This document guides you through creating a sheet file with multiple scales. First, we will be going over placing the sheet border around coordinate based model graphics. Then, we will go over attaching and scaling additional model files and lastly, placing text and dimensions in the sheet file. For setting up plan sheets see the CDOT Sheet File Creation document.

*Note:* This example uses details from the Bridge discipline. This procedure applies to any sheet file with multiple scales. If you are in another specialty, please substitute with your specialty group's information.

## Setting up the Sheet File with Multiple Scales:

## **Beginning a New Drawing File**

1. From the MicroStation Manager, select File > New.

File Directory Help		
Files:	Directories: C\Projects\00000\	3D - V8 DGN
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List Files of Type:	Drives:	
MicroStation DGN Files [*.dgn]		
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Show File Igons		
Workspace		
User	CDOT User	-
Project	00000	•
Interface:	CDOT	-

2. Enter a drawing file name that corresponds to the next consecutive sheet number and place it under the appropriate file location under C:\Projects\.....

New		
Directory		
Files	Directories:	
00000BridgeDetail01.dgn	C:\Projects\00000\Bridge\Drawings\	
	C:\ Projects (20000 Distrige Drawings Reference_Files Tabs	
File Type:	Drives:	
MicroStation DGN Files [*.dgn]		Help
Show File Igons		
Seed File		
	lobal\MicroStation\seed\Bridge 3D.dan	Select

3. Verify the **Seed File** corresponds to your discipline. If it does not, click Select and browse to C:\Program Files\Workspace\_CDOT\Standards-Global\MicroStation\Seed\...

New		
Directory		
Files	Directories:	
00000BridgeDetail01.dgn	C.\Projects\00000\Bridge\Drawings\	
	C) C) C) C) C) C) C) C) C) C)	<u>QK</u>
File Type:	Drives:	Cancel
MicroStation DGN Files [*.dgn]		Help
F Show File Igons		
Seed File \Workspace-CDOT\Standards-Gil	obal\MicroStation\seed\Bridge_3D.dgn	Select.

4. Highlight the Seed file for the Bridge discipline and Select **OK**.

File Directory		
Files Bridge_3D.dgn Construction_2D.dgn Construction_3D.dgn Hydraulics_3D.dgn Hydraulics_3D.dgn Landscape_and_Environmental_2D.dc Landscape_and_Environmental_3D.dc Materials_and_Geotechnical_3D.dgn Materials_and_Geotechnical_3D.dgn Roadway_Design_2D.dgn	Directories: \Standards-Global\MicroStation\seed\ C:\ Program Files Workspace-CDDT Standards-Global MicroStation seed	<u>ū</u> k
List Files of Tupe:	Drives	Cancel

**Note:** Seed files are separated out by discipline. The options include Bridge, Construction, Hydraulics, Landscape and Environmental, Materials and Geotechnical, Roadway Design, ROW, Survey, Topo, Traffic, and Utilities.

5. In the New dialog box, select OK.

Diectory		
Files	Directories:	
00000BridgeDetail01.dgn	C.\Projects\00000\Bridge\Drawings\	
	C \ Porojects Pologo Polog	QK
		Cance
File Type:	Drives:	
File Type: MicroStation DGN Files [*.dgn]		Help
File Type: MicroStation DGN Files [*dgn] Show File I <u>c</u> ons		Help

6. The file you created will be highlighted. Select **OK** to open that file.

MicroStation Manager		
<u>File Directory Help</u>		
Files: [00000BridgeDetail01.dgn	Directories: C:\Projects\00000\Bridge\Drawings\	3D - V8 DGN
00000BridgeDetail01.dgn	C\ Projects 00000 Bridge Drawings Reference_Files Tabs	
List Files of <u>Type</u> : <u>MicroStation DGN Files [*.dgn]</u>	Drives:	<u>Q</u> K Cancel
Workspace Broject	CDOT User	

## **Attaching Model Files to the Sheet File**

7. Select **File** > **Reference**.

Ele Edit Element Settings Tools Utilities Workspace Wind	ow <u>H</u> elp
<u>New</u>	Ctrl+N
🗳 Open	Ctrl+O
Close	Ctrl+W
Save	Ctrl+S
Save As	
Compress	
Save Settings	Ctrl+F
Reference	
Reference Raster Manager	
Reference Raster Manager Models	
Reference Raster Manager Models Import	
Reference Raster Manager Models Import Export	;
Reference Raster Manager Models Import Export Print Pre <u>v</u> iew	;
Reference Raster Manager Models Import Export Print Preview Print Prot	) Ctrl+P
Reference Raster Manager Models Import Export Print Preview Print Batch Print	) Ctrl+P
Reference Raster Manager Models Import Export Print Preview Print Batch Print Associate	, Ctrl+P

Or choose the **Reference** icon from the **Primary Tools** toolbar.

