

Module 13 OpenRoads Designer Sheeting 2024



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About this Practice Workbook...

- The Module 13 Sheeting.Zip file will be provided for download.
- Exact the zip file to the root C:\
- All files are then automatically extracted here: C:\NCDOT Training\Roadway\ Module 13 – Sheeting
- With these subfolders:

Name	Date modified	Туре	Size
📕 Drainage	3/16/2022 3:32 PM	File folder	
📕 Final Survey	3/16/2022 3:32 PM	File folder	
📕 Roadway	3/16/2022 3:32 PM	File folder	
WorkSet	3/16/2022 3:32 PM	File folder	

The Module 13 Sheeting PDF will also be located here.

- This PDF file includes bookmarks providing an overview of the document. Click on the bookmark to quickly jump to any section in the file. You may have to turn on the bookmark function in your PDF viewer, such as Adobe Reader.
- The dataset used throughout this module uses English units and US Survey Feet.
- Each module in this series is self-contained. You can jump to any module and begin the exercises.
- The *NCDOT_WorkSets.inp* on your desktop should be set the following variables:
 - NCDOT_USE_LOCAL_WORKSETS = L2
 - NCDOT_UNIT_TRAINING_WORKSETS = Roadway
- This training module uses the DOT-US North Carolina WorkSpace, R-2635C (Training) WorkSet and NCDOT_Roadway Role. It is very important that you select the correct WorkSpace, WorkSet and Role.
- For more information on setting up workspaces, <u>click here.</u>
- The tool tips and help were copied from the Bentley Online Help. See this link for the complete list of tools and common usage.
 <u>OpenRoads Designer CE Help (bentley.com)</u>
- NCLUG/NCDOT Bentley ORD Open X presentations from each NCDOT Department:



NCLUG - 2022 TECH Talks

- This workbook was written with the release of OpenRoads Designer 10.10.XX.XX (2021)
 OpenRoads Designer 2021 R2 update: <u>OpenRoads Designer Readme (bentley.com)</u>
 <u>OpenRoads Designer 2021 Release 2 Introduction - YouTube</u>
- This workbook has been updated for the 2023 Release of OpenRoads Designer (23.00.00.129)



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Overview

OpenRoads Designer (ORD) provides the tools to easily create plan, profile and x-section sheets in various formats such as plan only, plan and profile, or profile only sheets. MicroStation Named Boundaries are used to define the clipping areas for the plan, profile and X-section portions of the drawings and sheets.

The various design files required to assemble the sheets are attached as references to the a layout file. For Example, the alignment (ALGG) geometry and survey files are attached to the plan profile layout (PPL) as references. Sheets will be created by using the Named boundary tool and selecting the *Mode* (plan, profile or XS) and *Drawing Seed* of the sheet you wish to



create. The software then creates "Drawing" and "Sheet" Models for each named boundary. Named boundaries will be created in the 2D plan view for plan sheets, 2D profile view for profile sheets and a 3D models view for X-sections. This is a new workflow that this module will help explain.

Note that this workbook refers to a "model" as a Microstation model space, such as a design model (black background), a drawing model (gray background) and a sheet model (white background). Further explanation of Microstation models is included in this workbook. The rest of the plan sheets such as title, typical, details, and summaries are produced as in the past with design elements being drawn into the DGN files (design model) and a border referenced. Then they are referenced to a sheet model for *Sheet Indexing* (explained later in this workbook).

The sheet model is then used for plotting or PDF generation.



New Sheet Components overview for OpenRoads Designer

This is an Example of a Roadway sheet you will create in the module. A few new components to a sheet have been noted for new users.







MicroStation Models and Type

In the past, the designer had **one 2D default design Model** inside of a design DGN file. The concept of **multiple Microstation Models** within a design file will be used often in ORD. There are three (3) basic Microstation Model Types, **Design** (black background), **Drawing** (gray background) and **Sheet** (white background). Design Models can be 2D or 3D. Drawing and Sheet Models are usually 2D.



It is helpful to think of a Microstation Model as a design file within a design file or another analogy to think of is that a Microstation Model in a design file is like Worksheets in a Workbook in MS Excel. The Microstation Model is a container that the elements are stored in. This term **MicroStation Model** should not be confused with the ORD **3D Design Model** of the proposed surfaces that the designer produces with the ORD software. It is likely that the designer will have an ORD **3D Design Model** of the proposed surfaces drawn into a **3D Microstation Model** inside of a **2D design DGN file**. That is one DGN file containing one or more Microstation Models. This concept will be further explored in the **Corridor Modeling Module** in NCDOT's ORD Training

Looking under the Home Tab \rightarrow Primary Tool Group \rightarrow Models Tool in this file shows an example of multiple **Models** used in a DGN file to contain the design as well as plan sheets in one DGN file. This concept will be further explored in the **Sheeting Module** in NCDOT's ORD Training.





Below is an example of a **3D Design Model** produced with the ORD software. A new concept



introduced in ORD is the use of different types of **Microstation Models** in a DGN file. ORD uses **Microstation Design, Drawing, and Sheet Models** to carry the project from design through plan sheet production. Each type of **Microstation Model** has a distinguishing background color for easy identification when the user is in it.



the drawing model.

	Design	Drawing	Sheet
Plan	Yes	Yes	Rarely
Profile	Rarely	Yes	Rarely
XS	No (N/A)	Yes	Rarely

F

Features drawin in 2D/3D design models may appear on the drawing and sheet models (not actual labels)



Note that the **Microstation 3D Design Model** is usually shown in *illustration* mode which also have a white background. The distinguishable difference between the **Microstation 3D Design Model** and the **2D Microstation Sheet Model** (both have white background) is the **Microstation 2D Sheet Model** is usually shown with sheet border (shadow) and it's at a 1:1 Annotation Scale.





General Sheeting Process Overview

- 1. Create Custom Title Block Border (**TBB**) for the NCDOT Unit. Each NCDOT Unit and for each STIP Project, the TBB will be unique, e.g. PE seal blocks, company logo, right of way and construction revision notes, etc.
- 2. Create the Plan Profile Layout (PPL) file. Cross section will have the XS Port Layout (XPL) equivalent. The PPL and XPL contain the Named Boundaries (clip areas) and reference files that are shown in plan, profile and XS sheets.
- 3. Generate the Drawings and Sheets from the Named Boundaries. All Drawings should be placed in the Plan Drawings (PLD), Profile Drawings (PRD) and XS Drawings (XSD) DGN file. All Sheets should be placed in the Plan Sheets (PLS), Profile Sheets (PRS) and XS Sheets (XSS) DGN file. Rather than placing all the drawings and sheets in the active PPL file, it is recommended to place them in the listed files above to prevent file size getting too large causing extremely slow navigation.
- **4.** Edit the **WorkSet** (.dgnws) properties to place the STIP Number on the sheets and use **Sheet Indexing** to organize and re-number the project sheet sets.
- 5. Print, Print Organizer and PDF Creation



Exercise 1 – Create Title Block Border (TBB)

A custom Title Block Border (TBB) file should be created by each NCDOT Unit and for each STIP Project. Each TBB file will reside in each NCDOT Unit folder which may also include the PE seal cell and PEF's company logo where applicable. The following procedure is customized to Roadway Design.

A. Create a new file called **R-2635C_RDY_TBB.dgn** and place it in the following folder: C:\NCDOT Training\Roadway\Training-RD_R-2635C\Module 13 -Sheeting\Roadway\Sheets

File name:	R-2635C_RDY_TBB V	Save
Save as type:	MicroStation DGN Files (*.dgn)	Cancel
Seed:	C:NCDOT_CONNECT_WORKSPACE\Configuration_10_12\WorkSpaces\DOT-US North Carolina\Roles\NCDOT_Roadway\Standards\Sheet Borders\Seed2D - Roadway_Custom_Title_Block_Sheet_Borders.dgn	Browse

Note that there is a **TBB Seed File** to be used when creating this new **TBB** file in the WorkSpace which have predefined template borders.

C:\NCDOT_CONNECT_WORKSPACE\Configuration_2023\WorkSpaces\DOT-US North Carolina\Roles\NCDOT_Roadway\Standards\Sheet Borders

B. Open the **R-2635C_RDY_TBB.dgn** file and note the four different predefined template borders.

D Models									
Туре	2D/3D	Name	Description	☆	Design File				
0 1		RD_Title_Bl	Base	\checkmark	C:\NCDOT Tra\BR-0093_rdy_TBB.dgn				
Q		RD_Title_Bl	Base+Right of Way Number	\checkmark	C:\NCDOT Tra\BR-0093_rdy_TBB.dgn				
ပ္		RD_Title_Bl	Base+Right of Way Number+Revisi	\checkmark	C:\NCDOT Tra\BR-0093_rdy_TBB.dgn				
Q		RD_Title_Bl	Base+Right of Way Number+Revisi	\checkmark	C:\NCDOT Tra\BR-0093_rdy_TBB.dgn				



C. In the **RD_Title_Block_Basic** Microstation Design Model customize the project location information. Edit the county text to **WAKE** (default).



D. The **dot** in the middle of the State (downtown Raleigh) should be used as the anchor point to place the shape of the county or counties the project is located in. Navigate to the Drawing tab, and select the Place Active Cell tool.



Place the active cell

The cell library (.cel) with all the counties in North Carolina is stored in the WorkSpace: {WorkSpace)\Configuration\Organization-

Civil\Disciplines\NCDOT_Roadway\Standards\Cell\Roadway_Counties.cel









E. Place **PE seal** (when applicable). In the *C:\NCDOT Training\Roadway\Training-RD_R-2635C\Module 13 - Sheeting\Roadway\Sheets* folder there is a **cell library** (.cel) with an example PE seal cell. Place this cell in the center **red dot** as the cell anchor point for the appropriate seal block (ROADWAY DESIGN ENGINEER).



F. Place **company logo** (for PEFs when applicable). Place a fence around the layout of the **PREPARED BY** block **to the right of the title block** and using the **red dot** as the anchor point, **Copy** the fence content into the **starting point** of the **last separator line**.







G. In the Roadway\Sheet folder there is a generic image of a company logo. Use Raster Manager to place this image Interactively using the corners of the red block. Go to Home > Raster Manager > File > Attach > Raster and select the Company_Logo.jpg file from C:\NCDOT Training\Roadway\Training-RD_R-2635C\Module 13 - Sheeting\Roadway\Sheets. Make sure Place Interactively is checked.

Home	Terrain	Geometry	Site	Corrido	ors Mo	odel Det	ailing	Drawir
nstruction	Class Elen 🔻	Default ((none))	•	• 0 •	Explorer	Attach Tools •	 □ ■ >	e e e e e e e e e e e e e e e e e e e
	Attr	ibutes				F F	Reference	ces
						F	Raster N	/lanager
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						🤣 F	Reality N	Лesh
						<u>ن</u> ا	Attach i	Twin
Fi	ile 🔻				6	Ope	n Read	l-Only
D	irectory 🔻	•				Place	e Intera	actively
						Ope	n Setti	ngs Dialog
. ſ								
File name:	Company_l	Logo						



Note for the other three (3) predefined borders, the county block is automatically referenced in from the first border as a **Saved View**. The other blocks, such as **PE seals** and **company logo** will have to repeat the procedure as the first border if needed.





At this point you are done with the TTB file creation. The next step is determining when and how the TBB is attached to the plan and profile sheets.

*** IMPORTANT ***

There are two (2) ways to attach the **TBB** to the plan and profile sheets; 1) **before** creating the sheets, attach (reference) the **TBB** to the **Drawing Seed** (.dgnlib) in the **WorkSpace** or 2) **after** creating the sheets, attach (reference) the **TBB** to the **Microstation Sheet Models**. The determining factor will mostly be whether you are working inside ProjectWise (PW) or outside it. If you are working outside PW (non-managed WorkSpace), you are allowed to edit or attach the TBB file to the WorkSpace .dgnlib (Drawing Seed) file. If you are working inside PW (managed WorkSpace) you are not allowed to edit and attach the TBB to the WorkSpace .dgnlib (Drawing Seed) file.

Steps to Attach the TBB to the WorkSpace .dgnlib (Drawing Seed) File

 All Drawing Seed Files (.dgnlib) are stored in the WorkSpace. {WorkSpace}\Configuration_2023\Organization-Civil\NCDOT\Dgnlib\Sheet Seeds
 Open the Drawing Seed DGNLIB you are going to use (in this exercise it is Plan Only 50
 Scale.dgnlib). Make sure the DOT-US North Carolina WorkSpace, R-2635C (Training)
 WorkSet and the NCDOT_Roadway Role are active when opening this file.

OpenRoads Designer 2023

 WorkSpace
 WorkSet
 Role

 DOT-US North Carolina *
 Training-RD_R-2635C *
 NCDOT_Roadway *

Recent Files



Plan_50_Scale.dgnlib C:\NCDOT_CONNECT_WORKSPACE\Configuration_2023\Organization-Civil\NCDOT\Dgnlib\Sheet Seeds\ Modified: 6/7/2024 8:50:32 AM Size: 448 KB



B. Open the Microstation Sheet Model L – Plan 50 Scale [Sheet].





C. **Reference** the **TBB** file to this Microstation Sheet Model. Use **Coincident World** because the origin of the sheet model is (0,0). Remember to set the **Nested Depth = 1** to display the county block **Saved View** in the other three (3) predefined template borders.

References (4 of 4 unique	, 4 displayed)		-	- 🗆 X
Tools <u>P</u> roperties				
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Slot 🌾 🗋 File Nan	ne	Model	Description	Logical
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2\\	\R-2635C_RDY_TBB	d RD_Title_Block_Basic	Base	
Nested Attachments:	Live Nesting		▼ Nesting Depth:	1
Display Overrides:	Allow		•]
Ne <u>w</u> Level Display:	Use MS_REF_N	EWLEVELDISPLAY	Configuration Variab)
Global LineStyle Scale:	Master		-]
Synchronize View:	(No View)		(none)	•
Toggles				
	I I k 4	1::1 🛒 🖉 😪 🆽	8	
			ОК	Cancel



D. Go back to the **Default** (2D) Microstation Design Model, **Fit View**, **Save Settings** and **Exit** out of the file.



When the sheets are created (in the next exercises) using this **Drawing Seed**, the **TBB** is included as a reference file with the rest of the sheet border attached to the sheet.





Once the sheets have been created, the **TBB** can be detached from the WorkSpace .dgnlib (Drawing Seed) file.

Steps to Attach the TBB to the Microstation Sheet Model File

COME BACK TO THIS SECTION AFTER MAKING THE SHEETS IN EXERCISE 2

A. After the sheets have been created, **Open** the Plan Sheet (**PLS**) file in the **Roadway\Sheets** folder.



- B. Navigate to the first Microstation Sheet Model.
- C. Reference the TBB file to this Microstation Sheet Model. Use Coincident World because the origin of the sheet model is (0,0). Remember to set the Nested Depth = 1 to display the county block Saved View in the other three (3) predefined template borders.



Module 13 – Sheeting

References (48 of 52 unique, 47 displayed)

Tools	<u>P</u> roperties									
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Slot	🏴 🗅 File Name ^	Model	Description Logical	Orientation	Presentation	Visible Edges	٠	کمہ	¥.	G
1	R-2635C_RDY_PLD.dgn	L - Plan 004 [Drawing]	L - Plan L - Plan		Wireframe	Wireframe	\checkmark	×.	\checkmark	
2	R-2635C_RDY_TBB.dgn	RD_Title_Block_Basic	Base	Coincident - World	Wireframe	Wireframe	\checkmark	×	*	







Changing to a different predefined template border on a per sheet basis

When there is a construction revision or right of way revision to one or more sheets, while in the Microstation Sheet Model you may simply go to the **Reference** dialog box. After doubleclicking on the **TTB** reference file, select the desire border under the **Model** drop-down list.

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<u>F</u> ile Name:	R-2635C_RDY_TBB.dgn	<u>B</u> rowse			
Full Path:	\roadway\sheets\r-2635c_rdy_tbb.dgn				
Model:	RD_Title_Block_Basic	~			
Logical Name:	Name	Description			
Description:	RD_Title_Block_Basic	Base			
Detail Scale:	RD_Title_Block_Basic_RW	Base+Right of Way Number			
Detail Scale.	RD_Title_Block_Basic_RW_Rev3eal	Base+Right of Way Number+Revision Seal			
Scale (Master:Ref):	RD_Title_Block_Basic_RW_RevSeal_Add Rev N	Base+Right of Way Number+Revision Seal	-		
Named Group:					
Revision:	<		>		
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			_		



Exercise 2 – Plan Sheets

Preparing the Plan Profile Layout (PPL) file. The PPL file contains reference files shown on the plan sheets as well as *Named Boundaries*. Named Boundaries are simply clipped areas of each sheet. This PPL file will be provided in the training dataset. For a NEW Project, Follow the instructions in Module 1 for creating design files from the WorkSpace seed.

C:\NCDOT Training\Roadway\Training-RD_R-2635C\Module 13 - Sheeting\Roadway\Sheets\R-2635C_NCDOT_PPL.dgn

- A. Reference the master *R-2635C_RDY_ALG.dgn* file (Interactive Default Model and Nested Depth =1) from the Roadway\Alignment folder and give it the logical name of "dsn" (so the pen table can print it solid black). Note that the master ALG file reference other Alignment (ALG) DGN files. The Nested Depth=1 is necessary to include the other reference files associated with the master ALG. For this training all alignments were placed in the master ALG file.
- B. Open the file: R-2635C_NCDOT_PPL.dgn using the DOT-US North Carolina
 WorkSpace, R-2635C (Training) WorkSet and NCDOT_Roadway Role.
- **C.** Reference the *R-2635C_NCDOT_FS.dgn* file from the **Final Survey** folder (Coincident World Default model) from the Final Surveys folder and give it the logical name of "pln1" (so the pen table can print it dithered/gray scale).
- D. Reference the *R-2635C_NCDOT_FS.dgn* file (Interactive Existing Terrain Model) from the Final Survey folder and make it Active. This is necessary to show the existing ground profile on the profile sheets. The existing terrain boundaries are not to be printed so no logical names are required.

