OpenRoads Designer User Manual

U.S. Department of Transportation
Federal Highway Administration

Chapter 14

PLAN SHEET PRODUCTION

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Chapter 14 Plan Sheet Production

This chapter covers Plan Sheets creation. Plan Sheets are printed to PDF and combined with other Plan Sheets to create a Plan Set. ***NOTE:*** Production of Road Cross Section Sheets are discussed in *Chapter 16 – Cross Sections*.

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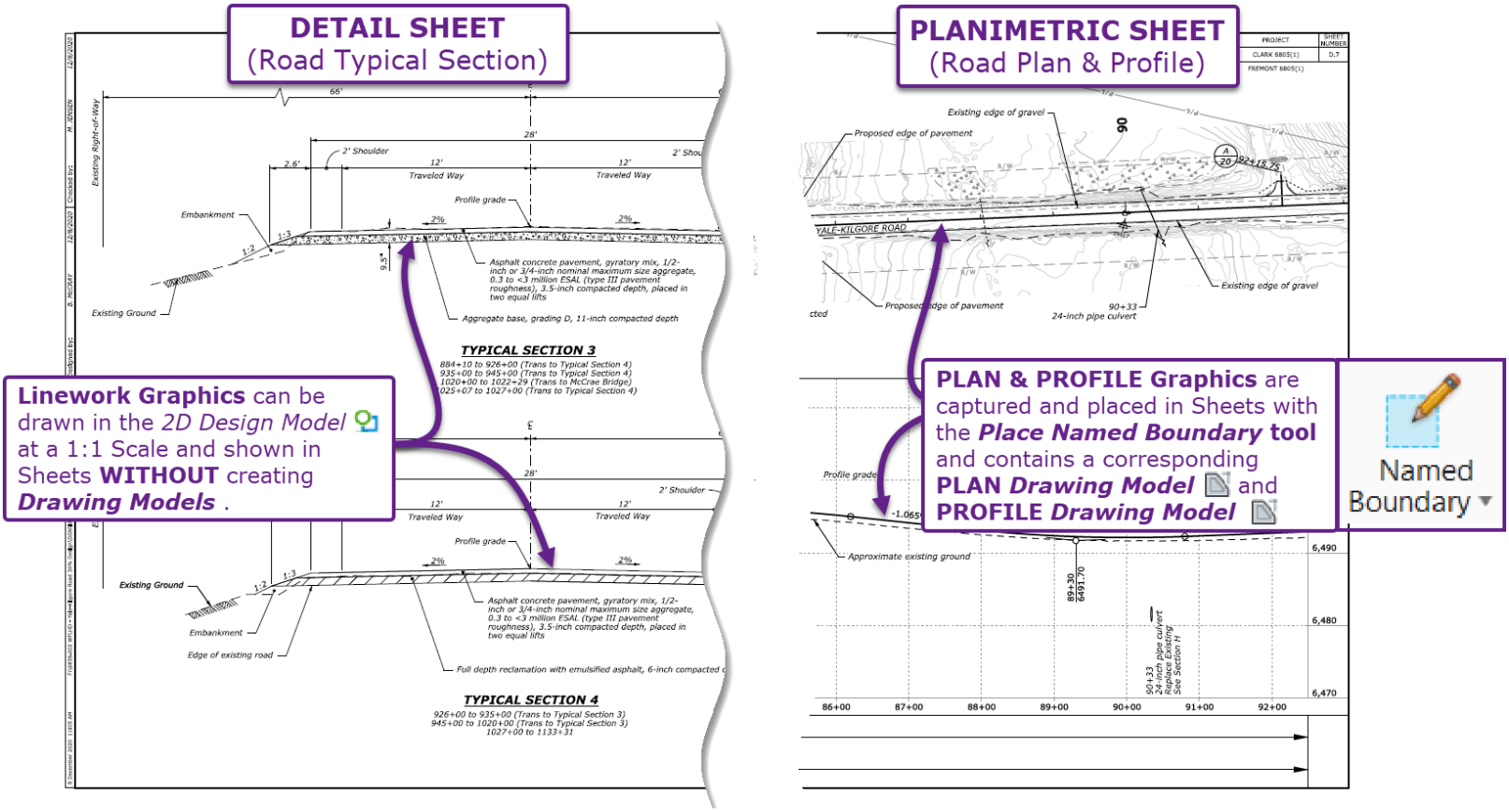
14A – INTRODUCTION TO PLAN SHEET PRODUCTION

In general, all sheets that comprise a typical FLH Plan Set can be classified into two broad categories – **Planimetric Sheets** and **Detail Sheets**. In the ORD Software, the sheet creation workflows and techniques are different depending on the category.

Planimetric Sheets: Planimetric Sheets show plan and/or profile information that is geo-referenced, meaning drawn in the "real-world" location (usually directly atop the Survey Map). Planimetric sheets will always show a "Plan-view" and/or a Profile. Examples of Planimetric Sheets include Road Plan and Profile Sheets, Erosion Control Sheets, Culvert Plan/Profile Sheets. ***IMPORTANT:*** Planimetric Sheets are created with the *Place Named Boundary* tool and typically require the creation of *Drawing Models*. The creation of Planimetric Sheets is shown in *14B - Creating Road Plan & Profile Sheets* and *14C – Creation of Other Planimetric Sheet Types.*

Detail Sheets: Detail Sheets show information that is NOT geo-referenced. Examples of Detail Sheets include Road Typical Section Sheets, Title Sheets, FLH Standard Details, and custom Project Detail Sheets, such as a curb and gutter detail. In general, Detail Sheets are used to show text elements, Excel tables, and Linework graphics that are drawn in the *2D Design Model*, but are placed outside the limits of the Survey Map. The workflow for creating Detail Sheets is more expediated than Planimetric Sheets because Detail Sheets do NOT require the creation of *Drawing Models*. See *14D – Creation of Detail Sheets – Workflow*.

NOTE: Production of Road Cross Section Sheets are discussed in *Chapter 16 – Cross Sections*. This chapter discusses the creation of sheets for use in a FLH Plan Set.



14A.1 Sheets Models, Drawing Models, and Named Boundaries

Up to this chapter, all tasks have been performed in either the *2D Design Model*, *3D Design Model*, or a *Profile Model*.

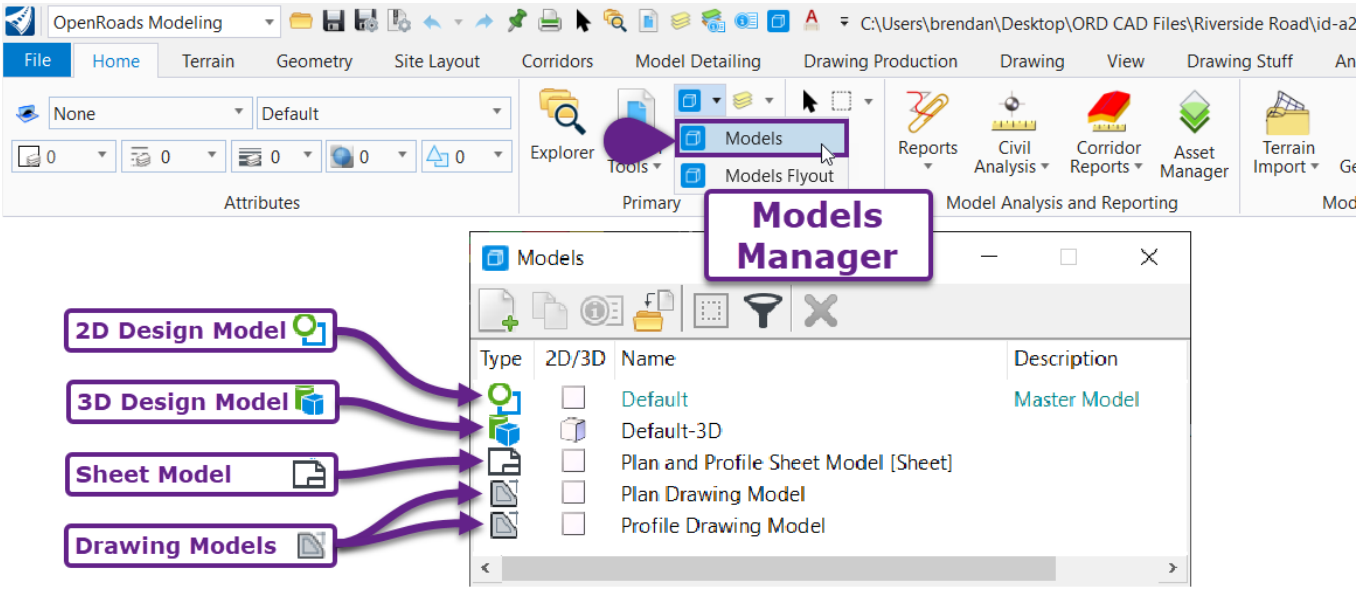
For Plan Sheet production, there are two additional Model types that User will interact with: *Drawing Models* and the *Sheet Models*. See the next page for a visualization of how the various *Model* types and *Named Boundary* elements interact.

> ***Drawing Model*:** A clipped portion of the *2D Design Model*, *3D Design Model*, or *Profile Model*. The clipping shape for a *Drawing Model* is an enclosed shape called a ***Named Boundary*** element. There are three different types of *Drawing Models*:
>
> > **PLAN *Drawing Models*:** A clipped portion of the *2D Design Model* used to show alignments, mapping and other planimetric features.
> >
> > **PROFILE *Drawing Models*:** A clipped portion of a Profile Model used to show Profile graphics. The Profile Grid is created and annotated in the PROFILE *Drawing Model*
> >
> > **CROSS SECTION *Drawing Models*:** A clipped portion or "slice" of the *3D Design Model* used primarily to show Road Cross Sections. See *Chapter 16 - Cross Section Production*.
>
> ***Sheet Model*:** A Model that represents a single sheet in a Plan Set. To show mapping, corridor, and linework graphics, the *2D Design Model* and *Drawing Models* are referenced into the *Sheet Model*. Text elements, such as Notes, callouts, and dimensions, are typically created and placed in the *Sheet Model*. See *Chapter 15 – Stationing, Annotation, and Dimensioning*. Similarly, the FLH Sheet Border cell is placed in the *Sheet Model*.

In Plan Sheet production, the User will place ***Named Boundary*** elements to create *Drawing Models*.

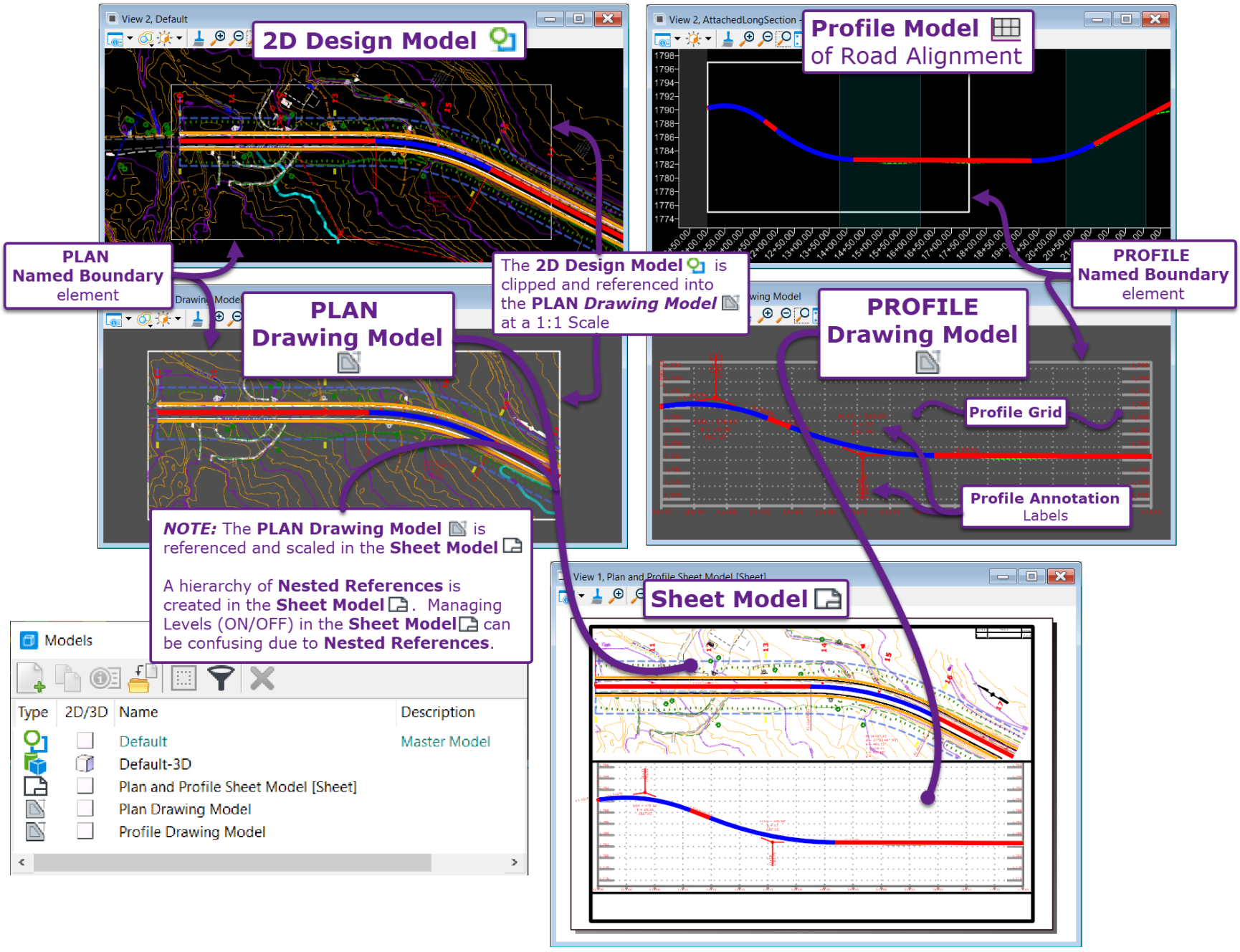
> ***Named Boundary:*** An enclosed element that can be placed in the *2D Design Model*, *3D Design Model*, or the *Profile Model*. Each *Named Boundary* element corresponds to a particular *Drawing Model*. There are many types of *Named Boundaries* used for different models and situations. See *14A.3.a Place Named Boundary tool – Overview*.

TIP: Use the **Models Manager**, to identify Model types, which are identified by the adjacent icon.



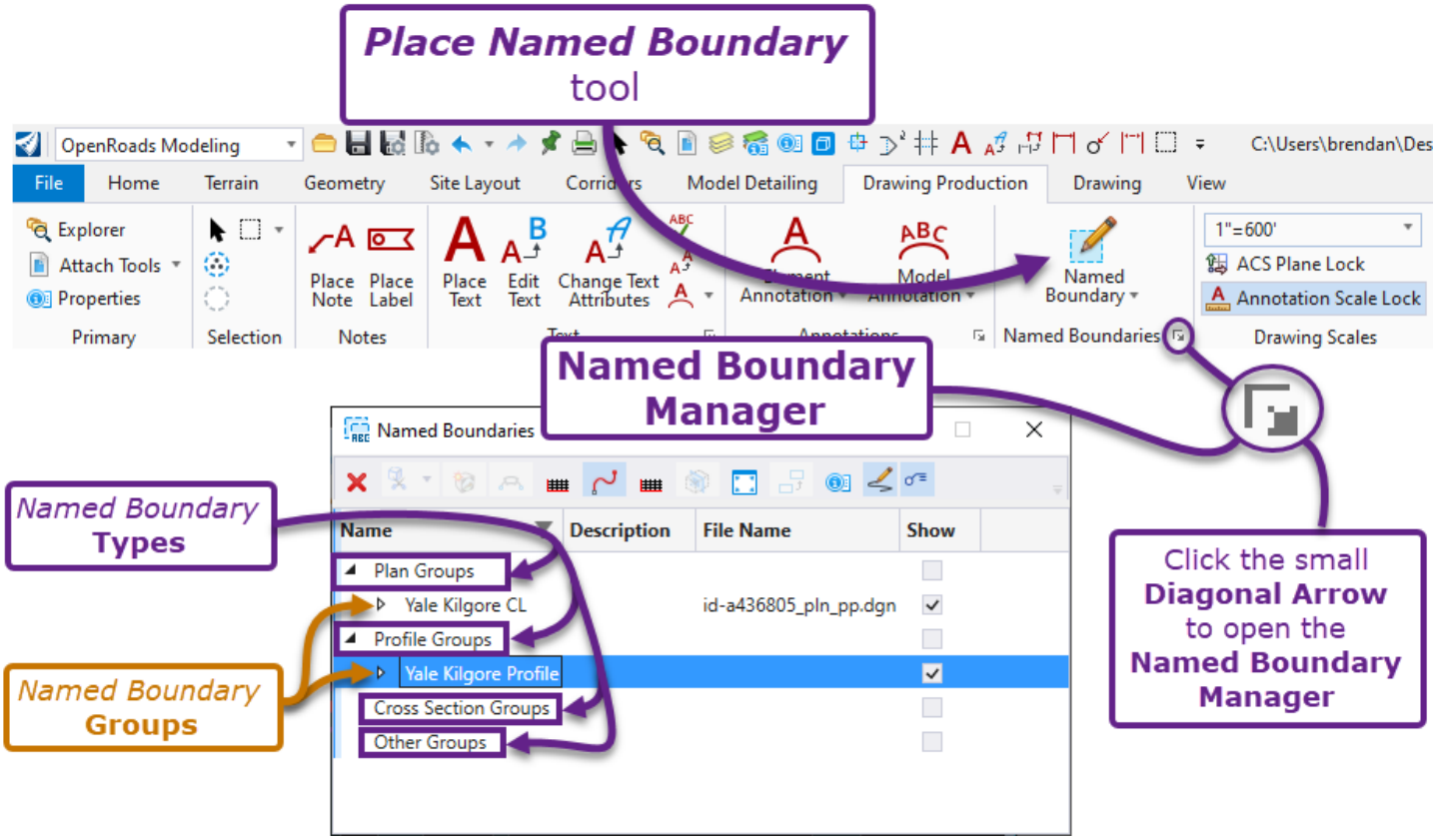
14A.2 Relationship of Models Types Used in Plan and Profile Sheet Production

The *Design Models* (i.e., 2D and Profile) are displayed in *Drawing Models* through automated **REFERENCING** and **CLIPPING** operations that occur when *Named Boundary* elements are placed. Similarly, *Drawing Models* are **REFERENCED** into the *Sheet Model*.



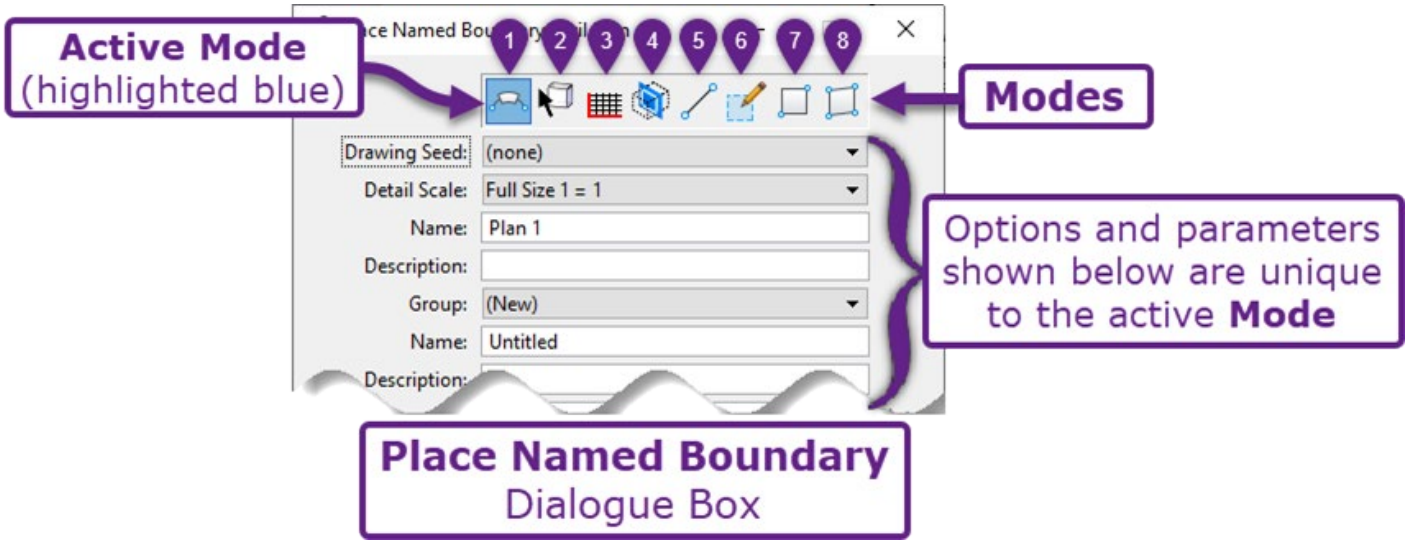
14A.3 Place Named Boundary tool and the Named Boundary Manager

The *Place Named Boundary* tool is primarily used to create *Named Boundary* elements but can directly create *Drawing Models* and *Sheet Models* if the *Create Drawing* box is CHECKED. Conventionally, *Drawing Models* and *Sheet Models* are created from the *Named Boundary Manager.* In the *Named Boundary Manager,* all *Named Boundary* elements are organized by Type and Group.



14A.3.a Place Named Boundary tool – Overview

The *Place Named Boundary* tool has several *Modes* which correspond to the **Type** of *Named Boundary* element that will be created. The *Modes* also correspond to which **Model** that the *Named Boundary* elements can be placed in. The first thing to do when the *Place Named Boundary* tool is initially opened, is to set the proper *Mode*.



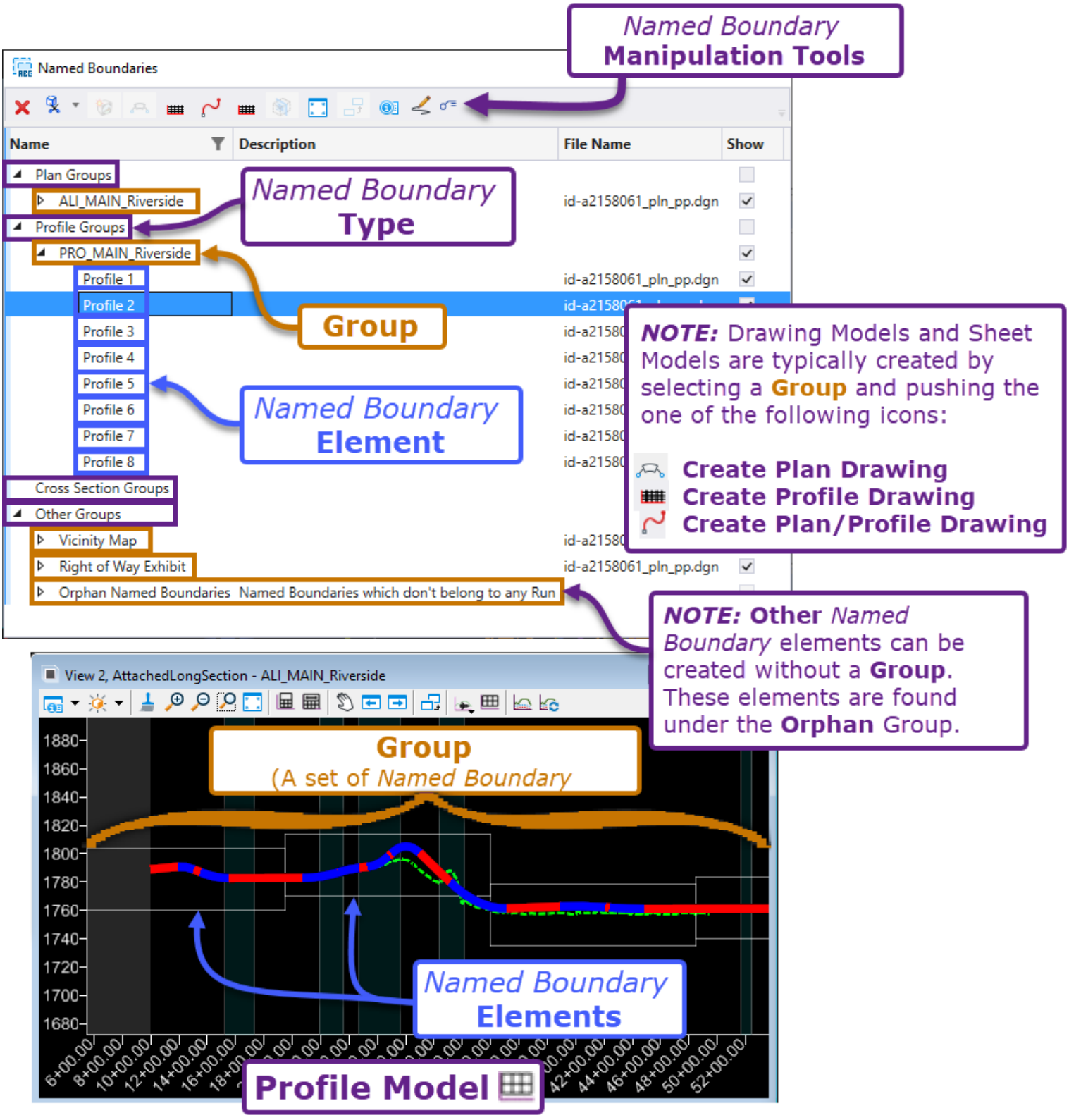
Place Named Boundary MODES			
	Mode:		Description:
1		**Civil Plan**	Creates PLAN *Named Boundary* elements in the *2D Design Model*. This Mode requires the User to select an Alignment. The Plan *Named Boundaries* are automatically centered on the selected Alignment. This Mode is commonly used in conjunction with the Civil Profile Mode to create Road Plan & Profile Sheets, Wall Plan & Profile Sheets, or Culvert Plan & Profile Sheets. For a detailed workflow using this Mode to create Road Plan & Profile sheets, see *14B – Creating Road Plan & Profile Sheets – Workflow*. This Mode is also used to create Plan-Plan sheets and Full-Page Plan sheets. See *14C.1 Plan-Plan Sheets and Full-Page Plan Sheets*.
2		**Civil Plan By Element**	This Mode provides an alternate workflow for creating PLAN *Named Boundary* elements. In the *2D Design Model*, the User will **manually draw** the boundary shape for the PLAN *Named Boundary* element. This Mode is useful because it allows any enclosed shape (such as a SmartLine) to be converted to a PLAN *Named Boundary* element. For a detailed workflow using this Mode, see *14C.3 Place Multiple Approach Road Plan & Profiles on the Same Sheet*.
3		**Civil Profile**	Creates PROFILE *Named Boundary* elements in a *Profile Model*. This option has two *Methods* for placement of PROFILE *Named Boundaries:* the ***From Plan Group*** method and the ***Station Limits*** method. If the ***From Plan Group*** **Method** is used, then the length and position of each PROFILE *Named Boundary* is automatically coordinated with the length of the corresponding PLAN *Named Boundary*. An example of the *From Plan Group* Method is shown in *14B – Creating Road Plan & Profile Sheets – Workflow* and *14C.3 Place Multiple Approach Road Plan & Profiles on the Same Sheet*. If the ***Station Limits*** **Method** is used, then the User manually specifies the Length and Start/End Station for the PROFILE *Named Boundary* element. An example of the *Station Limits* Method is shown in *14C.4 Plan and Profile Sheets for Culverts, MSE Walls, and Bridges*.
4		**Civil Cross Section**	Creates CROSS SECTION *Named Boundary* elements in the *3D Design Model*. This MODE is intended for Road Cross Section and NOT Culvert Cross Sections. See *Chapter 16 - Cross Section Production*.
5		**Civil Cross Section by 2 Points**	Although this Mode is operated from the *2D Design Model*, it will create a single CROSS SECTION *Named Boundary* element in the *3D Design Model*. This Mode works by selecting an Alignment, then clicking two points to define the CROSS SECTION *Named Boundary* length. This Mode could be used to quickly create a Culvert cross section. However, a corresponding PLAN view is NOT additionally created. The recommended Culvert Plan and Profile Sheet Production Workflow is shown in *14C.4 Plan and Profile Sheets for Culverts, MSE Walls, and Bridges*.

Place Named Boundary MODES			
	Mode:		Description:
6		**From Drawing Boundary**	Creates a Plan view from a pre-defined *Named Boundary* shape. Differing from the *Civil Plan* Mode, this *Mode* does not require an Alignment, which means the User can place the *Named Boundary* in any location. In the *2D Design Model*, the *Named Boundary* will change dimensions depending on the specified Drawing Scale, such that it fits perfectly into the allotted space in the *Sheet Model*. The resulting *Named Boundary* element is placed in the *Other Group* within the **Named Boundary Manager.**
7		**By 2 Points**	This Mode is used to quickly create a custom Named Boundary frame for showing a Plan view. Additionally, this Mode can be used to show Linework from the *2D Design Model* for a Detail Sheet. In the *2D Design Model*, the User will click on two locations to define the rectangular shape of the *Named Boundary* element to be created. An example of the *By 2 Points* method is shown in *14D – Creation of Detail Sheets – Workflow*. The Drawing Seeds used for this Mode are drawn from a different set from those used in the **Civil Plan** Mode. ***WARNING:*** Currently, Drawing Seeds have NOT been setup for this Mode in the FLH WorkSpace. The User will have to manually set the Drawing Scale (shown in *14D.6 Reference the Named Boundary into the Sheet Model*) and create the *Sheet Model* - which is shown in *14D.4 Manually Create the Sheet Model*. The resulting *Named Boundary* element is placed in the *Other Group* within the **Named Boundary Manager.**
8		**By Polygon**	This Mode operates identically to the *By 2 Points* mode – with the difference being the User can create irregular shaped *Named Boundary* elements. The resulting *Named Boundary* element is placed in the *Other Group* within the **Named Boundary Manager.**

14A.3.b Named Boundary Manager - Overview

The **Named Boundary Manager** is where all previously-created *Named Boundary* elements are shown and organized. Typically, *Drawing Models* and *Sheet Models* are created from this toolbox. See the next page for an explanation of the different Tools found at the top of the Manager.

NOTE: The "Other Groups" drop-down is designated for *Named Boundary* elements created from the following **Modes:** *From Drawing Boundary, By 2 Points*, and the *By Polygon*.



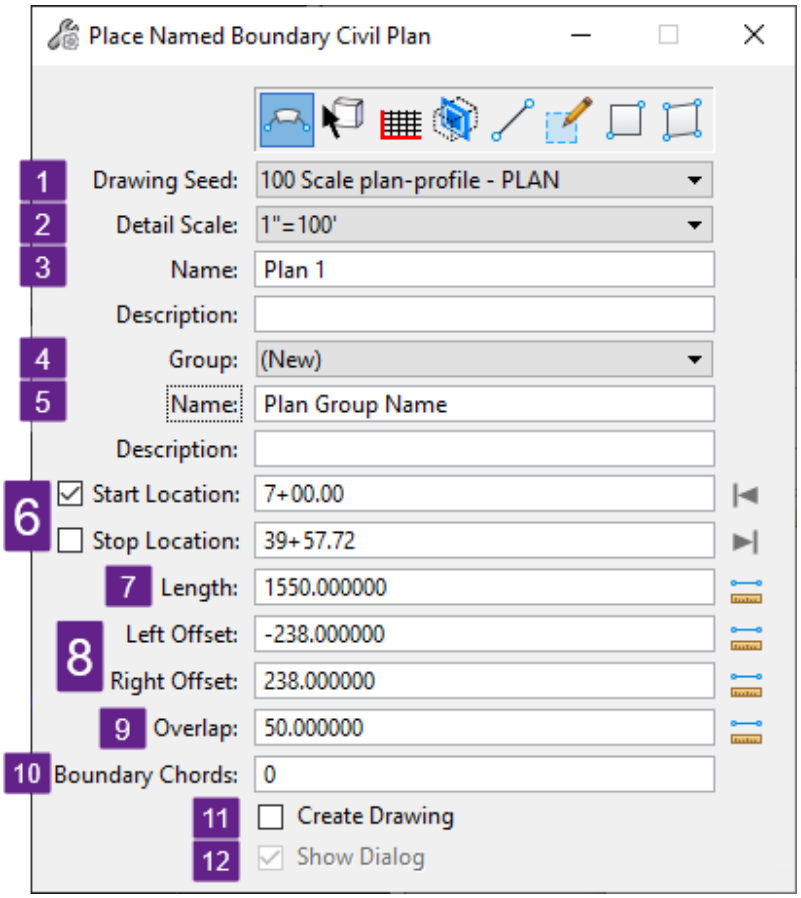
Groups: A Group is simply a set of related *Named Boundary* elements. Every *Named Boundary* element is assigned to a Group in creation of the element. Groups are created and assigned in the *Place Named Boundary* Dialogue Box. Before creation of *Named Boundaries*, the ORD File will not contain any Groups. The first Group is automatically created with the first run of the *Place Named Boundary* tool.

WARNING: When creating *Named Boundary* elements, ensure that the correct **Group** is assigned. The **Group** for a *Named Boundary* element can NOT be re-assigned after creation. Also, the **Name** assigned to a **Group** CANNOT be changed after initial creation

Named Boundary Manager – Manipulation Tools		
Manipulation Tool:		**Description:**
	**Delete**	Deletes a single *Named Boundary* element or an entire Group.
	**As Clip Volume**	Current Station Limits for the PROFILE *Named Boundary* element.
	**As Fence**	Current Elevation of the top and bottom of the PROFILE *Named Boundary*.
	**As Clip Mask**	The incremental vertical distance in which the *Named Boundary* will be moved.
	**Create Drawing**	Creates a *Sheet Model* from a *Named Boundary* that belongs to the "Other Group". *Named Boundaries* created from the **From Drawing Boundary**, **By 2 Points**, and **By Polygon** modes are placed in the "Other Group".
	**Create Plan Drawing**	Creates only PLAN *Drawing Models* and *Sheet Models*. The resulting *Sheet Models* will ONLY show PLAN graphics.
	**Create Profile Drawing**	Creates only PROFILE *Drawing Models* and *Sheet Models*. The resulting *Sheet Models* will ONLY show PROFILE graphics.
	**Create Plan/Profile Drawing**	Creates both PLAN and PROFILE *Drawing Models*. The resulting *Sheet Models* will show both PLAN and PROFILE graphics.
	**Create Alternate Plan Profile Drawing**	Creates a set of sheets that alternates between Plan Sheets and Profile Sheets. Alternating Plan/Profile sheets are NOT used in a typical FLH Plan Set.
	**Create Cross Section Drawing**	Creates a set of Cross Section *Drawing Models* and *Sheet Models*.
	**Fit to Named Boundary**	The selected (highlighted) *Named Boundary* will be centered and zoomed to in the active *View*.
	**Copy Named Boundary**	Creates a Copy of Named Boundary.
	**Properties**	Opens the Properties Box for the selected *Named Boundary* or Group.
	**Show to Create Drawing Dialog**	If this option is toggled ON, then the User will be prompted with Dialog options pertaining to Model Annotations and Drawing Scales. It is recommended that this option is always toggled ON when creating Sheets.
	**Annotate Plan Drawing Models**	If this option is toggled, then the Alignment will be Annotated within the *Drawing Model*. In other words, Stationing ticks and labels will be created in the *Drawing Model*. If the Alignment has been Annotated in a different location (i.e., in the _ALI.dgn), then duplicate sets of Annotations will be shown *Sheet Models*.

14A.3.c Plan Named Boundary Options

This section explains various options and parameters found in the ***Civil Plan*** mode of the *Place Named Boundary* dialogue box.



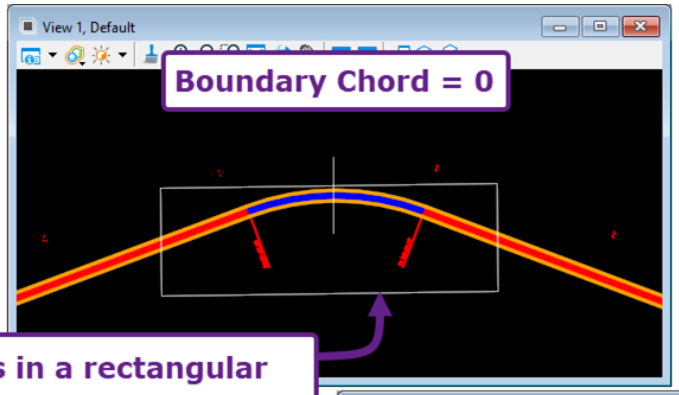
Civil Plan Dialogue Options		
Dialogue Option:		**Description:**
1	**Drawing Seed**	*Drawing Seeds* are pre-configured Civil Plan options that correlate with a particular Drawing Scale and sheet type. The *Drawing Seeds* listed in this drop-down have been created by FLH for standard design situations and scales. For example, *Drawing Seeds* that end in "…plan-profile – PLAN" are used to create Plan & Profile Sheets.
2	**Detail Scale**	The *Detail Scale* is automatically set by the *Drawing Seed*. ***WARNING:*** The User should never need to change this parameter because it is automatically set when the *Drawing Seed* is selected.
3	**Name**	Name to be given to the *Named Boundary* element. When multiple *Named Boundary* elements are created, the Name will automatically increment for succeeding *Named Boundary* elements.
4	**(Plan) Group**	A **Group** is a set of related *Named Boundary* elements. When the *Place Named Boundary* tool is used ONCE, then all *Named Boundary* elements created will be assigned to the specified the **Group**. If additional *Named Boundary* elements need to be created, they should be assigned to the previously-created **Group**.
5	**(Plan Group) Name**	If *(New)* is displayed in the **Group** drop-down, then after *Named Boundary* creation, a **Group** will be created with the Name shown in this box.

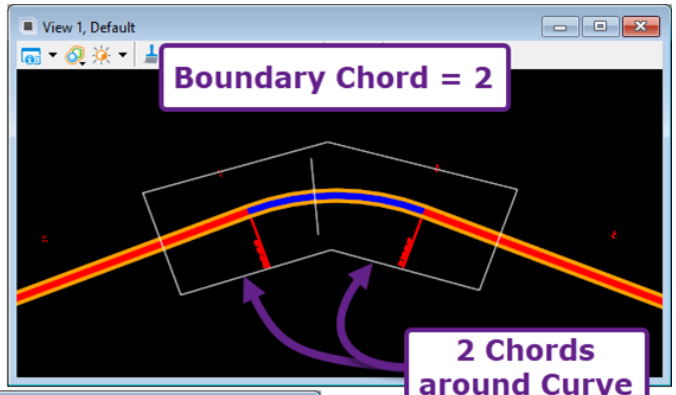
Civil Plan Dialogue Options		
Dialogue Option:		**Description:**
6	**Start/Stop Location**	Specifies the start and end station for placement of PLAN *Named Boundary* elements. Check the adjacent box to **lock** Start/Stop Locations. ***NOTE:*** If the Start and End Location exceeds the **Length** value, then multiple PLAN *Named Boundary* elements will be created. ***TIP:*** To create blank space for the first sheet of Road Plan & Profile Plans, the User can key-in a **Start Location** station value that is less than the start station of the Alignment. This blank space is generally used to show Utility contact information and the BEGIN PROJECT information.
7	**Length**	Specifies the *overall* Length of each *Named Boundary* element to be created. ***NOTE:*** This value is automatically set by the **Drawing Seed** so that the resulting *Named Boundary* elements are the correct **Length**. The **Length** value also includes **Overlap** distance. The resulting PROFILE Grid length is actually the **Length** minus the **Overlap**. For example, a **Length** of 1550 feet with an **Overlap** of 50 feet will correspond to a PROFILE length of 1500 feet. See *14C – Creating Road Plan & Profile Sheets – Workflow*.
8	**Left/Right Offset**	The **Left/Right Offset** set the total width of the *Named Boundary* elements. The total width of the *Named Boundary* element is the (absolute value of the) **Left Offset** plus the **Right Offset**. The **Left/Right Offset** can be manipulated to better center the Alignment in the *Named Boundary* element. However, the **Left/Right Offset** should add up to the default total width to ensure the Plan fits into the allotted space within the FLH Border.
9	**Overlap**	The **Overlap** extends the limits of the PLAN view slightly further than the limits of the PROFILE view. There will be a slight overlap between adjacent PLAN *Named Boundaries*. Due to **Overlap**, PLAN *Named Boundaries* are slightly longer than the corresponding PROFILE *Named Boundary*
10	**Boundary Chords**	**Boundary Chords** are only relevant on curve segments. When **Boundary Chords** are used, the resulting PLAN *Named Boundary* element will NOT be rectangular but will wrap around curves in the Alignment. In general, the higher the Boundary Chord value, the closer the *Named Boundary* element will conform to the curve. For Road Plan & Profile sheet creation, it is recommended that the **Boundary Chords** value is set to 0. The next page discusses Boundary Chords in detail.
11	**Create Drawing**	If this box is CHECKED, then *Drawing Models* and *Sheet Models* will be automatically created after the placement of the *Named Boundary* element. It is recommended that this box is UNCHECKED. Typically, *Drawing Models* and *Sheet Models* should be created from the Named Boundary Manager.
12	**Show Dialog**	This option is only available if the **Create Drawing** box is CHECKED. If this box is CHECKED then the User will be presented with options pertaining to the Annotations and Sheet Sizes for the *Drawing Models* and *Sheet Models*.

14A.3.c.i Boundary Chords and the FLH Sheet Border

It is recommended that Boundary Chords are NOT used in creation of PLAN *Named Boundaries*. If Boundary Chords are used, then awkward placement will arise in the *Sheet Model*. The FLH Border has a rectangular space allotted for the PLAN, so the *Named Boundary* elements should also be rectangular.

In an ideal workflow, the User will place PLAN *Named Boundary* elements with the Boundary Chords value set to 0. Initially, the rectangular PLAN *Named Boundary* elements may not fit as intended around curves. However, after placement, the PLAN *Named Boundary* elements can be manually moved and rotated for better fit around curves. This process is shown in *14B.4.d STEP 4: Adjust Orientation of PLAN Named Boundaries*.

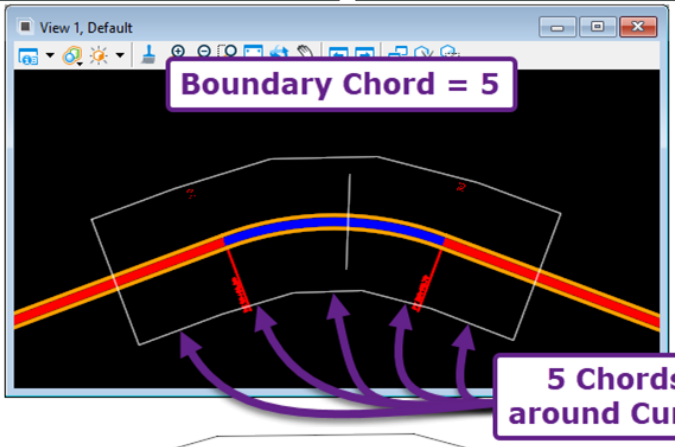


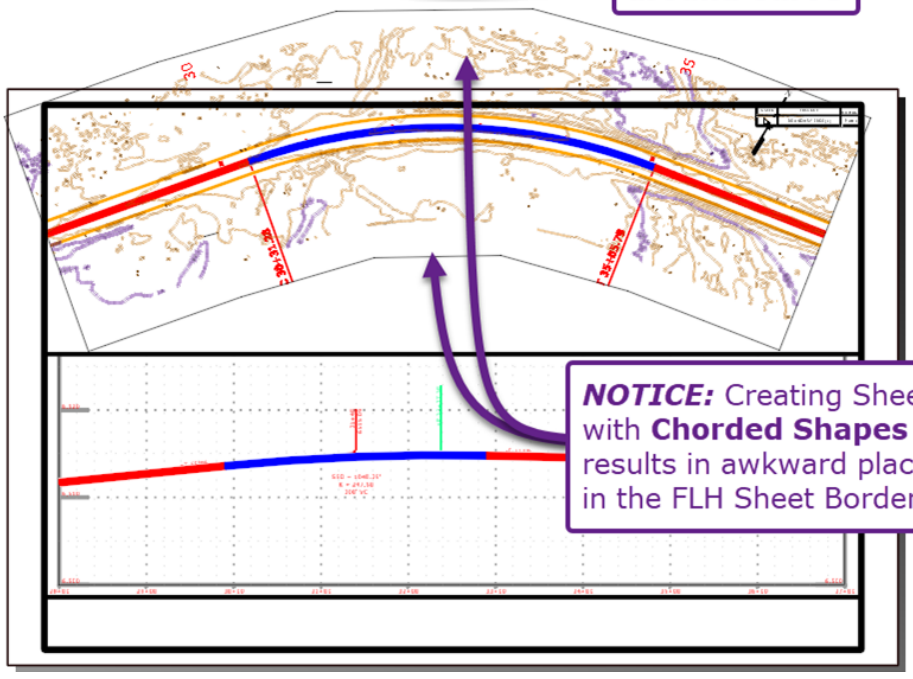


Results in a rectangular shape

This shape can be moved and rotated for better positioning around the alignment.

TIP: For perfect placement, re-position the *Named Boundary* Elements before creating Sheet Models

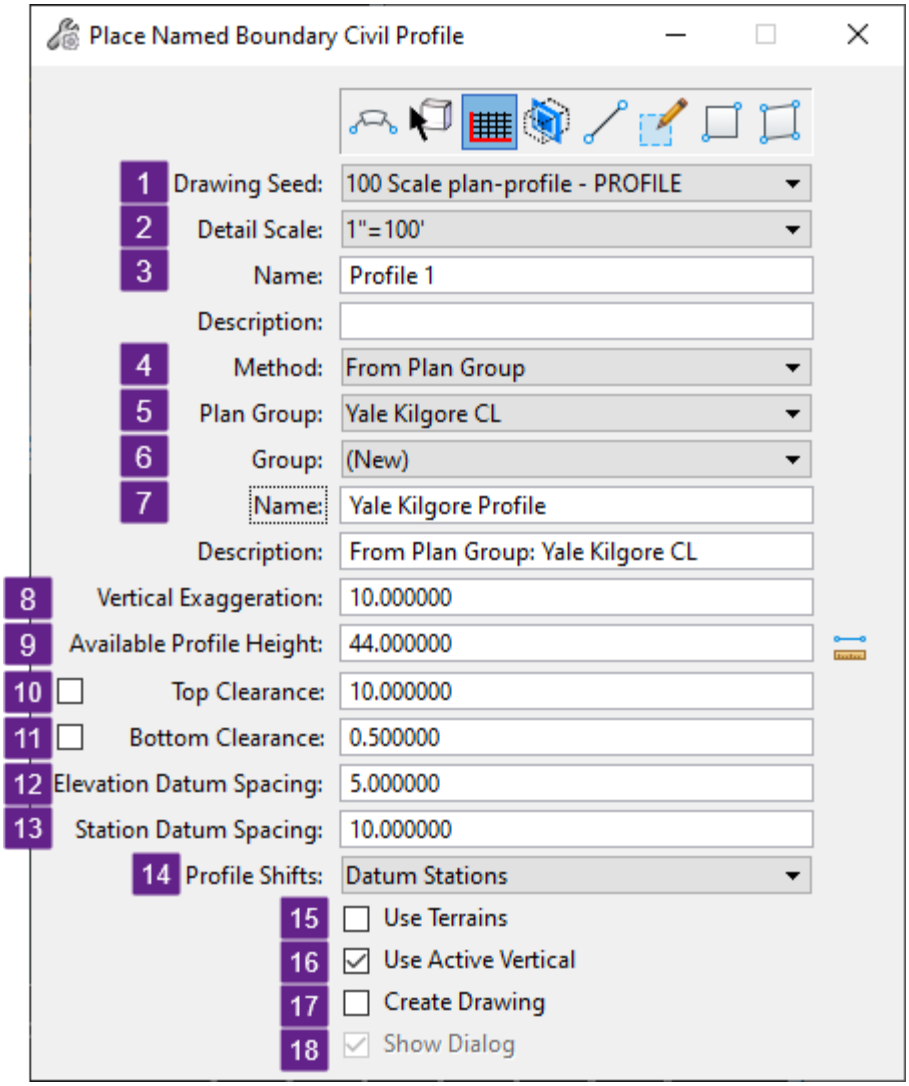




NOTICE: Creating Sheets with **Chorded Shapes** results in awkward placement in the FLH Sheet Border

14A.3.d Profile *Named Boundary* Options

This section explains various options and parameters found in the ***Civil Profile*** mode of the *Place Named Boundary* dialogue box.



NOTE: The **Profile Shifts**, **Top/Bottom Clearance**, and **Elevation Datum Spacing** options are discussed in greater detail in *14A.3.d.i Profile Shift Strategies*. These options determine how a profile is split to display on a single sheet.

Civil Profile Dialogue Options		
Dialogue Option:		**Description:**
1	**Drawing Seed**	*Drawing Seeds* are pre-configured Civil Profile options that correlate with a particular Scale and sheet type. When creating Road Plan & Profile sheets, the *Drawing Seed* must correspond with the seed used in PLAN *Named Boundary* creation.
2	**Detail Scale**	The *Detail Scale* is automatically set by the *Drawing Seed*. THE USER SHOULD NOT CHANGE THE DETAIL SCALE.
3	**Name**	Name to be given to the *Named Boundary* element. When multiple *Named Boundary* elements are created, the Name will automatically increment.

Civil Profile Dialogue Options			
Dialogue Option:		**Description:**	
4	**Method** (Dictates how the Start and End Station for a *Named Boundary* element is set)	**Station Limits**	With this Method, the User can key in a **Start Location** and **End Location** to set the Length of a PROFILE *Named Boundary*. Alternatively, the User can specify the **Start Location** and **Length** to place the PROFILE *Named Boundary*. This **Method** works well for minor features, such as a Culvert Profile or MSE Wall Profile. However, this **Method** is NOT appropriate for Road Plan & Profiles.
		From Plan Group	The **Length, Start Location,** and **End Location** are automatically set by the **Plan Group**. This **Method** is used to automatically align PROFILE *Named Boundary* elements with previously-created PLAN *Named Boundary* elements.
5	**Plan Group**	This option is only shown when **From Plan Group** is selected as the Method. This drop-down is used to specify which Plan Group *Named Boundary* elements to align the *PROFILE Named Boundary* elements to.	
6	**(Profile) Group**	This is used to create a **Profile Group** – which should not be confused with Plan Groups.	
7	**(Profile Group) Name**	If *(New)* is displayed in the (Profile) **Group** drop-down, then after *Named Boundary* creation, a **Profile Group** will be created with the Name entered in this box.	
8	**Vertical Exaggeration**	Sets the Vertical Exaggeration for the Y-axis of the resulting Profile Grid. ***WARNING:*** The Vertical Exaggeration of a Profile Grid can NOT be changed after the creation of the PROFILE *Drawing Model*  .	
9	**Available Profile Height**	Sets the unscaled and unexaggerated height (elevation) dimension of the resulting PROFILE *Named Boundary* element. For example, if this value is 44.00, then the resulting Profile Grid will show an elevation difference of 44 feet from bottom to top. In the *Profile Model*  , the height dimension of PROFILE *Named Boundary* element will exactly equal the **Available Profile Height** used in creation. ***WARNING:*** Typically, his value should NOT be manually changed. Changing this value may result in a Profile Grid that is too tall to fit within the FLH Sheet Border. When the User changes the **Vertical Exaggeration** value, then **Available Profile Height** is automatically changed. This happens so the Profile Grid fits perfectly into the allotted Profile space in FLH Sheet Border, regardless of the specified **Vertical Exaggeration**. If the **Available Profile Height** is changed by the User, then the resulting Profile Grid may not fit into the Border as intended.	
10	**Top Clearance**	**This option is only utilized if the box next to it is checked.** This option creates a buffer between the top of the PROFILE *Named Boundary* element and the Profile and/or Existing Ground. The Profile and/or Existing Ground will never encroach in the **Top Clearance** buffer. If the **Top Clearance** CANNOT be honored with a single *Named Boundary*, then that *Named Boundary* will be split into 2 or more *Named Boundary* elements to achieve the specified **Top Clearance**. To prevent unnecessary Profile Splits, it is recommended that this box is NOT checked.	

Civil Profile Dialogue Options			
Dialogue Option:		**Description:**	
11	**Bottom Clearance**	**This option is only utilized if the box next to it is checked.** When this option is enabled, then a buffer will be created at the bottom of the PROFILE *Named Boundary* element. If the **Bottom Clearance** CANNOT be honored for a particular *Named Boundary*, then that *Named Boundary* will be split into 2 or more *Named Boundary* elements to achieve the specified **Bottom Clearance**. To prevent unnecessary Profile Splits, it is recommended that this box is NOT checked.	
12	**Elevation Datum Spacing**	This value determines the elevation rounding for the placement of the bottom edge of the PROFILE *Named Boundary* element. For example, if this value is set to 5, then the bottom of the *Named Boundary* will be placed at an elevation that is a multiple of 5 (i.e. 1795, 1800, 1805…). If this value is set to 1, then the bottom will be placed on any whole number integer (i.e., 1795, 1796, 1797…).	
13	**Station Datum Spacing**	This value is only relevant when Profile Spits occur. The station location of the split will be rounded according to this value.	
14	**Profile Shifts** (These options specify how to Split the Profile when necessary)	**Datum Stations**	The Profile Split will occur at round stations as specified by the value inputted into the **Station Datum Spacing** box
		Where Needed	The Profile Split will occur at the exact location where the Profile sprawls past the bottom or top of the *Named Boundary* element.
		At Profile Points	The Profile Split will occur at Profile geometry points – such as the VPC and VPT. If the **Use Terrains** box is CHECKED, then Profile Split may occur at a vertex along the Existing Ground Profile.
		Do Not Shift	Even if the Profile sprawls above or below the *Named Boundary* element, no Profile Shifts will occur.
15	**Use Terrains**	If this box is UNCHECKED, then the Terrain Profile is NOT considered for Profile Shifts and Top/Bottom Clearances. In other words, the Terrain can be "cut-off" from the top or bottom of the Profile Grid if this box is UNCHECKED. If this box is CHECKED, then Terrain Profiles will be considered in Profile Shifts and Top/Bottom Clearances.	
16	**Use Active Vertical**	If this box is CHECKED, then Active Profile (typically the Road Profile) is considered for Profile Shifts and Top/Bottom Clearances. In other words, if the Profile sprawls past the bottom or top of the *Named Boundary* element (or into the Clearance buffers), then a Profile Shift will occur.	
17	**Create Drawing**	If this box is CHECKED, then *Drawing Models* and *Sheet Models* will be automatically created after the placement of PROFILE *Named Boundary* elements. It is recommended that this option is UNCHECKED so that *Drawing Models* and *Sheet Models* are created from the *Named Boundary Manager.*	
18	**Show Dialog**	This option is only available if the **Create Drawing** box is CHECKED. If this box is CHECKED then the User will be presented with options pertaining to the Annotations and Sheet Sizes for the *Drawing Models* and *Sheet Models*.	

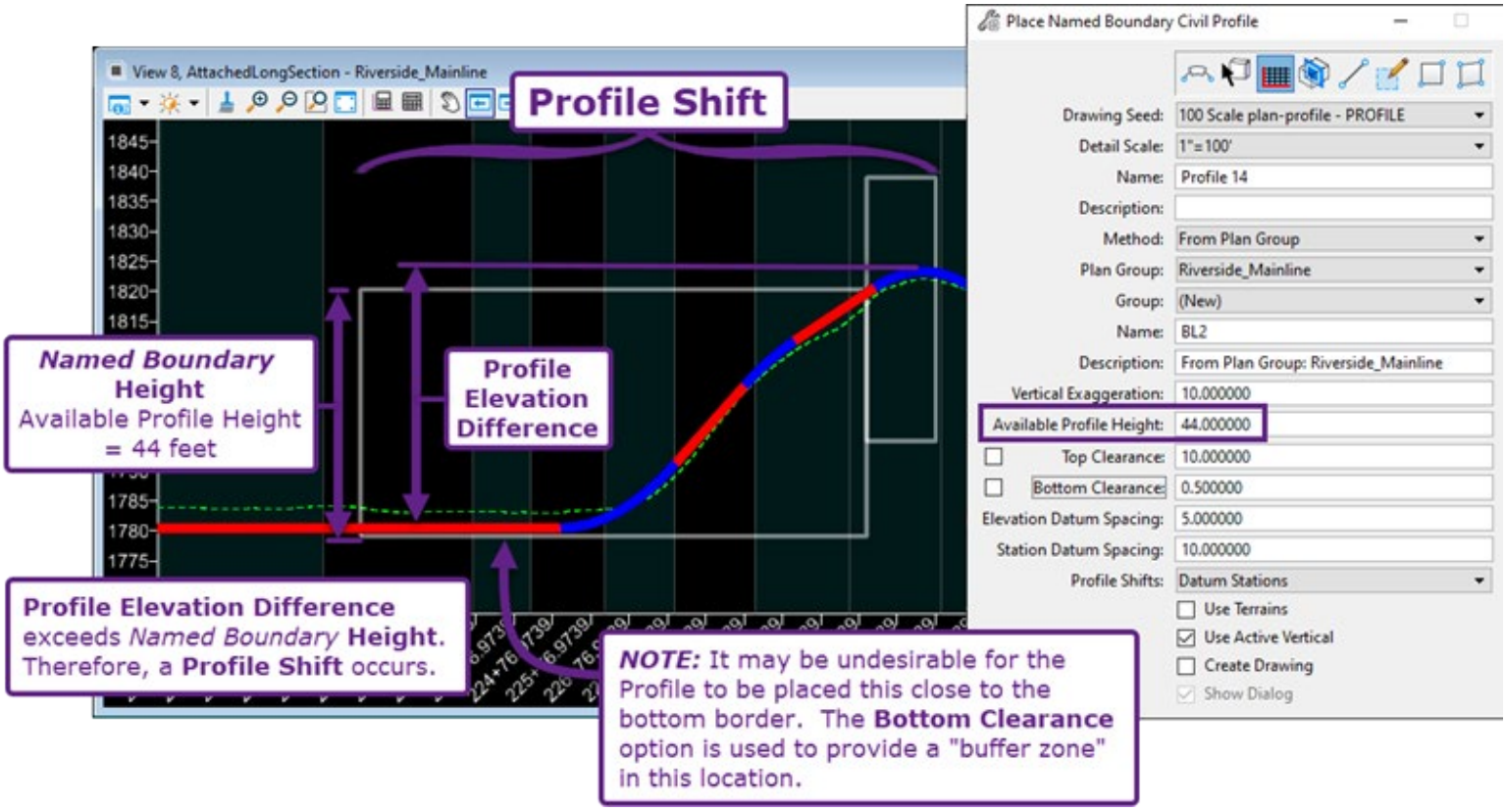
14A.3.d.i Profile Shift Strategies

This section is intended to explore the various options and parameters that affect and trigger Profile Shifts.

IMPORTANT: The options and inputs shown in the *Place Named Boundary* dialogue box are the only control the User has for automated Profile Shifts. Profile Shifts CANNOT be reconfigured after the creation of the Named Boundary elements. **The horizontal location of the Profile Shift CANNOT be manually shifted after placement.**

TIP: A workflow for manually placing PROFILE *Named Boundary* elements to customize Profile Shift behavior is *14E.9 Profile Shift Strategy: Manual Placement*. This strategy involves using the *Do Not Shift* option (from the *Profile Shifts* drop-down) to prevent all automated Profile Shifts for initial placement of PROFILE *Named Boundaries*. Next, the User creates custom PROFILE *Named Boundaries* for the sheets that need Profile Shifts.

What triggers a Profile Shift? For a single sheet, if the Profile sprawls past the top or bottom of PROFILE *Named Boundary* element, the Profile Grid will be split into two or more segments. On any given sheet, this occurs because the height dimension of the PROFILE *Named Boundary* element CANNOT fit the elevation difference shown in the Profile.

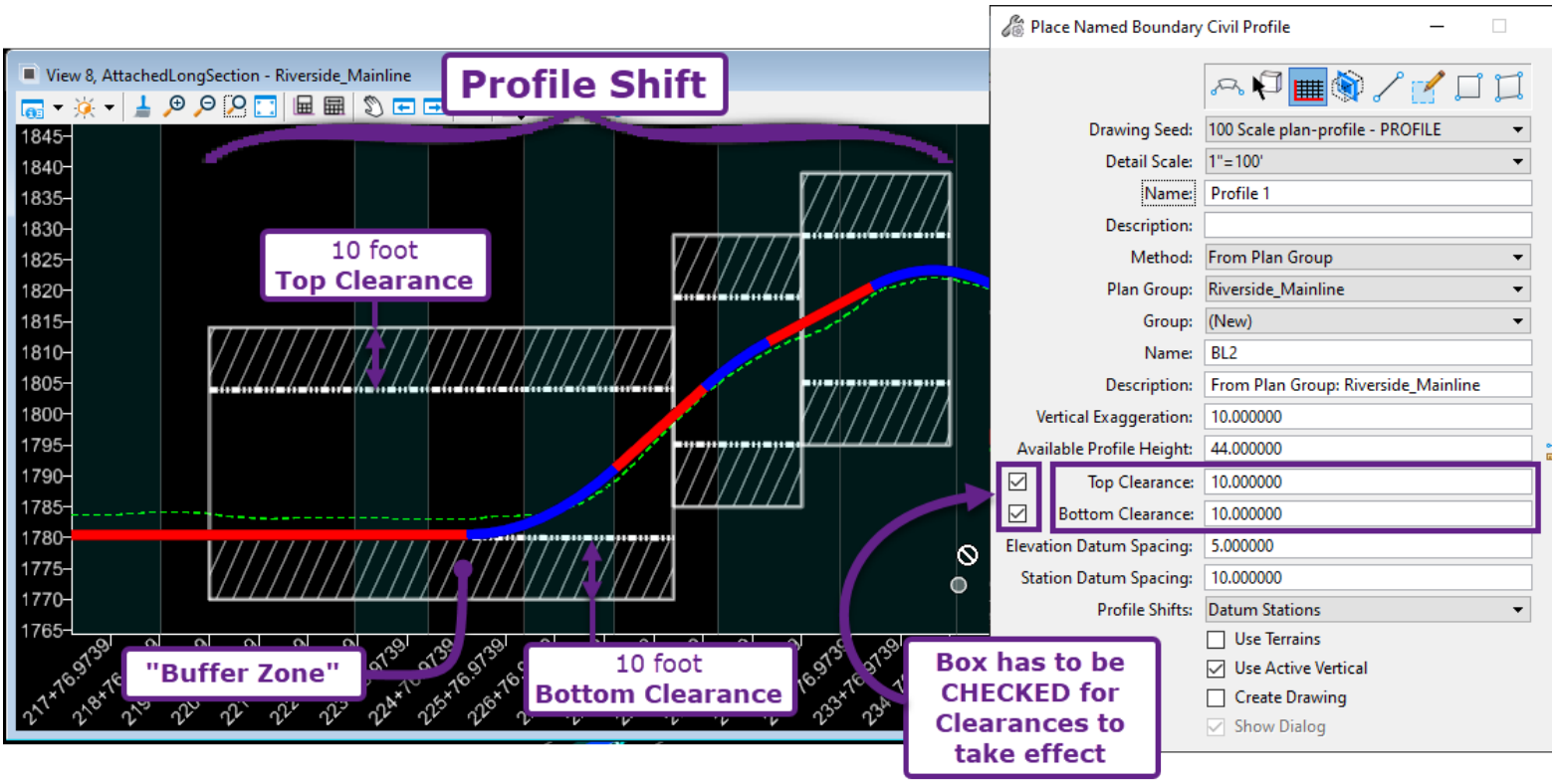


Vertical Exaggeration and **Available Profile Height:** These two options affect the overall height dimension of a PROFILE *Named Boundary* element and how much elevation change that the *Named Boundary* can display. For example, to discourage Profile Shifts, the User can decrease the **Vertical Exaggeration** and/or increase the **Available Profile Height**.

WARNING: Changing the **Available Profile Height** while keeping the **Vertical Exaggeration** constant results in a Profile Grid that does NOT fit perfectly into the allotted Profile space in the Sheet Model.

Top Clearance and **Bottom Clearance:** These options create a buffer around the top and/or bottom of the PROFILE *Named Boundary* element. If the Profile sprawls into the buffer zone, then a Profile Shift will occur. To discourage Profile Shifts, it is recommended that these options are NOT used (ensure the box is UNCHECKED). Notice in the graphic below, when Clearances are used, the effective Available Profile Height is reduced. As a result, three Profile Shifts are needed to accommodate the Profile in this steep area.

NOTE: The Top and Bottom Clearances are ONLY used when the adjacent boxes are CHECKED.



Elevation Datum Spacing: This value determines where the bottom edge of the PROFILE *Named Boundary* element is placed. The bottom elevation of the *Boundary* is always a multiple of this number. In some instances, the Profile can be fit into the *Named Boundary,* but a Shift still occurs. This may be due to a large **Elevation Datum Spacing** value which places the *Boundary* at a nice "round" elevation, instead of directly centered on the Profile.

