Labs for MicroStation V8i Select Series 2

Colorado Department of Transportation

CADD and Engineering Innovation Updated November 19, 2010



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Software Versions

The software products referred to in this publication are furnished under a license and may only be used in accordance with the terms of such license. This document intended for use with the following software versions:

MicroStation® version 0811.07.443 InRoads® version 08.11.07.428 CDOT Configuration Version 05.00.00

Document Conventions

There are several conventions that are used throughout this document to indicate actions to be taken or to highlight important information. The conventions are as follows:

<u>ltem</u>	Meaning
View Perimeter	a command name or a file that you are to select
Tools > Options	a command path that you are to select – usually from the pull-down menus
Document Name	the name of a document that is not hyperlinked
Emphasis	style used when referring to important word or phrases
<u>Hyperlink</u>	style used when you have a direct link to another document on the web
Key in	entering data with the keyboard
Quote	style used to indicate an external source quotation
Note: text	information about a command or process that you should pay particular attention to
1. Numbered Steps	actions that you are to perform as part of the lab activities
<d> or Data</d>	press the data button on the mouse
< R> or Reset	press the reset button on the mouse
<t> or Tentative</t>	press the tentative button on the mouse

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LAB 1 - Getting Started in MicroStation

Chapter Objectives:

After completing this exercise you will know how to:

- Start MicroStation
- Open a MicroStation design file
- Use the MicroStation mouse buttons
- Navigate the MicroStation interface
- Use the **View Control** commands
- Assign view controls to the mouse wheel
- Float and dock toolbars
- Show and hide tools on toolbars
- Access the MicroStation Key-in box

Lab 1.1 - Starting MicroStation

To start MicroStation:

1. Select Start >All Programs > Bentley > MicroStation V8i (SELECTseries 2) > MicroStation V8 XM Edition

or

Double-click on the MicroStation V8i (SELECTseries 2) icon located on your desktop.



MicroStation will start and the **MicroStation Manager** dialog box will appear on your screen.

Look in:	Reference_Files	- 😳 🤣 🗁 🛄-	ື 🔄 🖻	3D - V8 DGN
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Libraries Me Computer Computer Network	Elbert.dgn III IIII III III III III III IIII IIII	11/20/2007 7:47 AM	MicroStat Dpen Cancel Options	User: CDOT User - Project: 12345 - Interface: CDOT -

Lab 1.2 - The MicroStation Manager Dialog Box

The **MicroStation Manager** is your file management interface in MicroStation. It allows you to create, rename, delete, and open files as well as set workspace parameters. Within MicroStation Manager the user will set three important components: User, Project, and Interface. Setting these components allow you to more easily access the project directory structure and customize the MicroStation interface.

Note: Do not press **<Enter>** after you key data in a dialog box unless you are ready to apply the settings. Use the **<Tab>** key or your mouse cursor to move from one field to the next to choose or enter your setup options before you **Apply** or **OK** the command.

Opening files

- 1. In the lower right-hand portion on the dialog box set the three components as shown below
 - User: CDOT User
 - ◆ Project: **12345**
 - ♦ Interface: CDOT

Note: The Project option automatically sets the directory to C:\Projects\12345. You'll lean more about the project configuration file (PCF) in chapter 4.

- 2. In the MicroStation Manager, navigate to \Design\Drawings\Reference_Files folder.
- 3. Highlight 12345DES_Model.dgn as the design file to open.
- 4. A thumbnail preview of the file is shown.
- 5. Select **Open** to open the design file.
- 6. This is a design model file of CDOT project SH 86, which will serve as the example project for this class as well as other CDOT training classes.

Look in:	Reference_	Files	🔹 🧐 🥬 🛄	• 🗋 🔄 💽	3D - V8 DGN
(An)	Name		Date modified	Туре	
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cent Places	🕌 12345DES_	Interchange.dgn	11/20/2007 7:46	AM MicroStat	
	🕌 12345DES_	Intersec100SH86.dgn	11/20/2007 4:08	PM MicroStat	
	🕌 12345DES_	Model##.dgn	2/18/2010 7:48 A	M MicroStat	
Desktop	🕌 12345DES_	Model.dgn	2/18/2010 12:25	PM MicroStat	
<u></u>	🕌 12345DES_		11/20/2007 7:47	AM MicroStat	
676	🕌 12345DES_		11/20/2007 7:47		
Libraries	🕌 Elbert.dgn		11/20/2007 7:47	AM MicroStat	
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omputer					
	•	III		+	
	File name:	12345DES_Model.dgn	-	Open	User: CDOT User
Network	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)	•	Cancel	Project: 12345
		Open as read-only		Options	Interface: CDOT

Note: The CDOT Menu opens automatically. You'll use this menu later. For now, minimize or close the CDOT menu.

Lab 1.3 - Working with the Mouse

While in MicroStation, your mouse operations include:

<D> Data (usually the *left* button) for selecting tools, highlighting fields, moving dialog boxes, confirming actions, etc.

R> Reset (usually the *right* button) for terminating commands, rejecting actions, etc.

<T> Tentative (usually the *middle* button or scroll wheel) for snapping to existing elements at exact locations.

Lab 1.4 - Access Pull-Down Menus

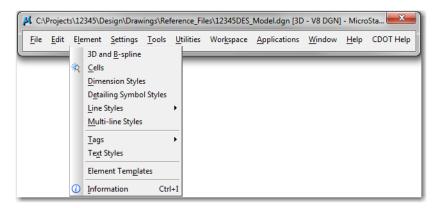
Use pull-down menus to select settings and non-drawing commands from the application window. You can either post a menu (display it until you select a function from the menu) or open the menu and select a command all in one step.

Post a pull-down menu from the command window

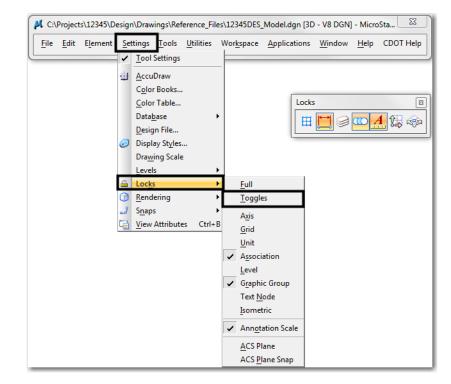
- 1. Point your cursor to **File** in the application window and select it by **clicking** the data point once **<D>**.
 - The pull-down menu appears.

	C.0	Project	S/12345/De	esign\Draw	ings\Ref	rerence_Fil	es\12345DES	Model.dgn [3D	- V8 DGNJ	- Micro	Sta 🔀
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P	5	Open									Ctrl+O
	9	<u>Close</u>									Ctrl+W
e	1 5	ave									Ctrl+S
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	4	Associa	t <u>e</u>								
	F	Propert	ies								Alt+Enter
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2	S	5en <u>d</u>									
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	2	2 C:\Pro	ojects\1234	5\Design\D	rawings	\12345DES	_Plan##.dgn				
	3	C:\Pro	ojects\1234	5\ROW_Su	vey\Dra	wings\Ref	erence Files\1	2345SURV_Topo	100Scale01	.dgn	
	4	C:\Pro	ojects\1234	5\Design\D	rawings	\12345DES	GenINote##	.dgn			

- Menu names followed by ... indicate a dialog box will open when you select the item.
- Names with an arrow to the right indicate there is a sub-menu associated with the item.
- You can also use the keyboard to select a command from a menu.
- The bottom portion of the file menu will display a file history allowing the user to open previously opened files more easily.
- 2. Use the up and down arrow keys on your keyboard to move up and down an item list or move your cursor.
 - Text to the right of an item indicates the hot key or shortcut to use to activate the command (e.g., Ctrl+N means to hold down the Ctrl key and type N).
 - Underlined letters indicate a shortcut key to choose an item from a menu.
- 3. Move your cursor to **Element** to show the element pull-down menu.



Lab 1.5 - Open a Settings Box



1. Select **Settings > Locks > Toggles** to open the **Locks** settings box.

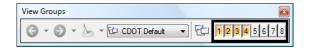
- **Note:** A settings box, like the Locks box, does not have any command buttons (**OK**, **Close**, etc.). Settings boxes can be left open while working in MicroStation.
- 2. Close the Locks settings box by selecting the X in the upper right hand corner.



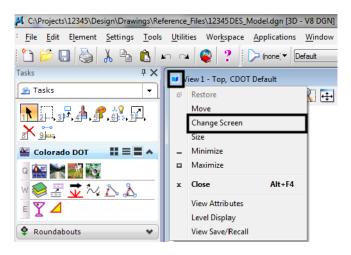
Lab 1.6 - Control Views

Turn on additional views

 From the View Toggles box (lower left of the screen), toggle on views 2, 3 and 4. <D>.



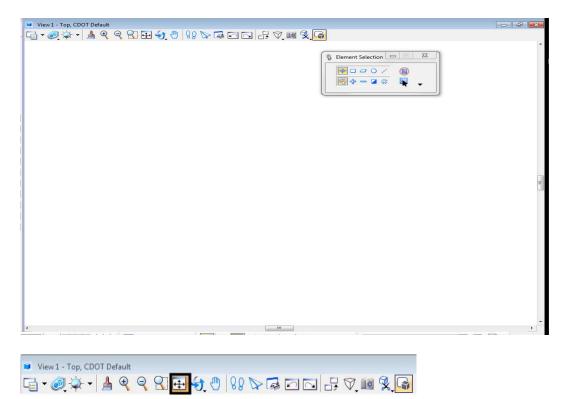
Note: By default, views 1-4 open in screen 1, views 5-8 open in screen 2. To move a view to a different screen, select the "M" icon on the left side of the view title bar and choose **Change Screen**.



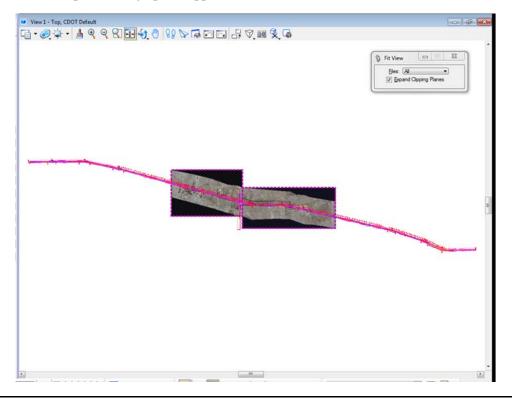
- 📕 C\Projects\12345\Design\Drawings\Reference_Files\12345DES_Model.dgn [3D V8 DGN] MicroStation V8i (SELECTseries 2) (1) - 0 -X Eile Edit Element Settings Tools Utilities Workspace Applications Window Help CDOT Help 🗅 📂 🗔 🍓 👗 🐁 🛍 🗠 🛥 🚭 ? 🕞 (none) = Defaut 0.000 ▶ N 90'00'00.00" E Z 4668.853 🔟 • 🗈 • 🖬 • 🔍 • 🛃 • 🏹 • 🥩 • 🖏 • 🕼 • 🕡 🖶 • 🔌
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 View 2 - Right Isometric, CDOT Default . . . F 🔎 Tasks N 🗊 💕 🏭 🖉 🔐 🚰 💱 Element Selection 😐 🗉 🔀 **2 i** No - 0 / N 💒 Colorado DOT 🛛 🔡 🚍 🔺 a 💒 🐂 🎆 🖏 🔀 🔶 🗕 🖉 🔒 🖕 ͷᢀᡜ<u>᠊</u>ᠯᡯ᠘᠘ ͼ<u>ͳ</u>⊿ Roundabouts Z Civil Geometry ¥ 🕅 Data Acquisition ۷ 🧏 Drawing v Drawing Composition 2 🛃 Solids Modeling * View 3 - Back, CDOT Default View 4 - Left, CDOT Default - • • Surface Modeling ¥ ₲ • @ 🖗 • 🛔 ९, ९ 월 🖬 🐓 ७ 👭 🏷 🛱 🖂 🖓 ۷ 🕒 Mesh Modeling * 🥵 Feature Modeling 🛛 👻 III Visualization v H Animati ۷ 🔜 🖬 🗤 🔨 🖌 💓 🗸 👹 🗸 🐨 🖬 📰 · C 12345678 💽 🕎 🔹 🕝 - 🕑 - 😓 - 🔂 CDOT Defeat At least one reference model was not found. Bement Selection > Identify element to add to set 🤳 🚔 Default
- 2. Select **Window > Tile** to arrange the views.

Fit View 1

1. From the View Control toolbar in View 1, select Fit View.



All of the plan view graphics appear in the view.



Rotate all views to top

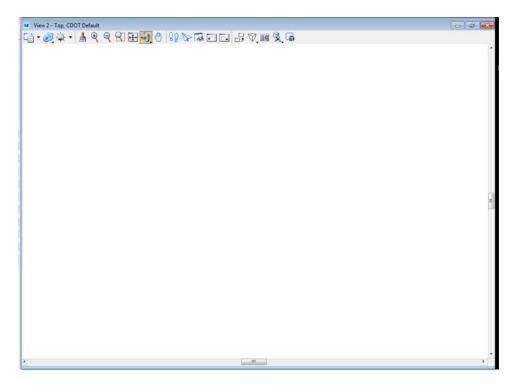
1. From the View Control toolbar in View 2 select Rotate View.



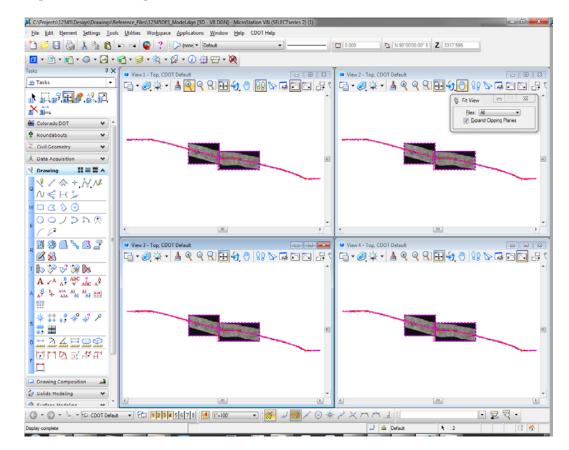
2. In the Rotate View tool settings box, set Method to Top.

📕 Rotate View	- • •
Method: Top	•

3. **<D>** in View 2 to change it to a top view (verify the view name is Top).



4. **Fit** view 2.



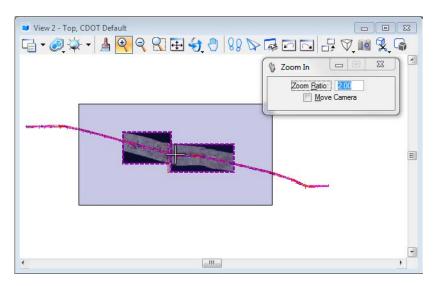
5. Repeat the above steps to rotate views 3 and 4 to a **Top** view and **Fit** the views.

Zoom In within a view

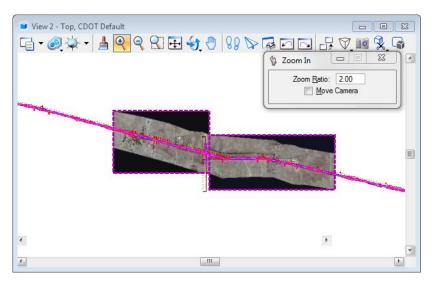
1. From the View Control toolbar in View 2, select Zoom In.



Place your cursor (the X cross-hair) in the center of the intersection and place a data point <D>.



The view is updated to **Zoom In** twice as close. The center of the view is the data point you identified.



- C\Projects\12345\Design\Drawings\Reference_Files\12345DE5_Model.dgn [3D V8 DGN] Micro ation V8i (SELEC File Edit Element Settings Tools Utilities Workspace Applications Window Help CDOT Help 🛅 📂 🗔 🍇 👗 🛍 🗠 斗 🚭 ? 🕞 honei = Detaut 0.000 № 90'00'00.00" E Z 4668.853 🔟 • 🖻 • 🖬 • 🖉 • 🚰 • 🏹 • 🖗 • 🖗 • 🕼 • 🕡 🖶 • 🥘 ŦΧ View 1 - Top, CDOT Default - • • View 2 - Top, CDOT Default . . . -🙆 Tasks N 2 37 R 5 38 1 💒 Colorado DOT Roundabouts ٧ Civil Geometry ٣ 🕅 Data Acquisition ۷ ng 🔢 🗏 🛋 🔺 V Dra ℁ℤ⊗÷ℵ№ №Ҁң≟ <u>- < > 0</u> 00/258 12 2 2 🖉 🖉 🦉 🖉 - - -View 3 - Top, CDOT Defaul Top, CDOT Defau □-@\$\$- ▲ 9, 9, 81 € 4, 8, 82 № ₽ ⊡ ₽ 기 : 🖸 🖬 🔍 (위 🔁 🔂 🗩 🖉 🔄 🖓 🖓 🖓 28 lb 💝 🗟 😪 📐 Element Selection $A \swarrow^{A} \swarrow^{B} \swarrow^{B} \swarrow^{ABC} \swarrow^{2} \bigstar^{A}$ 💽 🗆 🔿 🗸 😽 🔶 🗕 🔹 🙀 :4 * \$ 1 11 1 群 田 14202 hug stat Drawing Composition 1 ∂ Solids Modeling A Curfasa Madalias --💽 🕎 🗸 • 🕲 = 🕑 = 😓 = 🔂 CDOT Default Ŧ () * < × ∩ ∧.</p> 4 🤳 🖴 Defaul Bement Selection > Identify element to add to set h :2
- 3. Continue placing data points until you've zoomed in to the intersection as shown.

4. Reset **<R>** to end the **Zoom In** command.

Turn off the raster files

The model file has aerial photos attached. These raster images can be turned off while working in the file.

1. Select File > Raster Manager.

	R	aster	Ma	nager :	2 0	of 2 list	ed												×
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- 2. Select both .TIF files using the shift or ctrl key.
- 3. From the View toggles, bottom left of the dialog bog, toggle off all Views (1-8).

4. Close the **Raster Manager** box.

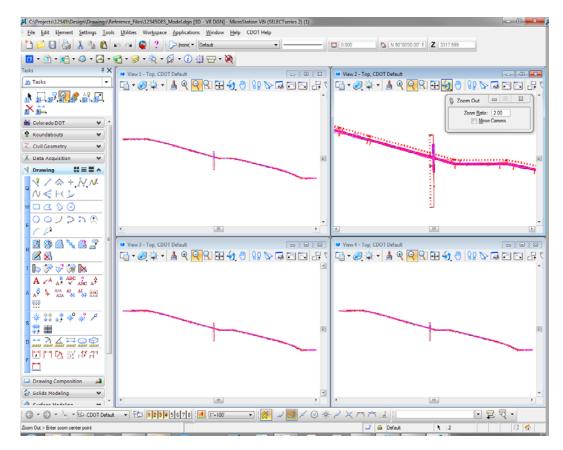
Zoom out in a view

1. From the View Control toolbar in View 2, select Zoom Out.



The view is updated to zoom out twice as far.

2. Again in View 2, **<D>** in the center of the intersection to zoom out again until you can see the entire intersection cross road.



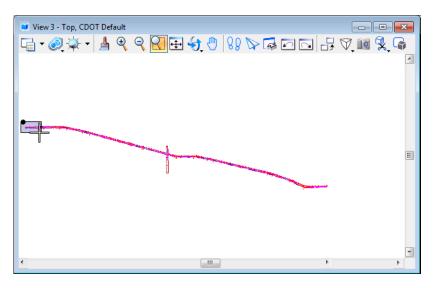
Use the Window Area command

1. From the View Control toolbar in View 3, select Window Area.

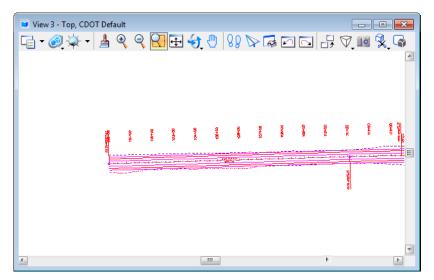


2. **<D>** above and to the left of the beginning of the project.

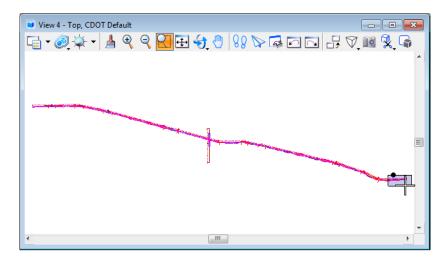
3. **<D>** again below and to the right of the first point as shown (this will draw a box around what you want to show close-up).



The view is updated to show the alignment at the beginning of the project.



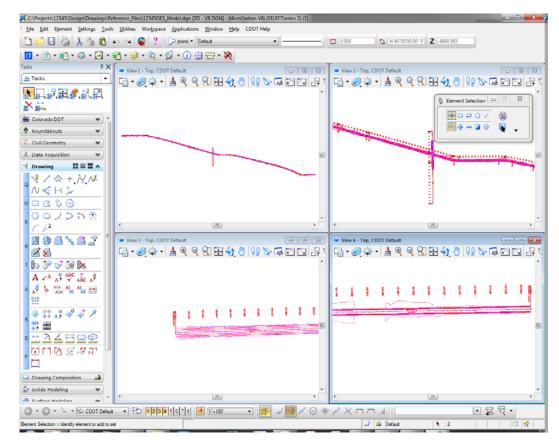
4. While still in the **Window Area command**, move your cursor over to View 4 and **<D>** above and to the left of the alignment end as shown.



5. **<D>** again below and to the right of the alignment end.

The view is updated to show the end of the project.

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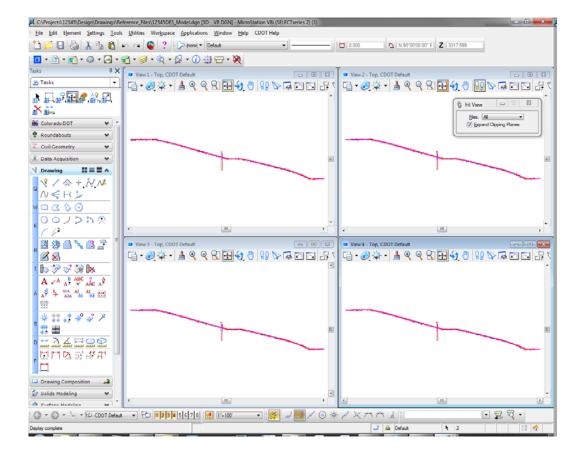


Your views should look similar to the illustration below.

#### Fit views

1. From View 2, select **Fit View**.

All of the graphics in View 2 are displayed in the view. The **Fit View** command is a handy way to see all graphics on levels that are on.



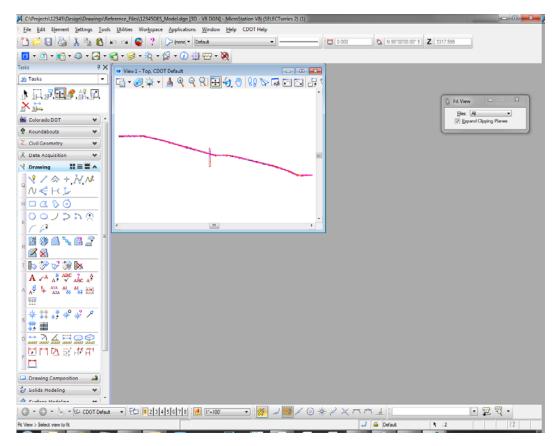
2. With the Fit command active, <D> in views 3 and 4 to select these views to fit.

#### **Close some views**

1. Toggle off views 2, 3 and 4 on the View Toggles box.



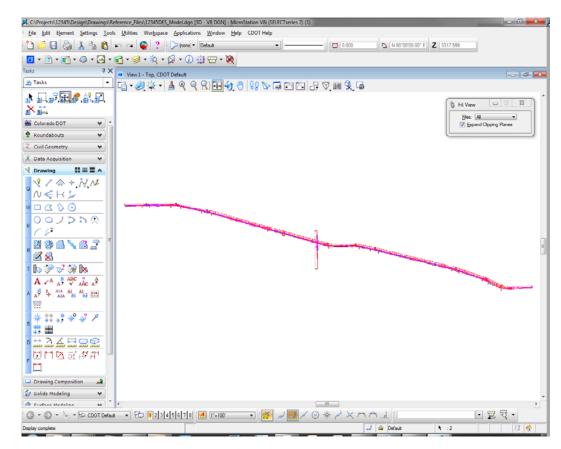
**Note:** You can also **click** the X icon in the view's upper right corner to close it or you can **double-click** on the M icon, the control menu icon, in the upper left corner of a view.



#### Make view one fill the screen

1. Select the **Maximize** button in the upper right corner of View 1.

2. **Fit** View 1.



#### Lab 1.7 - Mouse Wheel Settings

**Note:** If you do not have a mouse with a wheel, go to the next section titled *Try Out Tool Boxes*.

#### Use the wheel on the mouse to Zoom In/Out

- 1. Position your cursor over the center of the intersection.
- 2. Roll the wheel up; this zooms in on your graphics.
- 3. Roll the wheel back; this zooms out.
  - **Note:** If you **<T>** on a location before rolling the wheel MicroStation will zoom in/out around that point.

#### Change the wheel settings

1. Select Workspace > Preferences > Mouse Wheel.

2. Set the Wheel to Pan Left/Right.

Preferences [CDOT User]		
Category Database Input Look and Feel Mouse Wheel Operation Position Mapping Raster Manager Reference Spelling Tags Tags Tags A Spelling Task Navigation Text View Options - Civil View Options	Ott       + Wheel:       Walk Forwards/Backwards         Shift + Wheel:       Pan Left/Right       Ca         Att + Wheel:       Pan Left/Right       Ca         Zoom In/Out Ratio:       2.000         Navigate Distance (Cursor/Wheel):       3       %         Navigate Distance (Mouse):       10       %	<u>)</u> K ncel faults
	Sets default action when you roll the mouse wheel.	

- 3. Select **OK** to accept the changes and close the dialog box.
- 4. Move your mouse wheel back and forth to pan in the view.
  - **Note:** You can also **Pan** by selecting the pan command on the **View Control** toolbar. Specify a "from" and "to" point to move in the view.

View 1 - Top, CDOT Default
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Pan View
Pan View
Move Camera

You can also **Pan** by pressing **<Shift>** on the keyboard and click **<D>** in the view. Then, drag your cursor in the direction you wish to move.

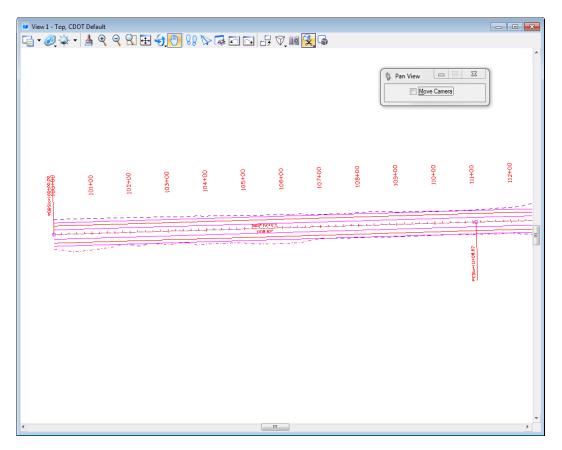
- a. Practice panning with the **Pan** tool.
- b. Practice panning using **<Shift>+<D>**.
- *Note:* After you start panning, you can release the both the **<Shift>** and the **<D>** keys. **<D>** again to end the command.

5. Set your wheel for the view control option you prefer (Workspace > Preferences > Mouse Wheel).

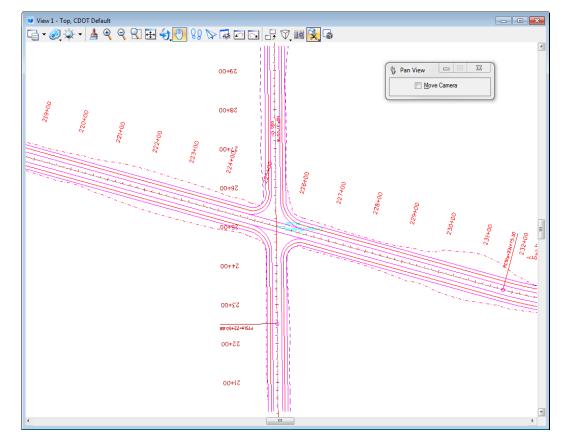
Input       Set Mouse Wheel Preferences.         Mouse Wheel       Operation         Position Mapping       Shift + Wheel: Pan With Zoom •         Raster Manager       Reference         Reference Spelling       Tags         Tags       Zoom In/Out Ratio:         Task Navigation       Text         New Options       Navigate Distance (Cursor/Wheel):         Solution Item Description       To %	Preferences [CDOT User]		
	Category Database Input Look and Feel Mouse Wheel Operation Position Mapping Raster Manager Reference Spelling Tags Task Navigation Text View Options	Set Mouse Wheel Preferences. Wheel: Zoom In/Out  Ctrl + Wheel: Pan With Zoom Ctrl + Wheel: Pan With Zoom Alt + Wheel: Pan Left/Right Zoom In/Out Ratic: 2.000 Navigate Distance (Cursor/Wheel): 3 % Navigate Distance (Mouse): 10 %	Cancel

## Pan the project site

1. **Window** in to the beginning of the project as shown.

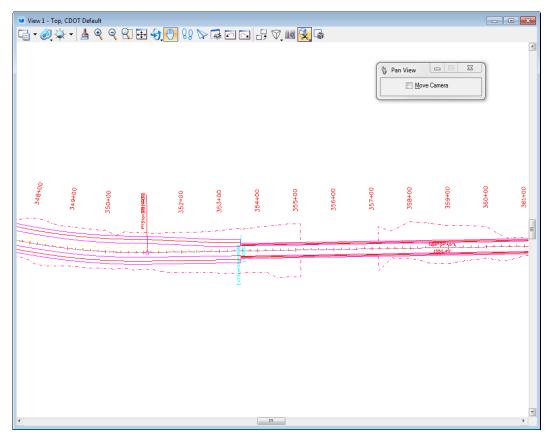


- 2. Use panning to review the SH 86 project site.
  - Start at the POB (STA 100+00) and pan to the right along SH 86.

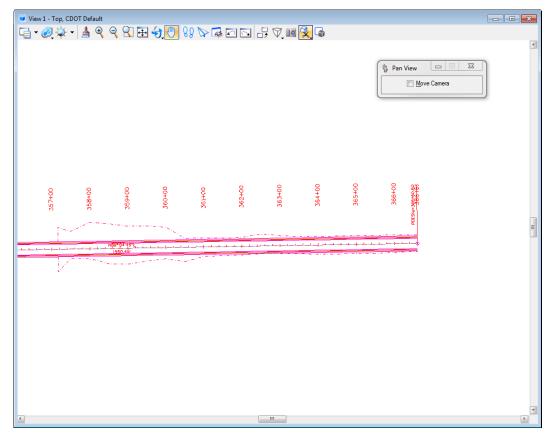


• Pan across the intersection (between STA 220+00 and 230+00).

• Continuing panning to the right through the transition from rural 2-lane to urban 2-lane with curb and sidewalk (around STA 353+00).



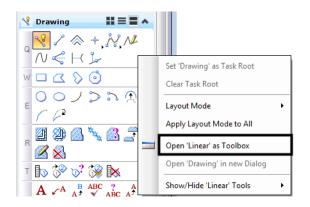
• Stop at the POE.



# Lab 1.8 - Try Out Tool Boxes

#### Pull a tool bar from the main palette

- 1. **<R>** on the *Linear Elements* section of the **Drawing** task menu to display the Flyout menu.
- 2. **<D>** on the **Open 'Linear' as ToolBox** option.



3. Select the Place SmartLine command.



The **Tool Settings** box shows this command's settings options.

4. Select the **Place Line** command from the **Linear Elements** toolbar and notice the changes in the Tool Settings box.

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Linear - Task		Length: Angle:	32.835 S19°54'12.(
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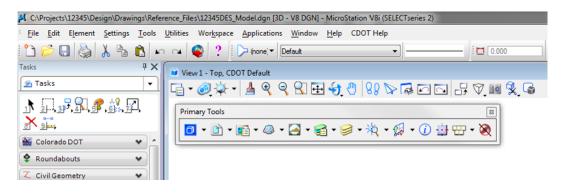
The **Tool Settings** box updates for each tool selected.

5. Close the Linear Elements toolbar by clicking the x in the upper right corner.

#### **Float and Dock Toolbars**

#### Float the Primary Toolbar

- 1. Position your cursor over the edge of the **Primary Tools** toolbar at the top of the application window.
- 2. Hold down the data button and drag the toolbar until it "floats" in the view.



3. Repeat for the **Standard** toolbar.

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Toggle the Primary Tools toolbox off/on

1. Select Tools > Primary.

The Primary Tools toolbox is turned off.

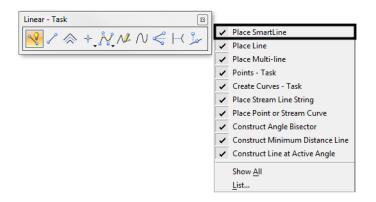
- 2. Select **Tools > Primary** again to toggle it back on.
- 3. Dock the **Primary Tools** and **Standard** toolbars back to the upper right corner of the application window by dragging the title bar with the data button.



**Note:** Any toolbar can be docked on the perimeter (top, bottom, left, or right sides) of MicroStation's application window.

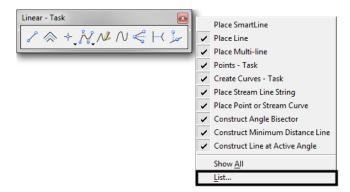
#### **Show/Hide Tools**

- 1. Open the Linear Elements toolbar as shown above.
- 2. Right-click anywhere on the Linear Elements toolbar. In the list of tools, toggle off Place SmartLine.



The SmartLine tool is removed from the toolbar.

- 3. Right-click <R> again and turn Place SmartLine back on.
- 4. **Right-click <R>** and choose **List.**



5. Toggle *off* the last four tools.

Click to Show or Hide Tools	
Place SmartLine	OK
Place Line	
Place Multi-line	Cancel
Points - Task	
Create Curves - Task	
Place Stream Line String	
Place Point or Stream Curve	
Construct Angle Bisector	
Construct Minimum Distance Line	
Construct Line at Active Angle	

6. Choose OK.

The toolbar is updated to show these tools hidden.

7. Right-click <R> and select Show All.

Linear - Task 🛛 🛛		
		Place SmartLine
	~	Place Line
	~	Place Multi-line
	1	Points - Task
	1	Create Curves - Task
	~	Place Stream Line String
		Place Point or Stream Curve
		Construct Angle Bisector
		Construct Minimum Distance Line
		Construct Line at Active Angle
		Show <u>A</u> ll
		<u>L</u> ist

All tools are now shown on the toolbar.

Linear - Task		8
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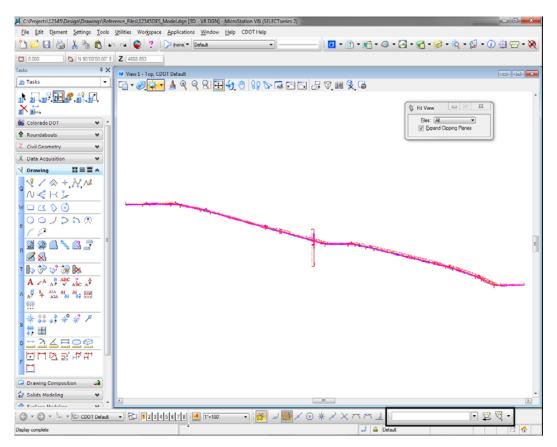
8. Close the Linear Elements toolbar (click the X in the upper right corner)

*Note:* Use this procedure to customize any toolbar to show just the tools you want.

# Lab 1.9 - Using the Key-In Box

# Open and dock the key-in box

1. Verify the **Key-in** box is opened and docked.



**Note:** If the **Key-In** box is not open, select **Utilities > Key-**in to open it.

2. Float the **Key-in** box from its docked position.

🐨 Key-in	×
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3. Expand it by grabbing the bottom of the box and dragging down.

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Key-ins can be selected from the list but are typically typed directly into the box.

4. Grab the title bar of the key-in box and drag it to the blank space at the top of the application window.

C:\Projects\12345\Design\Drawings\Refe	ence_Files\12345DES_Model.dgn [3D - V8 DGN] - MicroStation V8i (SELECTseries 2)	
: <u>File Edit Element Settings T</u> ools	Utilities Workspace Applications Window Help CDOT Help	
1 2 2 2 3 4 6 4	🕰 🔮 ? 🛛 🗁 (none) 🔻 Default 🔹	- 🖸 🕶 🛅 🕶 🚮
0.000 🖸 🖸 🖸 🖸	Z 4668.853	• 🛱 🕰 •
Tasks 🖁 🗙	View 1 - Top, CDOT Default	
🖻 Tasks 💌		
ſ <b>₹</b> , <b>37,<b>₽</b>,<b>8</b>,<b>8</b>,<b>1</b>,</b>		

The **Key-in** box docks beside the other tool bars in the application window.

**Note:** You can also dock the **Key-in** box at the bottom of the screen if you prefer.

#### Lab 1.10 - Save Settings

Save settings in the file so the views will look the same when you next open the design file.

- 1. **Fit** View 1.
- 2. In the **Key-in** box you just docked, place a data point to set the focus in this box (you will get a blinking cursor).
- 3. Key in *File* (short for File design), then press <Enter> on the keyboard.

i Filedesign 🗨 🕎 📆 🔻

Note: You always press <Enter> or <Tab> after key-ins in the Key-in box.

Keep the **Key-in** box docked. It is where you will key in all MicroStation commands.

**Note:** To **Save Settings**, you could also select **File > Save Settings** or use the short cut **CTRL-F**. Most commands can be accomplished with either key-ins or by selecting from the menu or toolbars.

By saving settings, the next time you enter this design file, it will be exactly as you left it.

- 4. Choose **File > Exit** to exit MicroStation and your design file.
  - Note: You can change your MicroStation user preferences to always save setting upon exiting the file. Select Workspace > Preferences > Operation and toggle on Save Settings on Exit. Just remember that if you're working in another user's file, you'll change their setting.

# LAB 2 - Levels

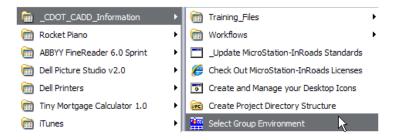
#### Chapter Objectives:

After completing this exercise you will know how to:

- Attach the appropriate levels by using the **Select Group** program
- Use Level Display to turn levels on/off
- Use key-ins to turn levels on/off
- Set the active level for placing graphics
- Use shortcuts for turning all levels on/off
- Turn levels off by graphically selecting an element
- Turn different levels on/off in different views
- Customize the Level Display and Level Manager boxes
- Sort levels
- Save a view for later recall
- Access CDOT standard level filters
- Use level filters to manage levels and turn groups of level on/off

# Lab 2.1 - Starting MicroStation

1. From your desktop's Start Menu, choose Start > All Programs > _CDOT_CADD_Information > Select Group Environment.



2. In the Select Group Environment box, select xxMulti-Discipline, and then select OK.

CDOT Select Group Environment	- • •
Bridae xxMulti-Discipline	ок
	Cancel
	About

*Note:* This will allow you access to all discipline's levels.

3. Start MicroStation and open the design file **12345DES_Model.dgn** from the **c:\Projects\12345\Design\Drawings\Reference_Files** folder.

Look in:	Reference_	Files	- 🕝 🤌 🗁 🛄 -	Ü 줄 🗈	3D - V8 DGN
æ	Name	*	Date modified	Туре	
-	🖊 12345DES_	Align.dgn	6/23/2007 7:12 PM	MicroStat	
ecent Places	🖊 12345DES_	Interchange.dgn	11/20/2007 7:46 AI	M MicroStat	
	🖊 12345DES_	Intersec100SH86.dgn	11/20/2007 4:08 PM	/ MicroStat	
	🖊 12345DES_	Model##.dgn	2/18/2010 7:48 AM	MicroStat	and pro-
Desktop	🕌 12345DES_	Model.dgn	10/26/2010 12:22 .	. MicroStat	
<u></u>	🖊 12345DES_	Phasing.dgn	11/20/2007 7:47 AI	MicroStat	
(1991)	🖊 12345DES_	Prof03.dgn	11/20/2007 7:47 AI	M MicroStat	
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Computer					
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Network	File name:	12345DES_Model.dgn	-	Open	User: CDOT User
	Files of type:	CAD Files (*.dgn;*.dwg;*.dw	f) 🔻	Cancel	Project: 12345
		Open as read-only		Options	Interface: CDOT

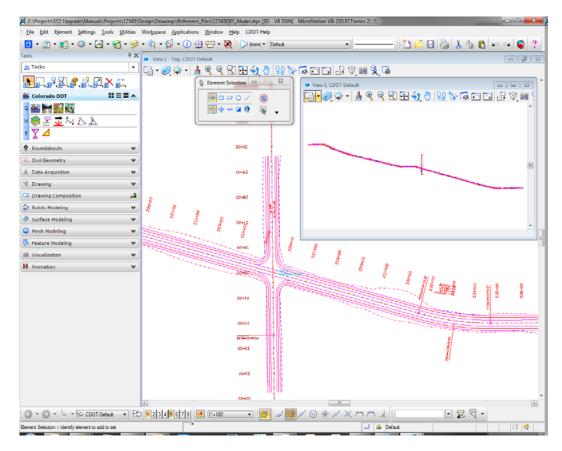
View 1 is a plan view of the entire project that you set up in the last lab.

- 4. Minimize or Close the CDOT Menu.
- 5. Open View 5 from the **View Toggles** toolbar (lower left).



- 6. **Fit** View 5.
  - **Note:** If you want to move View 5 to the left screen, select the **Change Screen** option from the view's control menu.

🔍 V	iew 3 - Back, CDOT Default		- • ×
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	Move		A
	Change Screen		
	Size		
-	Minimize		
	Maximize		
x	Close Alt+F4		
	View Attributes		
	Level Display		
	View Save/Recall		
			-
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7. In View 1, Window Area around the intersection as shown.

## Lab 2.2 - Working with Levels

#### **Sorting Levels**

1. Select Settings > Level > Display (or, from the Primary toolbar select Level Display).

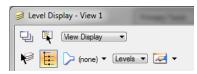
Primary Tools	
Image: A state of the state	🥪 • 👯 • 🕼 • 🛈 🕂 🐨 • 📎

The Level Display box opens. It is used to turn levels on and off.

- 🏓 Level Display View 1 - - X 🕒 関 View Display 🔹 🜾 📴 🏳 (none) 🔻 Levels 💌 📈 🔻 E-Model.dgn 12345SURV_Topo100.dgn Name 1 Number File Logical Used . E Default 12345DES. 0 • ALG_COGO_Points 19001 12345DES. ALG_EVENT_Points 19002 Alignments.dgnlib ALG_EXISTING_Hor-Alignment 19003 Alignments.dgnlib ALG_EXISTING_Hor-Alignment-Sta-Major 19004 Alignments.dgnlib ALG_EXISTING_Hor-Alignment-Sta-Minor 19005 Alignments.dgnlib ALG_EXISTING_Hor-Alignment-Text 19006 Alignments.dgnlib ALG_EXISTING_Hor-Cardinals 19007 Alignments.dgnlib ALG_EXISTING_Hor-Keypoints Alignments.dgnlib 19008 ALG_EXISTING_Hor-Tangent-Lines 19009 Alignments.dgnlib ALG_EXISTING_Hor-Tangent-Text 19010 Alianments.danlib ALG_EXISTING_Ver-Alignment Alignments.dgnlib 19011 ALG_EXISTING_Ver-Alignment-Text 19012 Alignments.dgnlib ALG_EXISTING_Ver-Keypoints 19013 Alignments.dgnlib ALG_EXISTING_Ver-Tangent-Lines 19014 Alignments.dgnlib ALG_EXISTING_Ver-Tangent-Text 19015 Alignments.dgnlib ALG_OTHER_Hor-Alignment 19016 Alignments.dgnlib ALG_OTHER_Hor-Alignment-Sta-Major 19017 Alignments.dgnlib ALG_OTHER_Hor-Alignment-Sta-Minor 19018 Alignments.dgnlib
- 2. In the top left corner on the Level Display box, toggle *off* all of the Views.

With all views off, there are no levels available to turn on/off (the levels are grayed-out).

3. Turn on View Index 1 and leave all other views off.



4. **<D>** on the column heading **Name** to sort by name, then **<D>** on **Used** to bring the used levels to the top of the list.

🥩 Level Display - View 1	- Teacher				• ×
🖵 🕅 View Display 🔻					
(none) 🔻 Levels 💌 📈	- 1				
E-12345DES_Model.dgn					
Name	Number	File	Logical	Used `	-
Default	0	12345DES		•	E
ALG_COGO_Points	19001	12345DES		•	
ALG_PROPOSED_Hor-Alignment	19029	12345DES		•	
ALG_PROPOSED_Hor-Alignment-Sta	19030	12345DES		•	
ALG_PROPOSED_Hor-Alignment-Sta	19031	12345DES		•	
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES		•	
ALG_PROPOSED_Hor-Cardinals	19033	12345DES		•	
ALG_SECONDARY_Hor-Alignment-S	19043	12345DES		•	
ALG_SECONDARY_Hor-Alignment-S	<b>19044</b>	12345DES		•	
ALG_SECONDARY_Hor-Cardinals	<b>19046</b>	12345DES		•	
DES_ROADWAY_Curb-Top	14041	12345DES		•	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES		•	
DES_ROADWAY_Lane-Line	14044	12345DES		•	
DES_ROADWAY_Misc	14045	12345DES		•	
DES_ROADWAY_Point-of-Slope-Sel	14046	12345DES		•	
DES_ROADWAY_Shoulder	14047	12345DES		•	
DES_ROADWAY_Toe-of-Fill	14051	12345DES		•	
DES_ROADWAY_Top-of-Cut	14052	12345DES		•	
DRAFT_LC-Center_WT-3	22018	12345DES		•	
ALG_EVENT_Points	19002	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment	19003	Alignments.dgnlib	)		-

*Note:* The highlight color may vary based on your Windows Theme setting.

5. Scroll through the list of levels.

The levels which are used (those with graphics placed on them) appear in bold text. All other unused levels are from the attached libraries.

Level Display - View 1					×
🖵 🕅 View Display 🔻					
None) - Levels -	-				
□-12345DES_Model.dgn					
Name	Number 1	File	Logical	Used	
Default	0	12345DES		•	
TOPO_SURVEY_Fldbk_Codes	10	Topo.dgnlib			
TOPO_SURVEY_Fldbk_Elevations	11	Topo.dgnlib			
TOPO_SURVEY_Fldbk_Errors	12	Topo.dgnlib			
TOPO_SURVEY_Fldbk_Names	13	Topo.dgnlib			
TOPO_SURVEY_Fldbk_Notes	14	Topo.dgnlib			
TOPO_SURVEY_Fldbk_Symbols	15	Topo.dgnlib			
TOPO_SURVEY_Misc	149	Topo.dgnlib			
TOPO_SURVEY_Symb	199	Topo.dgnlib			
TOPO_CULVERT_Cast-Iron	262	Topo.dgnlib			
TOPO_CULVERT_Perforated-Underdrain-CMP	263	Topo.dgnlib			
TOPO_CULVERT_Perforated-Underdrain-PVC	264	Topo.dgnlib			
TOPO_CULVERT_Reinforced-Concrete-Pipe	265	Topo.dgnlib			
TOPO_CULVERT_Reinforced-Conc-Pipe-Ellip	266	Topo.dgnlib			
TOPO_CULVERT_Corr-Steel-Pipe	267	Topo.dgnlib			
TOPO_CULVERT_End-Sec-RCP	268	Topo.dgnlib			
TOPO_CULVERT_End-Sec-RCP-Ellip	269	Topo.dgnlib			
TOPO_CULVERT_End-Sec-Corr-Stl-Pipe	270	Topo.dgnlib			
TOPO_CULVERT_End-Sec-Cor-Stl-Pipe-Arc	271	Topo.dgnlib			
TOPO_CULVERT_Cor-St-Pipe-Arch-Bit-Ctd-Eq	274	Topo.dgnlib			
TOPO_CULVERT_Cor-Plastic-Pipe	275	Topo.dgnlib			-

6. **<D>** on the column heading **Number** to sort by level number.

Note that levels are grouped by number. For example, all Roadway Design levels are 14000 series; all Right-of-Way levels are 15000 series, etc.

7. **<D>** on the column heading **Name** to sort the levels alphabetically by name and scroll through the level list. (If you toggle the **Name** column, you will sort A - Z, then Z - A). Toggle **Name** until you sort A - Z.

Level Display - View 1				-	x
🖵 🏹 🚺 View Display 🔹					
	_				
🜾 📴 🏳 (none) 🔻 Levels 💌 [	~~~ <b>~</b>				
- Model.dgn					
12345SURV_Topo100.dgn					
Name ^	Number	File	Logical	Used	1
Default	0	12345DES		•	1
ALG_COGO_Points	19001	12345DES		•	
ALG_EVENT_Points	19002	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment	19003	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment-Sta-Major	19004	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment-Sta-Minor	19005	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment-Text	19006	Alignments.dgnlib			
ALG_EXISTING_Hor-Cardinals	19007	Alignments.dgnlib			
ALG_EXISTING_Hor-Keypoints	19008	Alignments.dgnlib			
ALG_EXISTING_Hor-Tangent-Lines	19009	Alignments.dgnlib			
ALG_EXISTING_Hor-Tangent-Text	19010	Alignments.dgnlib			
ALG_EXISTING_Ver-Alignment	19011	Alignments.dgnlib			
ALG_EXISTING_Ver-Alignment-Text	19012	Alignments.dgnlib			
ALG_EXISTING_Ver-Keypoints	19013	Alignments.dgnlib			
ALG_EXISTING_Ver-Tangent-Lines	19014	Alignments.dgnlib			
ALG_EXISTING_Ver-Tangent-Text	19015	Alignments.dgnlib			
ALG_OTHER_Hor-Alignment	19016	Alignments.dgnlib			
ALG_OTHER_Hor-Alignment-Sta-Major	19017	Alignments.dgnlib			
ALG_OTHER_Hor-Alignment-Sta-Minor	19018	Alignments.dgnlib			
ALG_OTHER_Hor-Alignment-Text	19019	Alignments.dgnlib			
ALG_OTHER_Hor-Cardinals	19020	Alignments.dgnlib			

*Note:* All MicroStation levels are assigned both names and numbers.

8. Right-click in any column heading (Name, Number, etc.) and toggle off the column Logical.

🥩 Level Display - Vi	ew 1				
🖳 🏹 🛛 View Dis	splay 🔻				
🌾 📴 ≻ (no	ne) 🔻 Levels 💌 🚦				
B-12345DES_Mo					
₫- <u>₩</u> 12345SUR	V_lopo100.dgn				
Name ^	Save Layout	• umber	File	Logical	Used 🔺
	✓ Name		12345DES	S	•
ALG_COGO_Poin	Library	9001	12345DE9		•
ALG_EVENT_Points	✓ Number	9002	Alignments.	-	
ALG_EXISTING_Hor		9003	Alignments.	-	
ALG_EXISTING_Hor	Description	9004	Alignments.	-	
ALG_EXISTING_Hor		9005	Alignments.	-	
ALG_EXISTING_Hor	<ul> <li>Logical</li> </ul>	9006 9007	Alignments.	-	
ALG_EXISTING_Hor	Color	9007	Alignments.	-	
ALG_EXISTING_Ho	Style	9008	Alignments.	-	
ALG EXISTING Hor	Weight	9010	Alignments	-	
ALG_EXISTING_Ver	Material	8011	Alignments		
ALG_EXISTING_Ver		9012	Alignments	-	
ALG EXISTING Ver	Lock	9013	Alignments	-	
ALG EXISTING Ver	Plot	9014	Alignments.	-	
ALG_EXISTING_Ver	✓ Used	9015	Alignments.	dgnlib	
ALG_OTHER_Hor-A	Elements	9016	Alignments.	dgnlib	
ALG_OTHER_Hor-A	New Level	9017	Alignments.	dgnlib	
ALG_OTHER_Hor-A	NEW LEVEL	9018	Alignments.	dgnlib	
ALG_OTHER_Hor-A	Show <u>A</u> ll	9019	Alignments.	dgnlib	
ALG_OTHER_Hor-C	<u>L</u> ist	9020	Alignments.	dgnlib	-
	Restore <u>D</u> efaults				

You can customize the look of the **Level Display** box by turning on/off information columns.

# Turn levels on/off using Level Display

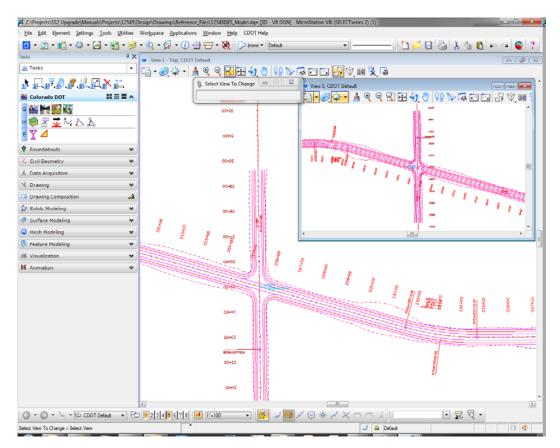
1. With the levels now sorted by name, **<D>** on the column heading **Used** until all used levels are brought to the top of the list. This now sorts all used levels alphabetically.

📄 Level Display - View 1					x
🖵 🏹 🛛 View Display 🔹					
(none) 🔻 Levels 💌 📈					
	<u> </u>				
□-12345DES_Model.dgn					
🗄 场 12345SURV_Topo100.dgn					
Name	Number	File	Logical	Used 🍸	-
Default	0	12345DES		•	E
ALG_COGO_Points	19001	12345DES		•	
ALG_PROPOSED_Hor-Alignment	19029	12345DES		•	
ALG_PROPOSED_Hor-Alignment-Sta	19030	12345DES		•	
ALG_PROPOSED_Hor-Alignment-Sta	19031	12345DES		•	
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES		•	
ALG_PROPOSED_Hor-Cardinals	19033	12345DES		•	
ALG_SECONDARY_Hor-Alignment-S	19043	12345DES		•	
ALG_SECONDARY_Hor-Alignment-S	19044	12345DES		•	
ALG_SECONDARY_Hor-Cardinals	19046	12345DES		•	
DES_ROADWAY_Curb-Top	14041	12345DES		•	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES		•	
DES_ROADWAY_Lane-Line	14044	12345DES		•	
DES_ROADWAY_Misc	14045	12345DES		•	
DES_ROADWAY_Point-of-Slope-Sel	14046	12345DES		•	
DES_ROADWAY_Shoulder	14047	12345DES		•	
DES_ROADWAY_Toe-of-Fill	14051	12345DES		•	
DES_ROADWAY_Top-of-Cut	14052	12345DES		•	
DRAFT_LC-Center_WT-3	22018	12345DES		•	
ALG_EVENT_Points	19002	Alignments.dgnlib	1		
ALG_EXISTING_Hor-Alignment	19003	Alianments.danlib			-

*Note:* You may have to click **Used** twice to get all used levels to the top.

2. Scroll up to the top of the list to see the used levels.

Note: Sorting by Used is a handy way to quickly find a level that you want to turn on/off.



3. Window Area around the same intersection location in View 5 as in View 1.

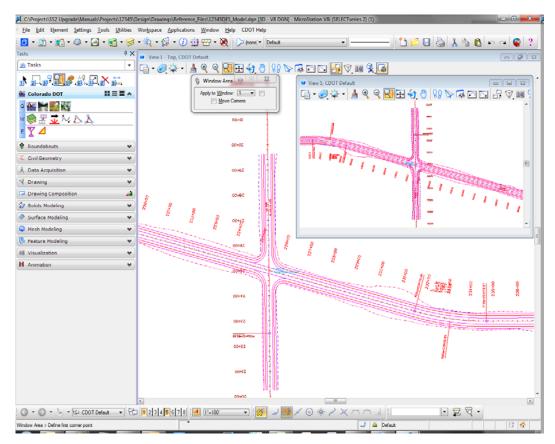
4. From the **View Toggles** toolbar toggle *off* View Index 1 and toggle *on* View Index 5 and scroll through the level list.



- - X 🥩 Level Display - View 5 🕒 🙀 View Display 🔹 E-Model.dgn 12345SURV_Topo 100.dgn Name Number File Logical Used . Default 0 12345DES_Model.dgn 12345DES_Model.dgn ALG_COGO_Points 19001 ALG_PROPOSED_Hor-Alignment 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Sta. 12345DES_Model.dgn 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Sta 19031 12345DES_Model.dgn 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Text 19032 ٠ ALG_PROPOSED_Hor-Cardinals ALG_SECONDARY_Hor-Alignment-S. 12345DES_Model.dgn 19043 ALG_SECONDARY_Hor-Alignment-S. 12345DES_Model.dgn 19044 12345DES_Model.dgn 12345DES_Model.dgn ALG_SECONDARY_Hor-Cardinals 19046 DES_ROADWAY_Curb-Top 14016 14044 DES_ROADWAY_Edge-Of-Road-Oil 12345DES_Model.dgn DES_ROADWAY_Lane-Line 12345DES_Model.dgn 14045 12345DES_Model.dgn DES_ROADWAY_Misc DES_ROADWAY_Point-of-Slope-Sel... 14046 12345DES_Model.dgn DES_ROADWAY_Shoulder 14047 12345DES_Model.dgn 12345DES_Model.dgn 12345DES_Model.dgn DES_ROADWAY_Toe-of-Fill DES_ROADWAY_Top-of-Cut 14051 14052 12345DES_Model.dgn
- 5. **<D>** on the level **ALG_PROPOSED_Hor-Alignment-Text** to turn it off.

- **Note:** Level displays are view dependent you can have different levels on/off in different views.
- 6. In View 5, hold down the data button and drag to turn off all ALG levels except the ALG_PROPOSED_Hor-Alignment level as shown.

Level Display - View 5					x
🖵 🕅 View Display 🔹					
🌾 📴 🏳 (none) 🕶 Levels 💌 🎑	-				
E-12345DES_Model.dgn ৳-12345SURV_Topo100.dgn					
Name	Number	File	Logical	Used	-
Default	0	12345DES_Model.dgn		•	Ξ
ALG_COGO_Points	19001	12345DES_Model.dgn		•	_
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Alignment-Sta	19030	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Alignment-Sta	19031	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn		•	
ALG_SECONDARY_Hor-Alignment-S	19043	12345DES_Model.dgn		•	
ALG_SECONDARY_Hor-Alignment-S	19044	12345DES_Model.dgn		•	
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn		•	
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn		•	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model.dgn			
DES_ROADWAY_Lane-Line	14044	12345DES_Model.dgn			
DES_ROADWAY_Misc	14045	12345DES_Model.dgn			
DES_ROADWAY_Point-of-Slope-Sel	14046	12345DES_Model.dgn			
DES_ROADWAY_Shoulder	14047	12345DES_Model.dgn			
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model.dgn			
DES_ROADWAY_Top-of-Cut	14052	12345DES_Model.dgn			
DRAFT_LC-Center_WT-3	22018	12345DES_Model.dgn			
ALG_EVENT_Points		Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment		Alignments.dgnlib			



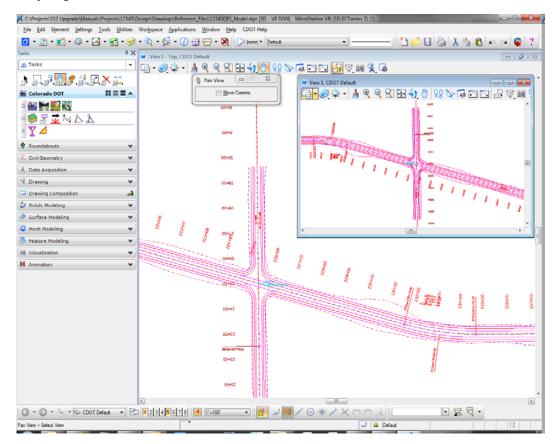
The intersection text is now off in View 5 but on in View 1.

7. Turn *off* View Index 5 and turn View Index 1 back *on*.



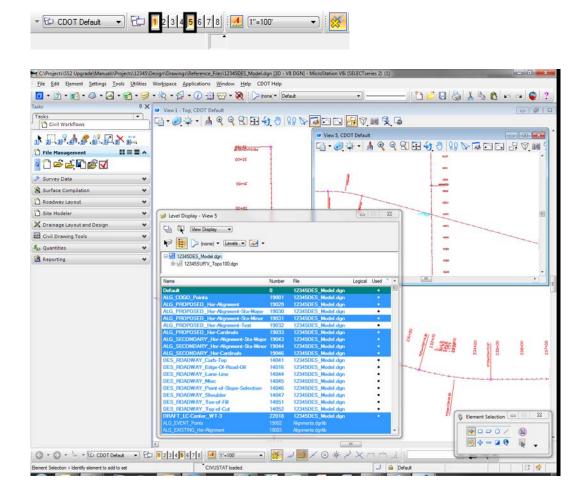
- - - X 🖵 🕅 🚺 View Display 🔹 | ▶ (none) ▼ Levels ▼ 🖂 ▼ E-Model.dgn Logical Used Name Number File Default 12345DES_Model.dgn 0 ALG_COGO_Points 19001 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment 19029 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Sta-Major 19030 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Sta-Minor 19031 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Text 12345DES_Model.dgn 19032 ALG_PROPOSED_Hor-Cardinals 12345DES_Model.dgn 19033 12345DES_Model.dgn ALG_SECONDARY_Hor-Alignment-Sta-Major 19043 12345DES_Model.dgn ALG_SECONDARY_Hor-Alignment-Sta-Minor 19044 ALG SECONDARY Hor-Cardinals 12345DES Model.dan 19046 DES_ROADWAY_Curb-Top 12345DES Model.dgn 14041 DES_ROADWAY_Edge-Of-Road-Oil 12345DES_Model.dgn 14016 DES_ROADWAY_Lane-Line 14044 12345DES_Model.dgn 12345DES_Model.dgn DES_ROADWAY_Misc 14045 DES_ROADWAY_Point-of-Slope-Sele 14046 12345DES_Model.dgn DES_ROADWAY_Shoulder 14047 12345DES_Model.dgn DES_ROADWAY_Toe-of-Fill 14051 12345DES_Model.dgn DES_ROADWAY_Top-of-Cut 12345DES_Model.dgn 14052 12345DES_Model.dgn **DRAFT LC-Center WT-3** 22018 G_EVENT_Points Alignments.dgnlib EXISTING Hor-Alia
- 8. Hold down the data button and drag across all **DES**_ levels to turn them off in View 1.

Only alignment levels are now on in View 1.



9. Turn *off* the levels ALG_PROPOSED_Hor-Alignment-Text_and ALG_PROPOSED_Hor-Alignment-Sta-Major_in View 1.

🔰 Level Display - View 5	E E				x
🖵 🏹 Miew Display 🔻					
🔃 խ (none) 🔻 Levels 🔻 📈 🕶					
E-W 12345DES_Model.dgn E-W 12345SURV_Topo100.dgn					
Name	Number	File	Logical	Used	•
Default	0	12345DES_Model.dgn		•	
ALG_COGO_Points	19001	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn		•	_
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Alignment-Sta-Major	19043	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Alignment-Sta-Minor	19044	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn		•	
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn		•	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model.dgn		•	
DES_ROADWAY_Lane-Line	14044	12345DES_Model.dgn		•	
DES_ROADWAY_Misc	14045	12345DES_Model.dgn		•	
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Model.dgn		•	
DES_ROADWAY_Shoulder	14047	12345DES_Model.dgn		•	
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model.dgn		•	
DES_ROADWAY_Top-of-Cut	14052	12345DES_Model.dgn		•	
DRAFT_LC-Center_WT-3	22018	12345DES_Model.dgn		•	_
ALG_EVENT_Points	19002	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment	19003	Alignments.dgnlib			Ŧ



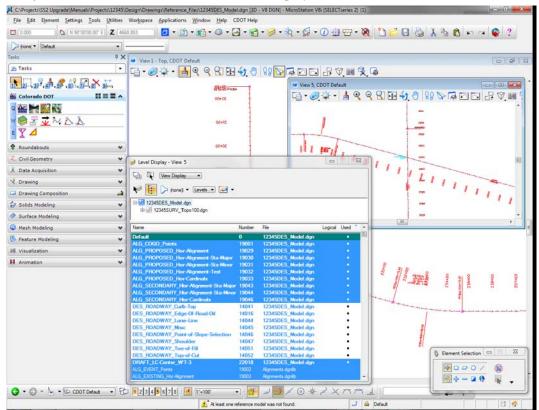
10. Turn *on* View Index 5 so that both View Index 1 and 5 are now *on*.

The Level Display dialog box reflects the active view's settings. The active view is recognized by a change in the color of the view title bar (in this example, View 5).