Note: selecting the existing terrain boundary and using the heads-up display to make it the *Active* terrain model creates a **Default-3D** Microstation Design Model and automatically referenced to the **Default** (2D) Microstation Design Model.



E. Older V8 DGN files may display large arrowheads when this file is referenced.



Newer DGN files (included with this dataset) will not have this issue. This is an issue with the custom line style scaling. If the problem exists, change the **Global LineStyle Scale** from *Master* to *Reference* and disable **Annotation Scale** ("A" icon at the bottom right corner of the reference dialog box).

Attachment Properti	ies: r-2635c_ncdot_fs.dgn			×
<u>F</u> ile Name:	\\Final Survey\R-2635C_NCDOT_FS.c	lgn	Browse	
Full Path:	\final survey\r-2635c_ncdot_fs.dgn			
<u>M</u> odel:	Default	-		
Logical Name:	pln			
Description:	Master Model			
Detail Scale:	1"=50'	•		
Sc <u>a</u> le (Master:Ref):	1.00000000 : 1.00000000			
Named Group:		•		
Revision:		•		
Le <u>v</u> el:		•		
Nested Attachments:	Live Nesting	Nesting Depth:	1	
Display Overrides:	None			
Ne <u>w</u> Level Display:	Master			
Global LineStyle Scale:	▶ Reference			
Synchronize View:	Master * Reference			·
Toggles				
		<u>O</u> K	Cancel	

- F. Reference the *R-2635C_HYD_DRN.dgn* file from the **Drainage** folder and give it the logical name of "drn1" (so the pen table can print it solid black).
- **G.** Reference the *R-2635C_RDY_ROW.dgn* file from the **Roadway\Design** folder and give it the logical name of "dsn1" (so the pen table can print it solid black).
- H. Reference the master *R-2635C_RDY_CMD.dgn* file (Interactive Default-3D Model and Nested Depth =1) from the Roadway\Design folder and give it the logical name of "dsn2" (so the pen table can print it solid black). Note that when referencing the Default-3D Microstation Design Model, the Default (2D) Microstation Design Model is automatically referenced. Also note that the master CMD file reference other corridor modeling (CMD) DGN files. The Nested Depth=1 is necessary to include the other reference files associated with the master CMD. CMD files contain the slope stake linework generated from the corridor models as

well as other traditional DSN elements, e.g. EOTs, paved shoulder, curb and gutter and other 2D linework.





 Reference the *R-2635C_RDY_DSN.dgn* file from the Roadway\Design folder and give it the logical name of "dsn3" (so the pen table can print it solid black). DSN files may contain annotations.

Drawing Production Ribbon Tab

The **Drawing Production** Tab is found under the **OpenRoads Modeling** Workflow.



New tools: Civil Labeler/Civil Label Manager and Cross Section Navigator (more on these later in the training)



The *Drawing Production* Tab or Ribbon tab is broken into 12 tool groups and contains the tools that the roadway designer needs to automatically and manually create **Named Boundaries,** annotation to designs and drawings as well as create plan, profile, and cross section sheets.



Named Boundaries Tool Group

One of the tool groups of the *Drawing Production* Ribbon Tab is the *Named Boundaries* Tool Group. Choosing the tools in this group will place or adjust the named boundaries (clip area shapes) to create plan, profile, and cross section sheets. Note currently adjusting the named boundaries is only applicable to profiles.



Place Named Boundary Tool

Modes across the top of Place Named Boundaries tools:

Carl Place Named Bo	undary Civil Plan	—		×
	🔁 🏳 🏬 衸	/ 📝 🗔] []	
Drawing Seed:	(none)		•	
Detail Scale:	Full Size 1 = 1		•	

Setting	Description
Place Named Boundary	Opens the Place Named Boundary tool to create place named
	boundaries.
Civil Plan	<i>,</i>
	Place named boundary <u>civil plan</u> mode tool.
Civil Plan by Element	
	Place named boundary <u>civil plan by element</u> mode tool.
Civil Profile	





Setting	Description
	Place named boundary <u>civil profile</u> mode tool.
Civil Cross Section	Creates <u>civil cross section</u> sheets.
Civil Cross Section 2 Points	Place named boundary <u>civil cross section 2 points</u> mode tool.



Place Named Boundary **Civil Plan** Mode

Carl Place Named Bo	undary Civil Plan — 🗌	X
	₽₽ ₩₩\$} / <u>/</u> □□	
Drawing Seed:	(none) 🔻	
Detail Scale:	Full Size 1 = 1	
Name:	Plan 1	
Description:		
Group:	(New) 🔻	
Name:	Untitled	
Description:		
Start Location:		◀
Stop Location:		▶
Length:	100.000000	oO Instantat
Left Offset:	-50.000000	oo
Right Offset:	50.000000	oO liteiteiteit
Overlap:	0.000000	00 Instatut
Boundary Chords:	10	
	Create Drawing	
	Show Dialog	

Drawing Seed	Specifies the drawing seed that sets default values. Also contains default values for the next dialog box "Create Drawing".
Detail Scale	Sets the scale at which the named boundary will be placed.
Name	Enter name of the named boundary. This is usually a sheet number association but not required. Note: MicroStation models cannot contain the following characters in the name or group: \V:*?<> \"\t\n&=,'
Description	Enter brief description for the new group.
Group	Selects the named boundary group. You can also create a new group by selecting New from the drop-down. This automatically set when selecting the horizontal alignment. Note: MicroStation models cannot contain the following characters in the name or group: \V:*?<> \"\t\n&=,'



Name	Enter name of the new group.
Description	Enter brief description for the new group.
Start Location	Sets the begin station.
Stop Location	Sets the stop station.
Length	Sets the length, along the path element (horizontal alignment). It's usually 1400' stations per sheet at 1″=50' scale.
Left Offset	(Available only when By Length is selected) Sets the distance from left of the path. If you use the Measure Distance tool next to the field, the measured distance displays in the Left Offset field.
Right Offset	(Available only when By Length is selected) Sets the distance from right of the path. If you use the Measure Distance tool next to the field, the measured distance displays in the Right Offset field.
Overlap	(Available only when place an array of named boundaries along a path is selected) Sets the distance, along the path element, by which the named boundary element is to be extended. Positive values extend it and negative values shorten it. If you use the Measure Distance tool next to the field, the measured distance displays in the Overlap field.
Boundary Chords	(Available only when By Length is selected) Sets the number of chord of vertices along the top and bottom of the named boundary. More the chords, better is the stroking of the named boundary in a curve.
Create Drawing	Opens the Create Drawing dialog after creating the named boundary to create a saved view from the selected named boundary and automate dynamic views.
Show Dialog	When enabled, a dialog with additional parameters set by the Drawing Seed is shown.

Place Named Boundary Civil Plan by Element

This is not covered in this training but the link to Bentley help located below: <u>Place Named Boundary Civil Plan by Element (bentley.com)</u>

*** IMPORTANT ***



If your project has an interchange sheet or multiple interchange sheets, please go to **Exercise 3** – **Named Boundaries for Interchange Sheets** first. The procedure is different than normal sheets and you first must create the Interchange sheets, then the surrounding sheets afterward.



Place Civil Plan Named Boundary Workflow

- 1. Select *Civil Plan* mode.
- 2. Select the *Drawing Seed* to be used. This seed will contain the default scaling and named boundaries dimensions users can override.
- 3. Key in the name of the starting Named Boundary, e.g. "Plan 004".
- 4. Select the horizontal alignment as the baseline element for named boundary placement.
- 5. Key in (or graphically select on-screen) the **Start** and **Stop** Station values.
- 6. Modify other fields as needed.
- 7. Enable the *Create Drawing* toggle. This will display the next **Create Drawing** dialog box.
- 8. Data point in the DGN file to place boundaries, then another data point to Accept.
- 9. Select OK on the Create Drawing dialog is displayed.
- 10. The **Create Drawing** dialog box is where users can select the North Arrow NAD designation and in which DGN file the Microstation Drawing and Sheet Microstation Models are to be stored.
- A. Open the **R-2635C_NCDOT_PPL.dgn** file in the **WorkSet** folder.
- B. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.





C. Choose the **Civil Plan** tool to change the data fields in the dialog box to reflect the data needed for plan sheet layout.

🄏 Place Named Boundary Civil Plan — 🗆 🗙		×
	P 🗊 🔪 🖉 🛄	
Drawing Seed:	(none) 🔻	
Detail Scale:	Full Size 1 = 1	
Name:	Plan 1	
Description:		
Group:	(New) 👻	
Name:	Untitled	
Description:		
Start Location:		◀
Stop Location:		▶
Length:	100.000000	oo
Left Offset:	-50.000000	oo
Right Offset:	50.000000	00
Overlap:	0.000000	00
Boundary Chords:	10	
	Create Drawing	
	Show Dialog	

- D. Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.
- E. Select the **50 Scale Plan** *Drawing Seed*.

Note: The **Drawing Seed** defines default values and other parameters required to create sheets. The **Drawing Seeds** for *Civil Plan* mode are:

Drawing Seed:	Plan 50 Scale
Detail Scale:	Name
Name:	(none)
Description:	Earthwork
Description.	Plan 20 Scale
Group:	Plan 50 Scale
Name:	Plan 100 Scale
Description:	Plan and Profile 50 Scale - PLAN
Start Location:	Plan Interchange Detail 50 Scale
Stop Location:	Plan-Plan 50 Scale

Note the **Detail Scale** automatically changes to 1'' = 50' and the **Length** and **Offset** of the sheet boundary and **Boundary Chords** change to accommodate the 1'' = 50' scale.



F. Set the first Name field to be **004** since NCDOT begins their plan sheets at sheet 4. The first Name field defines the **root name** of each of the named boundaries. Using the name **Plan 004** begins the incremental numbering with the first named boundary.

Name Specified in Dialog004First Named Boundary004Second Named Boundary005Third Named Boundary006

- G. A **Description** can be entered but the Name alone is typically sufficient.
- H. Set the *Group* to **New** to create a new named boundary group. Once named boundaries have been created for alignments, the names of the boundary groups appear here to be chosen later if necessary.
- I. Set the second *Name* field to be **L** to coincide with the alignment name. This second name is the name of the **Group** of named boundaries used along the **L** alignment. This field may also be automatically set when a horizontal alignment is selected.
- J. A **Description** can be entered but the Name alone is typically sufficient.
- K. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the mainline **L alignment** on screen.

Place Named Boundary Civil Plan > Identify Path Element

L. Select the left arrow and right arrows to lock the Start and Stop Locations to the beginning and end of the L alignment (This works for placing sheets for the entire alignment). You may also key-in the desired stop and stop stations in these fields. For this training select the start station by checking box or selecting start station in the plan view and for the stop location select 10 sheets or so to save time.

\sim	Start Location:	305+00.00	
\checkmark	Stop Location:	747+97.40	

M. Check the **Create Drawing** box to create the Drawing Microstation Models for the purpose of annotations.


N. Check the **Show Dialog** box to open the Create Drawing Dialog Box where the user can select the North Arrow NAD designation as well as define in which files the drawing and sheet models are to be created in.



O. Follow the prompt and **Data Point** in the **2D View** to accept placement of the boundaries as shown.



Once the Named boundaries have been created the **Create Drawing** dialog box will appear next.



Create Drawing (Plan)

Most of the settings have been filled in by default from the selected **Drawing Seed** (previous dialog box). Here are some settings requiring user's input:

Create Drawing	×
M	ode: Plan Dgn:
View Name: Drawing Seed: View Type: Discipline: Purpose:	L - 004 Plan 50 Scale Civil Plan View
Model Name: Seed Model: Filename:	Drawing Model L - 004 Plan_50_Scale.dgnlib, L - Plan 50 Scale (Active File) 1"=50' None
Model Name: Seed Model: Filename: Sheets: Drawing Boundary: Detail Scale :	Sheet Model L - 004 Plan_50_Scale.dgnlib, L - Plan 50 Scale [Sheet] (Active File) (New) Full Size 1 = 1 Plan 50 Scale T''=50'
	 Add To Sheet Index Make Sheet Coincident ✓ Open Model Oc Cancel



Each Item in the **CREATE DIALOG** box Description.

Setting	Description
Mode	Plan
Name	Shows the name of the saved view that will be created.
One sheet per Dgn	If on, each sheet model, and all drawing models attached to the sheet model, are created in an individual .dgn file in the selected folder. The name of each .dgn file created will match the name of the created saved view.
Drawing Seed	Defines the drawing seed template from which the detailing symbol style will be used for the callout.
View Type	Displays the saved view type. The saved view type displayed depends on the saved view settings in the seed file selected in the Drawing Seed drop-down list.
Discipline	Displays the discipline of the drawing. It can be modified from the saved view properties in the Properties dialog.
Purpose	Displays the purpose of the saved view. It can be modified from the saved view properties in the Properties dialog.
Seed Model	Displays the seed model from which the drawing model will be created. This seed model is derived from the template selected in the Drawing Seed drop- down list.
Filename	If on, you can select the file in which the drawing model will be created. By default, the drawing model is created in the active file. You can create a new file that will contain the new drawing model by clicking Create New Drawing File icon. You can also create the drawing model in an existing file by clicking Browse Drawing File Browse Drawing File icon. Note: If you select an existing file to create the drawing model, make sure the file belongs to the same WorkSet, else the OK button in the dialog will be dimmed.
Annotation Scale	Sets the scale factor for text and dimensioning in the drawing model. The annotation scale of the drawing model is used as the detail scale when it is attached to a sheet. Note: Only the scales that match the master units of the seed file are populated in this drop-down list.



Setting	Description
Annotation Group	Selects the drawing annotation group that defines how drawing models are annotated. The drawing annotation group defines grids, XY coordinate labels, north arrows, frame annotation, etc. that are created in the drawing model and are to be shown on the final sheet. Annotation groups are found in the OpenRoads Standards under Annotation Groups.
Seed Model	If on, you can select the seed model from which the sheet model will be created. This seed model is derived from the template selected in the Drawing Seed drop-down list, except for the case when you place a named boundary using a drawing boundary with the Create Drawing check box turned on. In this case, the sheet-seed model is the one that contains the drawing boundary. This is to make sure that the drawing fits exactly in the selected drawing boundary.
Filename	If on, you can select the file in which the sheet model will be created. By default, the sheet model is created in the active file. You can create a new file that will contain the new sheet model by clicking Create New Sheet File icon. You can also create the sheet model in an existing file by clicking Browse Sheet File icon. Note: If you select an existing file to create the sheet model, make sure the file belongs to the same WorkSet, or else the OK button in the dialog will be dimmed.
Sheets	Sets the sheet model in which you want to place the drawing. You can also select New to create a new sheet model.
Annotation Scale	Sets the scale factor for text and dimensioning in the sheet model. Note: Only the scales that match the master units of the seed file are populated in this drop-down list.
Drawing Boundary	 Sets the drawing boundary in the sheet model where the drawing will be placed. This option lists the following: New - Creates a new drawing boundary. List of empty drawing boundaries (drawing boundaries that do not have a saved view attached) of same View Type contained in the sheet model selected in the Sheets drop-down list. If Sheets is set to New, lists the empty drawing boundaries of same view type available in the sheet-seed model. In this case, a new sheet model is created and the selected drawing boundary is filled with the saved view. If multiple



Setting	Description
	 saved views are to be placed, then for each saved view a new sheet model is created and the saved view is placed with new drawing boundary. If Sheets is set to an existing sheet model, then the first saved view is placed in that sheet model, in the selected drawing boundary. For the remaining saved views, a new sheet model cloned from sheet seed model is created for each saved view and the saved view is placed in the selected drawing boundary in each sheet model. Optimize For - This option is available when you want to place multiple views and if the sheet model in which you want to place the saved views contains more than one drawing boundary of the same View Type. Following examples explain the use of this option in different scenarios
	 Say you want to place an array of four named boundaries of view type "Section" and the sheet model selected in the Sheets drop-down list contains five empty drawing boundaries of type "Section". In this case, if you select Optimize For, the name boundaries will be placed on the first four drawing boundaries, in the sequence of their drawing identifiers. This option is also available if you choose to create a new sheet model and if the sheet-seed model contains more than one drawing boundary of the same view type. Say you have six saved views to be placed and the selected sheet-seed model has only two empty drawing boundaries. If you select Optimize For, two saved views will be placed in the selected sheet models. For the remaining four saved views, two new sheet models will be created by cloning the sheet-seed model and two saved views will be placed in each of the sheet models.
Detail Scale	 Sets the detail scale of the drawing attachment in the sheet model. In addition to standard scales, MicroStation calculates following recommended scales and displays them in this drop-down list: By Named Boundary - (Available only when you create dynamic view from a named boundary) The detail scale stored on the named boundary. Fit View to Drawing Boundary - The closest standard scale at which the saved view attachment will fit into the selected drawing boundary.



Setting	Description
	 Fit View to Sheet Boundary - The closest standard scale at which the saved view attachment will fit into the sheet boundary. Custom - allows you to define a custom scale. Note: Only the scales that match the master units of the seed file are populated in this drop-down list.
Add to Sheet Index	Adds the sheet model to the sheet index. Note: If some other user already has the sheet index in edit mode, the sheet model cannot be added to the sheet index. In such case, a message is displayed in the message center.
Select a folder from Sheet Index	Opens the Sheet Index Folder Picker from which you can select the folder in which the sheet model should be added.
Make Sheet Coincident	(Available only if the sheet model does not contain a drawing boundary) If on, the reference in the sheet model is made coincident with the design model. For this, if required, the sheet boundary is moved and rotated to fit around the reference. If off, the reference is moved and rotated so that it is attached at the center of sheet boundary.
Open Model	If this check box is on, the last sheet model that was created opens.