Station Datum Spacing: This value is used to round-off the Station where the Profile Shift match line occurs. This value and Station Rounding is applied ONLY if the *Datum Stations* option is selected from the *Profile Shifts* drop-down.

WARNING: If the Start Station of the Alignment is an "un-round" number – such as 9+6**7.46** – then the Profile Shifts will occur at multiples of this value – such as 12+4**7.46** or 15+1**7.46**.

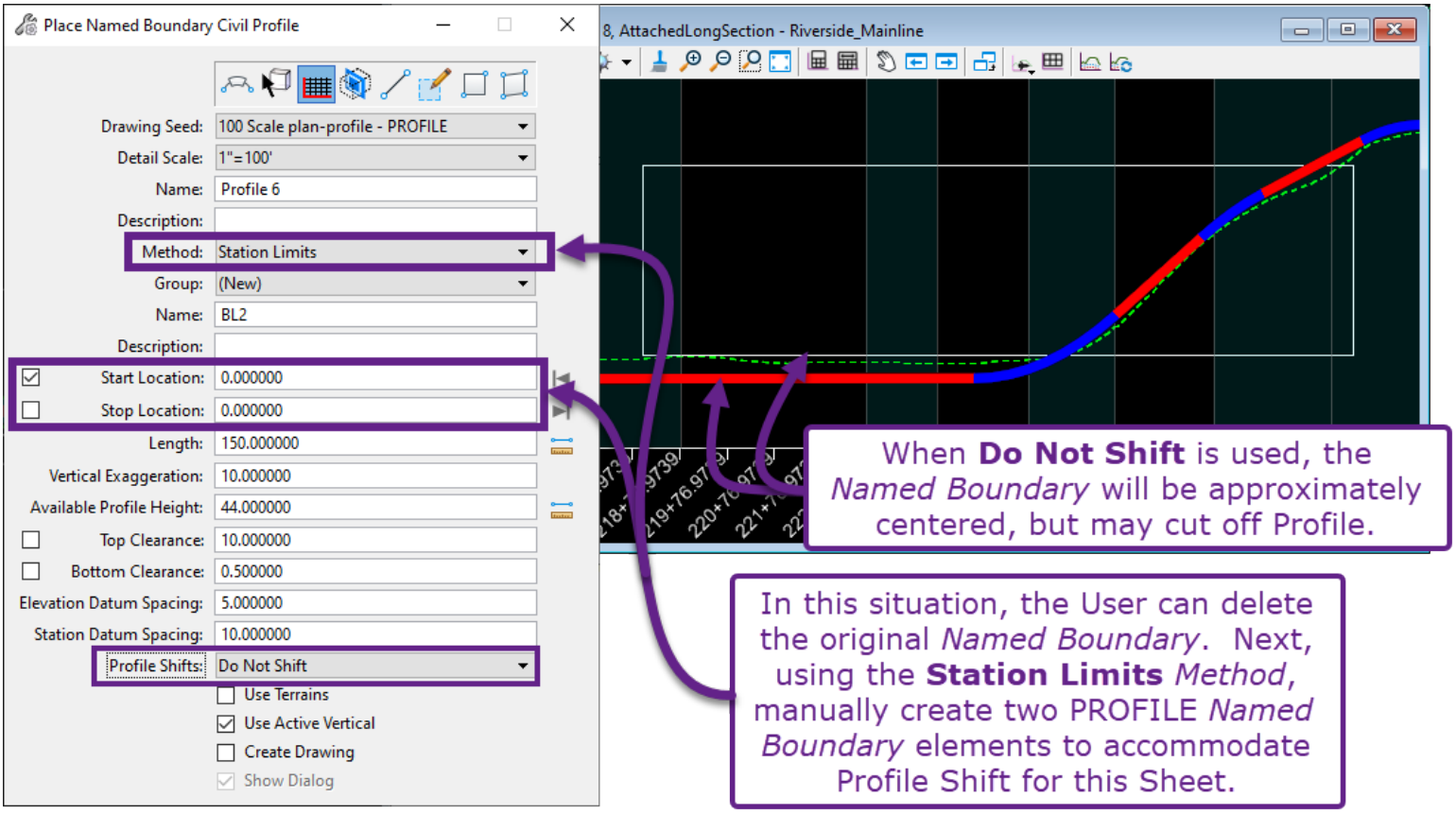
Profile Shifts drop-down – these options provide different methods for the location of the Profile Shift. ***WARNING:*** For the current edition of the software, the *Where Needed* and *Profile Point* options are defective. If either of these options are selected, the Profile Shifts will behave as though the *Datum Station* option is selected.

Datum Stations: The Profile Shift will occur at round stations as specified by the value inputted into the *Station Datum Spacing* box.

Where Needed: The Profile Shift will occur at the exact location where the Profile sprawls past the bottom or top of the Named Boundary element.

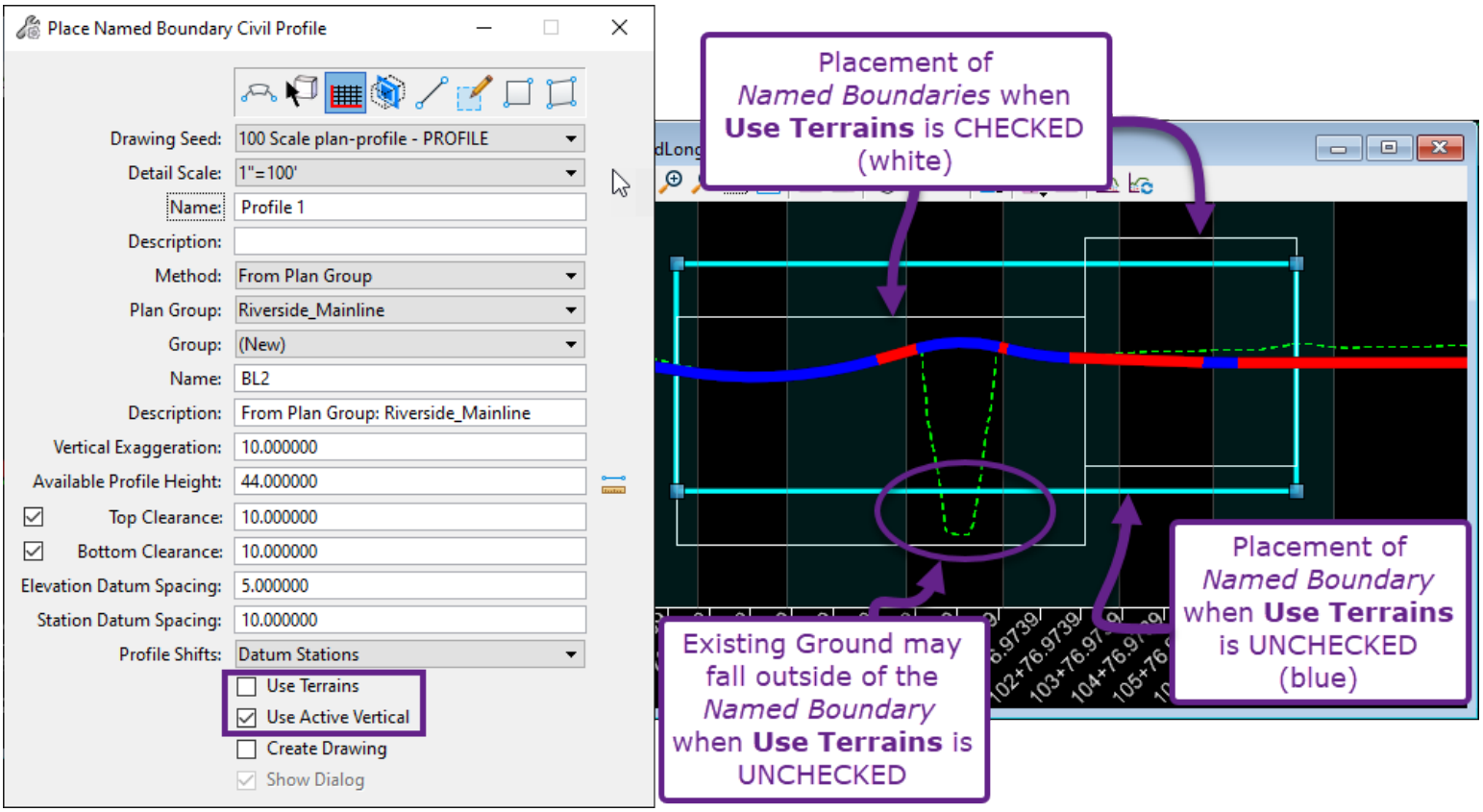
At Profile Points: The Profile Split will occur at Profile geometry points – such as the VPC and VPT.

Do Not Shift - Even if the Profile sprawls above or below the Named Boundary element, no Profile Shifts will occur.



Use Terrains and **Use Active Vertical:** These options determine which element in the Profile Model to analyze Shifts for. For example, if **Use Active Vertical** is CHECKED and **Use Terrains** is UNCHECKED, then it is possible to have the Terrain (Existing Ground) Profile sprawl past the bottom or top of the *Boundary* without a Profile Shift occurring. If both options are CHECKED, then the Terrain (Existing Ground) Profile will always be displayed. Profile Shifts will occur to accommodate the Terrain (Existing Ground) Profile within the *Boundary*.

WARNING: Enabling the **Use Terrains** option may take an exorbitant amount of time to process and create *Named Boundary* elements. This is because the software has to analyze EVERY vertex found in the Terrain (Existing Ground) Profile when analyzing *Boundary* placement. For longer Alignments, the **Use Terrains** option will likely crash the software due to the shear amount of data that has to be processed.



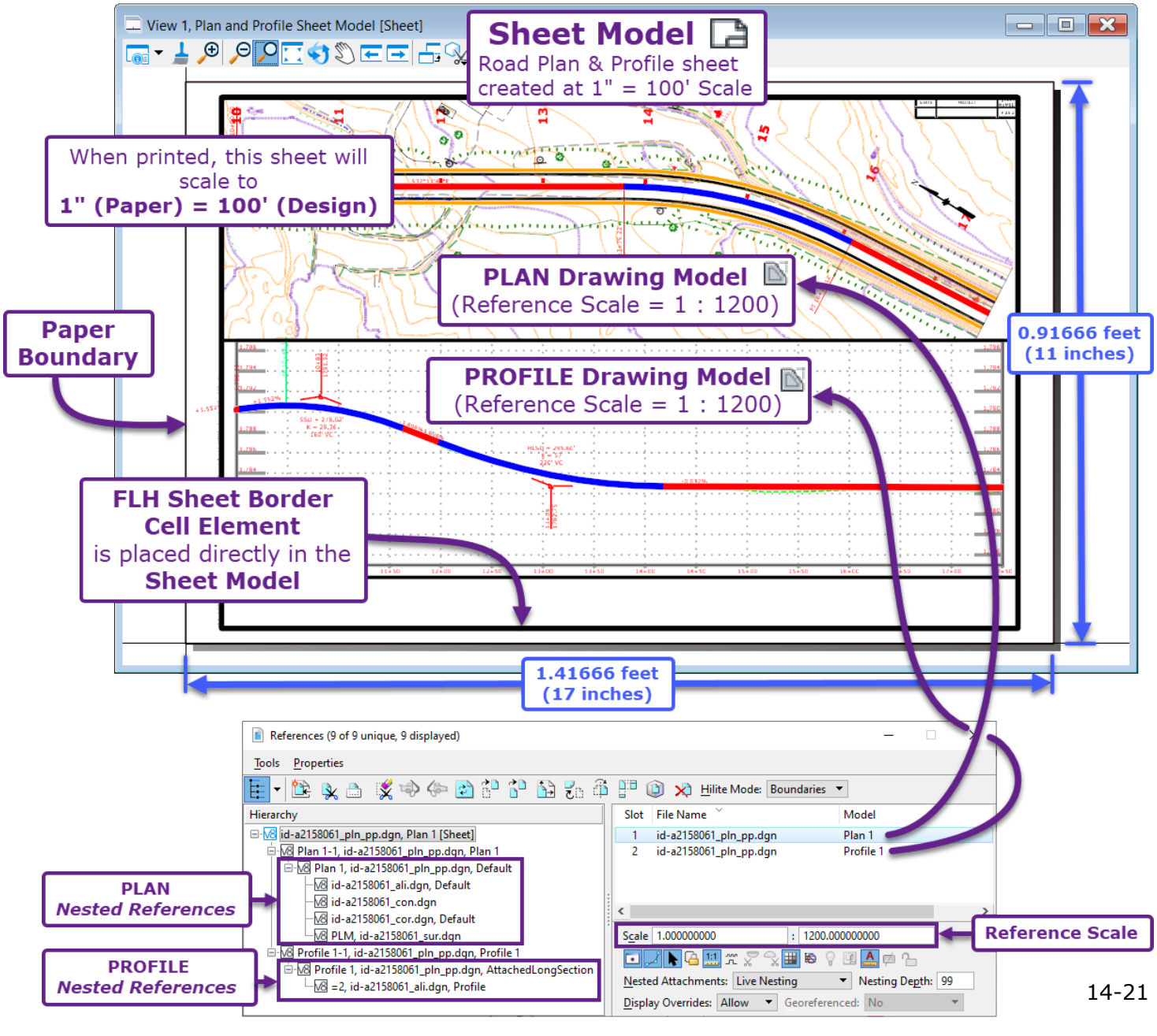
14A.4 Sheet Models Overview

A *Sheet Model* represents a single page in the plan set. Each *Sheet Model* should contain some variation of the FLH Border (Cell element).

Embedded into the *Sheet Model* is a rectangular outline that represents the paper size of the sheet. A typical FLH Plan Set is created on 11”x17” paper. Most FLH Plan Sheet Production Resources are intended for 11”x17” sheet creation. However, 8.5”x11”, 24”x36”, and Roll Plot sheets can be created through alternate workflows. See *14D.4 Manually Create the Sheet Model*.

Even though paper is often discussed in terms of inches, the *Sheet Model* is defined in **decimal feet units**. The rectangular outline of the sheet measures to 0.91666 feet (11 inches) x 1.4166 feet (17 inches). The decimal feet units is relevant when working with *Reference Scale* factors for showing design graphics at the appropriate *Drawing Scale*.

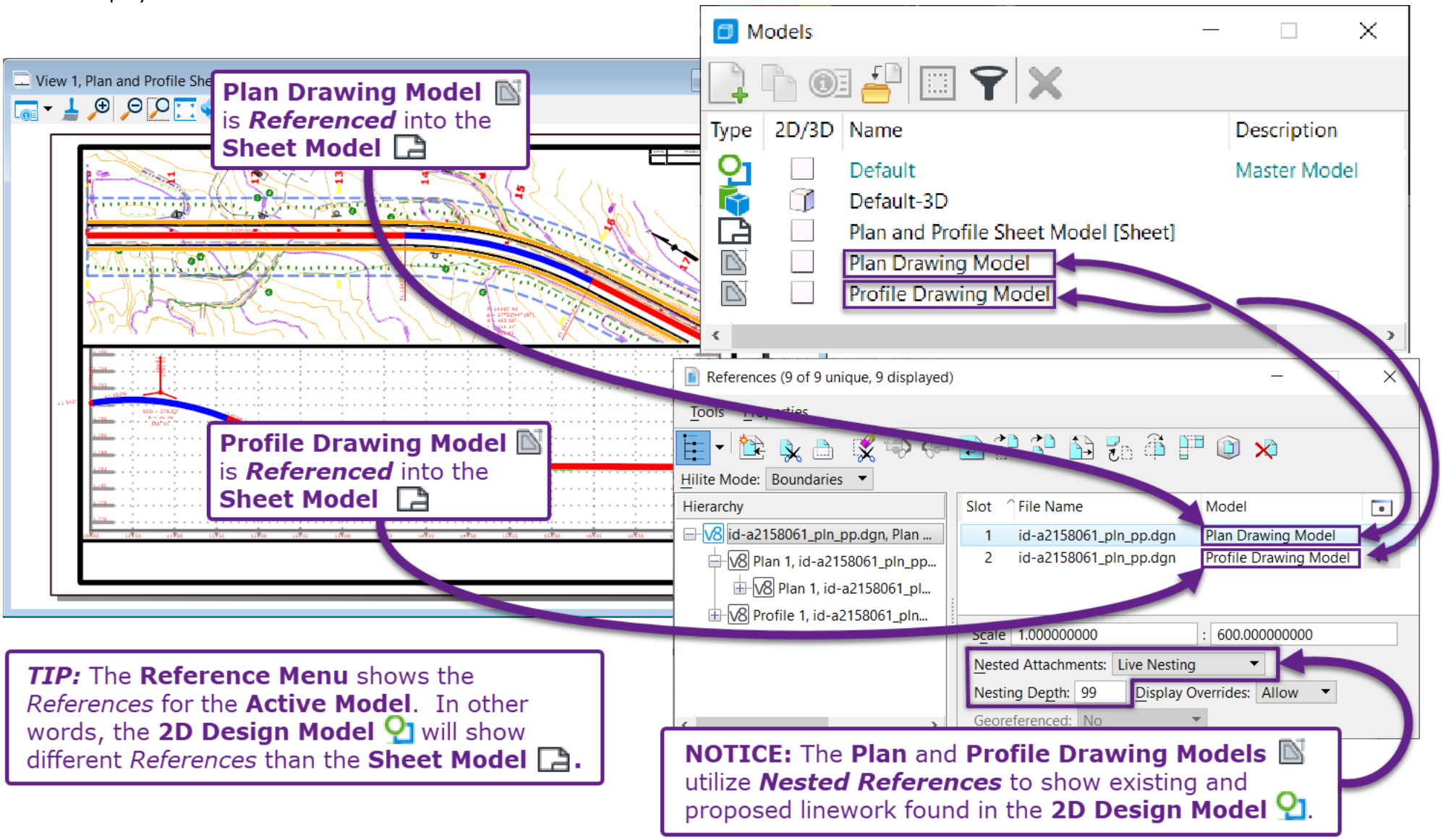
Scale Factor in Sheets Models	
Drawing Scale	**Reference Scale**
1” = 10’	**1 : 120**
1” = 20’	**1 : 240**
1” = 40’	**1 : 480**
1” = 50’	**1 : 600**
1” = 60’	**1 : 720**
1” = 100’	**1 : 1200**
1” = 200’	**1 : 2400**



14A.4.a Reference Mapping for a Typical Plan Sheet

Shown below is the *Reference* configuration for a *Sheet Model* that contains a *Plan Drawing Model* and a *Profile Drawing Model*.

IMPORTANT: Shown below, the *Sheet Model* and *Drawing Models* belong to the same ORD File (id-a2158061_pln_pp.dgn). It is important for the User to understand that *References* are NOT only used to display a different ORD File in the current ORD File. *References* are also used to display different *Models* contained in the same ORD File.



14A.4.b Nested References in Drawing Models and Sheet Models

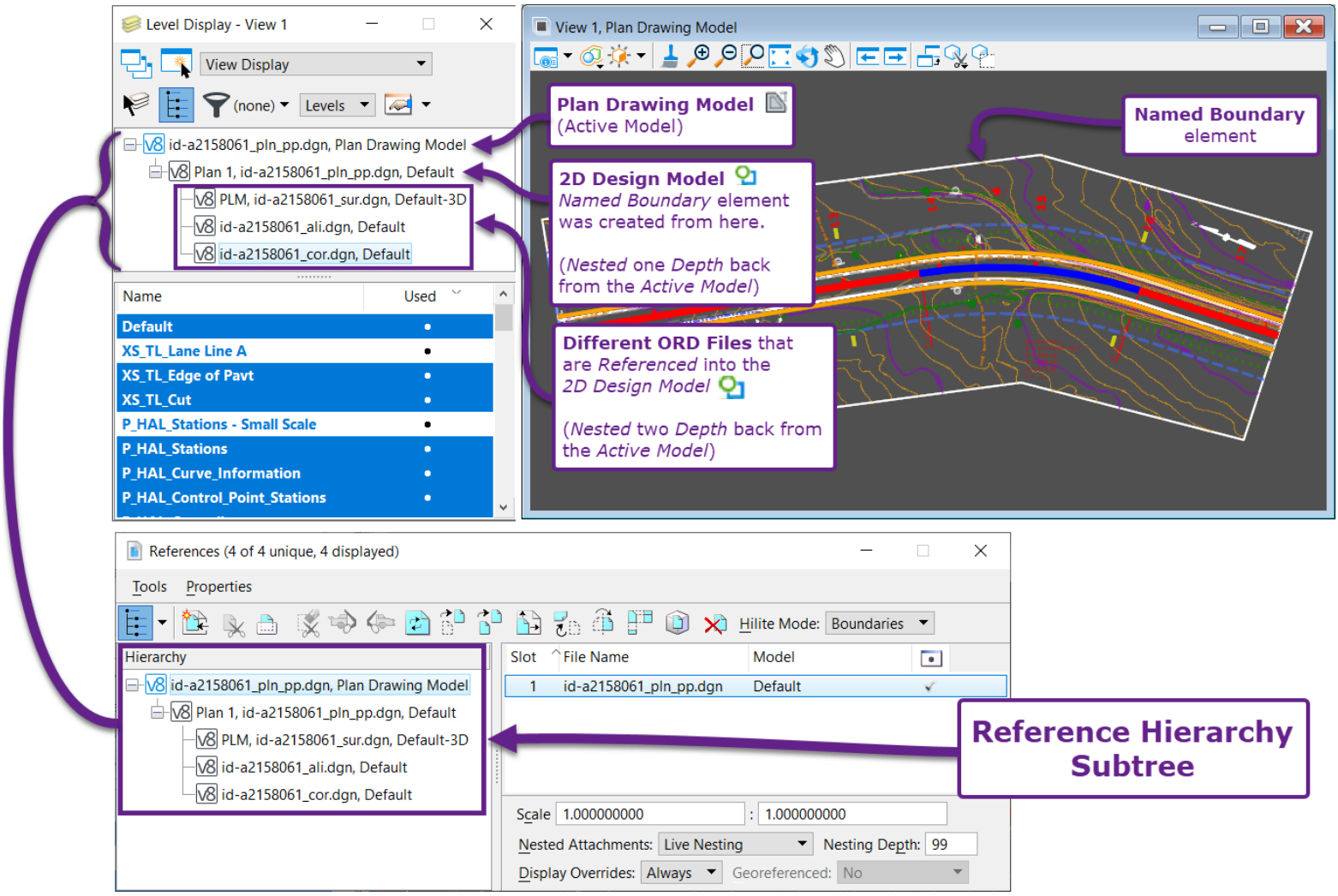
By default, the *Place Named Boundary* tool will automatically create *Nested References* (Live Nesting) in the resulting *Drawing Models* and *Sheet Models*.

WARNING: The use of *Nested Referencing* is discouraged for typical Referencing operations. However, it is unavoidable when working with *Sheet Models* and the *Place Named Boundary* tool.

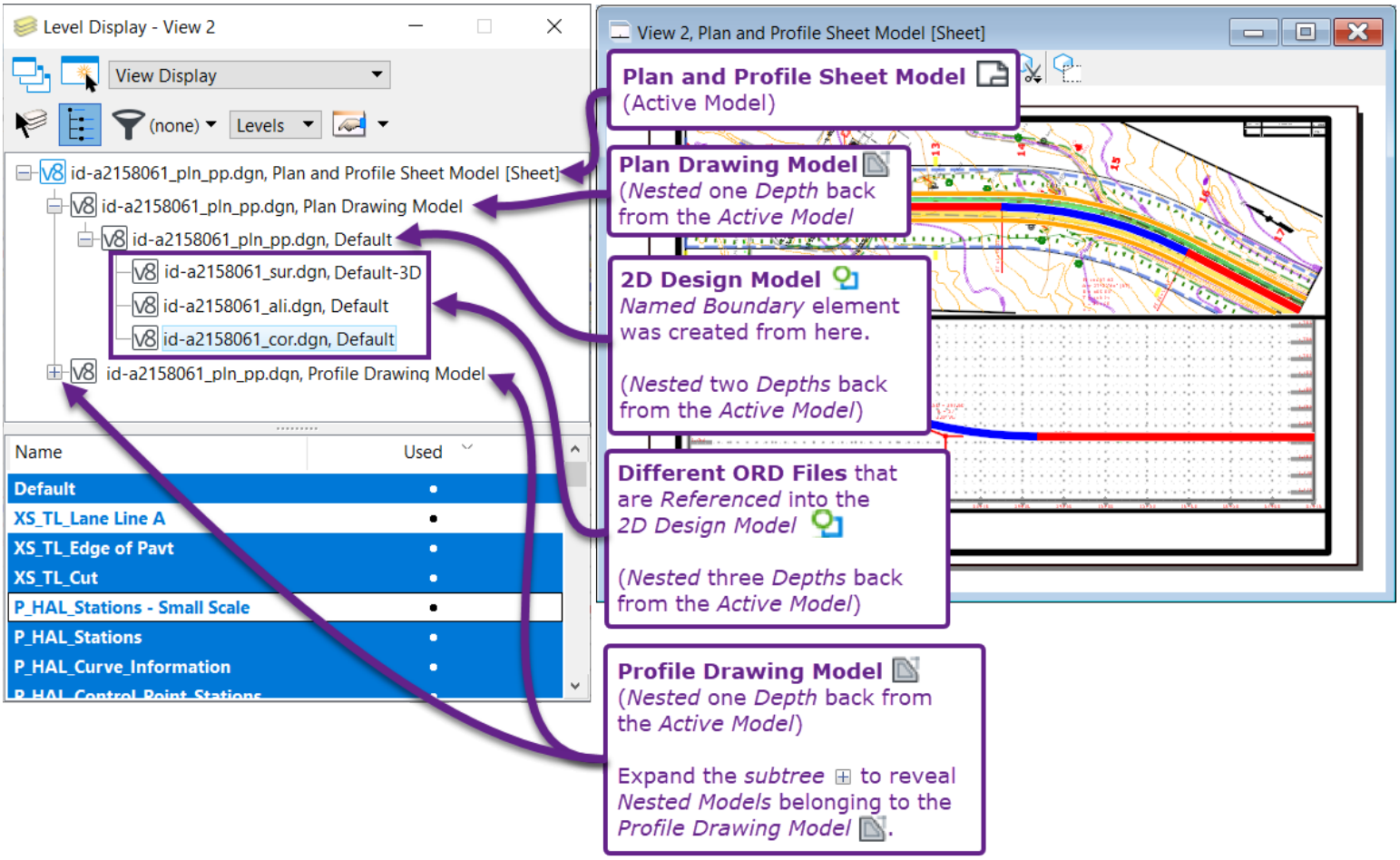
TIP: *Nested Referencing* can be identified either in the *Reference Menu* or *Level Display Menu*. The User must expand the *Reference Hierarchy* subtrees to access the *Level Display* for *Nested References.*

The graphic below shows how *Nested References* are arranged in a *Drawing Model*.

A **PLAN** *Drawing Model* is shown below. However, this configuration is also reflective of the *Nested References* arrangement for a **PROFILE** *Drawing Model*.



The graphic below shows how *Nested References* are arranged in a *Sheet Model*.



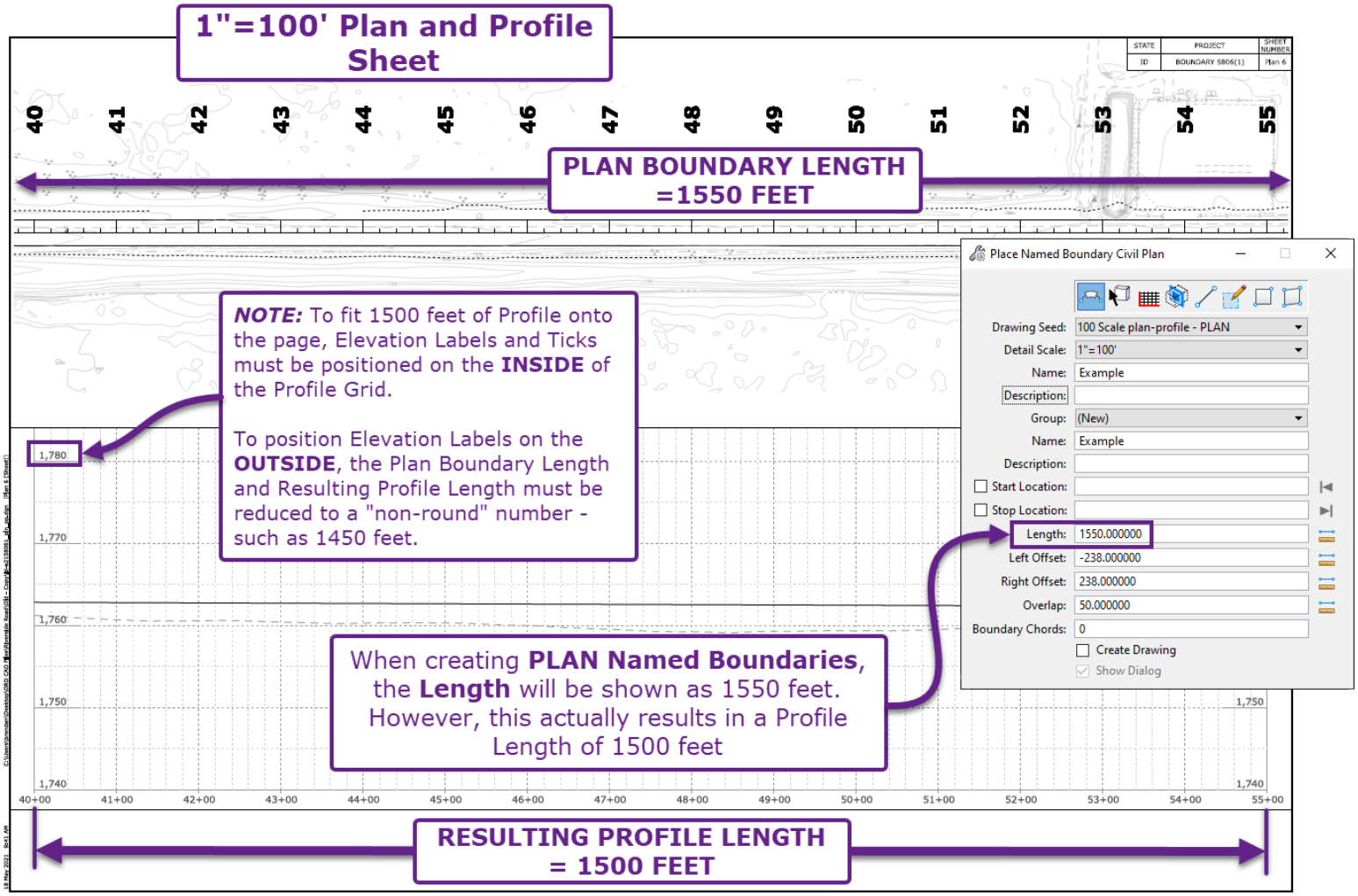
14B – CREATING ROAD PLAN & PROFILE SHEETS - WORKFLOW

This workflow shows how to create Road Plan & Profile Sheets for a typical FLH Project. In this example, the Road Plan and Profile will be set to a drawing scale of 1”=100’ with a Profile Vertical Exaggeration of 1H:10V.

This procedure is applicable for the various Scales shown below. The table assumes as 11”x17” Page Size is used.

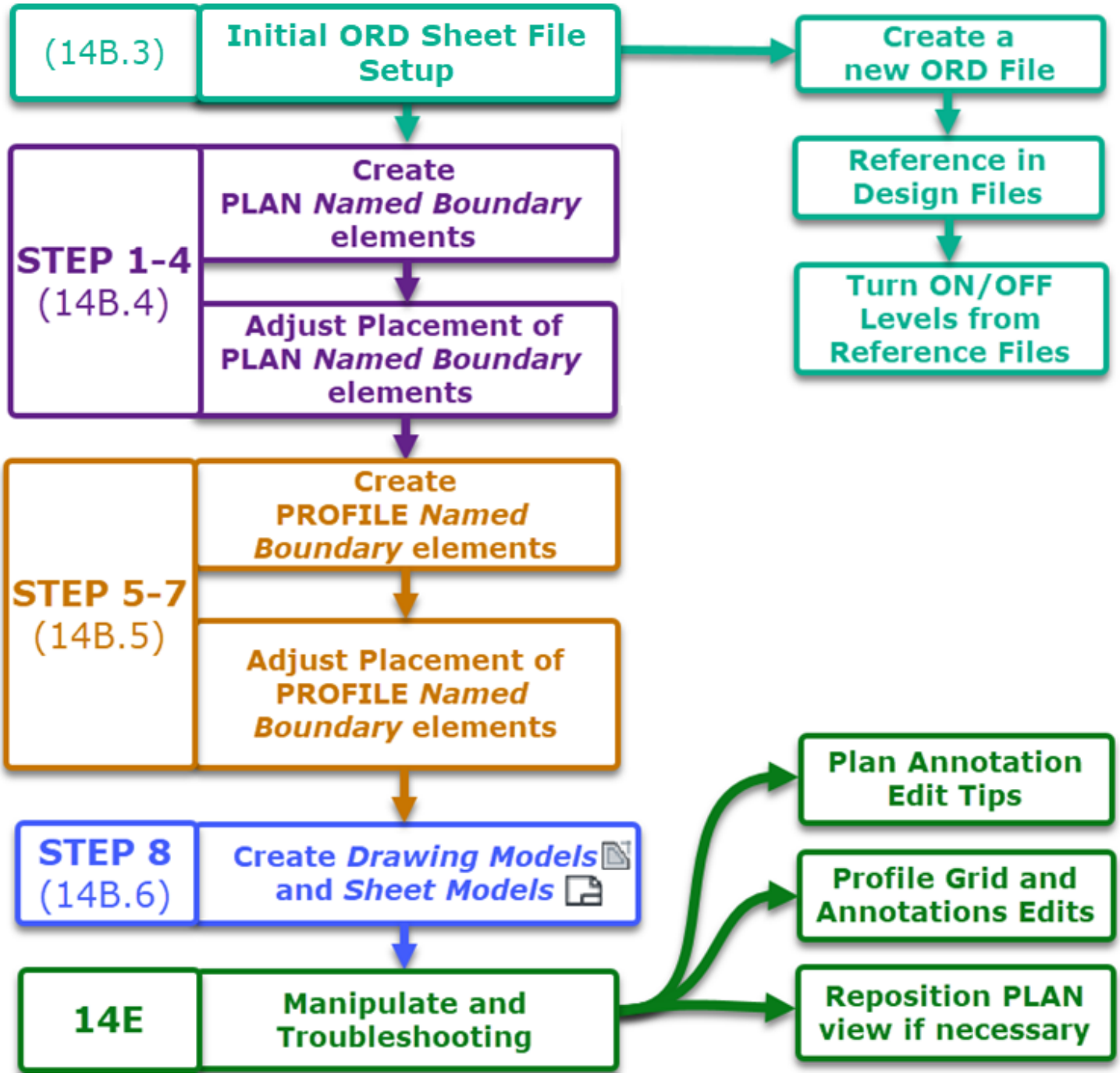
Length of Alignment/Profile per Sheet		
Scale	**Resulting Profile Length**	**Plan Length****
1” = 10’	**150 feet**	155 feet
1” = 20’	**300 feet**	310 feet
1” = 40’	**600 feet**	620 feet
1” = 50’	**750 feet**	775 feet
1” = 60’	**900 feet**	930 feet
1” = 100’	**1500 feet**	1550 feet
1” = 200’	**3000 feet**	3100 feet

*****PLAN LENGTH WARNING:***
When creating **PLAN Named Boundaries**, the **Length** is shown slightly longer than then the Resulting Profile Length.



14B.1 Plan & Profile Sheet Creation Flow Chart

The Flow Chart provides an overview of the suggested workflow for creating Plan & Profile sheets.



14B.2 Warnings and Considerations for Plan & Profile Sheet Creation

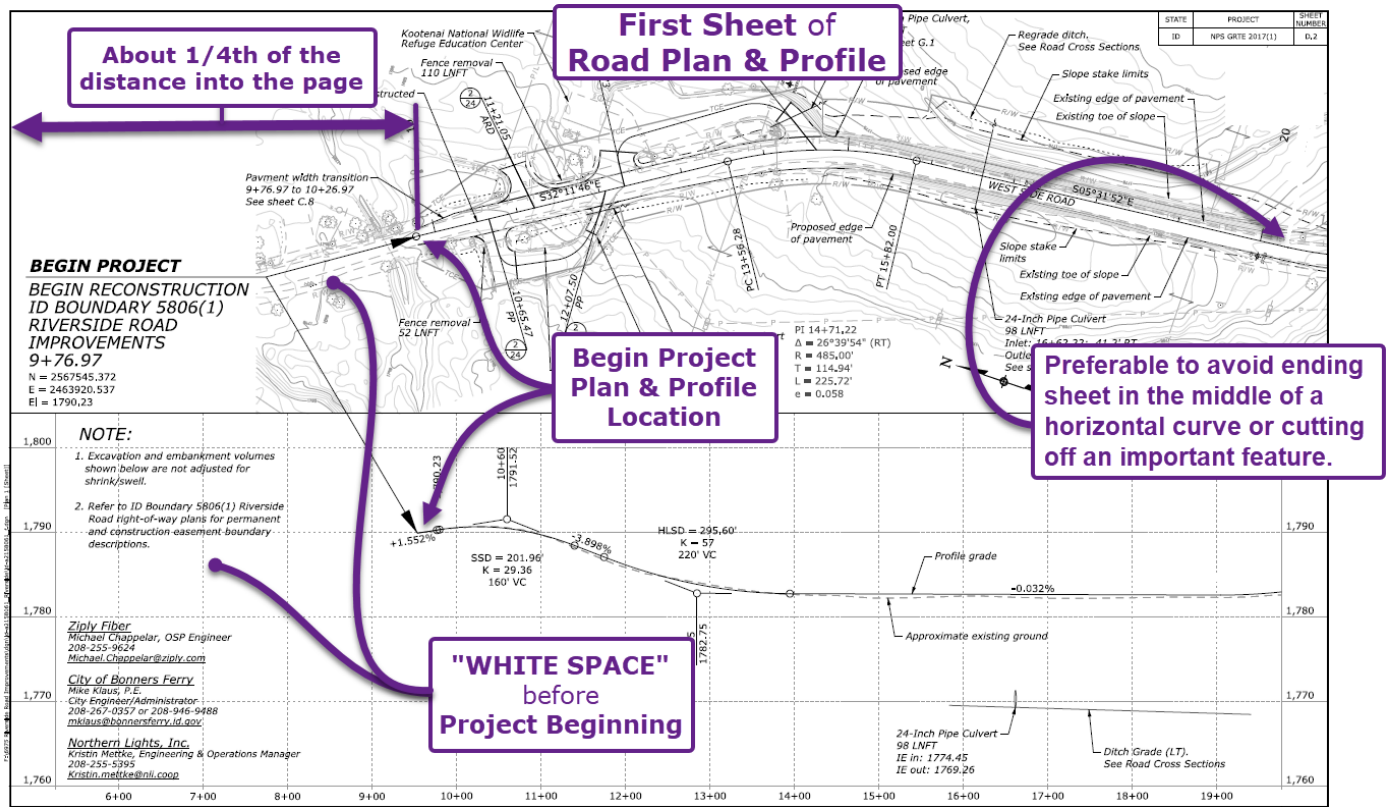
WARNING: In the current design iteration (or milestone), the Alignment, Profile, and Corridor should be **finalized** before creation of Sheets. Adjustments and edits made to major design elements – especially the Alignment – may necessitate the re-creation of the Sheets or tedious repositioning of Plan *Named Boundaries*.

WARNING: The resulting Plan & Profile Sheets are not very dynamic. Adjusting Plan & Profile Sheets after creation may NOT be possible. When creating Plan & Profile Sheets, the User is presented with numerous options and dialogue settings – all of which have implications to the layout of Plan & Profile *Named Boundaries* elements. In general, the User has ONE ATTEMPT to place Plan & Profile *Named Boundaries* in the correct locations. Especially for longer road projects, incorrect placement of *Named Boundary* elements can result in a re-do of the Plan & Profile Sheets. The User should examine and approve of the placement of all *Named Boundary* elements before creation of *Sheets Models* and *Drawing Models*.

WARNING: After *Sheets Models* and *Drawing Models* have been created, the User CANNOT change the Drawing Scale or Profile Vertical Exaggeration. If the Drawing Scale or Vertical Exaggeration needs to change, then new Sheets must be created.

IMPORTANT CONSIDERATION: For the first page of the Road Plan & Profile, it is conventional to show some "white space" before the starting location of the project. The project starting location should be about 1/4th of the way into the page. **THIS IS COMMONLY OVERLOOKED WHEN FIRST CREATING SHEETS.** Failure to accommodate "white space" at the beginning of the project requires re-creation of Sheets. All Text, Notes, and Callouts in the *Sheet Models* may have to be rearranged or re-created.

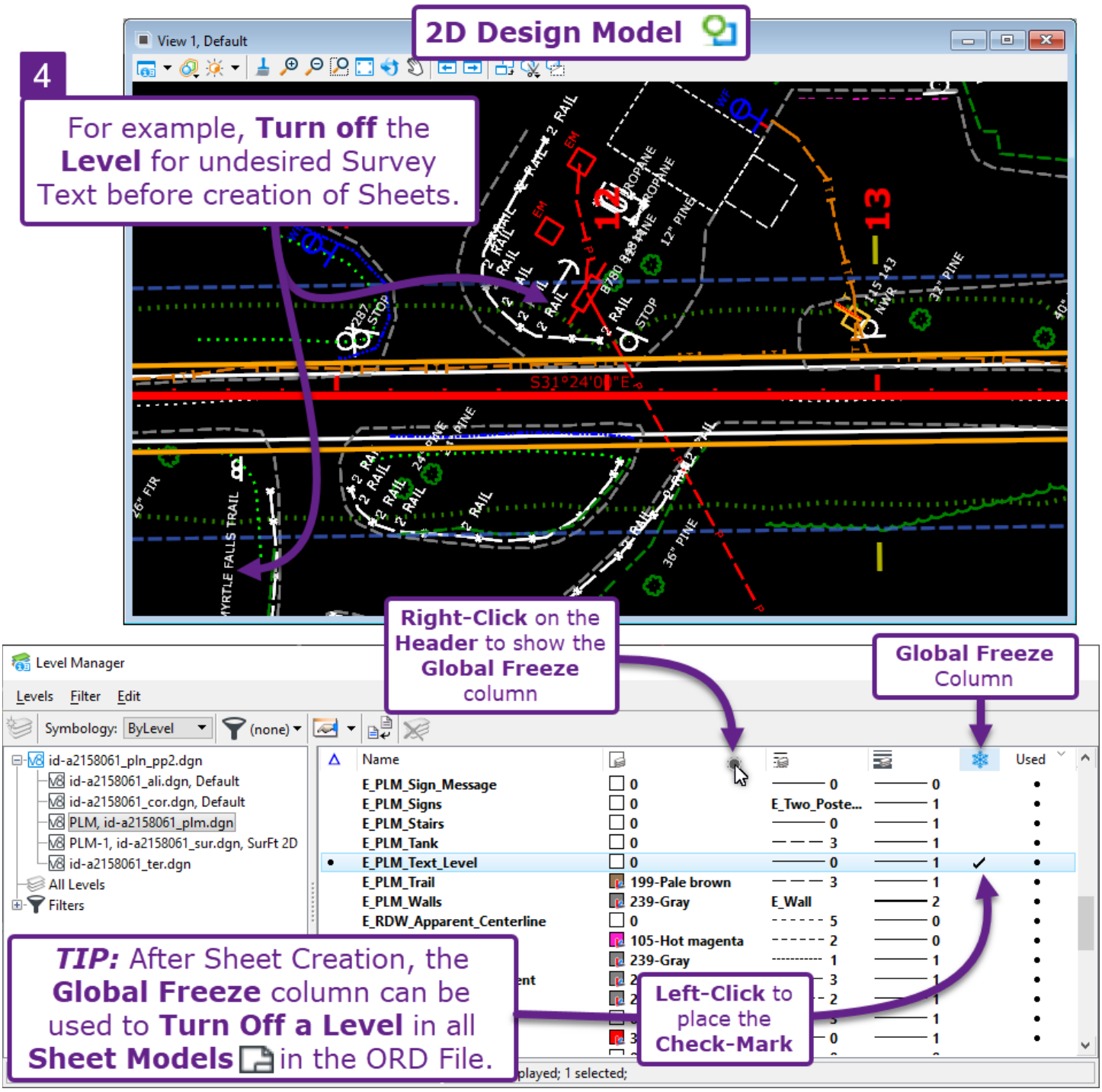
IMPORTANT CONSIDERATION: When it can be avoided, do NOT place the match-line (edge) of a sheet along a horizontal curve, bridge, culvert, or other important feature. The extent of Plan & Profile to be shown on a sheet can be reduced to show the entirety of the important feature on the next sheet. A workflow for accommodating important features that fall near a match line is shown in *14B.4.c STEP 3: Layout of Subsequent Named Boundary elements*.

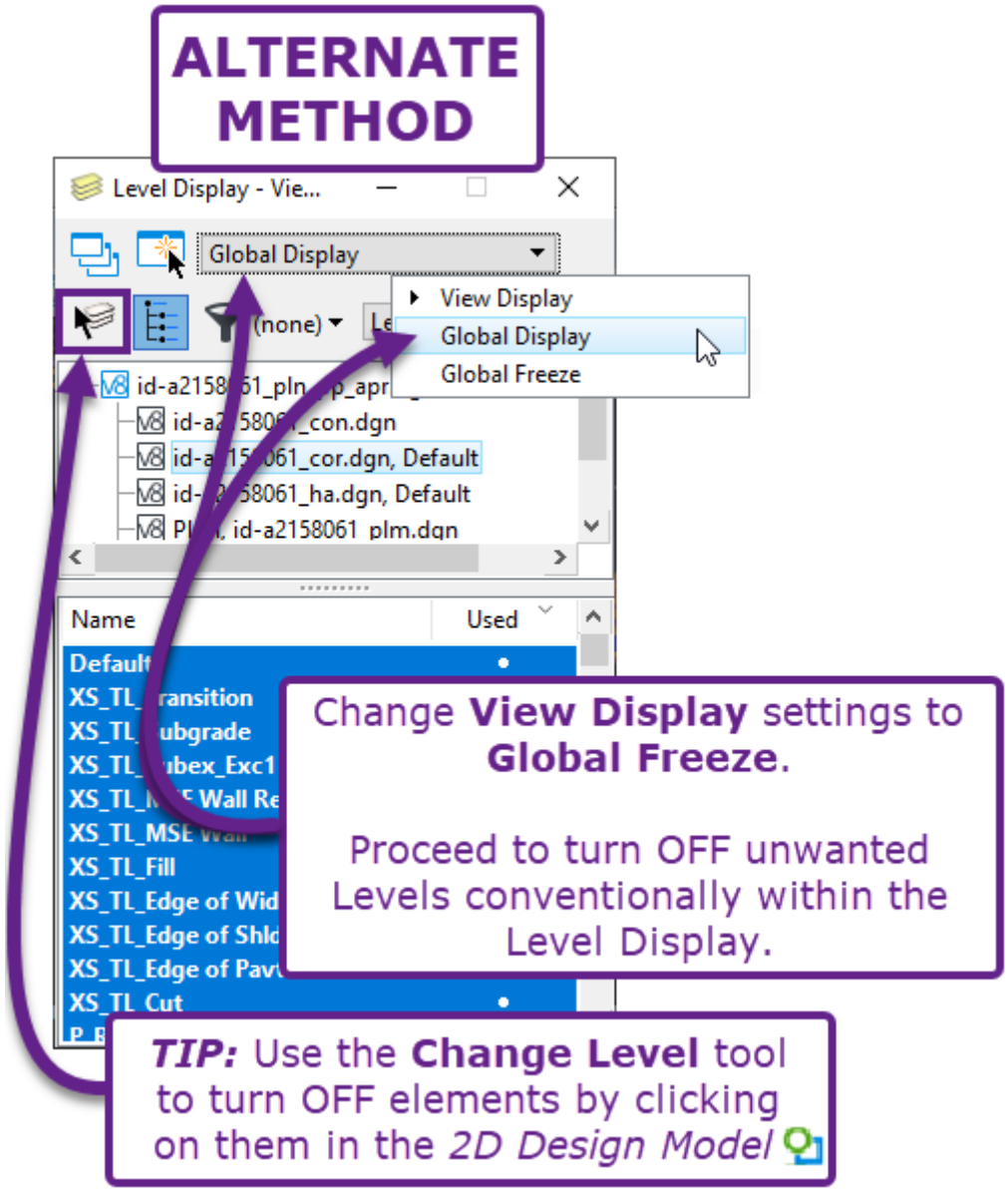


14B.3 Initial Plan Sheet ORD File Setup

Before the *Place Named Boundary* tool is used, the following procedures must be performed:

1	**Create a new ORD File** to contain the Plan Sheets. See *3B – Create a New ORD File*. The new Plan Sheet ORD File should be named in accordance with ORD File Naming Conventions listed in Chapter 3. See *3C – ORD File Naming Conventions*. Naming Convention for Road Plan & Profile ORD Files by Agency: ***WFLHD:*** project specific prefix**_pln_pp**.dgn ***EFLHD:*** 01_project number_pln_pp.dgn ***CFLHD:*** **PNP**(alignment descriptor)project descriptor.dgn
2	Set the coordinate system for the new ORD Sheet File. See *3D.1 Set the Coordinate System*.
3	In the *2D Design Model* of the new ORD Sheet File, **Reference** in all Survey ORD Files and Design ORD Files. Reference in all ORD Files that contain linework, graphics, and corridor models to be shown in the Road Plan & Profile. ***WARNING:*** **Do NOT use Nested References when creating these ORD Sheet Files. Reference in all necessary Design ORD Files without utilizing Nested Referencing.** For more information on which ORD Files should be *referenced* into the Plan and Profile ORD File, see *2F.1 Project Organization and Referencing Map for ORD Files*.
4	In the *2D Design Model*, turn off all **Levels** that should NOT be shown in the Road Plan & Profile sheets. After configuring all **Levels** in the Plan Sheet ORD File, the User must *Save Settings*. If *Save Settings* is not performed, then **Levels** will revert the next time this Plan Sheet ORD is opened. The Level configuration in the *2D Design Model* at the time of creation will set the initially Level configuration in the *Sheet Models*. ***NOTE:*** The User can turn Levels on/off for a Sheet-by-Sheet basis. However, it is more efficient to configure Level settings in the *2D Design Model*, before the creation of *Sheet Model*). See graphical example on next page.


2D Design Model
4
For example, **Turn off** the **Level** for undesired Survey Text before creation of Sheets.
View 1, Default
Right-Click on the Header to show the Global Freeze column
Global Freeze Column
Level Manager
Levels Filter Edit
Symbology: ByLevel
(none)
id-a2158061_pln_pp2.dgn
id-a2158061_ali.dgn, Default
id-a2158061_cor.dgn, Default
PLM, id-a2158061_plm.dgn
PLM-1, id-a2158061_sur.dgn, SurFt 2D
id-a2158061_ter.dgn
All Levels
Filters
Name
Used
E_PLM_Sign_Message
E_PLM_Signs
E_PLM_Stairs
E_PLM_Tank
E_PLM_Text_Level
E_PLM_Trail
E_PLM_Walls
E_RDW_Apparent_Centerline
105-Hot magenta
239-Gray
E_Two_Poste...
E_Wall
Left-Click to place the Check-Mark
TIP: After Sheet Creation, the **Global Freeze** column can be used to **Turn Off a Level** in all **Sheet Models** in the ORD File.

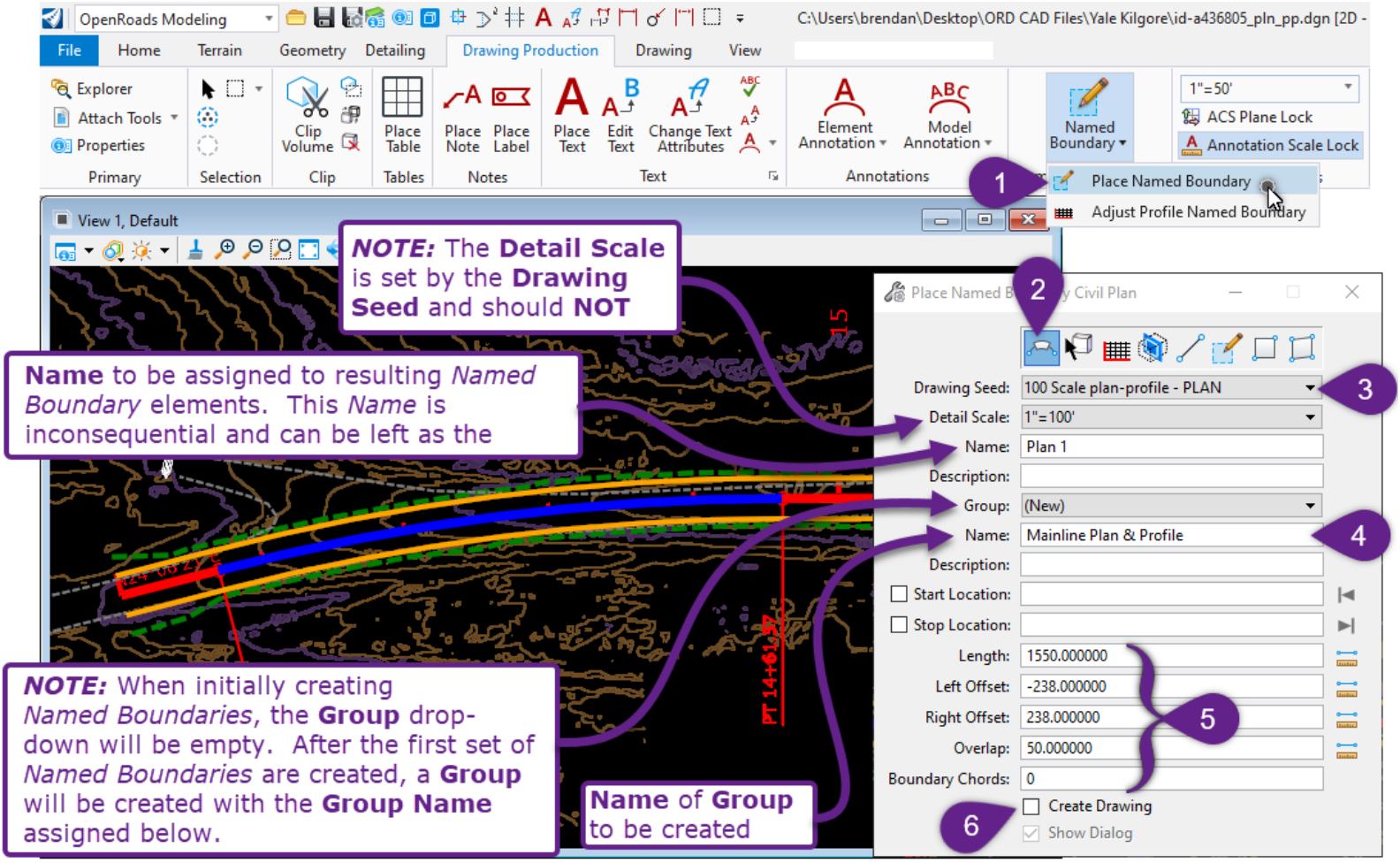

ALTERNATE METHOD
Level Display - Vie...
Global Display
View Display
Global Display
Global Freeze
(none)
id-a2158061_pln_apr
id-a2158061_con.dgn
id-a2158061_cor.dgn, Default
id-a2158061_ha.dgn, Default
id-a2158061_plm.dgn
Name
Used
Default
XS_TL_Fill
XS_TL_Edge of Wid
XS_TL_Edge of Shld
XS_TL_Edge of Pavt
XS_TL_Cut
Change View Display settings to Global Freeze.
Proceed to turn OFF unwanted Levels conventionally within the Level Display.
TIP: Use the Change Level tool to turn OFF elements by clicking on them in the 2D Design Model

14B.4 STEPS 1-4: Placing PLAN Named Boundaries

After setup of the ORD Sheet File has been completed, the User can begin to layout *Named Boundaries* for the creation of *Drawing Models* and *Sheet Models*.

14B.4.a STEP 1: Initial Setup of the *Named Boundary* Dialogue Box

In this step, the *Prompts* shown at bottom of the screen are ignored as the *Named Boundary* dialogue box is setup.



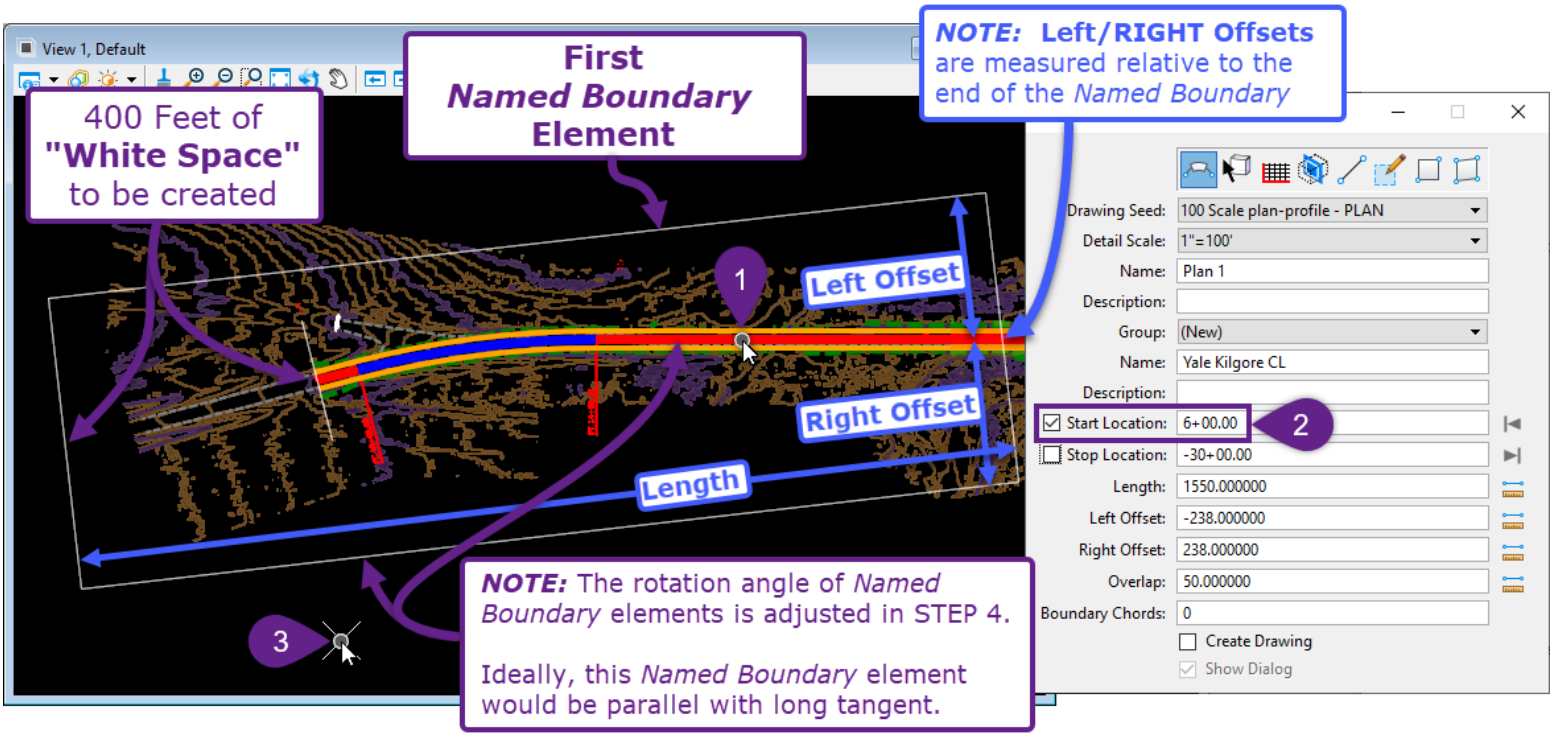
1	From within the 2D Design Model, select the Place Named Boundary tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Named Boundaries***].
2	In the *Place Named Boundary* Dialogue Box, select the *Civil Plan* mode by clicking on the icon .
3	In the *Place Named Boundary* Dialogue Box, select the appropriate *Drawing Seed* from the drop-down. The *Drawing Seeds* correspond to different scales and configurations for the resulting *Sheet Models*. The *Drawing Seed* sets the **Length**, **Left/Right Offset**, and **Overlap**. These values Should NOT be changed. In this example, ***100 Scale plan-profile – PLAN*** is used. ***WARNING:*** If the ***100 Scale Plan*** option is used, then the resulting *Sheet Models* would NOT have space for the Profile. The Plan portion would take up the entire page. Similarly, if the ***100 Scale Plan-Plan*** option is used, then the resulting *Sheet Models* would have a Plan-Plan configuration – with the Profile portion omitted.
4	***NOTICE:*** After the *Drawing Seed* is selected from the drop-down, the settings pertaining to the size, position, and placement of the *Named Boundary* elements are auto-filled. These auto-filled values will correlate with the Drawing Scale (i.e., 1”=100’) to perfectly fit the Plan and Profile views on the 11”x17” Sheet Border. ***WARNING:*** These values may be manipulated to better position the Alignment within the *Named Boundary* OR to shorten a *Named Boundary* element to avoid “cutting off’ a horizontal curve or important feature. The **Length** and **Left/Right Offset** can be REDUCED, but these values should never be increased above the default values. Doing so would cause the Plan to sprawl past the Sheet Border and/or overlap with the Profile. ***OVERLAP:*** Typically, the *Overlap* value should NOT be adjusted and left at the default value. The User should be aware of the Overlap value when planning for length of Profile to show on a Sheet. ***BOUNDARY CHORDS:*** It is recommended to leave the Boundary Chords value at 0. See *14A.3.c.i Boundary Chords and the FLH Sheet Border*.
5	In the *Place Named Boundary* Dialogue Box, type in and appropriate **Group** name. In this case, the name given to the **Group** is “Yale Kilgore CL”.
6	UNCHECK the *Create Drawing* box. If this box were checked, then *Sheet Models* will be created without Profiles.

14B.4.b STEP 2: Layout of the First *Named Boundary*

In this step, the User will need to pay attention to both the *Prompts* and the *Place Named Boundary* dialogue box. It is very IMPORTANT for the User to know which *Prompt* is currently displayed.

Also in this step, the User will setup the "White Space" before the Start Point of the Project. For a graphical example of "White Space", see *14.B.2 Warnings and Considerations for Plan & Profile Sheet Creation*. The table on the right shows the APPROXIMATE length to add before the Start Point to achieve the desired "White Space". In this example, the 1"=100' Scale is used, so approximately 400 feet of "White Space" should be shown before the start point.