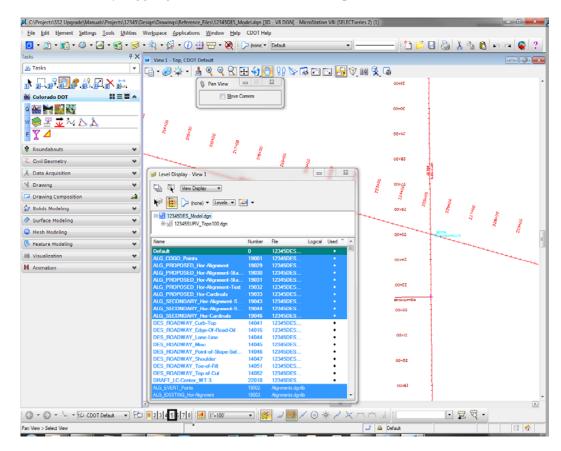
To make the displayed levels in View 5 match those in View 1;

- 11. Make View 1 the active view by left clicking on the View 1 title bar.
- 12. In the *Level Display* dialog box, **<D>** the **Apply to Open Views** button.

🥩 Level Display - View 1					X	
View Display						
Apply To Open Views Levels V						
□ 12345DES_Model.dgn						
Name	Number	File	Logical	Used		•
Default	0	12345DES_Model.dgn		•		
ALG_COGO_Points	19001	12345DES_Model.dgn		•		



13. Bring View 5 to the front and notice that the displayed levels match View 1.



14. Close View 5 by toggling off View 5 in the View Groups tool box

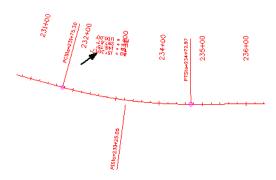
**Note:** Clicking on the X in the upper right corner of the view window will also close out of View 5

# Turn levels on/off By Element

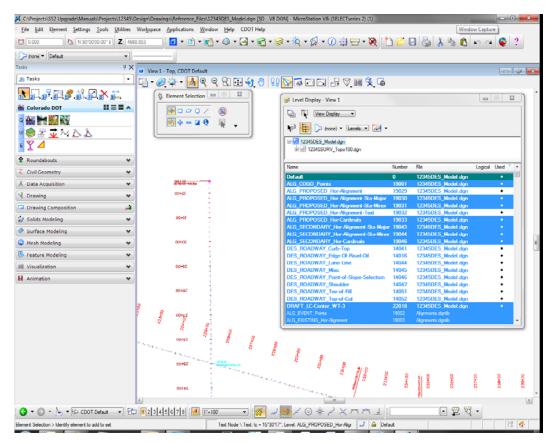
1. The station and alignment text levels are currently *on*. **Right-click** anywhere over the level names and select **Off By Element**.

🏓 Level Display - View 1				
🖵 🕅 View Display 🔹				
🔎 📴 🍃 (none) 🕶 Levels 🔹 💌 🕶				
12345DES_Model.dgn				
Name	Number	File	Logical Used 🍸	-
Default	0	12345DES_Model	.dgn •	
ALG_COGO_Points	19001	12345DES_Model	.dgn •	
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model	.dgn •	
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model	.dgn •	
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model	dan •	
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Mode	Set <u>A</u> ctive	
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Mode	Jump To Active Level	
ALG_SECONDARY_Hor-Alignment-Sta-Major	19043	12345DES_Mode	Create Display Set	
ALG_SECONDARY_Hor-Alignment-Sta-Minor	19044	12345DES_Mode	Create Display Set	
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Mode	All On	
DES_ROADWAY_Curb-Top	14041	12345DES_Mode	All Off	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Mode	_	
DES_ROADWAY_Lane-Line	14044	12345DES_Mode	Invert On/Off	
DES_ROADWAY_Misc	14045	12345DES_Mode	Off By Element	
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Mode	All Except Element	
DES_ROADWAY_Shoulder	14047	12345DES_Mode	All Except Element	
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Mode	Save Filter	
DES_ROADWAY_Top-of-Cut	14052	12345DES_Mode	-	
DRAFT_LC-Center_WT-3	22018	12345DES_Mode	Level <u>M</u> anager	
ALG_EVENT_Points		Alignments.dgnlib		
ALG_EXISTING_Hor-Alignment	19003	Alignments.dgnlib		-

2. **<D>** on the red alignment curve text as shown.



The level **ALG_PROPOSED_Hor-Alignment-Text** is turned *off* by graphically picking an element on that level.

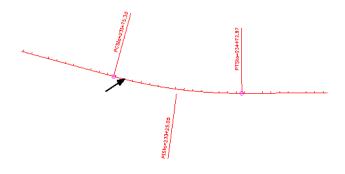


- 🏓 Level Display View 1 - - X 🕒 関 View Display 🔹 🌾 📴 🍃 (none) 🔻 Levels 🔻 🛃 🔻 E-Model.dgn te-12345SURV_Topo100.dgn Name Logical Used Number File . = Default 0 12345DES_Model.dgn • 19001 12345DES_Model.dgn ALG_COGO_Points ALG_PROPOSED_Hor-Alignment 19029 12345DES_Model.dgn . ALG_PROPOSED_Hor-Alignment-Sta-Major ALG_PROPOSED_Hor-Alignment-Sta-Minor 12345DES_Model.dgn 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Text ALG_PROPOSED_Hor-Cardinals 12345DES_Model.dgn • 19032 12345DES_Model.dgn ALG_SECONDARY_Hor-Alignment-Sta-Major 19043 12345DES_Model.dgn ALG_SECONDARY_Hor-Alignment-Sta-Minor 19044 12345DES_Model.dgn ALG SECONDARY Hor-Cardinals 12345DES Model.dgn 19046 12345DES_Model.dgn DES ROADWAY Curb-Top 14041 ٠ 12345DES_Model.dgn DES_ROADWAY_Edge-Of-Road-Oil 14016 . DES_ROADWAY_Lane-Line 14044 12345DES_Model.dgn ٠ 12345DES_Model.dgn DES_ROADWAY_Misc 14045 • DES_ROADWAY_Point-of-Slope-Selection 14046 12345DES_Model.dgn ٠ DES_ROADWAY_Shoulder 14047 12345DES_Model.dgn DES_ROADWAY_Toe-of-Fill 14051 12345DES_Model.dgn • DES_ROADWAY_Top-of-Cut 14052 12345DES_Model.dgn • 12345DES Model.dgn DRAFT_LC-Center_WT-3 22018
- 3. Turn off the Level DRAFT_LC-Center_WT-3.

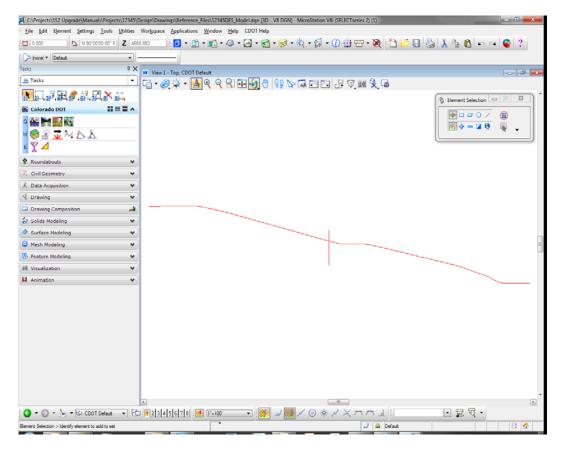
4. Right-click again anywhere in the Level Display box and select All Except Element.

🔰 Level Display - View 1			
🖵 🕅 Mew Display 🔹			
🜾 📴 🍃 (none) 🕶 Levels 💌 🜌 🕶			
Name	Number	File	Logical Used 🎽 🔺
Default	0	12345DES_Model.c	lgn • 🗏
ALG_COGO_Points	19001	12345DES_Model.c	ign •
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model_0	ian •
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model	Set <u>A</u> ctive
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model	Jump To Active Level
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model	Create Display Set
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.	
ALG_SECONDARY_Hor-Alignment-Sta-Major		12345DES_Model	All O <u>n</u>
ALG_SECONDARY_Hor-Alignment-Sta-Minor		12345DES_Model	All Off
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model	Invert On/Off
DES_ROADWAY_Curb-Top	14041	12345DES_Model	invertion/on
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model	Off By Element
DES_ROADWAY_Lane-Line	14044	12345DES_Model	All Except Element
DES_ROADWAY_Misc	14045	12345DES_Model	
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Model	Save Filter
DES_ROADWAY_Shoulder	14047	12345DES_Model	Level Manager
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model	Level <u>M</u> anager
DES_ROADWAY_Top-of-Cut	14052	12345DES_Model.c	
DRAFT_LC-Center_WT-3	22018	12345DES_Model.c	ign •
ALG_EVENT_Points	19002	Alignments.dgnlib	
ALG_EXISTING_Hor-Alignment	19003	Alignments.dgnlib	

5. **<D>** on the SH 86 (mainline) red-centerline.



6. **Fit** View 1.



All elements except the centerlines are turned off in the view. The **Off By Element** and **All Except Element** are handy options to turn levels on/off without knowing the level names or number.

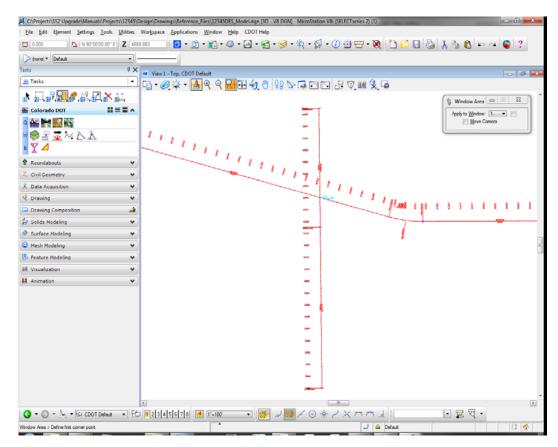
**Note:** You can also use the **Change Level** command, with the **Level** option set to **Display Only** or **Display Off**, to accomplish the same task.



Turn *on* all of the alignment levels (data point **<D>** and drag across all **ALG** levels.

🥩 Level Display - View 1		C Cargonal			x
🔁 🏹 🛛 View Display 🔻					
📔 📴 🎾 (none) 🔻 Levels 💌 🛹 🗸					
E-₩ 12345DES_Model.dgn ৳-₩ 12345SURV_Topo100.dgn					
Name	Number	File	Logical	Used 🍸	-
Default	0	12345DES_Model.dgn		•	
ALG_COGO_Points	19001	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Alignment-Sta-Major	19043	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Alignment-Sta-Minor	19044	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn		•	
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn		•	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model.dgn		•	
DES_ROADWAY_Lane-Line	14044	12345DES_Model.dgn		•	
DES_ROADWAY_Misc	14045	12345DES_Model.dgn		•	
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Model.dgn		•	
DES_ROADWAY_Shoulder	14047	12345DES_Model.dgn		•	
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model.dgn		•	
DES_ROADWAY_Top-of-Cut	14052	12345DES_Model.dgn		•	
DRAFT_LC-Center_WT-3	22018	12345DES_Model.dgn		•	
ALG_EVENT_Points	19002	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment	19003	Alignments.dgnlib			-

7. Window in to the intersection as shown.

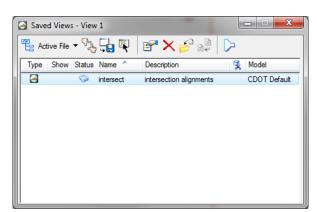


#### Save a view

- 1. **<D>** in the **Key-in** box to set the focus.
- 2. Key in *sv=intersect,intersection alignments* and press <Enter>.

Note: Always press <Enter> or <Tab> after key-ins.

- 3. **<D>** in View 1 to select it as the view to save.
- 4. Verify you saved the view. Select Utilities > Saved Views.



- **Note:** The **Saved Views** dialog box opens and the saved view shows in the list. The **Saved Views** dialog is used to manage your saved views (create and delete views, edit view names and descriptions, and recall saved views).
- 5. Close the Saved Views dialog box.

You may recall this saved view in upcoming labs.

#### Turn all levels on/off

1. Right-click again in Level Display and select All On.

🥩 Level Display - View 1	-		
🖵 🖏 View Display 🔹			
🜾 📴 🍃 (none) 🔻 Levels 🔹 🜌 🕶			
□ - 12345DES_Model.dgn ⊕ - 12345SURV Topo 100.dgn			
Name	Number	File	Logical Used
Default	0	12345DES_Model.dgn	• • •
ALG_COGO_Points	19001	12345DES_Model.dgn	Set <u>A</u> ctive
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn	Jump To Active Level
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn	Create Display Set
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn	1.7
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn	All O <u>n</u>
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn	All Off
ALG_SECONDARY_Hor-Alignment-Sta-Major		12345DES_Model.dgn	Invert On/Off
ALG_SECONDARY_Hor-Alignment-Sta-Minor		12345DES_Model.dgn .	-
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn	Off By Element
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn	All Except Element
DES_ROADWAY_Edge-Of-Road-Oil	14016 14044	12345DES_Model.dgn	Save Filter
DES_ROADWAY_Lane-Line DES_ROADWAY_Misc	14044	12345DES_Model.dgn 12345DES_Model.dgn	<u>adve Filter</u>
DES_NOADWAT_MISC DES_ROADWAY_Point-of-Slope-Selection	14045	12345DES_Model.dgn	Level <u>M</u> anager
DES_ROADWAT_Foint-of-sidee-selection DES_ROADWAY_Shoulder	14046	12345DES_Model.dgn	
DES ROADWAY Toe-of-Fill	14051	12345DES_Model.dgn	
DES ROADWAY Top-of-Cut	14052	12345DES_Model.dgn	
DRAFT LC-Center WT-3	22018	12345DES_Model.dgn	
ALG EVENT Points	19002	Alignments.dgnlib	
ALG EXISTING Hor-Alignment	19002	Alignments.dgnlib	
	13003	7 signmenta.ognilo	

All levels are turned on in View 1.

2. **Fit** View 1.

Level Display - View 1				<b>- - X</b>
🖓 🏹 View Display 🔻				
🖗 📴 🏳 (none) 🔹 Levels 💽 🎑 🔹				
Name	Number	File	Logical	Used 🔪 🦯
Default	0	12345DES_Model.dgn		•
ALG_COGO_Points	19001	12345DES_Model.dgn	6 . A .:	
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn	Set <u>A</u> ctive	
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn	Jump To /	Active Level
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn	Create Dis	play Set
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn		
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn	All O <u>n</u>	
ALG_SECONDARY_Hor-Alignment-Sta-Major	19043	12345DES_Model.dgn	All Off	
ALG_SECONDARY_Hor-Alignment-Sta-Minor		12345DES_Model.dgn	Invert On	/Off
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn -	-	
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn	Off By Ele	ment
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model.dgn	All Except	Element
DES_ROADWAY_Lane-Line	14044	12345DES_Model.dgn =	0 E14	
DES_ROADWAY_Misc	14045	12345DES_Model.dgn	Save Filter	
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Model.dgn	Level Mar	ager
DES_ROADWAY_Shoulder	14047	12345DES_Model.dgn		5
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model.dgn		•
DES_ROADWAY_Top-of-Cut	14052	12345DES_Model.dgn		•
DRAFT_LC-Center_WT-3	22018	12345DES_Model.dgn		•
ALG EVENT Points	19002	Alignments.dgnlib		
ALG_EVENT_Foints ALG_EXISTING Hor-Alignment	19003	Alignments.dgnlib		

3. **Right-click** in the level display box and select **All Off** to turn all levels *off* in View 1.

Note: You can also turn all levels on or off with the key-ins on=all and of=all.

- 4. Turn all levels back *on* in View 1.
- 5. Window in to the end of the project as shown.

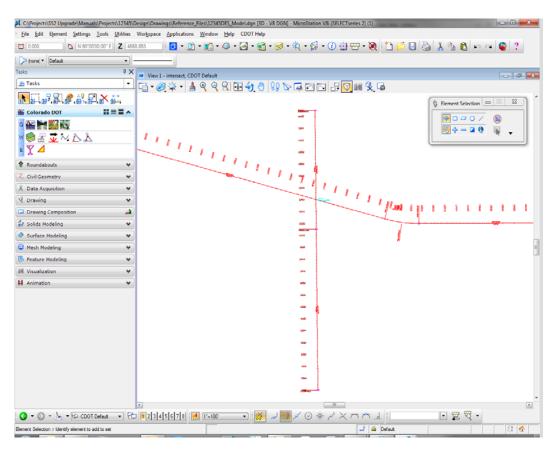
363+00	364+00	365+00	366+00	366+61

#### Recall the saved view

1. In the **Key-in** box, key in *vi=intersect*.

Don't forget to **<Tab>** or **<Enter>** after key-ins.

2. **<D>** in View 1.

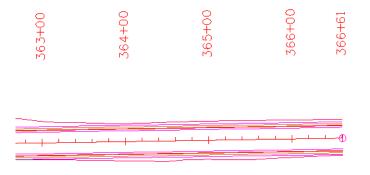


The saved view of the alignment and stationing is recalled in View 1. The appropriate levels from the saved view are turned on/off.

3. From the View Control toolbar, select View Previous.



The previous view of the beginning of the project is recalled. Notice that all levels are turned back on from this previous view.



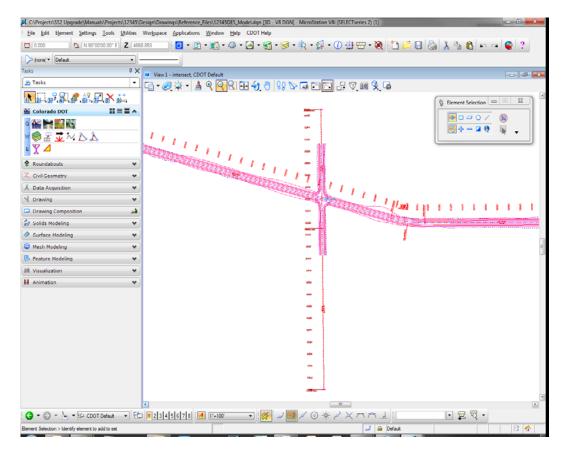
4. Select View Next.



This recalls the intersection view again with the design levels turned off.

#### Use key-ins to turn level on/off

- 1. Key in **on=all**, then **<Tab>** or **<Enter>**.
- 2. **<D>** in View 1 to turn all level back on in this view.



- **Note:** Levels are view-dependent. When using key-ins, you must select the view with a data point **<D>** to tell MicroStation which view to turn levels on or off.
- 3. Key in **of=des***.

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- 📕 C\Projects\SS2 Upgrade\Manuals\Projects\12345\Design\Drawings\Reference_Files\12345DES_Model.dgn [3D V8 DGN] MicroStation V8i (SELECT series 2) (1) - 0 -X- / · Eile Edit Element Settings Tools Utilities Workspace Applications Window Help CDOT Help 0.000 • Default [> (none) ▼ 7 X View 1 - Top, CDOT Default - 2 💌 ▁<mark>ੵ੶∅☆੶≜੧ੑੑੑੑੑ</mark>ੑੑੑੑੑੑ₽₽<del>ੑ</del>ੵ%₽₽₽₽₽₽₽₽₩%₽ 🔎 Tasks N 🗊 🖉 🖉 🖓 🖾 💦 🛣 Element Selection 💒 Colorado DOT Peritor and I 😼 🗆 🖉 🗸 🔊 🔊 a 🔛 🐂 🎫 👯 🗑 💠 = 🖬 🏘 🙀 294 . vi 🥪 🗄 😼 🚧 📐 **** E Y 🖊 ...... Roundabouts ٧ Z Civil Geometry 7 * 1111 Margansananan Ì 🕅 Data Acquisition ۷ 🔏 Drawing ۷ Drawing Composition --👉 Solids Modeling v Surface Modeling ۷ 😳 Mesh Modeling ant ۷ **,** 5 Feature Modeling ۷ III Visualization ۷ ...... H Animation ----1944 -100 Atla 1944
- 4. **<D>** in View 1 to select View 1.

🕒 • 🕑 - 🌭 • 🖾 CDOT Default - 🔹 🔂 🗾 2 3 4 5 6 7 8 🔜 11-100

Display complete

All **DES**_levels are turned off in view 1. You can use wild cards with key-ins to turn a group of levels on or off.

■ ※ × ホホ」

🤳 🖴 Default

### Set the active level

1. In the Level Display box, double-click on the level ALG_PROPOSED_Hor_Alignment to set it active.

🏓 Level Display - View 1				-	x
🖵 🖏 View Display 🔹					
🌾 📴 🍃 (none) 🕶 Levels 💌 🐱 🕶					
Name	Number	File	Logical	Used 🔪	
Default	0	12345DES_Model.dgn		•	=
ALG_COGO_Points	19001	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Alignment-Sta-Major	19043	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Alignment-Sta-Minor	19044	12345DES_Model.dgn			
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn		•	
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn		•	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model.dgn		•	
DES_ROADWAY_Lane-Line	14044	12345DES_Model.dgn		•	
DES_ROADWAY_Misc	14045	12345DES_Model.dgn		•	
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Model.dgn		•	
DES_ROADWAY_Shoulder	14047	12345DES_Model.dgn		•	
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model.dgn		•	
DES_ROADWAY_Top-of-Cut	14052	12345DES_Model.dgn		•	_
DRAFT_LC-Center_WT-3	22018	12345DES_Model.dgn			
ALG_EVENT_Points	19002	Alignments.dgnlib			
ALG_EXISTING_Hor-Alignment	19003	Alignments.dgnlib			Ŧ

The background color changes to green.

*Note:* You can also use the *lv*= key-in to set the active level.

The active level is also reflected in the Attributes toolbar at the top of the screen.



2. Turn all levels *off* in View 1.

C\Projects\SS2 Upgrade\Manuals\Projects\12345\D	esign\Drawings\Reference_Files\12345DES_ModeLdgn [3D - V8 DGN] - MicroStation V8i (SELECTseries 2) (1)	- 0
<u>File Edit Element Settings Tools Utilities</u>	Workspace Applications Window Help CDOT Help	
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(none; • ALG_PROPOSED_Hor-Alignment •		
Tasks 🛛 🖗 🗙	View 1 - Top, CDOT Default	- a <b>-</b>
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	Name Number File Lo -	
	ALG_COGO_Points 19001 12345DES_Model.dgn	
	ALG_PROPOSED_Hor-Alignment 19029 12345DES_Model.dgn	
	ALG_PROPOSED_Hor Alignment-Sta-Major 19030 12345DES_Model.dgn	
	ALG_PROPOSED_Hor-Alignment-Sta-Minor 19031 12345DES_Model.dgn ALG_PROPOSED_Hor-Alignment-Text 19032 12345DES_Model.dgn	
	ALG_PROPOSED_Hor-Cardinals 19033 12345DES_Model.dgn	
	ALG_SECONDARY_Hor-Alignment-Sta-Major 19043 12345DES_Model.dgn ALG_SECONDARY_Hor-Alignment-Sta-Minor 19044 12345DES_Model.dgn	
	ALG_SECONDARY_Hor Cardinals 19046 12345DES_Model.dgn	
	DES_ROADWAY_Curb-Top 14041 12345DES_ModeLdgn +	
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Pan Vew > Select Vew		
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All levels are turned off except the alignment centerline because it is the active level.

**Note:** The active level is always displayed provided the option **Display Active Level in** All Views is toggled on in **Workspace > Preferences > Operation**. If this option is turned off, you can also turn the active level on/off.

- K C/Projects/SS2 Upgrade/Manuals/Projects/12345/Design/Drawings/Reference_Files/12345DES_Model.dgn [3D V8 DGN] MicroStation V8i (SELECTseries 2) (1) Eile Edit Element Settings Tools Utilities Workspace Applications Window Help CDOT Help 10.000 | 🕒 N 970700 07 E | Z | 4555 553 🔄 🚺 = 🛐 = 🚳 = 🙆 = 🚰 = 🥰 = 🥳 = 🌾 = 🌾 = 🌾 = 🌾 = 🏹 = 🎊 🗋 🖆 = 🎊 🕺 🐧 👘 🛥 🚳 ? > (none) - DES_ROADWAY_Toe-of-Fill -4 X View 1 - Top, CDOT Default 🔎 Tasks └─<mark>|</mark>╔_╹-@ॣ`-|**≜**९९९छ⊕�;७१४४ଢ⊡⊡|₽∇,≋%,© N2 37 47 47 67 67 77 77 Element Selection 23 💒 Colorado DOT 🔮 🗆 🗢 🔾 🗡 a 💒 🐂 🌌 💐 🗑 🔶 = 🖬 🍕 🙀 🈂 差 😼 🚧 👗 e 🍸 ⊿ Roundabouts Z Civil Geometry ~ 🕅 Data Acquisition 23 Level Display - View 1 V Drawing 🖵 🙀 View Display 💌 Drawing Col 📢 📴 🎾 (none) 🕶 Levels 💌 🕶 🕶 🛃 Solids Modeling 12345DES_Model.dgn
   12345SURV_Topo100.dgn Surface Modeling 😳 Mesh Modeling Number File 5 Feature Modeling Name Lo -III Visualization H Animation V Ten of I 🔇 = 🕘 - 🌭 = 🔂 CDOT Defauk - 🚽 🔂 🛿 2 3 4 5 6 7 8 🛃 11-100 2 × 0 × 2 × ~ ~ 4 💽 🛱 🖣 2 DES_ROADWAY_To
- 3. Key in *lv=14051*, to change the active level to the **Toe-of-Fill** level.

This level is automatically turned on in the view and now shows with a green background in the **Level Display** box.

4. Close the Level Display box.

#### Lab 2.3 - Working with the Level Manager

The **Level Manager** shows all of the level libraries that are attached to your design file, level names, numbers, descriptions, etc. The **Level Manager** also displays each level's **ByLevel** symbology – the color, line style and weight assigned to that level, which conforms to CDOT's CADD standards. Additional information such as if the level is used, frozen, available for plotting, etc. are also shown in the **Level Manager**.

1. Open the Level Manager. Select Settings > Level > Manager or on the Primary toolbar select Level Manager.



2. Sort the **Level Manager** on **Used** to bring all the used levels to the top of the list, you may need to scroll over to the right to see the column **Used**.

1	🛃 Level Manager									×
Levels Filter Edit										
Symbology: ByLevel ▼   → (none) ▼   →										
	E Model.dg	△ Name	Number	Description	<b>1</b>	50	19	۲	Used	<b>^</b>
Ы	12345SURV_Top	Default	0		0	0	0	~	•	
Ш	- All Levels	ALG_COGO_Points	19001	COGO Points	5	0	<u> </u>	~	•	-
	🗄 🏷 Filters	ALG_PROPOSED_Hor-Alignment	19029	Proposed Horiz. Cent	3	<b>0</b>	<b>—</b> 4	~	•	
		ALG_PROPOSED_Hor-Alignment-Sta-Ma	-	Proposed Horiz. Alg	3	0	<u> </u>	~	•	
Ш		ALG_PROPOSED_Hor-Alignment-Sta-Mir		Proposed Horiz. Alg	3	0	3	· ·	•	
Ш		ALG_PROPOSED_Hor-Alignment-Text	19032	Proposed Horiz. CL T	3	0	!	<u> </u>	•	
		ALG_PROPOSED_Hor-Cardinals ALG_SECONDARY_Hor-Alignment-Sta-M	19033 laior 19043	Proposed Horiz. Key Secondary Horiz. Alg	3	0		<i>.</i>		
		ALG_SECONDART_Hor-Alignment-Sta-M		Secondary Horiz. Alg	35	0	3			
		ALG SECONDARY Hor-Cardinals	19046	Secondary Horiz, Ke	35	0	1	2		
		DES ROADWAY Curb-Top	14041		3	0	3	2	•	
		DES_ROADWAY_Edge-Of-Road-Oil	14016		3	0	<u> </u>	1	•	
		DES_ROADWAY_Lane-Line	14044		4	DES_L	1	~	•	
	< <u> </u>	DES_ROADWAY_Misc	14045		6	<b>0</b>	<u> </u>	~	•	-
	Active Level: DES_ROADWA	Y_Toe-of-Fill 1258 of 12	258 displayed; 1 s	elected;						

# **Level Libraries**

Level libraries are master templates of levels. The discipline-specific level libraries (Roadway Design, ROW, Alignments, etc.) are attached to your design file via the **Select Group Environment** utility program that you ran before starting MicroStation. The **Select Group** program has two options: **Bridge** and **xxMulti-Discipline**. All groups except Bridge should choose **xxMulti-Discipline** to attach all level libraries. The Bridge option just attaches level libraries needed for the Bridge group.

When a level is set active and graphics are placed on this level, the level is copied from the library file to the active design file.

Used levels that are copied to the design file appear bold in the **Level Manager**. All unused levels are in the library.

1. Scroll through the list of levels.

All levels have a logical level naming convention according to their library (e.g. all roadway design levels start with **DES**, all alignment levels with **ALG**, topo levels with **TOPO**).

2. Right click in the column headings and toggle Library on.

Levels Filter Edit							
Symbology → M 12345DES_Model.dg	y: ByLevel  (none)	• 🞑 •		Number	Description	Save Layout	Used
Ilians 12345SURV_Top     Al Levels     Fiters	ALG_PROPOSED_H ALG_PROPOSED_H ALG_PROPOSED_H ALG_SECONDARY_	lor-Alignment-Sta-Major lor-Alignment-Sta-Minor lor-Alignment-Text Hor-Cardinals Hor-Alignment-Sta-Major Hor-Alignment-Sta-Minor Hor-Cardinals tho-Top Jge-Of-Road-Oil		0 19001 19029 19030 19031 19032 19033 19043 19044 19046 14041 14016 14044	COGO Points Proposed Proposed Proposed Proposed Secondar Secondar		
Active Level: DES_ROADWA	ytoe of-fill	1258 of 1258 di	splayed; 1 selecte	d;		Global Display Global Freeze Lock Plot Used Elements Transparency Show <u>All</u> List Restore <u>D</u> efaults	

The library name is now shown in its own column in Level Manager.

Name		Number	Description	
DRAFT_LC-Center_WT-3	Standard_Levels	22018		1
DES_ROADWAY_Top-of-Cut	Roadway_Design	14052		13
DES_ROADWAY_Toe-of-Fill	Roadway_Design	14051		10
DES_ROADWAY_Shoulder	Roadway_Design	14047		5
DES_ROADWAY_Point-of-Slope	Roadway_Design	14046		5
DES_ROADWAY_Misc	Roadway_Design	14045		6
DES_ROADWAY_Lane-Line	Roadway_Design	14044		4
DES_ROADWAY_Edge-Of-Road-Oil	Roadway_Design	14016		3
DES ROADWAY Curb-Top	Roadway Design	14041		3

### Change the look of the Level Manager box

- 1. Right-click in any column heading (Name, Number, etc.) and select List.
- 2. Toggle heading on or off so that Name, Color, Style, Weight, and Used are on and select OK.

Show/Hide Tools		
Click to Show or Hide Tools	The second secon	QK Cancel

🛃 Level Manager					X
Levels <u>Filter</u> Edit					
🧐 🔀 📑 🖉 Symbology	r: ByLevel 💌   🏳 (none) 🔻 🔝 👻				
	Name		59	12	Used 🔪 🔺
	Default	0	O	0	• 🗉
- All Levels	ALG_COGO_Points	5	O	<u> </u>	•
🗄 🕞 Filters	ALG_PROPOSED_Hor-Alignment	3	o	4	•
	ALG_PROPOSED_Hor-Alignment-Sta-Major	3	o	<u> </u>	•
	ALG_PROPOSED_Hor-Alignment-Sta-Minor	3	0	<u> </u>	•
	ALG_PROPOSED_Hor-Alignment-Text	3	O	<u> </u>	•
	ALG_PROPOSED_Hor-Cardinals	3	0	1	•
	ALG_SECONDARY_Hor-Alignment-Sta-Major		O	<u> </u>	•
	ALG_SECONDARY_Hor-Alignment-Sta-Minor		0	3	•
	ALG_SECONDARY_Hor-Cardinals	35	0	1	•
	DES_ROADWAY_Curb-Top	3	0	3	•
	DES_ROADWAY_Edge-Of-Road-Oil DES_ROADWAY_Lane-Line	4			
4 III +	DES_ROADWAY_Lane-Line DES_ROADWAY_Misc	<u>4</u>	DES_LANE_Skip_existing		
	. = =		U	2	-
Active Level: DES_ROADWA	Y_Toe-of-Fill 1258 of 1	258 displayed; 1 selected	:		

The Level Manager box updates to reflect the changes.

3. Close the Level Manager box.

### **ByLevel Symbology**

**ByLevel** symbology ensures that CDOT CADD standards are met by placing graphics **ByLevel** (the color, line style and weight assigned to that level in the level library).

*Note:* When placing graphics using the CDOT Group Menus, the correct level, along with it's **ByLevel** symbology is automatically set for you.

#### Analyze an element

1. In the **Key in** box type *vi=intersect*, Enter the keyin and then **<D>** in view 1 to recall the alignment saved view.

🐨 Key-in	×
vi=intersect	• 🛱 🛱 •

2. From the **Primary** toolbar, select **Element Information**.

Primary Tools		
	• 🥩 • 🔌 • 🙀 •	v 🚺 🗄 🕁 🗸 📎
		Element Information

3. **<D>** on the horizontal alignment centerline graphic.

📕 Element Info ^ / Line 1.0.1 Line Arc Line Arc General Descriptio ALG_PROPOSED_Hor-Alignment Level ByLevel (3) ByLevel (0) ByLevel (4) Color Line Style Weight Class 'nman Template None Transparency 0 Geometry Groups Extended Raw Data

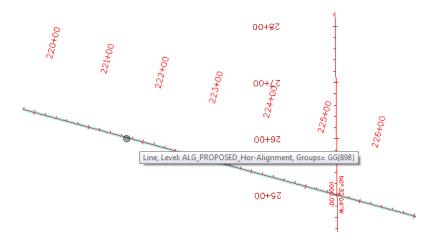
**Element Information** shows that the alignment was placed on ALG_PROPOSED_Hor_Alignment level and placed with ByLevel Symbology.

- 4. **Exit** out of the **Element Information** box.
- 5. Open the Level Manager box.
- 6. Find the ALG_PROPOSED_Hor_Alignment level and note the ByLevel Symbology is set up in the Level Manager.

😭 Level Manager					
Levels Filter Edit					
Symbolog	iy: ByLevel 💌 խ (none) 🔻 🖂 🔻				
P 12345DES_Model.dg	Name	6	50	12	Used 🔪 🔺
	Default	0	0	O	• E
- All Levels	ALG_COGO_Points	5	0	2	•
🗄 🕞 Filters	ALG_PROPOSED_Hor-Alignment	3	<u> </u>		•
	ALG_PROPOSED_Hor-Alignment-Sta-Major	3	0		•
	ALG_PROPOSED_Hor-Alignment-Sta-Minor	3	O	<u> </u>	•
	ALG_PROPOSED_Hor-Alignment-Text	3	o		•
	ALG_PROPOSED_Hor-Cardinals	3	o	<u> </u>	•
	ALG_SECONDARY_Hor-Alignment-Sta-Major		O	<u> </u>	•
	ALG_SECONDARY_Hor-Alignment-Sta-Minor		o	<u> </u>	•
	ALG_SECONDARY_Hor-Cardinals	35	0	1	•
	DES_ROADWAY_Curb-Top	3	o	<u> </u>	•
	DES_ROADWAY_Edge-Of-Road-Oil	3	0	<u> </u>	•
	DES_ROADWAY_Lane-Line	<u> </u>	DES_LANE_Skip_existing	1	•
I → III	DES_ROADWAY_Misc	6	0	<u> </u>	• •
Active Level: DES_ROADWA	Y_Toe-of-Fill 1258 of 1	258 displayed; 1 selected	:		

### **Review Pop-up information**

1. Hold your cursor over the centerline of SH 86 (the mainline alignment).



MicroStation's "pop-up" information tells you the type of graphic (line) and the level on which it is placed (**ALG_PROPOSED_Hor_Alignment**.) Pop-up information is a quick way to determine what level graphics are on.

#### **Level Filters**

**Level Filters** are groups of levels created in the **Level Manager** by filtering on virtually any level criteria (name, number, color, etc.) and then naming the filter. These level groups can then be turned on/off using the filter.

#### **Review the filters**

- 1. In the left pane of the Level Manager box, click on Filters.
- 2. Click on the column name Filter to sort alphabetically by filter name.

<u>L</u> evels <u>F</u> ilter <u>E</u> dit								
🗋 🗙 📳 Symbolog	y: ByLevel 💌   🔎 (non	e) 🔻 🚾 🕇						
- 12345DES_Mode _	Filter ^	Level Group	Δ	Name	-	===	=	Used
	Alignments [Alignments]			ALG_*				
<u>−                                    </u>	Basins [Hydraulics]			BASIN_				
E-> Filters	Bridge-All [Bridge]			BRDG_*, "GEO				
⊕- > Alignments [A] ≡	Bridge [Bridge]	1		BRDG_*, "Default"				
-> Bridge [Bridge	Bridge+Draft [Bridge]	~						
-> Bridge+Draft [	Bridge+Draft+Sheet [Bri	1						
	Buildings [Topo]			TOPO_Building_*				
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— 🕞 Bridge-All [Bric	Color [Standard_Levels]			_co				
— Construction [	Construction [Construction]							
🗄 🖒 GIS [GIS]	Culverts [Topo]			TOPO_Culvert_*				
Hydraulics [Hy	Curb and Gutter [Topo]			TOPO_CurbGutr_*				
H-> Landscape ar	Draft [Standard_Levels]			Draft				
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→ Mode A 12345DES_Mode A	Filter	Level Group		Name		Save Layout	Layout 1
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Active Level: DES_ROADWA	Electric [Topo]	105 of 105 c	display	TOPO Electric • ved; 1 selected;	~	Logical Color Style Weight Material	
					<b>~</b>	Global Display Global Freeze Lock Plot Used Elements Transparency Show <u>A</u> ll List	

3. Turn on the **Number** column.

There are several standard CDOT filters, which are based on name and number. The CDOT standard level naming and numbering convention enables the efficient use of level filters.

evels <u>F</u> ilter <u>E</u> dit								
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	Filter 🔷	Level Group	Δ	Name	Number	==	E	
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⊕-> Alignments [A ≡	Bridge [Bridge]	~		BRDG_*, "Default"				
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	Color [Standard_Levels]			_co	22000-2			
	Construction [Construction]				21000-2			
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	Curb and Gutter [Topo]			TOPO_CurbGutr_*				
🗄 🕞 Landscape ar	Draft [Standard_Levels]			Draft	22000-2			
L Materiale and								

- **Note:** Level filters are stored in level libraries (note the library name in brackets beside the filter).
- 4. In the left pane of the Level Manager, Click the + symbol next to the Filters to expand the list.

- 🚮 Level Manager - - × Levels <u>Filter</u> Edit 🗋 🗙 📳 Symbology: ByLevel 🔽 | 🔎 (none) 🔻 🚾 🔻 . Filter ^ Level Group 🛕 Name . - 🕞 Bridge-All [Bridge] Number == = - Construction [Construction] Alignments [Alignments] ALG_* 19000-1. 🗄 🗁 GIS [GIS] Basins [Hydraulics] BASIN_ 11000-1.. BRDG_*, "GEO... BRDG_*, "Default" Hydraulics [Hydraulics] Bridge-All [Bridge] Bridge [Bridge] Landscape and Environmental [L] Bridge+Draft [Bridge] ~ Materials and Geotechnical [Mate Bridge+Draft+Sheet [Bri.. ~ Roadway Design [Roadway_De Buildings [Topo] TOPO_Building_* 1-9999 Fences TOPO_Camping_* 1-9999 Camping [Topo] Guardrail Color [Standard_Levels] _co 22000-2 Phasing 21000-2. Construction [Construction] Roadway TOPO_Culvert_* Culverts [Topo] 1-9999 TOPO_CurbGutr_* Surface Curb and Gutter [Topo] 1-9999 22000-2. Draft [Standard_Levels] Draft ROW [ROW] Chandard Laurala (Cha Active Level: DES_ROADWAY_Toe-of-Fill 105 of 105 displayed; 1 selected;
- 5. Click the + symbol next to the **Roadway Design** to expand this list.

6. **Click** on **Roadway** to review the levels that make up this filter (all design levels with Roadway in the name).

<u>L</u> evels <u>F</u> ilter <u>E</u> dit								
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-> Bridge-All [Bridge]	Δ	Name	6	:0	20	8	۲	
-> Construction [Construction]		DES_Roadway_*						
🖶 🍃 GIS [GIS]		DES_ROADWAY	4	D		(none)	1	
🗄 ⊳ Hydraulics [Hydraulics]		DES_ROADWAY	5			(none)	1	
🗄 🏳 Landscape and Environmental [L 🚃		DES_ROADWAY	5			(none)	~	
🕀 🏷 Materials and Geotechnical [Mate		DES_ROADWAY	3			(none)	~	
🕂 🗁 Roadway Design [Roadway_Des		DES_ROADWAY	6			(none)	~	
-> Fences		DES_ROADWAY	3			(none)	~	
		DES_ROADWAY	_			(none)	~	
		DES_ROADWAY	_	) D		(none)	~	
-> Roadway		DES_ROADWAY_App	_			(none)	~	
-> Surface		DES_ROADWAY_Cont	_		·	(none)	~	
		DES_ROADWAY_Curb	_			(none)	~	
		DES_ROADWAY_Curb	7			(none)	~	

Note that this filter contains both used levels in the active file and unused levels in the library.

- 😭 Level Manager - - X Levels Filter Edit 🥪 💓 📳 🛛 Symbology: ByLevel 💌 | 🏳 (none) 🔻 🖾 🔻 ▲ Name - Bridge-All [Bridge] . .0 8 ۲ - Construction [Construction] DES_Guardrail_ 🖃 🏷 GIS [GIS] DES_GUARDRAIL_Cable 5 GU. 1 (none) + Hydraulics [Hydraulics] 5 GU., DES GUARDRAIL En... (none) ~ DES GUARDRAIL_Im... . 5 — 5 GU... (none) - 🏳 Materials and Geotechnical [Mate DES GUARDRAIL Tr... (none) 1 DES_GUARDRAIL_Ty... 5 GU... DES_GUARDRAIL_Ty... 5 GU... (none) ~ Roadway Design [Roadway_Des (none) Fences DES_GUARDRAIL_Symb 5 (none) Guardrail DES_GUARDRAIL_Ty... 5 GU... DES_GUARDRAIL_Ty... 5 GU... ~ (none) Phasing ~ (none) ≽ Roadway DES_GUARDRAIL_Ty... 5 GU.. (none) Surface ROW [ROW] Chandland La Ja ICi Active Level: DES_ROADWAY_Toe-of-Fill 10 of 1574 displayed; 1 selected;
- 7. Click on **Guardrail** to review all design levels with Guardrail in the name.

- **Note:** This filter does not have any used levels in the active design file. All levels are from the library.
- 8. Right-click in any column heading and turn on the Number column.
- 9. Click on the upper level **Roadway Design** filter and review levels.

evels <u>F</u> ilter <u>E</u> dit								
🖉 🔀 🔤 Symbology: ByLevel 💌		(none) 🔻 🚾 👻						
-> Bridge-All [Bridge]	Δ	Name [	6	:0	20	٨	۲	
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🕀 🗁 GIS [GIS]		DES_ROADWAY	4	D		(none)	· ·	
Hydraulics [Hydraulics]		DES_ROADWAY	5			(none)	/	_
🖶 🕞 Landscape and Environmental [L		DES_ROADWAY	5			(none)	~	
⊕-> Materials and Geotechnical [Mate		DES_ROADWAY	3			(none)	1	
🖃 🗁 Roadway Design [Roadway_Des		DES_ROADWAY	6			(none)	~	
- 🕞 Fences		DES_ROADWAY	3			(none)	~	
- 🕞 Guardrail		DES_ROADWAY				(none)	~	
-> Phasing		DES_ROADWAY	10	D		(none)	~	
-> Roadway		DES_BIKEPATH	3			(none)	~	
-> Surface		DES_GUARDRAIL_Cable	_			(none)	1	
			4	FE		(none)	~	
ELS Standard Lovels [Standard Lovel		DES_PHASING	5			(none)	~	

Note that this filter is not filtered on name, but instead contains all levels in the Roadway Design level number range (14000 - 14999). This includes all "children" filter levels like Guardrail and Roadway.

#### Use level filters to turn levels on/off

The level filters are stored in the level libraries, accessed via the **Level Manager**. However, to actually use the filters, you need to use **Level Display**.

1. Close the Level Manager.

2. Open the Level Display box from the Primary toolbar.

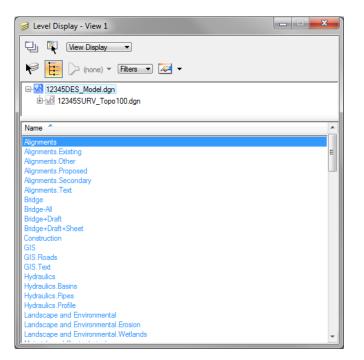


- 3. Set the active level to **Default** by **double-clicking** it in the **Level Display** box.
- 4. Turn *off* all levels.
- 5. Change the **Show** option from **Levels** to **Filters.**

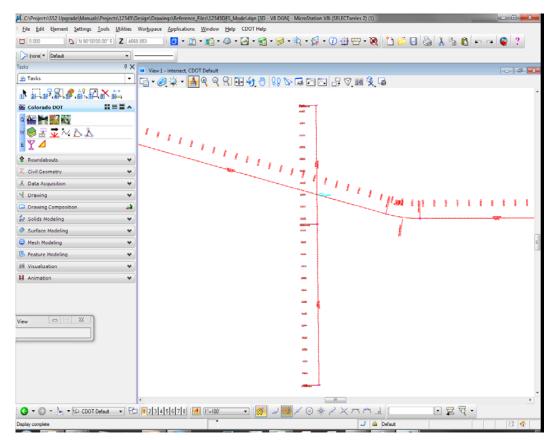
🥩 Level Display - View 1			x
🖓 🕅 View Display			
Image: Weight of the second secon			
Name	Number	File	Lo 🔺
Default	0	12345DES_Model.dgn	=
ALG_COGO_Points	19001	12345DES_Model.dgn	
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn	
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn	
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn	
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn	
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn	
ALG_SECONDARY_Hor-Alignment-Sta-Major	19043	12345DES_Model.dgn	
ALG_SECONDARY_Hor-Alignment-Sta-Minor	19044	12345DES_Model.dgn	
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn	
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn	
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model.dgn	
DES_ROADWAY_Lane-Line	14044	12345DES_Model.dgn	
DES_ROADWAY_Misc	14045	12345DES_Model.dgn	
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Model.dgn	
DES_ROADWAY_Shoulder	14047	12345DES_Model.dgn	
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model.dgn	
DES ROADWAY Top-of-Cut	14052	12345DES Model.dgn	Ŧ
			•

6. Sort the Level filters alphabetically in ascending order.

7. Toggle on the Alignments filter.



Only the alignment levels (centerline and stationing levels) are turned on. Choosing the filter turns on all levels in the filter.



**Note:** If you toggle the filter off, it turns *all levels* on by default. However, selecting the filter again resets the filter and turns on only the filter levels.

#### Use level filters to select a group of levels

1. With the Alignments filter selected, change the Show option back to Levels.

🎯 Level Dis	play - View 1	
- Li 🕰	View Display	<b>•</b>
r 🔁	🏳 (none) 🔻	Levels     Filters

2. Change the List Filter from (none) to Alignments > Proposed.

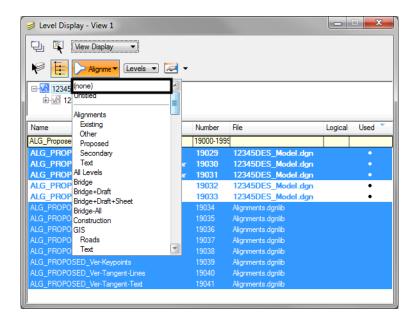
Level Display - View 1				×
🕞 🏹 🛛 View Display 🔻				
🞼 🔽 (none) 🔻 Levels 🔍	- 12			
□- <u>v</u> 12345 (none) ⊕- <u>v</u> 12 Untitled				
Alignments				
Name Existing Other		Number	File	Lo 🔺
Default Proposed		0	12345DES_Model.dgn	
ALG_COGO Secondary		19001	12345DES_Model.dgn	
ALG_PROP Text		19029	12345DES_Model.dgn	
ALG_PROP All Levels	I.	19030	12345DES_Model.dgn	
ALC PROP Bridge	r	19031	12345DES_Model.dgn	
ALG_PROP Bridge+Draft Bridge+Draft+Sheet		19032	12345DES_Model.dgn	
ALG_PROP Bridge-All		19033	12345DES_Model.dgn	
ALG_SECO Construction	jo	r 19043	12345DES_Model.dgn	
ALG_SECO GIS	10	r 19044	12345DES_Model.dgn	
ALG_SECO Roads		19046	12345DES_Model.dgn	
DES_ROAD Text	+	14041	12345DES_Model.dgn	
DES_ROADWAY_Edge-Of-Road-Oil		14016	12345DES_Model.dgn	
DES_ROADWAY_Lane-Line		14044	12345DES_Model.dgn	
DES_ROADWAY_Misc		14045	12345DES_Model.dgn	
DES_ROADWAY_Point-of-Slope-Select	tion	14046	12345DES_Model.dgn	
DES_ROADWAY_Shoulder		14047	12345DES_Model.dgn	
DES_ROADWAY_Toe-of-Fill		14051	12345DES_Model.dgn	
DES ROADWAY Top-of-Cut		14052	12345DES Model.dgn	-
				F

The list of hundreds of levels is filtered down to only a few (the levels contained in the Proposed Alignments filter).

3. Turn off the ALG_Proposed_Hor-Alignment-Text and ALG_Proposed_Hor-Cardinals levels.

Display - View 1					x
🖵 🏹 New Display 🔹					
E-100 12345DES_Model.dgn					
Name	Number	File	Logical	Used	-
ALG_Proposed_*	19000-199	99			_
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn			
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Cardinals	<b>19033</b>	12345DES_Model.dgn		•	
ALG_PROPOSED_Hor-Keypoints		Alignments.dgnlib			
ALG_PROPOSED_Hor-Tangent-Lines		Alignments.dgnlib			
ALG_PROPOSED_Hor-Tangent-Text	19036	Alignments.dgnlib			
ALG_PROPOSED_Ver-Alignment		Alignments.dgnlib			
ALG_PROPOSED_Ver-Alignment-Text		Alignments.dgnlib			
ALG_PROPOSED_Ver-Keypoints		Alignments.dgnlib			
ALG_PROPOSED_Ver-Tangent-Lines	19040	Alignments.dgnlib			
ALC_F HOF OULD_VER Hangent-bries					

- **Note:** Use Level Filters to improve your MicroStation efficiency when searching for levels. Setting the List Filter is an efficient way to work with levels. Instead of scrolling through hundreds of levels to find a level to turn on, off or set active, the filter breaks the levels down into a logical and manageable group.
- 4. Set the List Filter back to (none) to show all levels in the Level Display list.



- 5. Close the Level Display box.
- 6. **Fit** View 1.
- 7. Save your settings (File > Save Settings).

8. Exit MicroStation.

# LAB 3 - 3D View Control

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Check the elevation of an element
- Rotate a view using the *rv* = keyin
- Rotate a view using the 3-point method
- Rotate a view by element
- Rotate to a standard view (Top, Front, etc.)
- Check and set the Active Depth
- Check and set the **Display Depth**

## Lab 3.1 - Starting MicroStation

1. Start MicroStation and open the design file **12345DES_Model.dgn**from the **C:\Projects\12345\ Design\Drawings\Reference_Files** folder.

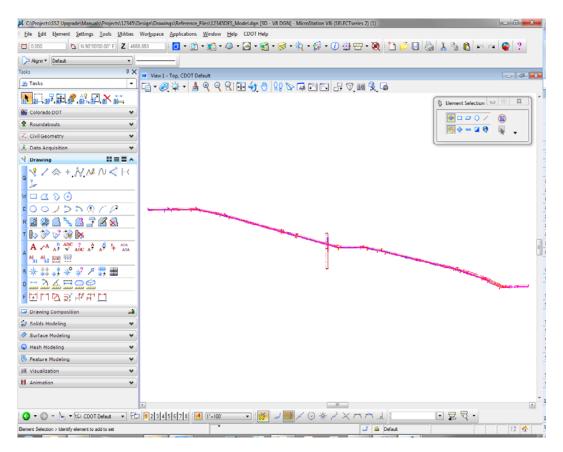
You will use this CDOT project, which has proposed graphics placed at the correct elevations, to practice with the concept of 3D view controls.

2. Look in the top title bar of the MicroStation window and note that this is a 3D file.

 C\Projects\SS2 Upgrade\Manuals\Projects\12345\Design\Drawings\Reference_Files\12345DES_Model.dgf
 [3D - V8 DGN]
 MicroStation V8i (SELECTseries 2) (1)

 File
 Edit
 Element
 Settings
 Tools
 Utilities
 Workspace
 Applications
 Window
 Help
 CDOT Help

#### 3. **Fit View** 1



The design file shows only the proposed alignments because only the ALG levels were turned on when settings were last saved.

### Lab 3.2 - Checking Element Elevations

You can quickly check the coordinates of any point (including the Z coordinate in a 3D file) by placing a tentative point.

1. Key in *vi=intersect* to recall the alignment saved view.

**Note:** Always press **<Enter>** or **<Tab>** after keyins.

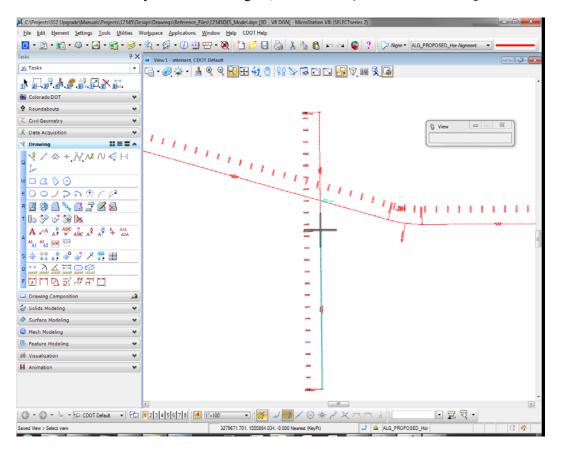
- K C/Projects/SS2 Upgrade/Manuals/Projects/12345/Design/Drawings/Reference_Files/12345DES_Model.dgn [3D V8 DGN] MicroStation V8i (SELECTSeries 2) (1) · File Edit Element Settings Tools Utilities Workspace Applications Window Help CDOT Help N 90°00'00.00" E Z 4668.853 i 🗖 🛛 0.000 💷 📴 • 🖻 • 📾 • 🗃 • 🚳 • 🚳 • 🎋 • 🕼 • 🕐 🌐 🐨 • 🥘 🎦 📁 🖓 👗 🐁 🛍 🗠 🛥 🚳 📍 Default - 
   P X
   View1 - intersect, CDOT Default
   🔎 Tasks ᅶᇦᆠᄵᆕ᠅ᆠᆥᆥᇰᇰᇱᅖᄿᅻᆥᅇᅓᇛᇊᇊᇥᄶᇔᅆᆇᅝ N2 37 🗗 🔗 🔐 🖬 💦 🚎 🖇 Element Selection 😐 23 💒 Colorado DOT -No - 0 / 🔘 🕏 Roundabouts 👻 🗑 🔶 🗕 🖉 👰 294 ÷ * Z Civil Geometry **** 🕅 Data Acquisition * ...... 태르콜 ^ V Drawing 🧏 / 🌣 + <u>N</u>N N << H ł 7 1111 Marquess Constants ž 0020 00100010 -2 2 🖉 🔧 🖉 🖉 🔊 ant 61₈₁ 61₈₂ 800 111 ******* -14=92 --· 데디어 및 박유민 -Drawing Composition a l -Solids Modeling ٧ 1.000 Surface Modeling ¥ næ Mesh Modeling ۷ ..... **B** Feature Modeling ¥ Alla III Visualization v 1964 H Animati ۷ • 🕎 📆 • 😋 - 💿 - 🌭 - 🔂 CDOT Default - - 🔂 12345678 ⊇ 😹 ⊿ 👼 🖉 ⊙ 🛠 🖉 X ⌒ ⌒ 斗 🗄 🤳 🖴 Defaul Element Selection > Identify element to add to set
- 2. **<D>** anywhere in View 1 to recall the saved view.

The design file has some graphics, like the horizontal alignment, placed at elevation 0. Other graphics, like contours generated by InRoads, are placed at an elevation range of approximately 6600 ft.

3. On the Attributes toolbar, set the filter to Alignments-Proposed and then set the active level to ALG_PPROPOSED_Hor-Alignment.

Attributes		Attributes				
(none:      Default	-	Alignır 🕶	Default  Filter: Alignments.Proposed	_	_	-
Alignments		_	Default	~	0	
Existing Other			ALG_PROPOSED_Hor-Alignment	~	0	
Proposed			ALG_PROPOSED_Hor-Alignment-Sta-Major	~	0	
Secondary			ALG_PROPOSED_Hor-Alignment-Sta-Minor	1	0	
Text			ALG_PROPOSED_Hor-Alignment-Text	~	0	
All Levels			ALG_PROPOSED_Hor-Cardinals	~	0	
Bridge			ALG_PROPOSED_Hor-Keypoints	1	0	
Bridge+Draft			ALG_PROPOSED_Hor-Tangent-Lines	1	0	
Bridge+Draft+Sheet			ALG_PROPOSED_Hor-Tangent-Text	1	0	
Bridge-All			ALG_PROPOSED_Ver-Alignment	~	0	
Construction GIS			ALG_PROPOSED_Ver-Alignment-Text	1	0	
Roads			ALG_PROPOSED_Ver-Keypoints	~	0	
Text			ALG_PROPOSED_Ver-Tangent-Lines	~	0	
Hydraulics			ALG_PROPOSED_Ver-Tangent-Text	~	0	

- 4. Place a **Tentative** point **<T>** on the North-South crossroad alignment just south of the intersection.
  - **Note:** The **Tentative** button in the CDOT workspace is set to the *Left and Right Cord* on the mouse. If you want to change it, select **Workspace > Button Assignments**.



The tentative point jumps to the closest key-point on the element. You will see a large cross-hair at the key-point. You'll learn more about keypoint and other snap modes in other chapters.

A tentative point is a temporary location that displays the coordinates for the point in the *Message Field* (bottom of screen).

3279671.701, 1555884.034 -0.000 / earest (KeyPt)

Note that the centerline alignment graphic in the top view (plan view) has a Z value of  $\mathbf{0}$ . Therefore it has an elevation of  $\mathbf{0}$ . 5. Open Level Display and set the level Filter to None to show all levels. Sort by Name and then Used levels. Turn on the levels DES_ROADWAY_Toe-of-Fill and DES_ROADWY_Top-of-Cut.

			X
🖵 🕅 View Display 🔻			
📢 📴 🍃 (none) 🔻 Levels 💌 🛹 🗸			
12345DES_Model.dgn			
Name	Number	File	Logical Used 🔨 🔺
ALG_COGO_Points	19001	12345DES_Model.dgn	. E
ALG_PROPOSED_Hor-Alignment	19029	12345DES_Model.dgn	•
ALG_PROPOSED_Hor-Alignment-Sta-Major	19030	12345DES_Model.dgn	•
ALG_PROPOSED_Hor-Alignment-Sta-Minor	19031	12345DES_Model.dgn	•
ALG_PROPOSED_Hor-Alignment-Text	19032	12345DES_Model.dgn	•
ALG_PROPOSED_Hor-Cardinals	19033	12345DES_Model.dgn	•
ALG_SECONDARY_Hor-Alignment-Sta-Major	19043	12345DES_Model.dgn	•
ALG_SECONDARY_Hor-Alignment-Sta-Minor	19044	12345DES_Model.dgn	•
ALG_SECONDARY_Hor-Cardinals	19046	12345DES_Model.dgn	•
DES_ROADWAY_Curb-Top	14041	12345DES_Model.dgn	•
DES_ROADWAY_Edge-Of-Road-Oil	14016	12345DES_Model.dgn	•
DES_ROADWAY_Lane-Line	14044	12345DES_Model.dgn	•
DES_ROADWAY_Misc	14045	12345DES_Model.dgn	•
DES_ROADWAY_Point-of-Slope-Selection	14046	12345DES_Model.dgn	•
DES_ROADWAY_Shoulder	14047	12345DES_Model.dgn	•
DES_ROADWAY_Toe-of-Fill	14051	12345DES_Model.dgn	•
DES_ROADWAY_Top-of-Cut	14052	12345DES_Model.dgn	•
DRAFT_LC-Center_WT-3	22018	12345DES_Model.dgn	•
ALG_EVENT_Points	19002	Alignments.dgnlib	<b>T</b>

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6. **<T>** on one of the cut or fill lines and note its elevation (Z coordinate).

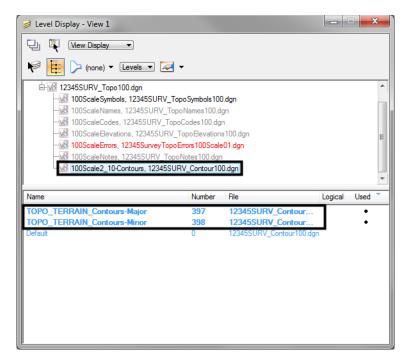
7. **<T>** on a few other top or toe lines and note the elevations.

The graphics should be placed at a depth of approximately 6620 ft. or within a close range.

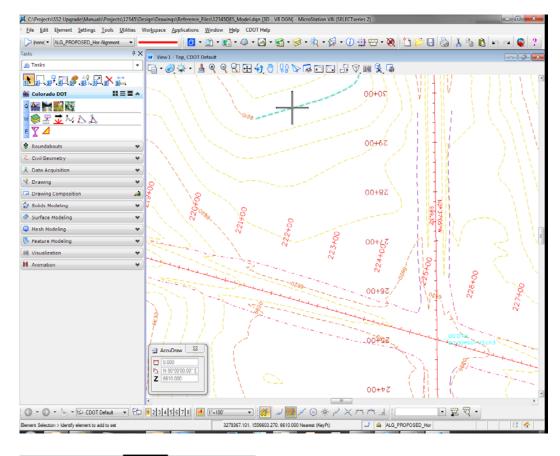
8. In Level Display, click on the + symbol next to the file **12345SurveyTopo100Scale.dgn** to expand the list of reference files.

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9. Highlight the reference_100Scale2_10-Contours, 12345SURV_Contour100.dgn and turn on levels TOPO_TERRAIN_Contours-Major and TOPO_TERRAIN_Contours-Minor.



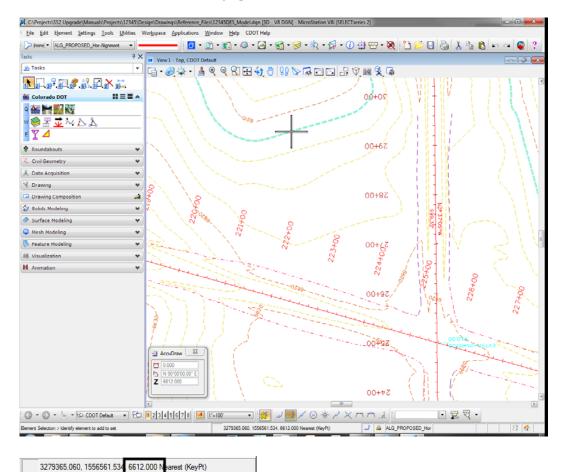
- **Note:** The contour file is a reference to the design model file. You'll learn more about references in the *Create the Project and Design Model* lab.
- 10. Window in on some of the contours to the right of the intersection so that you can easily read the labels.



11. **<T>** on some of the major contour graphics and note the elevations.

3279367.101, 1556603.270 6610.000 Nearest (KeyPt)

The major contours are placed at 10 ft. intervals.



12. **<T>** on some of the minor contour graphics and note the elevations.

The minor contours are placed at 2 ft. intervals.

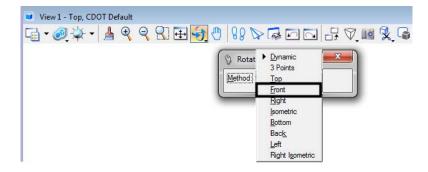
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- 13. In Level Display, turn off the existing major and minor contour levels as shown.

14. In Level Display, highlight the **12345DES_Model.dgn** file to work with the master file levels again and turn all levels on.

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### Lab 3.3 - Rotating a 3D Standard View

1. From the View Control toolbar, select Rotate View.

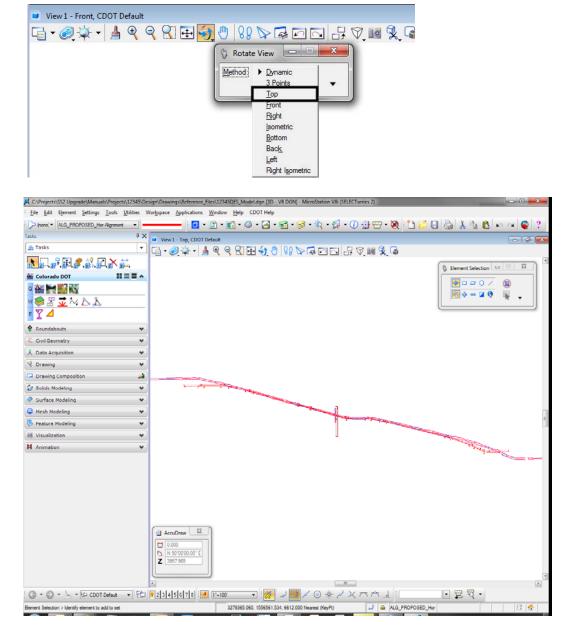


- 2. In the Tool Settings box, set Method to Front.
- 3. **Fit** View 1.