- A. The check box for **One Sheet per DGN** if checked a DGN file will be created for each sheet. The NCDOT standard is leave this unchecked.
- B. **Drawing Model** Options (where and how to annotate north arrows and match lines the drawings):

		Drawing Model	
	Model Name:	L - 004	
	Seed Model:	Plan_50_Scale.dgnlib, L - Plan 50 Scale	
\checkmark	Filename:	R-2635C_RDY_PLD.dgn	— 📮
	A	1"=50' 🗸	
	Annotation Group:	NC_Plan Annotation NAD 83 2001	

Filename (check to enable):

C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets**R-**2635C_RDY_PLD.dgn (Plan Drawings)

Note the two (2) icons to the right of this field **Browse Drawing File** and the second icon with the "+" symbol is **Create New Drawing File**. *Browse Drawing File* will add drawings to the existing drawings already in the file. *Create New Drawing File* will create a new file to place the drawings in. If selecting *Create New Drawing File* and selecting an existing file, it will **DELETE** any the existing drawings in the file and make a fresh blank copy. If **Create New Drawing File** is selected, a seed file from the WorkSpace can be used.

{WorkSpace}\Configuration\Organization-Civil\NCDOT\Seed\Seed2D - English Design.dgn.

It is not necessary to choose a specific drawing seed since the software will place the Microstation Drawing Models in this file. The master Default Model (from the seed) is a Microstation Design Model.

In this exercise this is our first set of plan drawings, we can select **Create New Drawing File** and select the existing **PLD** file (blank) to put the drawings in. As you generate more drawings, you may select **Browse Drawing File** to add to it. **Annotation Group** (North Arrow NAD and Match Lines):





C. Sheet Model Options (attaching the drawing to the sheet and scale it down to Full Size 1 = 1):

	Sheet Model	
Model Name:		
Seed Model:	Plan_50_Scale.dgnlib, L - Plan 50 Scale [Sheet]	
Filename:	R-2635C_RDY_PLS.dgn	4
Sheets:	(New) 🔻	
A	Full Size 1 = 1	
Drawing Boundary:	Plan 50 Scale 🗸	
Detail Scale :	1"=50' 🗸	



Filename (check to enable):

C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets\R-2635C_RDY_PLS.dgn (Plan Sheets)

Note the two (2) icons to the right of this field <a>Image: The first folder icon is Browse Sheet File and the second icon with the "+" symbol is Create New Sheet File. Browse Sheet File will add sheets to the existing sheets already in the file. Create New Sheet File will create a new file to place the sheets in. If selecting Create New Sheet File and selecting an existing file, it will <u>DELETE</u> any the existing sheets in the file and make a fresh blank copy.

If **Create New Sheet File** is selected, a seed file from the WorkSpace can be used. {WorkSpace}\Configuration\Organization-Civil\NCDOT\Seed**Seed2D - English Design.dgn**.

It is not necessary to choose a specific sheet seed file since the software will place the Microstation Sheet Models in this file. The master Default Model (from the seed) is a Microstation Design Model.

In this exercise this is our first set of plan sheets, we can select **Create New Sheet File** and select the existing **PLS** file (blank) to put the sheets in. As you generate more sheets, you may select **Browse Sheet File** to add to it.

Note the **Annotation Scale** is always set to **Full Size 1 = 1** for all sheets.

A	Full Size 1 = 1
Drawing Boundary:	Plan 50 Scale
Detail Scale :	1"=50' -
	Add To Sheet Index Make Sheet Coincident Open Model

Add To Sheet Index should remain *uncheck* at this point. We will go over Sheet Indexing later in this training.

Open Model should be *checked* on to display the last sheet when it has completed the process.





Now that we have created the Sheets let's look at where all the named boundaries are stored

NOTE: the match line text is not filling in the alignment name -L- currently. Manually edit this text.



Named Boundary Manager

The **Named Boundary Manager** is where are the named boundaries placed in the PPL file and their groups are stored in. You may open the Named Boundary Manager and create drawings and sheets anytime after the Named boundaries have been placed in the PPL file.

A. Go back to the *R-2635C_NCDOT_PPL.dgn* file and Select the **Named Boundary Manager**. It's the small square in the lower right corner.

		-									-								
Drawing Pro	oduction D	rawing	Util	ities (Collab	orate	View	Help	NC	DOT R	oadway								
ce Style Manager	Place Place Note Label	A Place Text	A 1 Edit Text	Change T Attribut	Text A		Civil Labeler	Elemen	nt on▼ M	ہ D Iodel /	rawing	' Se	Cr	oss Navigat	or	Named Boundary v	Shee	et lary	Full Size 1 = 1
Tables	Notes			Text		Б	Labels		Annot	ations		G.	Re	view		Named Boundaries	🔄 Sheet Bo	undary	Drawing Sca
							amed Bou	ndaries		1	~ -	-		×	<		Named Bou Manage nar	Indarie ned boi	s undaries and
						×	× v 🛛		₩ ~~		SP		•	<		-	named bou	ndary g	roups
						Name	,	T	Descri	ption	File Name			Show					
						⊿ Pl	an Group	5											
						-	L				R-2635C_R	DY_PPL	dgn	~	J.				
							004				R-2635C_R	DY_PPL	dgn	~	ų				
							005				R-2635C_R	DY_PPL	dgn	~					
							006				R-2635C_R	DY_PPL	dgn	~					
							007				R-2635C_R	DY_PPL	dgn	~					
							008				R-2635C_R	DY_PPL	dgn	~					
							009				R-2635C_R	DY_PPL	dgn	~					
							010				R-2635C_R	DY_PPL	dgn	~					
							011				R-2635C_R	DY_PPL	dgn	~					
							012				R-2635C_R	DY_PPL	dgn	~					
							013				R-2635C_R	DY_PPL	dgn	~					
							014				R-2635C_R	DY_PPL	dgn	~					
							015				R-2635C_R	DY_PPL	dgn	~					
							016				R-2635C_R	DY_PPL	dgn	\checkmark					
							017				R-2635C_R	DY_PPL	dgn	~					
							018				R-2635C_R	DY_PPL	dgn	~	•	1			

- Expand the **Plan Group** L and pick the named boundary **004**. Notice the icons that were greyed out now become active.
- This is where you can delete your Named Boundaries if you need to re-create them.
- Other options are shown below for Icons along the top, but you can also right click on the named boundary **004** to get same options.
- Another note is that the **Named boundaries** when selected has grips for editing. This helps when trying to show something just off the clipped area on top or bottom of the sheet.



Setting	Description
Delete	×
	Deletes the selected named boundary or named boundary group. Also, if the named boundary is deleted, it's associated saved view is also deleted.
Apply	 Enabled when you select a named boundary. Selecting the down arrow next to the Apply icon gives following options: As Clip Volume - Applies the selected named boundary as a clip volume. As Fence - Applies the selected named boundary as a fence. As Clip Mask - Applies the selected named boundary as a clip mask.
Create Drawing	 Opens the Create Drawing dialog in which you can create saved view from the selected named boundary and automate dynamic views.
Create Plan Drawing	R Enabled when you select a plan named boundary or plan named boundary group.
Create Profile Drawing	Enabled when you select a profile named boundary or profile named boundary group.
Create Cross Section Drawing	Enabled when you select a cross section named boundary or cross section named boundary group.
Fit to Named Boundary	Adjusts the magnification such that the selected named boundary is fit in the view.
Copy Named Boundary	Enabled when you select a plan named boundary. Starts the Copy Named



Setting	Description							
	Boundary tool to create a copy of the selected named boundary. You can change the default name of the named boundary in the Name field of the Copy Named Boundary tool settings window.							
Properties	Opens the Properties dialog and displays the properties of the selected named boundary or named boundary group. For detailed information refer to Properties Dialog in MicroStation help.							
Show Create Drawing dialog	Opens the Create Drawing dialog in which you can create saved view from the selected named boundary and automate dynamic views.							
Annotate Plan Drawing Models	ہے Adds annotation to selected element.							
Named Boundaries list box	 The named boundaries list box displays the following columns: Name - Name of the named boundary or named boundary group. Description - Description of the named boundary or named boundary group. File Name - Sets the name of the named boundary or named boundary group you want to create. Show - Check box to turn on or off the display of the named boundary or named boundary 							



A. To create the drawings and sheets, at any point after the Named Boundaries are stored in the Named Boundary Manager, simply enable Show the **Create Drawing Dialog** (highlighted in light blue when enabled) and right mouse click on either the **Named Boundary Group** (to create drawing and sheets for the entire group) or just the **individual Named Boundary or Boundaries** you wish to create.

Show the Create Drawing Dialog

B. Select **Create plan drawing**. This will take you to the **Create Drawing** dialog box in the previous exercise.

004	R-2635C_RDY_PPL_dag	
005	R-2635C_RDY	
006	R-2635C RDY 🤽 Apply	۲.
007	R-2635C RDY 🦰 Create plan drawing	
008	R-2635C_RDY 🗾 Fit To Named Boundary	
009	R-2635C_RDY Properties	



Page

Reviewing the Drawings

- A. Go back to the *R-2635C_RDY_PLD.dgn* file in the **Roadway\Sheets** folder.
- B. Click on the **Models** tool button.

Home	Terrain	Geometry	Site	Corridors		odel Deta	Drawing Proc		
ne	•	Default ((none))		•			0.	🥯 • 📉	
	0 •		▼		Explorer	Attach	٥	Models	
				,		Tools 🔻	٥	Models Flyout	
	Att	ributes				Pr	imary		

C. Note the Microstation Drawing Model **Type** in this file.

🗇 Mode	els					- 🗆 X						
) h	OI 🎒	X 7										
Туре	2D/3D	Name	Description	*	Design File	Sheet Number						
언		Default	Master Model	\checkmark	C:\NCDOT Trai\R-2635C_	_RDY_PLD.dgi						
		L - 004 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_	_RDY_PLD.dgi						
		L - 005 [Drawing]		×	C:\NCDOT Trai\R-2635C_	_RDY_PLD.dgi						
		L - 006 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_	DOT Trai\R-2635C_RDY_PLD.dgi						
		L - 007 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_	_RDY_PLD.dgi						
		L - 008 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C	_RDY_PLD.dgi						
		L - 009 [Drawing]		\checkmark	✓ C:\NCDOT Trai\R-2635C_RDY_PLD.dgi							
		L - 010 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_	RDY_PLD.dgi						
		L - 011 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLD.dgi							
		L - 012 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C	_RDY_PLD.dgi						
		L - 013 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C	_RDY_PLD.dgi						
		L - 014 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_	_RDY_PLD.dgi						
		L - 015 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C	_RDY_PLD.dgi						
		L - 016 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_	_RDY_PLD.dgi						
		L - 017 [Drawing]		×	C:\NCDOT Trai\R-2635C	_RDY_PLD.dgi						
		L - 018 [Drawing]		\checkmark	C:\NCDOT Trai\R-2635C_	_RDY_PLD.dgi						
		L - 019 [Drawing]		×	C:\NCDOT Trai\R-2635C	RDY PLD.da						

- D. double click on any of these Microstation Drawing Models to take you to to that plan drawing. You can also right click on these to get more options.
- E. You can also access the Microstation Drawing Models from the **View Group** pull down at the bottom left corner of the screen.

		Name	Model
		🔁 Default	O Default
		🔁 L - 004 [Drawing] Views	🖾 L - 004 [Drawing]
		🔁 L - 005 [Drawing] Views	🖾 L - 005 [Drawing]
		🔁 L - 006 [Drawing] Views	🖹 L - 006 [Drawing]
		🔁 L - 007 [Drawing] Views	🖹 L - 007 [Drawing]
		🔁 L - 008 [Drawing] Views	🖹 L - 008 [Drawing]
		🔁 L - 009 [Drawing] Views	🖹 L - 009 [Drawing]
		🔁 L - 010 [Drawing] Views	🖹 L - 010 [Drawing]
		🔁 L - 011 [Drawing] Views	🖾 L - 011 [Drawing]
		🔁 L - 012 [Drawing] Views	🖹 L - 012 [Drawing]
		🔁 L - 013 [Drawing] Views	🖹 L - 013 [Drawing]
51		🔁 L - 014 [Drawing] Views	🖹 L - 014 [Drawing]
01			
	-	🔁 Default 🔹 🔽	ן א 2 3 4 5 6 7 8 🔀 א 🚛
	Element Selection > Ide	entify element to add to set	



Note in each Microstation Drawing Model, the addition of the **North Arrows** in the upper right corner and **Match Lines** (and Match Line Text) as part of the annotation group selected earlier. The north arrow cell can be moved and reposition anywhere in the drawing.





Page

Reviewing the Sheets

- A. Go back to the *R-2635C_RDY_PLS.dgn file* in the **Roadway\Sheets** folder.
- B. Click on the **Models** tool button.

Home	Terrain	Geometry	Site	Corridors		odel Deta	iling	Drawing Proc		
ne	•	Default ((none))	•	6		0.	≶ - 🏹		
• =	0 •	50 v 🔊 0	· • \	0 •	Explorer	Attach	٥	Models		
			[4]	0		Tools 🔻	۵	Models Flyout		
	Attr	ibutes				Pr	imary			

C. Note the Microstation Sheet Model **Type** in this file.

🗇 Mod	lels					- 🗆 X							
)	OI 🎒	X Y											
Type	2D/3D	Name	Description	*	Design File	Sheet Number							
인		Default	Master Model	×	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	gr							
La I		L - 004		×	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	yr 004							
Cà l		L - 005		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	jr 005							
Cà		L - 006	L - 006 ✓ C:\NCDOT Trai\R-2635C_RDY_PLS.dgr 006										
La I		L - 007	107 C:\NCDOT Trai\R-2635C_RDY_PLS.dgr 007										
La I		L - 008	- 008 ✓ C:\NCDOT Trai\R-2635C_RDY_PLS.dqr 008										
La I		L - 009		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	jr 009							
D		L - 010		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	gr 010							
La I		L - 011		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	yr 011							
La I		L - 012		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	gr 012							
Ca l		L - 013		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	yr 013							
Cà l		L - 014		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	gr 014							
La I		L - 015		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	gr 015							
La I		L - 016	C:\NCDOT Trai\R-2635C_RDY_PLS.dgr 016										
		L - 017		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	gr 017							
Ca		L - 018		\checkmark	C:\NCDOT Trai\R-2635C_RDY_PLS.dg	gr 018							
La		L - 019		~	C:\NCDOT Trai\R-2635C RDY PLS.do	ar 019							

- D. Double click on any of these Microstation Sheet Models to take you to that plan sheet. You can also right click on these to get more options.
- E. You can also access the Microstation Sheet Models from the **View Group** pull down at the bottom left corner of the screen.

		Name	Model	
		🔁 Default	P Default	
		🔁 L - 004 Views	L - 004	
		🔁 L - 005 Views	L - 005	
		🔁 L - 006 Views	🕒 L - 006	_ 11
		🔁 L - 007 Views	🕒 L - 007	
		🔁 L - 008 Views	🕒 L - 008	
		🔁 L - 009 Views	🕒 L - 009	
		🔁 L - 010 Views	🕒 L - 010	
		🔁 L - 011 Views	🕒 L - 011	
		🔁 L - 012 Views	🕒 L - 012	
		🔁 L - 013 Views	🕒 L - 013	
1 5 2		🔁 L - 014 Views	🕒 L - 014	
55				-
	-	🔁 L - 007 Views 🔹	1 2 3 4 5 6 7 8	لې
	Element Selection > Ide	entify element to add to set		



Note in each Microstation Sheet Model, the drawings and the NCDOT Unit **TBB** file are referenced in. Additionally, the **Project STIP Number** and **sheet number** fields are also filled in.



Exercise 3 – Named Boundaries for Interchange Sheets

This exercise focuses on creating the Named Boundaries for the interchange sheets first. Then create the surrounding Named Boundaries. Careful upfront planning should be exercised.

- A. Open the R-2635C_NCDOT_PPL_INTERCHANGE.dgn file in the WorkSet folder.
- B. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.

Drawing Production		Drawing	Util	ities Co	llaborate	View	Help	NCDOT Roadway					
ce Style Manager	Place Pla Note Lab	Ace Place Text	A 1 Edit Text	A ⁴ Change Tex Attributes	ABC A ^A , t A →	Civil Labeler	Element Annotation •	Drawing Model Annotation •	Cross Section Navigator		Named Boundary •		1"=50'
Tables	Notes			Text	E.	Labels	An	notations 🕞	Review	Nam	Place	Name	ed Boundary
											🛗 Adjus	t Prof	file Named Boundary

C. Choose the **Civil Plan** tool to change the data fields in the dialog box to reflect the data needed for plan sheet layout.

Contract Place Named Bo	undary Civil Plan —	\times							
	┍┓╒┚ ▥ 🖏 🖍 🖂 🖂								
Drawing Seed:	(none) 🔹								
Detail Scale:	Full Size 1 = 1								
Name:	Plan 1								
Description:									
Group: (New)									
Name:	Untitled								
Description:									
Start Location:		◀							
Stop Location:									
Length:	1400.000000	00							
Left Offset:	-450.000000	00							
Right Offset:	450.000000	00 Instantial							
Overlap:	0.000000	00 Instanted							
Boundary Chords:	5								
	Create Drawing								
	Show Dialog								

D. Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.



E. Select the **100 Scale Plan** *Drawing Seed*.

Note: The **Drawing Seed** defines default values and other parameters required to create sheets. For an interchange layout, you may place it on a **100 Scale 22"X34"** (ANSI D) paper or on a **50 Scale Interchange Detail Sheet 34"x62"** paper. The **Drawing Seeds** for *Civil Plan* mode are:

Drawing Seed:	Plan 100 Scale
Detail Scale:	Name
Name:	(none)
Description:	Earthwork
C	Plan 20 Scale
Group:	Plan 50 Scale
Name:	Plan 100 Scale
Description:	Plan and Profile 50 Scale - PLAN
Start Location:	Plan Interchange Detail 50 Scale
Stop Location:	Plan-Plan 50 Scale

Note the **Detail Scale** automatically changes to **1**" = **100'** and the **Length** and **Offset** of the sheet boundary and **Boundary Chords** change to accommodate the 1" = 100' scale.

