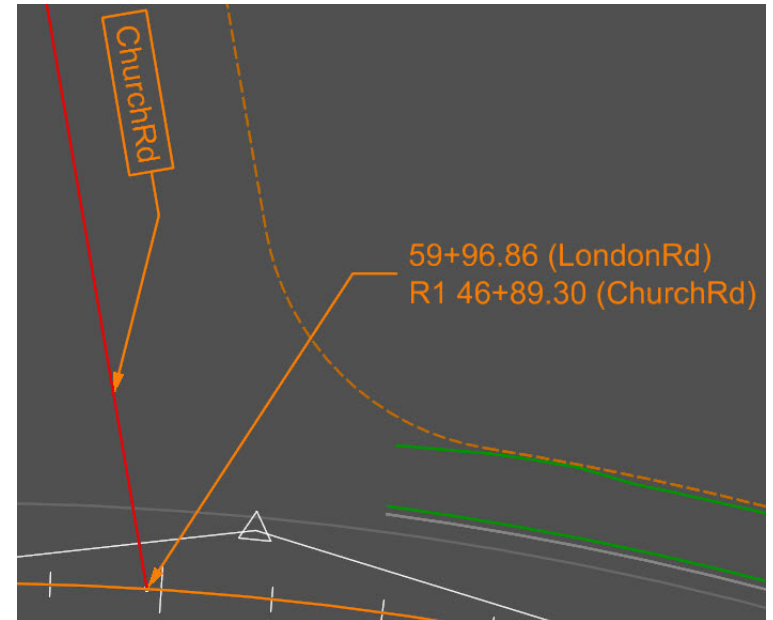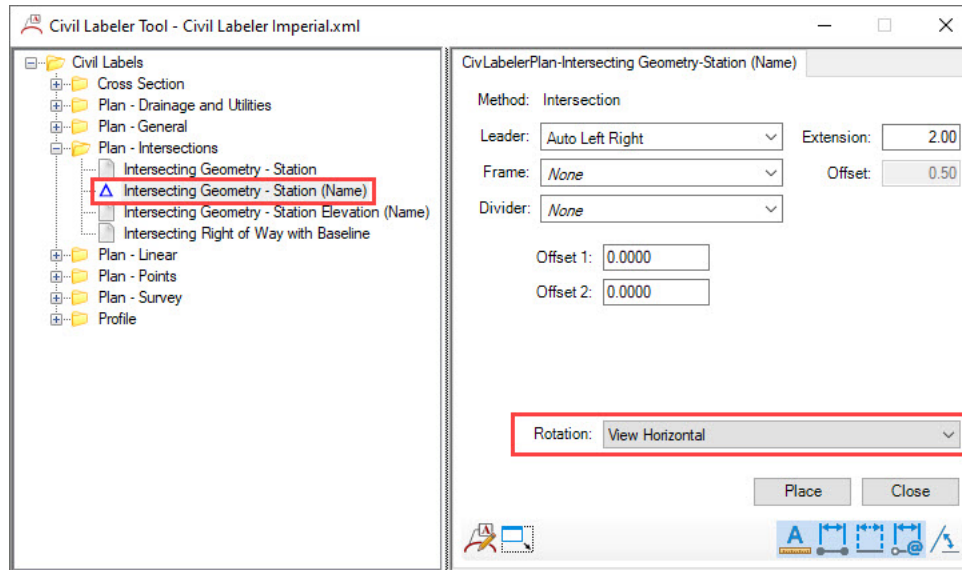
   e. Set the *Rotation* option to **Tangent**.