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The view is rotated from Top (plan view) to Front (elevation view). Note that some graphics, (like the red horizontal alignments you checked earlier), are displayed at elevation 0 below the proposed graphics (edges of oil, cut/fill lines, etc.), which are displayed at the correct elevation (6620 ft. range).

- **Note:** Rotating to the Front view is a handy way to visually check your file for erroneous information or bad elevations which "spike" down to 0.
- 4. Select the Rotate View command again and set the Method to Top.



This returns the view to a plan view and its original un-rotated settings.

5. Key in *vi=front*.

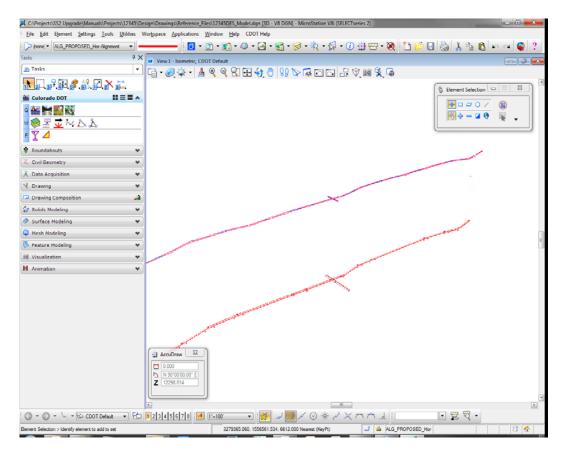
6. **<D>** to select the view.

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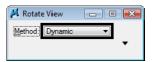
The view is rotated back to an elevation view. You can use the **vi**= keyin to rotate to standard views (top, front, isometric, etc.) as well as to recall saved views.

- 7. Key in *vi=iso*.
- 8. **<D>** to select the view.

9. **Fit** the view.



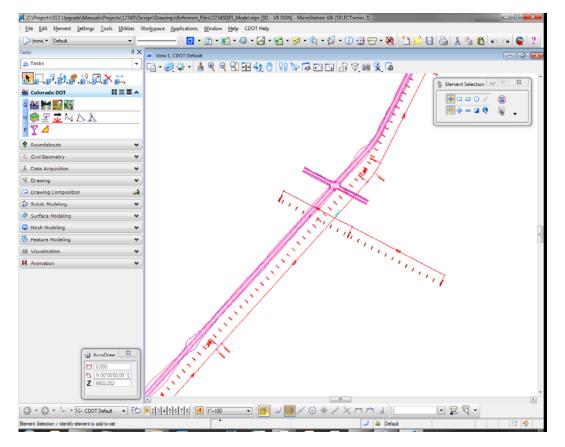
- 10. This gives another 3D perspective of the design file graphics.
- 11. Select the Rotate View command again and set the Method to Dynamic.



- 12. **<D>** near the intersection in the view to identify it for rotation, then move your cursor in a counter-clockwise motion.
  - **Note:** You can also **<D> and hold** on the "+" displayed when the command is selected, then drag it to the location you would like to rotate about. The rotation point can be Accusnapped to a graphic element. This will make it easier to control the rotation and keep the desired elements within the view.

As you move your cursor the view dynamically rotates.

13. **Zoom in** on the intersection and continue experimenting with the **Dynamic** rotation option until you're comfortable with the tool.



**Note:** If you **<T>** on a location (like the intersection center) after selecting the **Dynamic** method, you will rotate about the tentative point.

## Lab 3.4 - Check the Active Display Settings

## **Check the Current Active Depth**

- 1. Rotate the view back to Top.
- 2. Fit the view.
- 3. In the MicroStation **Key-in** box, key in *az=\$* to check the active depth.
  - **Note:** The dollar symbol (\$) is used to request current settings. You can also use a question mark (?).

MicroStation prompts: Select View.

- 4. **<D>** anywhere in View 1 (top view).
  - **Note:** Active and Display depths are view dependent (i.e. you set these in each view). Therefore, you have to tell MicroStation which view you want to check the **Active Depth** in by data pointing in the view.

5. Check the **Message** field.

View 1: Active Depth=-8847.120

MicroStation returns the current active depth setting. Yours may be different than shown. This means if any graphics are placed in the design file's top view without giving them an elevation, they will go in at this elevation or depth.

Since the depth axis of the top view (plan view in a 3D file) is the Z axis, this means graphics will be placed at this elevation.

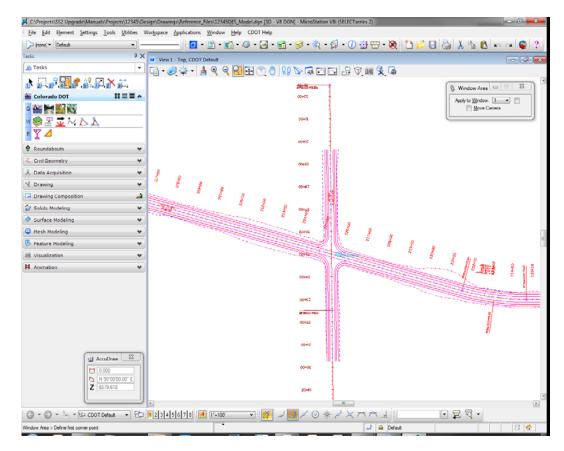
- 6. Key in *az=0*.
- 7. **<D>** to select the view.
- 8. Key in **az=\$**.
- 9. **<D>** to select the view.

View 1: Active Depth=0.000

You have now set the active depth to 0. Any new graphics placed in the file will be placed at an elevation of 0, unless you snap to an element at another elevation.

# **Check Current Display Depth Settings**

1. **Window** in around the intersection.



- 2. Key in *dp=\$*, then press <Enter>.
- 3. **<D>** in View 1.
- 4. Check the **Message** for the current display depth settings.

View 1: Display Depth=-10490.498,17125.695

The current display depth in the top view is set very large. Yours may vary from that shown. Therefore, you are able to see all the graphics in the top view since they fall in the depth (elevation) range.

5. Key in *dp*=6000,7000.

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- 6. **<D>** anywhere in View 1 and look at your graphics.

The graphics placed at this elevation range (shoulder, edge-of-oil, cut/fill lines, etc.) now appear in the view. All of the graphics placed at elevation 0, like the red proposed horizontal alignment, stationing and alignment text, are not displayed.

7. Key in **dp= -10,100**.

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- 8. **<D>** anywhere in View 1 and look at your graphics.

Only the elements placed in this elevation range (e.g. the proposed horizontal alignment and text placed at 0) appear in the view. All other graphics are outside of this elevation range and are not displayed.

9. Fit View 1.

All of the graphics appear in the view.

- 10. Key in **dp=\$**.
- 11. **<D>** anywhere in View 1 and check the **Message** field.

View 1: Display Depth=-10490.498,17125.695

The display depth range is automatically expanded after using the **Fit** command to show all of the elements in the view.

#### Lab 3.5 - Turn On Raster Images

1. Select File > Raster Manager.

2. Select both raster images using the **Shift** or **CTRL** buttons and toggle on View 1 from the lower left of the dialog box.

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- 3. Close the Raster Manager box.
- 4. Fit View 1.

The raster images are now on for a future lab.

- 5. Select File > Save Settings.
- 6. This saves all settings changes, including open views, levels turned on/off, active and display depth settings, etc. The next time you enter this design file, it will appear just as you left it.
- 7. Exit MicroStation.

# LAB 4 - Creating the Project and Design Model

In this lab, you'll create a new **12345** project using the **Create Project Directory Structure** program. Then, you'll create a new Roadway Design model from an auto-populated file (generated by the Create Project Directory Structure program) and by creating one from a CDOT 3D seed file. Once created, you'll reference other discipline's work in order to start the design.

In subsequent labs, you'll use a similar process to create other discipline model files (Bridge, Landscape & Environmental, Traffic, etc.).

#### Chapter Objectives:

After completing this exercise you will know how to:

- Create a new project and project configuration file (PCF) using the **Create Project Directory Structure** program.
- Re-assign a project number via the PCF.
- Create a new design model using a CDOT seed file.
- Create a new design model using an auto-populated model file.
- Attach a reference.
- Turn reference displays on/off.
- Turn reference levels on/off.

#### Lab 4.1 - Create a Sample 99999 Project

In this example, you are starting your project before a project number has been assigned. You will temporarily assign the project number 99999. Later in this lab, you will learn how to change this project number by updating MicroStation's project configuration file.

- From the Windows Start Menu, select Start > All Programs > _CDOT_CADD_Information > V08.11.xx-V8i > Create V8i Project Directory Structure.
- 2. Verify that the *Project Template* location is set to C:\Workspace\Workspace CDOT_V8i\Project Template.
- 3. Set *Destination* to C:\Projects.
- 4. Key in **99999** for the **Project Code**.

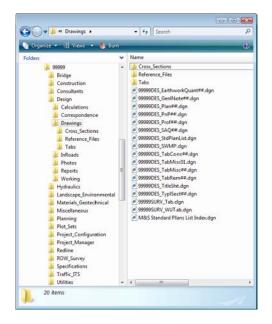
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Project Template: Destination:		<ul> <li>Apply</li> </ul>
Job Project Code (JPC):	C:\Projects	Close
Create Project Configu	uration File	About

The project number must be a 5-digit numeric code.

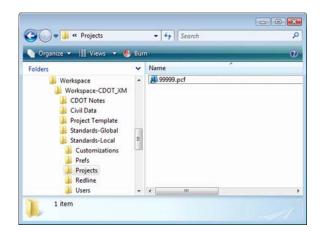
- 5. Toggle on Create Project Configuration File.
- 6. Select Apply.

The project directory structure is created in the **C:\Projects** folder and the Project Configuration File (PCF) file is created.

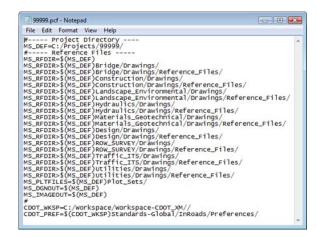
- 7. Close the CDOT Project Creation Utility.
- Use *My Computer* or *Windows Explorer* to navigate to the C:\Projects\99999 folder to review your project directory structure. Note that several generic CDOT files (e.g. 99999Des_Model.dgn) have automatically been created.



9. Use *My Computer* or *Windows Explorer* to navigate to C:\Workspace > Workspace - CDOT_V8i> Standards-Local > Projects.



10. Double-click on the **99999.pcf** file to open it in **Notepad**.



The PCF defines a specific directory that MicroStation defaults to when opening up a DGN file or referencing model files. It makes setting paths much easier in MicroStation.

If your project was installed on a project manager's machine, you could edit this file to specify the location. See the *CDOT PCF Management* workflow for more information.

- 11. Close the *Notepad* file. If prompted to save changes, select No.
- 12. Close My Computer or Windows Explorer.

You will later edit the 99999 project and update it with an actual project number. For now, you will continue working in the example 12345 project.

#### Lab 4.2 - Select Group Environment

Run the **Select Group Environment Utility** to determine which CDOT level libraries will be attached and available for use.

 From your desktop's Start Menu, choose Start > All Programs > _CDOT_CADD_Information > 08.11.xx-V8i > Select Group Environment. In the *Select Group Environment* box, select xxMulti-Discipline, and then select OK.

CDOT Select Group Environment	- • •
Bridge xxMulti-Discipline	ОК
	Cancel
	About

Any MicroStation design file that is now opened will have all level libraries (general and all disciplines) automatically attached.

**Note:** You only have to run this program once. The only time you have to re-run it is if you wish to switch groups on the same machine.

### Lab 4.3 - Starting MicroStation

- Start MicroStation by double-clicking the desktop shortcut or by selecting Start > All Programs > Bentley > MicroStation V8i (SELECTseries 2).
- 2. Set the MicorStation Workspace in the lower portion on the dialog box, set:
  - User: CDOT User

This sets user preferences and users customized options like custom toolbars.

- Project: **12345**
- *Note:* Be sure to re-set this option because it will default to you upper level project directory.

This Project component of the workspace should already be set by the PCF file created by running the *CDOT Project Creation Utility*. It sets the proper path for opening, saving and attaching files.

♦ Interface: CDOT

This loads custom menus and tools at the organizational level. The CDOT interface will load, among other things, the **CDOT Groups Menu**.

File Open - C:\Projects\12345\								
Look in:	12345 👻		🎯 🤌 📂 💷 👘 🎦 🏂 🖹		5 💽			
(Here)	Name	Date modif	Туре	Size	<u></u> Γ			
Recent Places	퉬 Bridge	10/21/2010	File folder					
	Construction	10/21/2010	File folder					
	퉬 Consultants	11/21/2007	File folder					
	퉬 Design	10/21/2010	File folder		=			
Desktop	light Hydraulics	10/21/2010	File folder					
e a	퉬 Landscape_Environmental	10/21/2010	File folder					
6 <b>6</b> 7	퉬 Materials_Geotechnical	10/21/2010	File folder					
Libraries	liscellaneous	10/21/2010	File folder					
	퉬 Planning	10/21/2010	File folder					
	Plot_Sets	10/21/2010	File folder					
Computer	Project_Configuration	2/17/2010	File folder					
	퉬 Project_Manager	10/21/2010	File folder		_			
	• • • • • • • • • • • • • • • • • • •	0/17/2010	P0122-041-0		· I			
Network	File name: 12345DES_Mod	del.dgn	-	Open		User: CDOT User 👻		
	Files of type: CAD Files (*.dgn	CAD Files (*.dgn;*.dwg;*.dxf)		Cancel		Project: 12345 💌		
	Open as read-only			Options		Interface: CDOT 👻		

### Lab 4.4 - Create a New Design Model File

There are two ways you can create a new file: Using a seed file or from a CDOT autopopulated model file. You'll practice both in this session.

#### Creating a new design file using a CDOT seed file

1. From the MicroStation Manager dialog box, select the **New File** icon.

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	Name		Date modif	Туре	Size	New file		
and the second s	퉬 Bridge		10/21/2010	File folder		The me		
Recent Places	Construction		10/21/2010	File folder				
	퉬 Consultants		11/21/2007	File folder				
·	퉬 Design		10/21/2010	File folder		=		
Desktop	) Hydraulics		10/21/2010	File folder		-		
<b></b>	퉬 Landscape_E	nvironmental	10/21/2010	File folder				
6 <b>6</b> 7	🌗 Materials_Ge	otechnical	10/21/2010	File folder				
Libraries	퉬 Miscellaneou	s	10/21/2010	File folder				
	퉬 Planning		10/21/2010	File folder			1	
	Plot_Sets		10/21/2010	File folder				
Computer	Project_Conf	iguration	2/17/2010	File folder				
	🌗 Project_Mana	ager	10/21/2010	File folder		-		
	Dealline.		2/17/2010	F01 21011				
Network	File name:	12345DES_Mod	lel.dgn		C	Open	User:	CDOT User
	Files of type:	CAD Files (*.dgn	;*.dwg;*.dxf)	•	C	ancel	Project:	12345
		Open as read	only			ptions	Interface:	Срот

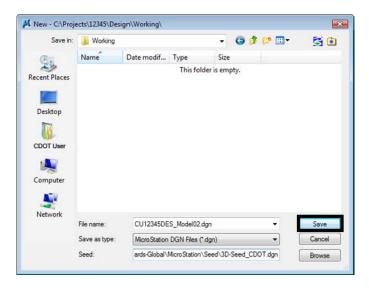
2. In the **Seed File** section, choose the **Browse** button.

Save in:	12345			G 🦸 📂 🗔 🔹 🤮 💽		
æ.	Name		Date modified	Туре	Size	-
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Recent Places	Construction		6/10/2009 1:33 PM	File Folder		
-	Consultants		11/21/2007 3:38 PM	File Folder		
-	🔒 Design		6/10/2009 1:33 PM	File Folder		
Desktop	Hydraulics		6/10/2009 1:33 PM	File Folder		E
100	Landscape_Environme		6/10/2009 1:33 PM 6/10/2009 1:33 PM	File Folder File Folder		
CDOT User	🌙 Miscellaneo u	s	6/10/2009 1:33 PM	File Folder		
	🔒 Planning		6/10/2009 1:33 PM	File Folder		
	Plot_Sets		6/10/2009 1:33 PM	File Folder		
Computer	🍶 Project_Confi	guration	6/10/2009 1:33 PM	File Folder		
	🌛 Project_Mana	iger	6/10/2009 1:33 PM	File Folder		
	🍌 Redline		6/10/2009 1:33 PM	File Folder		
Network	ROW Survey		6/10/2009 1-33 PM	File Folder		
Hermony	File name:			*	Sa	ve
	Save as type:	Micro Station	stion DGN Files (*.dgn)		Can	cel
	Seed:	danda Clabal	\MicroStation\seed\Roa	duran Desire 2	Brow	_

📕 Select Seed Fi	le - C:\Workspace\Workspace-CDOT_V8i\Standards	s-Global\MicroStation\	Seed\
Look in:	🎉 Seed 👻	G 🤌 📂 🛄 -	3 🖹
Ca.	Name	Date modified	Туре
Recent Places	2D-Seed CDOT.dgn	9/30/2010 9:34 AM	MicroStation \
	3D-Seed_CDOT.dgn	10/7/2010 1:34 PM	MicroStation \ MicroStation \
Desktop	Bridge-2D-Seed_CDOT.dgn Bridge-3D-Seed_CDOT.dgn	9/30/2010 9:34 AM 9/30/2010 9:34 AM	MicroStation \ MicroStation \
Libraries			
Computer			
() Network			
	•		•
	File name: <u>3D-Seed_CDOT.dgn</u>	•	Open
	Files of type: MicroStation DGN Files (*.dgn)	•	Cancel

3. Highlight the seed file **3D-Seed_CDOT.dgn** and choose **Open**.

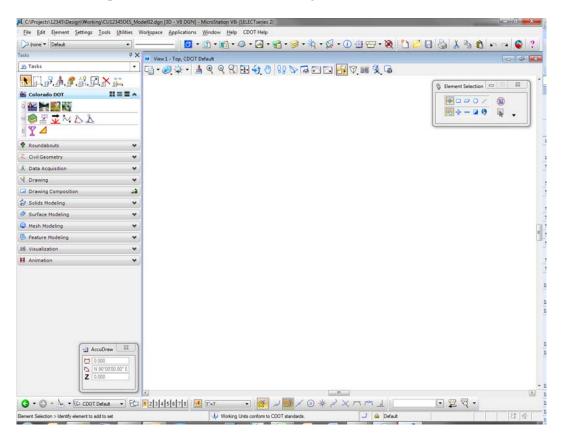
- **Note:** The seed file will copy over all of CDOT's default MicroStation settings when creating the new file.
- 4. Set the **Directory** to **\Design\Working**.
- 5. Set **Save as Type:** to MicroStation DGN Files (*.dgn).
- 6. Key in the name CU12345DES_Model02.dgn.
- 7. Select Save to create the file.



The file is created from the seed file and placed in the **Working** folder. When creating a new working model file, you'll prefix it with your initials (you'll use CU for CDOT USER for this class).

The working folder is for files that you are using for your design process prior to the design being finished. Once complete, you will move the files to the **Reference_Files** folder and take the CU off of the file name.

- 8. In the MicroStation Manager box, choose Open.
- 9. The blank file opens with all of the standard settings from the CDOT seed file.



#### **Check settings**

1. Select **Settings > Design File > Working Units**. These are the CDOT standard units copied from the seed file.

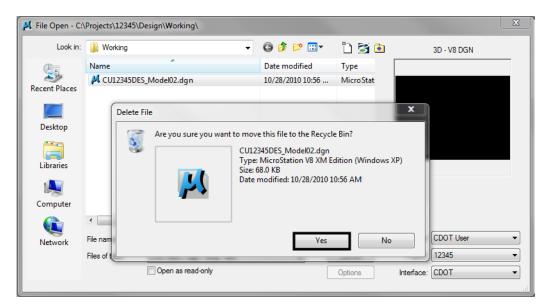
Design File Settings	
Category Active Angle Active Scale Angle Readout Avis Civil Formatting Color Data Acquisition Element Atributes	Modify Working Uht Settings Linear Units <u>Format: MU Master Uht: Survey Feet Sub Uht: Survey Inches Accuracy (0.123 Custom </u>
Element Autobites Fence Grid Isometric Locks Snaps Stream Views Working Units	Advanced Settings Resolution: 12000 per Distance Survey Foot Working Area: 1.42159E+008 Miles Solids Area: 157.829 Miles Solids Accuracy: 8.33333E-006 Survey Feet
	Focus Item Description Select category to view.

2. **<D> Angle Readout** from the *Category* list. These are the CDOT standard units copied from the seed file.

Design File Settings		
Category Active Angle Active Scale Angle Readout Avis Civil Formatting Color Data Acquisition Element Attributes	Modify Angle Readout Settings Format: DD MM SS Accuracy: 0.12	<u>Q</u> K Cancel
Fence Grid Isometric Locks Snaps Stream Views Working Units	Direction Mode: (Bearing	

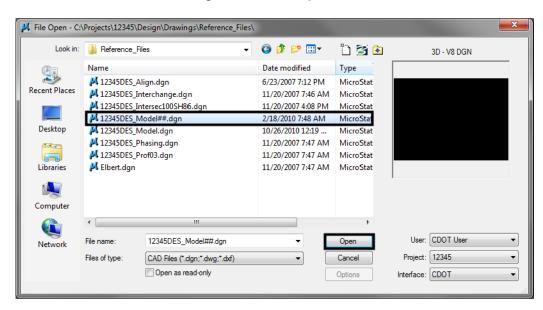
- 3. **Cancel** the dialog box.
- 4. Choose File > Close to return to the MicroStation Manager.

5. From the **MicroStation Manager** select the file and press the **Delete** key on your keyboard and choose **Yes** from the **Delete File** box to delete the file you just created.

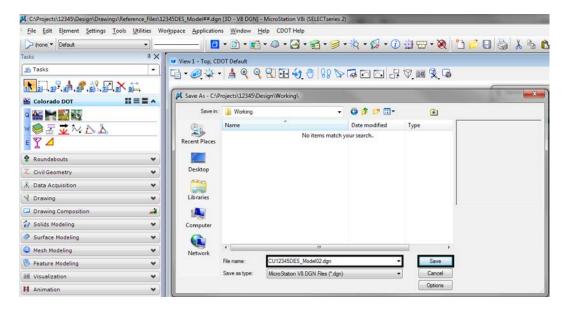


# Lab 4.5 - Create a New File by Copying an Auto-populated Model File

- 1. In the MicroStation Manager, navigate to the \Design\Drawings\Reference_Files folder.
- 2. Select 12345DES_Model##.dgn and choose Open.



3. After opening the file, select File > Save As, navigate to the \Design\Working folder key in the name CU12345DES_Model02.dgn and select Save.



The file is copied to the new name into the working folder.

#### **Check settings**

1. Select **Settings > Design File > Working Units**. These are the CDOT standard units, which are the same as the seed file units.

Design File Settings	
Category Active Angle Active Scale Angle Readout Axis Civil Formatting Color Data Acquisition Element Attributes	Modify Working Unit Settings Linear Units Format: MU Master Unit: Survey Feet Sub Unit: Survey Inches Accuracy 0.123 Custom
Element Attributes Fence Grid Isometric Locks Snaps Stream Views Working Units	Advanced Settings Resolution: 12000 per Distance Survey Foot Working Area: 1.42159E+008 Miles Solids Area: 157.829 Miles Solids Accuracy: 8.33333E-006 Survey Feet Edit Focus Item Description Select category to view.

2. **<D> Angle Readout** from the *Category* list. These are the CDOT standard units, which are the same as the seed file units.

Design File Settings		
Design File Settings	Modify Angle Readout Settings Format; DD MM SS Accuracy: 0.12 Direction Mode: Bearing Focus Item Description	QK Cancel
	Select category to view.	

- 3. **Cancel** the dialog box.
  - **Note:** The auto-populated file provides the same settings as a seed file. You can create a new file either way with the same results. However, by copying a CDOT auto-populated file, the name is automatically set to the CDOT standard, you only have to change the counter.

#### Lab 4.6 - Attach the Survey/Topo Reference

After creating your initial design model, you can attach other groups' work that you'll need to start your design. In this case, attach the existing survey and topographic information.

1. Select **File > Reference**.

*Note:* You can also choose **References** from the **Primary** toolbar.



- 2. On the **References** dialog, select **Tools > Attach**.
- 3. Your current **Directory** should be **C:\Projects\12345** (obtained from your PCF file).
- 4. Navigate to \ROW_Survey \Drawings \Reference_Files.

Look in:	Reference_	Files	- 🗿 🏚 📂 🛄 -	S 🖲	3D - V8 DGN
(Ana	Name	*	Date modified	Туре	
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ent Places	🖊 12345SURV	/_Contour100.dgn	11/26/2007 2:35 PM	MicroStation V8 X.	
	🖊 12345SURV	/_Model.dgn	11/20/2007 7:49 AM	MicroStation V8 X.	A CONTRACTOR OF THE OWNER O
·	🖊 12345SURV	/_Topo20.dgn	11/26/2007 1:36 PM	MicroStation V8 X.	
Desktop	🖊 12345SURV	/_Topo40.dgn	11/26/2007 1:41 PM	MicroStation V8 X.	
<b>-</b>	12345SURV	/_Topo50.dgn	11/26/2007 1:43 PM	MicroStation V8 X.	· ·
122	12345SURV	/_Topo100.dgn	11/26/2007 2:35 PM	MicroStation V8 X	
ibraries	12345SURV	/_Topo200.dgn	11/26/2007 1:38 PM	MicroStation V8 X.	
	🕌 12345SURV	/_Topo400.dgn	11/26/2007 1:43 PM	MicroStation V8 X.	
	🖊 12345SURV	/_Topo500.dgn	11/26/2007 1:45 PM	MicroStation V8 X.	Attachment Method
omputer	🖊 12345SURV	/_TopoCodes100.dgn	11/26/2007 1:45 PM	MicroStation V8 X.	Interactive
~	🕌 12345SURV	/_TopoElevations100.dgn	11/26/2007 1:46 PM	MicroStation V8 X.	
	🖊 12345SURV	/_TopoNames100.dgn	11/26/2007 1:46 PM	MicroStation V8 X.	
Vetwork	🖊 12345SURV	/_TopoNotes100.dgn	11/26/2007 1:46 PM	MicroStation V8 X.	
ACCOUNT N	🕌 12345SURV	/_TopoSymbols100.dgn	11/26/2007 1:46 PM	MicroStation V8 X.	ition V8 X.
	🖊 JERRY_Elbe	ert.dgn	11/20/2007 7:50 AM	MicroStation V8 X.	
	•	III		4	
	File name: 12345SURV_Topo100.dgn		•	✓ Open	
	Files of type:	Files of type: CAD Files (*.dgn;*.dwg;*.dxf)		Cancel	
	Save Relative Path			Options	

5. Select **12345SURV_Topo100.dgn** from the list of files.

6. Set Attachment Method to Interactive and select Open.

The Interactive method allows you to supply additional reference settings in the next dialog box.

- In the Reference Attachment settings box, key in a Logical Name of Survey/ Topo and set:
  - Orientation to Coincident World (to align Master file and Reference file global origins)
  - **Scale** to **1**:**1** (to bring in graphics full scale)
  - Nested Attachments to No Nesting
  - Display Raster Reference on

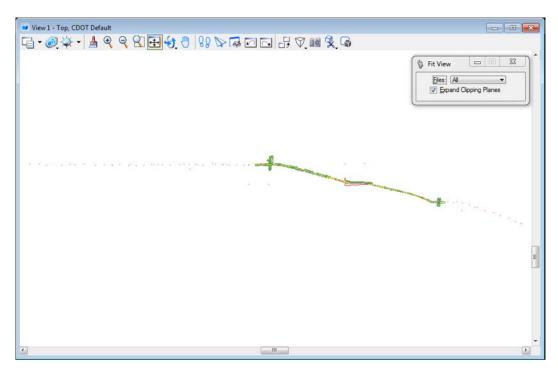
	Global LineStyle Scale: Master 🔻
L	Synchronize with Saved View
L	Toggles
L	Drawing Title
	Create

Global Linestyle Scale None

8. Select **OK**.

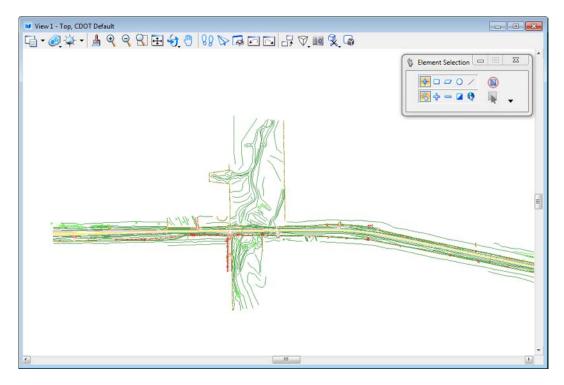
Reference Attachment S	ettings for 12345SURV_Topo100.dgn
-	5SURV_Topo100.dgn awings\Reference_Files\12345SURV_Topo100.dgn * Default *
Logical Name:	
Description: Globa	al Origin aligned with Master File
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views (none)	
Named Fences (nor	e)
Detail Scale:	
Sc <u>al</u> e (Master:Ref):	1.000000 : 1.000000
Named Group:	<b></b>
Revision:	· · · · · · · · · · · · · · · · · · ·
Level:	<b></b> ]
Nested Attachments:	
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Synchronize w	ith Saved View
Toggles	ا الم الح
Drawing Title	
Create	
	Drawing
	OK Cancel

9. **Fit** the view.



The Survey/Topo reference is attached to the design model master file. The graphics come in at their true coordinates (Coincident-World) and the actual size (1:1 scale).

10. Window in on the Survey graphics at the beginning of the project.



11. In the **Reference** dialog, make sure **Show Hierarchy** is turned on and highlight the Survey/Topo reference on the right-side.

References (1 of	1 unique, 1 displ	ayed)				x
Tools Settings						
🗄 - 🗋 😫 😣	👌 🌿 🍫	🄄 🔁 🖗	🖻 🔂 🌮 🛱 ቸ	i 📦 🗙 Hilite Ma	ode: Boundaries 👻	
Hierarchy	Slot 🏱 🛅	File Name	Model	Description	Logical	Orient
	1	12345SURV_Top	o100 CDOT Default	Global Origin aligne		Coinc

12. Toggle the **Display** option *off*.

🗈 References (1 of	f 1 unique, 0 displayed)	x					
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Hierarchy	Slot 🏱 🗋 File Name Model Description Logical	Orient					
⊞-	1 12345SURV_Topo 100 CDOT Default Global Origin aligne						
	<						
	Scale 1.000000 : 1.000000 <u>R</u> otation 00°00'00''						
	Offset <u>X</u> 0.000 <u>Y</u> 0.000 <u>Z</u> 0.000						
		epth:					
	New Level Display: Config Variable  Georeferenced: No						

13. **Fit** the view.

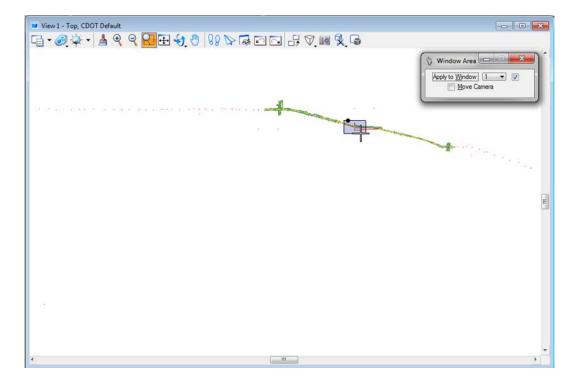
With the reference display turned off, there are no graphics to display, since the design model is currently empty.

- 14. Toggle the **Display** option back *on*.
- 15. **Fit** the view.

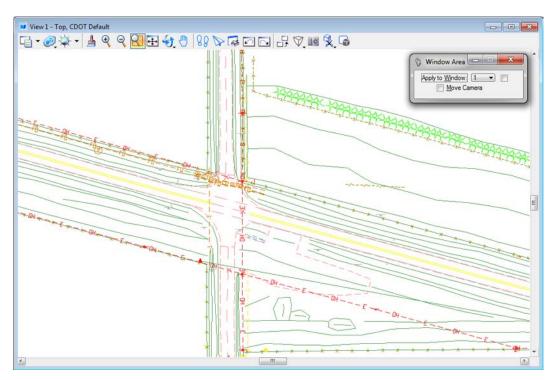
The design file is now ready to placed proposed graphics with survey and topo graphics referenced for information purposes.

#### Turn survey levels on/off

1. Window around the intersection near the center of the project.



2. **Zoom** in as shown.



3. Hover over one of the barbed wire fence lines.



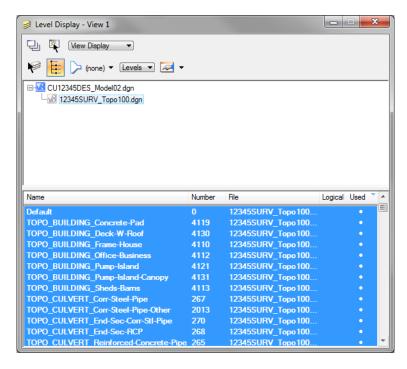
Basic element information "pops up" at your cursor location. MicroStation tells you that the element is on level **TOPO_FENCE_Barbed-Wire** and located in the **Survey/Topo** reference.

- 4. Open Level Display from the Primary toolbar.
- 5. Highlight the master file CU12345Design_Model02.dgn.

#### 6. Sort on **Used** levels.

🔰 Level Display - View 1					×
🖵 🏹 🛛 Mew Display 🔹					
rone) 🔻 Levels 🔹 🖂	•				
CU12345DES_Model02.dgn					_
Name	Number	File	Logical	Used	•
Name Default	Number 0	File CU12345DES_Model02.dgn	Logical	Used	
			Logical	Used	
Default	0	CU12345DES_Model02.dgn	Logical	Used	
Default ALG_COGO_Points	0 19001	CU12345DES_Model02.dgn Alignments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points	0 19001 19002	CU12345DES_Model02.dgn Alignments.dgnlib Alignments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points ALG_EXISTING_Hor-Alignment	0 19001 19002 19003	CU12345DES_Model02.dgn Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points ALG_EXISTING_Hor-Alignment ALG_EXISTING_Hor-Alignment-Sta-Major	0 19001 19002 19003 19004	CU12345DES_Model02.dgn Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points ALG_EXISTING_Hor-Alignment ALG_EXISTING_Hor-Alignment-Sta-Major ALG_EXISTING_Hor-Alignment-Sta-Minor	0 19001 19002 19003 19004 19005	CU12345DES_Model02.dgn Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points ALG_EXISTING_Hor-Alignment ALG_EXISTING_Hor-Alignment-Sta-Major ALG_EXISTING_Hor-Alignment-Sta-Minor ALG_EXISTING_Hor-Alignment-Text	0 19001 19002 19003 19004 19005 19006	CU12345DES_Model02.dgn Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points ALG_EXISTING_Hor-Alignment ALG_EXISTING_Hor-Alignment-Sta-Major ALG_EXISTING_Hor-Alignment-Text ALG_EXISTING_Hor-Alignment-Text ALG_EXISTING_Hor-Cardinals	0 19001 19002 19003 19004 19005 19006 19007	CU12345DES_Model02.dgn Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points ALG_EXISTING_Hor-Alignment ALG_EXISTING_Hor-Alignment-Sta-Major ALG_EXISTING_Hor-Alignment-Sta-Minor ALG_EXISTING_Hor-Alignment-Text ALG_EXISTING_Hor-Cardinals ALG_EXISTING_Hor-Keypoints	0 19001 19002 19003 19004 19005 19006 19007 19008	CU12345DES_Model02.dgn Aigments.dgnlib Aigments.dgnlib Aigments.dgnlib Aigments.dgnlib Aigments.dgnlib Aigments.dgnlib Aigments.dgnlib	Logical	Used	
Default ALG_COGO_Points ALG_EVENT_Points ALG_EXISTING_Hor-Alignment ALG_EXISTING_Hor-Alignment-Sta-Major ALG_EXISTING_Hor-Alignment-Sta-Minor ALG_EXISTING_Hor-Alignment-Text ALG_EXISTING_Hor-Cardinals ALG_EXISTING_Hor-Cardinals ALG_EXISTING_Hor-Keypoints ALG_EXISTING_Hor-Tangent-Lines	0 19001 19002 19003 19004 19005 19006 19007 19008 19009	CU12345DES_Model02.dgn Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib Alignments.dgnlib	Logical	Used	

- **Note:** That there are no used levels in the master file since there are no graphics in the design model file.
- 7. Highlight the **Survey/Topo** reference underneath the master file
- 8. Sort on Name, then sort on Used.



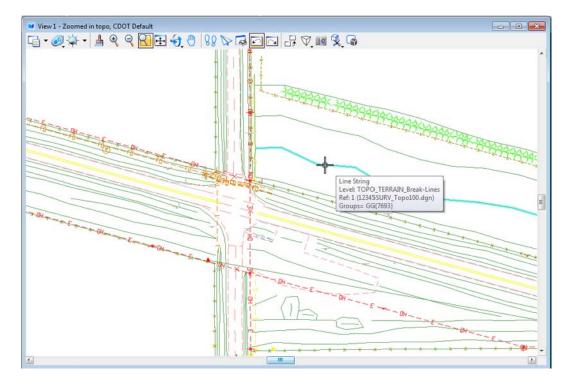
*Note:* That the reference has several used levels.

9. Turn off the level TOPO_FENCE_Barbed-Wire.

🔰 Level Display - View 1				x
🖵 🏹 🛛 Mew Display 🔹				
None) 🕶 Levels 🔹 🐼	•			
CU12345DES_Model02.dgn				
Name	Number	File	Logical Used	A 7
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			. •	
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TOPO_ELECTRIC_Pedestal TOPO_ELECTRIC_Power-Pole	4373 4375	12345SURV_Topo 100 12345SURV_Topo 100		× ×
TOPO_ELECTRIC_Pedestal TOPO_ELECTRIC_Power-Pole TOPO_ELECTRIC_Underground-Line	4373 4375 4310	12345SURV_Topo 100 12345SURV_Topo 100 12345SURV_Topo 100		E
TOPO_ELECTRIC_Pedestal TOPO_ELECTRIC_Power-Pole TOPO_ELECTRIC_Underground-Line TOPO_ELECTRIC_Vault	4373 4375 4310 4380	12345SURV_Topo100 12345SURV_Topo100 12345SURV_Topo100 12345SURV_Topo100	•	E
TOPO_ELECTRIC_Pedestal TOPO_ELECTRIC_Power-Pole TOPO_ELECTRIC_Underground-Line TOPO_ELECTRIC_Vault TOPO_FENCE_Barbed-Wire	4373 4375 4310 4380 1610	12345SURV_Topo 100 12345SURV_Topo 100 12345SURV_Topo 100 12345SURV_Topo 100 12345SURV_Topo 100		E
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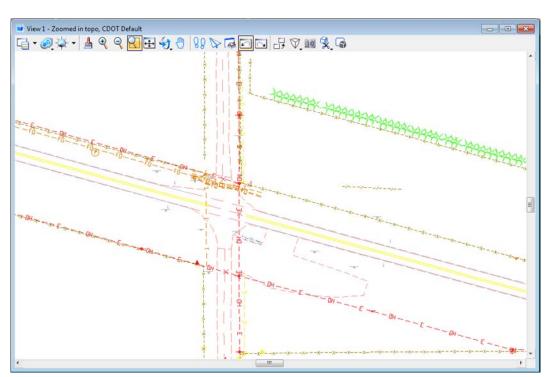
10. Right click in the list of levels and select Off By Element.

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🖵 🖳 Mew Display 🔻							
CU12345DES_Model02.dgn							
Name	Number File	1	Logical	Used	*		
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TOPO_ELECTRIC_Power-Pole	Jump To Active Level	_Торо 100			E		
TOPO_ELECTRIC_Underground-Line	Create Display Set	_Торо 100					
TOPO_ELECTRIC_Vault	All On	_Торо 100		•			
TOPO_FENCE_Barbed-Wire	All Off	_Topo 100		•			
TOPO_FENCE_Cattleguard TOPO FENCE Chain-Link	-	_Торо 100 _Торо 100		•			
TOPO_FENCE_Chain-Link	Invert On/Off	_Topo 100					
TOPO FENCE Gate-Barbed-Wire	Off By Element	Topo 100					
TOPO_FENCE_Gate-Metal	All Except Element	_Торо 100					
TOPO_FENCE_Other	Court Filter	Торо 100					
TOPO_FENCE_Post	<u>S</u> ave Filter	_Торо 100					
TOPO FENCE Snow	Level <u>M</u> anager	<u>Topo 100</u>		•	-		



11. **<D>** on one of the green breaklines to turn off the level **TOPO_TERRAIN_Break-Lines.** 

12. **Update** the view.



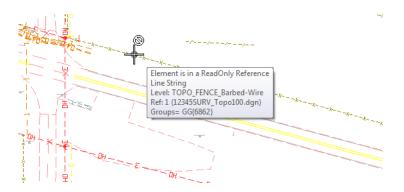
13. Turn other Survey levels on/off as desired.

Note: You have control over all reference levels just like levels in the master file.

- 14. Turn all Survey levels back on.
- 15. From the MicroStation Main taskbar, select Delete Element.

L	C:\P	rojects	\12345\De	sian\Worki	ing\CU12	345DES	Mode
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16. **<D>** on the barbed wire fence.



The command is now not available because the barbed wire fence is in the reference file, not the active file. You can not delete or modify reference graphics.

17. In the Reference dialog, turn off **Snap** for the **Survey/Topo** reference.

	Offset <u>X</u> 0.000	<u>Y</u> 0.000
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		fig Variable <ul> <li><u>Georeferenced:</u></li> </ul>
C	Snap	

18. Try to tentative snap on some of the Survey graphics.

With **Snap** turned off, you can't tentative to the graphics in the reference file.

19. In the Reference dialog, and turn off **Locate** for the **SurveyTopo** reference.

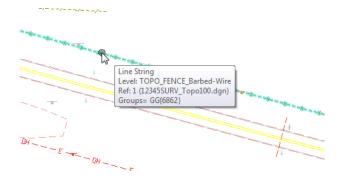


20. On the *Main* taskbar, choose the **Element Selection** tool and hold your cursor over some of the survey graphics.

C:\Projects\12345\Design\Working\CU12345DES_Mo	del02.dgn [3D - V8 DGN] - MicroStation V8i (SELECTseries 2)
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🕅 Data Acquisition 🔹	Line String Level: TOPO_FENCE_Barbed-Wire
💙 Drawing 🔹	Ref: 1 (12345SURV_Topo100.dgn) Groups= GG(5862)
Drawing Composition	
🛜 Solids Modeling 🔹 🗸	
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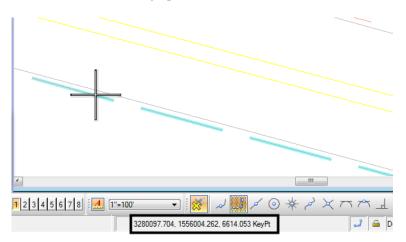
With **Locate** off, you can't located reference elements for information, measuring, copying, etc.

- 21. In the **References** dialog, turn **Snap** and **Locate** back *on* for the Survey/Topo reference.
- 22. Hold your cursor over some of the reference graphics.



You can now locate the graphics.

23. **<T>** on some reference graphics.

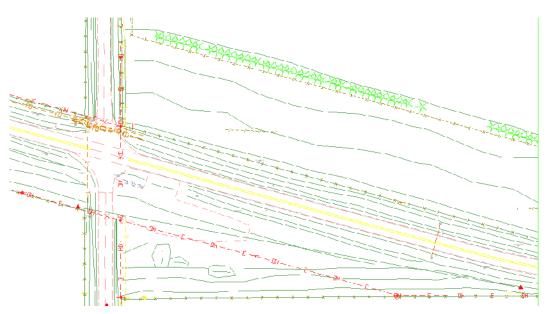


You can now snap to the reference graphics for coordinate information.

**Note:** It's often helpful to turn **Snap** off in a reference in dense areas where you don't want to snap to reference graphics. It's useful to turn **Locate** off for a reference if you're copying master file graphics and you don't want to accidentally copy the reference graphics.

#### **Live Nesting**

1. Window around the intersection as shown.

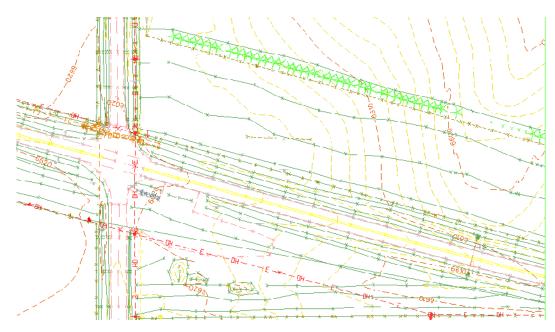


2. In the Reference dialog, change **No Nesting** to **Live Nesting** and set the **Depth** to **1**. Expand the **Hierarchy** list to show all nested references.

🗈 References (8 of 8	8 unique, 3 displayed)	
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Hierarchy	Slot 🏱 🛅 File Name Model Description Logical	Orientation
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	<	- F
	Scale 1.000000 : 1.000000 <u>R</u> otation 00°00'00''	
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	Ne <u>w</u> Level Display: Config Variable 🔻 Georeferenced: No 💌	

The Survey fieldbook data files, which are referenced to the Survey/Topo model, are now displayed in the file.

3. Review the graphics.

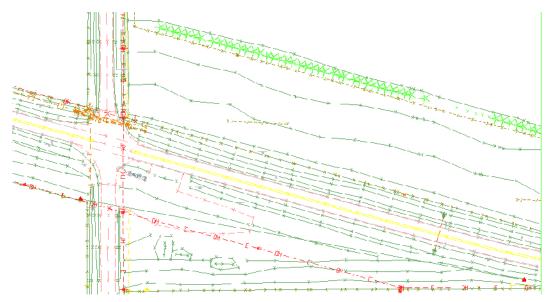


The Nested graphics, including the existing contours are now shown in the file.

4. On the left side of the **Reference** dialog, highlight the **Survey/Topo** reference. On the right-hand side of the **References** box, highlight the **Contour (Surface data)** nested reference and toggle **off** the **Display**.

Tools Settings					
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The display of just the nested contour graphics is turned off.



5. Turn the **Contour** reference **Display** back on.

6. On the left side of the **Reference** dialog, highlight the **Design Model** master file. On the right-hand side of the **References** box, highlight the **Survey/Topo** reference and toggle **off** the **Display**.

References (8 of 8 unique, 0 disp	layed)	- D X
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All graphics in the file are turned off.

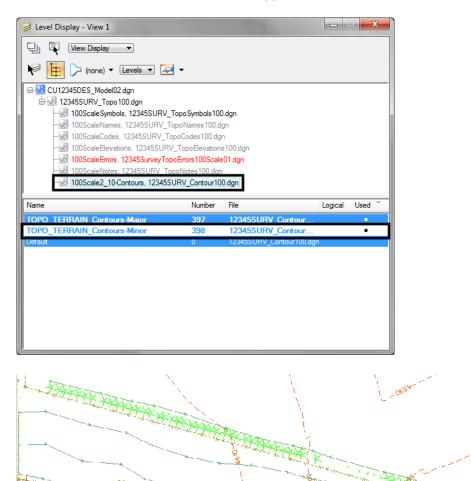
- **Note:** With a nested reference, when you turn off the display of the upper level reference, all nested references are turned off too.
- 7. Turn the **Survey/Topo** reference display back **on**.

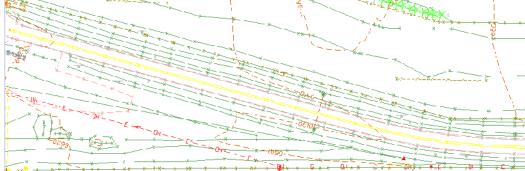
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8. Open the Level Display box and expand the Target Tree list.

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U View Display -								
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- 12345SURV_Topo 100.dgn								
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9. Select the Contour nested reference and toggle off the minor contour level.





You have control over all nested reference levels via Level Display.

10. Turn the minor contours back *on* and **Close** the **Level Display** box.

You will work more with nested references and the Copy Attachment options in later labs.

📕 File Open - C:\Pi	Projects\12345\De	esign\Working\				<b>X</b>
Look in:	\mu Working		•	G 🤌 📂 🛄 -	1 🛐 🗈	3D - V8 DGN
Recent Places	Name CU12345DES_ CU12345DES_ File name: Files of type:	Model02.dgn	Select Open Scan for V Open with Restore pr Send to Cut Copy Create sho Delete Rename Properties	n revious versions ortcut	Type MicroStat	User: CDOT User  Project: 12345 Interface: CDOT

11. Choose File > Close to return to the MicroStation Manager.

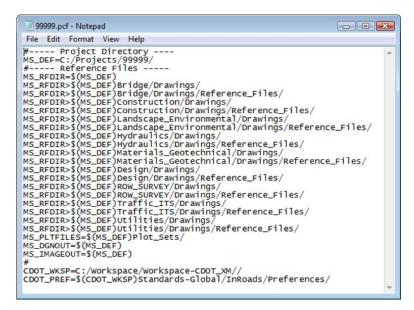
- 12. From the **MicroStation Manager** select the file **CU12345DES_Model02.dgn** and press the **Delete** key on your keyboard and choose **Yes** from the **Delete** *File* box to delete the file.
  - **Note:** In this class, you'll work with the previously created Design Model file **12345DES_Model.dgn** in the Reference_Files folder.
- 13. Cancel the MicroStation Manager box.

#### Lab 4.7 - Update Project 99999

You have now been assigned a project code of **54321** for the previously created 99999 project. Update the PCF to reflect this change.

1. Using My Computer or Windows Explorer, navigate to the CDOT workspace (C:\Work-space\Workspace-CDOT_V8i\Standards-Local\Projects).

2. Double-click on **99999.pcf** to open it with **Notepad**.

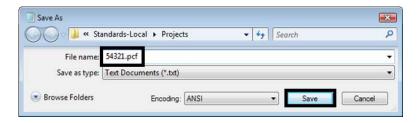


3. On the second line under **Project Directory**, edit it as follows:

MS_DEF=C:/Projects/54321/

99	9999.pc	f - Notep	ad		
		Format			
# MS_0	<pre># Project Directory MS_DEF=C:/Projects/54321/</pre>				
#	R	=\$(MS_		les	

4. Select **File > Save As**, name the file **54321.pcf**. and select **Save**.



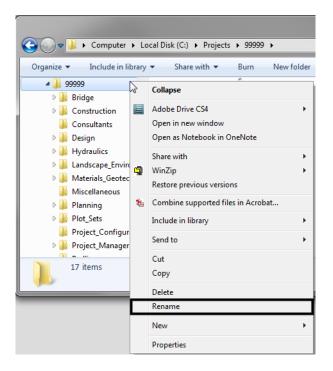
**Note:** By updating the MS DEF path, all reference paths are updated as well.

5. Close the **54321.pcf** file in **Notepad**.

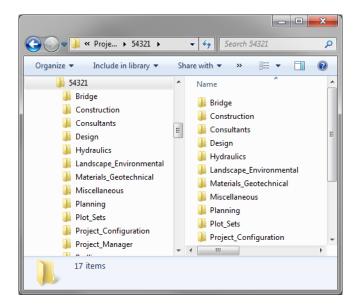
6. Delete the **99999.pcf** file from the **C:\Workspace\Workspace CDOT_V8i\Standards-Local\Projects** folder.

Computer  Local Disk (C:)  Worl	orkspace  Workspace-CDOT_V8i  Standar
Organize 🔻 🧊 Open with NOTEPAD 🔻 Burr	ırn New folder
<ul> <li>VM</li> <li>Windows</li> <li>Workspace</li> <li>Workspace-CDOT_VE</li> <li>CDOT Notes</li> <li>Civil Data</li> <li>Project Template</li> <li>Standards-Global</li> <li>Standards-Local</li> <li>Customizations</li> <li>Prefs</li> <li>Projects</li> <li>Users</li> </ul>	Date modifie       6/21/2010 8:       6/21/2010 8:       6/21/2010 8:       6/21/2010 8:       0pen with NOTEPAD       Open with       WinZip       Restore previous versions       Adobe Drive CS4       Send to       Cut       Copy
99999.pcf Date mo MicroStation Project Configuration	Create shortcut
	Rename
	Properties

7. Using My Computer or Explorer, navigate to the C:\Projects\99999 folder.



8. Rename the folder C:\Projects\54321.



9. Start MicroStation and select the Project drop-down

📕 File Open - C:	\Projects\12345	Design\Working\					
Look in:	🕌 Working		- G 🕻	• 🖅 💜 🐧	i) 🛐 🖻		3D - V8 DGN
Recent Places	Name CU12345D	ES_Model02.dgn		modified 3/2010 1:06 PM	Туре		
Computer	•	187			4		
Network	File name:	CU12345DES_Model02.dg	IN	-	Open	User:	CDOT User 💌
NetWORK	Files of type:	CAD Files (*.dgn;*.dwg;*.dw	f)	•	Cancel	Project:	
		Open as read-only			Options	Interface:	No Project 12345 54321
_	_		_				PCF-Vars New

Note that 99999 is no longer available and has been replaced by 54321.

10. Set **Project** to **54321**.

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lecent Places	Constructio	n	10/21/2010	File folder						
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	🜗 Design		10/21/2010	File folder			=			
Desktop	Hydraulics		10/21/2010	File folder						
	Landscape_	Environmental	10/21/2010	File folder						
6	Materials_G	eotechnical	10/21/2010	File folder						
Libraries	Miscellaned	ous	10/21/2010	File folder						
	Planning		10/21/2010	File folder				1		
	Plot_Sets		10/21/2010	File folder						
Computer	Project_Cor	nfiguration	2/17/2010	File folder						
	Project_Mai	nager	10/21/2010	File folder			-			
		-		·	_		_		(	
Network	File name: CU12345DES_Model02.dgn		Model02.dgn 👻		Open		User:	CDOT User		
Files of type: CAD Files (*.dgn		;*.dwg;*.dxf)	•		Cancel		Project:	54321		
		Open as read-only				Options	=	Interface:		

The project directory structure is selected.

- **Note:** All files prefixed with 99999, would need to be renamed with the prefix 54321 on the hard drive.
- 11. Cancel the MicroStation Manager.

## LAB 5 - Drawing Basics using the CDOT Menu

In this lab you will learn how to access the CDOT Menu and become familiar with its different components and operation. You will use the CDOT Menu to set standards (level, color, line style, line weight), automatically select drawing tools, and then place basic elements (lines, circles, arcs, etc.).

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Access the CDOT Menu
- Access the CDOT Bridge Menu
- Use the CDOT Menu to set element attributes
- Use the CDOT Menu to place basic elements (lines, arcs, circles, shapes, etc.)
- Use the **Delete** command
- Use the **Undo** and **Redo** functions
- Change the element highlight color

#### Lab 5.1 - Create a Miscellaneous Details file

Create this file to practice placing graphics using the CDOT Menu, as well as to draw a few miscellaneous details that later can be placed on a sheet.

- 1. Start MicroStation from your desktop shortcut or from the Start Menu.
- 2. From MicroStation Manager, select the New File icon.

🕌 File Open - C:\	Projects\12345\Design\Worl	king\				X
Look in:	길 Working	•	G 🤌 📂 🛄 🔻		3D - V8 DGN	
<b>C</b> a	Name		Date modified	Туре		

- 3. Verify the Seed File is set to 3D-Seed_CDOT.dgn.
- 4. Set the **Directory** to **Design\Working**.
- 5. Key in a file name CU12345DES_MiscDetails01.dgn.

Note: CU stands for "CDOT User" the initials you'll use for training purposes.

6. Select Save.

New - C:\Proje	cts\12345\Desig	n\Working\				×
Save in:	Working	•	G 🤌 📂 🛄 -			8
(Ba	Name	*	Date modified	Туре	Size	
Recent Places		Ν	No items match your se	arch.		
Desktop						
Libraries						
Computer						
Network	File name:	CU12345DES_MiscDetails01.dgn			-	Save
	Save as type:	MicroStation DGN Files (*.dgn)			•	Cancel
	Seed:	C:\Workspace\Workspace-CDOT_\	V8i\Standards-Global\Mic	roStation\seed\3D-Seed	_CDOT.dgn	Browse

7. With the CU12345DES_MiscDetails01.dgn file highlighted in the MicroStation Manager, select Open to open it.

File Open - C:\	Projects\12345\[	Design\Working\			×	J
Look in:	퉬 Working	•	G 👂 📂 🛄 -	i) 🗃 🖻	3D - V8 DGN	
Recent Places	Name K CU12345DE	S_MiscDetails01.dgn	Date modified 10/28/2010 1:50 PM	Type MicroStat		
Desktop						
Libraries						
Computer						I
	•			F		I
Network	File name:	CU12345DES_MiscDetails01.dgn	L	Open	User: CDOT User 🔹	
	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)		Cancel	Project: 12345	
		Open as read-only		Options	Interface: CDOT	đ

#### **Check Seed File Settings**

1. Select Settings > Design File... then select Working Units and review the CDOT defaults.

Category	Modify Working Unit Settings
Active Angle Active Scale Angle Readout Axis Civil Formatting Color Data Acquisition Element Attributes	Linear Units Format: MU ▼ Master Unit: Survey Feet ↓ Label: ' Label: ' Accuracy 0.123 ↓ Qustom
Fence Grid Isometric Locks Snaps Stream Views Working Units	Advanced Settings Resolution: 12000 per Distance Survey Foot Working Area: 1.42159E+008 Miles Solids Area: 157.829 Miles Solids Accuracy: 8.33333E-006 Survey Feet Edit Focus Item Description Select category to view.

2. Select Angle Readout from the *Category* list.

Design File Settings	and the second se	
Category Active Angle Active Scale Angle Readout Axis Civil Formatting Color Data Acquisition	Modify Angle Readout Settings Format: DD MM SS • Accuracy: 0.12 •	<u>Q</u> K Cancel
Element Attributes Fence Grid Isometric Locks Snaps Stream Views Working Units	Direction Mode: Bearing	
	Focus Item Description Select category to view.	

- 3. **Cancel** the dialog box.
- 4. Key in *dp***=\$** to check the display depth.
- 5. **<D>** anywhere in the view to select it.
- 6. Review the CDOT defaults in the message field.

View 1: Display Depth=-1000.000,15000.000

- 7. Key in **az=\$** to check the active depth.
- 8. **<D>** anywhere in the view to select it.

9. Review the CDOT defaults in the message field.

View 1: Active Depth=0.000

#### **Open the CDOT Menu**

1. The CDOT Menu opens automatically when MicroStation is started. If it has been closed and needs to be re-opened, select the CDOT icon *Colorado DOT* Task Tab.

Tasks	Ψ×
😤 Tasks	-
<mark>1 2</mark> , 3 ³ , 4 ¹ , 6 ² , 6 ² , 1 ² , 8 [×] 9 [∞] ,	
Colorado DOT	~
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E Y 🖊	
Roundabouts	*

2. The CDOT Menu opens. The CDOT menu is broken up into several main parts, as shown below.

🛄 CDOT Menu			
CDOT Groups CDOT Tools	Options Help	<ul> <li>Pull-Down Menus</li> </ul>	
Drafting Bridge Construction Design Geometry Hydraulics	Status Existing Drafting	Proposed     Filters     A	?
Landscape Environmental Materials Geotechnical ROW Survey Traffic ITS Utilities Explorer Window	Border Border RE Dimensions Linework Patterning Symbols Text Categories	Clip Boundary Match Line Utility Revision Cloud Border (Plan 11"x17") Border (Plan 11"x17") Border (Plan 8.5"x1") Lands Border (Pnofile 11"x17") Border (Profile 11"x17") Border (Title 11"x8.5") Portra Border (Title 11"x8.5") Portra Border Limits (11"x17") Call 811 Stamp (Formerly UN CDOT Logo North Arrow Standard	it
Settings		•	•

3. Selecting **Settings** allows the user to apply an *Active Scale* and *Active Angle* to elements being placed.

Active Settir	ngs	- • ×
Active Scale:	100.00	Apply
Active Angle:	0.00	Close
		Close

🔛 CDOT Menu							
CDO	OT Groups 0	CDOT Tools	Options	Help			
V	Drafting Bridge			isting	Proposed		?
V	Constructio	n		ourig	© noposed		
$\checkmark$	Design Geometry				<b>∖</b> A * @[	AII	
$\checkmark$	Hydraulics			der	Clip Boundary		<b>^</b>
	Landscape E Materials Ge	invironmenta otechnical	l.	r RE	Utility Revision C		
$\checkmark$	ROW Survey	/		isions	* Border (Plan 11')	x8.5") Portrait	
$\checkmark$	Traffic ITS Utilities			vork	Horder (Plan 8.5 Horder (PnP 11) →		Ш
Ľ	Select All			ming	☆ Border (Profile 1 ☆ Border (Title 11')		
F	Deselect All			bols	<ul> <li>☆ Border (Typical S</li> <li>☆ Border Limits (11)</li> </ul>		
				ext	☆ Call 811 Stamp (I ☆ CDOT Logo	Formerly UN	
					☆ North Arrow Skie ☆ North Arrow Star		
	Settings.						-

4. From the pull-down menus select **CDOT Groups > Select All.** 

5. Select **Drafting** from the *Explorer Window*.

🛄 CDOT Menu		- • •
CDOT Groups CDOT Tools	Options Help	
- Drafting - Bridge - Construction	Status Existing	Proposed
Design Geometry Hydraulics Landscape Environmental	Drafting	
Materials Geotechnical ROW Survey Traffic ITS	Border Border RF	Clip Boundary
Utilities	Dimensions	<ul> <li>✤ Border (Plan 11"x17")</li> <li>✤ Border (Plan 11"x8.5") Portrait</li> </ul>
4	Linework	
	Symbols	
	Text	☆ Call 811 Stamp (Formerly UN ☆ CDOT Logo ☆ North Arrow Skier
Settings		North Arrow Standard
Jotanga		

6. Review some of the categories and items available for general drafting.

7. Select **Design** from the *Explorer Window*.

EDOT Menu			- • ×
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction	Status	Proposed	?
Design     Geometry     Hydraulics     Landscape Environmental	Design		All
Materials Geotechnical ROW Survey	Fence	N Barbed Wire	
· Traffic ITS	Guardrail	Chain Link	
	Phasing	Gate	
< III >	Profile Roadway	Silt	
	Hoddway	Wood	
	Structure	Noven Wire Con ★ Deer Gate	bination
	Surface	l'	
	Temporary		
	Xsection		
Settings		L	

- 8. Review some of the categories and items available for the **Roadway Design Group**.
- 9. From the *Explorer Window*, open other groups of interest (Hydraulics, Traffic, Utilities, etc.) and review the available categories and items.

🟪 CDOT Menu			
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction	Status © Existing	Proposed	?
Design Geometry <mark>Hydraulics</mark> Landscape Environmental	Hydraulics	<b>∖A * </b>	All
<ul> <li>Materials Geotechnical</li> <li>ROW Survey</li> <li>Traffic ITS</li> <li>Utilities</li> </ul>	Conveyance Drainage Basin FES (Plan)	Channel Concrete Box Cul Ditch Inigation	ivert
۰ III • • •	FES (Profile)	Subsurface Drain	S
	Inlets (Plan)		
	Inlets (Profile)		
	Miscellaneous		
	Pipes (Plan)		
	Pipes (Profile)		
Settings	Structures		

### Lab 5.2 - Place Graphics with the CDOT Menu Place Lines

1. In the CDOT Menu Explorer select **Drafting**, then select the **Linework** category.

CDOT Menu		
CDOT Groups CDOT Tools	Options Help	
Drafting Bridge Construction	Status Existing	Proposed
Design Geometry Hydraulics Landscape Environmental	Drafting	WTLCCOMA
Materials Geotechnical     Materials Geotechnical     ROW Survey     Traffic ITS     Utilities	Border Border RE	Center (Thick)  Center (Thin)  Continuous (Thick)  Continuous (Thin)
< +	Dimensions	Dashed (Thick) Dashed (Thin) Divide (Thick) Divide (Thick) Divide (Thin)
	Patterning           Symbols	Dotted (Thick)  Dotted (Thin)  Hidden (Thick)
	Text	[°] → Hidden (Thin) [°] ↓ Long/Short (Thick) [°] ↓ Long/Short (Thin) [°] ▲ Misc Hidden Information
Settings		

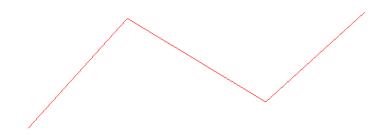
- 2. This category is used for general drafting work that is placed on standard drafting levels. The Filters are used to organize the different linework Items.
- 3. Set the Filter to **WT**, for line weight
- 4. Select the Item Weight 3.