- F. Set the first **Name** field to be **006** since we have estimated sheet 4 and sheet 5 will come before our first interchange sheet.
- G. Key-in 100 Scale Interchange Sheet as the Description.
- H. Set the *Group* to **New** to create a new named boundary group. Once named boundaries have been created for alignments, the names of the boundary groups appear here to be chosen later if necessary.
- I. Set the second *Name* field to be **L** to coincide with the alignment name. This second name is the name of the **Group** of named boundaries used along the **L** alignment. This field may also be automatically set when a horizontal alignment is selected.
- J. A **Description** can be entered but the Name alone is typically sufficient.
- K. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the mainline **L alignment** on screen.

File Saving > Identify Path Element



L. Key-in the Start (325+00) and Stop (353+00) stations on mainline chain -L- of the interchange sheet. This is usually 2800' stations in lengths for a typical interchange (twice the 1400' length of a regular 50 Scale sheet). Hitting Enter after the station key-in will lock the value indicated by the check mark on the left.



M. By default, it will split the left and right offsets at an even **1030'** on each side (100 Scale). In this layout we want to encompass more on top of the sheet so the left offset should be key-in as **-1220** and right offset should be adjusted to **840**.

Left Offset:	-1200.000000	00 Instant
Right Offset:	840.000000	oo

N. Uncheck Create Drawing and Show Dialog because we want to store just the named boundaries for now.

		Create	Dra	wing				
		Show	Dialo	og				
ام م	Data	Doint	in	+ha	20	View	+0	~~

O. Follow the prompt and **Data Point** in the **2D View** to accept placement of the boundaries as shown. **Data Point** three (3) times to complete the placement and dialog box should disappear.



Q. Locate the next interchange on **sheet 15** near the middle of the project.



R. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.

Drawing Production		Drawing Utilities		ties Coll	Collaborate Vie		Help	NCDOT Roadway								
ce Style Ne Manager	Place Pl Note La	ace abel	A Place Text	A 1 Edit Text	A ^A t Change Text Attributes		Civil Labeler	Element Annotation •	Drawing Model Annotation •	,	Cross Section Navigator		Na Boun	rmed ndary ▼		1"=50' ACS Plane Lock Annotation Scale
Tables	Notes	s		T	ext	E.	Labels	Anı	notations	G.	Review	Nam	2	Place	Name	d Boundary
													ш	Adjus	t Profi	ile Named Boundary

S. Choose the **Civil Plan** tool to change the data fields in the dialog box to reflect the data needed for plan sheet layout.

-						
🎉 Place Named Boundary Civil Plan 🛛 🗆						
	₽₽₩₩					
Drawing Seed:	(none) 🔻					
Detail Scale:	Full Size 1 = 1					
Name:	Plan 1					
Description:						
Group:	(New) 🔻					
Name:	Untitled					
Description:						
Start Location:		◀				
Stop Location:						
Length:	1400.000000	00 [initiatian]				
Left Offset:	-450.000000	00 [initial]				
Right Offset:	450.000000	00 [initiatiat				
Overlap:	0.000000					
Boundary Chords:	5					
	Create Drawing					
	Show Dialog					

T. Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.



U. Select the **Plan 100 Scale** *Drawing Seed*.

Note: The **Drawing Seed** defines default values and other parameters required to create sheets. For an interchange layout, you may place it on a **100 Scale 22"X34"** (ANSI D) paper or on a **50 Scale Interchange Detail Sheet 34"x62"** paper. The **Drawing Seeds** for *Civil Plan* mode are:

Drawing Seed:	Plan 100 Scale
Detail Scale:	Name
Name:	(none)
Description:	Earthwork
Contraction	Plan 20 Scale
Group:	Plan 50 Scale
Name:	Plan 100 Scale
Description:	Plan and Profile 50 Scale - PLAN
Start Location:	Plan Interchange Detail 50 Scale
Stop Location:	Plan-Plan 50 Scale

Note the **Detail Scale** automatically changes to **1**" = **100**' and the **Length** and **Offset** of the sheet boundary and **Boundary Chords** change to accommodate the 1" = 100' scale.

- V. Set the first Name field to be **015** since we have estimated sheet 7 thru 14 will come before this interchange sheet.
- W. Key-in 100 Scale Interchange Sheet as the Description.
- X. Set the *Group* to **L** to add to the **006** named boundary created in this group.
- Y. A **Description** can be entered but the Name alone is typically sufficient.
- Z. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the mainline **L alignment** on screen.

File Saving > Identify Path Element



AA. Key-in the Start (465+00) and Stop (493+00) stations on mainline chain -L- of the interchange sheet. This is usually 2800' stations in lengths for a typical interchange (twice the 1400' length of a regular 50 Scale sheet). Hitting Enter after the station key-in will lock the value indicated by the check mark on the left.

• • • •				
	\sim	Stop Location:	353+00.00	
	~	Start Location:	325+00.00	◀

BB. By default, it will split the left and right offsets at an even **1030'** on each side (100 Scale). These values may need to be re-entered if it holds the same values from the previous steps.

Left Offset:	-1030.000000	oO
Right Offset:	1030.000000	oO

CC. Uncheck Create Drawing and Show Dialog because we want to store just the named boundaries for now.

Create Drawing
Show Dialog

DD.Follow the prompt and **Data Point** in the **2D View** to accept placement of the boundaries as shown. **Data Point** three (3) times to complete the placement and dialog box should disappear.

Saving > Accept/Reject. Identify Path start point to place bound

For the purpose of this exercise, we are done with the two (2) interchange sheets. The next exercise will be creaating the surrounding sheets.





Exercise 4 – Named Boundaries Surrounding Interchange Sheets

This exercise focuses on creating the Named Boundaries surrounding the interchange sheets after they have been created. Careful upfront planning should be exercised.

- A. Open the **R-2635C_NCDOT_PPL_INTERCHANGE.dgn** file in the **WorkSet** folder.
- B. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.



C. Choose the Civil Plan tool to change the data.

	-				
🏀 Place Named Boundary Civil Plan 🛛 🗆					
	₽₽₩ 🖉 🖊 🖾 🖾				
Drawing Seed:	(none) 🔻				
Detail Scale:	Full Size 1 = 1				
Name:	Plan 1				
Description:					
Group:	(New) -				
Name:	Untitled				
Description:					
Start Location:		◀			
Stop Location:					
Length:	1400.000000	00 [10000001			
Left Offset:	-450.000000	00 [1000000]			
Right Offset:	450.000000	00 [1000000]			
Overlap:	0.000000	00 [1000000			
Boundary Chords:	5				
	Create Drawing				
	Show Dialog				



- D. Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.
- E. Select the **50 Scale Plan** *Drawing Seed*.

Note: The **Drawing Seed** defines default values and other parameters required to create sheets. The **Drawing Seeds** for *Civil Plan* mode are:

Note the **Detail Scale** automatically changes to **1**" = **50**' and the **Length** and **Offset** of the sheet boundary and **Boundary Chords** change to accommodate the 1" = 50' scale.

F. Set the first Name field to be **004** since NCDOT begins their plan sheets at sheet 4. The first Name field defines the **root name** of each of the named boundaries. Using the name **Plan 004** begins the incremental numbering with the first named boundary.

Name Specified in Dialog 004

First Named Boundary 004 Second Named Boundary 005 Third Named Boundary 006



- G. A **Description** can be entered but the Name alone is typically sufficient.
- H. Set the Group to L to add to the **006** and **015** named boundaries created in this group.
- Set the second Name field to be L to coincide with the alignment name. This second name is the name of the Group of named boundaries used along the L alignment. This field may also be automatically set when a horizontal alignment is selected.
- J. A **Description** can be entered but the Name alone is typically sufficient.
- K. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the mainline **L alignment** on screen.

File Saving > Identify Path Element

L. Select the left arrow to lock it to the beginning of the horizontal alignment. We know the sheet 006 (interchange) begins on station 325+00 so this will be Stop Location for sheet 005. Key-in 325+00 for the Stop Location and hit Enter to lock it.

Start Location:	305+00.00	◀
Stop Location:	325+00.00	

 M. The two sheets (004 and 005) can accommodate up to 2800' stations in length. Therefore, we can adjust the beginning of sheet 004 to have more room by keying-in 297+00 (305+00 – 800) as the Start Location. This results in evenly distributing 1400' stations of length between the two (2) sheets.

		Start Location:	297+00.00	◀
		Stop Location:	325+00.00	▶
N.	Uncheck the Cr	eate Drawing a	nd Show Dialog box.	
			Create Drawing	

_	1	-
	Show Dialog	

O. Follow the prompt and **Data Point** in the **2D View** to accept placement of the boundaries as shown.

Place Named Boundary Civil Plan > Accept/Reject. Identify Path start point to place boundary





- P. Continue to sheet **007** after sheet **006** (interchange).
- Q. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.



- R. Choose the Civil Plan tool to change the data
- P. Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.
- Q. Select the **50 Scale Plan** *Drawing Seed*.
- R. Set the Name field to 007.
- S. A **Description** can be entered but the Name alone is typically sufficient.
- T. Set the Group to L.
- U. A **Description** can be entered but the Name alone is typically sufficient.
- V. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the mainline **L alignment** on screen.

File Saving > Identify Path Element



W. Key-in **353+00** for **Start location** and **465+00** as the **Stop Location** and hit **Enter**.



X. Uncheck the Create Drawing and Show Dialog box.

Create Drawing
Show Dialog

Y. Follow the prompt and **Data Point** in the **2D View** to accept placement of the boundaries as shown.

Place Named Boundary Civil Plan > Accept/Reject. Identify Path start point to place boundary



AA. Continue to sheet **016** after sheet **015** (interchange).

BB. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.

Drawing	Production	Drawing	Util	lities Co	laborate	View	Help	NCDOT Roadway					
ce Style ble Manage	Place Pla Note La	ace Plac bel Tex	A f e Edit t Text	A ⁴ Change Tex Attributes		Civil Labeler	Element Annotation •	Drawing Model Annotation •	Cross Section Navigator		Named Boundary •		1"=50'
Tables	Notes			Text	Fa	Labels	An	notations 🕞	Review	Nam	Place	Name	ed Boundary
											🛗 Adjus	st Prof	ile Named Boundary

CC. Choose the Civil Plan tool to change the data

DD.Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.

- EE. Select the **50 Scale Plan** Drawing Seed.
- FF. Set the Name field to 016
- GG. Set the Group to **L**.



- HH. A Description can be entered but the Name alone is typically sufficient.
- II. Note the prompt in the lower left corner asking to Identify Path Element. The user will graphically select the mainline L alignment on screen.



JJ. Key-in 493+00 (Sheet 016) for Start Location and 689+00 (Sheet 029) as the Stop Location and hit Enter.

	Start Location:	493+00.00	◀
	Stop Location:	689+00.00	
eate Drawing and Show Dialog box.			

KK. Uncheck the Cr



MM. Follow the prompt and Data Point in the 2D View to accept placement of the boundaries as shown.



OO. Continue to sheet 030 top of the first interchange sheet 006.

PP. Under the Drawing Production Tab \rightarrow Named Boundary tool group \rightarrow Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.







RR. Uncheck the boxes for the Start Location and Stop Location if they are checked.

SS. Select the **50 Scale Plan** Drawing Seed.

TT. Set the Name field to 016

UU. Set the Group to (New).

VV. Set the second **Name** field to be **Y8** to coincide with the alignment name. This second name is the name of the Group of named boundaries used along the **Y8** alignment. This field may also be automatically set when a horizontal alignment is selected.

WW. A **Description** can be entered but the Name alone is typically sufficient.

XX. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the **Y8** alignment on screen.

File Saving > Identify Path Element

YY. Deviation from Normal Layout

Normally it is customary to use the horizontal alignment lengthwise (1400' at 50 Scale) to layout the named boundaries. In this situation, we will need to use the sheet "width-wise" to accommodate the two-way loops\ramps.

Key-in 8+70 for Start Location and 19+00 as the Stop Location and hit Enter.

Start Location:	8+70.00	◀
Stop Location:	19+00.00	

ZZ. Key-in 1030 as the Length, -700 as the Left Offset, 700 as the Right Offset.

	Length:	1030.000000	00 Instanted	
	Left Offset:	-700.000000		
	Right Offset:	700.000000	00	
AAA. Uncheck the Create Drawing and Show Dialog box.				

Create Drawing
Show Dialog





BBB. Follow the prompt and **Data Point** in the **2D** View to accept placement of the boundaries as shown.

- CCC. Continue to sheet **031** bottom of the first interchange sheet **006**.
- DDD. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.
- **EEE.** Choose the **Civil Plan** tool to change the data Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.
- FFF. Select the **50 Scale Plan** Drawing Seed.
- GGG. Set the Name field to 031.
- HHH. Set the **Group** to **Y8.**
- III. Set the second **Name** field to be **Y8** to coincide with the alignment name. This second name is the name of the Group of named boundaries used along the **Y8** alignment. This field may also be automatically set when a horizontal alignment is selected.
- JJJ. A **Description** can be entered but the Name alone is typically sufficient.
- KKK. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the **Y8** alignment on screen.



I'm going to assume you know how to do all of these steps now, and I'll just show the end result of these exercises. If you're still not sure on the steps, refer to previous examples. – A tired intern

LLL. Key-in **38+15** for Start Location and **52+14** as the **Stop Location** and hit **Enter**. Note that depending on the sensitivity, when keying-in the full 1400' station (52+15) to a sheet, it sometime wants to create two (2) named boundaries, instead of one.

MMM. Reset and take the default Length, Left Offset and Right Offset.

NNN. Uncheck the Create Drawing and Show Dialog box.

OOO. Follow the prompt and **Data Point** in the **2D View** to accept placement of the boundaries as shown.



- PPP. Continue to sheet **032** on -**Y11** next crossing grade separation. This part of the exercise we will be placing a new type of sheet, **Plan (Top)-Plan (Bottom).** It's similar to the dual-profile sheet.
- QQQ. Under the *Drawing Production* Tab → *Named Boundary* tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.
- **RRR.** Choose the **Civil Plan** tool to change the data Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.

SSS. Select the **50 Scale Plan-Plan** Drawing Seed.



TTT. Set the **Name** field to **032T**. "T" is the top part of the sheet. (set it to 033T if the previous steps made 2 named boundaries)

UUU. Set the Group to (New).

- VVV. Set the second **Name** field to be **Y11** to coincide with the alignment name. This second name is the name of the Group of named boundaries used along the **Y11** alignment. This field may also be automatically set when a horizontal alignment is selected.
- WWW. A **Description** can be entered but the Name alone is typically sufficient.
- XXX. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the **Y11** alignment on screen.
- YYY. Key-in 8+50 for Start Location and 16+50 as the Stop Location and hit Enter.
- ZZZ. Key-in 800 as the Length and accept the default values for Left Offset and Right Offset.
- PPP. Uncheck the **Create Drawing** and **Show Dialog** box.
- QQQ. Follow the prompt and **Data Point** in the **2D View** to accept placement of the boundaries as shown.





- RRR. Continue to sheet **032** on **-Y11** next crossing grade separation. This part of the exercise we will be placing a new type of sheet, **Plan (Top)-Plan (Bottom).** It's similar to the dual-profile sheet.
- SSS. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.
- **TTT.** Choose the **Civil Plan** tool to change the data Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.

UUU. Select the **50 Scale Plan-Plan** Drawing Seed.

VVV. Set the Name field to 032B. "B" is the bottom part of the sheet. (or 033B)

WWW. Set the **Group** to **Y11.**

- XXX. Set the second **Name** field to be **Y11** to coincide with the alignment name. This second name is the name of the Group of named boundaries used along the **Y11** alignment. This field may also be automatically set when a horizontal alignment is selected.
- YYY. A **Description** can be entered but the Name alone is typically sufficient.
- ZZZ. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the **Y11** alignment on screen.

AAAA. Key-in 23+50 for Start Location and 35+49 as the Stop Location and hit Enter.

BBBB. Key-in **1200** as the **Length** and accept the default values for **Left Offset** and **Right Offset**.

CCCC. Uncheck the $\ensuremath{\text{Create Drawing}}$ and $\ensuremath{\text{Show Dialog}}$ box. so close to cccp







You may choose to complete the other intersections the same manner, but this part of the exercise is complete.

Once they are complete, use the **Named Boundary Manager** to inspect the named boundaries and their **Groups**.



Next, we will focus in joining the overlapping named boundaries at their **Match Line** locations. Page | 72


Exercise 5 – Crossing Road Match Lines

After placing the Named Boundaries on the surrounding sheets, the next step is to merge the two (2) Named Boundaries together, therefor eliminating any overlap. This is done with basic Microstation commands at the Match Line location.

A. Locate the first interchange sheet **006** at the top where it overlaps with sheet **030**.



B. Under the *Drawing* Ribbon Tab, *Modify* Tool Group, select **Insert Vertex**.

Drawing Utilities Collaborate View Help NCDOT Roadway	
◎ @ [] X / / / / O T + T * T	
Fence Place Place Arc Move Con	V. Rotate
Tools 🖲 🖣 🕈 SmartLine Line Tools 🔻 🕅 🕇 A 🔻	Cline * Element Element Multiple * Delete Vertex
Selection Placement N	Anipulate Modify / Extend Line

C. Select the top part of the **006** Named Boundary and **Insert Vertex** to where the two (2) named boundaries intersects on the left of **030**. Use **Intersection** snap mode.

	« 🕺 🖉	
	shape Level: Sheet_Named_Boundary	((none))
SPECIAL LATERAL V-DITCH WITH CLASS 197 BP RAP	Named Boundary: Y8: 17	
FROM SING STOO SOLO SING SEE DETAIL #16		



D. Select the same top part of the **006** Named Boundary and **Insert Vertex** to the right where it intersects with **030**.



E. Select **Modify Element** and click on the adjacent point on the **006** Named to the left (inside) of the intersection point and place it on the bottom right corner of **030**.