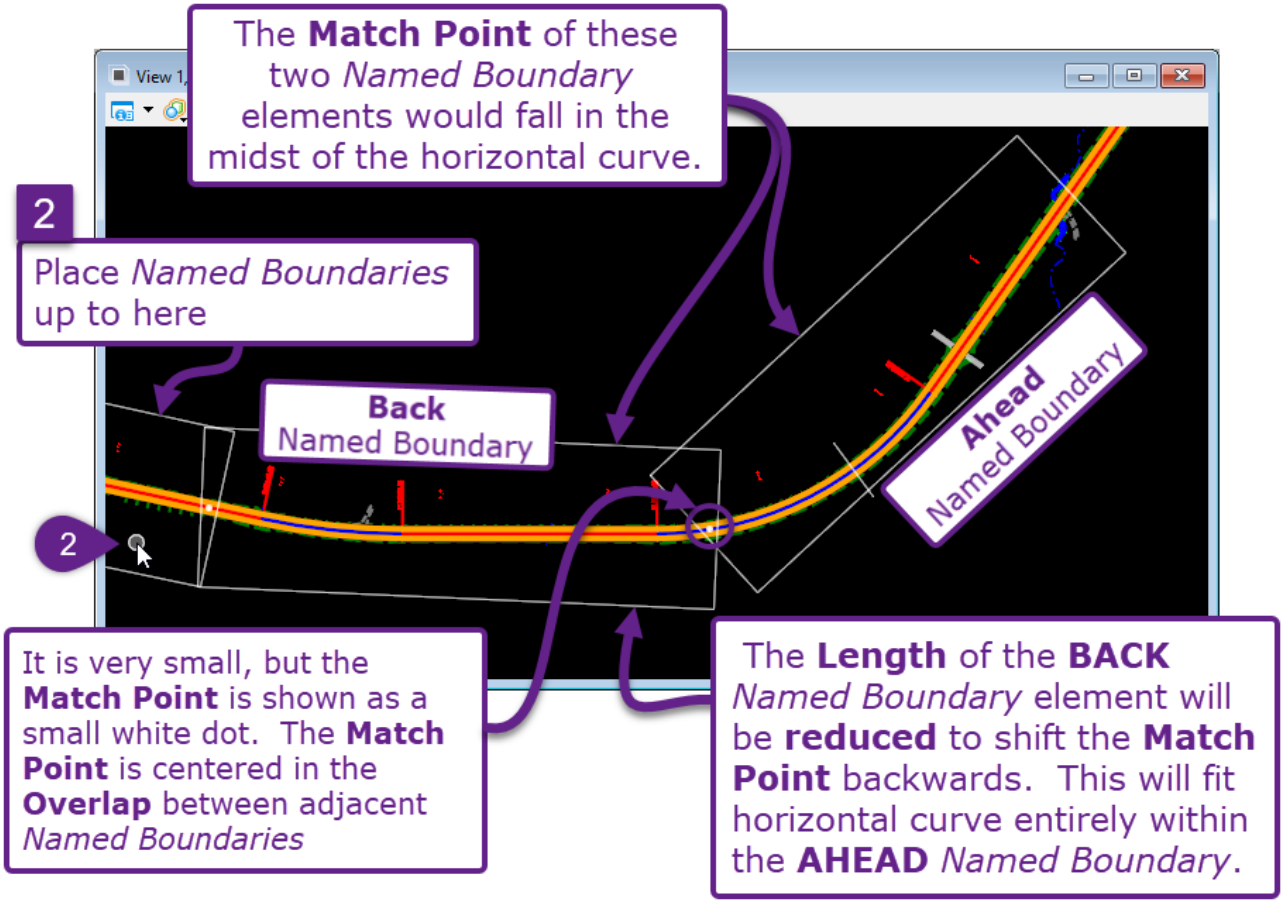
Recommended Length of "White Space"	
Scale	**Length before Start**
1" = 10'	**40 feet**
1" = 20'	**80 feet**
1" = 40'	**160 feet**
1" = 50'	**200 feet**
1" = 60'	**250 feet**
1" = 100'	**400 feet**
1" = 200'	**800 feet**



1	*Prompt: Place Named Boundary Civil Plan > Identify Path Element* – In the View, Left-Click on the Road Alignment (referred to as the Path Element).
2	*Prompt: Place Named Boundary Civil Plan > Accept/Reject*. Identify Path start point to place boundary – In the Place Named Boundary dialogue box, type in the Start Location and press Enter to lock it. In this example, the Alignment begins at 10+00. According to the table shown above, the approximate amount of "White Space" to add before the Start Point is 400 feet for a 1"=100' scale. Therefore, the Start Location should be 6+00 (10+00 – 4+00 = 6+00).
3	Ensure that the box next to Start Location is checked. Left-Click in the *View* to advance to the next Prompt. ***NOTE:*** The User may have to Left-Click in the *View* twice to advance to the next Prompt.

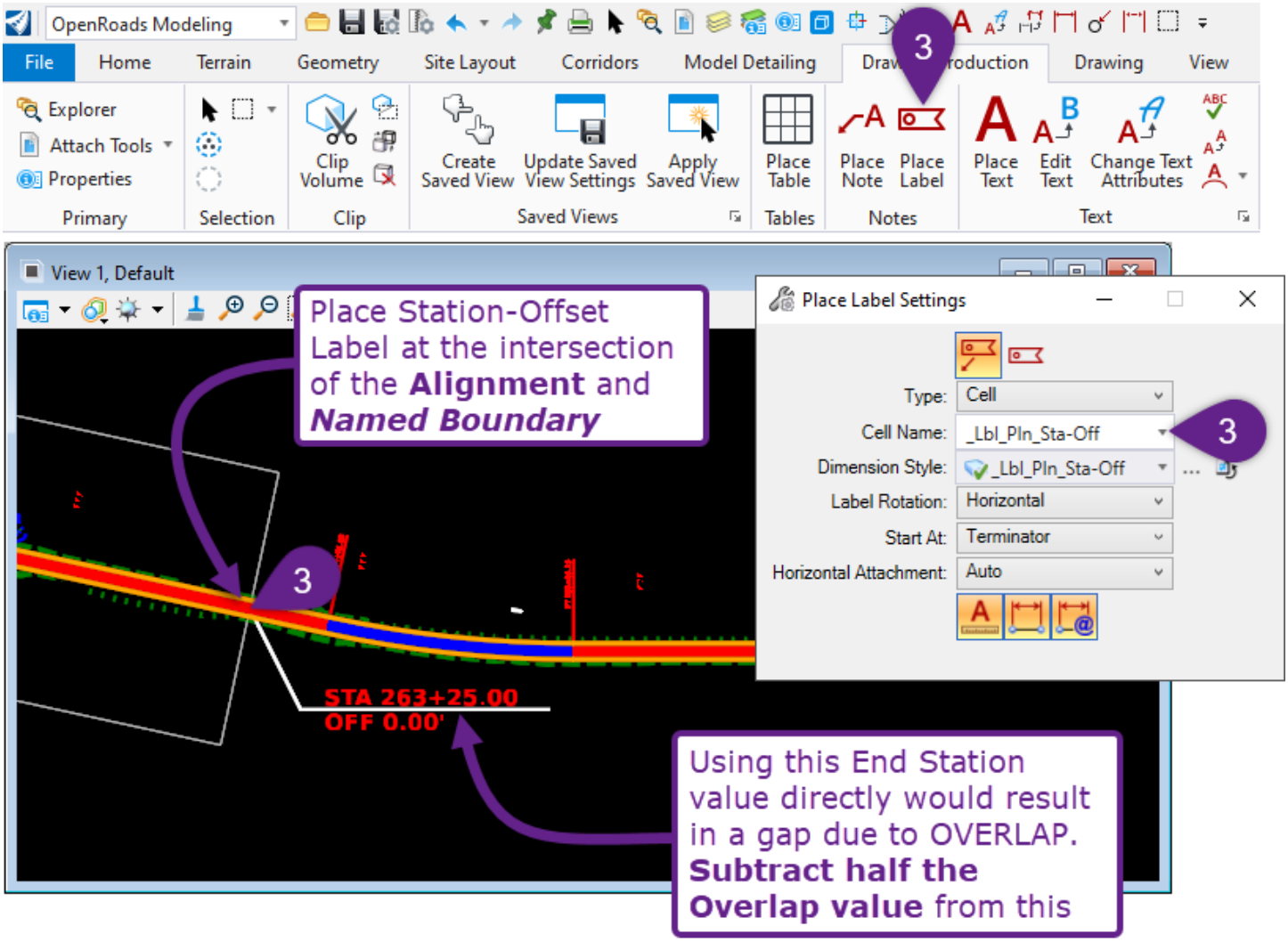
14B.4.c STEP 3: Layout of the Subsequent *Named Boundary* Elements

In this step, the User will carefully place the remaining Named Boundary elements. This step also demonstrates how to change Named Boundary lengths to prevent the sheet match line from landing on a horizontal curve or an important feature.



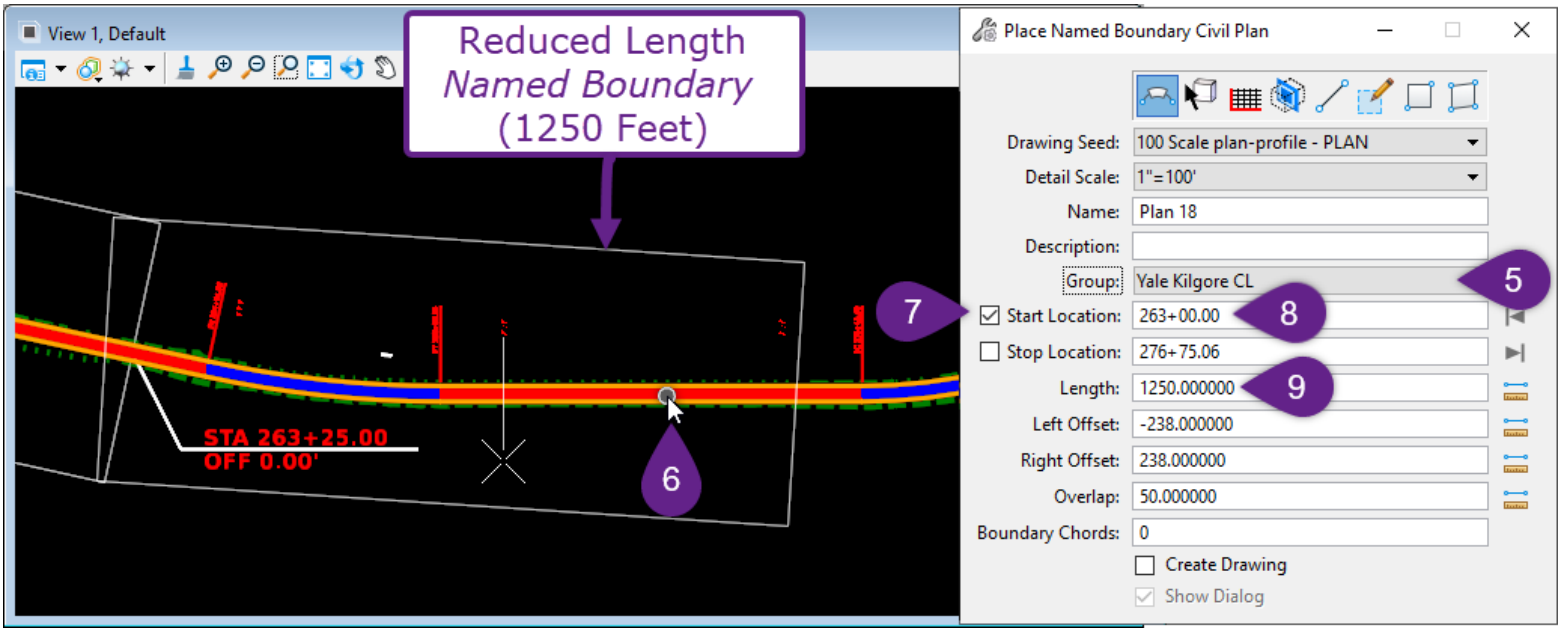
1	Prompt: Place Named Boundary Civil Plan > Identify Path end point to place boundary – By moving the mouse cursor along the length of the Alignment, the User will see a preview of where each *Named Boundary* element will be placed. **Examine the placement of each *Named Boundary* element – from beginning to end of the Alignment.** If the Match Point location of all *Named Boundary* elements are acceptable, then proceed to *14B.4.d STEP 4 Adjust Orientation of PLAN Named Boundaries*. If the **Match Point** between *Named Boundary* elements falls in an undesirable location (i.e., a horizontal curve or important feature), then proceed to 2.
2	As shown in the graphic above, the **Match Point** for this example would land in the midst of a horizontal curve, which is undesirable. Place the mouse cursor before the **Back** Named Boundary. Left-Click to create all Named Boundaries leading up to the **Back** Named Boundary. ***WARNING:*** Do NOT place the **Back** *Named Boundary*. ***WARNING:*** In the *Named Boundary* dialogue box, ensure that the *Create Drawing* box is NOT checked. *Drawing Models* and *Sheet Models* will be created in later steps.

To prevent the **Back** *Named Boundary* from ending in a horizontal curve, the length of this Named Boundary must be reduced. Again, the *Place Named Boundary* tool will be used, but ONLY to place the **Back** *Named Boundary* at a reduced length. In preparation to place the **Back** *Named Boundary*, determine the station of the LAST Named Boundary placed on the previous page.



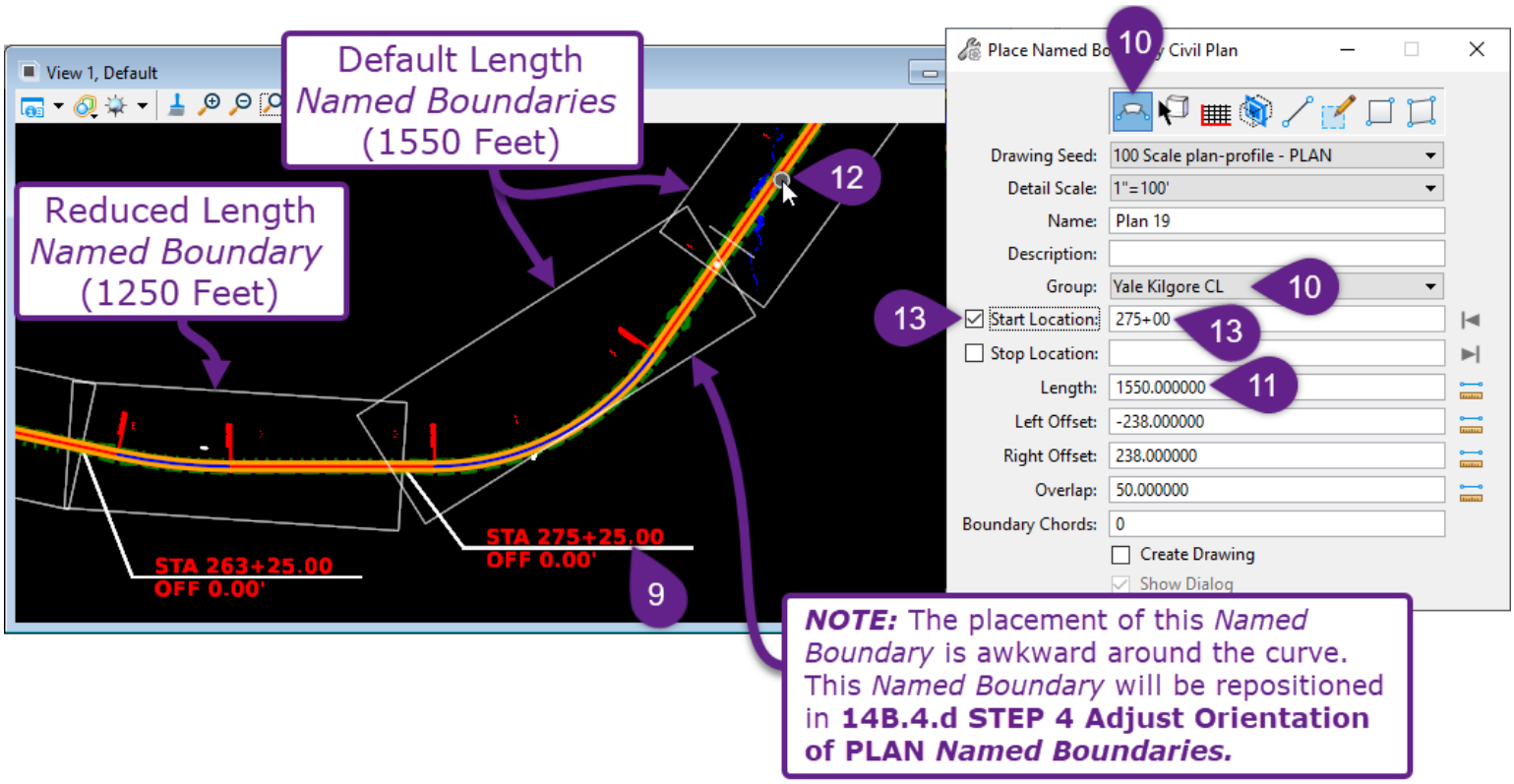
3	Using *Place Label* tool, place a Station-Offset Label (_Lbl_Pln_Sta-Off) to determine the End Station of the last *Named Boundary* element placed in 2 (previous page). In this case, the end Station of the last *Named Boundary* element is 263+25.00. However, this Station should not be directly used due to *Named Boundary* **OVERLAP**. To account for *Named Boundary* **OVERLAP**, the next *Named Boundary* must be placed at HALF the Overlap value behind last *Named Boundary*. In the case of a 1"=100' scale, the **Overlap** value is set to 50' (which is shown in the *Place Named Boundary* dialogue box). **Overlap Value** = 50 **Start Station for next Back Named Boundary** = (263+25.00) – (50/2) = **263+00.00**

Next a single *Named Boundary* element – with a reduced **Length** – will be placed at the **Start Station** determined on the previous page. **IMPORTANT:** Ensure the single *Named Boundary* is assigned to the *Group* used to create the first set of *Named Boundary* elements. See step 5 below.



4	Refer to *14B.4.a STEP 1: Initial Setup of the PLAN Named Boundary Dialogue Box* for the re-setup of the Named Boundary Dialogue Box. Open the *Place Named Boundary* tool. Ensure that *Civil Plan* mode is enabled.  Ensure that the correct *Drawing Seed* is enabled from the drop-down.
5	***IMPORTANT:*** Instead of creating a new **Group**, select the previously-created **Group** from the drop-down (created in *14B.4.a STEP 1: Initial Setup of the PLAN Named Boundary Dialogue Box*). In this case, the **Group** is called "Yale Kilgore CL".
6	Prompt: *Place Named Boundary Civil Plan > Identify Path Element* – In the View, Left-Click on the Road Alignment (referred to as the *Path Element*).
7	*Prompt: Place Named Boundary Civil Plan > Accept/Reject. Identify Path start point to place boundary* In the *Place Named Boundary* dialogue box, type and lock in the Start Location determined on the last page. In this case, the Start Location is 263+00. Ensure the box next Start Location is checked. Left-Click in the View to preview the *Named Boundary* element and advance to the next *Prompt*.
8	*Prompt: Place Named Boundary Civil Plan > Identify Path end point to place boundary –* In the *Place Named Boundary* dialogue box, experiment with a reduced **Length** value. In this case, a length of **1250 feet** is used to fall short of the horizontal curve ***NOTE:*** Due to the OVERLAP of 50, the Resulting Profile Length for this sheet will be **1200 feet**. The OVERLAP value should be considered for placement of Match Points on nice, round Stations. Left-Click in the View to place the reduced Length *Named Boundary* element.

Finally, the remaining *Named Boundary* elements will be placed. As shown in 3, the first *Named Boundary* element of this sequence needs to be placed at the appropriate Start Station – with respect to the OVERLAP value.



9	As shown in 3, determine the Start Location for the next *Named Boundary* element. In this case, the End Station of the previously placed *Named Boundary* is 275+25.00 – which means the Start Location will be 275+00.00 (due to the Overlap).
10	Open the *Place Named Boundary* tool. Ensure that *Civil Plan* mode is enabled.  Set the *Drawing Seed* and ensure the appropriate **Group** is used
11	In the *Place Named Boundary* dialogue box, **change the Length back to the default value**. In the case of 1"=100' plans, the default value is 1550 feet. The previous *Named Boundary* element was placed at 1250 feet – ensure the **Length** is returned to the default value.
12	Prompt: Place Named Boundary Civil Plan > Identify Path Element – In the View, Left-Click on the Road Alignment (referred to as the Path Element).
13	*Prompt: Place Named Boundary Civil Plan > Accept/Reject. Identify Path start point to place boundary* In the *Place Named Boundary* dialogue box, type and lock in the Start Location (determined in Step 3I). In this case, the Start Location is 275+00. Ensure the box next Start Location is checked. Left-Click in the View to preview the *Named Boundary* element and advance to the next *Prompt*.
14	Refer to 2 and 3 for the placement of the remaining *Named Boundary* elements. **Inspect the placement of all remaining** *Named Boundary* **elements before creation**. Ensure the *Create Drawing* box is NOT checked.

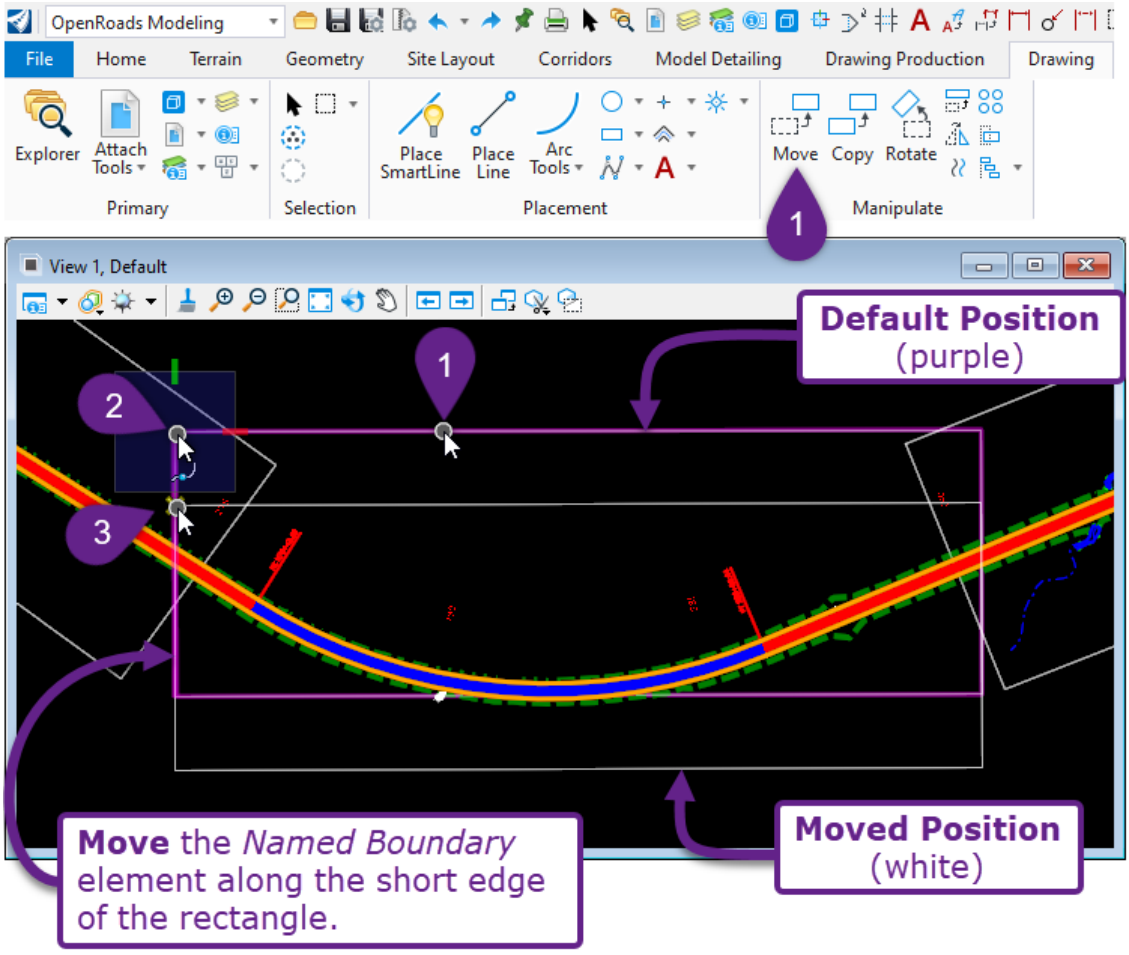
14B.4.d STEP 4: Adjust Orientation of PLAN *Named Boundaries*

In this step, the PLAN *Named Boundaries* will be moved and rotated into the desired position. This step is ONLY necessary if the default placement of the PLAN *Named Boundary* is unsatisfactory.

NOTE: When *Sheet Model* are eventually created, each PLAN *Named Boundary* that is manually repositioned will require slight adjustment in the corresponding *Sheet Model*. The readjustment in the *Sheet Model* is shown in *14E.1 Rotate and Move Plan Views*.

14B.4.d.i Move a PLAN *Named Boundary* element

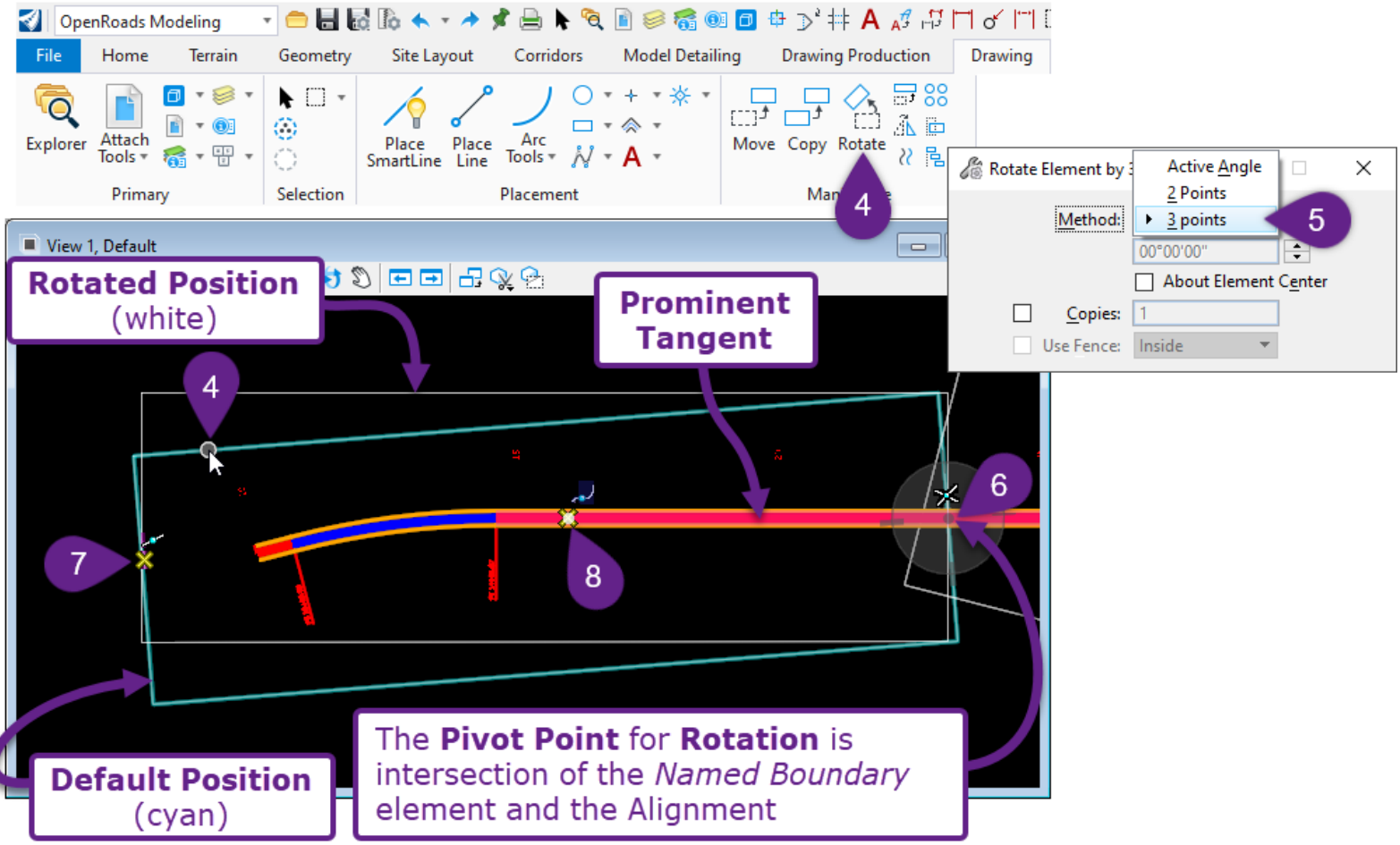
In this demonstration, a PLAN *Named Boundary* element is moved for better placement around a curve. As shown below, the default location for the *Named Boundary* is uncentered around the curve.



1	With the PLAN *Named Boundary* element *selected*, use the *Move* tool.
2	*Prompt: Move Element > Enter first Point* – With the *Nearest Snap* toggled on click on a point along the short side of the rectangle. ***TIP:*** When Moving PLAN *Named Boundary* elements, have the *Nearest Snap* toggled on. Move the element along the short edge of the rectangle. By doing so, the OVERLAP distances are unaffected and the *Named Boundary* remains in the same longitudinal position.
3	*Prompt: Move Element > Enter point to define distance and direction* – Along the short edge of the rectangle, select the location to move the *Named Boundary* element to.

14B.4.d.ii Rotate a PLAN *Named Boundary* element

In this demonstration, a PLAN *Named Boundary* element is rotated to be parallel with the prominent tangent. The prominent tangent is the longest tangent contained within a PLAN *Named Boundary* element.



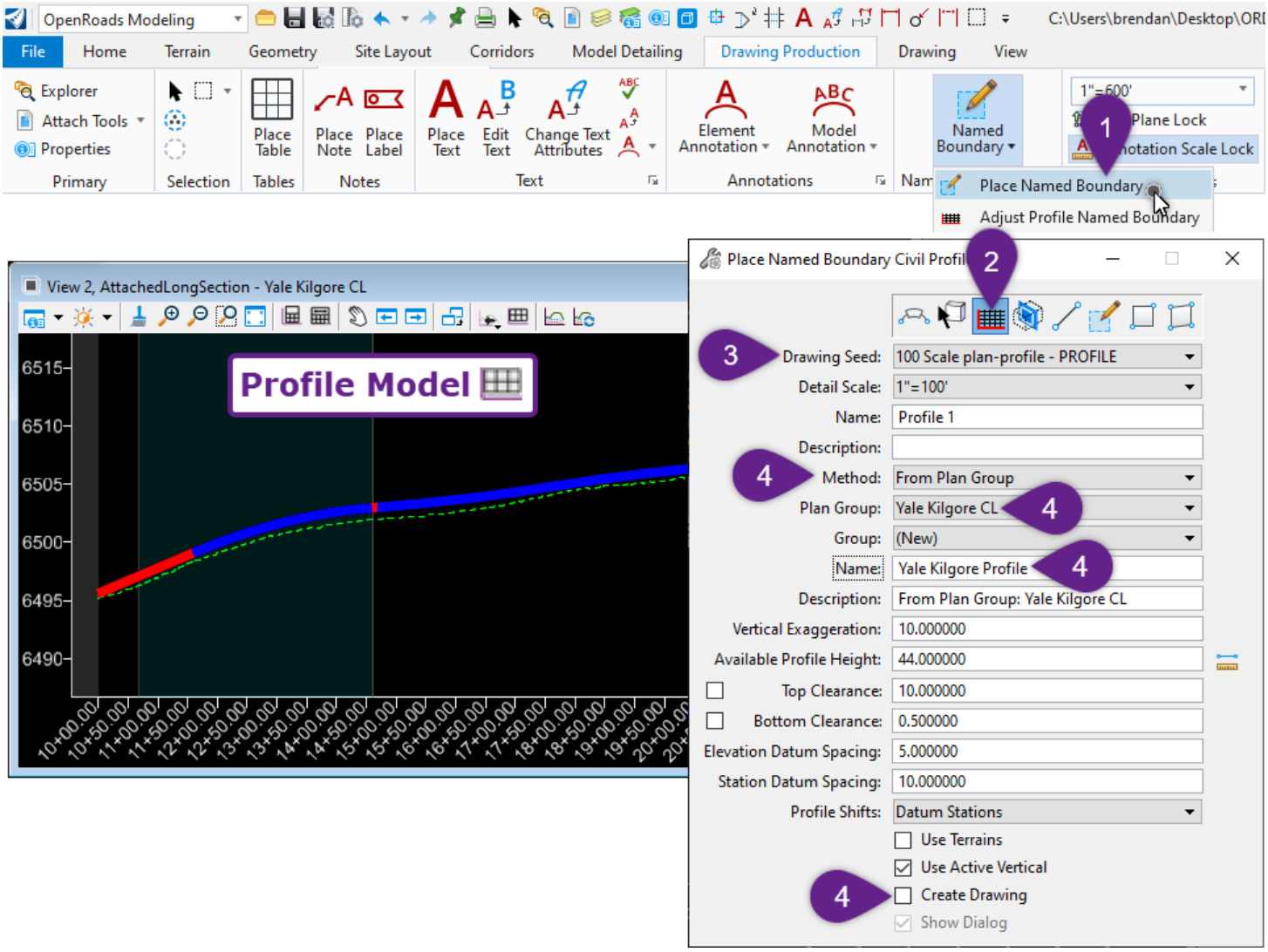
4	With the PLAN *Named Boundary* element S*elected*, use the *Rotate* tool.
5	In the *Rotate* dialogue box, change the *Method* to *3 points*.
6	*Prompt: Rotate Element > Enter pivot point (point to rotate about)* – The Pivot Point is the intersection of the *Named Boundary* element and the Alignment. With the *Intersection Snap* toggled on, select this location.
7	*Prompt: Rotate Element > Enter point to define start of rotation* – The second point is midpoint of the *Named Boundary* element (located directly across from the Pivot Point). With the *Midpoint Snap* toggled on, select this location.
8	*Prompt: Rotate Element > Enter point to define amount of rotation* - The third point is on the Alignment; at any location along the prominent tangent. With the *Nearest Snap* toggled on, select any location on this tangent.

14B.5 STEPS 5-7: Create PROFILE *Named Boundary* Elements

In this phase of the workflow, PROFILE *Named Boundary* elements are created in the *Profile Model* of the Alignment.

The *Profile Model* of the Alignment must be opened in this process.

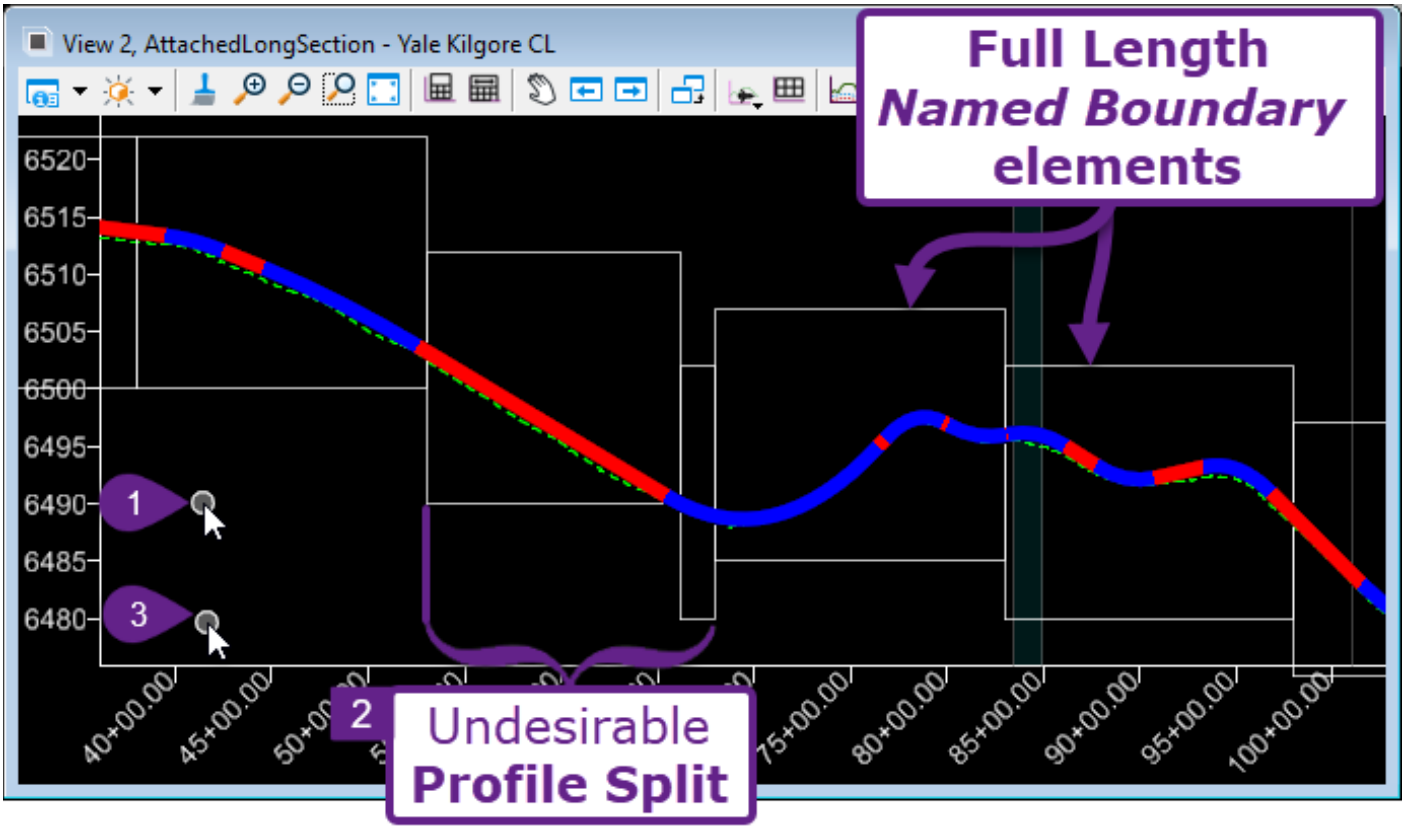
14B.5.a STEP 5: Initial Setup of the *Named Boundary* Dialogue Box



1	From within Profile Model  of the Alignment, select the Place Named Boundary tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Named Boundaries***].
2	In the *Place Named Boundary* Dialogue Box, select the *Civil Profile* mode by clicking on the icon  .
3	In the *Place Named Boundary* Dialogue Box, select the appropriate **Drawing Seed** from the drop-down. The *Drawing Seed* for the PROFILE *Named Boundaries* must correspond to the *Drawing Seed* used in PLAN *Named Boundary* creation. In *14B.4.a STEP 1: Initial Setup of the Named Boundary Dialogue Box*, the ***100 Scale plan-profile – PLAN*** option was used. Therefore in this step, the PROFILE *Named Boundary Drawing Seed* should be set to: ***100 Scale plan-profile – PROFILE***
4	**METHOD:** Set the *Method* to "**From Plan Group**". **PLAN GROUP:** Set the *Plan Group* to the **Group** created in *14B.4.a STEP 1: Initial Setup of the Named Boundary Dialogue Box*. In this case, the **PLAN GROUP** is set to "Yale Kilgore CL". ***WARNING:*** All PLAN *Named Boundaries* should belong to a SINGLE **PLAN GROUP**. If more than one **PLAN GROUP** is shown in the drop-down, the PLAN *Named Boundaries* were created incorrectly. **PROFILE GROUP NAME:** A Profile Group will be created after the placement of PROFILE *Named Boundary* elements. Assign the Profile Group a Name. **CREATE DRAWING:** Ensure that this box is UNCHECKED. In this example, no other configuration is necessary. For a full explanation of each configuration option, see *14A.3.d Profile Named Boundary Options*.

14B.5.b STEP 6: Layout of PROFILE Named Boundary Elements

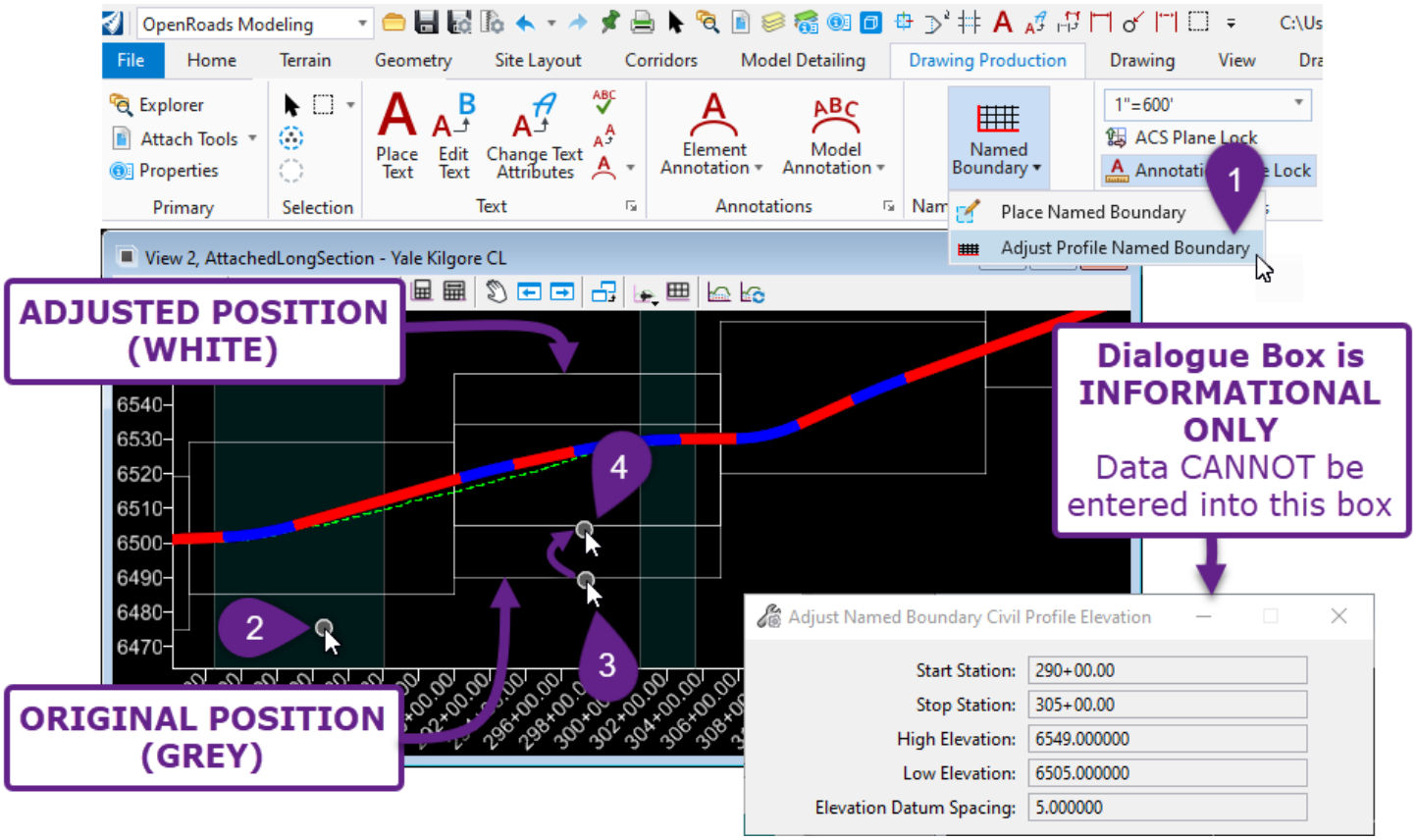
In this step, the User will preview and place the PROFILE *Named Boundary* elements. Before placement, search for undesirable Profile Splits. If an undesirable Profile Split is found, do NOT place the PROFILE *Named Boundary* elements. Exit out of the command and change the *Profile Shifts* option. See *14A.3.d.i Profile Shift Strategies*.



1	Prompt: Place Named Boundary Civil Profile > Identify Profile View - Left-Click anywhere within the Profile Model to advance to the next Prompt. ***NOTE:*** If the *Prompt Bar* is displaying the message "*New Node*", then the User will have to Left-Click in the *Profile Model* twice to advance.
2	Prompt: *Place Named Boundary Civil Profile > Accept/Reject. Data point Profile View to place boundary –* In this step, a preview of the PROFILE *Named Boundary* elements will be shown. Scroll along the Profile to search for undesirable Profile Splits. ***NOTE:*** In this Step, the User can NOT edit the vertical placement of the *Named Boundary* elements. The vertical placement of the *Named Boundary* elements can be adjusted after creation. Vertical adjustments are performed with the *Adjust Profile Named Boundary* tool – which is shown in *14B.5.c STEP 7: Adjust Vertical Position of PROFILE Named Boundaries* (next page).
3	If no undesirable Profile Shifts are found, proceed to place the *Named Boundary* elements. Left-Click anywhere within the *Profile Model* to advance to place the PROFILE *Named Boundaries*.

14B.5.c STEP 7: Adjust Vertical Position of PROFILE Named Boundaries

In this step, the User will vertically adjust the PROFILE *Named Boundary* elements with the *Adjust Profile Named Boundary* tool.



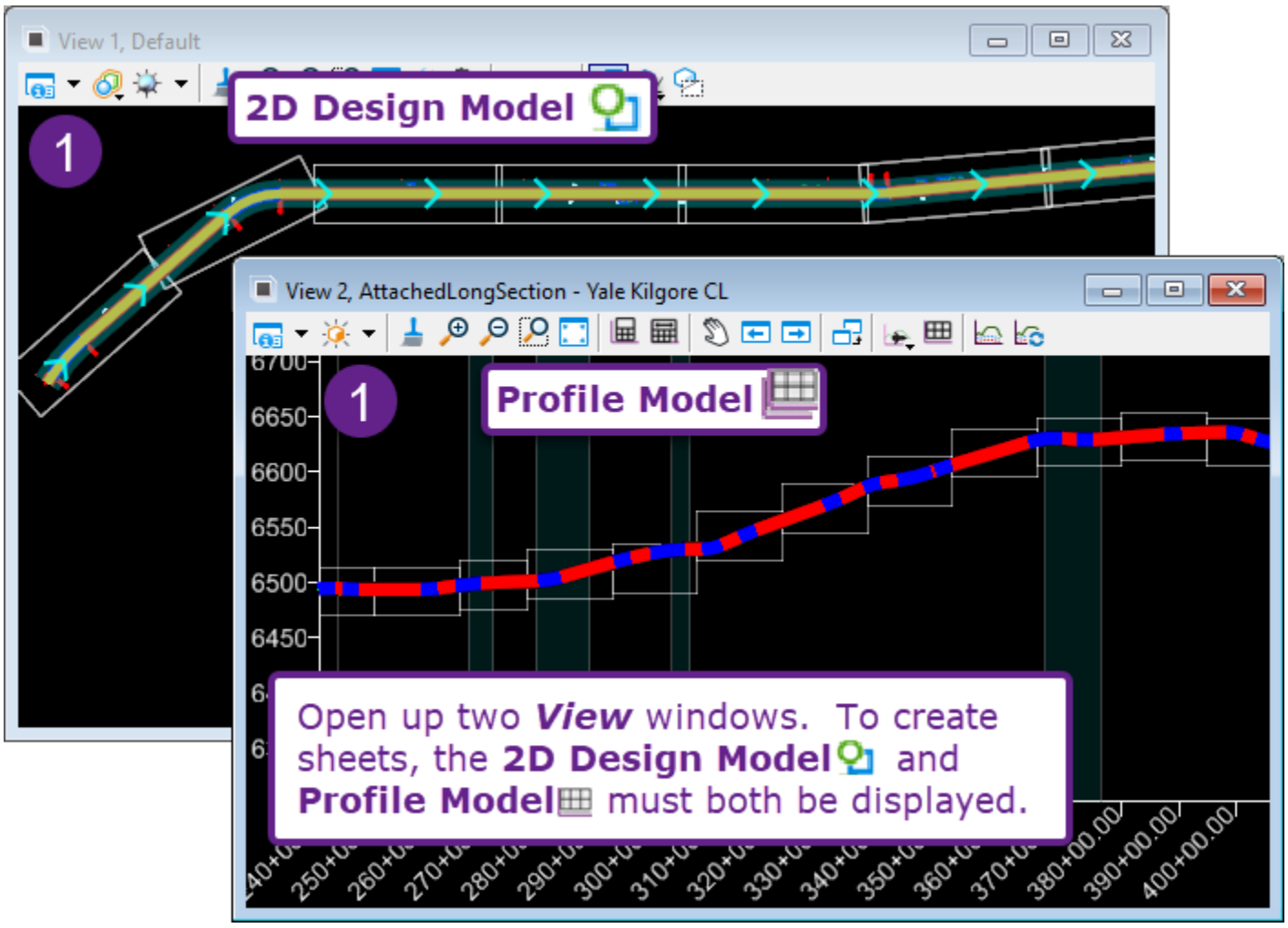
1	From within Profile Model of the Alignment, select the Adjust Profile Named Boundary tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Named Boundaries***].
2	*Prompt: Adjust Named Boundary Civil Profile Elevation > Identify Profile View* - Left-Click anywhere within the *Profile Model* to advance to the next *Prompt*.
3	*Prompt: Adjust Named Boundary Civil Profile Elevation > Select Named Boundary Element* – Left-Click on the PROFILE *Named Boundary* element to be vertically adjusted
4	*Prompt: Adjust Named Boundary Civil Profile Elevation > Accept/Reject*. Data point in *Profile View* to place – Using the Mouse Cursor, position the PROFILE *Named Boundary* element where desired. Left-Click to accept placement.

Adjust Profile Named Boundary	
Dialogue Option:	**Description:**
Start/Stop Station	Current Station Limits for the PROFILE Named Boundary element.
High/Low Elevation	Current Elevation of the top and bottom of the PROFILE Named Boundary.
Elevation Datum Spacing	The incremental vertical distance in which the Named Boundary will be moved.

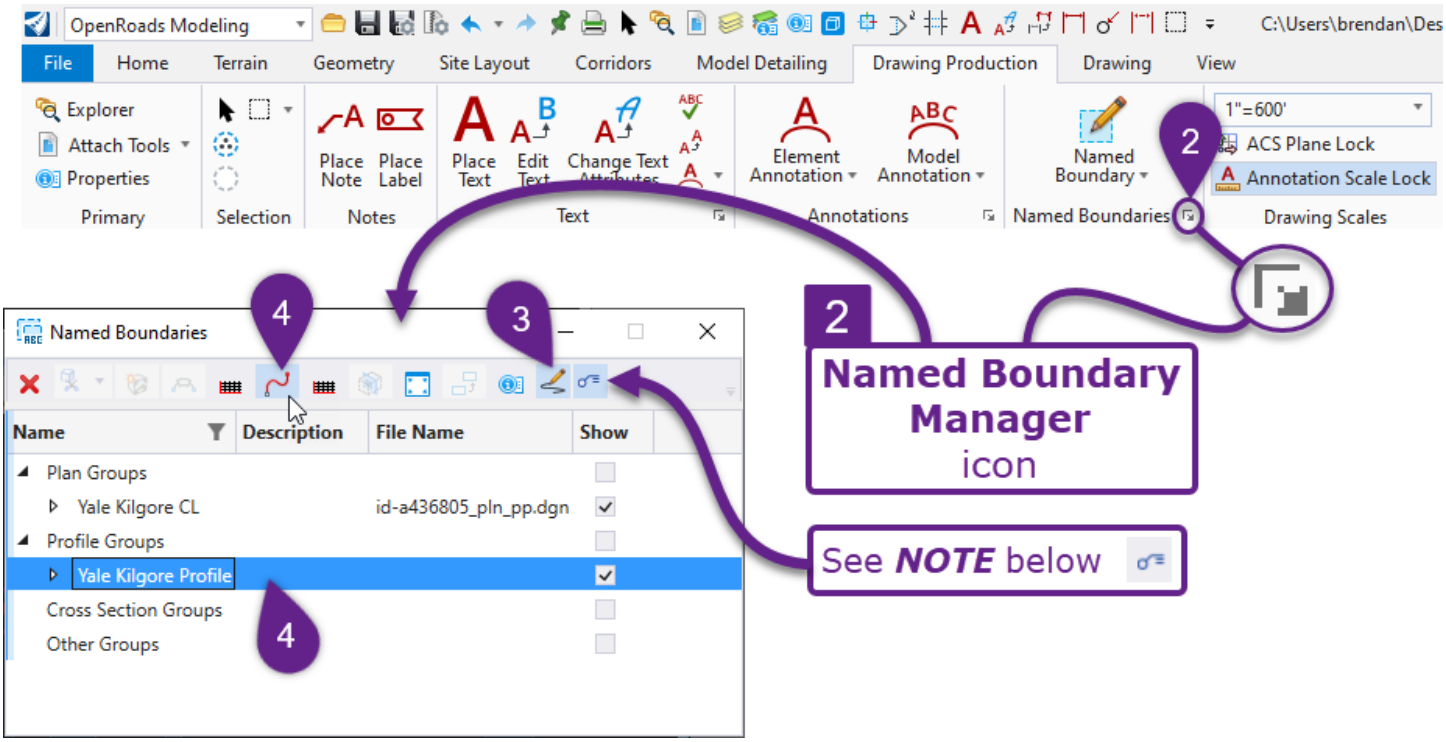
14B.6 STEP 8: Create Drawing and Sheet Models

In this Step, the User will create *Drawing Models* and *Sheet Models* from the **Named Boundary Manager**.

IMPORTANT WARNING: Before *Drawing Models* and *Sheet Models* are created, ensure that PLAN and PROFILE *Named Boundary* elements are in the intended position. Moving *Named Boundary* elements after the creation of *Drawing Models* and *Sheet Models* is very problematic.



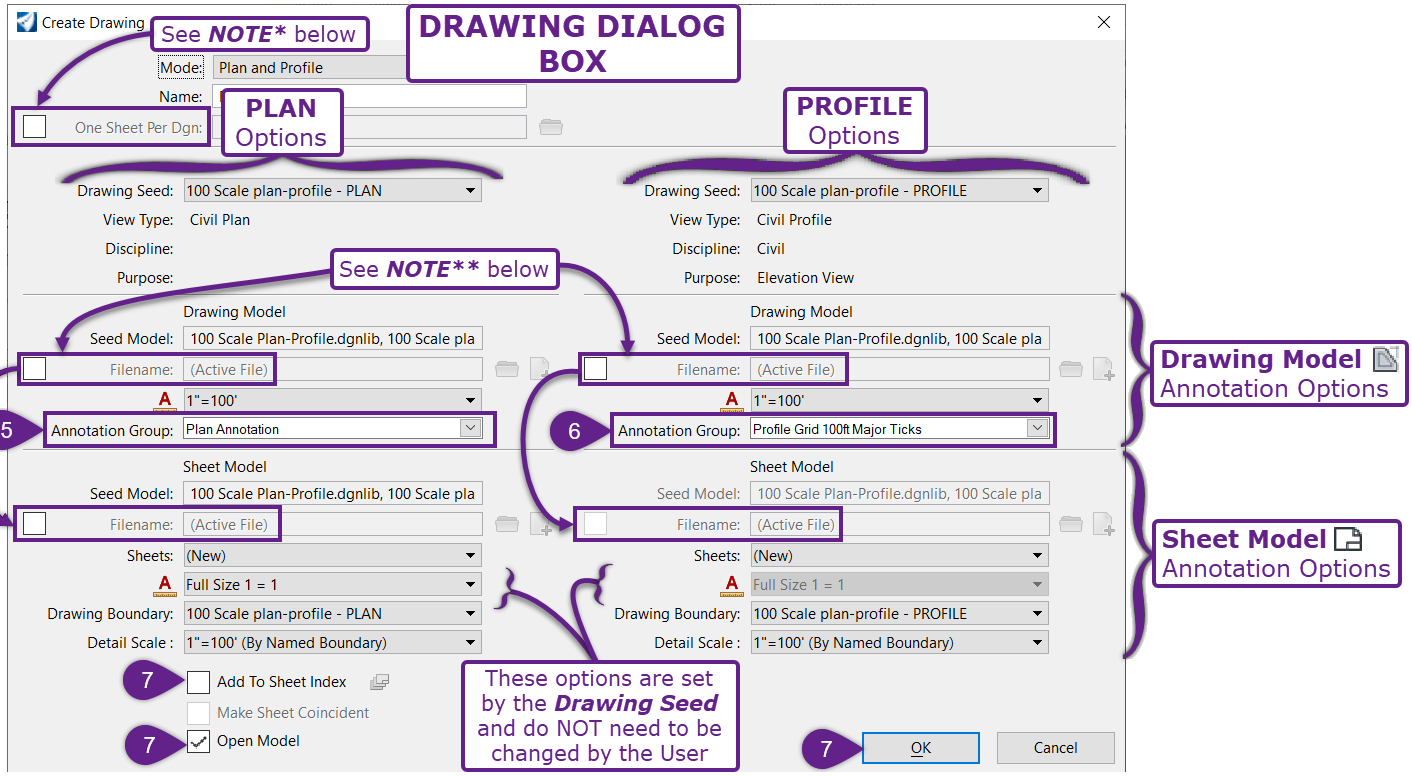
1	To create Plan & Profile sheets, the User needs to have two *Views* open. The *2D Design Model* should be displayed in a *View.* In the other *View*, display the *Profile Model* of the Alignment.



2	Open the **Named Boundary Manager** from the Ribbon. Ribbon location: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Named Boundaries***]. ***NOTE:*** The **Named Boundary Manager** does not have a conventional icon. Instead, the diagonal arrow will open it up .
3	In the **Named Boundary Manager**, ensure that *Show Drawing Dialog* is toggled ON (highlighted light blue).
4	In the **Named Boundary Manager**, select (highlight) the Profile Group that was created in *14B.5.a STEP 5: Initial Setup of the Named Boundary Dialogue Box*. Push the Create plan/profile drawing button

NOTE: A setting for the User to consider is the *Annotate Plan Model* option . When this option is toggled ON, then the Alignment will be Annotated within the *Drawing Model* . In other words, Stationing ticks and labels will be automatically created in the *Drawing Model* .

However, this option is unnecessary if the Alignment has been Annotated in a different location, such as the Alignment ORD File. If the Alignment has been Annotated in a different location, the then two duplicate sets of Annotations will be found in the *Drawing Models* and *Sheet Models* .



5	**PLAN Annotation Group:** This option pertains to elements that will automatically be placed in the PLAN *Drawing Model*. The default PLAN option – which is called "Plan Annotation" – will simply create a North Arrow cell element that is oriented in the correct direction. Select the "Plan Annotation" option from the drop-down.
6	**PROFILE Annotation Group:** This option pertains to the display of the Profile Grid. The User should select the PROFILE Group option that corresponds with the Scale used in previous operations. In general, different Scale options will show the Major and Minor ticks/labels at different spacing or different configurations. Select the "Profile Grid 100ft Major Ticks" option from the drop-down.
7	Press OK to finally create the PLAN and PROFILE *Drawing Models* and *Sheet Models*. Before pushing OK, the User should consider the following CHECK BOXES: **Add To Sheet Index -** updates the Sheet Index with new *Sheet Model* information. **Open Model** – After processing, the last Sheet in the Alignment will be automatically opened.

NOTE*: If the **One Sheet Per DGN** option is CHECKED, then a new ORD FILE (DGN) will be created for each *Sheet Model*. In other words, the User has the option to place all *Sheet Models* within the current ORD FILE – OR – place each *Sheet Model* in its own ORD FILE. It is recommended that this option is UNCHECKED for longer Alignments.

NOTE**: If **File Name** is checked, then the resulting *Drawing Models* and/or *Sheet Model* are placed in a separate ORD FILE.

After Step 8G, the *Drawing Models* and *Sheet Models* are created.

For common workflows and problems that arise after creation, proceed to *14E – Troubleshoot and Manipulate Drawing Models and Sheet Models*

14C – CREATION OF OTHER PLANIMETRIC SHEET TYPES

14C.1 Plan-Plan Sheets and Full-Page Plan Sheets

Plan-Plan Sheets and Full-Page Plans Sheets are created the same procedures shown in *14B – Creating Road Plan & Profile Sheets – Workflow*. Like the Plan-Profile workflow, Plan-Plan Sheets and Full-Page Plans Sheets are centered and placed along an Alignment.

When creating PLAN *Named Boundary* elements for Plan-Plan Sheets or Full-Page Plans Sheets, the only notable difference is the **Drawing Seed** type that is selected. See 3 of *14B.4.a STEP 1: Initial Setup of the PLAN Named Boundary Dialogue Box*

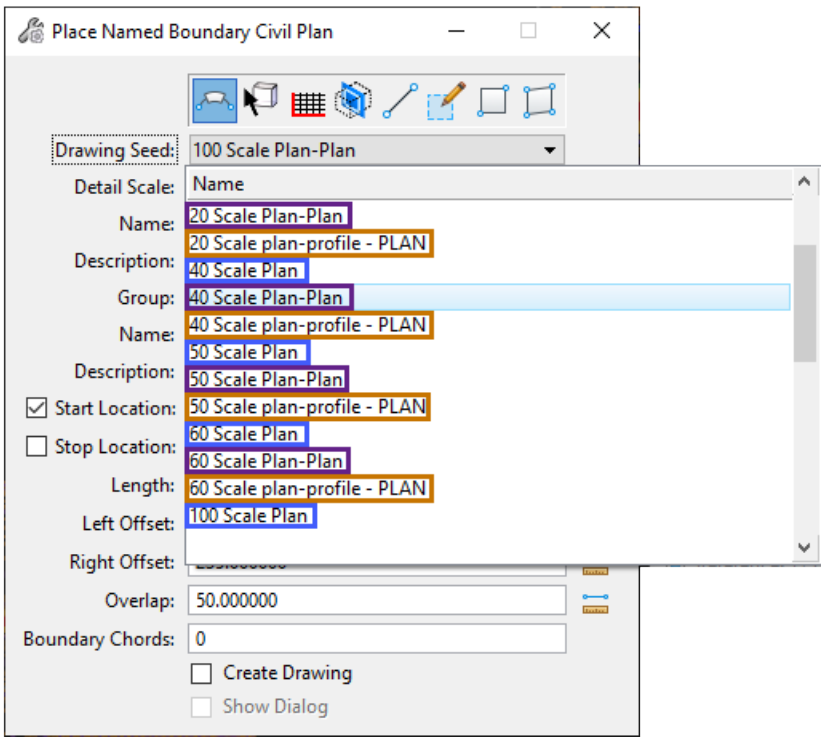
Plan-Profile Sheets: The Drawing Seeds for creation of **Plan-Profile** sheets contains the suffix (plan-profile – PLAN). For example: "50 Scale plan-profile – PLAN". This type of drawing seed is intended for Plan-Profile sheet creation.

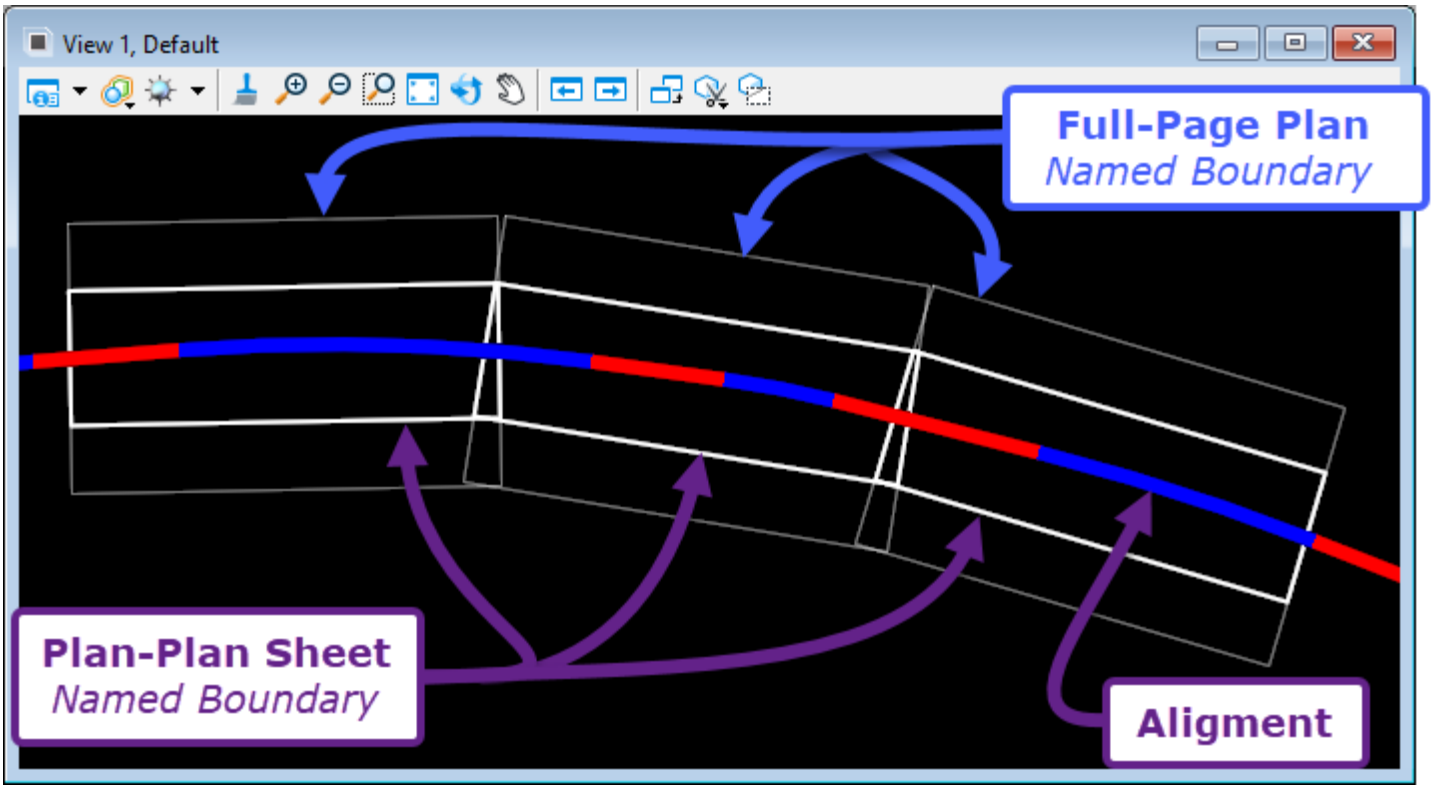
Plan-Plan Sheets: The Drawing Seeds for creation of Plan-profile sheets contains the suffix (Plan-Plan). For example: "20 Scale Plan-Plan". This type of Drawing Seed will create a two plan-views per sheet. This type of Drawing Seed is typically used for Erosion Control plan-plan sheets.