CDOT Menu			- • •
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction Design	Status Existing	Proposed	2
- Geometry Hydraulics Landscape Environmental	Drafting	WT LC CO	MAI
Materials Geotechnical ROW Survey	Border	∿ Weight 0 √ Weight 1	
⊕ Traffic ITS	Border RE	Weight 2	
····· Utilities	Dimensions	Weight 3 Weight 4	
< III >>	Linework	veight 5 veight 6	
	Patterning	Weight 7	
	Symbols		
	Text		
Settings			

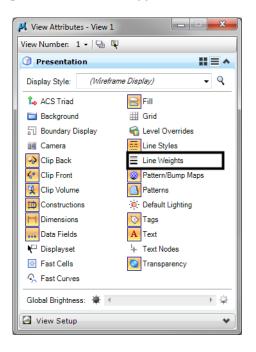
The filter determines the appropriate drafting level for the **SmartLine**. The Smartline command is the default for this menu item. All other drafting commands should be either be picked from the CDOT Main tool bar or entered as a key-in.



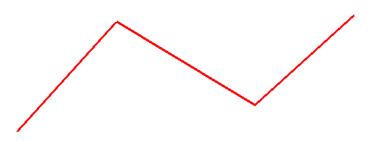
5. Data point in View 1 to enter vertices for the SmartLine.



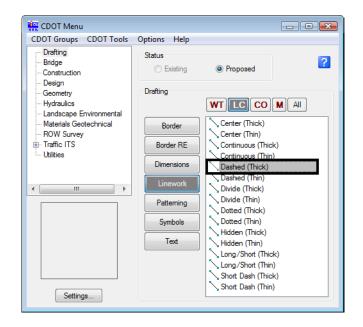
- 6. **<R>** when finished.
  - **Note:** Always **<R>** when you are finished drawing an element. The active drawing tool (in this case SmartLine) remains active so that you can place another line without having to re-select the item from the menu.
- 7. The seed file settings have line weights turned off to provide a better on screen display. To see the line weights, select the view attributes icon from the view tools at the bottom of each view window. You may also select Settings > View Attributes from the MicroStation pull-down menus. Toggle Line Weights on.



**Note:** Selecting the down arrow from the view attributes icon will open the dialog box temporarily allowing the user to toggle on line weights without bringing up the dialog box permanently. The dialog box will disappear when the mouse if moved away.



- 8. If you have opened the View Attributes dialog box, close it and return to the CDOT menu.
- 9. Set the Filter to LC, for linestyle.
- 10. Select the Item Dashed (Thick).



11. Place another **SmartLine** and note the change in line style and the active level on which it is placed.

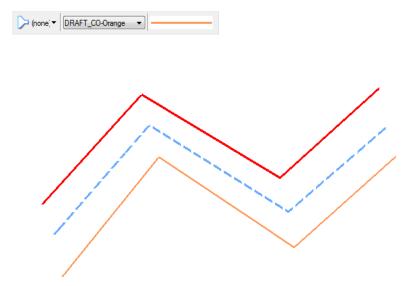
(none; 

DRAFT_LC-Dashed_M

DRAFT_LC-Dashed_M

- 12. **<R>** when done.
- 13. Set the Filter to CO, for Color.
- 14. Select the Item **Plot Orange**.

15. Place another **SmartLine** and note the change in both line style and color and the active level on which it is placed.



# **Place Circles**

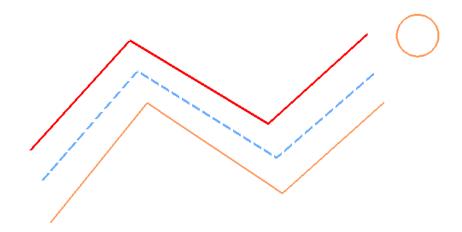
- 1. In the CDOT Menu, set the **Category**, **Filter** and **Item** to establish whatever level and symbology you like.
- 2. From the **Drawing** task tab, select the **Circle** icon.

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🗣 Roundabouts 🔹
∠ Civil Geometry
🕅 Data Acquisition 🔹
😢 Drawing 📰 🗮 🔺
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🗖 Drawing Composition

3. In the Tool Settings box, set Fill Type to None.



- 4. Follow your prompts and **<D>** to identify the center of the circle, then **<D>** to place a point on the circle.
  - **Note:** As we started a new drawing the zoom area may be larger or smaller. Your drawing may not look exactly as shown below due to this; simply place the first circle then window area around the element.

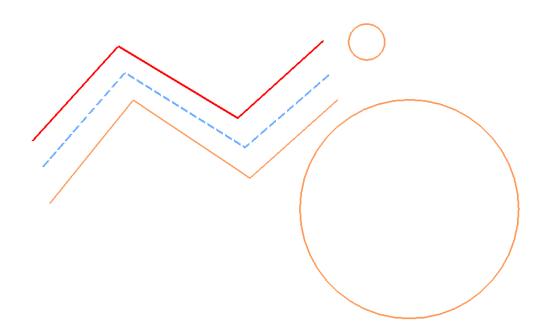


- 5. **<R>** when done.
- 6. In the **Tool Settings** box, toggle on **Diameter** and key in a value of **5**.

🖇 Place Circle
Method Center -
Area Solid ▼ Fill Type: None ▼ Fill <u>C</u> olor: S 3 ▼
Diameter 5.000

**Note:** *Important!* Don't forget to tab after keying in the value. Otherwise, your entry will not be accepted. *This is true for all fields in MicroStation dialog boxes.* 

7. **<D>** to identify the center of the 5 ft. diameter circle.

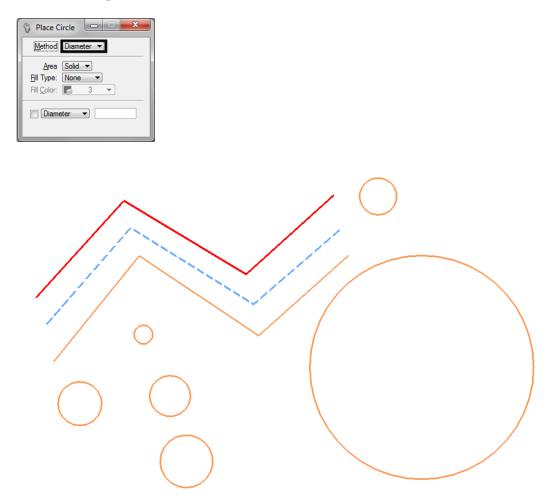


- 8. **<R>** when done.
- 9. Practice placing circles with other diameter or radius values.
- 10. In the **Tool Settings** box, set **Method** to **Edge** and toggle off the **Diameter** or **Radius** constraint.



11. Follow your prompts and **<D>** to place a circle by specifying three edge points. **<R>** when done.

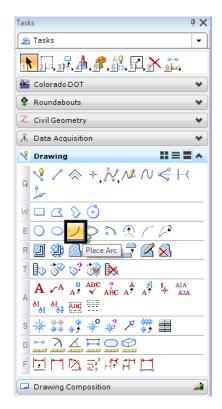
12. In the **Tool Settings** box, set the **Method** to **Diameter** and follow your prompts to place a circle with two points for the diameter. **<R>** when done.



#### **Place Arcs and Shapes**

1. In the CDOT Menu, set the **Category**, **Filter** and **Item** to establish the correct level and symbology.

2. From the *Drawing* task tab, select the Arc icon.

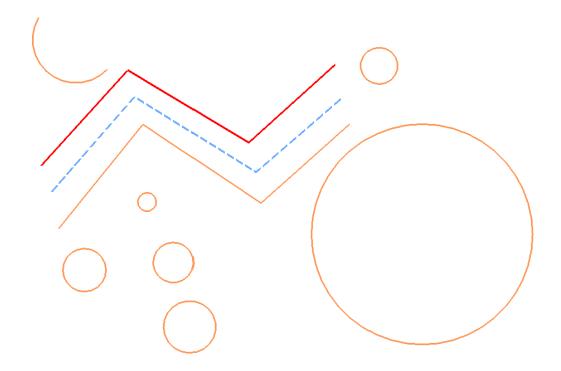


3. In the Tool Settings box, set the Method to Start, Center.

🖇 Place Arc	- • ×
Method Start, C	enter 💌
Radius:	
Length:	
Start Angle:	
Sweep <u>A</u> ngle:	
Direction:	CCW -

- 4. Follow the prompts and **<D>** anywhere to place the first arc endpoint.
- 5. **<D>** to define the arc center.

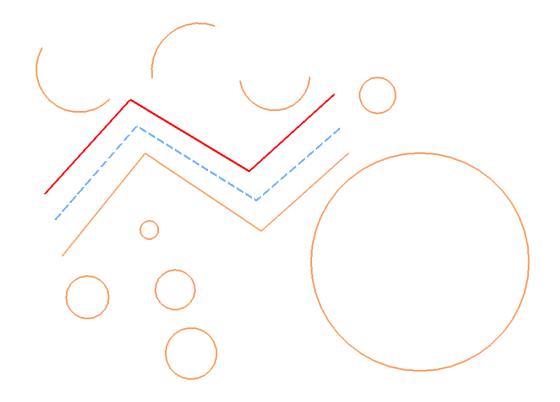
6. **<D>** to define the second endpoint.



- 7. **<R>** when done.
- 8. In the Tools Settings box, set the Method to Start, Mid, End.

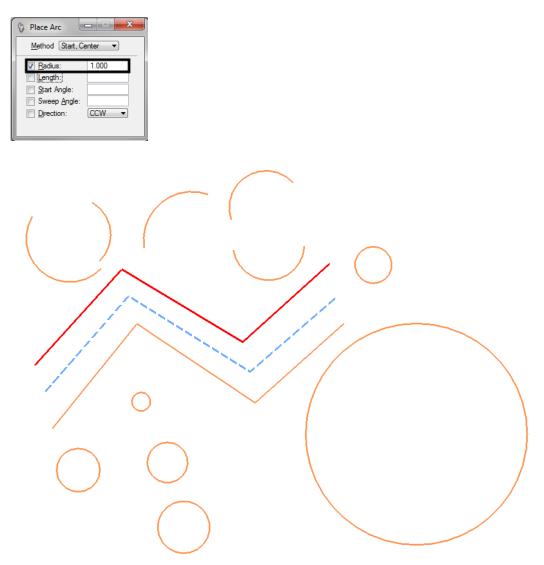


9. Follow the prompts to place an arc by 3 points.



10. Repeat the above step, but place the arc in the opposite direction.

11. Using any of the available methods, constrain the radius by clicking in the check box as shown, and place another arc.



- 12. Try setting other constrains and place additional arcs.
- 13. **<R>** when done.

- Tasks Ψ× 🔎 Tasks • 1 🗐 📲 着 💰 🗐 🗡 🚟 💒 Colorado DOT ۷ Roundabouts ۷ ∠ Civil Geometry ¥ 🕅 Data Acquisition ¥ 🤏 Drawing 🧏 🖍 🐟 + ¦½ № № < H( Q ٥ 80 W 🔲 ~ E O Place Shape A C 2 r 🔟 🎱 🙆 🍾 🙆 📑 🗹 😣 T 🗈 🤣 💕 🐝 📐  $A \checkmark^{A} \overset{B}{\xrightarrow{}} \overset{ABC}{\xrightarrow{}} \overset{?}{\xrightarrow{}} \overset{A}{\xrightarrow{}} \overset{A}$ AI AI ABC s 🔆 🗱 💱 🦑 🦨 🎢 🏥 ┍╘┙╚╲═╝╫╜╘┓ 🗔 Drawing Composition <u>_</u>
- 14. In the *Drawing* task tab, select the **Place Shape** icon.

- Place Shape

  Place Shape

  Arge: 00°0000"

  Arge: Solid 

  Fill Type: None

  Fill Color: 0

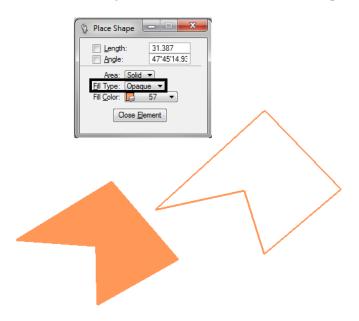
  Close Dement
- 15. **<D>** to place vertices for an unconstrained shape.

Place Shape	
Length: 16.532 Angle: 107*5746.7	
A <u>r</u> ea: Solid ▼ <u>F</u> ill Type: None ▼ Fill Color: ► 57 ▼	
	$\wedge$
	$\langle \rangle$

16. For the last data point (to close the shape), select **Close Element**.

💱 Place Shape 🗖 🗖 💌 🗙	1
□ Length: 22.353 □ Angle: 146°5′55.75	
A <u>r</u> ea: <u>Solid</u> ▼ <u>F</u> ill Type: <u>None</u> ▼	
Fill <u>C</u> olor: <b>■</b> 57 ▼ Close <u>E</u> lement	
	$\rightarrow$

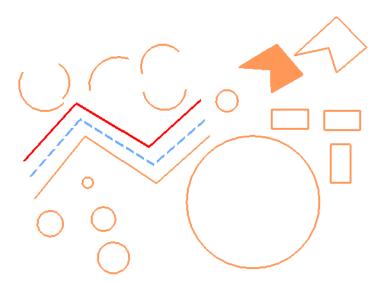
17. In the Tool Settings box, set **Fill Type** to **Opaque** and place another shape.



18. Set Fill Type back to **None**.

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AI AI ABG s 🔆 🗱 🔹 🌾 🦨 💥 🎟 ··· → ↓ ↓ <del>|</del> ○ ♥ D ┍╘┙┍╲═┊╓┙╓┍ 🖵 Drawing Composition <u>____</u>
- 19. On the Drawings task tab, select Place Block.

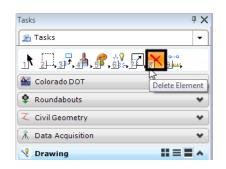
- 20. **<D>** for the first corner of the block.
- 21. **<D>** for the opposite corner.
- 22. Place a few more blocks until you're comfortable with the command.



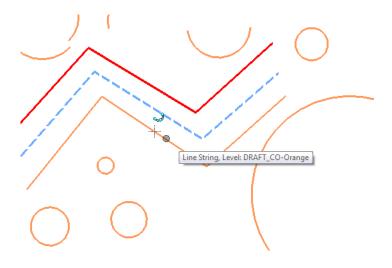
## Lab 5.3 - Delete and Undo

#### **Delete an element**

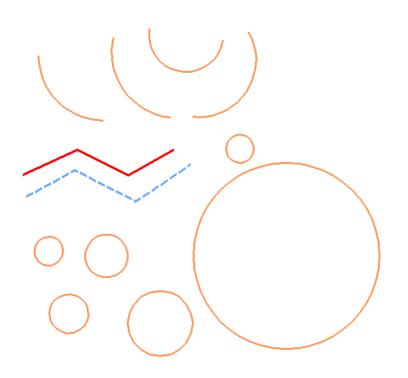
- 1. **Fit** View 1.
- 2. From the Main task toolbar, select Delete Element.



3. Move your cursor over the orange line until it highlights.



4. **<D>** to delete.



#### Undo and Redo the deletion

1. From the **Standard** toolbar, select **Undo**.



The line reappears.

2. Select Redo.



The line is deleted again.

**Note:** You can also choose **Edit > Undo** to reverse the previous action and get a description of what you are undoing.

In addition to the **Delete** command, the **Undo/Redo** commands work for most MicroStation drawing tools.

If you have elements that are close to or on top of each other, **<R>** until the element you want to delete highlights, then **<D>** to delete.

### Lab 5.4 - Change the Element Highlight Color

- 1. Select Settings > Design File > Color.
- 2. Set Element Highlight Color to Yellow.

Category       Modify Color Settings         Active Angle       Permethylic Color Settings         Active Scale       Angle Readout         Angle Readout       Pawing Pointer Color:         Active Scale       Selection Set Color:         Color       Data Acquisition         Bement Attributes       Fence         Grid       Isometric         Locks       Snaps         Stream       Vews         Working Units       Focus Item Description         Set the color in which identifier	OK Cancel

- 3. Select OK.
- 4. Choose Delete Element from the Main toolbar.
- 5. Move your cursor over an element until it highlights.
- 6. Notice the highlight color is now yellow.
- 7. **<D>** to delete the element.

The **Delete Element** command remains active and you can continue deleting elements.

8. Set the highlight to a color you prefer.

#### Lab 5.5 - Delete All

- 1. Select Edit > Select All to put all elements you've drawn in a MicroStation selection set.
- 2. Choose **Delete** from the **Main** toolbar.
- 3. All elements selected are deleted.

# LAB 6 - Draw the Median Island Nose Section

In this lab, you'll draw the nose section shown below using AccuDraw and precision keyins.



1. If AccuDraw is docked, as shown below, drag the AccuDraw Window and float it in the view.

X -7588.525	Y -1114.924	Z 0.000

*Note:* If AccuDraw is not on, toggle it on from the **Primary** toolbar.



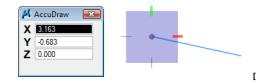
If your compass is set to **Polar** mode, below left, switch it to **Rectangular** mode, below right, by pressing **<spacebar>** on the keyboard.

📕 AccuDraw 🛛 🐹	📕 AccuDraw 🛛 🐹
0.000	<b>X</b> -7353.721
N 90°0'0.00" E	<b>Y</b> -1128.606
Z 0.000	<b>Z</b> 0.000

#### Lab 6.1 - Draw a Concrete Gutter Pan Section

- 1. On the CDOT Menu, set the Explorer to Drafting, the Category to Linework, the Filter to WT and select Item Weight 1.
- 2. Key in *xy=990,990* to define the begin of the line
- 3. Key in *xy=1100,1100* to define the end of the line
- 4. Select Fit View to zoom around the line
- 5. Delete the line
- 6. Select Place Smartline
- Key in *xy=1000,1000* to define the starting coordinate for drawing the section (the upper left corner).
  - **Note:** If you can't see the line's endpoint and it is "rubber banding" into the view, **Zoom Out** and then *reset once* **<R>** back into the **Place Line** command. If you zoom with your mouse wheel, you don't have to reset.

8. Set your cursor to slope down and to the right to establish the direction.



- Use the AccuDraw's rectangular compass to place the median's 8 ft. gutter pan at a 1:12 slope. Key in 8 for X and 8/12 for Y. (The Y value updates to -0.667). Make sure your cursor is set to slope *down* before entering the values.
  - **Note:** Remember, *do not* move your cursor into the AccuDraw window to key in your values; you may lose your positive/negative axis orientation. The focus (blinking cursor) is already set for you in the X field just start typing! Then, **<Tab>** or arrow down to the next field.

ſ	А 🕌	ccuDraw 🔯	📕 AccuDraw	X				
		8.000	X 8.000 Y -0.667			•		
	Z	-8.000	Z 0.000		-	•	 	
	_	÷ 12					 	 
L		-0.667						

- 10. **<D>** to place the point.
- 11. **Zoom in**, if necessary, to see the line.

📕 AccuDraw	-X-	
<b>X</b> 4.096		
Y -1.094		
Z 0.000	_	

Note that the compass rotates to the segment. You actually want to place the next line from the horizontal axis, so you need to rotate the compass so that X is horizontal.

12. Press **V** on the keyboard to rotate the compass to the view. The X-axis (red tic mark) should now be horizontal.



- 13. Position your cursor up and to the right to establish the direction of the next segment.
- 14. Key in **2** for **X** and **2/12** for **Y**. (The Y value updates to 0.167 to establish the slope on the next line).



- 15. **<D>** to place the point.
- 16. Press V on the keyboard to rotate the compass to the view.



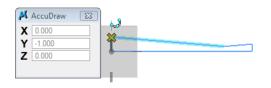
- 17. Lock your cursor on the –Y axis by moving your mouse to the left and hitting enter; then key in .5 in the Y field for the next segment. **<D>** to place the point.
  - **Note:** You don't have to key in the negative, AccuDraw knows the direction from your cursor location.



- 18. Press V on the keyboard to rotate the compass back to the view.
- 19. Lock your cursor on the -X axis and key in 10 in the X field. **<D>** to place the point.

AccuDraw         Image: Constraint of the second secon	-
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20. Hover over the starting point of the median section. When you see the bold X,  $\langle D \rangle$  to AccuSnap to the point to complete.



#### Draw the median cover

1. **Fit** the view.

AccuDraw 🔯	
AccuDraw 23	
AccuDraw 23 997.154 994.342	

- 2. Select the **Place Block** command.
- 3. AccuSnap on the upper-left corner of the median.

Shape, Level: DRAFT_W	ī-1	
AccuDraw           X           1000.000           Y           1000.000            Z           0.000		

- 4. Place your cursor down and to the left to establish the direction.
- 5. Using AccuDraw's rectangular window, place a 2 ft. X 4 in. block as shown. Key in 2 for X and :4 for Y (don't forget the colon in front of the 4 to specify inches.) <D> to place the point.
- 6. **<R>** when done.

 _		
📕 AccuDraw 📧		
2.000 Y 2.000 Z 0.000		

### Draw the pavement section

- 1. While still in the **Place Block** command, **AccuSnap** on the upper-right corner of the concrete section.
  - a. Using AccuDraw, place a 3.5 ft X 6" block as shown.

	 	 -	
AccuDraw 🔀			
<b>Y E</b> Z 0.000			

- 2. In the Place Block Tool Settings, toggle Fill Type to Opaque.
  - a. Use AccuDraw to place two 1.5 ft X 3 in. and one 6 in. X 3 in. filled blocks to create the pattern as shown.

		Place Block <u>M</u> ethod: Orthog Area: Solid Fill Type: Opaqu	•		
	 	Fill <u>C</u> olor:	1		
J         AccuDraw           X         0.500           Y         D250           Z         0.000				1	

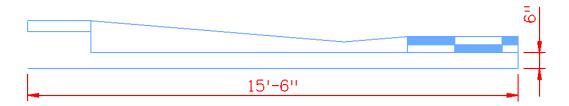
3. Set Fill Type back to None.

#### Draw the Subgrade Section

1. Select the Place SmartLine tool.

V Drawing	<b>∷</b> ≡ <b>≡</b> ∧
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2. AccuSnap on the lower-right corner of the asphalt to start the subgrade.



- 3. Use the information above to place the **SmartLine** using **AccuDraw**.
- 4. To practice drawing these lines again using precision keyins, **Delete** the two lines you just placed to start over.



- 5. Re-draw the two lines using the dx= precision keyin (delta keyin).
  - AccuSnap to the starting point.
  - ♦ Key in *dx=,-:6* for the first line.
  - ♦ Key in *dx=-15.5* for the second line.

**Note:** Don't forget the negative signs. You could also key in **.5** instead of **:6** and **15:6** instead of **15.5**.

- 6. Again, **Delete** the two lines you just place to start over.
- 7. Re-draw the two lines using the *di*= precision keyin (distance, direction keyin).
  - Select the Smartline command
  - AccuSnap to the starting point
  - ♦ Key in *di=:6,-90* for the first line
  - ♦ Key in *di=15.5,180* for the second line
  - AccuSnap to the location shown to finish

**Note:** You don't need the negative signs because of the direction you move the mouse.



8. **Fit** the view.

You've now used MicroStation's two main techniques for precision placement – precision keyins and **AccuDraw**. By using each method, you can compare the two methods and determine which you prefer.

You'll practice more with precision keyins and AccuDraw in other labs.

- 9. Save Settings (File > Save Settings).
- 10. **Exit** MicroStation.

# LAB 7 - Place Guardrail Lines

In this exercise, you'll place guardrail lines in the design model file and then work with the custom line styles.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Use the CDOT Menu to place custom lines styles
- Change the direction of a directional line style
- Change the elevation of an element after placement
- Change the level on which an element was placed
- Update graphics to *ByLevel Symbology*

### Lab 7.1 - Open the Design Model File

1. From the MicroStation Manager, open the **12345DES_Model.dgn** file from the **\Design\Drawings\Reference_Files** folder

Note that the aerial photo raster images are attached.

2. Select the **Raster Manager Icon** from the Primary toolbar, or you may select **File > Raster Manager**.



3. Select both raster images, **09a.tif** and **10a.tif**, and turn off their display in View 1.

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- 📕 View Attributes View 1 - - X View Number: 1 🛛 🖳 🖳 Presentation Display Style: (Wireframe Display) - Q 🔒 ACS Triad 😑 Fill 🔲 Background 🖽 Grid Boundary Display Cevel Overrides Ene Styles 🚺 Camera Clip Back Line Weights Clip Front Pattern/Bump Maps Q. Patterns Clip Volume Þ Constructions i Default Lighting Dimensions Tags 💶 Data Fields Text Α Displayset ↓ Text Nodes 🔆 Fast Cells Transparency 🖳 Fast Curves Global Brightness: 👾 < þ. 🔄 View Setup ¥
- 4. Select the View Attributes icon from the view toolbar and toggle Off Line Styles

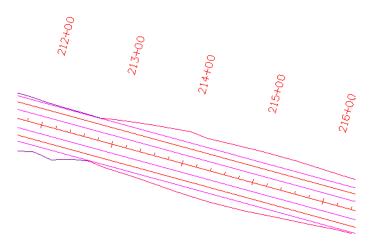
### Lab 7.2 - Draw the Guardrail

Next, you'll follow the steps below to place guardrail along the fill area approaching the intersection.

#### Create the guardrail trace lines

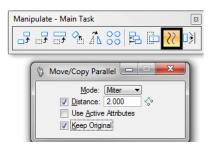
Create temporary lines using the **Move/Copy Parallel** command.

1. **Window** in to the area to the left of the intersection around station range 212+00-216+00 as shown.



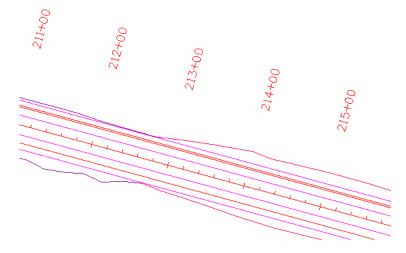
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- 2. From the *Main* task toolbar, open **Manipulate** as a toolbar.

- 3. Select the **Move Parallel** tool from the *Manipulate* toolbar.
- 4. In the *Tool Settings* box:
  - Toggle on **Distance** and key in *2*.
  - Toggle on Keep Original.

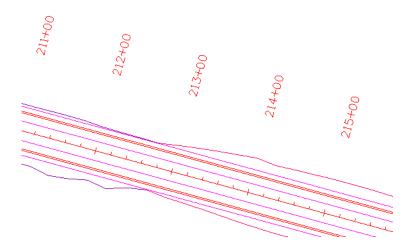


- 5. **<D>** on the red Edge of Oil line on the upper (North) side of the road.
- 6. Move your cursor up to establish the direction for the parallel copy.

7. **<D>** to copy the Edge of Oil line.



8. Repeat the above steps to create a guardrail trace line for the lower (South) side of the road. Be sure to parallel copy the Edge of Oil line.

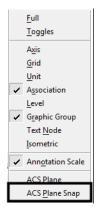


Trim the trace line for the extent of the guardrail

- 1. On the *CDOT Menu*, select **Draffing > Linework**.
- 2. Set the Line Weight category to 1.

Note: This should automatically select the Place SmartLine tool.

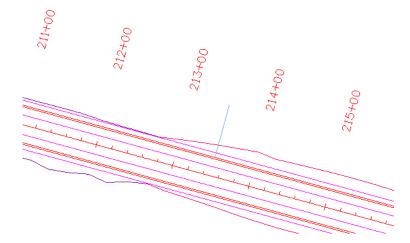
3. On the Status bar, turn Off **ACS Depth Snap**.



- *Note:* Make sure that **ACS Depth Snap** lock does *not* have a check mark beside of it to ensure that it is off.
- 4. On the Status bar, set the active snap mode to **Perp**.

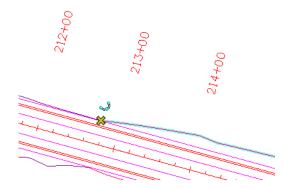


5. **<D>** on the guardrail trace line you just copied.



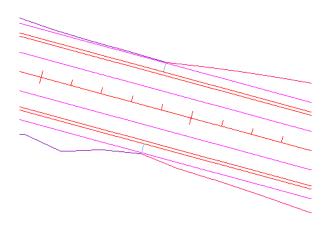
As you move your cursor, note how you can only place perpendicular to the trace line.

6. AccuSnap on the endpoint of the Toe of Fill line as shown to draw the perpendicular line.



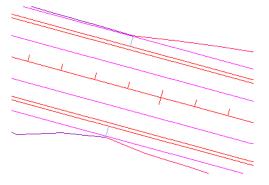
This will serve as the cutting element for the trace line. The guardrail starts at the beginning of the toe of fill line.

- 7. **<R>** when done.
- 8. Repeat the above steps to create a trim line for the other side of the road and be sure to **AccuSnap** to the end of the toe of fill line.

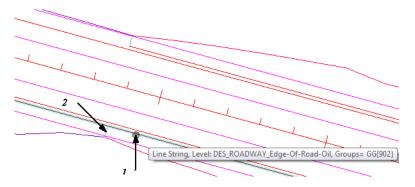


- K C:\Projects\SS2 Upgrade\Manuals\Projects\12345\Design\Drawings\Reference <u>File Edit Element Settings Tools Utilities Workspace Applications</u> 🔁 • 🗈 • 📻 • 🚳 • 🗛 • 🥪 • 🍃 • 📩 • 🎲 - 👬 Tasks Ψ× Top, CDC 💁 Tasks • ₫,₫,₫,₫,₫ -7 1 Modify Element 💒 Colorado DOT Ľ 2 Partial Delete Roundabouts Break Element By Point ∠ Civil Geometry 3 🕅 Data Acquisition 4 Extend Line Trim To Intersection 5 V Drawing Trim To Element **V** NZ. 6  $\otimes$ + Q Trim Multiple ما 8 IntelliTrim w 🗆 📿 📎 🏹 ⊃* 9 Insert Vertex 00ノンか 10 Е ]* 0 Delete Vertex 🚳 구 2 🎱 🙆 R Construct Circular Fillet Q T b 🤣 🗞 🐝 W Construct Chamfer  $A \sim^A A \neq^B \sqrt{ABC}$ ABC A Open 'Modify' as Toolbox 1.10 AI AI AD
- 9. Select the Trim To Element command.

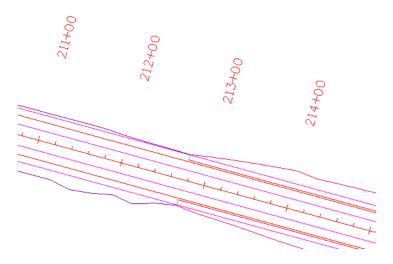
- 10. **<D>** on the trace line on the side of the element to keep, to the right of the perpendicular line.
- 11. **<D>** on the perpendicular line to trim the trace element to this point.



**<D>** to accept.



- 12. **Update** your view, if necessary.
- 13. Repeat to trim the lower side as shown.



14. Delete the blue perpendicular trim lines.

# Check the ACS Plane Snap lock

1. **<T>** on the left end of the upper trace line.

3278437.039, 1556493.963 6629.277 learest (KeyPt)

Note that the trace lines were copied at the same elevation as the edge of oil lines. When you place the guardrail lines, you want to place them at an elevation of 0.

**Note:** If you want the guardrail lines to pick up the correct elevations of the roadway surface, you can drape them with InRoads.

- 2. Key in *az=0*
- 3. **<D>** anywhere in the view to set the active depth.

View 1: Active Depth=0.000

*Note:* The CDOT default active depth is set to 0.

4. Select the **Locks** button from the *Status* bar.

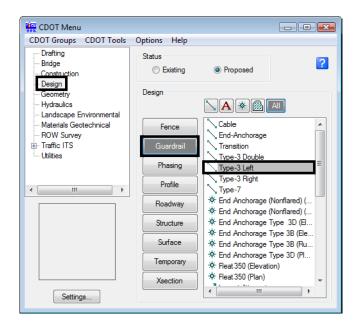
5. Turn ACS Plane Snap lock On.

	<u>F</u> ull
	<u>T</u> oggles
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	ACS Plane
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With **ACS Plane Snap** lock turned on, you will place elements at the active depth instead of picking up the elevation of elements you snap on.

### Place the guardrail lines

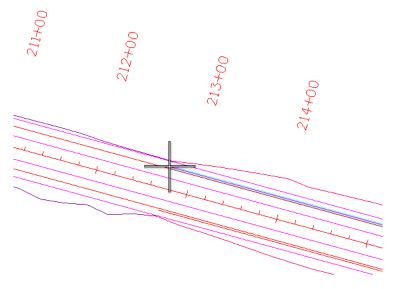
- 1. On the CDOT Menu, select **Design** from the *Explorer Window*.
- 2. Set the Category to Guardrail and select the item Type 3 left.



**Note:** This *automatically* sets the active level to *DES_GUARDRAIL_Type-3_Left* with all *ByLevel* settings (color, style and weight), and *automatically* selects the **Place SmartLine** command. Note that the ByLevel style is a directional custom line style called GUARDRAIL_Left_Proposed.

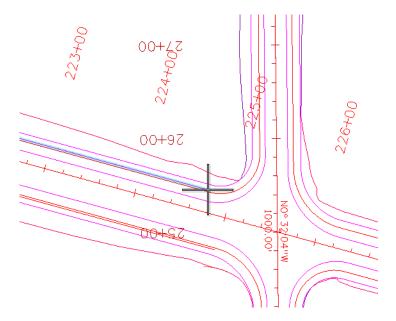
Attributes	(	
(none)		
	Color	: (ByLevel) 5
	Style	: (ByLevel) GUARDRAIL_Left_proposed
	Weight	: (ByLevel) 2

3. **<T>** on the left endpoint of the upper trace line as shown.



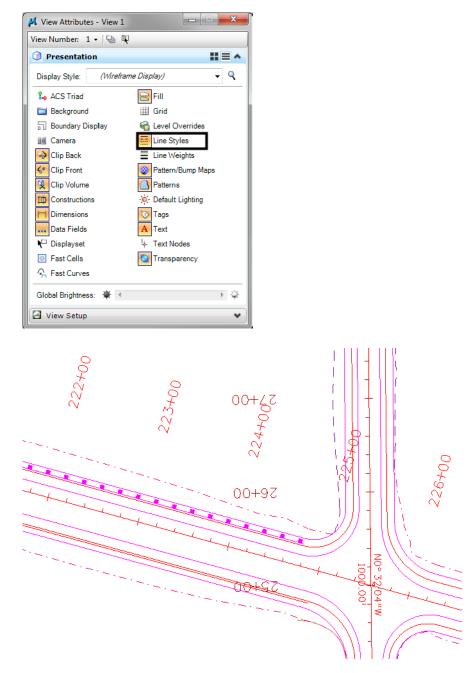
Check the message field. Note that with *ACS Plane Snap* lock on, you're placing the line at a Z value of 0 instead of the elevation of the line's endpoint.

- 4. **<D>** to accept.
- 5. **Pan** or **Zoom** to locate the other endpoint of the trace line near the intersection.
  - **Note:** Remember when using View Controls in the middle of a drawing command, reset **<R>** once to get back to the command.



6. Snap **(<T>**, then **<D>**) on the right endpoint as shown.

7. **<R>** when done.



8. Select Settings > View Attributes and toggle on Line Styles.

9. On the CDOT Menu select Guardrail Type-3 Right.

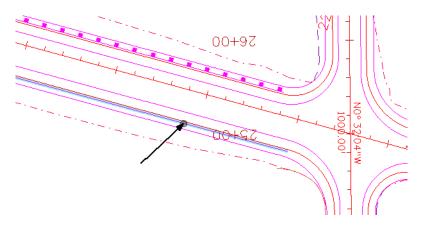
10. For the South side of the road we will use a different method. Select the **Change Element Attributes** from the Main task toolbar.

C:\Projects\SS2 Upgrade\Manuals\Projects\12	2345\Desi
: <u>F</u> ile <u>E</u> dit E <u>l</u> ement <u>S</u> ettings <u>T</u> ools <u>U</u> til	ities Wc
🚺 • 🗈 • 🖬 • 🚳 • 🖂 • 🧺 •	🥩 🔹
Tasks	Ψ×
🔁 Tasks	-
Colorado DOT Change Element Attrib	utes
Roundabouts	*
Civil Geometry	*
🕅 Data Acquisition	~

11. From the Tool Settings window toggle on Use Active Attributes, as well as Level, Color, Style, and Weight, this will use the correct guardrail line as selected from the CDOT menu.

🖇 Change Attribu	tes		23	
Vse Active Attrib	utes 🗡			
Level:	DES_GUA	RDRAI	L	
Color:	2	5	-	
V Style:	GUARDR.	AIL_Rig	h 🕶	
Veight:		(0) ByL	<u>.</u> •	
Transparency:		0	-	
Priority:	4	0	-	
Class:	Primary		-	
Template:	None		-	
Use <u>F</u> ence:	nside	-		
Make Copy				
Change Entire E	lement			

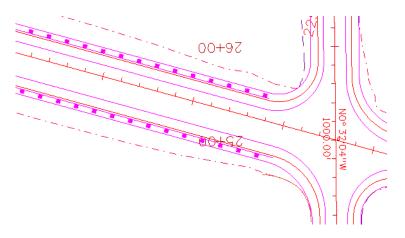
12. Select the South guardrail line.



**Note:** We have changed the attributes of the trace line to be the new guardrail line. Some custom line styles, like these, depend on the direction they are drawn. If the new guardrail line is placed in the wrong direction (the posts should be on the outside), select the **Change Direction** tool from the *Misc. Tools* task toolbar in the Colorado DOT task tab.



- *Note:* The *Misc. Tools* toolbar was created for CDOT using handy tools from within MicroStation.
- 13. Select the South guardrail line.



**Note:** Since we simply changed the attributes of the line we offset, it remains at its original elevation. We must now change the elevation of the new element to 0.

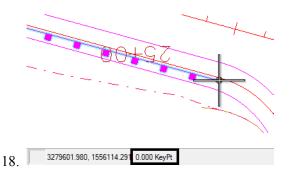
CDOT Menu		
CDOT Groups	CDOT Tools Options Help	
Trafting     Bridge     Construction     Design     Geometry	AutoTrack Breakline Cell Divide Change Text Case	Proposed ?
Hydraulics Landscape E Materials Geo	County Sheet Composer Edit Text Along	
	gINT Translator Levels Off	ind-Anchorage ransition ype-3 Double
•	Measure XY Distance Misc. Tools ModEley	ype-3 Left ype-3 Right ype-7
	Redlines Roughen SignCAD Steel	Ind Anchorage (Norflared) ( ind Anchorage (Norflared) ( ind Anchorage Type 3D (El ind Anchorage Type 3B (Ele ind Anchorage Type 3B (Ru ind Anchorage Type 3D (Pl
Setting	Stratify Survey Text to Node Traffic Accident Traffic Stripmap	eat350 (Elevation) eat350 (Plan)

14. From the CDOT Menu, select **CDOT Tools > ModElev**.

15. From the Tool Settings window, type an elevation of **O** and select **Single**.



- 16. Select **<D>** the new guardrail line.
- 17. The elevation has been changed to 0. To check, snap **<T>** to the endpoint of the line and notice the elevation in the status bar.

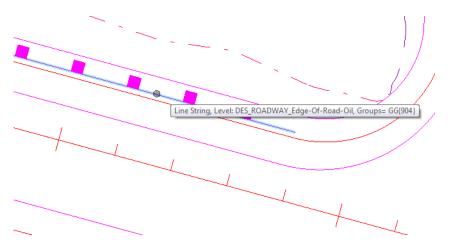


19. Turn AccuSnap back On.



# **Delete the North trace line**

- 1. Select **Delete** from the **Main** task toolbar.
- 2. Hover over on the trace line with your mouse.
  - *Note:* Watch for the trace line (not the guardrail line) to highlight. If you see the guardrail posts highlighted, **<R>** until the trace line highlights (watch for pop-up information to show the line on level *DES_ROADWAY_Edge-of-Road-Oil*).



When using the **Delete** command, use the reset button to select coincident elements.

3. With the correct line highlighted, **<D>** to accept.

# Lab 7.3 - Use Element Information to Change Levels

1. Select **Element > Information** or select this command from the *Primary* toolbar.



- 2. **<D>** on the upper *Type 3* guardrail lines you've just placed.
- 3. Read the basic element information in the *Message* field.

Line, Level: DES_GUARDRAIL_Type-3_Left

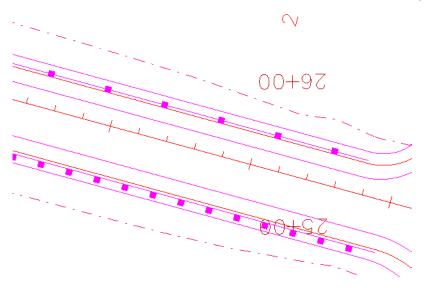
This is the same as the pop-up information provided when you "hover" over an element with your cursor.

4. In the *General* section of the *Element Information* box review the element attributes and properties.

	~
Line	
DES_GUARDRAIL_Type-3_Left	-
DES_GUARDRAIL_Type-3_Left	
DES_PHASING-Hatch	
DES ROADWAY Curb-Back	
DES_ROADWAY_Ditch-Flowline	
	*
1196.616	
	DES_GUARDRAIL_Type-3_Left DES_GUARDRAIL_Type-3_Left DES_GUARDRAIL_Type-3_Left DES_GUARDRAIL_Type-7 DES_Misc DES_PHASING DES_PHASING DES_RHASING-Hatch DES_ROADWAY_Approach DES_ROADWAY_Curb-Rack DES_ROADWAY_Curb-Rack DES_ROADWAY_Curb-Flowline DES_ROADWAY_Curb-Botom

5. Set the Level to DES_GUARDRAIL_Type_7.

The element is moved to the *DES_GUARDRAIL_Type_7* level and the graphics update.



- **Note:** *Element Information* is one way to change element attributes or properties if the element was originally placed incorrectly.
- 6. Select the Element Information command again and change the **Level** back to **DES_GUARDRAIL_Type-3_Leff**.

7. Select the **Geometry** section to review the element geometry.

Start End Length	3278437.042,1556493.962,-0.000 3279597.595,1556177.673,-0.000 1202.881
Direction	S74*45'18.96"E
📕 Element Info	
⊡- N <selection></selection>	
General	4
Description	Line
Level	DES_GUARDRAIL_Type-3_Left
Color	ByLevel (5)
Line Style	ByLevel (GUARDRAIL_Left_proposed)
Weight	ByLevel (2)
Class	Primary
Template	None
Transparency	0
Geometry	
⊞ Start	3278437.042,1556493.962,-0.000
⊞ End	3279597.595,1556177.673,-0.000
Length	1202.881
Direction	S74°45'18.96"E
Elevation Angle	N90°0'0"E
DeltaX	1160.554
DeltaY	-316.289
DeltaZ	0.000
Total Length	1202.881
Extended	6
Raw Data	

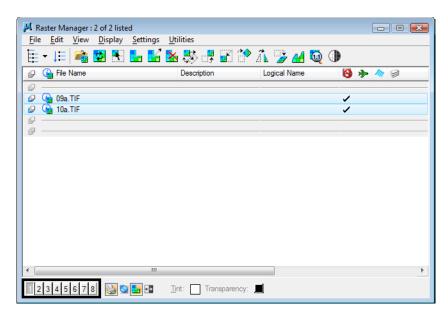
Note: The element was placed at the CDOT default active depth of 0 in the 3D file.

8. Close the Element Information dialog box when done.

#### Lab 7.4 - Turn Rasters Back On

1. **Fit** the view.

2. Select the **Raster Manager** icon from the *Primary Toolbar* and turn both raster files back on in View 1.



- 3. Fit your view if you don't see the raster images.
- 4. Select File > Save Settings.

# LAB 8 - Create 3D Utility Graphics

In this example, you'll create a Utility model file, work with references, and then place proposed 3D utility lines using the CDOT Menu and the parallel copy tool. You'll also modify the graphics as necessary.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Work with nested references
- Use the Copy Attachment option for references
- Use the CDOT Menu to place custom line styles (Utility lines).
- Place elements in 3D using **Depth Lock**
- Manipulate elements using the **Parallel Copy** tool
- Modify elements using the **Trim** tools

## Lab 8.1 - Create the Utility Model File

- 1. Open the MicroStation Manager and set the Project to 12345.
- 2. Set the directory to \Utilities\Drawings\Reference Files.

Look in:	Reference_	Files	- 🕝 🏂 📂 🛄 -	🗋 줄 🖻	3D - V8 DGN
æ	Name	*	Date modified	Туре	
Recent Places	🕌 12345UTIL	Model.dgn	2/18/2010 10:32 AM	MicroStat	
Dealstern					
Desktop					
Libraries					
Computer					
	•			•	
Network	File name:	12345UTIL_Model.dgn	-	Open	User: CDOT User
	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)	•	Cancel	Project: 12345
		Open as read-only		Options	Interface: CDOT

- 3. Open the file **12345UTIL_Model.dgn**. The blank Utility model file opens.
- 4. Select File > Save As...
- 5. Set the Directory to \Utilities\Working.

Save in:	📗 Working	•	G 🤌 📂 🛄 🗸	*	
<b>A</b>	Name	*	Date modified	Туре	
cent Places		No items match y	our search.		
Desktop					
Libraries					
					,
omputer					
(i) Network	•			•	
Network	File name:	CU12345UTIL_Model.dgn	-	Save	
	Save as type:	MicroStation V8 DGN Files (*.dgn)	-	Cancel	
				Options	

6. Change the file name to CU12345UTIL_Model.dgn and select Save.

The new file is created in the *Working* folder.

# Lab 8.2 - Attach References

1. Select **References** from the **Primary** toolbar.

Primary Tools	
Image: Image	0
References	_

 From the *References* dialog box, select Tools > Attach and select the 12345DES_Model.dgn file from the \Design \Drawings \Reference Files folder.

Look in:	Reference_		- 🕝 🌶 📂 🛄-	3 🖲	3D - V8 DGN
Æ	Name	*	Date modified	Туре	
	🕌 12345DES_/	Align.dgn	6/23/2007 7:12 PM	MicroStation V8 X.	
Recent Places	🕌 12345DES_I	nterchange.dgn	11/20/2007 7:46 AM	MicroStation V8 X.	
	🕌 12345DES_I	ntersec100SH86.dgn	11/20/2007 4:08 PM	MicroStation V8 X.	
	🕌 12345DES_I	-	11/1/2010 1:02 PM	MicroStation V8 X.	
Desktop	🕌 12345DES_I	Model.dgn	11/1/2010 1:03 PM	MicroStation V8 X.	
<u> </u>	🕌 12345DES_F		11/20/2007 7:47 AM	MicroStation V8 X.	
	🕌 12345DES_F	Prof03.dgn	11/20/2007 7:47 AM	MicroStation V8 X.	
Libraries	🖊 Elbert.dgn		11/20/2007 7:47 AM	MicroStation V8 X.	
					Attachment Method
Computer					Interactive
Network					
	•			4	
	File name:	12345DES_Model.dgn	•	Open	
	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)	•	Cancel	
	•	Save Relative Path		Options	

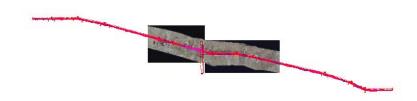
3. Verify the *Attachment Method* is set to **Interactive** and select **Open**.

 In the Attachment Settings box, keyin a Logical Name of Design and a Description of Design Model Plan. Make sure Display Raster Reference is on. Set the other options as shown and select OK.

Reference Attachment S	Settings for 12345DES_Model.dgn
Full Path:\Dr Model: CDO Logical Name:	5DES_Model.dgn awings\Reference_Files\12345DES_Model.dgn T Default
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views (none	·
Named Fences (nor	ne)
Detail Scale: Sc <u>al</u> e (Master:Ref):	
Named Group:	<b>•</b>
Revision:	
Level:	
Nested Attachments:	No Nesting   Depth: 1
Display Overrides:	
	Use MS_REF_NEWLEVELDI+
Global LineStyle Scale:	
Synchronize w	ith Saved View
Toggles	기 🍋 🏭 🌧 🐓 🏭 อ 💡 🗹 📶
Drawing Title	
Create	Display Raster References
Name:	Drawing
	<u>QK</u> Cancel

5. **Fit** the view.

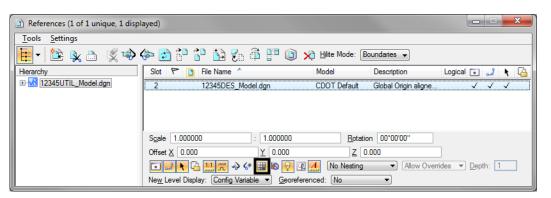
The Design reference graphics, along with the raster photos, appear in the Utility model file.



## Lab 8.3 - Raster Images

Since *Display Raster References* was turned on when attaching the reference, the aerial photos were attached with the design model file (they were turned on in the Design Model file from the last lab). You can quickly turn them off from the *Reference* dialog instead of opening the *Raster Manager*.

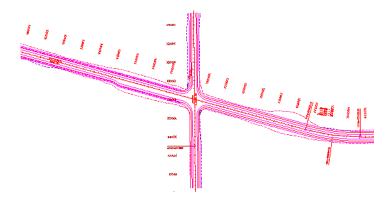
1. In the *References* box, highlight the **Design** reference and toggle **Display Raster** References *off.* 





### Lab 8.4 - Work with Reference Files

1. **Window** in on the Intersection.



2. On the **Reference** dialog, change **No Nesting** to **Live Nesting** and set **Depth** to **1**.

References (1 of 1 unique, 1 displ	ayed)	1000	
Tools Settings			
🔃 र 陰 💺 🗎	🄄 🔁 🗗 🚹 🔂 🌮 🖨 🖤 🛈	🗙 Hilte Mode: Boundaries 👻	
Hierarchy	Slot 🏱 🛅 File Name	Model Description	Logical Orientation
CU12345UTIL_Model.dgn	2 12345DES_Model.dgn	CDOT Default Global Origin aligne	Coincident
	·		۲.
	Scale 1.000000 : 1.000000	Rotation 00°00'00''	
	Offset X 0.000 Y 0.000	<u>Z</u> 0.000	
			emides 💌 Depth: 1
	New Level Display: Config Variable  Georef	erenced: No 💌	

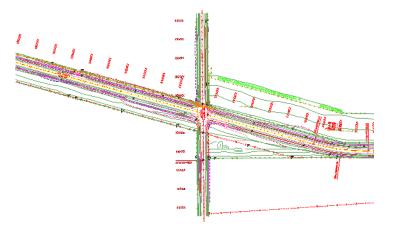
3. In the *Hierarchy* pane, select the **Design** reference file as shown below. On the right, select the **Survey/Topo** nested reference and make sure that **Display is** toggled **on**.

References (2 of 2 unique, 2 displ	layed)			
Tools Settings				
📴 - 陰 🗞 👌 🛒 🔷	(= 🖻 († († 🛍 7. 4 († (†	💥 <u>Hi</u> lite Mode: 🖪	oundaries 👻	
Hierarchy	Slot 🏱 🛅 File Name	Model	Description	Logical 💽 🎜 🦎
E-100 CU12345UTIL_Model.dgn	1 12345SURV_Topo100.dgn	CDOT Default	Global Origin aligne	$\checkmark$ $\checkmark$ $\checkmark$
te-wd 12345DES_Model.dgn				
	Scale 1.000000 : 1.000000	Rotatio	on 00°00'00''	
	Offset X 0.000 Y 0.000	<u>Z</u> 0	.000	
	- 🖸 🚅 💽 🖓 🖓 💔 🏢 🗟 😭 [	<u>A</u> Live Nesting	<ul> <li>Allow Overrid</li> </ul>	les ▼ <u>D</u> epth: 1
	New Level Display: Config Variable	erenced: No	•	

4. Open the *Level Display* box, make sure the *Show Target Tree* button is **On**, and select the **Survey/Topo** Reference. Right click on the bottom pane and choose **All On** to turn on all reference levels.

🏓 Level Display - View 1				- <b>)</b>	x
🖵 🕱 (View Display 🔹					
(none) - Levels	<u>-</u>				
CU12345UTIL_Model.dgn					
Name	Number File		Logical	Used	<b>^</b>
Name Default	Number File Set Active	URV_Topo100	Logical	Used •	
Default TOPO_BUILDING_Concrete-Pad	Set <u>A</u> ctive	URV_Topo 100		Used •	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof	Set <u>A</u> ctive Jump To Active Level	URV_Topo 100 URV_Topo 100		Used •	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House	Set <u>A</u> ctive	URV_Topo 100 URV_Topo 100 URV_Topo 100		Used •	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Office-Business	Set <u>A</u> ctive Jump To Active Level	URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100		• • •	4 III
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Office-Business TOPO_BUILDING_Pump-Island	Set <u>A</u> ctive Jump To Active Level Create Display Set	URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100		Used •	4 III
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Office-Business TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop	Set <u>A</u> ctive Jump To Active Level Create Display Set All O <u>n</u> All O <u>ff</u>	URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100		• • •	4 III
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Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Office-Business TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Sheds-Barns TOPO_CULVERT_Corr-Steel-Pipe	Set <u>A</u> ctive Jump To Active Level Create Display Set All O <u>n</u> All O <u>ff</u>	URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100		Used •	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Frame-House TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Sheds-Barns TOPO_CULVERT_Corr-Steel-Pipe TOPO_CULVERT_Corr-Steel-Pipe-Oth	Set Active Jump To Active Level Create Display Set All O <u>n</u> All O <u>ff</u> Invert On/Off	URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100		Used	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Office-Business TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Sheds-Barns TOPO_CULVERT_Corr-Steel-Pipe TOPO_CULVERT_Corr-Steel-PipeOth TOPO_CULVERT_End-Sec-Corr-Stl-Pip	Set <u>A</u> ctive Jump To Active Level Create Display Set All O <u>n</u> All O <u>ff</u> <u>I</u> nvert On/Off Off By Element All Except Element	URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100		Used	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Office-Business TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Sheds-Barns TOPO_CULVERT_Corr-Steel-Pipe TOPO_CULVERT_Corr-Steel-PipeOth TOPO_CULVERT_End-Sec-Corr-StI-Pip TOPO_CULVERT_End-Sec-RCP	Set Active Jump To Active Level Create Display Set All On All Off Invert On/Off Off By Element	URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100 URV_Topo 100		Used	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Frame-House TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Sheds-Barns TOPO_CULVERT_Corr-Steel-Pipe TOPO_CULVERT_Corr-Steel-Pipe-Oth TOPO_CULVERT_End-Sec-Corr-StI-Pip TOPO_CULVERT_End-Sec-RCP TOPO_CULVERT_Reinforced-Concret	Set <u>A</u> ctive Jump To Active Level Create Display Set All O <u>n</u> All O <u>ff</u> <u>I</u> nvert On/Off Off By Element All Except Element <u>S</u> ave Filter	URV_Topo 100 URV_Topo 100		Used	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Office-Business TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Sheds-Barns TOPO_CULVERT_Corr-Steel-Pipe TOPO_CULVERT_Corr-Steel-Pipe-Othe TOPO_CULVERT_End-Sec-Carr-StI-Pit TOPO_CULVERT_Reinforced-Concrete TOPO_CULVERT_Reinforced-Concrete TOPO_CULVERT_Corb	Set Active Jump To Active Level Create Display Set All O <u>n</u> All O <u>ff</u> Invert On/Off Off By Element All Except Element Save Filter Level Manager	URV_Topo 100 URV_Topo 100		Used	
Default TOPO_BUILDING_Concrete-Pad TOPO_BUILDING_Deck-W-Roof TOPO_BUILDING_Frame-House TOPO_BUILDING_Frame-House TOPO_BUILDING_Pump-Island TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Pump-Island-Canop TOPO_BUILDING_Sheds-Barns TOPO_CULVERT_Corr-Steel-Pipe TOPO_CULVERT_Corr-Steel-Pipe-Oth TOPO_CULVERT_End-Sec-Corr-StI-Pip TOPO_CULVERT_End-Sec-RCP TOPO_CULVERT_Reinforced-Concret	Set <u>A</u> ctive Jump To Active Level Create Display Set All O <u>n</u> All O <u>ff</u> Invert On/Off Off By Element All Except Element Save Filter Level <u>Manager</u> 2-L 3531 123452	URV_Topo 100 URV_Topo 100		Used •	

The nested Survey/Topo graphics are displayed.



5. Back in the Reference dialog box, select the upper-level **CU12345UTIL_Model.dgn** master file in the *Hierarchy* pane. On the right, select the **12345DES_Model.dgn** reference and **toggle off** *Display*.

Both Design and Survey/Topo are turned off since Survey/Topo is nested.

6. Turn the display of the **Design** reference back **On**.

 How would you turn off the Design graphics and leave the Survey/Topo graphics on? Currently, as nested references, you can't do this. However, in the next section you will accomplish this using Copy Attachments.

# **Use the Copy Attachments Option**

Many times, especially in Model files, you want all your references to be upper level references (as opposed to nested references) so that you can turn on/off the display of individual reference files. To accomplish this you can either reference all the nested files one by one or you can use the **Copy Attachments** option.

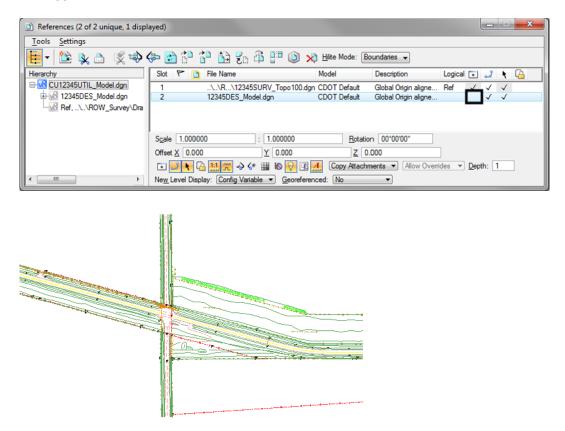
1. With the *Design* reference selected on the right, change the **Live Nested** option to **Copy Attachments.** 

🗈 References (2 of 2 unique, 2 displ	ayed)		X
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	New Level Display: Config Variable	erenced: Copy Attachments	

**Note:** Notice that in the Hierarchy pane of the **References** dialog box both the Design and the Survey/Topo references are now upper level references. As a result of changing *Live Nesting* to *Copy Attachments*, the nested Survey/Topo reference was copied in as a direct attachment.

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4	New Level Display: Config Variable  Georef	erenced: No	•			

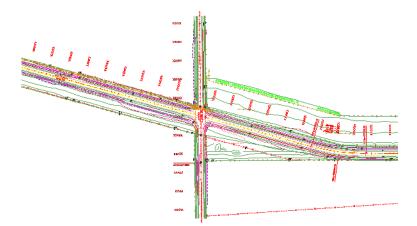
2. On the right-hand side of the *References* box, select the reference for the **Design** model and toggle the *Display* off.



With both references as direct attachments, each reference can be individually turned on/ off. In this example the Design reference is turned off while the Survey/Topo graphics remain on.

**Note:** As a rule of thumb for Model files, you can reference nested to avoid having to attach multiple times. Then, once the nested references are attached, use the **Copy Attachments** option to make all nested references direct attachments. For Sheet files (see Chapter 9), you should typically use nested attachments.

3. Turn the *Design* reference display back **On**.



# Lab 8.5 - Drawing in 3D (Using ACS Plane Snap Lock)

In the next series of steps, you will practice placing utility graphics from the CDOT Menu with and without *ACS Plane Snap lock*. The ACS Plane Snap lock sets the elevation of the graphics are placed in a 3D file.

# **Place overhead electrical lines**

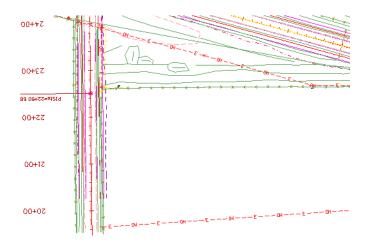
1. To check your active depth, key in *az=\$* then *<D>* in the view.

The default active depth for the CDOT for the Utility model file is **0.00**.

Select the Locks button on the status bar and verify that ACS Plane Snap lock is turned Off.



With *ACS Plane Snap lock* turned off, you will pick up the elevation of elements you snap to in a 3D file.



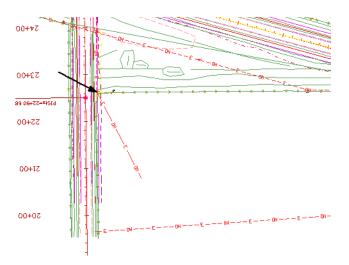
2. **Zoom in** on the south side of the intersection cross road.

- 3. On the CDOT Menu highlight the **Utilities** group and set *Status* to **Proposed**.
- 4. Select the **Electric** category.
- 5. Set the *Filters* category to All.
- 6. Select the **Overhead Line** item.

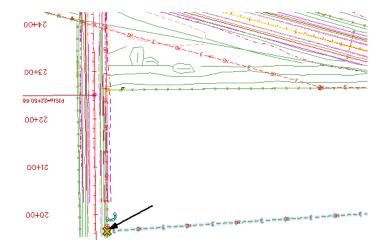
CDOT Menu		[	- • •
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction	Status	Proposed	?
Design Geometry Hydraulics Landscape Environmental	Utilities	<b>∖A</b> * @[	All
Materials Geotechnical ROW Survey	Electric	Overhead Line	
· Traffic ITS Utilities	Fiber Optic	A <new string<br="" text="">&amp; Catenary Pole</new>	>
	Gas	☆ Decorative Light ☆ Fire Alarm Box	Standard
	Sanitary Sewer	☆ Fire Alarni Box	
< <u> </u>	Telephone	☆ Lighting Post ☆ Manhole	
	Television	* Miscellaneous	
	Water	☆ Pedestal or Pull E ☆ Power Pole	lox
		☆ Relocated Light \$ ☆ Tower	Standard
		☆ Tower ☆ Vault	
Settings			

Note that the active level is automatically set to *UTIL_ELECTRICAL_Overhead* and the *Place SmartLine* command is started.

7. **AccuSnap** to the end of the existing North/South overhead line at the power pole as shown.



8. AccuSnap to the end of the existing east/west overhead line at the power pole as shown.



- 9. **<R>** to complete this line.
- 10. Turn Off the display of the Topo/Survey reference to better see the proposed graphics.

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55+00	
51+00	
50+00	
00+61	
3279698.617, 155	5598.078 6627.317 KeyPt

11. **<T>** on the end of the proposed overhead electrical line you just placed.

- **Note:** Even though the active depth is 0, since **Depth lock** is turned off the line was placed at the elevation of the existing overhead line (6627.317).
- 12. **<T>** on the other end of the proposed overhead electrical line to check its elevation.

3279695.272, 1555897.262 6623.081 KeyPt

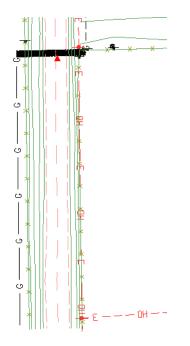
## Place proposed gas lines

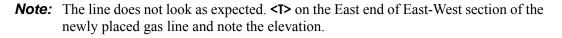
- 1. Turn **Off** the display of the *Design* reference and turn **On** the display of the *Survey/Topo* reference.
- 2. On the CDOT Menu, select the *Gas* category.

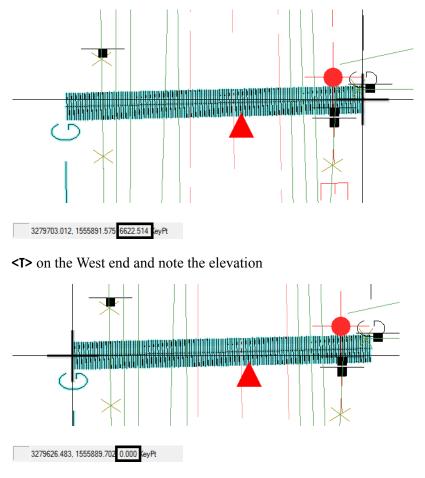
3. Select the **Gas Line** item.

🚆 CDOT Menu			_ 0 🔀
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction	Status	Proposed	?
Design Geometry Hydraulics Landscape Environmental	Utilities	<b>∖A* </b>	AII
Materials Geotechnical ROW Survey	Electric	Gas Line	ine
	Fiber Optic	A <new strin<br="" text="">☆ Manhole</new>	ig>
	Gas	i ☆ Valve i ☆ Vault	
4	Sanitary Sewer	* Vent-Pipe	
	Telephone		
	Television		
	Water		
Settings			

- 4. **<T>** on the end of the existing gas line on the east side of the road.
- 5. Place data points to draw the gas line in the approximate location shown.
- 6. **<R>** when done.

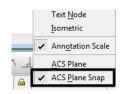






**<T>** snapping to an existing element positions the starting point of the new element at the elevation of the original element. Subsequent points that are not snapped to are placed at the *Active Depth* (Elevation) *of 0*. In this case, what you see is a proposed gas line that goes from an elevation of +/- 6622 to an elevation of 0 making the utility much longer than it should be. Because there are now so many "G" symbols in a line that is over 6000' long, it gives the appearance of a thick line.

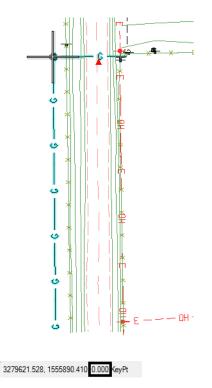
- 7. **Delete** the proposed gas utility line you just placed.
- 8. Select the **Locks** from the status bar.
- 9. Toggle On ACS Plane Snap Lock.