- F. Do the same (Modify Element) for the left bottom corner of 030.
- G. The remaining **vertices** inside **030**, use the **Delete Vertex** tool to remove them forming the two (2) merged named boundaries.

Drawing Utilities	Collaborate View Help NCDOT F	loadway			
 (i) (i) (i) (i) (i) (i) (i) (i) (i) (i)	$\begin{array}{c c} & & & \\ & & & \\ Place \\ SmartLine \\ Line \\ \end{array} \begin{array}{c} & & \\ Place \\ Line \\ Tools \\ \end{array} \begin{array}{c} & & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ $	Move Copy Rotate 2	Modify Element Element Multiple	⊃, ⊃,	Insert Vertex Delete Vertex
Selection	Placement	Manipulate	Modify	1	Extend Line



H. Follow the same procedure for the other overlapping named boundaries. Use the same set of **basic Microstation Tools**.

After the drawings and sheets have been created, use **Microstation** to draw the **Match Lines** and use the **Civil Labeler** to place the **Match line Texts**. Do these things in the Microstation Drawing Model.



Module 13 – Sheeting





Exercise 6 - Profile Sheets

Now let's create the (base) Profile sheet boundary layout in the file *R*-2635C_NCDOT_PPL_INTERCHANGE.dgn (plan/profile layout) and write the profile sheets to this file *R-2635C_NCDOT_PRS.dgn*. (Note: Just like the plan sheets NCDOT is looking into creating a "PRD" file to put the drawings in and the "PRS" to put just sheets in).

- 1. Open the *R-2635C_NCDOT_PPL.dgn* in the WorkSet folder.
- 2. Have both the **Plan View** and **Profile View** opened. We will be working mostly in the Profile View.
- 3. Place Named Boundary Civil Profile
 - A. Workflow
 - 1. In the **PPL** open the **Profile View** (required).
 - 2. Select the Civil Profile Mode and Drawing Seed.
 - 3. Set the station limits as desired.
 - 4. Modify other fields and toggles as needed.
 - 5. Enable the **Create Drawing** toggle.
 - 6. **Data Point** in the **Profile View** to place boundaries.

A. Under the *Drawing Production* Tab \rightarrow *Named Boundary* tool group \rightarrow **Named Boundary** dropdown, choose the **Place Named Boundary Create** tool to access the Place Named Boundary dialog box.



B. `Choose the **Civil Profile** Mode to change the data fields in the dialog box to reflect the data needed for profile sheet layout.



Below are the descriptions of the data fields for creating profile drawings and sheets:

Setting Description



Setting	Description
Drawing Seed	Specifies the drawing seed that sets default values for all of the values on the dialog except the start and stop locations. Also contains definitions for what seed files are used to create the cross sections drawing and seed models including how the drawings are positioned on the sheets.
Detail Scale	Sets the scale at which the named boundary will be placed.
Name	Enter name of the named boundary.
Description	Enter brief description for the new group.
Group	Selects the named boundary group. You can also create a new group by selecting New from the drop-down.
Method	 Station Limits From Plan Group The limits of the profile boundaries will match the plan boundaries in the specified Plan Group.
Plan Group	Available if From Plan Group is selected as the method.
Group	Selects the named boundary group. You can also create a new group by selecting New from the drop-down.
Name	Enter name of the new group.
Description	Enter brief description for the new group.
Vertical Exaggeration	Specifies the vertical exaggeration for displayed profile. Values greater than 1.0 for this parameter increase the exaggeration.
Available Profile Height	The depth of view in model units (unscaled) that the profile view can display before needing to adjust and step the view.
Top Clearance	The height in model units (unscaled) above the profile that is maintained relative to the design and or terrain models in the view.
Bottom Clearance	The height in model units (unscaled) below the profile that is maintained relative to the design and or terrain models in the view.
Elevation Datum Spacing	When a profile is shifted, the starting elevation will always be a multiple of this this value.
Station Datum	The rounding applied to the station location when splitting the profile to



Setting	Description
Spacing	generate stepped profiles.
Profile Shifts	Datum Stations, Where Needed or Do Not Shift
Use Terrains	Enable to use active surface information in drawing the profile.
Use Active Vertical	Enable to use active vertical information in drawing the profile.
Whole Conduits Only	Draws whole conduits on a sheet.
Create Drawing	Opens the Create Drawing dialog after creating the named boundary to create a saved view from the selected named boundary and automate dynamic views.
Show Dialog	When enabled, a dialog with additional parameters set by the Drawing Seed is shown.

C. Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.

D. Select the **Profile - 50 Scale Profile** Drawing Seed. This will create a **Top** and **Bottom** (dual) Profile 1400' stations each per sheet.

Note: The **Drawing Seed** defines default values and other parameters required to create drawings and sheets. The Drawing Seeds for **Civil Profile** mode are:

Also note the Detail Scale automatically changes to **1**" = **50**' and the Length and other settings changed based on the Drawing Seed selected.

E. Set the first Name field to be **040** since the last plan sheet is **039**. This is just the continuation from the **last plan sheet** number.

F. A **Description** can be entered but the Name alone is typically sufficient.

G. Select Station Limits as the method.

Method:	Station Limits
Group:	Station Limits
Name:	From Plan Group



Note the other option is **From Plan Group.** From Plan Group uses the station limits based on the plan named boundaries. When the stations on the plan sheets match the stations on the profile sheet, sheet per sheet, sometime this desirable and standard. In this situation we have 100 scale interchange sheets (2800') so we are not able to match the plans. If From Plan Group is selected an option to select a Named Boundary Plan Group is made available.

H. Set the **Group** to **New** to create a new profile named boundary group.



I. The **Name** of the Profile Group will automatically be set to the vertical alignment name when you **Data Point** to the **Profile View**.

J. **Start Location: Data Point** in the **Profile View** and click on the **left arrow button** to the right of field to lock it to the beginning station (**305+00**)

Stop Location: Data Point in the **Profile View** and click on the **right arrow button** to the right of field to lock it to the ending station (688+31.97)

K. Check on Use Terrains, Use Active Vertical, Create Drawing and Show Dialog.



L. **Data Point** in the **Profile View** twice to accept and place the named boundaries. The **Create Drawing** dialog box should then appear.





Note that after the placement, the individual profile named boundaries can be adjusted up and down using the **Adjust Profile Named Boundary** tool

Drawing Pr	oduction D	Prawing Utilities	Collaborate	View	Help	NCDOT Roadway				
ce Style Manager	Place Place Note Label	A A f /	A [#] A ^{BC} A ^A nge Text A ^A ributes A ▼	Civil Labeler	Element Annotation •	Drawing Model Annotation •	Cross Section Navigator	Na Bour	amed adary •	
Tables	Notes	Text	E.	Labels	An	notations 🕞	Review	Nam 🛃	Place Name	d Boundary
								ш	Adjust Profi	le Named Boundary
	420- 415- 410- 405- 390- 395- 390- 375- 370- 365- 360- 355- 366- 360- 355- 350- 345- 346- 346- 346- 346- 345- 346- 346- 346- 346- 346- 346- 346- 346	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		1 20 40 40 40 40 40 40 40 40 40 40 40 40 40		Adjust Named E S S S Hig Lov Elevation Datu S S S S S S S S S S S S S S S S S S S	Boundary Civil Profile Elevation Soundary Civil Profile Elevation tart Station: 347+00.00 top Station: 361+00.00 h Elevation: 395.000000 w Elevation: 320.000000 im Spacing: 10.000000	m -		R



Create Drawing (Profile)

Most of the options have been filled in by default from the selection of the **Drawing Seed**. There are some values the user can override.

Vreate Drawing	×
M One Sheet Per	ode: Profile
View Name: Drawing Seed: View Type: Discipline: Purpose:	L - 040 Profile - Profile 50 Scale Civil Profile Civil Profile View
Model Name: Seed Model: Filename: Annotation Group:	Drawing Model L - 040 Profile - Profile_50_Scale.dgnlib, L - Profile - Pi R-2635C_RDY_PRD.dgn 1"=50' Profile Grid
Model Name: Seed Model: Filename: Sheets: A	Sheet Model L - 040-1 [Sheet] Profile - Profile_50_Scale.dgnlib, L - Profile - Pi R-2635C_RDY_PRS.dgn (New) Full Size 1 = 1 Optimize for
Drawing Boundary: Detail Scale :	I"=50' Add To Sheet Index Make Sheet Coincident Open Model



Each Item in the **CREATE DRAWING** box Description:

Setting	Description
Mode	Profile
Name	Shows the name of the saved view that will be created.
One sheet per Dgn	If on, each sheet model, and all drawing models attached to the sheet model, are created in an individual .dgn file in the selected folder. The name of each .dgn file created will match the name of the created saved view.
Drawing Seed	Defines the drawing seed template from which the detailing symbol style will be used for the callout.
View Type	Displays the saved view type. The saved view type displayed depends on the saved view settings in the seed file selected in the Drawing Seed drop-down list.
Discipline	Displays the discipline of the drawing. It can be modified from the saved view properties in the Properties dialog.
Purpose	Displays the purpose of the saved view. It can be modified from the saved view properties in the Properties dialog.
Seed Model	Displays the seed model from which the drawing model will be created. This seed model is derived from the template selected in the Drawing Seed drop-down list.
Filename	If on, you can select the file in which the drawing model will be created. By default, the drawing model is created in the active file. You can create a new file that will contain the new drawing model by clicking Create New Drawing File icon. You can also create the drawing model in an existing file by clicking Browse Drawing File Browse Drawing File icon. Note: If you select an existing file to create the drawing model, make sure the file belongs to the same WorkSet, else the OK button in the dialog will be dimmed.
Annotation Scale	Sets the scale factor for text and dimensioning in the drawing model. The annotation scale of the drawing model is used as the detail scale when it is attached to a sheet. Note: Only the scales that match the master units of the seed file are populated in this drop-down list.



Setting	Description
Annotation Group	Selects the drawing annotation group that defines how drawing models are annotated. The drawing annotation group defines grids, XY coordinate labels, north arrows, frame annotation, etc. that are created in the drawing model and are to be shown on the final sheet. Annotation groups are found in the OpenRoads Standards under Annotation Groups.
Seed Model	If on, you can select the seed model from which the sheet model will be created. This seed model is derived from the template selected in the Drawing Seed drop-down list, except for the case when you place a named boundary using a drawing boundary with the Create Drawing check box turned on. In this case, the sheet-seed model is the one that contains the drawing boundary. This is to make sure that the drawing fits exactly in the selected drawing boundary.
Filename	If on, you can select the file in which the sheet model will be created. By default, the sheet model is created in the active file. You can create a new file that will contain the new sheet model by clicking Create New Sheet File icon. You can also create the sheet model in an existing file by clicking Browse Sheet File icon. Note: If you select an existing file to create the sheet model, make sure the file belongs to the same WorkSet, or else the OK button in the dialog will be dimmed.
Sheets	Sets the sheet model in which you want to place the drawing. You can also select New to create a new sheet model.
Annotation Scale	Sets the scale factor for text and dimensioning in the sheet model. Note: Only the scales that match the master units of the seed file are populated in this drop-down list.
Drawing Boundary	 Sets the drawing boundary in the sheet model where the drawing will be placed. This option lists the following: New - Creates a new drawing boundary. List of empty drawing boundaries (drawing boundaries that do not have a saved view attached) of same View Type contained in the sheet model selected in the Sheets drop-down list. If Sheets is set to New, lists the empty drawing boundaries of same view type available in the sheet-seed model. In this case, a new sheet model is created and the selected drawing boundary is filled with the saved view. If multiple



Setting	Description
	 saved views are to be placed then for each saved view a new sheet model is created and the saved view is placed with new drawing boundary. If Sheets is set to an existing sheet model, then the first saved view is placed in that sheet model, in the selected drawing boundary. For the remaining saved views, a new sheet model cloned from sheet seed model is created for each saved view and the saved view is placed in the selected drawing boundary in each sheet model. Optimize For - This option is available when you want to place multiple views and if the sheet model in which you want to place the saved views contains more than one drawing boundary of the same View Type. Following examples explain the use of this option in different scenarios
	 Say you want to place an array of four named boundaries of view type "Section" and the sheet model selected in the Sheets drop-down list contains five empty drawing boundaries of type "Section". In this case, if you select Optimize For , the name boundaries will be placed on the first four drawing boundaries, in the sequence of their drawing identifiers. This option is also available if you choose to create a new sheet model and if the sheet-seed model contains more than one drawing boundary of the same view type. Say you have six saved views to be placed and the selected sheet-seed model has only two empty drawing boundaries. If you select Optimize For, two saved views will be placed in the selected sheet models.
Detail Scale	 Sets the detail scale of the drawing attachment in the sheet model. In addition to standard scales, MicroStation calculates following recommended scales and displays them in this drop-down list: By Named Boundary - (Available only when you create dynamic view from a named boundary) The detail scale stored on the named boundary. Fit View to Drawing Boundary - The closest standard scale at which the saved view attachment will fit into the selected drawing boundary.



Setting	Description
	 Fit View to Sheet Boundary - The closest standard scale at which the saved view attachment will fit into the sheet boundary. Custom - allows you to define a custom scale. Note: Only the scales that match the master units of the seed file are populated in this drop-down list.
Add to Sheet Index	Adds the sheet model to the sheet index. Note: If some other user already has the sheet index in edit mode, the sheet model cannot be added to the sheet index. In such case, a message is displayed in the message center.
Select a folder from Sheet Index	Opens the Sheet Index Folder Picker from which you can select the folder in which the sheet model should be added.
Make Sheet Coincident	(Available only if the sheet model does not contain a drawing boundary) If on, the reference in the sheet model is made coincident with the design model. For this, if required, the sheet boundary is moved and rotated to fit around the reference. If off, the reference is moved and rotated so that it is attached at the center of sheet boundary.
Open Model	If this check box is on, the last sheet model that was created opens.



I. The check box for **One Sheet Per Dgn** if checked a DGN file will be created for each sheet. The NCDOT standard is leave this **unchecked**.

	Create Drawing		×
	М	ode: Profile	•
	One Sheet Per	Dgn:	
۱.	Verify default mode set	tings from the Drawing Seed selection.	
	View Name:	L - 040	
	Drawing Seed:	Profile - Profile 50 Scale	
	View Type:	Civil Profile	
	Discipline:	Civil	
	Purpose:	Profile View	
٢.	Drawing Model Options	s (Profile Annotation and Grid Lines):	
		Drawing Model	
	Model Name:	L - 040	
	Seed Model:	Profile - Profile_50_Scale.dgnlib, L - Profile - Pi	
	Filename:	R-2635C_RDY_PRD.dgn	4
	A	1"=50'	
	Annotation Group:	Profile Grid	

Filename (check to enable):

C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets**R**-2635C_RDY_PRD.dgn (Profile Drawings)

Note the two (2) icons to the right of this field i. The first folder icon is **Browse Drawing File** and the second icon with the "+" symbol is **Create New Drawing File**. *Browse Drawing File* will add drawings to the existing drawings already in the file. *Create New Drawing File* will create a new file to place the drawings in. If selecting *Create New Drawing File* and selecting an existing file, it will **DELETE** any the existing drawings in the file and make a fresh blank copy. If **Create New Drawing File** is selected, a seed file from the WorkSpace can be used.



{WorkSpace}\Configuration\Organization-Civil\NCDOT\Seed\Seed2D - English Design.dgn.

It is not necessary to choose a specific drawing seed since the software will place the Microstation Drawing Models in this file. The master Default Model (from the seed) is a Microstation Design Model.

In this exercise this is our first set of profile drawings, we can select **Create New Drawing File** and select the existing **PLD** file (blank) to put the drawings in. As you generate more drawings, you may select **Browse Drawing File** to add to it. **Annotation Group (Profile Grid** – set by default by the Drawing seed Selection):

L. Sheet Model Options (attaching the drawing to the sheet and scale it down to Full Size 1

= 1):		
	Sheet Model	
Model Name:	L - 040-1 [Sheet]	
Seed Model:	Profile - Profile_50_Scale.dgnlib, L - Profile - Pr	
Filename:	R-2635C_RDY_PRS.dgn	😑 📮
Sheets:	(New) 🔻	
A	Full Size 1 = 1	
Drawing Boundary:	Optimize for	
Detail Scale :	1"=50' 🗸	

Filename (check to enable):

C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets**R-**2635C_RDY_PRS.dgn (Profile Sheets)

Note the two (2) icons to the right of this field **Browse Sheet File** and the second icon with the "+" symbol is **Create New Sheet File**. Browse Sheet File will add sheets to the existing sheets already in the file. Create New Sheet File will create a new file to place the sheets in. If selecting Create New Sheet File and selecting an existing file, it will **DELETE** any the existing sheets in the file and make a fresh blank copy.

If **Create New Sheet File** is selected, a seed file from the WorkSpace can be used. {WorkSpace}\Configuration\Organization-Civil\NCDOT\Seed**Seed2D - English Design.dgn**.

It is not necessary to choose a specific sheet seed file since the software will place the Microstation Sheet Models in this file. The master Default Model (from the seed) is a Microstation Design Model.



In this exercise this is our first set of sheets, we can select **Create New Sheet File** and select the existing **PLS** file (blank) to put the sheets in. As you generate more sheets, you may select **Browse Sheet File** to add to it. Note the **Annotation Scale** is always set to **Full Size 1 = 1** for all sheets. The **Detail Scale** is based on the Drawing Seed selection and the scale of Ptofile Named Boundaries.

M. Add To Sheet Index should remain *uncheck* at this point. We will go over Sheet Indexing later in this training. **Open Model** should be *checked* on to display the last sheet when it has completed the process.

Add To Sheet I	ndex 🕒		
Make Sheet Coincident			
🔽 Open Model			
	<u>О</u> К	Cancel	

N. Review the created profile drawings and sheets. Remember to reference the Roadway Design Title Block Border (TBB) file to the WorkSpace Sheet Seed DGNLIB before creating the drawings and sheets or reference the TBB manually to the sheets afterward.