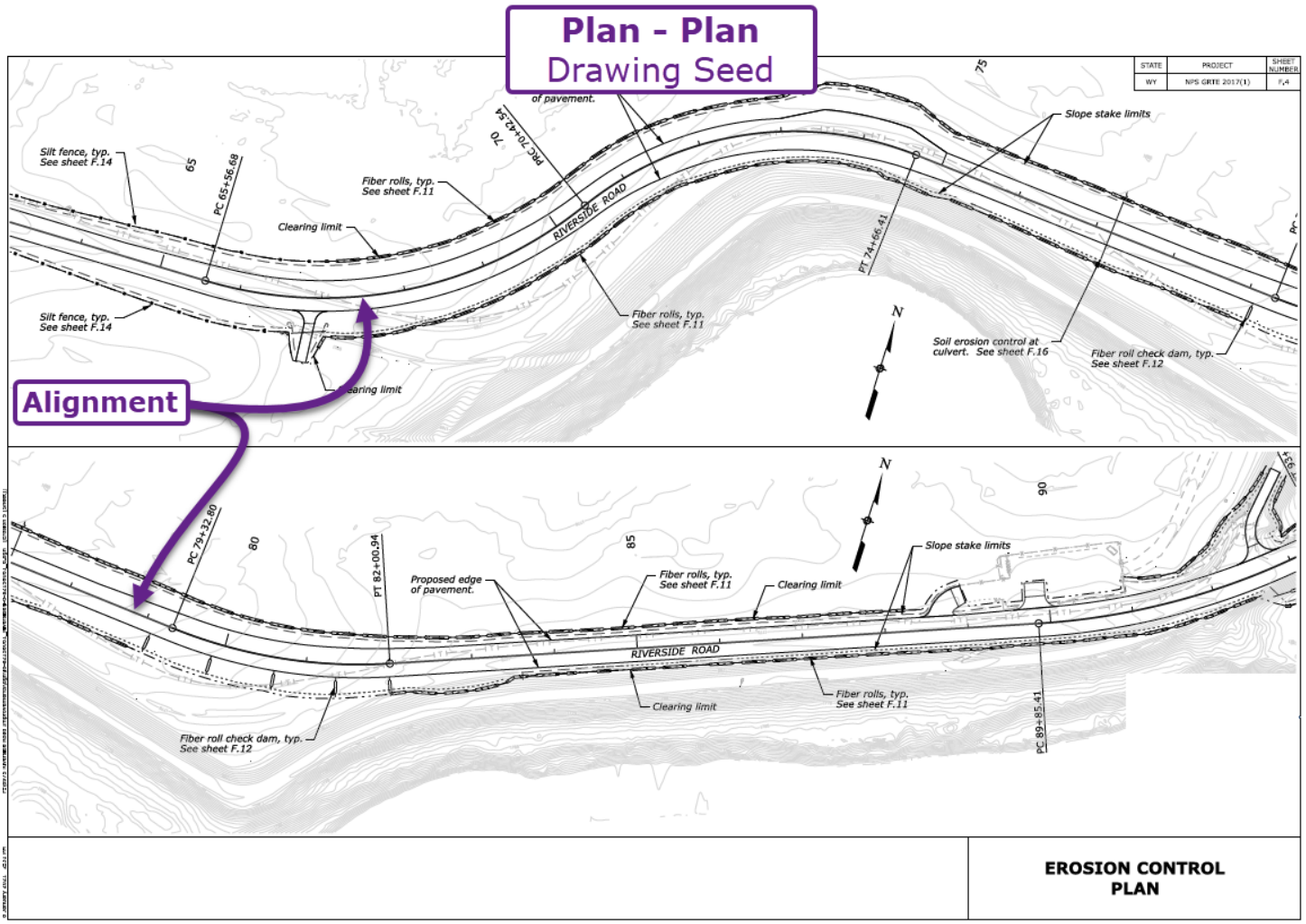
Full-Page Plan Sheets: The Drawing Seeds for creation of Plan-profile sheets contains the suffix (Plan-Plan). For example: "40 Scale Plan". This type of Drawing Seed will create a single plan-view per sheet. The single plan-view will occupy the entire vertical space in the FLH Sheet Border.

IMPORTANT: **Full-Page Plan Sheets** are exactly twice the height of **Plan-Plan** and **Plan-Profile Sheets**.

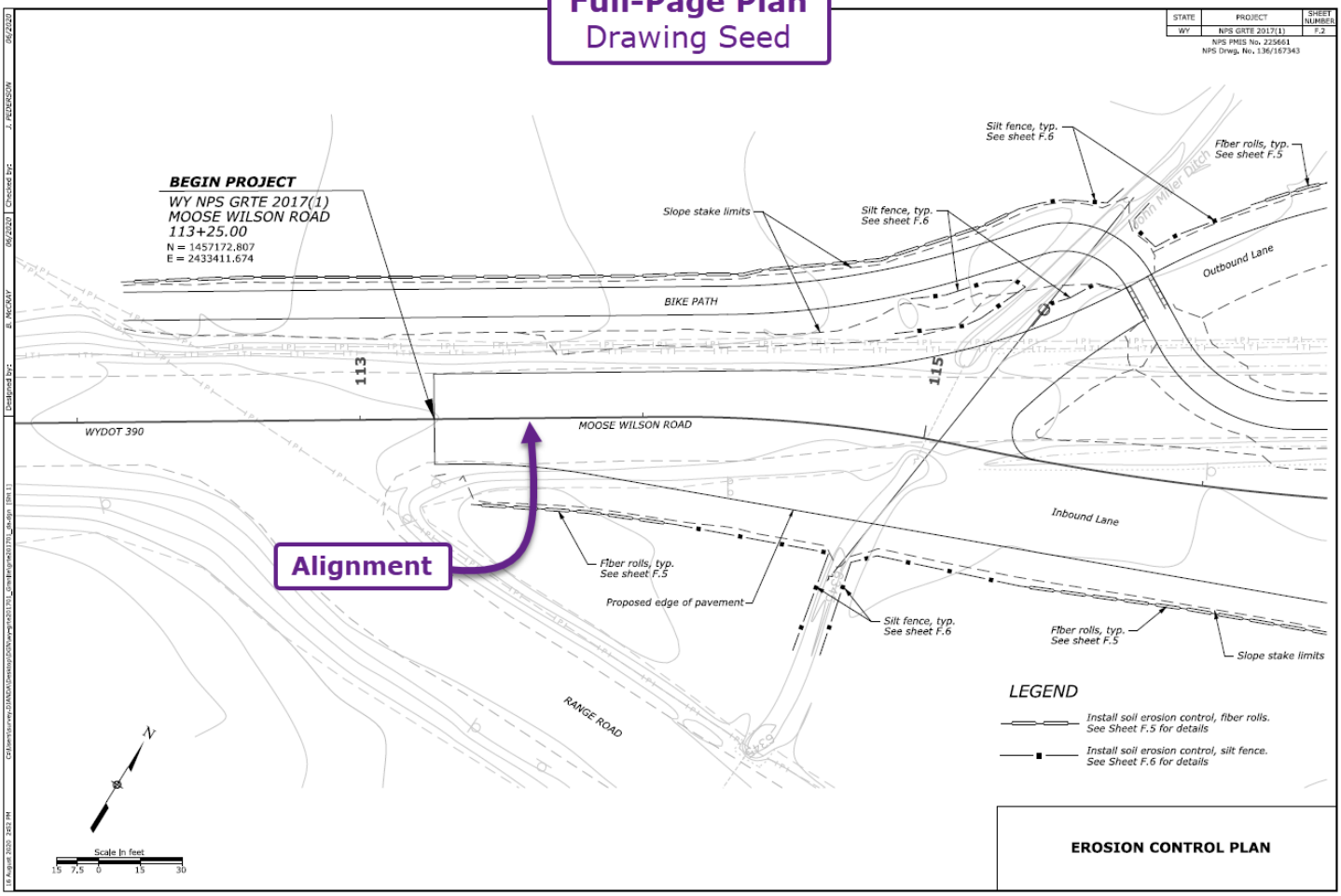
See the next page for example **Drawing Seed** type.




View 1, Default
Full-Page Plan
Named Boundary
Plan-Plan Sheet
Named Boundary
Aligment


Plan - Plan
Drawing Seed
Alignment
Silt fence, typ. See sheet F.14
Fiber rolls, typ. See sheet F.11
Clearing limit
RIVERSIDE ROAD
Slope stake limits
Soil erosion control at culvert. See sheet F.16
Fiber roll check dam, typ. See sheet F.12
Proposed edge of pavement.
EROSION CONTROL PLAN

Full-Page Plan
Drawing Seed



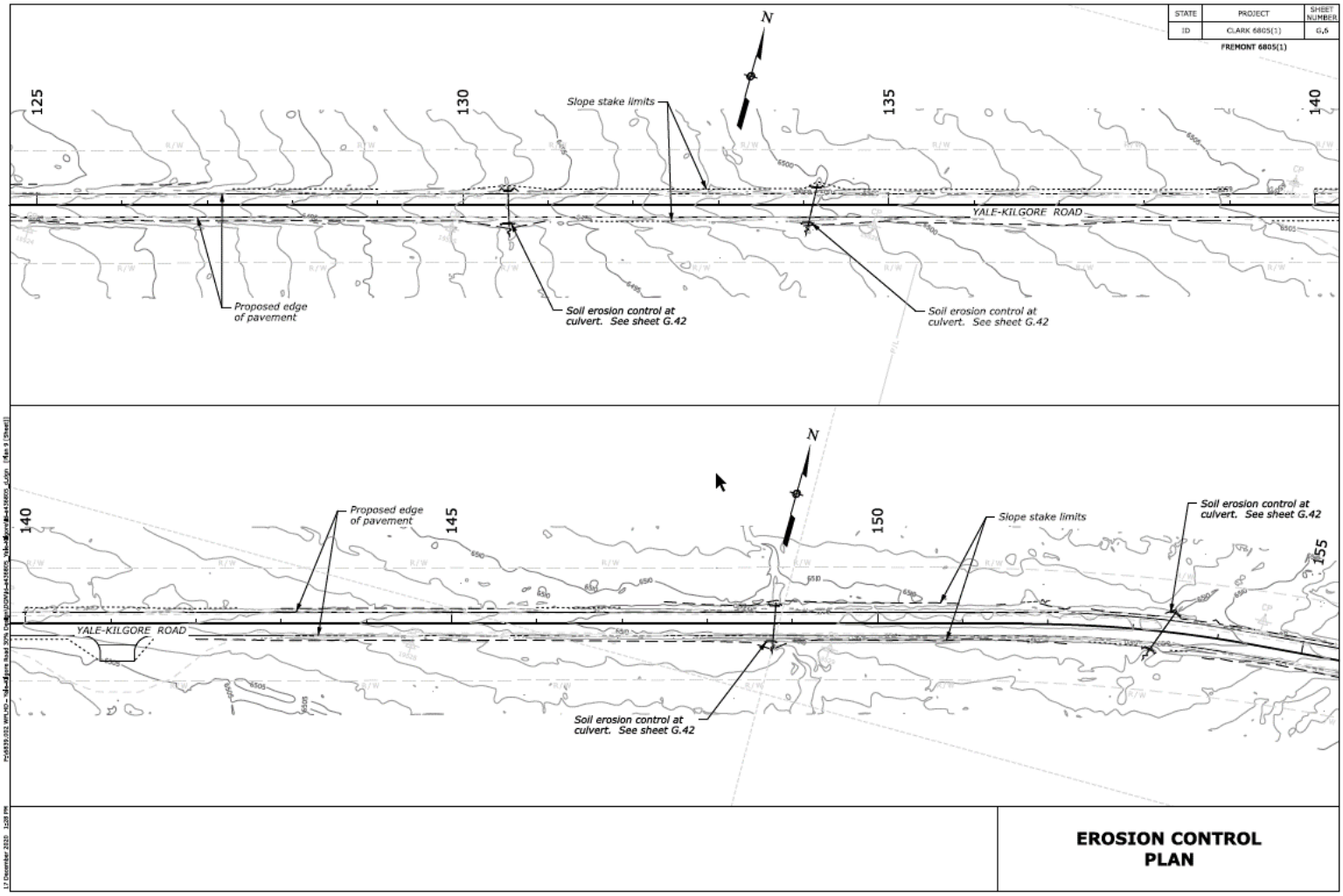
14C.1.a Plan-Plan Sheet – Condensed Workflow

In a typical FLH Plan Set, some sections are shown in a Plan-Plan configuration. Examples of common Plan-Plan sections include Erosion Control, Utilities, Permeant Traffic Control, and Right of Way. See the graphic below for an example Plan-Plan sheet configuration.

Plan-Plan Sheets are created in a similar procedure as Road Plan & Profile sheets, with a few notable exceptions:

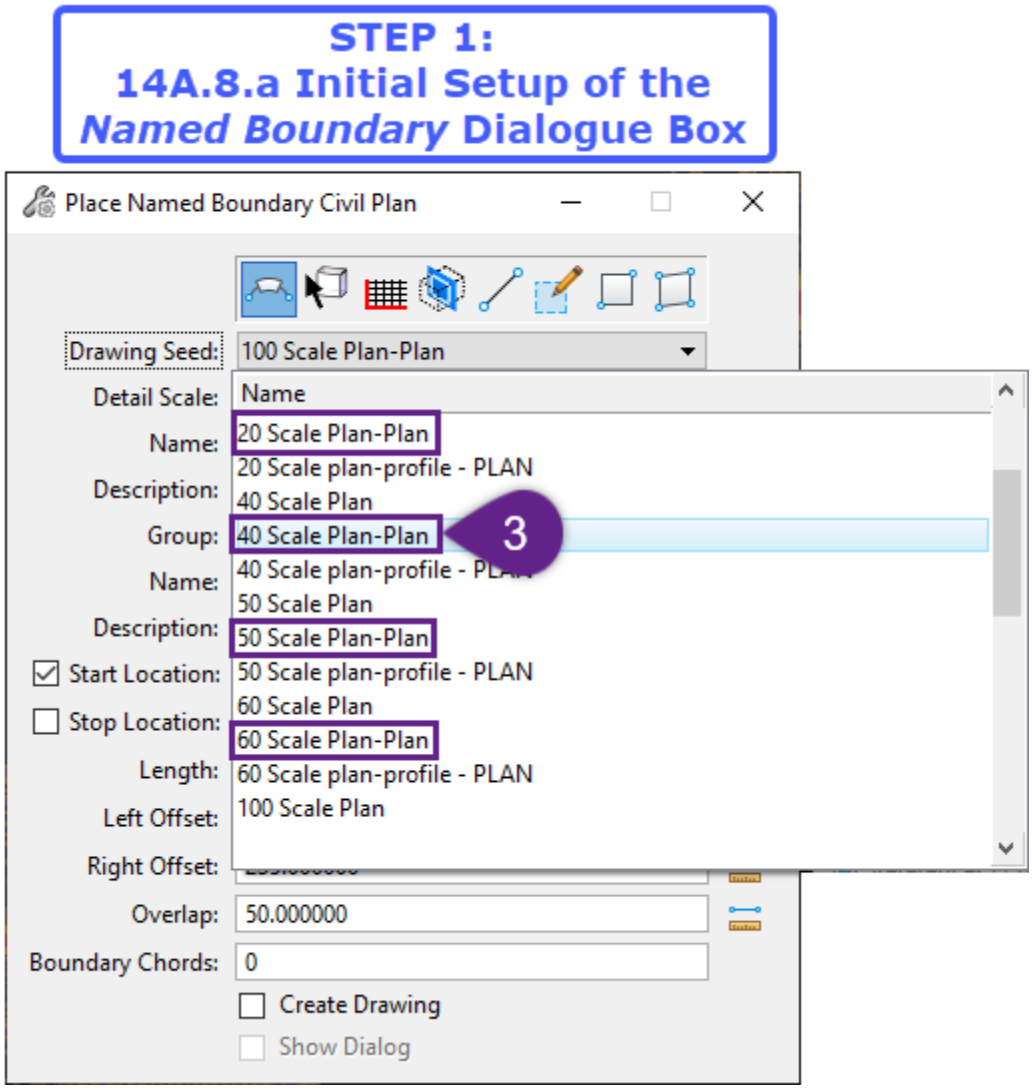
Drawing Seed: Use a Drawing Seed that contains a "…Plan-Plan" suffix and corresponds with the appropriate scale. For example, a Drawing Seed named: "100 Scale Plan-Plan" contains a 1"=100' drawing scale and produces plan-plan sheets.

Profile Named Boundaries: Plan-Plan sheets do not show Profile graphics. Therefore, the User will not have to create PROFILE *Named Boundaries*.



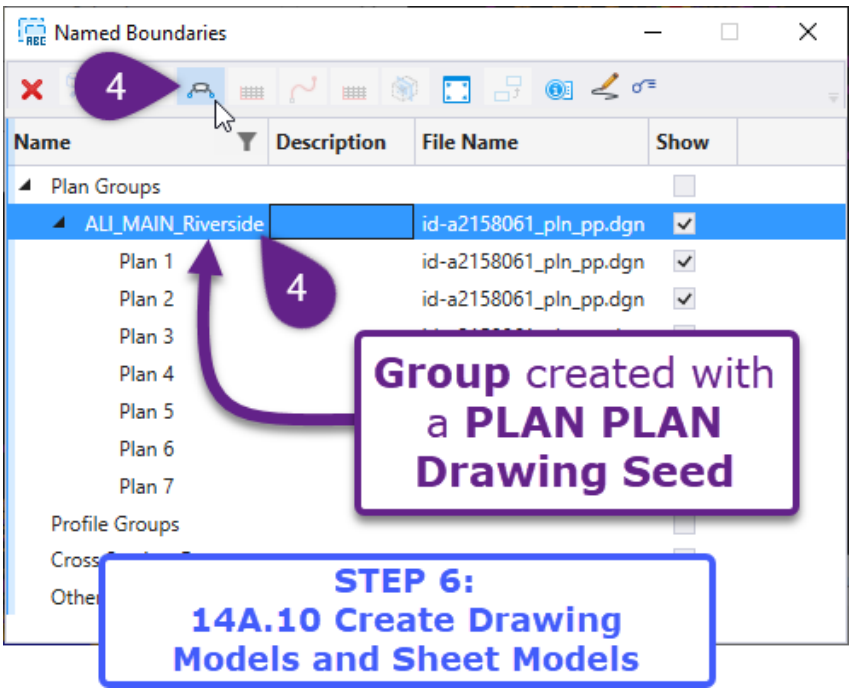
For the creation of Plan-Plan Sheets, follow the exact workflow shown in *14B – Creating Road Plan & Profile Sheets – Workflow*. However, make the following *minor* exceptions to this workflow:

- In 3 of *14B.4.a STEP 1: Initial Setup of the Named Boundary Dialogue Box*, select a designated Plan-Plan Drawing Seed – as shown in the graphic below.

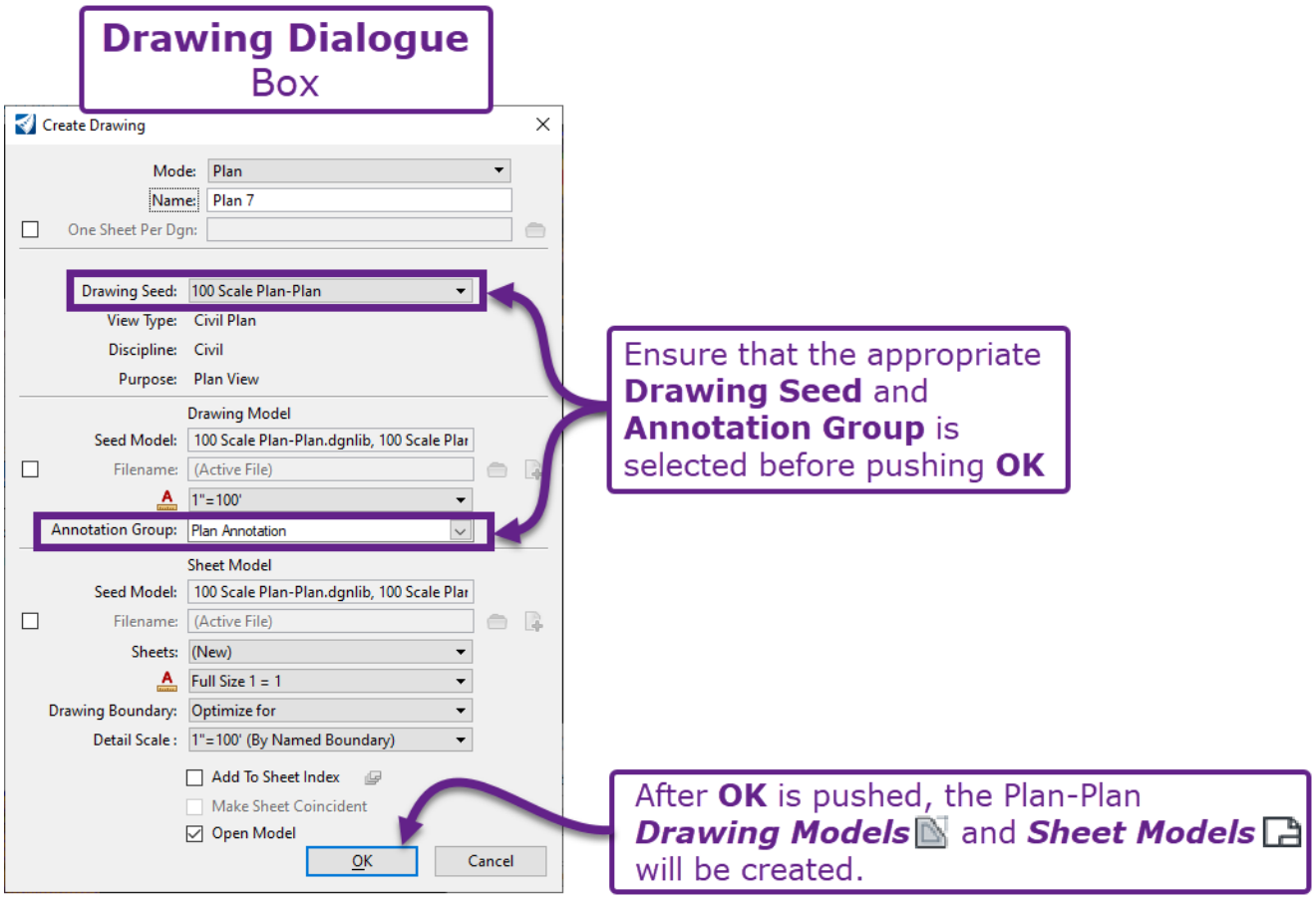


- **Skip over** *14B.5 STEP 5-7: Create PROFILE Named Boundary Elements*. DO NOT CREATE PROFILE NAMED BOUNDARIES ELEMENTS.

- In 4 of *14B.6 STEP 8: Create Drawing Models and Sheet Models*; within the *Named Boundary Manager,* select and highlight the PLAN Group. With the PLAN Group selected, use the *Create Plan Drawing* tool .



- The *Drawing Dialogue* box shown in *14B.6 STEP 8: Create Drawing Models and Sheet Models* is slightly different. Typically, no changes are necessary in this *Drawing Dialogue* box. However, ensure that the appropriate *Drawing Seed* and *Annotation Group* are selected.

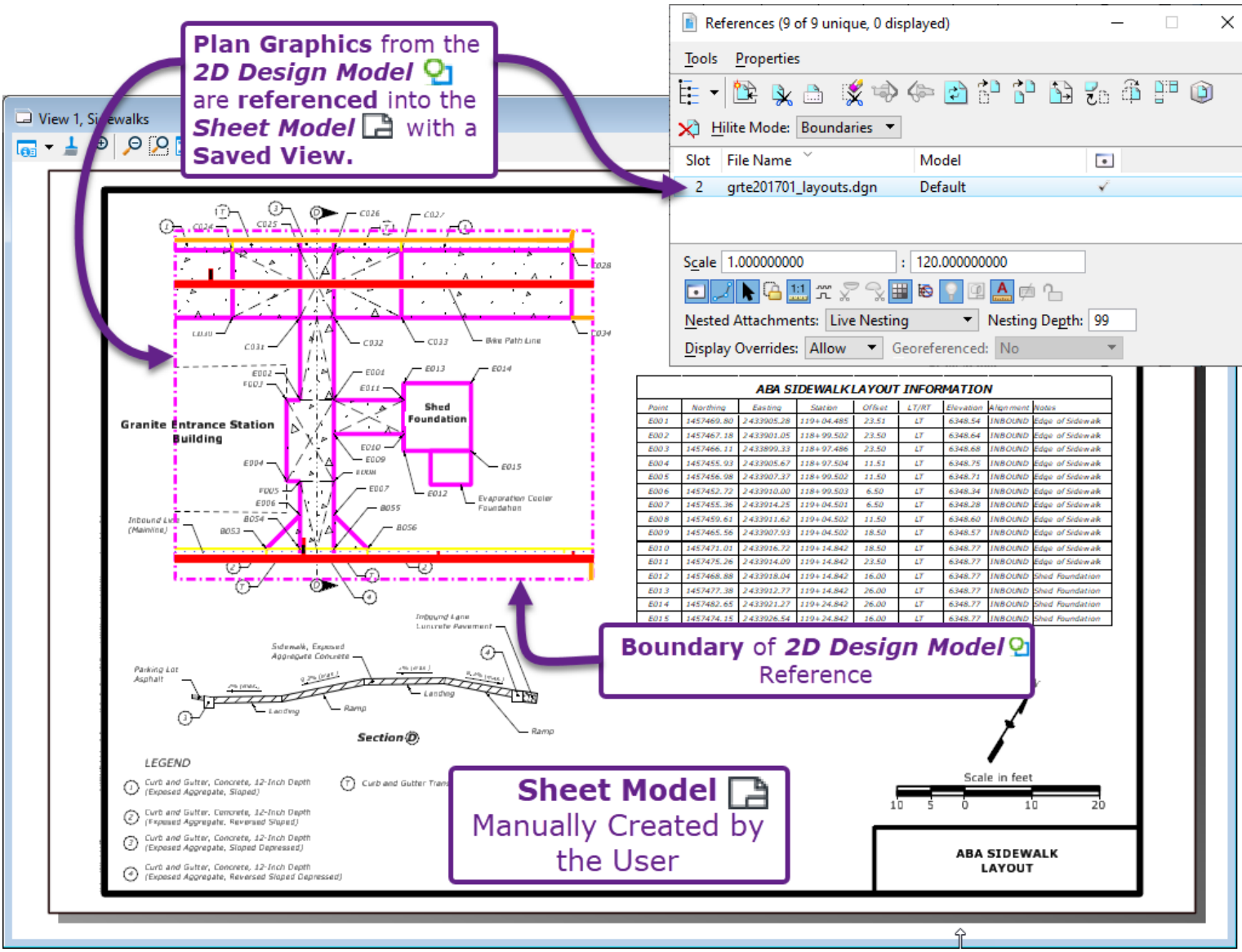


14C.2 Exhibits and One-Off Plan Sheet Graphics

Many exhibits and miscellaneous sheets require the display of a single Plan view. This method provides an alternate method for creating a plan sheet, without using the *Place Named Boundary* tool or *Drawing Models*. This method can be quicker and simpler than using the *Place Named Boundary* tool.

In this method, the User will manually create a *Sheet Model* and then reference a *Saved View* into it to display Plan graphics.

Saved Views are convenient for the creation of Exhibits and One-Off Plan Sheets because the Design Scale and size of the Plan View can be modified. This differs from PLAN *Drawing Models* or PLAN *Named Boundary* elements, which are relatively static and difficult to adjust after creation.

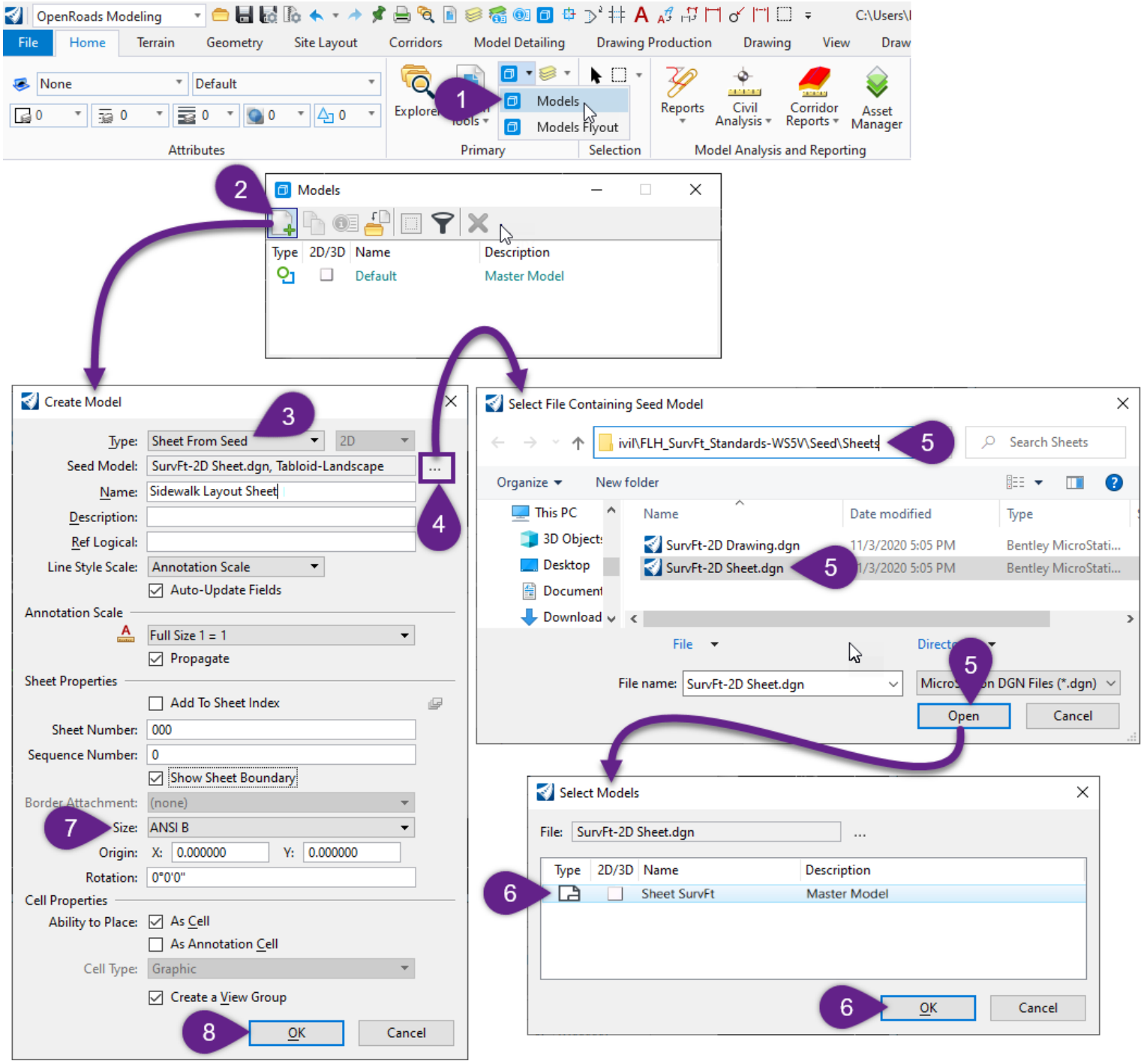


14C.2.a Miscellaneous Plan Sheet ORD File Setup

Before proceeding with the subsequent workflows, create and setup a new Plan Sheet ORD File. Reference all necessary Design ORD Files into new ORD Sheet File. See *14B.3 Initial ORD Sheet File Setup*.

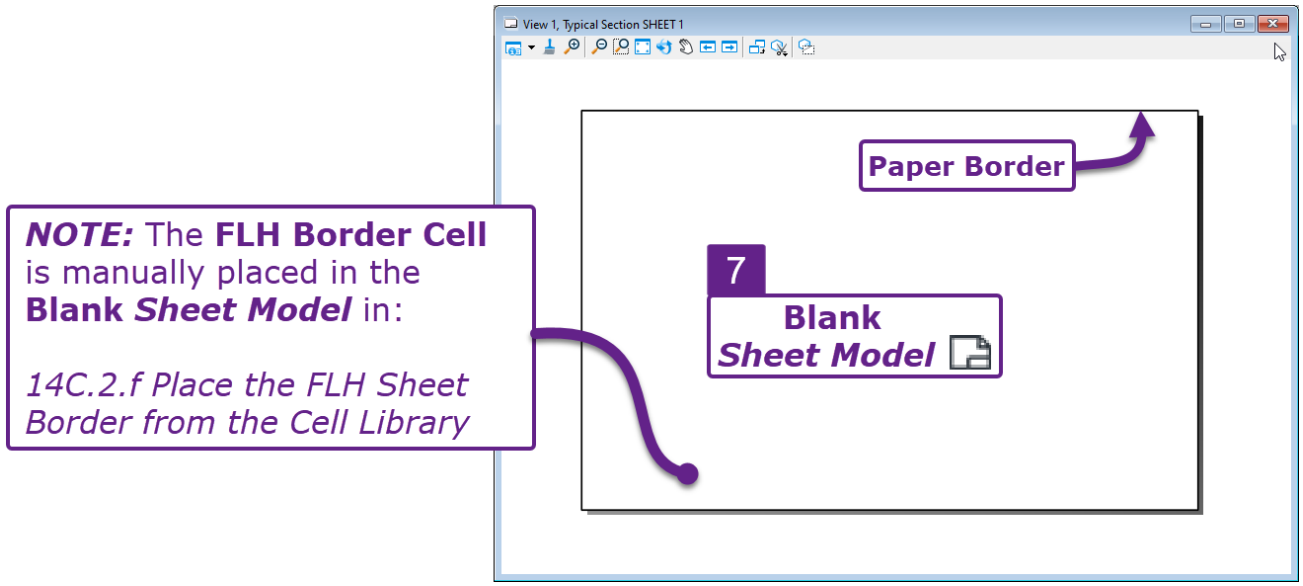
14C.2.b Manually Create the Sheet Model

In this step, a blank *Sheet Model* is created from the *Models* Menu. If desired, the User can create 8.5”x11.5” (Letter) paper sizes for use in Exhibits, which is selected in step 7 shown below.



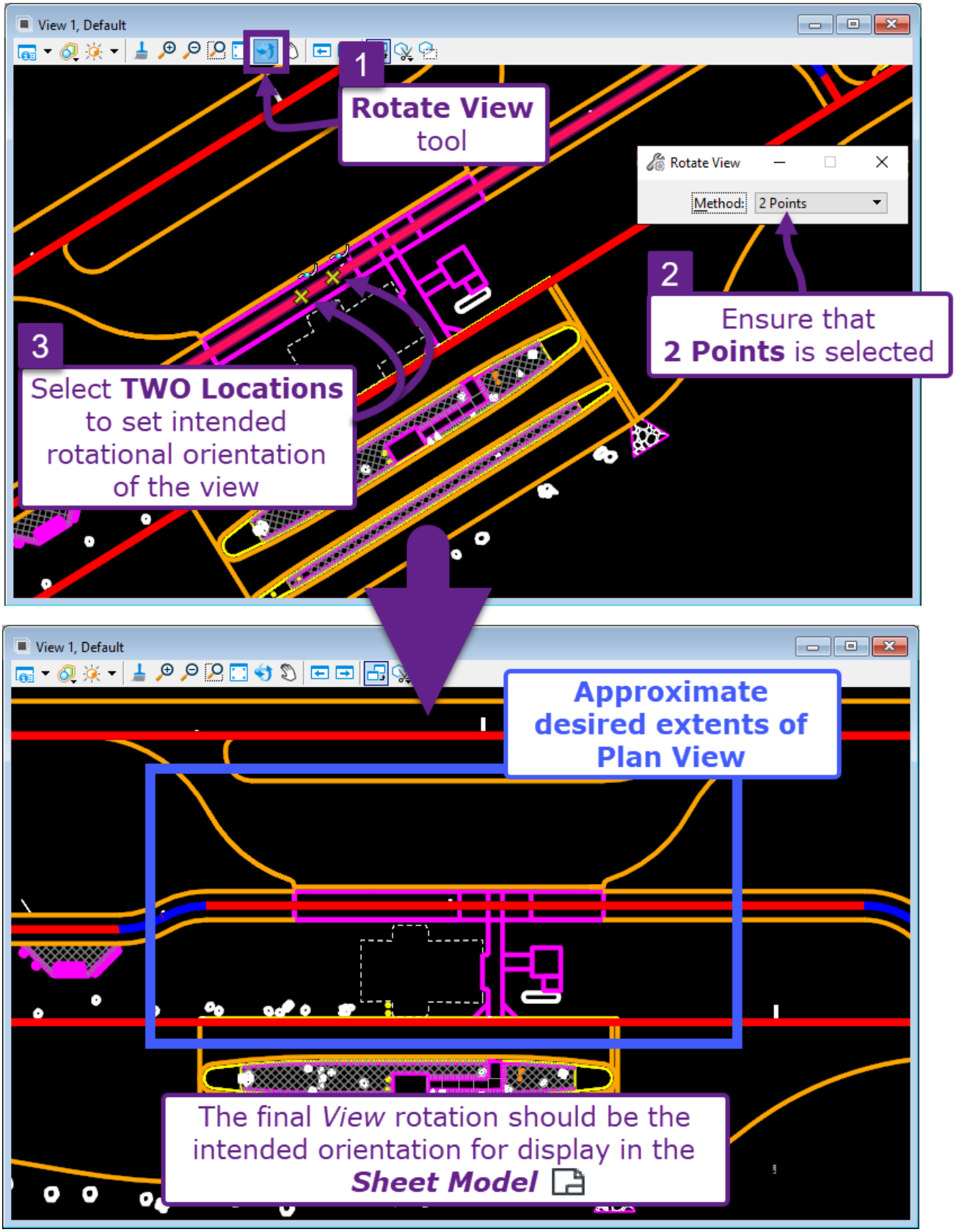
1	Open the *Models* menu from the ribbon: [***OpenRoads Modeling*** → ***Home*** → ***Primary***]
2	In the *Models* menu, select the **Create a new model** icon
3	In the *Type* drop-down, set to **Sheet from Seed**.

4	**Seed Model:** If the appropriate Seed Model is NOT shown, then select the ... icon to locate it. The appropriate Seed Model depends on the Survey Units (i.e., Survey Feet or International Feet). For projects in **Survey Feet**, the appropriate Seed Model is called: "SurvFt-2D Sheet.dgn, Sheet SurvFt" For projects in **International Feet**, the appropriate Seed Model is called: "IntlFt-2D Sheet.dgn, Sheet IntlFt"
5	Locate the **Seed Model** file. For projects in **Survey Feet**, the Seed Model file is found in the FLH WorkSpace in the following location: …\Configuration\Organization-Civil\FLH_Stds-WS10.10.21.00V\Seed**Survey**\Sheets For projects in **Survey Feet**, the Seed Model is located in the following location: …\Configuration\Organization-Civil\FLH_Stds-WS10.10.21.00V\Seed**International**\Sheets
6	In the *Select Models* box, select the provided Seed Model.
7	Select the **Size** for the *Sheet Model*. For typically plan sheets, the Size should be set to **Tabloid Landscape**. ***NOTE:*** Tabloid means 11x17". Letter means 8.5x11".
8	Select OK to create the blank *Sheet Model*.

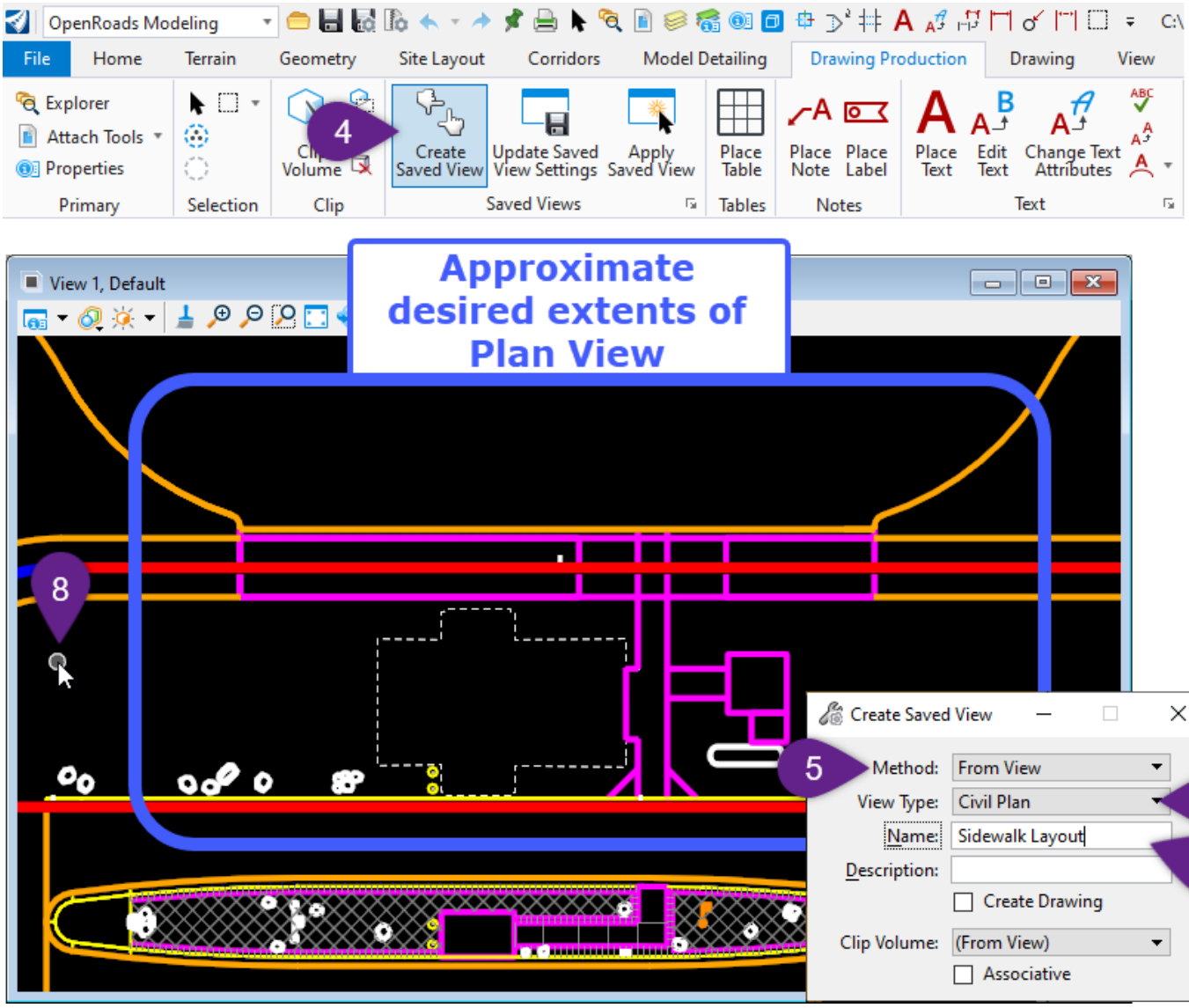


14C.2.c Create a Saved View in the 2D Design Model

In this step, a **Saved View** will be created around the intended Plan graphics in the *2D Design Model*. Before a **Saved View** is created, the *Rotate View* tool, is used to rotate the *2D Design Model* view to the desired rotational orientation.



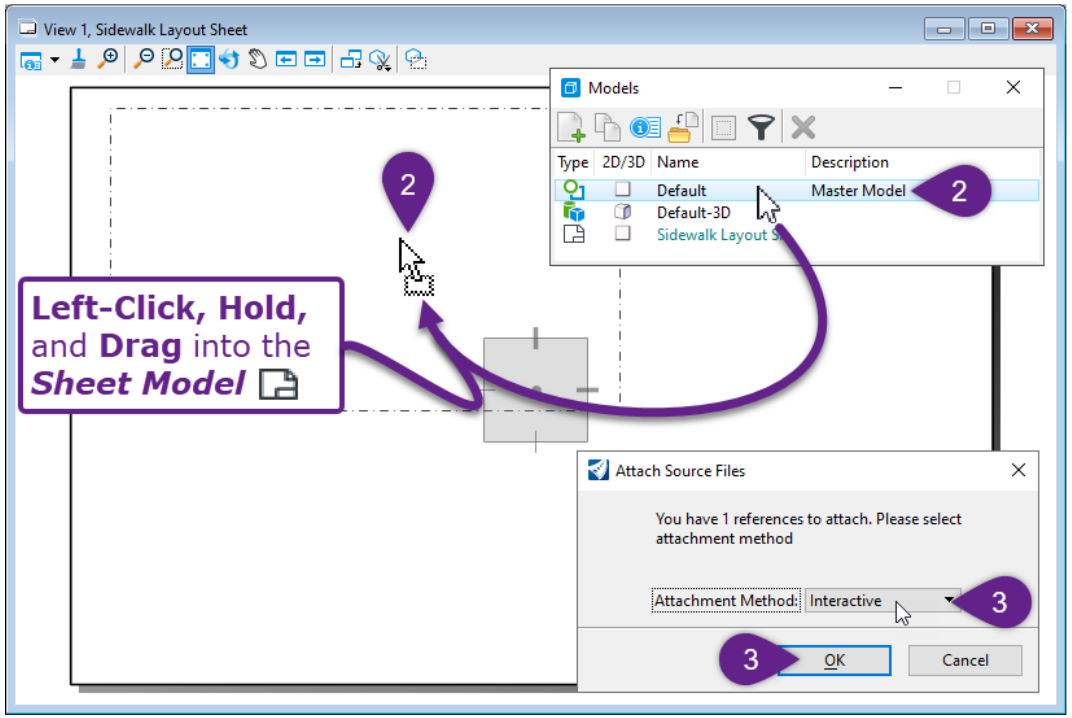
Shown below, the *Saved View* will be captured from the *2D Design Model*.

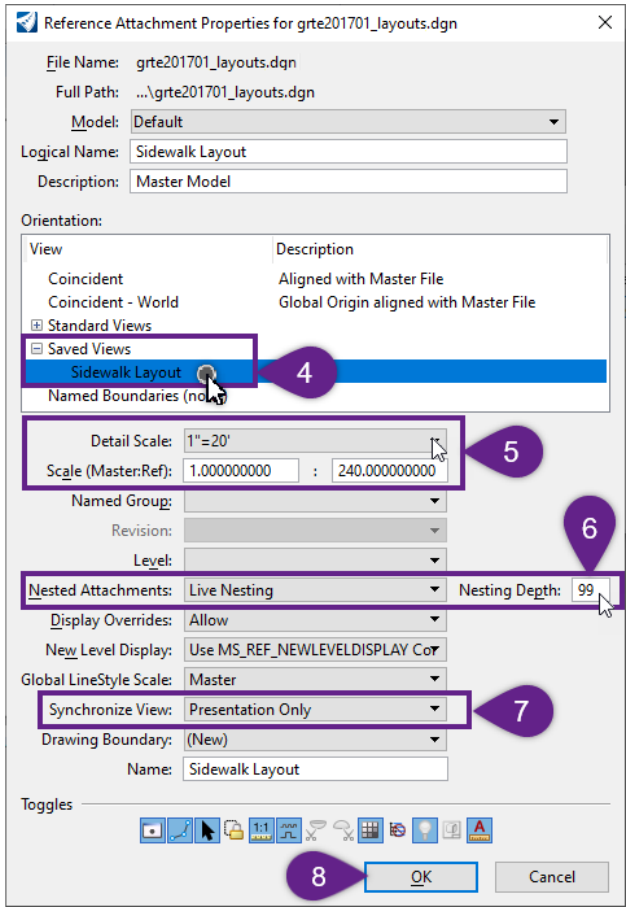


4	From within *2D Design Model*, select the *Create Saved View* tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Saved Views***].
5	Before following the *Prompts,* complete the following: Ensure the **Method** is set to *From View*.
6	Change the **View Type** to *Civil Plan*.
7	Assign the *Saved View* an appropriate **Name**.
8	*Prompt: Create Saved View > Select Source View* – Left-Click anywhere in the 2D Design Model to capture the Saved View. ***WARNING:*** Before proceeding with this step, ensure that the *View* is showing a larger swath of area then will be shown in the *Sheet Model*. The *Saved View* should contain more *2D Design Model* area then to be shown in the plans.

14C.2.d Reference the Saved View into the Sheet Model

In this step, the *Saved View* is referenced to the *Sheet Model* - which was created in *14C.2.b Manually Create the Sheet Model*. This step is performed from the *Sheet Model*.



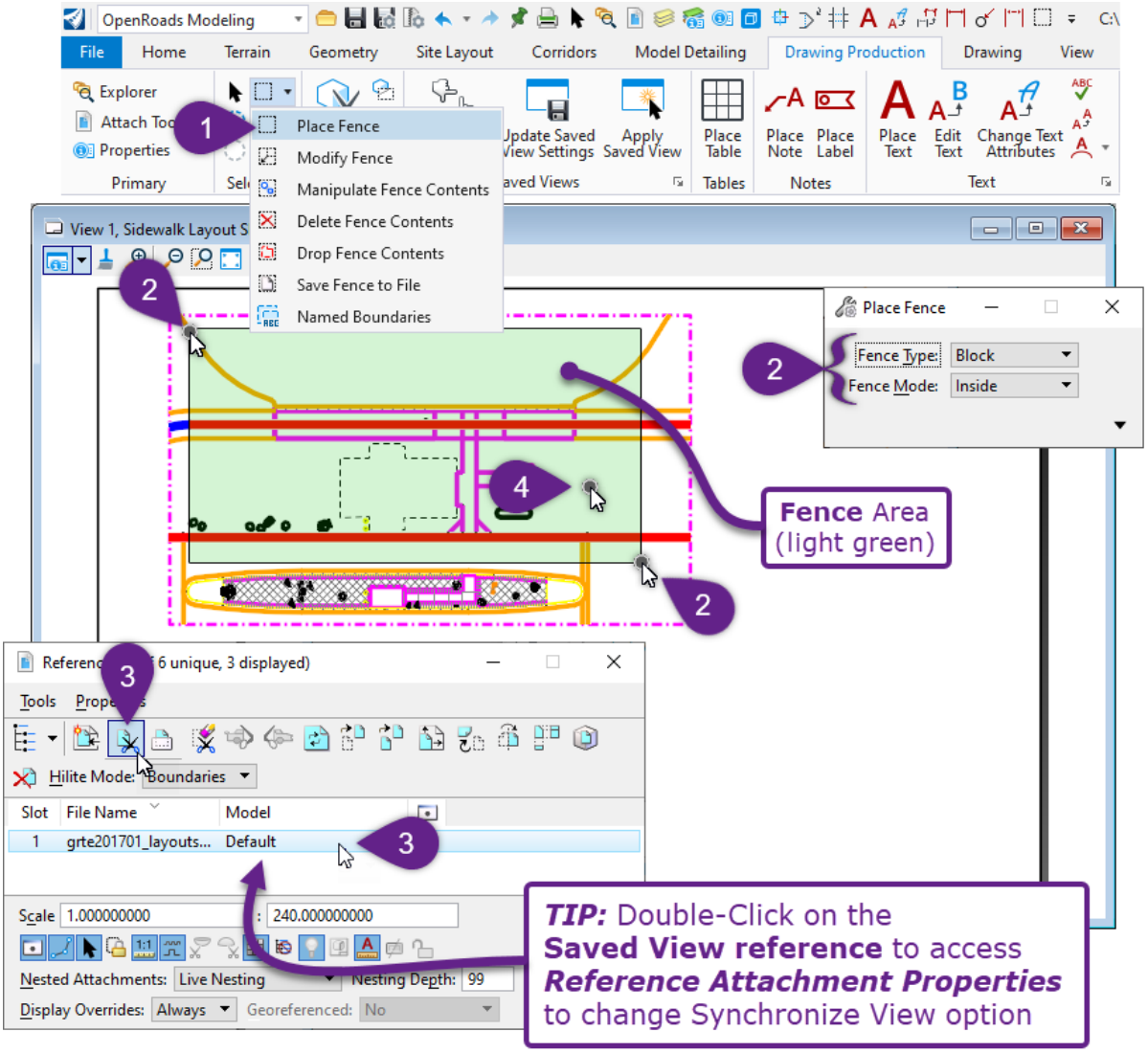


2	Left-Click and hold on the *2D Design Model*. With the Left-Click button held down, drag the *2D Design Model* into the opened *Sheet Model*.
3	In the *Attach Source Files* box, change the *Attachment Method* to **Interactive**
4	In the *Reference Attachment Properties* box, expand the **Saved Views** drop-down and select the Name of the Saved View created in the previous step. In this case, "Culvert Plan" is selected (highlighted)
5	From the **Detail Scale** drop-down, select an appropriate scale. In this case, 1"=20' scale is selected. ***NOTE:*** The **Detail Scale** (or sometimes referred to as *Drawing Scale* can be changed after placement – if the graphics need to be bigger or smaller on the sheet.
6	Ensure that *Nested Attachments* is set to **Live Nesting**. Also, set the **Nesting Depth** to **99**.
7	Set the *Synchronize View* drop-down to **Presentation Only**. ***NOTE:*** This option needs to be set to enable *Clipping* operations for the **Saved View** reference. If this option is NOT set, then the **Saved View** Reference CANNOT be clipped the next section.

14C.2.e Clip, Move, and Change Scale of the Saved View

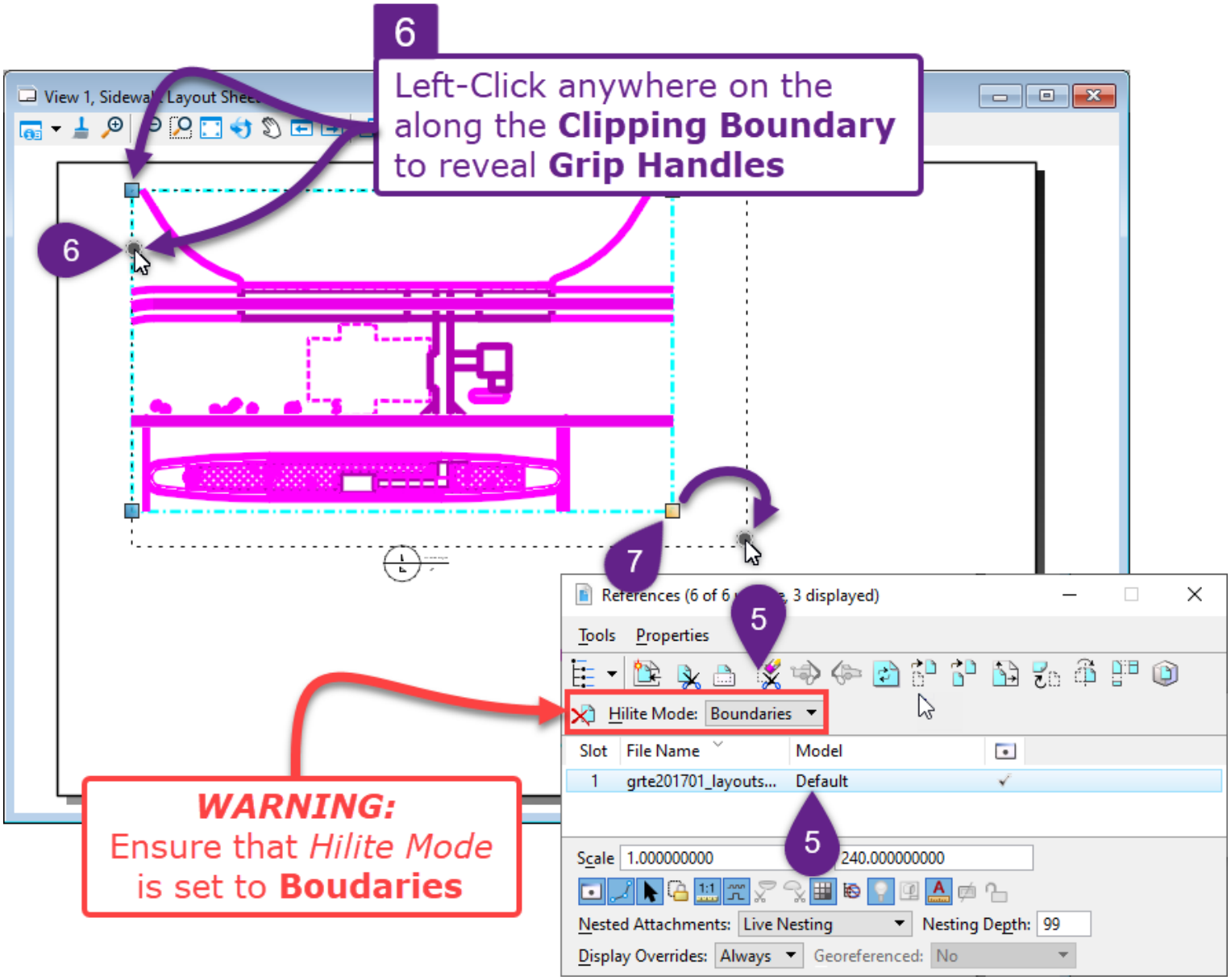
In this step, an interactive Boundary will be placed on the *Saved View* reference with a *Fence* element. If needed, the interactive Boundary (*Fence*) can be expanded or contracted later – as shown on the next page.

WARNING: In the *Reference Attachment Properties* box of the *Saved View* reference, ensure that the *Synchronize View* option is set to **Presentation Only**. This option needs to be enabled for clipping operations.



1	Select the *Place Fence* tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Selection***].
2	In the *Dialogue Box*, ensure that *Fence Type* is set to **Block**. Ensure that *Fence Mode* is set to **Inside**. In the *Sheet Model*, place the Fence by selecting two locations that represent opposite corners of the Block (rectangle).
3	In the *References Menu*, select (highlight) the *Saved View* reference and select the *Clip Reference* icon.
4	Prompt: Set Reference Clip Boundary > Accept/Reject Fence Clip Boundary – Left-Click anywhere in the Sheet Model View to clip the reference.

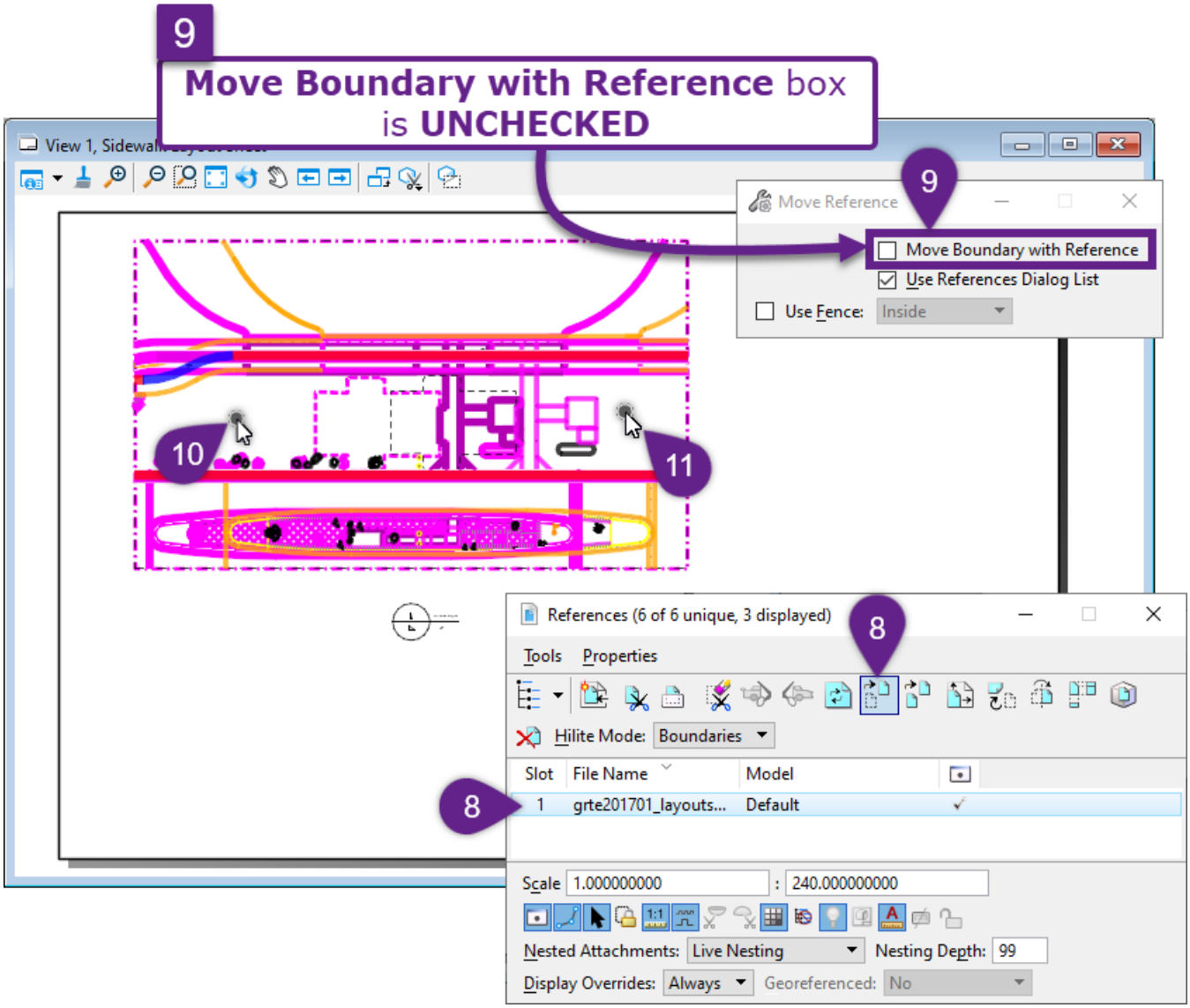
The Clipping Boundary of the *Saved View* reference can be adjusted by revealing Grip-Edit Handles.



5	In the *References Menu*, ensure that *Highlight Mode* is set to **Boundaries.** Select (highlight) the *Saved View* reference to reveal the Clipping Boundary.
6	Left-Click anywhere on the dashed-pink Clipping Boundary to reveal **Grip-Edit Handles**. Using the Grip-Edit Handles, drag the corners of the Clipping Boundary to the desired locations
7	Using the Grip-Edit Handles, drag the corners of the Clipping Boundary to the desired locations

The contents of the *Saved View* reference can Moved for better positioning in the Sheet.

WARNING: When Moving the *Saved View* reference, ensure that the **Move Boundary with Reference** box is UNCHECKED. If this box is CHECKED, then the Clipping Boundary is also be moved – which means the User must reset the Clipping Boundary after the *Saved View* reference is Moved. When this box is UNCHECKED, the Clipping Boundary does NOT Move along with the reference – only the reference graphics are moved.

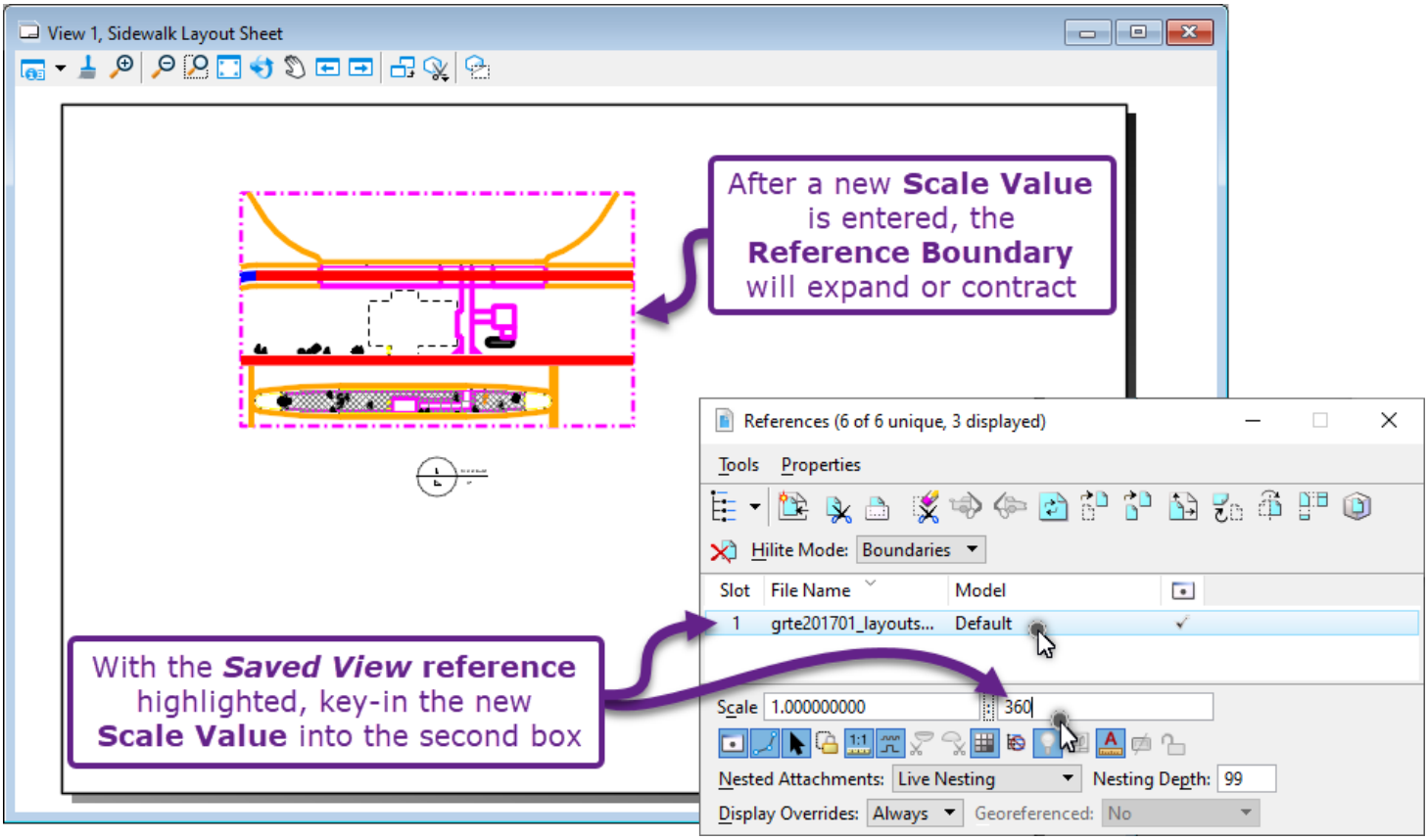


8	In the *Reference Manager*, left-click and highlight the *Saved View* reference. Select the *Move Reference* icon
9	In the *Dialogue Box*, ensure that the **Move Boundary with Reference** box is UNCHECKED.
10	Prompt: Move Reference > Enter point to move from – Select a base point to move the reference from.
11	Prompt: Move Reference > Enter Point to move to - Select the location to move the refence to.