10. On the Snap Mode toolbar, toggle AccuSnap Off.



- **Note:** AccuSnap doesn't work consistently when **Depth Lock** is on. Therefore, to ensure Depth lock works correctly, toggle AccuSnap off.
- 11. Place the proposed gas line again by a **<T>** on the end of the existing gas line and then placing the other data points in the approximate location shown.
- 12. **<T>** anywhere on the proposed gas line you just placed and note the elevation.



Since ACS Plane Snap lock is on, the proposed gas line was placed at an elevation of **0**.

*Note:* To return to the default settings, turn *ACS Plane Snap lock* Off and toggle *AccuSnap* back On.

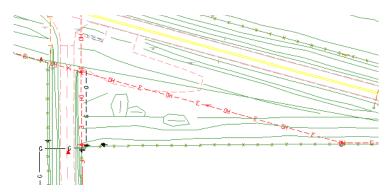
# Place fiber optic lines using parallel copy

Follow the steps below to place a fiber optic line by copying parallel an existing telephone line.

#### Locate reference graphics for copying

1. Turn off the TOPO_TERRAIN_Break-Lines level in the SurveyTopo reference.

2. **Window** in on the existing overhead electrical line in the southeast quadrant of the intersection as shown.

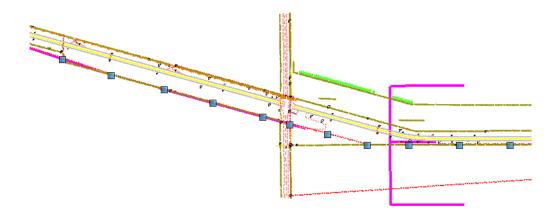


- 3. Select the **Move Parallel** tool from the *Main* task toolbar.
- 4. In the *Tool Settings* box, set the options as shown below.

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Z Civil Geom		Scale	☑ <u>Distance:</u> 6.000 ☆ ☑ Use <u>A</u> ctive Attributes
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	6	Array	
° ja 🖻	7	Align Elements By Edge	
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EOOZ	9	Move Parallel	
r 🖉 🎱 ( ^D )	0	Move To Contact	-
т 🎝 🖗 🚛		Open 'Manipulate' as Toolbox	

- 5. **<D>** on the existing overhead line
- 6. Move the cursor down to specify the direction of the parallel copy.

7. **<D>** to place the copy.



- **Note:** When copying graphics from a Topo file, elements will maintain a hard coded linestyle scale and thus appear at the incorrect scale. This scale needs to be adjusted using the Element Info tool. In this example the linestyle scale of the new utility line need to be changed from a value of 100 to 1.
- 8. Select the new graphic and **<D>** on the *Element Info* tool.



- 9. Expand the *Extended* category and *Line Style Parameters* sub-category.
- 10. Change the value of the *Scale* option to **1**.

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Selection>	
General	8
Geometry	8
Groups	8
Extended	ŝ.
Model	CDOT Default
Last Modified	8/18/2009 3:11 PM
Snappable	Snappable
Modified	Modified
New	New
Locked	Unlocked
Thickness	0.000
Line Style Parameter	rs
Scale	1.00000
Width Mode	None
Shift Mode	None
Corner Mode	From Line Style
Raw Data	3)

11. **Close** the Element Info

#### Change element attributes

Change the overhead electrical line to an underground fiber optic line using the *Change Element Attributes* command.

1. Set the active level to UTIL_FIBEROPTICS (hint: use a filter to help you set the level).

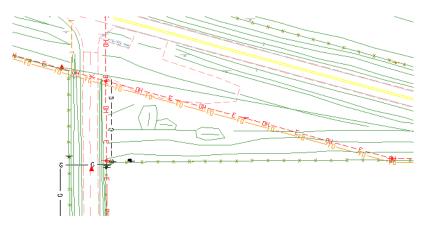
Attributes				
D Utilitie 🔻	UTIL_FIBEROPTICS			
	UTIL_FIBEROPTICS UTIL_FIBEROPTICS_Overhead UTIL_FIBEROPTICS_Symb UTIL_FIBEROPTICS_Text	>>>>	0 0 0	

- 2. Select the Change Element Attributes command from the Main task toolbar.
- 3. Set *Method* to Change.
- 4. Toggle On Use Active Attributes.
- 5. Toggle On *Level* (this picks up the active level).

Tasks 7 X	View 1 - Top, CDOT Default
1     2     3     4     5     3     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5     5 <th>Change Attributes</th>	Change Attributes
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✓     Civil Geometry       ▲     Data Acquisition	
😢 Drawing 🔛 🗮 🗮 🔺	Weight: (1) ByLε ▼
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0 C D D W	Template: None 💌
	Use <u>Fence</u> : <u>Inside</u> Make Copy Change Entire Element

6. **<D>** on the overhead electrical line you just copied as the element to change.

7. **<R>** when done.



Since the *Use Active Attributes* option was turned on, the element was changed to the active level UTIL_FIBEROPTICS.

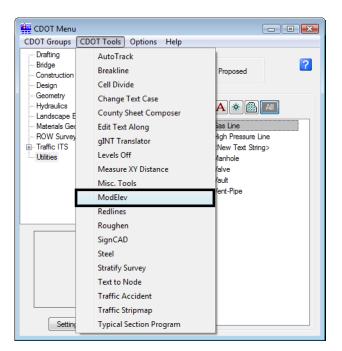
#### Set the elevation

1. **<T>** on the fiber-optics line you just placed.

```
3279913.476, 1555958.930 6616.131 KeyPt
```

The proposed fiber-optics line is in the 6615 elevation range (your exact elevation may be vary depending on where you placed a tentative point). This elevation is wrong for the fiber optic line since you copied the overhead electrical line. For now, you can set the elevation of this line to 0 and later, it can be placed as a feature in the InRoads surface at the correct elevation. One way to set the elevation of an element is to use the **ModElev** command on the CDOT Menu.

2. On the CDOT Menu, select **CDOT Tools > ModElev**.



3. In the *ModElev* tool settings box, set the elevation to *O*.

📕 Mod Ele	ev 🗖 🗖 💌
Elevation:	0.000000
Single	Fence All

- 4. Select **Single** (to identify a single element).
- 5. **<D>** on the new fiber-optics line you created.
- 6. **<D>** to accept.
- 7. **<R>** when done.
- 8. **<T>** on the fiber-optics line to check its elevation.

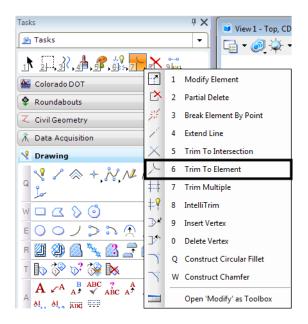
3279531.734, 1556062.755 0.000 KeyPt

The Z value is now at 0. Use the ModElev command to easily set the elevation of any element or group of elements (selected with a fence).

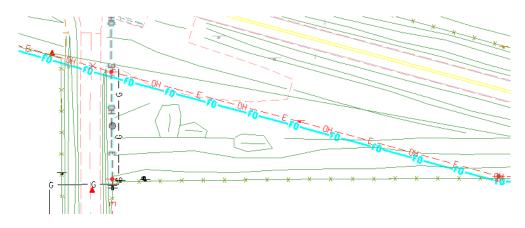
#### Trim graphics

The new fiber optic line is only going in on the east side of the intersection cross road. Follow the steps below to use the *Extend Element to Intersection* command to trim the fiber optic graphics.

1. Select the Trim to Element tcommand from the Main task toolbar.

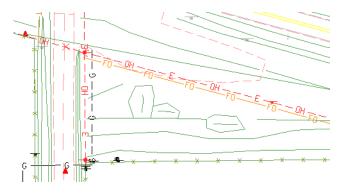


2. **<D>** on the fiber optic line to the right of the intersection, this is the section we wish to keep.



3. **<D>** on the north/south proposed overhead electrical line as the cutting element.

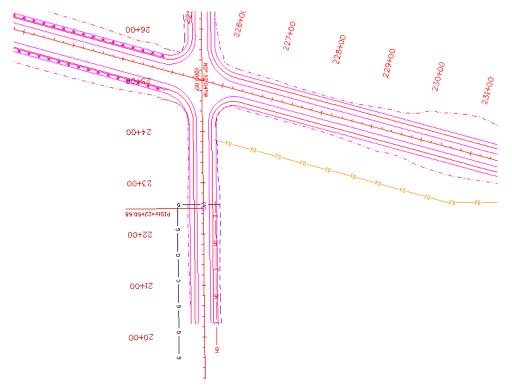
The fiber-optics lines are trimmed as shown.



- 4. Turn off the display of the **Survey/Topo** references.
- 5. **Fit** the view.



Only the proposed gas, electric and fiber-optic utility graphics should appear in the *CU12345UtilityModel01.dgn* file.



6. Turn the display of the *Design* reference **On** and window into the intersection as shown.

# Move the utility model to the Reference Files folder

Move the utility model so that other groups can reference your work.

- 1. Select File > Save As and set the directory to the project's \Utilities\Drawings\Reference_Files folder.
- 2. Remove the **CU** initials from the file name and select **Save**.

Save in:	Reference_	Files	•	G 🤌 📂 🖽 🗸	۲	3D - V8 DGN
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ecent Places						
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Network	•				4	
	File name:	12345UTIL_Model	dgn	-	Save	
	Save as type:	MicroStation V8 DG	N Files (*.dan)	•	Cancel	

The file is saved to the new location.

- **Note:** The project template delivers standard dgn's for model and sheet files as starter files. Use caution when prompted to confirm saving over an existing file as you could lose data.
- 3. Select **File > Close**.
- 4. In the *MicroStation Manager* verify that the file was saved to the *Reference_Files* folder.

1	File Open - C:\	\Projects\12345\U	Itilities\Drawings\Reference_Files\				X
	Look in:	Reference_Fi	les 🔻	G 🤌 📂 🛄 🗸	"L) 줄 🖻		
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	Network	File name:	CU12345UTIL_Model.dgn	-	Open	User: CDOT User	-
		Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)	•	Cancel	Project: 12345	•
			Open as read-only		Options	Interface: CDOT	-
							н

- 5. Set the directory to **\Utilities\Working**.
- 6. **Right-click** while hovering over the file and select **Delete** to delete the file from the Working folder.

File Open - C:	\Projects\12345\U	tilities\Working\			
Look in:	퉬 Working	•	G 🤌 📂 🖽 🗸	D 🗟 🗈	3D - V8 DGN
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Libraries		Restore previous versions			
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	Files of type:	Rename		Cancel	Project: 12345
		Properties		Options	Interface: CDOT 🔹

7. **Cancel** the MicroStation Manager to exit.

# LAB 9 - Create Landscape Graphics

In this lab you'll create a Landscape & Environmental (L&E) model file and then use the CDOT Menu to place silt fence lines, hay bale cells and wetlands regions.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Use the CDOT Menu to place L&E custom lines
- Use the CDOT Menu to place L&E cells
- Use the CDOT Menu to place L&E shapes (wetlands)
- Use the CDOT Menu to pattern areas

## Lab 9.1 - Create the L&E Model File

- 1. Start MicroStation.
- 2. Re-set Project to 12345.
- 3. Set the directory to \Landscape_Environmental\Drawings\Reference Files.
- 4. Select the file 12345LAND_ENVI_Model.dgn and select Open.

Look in:	Reference_	Files 🔻	G 🤌 📂 🖽 🛪	- "L] 🍯 🗎	
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	•	Ш		4	
Network	File name:	CU12345UTIL_Model.dgn	-	Open	User: CDOT User
	Files of type: CAD Files (*.dgn;*.dwg;*.dwf)		•	Cancel	Project: 12345

 After opening the file, select File > Save As... and set the directory to C:\Projects\12345\Landscape_Environmental\Working. 6. Change the file name to CU12345LAND_ENVI_Model.dgn and select Save to save a copy to the Working folder.

Save As - C:\P	rojects\12345\La	ndscape_Environmental\Working\			×
Save in:	🐌 Working	•	G 🌶 📂 🛄 🗸	*	
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Recent Places		No items match yo	our search.		
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Network	File name:	CU12345LAND_ENVI_Model.dgn	•	Save	
	Save as type:	MicroStation V8 DGN Files (*.dgn)	•	Cancel	
				Options	

- 7. Select **References** from the **Primary** toolbar.
- Using what you've learned, attach the Design model reference (from Design's \Drawings\ Reference_Files folder), Coincident-World and at a 1:1 scale. Copy
   Attachments at a depth of 1 to bring in the Survey/Topo as direct attachments. See below.

References (2 of 2 unique, 2 displ	ayed)					x
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	2 12345SURV_Topo100.dgn	CDOT Default	Global Origin aligne	Ref √	1 1	·
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9. Fit the view.

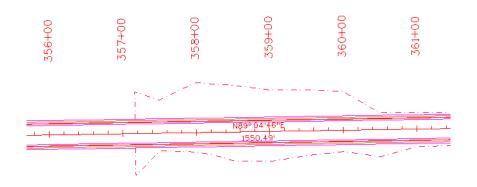


10. From the **Reference** dialog, Turn *off* the display of Design's raster references.

References (2 of 2 unique, 2 displ	ayed)				×
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	New Level Display: Config Variable  Geo	referenced: No	•		

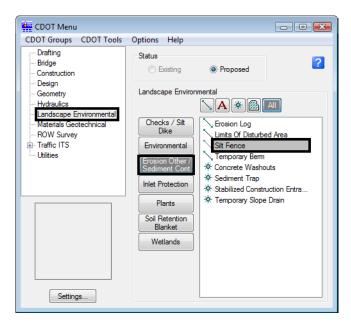
# **Place silt fence**

1. Window around the end of the project just east of the existing bridge.



- 2. From the CDOT Menu, select the Landscape Environmental Group.
- 3. Set Status to Proposed.
- 4. Set the category to Erosion Other / Sediment Control.

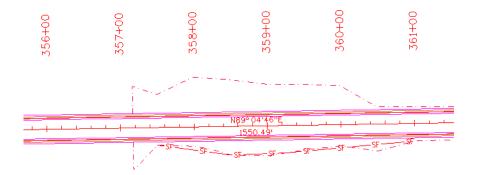
5. Select the Silt Fence item.



This automatically sets the active level to LAND_ENVI_Erosion-Silf-Fence and selects the Place SmartLine tool.

(none:

6. Place data points to draw the silt fence along the toe-of-fill line on the south side of the proposed road (similar to the one shown).

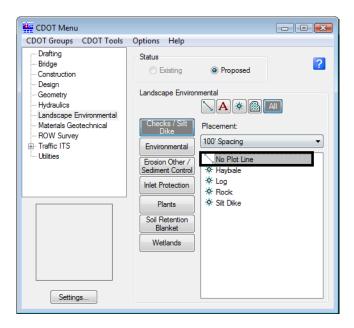


7. **<R>** when done.

### **Place Haybales**

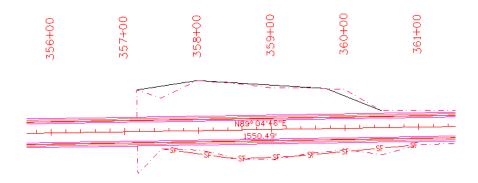
1. Set the category to **Checks / Silt Dike**.

2. Select the item **No Plot Line**.



This automatically sets the active level to **DRAFT_INFO_No-Plot** and selects the **Place SmartLine** tool. The **No Plot** level allows you to place a construction line representing the location of haybales, silt dikes, etc. that you can later divide with a cell.

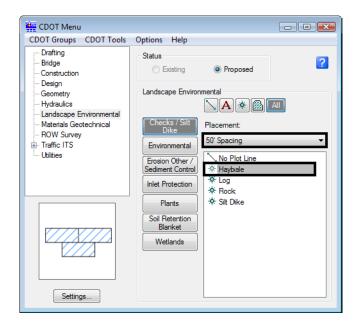
3. Place data points to draw the haybale construction line on the north side of the proposed road as shown.



4. **<R>** when done.

- CDOT Menu CDOT Groups CDOT Tools Options Help Drafting Status ? Bridge Existing Proposed Construction Design Landscape Environmental Geometry Hydraulics **∖** A ≉ 🚳 Landscape Environmental ks / Silt Materials Geotechnical Placement: ROW Survey 50' Spacing Traffic ITS Environmental ---- Utilities No Plot Line Erosion Other / ediment Control * Haybale 🔆 Log Inlet Protection * Rock 🔆 Silt Dike Plants Soil Retention Blanket Wetlands Settings... - • • 🚝 Active Settings Active Scale: 100.00 Apply Active Angle: 0.00 Close
- 5. On the CDOT Menu, select Settings and set Active Scale to 100, Apply and then Close.

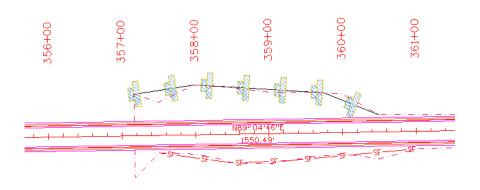
- 6. Set Placement to 50' Spacing.
- 7. Set the item to **Haybale**.



This automatically selects the **Place Cell** command and starts the **Cell Divide** program.

8. When prompted to Identify Element, <D> on the No Plot line you just placed.

9. **<D>** to accept.

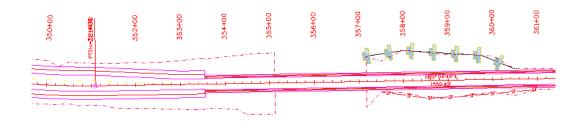


The No Plot line is divided with the haybale cells at 50 ft. intervals.

## **Create wetlands**

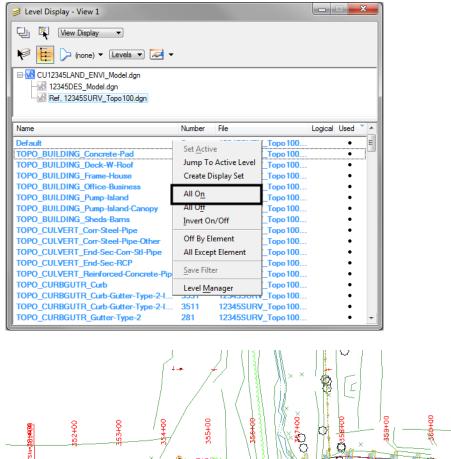
### Draw the wetland shapes

1. Pan over to the left to the area around the bridge as shown.



2. From the Reference File dialog box, turn on the display of the Survey/Topo file.

3. Open *Level Display*, highlight the Survey/Topo reference, right-click in the list of levels and turn on all of the Survey/Topo reference levels.



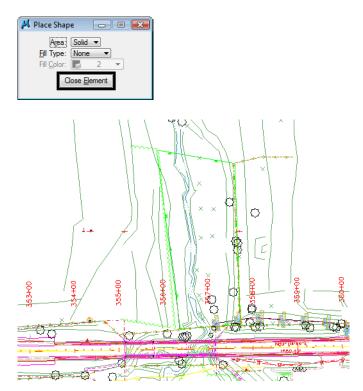


4. On the CDOT Menu, set the category to Wetlands.

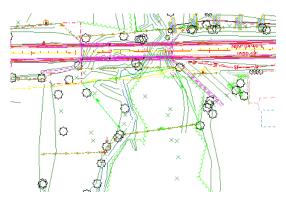
- CDOT Menu - • • CDOT Groups CDOT Tools Options Help Drafting Status ? Bridge Existing Proposed Construction Design Landscape Environmental Geometry Hydraulics 🔪 A 🕸 🙆 Landscape Environmental Checks / Silt ≺Wetland Le Materials Geotechnical Dike ROW Survey Wetland Rig ⊕ Traffic ITS Environmental Existing ---- Utilities Mitigation Erosion Other / 🛞 Permanent Sediment Control Temporary (Hatch) Inlet Protection Plants Soil Retention Blanket Settings...
- 5. Select the item Wetland Right.

This automatically sets the active level LAND_ENVI_Wetland-Right and selects the Place Shape tool.

6. Place data points to define the wetlands region as shown. To close the shape, select **Close Element** in the **Place Shape Tool Settings** box.

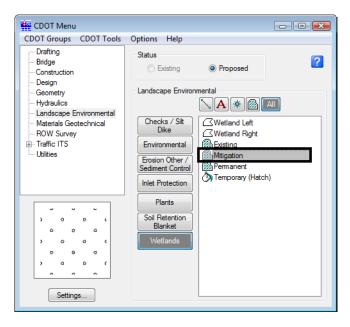


7. Repeat for the area on the other side of the bridge as shown.



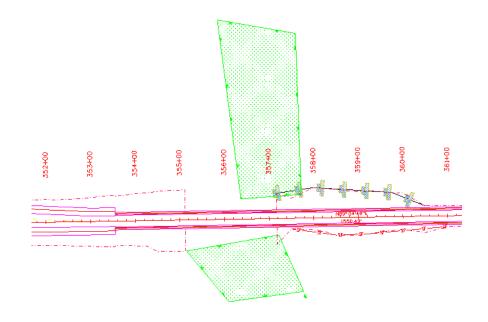
Pattern the wetlands

8. On the CDOT Menu, select the Mitigation item from the Wetlands category.



This automatically selects the Pattern Area command and sets the active pattern cell.

- 9. When prompted, **<D>** on the wetland shape you just drew and then **<D>** to accept.
- 10. Repeat for the other wetlands shape on the north side of the bridge.



11. Turn *off* the display of the **Survey/Topo** reference.

- 12. Save Settings.
- 13. Proceed to the next lab.

# LAB 10 - Create Hydraulics Graphics

### **Chapter Objectives:**

After completing this exercise you will know how to:

- Use the CDOT Menu to place Hydraulics custom lines (pipes)
- Use the CDOT Menu to place Hydraulics cells (inlets)
- Use the CDOT Menu to place Hydraulics terminators (RCES)

## Lab 10.1 - Create the Hydraulics Model File

- 1. In MicroStation, select **File > Open**.
- 2. Set the directory to \12345\Hydraulics\Drawings\Reference Files
- 3. Select the file **12345HydraulicsModel##.dgn** and select **Open**.

Look in:	🐌 Reference_	Files	- 🕝 🤣 📂 🖽 -	🗋 🍯 💽	3D - V8 DGN
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	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)	· · · · · · · · · · · · · · · · · · ·	Cancel	Project: 12345
		Open as read-only		Options	Interface: CDOT

4. Select File > Save As... and set the directory to \Hydraulics\Working

5. Change the file name to **CU12345HydraulicsModel.dgn** and select **Save** to save a copy to the **Working** folder.

₽ Save As - C:\P	rojects\12345\Hy	draulics\Working\			
Save in:	\mu Working	•	G 🤌 📂 🛄 -	*	
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Desktop					
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	File name:	CU12345HydraulicsModel##.dgn	•	Save	
	Save as type:	MicroStation V8 DGN Files (*.dgn)	•	Cancel	
				Options	

- 6. Select **References** from the **Primary** toolbar.
- Using what you've learned, attach the Design model reference (from Design's \Drawings\ Reference_Files folder), Coincident-World and at a 1:1 scale. Copy Attachments at a depth of 1 to bring in the Survey/Topo file as direct attachments. See below.

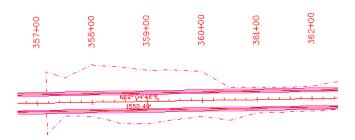
References (2 of 2 unique, 2 display	ayed)				23
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⊞- <mark>v&amp;</mark> CU12345HydraulicsModel##.dg	1 12345DES_Model.dgn	CDOT Default	Global Origin aligne	V V	$\checkmark$
	2 12345SURV_Topo100.dgn	CDOT Default	Global Origin aligne	Ref √ √	$\checkmark$
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	New Level Display: Config Variable  Geore	eferenced: No			

8. From the **References** dialog, turn off the display of the design model's raster references.

### **Place Inlets**

Using known coordinates and the **CDOT Menu**, place proposed Type R inlets along the curb flowline at the end of the project.

1. Window into the area shown near the end of the project.



This area of the projects is a proposed 2-Lane urban section with curb, gutter and sidewalk. You'll first place inlets along the curb flowline.

- 2. Select Locks from the status bar and make sure ACS Plane Snap lock is turned off.
- 3. On the CDOT Menu, select the Hydraulics Group.
- 4. Set the **Status** to **Proposed**, select the **Inlets (Plan)** category, and then select the **Type** *R L* **10** item.

EDOT Menu			
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction	Status © Existing	Proposed	?
Design Geometry Hydraulics Landscape Environmental	Hydraulics		
Materials Geotechnical	Conveyance	☆ Denver Type 16 (D ☆ Denver Type 16 (T	
Traffic ITS     Utilities	Drainage Basin	* Denver Type 16 (T	
····· Utilities	FES (Plan)	<ul> <li>✤ Type 13 (True Scal</li> <li>✤ Type C (True Scale</li> </ul>	)
	FES (Profile)	<ul> <li>☆ Type D (True Scale)</li> <li>☆ Type R L 10 (True Scale)</li> </ul>	
<ul> <li>▲ Ш →</li> </ul>	Inlets (Plan)	☆ Type R L 15 (True ☆ Type R L 5 (True S	
	Inlets (Profile)	<ul> <li>☆ Vane Grate (Double</li> <li>☆ Vane Grate (True S</li> </ul>	e) (Tr
	Miscellaneous	- ♦ Vane Grate w/Apro	n (D
	Pipes (Plan)	- ☆ Vane Grate w/Apro	n (T
	Pipes (Profile)		
Settings	Structures		

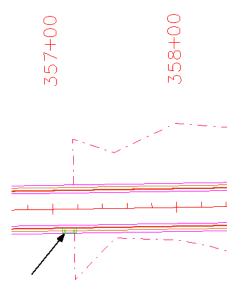
**Note:** This automatically sets the active level to **HYDR_Inlets** and selects the **Place Cell** command. The inlet cell is attached to your cursor at the origin point. Since you know the coordinate location for the inlets, you can place them with precision keyins.

5. Select Settings and set Active Scale to 1 and Active Angle to 180. Apply and then Close.

	Apply
80	Close
	80

6. For the 1st inlet, key in **xy=3292424.652, 1553316.387, 6351.8** 

The inlet appears in the location shown.



- **Note:** If you don't see the inlet, it could be outside your display depth. Key in **dp=0,7000. Enter**, and then select the view. You could also fit the view and then window back to this location.
- 7. For the 2nd inlet, key in **xy=3292674.652, 1553320.404, 6350.4**
- 8. For the 3rd inlet, key in *xy*= 3292900.384, 1553324.031, 6348.8
- 9. **<R>** to exit the **Place Active Cell** command

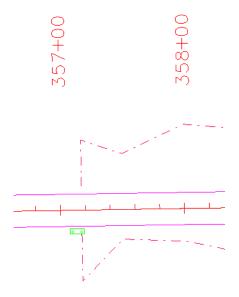
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		-Sta-Major 19043	12345DES_N			
		-Sta-Minor 19044	12345DES_N			
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		1550.49'				

10. Turn off the **Design** reference levels shown to better see the inlets.

## Connect the inlets with pipes

### Place the pipes

1. Zoom in on the first inlet.



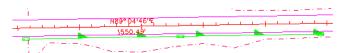
2. Verify that **Depth lock** is still turned **off**.

When placing pipes, you want to pick up the elevation of the inlets, therefore you need to turn **Depth lock off**.

- 3. On the CDOT Menu, set the category to Pipes (Plan).
- 4. Select the item **Reinforced Concrete**.

🚝 CDOT Menu			
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction	Status	Proposed	?
···· Design ···· Geometry ···· Hydraulics	Hydraulics		All
<ul> <li>Landscape Environmental</li> <li>Materials Geotechnical</li> <li>ROW Survey</li> <li>Traffic ITS</li> <li>Utilities</li> </ul>	Conveyance Drainage Basin FES (Plan)	Corrugated Meta	
	FES (Profile)	Concession	rete
	Inlets (Profile)		
	Miscellaneous Pipes (Plan)		
	Pipes (Profile)		
Settings	Structures		

- **Note:** This automatically set the active level to **HYDR_PIPES_Concrete** and selects the **SmartLine** tool.
- 5. AccuSnap on the right-side midpoint of the inlet to begin the pipe.
- 6. Pan to the right and AccuSnap on the left-midpoint of the second inlet.
- 7. Pan to the right and AccuSnap on the right-midpoint of the third inlet.
- 8. **<R>** when done.

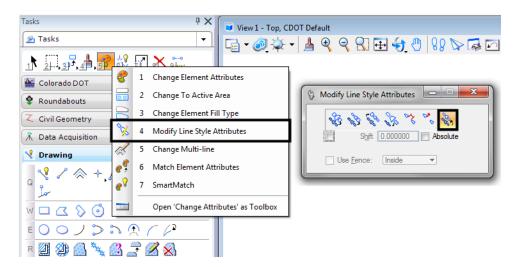


**Note:** This connects the inlets with the concrete pipe. Notice how the directional arrow on the pipe custom line style falls on top of the last inlet. You can correct this by shifting the custom line style.



### Shift the line

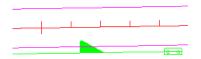
- 1. Select the Change Element Attributes toolbar from the Main toolbar.
- 2. Select the Modify Line Style Attribute command.
- 3. Set the **Modify** option to **Shift**.



**Note:** The Shift command is also located on the CDOT Misc. Toolbar under the Colorado DOT task tab.



4. **<D>** on the concrete pipe that you just placed and move your cursor to the left. Note how the custom line style shifts as you move your cursor. When the arrow is moved off of the inlet, **<D>** to accept.



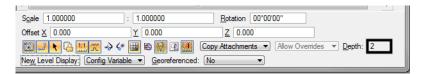
**Note:** Use the **Modify Line Style** command to shift custom lines styles as needed, especially in corners where there may be gaps.

### Place a Type C inlet and connect pipes

### Turn on the Survey/Topo reference

To help determine the location of the inlet, turn on the Survey/Topo Reference and the Contour reference.

On the Reference dialog, select the Design reference set the Copy Attachment Depth to 2.



**Note:** This brings in the Contour reference since the Contour model file is referenced to the Survey/Topo file.

2. Be sure the display of all other reference files are off.

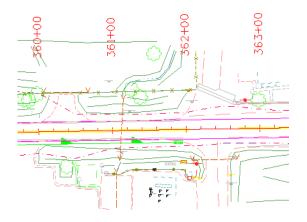
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### Turn on reference levels

1. In the Level Display box, turn on all of the Survey/Topo reference levels.

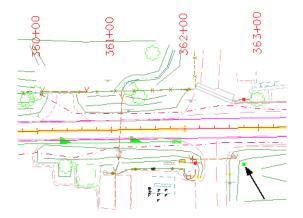
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TOPO_BUILDING_Frame-House	create Display Set	/_Topo 100		•	
TOPO_BUILDING_Office-Business	All O <u>n</u>	/_Topo 100		•	
TOPO_BUILDING_Pump-Island	All Off			•	
TOPO_BUILDING_Pump-Island-Canopy	Invert On/Off	/_Topo100		•	
TOPO_BUILDING_Sheds-Barns	<u></u>	_/_Topo 100		•	
TOPO_CULVERT_Corr-Steel-Pipe	Off By Element	/_Topo 100		•	
TOPO_CULVERT_Corr-Steel-Pipe-Other	All Except Element	/_Topo 100		•	
TOPO_CULVERT_End-Sec-Corr-StI-Pipe		_/_Topo 100		•	
TOPO_CULVERT_End-Sec-RCP TOPO_CULVERT_Reinforced-Concrete-Pip	Save Filter	/_Topo 100		•	
TOPO CURBGUTR Curb	Level Manager	/_Topo 100 / Topo 100			
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- 2. Turn on all Contour reference levels.
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- 3. Window into the location shown.

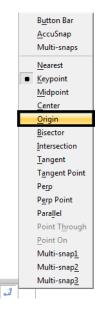


- • 🛄 CDOT Menu CDOT Groups CDOT Tools Options Help Drafting Status ? Bridge Existing Proposed Construction Design Hydraulics Geometry Hydraulics 💊 A 🚸 🙆 🔤 Landscape Environmental 🛠 Denver Type 16 (Doubl. Materials Geotechnical Convevance ROW Survey * Denver Type 16 (Triple)... Drainage Basin * Denver Type 16 (True Utilities 13 (True Scale) FES (Plan) pe C (True Sca vpe D (True S FES (Profile) * Type R L 10 (True Scale) Type R L 15 (True Scale) .€ Ш * ts (Plan) * Type R L 5 (True Scale) ☆ Vane Grate (Double) (Tr... Inlets (Profile) * Vane Grate (True Scale) Miscellaneous * Vane Grate w/Apron (D., 🔆 Vane Grate w∕Apron (T.. Pipes (Plan) Pipes (Profile) Structures Settings.
- 4. On the CDOT Menu, select the Inlets (Plan) category and then select the Type C item.

- **Note:** This automatically sets the active level to **HYDR_Inlets** and selects the **Place Cell** command. The inlet cell is attached to your cursor at the origin point.
- 5. Key in xy= 3292986.899, 1553291.431, 6347.0
- 6. **<R>** to exit the **Place Active Cell** command.

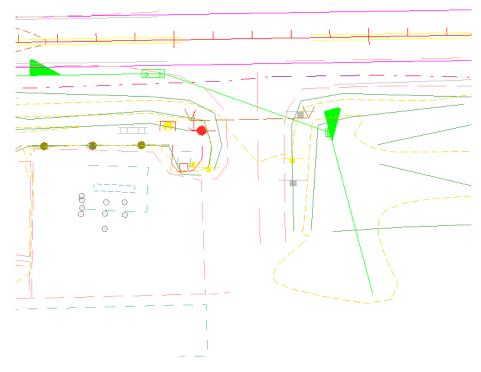


- 7. On the **CDOT Menu**, set the category to **Pipes (Plan)** and select the **Reinforced Concrete** item again.
- 8. Key-in **AZ=6346** then **<D>** in the view to set the active depth to 6346.0. This will allow the placement of the pipe outlet at the correct elevation.
- 9. AccuSnap on the right-midpoint of the last Type R L 10 inlet.



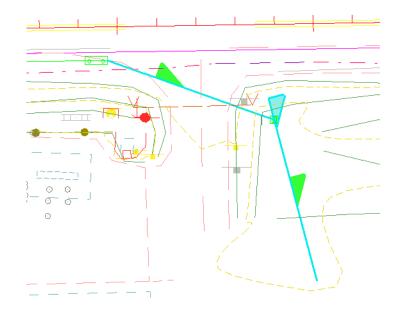
10. Select the **Origin** snap mode and **AccuSnap** on the Type C inlet. (see below).

11. Place a final **<D>** in the location shown for the end of the pipe near the contour line (see below).



12. **<R>** when done.

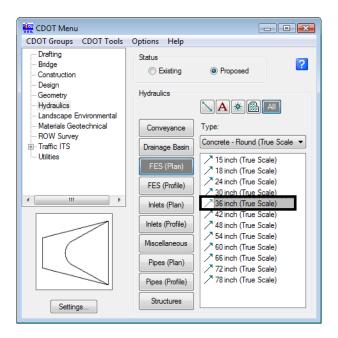
13. Use the **Modify Line Style** command again and **Shift** the pipe line style as necessary to ensure the arrow does not fall on top of an inlet.



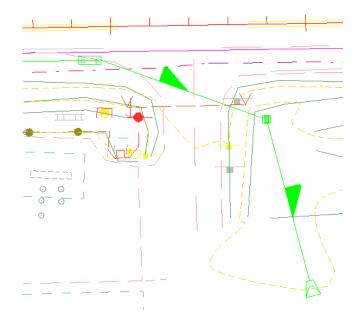
### Place the pipe terminator

The pipe terminates at a 36" RCES, which you can place as a cell line terminator.

- 1. On the CDOT Menu, set the category to **FES (Plan)**.
- 2. Set Type to Concrete Round.
- 3. Select the **36 inch** item.



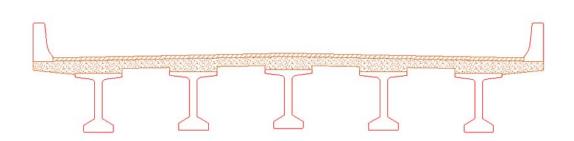
- *Note:* This automatically set the active level to HYDR_FES and selects the Place Active Line Terminator tool from the Cells toolbar.
- 4. **<D>** on the end of the concrete pipe as shown.
- 5. **<D>** to accept.



- **Note:** The RCES terminator is automatically rotated to the appropriate angle and placed on the end of the pipe.
- 6. Save Settings.
- 7. Exit MicroStation.

# LAB 11 - Draw a Bridge Typical Section

In this lab, you'll practice all of the drawing concepts you've learned so far to create a bridge typical section.



### **Chapter Objectives:**

After completing lab 11, you will know how to:

- Use the CDOT Menu to set active attributes (level, color, line style, weight).
- Use basic drawing tools (*AccuDraw*, *AccuSnap*, *Modify* and *Manipulation* tools, *cells*, *patterns*, etc.) to draw a bridge typical section and a reinforcement detail.
- Use *Selection Sets* to group graphics.

### Lab 11.1 - Create a Bridge Model File for Details

- **Note:** Since you have already selected *xxMulti-Discipline* from the *Select Group* utility, you have access to all Bridge levels. However, you could also select the Bridge Group before starting MicroStation to limit your levels to just those needed for Bridge.
- 1. Start MicroStation.
- 2. In the MicroStation Manager dialog box, re-set *Project* to 12345.
- 3. Set the directory path to \Bridge\Drawings\Reference_Files.

📕 File Open - C:\	Projects\12345\B	ridge\Drawings\Reference_Files\				X
Look in:	Reference_Fi	les 🗸	G 🤌 📂 🖽 -	- 		
Am	Name	*	Date modified	Туре		
2	🕌 12345BRDG_	_	2/18/2010 10:40 AM			
Recent Places	12345BRDG_	Prof.dgn	11/20/2007 7:45 AM	MicroStat		
Desktop						
Libraries						
Libitanes						
Computer						
	•			4		
Network	File name:	CU12345HydraulicsModel##.dgn	-	Open	User: CDOT User	•
	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)	-	Cancel	Project: 12345	•
		Open as read-only		Options	Interface: CDOT	-
						ad

4. Select the file *12345BRDG_Model.dgn* and then select **Open**.

The blank model file opens.

- 5. Select File > Save As... and set the directory to the project's \Bridge\Working folder.
- 6. Rename the file *CU12345BRDG_Detail.dgn* and select **Save**.

Note: Note that you are renaming this file from "Model" to "Detail".

📕 Save As - C:\P	rojects\12345\Br	idge\Working\			
Save in:	📔 Working	•	G 🌶 🖻 🛄 -	۲	3D - V8 DGN
Ca.	Name	*	Date modified	Туре	
Recent Places		No items match yo	our search.		
Desktop					
Libraries					
					,
Computer					
Network	•			•	
	File name:	CU12345BRDG_Detail.dgn	•	Save	
	Save as type:	MicroStation V8 DGN Files (*.dgn)	•	Cancel	
				Options	.4

The file is copied to the working folder with the initials *CU* (CDOT User, for training purposes).

Design File Settings	
Category Active Angle Active Scale Angle Readout Axis Civil Formatting Color Data Acquisition Element Attributes	Modify Working Unit Settings         Linear Units       MU         Format.       MU:SU         Master Unit:       MU:SU:PU         Sub Unit:       Survey Inches         Accuracy       0.1234
Element Attrobutes Fence Grid Isometric Locks Snaps Stream Views Working Units	Advanced Settings Resolution: 12000 per Distance Survey Foot Working Area: 1.42159E+008 Miles Solids Area: 157.829 Miles Solids Accuracy: 8.33333E-006 Survey Feet Edit
	Focus Item Description Set linear unit display format. Set to master unit only(MU), master and sub unit(MU:SU), or master, sub and positional units(MU:SU:PU).

7. Select Settings > Design File > Working Units and set the *Format* to MU:SU.

8. Select **OK** to change the coordinate readout. Your readout will now show values in feet and inches.

### Lab 11.2 - Draw a Bridge Typical Section

In the next series of steps, you'll use *AccuDraw* and MicroStation tools (*drawing tools*, *manipulation and modify tools*, *grouping tools*, etc.) to create the bridge typical section shown.

You'll begin by drawing construction lines on a drafting level, and then create the final detail on the appropriate bridge level.

### Draw the slab construction lines

You'll draw the right side of the top of slab starting at the crown point of the road. The right side consists of a 12 ft. travel lane and a 6 ft. shoulder, both at a 2% cross slope.

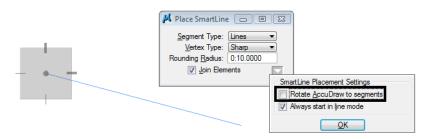
1. On the CDOT Menu *Drafting* group select the **Linework** category.

2. Set the filter to **WT** and select **Weight 1**.

🚆 CDOT Menu			- • ×
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction Design	Status Existing	Proposed	?
Geometry Hydraulics Landscape Environmental	Drafting		M AII
Materials Geotechnical ROW Survey	Border	Weight 0 Weight 1	
	Border RE	Weight 2	
- Ountes	Dimensions	Weight 3 Weight 4	
	Linework	Weight 5 Weight 6	
	Patteming	Veight 7	
	Symbols		
	Text		
Settings			

This sets the active level to **DRAFT_WT-1**.

- 3. **<D>** anywhere to place the first point.
- 4. Make sure your *AccuDraw* compass is in *Rectangular* mode. If it is not press <**spacebar>**.
- 5. In the *SmartLine Tool Settings* box, make sure *Rotate AccuDraw to Segments* is turned Off.



This will keep the X axis horizontal as you draw SmartLine segments.

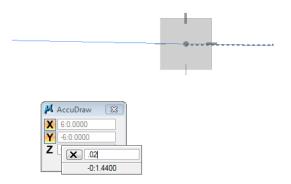
- 6. Move your cursor down and to the right to establish the direction of the *SmartLine*.
- 7. In *AccuDraw*, key in *12* for *X*, then **<TAB>**.
- 8. In AccuDraw, key in 12*.02 for Y, then <TAB>.
- 9. **<D>** to place the first *SmartLine* segment.
- 10. **Zoom In** if needed to see the line.

**Note:** Do not reset out of the *SmartLine* command. This will break the *SmartLine*, which you do not want to do. You want the top slab line to be all one element.

- •
📕 AccuDraw 🛛 🕅
12:0.0000
-12:0.0000
Z X .02
-0:2.8800

This creates the 12 ft. travel lane at a 2% slope.

- 11. For the next shoulder segment, move your cursor down and to the right to establish the direction of the *SmartLine*.
- 12. In AccuDraw, key in 6 for X, then <TAB>.
- 13. In AccuDraw, key in 6*.02 for Y, then <TAB>.



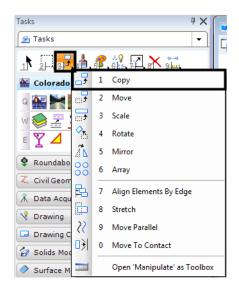
14. **<D>** to place the second *SmartLine* segment, this creates the 6 ft. shoulder at a 2% slope.

15. **<R>** out of the *SmartLine* command.

### Create the bottom slab construction line

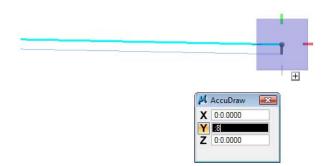
Vertically copy the top slab line down 8 inches for the bottom of slab on the right side.

1. Select the **Copy** command from the *Main* task toolbar.



- 2. AccuSnap on the right end of the top slab to identify the element to copy.
- Move your cursor down and lock on to the -Y AccuDraw axis to establish the copy direction. In *AccuDraw*, key in :8 for Y and the press <TAB> to accept the entry. The value converts to 0.667 feet.

*Note:* Don't forget to key in the colon before the 8 to specify 8 inches.

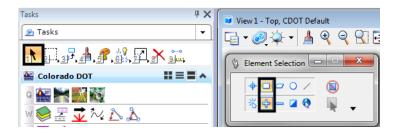


4. **<D>** to place the copy, then **<R>** to complete.

### Create the slab left side

Since the right and left sides of the road are symmetrical, you can *mirror* the right side to create the left side.

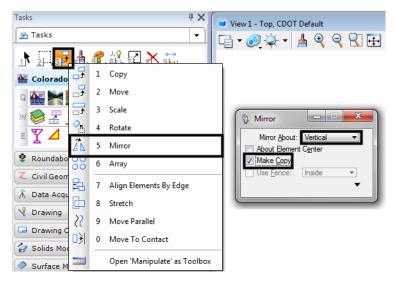
1. Select the **Element Selection** command and set the *Tool Settings* as shown.



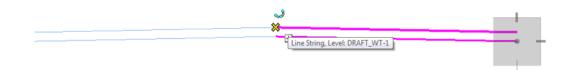
2. Place a fence around the slab graphics (**<D>** for upper left corner and then **<D>** for lower right corner).



- 3. Select the **Mirror** command from the **Main** task toolbar:
  - Set *Mirror About* to Vertical.
  - Toggle on Make Copy.



4. **<D>** on the left endpoint of the upper slab line (the crown point) for the mirror copy.



5. **<R>** when done.

6. Select the **Element Selection** command again and select the **Clear** icon from the tool settings window to remove the selection set.



7. Fit the view.

### **Place the girders**

- 1. On the *CDOT menu*, select the **Bridge** Group.
  - Set the *Category* to **Bridge Levels**
  - Set the *Type* to **Basic**
  - Select the **Outline** item

**Note:** This changes the active level from a **DRAFT** level to the **BRIDGE_OUTLINE** level for placing the girders.

(none) 🔻	BRDG_OUTLINE	•	
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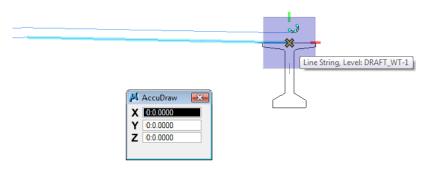
- 2. On the *CDOT menu*, select the **Bridge** Group.
  - Set the *Category* to **Cells**
  - Set the *Type* to **Girders-BT**
  - Select the **BT54** item

**Note:** This automatically selects the correct girder cell from the bridge cell library and activates the *Place Cell* command.

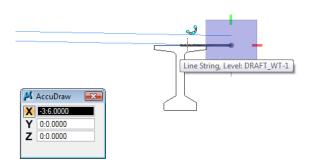
- 3. On the CDOT menu, select the **Settings** button
  - Set *Active Scale* to **1**
  - ♦ Set Active Angle to *O*
  - **<D> Close** to exit the Settings window
- 4. Using AccuDraw we can establish an orientation point from which to place the first girder. With the girder cell attached to your cursor, hover over right endpoint of the bottom slab line (don't *AccuSnap*, just hover and lock on to the point).



5. Click into the *AccuDraw* box to set it active and press the letter *O* on the keyboard to move the *AccuDraw* compass origin to this point.



6. Move you cursor to the left to establish the placement direction, and key in *3:6* in the *X* field.



7. With your cursor locked on the  $\boldsymbol{X}$  axis  $\boldsymbol{\langle D \rangle}$  to place the girder cell.



This places the first girder 3 ft. - 6 in. from the right side of the slab. You'll later move the girder down for the proper haunch depth.

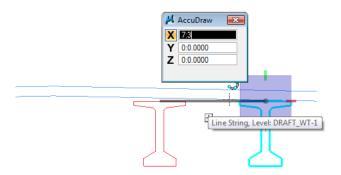
## Place additional girders

Copy the girder cells to space them 7 ft. 3 in on center.

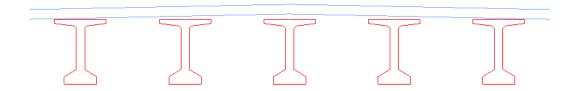
1. Select the **Copy** command.

- Tasks Ψ× 🥶 View 1 - Top, CDOT Default 🙆 Tasks •  $\Theta \circ \circ$ A <u>*8</u> 🛃 1 2 Copy Element x 3 1 Сору Ť 💒 Colorado Copies: 4 2 Move 🗣 Roundabo Use Fence Scale 3 🏹 Civil Geon ···: 1 Rotate 4 🕅 Data Acqu 5 Mirror 🧏 Drawing Array 6 Ŷ Q B L 7 Align Elements By Edge b w 🗖 📿 8 Stretch 22 Move Parallel 9 Е  $\bigcirc$  $\bigcirc$ ∎€ 0 Move To Contact R 顲 2 т 🎝 Open 'Manipulate' as Toolbox
- 2. In the *Tool Settings* box, key in *4* for the number of copies.

- 3. Click into the *AccuDraw* window to set it active.
- 4. **<D>** on the girder at the top midpoint.
- 5. Move your cursor to the left to establish the copy direction and key in **7:3** in the **X** field in **AccuDraw**.

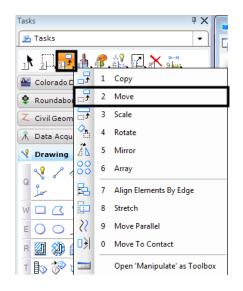


6. With your cursor locked on the *X axis*, **<D>** to place the copies.

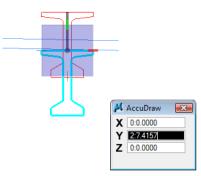


## Move the girders down to establish the haunch depth

1. Select the **Move** command from the *Main* task toolbar.



- 2. Click into the AccuDraw window to set active.
- 3. **<D>** on the right end girder at the top midpoint for the move from location.
- 4. Move your cursor up and lock on the *Y* axis to establish the direction, then press **<Enter>** on the keyboard.

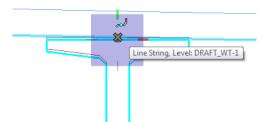


By pressing **<Enter>** you "smartlock" the *AccuDraw X* and *Z* axes, so that you can only move in the *Y* direction.

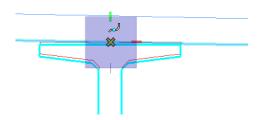


5. Press **N** on the keyboard for the **Nearest** snap mode.

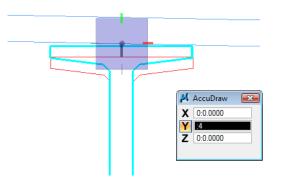
6. *Hover over* (do not data point) at the nearest snap point on the bottom slab line.



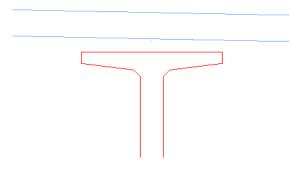
7. Press the letter **O** on the keyboard to move the **AccuDraw** origin to this point.



8. Move your cursor down to establish the move direction, lock on to the **-***Y* axis and key in **:***4* in the *AccuDraw Y* field.

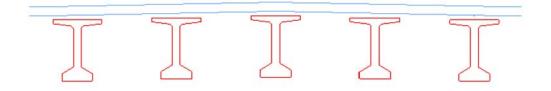


9. **<D>** to move the girder.



This moves the girder down 4 inches from the bottom of the slab for the correct haunch thickness.

10. Repeat the above steps to vertically move the remaining girders down 4 inches from the bottom of the slab.



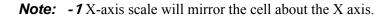
### Place the Bridge Rail

- 1. On the CDOT menu, select the **Bridge** Group.
  - Set the *Category* to **Bridge Rail**
  - Select the **Rail Type 7** item
- 2. AccuSnap on the left end of the top of slab as shown.

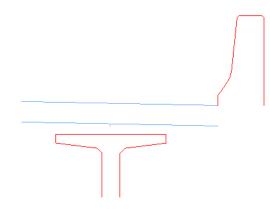
💥 —		
Line	tring, Level: DRAFT_WT-	1

- 3. For the right-side rail, select the **Place Active cell** command again.
- 4. In the *Tool Settings* box, **Unlock** the *XYZ lock* and set the *X* scale to -1.

V Place Active Cell		
Active <u>C</u> ell:	bridgerail_type_7	
Active Angle:	00°00'00.00''	
X Scale:	-1.000000	
Y Scale:	1.000000	
<u>Z</u> Scale:	1.000000	
	•	



5. Place the cell as shown.

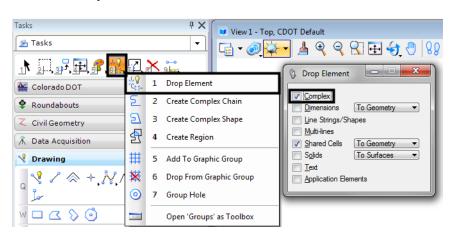


6. **<R>** when done.

### **Extend elements**

Extend the slab lines to join up with the bridge rail. To do this, you'll need to drop the bridge rail cell to its original elements.

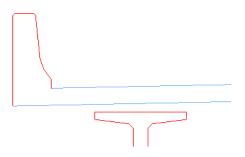
1. Select the Drop Element command from the Main task toolbar.



- 2. Toggle on **Complex** (the cell is considered a complex element).
- 3. **<D>** on the right-side bridge rail cell.
- 4. The cell is dropped to its original elements.

- Tasks Ψ× 🧃 View 1 - Top, CDC -🖻 Tasks 🕞 <del>-</del> 🕥 💢 -1 Modify Element Ž 💒 Colorado DOT L× 2 Partial Delete Roundabouts 3 Break Element By Point Civil Geometry Extend Line 4 🕅 Data Acquisition Trim To Intersection 5 🔇 Drawing 6 Trim To Element P ## 7 Trim Multiple ±9 8 IntelliTrim W 7 9 Insert Vertex 00ノンわ ① 75 Delete Vertex 0 2 🆄 🙆 <u> 3</u> 4 Q Construct Circular Fillet b 🗞 🔊 W Construct Chamfer A 🖍 Open 'Modify' as Toolbox
- 5. Select the Trim to Intersection from the *Main* task toolbar.

6. **<D>** on the bottom slab line and then **<D>** on the back of rail line to extend these elements.

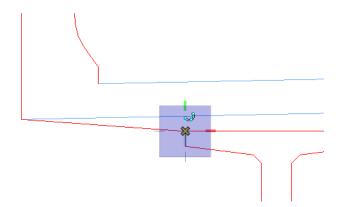


7. Repeat the above steps for the right side.

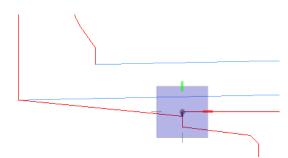
## Draw the slab

- 1. With the active level set to BRIDGE_OUTLINE, select the Place SmartLine tool.
- 2. Click in the *AccuDraw* window to set it active.
- 3. Starting on the left side, AccuSnap on the bottom of the bridge rail.
- 4. You want the next point to be 1" below the left-top of the first girder. To do this, you'll need to move the *AccuDraw* origin to the top of the girder and then locate 1" down.

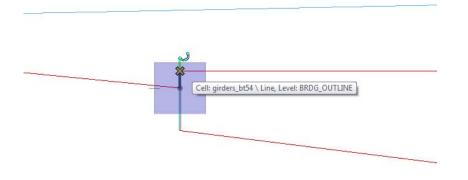
5. Hover over the left-top of the girder as shown, click in the *AccuDraw* box and press the letter *O* on the keyboard to move the *AccuDraw* origin to this point.



6. Move your cursor down, lock on the  $\mathbf{Y}$  axis and key in a value of :  $\mathbf{1}$  (1 inch).

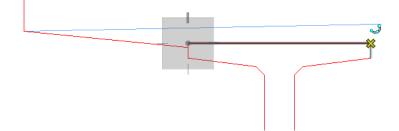


- 7. **<D>** to place the *SmartLine* segment.
- 8. **AccuSnap** on the left-top of the girder as shown.

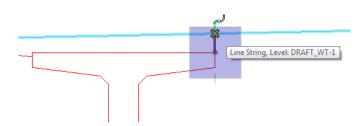


*Note:* Remember, if you make a mistake, **Undo** the last data point, don't reset out of the SmartLine command.

9. AccuSnap on the right-top of the girder as shown.



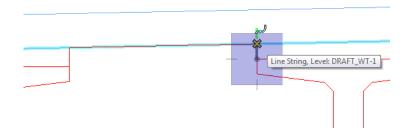
- 10. Move your cursor up, lock on to the **Y** axis and press **<Enter>** to smartlock the axis. You can now only move in the **Y** direction.
- 11. Press  $\mathbf{N}$  on the keyboard for the nearest snap point.



- 12. **<D>** on the bottom slab line as shown.
- 13. *Hover* over the next girder's top-left endpoint as shown.



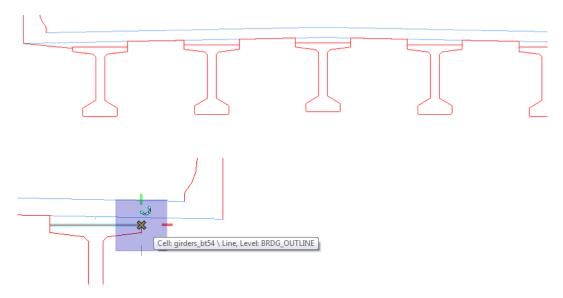
- 14. Press **O** on the keyboard to move the **AccuDraw** origin to this point (do not data point).
- 15. Move your cursor up, lock on to the **Y** axis, and press **<Enter>** to smartlock the axis.
- 16. Press **N** for the nearest snap point.
- 17. **<D>** on the bottom slab line as shown.



18. **<D>** on the top left girder edge as shown.

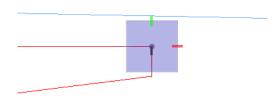


19. Continue these steps on each girder to place *SmartLine* segments as shown until you get to the last girder location shown below.

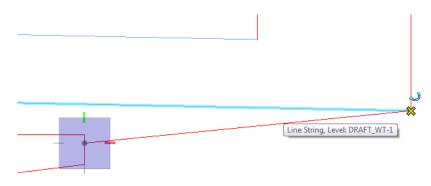


Remember to **Undo**, not reset, if you make a mistake on a segment.

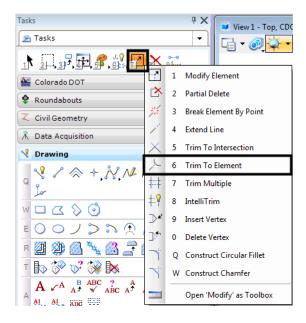
- 20. On the last girder (far right), move your cursor down, lock on to the Y axis and key in a Y value of :7 (1 inch).
- 21. **<D>** to place the point.



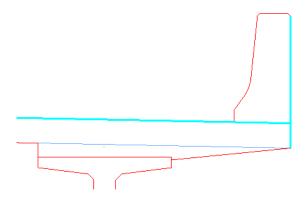
22. **<D>** on the right end of the bottom slab line.



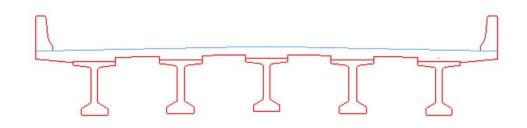
- 23. **<R>** out of the *Place SmartLine* command.
- 24. Select the Trim to Element tool from the Main task toolbar.



25. **<D>** on the blue top of slab line and then **<D>** on the back of bridge rail line to extend these elements.



- 26. Repeat for the left side.
- 27. **Delete** the blue bottom of slab lines.
- 28. Fit the view.

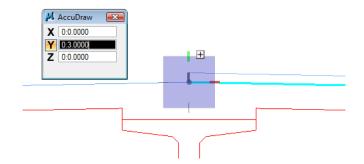


# Create the top of pavement

- 1. **Fit** the view.
- 2. Select the **Copy** command.
- 3. **<D>** on the right-side top slab line (blue construction line) at the crown point to select it for copying.

*Note:* If you select the bridge slab shape (red element), **<R>** until the top slab line highlights.

- 4. Move your cursor up and lock-in on AccuDraw's **Y** axis.
- 5. In AccuDraw, key in a Y value of :3 (3 inches).



- 6. **<D>** to copy the top slab line.
- 7. Repeat for the left side.

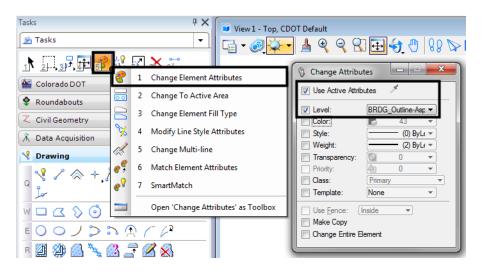
**Note:** You can move your cursor up and lock in on the last distance tic mark of 3 inches, eliminating the need to key in the Y value.

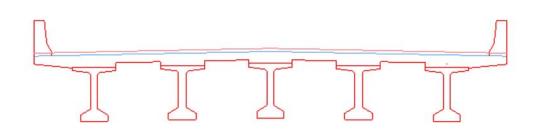
8. On the CDOT menu, select the **Bridge** Group.

- Set the *Category* to **Bridge Levels**
- Set the *Type* to **Outline**
- Select the **Outline-Asphalt** item

This sets the active level to the asphalt level.

9. Change the top of pavement lines to the active asphalt level.

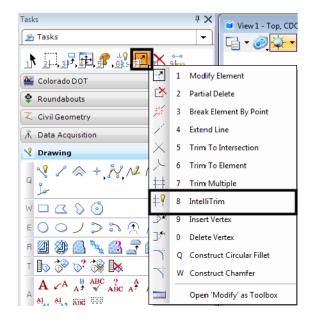




# Clean-up lines at the rails

You now need to trim the top of pavement lines that run through the bridge rails, as well as the bottom of the rail that extends below the top of slab.

1. Select the IntelliTrim command from the *Main* task toolbar.



2. Set the *Mode* to **Quick** and the *Operation* to Trim.



3. **<D>** on the vertical edge of the rail to select it as the cutting element, as shown below.

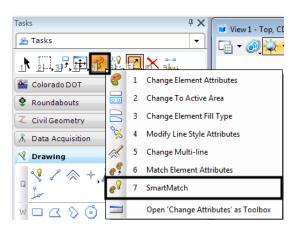
- Crossing line Cutting element
- 4. Draw a *crossing line* on the top of pavement line inside the rail as the portion to trim.

5. Repeat the above steps for the left-side rail.

## Lab 11.3 - Complete the Bridge Rail Graphics

Since you dropped the bridge rail cell to trim the graphics it is no longer one entity. Instead it was dropped to individual lines. You will now group the lines into a complex chain.

1. Select the **SmartMatch** command and **<D>** on any red bridge line to match it.



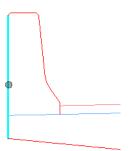
This sets the active level to *Bridge_Outline* to match the slab.

(none; - BRDG_OUTLINE -

- 2. Select Create Complex Chain from the Groups toolbar.
- 3. Set the *Method* to Automatic and toggle on Simplify Geometry.
  - **Note:** With the **Automatic** method, you do not have to individually identify each element to add to the complex chain. The elements are found automatically within a maximum gap range. **Simplify geometry** will make the new element a **SmartLine** instead of a complex element.

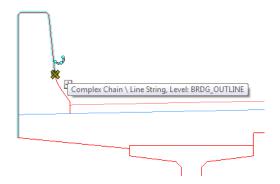
Tasks	+ ×         Image: View 1 - Top, CDOT Default           Image: View 1 - Top, CDOT Default	
1 2 3 , 3 , F 3 F	2 X Create Complex Chain	
Roundabouts	2 Create Complex Chain     Max Gap: 0:0.0100     Simplify geometry	1
Civil Geometry	4 Create Region	J
Drawing	5 Add To Graphic Group	
	6 Drop From Graphic Group	
Le le	O 7 Group Hole	
0 0 D 🗆 🗤	Open 'Groups' as Toolbox	

4. **<D>** on the first segment of the bridge rail as shown.

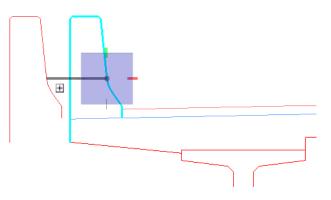


- <D> anywhere above this element to define the direction for adding elements. The remaining bridge rail elements are added to the chain and placed on the active *Bridge_Outline* level.
- 6. **<D>** to accept.
- 7. Repeat for bridge rail on other side of bridge.

**Note:** With some MicroStation commands (like the **Complex Chain** command), if you hover over the complex element it will still show you the individual elements that make up the chain. However, notice that pop-up information tells you it really is a complex chain. When you use the **Copy** command in the next step, you'll see the chained elements behave as one element.



8. Select the **Copy** command from the *Primary* toolbar and copy the bridge rail to a clear area of the design file.



The individual graphics are now chained together into one element.

- 9. **Undo** the copy.
  - **Note:** You can use the *Create Complex Shape* in a similar fashion to create closed shapes from individual graphics.

## Lab 11.4 - Create a Selection Set of the Bridge Section

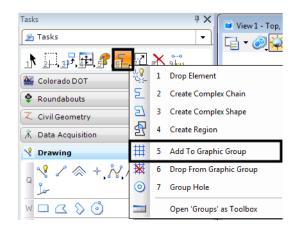
- 1. **Fit** the view.
- 2. Choose the **Element Selection** tool from the *Main* task toolbar.
- 3. Hold down the data button **<D>** and drag across the bridge section (corner to opposite corner). Be sure to include all of the section graphics in this area.