Now that we created sheets let's look at where all the links are located:

O. Go back to the *R-2635C_NCDOT_PPL_INTERCHANGE.dgn* in the **WorkSet** folder and Select **Named Boundary Manager**. (It's the small square in the lower right-hand corner).

Drawing Production Draw	ving Utilities Collaborate	View Help	NCDOT Roadway				
e Style Place Place Label	A A f A f A f A f A f A f A f A f A f A	Civil Element Annotation	Drawing Model Annotation	Cross Section Navigator	Named Boundary v	Sheet Boundary	Full Size 1 = 1
Tables Notes	Text 🖙 L	abels	Annotations 🕞	Review	Named Boundaries	🔟 Sheet Boundar	/ Drawing Sca
						Named Boundari	es
						Manage named b named boundary	oundaries and groups
	Named Boundaries			_		×	
	🗙 🎗 * 🔞 🖂 i	·····	۰ 🖬 📰 🛞)] 🟒 🕫		-	
	Name T	Description	File Name		Show		
	Plan Groups						
	Profile Groups						
	⊿ L		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🗸		
	040		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🗸		
	041		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🔽		
	042		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🗸		
	043		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🗸		
	044		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🗸		
	045		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🗸		
	046		R-2635C_RDY_PPL_	INTERCHANGE.	dgn 🗸	-	

P. Select the Profile Group L or the individual Named Boundary. Notice the icons across the top that were greyed out now become active. The Name Boundary Manager (NBM) is where the named boundaries can be edited and renamed/re-numbered. The drawings and sheets can also be created from the NBM by enabling Show the Create Drawing Dialog, right mouse click on the Group or individual named boundary and select Create profile drawing.

RE	Rec Named Boundaries —						×
×	😤 🔻 🌚	8	 ∼	🍥 🔝 📑 🞯	<u>∠</u> σ=		Ŧ
Na	me	Ŧ	Description	File Name	Show the Crea	ate Drawir	ng Dialog
Þ	Plan Groups						
4	Profile Groups	5					
	⊿ L			R-2635C_RDY_PPL_IN	TERCHANGE.dgr	n 🗸	
	040			R-2635C_RDY_PPL_IN	TERCHANGE.dgr	n 🗸	
	041			R-2635C_RDY_PPL_IN	TERCHANGE.dgr	1 🗸	
	042			R-2635C_RDY_PPL_IN	TERCHANGE.dgr	1 🗸	
	043			R-2635C_RDY_PPL_IN	TERCHANGE.dgr	1 🗸	
	044			R-2635C_RDY_PPL_IN	TERCHANGE.dgr	→	
	045			R-2635C_RDY_PPL_IN	TERCHANGE.dgr	√	
	046			R-2635C RDY PPL IN	TERCHANGE.dar	√	-



Exercise 7 – Multiple Profiles Per Sheet

- A. Open the *R-2635C_RDY_PPL_DRWYS.dgn* in the Roadway\Sheets folder.
- B. Have both the **Plan View** and **Profile View** opened. We will be working mostly in the Profile View.

C. Place Named Boundary Civil Profile

B. Workflow

- 1. In the **PPL** open the **Profile View** (required).
- 2. Select the Civil Profile Mode and Drawing Seed.
- 3. Set the station limits as desired.
- 4. Modify other fields and toggles as needed.
- 5. Enable the **Create Drawing** toggle.
- 6. **Data Point** in the **Profile View** to place boundaries.
- 7. Repeat steps 1-6 for the second profile.
- 8. In the **Create Drawing** dialog box, select the previous sheet instead of **New**.
- 9. Place the second and consecutive profiles on the same sheet.
- D. Zoom in the area begin inning of -**Y11** with the two 100' driveways. Open the **Plan** and **Profile** Views for -**DRWY1**-.



E. Under the *Drawing Production* Tab →
 Named Boundary tool

group → Named

Page | 91

Boundary dropdown, choose the **Place Named Boundary Create** tool to access the Place Named Boundary dialog box.



F. Choose the **Civil Profile** Mode to change the data fields in the dialog box to reflect the data needed for profile sheet layout.





- G. Uncheck the boxes for the Start Location and Stop Location if they are checked.
- H. Select the **50 Scale Profile Profile** Drawing Seed. This will create a **Top** and **Bottom** (dual) Profile 1400' stations each per sheet.

Note: The **Drawing Seed** defines default values and other parameters required to create drawings and sheets. The Drawing Seeds for **Civil Profile** mode are:

Drawing Seed:	(none) 👻
Detail Scale:	Name
Name:	(none)
Description:	Plan and Profile 50 Scale - PROFILE
Description.	Profile - Profile 20 Scale
Method:	Profile - Profile 50 Scale
Plan Group:	Profile 20 Scale
Group:	Profile 50 Scale
Name:	Profile SSD Analysis
Description:	

Also note the Detail Scale automatically changes to 1" = 50' and the Length and other settings changed based on the Drawing Seed selected.

- I. Set the first Name field to be **Profile 1**.
- J. A **Description** can be entered but the Name alone is typically sufficient.
- K. Select Station Limits as the method.

Method:	From Plan Group
Plan Group:	Station Limits
Group:	From Plan Group

- L. Set the **Group** to **New** to create a new profile named boundary group.
- M. The **Name** of the Profile Group will automatically be set to the vertical alignment name when you **Data Point** to the **Profile View**.
- N. **Start Location: Data Point** in the **Profile View** and key-in **4+50** (allow for the 50' buffer before the beginning of the profile).

Stop Location: Data Point in the **Profile View** and click on the **right arrow button** to the right of field to lock it to the ending station (6+00)

Length: key-in 200 (allow for the 50' buffer after the end of the profile).

\sim	Start Location:	4+50.00	◀
\sim	Stop Location:	6+00.00	
	Length:	200.000000	oo



O. Check on Use Terrains, Use Active Vertical, Create Drawing and Show Dialog.



P. Data Point in the Profile View twice to accept and place the named boundaries. The Create Drawing dialog box should then appear.



Create Drawing (Profile)

Most of the options have been filled in by default from the selection of the **Drawing Seed**. There are some values the user can override.

Q. The check box for **One Sheet Per Dgn** if checked a DGN file will be created for each sheet. The NCDOT standard is leave this **unchecked**.

Vreate Drawing		×
Mode: One Sheet Per Dgn:	Profile	
R. Verify default mode settings	from the Drawing Seed selection.	

View Name:	DRWY1 - Profile 1
Drawing Seed:	Profile - Profile 50 Scale 🔻
View Type:	Civil Profile
Discipline:	Civil
Purpose:	Profile View





S. Drawing Model Options (Profile Annotation and Grid Lines):

		Drawing Model	
	Model Name:	DRWY1 - Profile 1	
	Seed Model:	Profile - Profile_50_Scale.dgnlib, L - Profile - P	
	Filename:	(Active File)	—
	A	1"=50' 🔹	
A	Annotation Group:	Profile Grid	

Currently multiple profile drawings can be placed on a single sheet only if they are in the active PPL file. This is a known bug in 10.10.21.

T. Sheet Model Options (attaching the drawing to the sheet and scale it down to Full Size 1

		٠	
-	1	۱	٠
_	-	1	٠

Sheet Model					
Model Name:	DRWY1 - Profile 1				
Seed Model:	Profile - Profile_50_Scale.dgnlib, L - Profile - Pi				
Filename:	(Active File)	— 📮			
Sheets:	(New) 🔻				
A	Full Size 1 = 1				
Drawing Boundary:	Profile - Profile 50 Scale - a 🔹				
Detail Scale :	1"=50' (By Named Boundary)				

U. Add To Sheet Index should remain *uncheck* at this point. We will go over Sheet Indexing later in this training. Open Model should be *checked* on to display the last sheet when it has completed the process.

Add To Sheet I	ndex 📴	
Make Sheet Co	pincident	
🛹 Open Model		
	<u>о</u> к	Cancel

V. After the sheet has been created, go back to the **Multi-Model Views** and focus on the second driveway. Open the **Plan** and **Profile** Views for -**DRWY2-**.



W. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary Create tool to access the Place Named Boundary dialog box.

Drawing Pro	oduction Dr	rawing Util	ities Coll	aborate	View	Help	NCDOT Roadway					
ce Style ble Manager	Place Place Note Label	A A f Place Edit Text Text	A ⁴ Change Text Attributes	ABC At At	Civil Labeler	Element Annotation •	Drawing Model Annotation •	Cross Section Navigator		Named Boundary •		1"=50'
Tables	Notes		Text	E.	Labels	Anı	notations 🕞	Review	Nam	🗹 Place	Name	ed Boundary
										🛄 Adjus	st Prof	ile Named Boundary

X. Choose the **Civil Profile** Mode to change the data fields in the dialog box to reflect the data needed for profile sheet layout.



- Y. Uncheck the boxes for the **Start Location** and **Stop Location** if they are checked.
- Z. Select the **50 Scale Profile Profile** Drawing Seed. This will create a **Top** and **Bottom** (dual) Profile 1400' stations each per sheet.

Drawing Seed:	(none)
Detail Scale:	Name
Name:	(none)
Description: Method:	Plan and Profile 50 Scale - PROFILE
	Profile - Profile 20 Scale
	Profile - Profile 50 Scale
Plan Group:	Profile 20 Scale
Group:	Profile 50 Scale
Name:	Profile SSD Analysis
Description:	

Note: The **Drawing Seed** defines default values and other parameters required to create drawings and sheets. The Drawing Seeds for **Civil Profile** mode are:

Also note the Detail Scale automatically changes to **1**" = **50**' and the Length and other settings changed based on the Drawing Seed selected. AA. Set the first Name field to be Profile **1**.

BB. A **Description** can be entered but the Name alone is typically sufficient.



CC. Select Station Limits as the method.

Method:	From Plan Group
Plan Group:	Station Limits
Group:	From Plan Group

DD.Set the **Group** to **New** to create a new profile named boundary group.

- EE. The **Name** of the Profile Group will automatically be set to the vertical alignment name when you **Data Point** to the **Profile View**.
- FF. **Start Location: Data Point** in the **Profile View** and key-in **4+50** (allow for the 50' buffer before the beginning of the profile).

Stop Location: Data Point in the **Profile View** and click on the **right arrow button** to the right of field to lock it to the ending station (6+00)

Length: key-in 200 (allow for the 50' buffer after the end of the profile).

\sim	Start Location:	4+50.00	◀
\sim	Stop Location:	6+00.00	▶
	Length:	200.000000	oo

GG.

Check on Use Terrains, Use Active Vertical,





HH.**Data Point** in the **Profile View** twice to accept and place the named boundaries. The **Create Drawing** dialog box should then appear.



Create Drawing (Profile) Page | 96



Most of the options have been filled in by default from the selection of the **Drawing Seed**. There are some values the user can override.

II. The check box for **One Sheet Per Dgn** if checked a DGN file will be created for each sheet. The NCDOT standard is leave this **unchecked**.

	Create Drawing		×		
	M	ode: Profile	-		
	One Sheet Per [Dgn:			
IJ.	Verify default mode set	tings from the Drawing Seed selection.			
	View Name:	DRWY1 - Profile 1			
	Drawing Seed:	Profile - Profile 50 Scale			
	View Type:	View Type: Civil Profile			
	Discipline:	: Civil			
	Purpose:	Profile View			
KK.	Drawing Model Options	(Profile Annotation and Grid Lines):			
		Drawing Model			
	Model Name:	DRWY1 - Profile 1			
	Seed Model:	Profile - Profile_50_Scale.dgnlib, L - Profile - P			
	Filename:	(Active File)			
		1"=50' 🔹			
	Annotation Group:	Profile Grid			

Currently multiple profile drawings can be placed on a single sheet only if they are in the active PPL file. This is a known bug in 10.10.21.



LL. **Sheet Model** Options (attaching the drawing to the sheet and scale it down to **Full Size 1** = **1**):

Sheet Model					
Model Name:		l Name:	DRWY2 - Profile 1		
	Seed	Model:	Profile - Profile_50_Scale.dgnlib, L - Profile - Pr		
	F	ilename:	(Active File)		
		Sheets:	DRWY1 - Profile 1-1 [Sheet]		
		A	Full Size 1 = 1 ▼		
Drawing Boundary:		oundary:	(New)		
Detail Scale :		il Scale :	1"=50' 💌		

Note the **Sheets** field should be set to the sheet model the first profile was drawn in. The **Drawing Boundary** option is whether you want to place the drawing on the top (where the first profile was placed) or bottom of the sheet.

MM. Add To Sheet Index should remain *uncheck* at this point. We will go over Sheet Indexing later in this training. Open Model should be *checked* on to display the last sheet when it has completed the process.

Add To Sheet Index	
Make Sheet Coincident	
Open Model	
<u>O</u> K	Cancel



Review the created profile drawings and

sheets. Move the referenced drawing around to arrange them as desired. You may also have to move the labels around to avoid clutter.









Exercise 7 – Plan (Top) - Profile (Bottom) Sheet

Now let's create the Plan (Top) - Profile (Bottom) sheet named boundary layout in the file *R*-*2635C_NCDOT_PPL_Y11-EXAMPLE1.dgn*. Y11 is **Jenks Road** the second grade separation to the right of the first interchange sheet **006**.

A. Open the *R-2635C_NCDOT_PPL_Y11-EXAMPLE1.dgn* in the WorkSet folder.

B. Have both the Plan View and Profile View opened.

C. Place Named Boundaries.

Workflow

- 1. In the PPL open the Plan and Profile Views of Y11 (required).
- 2. Select the Civil Plan Mode and Drawing Seed.
- 3. Set the station limits as desired.
- 4. Modify other fields and toggles as needed.
- 5. Disable the Create Drawing toggle.
- 6. Data Point in the Plan View to place boundaries.
- 7. Select the Civil Profile Mode and Drawing Seed.
- 8. Set the station limits as desired.
- 9. Modify other fields and toggles as needed.
- 10. Enable the Create Drawing toggle.
- 11. Data Point in the Plan View to place the named boundaries
- D. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.





E. In the **2D Plan View** select the **Civil Plan** mode to change the data fields in the dialog box to reflect the data needed for plan sheet layout.



- F. Uncheck the boxes for the Start Location and Stop Location if they are checked.
- G. Select the Plan And Profile 50 Scale PLAN Drawing Seed.
 Note: The Drawing Seed defines default values and other parameters required to create drawings and sheets. The Drawing Seeds for Civil Plan mode are:

🔏 Place Named Boundary Civil Plan – 🗆 🗙						
	P 🖬 🌒 🖍 📝 🗍					
Drawing Seed:	Plan and Profile 50 Scale - PLAN	·				
Detail Scale:	Name					
Name:	(none)					
Description:	Earthwork					
Group	Plan 20 Scale					
Group.	Plan 50 Scale					
Name:	Plan 100 Scale					
Description:	Plan and Profile 50 Scale - PLAN					
Start Location:	Plan Interchange Detail 50 Scale					
Stop Location:	Plan-Plan 50 Scale					

Also note the **Detail Scale** automatically changes to 1'' = 50' and the **Length** and **Offsets** of the sheet boundary and **Boundary Chords** change to accommodate the 1'' = 50' scale.

- H. Set the first Name field to be 004.
- I. A **Description** can be entered but the Name alone is typically sufficient.
- J. Set the Group to **New** to create a new plan named boundary group.
- K. The second **Name** of the Group field should be **Y11** to coincide with the alignment name. This field is automatically set when a horizontal alignment is selected.
- L. A **Description** can be entered but the Name alone is typically sufficient.
- M. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the **Y11** alignment on screen.



N. Key-in the Start Location (10+00) and Stop Location (24+00) and hit Enter.



Q. Follow the prompt and **Data Point** three (3) times in the 2D **Plan View** to accept placement of the boundaries as shown.



- S. Uncheck the boxes for the Start Location and Stop Location if they are checked.
- T. Select the **50 Scale Plan-Profile** Drawing Seed.
 Note: The Drawing Seed defines default values and other parameters required to create drawings and sheets. The Drawing Seeds for Civil Profile mode are:

	Drawing Seed:	Plan and Profile 50 Scale - PROFILE 🔻
	Detail Scale:	Name
	Name:	(none)
Page 102	Description:	Plan and Profile 50 Scale - PROFILE
	Description.	Profile - Profile 20 Scale
	Method:	Profile - Profile 50 Scale
	Group:	Profile 20 Scale
	Name:	Profile 50 Scale
	Description:	Profile SSD Analysis
	Start Location:	



- U. Set the first Name field to be 004.
- V. A **Description** can be entered but the Name alone is typically sufficient.
- W. Select From Plan Group as the Method.
- X. Select Y11 as the Plan Group.

Method:	From Plan Group 🔻	
Plan Group:	Y11 👻	

- Y. The second **Name** of the Group field should be **Y11** to coincide with the alignment name. This field is automatically set when a **Profile View** is selected.
- Z. A **Description** can be entered but the Name alone is typically sufficient.
- AA. **Verify** the other settings.

	Vertical Foreservations F 000000	
	vertical Exaggeration: 5.000000	
	Available Profile Height: 90.000000	
	Top Clearance: 0.000000	
	Bottom Clearance: 0.000000	
	Elevation Datum Spacing: 10.000000	
	Station Datum Spacing: 10.000000	
BB. Check t	he Create Drawing and Show Dialog box.	
	🧹 Use Terrains	
	🤝 Use Active Vertical	
	Full Last Boundary	
	Whole Conduits Only	
	Create Drawing	
	🧹 Show Dialog	





CC. Follow the prompt and **Data Point** three (3) times in the **2D Profile View** to accept placement of the boundaries as shown.