Primary Tools										×
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8. From the Reference Manager tool bar select **Tools** > **Attach** 

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9. The first model file you reference should be the one containing coordinate based information. Search for that model file and verify the Attachment Method is set to *Interactive*. Select OK. If you are creating a sheet file containing details only with no coordinate based information, bring in the detail with the largest scale factor first and scale the border to this detail. Then, attach the remaining details into the sheet file following the procedure outlined below.

File Directory		
jles:	Directories:	
00000BridgeModel01.dgn	\Bridge\Drawings\Reference_Files\	3D - V8 DGN
00000BridgeModel01.dgn		
UUUUUBridgeModelU2.dgn 00000BridgeModel03.dgn		
00000BridgeModel04.dgn		
00000BridgeProfile01.dgn	🗁 Drawings	q. \ _1
Design A-Size Sheet Border.dgn	🗁 Reference_Files	Party computer and
		11111
ist Files of <u>⊺</u> ype:	Dri <u>v</u> es: A	ttachment Method:
MicroStation DGN Files [*.dgn]		nteractive

10. Under Reference Attachment Settings, key in a logical name and a description. For instance, the logical name might be *Plan View* for the BridgeModel drawing. The other settings should not have to be edited. Coincident-World is selected by default. Verify the Scale is to set to 1:1 and True Scale is checked ON. Select OK.

rui rad Modi	el: CDOT Default
 Logical Nam	Plan View
Descriptio	m: Global Origin aligned with Master File
)rientation:	
Name	Description
Coincident	Aligned with Master File
Coincident - V	Vorld Global Origin aligned with Master File
Тор	Standard View
Front	Standard View
Right	Standard View
Saala (M	exter Bob 1 00000 - 1 000000 - 17 True See
SCale (Ma	ster.hei)   1.00000t :   1.00000t   ⊯ <u>1</u> 1de 30a
	obments: No Nesting 🛛 📕 Depthy 🗍
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**Note:** When Coincident World under Orientation is selected and a scale factor of 1:1 is entered, plan graphics are being referenced to the sheet file with the true coordinate information. All other attachment methods will not maintain the true coordinate values.

11. The file will be shown in the References dialog box.

🔁 Re	eferences (1 of 1	unique, 1 displa	ayed)			
Tool	s <u>S</u> ettings					
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Slot	File Name	Model	Description	Logical	Presentation	- J <b>\</b>
1	00000BridgeModel01.dgn	CDOT Default	Global Origin align	e Plan View	Wireframe 🗸	
Scale	1.000000 : 1.000000	0 Rotation X 0°0'0''	Y 0°0'0''	Z 0°0'0''		
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**Note:** Whenever you make graphical model file changes, your sheet file will automatically update.

12. Fit View using the icon so the graphics for the first model file are displayed.



13. Select **File** > **Save Settings** from the **Primary** toolbar.

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E	e <u>E</u> dit	Elemen	t <u>S</u> etti	ngs	Tools	Uti	lities	Wor	<u>k</u> space	Wi	ndov	N
	New Open		Ctrl+N Ctrl+O	al	Draft	ing	Add	On's		F Help	) <b>1</b> -	
	<u>C</u> lose <u>Save</u> Save <u>As.</u> .	•3	Ctrl+W Ctrl+S						• 🗉	•		. 6
	Compres	s		•								
	Save Set	tings	Ctrl+F									
ł	Reference Raster Ma	e anager										

## **Rotating the View**

- 14. After the references are attached, you may need to rotate the view depending on the layout of the sheet. **Note:** You are not rotating the reference file(s). You are only rotating the view. The coordinate system will not change.
- 15. One option to rotate the view is to **Key-in** *rv* = *x*,*y*,*z* and press **<Enter>** or **<Tab>**.