- Note: The elements are added to the selection set and are highlighted purple (the selection set color). To change the color, choose Settings > Design File > Color > Selection Set Color. The lower right corner of the status bar shows how many elements are now in the selection set.
- 4. **<D>** in the center of the typical section, hold down the data button and drag the selection set to a new location in the file.
- 5. Drag the selection set back to its original location.
- 6. **<D>** anywhere in a clear area of your design file to remove the selection set.

*Note:* The selection set is a temporary group of graphics until you drop the set.

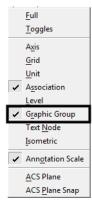
## Lab 11.5 - Create a Graphic Group of the Bridge Section

- 1. Use the **Element Selection** tool and place the bridge typical section graphics into a selection set again.
- 2. From the *Main* task toolbar, select Add to Graphic Group.

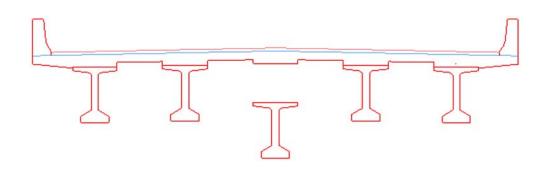


- 3. **<D>** to accept the selection set element to add to the group.
- 4. **<R>** out of the command.
- 5. **<D>** anywhere in a clear area of your design file to remove the selection set. The elements "un-highlight" and return to their normal symbology.

6. On the status bar, check your locks and make sure *Graphic Group lock* is **On**.



- 7. Select the **Move** command.
- 8. **<D>** on the bridge typical section graphics. All elements in the graphic group highlight.
- 9. Move the graphics and a new location and **<D>** to accept. With *Graphic Group lock* **On**, the elements behave as a group.
- 10. On the status bar, turn the *Graphic Group lock* Off.
- 11. Select the **Move** command again.
- 12. **<D>** on one of the BT 54 girders. Only the girder highlights.
- 13. Move it to a new location and **<D>** to accept.



With the Graphic Group lock Off, you can manipulate the individual elements in the group.

- 14. Undo the Move command on the girder.
- 15. Turn the *Graphic Group lock* back **On**.
- 16. Move the bridge typical section graphics back to their original location.
  - **Note:** When working in design model files, most InRoads graphics are displayed as graphic groups (*e.g.* contours, profiles, cross sections).

# Pattern pavement and slab

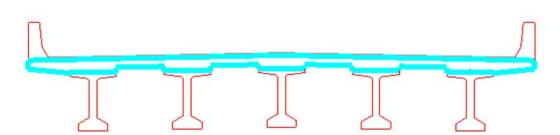
- 1. **Fit** the view.
- 2. From the **CDOT Menu** Explorer:
  - Select **Drafting**.
  - Set the *Category* to **Patterning**.
  - Select the **Concrete** item.

🗱 CDOT Menu			- • •
CDOT Groups CDOT Tools	Options Help		
Drafting Bridge Construction	Status Existing	Proposed	?
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Materials Geotechnical ROW Survey	Border	Asphalt	<u> </u>
Traffic ITS     Utilities	Border RE	+00 Asphalt	
····· Utilities	Dimensions	Bearing Pad	
۰ III ا	Linework	Concrete	E
	Patterning	Dots Earth	
	Symbols	Embankment	
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· · D .		Masonry	
· ·		RipRap	-
Settings		<	

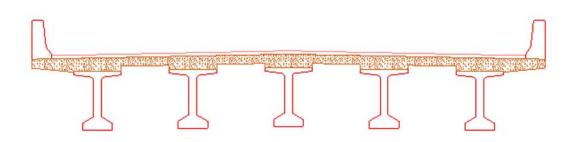
3. In the *Pattern Area Tool Settings* box set the *Method* to **Flood**, *Active Scale* to *1* and the *Active Angle* to *0*.

📕 Pattern Area	
🙈 🔗 🔯	🗐 🛅 🖊 🛄
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Row Spacing:	0:0.0000
Column Spacing:	0:0.0000
<u>A</u> ngle:	0°0'0''
Tolerance:	0:0.0000
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Snappable Pat	tem
True Scale	
	•

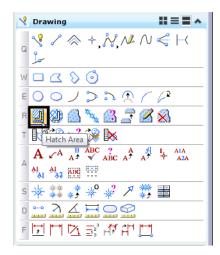
4. Make sure the entire region to flood is shown in your view. Then, **<D>** anywhere inside the bridge slab region. The region to flood with the pattern highlights.



5. **<D>** to accept. The shape is patterned with the concrete cell.



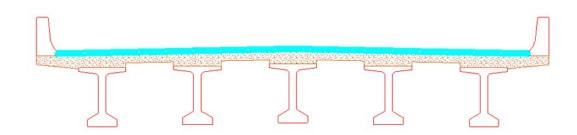
6. Select the **Hatch Area** command from the *Patterns* task toolbar.



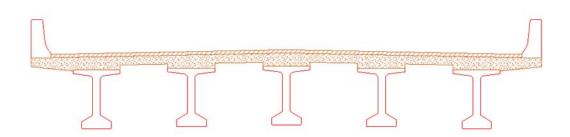
7. In *Tool Settings*, select the **Flood** method, set *Spacing* to:*3* and the *Angle* to *45*.



8. **<D>** anywhere inside the pavement area. A dynamic display shows the flooded area.



9. **<D>** to accept. The region is flooded with the hatch pattern.



- 10. Save Settings.
- 11. Exit MicroStation.

# LAB 12 - Create a Plan/Profile Sheet for the Intersection

Several plan/profile sheets have already been created using the InRoads *Plan/Profile Generator*. However, there are times when you need to create special plan or plan/profile sheets not created by the *Generator*. In this lab, you'll create a plan/profile sheet for the side road that runs through the intersection.

### **Chapter Objectives:**

After completing this exercise you will know how to:

- Create a sheet file using a generic project file.
- Attach model files coincident-world
- Attach model files as saved views.
- Rotate the view to horizontal
- Use the CDOT Menu to place a border and associated information (bar scale, north arrow, region cell, etc.)
- Use the CDOT Menu to place a clipping boundary.
- Clip references
- Work with reference levels.
- Move references

# Lab 12.1 - Review Plan/Profile Sheets

Review the Plan/Profile sheets for this project previously created by the InRoads *Plan/Profile Generator*.

1. Start MicroStation.

2. In the MicroStation Manager, open **12345DES_PnP10.dgn** from the project's ...**Design\Drawings** folder.

Look in:	📗 Drawings		- 🔇 🤌 📂 🛄-	"L) 🚰 🖻	3D - V8 DGN
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	🕌 12345DES_P	nP05.dgn	2/18/2010 11:22 AM	Micro	
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	12345DES_P	-	2/18/2010 11:23 AM	Micro	
677	12345DES_P	-	2/18/2010 11:23 AM		
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	12345DES_P	-	2/18/2010 11:24 AM		
Computer	12345DES_P	-	2/18/2010 11:25 AM		
	12345DES_P	nP14.dgn	2/18/2010 11:25 AM	Micro5 +	
	•			,	
Network	File name:	12345DES_PnP10.dgn		Open	User: CDOT User
	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf)	•	Cancel	Project: 12345
		Open as read-only		Options	Interface: CDOT

The *InRoads Plan/Profile Generator* automates the creation of sheet files along the mainline alignment. This includes rotating the plan-view to horizontal, placing the corresponding profile, placing the border, north arrow and match lines. MicroStation references are used to bring in plan and profile graphics to the active sheet file.

3. Use **Level Display** to review the reference levels on which plan and profile graphics are placed in the sheet file.

Level Display - View 1			X	
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🔛 🏳 (none) 🔻 Levels 🔹 🖛				
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				- III
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- **Note:** Only levels with graphics in the sheet file are sheet levels for the border, match line, north arrow, *etc*.
- 4. Open other plan/profile sheets, as desired, from the *Drawings* folder and review the sheets.

## Lab 12.2 - Create a New Sheet File

Since the *InRoads Plan/Profile Generator* did not create a sheet for the county cross road at the intersection, you'll create this P&P sheet file manually.

- 5. Select **File > New**.
- 6. Set the directory to the project's \Design\Drawings folder.
- In the New box, make sure that the seed file is set to *3D-Seed_CDOT.dgn*. If not, pick the **Browse** button and then select this file. Key in the name *12345DES_PnP19.dgn*.

Nineteen is the next number in the plan/profile set of sheets.

Save in:	Drawings		👻 🎯 🤌 🔛 👻			8 😣
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8. Select **Save** to create the file.

## Lab 12.3 - Attach the Model file

- 9. Select the **Reference** icon from the *Primary Tools* toolbar.
- 10. In the *References* dialog box, select **Tools > Attach**.

 Use the Directory pull-down menu and select the C:\Projects\12345\Design\Drawings\Reference_Files folder and select the file 12345DES_Model.dgn

Look in:	Reference_	Files	- 🔇 🤌 🛤	•	8 💽	3D - V8 DGN
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cent Places		Interchange.dgn	11/20/2007 7:40	5 AM Mic	roStation V8 X.	
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	Files of type:	CAD Files (*.dgn;*.dwg;*.dxf	)	•	Cancel	
	•	Save Relative Path			Options	

12. Verify the Attachment Method is set to Interactive. Select OK.

13. In the *Reference Attachment Settings* box:

- Key in a logical name of *Design* and *Proposed Intersection* for a description.
- Verify that *Orientation* is set to **Coincident-World** and the *Scale* is set at *1:1*
- Set *Nested Attachment* to Live Nesting and set *Depth* to *1*.
- Set Global Linestyle Scale to Master

File Name: 12345D	DES_Model.dgn
-	vings\Reference_Files\12345DES_Model.dgn
Model: CDOT [	
Logical Name: Design	
Description: Propose	ed Intersection
Orientation:	
View	Description
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Coincident - World	Global Origin aligned with Master File
Standard Views	
Named Fences (none)	)
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	OK Cancel

• Turn off Display Raster References.

#### 14. Select **OK**.

- **Note:** The **Coincident World** option ensures that references are attached with their true coordinate information. A scale factor of **1:1** ensures that plan graphics are referenced in actual size. These two options allow plan sheet graphics to maintain their true model coordinates and size.
- 15. Turn on the **Show Hierarchy** to expand the hierarchy list.

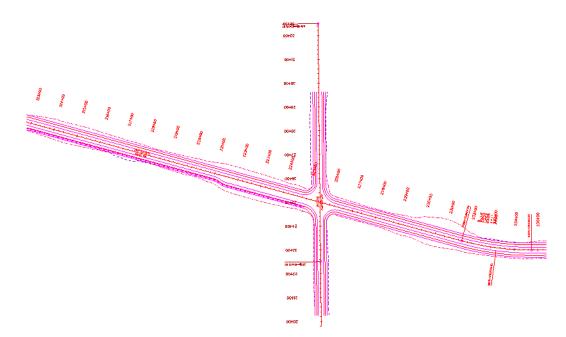
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			•		

- **Note:** Note that with nested references, the Survey/Topo reference is nested below the Design model file. You can typically reference model files as nested to sheet files instead of using the **Copy Attachment** command (as in this case, you want to show both Design and Survey/Topo graphics in the sheet file). However, if you need to control individual references in the sheet file, then use the **Copy Attachment** command.
- 16. Close the References dialog.
- 17. Fit View using the icon so all graphics are displayed.
- 18. Select **File > Save Settings** from the menu.

## Lab 12.4 - Rotate the View Using the 3-Point Method

Rotate the view so that the side road appears horizontal in the view.

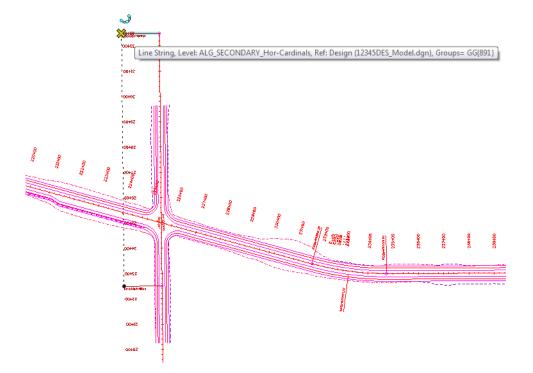
1. Window around the intersection as shown.



2. Select the Rotate View command and set the *Method* to 3 Points.

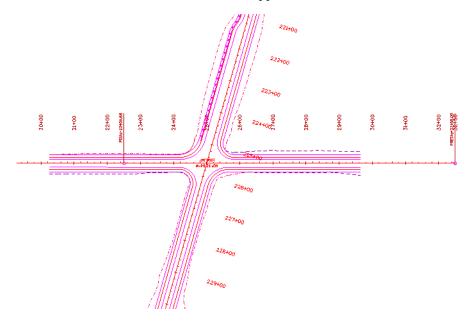


- 3. Follow your prompts and *AccuSnap* on the end of the PI leader line shown.
- 4. For the second point (X axis of the view), *AccuSnap* on the POE leader line.



5. For the third point (Y direction), **<D>** anywhere to the left of the first two points.

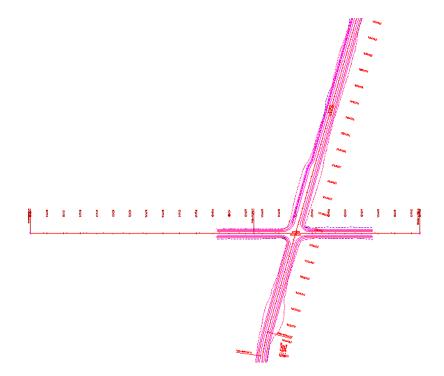
The view is rotated so that the side road appears horizontal.



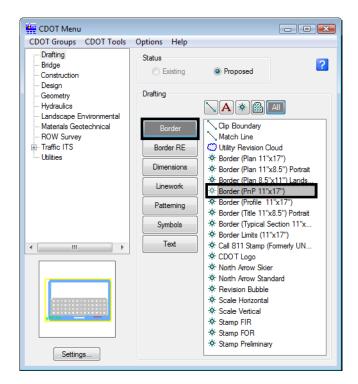
- **Note:** Remember that you are rotating the view, not the graphics. The graphics maintain their original coordinate position in the sheet file.
- **Note:** The leader lines are both placed at elevation 0. If you pick points at different elevations, you'll need to first turn on Depth lock before choosing the 3-Point rotation command to avoid a skewed rotation.

## Lab 12.5 - Place the Border Cell

6. **Zoom out** as shown.



7. From the *CDOT Menu* Explorer, select **Draffing** and then select the **Border** category and choose the **Border** (**PnP 11**"x17") Item.



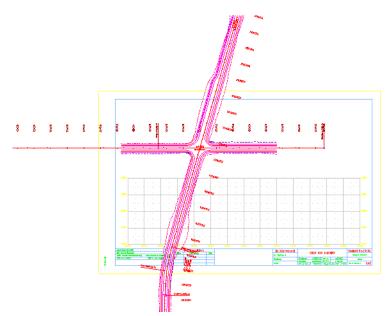
8. Select **Settings** and set *Active Scale* to *100* and *Active Angle* to *0*.

gs	
100.00	Apply
0.00	Close
	100.00

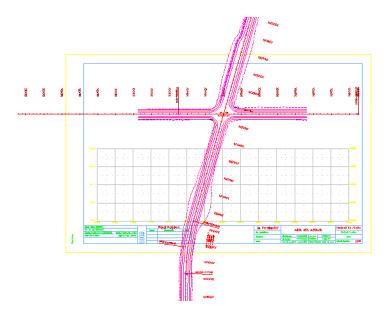
**Note:** Coordinate with the Region Surveyor when you are creating sheets that are not at a 1:100 scale. They will provide you with the topography and survey MicroStation files at a different scale. Otherwise, the line work and cells will not be the correct size for the print scale.

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.

- 9. Select Apply and Close in the Active Settings box.
- 10. When prompted to locate the cell origin of the sheet border, **<D>** in the approximate location shown to place it. Don't worry about an exact location you'll move it in the next step.

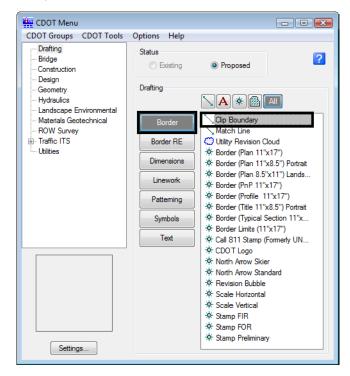


11. If necessary, use the **Move** command and move the border cell so that the intersection is centered in the upper plan portion as shown.



# Lab 12.6 - Placing a Clip Boundary

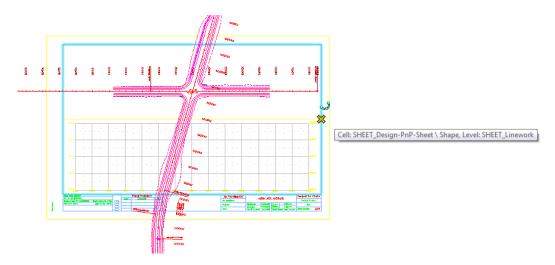
- 1. From the CDOT Menu Explorer select **Draffing**.
- Set the *Category* to **Border**
- Select the Item Clip Boundary
- Verify the SHEET_Clip-Boundary level is active.



**Note:** Since **Plot** is turned off for the level **SHEET_Clip-Boundary** in the **Level Manager**, it will not print.

The *Place SmartLine* command is now automatically selected, allowing you to draw an irregular closed shape that represents your clipping boundary of the model file. However, if your clipping boundary is a rectangle, you can use the *Place Block* command.

2. Select the **Place Block** icon from the *Main* toolbar and draw the clipping boundary as shown (corner to opposite midpoint on the blue inside margin).



# Lab 12.7 - Clip the Reference File

- 1. In the *References* dialog box, highlight the **Design** reference.
- 2. Select the **Clip Reference** icon.

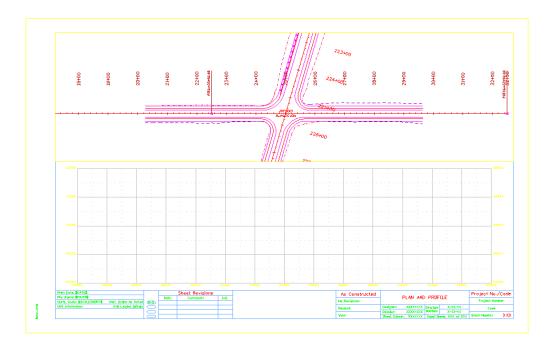
Tools Settings						
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lierarchy	Slot 🏱 🛅 File Name ^	Model	Description	Logical	• 4	×
-12345DES_PnP19.dgn	1 12345DES_Model.dgn	CDOT Default	Proposed Intersection	Design	5 5	$\checkmark$
	Scale 1.000000 : 1.000000	Rotatio	on 00°00'00''			
	Scale         1.000000         :         1.000000           Offset X         0.000         Y         0.000		on 00°00'00''			

**Note:** You can select more than one reference file at a time by holding the **<Shift>** or **<Control>** keys down while you are making your selection. You can clip multiple drawings in one step when they are all selected.

3. In the *Tool Settings* box, verify *Method* is set to **Element**.



- 4. When prompted to *Identify Clipping Element*, **<D>** on the rectangular clipping boundary you just placed.
- 5. **<D>** to accept.
- 6. Fit the MicroStation view and Save Settings after clipping the reference files.



**Note:** Once the clipping boundary is placed, do not delete it. The clipping region of the reference file will be lost if the boundary is deleted.

In the next Chapter, you'll edit the border text to add project specific information.

## Lab 12.8 - Turn Off the Profile Grid and Text

- 1. Open the *Level Display* box and turn **Off** the following levels:
- SHEET_Grid
- SHEET_Grid-Minor
- SHEET_Grid-Text

This turns off the border's grid for the profile. You'll use the grid provided by the InRoads profile.

# Lab 12.9 - Attach the Design Profile

- 1. In the *References* dialog box, select **Tools > Attach**.
- Use the Directory pull-down to navigate to the C:\Projects\12345\Design\Drawings\Reference_Files folder and select the file 12345DES_Prof04.dgn
- 3. Verify the *Attachment Method* is set to *Interactive*. Select **Open**.
- 4. In the *Reference Attachment Settings* box:
- Set *Orientation* to **Top**
- Key in a Logical Name of *Profile Side Road* and *Proposed profile for side road* as the *Description*.
- Set *Scale* to *1:1*
- Set Nested Attachment to No Nesting.

eference Attachment	Settings for 12345DES_Prof04.dgn
-	5DES_Prof04.dgn awings\Reference_Files\12345DES_Prof04.dgn
Model: CDO	I Default ▼
Logical Name: Profile	e Side Road
Description: Propo	osed profile for side road
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views (none	
Named Fences (nor	ne)
Detail Scale: Sc <u>a</u> le (Master:Ref):	
Named Group:	<b></b>
Revision:	<b></b>
Le <u>v</u> el:	<b></b>
Nested Attachments:	No Nesting   Depth: 1
Display Overrides:	Allow
New Level Display:	Use MS_REF_NEWLEVELDH
Global LineStyle Scale:	
Synchronize w	ith Saved View
Toggles	
•	2 🔪 🖓 🎲 🖓 🐨 🏢 🗟 🖓 💷 🚣
Drawing Title	
Create	
Name:	Drawing
	OK Cancel

5. Select **OK**.

- 6. The outline of the profile reference is attached to your cursor. **<D>** in the approximate location shown to place the profile.

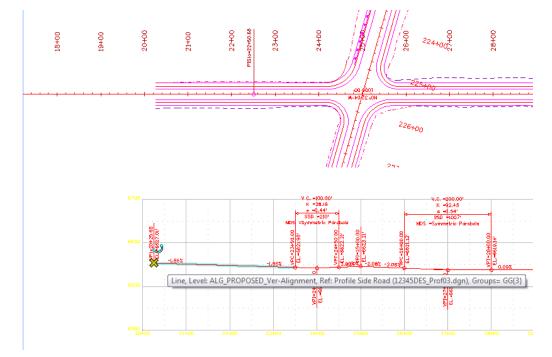
# Move the profile reference

Since you attached the profile reference by a top view, it did not come in at a precise location. Next, you'll move the profile to line it up better with the plan.

- 1. Turn on **AccuDraw** if it's not already on.
- 2. Highlight the *Profile* in the *Reference* dialog and select the **Move Reference** icon or select **Tools > Move**.

🗈 References (3 of 3 unique, 3 disp	layed)							83
Tools Settings								
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Hierarchy	Slot 🏱 🛅 File Name ^	Model	Description	Logical	٠	2	ł	( <u>A</u>
	1 12345DES_Model.dgn	CDOT Default	Proposed Intersection	Design	$\checkmark$	$\checkmark$	$\checkmark$	
	2 12345DES_Prof04.dgn	CDOT Default	Proposed profile for	Profi	$\checkmark$	$\checkmark$	$\checkmark$	
	Scale 1.000000 : 1.000000	Rotatic	n 00°00'00''					
0	Offset X 0.000 Y 0.000 Z 0.000							
	Image: Config Variable       Georeferenced:       No       No       Image: Config Variable       Georeferenced:       No							

• Click into the AccuDraw window to set it active.

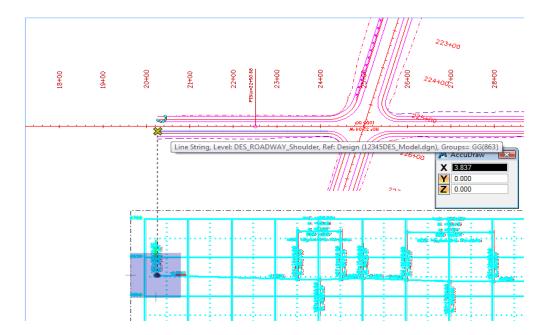


• Snap to the left end of the vertical alignment (the first VPI) as the Move From point.

Move your cursor to the left along AccuDraw's X axis to set the focus (blinking cursor) in the AccuDraw X field, then Press **Enter**.



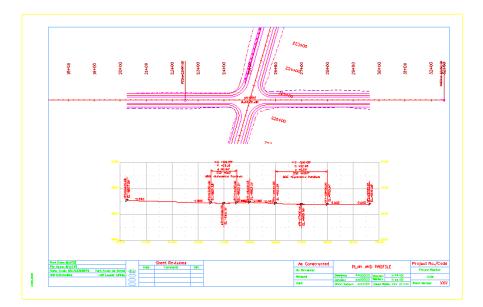
**Note:** The *Enter* key executes AccuDraw's *SmartLock*. It locks the Y and Z axes to 0 so you can only move in the X direction.



• Move your cursor and **AccuSnap** on the end of the shoulder line as shown. You can zoom in, if needed.

The beginning of the vertical alignment is now aligned with the beginning of the horizontal alignment.

- 3. **<R>** when done.
- 4. **Fit** the MicroStation view.

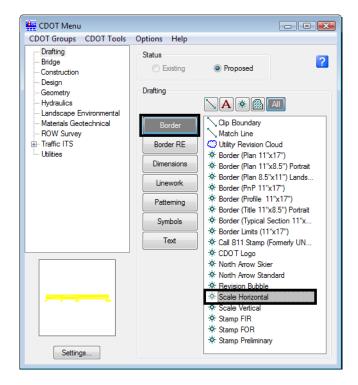


## Lab 12.10 - Place the Bar Scale, North Arrow, and RE Cells



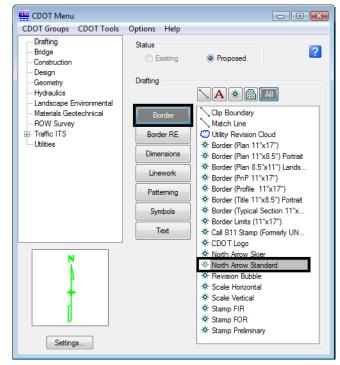
Follow the steps on the next page and use the diagram below to place the various border cells.

- 1. From the CDOT Menu Explorer, select Drafting. Set the Category to Border.
- 2. Select the Item Scale Horizontal.

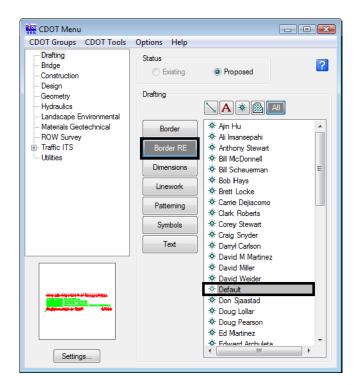


3. When prompted to locate the cell origin of the *Bar Scale*, **<D>** inside the sheet border.

4. Select the Item North Arrow Standard



- 5. When prompted to locate the cell origin of the *North Arrow*, **<D>** inside the sheet border.
- 6. Set the Category to Border RE.
- 7. Select the Item **Default**.



8. When prompted to locate the cell origin of the *Region Engineer* cell, **Zoom in** as necessary on the bottom portion of the border and **<T>** to the correct location and then **<D>** to accept.

# Lab 12.11 - Turn On the Reference Display

- 1. On the *References* dialog, select the **Survey/Topo** reference nested under the *Design* Reference.
- 2. Toggle on **Display** for the *Survey/Topo* reference.
- 3. Use *Level Display* to turn **On** all *Survey/Topo* levels.
- 4. **Fit** the view.



5. Save Settings.

# Lab 12.12 - Optional Exercise

Change the Design reference's nested depth to **2** and turn on the display of the contour reference – **12345SURV_Contour100.dgn.** Use **Level Display** to turn **On** the contour levels to display the existing contours in the plan sheet.



# LAB 13 - Create a Project Specific Border

In the last section, you placed a generic border for your plan/profile sheet from the CDOT menu. This is handy when you have only one or two sheets to create since you have to edit the border with project specific information for each sheet. But what if you had several sheets to create? You wouldn't want to edit every sheet to add the project information. Instead, you can create a project-specific border that can be used for all sheets of the same type. This way, you only have to fill in the project information one time.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Create a project-specific border cell library.
- Use the CDOT Menu to place the border and associated information.
- Edit the border text to place project-specific information.
- Make the border graphics a cell.

#### Lab 13.1 - Create the Border File

Since you will use this border for multiple sheets, create one project border to avoid editing multiple borders later.

- 1. In MicroStation Manager, select File > New.
- 2. Set the directory to C:\Projects\12345\Miscellaneous.
- 3. Verify the Seed File is set to 3D-Seed_CDOT.dgn, if not then select it as the seed file.
- 4. In the Name field, key in a drawing file name 12345DesignPlanBorder.cel.

Note: The .cel extension denotes this file as a cell library.

5. In the **New** dialog box, select **Save**.

New - C:\Proje	ects\12345\Miscella	aneous\		×
Save in:	🍌 Miscellaneous		- 🗿 🌶 📂 🛄 -	S 🖹
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<b>Desktop</b>				
Libraries				
Computer				
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	File name:	12345DesignPlanBorder.cel	<b></b>	Save
	Save as type: Seed:	MicroStation DGN Files (*.dgn) C:\Workspace\Workspace-CD0	oT_V8i\Standards-	Cancel Browse

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

#### Lab 13.2 - Use the CDOT Menu to Create the Border

- 1. From the CDOT Menu Explorer, select Drafting and set the Category to Border.
- 2. Select the Item Border (Plan 11"x17")

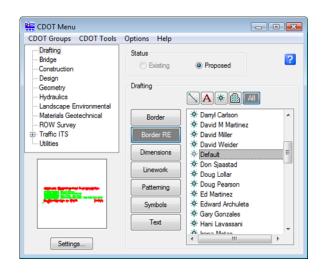
CDOT Menu		-	
CDOT Groups CDOT Tools	Options Help		
- Drafting Bridge Construction	Status Existing	Proposed	?
Design Geometry Hydraulics Landscape Environmental	Drafting		
- Materials Geotechnical - ROW Survey	Border	Clip Boundary	<u>^</u>
	Border RE	CO Utility Revision Clou Border (Plan 11'x17	") =
	Linework	<ul> <li>☆ Border (Plan 11"x8.3</li> <li>☆ Border (Plan 8.5"x1</li> </ul>	1") Lan
	Patterning	<ul> <li>※ Border (PnP 11'x17</li> <li>※ Border (Profile 11'x</li> <li>※ Border (Title 11'x8.5)</li> </ul>	17")
	Symbols	<ul> <li>☆ Border (Typical Sect</li></ul>	ion 11"
	Text	* Call 811 Stamp (For	
Settings		•	•

3. Select Settings and set Active Scale to 1 and Active Angle to 0.



- **Note:** You will create the generic project border cell at a scale of 1 (11 x 17 master units). You'll actually scale the border, according to your plot scale, later when the cell is placed in the sheet file.
- 4. Select Apply and Close in the Active Settings box.
- 5. **<D>** to place the border anywhere in the blank file.
- 6. Set the Category to Border RE.
- 7. Select the Item **Default**.

8. **Fit** the view.



9. When prompted to locate the **Region Engineer** cell, **<D>** to the location shown.

Print The	Name Filling		-	She	et Revisions	146	Colorado	Department	t of Transp	ortation	As Constructed		PLAN	SHEET	Project No.
Here Unit	nore FLCO 5 Sole SCAEDON Grandia	Vert. Scolar Ja No. URL Labor Sile	19E				10.011	City, Shafe	te Ceda		No Revolutes Revised	Dealgrans		Skutlere Nord-Bre	Project Har Dode
							Charles H	mber or St	ARTING FAR	Initials	Volte	Databart Sheet Suberts		Vaniters	

**Note:** You will not place the bar scale and north arrow cell now, but later in each individual sheet.

#### Move the border

The lower left corner of the border *must* be located at the 0,0 coordinate in the file since this will be the origin of the cell. So, move it to this location.

1. Place a **Fence** block around the entire border.

2. Select the **Move** command and toggle on **Use Fence**. Set the mode to **Inside**.



3. Snap to the lower-left corner of the yellow block (outside edge) as the move from point.

M View1 - Top	
Move from this point	
Calt SHEET_Design-Sheet \ Shape, Level: SHEET_Plot-Boundary 🔥 🖬 🖸 🛬 🖾 📾 🕜 🌾 🛠 🚱 🗸 📖	

- 4. Key in *xy=0,0* as the move to point.
- 5. The border moves to the new location.
- 6. Reset **< R>**.
- 7. Fit the view.
- 8. **<T>** on the lower-left edge to verify it's at 0,0.

0.000, 0.000, 0.000 KeyPt

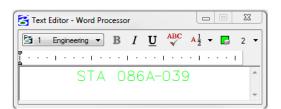
#### Lab 13.3 - Edit the Border Text with Project Specific Information

1. **Zoom in** on the lower-right corner of the border as shown.

	DL AN	SHEET		Project No.,	No./Code		
	PLAN	SHEET		Project Num	ber		
Designer:		Structure		Code			
Detoiler:		Numbers					
Sheet Subset		Subset Sheel	ts: XXX of XXX	Sheet Number	XXX		

- $\begin{array}{c|c} \hline \mathbf{Drawing} \\ \hline \mathbf{Drawing} \\ \hline \mathbf{C} \hline \mathbf{C} \hline \hline$
- 2. Select the Edit Text command from the Text toolbar under the Drawing task tab.

- 3. **<D>** on the **Project Number** text.
- 4. In the Text Editor, replace this with STA 086A-039.



- 5. **<D>** anywhere to accept.
- 6. **<D>** on the **Code** text.
- 7. In the **Text Editor**, replace this with **12345** and **<D>** to accept.
- 8. Edit the X's beside Designer and replace with your initials (CU is used in the illustration, but you can use yours).
- 9. **<D>** anywhere to accept.
- 10. Edit the X's beside Detailer and replace with your initials.
- 11. **<D>** anywhere to accept.

	PLAN SH			Project No./Code		
	PLAN	SHEET		STA 086A-0	39	
Designer:				12345		
Detoiler:		Numbers				
Sheet Subset:		Subset Shee	ts: XXX of XXX.	Sheet Number	XXX	

12. Fit the view.

## Lab 13.4 - Make the Border a Cell

1. Select Models from the Primary toolbar.



- 2. In the Models dialog box, select Edit Model Properties.
- 3. In the Model Properties box:
  - Toggle on Can be placed as cell.
  - Change the Name to 12345 Design Plan Border.
  - Change the **Description** to *Project Border Cell*.
  - For Ref. Logical key in *Plan Border*.
  - Leave all other options as shown

Model Pr	roperties	
	<u>T</u> ype:	Design
	<u>N</u> ame:	12345 Design Plan Border
	Description:	Project Border Cell
	<u>R</u> ef Logical:	Plan Border
	<u>A</u>	[1"=1' ▼
Line	e Style Scale:	Annotation Scale
		Update Fields Automatically
	<u>C</u> an be place <u>C</u> an be place	d as a cell Cell Type: Graphic 💌
	<u>0</u>	K

- 4. Select OK.
- 5. Close the Models box.
- 6. Save Settings (File > Save Settings).
- 7. Exit MicroStation.

# LAB 14 - Create a 40-Scale Plan Sheet

The CDOT default scale for plan sheets is 100. This lab illustrates how to create a special 40-scale plan sheet for the intersection.

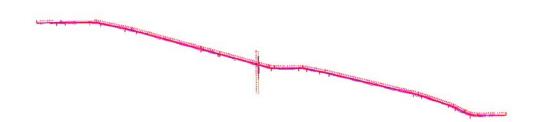
#### **Chapter Objectives:**

After completing this exercise you will know how to:

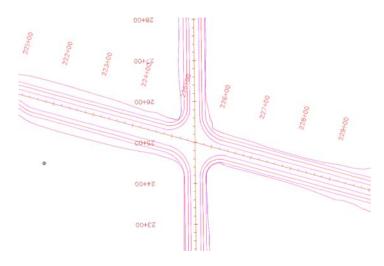
- Create a Plan sheet
- Scale the border for a 40-scale drawing
- Set the **Annotation Scale** to match the border and plot scale.

#### Lab 14.1 - Open the Model File

- 1. Start MicroStation and open **12345DES_Model.dgn** form the project's **\Design\Drawings\Reference_Files** folder.
- 2. Select File > Raster Manager and turn off the display of the raster files.
- 3. Fit the view.

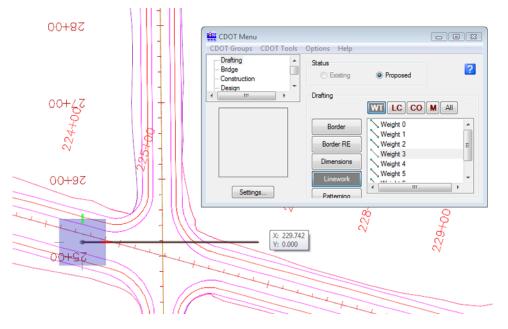


4. Window around the intersection as shown.



## Lab 14.2 - Determine the Rotation Angle for the Sheet

- 1. On the CDOT Drafting Menu, set Line Weight to 3.
- 2. Using AccuDraw, draw temporary horizontal line in the approximate location shown.



3. Select the **Measure Angle** command from the **Measure** toolbar under the *Drawing* task tab..



- 4. **<D>** on the horizontal line, then **<D>** on the SH86 proposed centerline.

MicroStation displays the result as approximately 15 degrees. This is the rotation angle needed to rotate the view to horizontal at the intersection in a counter-clockwise direction.

5. **Delete** the temporary measurement line.

#### Lab 14.3 - Placing the Plan Limits Cell

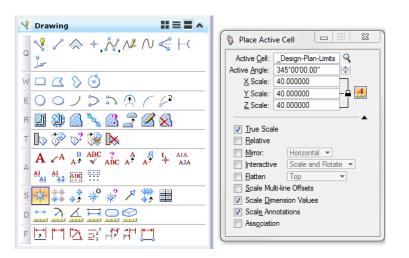
1. Select **Cells** form the **Primary** toolbar to open the cell library.

Primary Tools	8
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	Cells

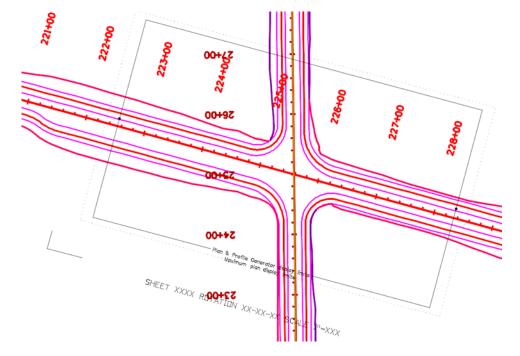
2. Toggle on **Display All Cells in Path** and select the **SHEET_Design-Plan-Limits** cell and make it the active placement cell.

<u>F</u> ile			
Use Shared Cells	) <u>i</u> splay All Cells In Path	Display: Wireframe	-
Name	Description 🔺		
HEET_CDOT-Logo	General Sheet CDOT Logo		>
HEET_Design-A-Size-Sheet	General Sheet Design A-S		1
HEET_Design-A-Size-Sheet-Land	General Sheet Design A-S		
HEET Desian-A-Size-Title-Sheet	General Sheet Design A-S		_
HEET_Design-Plan-Limits	General Sheet Design Pla		
HEET_Design-PnP-Sheet	General Sheet Design Pla 🖕		
(	•		
Active Cells			
Placement SHEET_Design	Point Element	Edit Delete	
Teminator NONE	Pattem NONE	Create Share	

- **Note:** This cell helps to define the plan sheet limits in the model file before placing the border in the sheet file. It contains text characters that can be edited to indicate sheet name, rotation, & scale. The outer line-work depicts the maximum display limits for graphics as it relates to the border sheet. The inside shape reflects ¹/₂ inch inside this maximum limit and is the clipping boundary. All graphical information for this cell is on to the MicroStation level, **DRAFT_INFO_No-Plot**.
- 3. Close the Cell Library dialog box.
- 4. Turn on the level **DRAFT_INFO_No-Plot** if it is not currently on.
- 5. Select the Place Active Cell command and set the Active Angle to -15 and the Scale to 40.

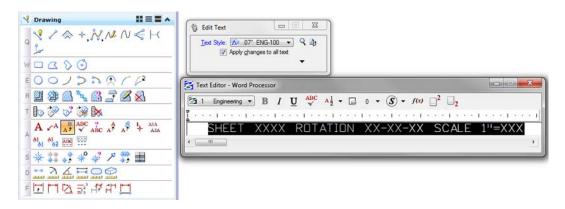


**Note:** The scale should be set to the plot scale of the sheet. Since the positive angles are measured counterclockwise in MicroStation, enter the 15 degree angle as *negative*. MicroStation converts this to a positive 345 degree angle.



6. Place plan limit cell in the approximate location shown.

7. Select the **Edit Text** command and **<D>** on the text at the bottom of the cell.



8. In the **Text Editor**, make the edits as shown.

Text Editor - Word Processor	
<b>B</b> I Engineering • <b>B</b> I $\underline{U} \sqrt[ABC]{A_2} \cdot \square 0 \cdot (S) \cdot f(x) \square^2 \square_2$	
<b>I</b>	· I · · · I · · · I · · · I ·
SHEET Intersection ROTATION 345-00-0	0 SCALE 1"=40
	<u> </u>

9. **<D>** anywhere in the view to accept.

## Lab 14.4 - Create the Drawing File

- 1. From the MicroStation menu bar, select **File > New**.
- 2. Set the directory to C:\Projects\12345\Design\Drawings.
- 3. Verify the Seed File is set to 3D-Seed_CDOT.dgn, if not then select it as the seed file.
- 4. In the Name field, key in a drawing file name 12345DES_Plan21.dgn
- 5. In the **New** dialog box, select **Save**. The Open button is used to accept the new file name and open the drawing at the same time.
- 6. The file you created will be highlighted. Select **Open** to open that file.

#### Lab 14.5 - Attach the Model File

- Attach the 12345DES_Model.dgn reference from the C:\Projects\12345\Design\Drawings\Reference_Files folder (use the Directory pull-down to quickly find the folder).
- 2. Verify the Attachment Method is set to Interactive. Select Open.
- 3. In the Reference Attachment Settings box:
- Key in a logical name of *Design* and *Proposed Intersection* for a Description.
- Verify that Orientation is set to Coincident-World and the Scale is set at 1:1

-	12345DES_Model.dgn \Drawings\Reference_Files\12345DES_Model.dgn
<u>M</u> odel: 0	CDOT Default
Logical Name: [	Design
Description:	Proposed Intersection
Drientation:	
View	Description
Coincident	Aligned with Master File
Coincident - Wo	orld Global Origin aligned with Master File
E Standard Views	3
E Saved Views	
Named Fences	(none)
	ale: 1"=100'
Sc <u>al</u> e (Master:F	Ref): 1.000000 : 1.000000
Sc <u>a</u> le (Master:F Named Gro	Ref): 1.000000 : 1.000000
Sc <u>a</u> le (Master:F Named Gro Revis	Ref): 1.000000 : 1.000000
Sc <u>al</u> e (Master:F Named Gro Revis Le	Ref):       1.000000       :       1.000000         pup:
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• Set Nested Attachment to Live Nesting and set Depth to 1.

- 4. Select **OK**.
- 5. Fit the view.



6. Turn on the **Show Hierarchy** and expand the hierarchy list.

References (2 of 3 unique, 2 displaye	i)		x
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Note that with nested references, the **Survey/Topo** reference is nested below the Design model file.

The **Survey/Topo file** that is attached nested to the Model file is for a 100 scale plot. However, you're creating an intersection sheet at a 40 scale. Therefore, you need to attach the correct scale Survey/Topo reference.

- **Note:** Coordinate with the Region Surveyor when you are creating sheets that are not at a 1:100 scale. They will provide you with the topography and survey MicroStation files at a different scale. Otherwise, the line work and cells will not be the correct size for the print scale.
- 7. Select the Design model reference and change the nesting to **No Nesting** to remove the 100 scale **Survey/Topo** reference.

References (1 of 1 unique, 1 displaye	d)	
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	New Level Display: Config Variable  Georeferenced: No	<b>•</b>

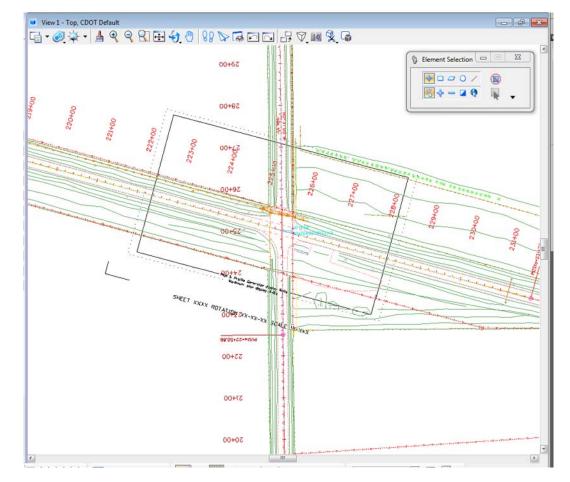
8. Attach the **12345SURV_Topo40.dgn** file from the project's **ROW_Survey_Drawings\Reference_Files** folder with the options shown.

Reference Attachment Settings for 12345SURV_Topo40.dgn				
Ele Name: 12345SURV_Topo40.dgn Full Path:\Drawings\Reference_Files\12345SURV_Topo40.dgn Model: CDDT Default				
Logical Name: 40 Scale Survey				
Description: 40 Scale Survey				
Orientation:				
View Description				
Coincident Aligned with Master File				
Coincident - World Global Origin aligned with Master File				
Saved Views (none)				
Named Fences (none)				
Detail Scale:         1"=100'         ▼           Scale (Master:Ref):         1.000000         :         1.000000				
Named Group:				
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Level:				
Nested Attachments: Live Nesting   Depth: 1				
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Global LineStyle Scale: Master 💌				
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Toggles				
Drawing Title				
Create				
Name: Drawing				
QK Cancel				

9. **Fit** the view.

#### Lab 14.6 - Rotate the View

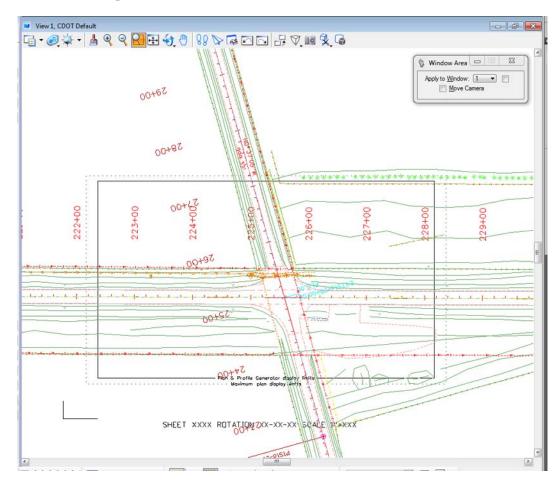
Rotate the view so that the portion of the mainline alignment through the intersection appears horizontal in the view.



1. **Window** around the intersection as shown.

2. Use the **Rotate View**, **3-Point** method to rotate the view so that the plan limits cell is horizontal to the view

**Note:** You can also use the keyin *rv=,,15* since you know the rotation angle from the plan limits cell. The commas are used as placeholders since you are not rotating about X and Y axis. You are only rotating about the Z axis – the perpendicular axis to the Top View.



The view is rotated so that the alignment appears horizontal.

**Note:** Remember that you are rotating the view, not the graphics. The graphics maintain their original coordinate position in the sheet file.

#### Lab 14.7 - Attach the Border Cell

- 1. Select Cells from the Primary toolbar.
- In the Cell Library dialog box, select File > Attach and navigate to the C:\Projects\12345\Miscellaneous folder.

3. Select the 12345DesignPlanBorder.cel file.

🔀 Cell Libra	ary: [\MicroStation	\Cell\Roadway D	esian.cel1			
File						
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Name		Description	<u> </u>	^		
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-	Libraries					
	Computer					
	Network	•	I	1		Þ
	INELWORK	File name:	12345DesignPlar	Border.cel	•	Open
		Files of type:	MicroStation Cell	Libraries (*.cel)		Cancel

This is the project-specific border created earlier.

4. Select **Open** to attach the cell library.

Cell Library: [\12345D	esignPlanBorder.cel]		X
<u>F</u> ile			
Use Shared Cells	Display All Cells In Path		Display: Wireframe
Name	Description	Ту	
12345 Design Plan Border	Project Border Cell	Gr	
		P.	
Active Cells			
Placement NONE	Point Element		Edit Delete
Terminator NONE	Pattern NONE		Create Share

The cell library only has one cell (model) – the **12345 Design Plan Border** that you previously created.

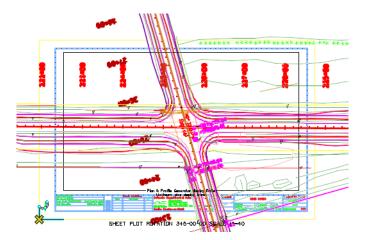
- 5. Select **Placement** to make the border the active placement cell.
- 6. Close the **Cell Library** dialog box.

# Lab 14.8 - Place the Border

- 1. Select **Place Active Cell** from the **Cells** toolbar.
- 2. In the **Tool Settings** box, set **Active Angle** to **0** and the **Active Scale** to **40** for X, Y and Z.

Active <u>C</u> ell:	Design Plan Border 🔍
Active <u>Angle</u> :	00°00'00.00''
X Scale:	40.000000
Y Scale:	40.000000 - 🛓 🚣
Z Scale:	40.000000
<u>R</u> elative <u>Mirror:</u>	Horizontal

- **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.
- **Note:** The **Active Scale** scales the border up 40 times around the full-sized graphics to match the plot scale.
- 3. AccuSnap on the lower left corner of the plan limits cell as shown to place the border.

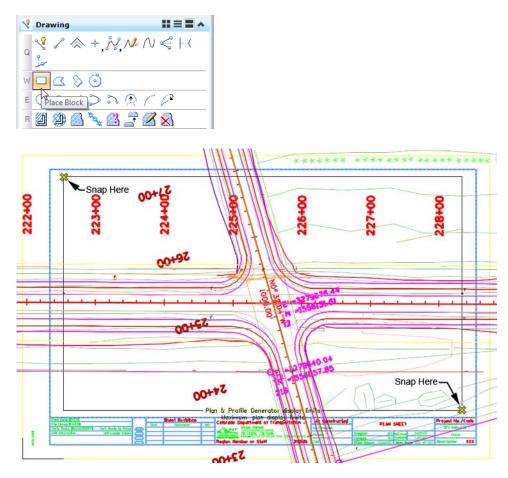


- 4. **<D>** to place the cell.
- 5. **<R>** to exit the command.

# Lab 14.9 - Place the Clip Boundary

1. From the CDOT Menu Explorer select **Draffing**.

- 2. Set the Category to **Border**.
- 3. Select the Item Clip Boundary.
- 4. Select the **Place Block** icon from the *Polygons* toolbar under the *Drawing* task tab and draw the clipping boundary by snapping on the opposite corners of the plan limits cell as shown (interior most line).



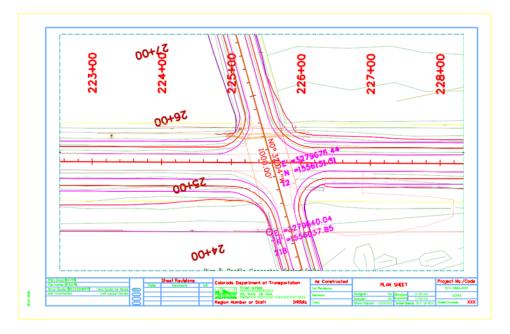
#### Lab 14.10 - Clip the Reference File

1. In the **References** dialog box, highlight both the **Design** and **Survey/Topo** references for clipping.

2. Select the **Clip Reference** icon.

References (7 of 7 unique, 2 displayed)	d)	X
Tools Settings		
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	2 12345SURV_Topo40.dgn CDOT Default 40 Scale Survey	40 🗸 🗸 🗸
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- 3. In the Tool Settings box, verify Method is set to Element.
- 4. When prompted to **Identify Clipping Element**, select the rectangular clipping boundary you just placed.
- 5. **<D>** to accept.
- 6. Fit the MicroStation view and Save Settings after clipping the reference files.

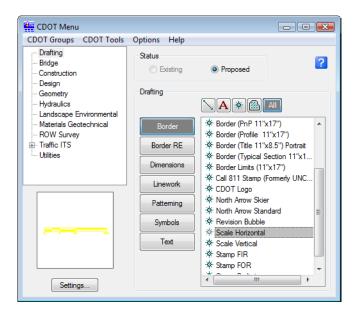


**Note:** Once the clipping boundary is placed, do not delete it. The clipping region of the reference file will be lost if the boundary is deleted.

## Lab 14.11 - Place the Bar Scale and North Arrow

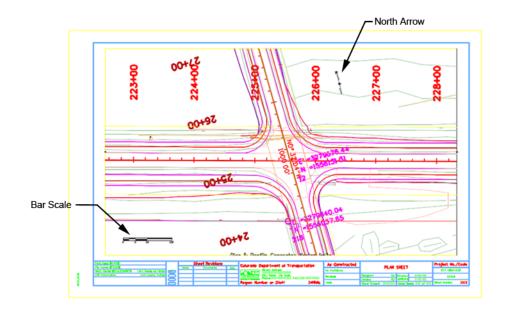
- 1. From the CDOT Menu Explorer, select **Drafting**.
- 2. Set the Category to **Border**.

3. Select the Item **Scale Horizontal**.



- 4. When prompted to locate the origin of the **Bar Scale**, **<D>** inside the sheet border as shown below.
- 5. Select the Item North Arrow Standard.

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CDOT Groups CDOT Tools	Options Help	
Drafting Bridge Construction	Status Existing	Proposed
Design Geometry Hydraulics Landscape Environmental	Drafting	
<ul> <li>Materials Geotechnical</li> <li>ROW Survey</li> <li>Traffic ITS</li> <li>Utilities</li> </ul>	Border Border RE	
	Dimensions Linework	<ul> <li>☆ Border (Typical Section 11"x1</li> <li>☆ Border Limits (11"x17")</li> <li>☆ Call 811 Stamp (Formerly UNC</li> <li>☆ CDOT Logo</li> </ul>
N	Patterning	
	Symbols	<ul> <li>☆ Revision Bubble</li> <li>☆ Scale Horizontal</li> </ul>
	Text	
Settings		Stamp FOR



6. When prompted to locate the **North Arrow**, **<D>** inside the sheet border as shown.

## Lab 14.12 - Set the Text Scale Factor

Set the **Text Scale Factor** to match the border and plot scale factors.

- 1. Select **Models** from the **Primary** toolbar.
- 2. In the Models box, select Model Properties.

Note the Annotation Scale is set to 1:100 – the CDOT default.

Pr

3. Change the Annotation Scale to 1:40.

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Models Models Type 2D/3D Name CDOT Defau Model Properties	Description Master Model		
Name: Description: Ref Logical: Line Style Scale: Cell Properties Can be place Can be place	1''=60'	I.00000( Graphic V	

- 4. Select OK.
- 5. At the Alert message, select Yes to propagate the changes.
- 6. Close the Models box.

The **Annotation Scale** for the file now matches the border and plot scales. Later, when text and dimensions are placed in this file, they will be the correct size.

### Lab 14.13 - Edit the Bar Scale

- 1. Window in to the bar scale cell.
- 2. Select the Edit Text command from the Text toolbar.
- 3. **<D>** on the **X'** text on the bar scale.
- 4. Change the text to 20' and **<D>** to accept.



5. Make the other edits as shown.



- 6. **Fit** the view.
- 7. Save Settings.
- 8. **Exit** MicroStation.

# LAB 15 - Create a Typical Section Sheet

Normally, all graphics are created in the model file and referenced to the sheet file. The sheet file contains the border, annotations and dimensions. However, typical section sheets are an exception to this rule.

Roadway Design typical sections can be created with the **CDOT Typical Section Generator Program**. The **Generator Program** not only creates the graphics, but it also annotates and dimensions the typical section. It uses a **Text Scale Factor** of 10 for all text. Therefore, the program must be run in a sheet file set up at a 10 scale. The auto-populated file **JPC#DES_TyplSect##.dgn** is automatically created with the text scale factor set to 10 and the border placed at a 10-scale. Therefore, run the **Typical Section Generator** in the sheet file.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Create a Typical Section sheet.
- Attach a project-specific border cell library.
- Use the **Replace Cell** command to replace a generic border with a project border.
- Use the **CDOT Typical Section Program** to automatically create a typical section based on input values.
- Use AccuDraw and "SmartLock" to align graphics.
- **Save** the typical section input file.

#### Lab 15.1 - Create a New Sheet File

1. Start MicroStation and open the file **12345DES_TyplSect##.dgn** from the **\12345\Design\Drawings** folder.



The file opens and contains the generic border.

Select File > Save As... and rename the file to 12345DES_TyplSect01.dgn and select OK.

The file is copied to the **Drawings** folder with the new name.

#### Lab 15.2 - Attach the Border Cell Library

- 1. Select **Cells** from the **Primary** toolbar.
- In the Cell Library dialog box, select File > Attach and navigate to the C:\Projects\12345\Miscellaneous folder.
- 3. Select the 12345DesignPlanBorder.cel file.
- 4. This is the project-specific border created earlier.
- 5. Select **Open** to attach the cell library.

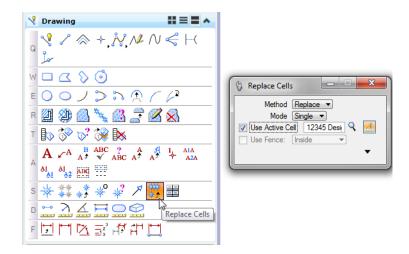
In Path Display: Wireframe
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•
Element Edit Delete
NONE <u>Create</u> Share

The cell library only has one cell (model) – the **12345 Design Plan Border** that you previously created.

- 6. Select **Placement** to make the border the active placement cell.
- 7. Close the Cell Library dialog box.

# Replace the border

1. Select **Replace Cells** from the *Cells* toolbar under the Drawing task tab.



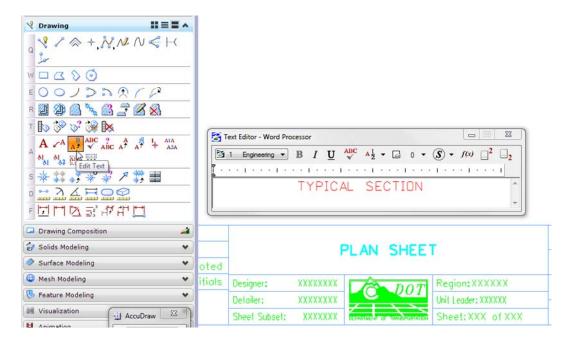
- 2. In the **Tool Settings** box
  - Set Method to Replace
  - Set Mode to Single
  - ◆ Toggle on Use Active Cell
- 3. When prompted to Identify Cell, <D> on the Typical Section Border.
- 4. **<D>** to accept.

The generic border is replaced with the project border.



## Lab 15.3 - Edit the Border Text for a Typical Section Sheet

- 1. Select the Edit Text Command from the *Text* toolbar under the *Drawing* task tab.
- 2. **<D>** on the **Plan Sheet** text.
- 3. Change the text to *Typical Section*.



4. **<D>** to accept.

	Т	YPICAL	SECTI	ON	
٦	Designer:	CU	Structure		
-	Detailer:	CU	Numbers	X-XX-XX	
	Sheet Subset:	XXXXXXX	XXXX Subset Sheets: XXX of XXX		

#### Lab 15.4 - Check Model Properties

- 1. Select File > Models from the menu (or select the Models icon from Primary Tools).
- 2. Select the Edit Model Properties icon

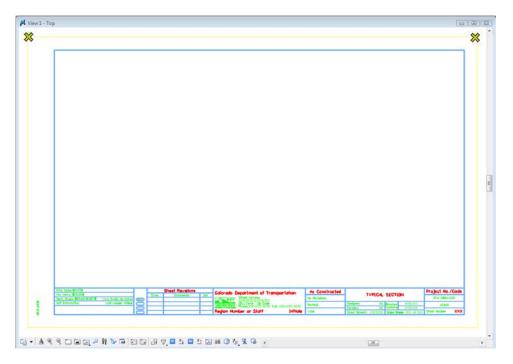
Note that the **Annotation Scale** factor is set to 1:10 for running the CDOT Typical Section Program. The text placed from the program will appear the correct size.

*Note:* You must change the Annotation Scale Factor if you run the Typical Section Program in any file other than the JPC#DES_TyplSect##.dgn file.

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		$E \bigcirc \bigcirc$	$E \bigcirc \bigcirc$	$E \bigcirc \bigcirc$	$E \bigcirc \bigcirc$
r 🔟 🎱 🙆 🛰 🔐 📑 🗭 😣		$\mathbb{R} \boxtimes \mathbb{Q} \boxtimes \mathbb{Q} \longrightarrow \mathbb{Q} \cong \mathbb{Q} \boxtimes \mathbb{Q}$ $\mathbb{T} \boxtimes \mathbb{Q} \otimes \mathbb{Q}^{2} \otimes \mathbb{Q}^{2} \otimes \mathbb{Q} \otimes \mathbb{Q}$ $\mathbb{A} \swarrow \mathbb{A} \boxtimes \mathbb{A} \longrightarrow \mathbb{A} \longrightarrow \mathbb{A} \otimes \mathbb{A} \otimes \mathbb{A} \xrightarrow{\mathbb{A}} \xrightarrow{\mathbb{A}} \mathbb{A} \xrightarrow{\mathbb{A}} \mathbb{A} \xrightarrow{\mathbb{A}} \xrightarrow{\mathbb{A}} \mathbb{A} \xrightarrow{\mathbb{A}} \xrightarrow{\mathbb{A}} \mathbb{A} \xrightarrow{\mathbb{A}} $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	R       Image: Constraint of the second
		$T \implies \bigcirc $	$T \implies \bigcirc $	$T \implies \bigcirc $	$T \implies \bigcirc $
	() Measure	$A \checkmark^{A} \land^{B} \land^{ABC} \land^{?} \land^{A} \land^{\mathcal{H}} \land^{I} \land^{IA} \land^{IA}$	$A \xrightarrow{A} \xrightarrow{A} \xrightarrow{B} \xrightarrow{ABC} \xrightarrow{2} \xrightarrow{A} \xrightarrow{A^{+}} \xrightarrow{1} \xrightarrow{A} \xrightarrow{AA} \xrightarrow{A^{+}} \xrightarrow{1} \xrightarrow{AAA} \xrightarrow{AAA} \xrightarrow{AAAA} AAAAAAAAAAAAAA$	$\begin{array}{c c} A & \swarrow A & A & A & A & A & A & A & A & A$	A $A \land A \Rightarrow $

3. Select the Measure Distance command and set the Distance to Between Points.

4. Measure the height and length of the border (AccuSnap along the yellow edge).



Note that the border measure  $110 \times 170$ , or 10 times the actual size. If the border cell was scaled to a factor other than 1:10 (like 1:100 for a plan sheet), then it must be re-scaled or replaced at the proper scale of 10.

#### Lab 15.5 - Start the Typical Section Program

🚆 CDOT Menu		
CDOT Groups	CDOT Tools Options Help	
Drafting     Bridge     Construction     Design     Geometry	AutoTrack Breakline Cell Divide	Proposed
Hydraulics Landscape E		
Materials Ged     ROW Survey     Traffic ITS     Utilities	gINT Translator Levels Off Measure XY Distance Misc. Tools ModElev Redlines	Zip Boundary       A         Atch Line       Itility Revision Cloud         Vorder (Plan 11'x17'')       Sorder (Plan 11'x17'')         Vorder (Plan 8.5'x11'') Lands       E         Vorder (PnP 11'x17'')       Sorder (Profile 11'x17'')         Vorder (Profile 11'x17'')       Sorder (Trute 11'x8.5'') Portrait         Vorder (Title 11'x17'')       Sorder 11'x1
Setting	SignCAD Steel Stratify Survey Text to Node Traffic Accident Traffic Stripmap	order Limits (11'x17") all 811 Stamp (Formerly UNC DOT Logo lorth Arrow Skier
	Typical Section Program	

1. On the CDOT Menu, select CDOT Tools > Typical Section Program.

The **CDOT Typical Section Program** lets the user input different values based on the desired roadway section. The various options are highlighted in blue.

CDOT Create Typical S File Options Help	ections			
Pavement Type Asphalt Concrete Overlay Widening	Pavement Thick Top Lift: Lift 3: Lift 2: Bottom Lift: ABC: Subbase	1.50         in           1.50         in           1.50         in           1.50         in           1.50         in           1.200         in           12.00         in	Median Type None Barrier Curb Depressed Mountable Curb Paved Single Lane / Ramp	Vertical Factor       ?         2.00       x Actual Vertical Distance         Roadway Cross Slope       ?         Cross Slope       ?         Z-Slopes       ?         Dist:       12.00       ft         Slope:       6.00       : 1
Left Side Outside Shoulder Travel Lane 10.00 ft 0.00 ft	Inside Travel Lane 12.00 ft	Median Left Shoulder Median 0.00 ft 0.00 ft	Right Median Shoulder ft 0.00 ft 0.00 ft	Right Side Inside Outside Travel Lane Travel Lane Shoulder 12.00 ft 0.00 ft 10.00 ft
Left Curb (a) None (b) Barrier (c) Mountable Sidewalk: (0.00) ft		Existing Paveme Left Side 0.00 ft Bench Left Side 0.00 ft	Right Side 0.00 ft Right Side 0.00 ft	Right Curb None Barrier Mountable Sidewalk: 0.00 ft
Required Fields (Must be C	Greater than 0.0)	Slope Away from Road	0.00	Apply Close

*Note:* Items that require input are shown in red.