To make the graphical contents bigger or smaller in the page, the *Detail Scale* (Drawing Scale) of the *Saved View* reference can be adjusted.

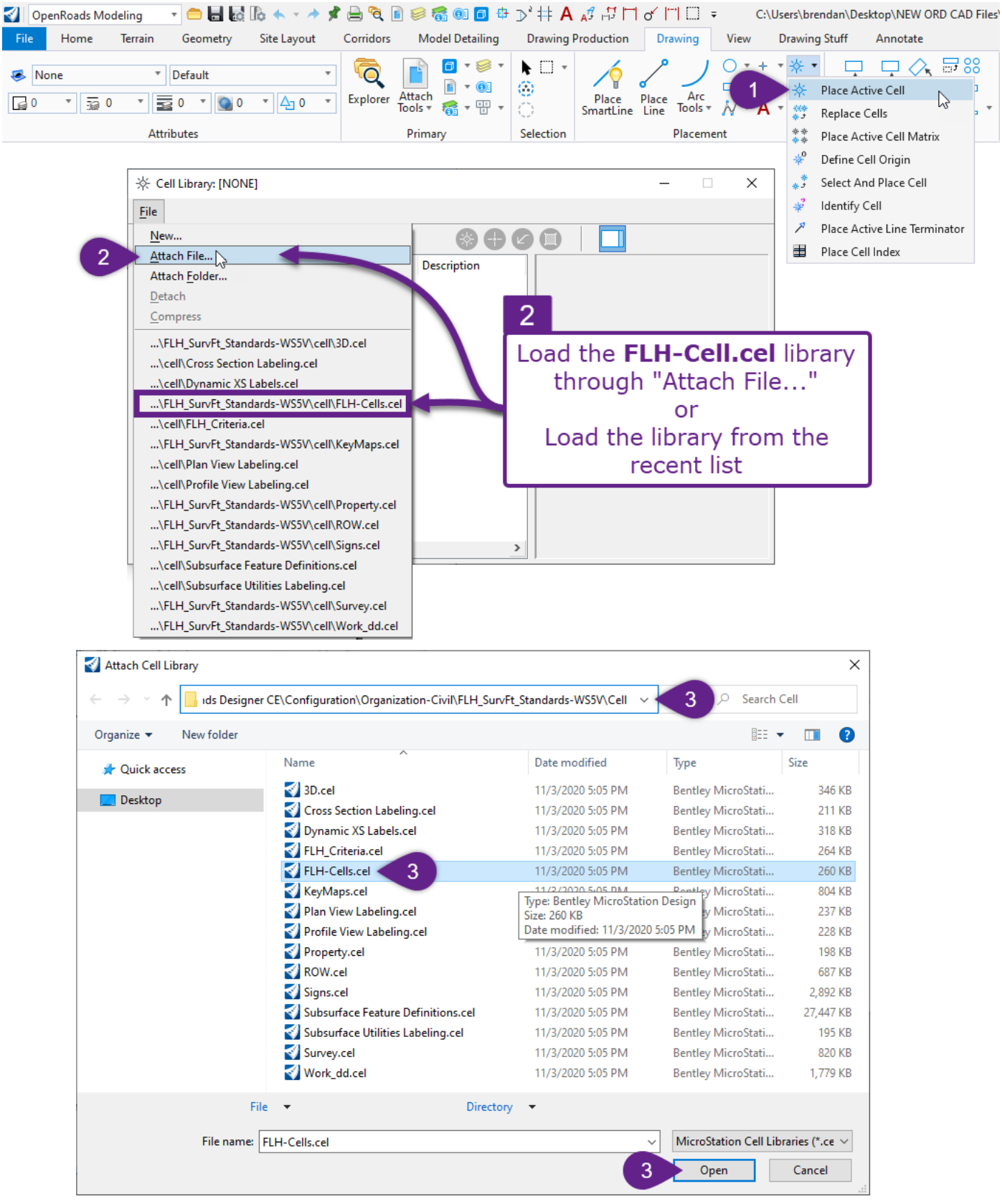
WARNING: When the *Detail Scale* is adjusted, the *Reference Boundary* (fence) will increase or decrease by the same factor. After this procedure, the User may have to manually re-adjust the *Reference Boundary* (fence), as shown two pages back.

TIP: Consult the *Scale Value in Sheet Model* table shown in *14A.4 Sheet Models Overview*. When possible, the User should use *Detail Scale* values that correlate with standard Drawing Scales (i.e., 1"=10 [1:120], 1"=40' [1:480], 1"=50' [1:600], etc..).

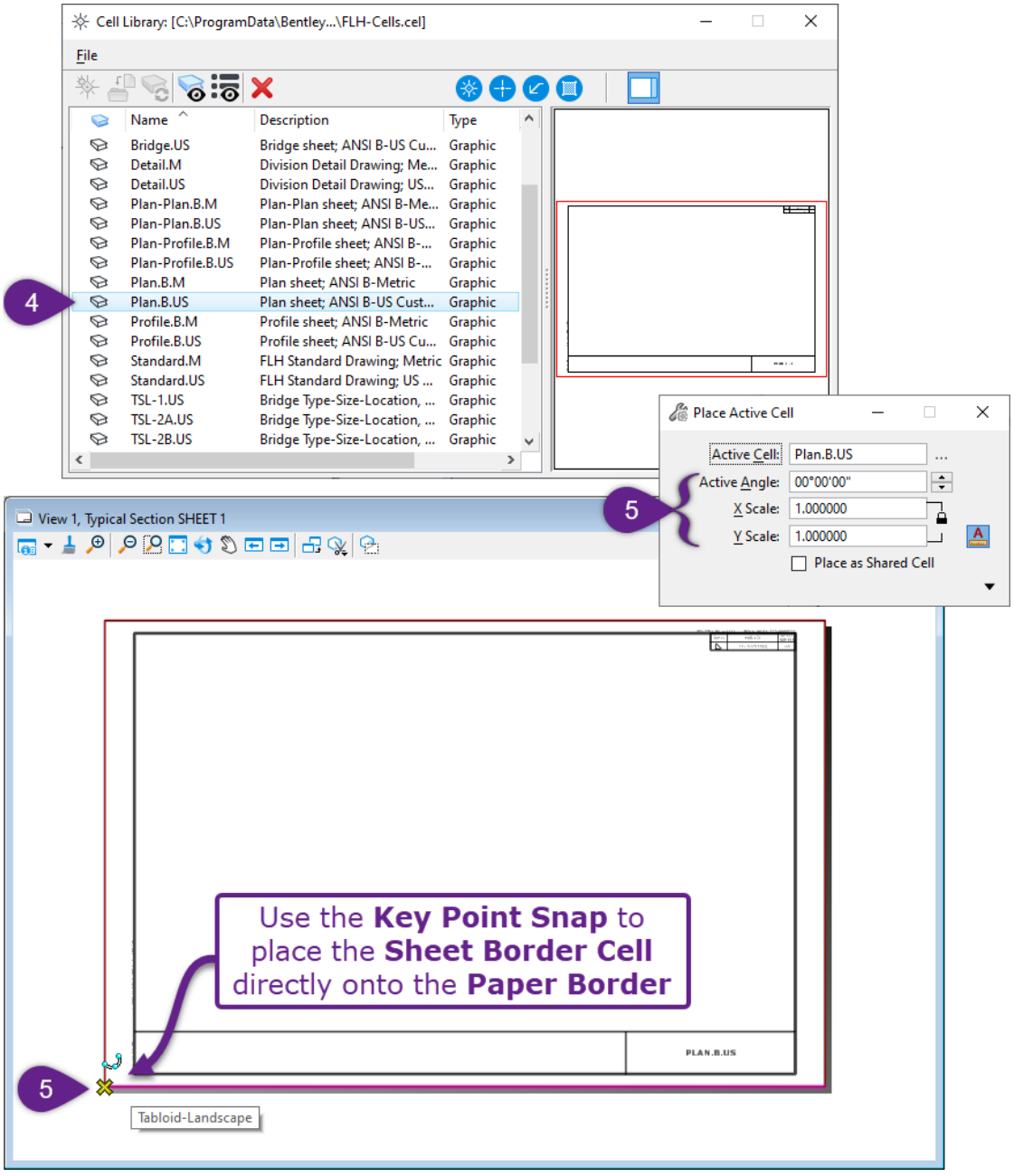


14C.2.f Place the FLH Sheet Border from the Cell Library

In previous step, a blank *Sheet Model* - without a Sheet Border cell – was created . In this step, the User will select and place a FLH Sheet Border cell from the Cell Library. All FLH Sheet Border cells are found in the "**FLH-Cells.cel**"

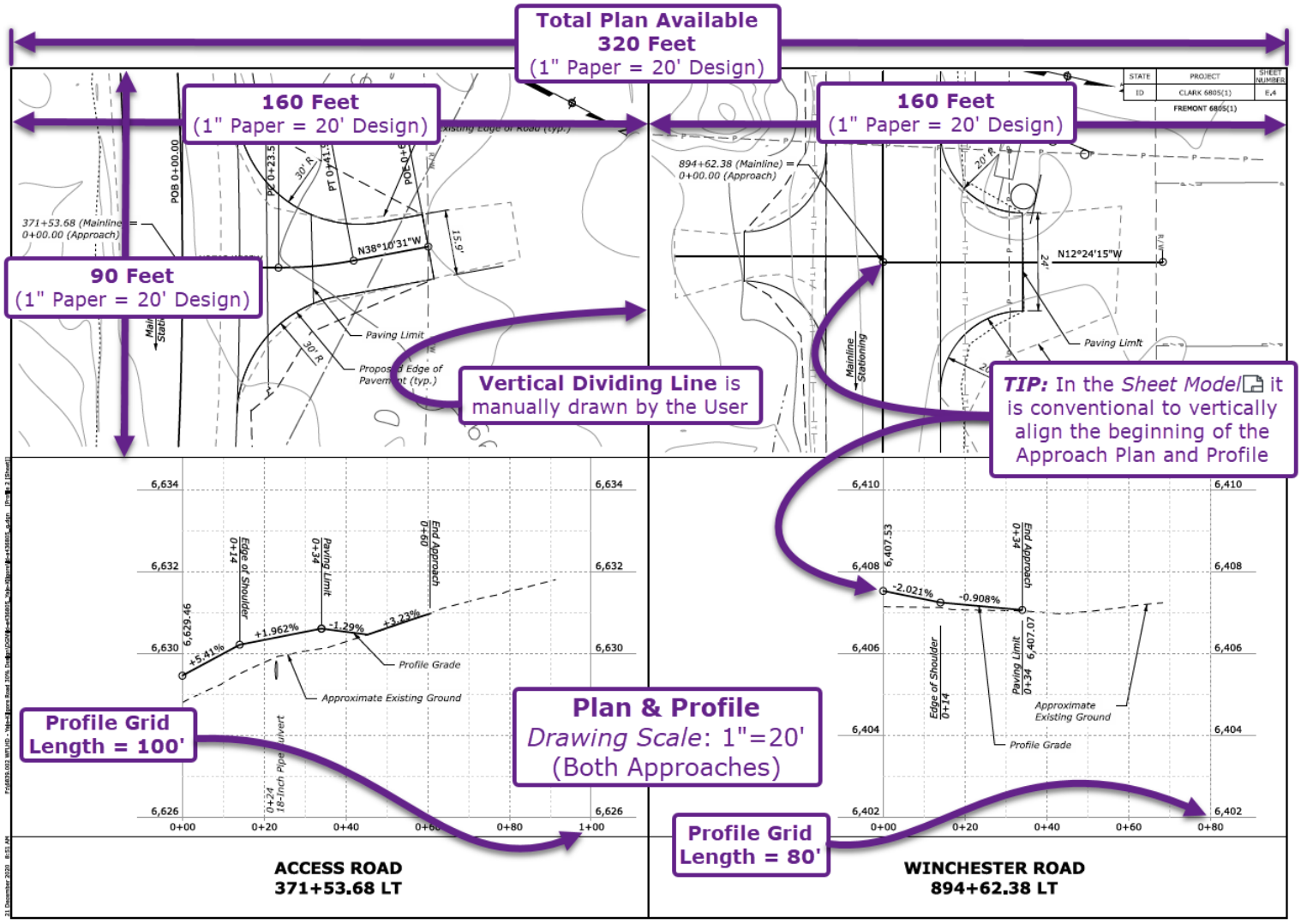


1	Select the *Place Active Cell* tool from the ribbon: [***OpenRoads Modeling*** → ***Drawing*** → ***Placement***]
2	In the Cell Library Menu, load the **"FLH-Cells.cel"** library.
3	Navigate to the Cell Library folder in the FLH WorkSpace. Select the **"FLH-Cells.cel"** library. The Cell Library is found in the FLH WorkSpace in the following location: …\OpenRoads Designer CE 10.10\Configuration\Organization-Civil\FLH_Stds-WS10.10.21.00V\Cell
4	Select (double-click) the appropriate Sheet Border cell from the available options. In this case, the "Plan.B.US" is used.
5	Place the Sheet Border cell on to the Paper Border. Use the Key-Point Snap to snap directly to the Paper Border. Ensure that **Active Angle = 0**. Ensure that the **X and Y Scale = 1.0000.**



14C.3 Place Multiple Approach Road Plan & Profiles on the Same Sheet

This workflow is used to create **TWO** separate Approach Plan & Profiles on the same sheet with a 1”=20’ Drawing Scale. However, this workflow can be slightly modified to show **THREE** Plan & Profiles. In this workflow, the ***Civil Plan By Element*** Mode is used to create the PLAN *Named Boundary* element. With this Mode, the User will manually create a rectangular element to serve as the PLAN *Named Boundary* element.



Before the creation of *Named Boundary* elements, *Drawing Models* and *Sheet Models*, the User should determine the appropriate *Drawing Scale* to show the approaches at. This determination is based on the lengths of the Approach Alignments and the length of Profile Grid to be shown.

If unsure about which *Drawing Scale* to use, 1”=20’ is a good place to start. The example shown above uses 1” = 20’ *Drawing Scales* for both these shorter approaches. The chart below recommends *Drawing Scales* based on the Total Plan Length Available per sheet and the desired length of the Profile Grid.

Approach Drawing Scale Recommendation Chart			
Drawing Scale	**Total Plan Length Available**	**Recommended Profile Grid Length (2 Plan & Profile per Sheet)**	**Recommended Profile Grid Length (3 Plan & Profile per Sheet)**
1” = 10’	**160 feet**	40-60 feet	25-40 feet
1” = 20’	**320 feet**	80-120 feet	50-80 feet
1” = 40’	**640 feet**	160-240 feet	100-160 feet

14C.3.a Approach Road ORD Sheet File Setup

Before Approach Road Sheets production, create and setup a new ORD File. See *14B.3 Initial Plan Sheet ORD File Setup*.

14C.3.b Create the Rectangular Element

In this step, the User will manually draw a rectangular element to serve as one of the PLAN *Named Boundary* elements to occupy half of the sheet. The rectangle can be drawn with the *Place Block* tool or by creating a rectangular enclosed shape with the *Smart Line* tool. The rectangular dimensions of the PLAN *Named Boundary* element will depend on the *Drawing Scale* to show the Approach Roads at.

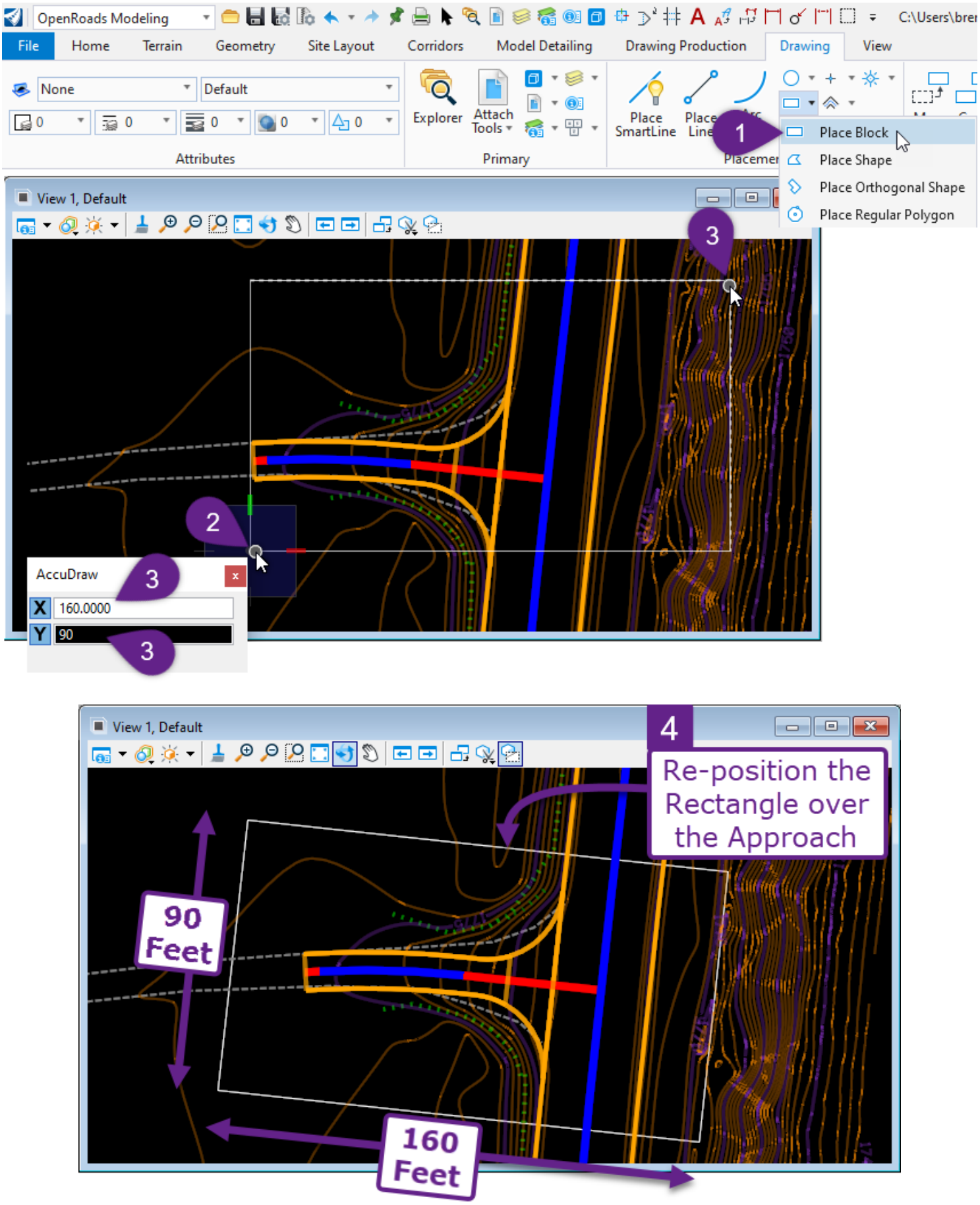
> ***NOTE:*** If practical, use the same Drawing Scale for all driveways and approaches.

Below is a chart for dimensional guidance when creating a PLAN *Named Boundary* element. This chart assumes the Plan view for the two Approaches will be equal (horizontal) size and placed on the same sheet.

Rectangle Dimensions for Approach Plan & Profile	
Drawing Scale	**Named Boundary Element Size to Occupy HALF of the Horizontal Space on the Sheet**
1" = 10'	**75' (Length) x 45' (Height)**
1" = 20'	**155' (Length) x 90' (Height)**
1" = 40'	**310' (Length) x 180' (Height)**

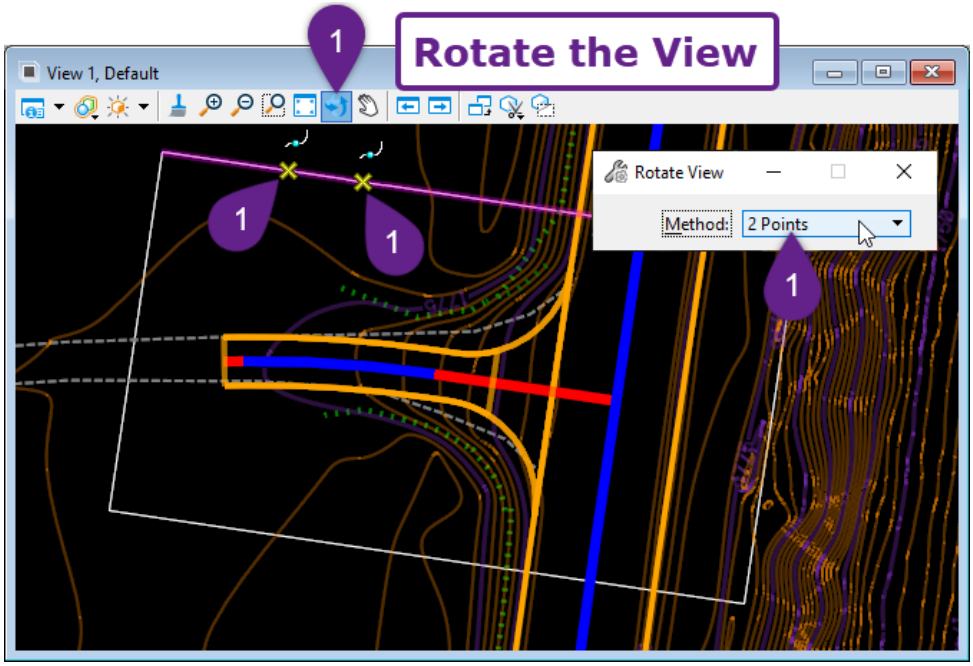
For example, for a 1"=10' Drawing Scale with two approaches shown on the same sheet, the User should create two rectangles (one for each approach). If both rectangles equal 75' (length) x 45' (height), then they will perfectly fit into the sheet border.

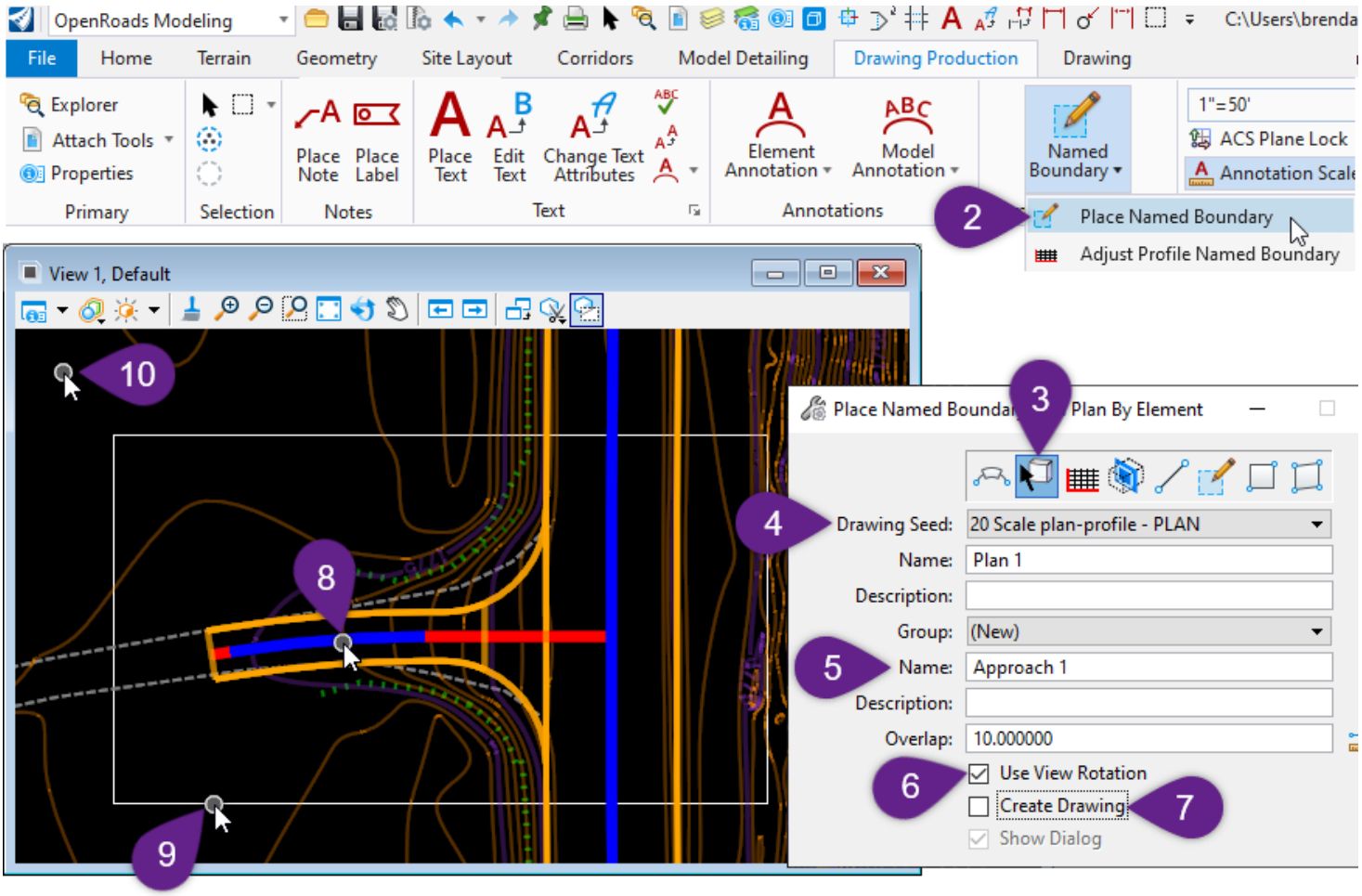
1	In the Ribbon, Left-Click on the *Place Block* tool. Ribbon Location: **OpenRoads Modeling** workflow → **Drawing** tab → **Placement** Panel
2	*Prompt: Enter first point* – Left-Click to specify the location of the lower-left corner.
3	*Prompt: Enter opposite corner* – With AccuDraw enabled, type and lock in the dimensions of the rectangle element. In this case, the *Drawing Scale* to be used is 1"=20' so the dimensions of the rectangle are 155' x 90'. Left-click to accept the dimensions and place the rectangle.
4	With the rectangle element created, re-position the rectangle over the Approach as desired. Use the Move and Rotate tools to reposition the rectangle. ***TIP:*** To avoid having to manually rotate the rectangle element, Rotate the View to the desired rectangle orientation before drawing the rectangle. ***TIP:*** For an Approach Alignment, typically the rectangle would be aligned with an imaginary line drawn between the start point and end point of the Alignment.


OpenRoads Modeling
File
Home
Terrain
Geometry
Site Layout
Corridors
Model Detailing
Drawing Production
Drawing
View
Explorer
Attach Tools
Place SmartLine
Attributes
Primary
1
Place Block
Place Shape
Place Orthogonal Shape
Place Regular Polygon
View 1, Default
2
3
AccuDraw
X
160.0000
Y
90
4
Re-position the Rectangle over the Approach
90 Feet
160 Feet

14C.3.c Create the PLAN Named Boundary Element

In this step, the *Place Named Boundary* tool is used with the ***Civil Plan By Element*** Mode to convert the rectangle element into a PLAN *Named Boundary*. Prior to creating the PLAN *Named Boundary*, rotate the view to align with the rectangle. This ensures that the PLAN *Drawing Model* is created at the correct orientation – when the "Use View Rotation" option is used in 6.





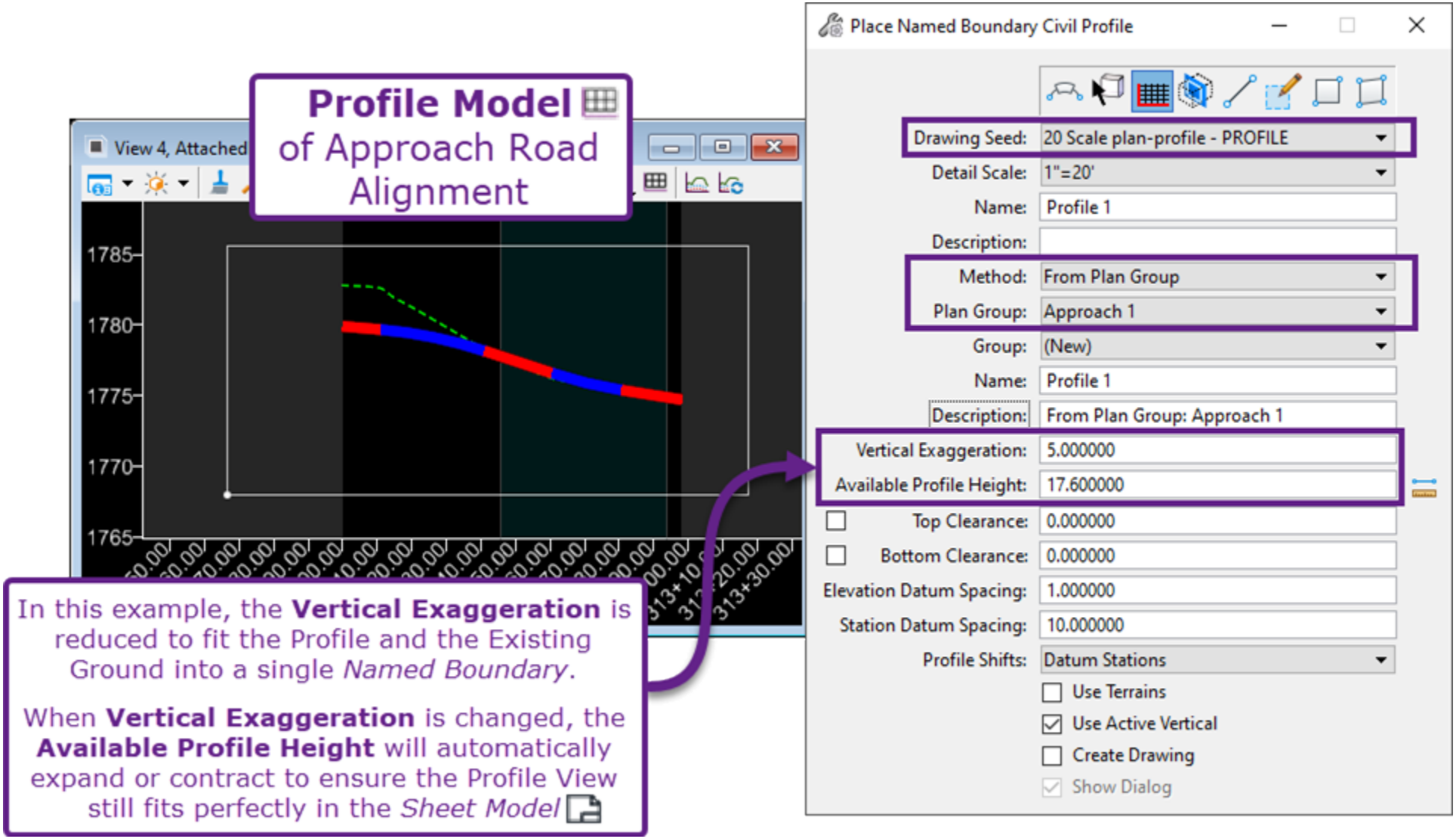
	Rotate the View
1	Select the *Rotate View* tool . Ensure the *Method* is set to *2 Points*. With the *Nearest Snap* toggled ON, select two locations on the top or bottom edge of the rectangle.
	Convert the Rectangle into a PLAN Named Boundary Element
2	Select the *Place Named Boundary* tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Named Boundaries***].
3	In the *Place Named Boundary* Dialogue Box, select the *Civil Plan By Element* mode by clicking on the icon .
4	In the *Place Named Boundary* Dialogue Box, select the appropriate *Drawing Seed* from the drop-down. The *Drawing Seed* should correspond to the dimensions of the rectangle drawn in the previous step. In this example, ***20 Scale plan-profile – PLAN*** is used.
5	In the *Place Named Boundary* Dialogue Box, assign the **Group** to be created an appropriate Name
6	CHECK the Use View Rotation box. When sheets are created, this option ensures the *Drawing Model* is aligned with the *View* rotation that was established in Step 1. If this option is NOT checked, then the *Drawing Model* will be orientated with North being straight upwards. ***WARNING:*** The exception is when the "Path Element" selected contains curves. When this is the case, the resulting *Drawing Model* is orientated in a best fit fashion. However, this is easily rotated in the *Sheet Model* to the correct orientation. See *14C.3.i Rotate and Move Drawing Model References*.
7	In the *Place Named Boundary* Dialogue Box, ensure that the **Create Drawing** option is UNCHECKED
8	*Prompt: Identify Path Element / Reset to Skip* – The "Path Element" is the Approach Alignment. Left-Click on the Approach Alignment to proceed. By selecting a "Path Element", the PROFILE *Named Boundary* element will exactly align with the limits of the PLAN *Named Boundary*. If a "Path Element" is NOT selected, then the PLAN and PROFILE *Named Boundaries* will NOT align. **Alternately:** This Mode can be used WITHOUT specifying a "Path Element". The User can manually create PLAN *Named Boundary* elements that are NOT associated with an Alignment. The User can Right-Click ("Reset") during this step to proceed without a "Path Element".
9	*Prompt: Select Element / Ctrl or Drag to Multi-Select* – Left-Click on the rectangular element that was created in the previous step.
10	Prompt: Accept/Reject. Data point in Plan View to place boundary – Left-Click anywhere in the View to convert the rectangular element into a PLAN Named Boundary element.

14C.3.d Create the PROFILE Named Boundary Element

In this section, the PROFILE *Named Boundary* element will be created using the *From Plan Group* **Method.** This is the same procedure shown in *14B.5 STEP 5-7: Create PROFILE Named Boundary Elements*. Refer to the aforementioned section for more detailed information.

Ensure that the **Drawing Seed** matches the *Drawing Seed* used in creation of the PLAN *Named Boundary Element* (4 on previous page)

Ensure that the **Method** is set to *From Plan Group* and the **Plan Group** created in the previous step is used (5 on previous page)

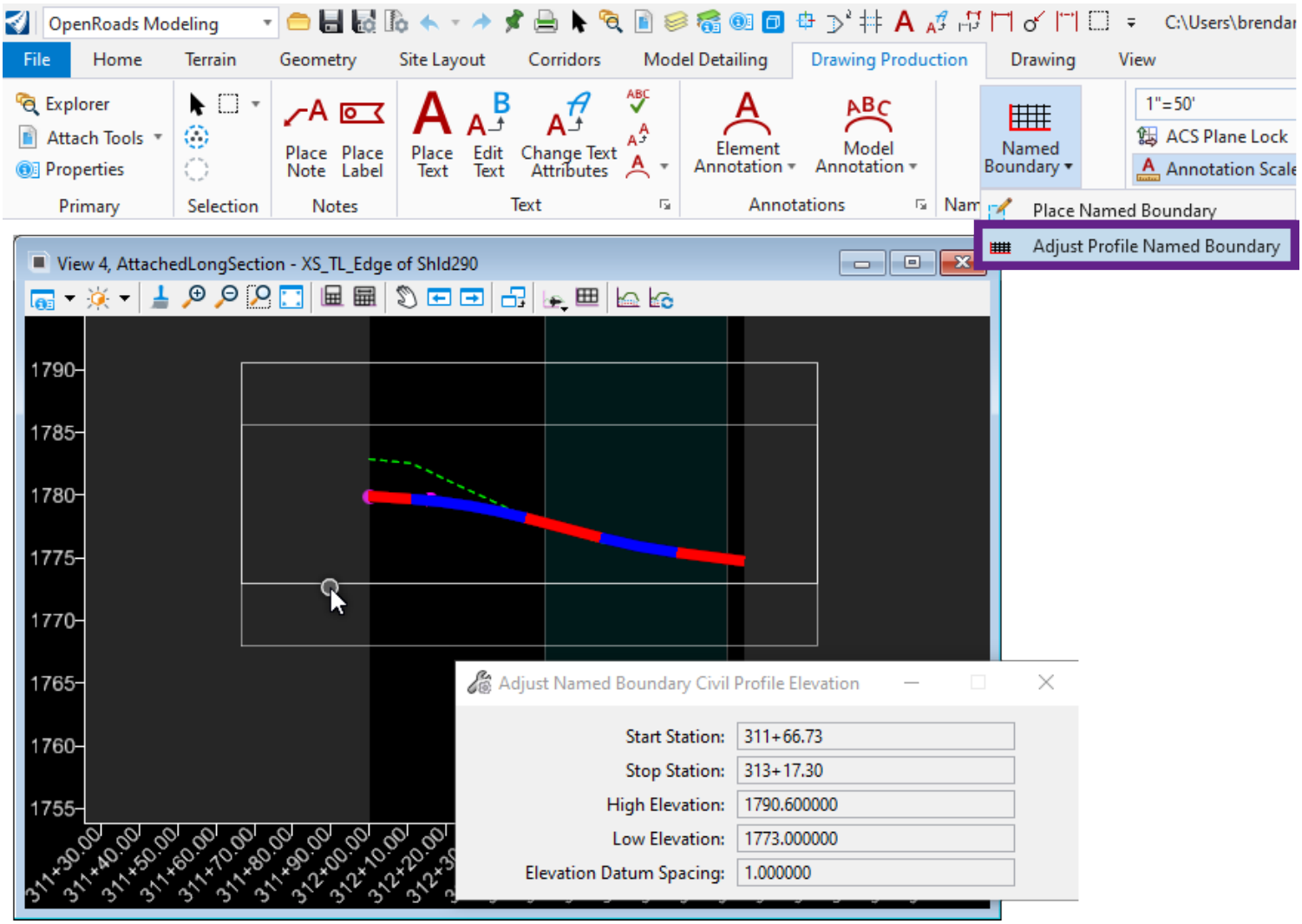


14C.3.e Adjust Vertical Position of the PROFILE Named Boundary Element

In this Step, the PROFILE *Named Boundary* element created in the previous step is adjusted if necessary. Vertical adjustments to the PROFILE *Named Boundary* element are performed with the *Adjust Profile Named Boundary* tool.

WARNING: The vertical position of a PROFILE *Named Boundary* element CANNOT be adjusted after the creation of *Drawing Models* and *Sheet Models*.

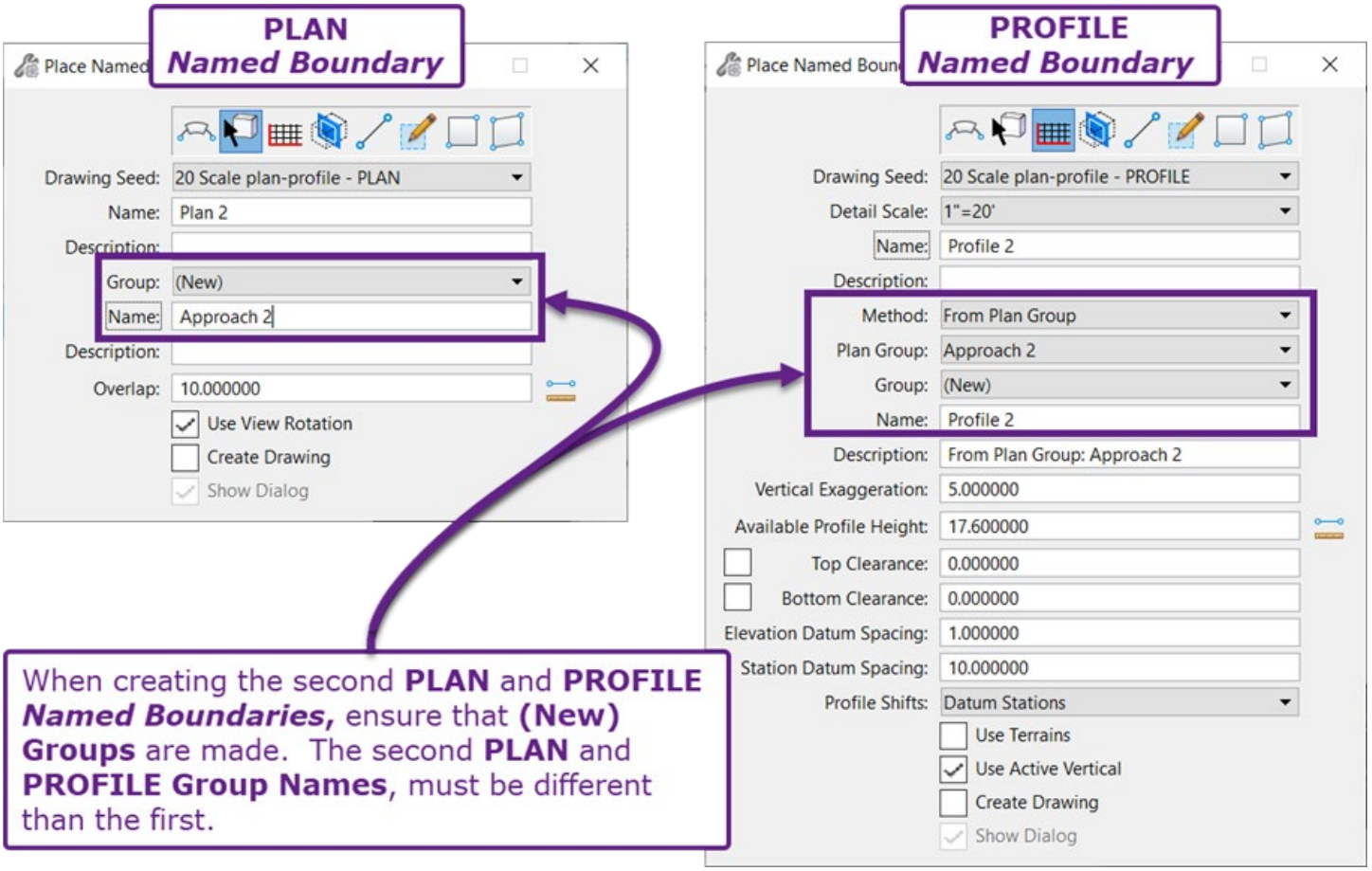
For a more detailed explanation of this procedure, see *14B.5.c STEP 7: Adjust Vertical Position of PROFILE Named Boundary Elements*.

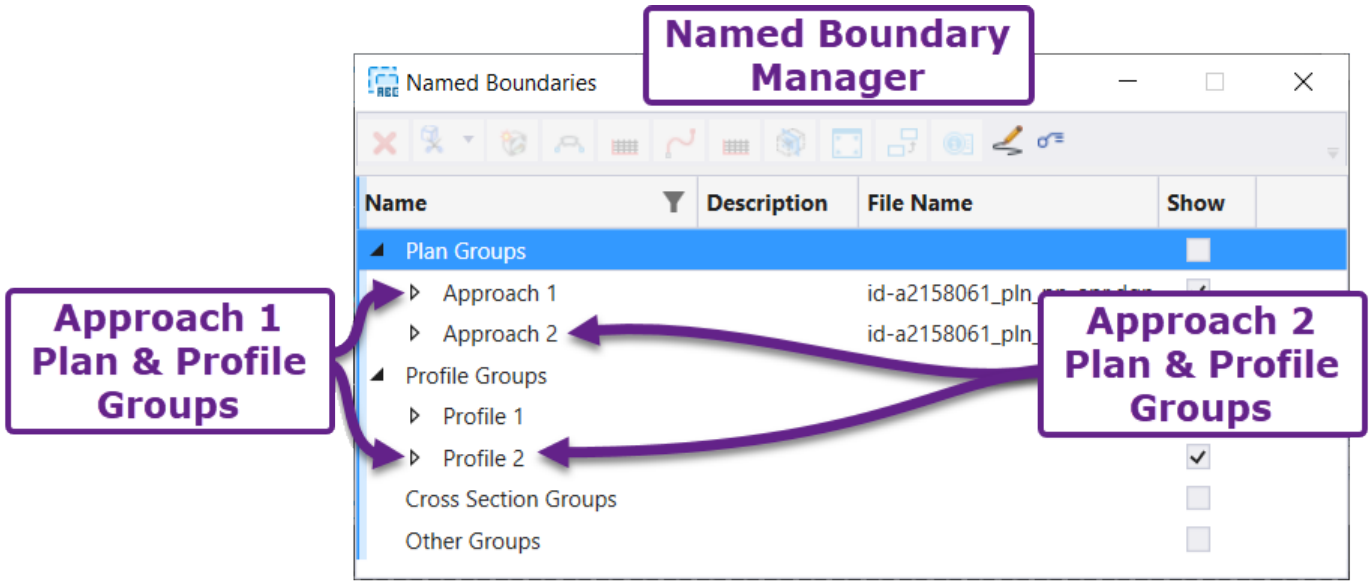


14C.3.f Create PLAN & PROFILE Named Boundary Elements for the Second Approach Road

Repeat procedures shown in *14C.3.b* through *14C.3.e* for the second Approach Road.

14C.3.b Create the Rectangular Element
14C.3.c Create the PLAN Named Boundary Element
14C.3.d Create the PROFILE Named Boundary Element
14C.3.e Adjust Vertical Position of the PROFILE Named Boundary Element



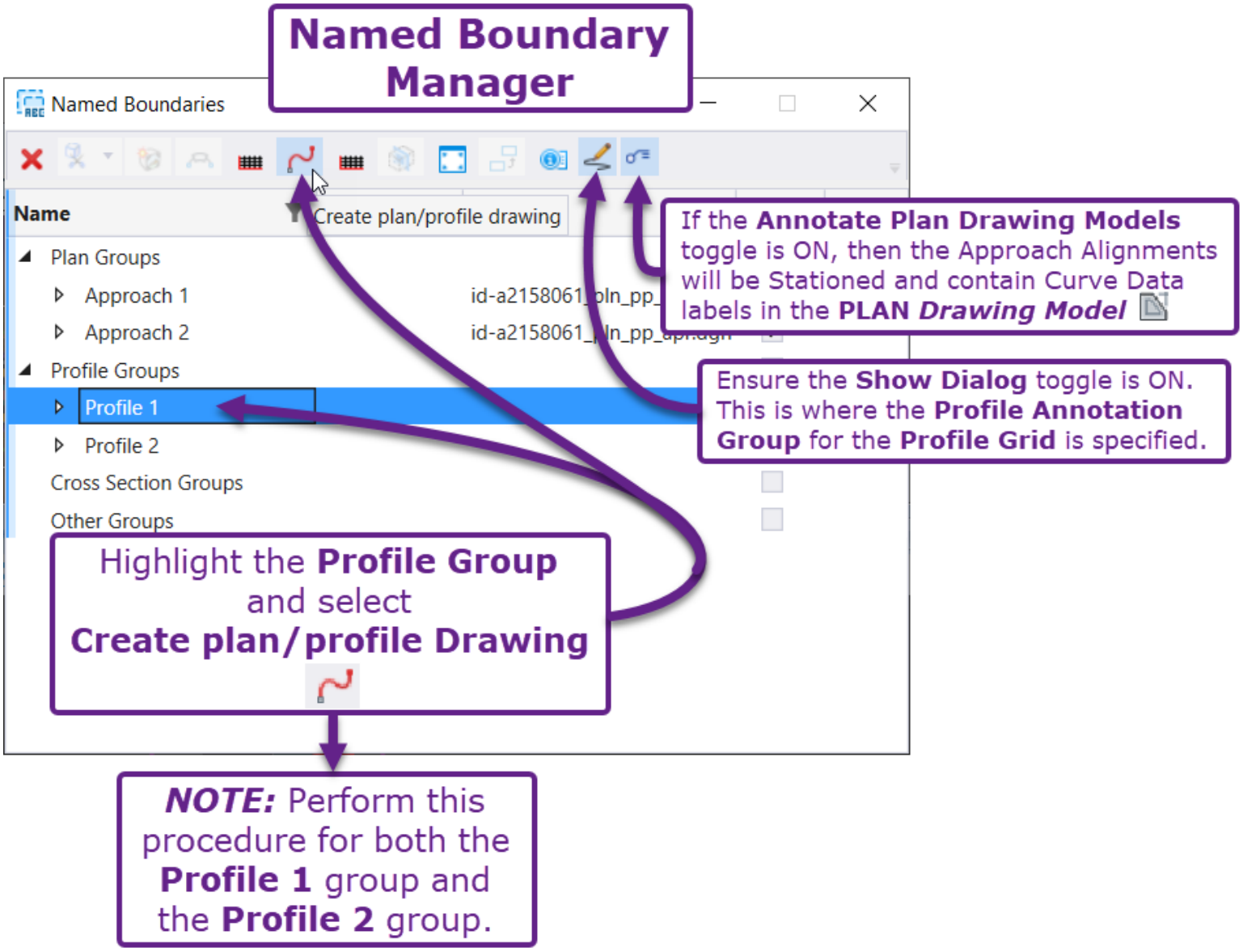


14C.3.g Create Drawing Models and the Sheet Model

In this step, *Drawing Models* and *Sheet Models* are created in the same procedure shown in *14B.6 STEP 8: Create Drawing Models and Sheet Models*. Refer to this section for more detailed information.

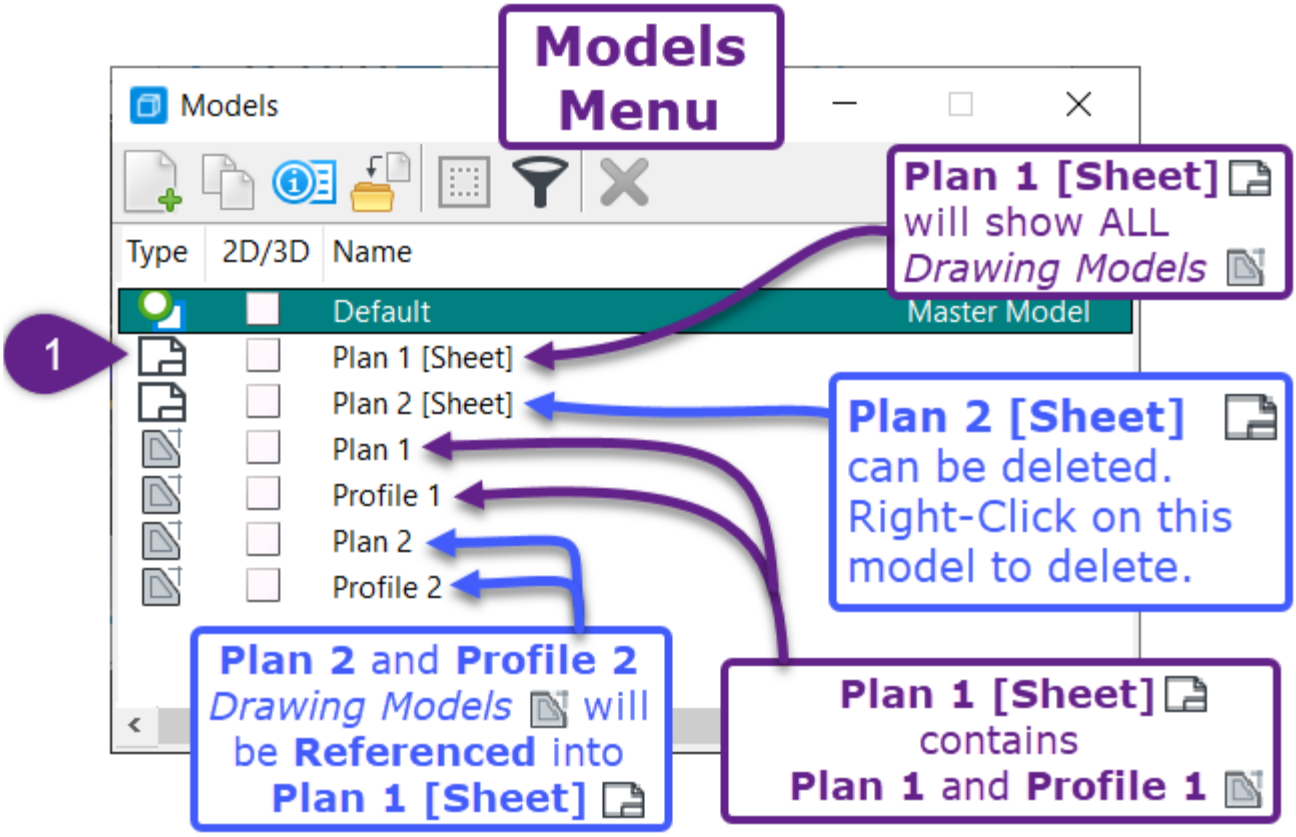
Two *Sheet Models* are created: one for Approach 1 and another for Approach 2. However, the *Sheet Model* for Approach 2 may be deleted or disregarded.

WARNING: When using the *Create plan/profile Drawing* tool, the *2D Design Model* and the *Profile Model* of the current Approach group must **BOTH** be opened.



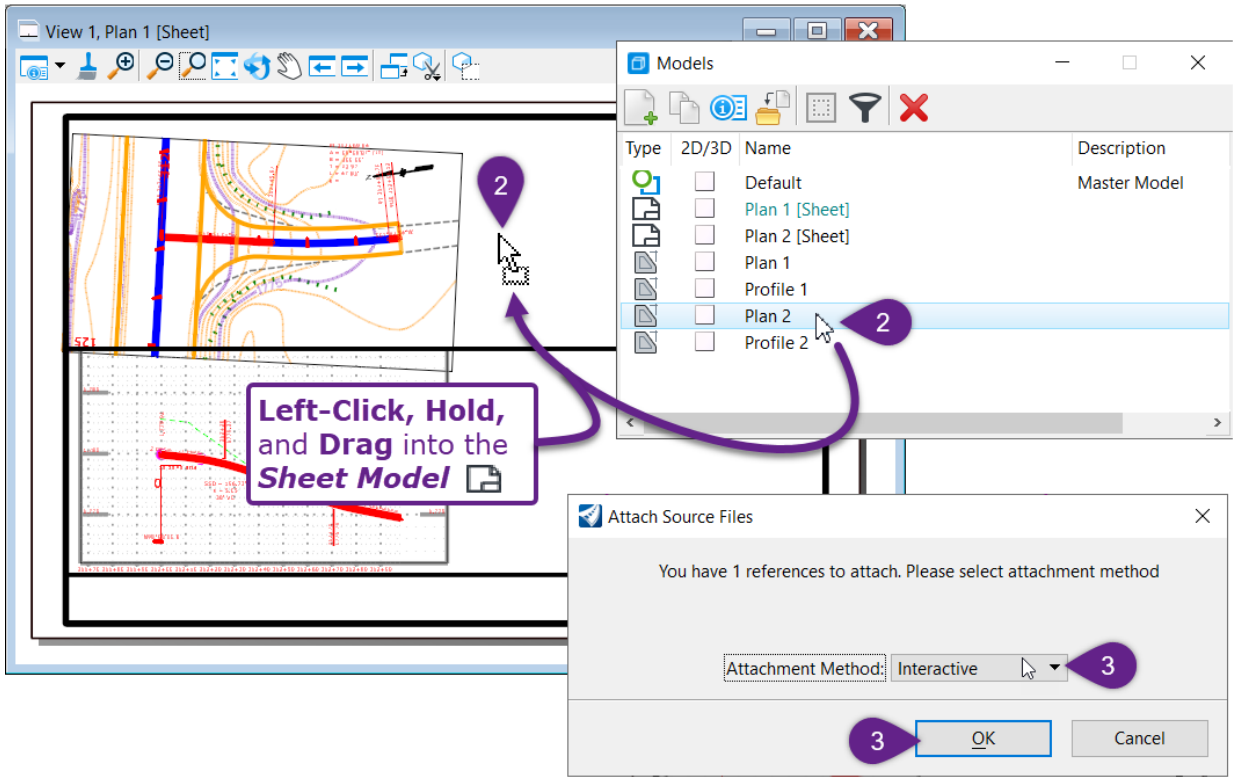
14C.3.h Combine Both Approaches in a Single Sheet Model

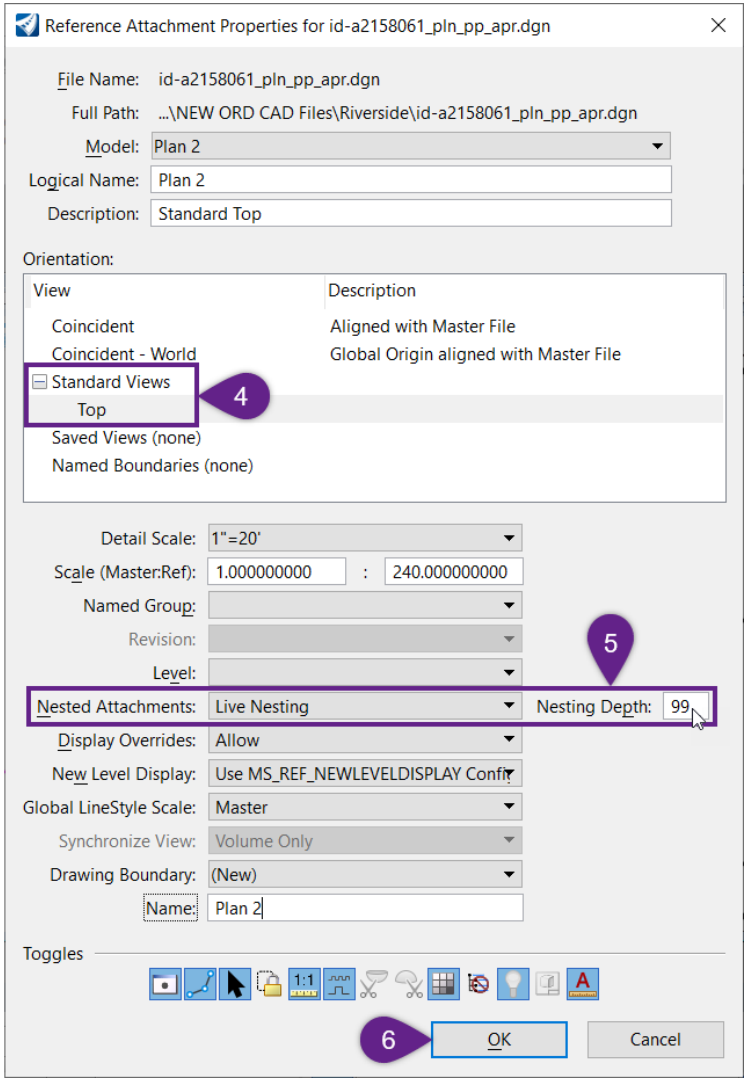
As a result of the previous step, a total of two *Sheet Models* and four *Drawing Models* were created. In this step, all four *Drawing Models* will be placed on a single *Sheet Model*.



1	From the *Models Menu*, enter the *Sheet Model* for the first Approach ("Plan 1 [Sheet]"). Double-click on "Plan 1 [Sheet]".

In this step, the PLAN *Drawing Model* is "dropped in" (referenced) into the *Sheet Model*. This same procedure will be repeated for the PROFILE *Drawing Model*.

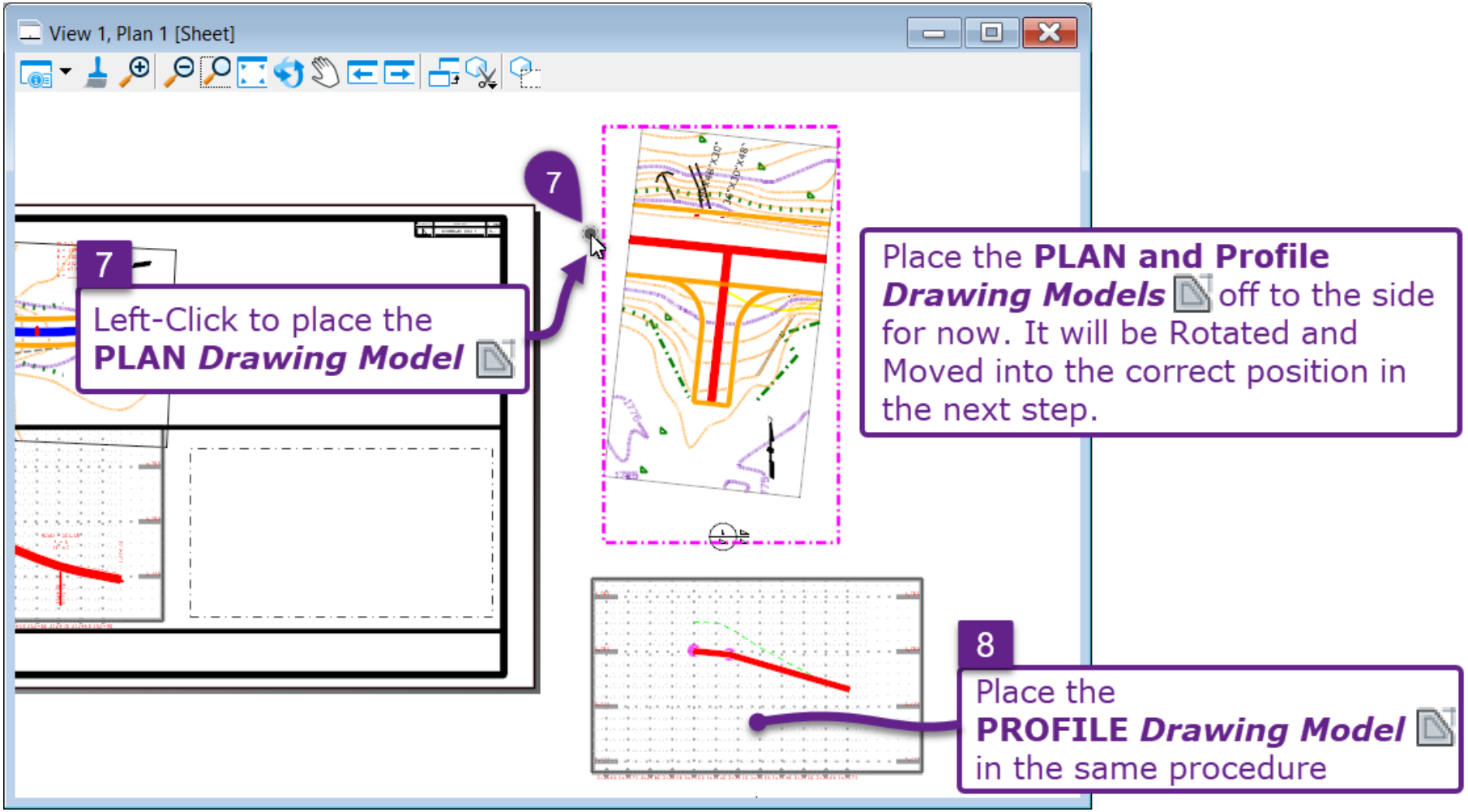




2	Left-Click and hold on the "Plan 2" *Drawing Model*. With the Left-Click button held down, drag the "Plan 2" model into the opened *Sheet Model*.
3	In the *Attach Source Files* box, change the *Attachment Method* to **Interactive** and select OK.
4	In the *Reference Attachment Properties* box, expand the *Standards Views* drop-down and select **Top**.
5	In the *Reference Attachment Properties* box, ensure that *Nested Attachments* is set to **Live Nesting**. Also, set the **Nesting Depth to 99**.
6	When all options in the *Reference Attachment Properties* box have been addressed, select OK to set the location for the *Drawing Model* reference.

This step shows the final step of "dropping in" (referencing) the PLAN *Drawing Model*

NOTE: In the *Sheet Model*, the PLAN *Drawing Model* will "dropped in" with the North facing upwards. On the next page, all *Drawing Model* references will be Moved and Rotated into the correct positions. See *14C.3.i Rotate and Move Drawing Model References*.