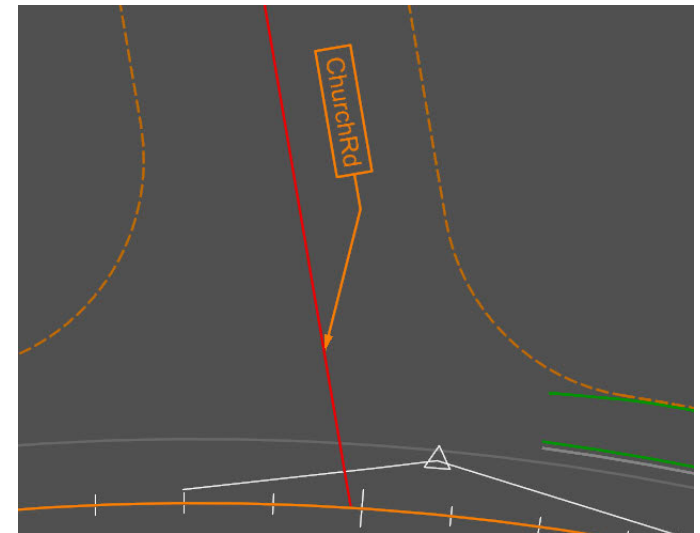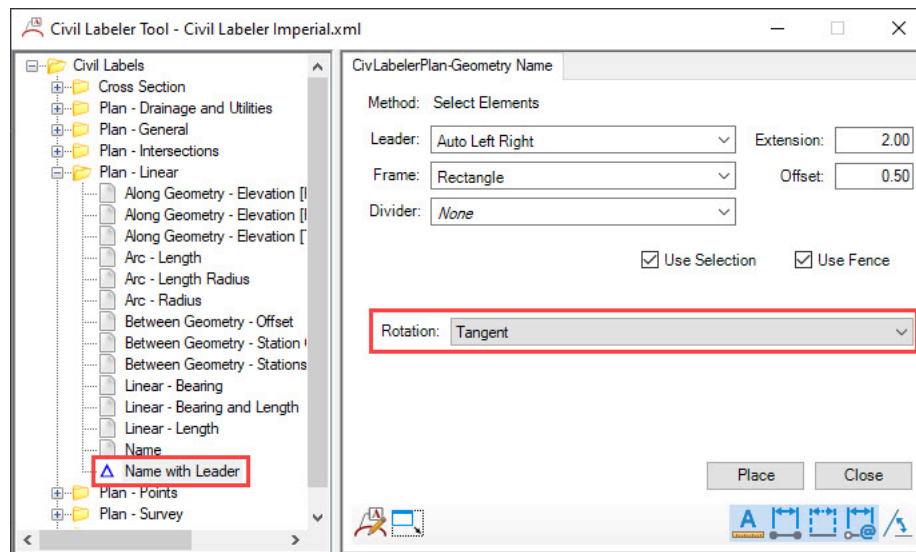
   f. Select **Place** and follow the prompts at the lower left corner of the screen.