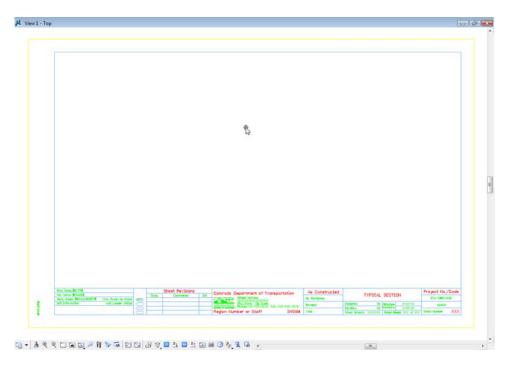
#### **Create a 2-Lane Rural Typical Section**

- 1. On the Create Typical Sections dialog box, select **Options > Writelock** to toggle it **On** (a check mark.
  - **Note:** If **Writelock** is **On**, permanent graphics will be generated in the file. If **Writelock** toggle is **Off**, the graphics are temporary and if you zoom or pan, the graphics will disappear. A check mark next to **Writelock** indicates that it is on.
- 2. Set the Typical Section Program options as shown.

쯙 CDOT Create Typical S	actions			
File Options Help	ections			
Pavement Type Asphalt Concrete Overlay Widening	Pavement Thicknes Top Lift: Lift 3: Lift 2: Bottom Lift: ABC: Subbase	s 3.00 in 1.50 in 0.00 in 12.00 in 12.00 in	Median Type None Barrier Curb Depressed Mountable Curb Paved Single Lane / Ramp	Vertical Factor 2.00 x Actual Vertical Distance Roadway Cross Slope Cross Slope _2.00 % Z-Slopes Dist: 12.00 ft Slope: 6.00 : 1
Left Side Outside Shoulder Travel Lane 10.00 ft 0.00 ft	Inside Travel Lane	ledian Left Shoulder Median 0.00 ft 0.00	Right Median Shoulder ft 0.00 ft 0.00 ft	Right Side Inside Outside Travel Lane Travel Lane Shoulder 12.00 ft 0.00 ft 10.00 ft
Left Curb None Barrier Mountable Sidewalk: 0.00 ft	t	Existing Paven Left Side 0.00 f Bench Left Side 0.00 f	Right Side t 0.00 ft Right Side	Right Curb       Image: None       Barrier       Mountable       Sidewalk:
Required Fields (Must be 0	Greater than 0.0)	Slope Awa from Road		Apply Close

3. Select Apply.

4. When prompted to locate the profile grade point, **<D>** near the top-center of the sheet as shown.



The 2-Lane rural section is automatically drawn, annotated and dimensioned.

- 5. *Do not* close the Create Typical Section dialog box.

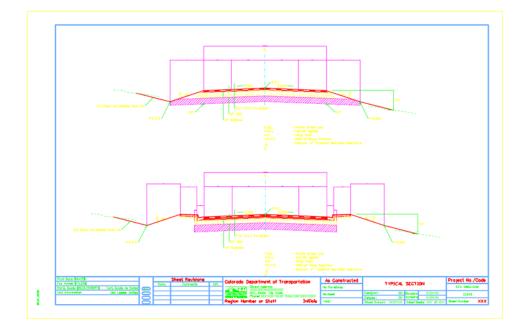
# **Create a 2-Lane Urban Typical Section**

Pavement Type Pavement Thick		kness		Median Type	Vertical Factor	
Asphalt	Top Lift:	3.00	in	None	2.00 x Actual Vertical Distance	
<ul> <li>Concrete</li> <li>Overlay</li> </ul>	Lift 2:	1.50 1.50	in in	<ul> <li>Barrier Curb</li> <li>Depressed</li> </ul>	Roadway Cross Slope Cross Slope .2.00 %	
Widening	Bottom Lift: ABC:	1.50 10.00	in in	<ul> <li>Mountable Curb</li> <li>Paved</li> </ul>	Z-Slopes	
	Subbase	14.00	in	⊚ Single Lane / Ramp	Dist:         12.00         ft           Slope:         6.00         : 1	
Left Side Outside Shoulder Travel Lane 10.00 ft 0.00 ft	Inside Travel Lane	Median Shoulder 0.00 ft	Left Median	Right Median Shoulder 0.00 ft 0.00 ft	Right Side Inside Outside Travel Lane Travel Lane Shoulde 12.00 ft 0.00 ft 10.00 ft	
Left Curb None Barrier		Existin Left S	ng Paveme Side ft	nt Right Side 0.00 ft	Right Curb ⊘ None ⊚ Barrier	
○ Mountable Sidewalk: 6.00 f	t	Bencl Left S		Right Side	O Mountable Sidewalk: 6.00 ft	

1. Set the **Typical Section Program** options as shown.

- 2. Select Apply.
- 3. When prompted to locate the profile grade point, **<D>** near the bottom-center of the sheet below the first section.

The 2-Lane urban section is automatically drawn, annotated and dimensioned.



4. *Do not* close the Create Typical Sections dialog box.

#### Save the 2-Lane Urban Section Input File

- 1. From the **Create Typical Section** dialog box, select **File > Save**.
- 2. Navigate to the C:\Projects\12345\Miscellaneous folder.
- 3. Key in a File name SH86_2L_Urban_Typical and select Save.

The input file is saved. If you need to generate this typical section again, Select **File > Open** form the **Create Typical Section** dialog box and select this text file.

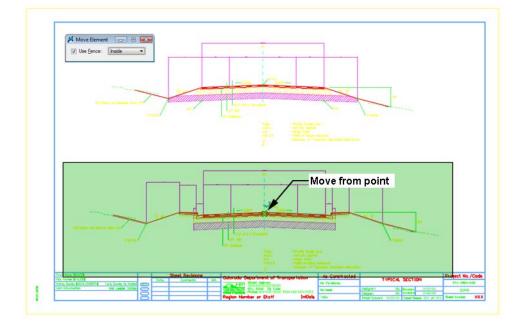
4. Close the Create Typical Section dialog box.

#### **Align the Sections**

Since you did not snap to a location for the sections, you may need to align the sections at their centerlines as well as move the section graphics into the border.

- 1. Place a fence block around the urban section.
- 2. Select the Move command from the Manipulation toolbar and toggle on Use Fence.

📕 Move Element 🛛 🗖	
♥ Use <u>F</u> ence: Inside	•

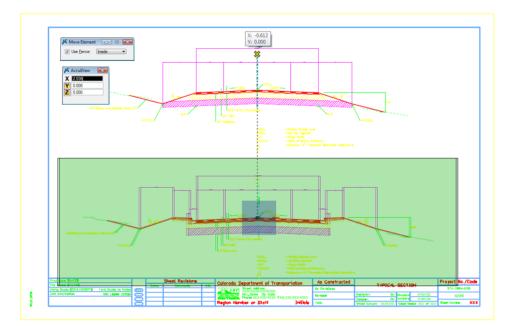


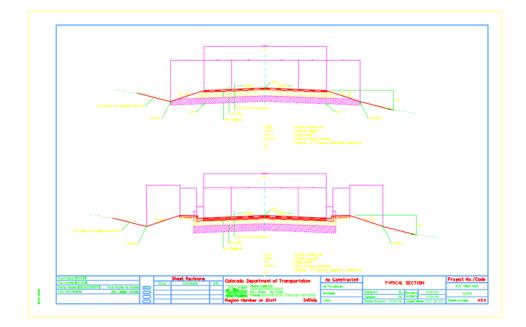
3. AccuSnap on the centerline of the urban section as shown for the move from point.

4. **Move** your cursor horizontally (either to the right or left), lock on AccuDraw's X-axis then press **<Enter>** on the keyboard.

This **smartlocks** the **AccuDraw** axis so that you can only move in the horizontal direction.

5. **<D>** on the rural section centerline as shown for the move to point.





The two sections are now aligned at the centerlines.

- 6. Fit the view.
- 7. Save Settings.
- 8. Exit MicroStation.

# LAB 16 - Create a Bridge General Layout Sheet at Different Scales

In this exercise, you'll create a General Layout sheet using the bridge graphics drawn earlier. The exercise will demonstrate how to create a sheet with graphics at different scales.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Place a border at a 40-scale.
- Create saved views in the model file for referencing to the sheet.
- Reference plan graphics coincident-world at 1:1
- Reference saved-view section and detail graphics at different scales on the same sheet

# Lab 16.1 - Setup Bridge Model File

# Open the bridge model file for plan

- 1. Start MicroStation.
- 2. Open the file CU12345BRDG_Model.dgn in the project's \Bridge \Working folder.

The blank bridge model file opens.

# **Reference the Design Model file**

- 1. Open Level Display and turn on the BRDG_TOOLS_Outline-Bridge level.
- 2. **Fit** the view.



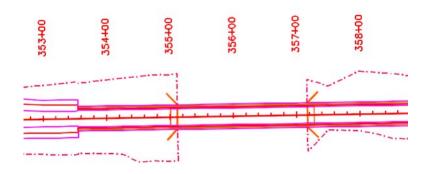
The proposed outline graphics for the bridge have been already created in plan view.

 Attach the 12345DES_Model.dgn from the project's \Design\Drawings\Reference_Files folder as shown. Attach Coincident-World at a Nesting Depth of 1. Do not attach raster references.

File Name: 1234	45DES Model.dgn
-	rawings\Reference Files\12345DES Model.dgn
Model: CDO	
Logical Name: Desi	
Description: Desi	gn Plan
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views	
Named Fences (no	ne)
Detail Scale: Scale (Master:Ref):	
Jogie (Master. Ner).	
Named Group:	<b></b>
Revision:	<b></b>
Le <u>v</u> el:	<b></b>
Nested Attachments:	Live Nesting   Depth: 1
Display Overrides:	Allow
Ne <u>w</u> Level Display:	Use MS_REF_NEWLEVELD+
Global LineStyle Scale:	Master
Synchronize v	with Saved View
Toggles	
	2 💦 🔁 🛄 🎢 🌛 < 🏢 🔊 🖓 🖉 🔛
Drawing Title	
Create	
Name:	Drawing
Humo.	
	OK Cancel

The design model is attached coincident to the proposed bridge graphics. A nested depth of 1 also references the Survey/Topo file (currently the Survey/Topo display is off). You will later reference the bridge plan to a sheet file.

4. **Zoom out** as shown.



5. Save Settings.

#### Move the Bridge Model to the Reference_Files folder

Since the work in the model file is complete, move from the **Working** folder to the **Reference_Files** folder so that other groups can reference, if needed.

- 1. Select File > Save As...
- 2. Set the directory to C:\Projects\12345\Bridge\Drawings\Reference_Files
- 3. Remove the CU (CDOT User) initial prefix and rename the file to **12345BRDG_Model.dgn.**

**Note:** Your initials are removed from the file when it is ready to transfer to the **Reference_Files** folder.

😤 Save As - C:\Pr	rojects\12345\Brid	lge\Drawings\Reference_Files\			×
Save in:	🕌 Reference_Fil	es 🔻	G 🤌 📂 🛄 🗸	۲	3D - V8 DGN
Ca	Name	*	Date modified	Туре	
	📕 12345BRDG_	Model.dgn	11/2/2010 1:02 PM	MicroStation V8 X.	
Recent Places	🖊 12345BRDG_	Prof.dgn	11/20/2007 7:45 AM	MicroStation V8 X.	
Desktop Libraries Computer					
Network	•			- F	
	File name:	12345BRDG_Model.dgn	•	Save	
	Save as type:	MicroStation V8 DGN Files (*.dgn)		Cancel	
				Options	

- **Note:** The project template delivers standard dgn's for model and sheet files as starter files. You may be prompted to confirm saving over an existing file. Please use caution when performing these tasks as you could lose data. Be sure the files are empty or you are working with the latest files.
- 4. Select **OK** to save the file.
- 5. Select File > Close to return to the MicroStation Manager.
- 6. In the MicroStation Manager, verify your 12345BRDG_Model.dgn file was copied to Reference_Files folder.

Save in:	🔒 Reference	Files	• 🗿 🗊 🗁 🛄 •	۲	3D - V8 DGf
e.	Name	*	Date modified	Туре	
Recent Places	A 12345BRD	G_Model.dgn	11/2/2010 1:02 PM	MicroStation V8 X.	
Desktop Desktop Libraries Computer					
Network	•			· ·	
THE WORK	File name:	123458RDG_Model.dgn	•	Save	

7. Change the directory to **\Bridge\Working**.

8. Select the **CU12345BRDG_Model.dgn** from the **Working** folder. *Right* click on the file and select **Delete**.

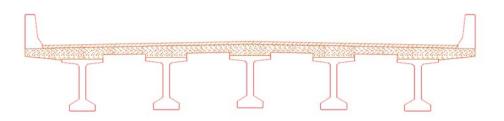
😤 File Open - C:\	Projects\12345\B	ridge\Working\					<b>×</b>
Look in:	\mu Working		•	G 🤌 📂 🛄 -	1 🖻 🗈		3D - V8 DGN
Recent Places	Name		Select Open Scan for V Open with	h	Type MicroStat licroStat	11.11	
Libraries Computer			Send to Cut Copy	revious versions	•		
Network	File name:	CU12345BRDG	Create sh Delete	ortcut	pen	User:	CDOT User 💌
	Files of type:	CAD Files (*.dgn;* Open as read-c	Rename Propertie	5	incel	Project: Interface:	

*Note:* Make sure you select the BRDG_Model file and *not* the BRDG_Detail file.

9. Select **Yes** to delete the working file if prompted to confirm deleting an existing file.

#### Open the bridge model file for section and details

- 1. Open the CU12345BRDG_Detail.dgn file from the C:\Projects\12345\Bridge\Working folder.
  - a. Create Saved Views
- 1. **Fit** the view.
- 2. Make sure that only the section graphics are showing in the view. If not, **Window** around the bridge section. Be sure that the entire section encompasses the view and no other graphics are shown in the view.

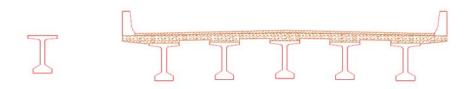


- 3. Save the view by keying in *sv=bridge section*
- 4. When prompted, **<D>** to in the view to save it.

5. Select **Utilities > Saved Views** to open the **Saved Views** dialog box and verify that the view was saved.

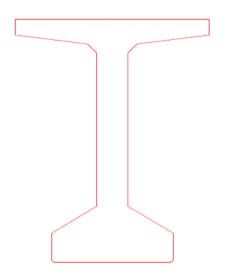
🛃 Save	d View:	s - View	1				23
E Act	ive File	- ^C	<b>5</b>	×	<b>e X</b>	p k	$\triangleright$
Туре	Show	Status	Name	^	Description		2
			bridge	section			
			111				•

- 6. Make sure the Graphic Group lock is turned off.
- 7. Select the **Copy** command and copy one of the BT 54 girder cells to the approximate location shown (outside of the section saved view).



This will be used as a reference on your details sheet.

8. **Window** around the single girder you just copied to create a saved view for the girder detail. Make sure only the girder is shown in the view.



9. Key in *sv=bridge rebar detail* and *<D>* in the view to save.

**Note:** You can either use the **sv**= keyin or the dialog box option to create saved views.

Saved Views - View	1	
🖺 Active File 🔻	🖫 🎗   🚰 ≻	K 🤌 🗣 🖒
Type Show Status	Name 🔷 De	scription
S (2)	bridge rebar detail	
	bridge section	
	III	4

- 10. **Fit** the view.
- 11. Save Settings.

#### Move the model file to the Reference_Files folder

You're finished working in this bridge model file, so move it to the Reference_Files folder.

- 1. Select File > Save As...
- 2. Set the directory to C:\Projects\12345\Bridge\Drawings\Reference_Files
- 3. Remove the CU (CDOT User) initial prefix and rename the file to **12345BRDG_Detail.dgn.**

Save in:	light Reference_Files	•	G 🏚 📂 🛄 🗸	*	
(Ang	Name	*	Date modified	Туре	
-	📕 12345BRDG_Mode	.dgn	11/2/2010 1:02 PM	MicroStation V8 X.	
ecent Places	🕌 12345BRDG_Prof.d	gn	11/20/2007 7:45 AM	MicroStation V8 X.	
Desktop					
Æ			2		
Libraries					
					J
Computer					
Network	•	III		•	
	File name: 1234	5BRDG_Detail.dgn	-	Save	
	Save as type: Micro	Station V8 DGN Files (*.dgn)	•	Cancel	
				Options	

- 4. Select **Save** to save the file.
- 5. Select File > Close to return to the MicroStation Manager.

- 6. In the MicroStation Manager, verify your 12345BRDG_Detail.dgn file was copied to Reference_Files folder.
- 7. Change the directory to the **\Bridge\Working** folder. Right click on the file and select **Delete** to delete the **CU12345BRDG_Detail.dgn** file.

😤 File Open - C:	\Projects\12345\B	ridge\Working\					x
Look in:	\mu Working		•	G 🌶 📂 🛄 -	D 🛛 🗈	3D - V8 DGN	
Ca.	Name	*		Date modified	Туре		
	🕌 CU12345BRI			11/3/2010 2:59 PM	MicroStat		
Recent Places	K CU12345Brid	dgeModel01.dgn		11/3/2010 2:59 PM	MicroStat		
		Delete Fi	le				
Desktop			Are you su	re you want to move t	his file to the Recy	rcle Bin?	
					5BRDG_Detail.dgn licroStation V8 XM	Edition (Windows XP)	
Libraries				Size: 39.0	0 KB		
				J Date mo	odified: 11/3/2010	2:59 PM	
Computer							
	•	_			Yes	No	
Network	File name:	CU12345					-
	Files of type:	CAD Files (*.dgn;*.dw	ıg;*.dxf)	<b>•</b> ]	Cancel	Project: 12345	-
		Open as read-only			Options	Interface: CDOT	

8. Select **Yes** to delete the working file if prompted to confirm deleting an existing file.

#### Lab 16.2 - Create the Sheet File

Create a new sheet file from a seed file.

- 1. In the MicroStation Manager, set the folder location to C:\Projects\12345\Bridge\Drawings.
- 2. Select the New File icon from the MicroStation Manager.



- 3. In the Seed File section, choose the Browse button.
- 4. Select the seed file **3D-Seed_CDOT.dgn** and select **OK**.

Name Date modified Type Size   Recent Places Reference_Files 11/3/2010 3:06 PM File folder   Desktop Tabs 11/21/2007 1:38 PM File folder   Desktop Desktop File folder File folder   Desktop Desktop File folder File folder   Network File name: 1245BRDG_Plan01.dgn Save	😤 New - C:\Proje	ects\12345\Bridge	e\Drawings\				X
Recent Places   Desktop   Libraries   Network     File name:     12345BRDG_Plan01.dgn     Save	Save in:	📗 Drawings		- 🗿 🤌 📂 🎞 -			S 🖲
Recent Places       Tabs       11/21/2007 1:38 PM       File folder         Desktop       Image: Computer Co	æ	Name	*	Date modified	Туре	Size	
Libraries Computer Network File name: 12345BRDG_Plan01.dgn	Recent Places	-	iles				
Libraries Computer Network File name: 12345BRDG_Plan01.dgn	Desktop						
Network File name: 12345BRDG_Plan01.dgn							
File name: 12345BRDG_Plan01.dgn	Computer						
File name: 12345BRDG_Plan01.dgn							
	Network	File name:	12345BRDG_Plan01.dgn			-	Save
Save as type. (Microstation DGN Hies ( .dgn)		Save as type:	MicroStation DGN Files (*.dgn)				
Seed: C:\Workspace\Workspace-CDOT_V8\\Standards-Global\Micro Station\seed\3D-Seed_CDOT.dgn Brows		Seed:	C:\Workspace\Workspace-CDO	DT_V8i\Standards-Global\Mic	croStation\seed\3D-Seed	_CDOT.dgn	Browse

5. In the Files field, key in the name **12345BRDG_Plan01.dgn.** 

6. Select Save.

The file appears in the folder list.

7. Select **Open** to open the file.

The empty file is created with all of the Bridge default settings from the seed file.

# **Reference the Plan graphics**

- 1. Reference the **12345BRDG_Model.dgn** file from the **\Bridge\Drawings\Reference_Files** folder.
- 2. In the Attachment Settings box, set the options as shown and select OK.

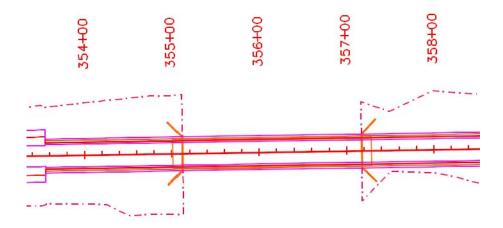
File Name: 123	45BRDG_Model.dgn
Full Path:\E	)rawings\Reference_Files\12345BRDG_Model.dgn
Model: CDC	T Default ▼
Logical Name: Bridg	ge Plan
Description: Bridge	ge Plan
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views (none	
Named Fences (no	ine)
Detail Scale	
Sc <u>al</u> e (Master:Ref)	: 1.000000 : 1.000000
Named Group	· •
Revision	· · · · · · · · · · · · · · · · · · ·
Revision	
Le <u>v</u> el	· · · · · · · · · · · · · · · · · · ·
Le <u>v</u> el <u>N</u> ested Attachments	· : Live Nesting ▼ Dept <u>h</u> : 1
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Le <u>v</u> el <u>N</u> ested Attachments Display Overrides Ne <u>w</u> Level Display Global LineStyle Scale	: : [Live Nesting    Depth: 1 : [Allow : [Use MS_REF_NEWLEVELDI#
Level Nested Attachments Display Overrides New Level Display Global LineStyle Scale	: : Live Nesting ▼ Depth: 1 : Allow ▼ : Use MS_REF_NEWLEVELDH : Master ▼ with Saved View
Level Nested Attachments Display Overrides New Level Display Global LineStyle Scale	: : Live Nesting ▼ Depth: 1 : Allow ▼ : Use MS_REF_NEWLEVELDH : Master ▼ with Saved View
Level Nested Attachments Display Overrides New Level Display Global LineStyle Scale	Image:
Le <u>vel</u> <u>N</u> ested Attachments Display Overrides Ne <u>w</u> Level Display Global LineStyle Scale Synchronize   Toggles	: : Live Nesting ▼ Depth: 1 : Allow ▼ : Use MS_REF_NEWLEVELDH : Master ▼ with Saved View
Leyel <u>N</u> ested Attachments Display Ovenides New Level Display Global LineStyle Scale Synchronize Toggles Toggles Create	: : Live Nesting ▼ Depth: 1 : Allow ▼ : Use MS_REF_NEWLEVELDH : Master ▼ with Saved View

The bridge plan and the nested design reference are attached to the sheet file. Since you attached at a 1:1 scale and Coincident-World, all of the bridge plan graphics are in their true coordinate locations and actual size.

3. **Fit** the view.



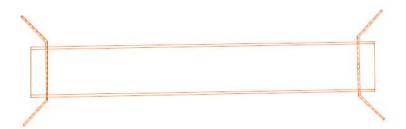
4. Window in on the bridge area as shown.



5. Toggle off the display of the Design reference.

🗈 References (1 of 1 unique, 0 displayed	d)	1.00	
<u>T</u> ools <u>S</u> ettings			
📴 - 🖹 🖗 👌 🛒 🏟 🆃	2 7 7 🗈 🕫 ቸ 🛈 🛪	Hilite Mode: Boundaries 👻	
Hierarchy	Slot 🏲 🛅 File Name ^	Model Description	Logical 💽 🎝 🦎 🛛
⊕- <u>v8</u> 12345BRDG_Plan01.dgn	1 12345BRDG_Model.dgn	CDOT Default Bridge Plan	Brid 🗸 🗸
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			<b>•</b>
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6. Only the graphics from the Bridge model are shown.



#### **Place the border**

With the bridge plan graphics in place, you can now place the border around them.

- 1. Select **Cells** from the **Primary** toolbar.
- Select File > Attach File and attach the 12345DesignPlanBorder cell library from the C:\Projects\12345\Miscellaneous folder.
- 3. Select the **Placement** option for this cell.

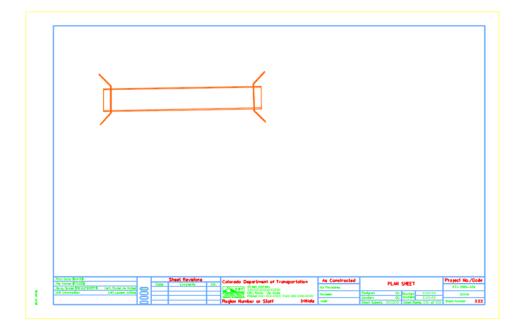
Cell Library: [\12345Desig	gnPlanBorder.cel]			- • ×
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4. Select the **Place Active Cell** command and place the border at a 40 scale.

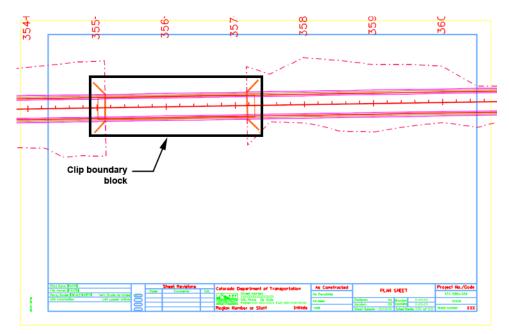
V Place Active Cell				
Active Cell:	Design Plan Border			
Active Angle:	00°00'00.00''			
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Y Scale:	100.000000 – 🖨 📶			
Z Scale:	100.000000			
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The border scale is the same as the plot scale of 1"=40'.

5. **<D>** to place the border in the location shown. Be sure to position the border so that the bridge plan is in the upper left corner.



6. Turn on the display of the design reference.

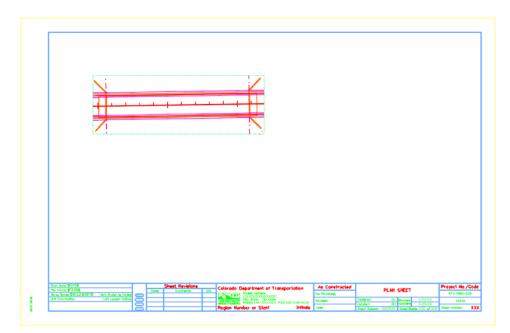


- 7. On the CDOT Menu Explorer, select Drafting.
  - Select the **Border** category.
  - Select the **Clip Boundary** item.
- 8. Select the **Place Block** command and place the clip boundary block as shown.

9. From the **Reference** dialog box, select the Bridge model reference and then select **Tools** > **Clip Boundary**.

🗈 References (1 of 1 unique, 0 displaye	d)		
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10. **<D>** on the clip boundary to clip the design model reference.



The bridge plan is now place inside the border at the proper coordinates. Design graphics levels can be turned on/off as needed.

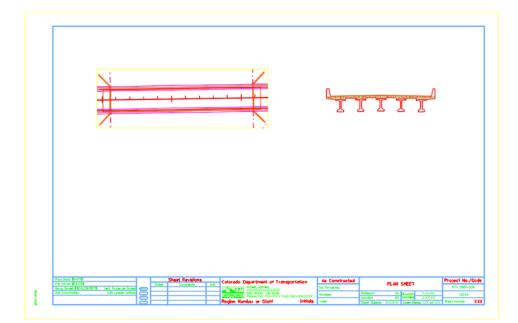
### **Reference additional graphics at various scales**

Reference the typical section at a scale of 1'' = 10'

- 1. From the References dialog, attach the file **12345BRDG_Detail.dgn** from the **\Bridge\Drawings\Reference_Files** folder.
- 2. In the Attachment Settings box:

Reference Attachment S	Settings for 12345BRDG_Detail.dgn				
File Name: 1234	5BRDG_Detail.dgn awings\Reference_Files\12345BRDG_Detail.dgn T Default				
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bridge rebar deta Named Fences (nor					
	Detail Scale: CUSTOM				
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Display Overrides:	Allow				
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Global LineStyle Scale: Master					
Synchronize with Saved View					
Toggles  Taggles  Trawing Title  Create Name: bridge section					
	<u>OK</u> Cancel				

- Select the saved view **Bridge Section** (the logical name will update to the saved view name).
- Set the **Scale** to **40:10**
- **Note:** When working with multiple scales, always key in the border scale in the first field (Master) and the detail scale in the second field (Ref). MicroStation will calculate the scale for your, or you could calculate it yourself and enter **4**:**1**.
- Set the other options as shown.



3. Select **OK** and **<D>** to position the saved view reference in the location shown.

4. Reference the **12345BRDG_Detail.dgn** again and repeat the above process and reference the bridge rebar detail at a scale of 1"=5'.

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*Note:* You'll annotate and dimension this sheet in the next lab.

- 5. **Fit** the view.
- 6. Save Settings.
- 7. Exit MicroStation.

# LAB 17 - Create a General Notes Sheet

The **12345DES_GenNote.dgn** has been created in the project's **\Design\Drawings** folder through the create project utility. This sheet file currently is linked to a generic notes doc file in the CDOT workspace. However, the sheet files should reference the project-specific notes file, **12345GemeralNote.dgn** located in the **\Design\Drawings\Reference Files** folder. You must first update the references in the sheet file to point to the project notes, and then edit the project notes file to be project-specific.

*Note:* This process is the same for any specialty group.

#### Chapter Objectives:

After completing this exercise you will know how to:

- Open a project notes sheet file.
- Update the Word document link to point to the 12345 project directory.
- Edit the project-specific general notes Word file.
- Re-link the General Notes Word file to the Notes sheet file.

# Lab 17.1 - Create Project General Notes Sheet

# **Updating Links**

1. Start MicroStation and open the file **12345DES_GenNote##.dgn** from the **C:\Projects\12345\Design\Drawings** folder.

THESE GENERAL NOTES SHEETS ARE LINKED TO A DOCUMENT FILE (DES_GROUNDO.DOC). TO EDIT, DOUBLE CLICK ON GRAPHIC. JF YOU EDIT THE FILE SHO RE-LINK THE FILES. TO LINK FILES, FIRST DELETE LINK, THE COPY INFORMATION DUT OF DOCUMENT FILE (DES_GROUNDO.DOC). IN MICROSTATION GO TO EDIT/PASTE SPECIAL, SELECT THE LINKED MICROSOFT OFFIC COOCUMENT, SLECCY MEHADE TO BE BY SIZE, FILL IN 18, CENTER AND PLANE DO TO MEHADE TO BE



This file was automatically generated by the create project utility program and contains links to a General Notes Word document in the generic project template folder. You will need to update these links to the General Notes Word document in the project folder.

2. Select Edit > Links.

3. Highlight the first link in the list and select **Change Source**.

Links			×
Links:	Туре	Update	Close
	DES_GenNote.doclOLE_Link1 Document DES_GenNote.doclOLE_Link2 Document	Manual Manual	Update Now Open Source Change Source Break Link
Source: Type: Update:	C:\\Tabs\12345DES_GenNote.doc Microsoft Office Word 97 - 2003 Docu O Automatic O Mar	ment	

 In the Change Source dialog box, set the Look in folder to C:\Projects\12345\Design\Drawings\Tabs and select the file 12345DES_GenNote.doc.

4	Change Source								×
	Look in:	퉬 Tabs			•	G 🤌	⊳ 🛄 🔁		
	Ca.	Name	Date modif	Туре	Size		Tags		
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	Desktop CDOT_User		TabEarthwork.x TabMisc.xls	Is					
	Network	File name:	12345DES_0	GenNote.doc			•	Open	
		Files of type:	All Files (*.*)				•	Cancel	
	Item Name:	OLE_LINK1							

- 5. Select **Open** to update the link.
- 6. Repeat this process for the second link.

Links				×
	ES_GenNote.doc!OLE_ ES_GenNote.doc!OLE_ ES_GenNote.doc!OLE_		Update Manual Manual	Close Update Now Open Source Change Source Break Link
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7. Close the Links dialog box.

#### 8. Save Settings (File > Save Settings).

The General Notes sheet file is now linked to the GenNotes.doc file in the project-specific folder. You can now edit the Word file for your project-specific requirements.

### **Editing the Notes**

1. Double click on the first notes link (left sheet).

This opens Microsoft Word and the GenNotes.doc file.

```
[Notes within [ ] are designer directions - delete all directions prior to final plan
submittal. All XXX shall be filled in by the designer during design phase. If the note does not
apply delete it.]
                                                                                                                                                     Prior to placing bituminous 
be paid for separately, but
         For preliminary plan quantities of pavement materials, the following rates of application
                                                                                                                                                     The Contractor shall coordi
        were used:
                                                                                                                                                     existing grades is obtained
unless otherwise approved b
             Overlay of planed areas sha
otherwise approved by the E
                                                                                                                                                     The pavement shall be cut to
                                                                                                                                                       for separately, but shall b
                                                                                                                                                     It is estimated that the ol
        Diluted emulsified asphalt for tack coat shall consist of 1 part emulsified asphalt and 1
                                                                                                                                                     Moisture-density control wi
        part water.
        Asphalt rejuvenating agent shall be diluted in accordance with manufacture's recommendations. For estimating purposes, [XXX] gallons of asphalt rejuvenating agent to one
                                                                                                                                                      Depth of moisture-density c
                                                                                                                                                            Eull depth of embankmen
Top IXXI Feet of these.
Full depth of embankmen
Full depth of all emban
        gallon of water was used.
        It should be noted that the use of asphalt rejuvenating agent is dependent on results of
                                                                                                                                                            Bases of cuts and fills
Bases of fills [XX] Fee
Full depth of spur dike
        tests performed after completion of surfacing and may not be required by the Engineer.
        Rejuvenating agent, if required, will be applied as seal coat at the time of construction. Rates of application shall be as determined by the Engineer at the time of application.
                                                                                                                                                            Full depth of embankmen
        Diluted [XXX] shall be used as a dust palliative where required and shall consist of a dilution of [XXX] and water, the portions of which shall be [XXX] part(s) water and [XXX] part [XXX], based on volume measurement. Locations shall be as directed by the Engineer.
                                                                                                                                                     Excavation required for com
that operation and will not
                                                                                                                                                      The minimum thickness of to required based on the avera
        Water shall be used as a dust palliative where required. Locations shall be as directed by
        the Engineer.
                                                                                                                                                      Type of compaction for this
        Magnesium Chloride shall be used as a dust palliative where required. Locations directed. It is estimated that [XXX] gallons will be required on this project.
                                                                                                         Locations shall be as
                                                                                                                                                      Concrete pipe joint fastene
                                                                                                                                                            All concrete culvert in All concrete culvert in
        The following shall be furnished with each bituminous naver:

    A ski type device at least 30 Feet in length.
    Short ski or shoe.

                                                                                                                                                       Guard posts, delineators an
              3. [XXX] Feet of control line and stakes.
                                                                                                                                                      Mile posts will be adjusted
        Any layer of bituminous pavement that is to have a succeeding layer placed thereon shall be
                                                                                                                                                      It is estimated that [XX] g
```

- 2. Read the first instructional paragraph (red text) and then delete it.
- 3. Delete the following text:

Prime Coat (MC-70) [XXXX]@ .XX Gals./Sq. Yd.
Seal Coat (RC[XX]) Diluted Emulsified Asphalt [XXXX]@ XX Gals./Sq. Yd. (Diluted)
Cover Coat Material [XXXX]@ XX Lbs./Sq. Yd.
Tack Coat (AC[XX]@XX Lbs./Sq. Yd.
Asphalt Rejuvenating Agent [XXXX]@ XX Gals./Sq. Yd.
Edit the following text to read as follows:
Tack Coat Diluted Emulsified Asphalt@ 0.1 Gals./Sq. Yd. (Diluted)

4.

Bituminous Pavement	@ 110 Lbs./Sq. Yd./Inch
Aggregate Base Course (Class 6)	@ 133 Lbs/Cu Yd

5. At the bottom of the first column, add a blank line to place the paragraph beginning "*The Contractor shall coordinate the shouldering*..." at the top of the next column.

Asphalt joints shall fall on lines, shoulders lines or median lines, except where stated in the plans.	It is estimated that [XX] gallons of pavement mar follows:
All travel lanes are subject to smoothness incentive/disincentive payments. Pavement smoothness incentive/disincentive shall be based on Inches/Mile.	White
Road approaches which require bituminous pavement shall be primed and an [XX] Inches thickness of pavement (and [XX] Inches thickness of ABC) placed as follows:	Final signing and striping will be done by state It is estimated that [XX] hours of blading with a
Public approaches and entrances to building or residences shall be paved 50 Feet out from the edge of shoulder or to the Right-Of-Way line, whichever is less. Field entrances shall	horsepower range will be required as directed by It is estimated that [XX] bours of dozing with a
be paved 4 Feet out from the edge of shoulder. ' The Contractor shall not park any vehicles or equipment in. or disturb any areas not	horsepower range will be required as directed by It is estimated that [XX] mile posts will be adju
approved by the Engineer.	Reset Marker.
Willings shall become the property of the State. The Contractor shall supply all necessary equipment to haul this material to a site within the limits of the	It is estimated that [XX] days of Traffic Contro] It is estimated that [XX] days of Traffic Contro]
project as direct by the Engineer. Prior to placing bituminous pavement, the paved surface	It is estimated that $[XX]$ hours of Flagging will
shall be swept and cleaned. This will not be paid for separately, but shall be included in the cost of the Hot Mix Asphalt Pavement item.	It is estimated that [XX] Sanitary Facility will It is estimated that [XX] Public Information Serv
The Contractor shall coordinate the shouldering operation such that full compliance to the existing	It is estimated that [XX] Mobile Profilegraph Opf
operation such that full compliance to the existing It is estimated that [XX] Mobile Pavement Marking Zone will be required on this project.	,
It is estimated that $[XX]$ hours will be required for potholing. The Contractor shall be responsible for contacting and coordinating with the appropriate utility representatives to be onsite during potholing and shall likewise be responsible for determining the type and	

reportable for contacting and contracting with the apploprise during representatives be onsite during potholing and shall likewise be responsible for determining the type and location of underground utilities as maybe necessary to avoid damage thereto. The Contractor shall refer to the utility specification for additional requirements.

It is estimated that [XX] tons of Hot Mix Asphalt Pavement (patching) will be required on this project.

6. Look at the top of the next page and note that your edits have adjusted the text wrapping. The next page now starts with the note:

It is estimated that [XX] Mobile Pavement Marking Zone will be required on this project.

Millings shall become the property of the State. The Contractor shall supply all necessary equipment to haul this material to a site within the limits of the project as direct by the Engineer.	It is estimated that [XX] days of Traffic Contro: It is estimated that [XX] days of Traffic Contro:
Prior to placing bituminous pavement, the paved surface	It is estimated that $[XX]$ hours of Flagging will
shall be swept and cleaned. This will not be paid for separately, but shall be included in the cost of the	It is estimated that $[XX]$ Sanitary Facility will
Hot Mix Asphalt Pavement item.	It is estimated that $[XX]$ Public Information Serv
	It is estimated that [XX] Mobile Profilegraph Op(

It is estimated that [XX] Mobile Pavement Marking Zone will be required on this project. It is estimated that [XX] hours will be required for potholing. The Contractor shall be responsible for contacting and coordinating with the appropriate utility representatives to be onsite during potholing and shall likewise be responsible for determining the type and location of underground utilities as maybe necessary to avoid damage thereto. The Contractor shall refer to the utility specification for additional requirements.

Contractor shall refer to the utility specification for additional requirements. It is estimated that [XX] tons of Hot Mix Asphalt Pavement (patching) will be required on this project. No Right-Of-Way acquisition will be needed for this project. All work will be completed entirely within the existing Right-Of-Way.

- 7. Review the text to make sure the edits are correct. If not, edit the text again until you're satisfied.
- 8. In Word, select File > Exit and select Yes when prompted to save changes.

You are returned to the General Notes sheet in MicroStation.

#### Review the changes in the sheet file

1. Zoom in on the notes on the first sheet and note your text edits have been updated in the DGN file.

GENERAL N	0755
For preliminary plan quantities of pavement materials, the following rates of application were used:	The contractor shall coordinate the shouldering operation such that full compliance to the existing grades is obtained on a daily basis following the paving operation for the affected area unless otherwise approved by the Engineer.
Tack Coat Diluted Emulsfiled Asphalt	Overlay of planed areas shall commence within 5 working days following the planning unless otherwise approved by the Engineer.
Diluted emulsified asphalt for tack coat shall consist of 1 part emulsified asphalt and 1 part water.	The pavement shall be cut to a neat line [XXX] as directed by the Engineer. This will not be paid for separately, but shall be included in the Not Mix Asphalt Pavement item.
Asphalt rejuvenating agent shall be diluted in accordance with manufacture's recommendations. For estimating purposes, [XXX] gallons of asphalt rejuvenating agent to one gallon of water was used.	It is estimated that the old road is to be obliterated at the following locations: $[XX + XX]$ Moisture-density control will be required for the full depth of those embankments on this project.
It should be noted that the use of asphalt rejuvenating agent is dependent on results of tests performed after completion of surfacing and may not be required by the Engineer.	Depth of moisture-density control for this project shall be as follows: Full depth of embankments within 100 Feet of bridge abutents. Too [XX] Feet of these embankments which [XX] Feet or more in height.
Rejuvenating agent, if required, will be applied as seal coat at the time of construction. Rates of application shall be as determined by the Engineer at the time of application.	full depth of embandments which are less than [XX] feet in height. Full depth of all embandments: Bases of cuts and fills [XX] Feet.
Diluted [XXX] shall be used as a dust pallistive where required and shall consist of a dilution of [XXX] and water, the portions of which shall be [XXX] part(s) water and [XXX] part [XXX], based on volume measurement. Locations shall be as directed by the Engineer.	Dases of fills [XX] feet or less in height, [XX] feet. Full depth of spur dikes [check with bridge section]. Full depth of embannent sections used for diches and channel changes.
Mater shall be used as a dust palliative where required. Locations shall be as directed by the Engineer.	Excavation required for compaction of bases of cuts and fills will be considered as subsidiary to that operation and will not be paid for separately.
Magnesium Chloride shall be used as a dust palliative where required. Locations shall be as directed. It is estimated that [2003] gallons will be required on this project.	The minimum thickness of topsoil shall be $[X0X]$ Inches. It is estimated that $[XX]$ Cu. Yds. will be required based on the average thickness of $[XX]$ Inches.
The following shall be furnished with each bituminous paver: 1. A ski type device at least 30 Feet in length. 2. Short ski or shoe.	Type of compaction for this project will be AASMIO T-[000]. Concrete pipe joint fasteners as shown on H-Standard are required on:
<ol> <li>[X00] Feet of control line and stakes.</li> <li>Any layer of bituminous pavement that is to have a succeeding layer placed thereon shall be</li> </ol>	All concrete culvert installations excluding side drains. All concrete culvert installations located at stations [XXX+XX].
completed full width before succeeding layer is placed.	Guard posts, delineators and [XXX] will be removed by State forces at no cost to the project. Mile posts will be adjusted or reset by State forces at no cost to the project.
Asphalt joints shall fall on lines, shoulders lines or median lines, except where stated in the plans.	It is estimated that [XX] gallons of pavement marking paint will be required on this project as follows:
All travel lanes are subject to smoothness incentive/disincentive payments. Pavement smoothness incentive/disincentive shall be based on Inches/Mile.	white[XX] gallons Yellow[XX] gallons
Road approaches which require bituminous pavement shall be primed and an [XX] Inches thickness of pavement (and [XX] Inches thickness of ABC) placed as follows:	Final signing and striping will be done by state forces at no cost to the project.
	It is estimated that $[XX]$ hours of blading with a motor grader in the $[XX]$ to $[XX]$ flywheel

2. Zoom in on the notes on the second sheet (right side) and notice that your edits have *not* been updated in the file.

It is estimated that  $\ensuremath{\left[\mathsf{XX}\right]}$  days of Traffic Control Inspection will be required on this project.

It is estimated that [XX] hours of Flagging will be required on this project.

It is estimated that [XX] Sanitary Facility will be required on this project.

It is estimated that [XX] Public Information Services will be required on this project.

It is estimated that  $\ensuremath{\left[\mathsf{XX}\right]}$  Mobile Profilograph Operation Zone will be required on this project.

It is estimated that [XX] Mobile Pavement Marking Zone will be required on this project.

It is estimated that [XX] hours will be required for potholing. The Contractor shall be responsible for contacting and coordinating with the appropriate utility representatives to be onsite during potholing and shall likewise be responsible for determining the type and location of underground utilities as maybe necessary to avoid damage thereto. The Contractor shall refer to the utility specification for additional requirements.

It is estimated that  $\ensuremath{\left[XX\right]}$  tons of Hot Mix Asphalt Pavement (patching) will be required on this project.

No Right-Of-Way acquisition will be needed for this project. All work will be completed

**Note:** If you make edits that change the wrapping of text between pages in the Word document, you must re-link the file for the edits to update in the MicroStation DGN file.

#### **Re-link the Word document**

1. Use the **Element Selection** tool to select the Word document link on the second (right-side) sheet.

#### 2. Select Delete.

IF YOU GOLT THE FILE SHEETS ARE LINKED TO A DOCUMENT FILE (QES GONNOTO DOC). TO EDIT, DOUBLE CLICK ON GRAPHIC. RE-LINK THE FILES! SPECIAL, SELEST THE LINKED MICROSOFT OFFIC DOCUMENTS, SELECT METHOD TO BE BY SIZE, FILL IN 18, CENTER AND PLACE DOCUMENT.

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- 3. Double-click on the Word document link on the first sheet to open the GenNotes.doc file.
- 4. Highlight all of the text on the second page and select Edit > Copy in Word.

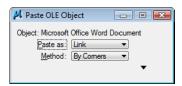
Prior to placing bituminous pavement, the paved surface shall be swept and cleaned. This will not be paid for	It is est
separately, but shall be included in the cost of the	It is est
Hot Mix Asphalt Pavement item.	It is est
	It is est
It is estimated that [XX] Mobile Pavement Marking Zone will be required on this project.	
It is estimated that [XX] hours will be required for potholing. The Contractor shall be responsible for contacting and coordinating with the appropriate utility representatives to be onsite during potholing and shall likewise be responsible for determining the type and location of underground utilities as maybe necessary to avoid damage thereto. The Contractor shall refer to the utility specification for additional requirements.	
It is estimated that [XX] tons of Hot Mix Asphalt Pavement (patching) will be required on this project.	
No Right-Of-Way acquisition will be needed for this project. All work will be completed entirely within the existing Right-Of-Way.	
The following clear zone criteria shall be used during this project: [XXXXXXXXXXXXXXX]	
where new pavement is to abut existing pavement, the existing pavement shall be removed to a neat vertical line using a cutting saw or other method as approved by the Engineer. Saw cutting asphalt will not be paid for separately, but shall be included in the cost of Removal of Asphalt Mat.	
All surveying necessary to complete the project will not be paid for separately, but shall be included in the work.	
The Contractor shall protect all existing survey <u>monumentation</u> designated to remain from damage during construction operations. Any monuments disturbed by the Contractor that are not designated for relocation, shall be reset at the Contractor's expense. The Contractor and Engineer shall note those monuments in the field prior to construction. See Tabulation of Survey.	
This work shall not be measured and paid for separately, but shall be included in the cost of the work.[Shall only be used when 5% or less, of the estimated cost of the line item makes up the additional work to be included. If the line item involves additional work of more than 5% of the line item price, the additional work shall be broken out into separate line items].	

- 5. *Do not* close Word.
- 6. Switch to the MicroStation application.

7. In MicroStation, select Edit > Paste Special and select the Linked Microsoft Office Word **Document** option and then select **Paste**.

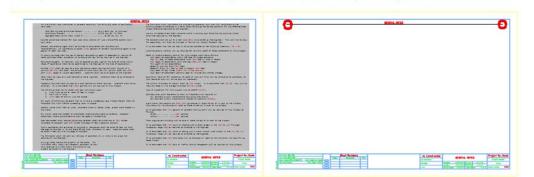
🔑 Paste Special 🛛 💈	x
Data Type	
Picture of Microsoft Office Word Document Embedded Microsoft Office Word Document	
Linked Microsoft Office Word Document	
Hich Text to Design Hile Text To Design File	
Paste Cancel	

8. In the Paste OLE box, set Paste As to Link and Method to By Corners.



9. Snap to the two ends of the top guideline as shown.

THESE GENERAL NOTES SHEETS ARE LINKED TO A DOCUMENT FILE (DES_Geminote.DOC). TO EDIT, DOUBLE CLICK ON GRAPHIC. IF YOU EDIT THE FILE AND INFORMATION WRAPS FROM ONE SHEET TO ANOTHER RE-LINK THE FILES! ID LINK FILES DELETELINK, THEN COPY INFORMATION OUT OF DOCUMENT FILE (DES CENING & DOC). IN MICROSTATION GO ID EDITS SPECIAL, SELECT THE LINKED MICROSOFT OFFIC DOCUMENTS, SELECT METHOD TO BE BY SIZE, FILL IN 18, CENTER AND PLACE DOCUMENT.



THESE GENERAL NOTES SHEETS ARE LINKED TO A DOCUMENT FILE (DES_Geminote.DOC). TO EDIT, DOUBLE CLICK ON GRAPHIC. IF YOU EDIT THE FILE AND INFORMATION WRAPS FROM ONE SHEET TO ANOTHER RE-LINK THE FILES! IBEVIA, SELEST THSI CHKEDE LINKSTHEN GEPY INFORMATION DUT OF DOGUMENT FILEY OSSZC. FILL'IN 18, CENTER AND ALIOE GO. J. GO.



10. Zoom in to review the notes and notice that the link has been updated to reflect your edits.

	GENERAL
It is estimated that $\ensuremath{\left[ XX \right]}$ Mobile Pavement Marking Zone will be required on this projection	ct.
It is estimated that [XX] hours will be required for potholing. The Contractor shall responsible for contacting and coordinating with the appropriate utility representative be onsite during potholing and shall likewise be responsible for determining the type location of underground utilities as maybe necessary to avoid damage thereto. The Contractor shall refer to the utility specification for additional requirements.	ves to
It is estimated that [XX] tons of Hot Mix Asphalt Pavement (patching) will be required this project.	d on
No Right-Of-Way acquisition will be needed for this project. All work will be complet entirely within the existing Right-Of-Way.	ted
The following clear zone criteria shall be used during this project: [XXXXXXXXXXXXXXXX]	
Where new pavement is to abut existing pavement, the existing pavement shall be remove neat vertical line using a cutting saw or other method as approved by the Engineer. S cutting asphalt will not be paid for separately, but shall be included in the cost of Removal of Asphalt Mat.	Saw
All surveying necessary to complete the project will not be paid for separately, but : be included in the work.	shall

- 11. Switch over to the Word document and select File > Exit. If prompted to save the file, select Yes.
- 12. In MicroStation, Fit the view.
- 13. Save Settings.
- 14. Exit MicroStation.

# LAB 18 - Create the Standard Plans List Sheet

The M&S standard sheet is created by downloading the M&S Standards Plan List Index file from the CDOT web site. You can then update the reference in the M&S sheet file to point to this downloaded file.

#### **Chapter Objectives:**

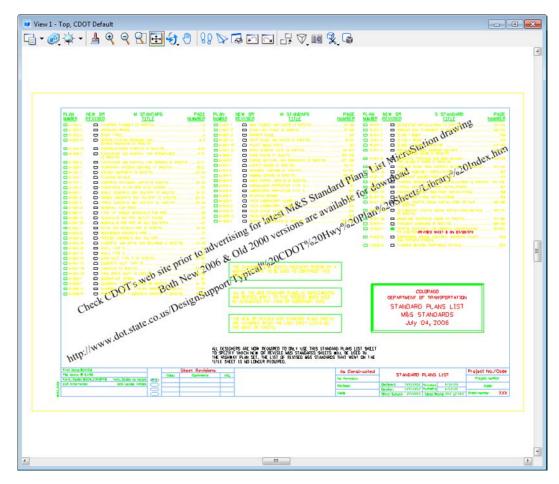
After completing this exercise you will know how to:

- Download the M&S Index file from the CDOT web site.
- Update the M&S sheet file reference to the downloaded file.
- Use the **Create Region** command to update the M&S Index Sheet for the project.

### Lab 18.1 - Create Project Standard Plans List Sheet

## **Open the Sheet File**

1. Start MicroStation and open the **12345DES_StdPlanList.dgn** file from the **C:\Projects\12345\Design\Drawings** folder.



The file opens and contains the border along with the M&S Standards Plan List reference. It also contains the web address to obtain the latest M&S Index file.

2. Select References from the Primary toolbar.

References (1 of 1 unique, 1 displayed)														-	23
<u>T</u> ools <u>S</u> ettings															
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Hierarchy	Slot	P 🚹	File N	Name	^				Model		Description		Logical	٠	2
- 12345DES_StdPlanList.dgn	1		M&S	Standa	ard Pla	ans List	Index.	dgn	CDOT	Default	Global Origin al	ligne		$\checkmark$	$\checkmark$
M&S Standard Plans List Index.dgn															
	4														
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	-				:					Rotation					
	Offset 2	<u>X</u> 0.00	0			<u>Y</u> 0	.000			<u>Z</u> -0.	001				
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	New Le	evel Disp	olav: C	`onfia∖	/ariable	e 🔻	Geore	ferenc	ed: N	0	•				

Note that the **M&S StandardPlansListIndex.dgn** file is already referenced from the project's **\Design\Drawings** folder. It was automatically placed here from the **Create Project Directory** utility.

Note: If you need newer or different version of the M&S Standards, you can download it from the following web address: www.dot.state.co.us/ DesignSupport/. Save the appropriate file to the project's \Design\Drawings folder and then re-attach this reference.

#### Update the M&S Index

1. Turn off the DRAFT_INFO_No-Plot level to turn off the text.

**Note:** Since the text is on a "no plot" level, you don't have to turn off the text. However, it just makes working in the file a bit easier.

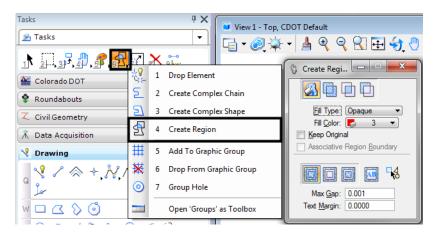
2. Set the active level to **DRAFT_WT-3**.



3. Window in to the top of the sheet as shown.

PLAN <u>NUMBER</u>	NEW OR Revised	M STANDARD <u>TITLE</u>	PAGE <u>NUMBER</u>	PLAN <u>NUMBER</u>
□ M-100-1	STANDARD			□ M-607-1
□ M-203-1	APPROACH			□ M-607-2
□ M-203-2	DITCH TYP			□ M-607-3
□ M-203-11				🗖 M-607-4
				🗖 M-607-10
□ M-203-12	SUPERELEY			M-607-15
□ M-206-1	EXCAVATION (2 SHEETS)			□ M-608-1

4. Select the **Create Region** command from the **Main** task toolbar and set the options as shown.



Note: The Fill Color drop down shows the color number assigned to that level when it is set to By Level. To check if it set to By Level, <D> Fill Color drop down. If the Color field reads "-1", then it is set to By Level.

Create Regi 🗖 🖻 💴	
Ell Type: Opaque  Fill Color:	
Associative	
Max Gap: Text Margin:	

- **Note:** If the Fill Color is set to By Level, the Tool Settings dialog box will not be updated if the active level is changed. However, the color of the new active level will be used when the region is created.
- 5. For the first plan in the list (M-100-1), **<D>** inside the block under the **Plan Number** column.
- 6. **<D>** to accept.

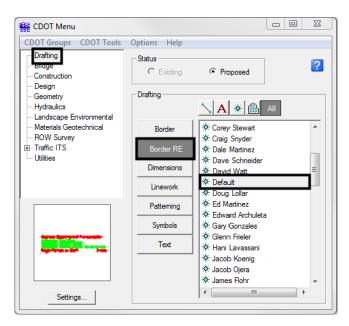
PL AN <u>NUMBER</u>	NEW OR <u>Revised</u>	M STANDARD <u>TITLE</u>	PAGE <u>NUMBER</u>
M-100-1			
□ M-203-1	APPROA		
M-203-2	🗆 DITCH Т		
□ M-203-11			
□ M-203-12	SUPEREI		

The block is filled-in using this tool.

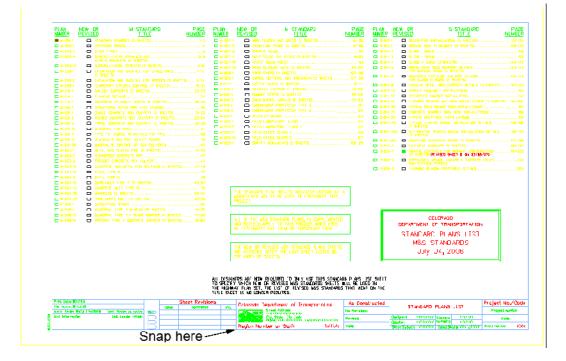
7. Fill in other blocks as desired.

## Fill in the Border Information

1. From the CDOT Menu Explorer, select **Drafting**, then the **Border RE** category and select the **Default** Resident Engineer cell.



- 2. Apply.
- 3. **Snap** to the location shown to place the cell.



- 4. Use the Edit Text command to edit the Project Number and Code as shown.
- 5. Use the **Edit Text** command to place your initials in the **Designer** and **Detailer** blocks.

	Project No./Code					
STANDARD	STANDARD PLANS LIST					
Designer: CL	Structure	X-XX-XX	12345			
Detailer: CU						
Sheet Subset: XXXXXXX	Subset Sh	eets: XXX of XXX	Sheet Number	XXX		

- 6. **Fit** the view.
- 7. Save Settings (File > Save Settings).
- 8. **Exit** MicroStation.

# LAB 19 - Create a Title Sheet

In this lab, you'll learn how to insert a Vicinity Map into the Project Title Sheet.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Open a project Title Sheet.
- Locate a vicinity map.
- Attach a vicinity map as a reference to the Title Sheet.
- Move and Clip the vicinity reference.

### Lab 19.1 - Create Project Title Sheet

#### **Open the Title Sheet file**

1. Start MicroStation and open the file **12345DES_TitleSht.dgn** for the **C:\Projects\12345\Design\Drawings** folder.

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This file was automatically generated by the Create Project Utility program and contains a links to an Excel spreadsheet file in the generic project template folder. You will need to update these links to the **12345DES_TitleSht.xls** file in the project folder.

# **Updating Links**

1. Select Edit > Links.

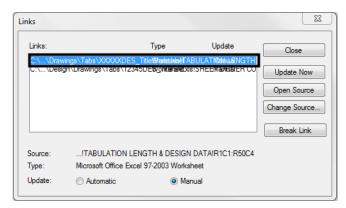
2. Highlight the first link in the list and select **Change Source**.

Links			23
	vings\Tabs\XXXXDE		
Source: Type: Update:		COMPLICATED PF xcel 97-2003 Work	

 In the Change Source dialog box, set the Look in folder to C:\Projects\12345\Design\Drawings\Tabs and select the file 12345DES_TitleSht.xls.

Change Source				2
Look in:	퉬 Tabs		- 🕝 🌶 📂 🛄-	
Recent Places	Name		Date modified	Туре
	12345DES_GenNote.doc		11/20/2007 7:47 AM	Microsoft
	12345DES_SWMP.doc		11/20/2007 7:47 AM	Microsoft
	12345DES_T	abEarthwork.xls	11/20/2007 7:47 AM	Microsoft
	12345DES_TabMisc.xls		11/20/2007 7:47 AM	Microsoft
Desktop	12345DES_T	abulation of Surfacing.xls	2/18/2010 2:17 PM	Microsoft
Libraries	[™] 12345DES_T	itleSht.xls	11/20/2007 7:47 AM	Microsoft
Computer				
	۲ III کې د ا			•
Network	File name:	12345DES_TitleSht.xls		Open
	Files of type:	All Files (*.*)	<b>•</b> ]	Cancel
Item Name:	SHEET ORDER COMPLICATED PROJECT!R1C1:R			

- 4. Select **Open** to update the link.
- 5. Repeat this process for the second link.



- **Note:** If the text is garbled (like in th eimage above), look for the "XXXXX" in the file path. Those are the links that need to be updated.
- 6. **Close** the **Links** dialog box.
- 7. Save Settings (File > Save Settings).

The Title sheet design file is now linked to the Excel spreadsheet file in the project-specific folder. You can now edit the Excel file for your project-specific requirements.

#### Edit the spreadsheet file

- 1. Double-click on the Tabulation of Length & Design Data link.
- 2. Excel starts and opens the **12345DES_TitleSht.xls** file.
- 3. In the *Design Data* portion of the file, make the following edits:

31	DESIGN DATA	S.H. XXX	*S.H. XXX	
32	MAXIMUM RADIUS OF CURVE	367.66 FT.	87.32 FT.	
33				
	MAXIMUM GRADE	1.50%	6.50%	
35				
	MINIMUM S.S.D. HORIZONTAL	152 FT.	44 FT.	
37				
	MINIMUM S.S.D. VERTICAL	245 FT.	122 FT.	
39				
	MAXIMUM DESIGN SPEED	88 MPH	40 MPH	
41				
	20XX DESIGN TRAFFIC	DHV = 270	DHV = 70	
43		ADT =1350	ADT = 350	
L	DHV TRUCK %	78		
45				
	CLEAR ZONE DISTANCE (TANGENT)	5.48 FT.	2.10 FT.	
47				
	CLEAR ZONE DISTANCE (XXX MIN. RADIUS)	7.6 FT.		
49				
50	CONSTRUCTION CLEAR ZONE (MIN 18')			
51				

4. When finished, select File > Exit In Excel. When prompted to save changes to the file, select Yes.

5. Switch back to the MicroStation file and note that the edits are now updated in the DGN file.

DESIGN DATA	S.H.		*S.H. XXX			
MAXIMUM RADIUS OF CURVE	367.66	FT.	87.32 FT.			
MAXIMUM GRADE	1.5	0%	6.50%			
MINIMUM S.S.D. HORIZONTAL	152	FT.	44 FT.			
MINIMUM S.S.D. VERTICAL	245	FT.	122 FT.			
MAXIMUM DESIGN SPEED	88 M	IPH	40 MPH			
20XX DESIGN TRAFFIC	DHV = 270					
DHV TRUCK %	ADT =1350 AI 7%		ADT = 350			
CLEAR ZONE DISTANCE (TANGENT)	5.48 FT.		2.10 FT.			
CLEAR ZONE DISTANCE (XXX MIN. RADIUS)	7.6	FT.				
CONSTRUCTION CLEAR ZONE (MIN 18')						
Print Date: \$DATE\$			She	et Revisi	ons	
file Name: \$FILES\$		De	ate:	Comments		lni
Horiz, Scale: \$SCALESHORT\$ Vert. Scale: As Noted	(R-X)					
Unit Information Unit Leader Initials						
	000					

6. Window in on the *Index of Sheets* link on the right side of the sheet.

## OF PROPOSED 086A-039

D. 12345

SHEET NO.	INDEX OF SHEETS
1	TITLE SHEET
2	STANDARD PLANS LIST SHEET
3-4	TYPICAL SECTIONS SHEET
5	GENERAL NOTES SHEET
6-8	SUMMARY OF APPROXIMATE QUANTITIES
9	STRUCTURE QUANTITIES
10	SUMMARY OF EARTHWORK
11	INTERSECTION DETAILS
12-13	WETLAND AND EROSION CONTROL PLAN
14	TEMPORARY WATER DIVERSION PLAN
15	CHANNEL DETAILS
16-17	SH 145 PLAN AND PROFILE SHEETS

- 7. Using what you've learned, Edit the **12345DES_TitleSht.xls** file and update the DGN file to read as shown below.
  - **Note:** When entering page ranges (e.g. 3-4) be sure to put a quote mark (') at the beginning of text entry, otherwise Excel will interpret this as a date (i.e. March 4).

SHEET NO.	INDEX OF SHEETS
1	TITLE SHEET
2	STANDARD PLANS LIST SHEET
3-4	TYPICAL SECTIONS SHEET
5	GENERAL NOTES SHEET
6-8	SUMMARY OF APPROXIMATE QUANTITIES
9	STRUCTURE QUANTITIES
10	SUMMARY OF EARTHWORK
11	INTERSECTION DETAILS
12-13	WETLAND AND EROSION CONTROL PLAN
14	TEMPORARY WATER DIVERSION PLAN
15	CHANNEL DETAILS
16-17	SH 145 PLAN AND PROFILE SHEETS

Note: You can insert and delete rows as needed in Excel.

- 8. Edit the Border Text
- 9. Use the Edit Text command to make project specific edits to the border as shown.
- 10. **Window** in to the top center of the title sheet and edit the project numbers, highway number and county name as shown.

## DEPARTMENT OF TRANSPORTATION STATE OF COLORADO



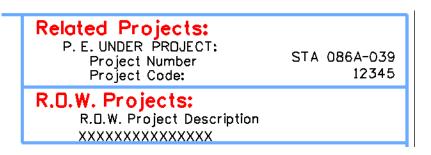
11. Window in to the lower-right corner and make the project edits as shown.