Create Drawing (Plan-Profile)

🜍 Create Drawing						×
Μ	lode: Plan and Profile	•				
One Sheet Per	Dgn:					
View Name:	Y11 - 004			View Name:	Y11 - 004	
Drawing Seed:	Plan and Profile 50 Scale - PLAN 🔻			Drawing Seed:	Plan and Profile 50 Scale - PROFILE -	
View Type:	Civil Plan			View Type:	Civil Profile	
Discipline:	Civil			Discipline:	Civil	
Purpose:	Plan View			Purpose:	Profile View	
	Drawing Model				Drawing Model	
Model Name:	Y11 - 004			Model Name:	Y11 - 004	
Seed Model:	Plan - Profile_50_Scale.dgnlib, L - Plan and Prc			Seed Model:	Plan - Profile_50_Scale.dgnlib, L - Plan and Pro	
Filename:	(Active File)		1	Filename:	(Active File)	
A	1"=50'				1"=50' -	
Annotation Group:	None			Annotation Group:	Profile Grid]
	Sheet Model				Sheet Model	
Model Name:	Y11 - 004			Model Name:	Y11 - 004	
Seed Model:	Plan - Profile_50_Scale.dgnlib, L - Plan and Prc			Seed Model:	Plan - Profile_50_Scale.dgnlib, L - Plan and Pro	
Filename:	(Active File)		4	Filename:	(Active File)	
Sheets:	(New)			Sheets:	(New) -	
<u>A</u>	Full Size 1 = 1				Full Size 1 = 1	
Drawing Boundary:	Plan and Profile 50 Scale - PLAN			Drawing Boundary:	Plan and Profile 50 Scale - PROFILE -	
Detail Scale :	1"=50'			Detail Scale :	1"=50' (By Named Boundary)	
	Add To Sheet Index					
	Make Sheet Coincident					
	Open Model					
					ОК С	ancel





DD.Drawing Model options (Plan): Filename (check on to enable): Browse Drawing File: C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets\R-2635C_RDY_PLD.dgn Annotation Group: Select desired North Arrow NAD Drawing Model

	Drawing Model		
Model Name	Y11 - 004		
Seed Model	Plan - Profile_50_Scale.dgnlib, L - Plan and Prc		
	R-2635C_RDY_PLD.dgn	-	4
A	1"=50' 🗸		
Annotation Group	NC_Plan Annotation NAD 83		

EE. Drawing Model options (Profile):

Filename (check on to enable):

Browse Drawing File:

C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets**R**-2635C_RDY_PRD.dgn

		Drawing Model	
	Model Name:	Y11 - 004	
	Seed Model:	Plan - Profile_50_Scale.dgnlib, L - Plan and Prc	
\checkmark	Filename:	R-2635C_RDY_PRD.dgn	😑 📮
	<u>A</u>	1"=50' 🔹	
	Annotation Group:	Profile Grid	



FF. Sheet Model options (Plan):

Filename (check on to enable): Browse Drawing File: C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets**R**-2635C_RDY_PLS.dgn

	Sheet Model		
Model Name:	Y11 - 004		
Seed Model:	Plan - Profile_50_Scale.dgnlib, L - Plan and Prc		
Filename:	R-2635C_RDY_PLS.dgn	=	4
Sheets:	(New) 👻		
A	Full Size 1 = 1		
Drawing Boundary:	Plan and Profile 50 Scale - PLAN <		
Detail Scale :	1"=50' 🗸		

GG. Sheet Model options (Profile): No user input required.

	Sheet Model	
Model Name:	Y11 - 004	
Seed Model:	Plan - Profile_50_Scale.dgnlib, L - Plan and Prc	
Filename:	(Active File)	+
Sheets:	(New) 🔻	
A	Full Size 1 = 1 ▼	
Drawing Boundary:	Plan and Profile 50 Scale - PROFILE	



HH.Check Open Model.



II. Click **OK** to create the drawings and sheets.





JJ. Verify with the Name Boundary Manager in the R-2635C_RDY_PPL_Y11-EXAMPLE1.dgn file.

	Named Boundaries				_		×
×	🧏 🕆 🕲 🖂 📖		ш 🛞	🔜 占 💿 🚄 🕫			Ŧ
Nam	e	T	Description	File Name			Show
. ▲ F	Plan Groups						
	▲ Y11			R-2635C_RDY_PPL_Y1	1-EXAMPI	E1.dgn	\checkmark
	Linked Profile Group	ups					
	004			R-2635C_RDY_PPL_Y1	1-EXAMPI	E1.dgn	~
I I F	Profile Groups						
	▲ Y11						~
	004			R-2635C_RDY_PPL_Y1	1-EXAMPI	E1.dgn	\checkmark
C	Cross Section Groups						
C	Other Groups						
•							


Exercise 8 – Plan (Top) - Plan (Bottom) Sheet

On some bridge projects with more than 1400' stations (less than 2800'), it may not be necessary to place them on two sheets. We can create the Plan (Top) - Plan (Bottom) sheet named boundary layout in the file *R-2635C_NCDOT_PPL_Y11-EXAMPLE2.dgn* to account for the extended limits without the need of two (2) sheets. Y11 is Jenks Road the second grade separation to the right of the first interchange sheet **006**.

A. Open the *R-2635C_NCDOT_PPL_Y11-EXAMPLE2.dgn* in the WorkSet folder.

- B. Have the **Plan View** opened.
- C. Place Named Boundaries

Workflow

- 1. In the **PPL** open the **Plan View** of **Y11** (required).
- 2. Select the Civil Plan Mode and Drawing Seed.
- 3. Set the station limits as desired.
- 4. Modify other fields and toggles as needed.
- 5. Enable the Create Drawing toggle.
- 6. **Data Point** in the **Plan View** to place the named boundaries

D. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.





E. In the **2D Plan View** select the **Civil Plan** mode to change the data fields in the dialog box to reflect the data needed for plan sheet layout.



- F. Uncheck the boxes for the Start Location and Stop Location if they are checked.
- G. Select the Plan-Plan 50 Scale Drawing Seed.
- H. Set the first Name field to be 004.
- I. A **Description** can be entered but the Name alone is typically sufficient.
- J. Set the Group to **New** to create a new plan named boundary group.
- K. The second **Name** of the Group field should be **Y11** to coincide with the alignment name. This field is automatically set when a horizontal alignment is selected.
- L. A **Description** can be entered but the Name alone is typically sufficient.
- M. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the **Y11** alignment on screen.
- N. Use the **left and right arrow buttons** to lock the beginning **Start Location** and ending **Stop Location** stations.
- O. Verify Length and Offsets.



P. Check on the Create Drawing and Show Dialog box.

 Create Drawing
 Show Dialog



Q. Follow the prompt and **Data Point** three (3) times in the 2D **Plan View** to accept placement of the boundaries as shown.





Create Drawing (Plan-Plan)

Vreate Drawing	×
M One Sheet Per	ode: Plan Dgn:
View Name: Drawing Seed: View Type: Discipline: Purpose:	Y11 - 004 Plan-Plan 50 Scale ▼ Civil Plan Civil Plan View
Model Name: Seed Model: Filename:	Drawing Model Y11 - 004 [Drawing] Plan - Plan_50_Scale.dgnlib, L - Plan Dual 50 S R-2635C_RDY_PLD.dgn 1"=50' NC_Plan Annotation NAD 83 NSRS 2007
Model Name: Seed Model: Filename: Sheets: Drawing Boundary:	Sheet Model Y11 - 004 [Sheet] Plan - Plan_50_Scale.dgnlib, L - Plan Dual 50 S R-2635C_RDY_PLS.dgn (New) Full Size 1 = 1 Plan-Plan 50 Scale - a
Detail Scale :	Add To Sheet Index Make Sheet Coincident Open Model <u>OK</u> Cancel



R. Drawing Model options:

Filename (check on to enable): Browse Drawing File: C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets\R-2635C_RDY_PLD.dgn Annotation Group: Select desired North Arrow NAD

	Drawing Model	
Model Name:	Y11 - 004 [Drawing]	
Seed Model:	Plan - Plan_50_Scale.dgnlib, L - Plan Dual 50 S	
Filename:	R-2635C_RDY_PLD.dgn	😑 📮
<u>A</u>	1"=50' 🔹	
Annotation Group:	NC_Plan Annotation NAD 83 NSRS 2007	

S. Sheet Model options:

Filename (check on to enable):

Browse Drawing File:

C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets**R-2635C_RDY_PLS.dgn**

Model Name:	Y11 - 004 [Sheet]	
Seed Model:	Plan - Plan_50_Scale.dgnlib, L - Plan Dual 50 S	
Filename:	R-2635C_RDY_PLS.dgn	😑 📮
Sheets:	(New) 🔻	
A	Full Size 1 = 1	
Drawing Boundary:	Plan-Plan 50 Scale - a 🔹	
Detail Scale :	1"=50' (By Named Boundary)	



T. Check Open Model.



U. Click **OK** to create the drawings and sheets. Adjustments to the reference file is sometime needed to move the named boundaries to fit within the borders.



V. Verify with the Name Boundary Manager in the R-2635C_RDY_PPL_Y11-EXAMPLE2.dgn file. Note you may rename 005 to **004B** (bottom) for clarity.

Name T	Description	File Name	Sho
Plan Groups			
⊿ Y11		R-2635C_RDY_PPL_Y11-EXAMPLE2.dgn	~
004		R-2635C_RDY_PPL_Y11-EXAMPLE2.dgn	~
005		R-2635C_RDY_PPL_Y11-EXAMPLE2.dgn	~
Profile Groups			
Cross Section Groups			
Other Groups			



Exercise 9 – Cross Section Sheets

Now let's create the cross section sheets. Note that the intent is each corridor is layout separately in order that intersecting corridors (grade separation) will not display, not unless this is desired by the user.

- A. Open the R-2635C_NCDOT_XPL_L.dgn (XS Port Layout) provided in the WorkSet folder: C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets
- B. Workflow
 - 1. Open both a 2D Plan and 3D Views (required).
 - 2. Select the Drawing Seed.
 - 3. Graphically ID the horizontal geometry in the 2D view.
 - 4. Set the Start and Stop station values.
 - 5. Modify other fields and toggles as needed.
 - 6. Enable the **Create Drawing** toggle.
 - 7. Data point in the 2D view to place named boundaries.
 - 8. Select **OK** on the **Create Drawing** dialog to create drawings and sheets.
- C. Under the Drawing Production Tab → Named Boundary tool group → Named Boundary dropdown, choose the Place Named Boundary tool to access the Place Named Boundary dialog box.



D. Select the Civil Cross Section mode.



NOTE: You must have both the 2D default view and the 3D model view open before you place the named boundaries.



Below are the descriptions of the data fields for creating plan sheets:

Drawing Seed	Specifies the drawing seed that sets default values for all of the values on the dialog except the start and stop locations. Also contains definitions for what seed files are used to create the cross sections drawing and seed models including how the drawings are positioned on the sheets.
Detail Scale	Sets the scale at which the named boundary will be placed.
Name	Enter name of the named boundary.
Description	Enter brief description for the new group.
Group	Selects the named boundary group. You can also create a new group by selecting New from the drop-down.
Name	Enter name of the new group.
Description	Enter brief description for the new group.
Start Location	Sets the begin station.
Stop Location	Sets the stop station.
Length	(Available only when By Length is selected) Sets the length, along the path element, of the named boundary element. Also determines the location, along the path, of subsequent boundary elements. If you use the Measure Distance tool next to the field the measured distance displays in the Length field.
Left Offset	(Available only when By Length is selected) Sets the distance from left of the path. If you use the Measure Distance tool next to the field, the measured distance displays in the Left Offset field.
Right Offset	(Available only when By Length is selected) Sets the distance from right of the path. If you use the Measure Distance tool next to the field, the measured distance displays in the Right Offset field.
Interval	Specifies the spacing between consecutive cross sections.
Vertical Exaggeration	Specifies the vertical exaggeration for displayed cross sections. Values greater than 1.0 for this parameter increase the exaggeration.
Top Clearance	Enables the top clearance to enter a value.
Bottom	Enables the bottom clearance to enter a value.



Clearance	
Elevation Datum Spacing	When a profile is shifted, the starting elevation will always be a multiple of this this value.
Include Event Points Only	Adds Horizontal and Vertical Event points.
Include Control Points	Adds cross sections at horizontal control points such as PC and PT.
Backward Facing	When toggled on, the named boundary is created from right to left instead of left to right. This causes a cut view that faces the descending direction of the alignment. It will be possible to open files created in 10.08.00.88 in this version and vice versa. The Backward Facing attribute will be true on named boundaries that are created with the Backward Facing option toggled on. It will be false otherwise.
Create Drawing	When enabled, the process to create the cross section sheets is automatically started after the named boundaries are created. When disabled, the named boundaries are created but the sheets are not created.
Show Dialog	When enabled, a dialog with additional parameters set by the Drawing Seed is shown.

E. Select the 20 Scale XS 150 LT-150 RT Drawing Seed.

Drawing Seed:	XS 10 Scale 150LT-150RT
Detail Scale:	Name
Group	(none)
Name	XS 5 Scale 75LT-75RT
D i ii	XS 10 Scale 150LT-150RT
Description	XS 20 Scale 300LT-300RT
Start Location	
1	

- F. Set the **Group** to **(New)**.
- G. The Name of the Group will automatically be set when selecting the horizontal alignment.



- H. **Description** is optional.
- I. Note the prompt in the lower left corner asking to **Identify Path Element**. The user will graphically select the **L** alignment on screen.
- J. Key-in the Start Location (310+00), Stop Location 320+00) and hit Enter.

\leq	
\sim	

•	·· · · ·	
Start Location:	310+00.00	◀
Stop Location:	320+00.00	



K. Verify remaining value based on the Drawing Seed selection.



Backward Facing

Show Dialog

M. **Data point** in the 2D view three (3) times to place the named boundaries.





Create Drawing (Cross Section)

Create Drawing	X
M One Sheet Per	ode: Cross Section
View Name:	L - 310+00.00
Drawing Seed:	XS 10 Scale 150LT-150RT
View Type:	Civil Cross Section
Discipline:	Civil
Purpose:	Section View
	Drawing Model
Model Name:	L - 310+00.00
Seed Model:	XS_10_Scale.dgnlib, L - 0+50.00
Filename:	R-2635C_RDY_XSD_L.dgn 🛑 📮
A	1"=10'
Annotation Group:	XS Grid with Annotation 10 Scale
	Sheet Model
	✓ Create Sheet Model
Model Name:	L - 310+00.00
Seed Model:	XS_10_Scale.dgnlib, L - 0+50.00 [Sheet]
Filename:	R-2635C_RDY_XSS_L.dgn 📁 📮
Sheets:	(New)
A	Full Size 1 = 1
Drawing Boundary:	XS 10 Scale 150LT-150RT
Detail Scale :	1"=10' (By Named Boundary)
	 Add To Sheet Index



N. Drawing Model options:

Filename (check on to enable):

Browse Drawing File:

 $\label{eq:c:NCDOT Training} Roadway \ Module \ 13 \ - \ Sheeting \ Roadway \ Sheets \ R-$

2635C_RDY_XSD_L.dgn

	Drawing Model	
Model Name:	L - 310+00.00	
Seed Model:	XS_10_Scale.dgnlib, L - 0+50.00	
Filename:	R-2635C_RDY_XSD_L.dgn	—
A	1"=10'	
Annotation Group:	XS Grid with Annotation 10 Scale	

O. Sheet Model options:

Filename (check on to enable):

Browse Drawing File:

C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets**R-2635C_RDY_XSS_L.dgn**

	Sheet Model Create Sheet Model	
Model Name:	L - 310+00.00	
Seed Model:	XS_10_Scale.dgnlib, L - 0+50.00 [Sheet]	
Filename:	R-2635C_RDY_XSS_L.dgn	😑 📮
Sheets:	(New) 👻	
A	Full Size 1 = 1	
Drawing Boundary:	XS 10 Scale 150LT-150RT	
Detail Scale :	1"=10' (By Named Boundary)	





P. Check the **Open Model** box and click the **OK** button to create drawings and sheets.



Exercise 10 – WorkSet and Sheet Index

Sheet Index is a core Microstation function to organize, group and re-number the WorkSet (Project) sheets. It works together with Microstation Print, Print Organizer, and Pen Tables (.tbl) to offer an extensive post-reproduction functionality. Sheet Index reads the WorkSet DGNWS file as its data source.

Project TIP Number

The **Project TIP Number** can automatically be entered on most sheets by directly editing the WorkSet **DGNWS** file. A DGNWS file is like any other DGN file you can open with Microstation. For most Projects, the DGNWS will be stored in a **WorkSet** folder. For this training, it is stored under:

{WorkSpace}\Configuration\Organization-Civil\Disciplines\NCDOT_Roadway\WorkSets**R-2635C (Training).dgnws**

- A. Open the file R-2635C (Training).dgnws.
- B. Click **File** >>> **Properties**.
- C. Under the WorkSet Properties heading key-in R-2635C as the Project Number.

Properties		_	×

- 4 🔀 Files (1)
 - 🔞 R-2635C (Training).dgnws

WorkSet Properties		~
Name	R-2635C (Training)	
Description		
Project Asset Type		
Project Industry		
Project Location		
Project Name		
Project Number	R-2635C	
Project Status		
WorkSpace	DOT-US North Carolina	

- D. Save Settings and Exit out of the file.
- E. Open a sheet model produced in earlier exercises and the **Project TIP Number** should automatically display in the upper right corner of the sheet.





Sheet Index

Workflow

- 1. Create the **folder structure**.
- 2. Edit the **folder properties**, e.g., starting sheet number.
- 3. Add sheet models into the folder (create sheet numbers).
- 4. Manage and access any sheets from any location within the **WorkSet** (Project).
- 5. Print, Print Organizer and PDF Creation
- A. Sheet Index can be edited from any DGN file within the WorkSet (Project). Open the **R**-**2635C_NCDOT_XPL_L.dgn** in the WorkSet folder.