Key-in	×
rv=0,0,-60	

**Note:** x = 0, y = 0, and z =Rotation Angle. You are rotating the view about the z-axis. This is the axis perpendicular to the view. Otherwise, if you are working in a 2D file the **key-in** would be **rv = value of rotation**.



16. You will be prompted to select the view you would like to rotate in. **<D>** (datapoint) in the active view window.

Rotate View (Relative) > Select view

The view will be rotated.



17. Or you can rotate graphics using **3 Points**. Select Rotate View.



Change the **Method** to **3 Points**.



**Note:** Make sure you are picking a data point near the 3D element. Do not snap to 3D elements because you will be rotating along the z axis instead of just the x and y plane. Turn Accusnap off or you can hold down the <Ctrl> and <Enter> keys down at the same time to temporarily disable Accusnap while you are locating the data points.

The view will be rotated.



## Attaching the Border and Resident Engineer Cell

18. From the CDOT Menu, select Drafting > Borders. From here you will select the type of border to use from the Place pull-down menu then select the Sheet Size. Select a Horizontal or Vertical Bar Scale then select the North Arrow type. Finally, select Resident Engineer information.



19. Select **Settings** if the desired sheet scale is something other than  $1^{"} = 100^{"}$ . In the Active Settings dialog box you can change the **Active Scale** and the **Active Angle**. In this example, the standard 11x17 sheet border is too large for the plot area when the **Active Scale** is set at  $1^{"} = 100^{"}$ .

🟪 Active Set	tings	- 🗆 🔀
Active Scale:	100.00	Apply
Active Angle:	0.00	Close

20. Prior to placing the border and border information, set the **Active Scale**. This should be set to the largest proposed scale factor you plan to have on your sheet. For example, if you have a plan view that should be plotted at 1" = 40' and a detail that should be plotted at 1" = 5', the largest scale detail would be 1" = 40'. Choose a scale factor in even increments such as 10, 20, 30, 40, 50, 60, 100, etc. Select **Apply**.

Active Set	tings	_ 🗆 🔼
Active Scale:	40	Apply
Active Angle:	0.00	Class

**Note:** The Active Angle is view independent and not associated with view rotation. Therefore, the x-axis is always horizontal regardless of the view rotation. You will not need to set this for correct placement of the North Arrow or other cells.

- 21. Select **Apply**, when the desired changes are made in the **CDOT Menu**.
- 22. First, you will be prompted to locate the lower left hand corner of the sheet border.

Locate lower left hand corner of sheet / Reset for next

**Note:** The sheet border cell is not anchored to your cursor but will be visible after you <D> (data-click) to accept placement.

23. Next, you will be prompted to locate the **Bar Scale**. <D> (data-click) to accept placement inside the sheet border.

Locate point for bar scale / Reset for next

24. Then you will be prompted to locate the **North Arrow**, <D> (data-click) to accept placement inside the sheet border.

Locate point for north arrow / Reset for next

25. Lastly, you will be prompted to locate the **Region Engineer** cell. Tentative snap and <D> (data-click) to accept placement.

		reset to call		
Prist Date: \$DATE\$		Sheet Revisio	ans	
Print Date: \$DATE\$ File Nome: \$FILE\$		Sheet Revisio	ons Init.	
Priat Date: \$DATE\$ Fit Kan: \$71258 Haft: Sole \$SALESHIRT! Vert. Scale: As Noted	(LEX)	Sheet Revisio	ons Init.	
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**Note:** Contact the CADD Manager if any edits need to be made to a Region Engineer cell. Remember, you **can** edit the cell with the Edit Text command until the changes are available in the next configuration.

26. Double click on any of the text fields in the border to add sheet specific information.



## Adding Additional Model Files to the Sheet File

27. Once you have referenced the model file with coordinate based information and brought in the border, you can begin adding additional model files with various

scales. Select the Attach Reference icon located on the reference file dialog box. Locate the Model file you want to attach. Select **OK**.