   - *Identify Geometry*: Select the **Church Rd.** centerline geometry.

   - *Place Label*: Place the label anywhere above the **Church Rd.** centerline geometry.

2. Label the intersection point of **London Rd.** and **Church Rd.** with intersecting station and alignment name.

    a. Expand the *Civil Labels* folder to *Civil Labels > Plan - Intersections*

    b. Select the label called **Intersecting Geometry - Station (Name)**

    c. Set the *Rotation* option to **View Horizontal**

    d. Select **Place** and follow the prompts at the lower left corner of the screen.

        ▪ *Identify first intersecting geometry*: Select the **London Rd.** centerline geometry.

        ▪ *Identify second intersecting geometry*: Select the **Church Rd.** centerline geometry.

        ▪ *Place Label:* Place the label as shown in the image above.

3. Label the beginning of the project. Use the label called **Begin Project**.
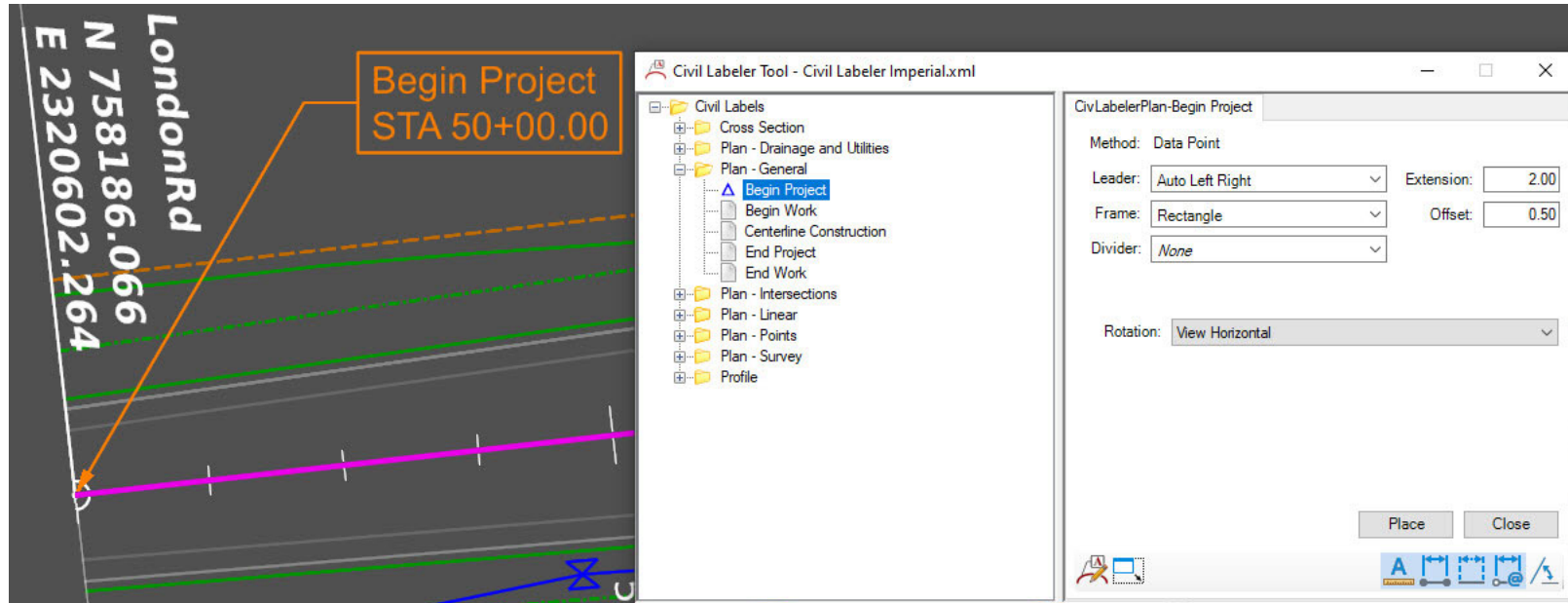
4. Experiment placing other types of labels such as **Station-Offset** and **Station-Offset-Elevation**. Also, try labeling in the profile drawing model as well.

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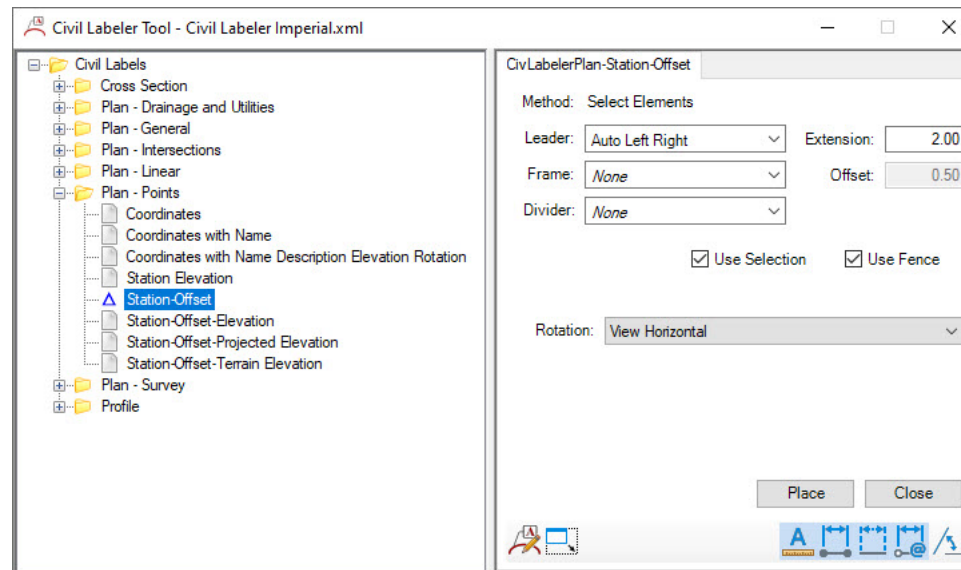
Additional Information about the Civil Labeler Tool

A label is made up of 5 parts:

- *Anchor Point* - Origin point of the label used for computing text.

- *Leader* (optional) - 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.

- *Frame* (optional) - Shape that can be placed around the civil label.

- *Divider* (optional) - Divider that can be used to split text within a civil label.