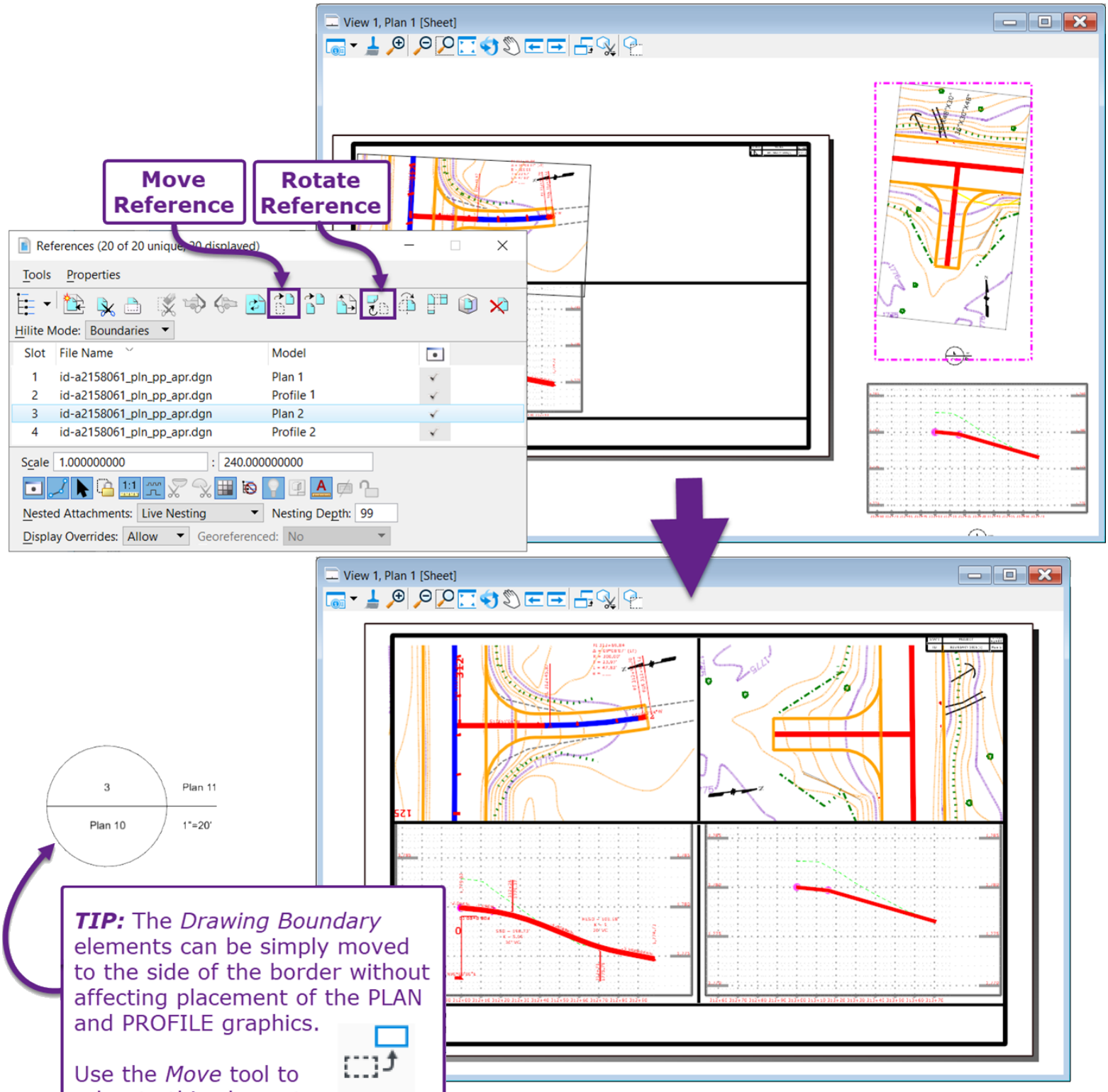


7	The preview location for the PLAN *Drawing Model* will be shown with a dashed border. Place the PLAN *Drawing Model* off to the side of the Sheet Border. Left-Click to accept the location.
8	Repeat 2 through 7 for referencing the **PROFILE** *Drawing Model*.

14C.3.i Rotate and Move Drawing Model References

In this step, the PLAN and PROFILE *Drawing Model* references will be rotated and moved into the appropriate positioning within the Sheet Border.

This is the same procedure shown in *14E.1 Rotate and Move Plan Views*. Refer to the this section for more detailed information.



14C.4 Plan and Profile Sheets for Culverts, MSE Walls, and Bridges

This workflow demonstrates how to create a single-page Plan and Profile Sheet for ancillary features such as culverts, MSE Walls and bridges. This workflow differs from the *14B – Creating Road Plan & Profile Sheets – Workflow* for the following reasons:

In this workflow, when the PROFILE *Named Boundary* elements are created, the **Station Limits** Method will be used. The **Station Limits** Method allows the User to customize the Length and Start/End Station of the PROFILE *Named Boundary* element. This differs from the **From Plan Group** Method shown in *14B.5 STEPS 5-7: Create PROFILE Named Boundary Elements*. When using the **From Plan Group** Method, the Length and Start/End Station of the resulting PROFILE *Named Boundary* elements are fixed to the corresponding PLAN *Named Boundary* elements.

This workflow is performed in a different sequence than *14B – Creating Road Plan & Profile Sheets – Workflow*. In this workflow, the PROFILE *Named Boundary* element is created prior to the PLAN *Named Boundary*. When using the **Station Limits** Method, the PROFILE *Named Boundary* is NOT linked to the PLAN *Named Boundary*, which means the PROFILE *Named Boundary* can be created first. For awkward Profiles, creating the PROFILE *Named Boundary* first can be advantageous because the User can experiment with lengths, heights, and exaggerations.

WARNING: The Vertical Exaggeration and Grid Dimensions (Height and Length) for the PROFILE *Named Boundary* CANNOT be changed after creation. The PROFILE *Named Boundary* elements will have to be **recreated** to show the Profile Grid with a different dimensional configuration.

To create the Plan-view, this workflow also demonstrates how to reference the *2D Design Model* into the *Sheet Model* using a **Saved View**. This is the same method shown in *14C.2 Exhibits and One-Off Plan Sheet Graphics*.

The **Saved View** alternative workflow can be a little more organized and convenient because the User does NOT have to create PLAN *Named Boundaries* and Plan *Drawing Models* in order to show planimetric graphics from the *2D Design Model* in the *Sheet Model*.

14C.4.a Culvert ORD Sheet File Setup

Before Culvert Sheet production, create and setup a new ORD File. See *14B.3 Initial Plan Sheet ORD File Setup*.

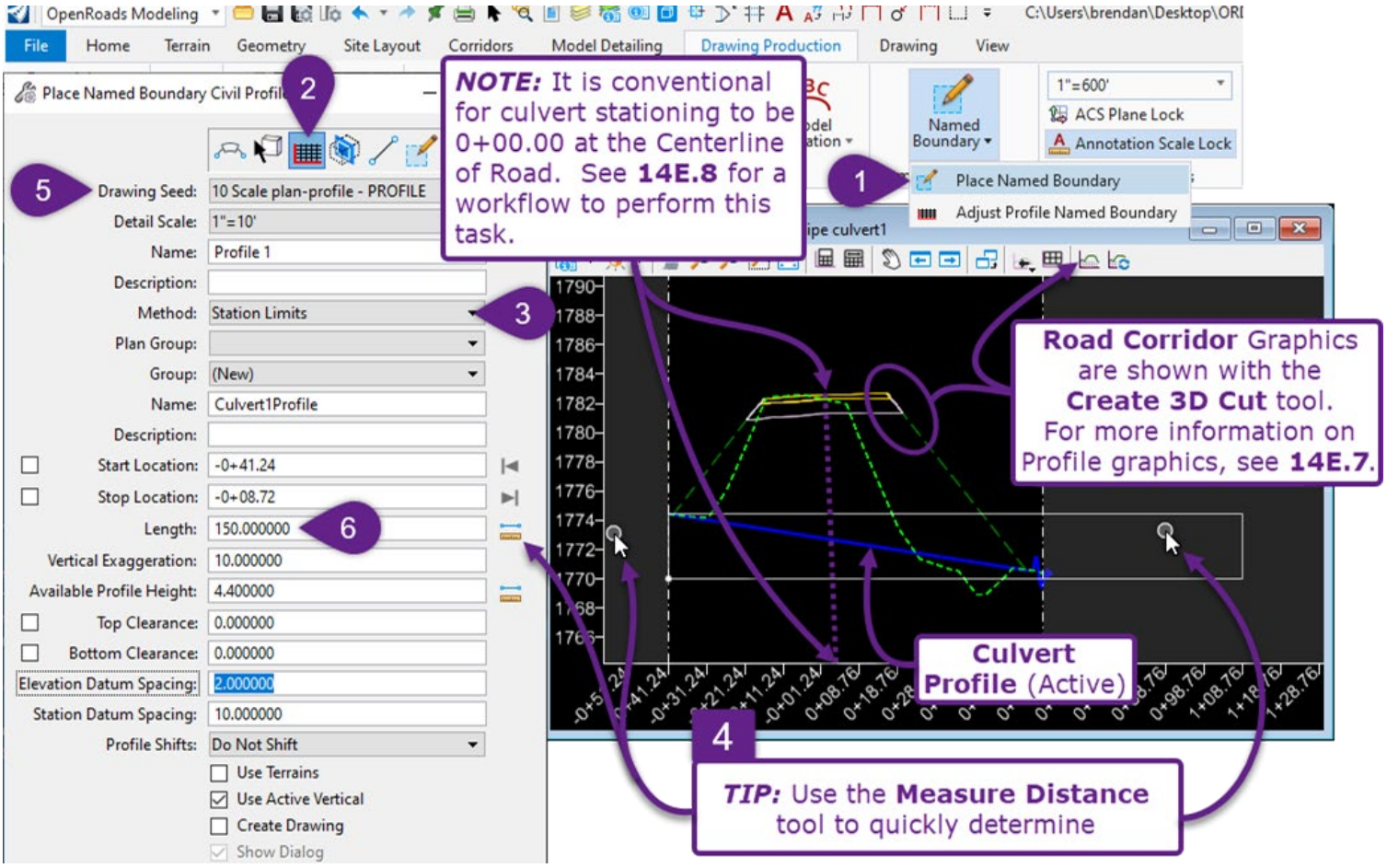
14C.4.b Create the PROFILE Named Boundary from Station Limits

In this step, the PROFILE *Named Boundary* element is created with the **Station Limits** method.

When establishing Station Limits and the length for the PROFILE *Named Boundary*, it's helpful to first determine the Drawing Scale. The chart below lists the appropriate *Named Boundary* length to fill the whole horizontal space on the sheet.

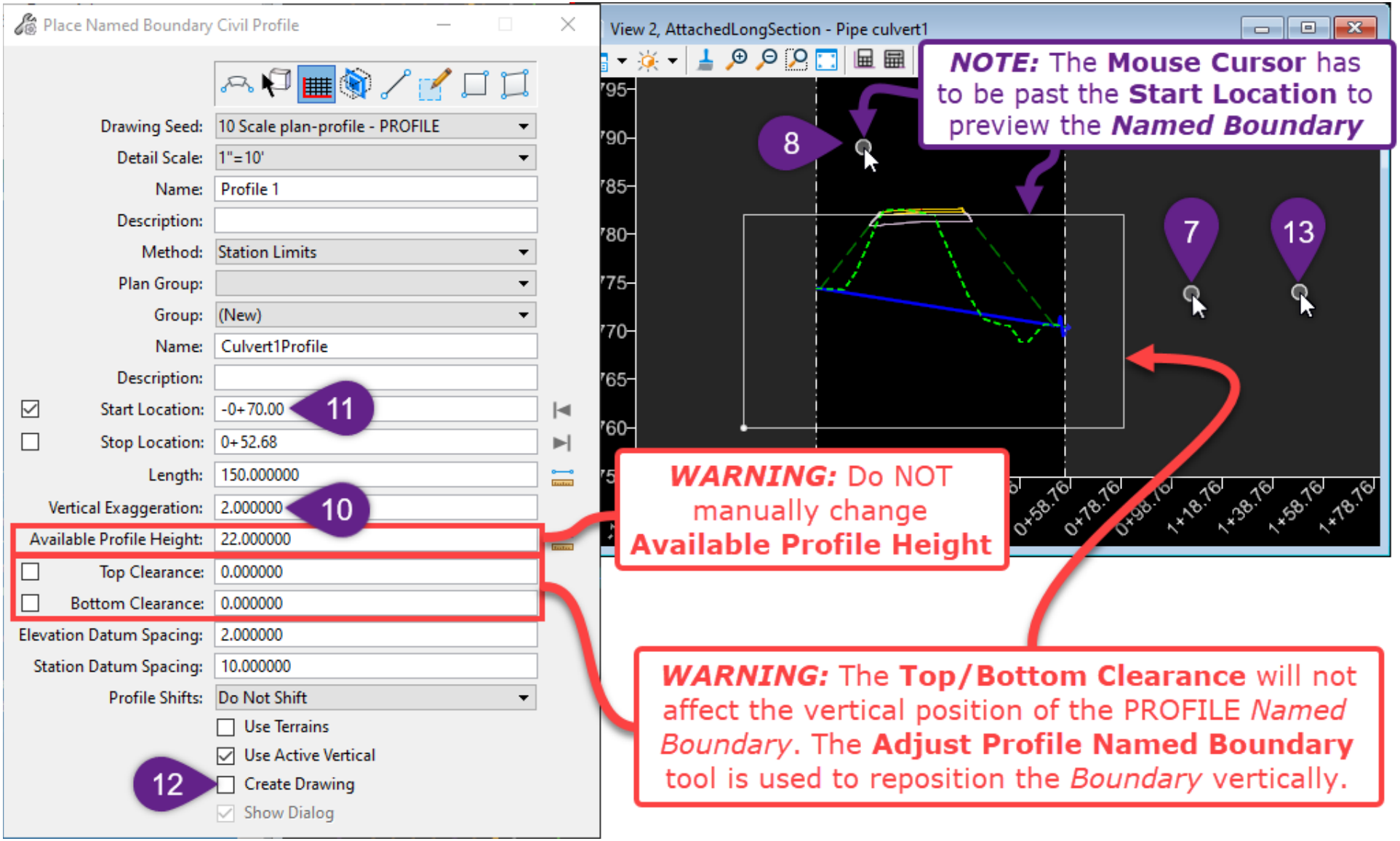
This step is performed from the *Profile Model* of the Culvert Alignment.

Length of PROFILE Named Boundary to Fill Whole Sheet	
Drawing Scale	**Profile Length**
1" = 10'	**150 feet**
1" = 20'	**300 feet**
1" = 40'	**600 feet**
1" = 50'	**750 feet**
1" = 60'	**900 feet**
1" = 100'	**1500 feet**



1	From within Profile Model of the Alignment, select the Place Named Boundary tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Named Boundaries***].

2	In the *Place Named Boundary* Dialogue Box, select the *Civil Profile* mode by clicking on the icon  .
3	**Method:** Ensure the *Method* is set to *Station Limits*.
4	By measuring around in the *Profile Model*  and using the chart on the previous page, determine what the appropriate **Length** and **Drawing Scale**. For the PROFILE *Named Boundary* element. In this case, it is desirable to show about 150 feet of **Length** – which in the chart corresponds to a 1"=10' **Drawing Scale**.
5	In the *Place Named Boundary* Dialogue Box, select the appropriate **Drawing Seed** from the *Drawing Scale* determined in the previous step. For this workflow, the **Drawing Seed** is important for creating the Profile Grid with the appropriate Height (*Available Profile Height*). In this example, ***10 Scale plan-profile – PROFILE*** is used. ***WARNING:*** Do NOT use the "10 Scale Profile" options from the **Drawing Seed** drop-down. The "10 Scale Profile" **Drawing Seed** would create a Profile that occupies the entire vertical space of the *Sheet Model*  .
6	Key-in the appropriate **Length** – as determined in 4. ***WARNING:*** Ensure the appropriate **Length** is entered AFTER the **Drawing Seed** is set. When the **Drawing Seed** is changed, the **Length** will change as well.


Place Named Boundary Civil Profile
Drawing Seed: 10 Scale plan-profile - PROFILE
Detail Scale: 1"=10'
Name: Profile 1
Description:
Method: Station Limits
Plan Group:
Group: (New)
Name: Culvert1Profile
Description:
Start Location: -0+70.00
Stop Location: 0+52.68
Length: 150.000000
Vertical Exaggeration: 2.000000
Available Profile Height: 22.000000
Top Clearance: 0.000000
Bottom Clearance: 0.000000
Elevation Datum Spacing: 2.000000
Station Datum Spacing: 10.000000
Profile Shifts: Do Not Shift
Use Terrains
Use Active Vertical
Create Drawing
Show Dialog
11
10
12
View 2, AttachedLongSection - Pipe culvert1
8
7
13
NOTE: The Mouse Cursor has to be past the Start Location to preview the Named Boundary
WARNING: Do NOT manually change Available Profile Height
WARNING: The Top/Bottom Clearance will not affect the vertical position of the PROFILE Named Boundary. The Adjust Profile Named Boundary tool is used to reposition the Boundary vertically.

The ***Start Location***, ***Stop Location***, and ***Vertical Exaggeration*** will be determined by trial and error. Initiate the placement of the PROFILE *Named Boundary* element by following the *Prompts*.

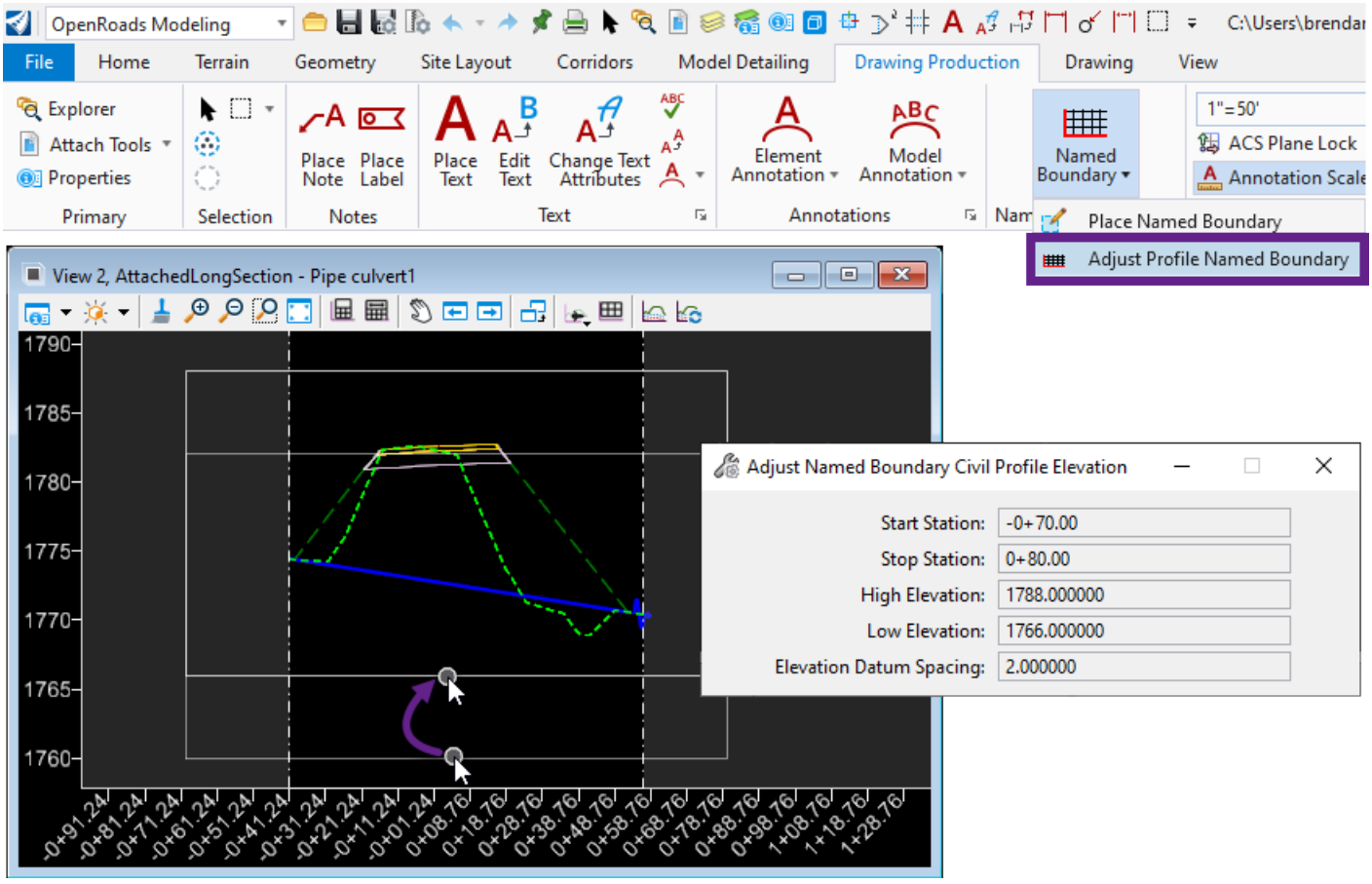
7	Prompt: Place Named Boundary Civil Profile > Identify Profile View – Left-Click anywhere in the Profile Model.
8	Prompt: Place Named Boundary Civil Profile > Identify Profile start point to place boundary - Left-Click anywhere in the Profile Model. The actual start point will be determined by trial and error in 11.
9	*Prompt: Place Named Boundary Civil Profile > Identify Profile end point to place boundary* – Do NOT proceed until Vertical exaggeration, Start Location, and Stop Location are calibrated. ***NOTE:*** The *Prompt* for this step may also read: *Boundary will not fit with given parameters. Change Profile Height, Window Clearances or Profile Shift location.* This *Prompt* typically appears when the Mouse Cursor is placed before the Start Location. Place the Mouse Cursor ahead of the Start Location to preview the PROFILE *Named Boundary* configuration.
10	Through trial and error, key-in the appropriate **Vertical Exaggeration** so that the PROFILE *Named Boundary* does NOT shift and the entire design is contained within the *Boundary*. In this case, a value of 2 is used. Place the Mouse Cursor ahead of the Start Location to preview the new PROFILE *Named Boundary* height after a new Vertical Exaggeration value is keyed-in. ***WARNING:*** When the **Vertical Exaggeration** value is changed, the **Available Profile Height** value will automatically change by an inverse factor. This is acceptable and needs to happened to show Profile Grid with the correct proportion in the *Sheet Model*. Do NOT manually change the **Available Profile Height**, unless the intent is to expand/contract the vertical allotted space that Profile Grid will occupy in the Sheet Border. ***WARNING:*** Some agencies and disciplines require that certain Vertical Exaggeration values are used for certain features. For example, Bridge Profiles are commonly shown with NO Vertical Exaggeration (i.e., Vertical Exaggeration = 1.0000). Vertical Exaggeration CANNOT be changed after the creation of the PROFILE *Named Boundary* element. ***IMPORTANT:*** The purpose of this step is to ensure the PROFILE *Named Boundary* element has enough height to entirely fit the design. The vertical position of the PROFILE *Named Boundary* element relative to the design will be adjusted with the *Adjust Profile Named Boundary* tool after placement (Do NOT have the *Create Drawing* box CHECKED). The vertical adjustment of the PROFILE *Named Boundary* is shown on the next page (*14B.5.c STEP 7: Adjust Vertical Position of the Profile Named Boundary*).
11	Through trial and error, key-in the appropriate **Start Location** for horizontal placement of the PROFILE *Named Boundary* element in the *Profile Model*. In this case, -0+60.00 is used for the **Start Location**. ***NOTE:*** *End Location* is automatically constrained by locking in the *Start Location* and *Length*. ***TIP:*** The Use can key-in a Start Location that is located prior to the Starting Station of the Profile. This technique could be used to create blank space prior to the beginning of the Profile.
12	Ensure the **Create Drawing** box is UNCHECKED. In this example, no other configuration is necessary. For a full explanation of each configuration option, see *14A.3.d Profile Named Boundary Options*.
13	Prompt: Place Named Boundary Civil Profile > Accept/Reject. Data point in Profile View to place boundary. If the preview of the PROFILE *Named Boundary* element and the parameters in *Place Named Boundary* Dialogue Box look acceptable, then Left-Click in the *View* to accept.

14C.4.c Adjust Vertical Position of the PROFILE Named Boundary Element

In this step, if necessary, the PROFILE *Named Boundary* element is adjusted. Vertical adjustments to the PROFILE *Named Boundary* element are performed with the *Adjust Profile Named Boundary* tool.

WARNING: The vertical position of a PROFILE *Named Boundary* element CANNOT be adjusted after the creation of *Drawing Models* and *Sheet Models*.

For a more detailed explanation of this procedure, see *14B.5.c STEP 7: Adjust Vertical Position of PROFILE Named Boundary Elements*.



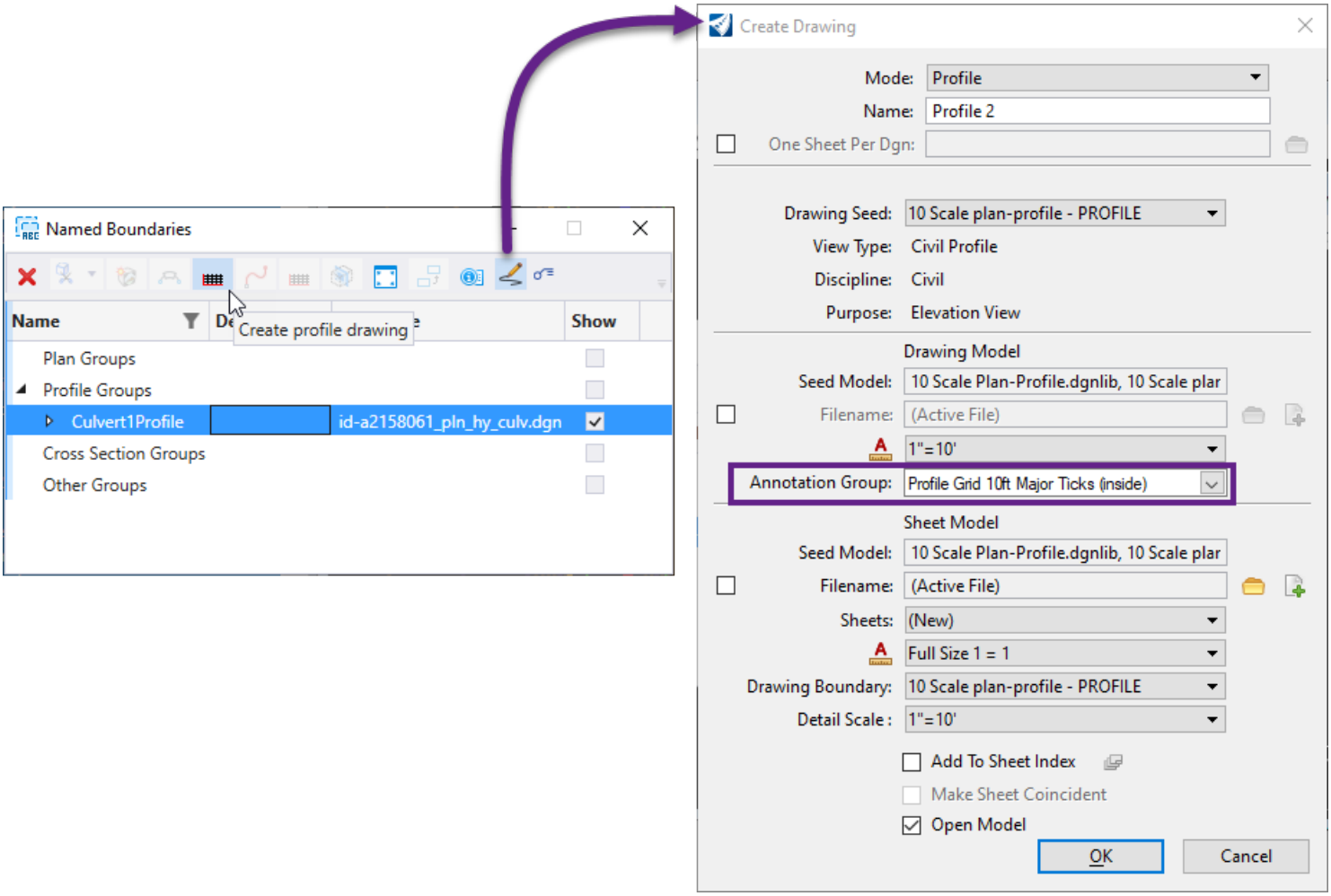
14C.4.d Create the PROFILE Drawing Model and the Sheet Model

In this step, only the PROFILE *Drawing Model* and *Sheet Model* are created. As stated in the introduction of this workflow, the PLAN view will be referenced into the PROFILE *Sheet Model* with a **Saved View** – which is shown in subsequent sections of this workflow.

This is the same procedure shown in *14B.6 STEP 8: Create Drawing Models and Sheet Models* – with one exception: the *Create profile drawing* tool is used in lieu of the *Create plan/profile Drawing* tool.

WARNING: When using the *Create profile drawing* tool, the *Profile Model* of the culvert must be opened.

TIP: Ensure that the *Show the Create Dialog* toggle is ON before using the *Create profile drawing* tool.

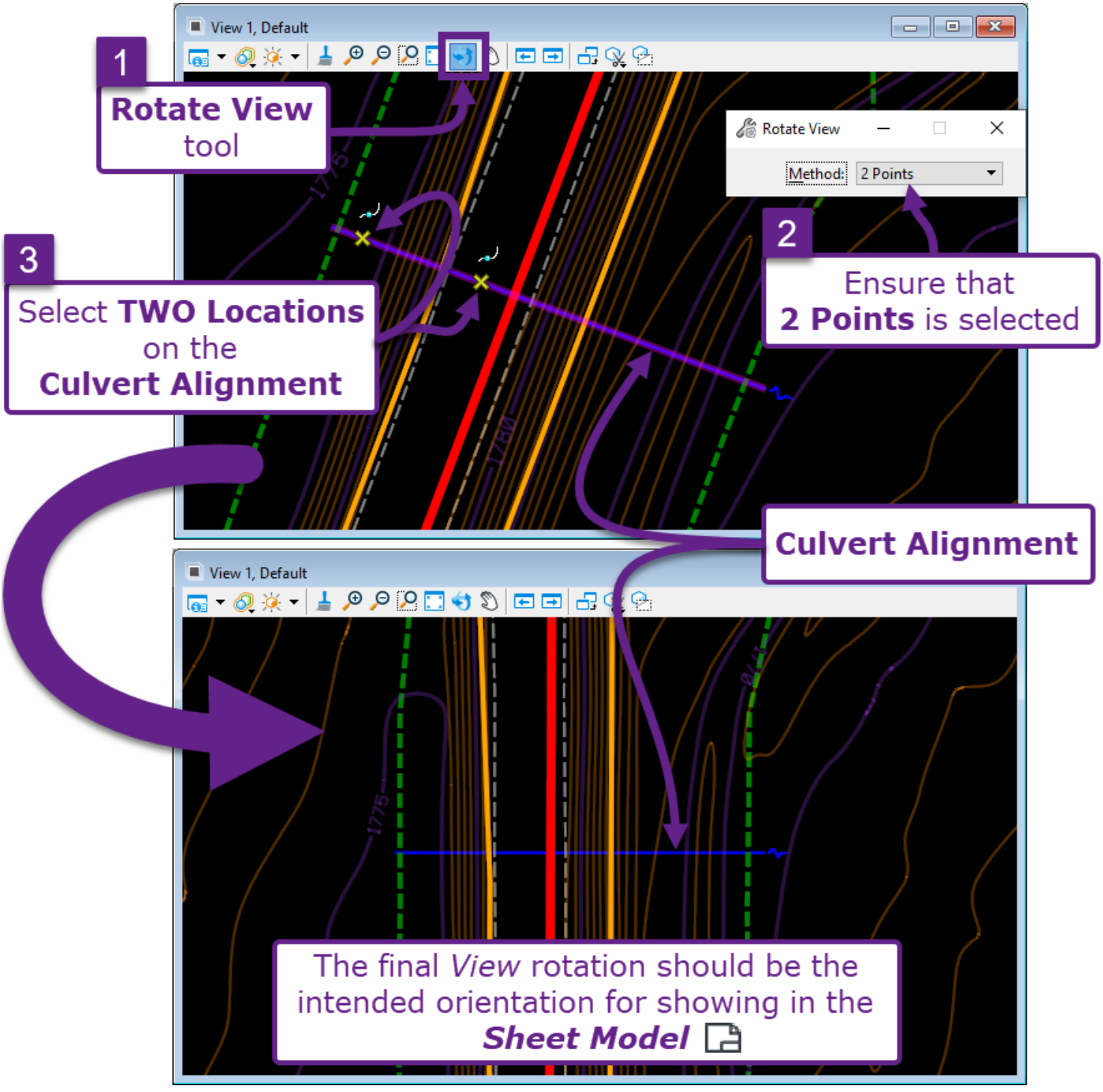


14C.4.e Create a Saved View in the 2D Design Model

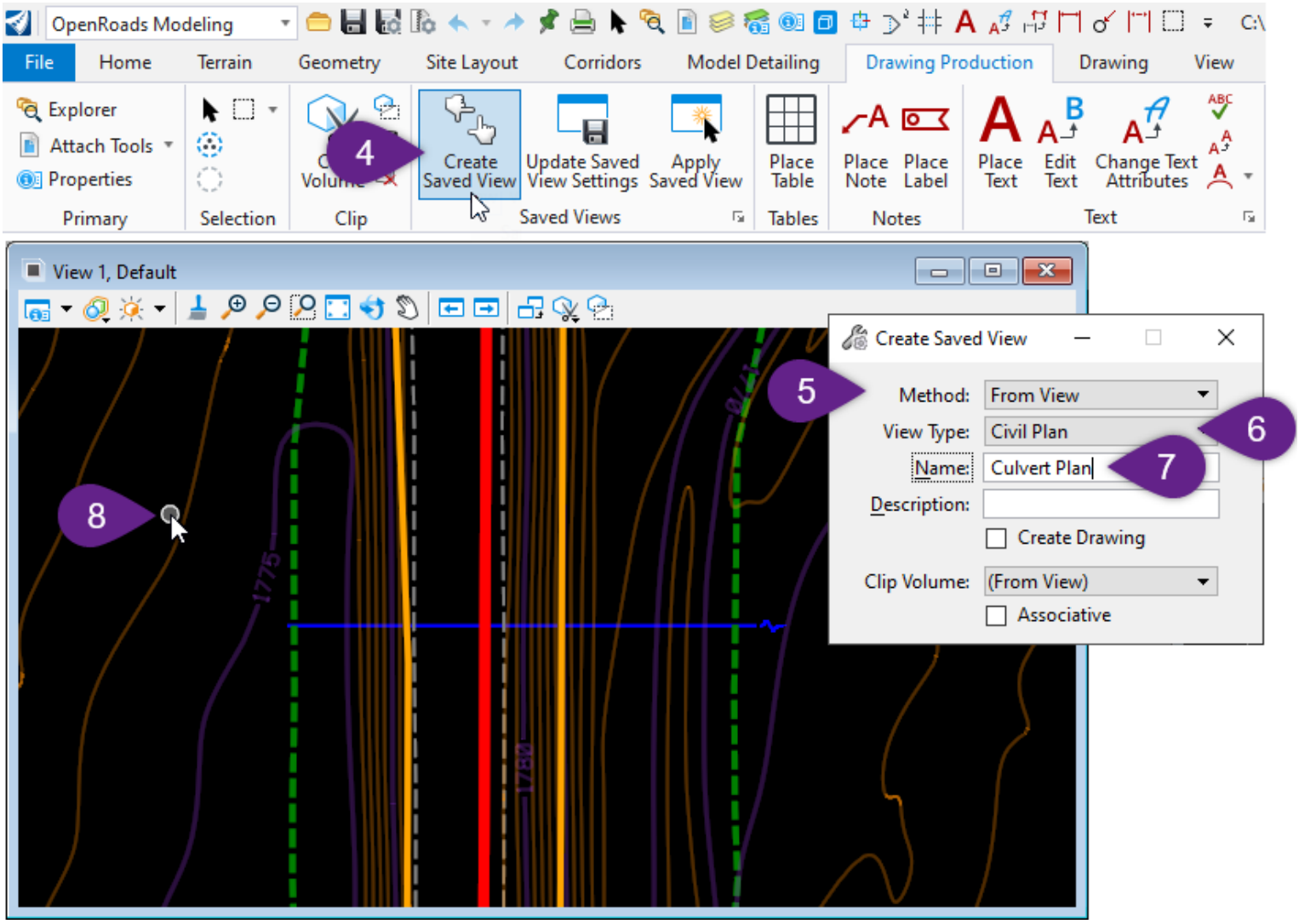
In this step, a **Saved View** will be created around the Culvert Alignment. Before doing so, the *Rotate View* tool, is used to rotate the *2D Design Model* to be orientated with the Culvert.

The **Saved View** method of "capturing" a plan view works similarly to the **Civil Plan** method (shown in *14B.4 STEPS 1-4 Placing PLAN Named Boundaries*). However, the **Saved View** method does NOT require the creation of PLAN *Named Boundary* elements or PLAN *Drawing Models*. The **Saved View** procedure shown here is more streamlined but could be replaced with **Civil Plan** method.

IMPORTANT: Before creating the **Saved View**, turn OFF all undesired Levels – as shown in *14B.3 Initial Plan Sheet ORD File Setup*.



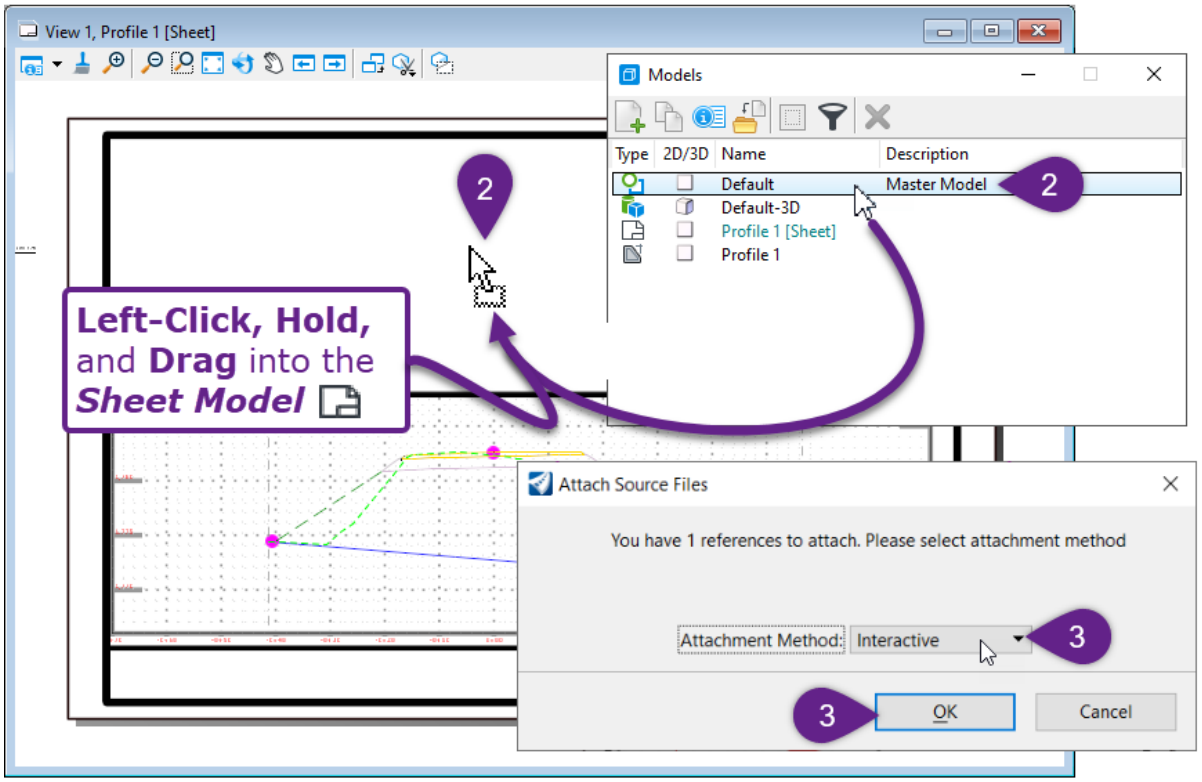
Shown below, the *Saved View* will be captured from the *2D Design Model* .

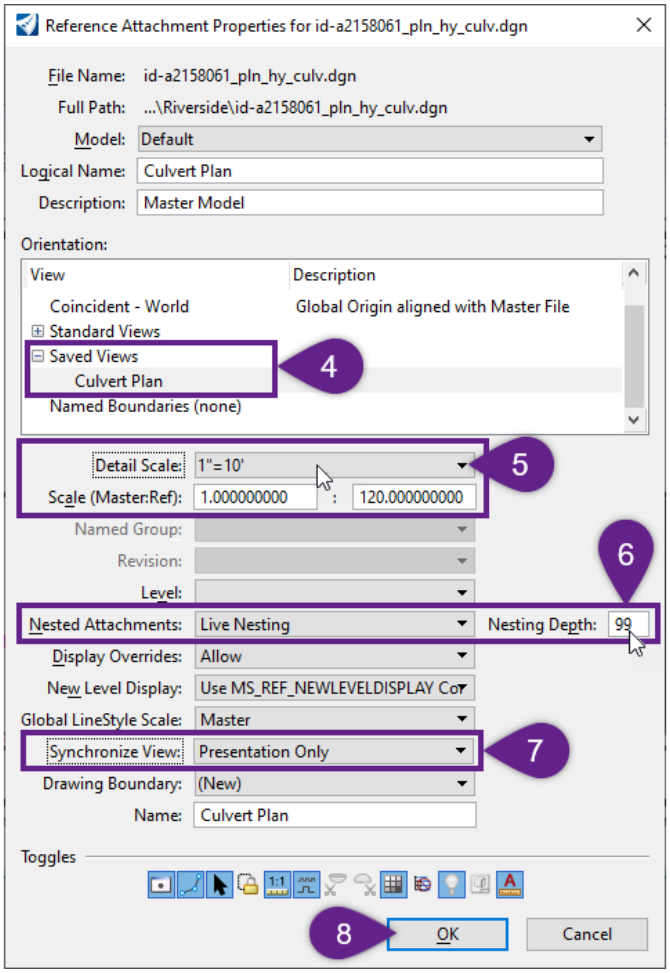


4	From within 2D Design Model , select the Create Saved View tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Saved Views***].
5	Before following the *Prompts,* complete the following: Ensure the **Method** is set to *From View*.
6	Change the **View Type** to *Civil Plan*.
7	Assign the *Saved View* an appropriate **Name**.
8	Prompt: Create Saved View > Select Source View – Left-Click anywhere in the 2D Design Model to capture the Saved View.

14C.4.f Reference the Saved View into the Sheet Model

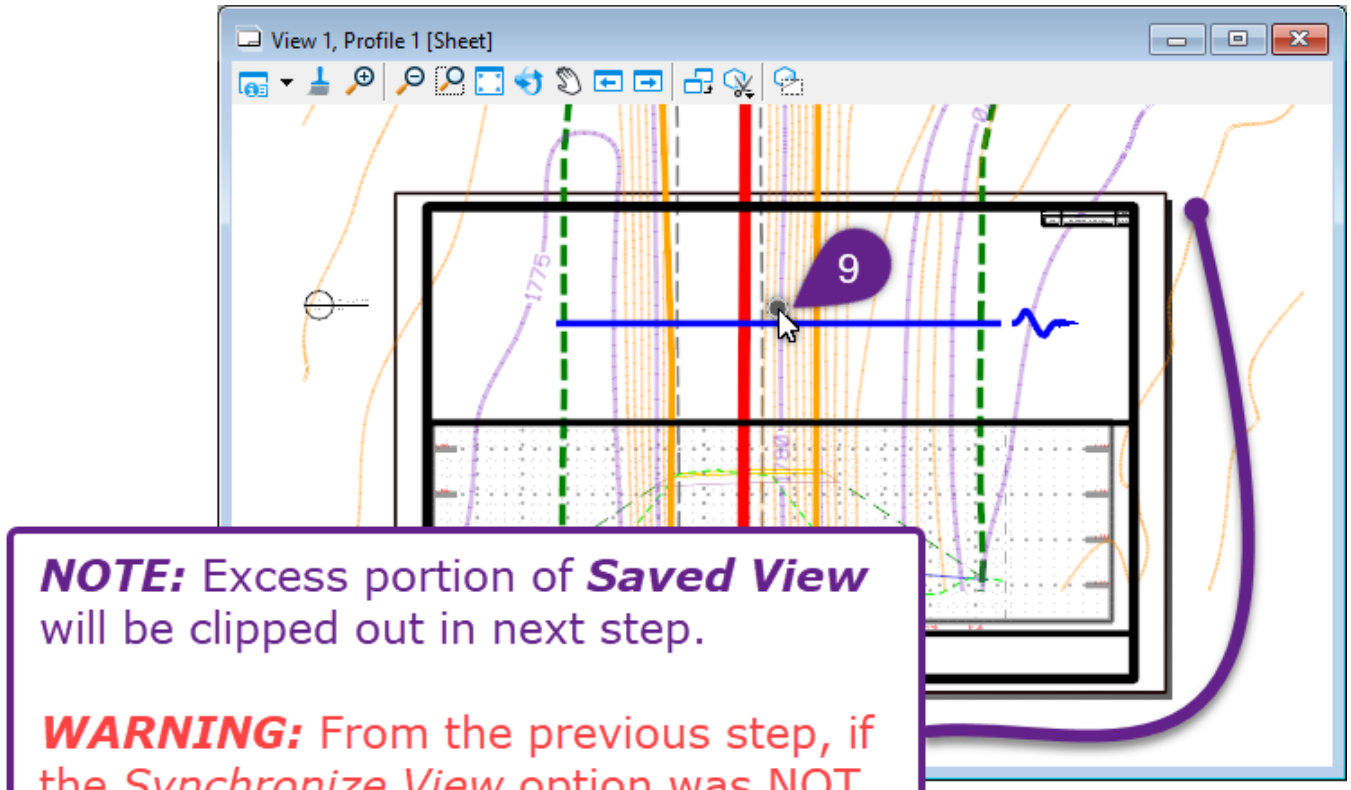
In this step, the *Saved View* is referenced in to the PROFILE *Sheet Model*. This step is performed from the *Sheet Model*.





2	Left-Click and hold on the *2D Design Model*. With the Left-Click button held down, drag the *2D Design Model* into the opened *Sheet Model*.
3	In the *Attach Source Files* box, change the *Attachment Method* to **Interactive**
4	In the *Reference Attachment Properties* box, expand the **Saved Views** drop-down and select the Name of the Saved View created in the previous step. In this case, "Culvert Plan" is selected (highlighted)
5	From the **Detail Scale** drop-down, select the appropriate scale. This should correspond with the **Drawing Seed** that was selected in Step 5 of *14C.4.b Create the PROFILE Named Boundary element*. In this case, 1"=10' scale is selected.
6	Ensure that *Nested Attachments* is set to **Live Nesting**. Also, set the **Nesting Depth** to **99**.

7	Set the *Synchronize View* drop-down to **Presentation Only**. ***NOTE:*** This option needs to be set to "Presentation Only" to enable *Clipping* operations for the **Saved View** reference. If NOT set, then the **Saved View** Reference CANNOT be clipped the next section.
8	When all options in the *Reference Attachment Properties* box have been addressed, select OK to place the *Saved View* reference.
9	After OK is selected in *Reference Attachment Properties* box in the previous step, the *Prompt* in the lower left corner will read: *Prompt: Attach Reference > Enter center point for view Culvert Plan* **(SAVED VIEW NAME)** *of reference id-ad158061_pln_hy_culv.dgn* **(ORD FILE NAME)** In the *Sheet Model*, Left-Click in the approximate center of the Plan portion of the Sheet Border. After Left-Clicking, the **Saved View**, will be placed. However, it will need to be clipped and adjusted (moved) – which is shown on the next page.



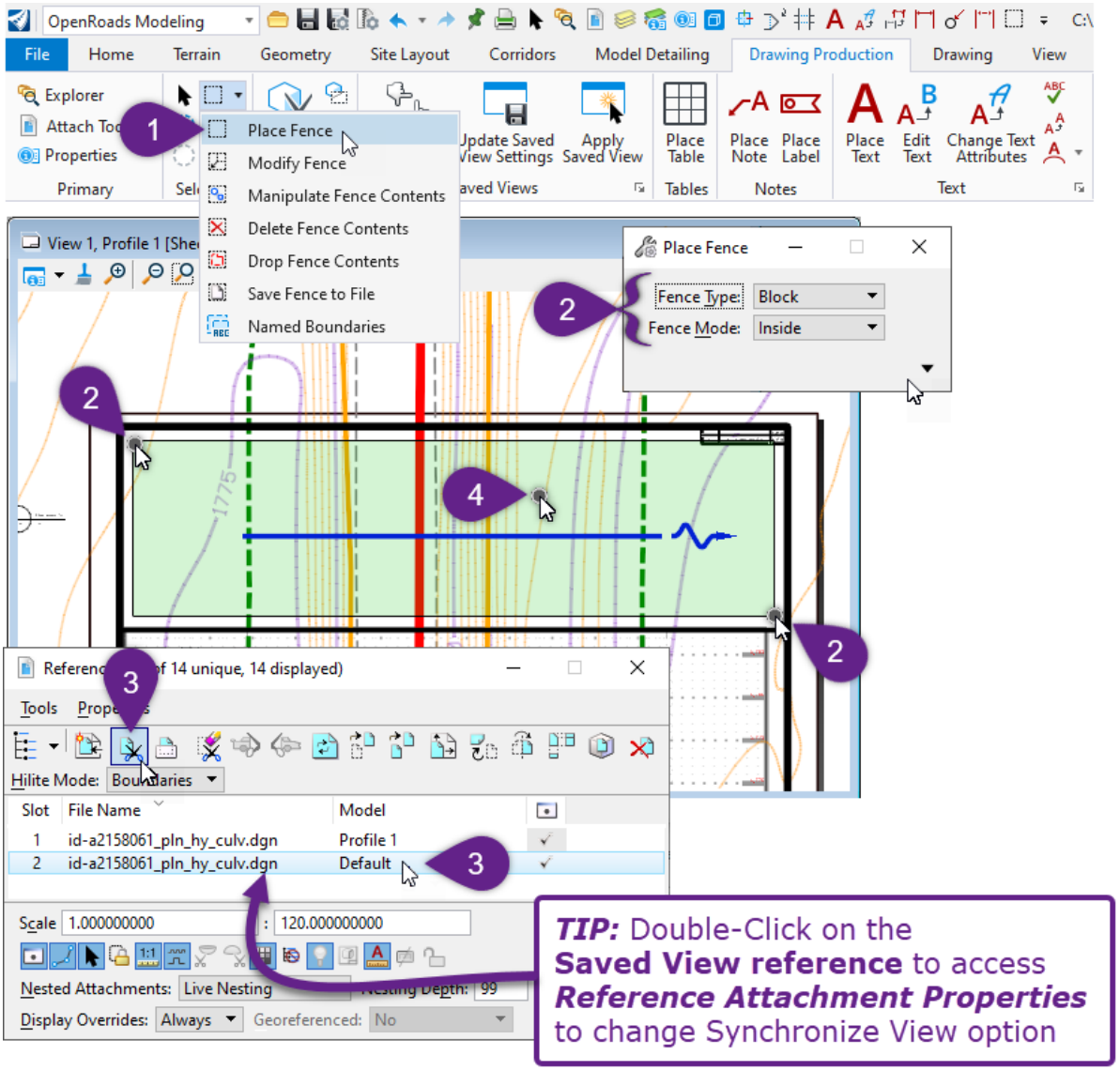
NOTE: Excess portion of ***Saved View*** will be clipped out in next step.

WARNING: From the previous step, if the *Synchronize View* option was NOT set to **Presentation Only**, then the ***Saved View* reference** will NOT be eligible for clipping.

14C.4.g Clip, Move, and Adjust the Saved View Reference

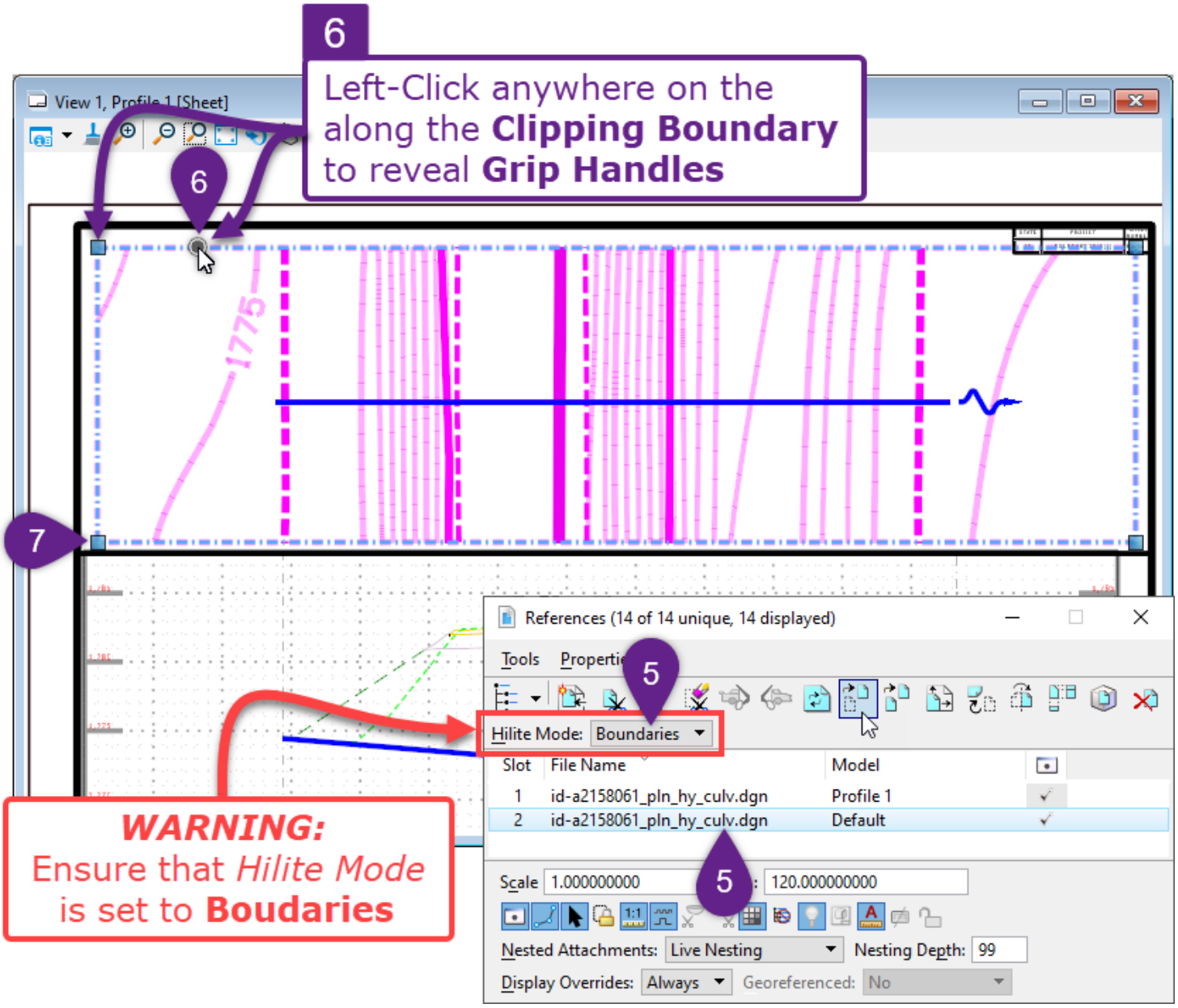
In this step, the excess portion of the *Saved View* reference is clipped by placing a *Fence* element.

WARNING: In the *Reference Attachment Properties* box of the *Saved View* reference, ensure that the *Synchronize View* option is set to **Presentation Only**. This option needs to be enabled for clipping operations.



1	Select the *Place Fence* tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Selection***].
2	In the *Dialogue Box*, ensure that *Fence Type* is set to **Block**. Ensure that *Fence Mode* is set to **Inside**. In the *Sheet Model*, place the Fence by selecting two locations that represent opposite corners of the Block (rectangle).
3	In the *References Menu*, select (highlight) the *Saved View* reference and select the *Clip Reference* icon.
4	Prompt: Set Reference Clip Boundary > Accept/Reject Fence Clip Boundary – Left-Click anywhere in the Sheet Model View to clip the reference.

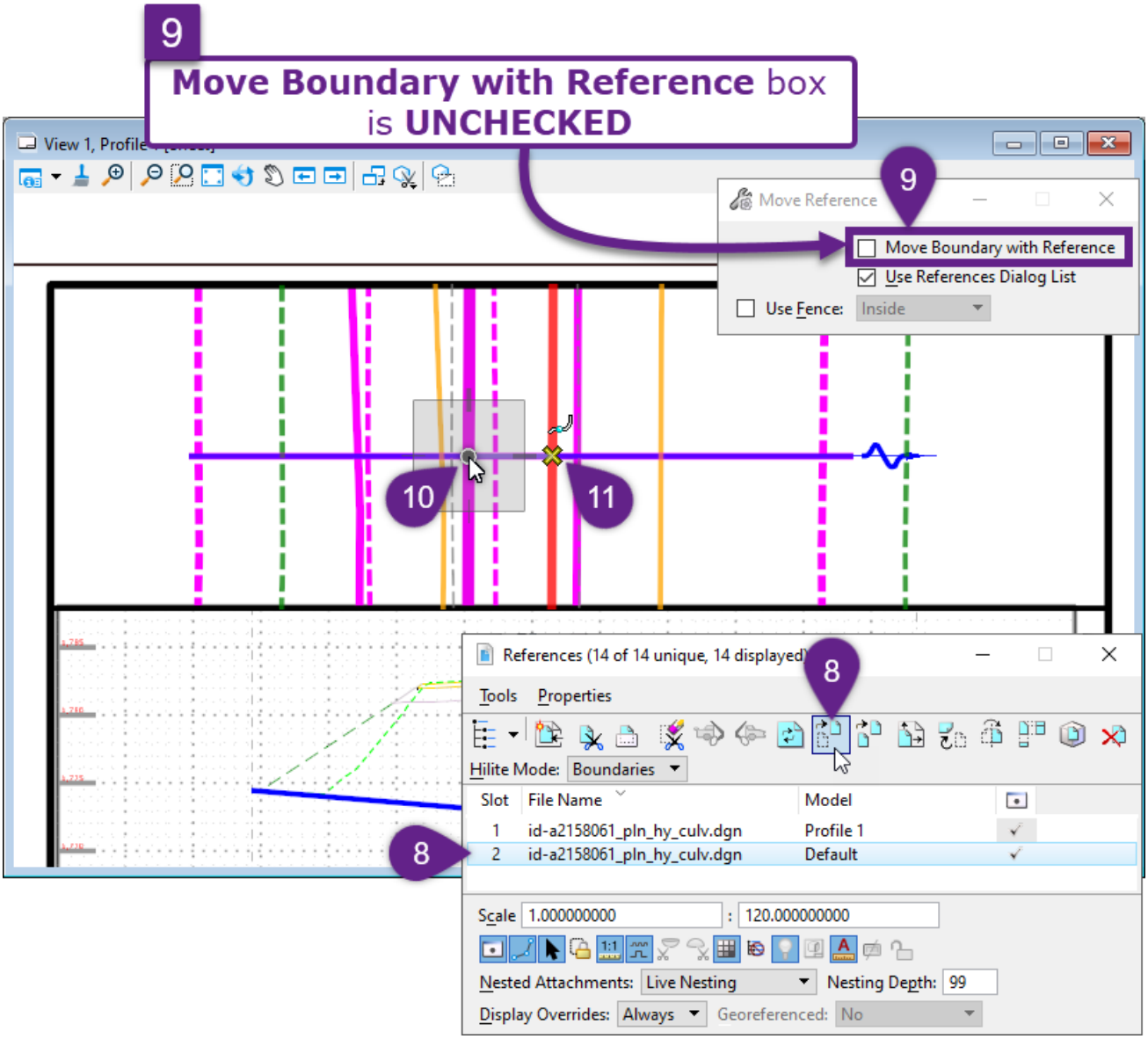
In this step, the Clipping Boundary of the *Saved View* reference will be adjusted by revealing Grip-Edit Handles.



5	In the *References Menu*, ensure that *Highlight Mode* is set to **Boundaries.** Select (highlight) the *Saved View* reference to reveal the Clipping Boundary.
6	Left-Click anywhere on the dashed-pink Clipping Boundary to reveal **Grip-Edit Handles**. Using the Grip-Edit Handles, drag the corners of the Clipping Boundary to the desired locations
7	Using the Grip-Edit Handles, drag the corners of the Clipping Boundary to the desired locations

In this step, the contents *Saved View* reference will be Moved for better positioning in the Sheet Border.

WARNING: When Moving the *Saved View* reference, ensure that the **Move Boundary with Reference** box is UNCHECKED. If this box is CHECKED, then the Clipping Boundary is also be moved – which means the User has to reset the Clipping Boundary after the *Saved View* reference is Moved. When this box is UNCHECKED, the Clipping Boundary does NOT Move along with the reference – only the reference graphics are moved.



8	In the *Reference Manager*, left-click and highlight the *Saved View* reference. Select the *Move Reference* icon.
9	In the *Dialogue Box*, ensure that the **Move Boundary with Reference** box is UNCHECKED.
10	Prompt: Move Reference > Enter point to move from – Select a base point to move the reference from.
11	Prompt: Move Reference > Enter Point to move to - Select the location to move the refence to.

14D – CREATION OF DETAIL SHEETS – WORKFLOW

This workflow is for detail sheet creation, such as Typical Section Sheets or Structural Detailing Sheets. This workflow shows graphics that are drawn to scale in the *2D Design Model* - but are unrelated to the survey mapping. These graphics are commonly drawn with the *View* unrotated (North facing up).

TIP: This workflow is catered toward the showing detail graphics. However, mapping graphics can be "dropped" or refenced into *Sheet Models* created with this workflow. This can be easily done with by creating a *Saved View*. See *14C.4.f Reference the Saved View into the Sheet Model*.

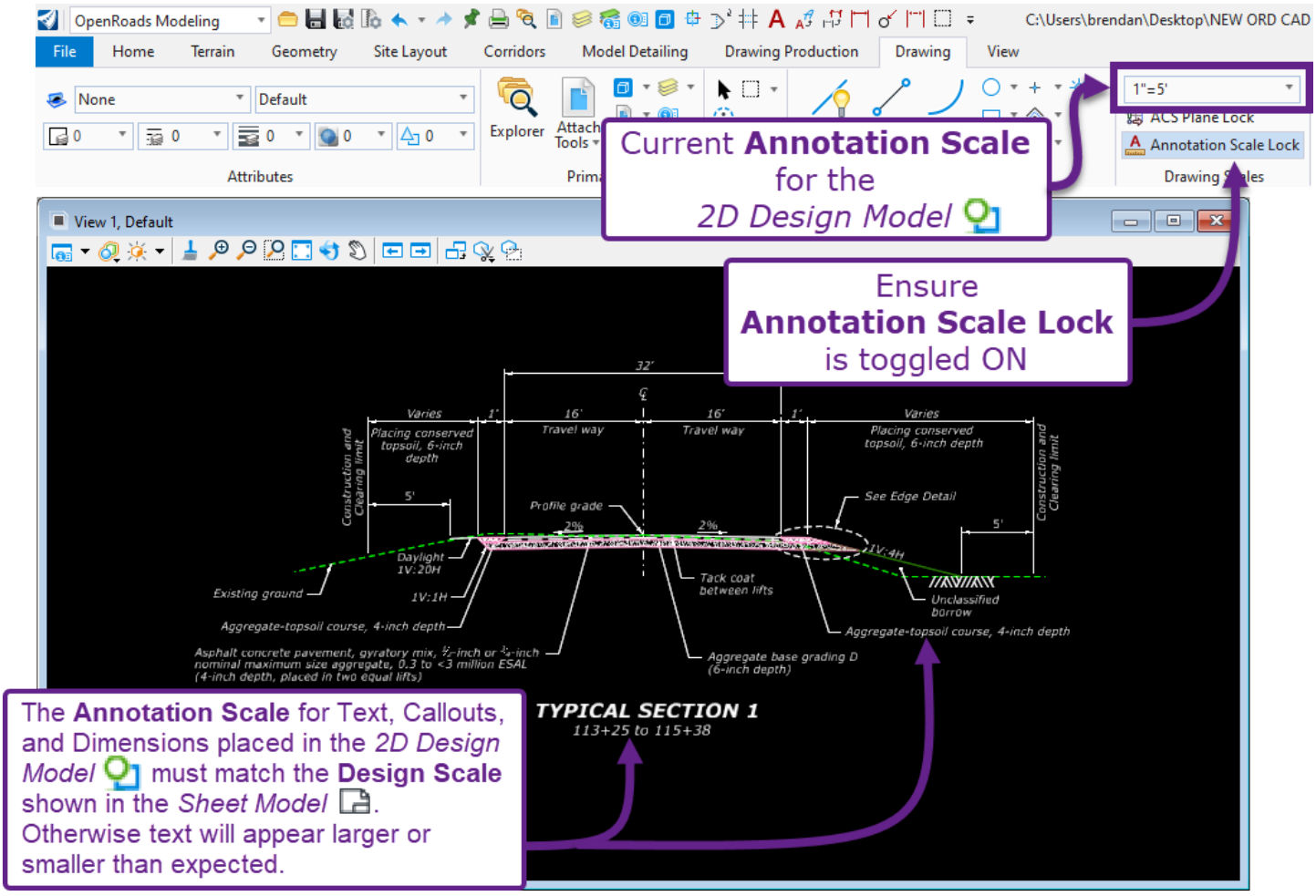
14D.1 Detail Sheet ORD Sheet File Setup

Before Detail Sheets production, create and setup a new ORD File. See *14B.3 Initial Plan Sheet ORD File Setup*.