File Directory		
Fijles: 00000BridgeModel02.dgn	Directories: \Bridge\Drawings\Reference_Files\	3D - V8 DGN
00000BridgeModel##.dgn 00000BridgeModel01.dgn		
000008/dgeModel03.dgn 000008/idgeModel03.dgn 000008/idgeModel04.dgn 000008/idgeProfile##.dgn Design A-Size Sheet Border.dgn	Could Bridge Could Drawings Reference_Files	
List Files of <u>T</u> ype:	l Dri <u>v</u> es:	Attachment Method:
CAD Files [*.dgn,*.dwg,*.dxf]		Interactive
Save <u>R</u> elative Path	DWG Options	<u>D</u> K Cance

28. Under Reference Attachment Settings, key in a logical name and a description. Set the Orientation to Top and set the Scale. When you set the Scale, key-in the scale factor of the border sheet into the first field. In this example it is 40. In the second field, key-in the scale factor you want the detail to be plotted at. In this example 5 represents 1"=5'. The overall scale factor for the detail is 40/5 = 8. MicroStation will calculate this for you.

ference Attac	hment Settings for 00000
<u>F</u> ile Name: 0000	0BridgeModel02.dgn
Full Path:\Re	eference_Files\00000BridgeModel02.dgn
Model: CD01	T Default
Logical Name: Top	
Description: Abutr	ment Reinforcing Detail
rientation:	
Name D	escription
Coincident Al	igned with Master File
Coincident - World G	lobal Origin aligned with Master File
op SI	tandard View
ront S	tandard View
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Scale (Master:Ref)	40.0000( : 5.00000( 🔽 <u>True Scale</u>
Nested Attachments:	No Nesting  Depth 1
Display Raster Refe	rences
<u>0</u> K	Cancel Options

<b>Formula:</b> Border Scale: scale the border cell was inserted
Detail Plot Scale: scale for specific detail to be plotted (See Step 22)
Scale Factor: model file insertion value
Scale Factor = Border Scale / Detail Plot Scale
Alternatively, you could key-in 8 into the first field and 1 in the second field. This means the new detail is 8 times larger than the first detail



With the **Orientation** set to **Top**, the model file is anchored to your cursor and you can place it interactively.

29. After the model file is positioned in the area you would like, <D> (data-click) to accept the placement of the additional model in the sheet file. The model file is placed relative to your active Z. Verify the active Z by snapping somewhere in the view, prior to placing the new detail. If the Z is not correct, you can interactively key-in AZ=0, select the view, hit reset and continue with the reference attachment.



30. Attach additional model files you would like to add to the sheet file.

Attach Reference		
<u>File</u> <u>Directory</u>		
Files: 00000BridgeModel03.dgn	Directories: \Bridge\Drawings\Reference_Files\	3D - V8 DGN
00000BridgeModel##.dgn 00000BridgeModel07.dgn 00000BridgeModel02.dgn 00000BridgeModel03.dgn 00000BridgeModel04.dgn 00000BridgeProfile##.dgn Design A-Size Sheet Border.dgn	C:\ Projects C:0000 Bridge Drawings Reference_Files	
List Files of <u>T</u> ype:	Dri <u>v</u> es:	Attachment Method:
CAD Files [*.dgn,*.dwg,*.dxf]		] Interactive
Save <u>R</u> elative Path	DWG Options	<u>O</u> K Cancel

31. In **Reference Attachment Settings**, key in a logical name and a description. Set the **Orientation** to **Top** and set the **Scale**. In this example the border cell was inserted at 40 (see Step 22 above), If you want the last detail to be plotted at a 1"=10" scale, leave **40** in the first field and key-in **10** to the second field. The overall scale factor for the detail is 40/10 = 4. MicroStation will calculate this for you.

<u>F</u> ile Name:	00000BridgeModel03.dgn
Full Path:	\Reference_Files\00000BridgeModel03.dgn
<u>M</u> odel:	CDOT Default
Logical Name:	Top-1
D <u>e</u> scription:	Bearing Detail
Irientation:	
Name	Description
Coincident Coincident - Worl	Aligned with Master File d Global Origin aligned with Master File
Гор	Standard View
ront	Standard View
Right	Standard View
Scale (Maste	r:Ref) 40.0000( : 10.0000( 🔽 <u>T</u> rue Scale
Nested Attachm	nents: <u>No Nesting</u> Depth: 1

# Formula: Border Scale: scale the border cell was inserted Detail Plot Scale: scale for specific detail to be plotted (See Step 22) Scale Factor: model file insertion value Scale Factor = Border Scale / Detail Plot Scale Alternatively, you could key-in 4 into the first field and 1 in the second field. This means the new detail is 4 times larger than the first detail



32. Place the model file interactively and *<*D> to accept placement in the sheet file.

# **Additional Sheet File Information**

## Setting up Text and Dimension Scale in the Sheet File

33. You must change the Annotation Scale Factor if the border cell was scaled to a factor other than 1:100. Otherwise, the text size in the sheet file will not correspond to the scale factor chosen when placing the border cell.