59+96.86 (LondonRd)
R1 46+89.30 (ChurchRd)

Frame   Text   Divider

Leader

Anchor Point
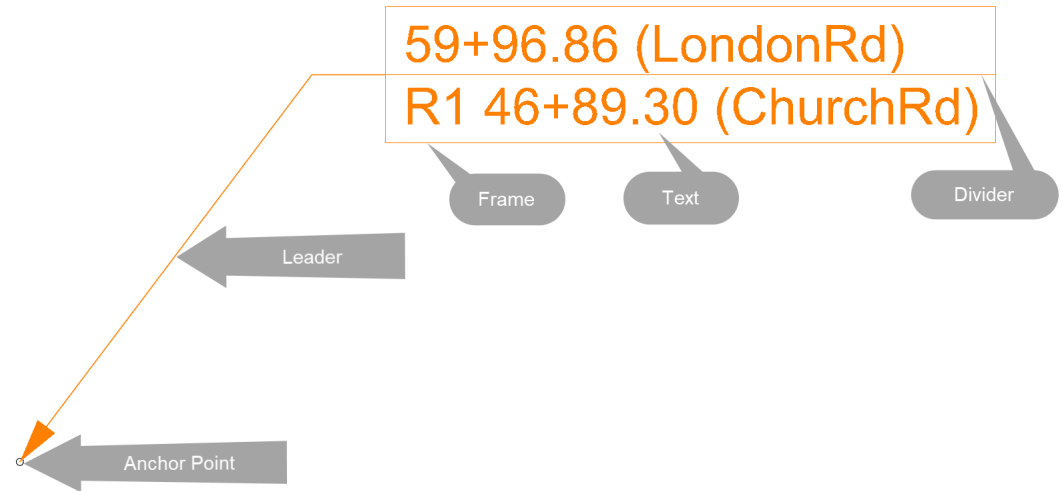
The five icons at the bottom right of the dialog define how the label behaves when the drawing scale is changed or when the referenced element changes.

- *Annotation Scale* - Labels created with this option enabled will scale when the *Annotation Scale* is adjusted.

- *Element Association* - Labels created with this option enabled AND the *Relative Association* option disabled will remain at their placement location when the reference element changes, only the leader line moves.

- *Annotation Association* - Labels created with this option enabled AND Element Association enabled will make the annotation associated to the element when the reference element changes. For example, if the reference element moves the label text will update.

- *Relative Association* - Labels created with this option enabled will remain at their relative location to the reference element when that reference element changes.

- *Rotational Association* - Labels created with this option enabled will ensure that if a reference element changes the label will maintain its relative rotation.

- The icon on the far lower left activates the **Civil Label Manager** which allows you to create new labels.

- The icon on the inner lower left activates *Collapse Mode*. When enabled the *Civil Labeler Tool* will collapse automatically after selecting the **Place** button.

Skills Assessment

The questions below will test your retention of the skills covered in this course.

---

1. Which of the following types of models are used when plan sheets are created.

   a. Design Models

   b. Details Models

   c. Drawing Models

   d. Sheet Models

   e. Layout Models

2. The Named Boundary...

   a. Defines the extent of what is displayed on the sheet.

   b. Defines the plan or profile view that is displayed in the Drawing Model and Sheet Model.

   c. Can be thought of as a shape used to clip the reference files.

   d. All of the above.

3. The drawing seed defines default values and other parameters required to create sheets. Three drawing seeds for plan drawings are included in the default workspace.

   a. True

   b. False

4. Labels should be placed in Drawing Models.

   a. True

   b. False

Skills Assessment - Answers

The answers to the skills assessment questions are highlighted below.

---

1. Which of the following types of models are used when plan sheets are created.

   a. **Design Models**

   b. Details Models

   c. **Drawing Models**

   d. **Sheet Models**

   a. Layout Models

2. The Named Boundary...

   a. Defines the extent of what is displayed on the sheet.

   b. Defines the plan or profile view that is displayed in the Drawing Model and Sheet Model.

   c. Can be thought of as a shape used to clip the reference files.

   d. **All of the above.**

3. The drawing seed defines default values and other parameters required to create sheets. Three drawing seeds for plan and profile drawings are included in the default training and examples workspace.

   a. **True**

   b. False

4. Labels should be placed in Drawing Models.

   a. **True**

   b. False

Summary

In this course, you learned how to create and annotate plan and profile sheets. You learned how to create and edit Named Boundaries that were used to generate various plan and profile sheets. You also learned about drawing models and sheet models that are used during the sheet creation process. And lastly, you learned how to add individual annotations to label specific location coordinates, station-offset values, elevations, and more.

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