14D.2 Draw the Detail Linework in the 2D Design Model

In the new ORD File created on the previous page, draw the graphics/linework to be shown in the Detail Sheet. Draw the graphics in the *2D Design Model* with the *View* unrotated. If the detail graphics and linework were drawn in a different ORD File, ensure it is referenced into this new Plan Sheet ORD File.

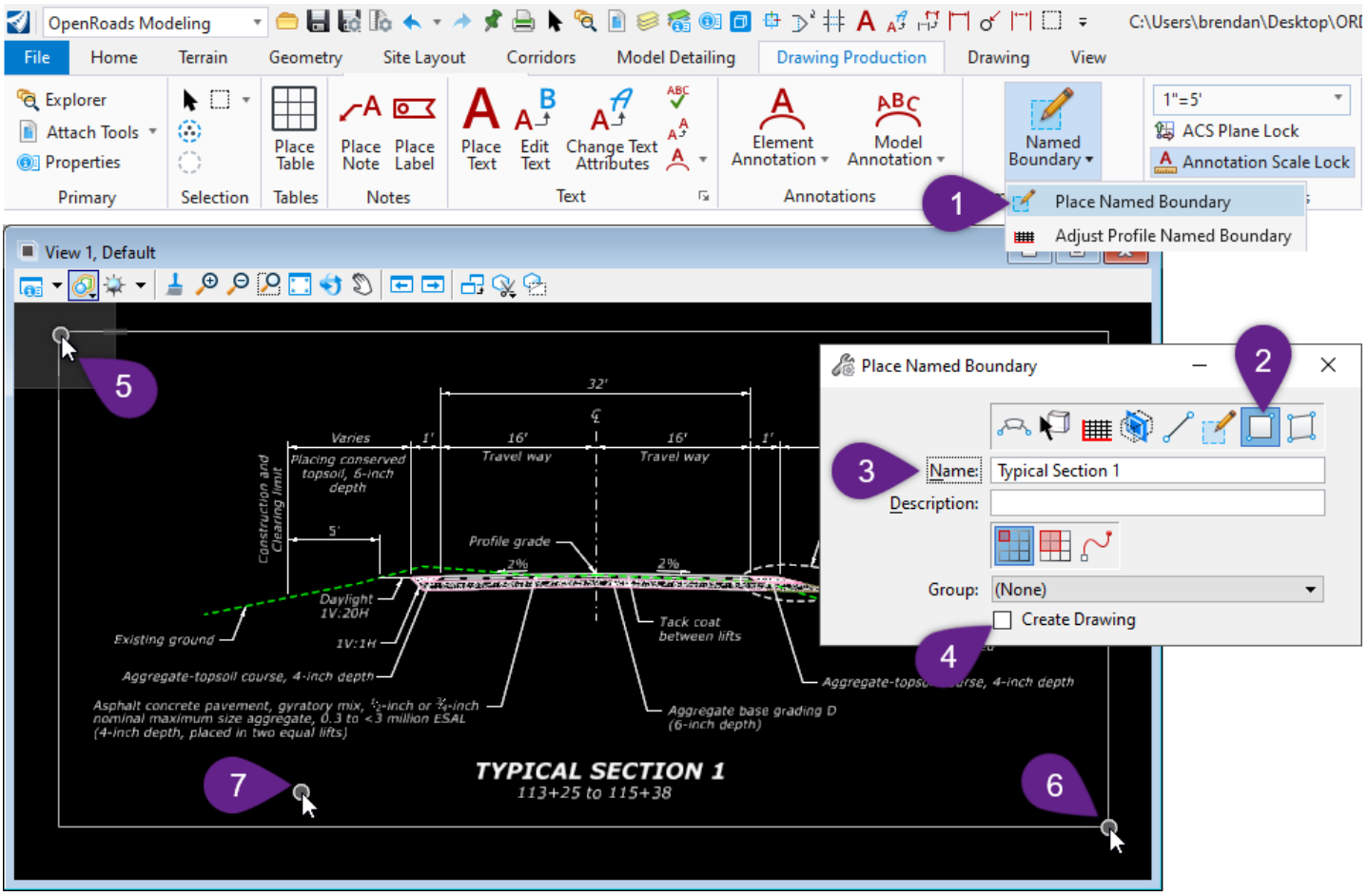
TIP: It is recommended to place Text, Callouts, and Dimensions in the *Sheet Models*, but an option is to place these in the *2D Design Model*. ***IMPORTANT:*** When placing Text in the *2D Design Model*, ensure the *Annotation Scale Lock* is toggled ON and the *Annotation Scale* is set to the same Drawing Scale that is to be shown on paper. See *15A.1 Best Practices for which Model to create Annotations in*.



14D.3 Create a Named Boundary Element with the By 2 Points Mode

In this step, a *Named Boundary* element is created with the **By 2 Points** mode.

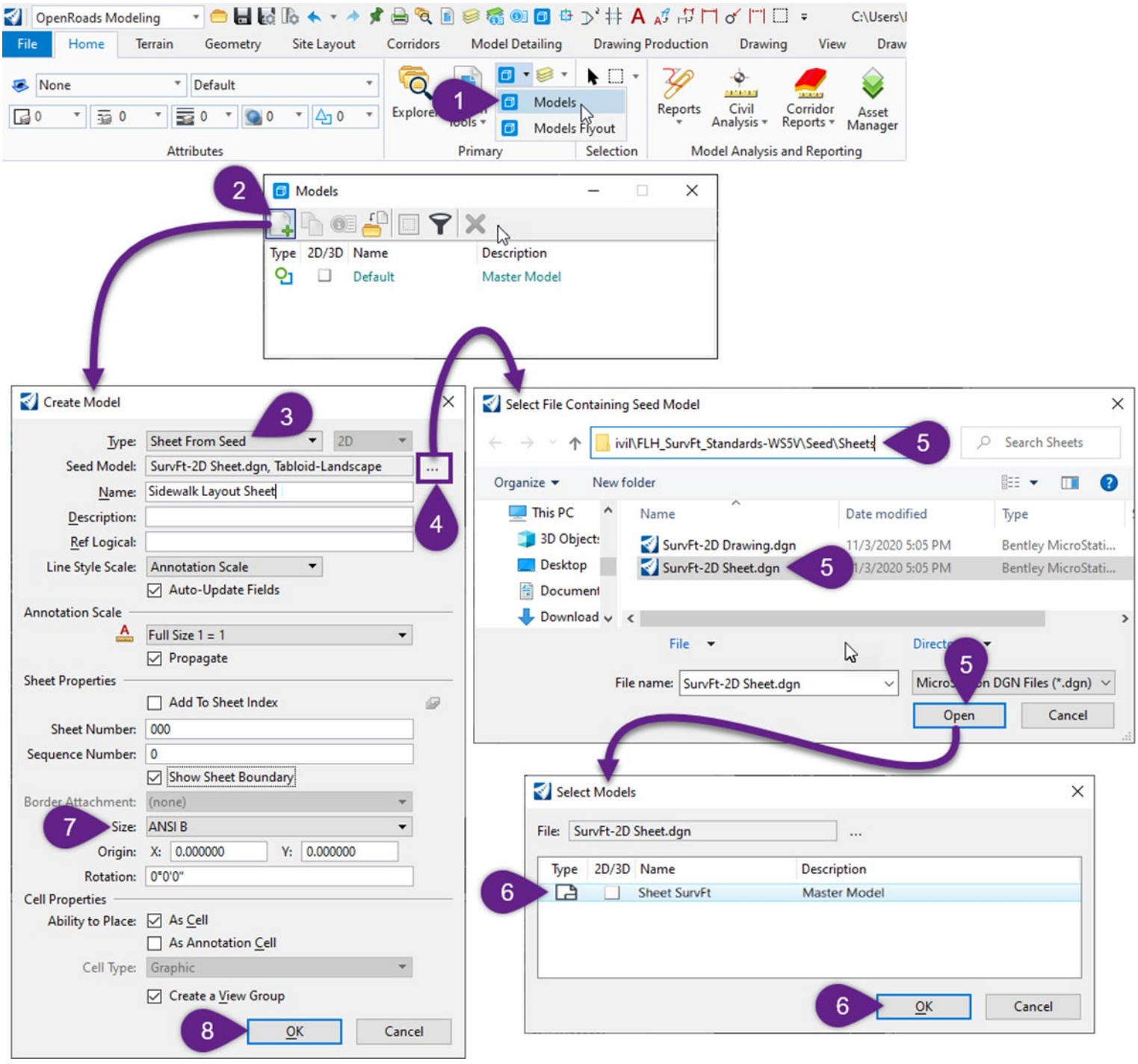
WARNING: In the *Place Named Boundary* dialogue box, ensure that the **Create Drawing** box is UNCHECKED. At this time, the *Drawing Seeds* for the **By 2 Points** and **By Polygon** modes have NOT been setup to correctly show the FLH Sheet Border.



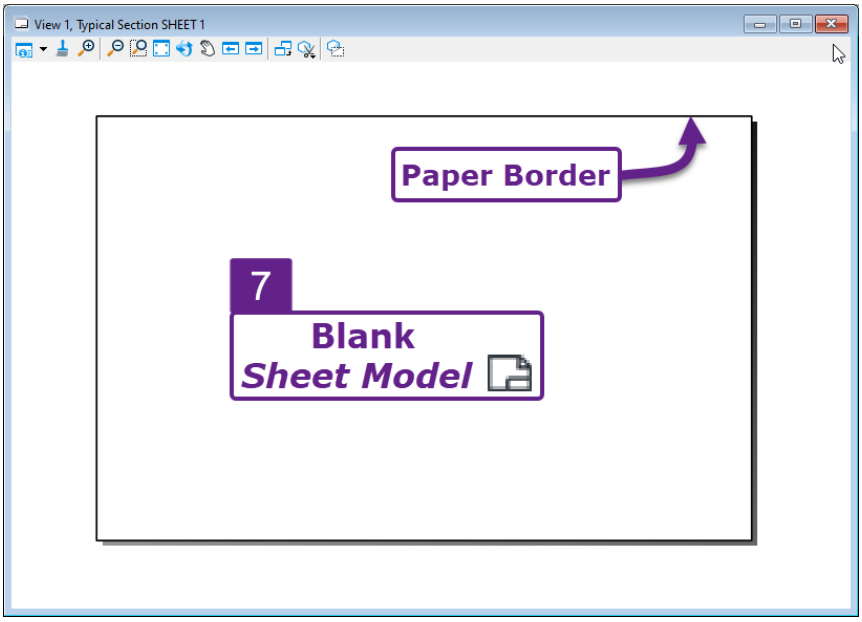
1	Select the *Place Named Boundary* tool from the Ribbon: [***OpenRoads Modeling*** → ***Drawing Production*** → ***Named Boundaries***].
2	In the *Place Named Boundary* Dialogue Box, select the ***By 2 Points*** mode by clicking on the icon .
3	In the *Place Named Boundary* Dialogue Box, assign the *Named Boundary* element an appropriate **Name**.
4	In the *Place Named Boundary* Dialogue Box, ensure the **Create Drawing** box is UNCHECKED.
5	Prompt: Place Named Boundary By 2 Points > Enter first point – Left-Click on the first corner of the rectangular Named Boundary element.
6	Prompt: Place Named Boundary By 2 Points > Enter opposite corner – Left-Click on the opposite corner of the rectangular Named Boundary element.
7	Prompt: Place Named Boundary By 2 Points > Accept to place Named Boundary or rotate AccuDraw to change the resultant saved view's orientation – Left-Click in the View to accept and place the Named Boundary element.

14D.4 Manually Create the Sheet Model

In this step, a blank *Sheet Model* is created from the *Models* Menu.

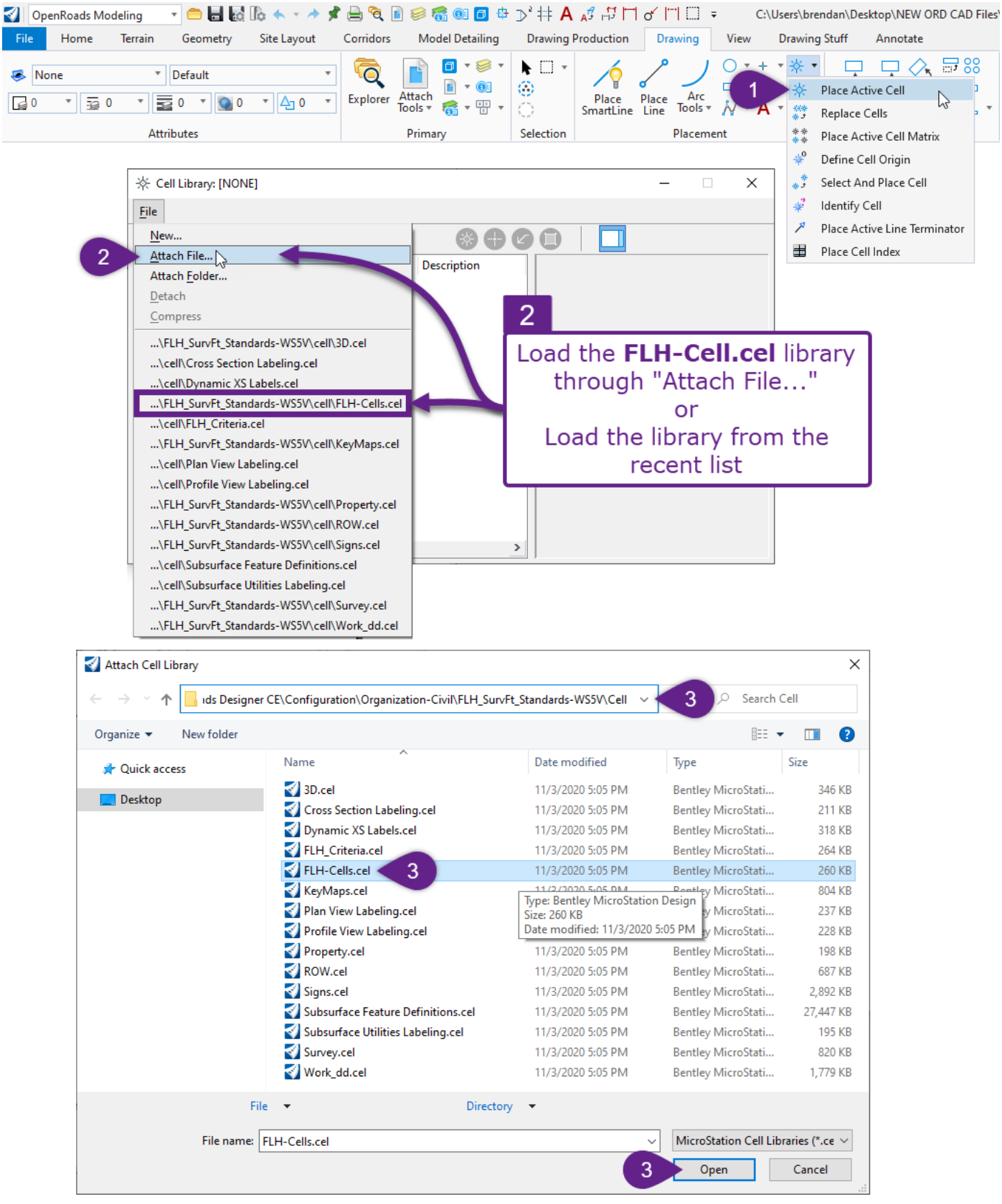


1	Open the *Models* menu from the ribbon: [***OpenRoads Modeling*** → ***Home*** → ***Primary***]
2	In the *Models* menu, select the **Create a new model** icon
3	In the *Type* drop-down, set to **Sheet from Seed**.
4	**Seed Model:** If the appropriate Seed Model is NOT shown, then select the ... icon to locate it. The appropriate Seed Model depends on the Survey Units (i.e., Survey Feet or International Feet). For projects in **Survey Feet**, the appropriate Seed Model is called: "SurvFt-2D Sheet.dgn, Sheet SurvFt" For projects in **International Feet**, the appropriate Seed Model is called: "IntlFt-2D Sheet.dgn, Sheet IntlFt"
5	Locate the **Seed Model** file. For projects in **Survey Feet**, the Seed Model file is found in the FLH WorkSpace in the following location: …\Configuration\Organization-Civil\FLH_Stds-WS10.10.21.00V\Seed**Survey**\Sheets For projects in **Survey Feet**, the Seed Model is located in the following location: …\Configuration\Organization-Civil\FLH_Stds-WS10.10.21.00V\Seed**International**\Sheets
6	In the *Select Models* box, select the provided Seed Model.
7	Select the **Size** for the *Sheet Model* . For typically plan sheets, the Size should be set to **Tabloid Landscape**. ***NOTE:*** Tabloid means 11x17". Letter means 8.5x11".

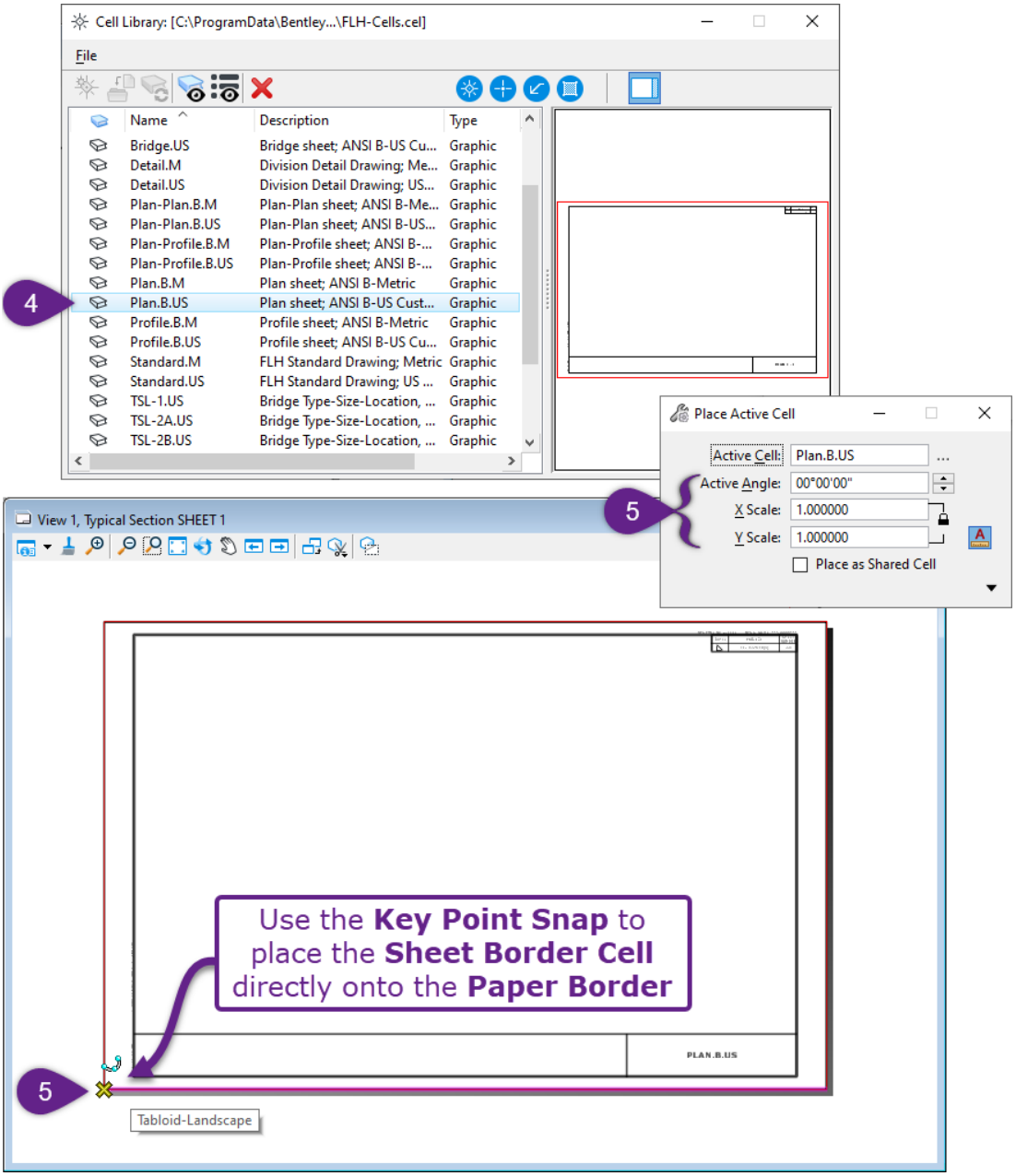


14D.5 Place the FLH Sheet Border from the Cell Library

In previous step, a blank *Sheet Model* - without a Sheet Border cell – was created. In this step, the User will select and place a FLH Sheet Border cell from the Cell Library. All FLH Sheet Border cells are found in the **"FLH-Cells.cel"**

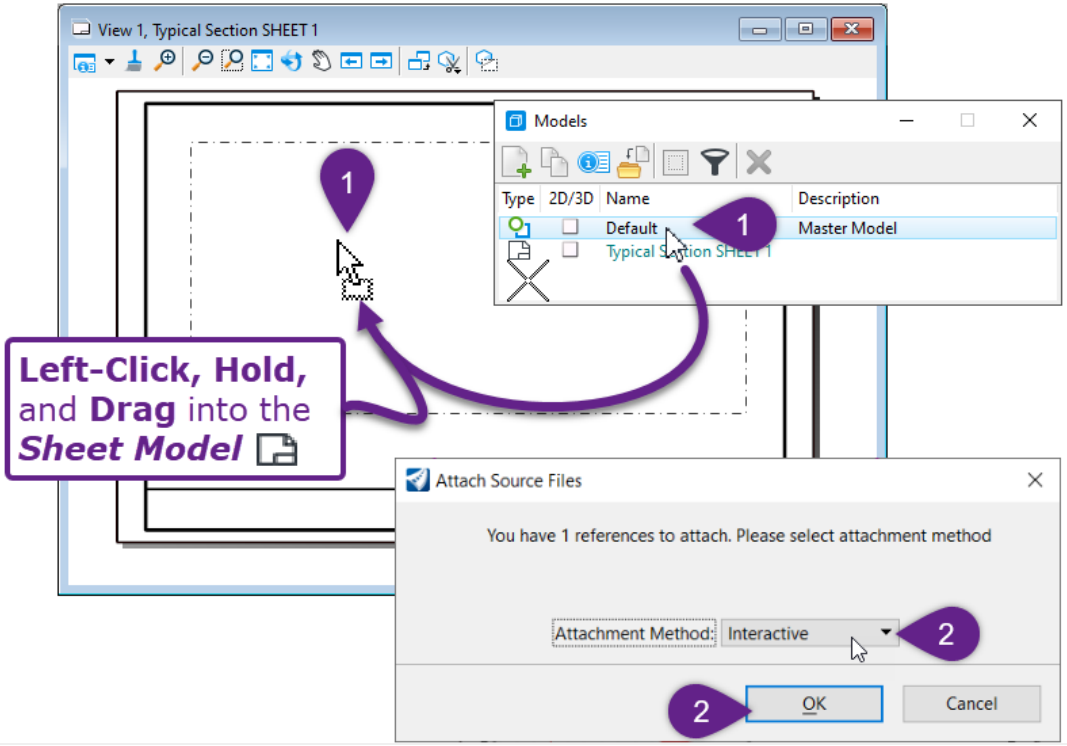


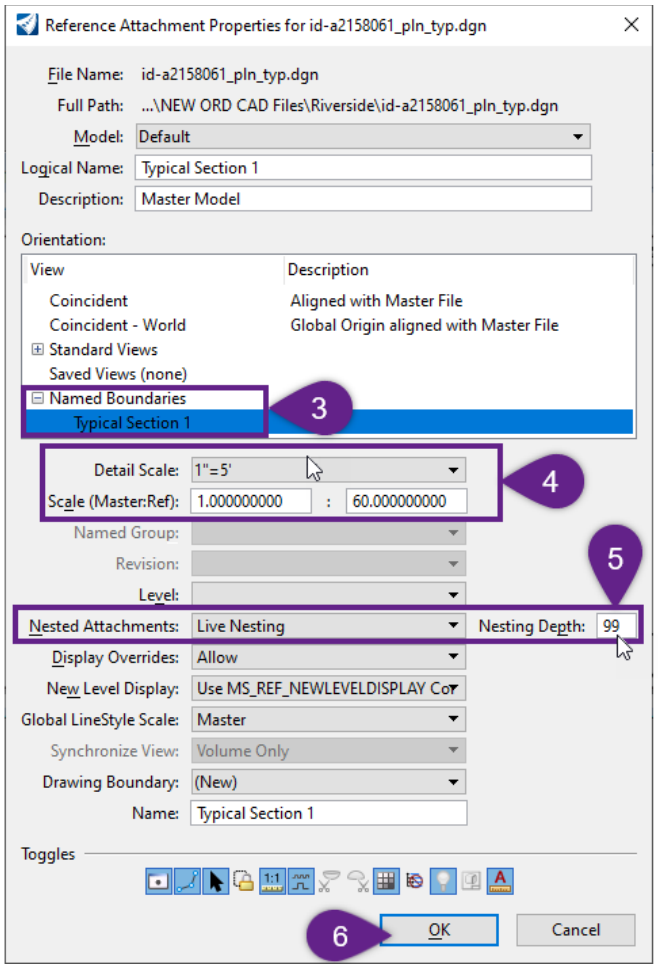
1	Select the *Place Active Cell* tool from the ribbon: [***OpenRoads Modeling*** → ***Drawing*** → ***Placement***]
2	In the Cell Library Menu, load the **"FLH-Cells.cel"** library.
3	Navigate to the Cell Library folder in the FLH WorkSpace. Select the **"FLH-Cells.cel"** library. The Cell Library is found in the FLH WorkSpace in the following location: …\OpenRoads Designer CE 10.10\Configuration\Organization-Civil\FLH_Stds-WS10.10.21.00V\Cell
4	Select (double-click) the appropriate Sheet Border cell from the available options. In this case, the "Plan.B.US" is used.
5	Place the Sheet Border cell on to the Paper Border. Use the Key-Point Snap to snap directly to the Paper Border. Ensure that **Active Angle = 0**. Ensure that the **X and Y Scale = 1.0000.**



14D.6 Reference the Named Boundary into the Sheet Model

In this step, the *Named Boundary* (created in Step 3) is referenced into the *Sheet Model*. This step is performed from the *Sheet Model*

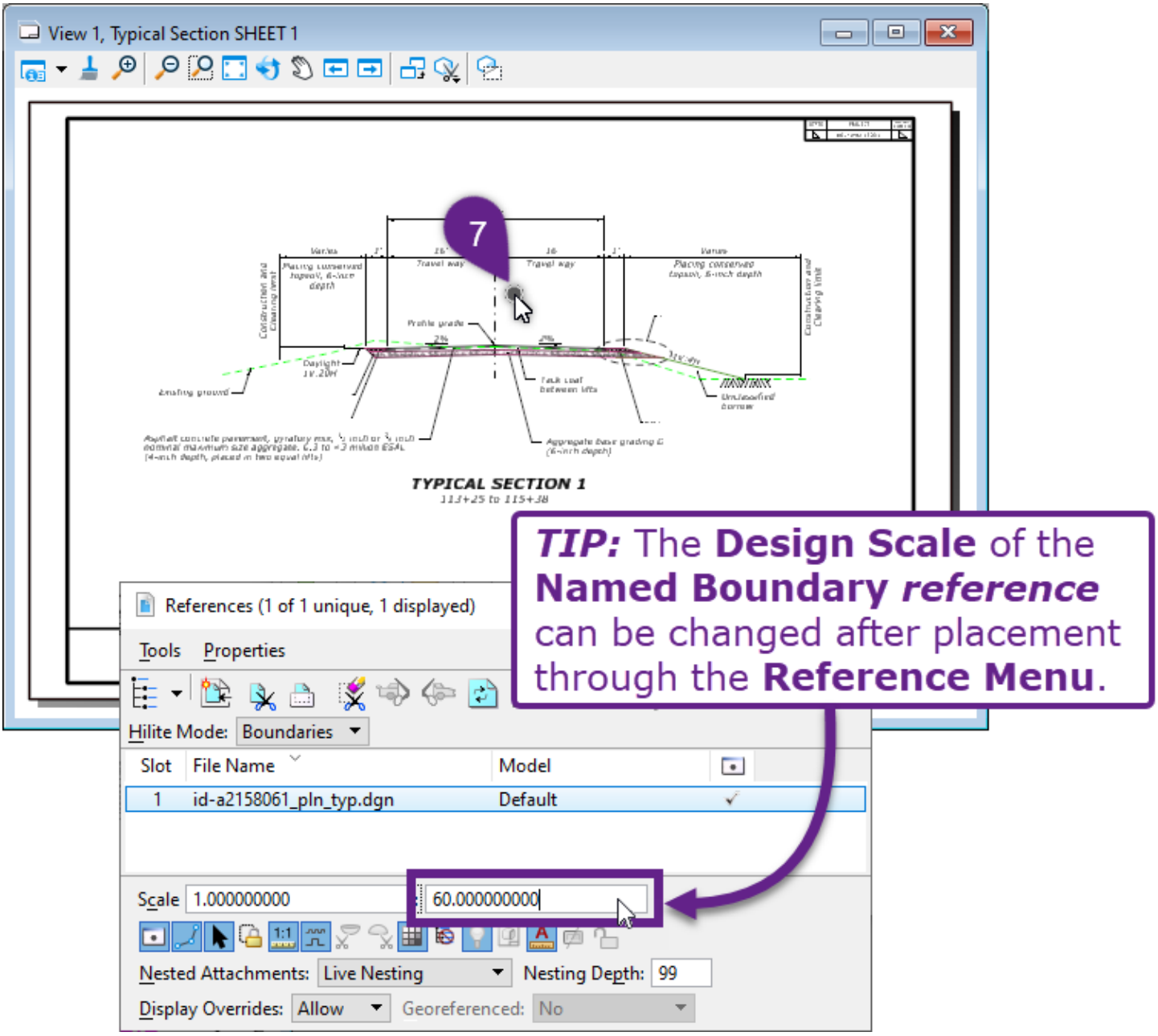




1	Left-Click and hold on the *2D Design Model*. With the Left-Click button held down, drag the *2D Design Model* into the opened *Sheet Model*.
2	In the *Attach Source Files* box, change the *Attachment Method* to **Interactive**
3	In the Reference Attachment Properties box, expand the **Named Boundary** drop-down and select the Name of the Named Boundary created in *14D.3 Create a Named Boundary Element with the By 2 Points Mode*. ("Typical Section 1")
4	From the **Detail Scale** drop-down, select the appropriate scale. ***NOTE:*** The Detail Scale (or sometime referred to as Drawing Scale) can be changed and experimented with later. The exception is if Text, Callouts, and Dimensions were placed in the *2D Design Model*. If text was placed in the *2D Design Model* then Detail Scale must match the *Annotation Scale*.
5	Ensure that *Nested Attachments* is set to **Live Nesting**. Also, set the **Nesting Depth** to **99**.
6	When all options in the *Reference Attachment Properties* box have been addressed, select OK to place the *Named Boundary* reference.

7	After OK is selected in *Reference Attachment Properties* box in the previous step, the *Prompt* in the lower left corner will read: *Prompt: Attach Reference > Enter center point for view Typical Section 1* **(Named Boundary Name)** *of reference id-a2158061_pln_typ.dgn* **(ORD FILE NAME)** In the *Sheet Model*, Left-Click in the desired location of the Sheet Border. After Left-Clicking, the **Named Boundary Reference** will be placed.

TIP: After placing the *Named Boundary* reference into the *Sheet Model*, the reference can be Moved, Rotated, and Clipped. See *14C.4.g Clip, Move, and Adjust the Saved View Reference* and *14E.1 Rotate and Move Plan Views*.



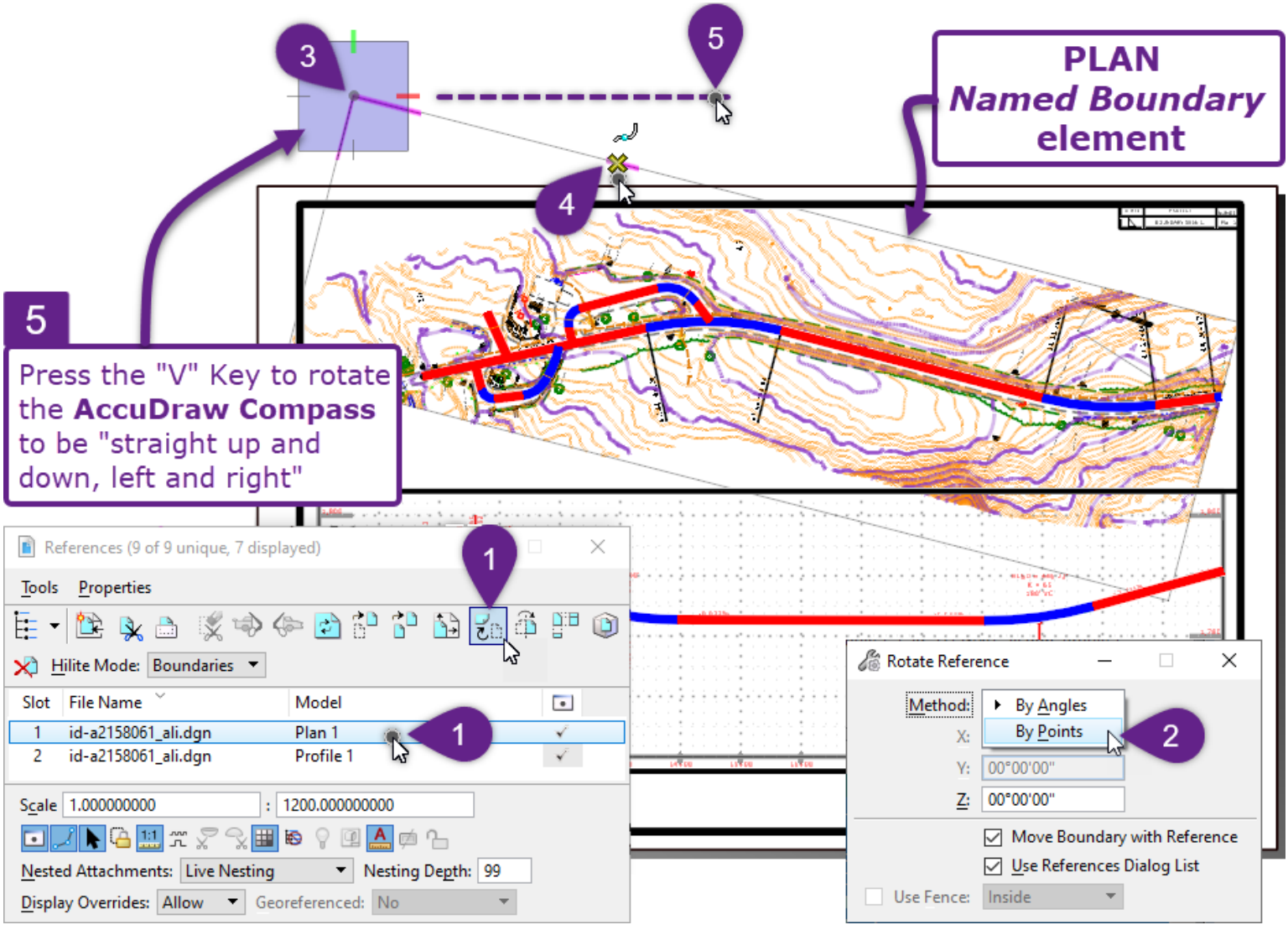
14E – TROUBLESHOOT AND MANIPULATE DRAWING AND SHEET MODELS

This step provides solutions to common problems and ancillary workflows associated with creation of *Drawing Models* and *Sheet Models*.

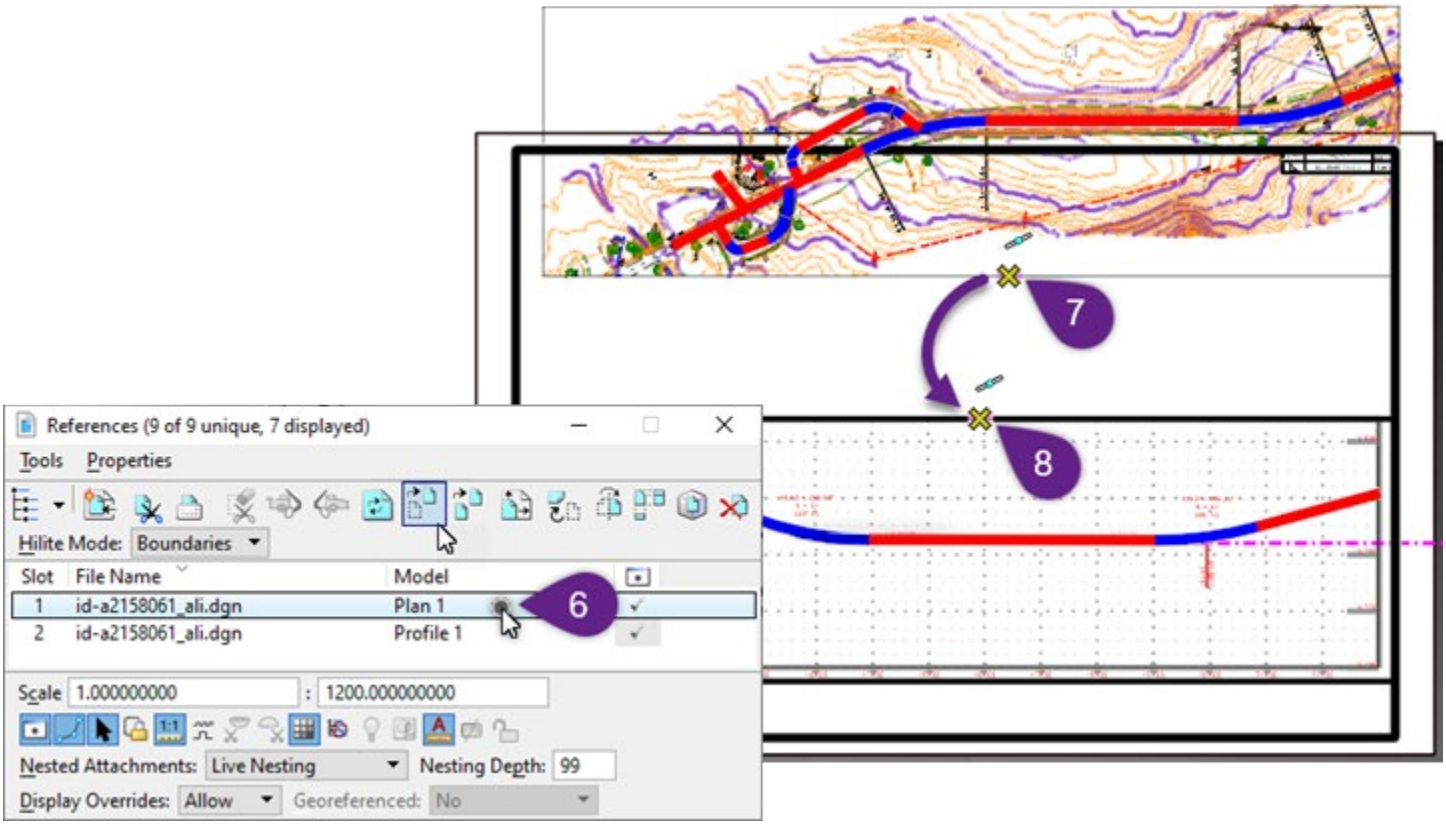
14E.1 Rotate and Move Plan Views

If PLAN *Named Boundary* elements were rotated in *14B.4.d STEP 4: Adjust Orientation of Plan Named Boundary Elements*, then the corresponding Plan view *Reference* will have to be rotated in kind (unfortunately, this is a known defect of the software).

This workflow is performed in the *Sheet Model*. Ensure the *References Manager* is opened before proceeding with this workflow. Also, ensure AccuDraw is toggled ON.



Rotate the PLAN Reference	
1	In the *Reference Manager*, left-click and highlight the PLAN *Drawing Model* reference. Select the *Rotate Reference* icon 
2	In the *Dialogue Box,* change the *Method* to **By Points**. The **By Points** method is equivalent to a 3-Point Rotation.
3	Prompt: Rotate Reference By Points > Enter pivot Point for reference rotation – The Pivot Point is the corner of the Named Boundary element. With the Key Point Snap toggled ON, select this location.
4	*Prompt: Reference By Points > Enter point to define start of rotation* – The second point is any location along the edge of the *Named Boundary* element. With the *Nearest Snap* toggled ON, select any location on this edge.
5	*Prompt: Reference By Points > Enter point to define amount of rotation* – The Third Point is determined with the aid of **AccuDraw Compass.** Ensure that AccuDraw is toggled ON. Press the "V" Keyboard Key to rotate the AccuDraw Compass to align with the *View* orientation. With the AccuDraw Compass axis' shown "straight up and down, left and right", select a location on the Horizontal Axis to complete the rotation.
Move the PLAN Reference	
6	In the *Reference Manager*, left-click and highlight the PLAN *Drawing Model* reference. Select the *Move Reference* icon 
7	*Prompt: Move Reference > Enter point to move from* – Select the Midpoint of the bottom edge of the PLAN *Named Boundary* element. With the *Midpoint Snap* toggled ON, select this location
8	*Prompt: Move Reference > Enter Point to move to* - Select the Midpoint of the Plan/Profile divider line.

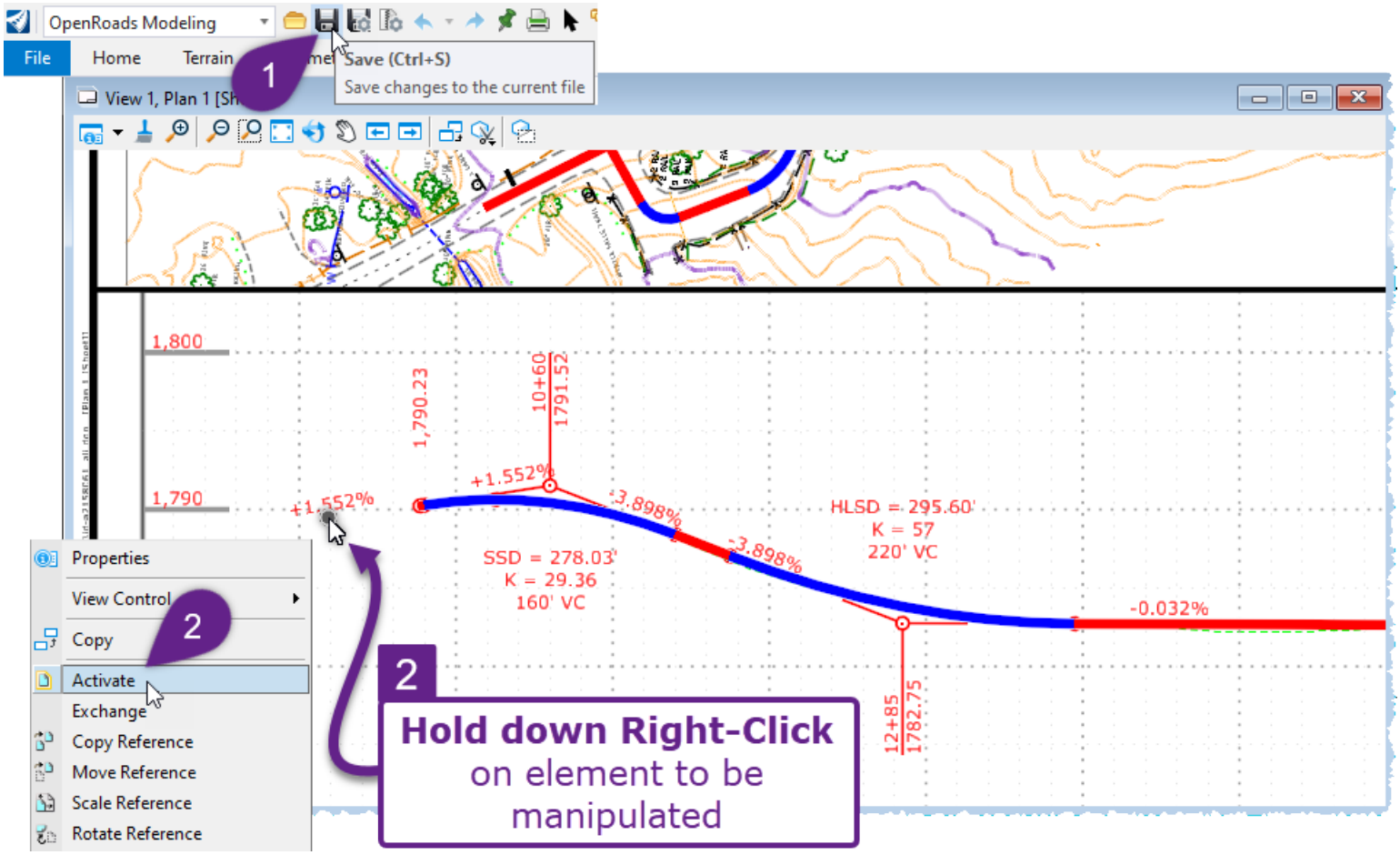


14E.2 Adjust Plan & Profile Annotations Labels TIPS

When working with Plan & Profile Sheets, the User will often have to manually re-adjust overlapping Plan and Profile Annotation Labels. Instead of rearranging Annotation Labels from the *Design* and *Drawing Models*, the User can readjust these Labels directly from *Sheet Model* by using the *Activate* tool. The *Activate* tool allows the User to edit elements that are contained in a *Reference Model*.

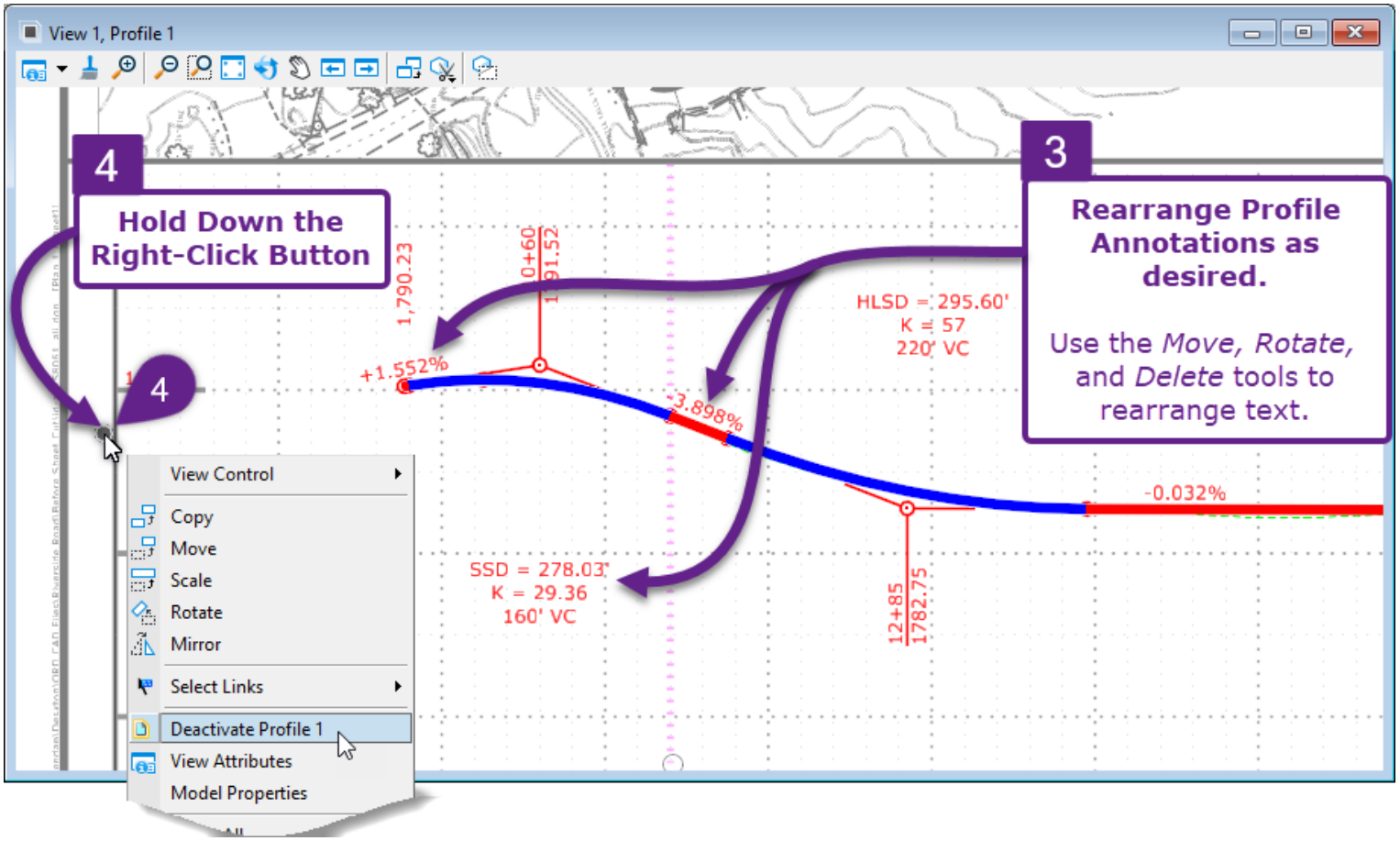
14E.2.a Adjust PROFILE Annotation Labels from the Sheet Model

In this workflow, a few Profile Annotation Labels will be moved and deleted for easier readability. This workflow is performed from the *Sheet Model*.



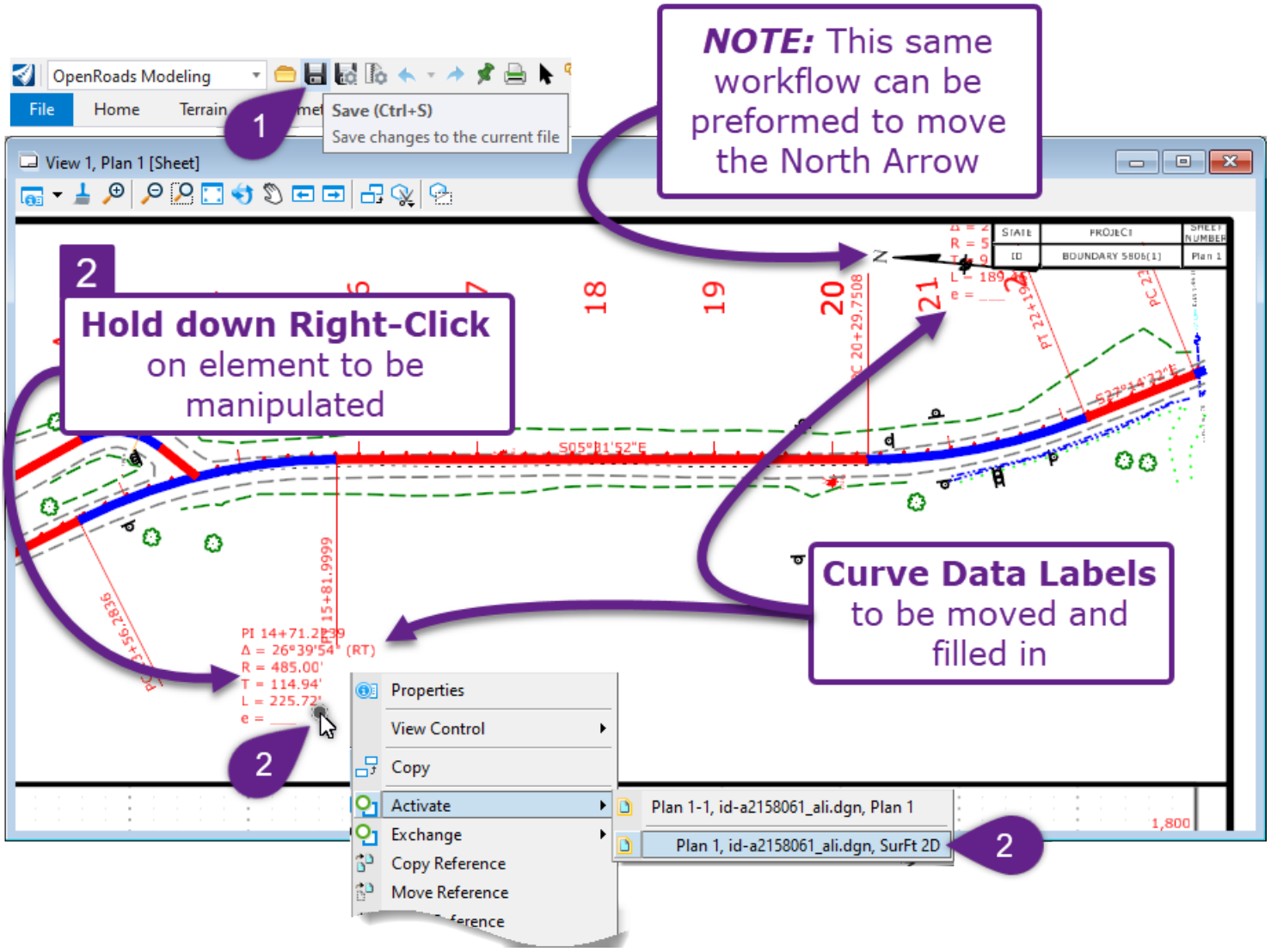
1	Before this workflow is performed, SAVE the ORD File. If the ORD File is not SAVED, it is possible that the one or two commands used before this workflow will be automatically un-done.
2	From within the *Sheet Model*, locate the PROFILE Annotation Label that will be manipulated. On the PROFILE Label to be manipulated, Right-click and continue to hold down the Right-Click button until the Right-Click Options appear. From the Right-Click options, select *Activate*.
3	After the *Activate* option is selected, the PROFILE *Drawing Model* reference will be *Activated* – meaning the elements contained in this reference are no longer "Read-Only" and can be manipulated. Rearrange and delete Profile Annotation Labels as desired.

4	After all Profile Annotations have be rearranged as desired, hold down the Right-Click button. From the Right Click options, select *Deactivate*.

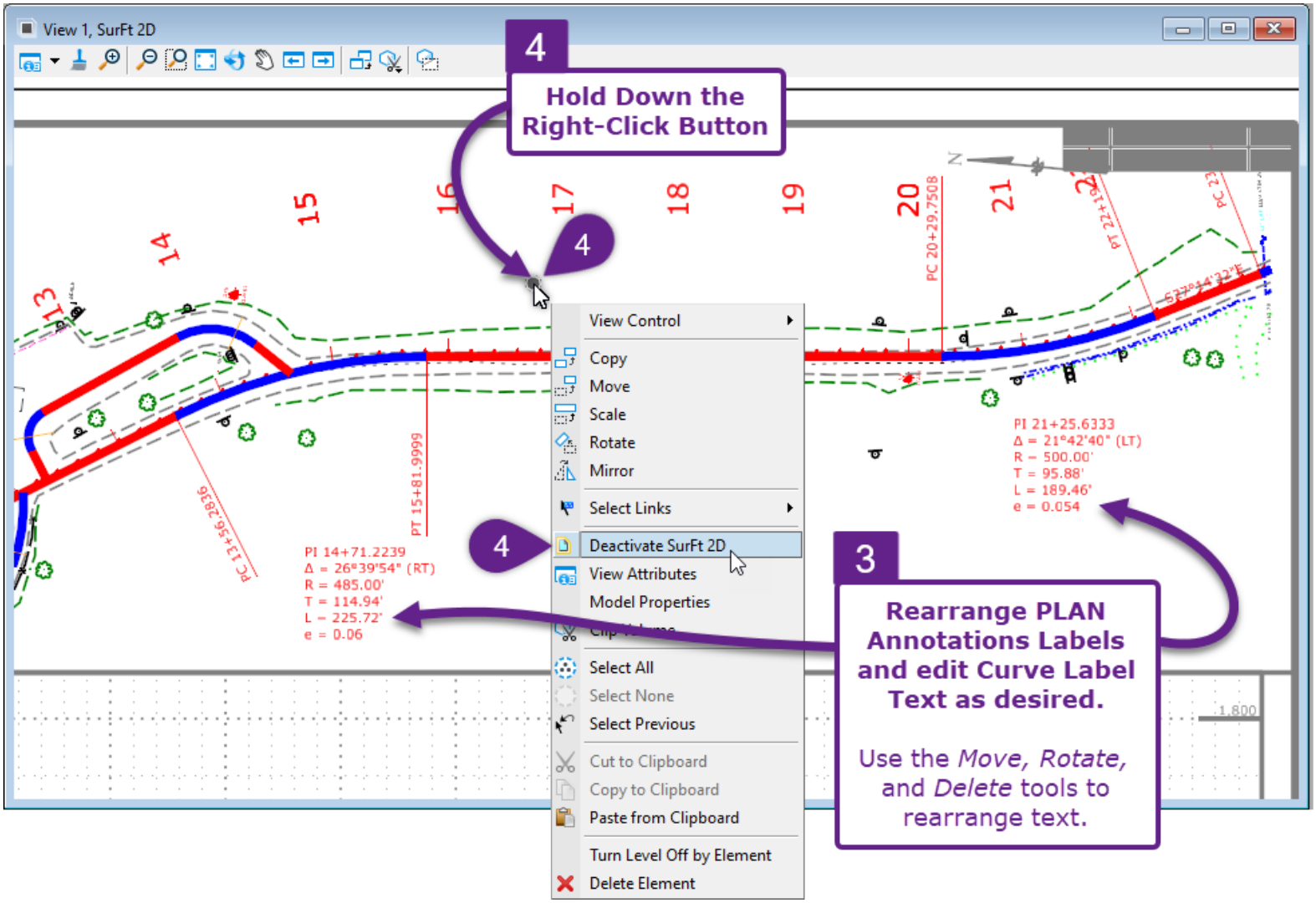


14E.2.b Adjust PLAN Annotation Labels from the Sheet Model

In this workflow, a few PLAN Annotation Labels will be moved and deleted for easier readability. Also from this workflow, the User may fill in the superelevation value in Curve Data label (e = _____). This workflow is performed from the *Sheet Model*.



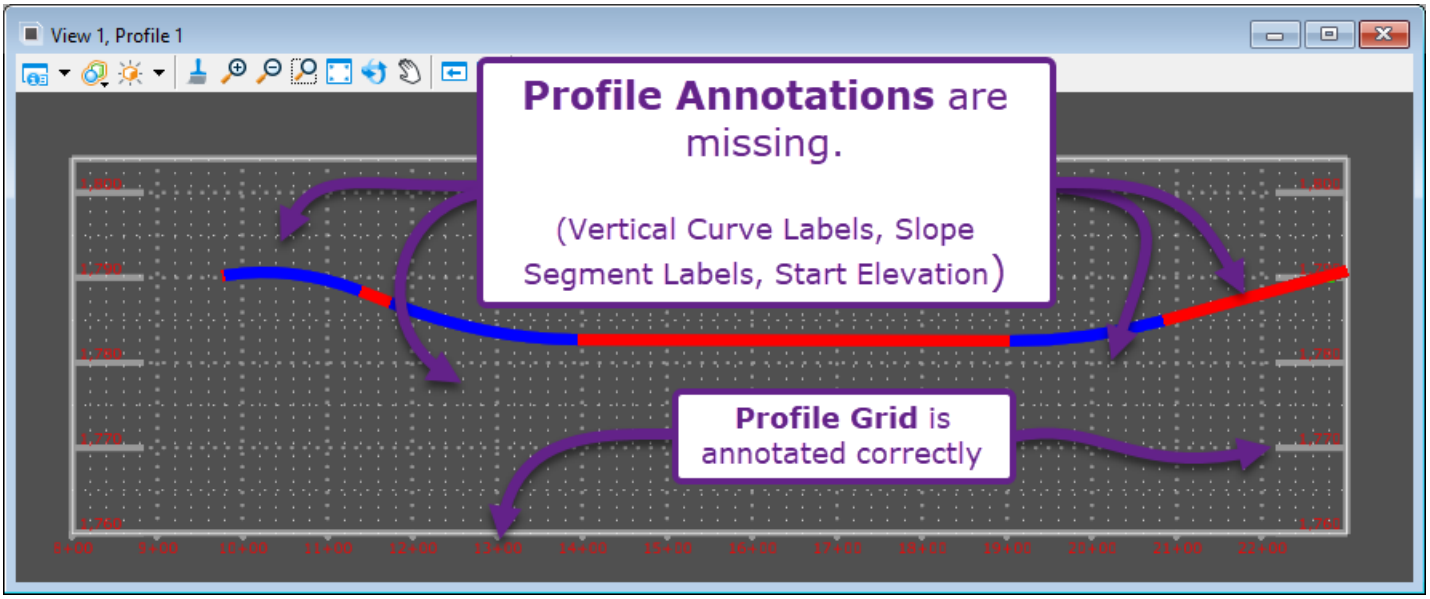
1	Before this workflow is performed, SAVE the ORD File. If the ORD File is not SAVED, it is possible that the one or two commands used before this workflow will be automatically un-done.
2	From within the *Sheet Model*, locate a PLAN Annotation Label that will be manipulated. On the PLAN Label to be manipulated, Right-click and continue to hold down the Right-Click button until the Right-Click Options appear. From the Right-Click options, expand the *Activate* options. Select the last *Model* in the list. ***NOTE:*** The list that appears corresponds to the *Nested References* used to reference the PLAN *Drawing Model* into the *Sheet Model*. In this case, the Curve Data Label Annotations are in the 2D Design Model – which is *Nested* one level back from the PLAN *Drawing Model*.



3	After the *Activate* option is selected, the *2D Design Model* reference will be *Activated* – meaning the elements contained in this reference are no longer "Read-Only" and can be manipulated. Rearrange and delete Plan Annotation Labels as desired.
4	After all Plan Annotations have been rearranged as desired, hold down the Right-Click button. From the Right Click options, select *Deactivate*.

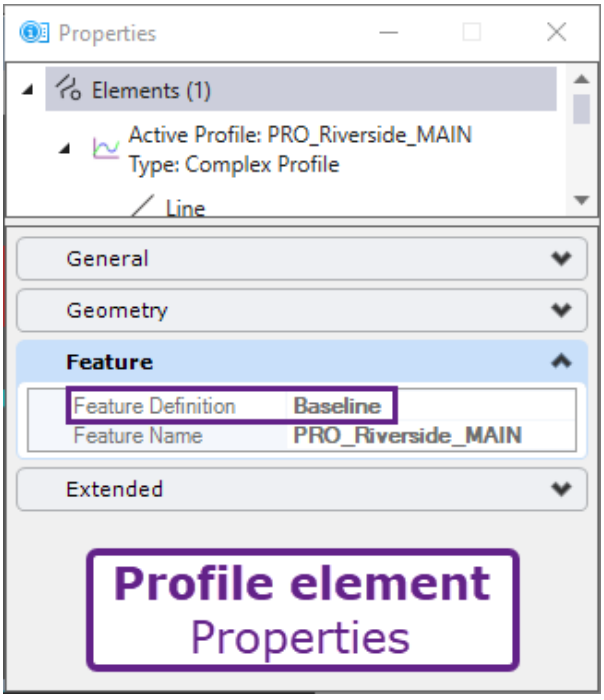
14E.3 Profile Vertical Curve Labels and Slope Labels do NOT Show

This section discusses common troubleshooting scenarios for Profile Annotation Labels. ***NOTE:*** See the *14E.4 Recreate and Manipulate the Profile Grid* for troubleshooting components of the Profile Grid.