B. Click on the **Explorer** tool button.

Home	Terrain	Geometry	Site	Corrido	ors M	odel Deta	ailing	Drawing P
ne	•	Default ((none))	•	•	Explorer	Attach Tools •	 • • • • • • 	I Not Series (Series (Seri
	Attr	ibutes				P	rimary	
					Explore Browse within a	r and man file	age the	e content

C. Click on the **Sheet Index** heading

Explorer	→ 🕂 🗙
🔞 File	~
📦 Items	~
🔗 Resources	~
JopenRoads Model	~
🕝 Sheet Index	^
🗘 🔣 😽 🥖 🧟 🔎 📲	
Ger Granning-RD_R-2635C	

D. Click on Open Sheet Index for Edit.

Exp	lorer	- ₽ ×
<u>18</u>	File	~
Ŷ	Items	~
	Resources	~
8	OpenRoads Model	~
y	Sheet Index	^
(2) 🔣 😂 💋 💁 🕫	
	Graining-RD R-2635C Open Sheet Index for Edit	

E. Click on Create Folder.

*
~
~
~
^

F. Key-in **Roadway** as the folder name.

Exp	lorer	▼ ₽ ×
<u>v</u> 8	File	*
ø	Items	~
	Resources	~
e	OpenRoads Model	~
ه	Sheet Index	^
(2) 🔣 😂 🧭 + - 🕼 🕞 🔈 🗶 🙀 🔎 🔐	
	Germanning-RD_R-2635C	
	👂 芦 Roadway	



G. While selecting the **Roadway** folder create a subfolder and name it **001 Title Typical Summary.**

Explorer	- ₽ X
🔀 File	♥
🗣 Items	~
🕞 Resources	~
🔮 OpenRoads Model	~
🕝 Sheet Index	^
🗘 🔣 😂 🗩 - 🕸 🕞 💪 🗙 🎑 🕫 🔐	
▲ 🛃 Training-RD_R-2635C	
🔺 📁 Roadway	
O01 Title Typical Summary	

H. While selecting the **Roadway** folder create a subfolder and name it **100 Plan**.

xplorer	→ 🕂 🗙
🔞 File	~
📦 Items	~
Resources	~
🕘 OpenRoads Model	~
G Sheet Index	^
🗘 🔣 😽 🧭 + - 🕸 🕞 🔈 🗶 🗙 🧝 🕫 🔡	
🔺 🛃 Training-RD_R-2635C	
🔺 📁 Roadway	
👂 📁 001 Title Typical Summary	
D 100 Plan	

I. While selecting the **Roadway** folder create a subfolder and name it **200 Profile**.

Expl	orer	- ₽ X
<u>v</u> 8	File	~
Ŷ	Items	~
	Resources	~
8	OpenRoads Model	~
g	Sheet Index	^
()	118 😂 🚫 + - 🕸 🕃 🔈 💙 💁 😕	
-	🛃 Training-RD_R-2635C	
	🔺 📁 Roadway	
	👂 📁 001 Title Typical Summary	
	▷ 📁 100 Plan	
	200 Profile	



J. While selecting the **Roadway** folder create a subfolder and name it **300 XS**.

Explorer	- + ×
6 File	*
📦 Items	~
Resources	~
JopenRoads Model	~
🕝 Sheet Index	^
🗘 🔣 😂 🖉 + - 🕸 🕞 🔈 🗶 🗶 🥘 🔎 🔡	
▲ 🛃 Training-RD_R-2635C	
🔺 📁 Roadway	
👂 📁 001 Title Typical Summary	
▷ 📁 100 Plan	
▷ 📁 200 Profile	
▷ 💭 300 XS	

Sheet index can be used to renumber any plan, profile or cross section sheet as long as it is a **Microstation Sheet Model**. In this exercise we will renumber the cross section (XS) sheets. **Before**

K. Right mouse click the 300 XS folder and select Properties.

Explorer		· + ×
🔞 File		*
😝 Items		*
Properties (Sheet Index)		→ ₽ ×
🔺 彦 Folder Link (1)		
C 200 XS		
→ 300 ×3		
General		^
Folder Name	300 XS	
Sheet Numbering Co	ntrols	*
Automatic Naming of Shee	On	
Increment	1	
Inherit Naming Rule From	Off	
Number of Digits	3	
Sheet Number Prefix		
Sheet Number Suffix		
Show Leading Zero	On	
Start Number	1	
Total Sheets Count	0	

L. Verify and edit if necessary these settings in Sheet Numbering Controls, Close the dialog





box and Save Settings.

- M. While selecting the **300 XS** folder click on **Add Sheet**.
- N. Browse to:

Page | 128

C:\NCDOT Training\Roadway\Training RD_R-2635C\Module 13 - Sheeting\Roadway\Sheets**R-2635C_RDY_XSS_L.dgn**

O. Select all the sheet models and click **OK**.



Sheets are now added to this folder and renumbered as part of the WorkSet (Project) Sheet Index.





You may access and open these sheets from any DGN file location (Windows file folder permissible) within the WorkSet (Project) simply by double clicking on it. **After**





Print, Print Organizer and PDF Creation

Unlike iPlot and iPlot drivers where we can directly print from Microstation to the plotter, the procedure now is to create a PDF and then print if necessary.

A. To create a **PDF** from a **Microstation Sheet Model**, simply click on the **Print** icon in the **Quick Access Toolbar** (upper left corner).



B. Note the default settings as configured in the WorkSpace. Adjust as needed and click **Print to File** to create the PDF.

Print (RD_pdf.pltcfg)	_		X
File Settings Resymbolization			_
Printer and Paper Size			
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Print Organizer (.pset) is similar to iPlot Organizer (.ips) in terms of functionality. It can be used to organize, group and store the WorkSet (Project) sheets for post-reproduction work.

A. **Print Organizer** can be accessed in a couple of ways. One method is through **Sheet Index**. Select the root folder of your Unit and click on **Open Print Organizer**.



B. Select **RD_PDF** as the **Print Style**.

5	Select Print Style		X
	Print Style Name	File Name	
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	4 Printer	PrintStyles.dgnlib	
	RD_PDF FS ANSI D 22x34	RD_Print_Style_PDF.dgnlib	



C. **Expand** the folder and select the sheets to create the PDF. (Click the folder icon on the left, not the individual sheets.)

Training-RD_R-2635C.pset - Print Organizer – 🗆 🗙										
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- E. In the Print dialog box, **Submit as** has two (2) options:
 - Separate print jobs each sheet in each PDF
 - Single print jobs all sheets in one PDF

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If **Separate print jobs** is selected, an option to **Output File Names** is available. Users can customize the **PDF file name** with **sheet numbers**.

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If Single print job is selected, the only option is to key in the desired PDF filename.

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	Open print file after creation
	OK Cancel

- F. Review the created PDF(s).
- G. Save this file (**R-2635C (Training).pset**) for future use in the appropriate Project folder. C:\NCDOT Training\Roadway\Module 13 - Sheeting\Roadway\Sheets



Exercise 11 - Front End Sheets – (1 Series Sheets)

The rest of the plan sheets such as **title, typical, details, summaries** are produced as in the past with design elements being drawn into the files.

The sheet borders for these types of sheets are contain in the cell library (.cel).

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<u>୍</u> ୱା		1	Title Sheet	\checkmark	C:\NCDOT_C\NCDOT_Sheets.cel				
<u>ତ</u> ା		1A	Index of Sheets, General Notes, and	\checkmark	C:\NCDOT_C\NCDOT_Sheets.cel				
<u>ତ</u> ା		1B	Conventional Symbols Sheet	\checkmark	C:\NCDOT_C\NCDOT_Sheets.cel				
<u>ତ</u> ା		Plan	Single Plan or Profile Sheet	\checkmark	C:\NCDOT_C\NCDOT_Sheets.cel				
<u>ତ</u> ା		Plan - Interchange Detail	34'x62"	\checkmark	C:\NCDOT_C\NCDOT_Sheets.cel				
<u>ତ</u> ୀ		Plan-Profile	Combination Plan and Profile Sheet	\checkmark	C:\NCDOT_C\NCDOT_Sheets.cel				
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Note there is also a seed file in the WorkSpace which can be used to create the Title, 1A and 1B Sheets.

```
{Workspace}\{Configuration}\WorkSpaces\DOT-US North
Carolina\Roles\NCDOT_Roadway\Standards\Seed\Seed2D -TSH_1A_1B.dgn
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	0 1		1A Design	Design Model 1A Sheet	\checkmark	C:\NC\Seed2D -TSH_1A_1B.dgn	
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	La		1B Sheet	Sheet Model 1B Sheet	\checkmark	C:\NC\Seed2D -TSH_1A_1B.dgn	003
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	_						



The Title sheet has a Design model that is referenced into the Sheet Model so it can be added to the Sheet Index. Below is an example of a new title Sheet referenced into a SHEET Model. There are only a few changes for this sheet in ORD



The seed file to start with is located here: C:\NCDOT_CONNECT_WORKSPACE\Configuration 10_10\Organization-Civil\NCDOT\Seed\Sheets\ Seed2D - English Design and 3 Sheets - ANSI D 22X34.dgn. This file contains 3 sheets set up for you to start and a design model to place the Title sheet border cell just as in V8i. The Title sheet will be produced as in the past in the Design model and then Referenced to a SHEET Model so it can be added to the Sheet Index for Printing. For this Training Module training this file has been provided To create the Title Sheet drawing model that the sheet model is created from will be provided in the Data set.

Create a base Title sheet from a seed file Create a new file with the above DGN used as a seed.



OpenRoads Designer 2023

 WorkSpace
 WorkSet
 Role

 DOT-US North Carolina * Training-RD_R-2635C * NCDOT_Roadway *

Recent Files

You haven't opened any files recently. To browse for a file, start by clicking on Browse.



Select new file

New - C:\NCI	DOT Training\Roadway\Training-RD_R-2635C\Module 13 -	Sheeting\Roadway\Sheets\		
Save in:	Sheets v 3 3	📂 🎞 🔻		
\wedge	Name	Date modified	Туре	Size
	Etchup Ketchup	6/4/2024 9:12 AM	File folder	
Home	🛿 R-2635C_RDY_PLD	6/18/2024 9:45 AM	Bentley MicroStation	960 KB
	🛿 R-2635C_RDY_PLS	6/18/2024 9:47 AM	Bentley MicroStation	768 KB
	R-2635C_RDY_PPL	6/12/2024 8:05 AM	Bentley MicroStation	524 KB
Desktop	R-2635C_RDY_PPL_DRWYS	6/4/2024 11:17 AM	Bentley MicroStation	588 KB
-	R-2635C_RDY_PPL_INTERCHANGE	6/18/2024 8:01 AM	Bentley MicroStation	2,092 KB
	R-2635C_RDY_PPL_Y11-EXAMPLE1	6/18/2024 9:25 AM	Bentley MicroStation	464 KB
Libraries	R-2635C_RDY_PPL_Y11-EXAMPLE2	6/18/2024 9:52 AM	Bentley MicroStation	468 KB
	R-2635C_RDY_PRD	6/18/2024 9:22 AM	Bentley MicroStation	3,216 KB
-	🔞 R-2635C_RDY_PRS	6/17/2024 11:16 AM	Bentley MicroStation	836 KB
This PC	₹ R-2635C_RDY_TBB	6/10/2024 9:27 AM	Bentley MicroStation	460 KB
<u></u>	R-2635C_RDY_TSH	6/4/2024 11:01 AM	Bentley MicroStation	464 KB
	R-2635C_RDY_TYP	8/7/2023 3:10 PM	Bentley MicroStation	556 KB
Network	🛿 R-2635C_RDY_VIC	6/4/2024 11:00 AM	Bentley MicroStation	460 KB
	R-2635C_RDY_XPL_L	6/19/2024 8:28 AM	Bentley MicroStation	488 KB
	R-2635C_RDY_XSD_L	6/18/2024 10:14 AM	Bentley MicroStation	1,220 KB
	R-2635C_RDY_XSS_L	6/19/2024 8:30 AM	Bentley MicroStation	588 KB

Navigate to the Folder: C:\NCDOT Training\Roadway\Training-RD_R-2635C\Module 13 - Sheeting\Roadway\Sheets

There is already a completed Title sheet provided in data set to create a sheet model with so we will name this training Title sheet: R-2635C_RDY_TSH_training.dgn. We will use the seed file: C:\NCDOT_CONNECT_WORKSPACE\Configuration 10_10\Organization-

Civil\NCDOT\Seed\Sheets\ Seed2D - English Design and 3 Sheets - ANSI D 22X34.dgn.

	File R-2635	C_RDY_TSH_TRAINING	~	Save
	Save as type:	MicroStation DGN Files (* dgn)	~	Cancel
Pag	Seed:	C:WCDDT_CONNECT_WORKSPACEIConfiguration_2023/Organize Seed2D - English Design and 3 Sheets - ANSI D 22X34.dgn		Browse



Select Save

We now have a blank file to start the Title sheet with.

Next we need to attach the Sheet Boundary Layout file Located here:

C:\NCDOT Training\Roadway\Training-RD_R-2635C\Module 13 - Sheeting\Roadway\Sheets\R-2635C_RDY_PPL.dgn

And, the Alignment file located here:

C:\NCDOT Training\Roadway\Training-RD_R-2635C\Module 13 - Sheeting\Roadway\Alignment\R-2635C_RDY_ALG.dgn

These files come in oriented north so we need to rotate the view 90 Deg. You can also use one of the borders to rotate the view by 2 points





We can now place a Title sheet cell from the

C:\NCDOT_CONNECT_WORKSPACE\Configuration_2023\Organization-Civil\NCDOT\Cell NCDOT_Sheets.cel select 1 for Title Cel You must use the Place Active Cell tool

Drawing Utilities Collaborate View Help NCDOT Roadway 🛈 🏵 — ☆ 80 Х t.... ţ, [[]]] P []]] $(\mathbf{\hat{n}})$ ΔN Arc Fence Place Place Move Copy Rotate \geq 昆 Ê • Ň Α -` Tools 🔻 Tools 🔻 SmartLine Line Selection Placement Manipulate **Place Active Cell**

Then, attach the cells to the file.



Place the active cell



The scale for the cell needs to be large to cover the sheet layout I used 17000. Place the cell so that the sheet boundary is in this general location.



Now we will manually place a sheet block to cover the area of the sheet boundary which only goes from matchline to matchline.

Sheets 1A and 1B have the sheet cell from NCDOT_ Sheets Cell library directly inserted into the sheet. (This process is the same as Microstation SS2 other that this needs to be done in a Sheet Model so the sheet can be added to the Sheet Index.)



Index of sheets, Standard Drawing List and General Notes- Sheet 1A

Sheets 1A and 1B have the sheet cell from NCDOT_ Sheets Cell library directly inserted into the sheet. (This process is the same as Microstation SS2 other that this needs to be done in a Sheet Model so the sheet can be added to the Sheet Index.)

As discussed before in this module vou can go to the Models (Select Home > Primary > Models) Drag and drop the sheet model project sheet Index folder.

	INDEX	de SHEETS	
	SHEET NUMBER	9467	
		TITLE SHEET	
	14	INDEX OF SHEETS GENERAL NOTES AND STANDARD DRAWINGS	
	18	CONVENTIONAL SYMBOLS	
	2A-1 THRU 2A-	RAVEMENT SCHEDULE AND TYPICAL SECTIONS	
	28-1 THERE 28-	HEXALINAX DE DALG	
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	30-1 THRU 30-	GEOTECHNICAL BUMMARIES	
	38-1	PARCELINDEX.SHEET	
	4 THRU	PLAN AND PROFILE SHEET	
	TMP-1 THELI TMP-	IPAR-PIC MANAGEMENT PLANC	
	PMP-1 THRU PMP-	FIN'S MENT MARKING PLANE	
	E-1 THRU E-	ELECTRICAL PLANS	
	EC-1 THRUEC-	EROSION CONTROL PLANS	
	RE-1 THRU RE-	REFORESTATION PLANS	
	BIGN-1 THRU SIGN-	STONING FLANS	
	BIG-1 THRU BIG-	SIGNAL PUNS	
	ITS-1 THRU ITS-	175 PLAN0	
	UC-1 THRU UC-	UTUITES CONSTRUCTION PLANS	
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Conventional Plan Sheet Symbols - Sheet 1B

Sheets 1A and 1B have the sheet cell from NCDOT_ Sheets Cell library directly inserted into the sheet. (This process is the same as Microstation SS2 other that this needs to be done in a Sheet Model so the sheet can be added to the Sheet Index.)

As discussed before in this module you can go to the Models (Select Home > Primary > Models) Drag and drop the sheet model to the project sheet Index folder.



sneets.

Typical Section Sheets - Sheet 2 (Series 2 sheets)



The Typical section sheet has a Design model that is referenced into the sheet Model so it can be added to the sheet index. sheet cell from NCDOT_ Sheets Cell library directly inserted into the sheet.

Plan sheets such as title, typical, details, summaries are produced as in the past with design elements being drawn into the files and a border referenced. The seed file to start with is located here: C:\NCDOT_CONNECT_WORKSPACE\Configuration 10_10\Organization-Civil\NCDOT\Seed\Sheets\ Seed2D - English Design and 3 Sheets - ANSI D 22X34.dgn. This file contains 3 sheets set up for you to start. The user will manually reference a design Model to a sheet Model for producing these sheets. This is a different workflow that the sheets semi-automatically produced for plan, profile, and cross section layout.

(This process is the same as Microstation SS2 other that this needs to be done in a Sheet Model so the sheet can be added to the Sheet Index.)

As discussed before in this module vou can go to the Models (Select Home > Primary > Models) Drag and drop the sheet model project sheet Index folder.

R-2635C_RDY_TYP.dgn (Typical Sections)





Printing: Exercise 10

NCDOT ORD workspace now uses Microstation print to produce PDF and plots.


The PLTCFG are located here C:\MICROSTATION_CONNECT_WORKSPACE-

10.10\Configuration\Organization-Civil\Disciplines\NCDOT_Roadway\Standards\Plot\ RD_pdf.pltcfg. This is the roadway example but other disciplines have a plot config in the same folder.

The Roadway pen table is also located in this folder : Roadway_CONNECT.tbl If you use the Roadway role the PLTCFG will setup your print dialog box for you to print.

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The Roadway_CONNECT.tbl still uses levels but also uses logical names to control printing.



Module 13 – Sheeting

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