Select **File** > **Models** from the **Primary** toolbar.



34. Select the **Edit Model Properties** icon

🔁 Models		
") 🖻 🗗 🗶 👙 🛄		
Type 2D/3D Name /	Description	│ ※│ Cell Type
🗇 🗊 CDOT Default	Master Model	
	Master Moder	

35. The **Annotation Scale** factor defaults to 1:100. Select the arrow to change the scale factor. If you try to place text before setting this, it will be too large since the drawing plot scale is at a 1:40.

<u>Type</u> Name:	 Design ▼ CDOT Defaul	<u>3</u>	0 *		
<u>D</u> escription: Bef Logical:	Master Model			=	
	1:100 es		<u>00.0000</u> : <b> </b>	1.00000	
Г <u>C</u> an be	placed as a ce Cell Type: Gr	aphic 🔻			
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36. From the pull down, select the **Annotation Scale** factor to match the scale factor used when placing the border cell.

Model	Properties	
<u>T</u> ype:	Design 🔻	3D 💌
<u>N</u> ame:	CDOT Default	
Description:	Master Model	
<u>R</u> ef Logical:	[	
A	1:100 💌	100.0000 : 1.00000
- Cell Propertie	1:1000 1:500 1:250 1:200 1:100 1:60	
	1:50	Cancel
	1:30 1:20 1:10 1:1 CUSTOM	

37. In this example, an annotation scale factor of 1:40 should display. Select OK.

Name: CDOT Default scription: Master Model	
scription: Master Model	
Logical:	
Logical. [	
🛃 1:40 💽 40.00000 : 1.00000	1
Il Properties	
<u>C</u> an be placed as a cell	
Cell Type: 🛛 Graphic 💌	

38. You will be prompted with the following dialog box. Select **Yes**. Selecting **Yes** will updated any text previous placed in your sheet file.

Alert		
0	Do you want to propa scale to existing annot	gate the new annotation ations?
	Yes	<u>N</u> o

39. Now, you can add text to the new sheet file. It will be scaled to the correct height based on the plot scale or in this case 1:40.

🔁 Pl	ace Text				X		
E E	<u>M</u> ethod: Text Style Active Angle: Height:	By Origin .07" 0*0'0.00" 0.002	00 E	• • •	م		
				Ann Loc Sca	iotat k : ( le : 4	ion Scale DN 10.000000	0:1

**Note:** Annotation Scale Lock must be turned **ON** when placing text or dimensions for the scale factor to take affect. Verify it is **ON** by hovering with your cursor over the *icon*.

40. You can dimension the model files in the new sheet file. The dimensions will be scaled to the correct size based on the plot scale or in this case 1:40.

H CDOT	T 3	<b>•</b> Q	9,	
<u>A</u> lignment:	View		<b>T</b>	
Location:	Automa	itic	•	
	<b>F %</b>			
Start Exter	nsion:	₩	Anno	tation Scale
			Lock	: ON
End Exten	ISION.			
End Exten	ment:	Standard	Scale	: 40.000000 :
✓ End Exten Text Align ✓ Text Fram	nsion: ment: e: <u>Box</u>	Standard	Scale	: 40.000000 :
<ul> <li>✓ End Exten</li> <li>Text Aligni</li> <li>✓ Text Frame</li> <li>✓ Prefix Text</li> </ul>	nsion: ment: e: <u>Box</u> t: ø	Standard	Scale	: 40.000000 :

Note: Annotation Scale Lock must be turned **ON** when placing text or dimensions for the scale factor to take affect. Verify it is **ON** by hovering with your cursor over the **I** icon. Also, verify the **Association** is **ON** so the dimensions will dynamically update when model changes are made. This setting is turned on by default.

41. The Sheet file now includes text and dimensions for multiple scaled details.



42. Select **File** > **Save Settings** before you exit MicroStation.