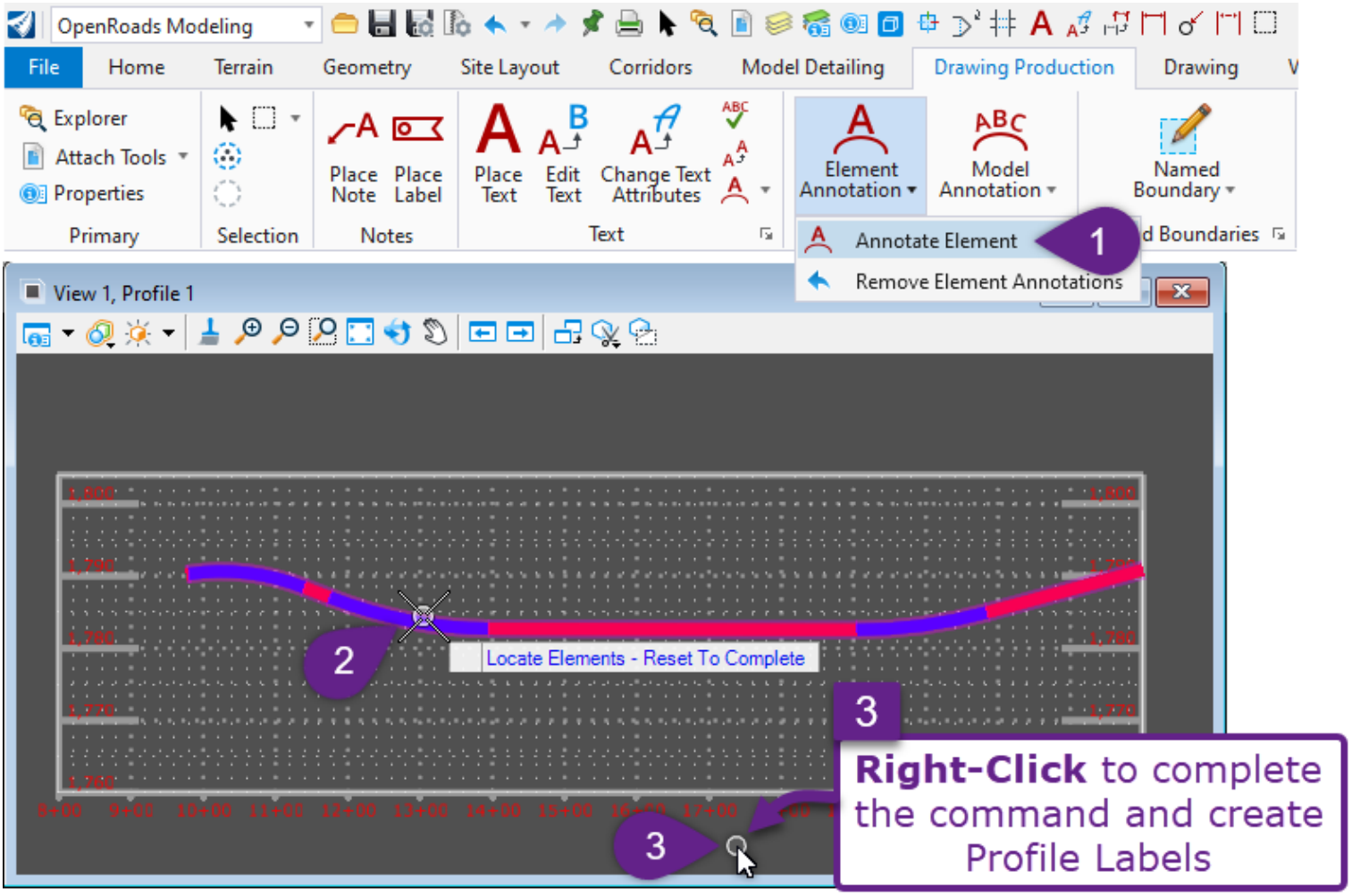
Issue 1: The Profile is NOT assigned to the correct Feature Definition: If the Profile element is assigned to an incorrect OR contains no Featured Definition, then the Profile will NOT be Annotated.

The Feature Definitions that are configured to show Profile Annotations include: "Baseline" and "Baseline – Alt 1-3". To check if the Profile is assigned to the correct Feature Definition, select the Profile Element and examine its Properties.



If the Profile element Feature Definition needs to be set or changed, the User must do so from the Alignment ORD File. Enter the *Profile Model* of the Alignment, to directly edit the Profile. To change or set a Feature Definition, see *7B.3.b Change Feature Definition with the Set Feature Definition tool*.

Issue 2: The Feature Definition is correct, but the Profile did NOT Annotate: After the Feature Definition of the Profile element has been confirmed, the User should attempt to Annotate the Profile with the *Annotate Element* tool. This workflow is performed from the PROFILE *Drawing Model*.



14E.4 Recreate and Manipulate the Profile Grid

The workflow shown in this section is a solution to address multiple issues:

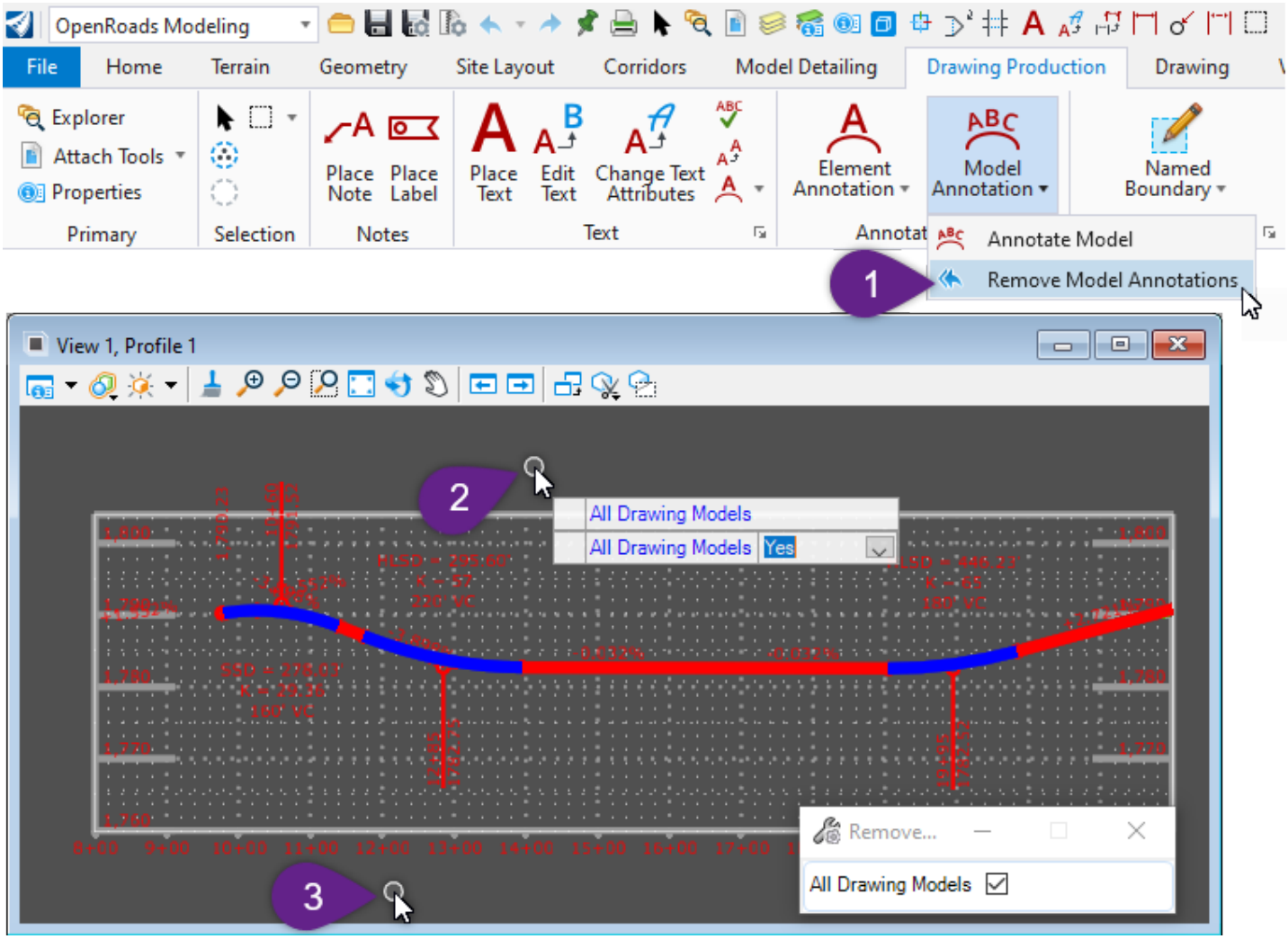
- The Profile Grid is missing after the creation of PROFILE *Drawing Models*
- The wrong Profile Grid *Annotation Group* was used in the creation of PROFILE *Drawing Models*. The User may wish to change the *Annotation Group* to better match the drawing scale.
- The Profile Grid *Annotation Group* was edited and needs to be reapplied to the PROFILE *Drawing Models*.
- Profile Annotations (vertical curve data, slope segment labels) need to be reapplied to all PROFILE *Drawing Models*.

This workflow uses the *Remove Model Annotation* tool to delete previously-created Grid and Profile from all PROFILE *Drawing Models*. Next, the *Annotate Model* is used to re-apply Grid and Profile Annotations to all PROFILE *Drawing Models*.

The following workflows are performed from the PROFILE *Drawing Model*.

14E.4.a Remove Model Annotations tool

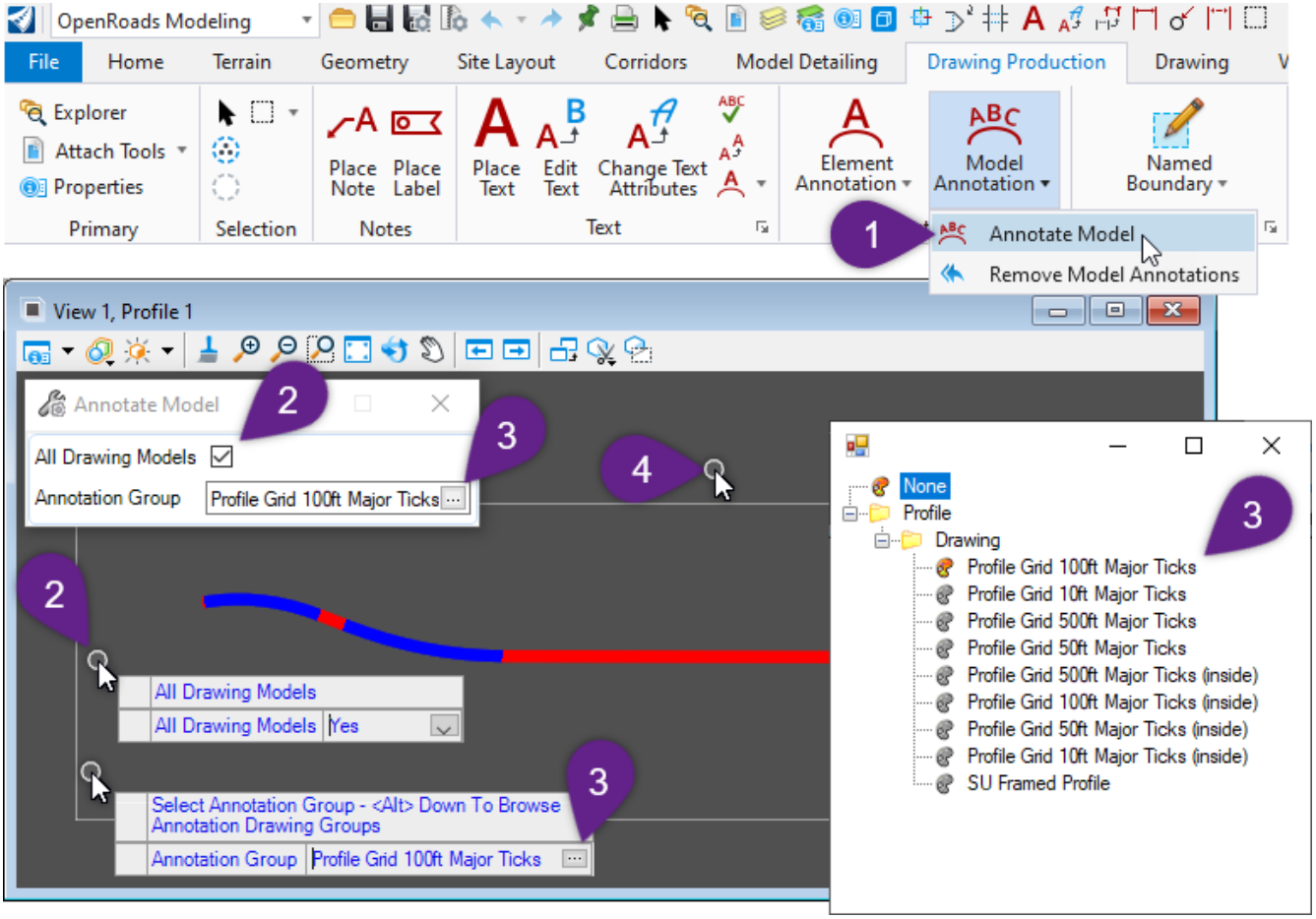
The *Remove Model Annotations* tool will remove both Profile Grid and Profile Annotations from a single PROFILE *Drawing Model* or for all PROFILE *Drawing Models* contained in an ORD File.



1	In the Ribbon, Left-Click on the *Remove Model Annotations* tool. Ribbon Location: OpenRoads Modeling workflow → Drawing Production tab → Annotations.
2	*Prompt: All Drawing Models* – If YES is selected, then Grid and Profile Annotations will be removed from all PROFILE *Drawing Models* contained in the ORD File. If NO, is selected, then Grid and Profile Annotations are only removed from the *active* PROFILE *Drawing Model*.
3	After YES or NO has been selected, Left-Click anywhere in the view to complete the command.

14E.4.b Annotate Model tool

The *Annotate Model* tool will create both Profile Grid and Profile Annotations for a single PROFILE *Drawing Models* or for all PROFILE *Drawing Models* contained in an ORD File.



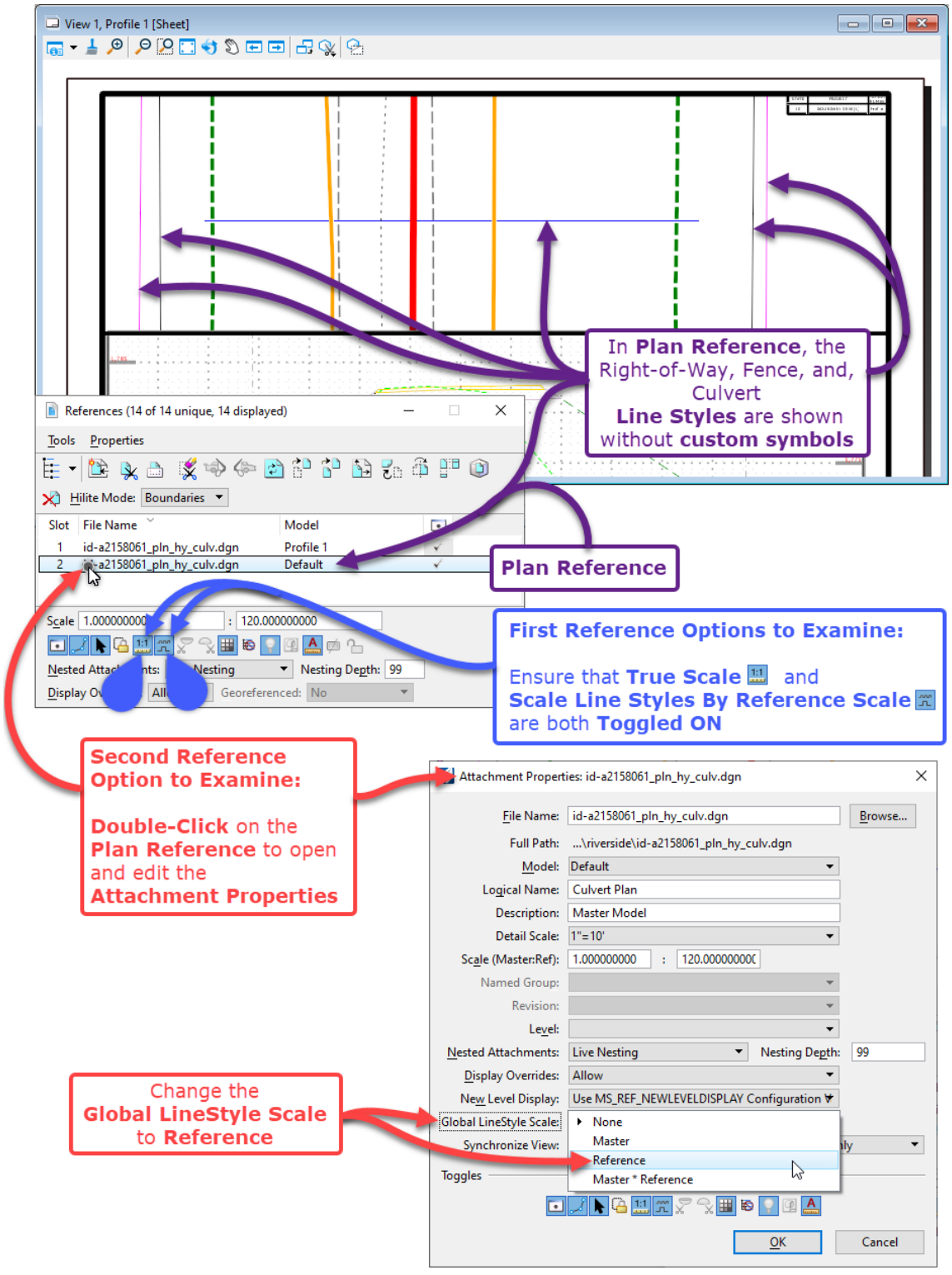
1	In the Ribbon, Left-Click on the *Annotate Model* tool. Ribbon Location: **OpenRoads Modeling** workflow → **Drawing Production** tab → **Annotations.**
2	*Prompt: All Drawing Models* – If YES is selected, then Grid and Profile Annotations will be created for all PROFILE *Drawing Models* contained in the ORD File. If NO, is selected, then Grid and Profile Annotations are created only for the *active* PROFILE *Drawing Model*.
3	*Prompt: Select Annotation Group - <Alt> Down to Browse Annotation Drawing Groups*. In this step, the User will select the appropriate Profile Grid *Annotation Group*. The Profile Grid *Annotation Grid* controls the spacing of major and minor labels. ***TIP:*** For roadway design, use "Profile Grid 100ft Major Ticks", "Profile Grid 10ft Major Ticks", or "Profile Grid 50ft Major Ticks" Simultaneously, press the ALT and DOWN Key to access the Annotation Group library.
4	If the options displayed in the Dialogue Box are acceptable, then Left-Click anywhere in the view to complete the command and create the Profile and Grid Annotations.

14E.5 Line Styles Displayed Incorrectly in the Sheet Model

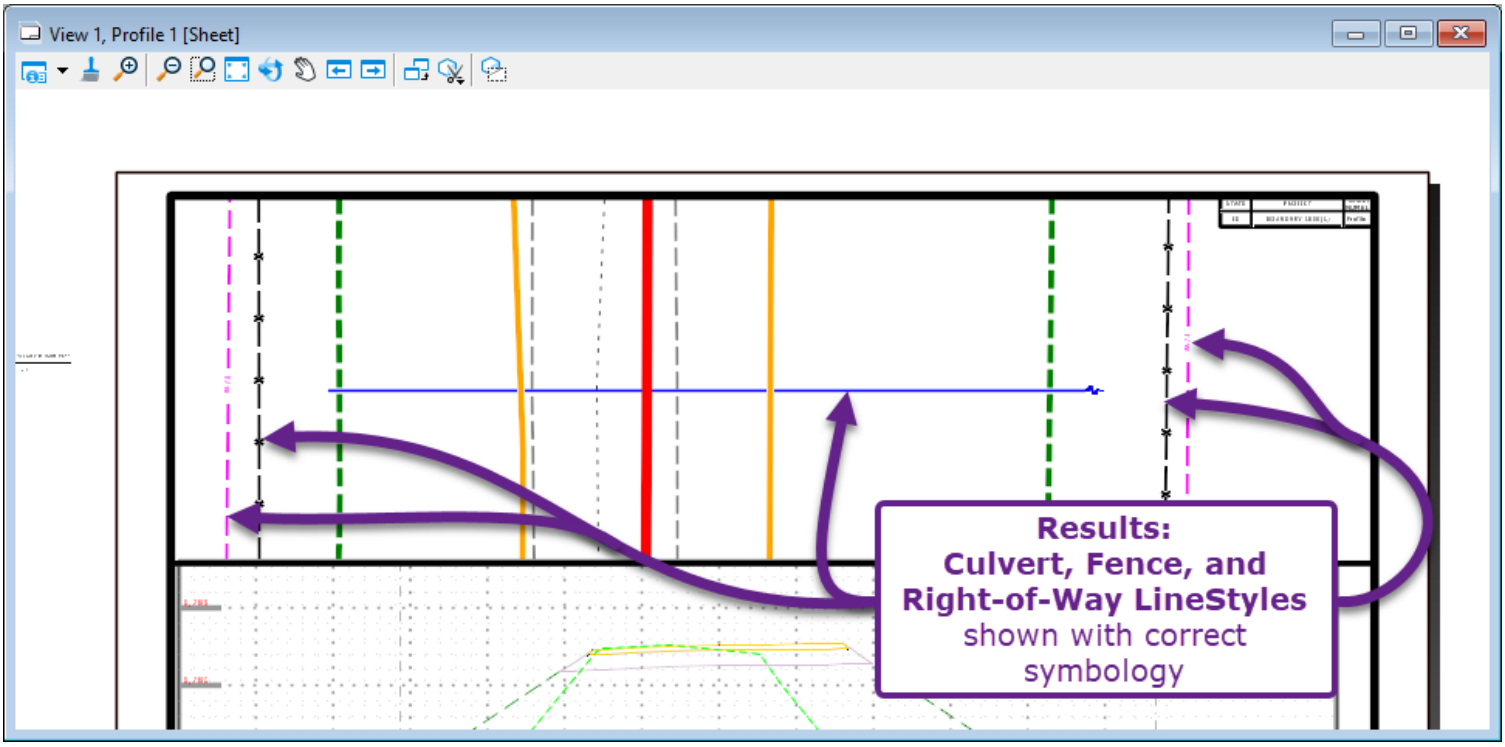
At seemingly random times, the Line Styles for graphical linework may be displayed incorrectly. This issue is common for custom or compound Line Styles, such as those used for fences, right-of-way, and culverts.

Generally, there are three Reference Options that the User should examine and manipulate when Line Styles are displayed incorrect: Ensure that **True Scale** is toggled ON .

- Ensure that **Scale Line Styles By Reference Scale** is toggled on .
- In the **Attachment Properties**, change the **Global LineStyle Scale** to **Reference**. (This is set to **None** by default).



Results: After all Reference Options have been altered, the custom and compound Line Styles should display correctly:

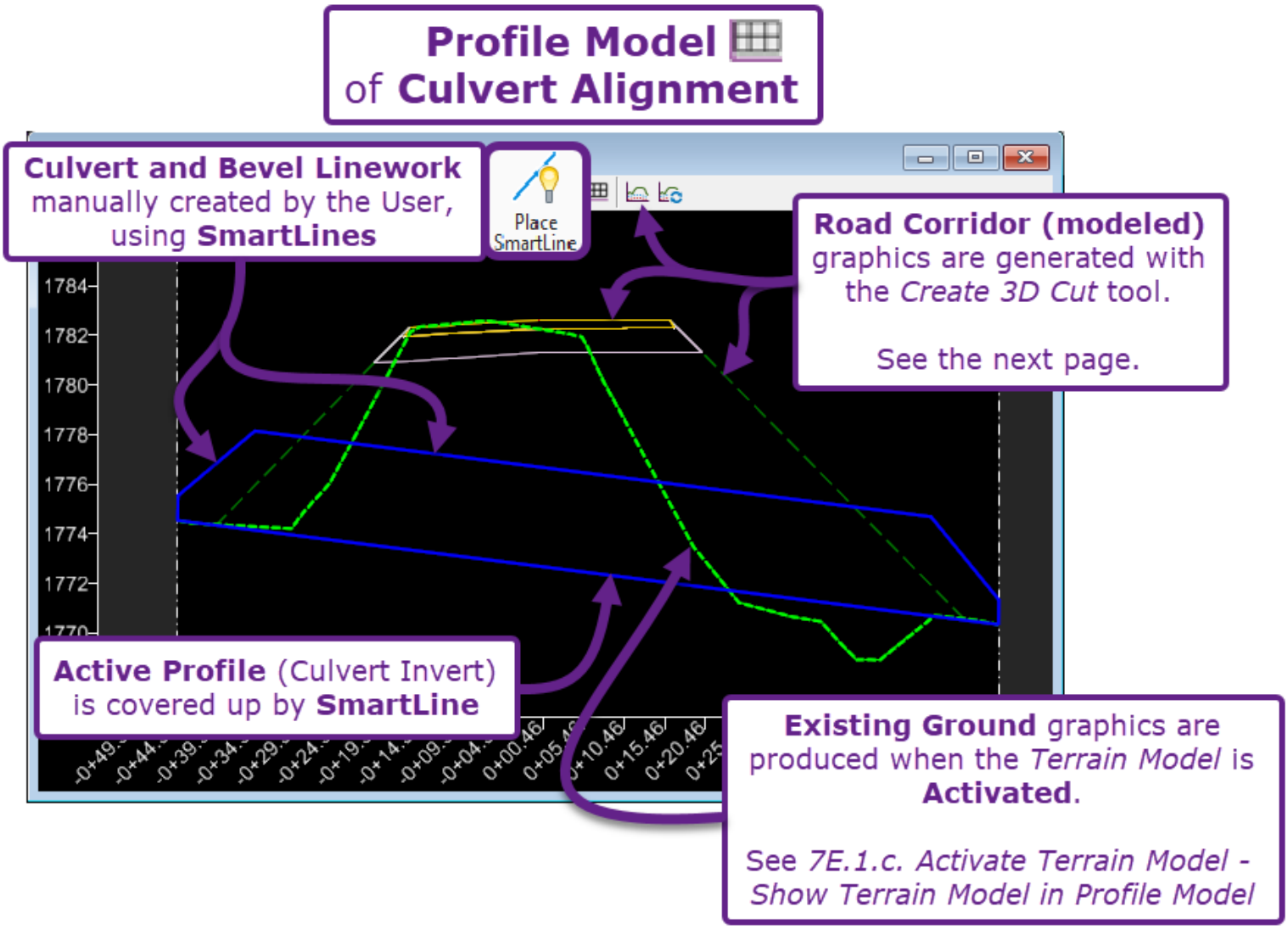


14E.6 Best Practice for Linework Graphics in a Profile

Particularly when working with Culvert Profiles, the User will need to manually draft features that are difficult or infeasible to model with Corridors, Linear Templates, or Surface Templates. For example, a Culvert with an end bevel would be manually drafted in the Profile because it is NOT practical or necessary to model a bevel in 3D.

BEST PRACTICE: Use MicroStation tools, such as SmartLines, to manually draw Profile features that are NOT to be modeled. Manually draw Profile features in the *Profile Model* of the Alignment.

BEST PRACTICE: Avoid drawing Profile Features in the PROFILE *Drawing Model* because the PROFILE *Drawing Model* may be vertically exaggerated. A *Profile Model* may visually appear vertically exaggerated, but dimensions and drafting behave in an unexaggerated fashion – despite the exaggerated appearance. See *7F.1.b Changing the Vertical Exaggeration of a Profile Model*.



14E.7 Best Practice for the Display of Corridors and Surface Templates Models in a Profile

A common issue is displaying intersecting Corridors, Linear Templates, and Surface Template models within a Profile. For example, the proposed Mainline of Road Corridor would need to be projected and displayed in a Culvert Profile.

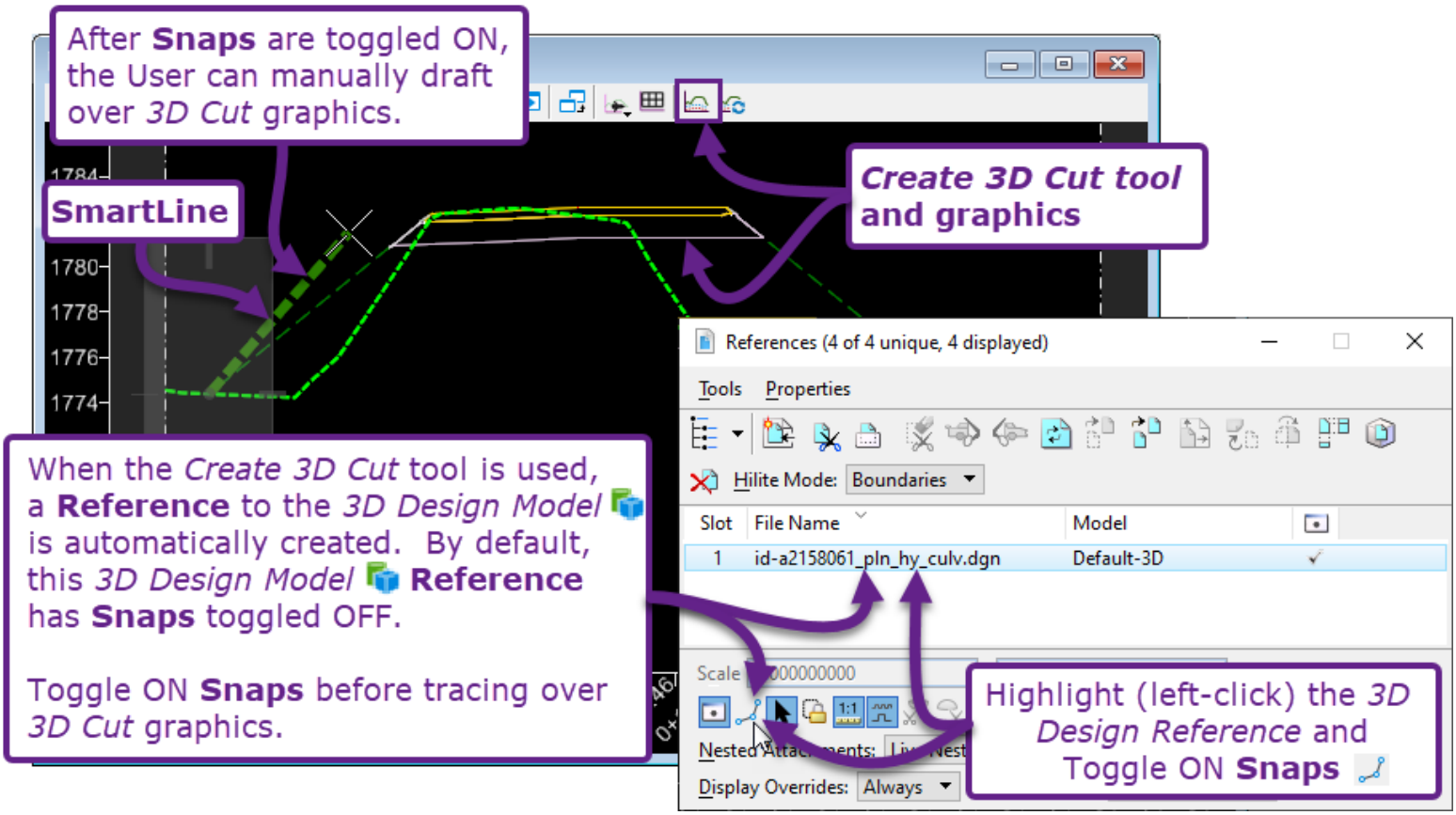
The *Create 3D Cut* tool is used to display modeling features (such as Corridors, Linear Templates, and Surface Templates) within the *Profile Model* of a Culvert Alignment. The *Create 3D Cut* tool is discussed and demonstrated in *7F.1.e Show Corridor and 3D Elements in a Profile Model with Create 3D Cut*.

IMPORTANT: The *Create 3D Cut* tool should be used in the *Profile Model* of a Culvert Alignment. The Culvert Alignment should be in a *Design* ORD File (i.e., _cor.dgn) and NOT a *Plan Sheet* ORD File (i.e., _pln_hy.dgn).

Unfortunately, the User CANNOT manipulate the symbology of the graphics that are generated by the *Create 3D Cut* tool. For example, the User does NOT have control of Line Weights of a Corridor that are projected into a *Profile Model* with the *Create 3D Cut* tool.

BEST PRACTICE: As a workaround for correct display of modeling graphics, use SmartLines and other MicroStation drafting tools to trace over graphics generated *Create 3D Cut* tool.

TIP: By default, the graphics brought into the *Profile Model* with the *Create 3D Cut* tool are "non-snappable" – which is a property of the *3D Design Model* **reference**. Before tracing over graphics, enable "Snaps" for the **reference** in the *Profile Model*

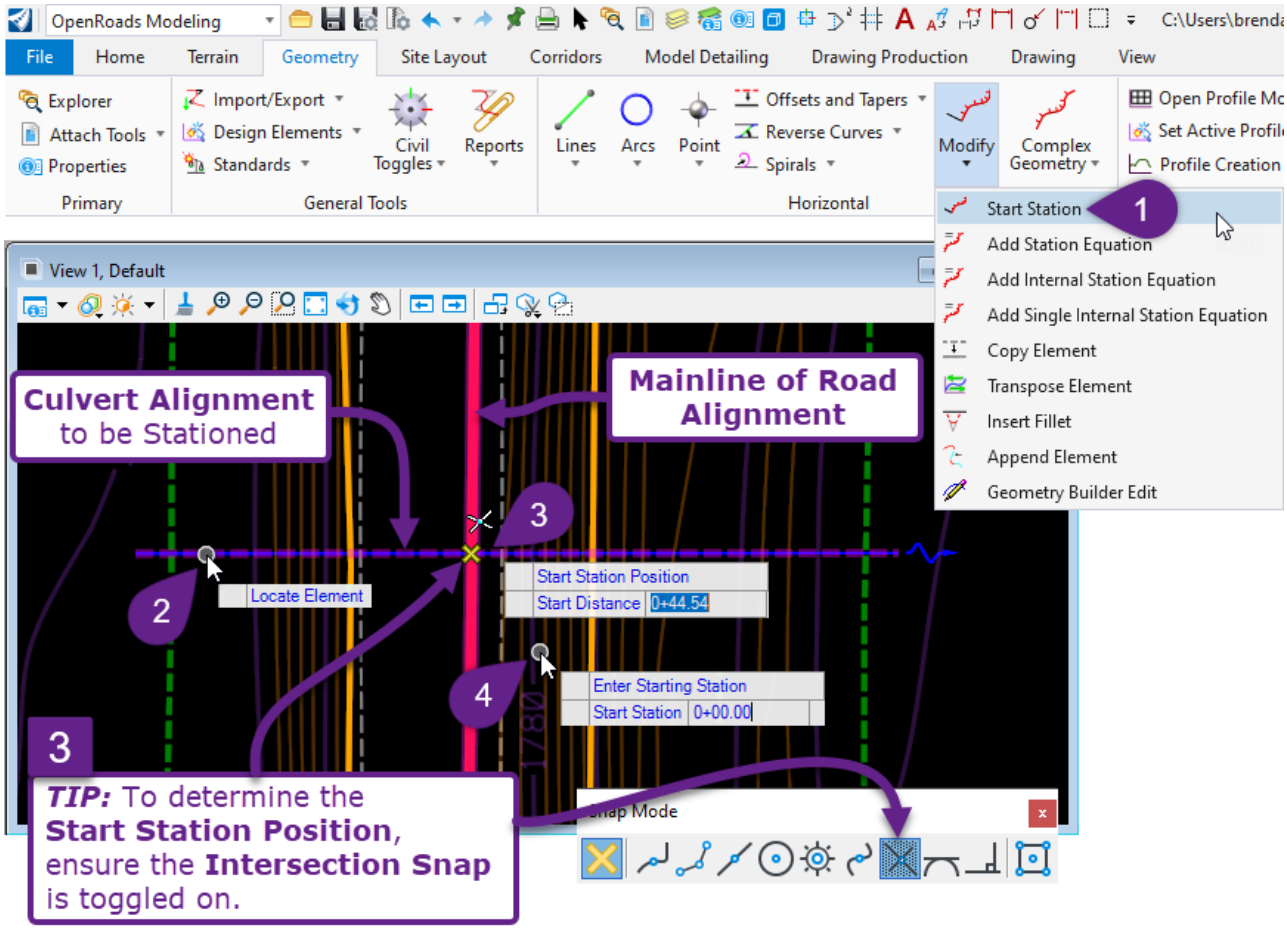


14E.8 Adjust Culvert Station To Place 0+00 at the Centerline of Road

Before creating the PROFILE *Named Boundary* element for a Culvert, the User should ensure that Culvert Alignment has the correct internal stationing. When a Culvert crosses the Mainline of Road, it is conventional to set the internal stationing of the culvert to 0+00 at the intersection of the Mainline Alignment and Culvert Alignment. For more information on this procedure, see *7E.4.a Start Station*.

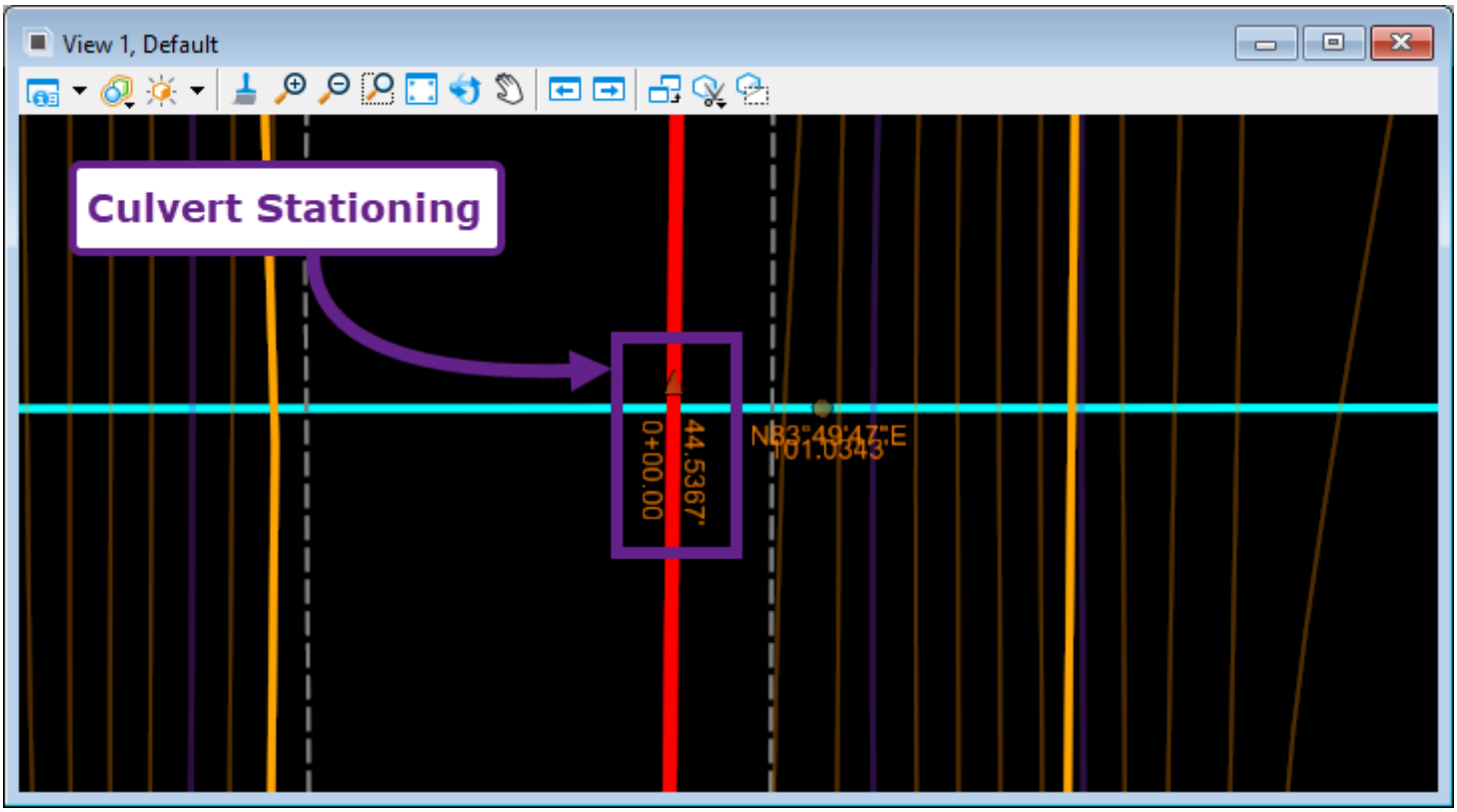
WARNING: This procedure should be performed before the creation of PROFILE *Named Boundary*. The User will have to re-create PROFILE *Named Boundary* elements, if the culvert is NOT correctly stationed.

NOTE: This procedure is performed in the ORD Design File that contains the Culvert Alignment.



1	From the Ribbon, select the *Start Station* tool: [***OpenRoads Modeling*** → ***Geometry*** → ***Horizontal***]
2	*Prompt: Locate Element* – In this case, the element to be stationed is the Culvert Alignment. Left-Click on the Culvert Alignment.
3	*Prompt: Start Station Position* – In this case, the *Start Station Position* is the intersection of the Culvert Alignment and Mainline of Road Alignment. Station values before the Start Station Position will be negative.
4	*Prompt: Enter Starting Station* – In this case, the desire is to have the internal station of the Culvert Alignment ot be 0+00 at the intersection with the Mainline of Road Alignment (*Start Station Position*). Key-in 0+00 and press the Enter key to lock. Left-Click in the *View* to complete the command.

Results: After Step 4, to confirm the Culvert Alignment was stationed correctly, **Select** the Alignment. The Stationing should be shown in Orange Text.

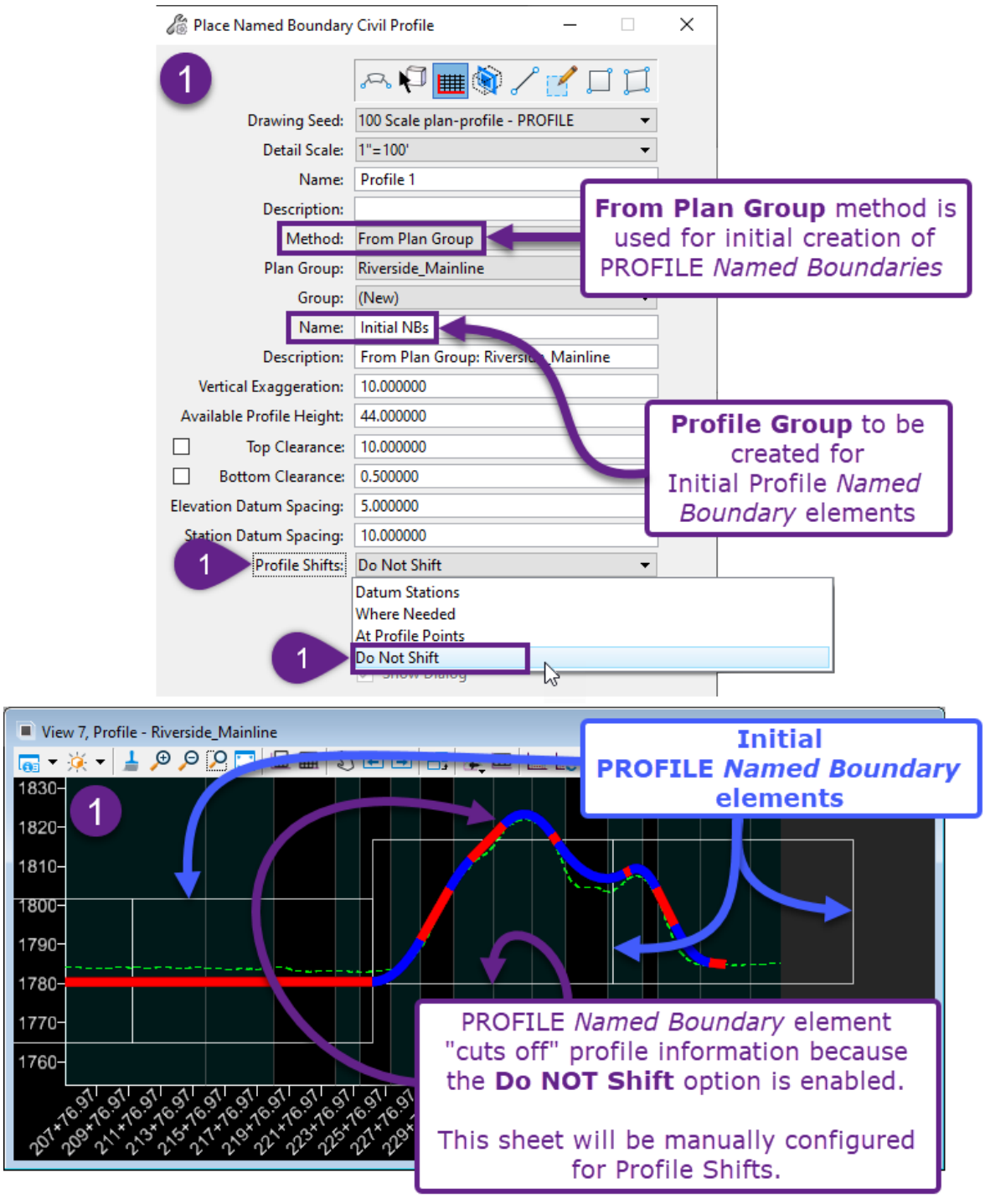


14E.9 Profile Shift Strategy: Manual Placement

This workflow demonstrates a strategy for the manual configuration of Profile Shifts. By default, Profile Shifts are automated – which gives the User very little control over the horizontal (station) location where the shift will occur. See *14A.3.d.i Profile Shift Strategies*.

In this workflow, the ***Do Not Shift*** option will be utilized when creating the initial PROFILE *Named Boundary* elements. When this option is used, the PROFILE *Named Boundary* elements will NOT be shifted – even if profile information is cut-off. For sheets that require a shift, the User will manually create two Profile *Named Boundary* elements.

Prior to this workflow, create PLAN *Named Boundary* elements for the Alignment. See *14B.4 STEPS 1-4: Placing PLAN Named Boundaries*.



Create the initial PROFILE *Named Boundary* elements

Method: **From Plan Group**
Profile Shifts: **Do Not Shift**
Group: **"Initial NBs"**

1

Create the initial PROFILE *Named Boundary* elements by following the procedure shown in: *14B.5 STEPS 5-7: Create Profile Named Boundaries*.

While doing so, ensure that the **Profile Shifts** option is set to **Do Not Shift**.

NOTE: For the creation of the initial PROFILE *Named Boundary* elements, the **Method** should be set to **From Plan Group.** When creating custom PROFILE *Named Boundary* elements to accommodate the Profile Shifts, the **Station Limits** method will be used.

NOTE: The initial PROFILE *Named Boundary* elements must be placed on a different **Group** then the subsequent PROFILE *Named Boundary* elements to be created. In this step, a **Group** is created for the initial PROFILE *Named Boundary* elements called "Initial NBs".

WARNING: When creating PROFILE *Named Boundary* elements, ensure that the **Create Drawing** box is UNCHECKED.

Create the PROFILE Named Boundary elements for the Profile Shift

Method: **Station Limits**
Profile Shifts: **(inconsequential)**
Group: **"Shifted NBs"**

2

In this case, two additional PROFILE *Named Boundaries* elements are needed to replace the initial *Boundary* shown below. The **Station Method** is used to create the shifted PROFILE *Named Boundaries* – which is discussed in detail in *14C.4 Plan and Profile Sheets for Culverts, MSE Walls, and Bridges*.

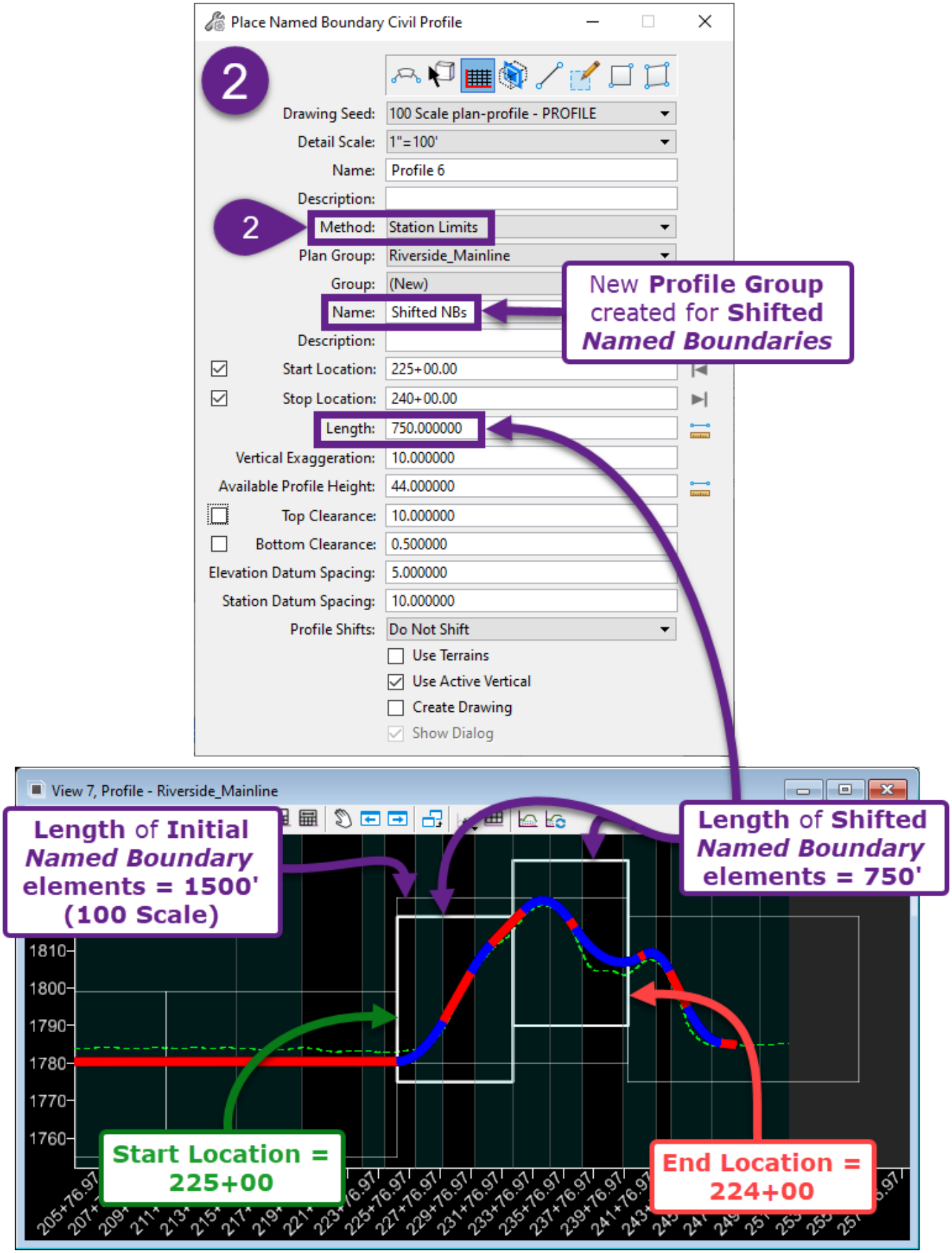
NOTE: Create and place these shifted *PROFILE Named Boundary* elements on a different **Group** than created for initial *Boundaries.* In this case, a **Group** called "**Shifted NBs"** is created.

TIP: The total length of both shifted *PROFILE Named Boundary* elements must equal to the length of the initial Profile *Named Boundary* that is being replaced. In this case, 100 Scale Profile is used, so the total length of the Profile *Named Boundary* is 1500'. See the table on *14B - Creating Road Plan & Profile Sheets – Workflow* for Profile lengths at standard scales.

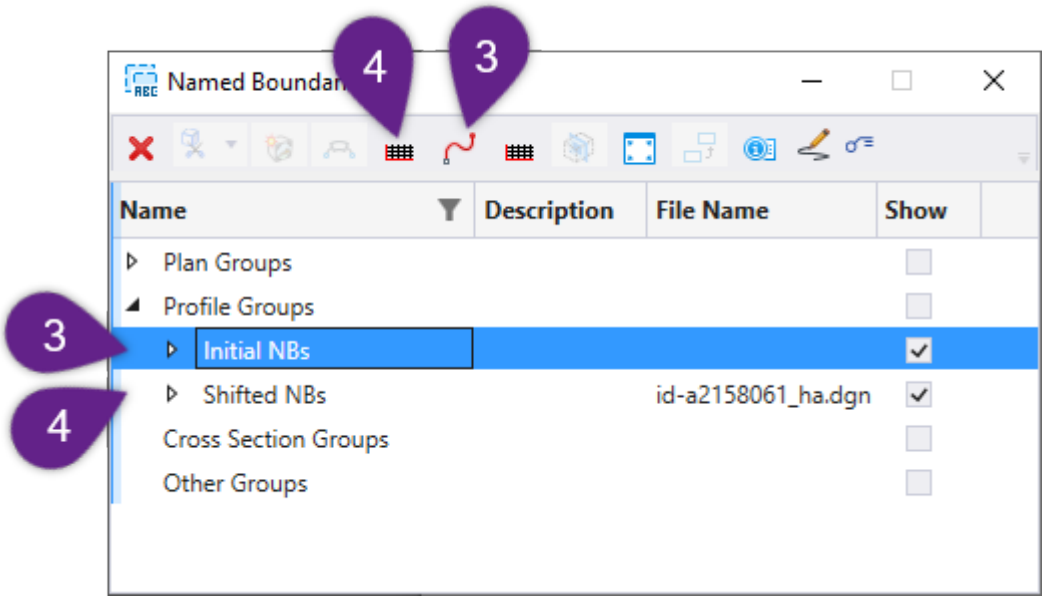
TIP: In this demonstration, two shifted *PROFILE Named Boundary* elements are created at the same length of 750'. If the desire is to use unequal lengths, then this step must be performed twice with varying lengths. Place the second shifted *PROFILE Named Boundary* element of unequal length on the same Group as the first, when running this procedure a second time.

TIP: Determine the Start and End Station of the initial PROFILE *Named Boundary* element before performing this step.

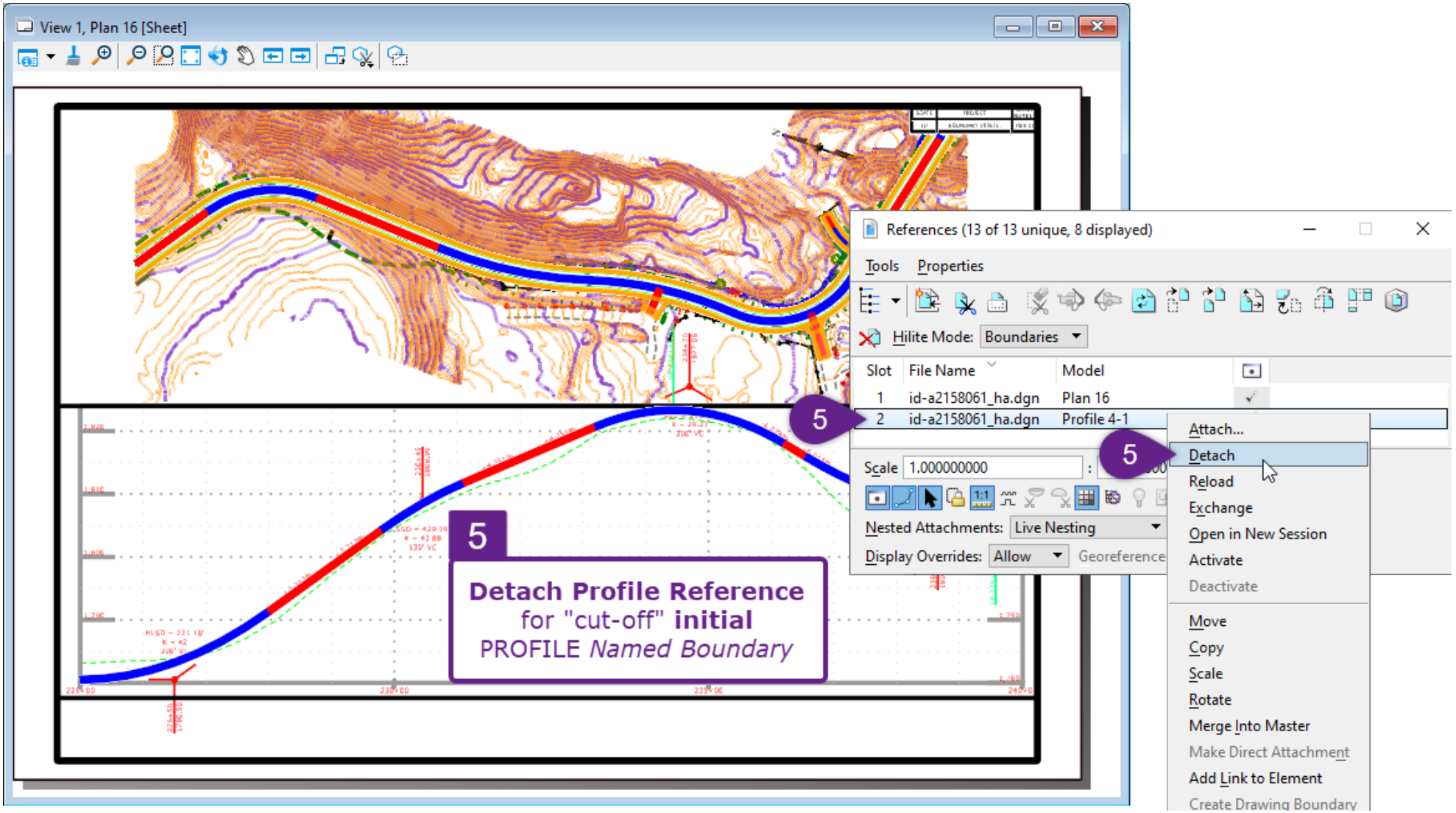
WARNING: When creating PROFILE *Named Boundary* elements, ensure that the **Create Drawing** box is UNCHECKED.


Place Named Boundary Civil Profile
2
Drawing Seed: 100 Scale plan-profile - PROFILE
Detail Scale: 1"=100'
Name: Profile 6
Description:
2
Method: Station Limits
Plan Group: Riverside_Mainline
Group: (New)
Name: Shifted NBs
Description:
Start Location: 225+00.00
Stop Location: 240+00.00
Length: 750.000000
Vertical Exaggeration: 10.000000
Available Profile Height: 44.000000
Top Clearance: 10.000000
Bottom Clearance: 0.500000
Elevation Datum Spacing: 5.000000
Station Datum Spacing: 10.000000
Profile Shifts: Do Not Shift
Use Terrains
Use Active Vertical
Create Drawing
Show Dialog
New Profile Group created for Shifted Named Boundaries
View 7, Profile - Riverside_Mainline
Length of Initial Named Boundary elements = 1500' (100 Scale)
Length of Shifted Named Boundary elements = 750'
1810
1800
1790
1780
1770
1760
Start Location = 225+00
End Location = 224+00

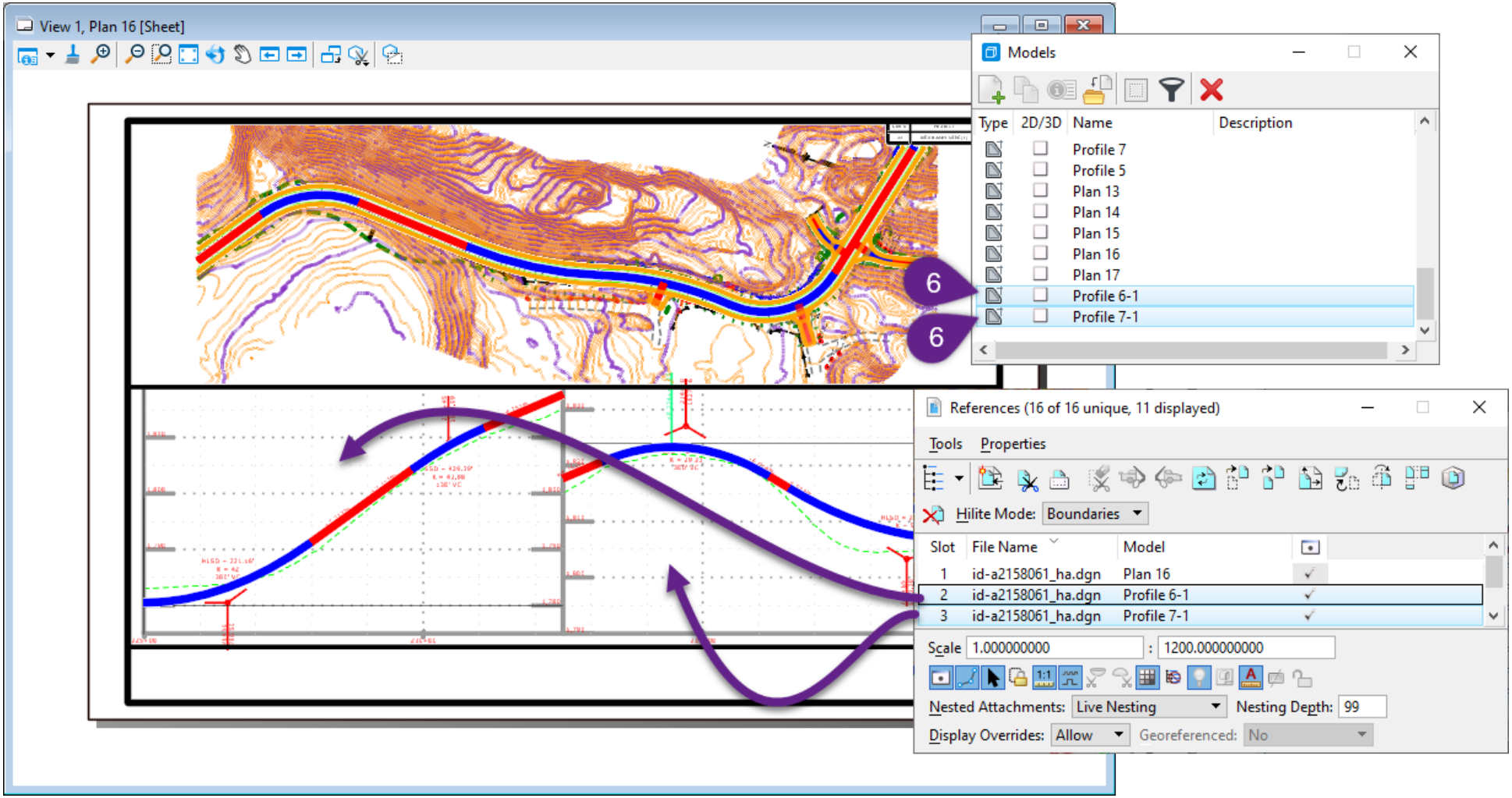
	Create Drawing Models and Sheet Models **for both Groups of PROFILE *Named Boundary* elements**
3	Create the Drawing Models and Sheet Model for the initial PROFILE Named Boundary element. See *14B.6 STEP 8: Create Drawing Models and Sheet Models* for more information. ***TIP:*** Use the **Create plan/profile drawing** tool to create the **initial** *Boundaries*.
4	Create the Drawing Models and Sheet Model for the shifted PROFILE Named Boundary element. See *14C.3.g Create Drawing Models and Sheet Models* for more information. ***TIP:*** Use the **Create plan/profile drawing** tool to create the **shifted** *Boundaries*. ***NOTE:*** The *Sheet Models* that are automatically created for the **shifted** *Boundaries* may be deleted



5 In the *Sheet Model* of the Plan and Profile sheets created from the initial PROFILE *Named Boundary* elements, detach the Reference for the "cut-off" Profile.



6	In the *Sheet Model*, reference in the *Drawing Models* that correspond with the shifted PROFILE *Named Boundary* elements. This procedure is described in *14C.3.h Combine Both Approaches in a Single Sheet Model*.



14E.10 Control Levels from the Sheet Model or 2D Design Model

The **Synchronize View** option determines if Levels shown in the *Sheet Model* are controlled from the *2D Design Model* or the *Sheet Model*. The **Synchronize View** option is found in the *Drawing Model*. The two recommended options are **Settings From Design Model** (default) and **Volume Option**.

Settings From Design Model: This is the default setting. When this setting is used, Levels are controlled in the *2D Design Model*. If a Level is turned OFF in the *2D Design Model*, then that Level is automatically turned OFF in all *Sheet Models* that use the *Settings From Design* option.

Volume Option: If changed to this option, Levels toggled ON/OFF in the *2D Design Model* does NOT affect the Level schema in the *Sheet Model*. This option is used to show a different set of Levels for a specific *Sheet Model* in the ORD File.