	Project No./Code
_	STA 086A-039
_	12345
_	Sheet Number

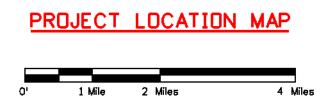
SHEE

1

12. Window in to the upper-right corner and make the project edits as shown.



13. **Window** around the bar scale and edit the text as shown.



## Place the RE cell

1. From the CDOT Menu, select Border RE from the Drafting group.

CDOT Menu		
CDOT Groups CDOT Tools	Options Help	
Drafting	C Existing C Pr	oposed ?
···· Design ···· Geometry	Drafting	
	A	* 🖗 All
Materials Geotechnical		y Stewart 🔺
ROW Survey	🔶 🔆 Craig	
⊡ Traffic ITS Utilities		Martinez
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	Linework X Davi	ult
	Patterning 🛛 🔆 Ed M	
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		b Koenig
	* Jaco	
	⇒ Jame	
Settings	•	4 III

2. Place the **Default** RE cell in the location shown by snapping to the lower-left corner.

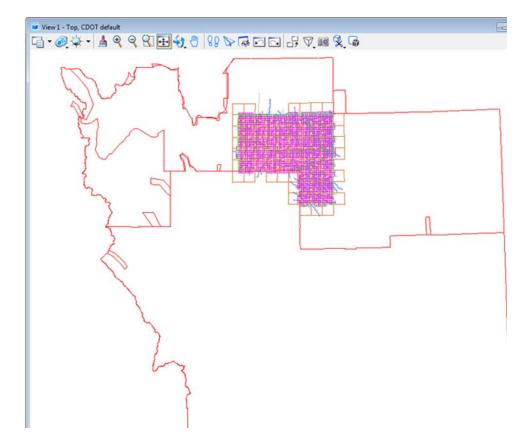
3 FT.	2.10 FT			PRDJECT LOCATION MAP		
FT.				0° L Me 2 Mes 4 Mes		
		eet Revisions		Colorado Department of Transportation	As Constructed	
	ote:	Comments	Init.	Street Address XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	No Revisions:	R
				City, State Zip Code Phone: XXX-XXX-XXX FAX: xXX-XXX-XXX	Revised:	P
				Region Number or Staff Initials	Void:	

- 3. Fit the View.
- 4. Save Settings.

#### Lab 19.2 - Review the Vicinity Map

Vicinity maps can be referenced to the title sheet. These maps can be in the form of vector files (CADD elements) or raster files (images).

The CDOT standard procedure is to use county maps that have been translated from GIS information, these maps can be found on the shared drive at: <u>\public\CADD County Maps\</u>. The county of interest should be copied to your project's ...**Design\Drawings\Reference_Files** folder and can be attached as a reference to the project's Title Sheet file.



 Select File > Open and open Elbert.dgn from the C:\Projects\12345\Design\Drawings\Reference_Files folder.

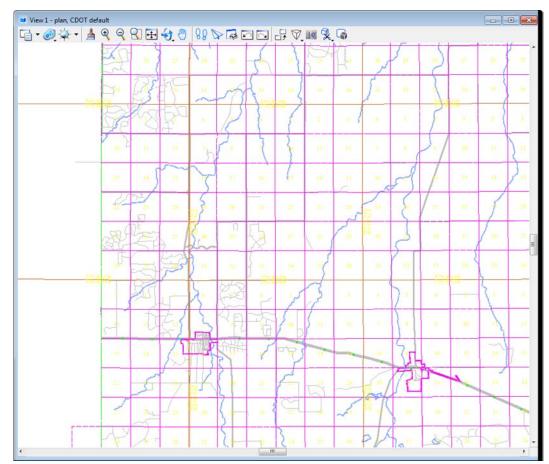
The Elbert county map was translated from GIS and copied from the <u>\public\CADD County</u> <u>Maps\</u> shared drive. This file contains a *Saved View* to assist in attaching it as a reference file.

6. Select **Utilities > Saved Views** from the MicroStation pull-down menu

R	🛃 Save	d View:	s - View	1					×	
	"Eg Act	tive File	- °t	Ç,	×	F	×	👌 岸		
l	Туре	Show	Status	Name	^		Desc	ription		
l				plan						
l										
	•									

<D> on the saved view by the name of *plan* and select the Apply Saved View button, then
 <D> in the view.





The MicroStation view updates to the limits of the saved view.

8. Close the Saved Views dialog box.

9. **Open** the **Level Display** from the **Primary** toolbar. Note that all information resides on **GIS_*** levels.

📄 Level Display - View 1					x
🖵 🏹 🛛 View Display 🔻					
(none) 🕶 Levels 💌 [	~				
🔀 Elbert.dgn					
Name	Number	File	Logical	Used	
GIS_Bridges	20000	Elbert.dgn		•	E
GIS_Cities	20001	Elbert.dgn			
GIS_County-Lines	20002	Elbert.dgn			
GIS_Engineering-Regions	20003	Elbert.dgn			
GIS_Highways	20004	Elbert.dgn			
GIS_Lakes	20005	Elbert.dgn			
GIS_Maintenance-Sections	20006	Elbert.dgn			
GIS_Milepoints	20007	Elbert.dgn		٠	
GIS_Rail-Lines	20008	Elbert.dgn			
GIS_ROADS-Local	20009	Elbert.dgn			
GIS_ROADS-Major	20010	Elbert.dgn			
GIS_ROADS-Ramps-Frontage	20011	Elbert.dgn			
GIS_Sections	20012	Elbert.dgn			
GIS_Sections-Text	20013	Elbert.dgn			
GIS_Streams	20014	Elbert.dgn			
GIS_Townships	20015	Elbert.dgn			
GIS_Townships-Text	20016	Elbert.dgn			
		Elbert.dgn			
ALG_COGO_Points		Alignments.dgnlib			

10. Turn level displays **on** and **off** to verify the data is on the correct levels. Turn all levels **on** when finished.

#### Attaching a vicinity map as a reference file

In the next series of steps, you will attach the vicinity file as a reference to the title sheet. Once attached, you can move, scale and clip the reference to fit the display limits in the sheet file.

- 1. Select File > Open and reopen the title sheet 12345DES_TitleSht.dgn from the project's ...\Design\Drawings folder.
- 2. Select **References** from the **Primary** toolbar.
- 3. In the **References** dialog, select **Tools > Attach**.
- 4. Set the directory to the project's ... \Design \Drawings \Reference_Files folder and select Elbert.dgn.

5. In the Attachment Setting	s box:
------------------------------	--------

<u>File Name:</u> Elbert	dgn
Full Path:\12	345\Design\Drawings\Reference_Files\Elbert.dgn
Model: CDOT	`default     ▼
Logical Name: Vicini	ty
Description: GIS L	ocator map for title sheet
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views	
plan Named Fences (non	e)
	-,
Sc <u>al</u> e (Master:Ref):	1.000000 : 5280.000000
Named Group:	<b></b>
Revision:	<b></b>
Le <u>v</u> el:	<b></b>
Nested Attachments:	
Display Overrides:	Allow
Ne <u>w</u> Level Display:	Use MS_REF_NEWLEVELDH
Ne <u>w</u> Level Display: Global LineStyle Scale:	Master
Ne <u>w</u> Level Display: Global LineStyle Scale: Synchronize w	Master
Ne <u>w</u> Level Display: Global LineStyle Scale: Synchronize w Toggles	Master  The Saved View
New Level Display: Global LineStyle Scale: Synchronize w Toggles	Master
Ne <u>w</u> Level Display: Global LineStyle Scale: Synchronize w Toggles	Master  The Saved View
New Level Display: Global Line Style Scale: Synchronize w Toggles Drawing Title Create	Master  The Saved View
New Level Display: Global Line Style Scale: Synchronize w Toggles Drawing Title Create	Master
New Level Display: Slobal LineStyle Scale: Synchronize w Toggles Drawing Title Create	Master ▼ th Saved View

- Under Orientation, select plan (the saved view).
- Key in a Logical Name of Vicinity and a Description of GIS locator map for title sheet.
- ◆ Key in a **Scale** of *1:5280*

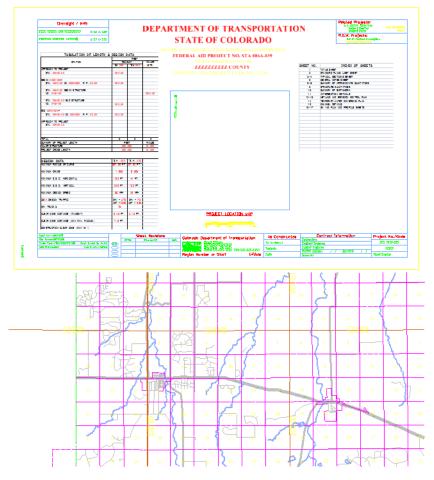
**Note:** CDOT GIS maps are designed based on a 1-mile insertions scale (1 inch = 1 mile) for graphics. The linestyle and text scale factors are also based on this scale.

6. Select **OK**.

The outline of the saved view reference is attached to your cursor.

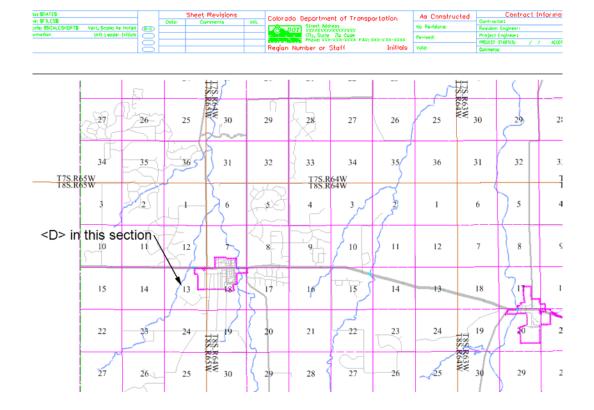
7. **<D>** anywhere underneath the plan sheet to attach the reference.

8. Select the MicroStation Fit command

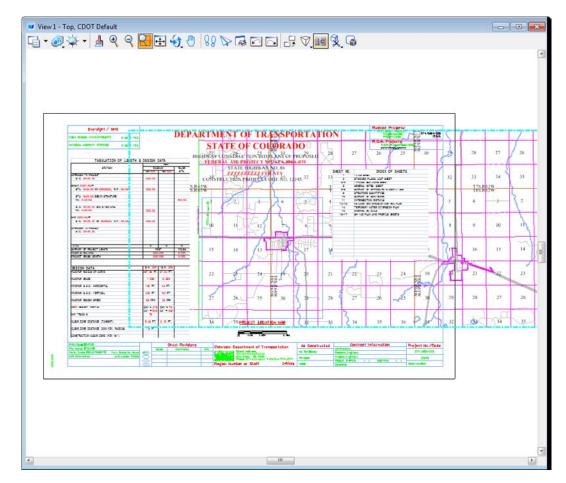


## Move the reference file to align with the title sheet

1. In the **References** dialog box, select **Tools > Move**.



2. When prompted to enter a point to move from, **<D>** on section 13 on the vicinity reference.



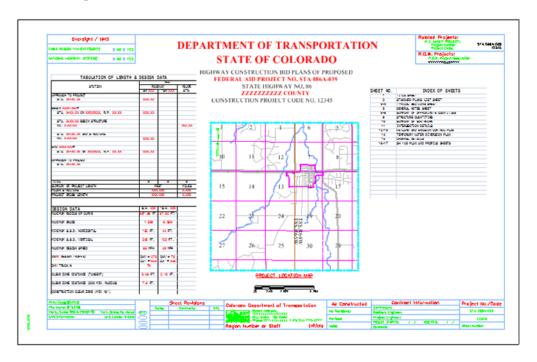
3. **<D>** approximately in the center of the project location map block for the move to point.

- 4. Continue to use the **Move Reference** command as needed to position the reference as shown.
- 5. **<R>** when done.

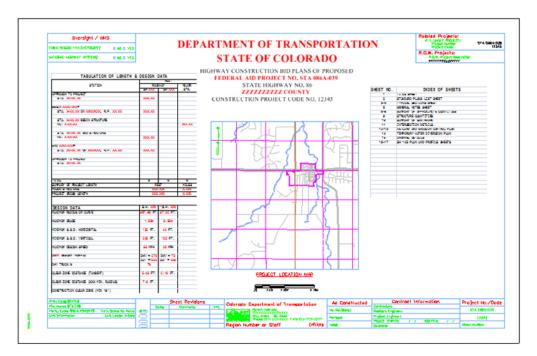
#### Clip the vicinity map reference

- 1. In the **Reference** dialog, highlight the **Vicinity** reference
- 2. Select Tools > Clip Boundary from the Reference File dialog.
- 3. In the Tool Settings box, set Method to Element.
- 4. MicroStation prompts 'Select clipping element'
- 5. **<D>** on the shape representing the limits of the project location map.

6. **<D>** to accept.



- 7. Open Level Display and turn off the GIS_Sections-Text and GIS_Township-Text.
- 8. **Fit** the view.



- 9. Save Settings.
- 10. **Exit** MicroStation.

# LAB 20 - Annotate the Intersection Plan/Profile Sheet

In this lab, you'll annotate the plan/profile sheet with text, notes, and custom text strings using the CDOT Menu.

#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Set the active angle for placing text
- Place Text using the CDOT Menu
- Rotate text
- Place notes with leader lines and a line terminator
- Create and place custom text strings for utility lines using the CDOT Menu

## Lab 20.1 - Open Project Plan/Profile Sheet

## **Start MicroStation**

1. Start MicroStation and open **12345DES_PnP19.dgn** from the **C:\Proj**ects\12345\Design\Drawings folder.



## **Check Text Annotation Scale**

1. Select **Models** from the *Primary* toolbar.

2. In the *Model* box, select Edit Model Properties.

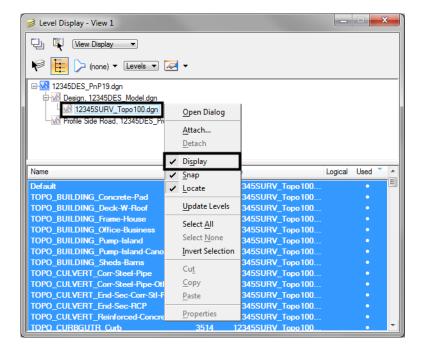
Primary Tools
Image: Image
Models
🖺 Active File 🔻 🎦 🐁 🚰 🗙 🤔 🛄 🕞
Type 2D/3D Name Description
CDOT Default Master Model
Model Properties
Ţype: Design ▼ 3D ▼
Name: CDOT Default
Description: Master Model
Ref Logical:
<u></u>
Line Style Scale: Global Line Style Scale   1.000000
Update Fields Automatically
Cell Properties
Can be placed as an annotation cell
QK Cancel

- 3. Note that the *Text Annotation Scale* is set to **1"=100'** (the default setting from the seed file).
  - **Note:** The **Text Annotation Scale** matches the border scale, which matches the scale for plotting 1"=100'.
- 4. Cancel the *Model Properties* box.
- 5. Close the *Models* box.

#### Work with sheet levels and references

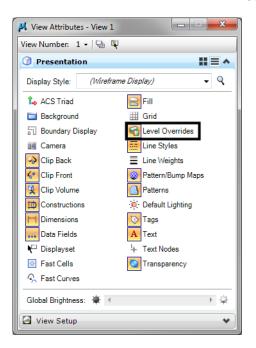
The plan limits cell placed along the mainline alignment in the Design model file appears in the sheet. This is on a No Plot level. However, if you don't want to see it, you can turn it off.

1. Open Level Display and turn off the DRAFT_INFO_No_Plot level in the *Design* reference.



2. In Level Display, turn off the **Survey/Topo** reference.

3. Select Settings > View Attributes, toggle on Level Overrides.



This applies the Symbology Overrides set in the CDOT level libraries for "graying out" the existing contour levels.

#### Edit the bar scale text

1. **Window** in on the bar scale cell in the lower left portion of the plan view.

2. Use the **Edit Text** command to edit the text as shown for a 100 scale plot.



#### Label the Intersection Alignments

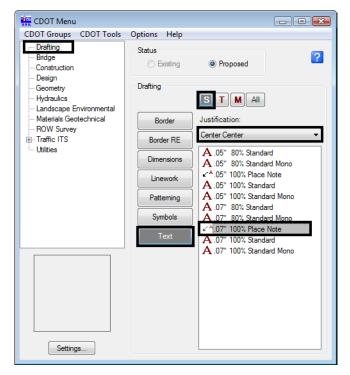
#### Set the active angle for placing the county road text

- 1. On the *CDOT Menu*, select **Settings**.
- 2. Set the Active Angle to *O*, Apply and then Close the box.

gs	
100.00	Apply
0.00	Close
	100.00

#### Set the text attributes using the CDOT Menu

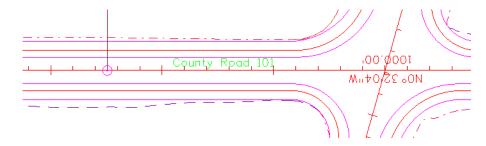
- 1. On the *CDOT Menu* Explorer, select **Drafting**. Set the category to **Text** and set the following options:
  - Filter: Standard (S)
  - Justification: Center Center



• Item: .07" 100% Standard

This sets the active level to **DRAFT_Text-3** and automatically selects the **Place Text** command.

- 2. In the Word Processor box, key in County Road 101.
- 3. **<D>** to the left of the intersection as shown to label the road.



4. **<R>** out of the *Place Text* command when done.

#### Set the active angle for the main alignment text

1. Select Settings > Design File > Angle Readout.

2. Set the *Options* as shown for *Decimal Degrees*.

Category	Modify Angle Readout Settings	
Active Angle Active Scale Angle Readout Axis Civil Formatting Color	Format: DD.DDDD  Accuracy: 0.12	<u>Q</u> K Cancel
Data Acquisition Element Attributes Fence Grid Isometric Locks	Direction Mode: Bearing	
Locks Snaps Stream Views Working Units		
	Focus Item Description Select category to view.	

3. Select the **Measure Angle** command from the *Measure* toolbar under the *Drawing* task tab.

✓   Drawing	
° 3 2 ≈ + 3, M V < H	
w 🗆 🔇 🛇 🔘	
${\tt E} \bigcirc $	-
r 🖉 🧶 🔝 🐂 🚳 📑 🗭 😣	Marcura Angla Paturaga Lings
T 🗈 🗞 🔊 🖓 😹	V Measure Angle between Lines
$A \checkmark^{A} \overset{B}{\checkmark} \overset{ABC}{\checkmark} \overset{?}{}_{ABC} \overset{A}{}_{A} \overset{\mathscr{A}}{}_{A} \overset{\mathscr{A}}{} \overset{\mathscr{A}}{}_{A} \overset{\mathscr{A}}{}_{A} \overset{\mathscr{A}}{}_{A} \overset{\mathscr{A}}{} \overset{\mathscr{A}}{}_{A} \overset{\mathscr{A}}{} \mathscr{$	About: Global Z   Angle:
s 🔆 *** <u>**</u> *° * [?] × *** 🔳	
	-

- 4. **<D>** on the centerline of the side road.
- 5. **<D>** on the centerline of SH 86.

The angle reads out at 74.14 degrees.

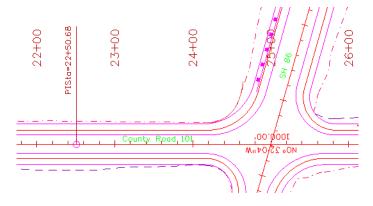
6. From the CDOT Menu, select **Settings** and set the **Active Angle** to **74.14**, **Apply** and then **Close**.

8	Measure Angle	Between Lines		22
	<u>A</u> bout: Angle:	Global Z 74.14°	T	

#### Place the SH 86 text at the active angle

1. On the *CDOT Menu* select **Drofting > Text** and select .07 again.

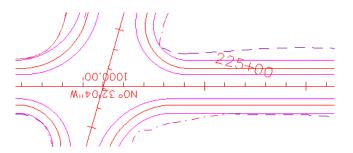
- 2. In the Word Processor box, key in SH 86.
- 3. **<D>** when shown to label the road.



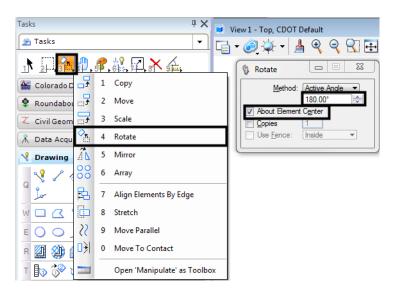
4. **<R>** out of the *Place Text* command when done.

#### Lab 20.2 - Rotate the InRoads Alignment Text

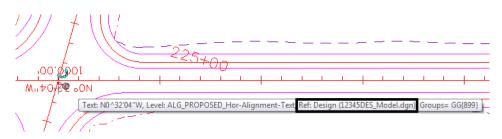
1. Window in at the intersection as shown.



- 2. Select the **Rotate** command from the *Main* task toolbar.
- 3. Set the Method to Active Angle, set the Angle to *180* and toggle On About Element Center.



4. **<D>** on the bearing text.



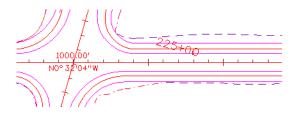
You can't rotate the text because it's in a reference.

*Important!* If you're in the Design group and "own" the Design reference, you can "exchange" to that reference to make modifications. Otherwise, contact Design.

- 5. Select File > Save Settings.
- 6. On the *References* dialog, select the Design reference and then select **Tools > Exchange**.

ools Settings		<u>an an a</u>		~				
Attach	🖘 🌤 🔁	6° 6° (	🔁 🐮 🛱 🚰 🕯	🔰 🗙 <u>H</u> ilite N	lode: Bounda	ries 👻		
Detach		Slot P	👌 File Name 个		Model	Description	Logical 💽 🔒	J 🕇
Detach All	1	1	12345DES_Model.d		CDOT Default	Proposed Intersecti	on Design 🗸	√ √
R <u>e</u> load		2	12345DES_Prof04.d	gn	CDOT Default	Proposed profile for	Profi 🗸	$\checkmark$ $\checkmark$
Reload All		•						,
Exchange		Scale 1.000	:	1.000000	Rota	tion 0°		
Open in New Session		Offset X 0.0	00 <u>Y</u>	0.000	Z	0.000		
Activate		• • •	语 📀 🐨 🔁	8 🖓 🖸 🧖	Live Nestin	ng 🔹 🔹 🗸	errides 🔻 Depth	: 1
Deactivate			splay: Config Variable					
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<u>С</u> ору								
Scale								
Rotate								
Merge Into Master	1							
Merge Into Master Make Direct Attachment								
Make Direct Attachme <u>n</u> t Create Drawing Title								
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Make Direct Attachme <u>n</u> t Create Drawing Title Mirror <u>H</u> orizontal Mirror <u>V</u> ertical								
Make Direct Attachment Create Drawing Title Mirror <u>H</u> orizontal Mirror <u>V</u> ertical Clip <u>B</u> oundary								
Make Direct Attachme <u>nt</u> Create Drawing Title Mirror <u>H</u> orizontal Mirror <u>V</u> ertical Clip <u>B</u> oundary Clip Mas <u>k</u>								
Make Direct Attachment								

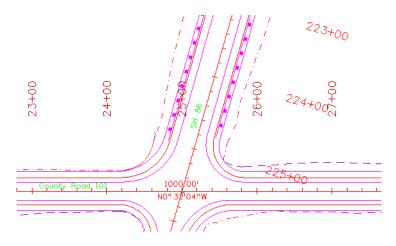
7. Select the **Rotate** command, **<D>** on the bearing text and then **<D>** to accept.



8. Select the **File** pull-down menu and open the sheet file from the list of last open files.

## Lab 20.3 - Place Notes

1. Window in above the intersection to view the guardrail as shown.

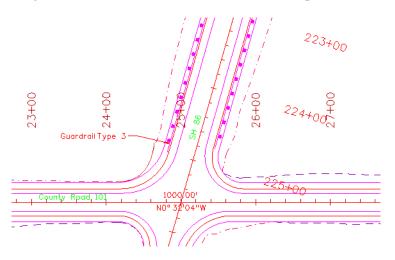


2. On the CDOT Menu Explorer, select Drafting > Text and select the .07" 100% Place Note item.

🛄 CDOT Menu			- • •
CDOT Groups CDOT Tools	Options Help		
Drafting     Bridge     Construction     Design     Geometry     Hydraulics     Landscape Environmental	Status Existing Drafting	Proposed	2
Materials Geotechnical     ROW Survey     Traffic ITS	Border Border BE	Justification: Left Bottom	<b>-</b>
	Dimensions Linework Patterning Symbols Text	A.05"         80% Standard           A.05"         80% Standard M. <a.05"< td="">         100% Place Note           A.05"         100% Standard           A.05"         100% Standard M.           A.05"         80% Standard M.           A.07"         80% Standard M.           A.07"         80% Standard M.           <a.07"< td="">         80% Standard M.           <a.07"< td="">         10% Standard M.           <a.07"< td="">         100% Standard M.           <a.07"< td="">         100% Standard M.           <a.07"< td="">         100% Standard M.</a.07"<></a.07"<></a.07"<></a.07"<></a.07"<></a.05"<>	
Settings			

- 3. Click inside the Word Processor box and key in Guardrail Type 3.
- 4. **<D>** on the guardrail as shown to define the start point of the note (note terminator).

5. Drag the cursor to the location shown and **<D>** to place the note leader.

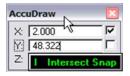


6. *IMPORTANT:* With your cursor on the *LEFT SIDE* of the leader line, **<R>** to place the text.

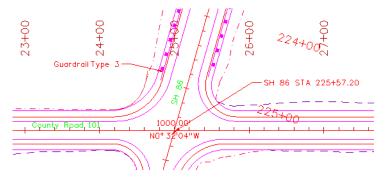
**Note:** If your cursor is on the right side of the leader when you reset, your note will be placed on the right side.

- 7. With the *Place Note* command still active, click in the **Word Processor** box and key in *SH 86 STA 225+57.20*.
- 8. On the *Snap Mode* toolbar select the Intersection Snap.

*Note:* You can also click in **AccuDraw** and press *I* on the keyboard.



- 9. AccuSnap to the intersection of the two centerlines as shown for the note terminator.
- 10. Drag your cursor out and **<D>** to place the leader line.



11. With our cursor on the *RIGHT* side of the leader, **<R>** to place the note.

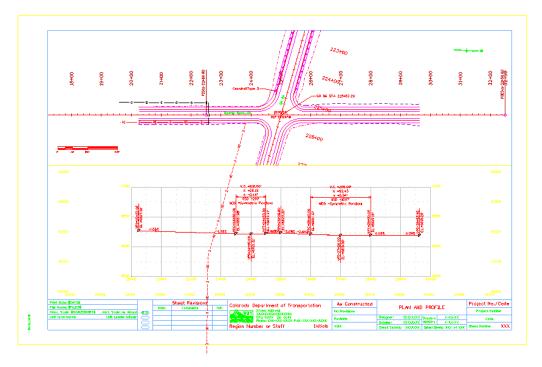
#### Lab 20.4 - Attach and Annotate Utility Lines

Next, you'll annotate proposed utility lines using the CDOT menu. However, the Utility model was not attached to plan sheet when it was created. Therefore, you must attach the Utility model after-the-fact in order to reference the utility lines for annotation.

#### **Reference the proposed Utility model**

- 1. **Fit** the view.
- 2. Open the **References** dialog box.
- Attach the *12345UTIL_Model.dgn* file from project's
   \Utilities\Drawings\Reference_Files folder. Be sure to attach Coincident-World at a *1:1* scale with No Nesting.

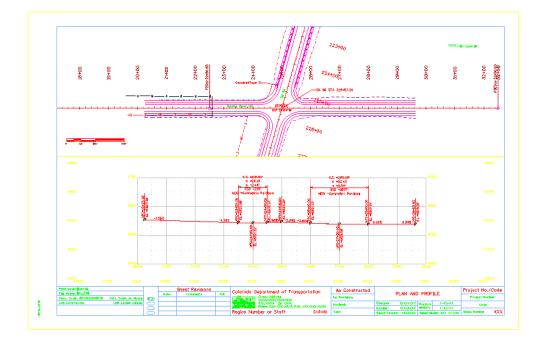
Reference Attachment S	Settings for 12345UTIL_Model.dgn
File Name: 1234	5UTIL_Model.dgn
Full Path:\Dr	awings\Reference_Files\12345UTIL_Model.dgn
Model: CDOT	Default 🔹
Logical Name:	
Description: Globa	al Origin aligned with Master File
Orientation:	
View	Description
Coincident	Aligned with Master File
Coincident - World	Global Origin aligned with Master File
Standard Views	
Saved Views (none)	
Named Fences (non	ie)
Detail Scale: Sc <u>al</u> e (Master:Ref):	
Named Group:	<b></b>
Revision:	
Level:	
Nested Attachments:	No Nesting   Depth: 1
Display Overrides:	Allow
Ne <u>w</u> Level Display:	Use MS_REF_NEWLEVELDH
Global LineStyle Scale:	Master
Synchronize w	ith Saved View
Toggles	
•	🛃 🔁 😥 🖓 📢 🏢 🏷 🕺 🕺
Drawing Title	
Create	
Name:	Drawing
	<u>O</u> K Cancel



The Utility model is reference, but needs clipping.

4. On the *References* toolbar, select the Utility reference and then select **Tools > Clip Boundary**.

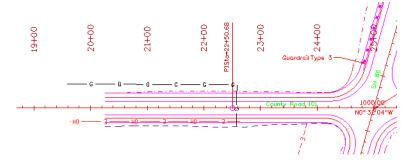
References (4 of 5 unique, 3 displayed)					23
Tools Settings					
🔃 + 🔁 😣 🖄 🔅 🖻	) 🗗 🔂 🐉 🖧 🛱 🖤 🔘 🛪 🗉	lilite Mode: Boundaries	3 🔻		
Hierarchy	Slot 🏱 🛅 File Name ^	Model	Description	Logical 💽 <i>3</i>	<b>۲</b>
12345DES_P Clip Reference	1 12345DES_Model.dgn 2 12345DES_Prof04.dan	CDOT Default CDOT Default	Proposed Intersection Proposed profile for		* *
	3 12345UTIL_Model.dgn	CDOT Default	Global Origin aligne	$\checkmark$ $\checkmark$	$\checkmark$
	•	III			•
	Scale 1.000000 : 1.000000	<u>R</u> otatio	n 0°		
	Offset X 0.000 Y 0.000	<u>Z</u> 0.	000		
	🖸 🗾 🔪 🖓 🛄 📆 🌛 🐓 🏢 🔊 🖓 [	🗐 <u>4</u> No Nesting	Allow Overrid	des 🔻 <u>D</u> epth: 1	
	New Level Display: Config Variable	ferenced: No	<b>•</b>		



5. **<D>** on the clip boundary block and then **<D>** to accept.

## Annotate the gas line

1. Window in on the plan sheet area shown.



- 2. From the *CDOT Menu* Explorer, select **Group Display > Utilities** and set the following options:
  - Set Status to Proposed
  - Set the **Category** to **Gas**
  - Set **Filters** to **All** (or Text)

Drafting Bridge	Status	
Construction	Existing	Proposed
Design Geometry	Utilities	
Hydraulics Landscape Environmental		
Materials Geotechnical	Electric	Gas Line
ROW Survey ⊡- Traffic ITS	Fiber Optic	High Pressure Line
Utilities		☆ Manhole
	Gas	☆ Valve ☆ Vault
	Sanitary Sewer	∛ Vent-Pipe
	Telephone	
• III	Television	
	Water	

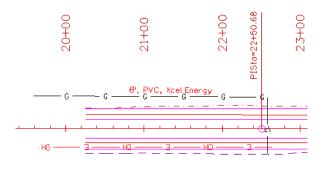
Select the item <New Text String>

- 3. In the **Create Text String** dialog box set the following from the drop down options:
  - ♦ Set Size to 6"
  - Set Material to PVC
  - For **Owner**, key in *Xcel Energy*

🚆 Create Text	String	- • •
Size:	6"	- 🖉 🛛 ОК
Material:	PVC	▼ Cancel
Owner:	Xcel Energy	- l
🖉 Indicates	that you can enter your ow	n values in this field

- 4. Select OK.
- 5. When prompted to *Identify Element*, **<D>** on the proposed gas line.

6. **<D>** above the line to accept the text placement.

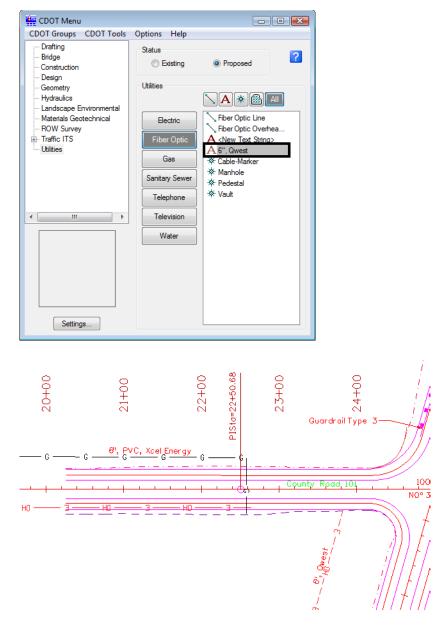


**Note:** Your custom text 6", PVC, Xcel Energy is saved as an item in the Gas category for placement again.

You can right-click on a custom text string and either edit or delete it.

## Annotate the fiber optic line

1. Create a custom text string (6", Qwest) for the fiber optic line and annotate as shown.



*Note:* Be sure to **<D>** near the bottom of the line to fit the annotation.

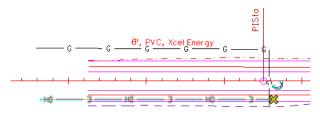
#### Lab 20.5 - Measure Graphics

Since you referenced your plan view graphics at a 1:1 scale, they are the actual size in the sheet file. Therefore, you can measure plan graphics in the sheet file and get the same results as measuring in the model file. Make sure that Locate is turned on for the reference before using the measuring tools on reference graphics.

#### **Measure Distance**

#### **Between points**

- 1. Measure the OH Electrical Line with the CDOT custom add-on tool.
  - From the CDOT Menu select CDOT Tools > Measure XY Distance
  - In the XY Distance Dialog box, set Measurement Option to Between points
  - AccuSnap on the *two* endpoints of the proposed Overhead electrical line as shown (snap to tie-in at power pole symbols – see arrows below)



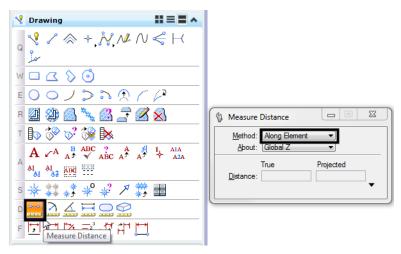
- $\bullet$  **<R>** when done
- Your results should match the dialog box

XY Distance
Measurement Options
Between points
C From point on element
C Perpendicular from element
C Perpendicular from point on element
C Tangent from element
C Tangent from point on element
Calculated Values
Delta X: -3.344'
Delta Y: 299.183'
Delta Z: 0'
Slope: 0%
Angle: 90° 38' 25.66"
Horiz. Distance: 299.202'
Slope Distance: 299.202'
☑ Use Reference Attachment Scale
Restart Exit

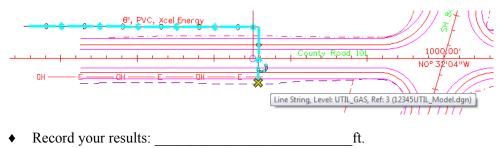
#### Along element

1. Measure the Gas Line with standard MicroStation tools.

 Select the Measure Distance command from the Measure toolbar under the Drawing task tab.

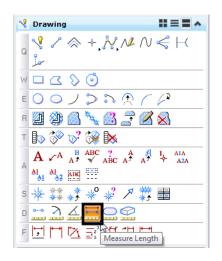


- Set the *Method* to Along Element
- AccuSnap on the *start* and *end* points of proposed 6" gas line as shown (see arrows).



Note: Individual results will vary based on how the line was originally drawn.

2. Select the **Measure Length** command.



- ♦ <D> on the gas line.
- Record your results: ______ft.

*Your results should be the same as in step 2*. With this command, you only have to select the element with a data point to get its entire length.

3. Use **Measure Length** to measure the length of the OH Electrical line.

🖇 Measure Le	ength 🗖 🗖 🗙
Tolerance (%):	1.000000 Mass Properties Display Centroid
<u>A</u> bout:	Global Z 🔹
Length:	299.202'
Direction:	270.64°

Your results should be the same as step 1 where you measure with the CDOT custom **XY Distance** tool.

*Note:* When measuring a straight line with this method, you also get the angle of the line.

#### Measure perpendicular

1. In the **Design** Model reference, turn **Off** the level **DRAFT_LC-Center_WT-3**.

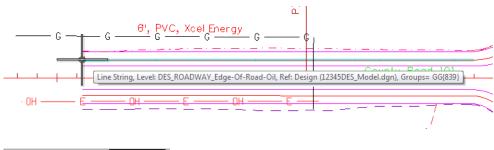
This element (a blue dashed line) is a coincident to the alignment centerline. Since you will only be working with the alignment, turn this level off and leave the **ALG_PROPOSED_Hor-Alignment** turned on.

- 2. Turn Depth lock Off.
- 3. **<T>** on the side road horizontal alignment and note the Z value.

3279671.701, 1555884.034, 0.000 KeyPt

Horizontal Alignments, like this one, are typically placed at elevation 0.

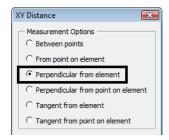
4. **<T>** on the red upper edge of oil line at the beginning of the alignment and note the Z value.



3279656.098, 1555658.860, 6626.647 KeyPt

The edge of oil line is placed at the correct elevation.

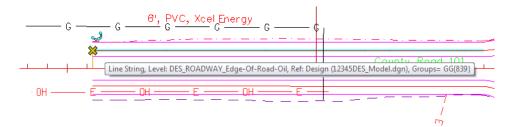
5. In the XY Distance dialog box, set the Option to Perpendicular from element.



6. **<D>** on the side road horizontal alignment.

MicroStation displays a horizontal tracking line.

7. AccuSnap on the end of the upper edge of oil line.



8. Review your results:

Horiz. Distance: Slope Distance:	18' 6626.672'		
Use Reference	Attachment Scale		
Restart	Exit		

Note that even though the two elements are at different elevations, the CDOT custom **XY Distance** tool provides both the **Horizontal Distance** of 18 feet along with the true 3D slope measurement (or **Total Distance**) of 6626.672 feet.

# LAB 21 - Annotate the Bridge General Layout Sheet

In this lab, you'll annotate the bridge general layout sheet with text, notes and dimensions.

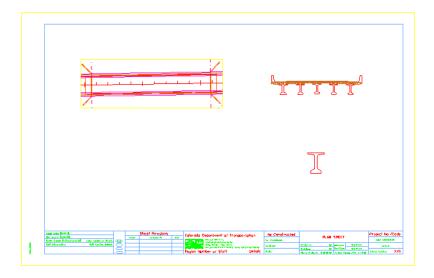
#### **Chapter Objectives:**

After completing this exercise you will know how to:

- Set and change the **Text Annotation Scale** to match the drawing scale.
- Place dimensions using the following methods:
  - ♦ Element
  - ♦ Linear
  - Angle between lines
  - Bearing and Distance
- Edit dimension text.
- Place notes with curved leaders.

#### Lab 21.1 - Open Project Plan Sheet

- 1. Start MicroStation
- 2. Start MicroStation and open **12345BRDG_Plan01.dgn** from the *C:\Projects\12345\Bridge\Drawings* folder.



#### Lab 21.2 - Place Text

Label the different part of the general layout sheet (plan, typical section, etc.)

#### Set text attributes

- 1. On the *CDOT Menu Explorer*, select **Drafting > Text** and set the following options:
  - Filter: Title (T)
  - Justification: Center Center
  - Item: .30" 100% Title

🔛 CDOT Menu		- 0 🔀
CDOT Groups CDOT Tools	Options Help	
Drafting Bindge Construction	Status Existing	Proposed
Design Geometry Hydraulics Landscape Environmental	Drafting	S T M AI
Materials Geotechnical	Border	Justification:
	Border RE	Center Center
	Dimensions	▲.14" 100% Place Note ▲ A .14" 100% Title
	Linework	A .14" 100% Title Mono A .30" 80% Title
	Patteming	A .30" 80% TitleMono
	Symbols	A .30'' 100% Title
Settings	Text	A .30" 100% Title Mono +

*Note:* This sets the active level to DRAFT_Text-2 and automatically selects the Place Text command.

- 2. In the Word Processor box, key in Plan
- 3. Drag your cursor into the view.
- 4. **<D>** to place the text as shown.

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		<u> </u>		Ţ	III	I	
	1-	iun					
					쓰		
Jan Kong Bang) An Anang Salah		Sheel Revisions	 riment of Transport	alico Ne Constructed			Project Hou/Gr

*Note:* The text is extremely large implying the text annotation scale is obviously wrong.

5. **<R>** out of the **Place Text** command.

### **Change the Text Annotation Scale**

- 1. Select **Models** from the **Primary** toolbar.
- 2. In the Model box, select Edit Model Properties.
- 3. The **Text Annotation Scale** is set to **1:100** (the default setting from the seed file).

**Note:** This is a 40-scale drawing (the border was placed at a 40 scale around the graphics). Scaling the text 100 times results is text that is the wrong size.

4. Change the Text Annotation Scale to 1:40 and select OK.

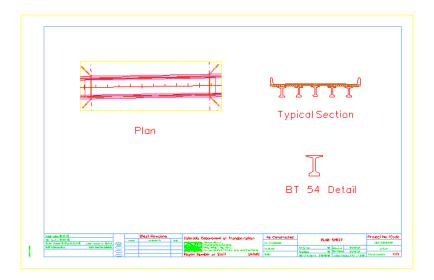
Model Properties		
Туре	e: Design 🔻 3D 💌	
Name	e: CDOT Default	
<u>D</u> escription	n: Master Model	
<u>R</u> ef Logica	d:	
<u>A</u>	1''=40' 👻	
Line Style Scale	e: Annotation Scale	
	Update Fields Automatically	
Cell Properties Cell Type: Graphic		
Can be placed as an annotation cell		
<u>O</u> K Cancel		

5. The text "Plan" is automatically resized for a 40-scale drawing and will now measure correctly when plotted.

Plan	Ţ

- 6. Close the *Models* box.
- 7. Select **File > Save Settings** to save the new settings.

- 8. Using the same text attribute settings, place the following text in the locations shown:
  - Typical Section
  - BT 54 Detail
- 9. Use the **Move** command to move the text to the desired location, if necessary.

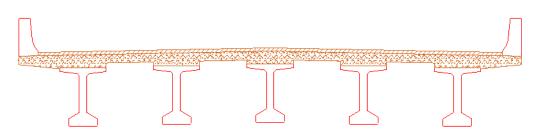


## Lab 21.3 - Dimension the Bridge Typical Section

Use the CDOT Menu to dimension the bridge typical section.

### Dimension the travel lanes and shoulder by element

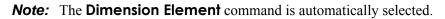
1. **Window** around the typical section.



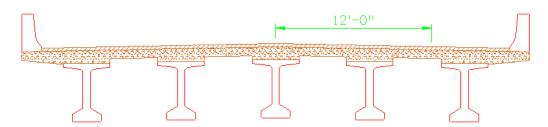
- 2. On the CDOT Menu Explorer, select Drafting and set the following options:
  - Category: Dimensions
  - ♦ Filter: x'-x"

Drafting       Bridge         - Construction       Existing Image: Proposed         - Design       - Geometry         - Hydraulics       Drafting         - Landscape Environmental       Materials Geotechnical         Border       H Dimension Linear Size	CDOT Menu CDOT Groups CDOT Tools	Options Help		
ROW Survey         Traffic ITS         Border RE         Dimension Angle Between         Dimension Angle Size         Dimensions         Linework         Patterning         Symbols         Text	Bidge     Construction     Design     Geometry     Hydraulics     Landscape Environmental     Materials Geotechnical     ROW Survey     Fraffic ITS	© Existing Drafting Border Border RE Dimensions Linework Patteming Symbols	.xx [*] B .xx [*] .xx: → Dimension Linear Size ⇒ Dimension Angle Betw → Dimension Angle Size → Dimension Element	xx1 x'-x" x'

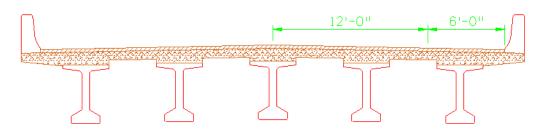
#### Item: Dimension Element



- 3. When prompted to select the element to dimension, **<D>** on the top pavement to the right of the centerline.
  - **Note:** This should select the 12 ft **SmartLine** segment which represents the travel lane, if not, **<R>** until you select the correct element.
- 4. Move your cursor up to establish the length of the extension line and **<D>** to place the dimension.



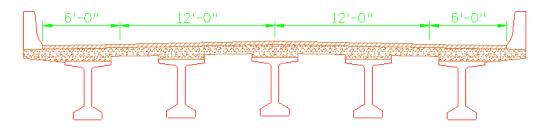
5. Repeat for the 6 ft. right-shoulder segment. **<D>** on the segment near the extension line and then **AccuSnap** on the 12 ft. dimension's terminator to place the dimension.



Note: The elements dimension actual size even though the bridge typical section was scaled up 4 times (40: 10 or 1:10 at a 40-scale). This is because Reference Scale is turned on in the Units tab of the dimension style. The units for dimensioning are, therefore, read from the model file instead of the sheet file. Reference Scale is on by default in all CDOT dimension styles.

M Dimension Styles - CDOT 3				
<u>Style</u> <u>V</u> iew				
🗄 -   🛅 🖟	] 👆 🛛 🗙 🖢 🞝 💐 😽			
Dimension Styles	Geometry Units Text Symbology Advance	ed		
Style:(none)	Primary Units	Secondary Units		
0.0007.4	✓ Use Working Units	Show Secondary Units		
CDOT 1 CDOT 2	Label Format: MU label-SU label 🔻	Label <u>F</u> ormat: MU 💌		
CDOT 2	Master Units: Survey Feet 💌 📩	Master Units: Meters 💌		
CDOT 4	Sub Units: Survey Inches 💌 "	Sub_Units: Meters 💌		
CDOT 5	Accuracy: 1/8	A <u>c</u> curacy: 0.1234 💌		
	Main Prefix: Main Suffix:			
	Upper Prefix: Upper Suffix:	Lower Prefix: Lower Suffix:		
	Leading Zero Trailing Zeros	✓ Leading Zero Trailing Zeros		
	Atemate Label Settings -	Altemate Label Settings		
	Scale	Angle Format		
	Reference Scale	Units: Angle		
	Scale Factor: 1.000000 Display: DD [^] MM'SS''			
Metric Format Leading Zero Trailing Zeros				
	Use Comma for Decimal			
	Units Separator: 1234.56			
	14'-0" 60"	200" Xxxxx Y Xx Yy		

6. Repeat for the left side of the road. Be sure to **AccuSnap** on the adjacent dimension's terminator to line up the dimensions.

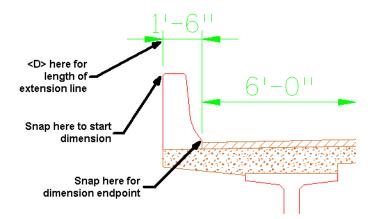


## Dimension the bridge rail curb using linear dimensions

1. On the CDOT Menu Explorer, change the Item to Dimension Linear Size

EDOT Menu			x
CDOT Groups CDOT Tools	Options Help		
Drafting     Bridge     Construction     Design	Status O Existing	Proposed	?
Geometry Hydraulics Landscape Environmenta	Drafting	.xx' B .xx' .xxxx' x'-x" x	
Materials Geotechnical ROW Survey	Border	Dimension Linear Size	
< III +	Border RE	Dimension Angle Size	
	Dimensions	Dimension Element	
	Linework		
	Patteming		
	Symbols		
Settings	Text		

- 2. Following your prompts, **AccuSnap** on the end of the back of the rail for the start of the dimension.
- 3. Move your cursor up to the approximate location shown and **<D>** to define the length of the extension line.
- 4. AccuSnap on the face of the curb as shown to define the end of the dimension.

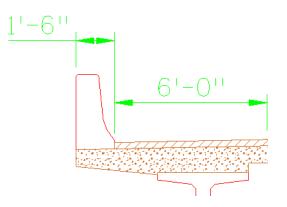


**Note:** The dimension text is too large for the dimension when placed inside the extension lines. You can **Modify** the text to solve this problem.

5. Select the **Modify** tool from the **Main** task toolbar.



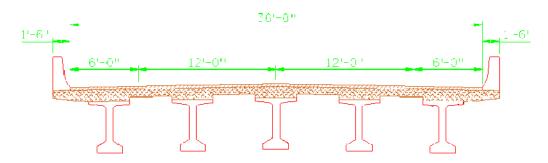
- 6. **<D>** on the 1'-6" curb dimension text.
- 7. Lock your cursor on AccuDraw X axis and move the text to the left as shown.



- 8. **<R>** when done.
- 9. Repeat the above steps and dimension the curb on the right side.

### Place additional linear dimensions

1. Using the **Linear Dimension** command, place additional dimensions for the width of the section as shown.



### Measure the typical section

- 1. Select the **Measure Distance** command and set the method to **Between Points**.
- 2. AccuSnap on the left outside curb line.
- 3. AccuSnap on the right outside curb line.

4. Review your results.

The typical section measures 144 ft, which is 4 times the actual size since the detail was scaled up on the drawing. While dimension commands can read reference units (via the **Reference Scale** option in the dimension style), measuring command can not. You should only use **Measuring** command in sheet files where the graphics have been referenced 1:1 (like plan view graphics). If graphics have been scaled in the sheet, you must return to the model file for true measurements.

# **Edit dimensions**

### Edit the dimension style

You can change the dimension style to show secondary units below the dimension line. While this is intended for dual dimensioning in metric, you can edit this text to add descriptions to your dimensions.

1. Select Element > Dimension Styles.

The **Dimension Styles** box opens. This is where all the CDOT standard dimension attributes are set. Typically, you will not need to change these settings for most dimensions.

2. Select the CDOT 3 style and then select the Unit category and toggle on Show Secondary Units

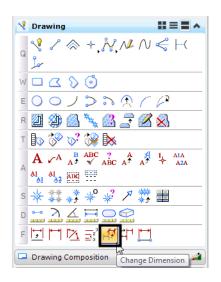
📕 Dimension Style:	📕 Dimension Styles - CDOT 3				
<u>Style V</u> iew					
📴 -   🛅 🖫	] 👆 📉 📐 🗗 💐 💐 🔀				
Dimension Styles	Geometry Units Text Symbology Advance	ed			
Style:(none)	Primary Units	Secondary Units			
Secdor 1	Use Working Units	Show Secondary Units			
CDOT 2	Label Format: MU label-SU label	Label Format: MU			
CDOT 3	Master Units: Survey Feet	Master Units: Meters			
Secdor 4	Sub Units: Survey Inches	Sub_Units: Meters  Accuracy: 0.1234			
CDOT 5	Main Prefix: Main Suffix:	A <u>c</u> onacy. (0.1234 •			
	Upper Prefix: Upper Suffix:	Lower Prefix: Lower Suffix:			
	Leading Zero Trailing Zeros	✓ Leading Zero Trailing Zeros			
	Alternate Label Settings 💌	Altemate Label Settings 💌			
	Scale	Angle Format			
	Reference Scale	Units: Angle			
	Scale Factor: 1.000000	Display: DD^MM'SS" -			
		Accuracy: 0			
	Metric Format	Leading Zero Trailing Zeros			
	Use <u>C</u> omma for Decimal				
	Units Separator: 1234.56 💌				
	140	O'O'' Xxxxx Yyyyyy Xxxx Yy			
	4.2672	$\sim$ $\sim$ $\sim$			

**Note:** Do not select the **save** icon.

3. Close the **Dimension Styles** box.

### Change dimensions

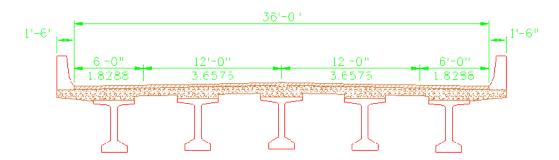
1. From the *Dimension* toolbar under the *Drawing* task tab, select **Change Dimension**.



2. **<D>** on the 12 ft travel lane dimension and then **<D>** to accept.

The dimension is updated to show the secondary units.

3. Repeat for the other dimensions as shown.



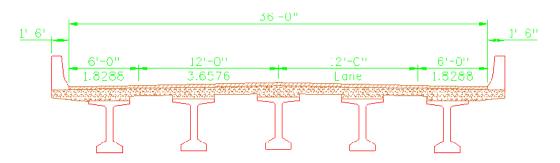
#### Change dimension text

- 1. Select the **Edit Text** command from the **Text** toolbar.
- 2. **<D>** on the 12 ft lane metric text.

**Note:** In the **Text Editor**, the dimension text appears as an asterisk (*) to denote that it is associative text.

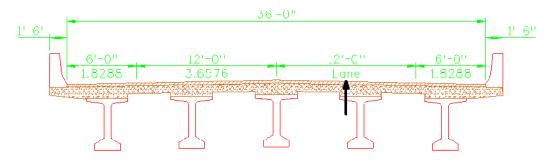
3. Change the text to Lane.

4. **<D>** to accept.



The text is updated on the dimension.

5. Repeat for the other travel lane and the shoulders as shown.

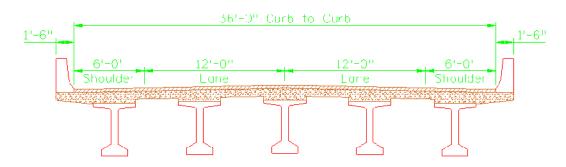


#### Edit dimension text

- 1. Using the **Edit Text** command, **<D>** on the 36 ft text.
- 2. In the **Text Editor**, click to the right of the asterisk to get a blinking cursor.
- 3. **Space** once and key in **Curb** to **Curb**.

📕 Text Editor - Word Processor	
$\boxed{\begin{array}{c c} \hline {\bf S} & 1 & \text{Engineering} \\ \hline \hline {\bf V} & B & I & \underline{U} & \sqrt{BC} & A\frac{1}{2} \\ \hline {\bf V} & A\frac{1}{2} \\ \hline {\bf $	
* Curb to Curb	~

4. **<D>** to accept.



Since you did not delete the asterisk, the text is still associated with the element. You just added text to the associated dimensions.

## **Dimension the Plan**

### Dimension the bearing of the centerline

1. On the CDOT menu, select Label Line.

🛄 CDOT Menu			
CDOT Groups CDOT Tools	Options Help		
- Drafting - Bridge - Construction	Status Existing	Proposed	2
Design Geometry Hydraulics Landscape Environmental	Drafting	.xx' B .xx'	xxx ⁱ x'-x" x'
Materials Geotechnical     ROW Survey     ⊡raffic ITS	Border BF	Dimension Linear S	etween
	Dimensions	Dimension Element	
	Linework		
	Symbols		
Settings	Text		

2. **<D>** on the SH 86 centerline.

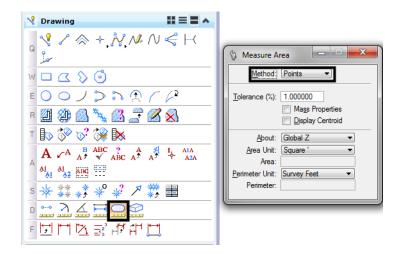
ľ		
	N\$9°4'46''E	

**Note:** Both Bearing and Distance are placed. If you do not want one of the dimensions, you can drop the dimension, turn off the **Graphic Group** lock and then delete the dimension.

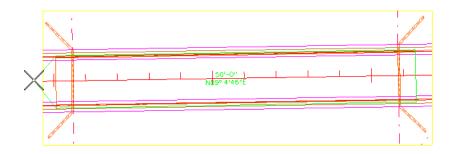
## Measure the bridge area

- 1. Turn ASC Plane Snap lock on.
- 2. Turn AccuSnap off.
- 3. Select the **Measure Area** command from the *Measure* toolbar under the *Drawing* task tab.

4. Set the **Method** to **Points**.



5. Snap to the four corners of the bridge as shown (see arrows) to dynamically draw a shape to measure.



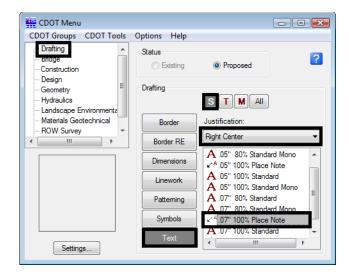
6. Reset **<R>** to close the shape to compute the area (do not loop back and snap on the first point).

🖇 Measure A	rea 🗖 🗖 🗙
Method:	Element
Tolerance (%):	1.000000
	Mass Properties
	Display Centroid
<u>A</u> bout:	Global Z 🔹
<u>A</u> rea Unit:	Square '
Area:	7441.5176 Sq.'
Perimeter Unit:	Survey Feet
Perimeter:	518.782'
[	

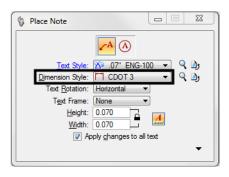
**Note:** The Points method is the only method that gives you a planar area with Depth lock turned on.

## Place a note with a curved leader

1. From the CDOT Menu, set the text options as shown.

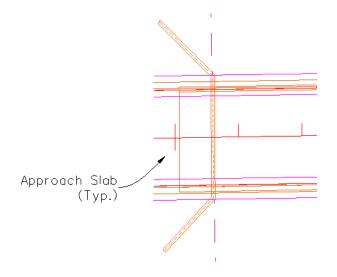


- 2. Select the **Place Note** command.
- 3. In the Tool Settings box, set the Dimension Style to CDOT 3.



**Note:** The **Place Note** command uses a dimension style for the leader and terminator as well as a text style. The CDOT 3 style will place a curved leader without an in-line leader.

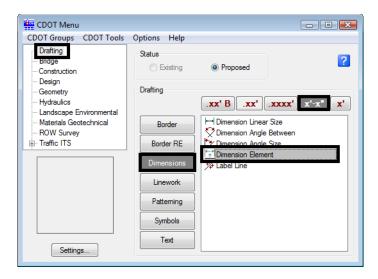
4. Place the note as shown.

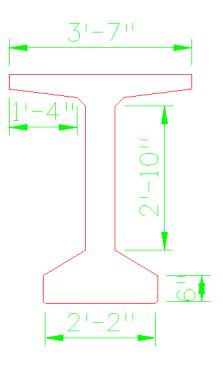


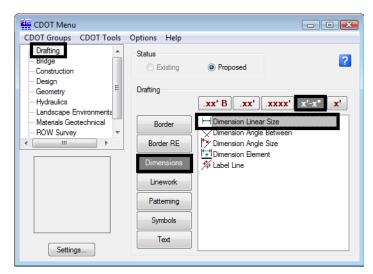
**Note:** Since this style does not use an in-line leader, you can place the text with a data point instead of a reset point on the side of the leader.

# **Dimension the Girder Detail**

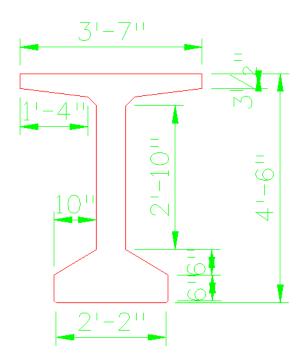
1. Use the **Element** method to dimension the girder as shown.

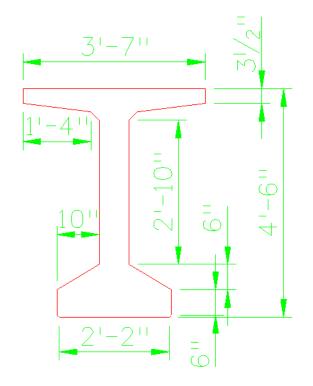






2. Use the **Linear** method to finish placing dimensions.





3. Use the **Modify** command to move the dimension text as shown.

- 4. **Fit** the view.
- 5. Save Settings.
- 6. **Exit** MicroStation.

# LAB 22 - Printing to a Printer

In this lab, you'll plot a single sheet to the classroom 11 x 17 printer.

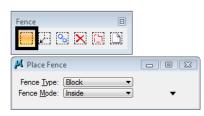
### **Chapter Objectives:**

After completing this exercise you will know how to:

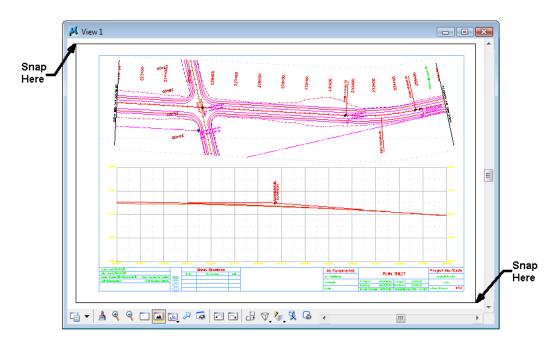
- Prepare a single sheet for printing.
- Print an 11x17 sheet to a printer.

# Lab 22.1 - Prepare the Sheet for Plotting

- 1. Start MicroStation and open **12345PDES_PnP9.dgn** from the project's ...**Design\Drawings** folder.
- 2. **Fit** the view.
- 3. Use the Edit Text command and edit the border text to add your initials as the Designer.
- 4. Select Place Fence and set the Fence Type to Block and Fence Mode to Inside.



5. **Snap** (**<T>**, then **<D>**) to the corners of the outer-most shape that goes all the way around the plan and profile sheet to place the fence.



# Lab 22.2 - Print the Sheet (Classroom Printer)

1. Select **File > Print** or choose the **Print** icon from the **Standard** toolbar.



- 2. From the Print dialog box, select File > Select Windows Printer and double-click on the Denver-HP1700 printer..
- 3. Set the dialog as shown here. Be sure to set the **Print Scale** to **100**.

😤 Print \\a-co-print\Denver-HP1700 (CDOT-DefaultPrinter_XM.pltcfg) 🛛 🕞 💷 🎫
<u>File</u> <u>C</u> onfiguration <u>Settings</u> <u>P</u> enTable
General Settings
Area: Fence Rasterized
View: Wew 1 View 1
Color: True Color Copies: 1
Pen table: CDOT-Pen Table.tbl
Printer and Paper Size
Windows driver
Paper: 11"x 17"
Total area: 17 x 11 in.
Landscape  Send to printer  Show design in preview
Print Scale and Position
Scale: 100.000 Q 1 in. (paper) to 100.000 ' (design)
Size: 17.000 11.000 in. + Maximize <u>R</u> otation: None ▼
<u>Qrigin:</u> 0.000 0.000 in.

4. Select the **Print** icon or **File > Print**.

The file is printed to the 11x17classroom plotter.

- *Note:* For tips on printing raster references (e.g. aerial photos), see the workflow **Printing Raster Images**.
- 5. Do not exit. Keep MicroStation open for the final plotting exercise.

## Lab 22.3 - Print the Sheet (CDOT Workflow)

1. Select **File > Print** or choose the **Print** icon from the **Standard** toolbar.



2. If prompted, select **CDOT-DefaultPrinter_XM.pltcfg** for the print driver, and then select **OK**.

<u>File</u> Configuration Settings PenTable	
실 🤤 🕀 🗄 🔁 🔸	I
General Settings	
Area: Fence  Rasterized	//////////////////////////////////////
View: View 1	
Color: True Color  Copies: 1	
Pen table: CDOT-Pen Table.tbl	
Printer and Paper Size	
Windows driver 🔻 🭳 壯 👽 Full	
Paper: 17x11	
Total area: 17 x 11 in.	
Landscape   Send to printer	Show <u>d</u> esign in preview
Print Scale and Position	
<u>S</u> cale: 100.000 Q 1 in. (pa	per) to 100.000 ' (design)
Size: 17.000 11.000 in. +‡+ Ma	aximize <u>R</u> otation: None
<u>O</u> rigin: 0.000 0.000 in. ♥ Aut	o- <u>c</u> enter

3. Set the dialog as shown here. Be sure to set the **Print Scale** to **100**.

4. Select the **Print** icon or **File > Print**.

*Note:* For tips on printing raster references (e.g. aerial photos), see the workflow **Printing Raster Images**.

5. Do not exit. You'll keep MicroStation open for the final plotting exercise.

## **Optional Exercise**

- 1. Open the **12345BRDG_Plan01.dgn** file from the project's ...**Bridge****Drawings** folder.
- 2. Plot the sheet to the classroom printer. Be sure to set the **Print Scale** to **40**.
- 3. Do not exit. You'll keep MicroStation open for the final plotting exercise.

# LAB 23 - Batch Printing to PDF

In this lab, you'll use **Batch Printing** to print multiple files at one time. Instead of printing to a printer, you'll print to PDF for the reproduction department (i.e. a plot set for a milestone submittals).

Note: To batch print to a printer, see the workflow CDOT Batch Printing.

### Chapter Objectives:

After completing this exercise you will know how to:

- Select files to batch print.
- Set and change batch process specifications.
- Create a batch process job file (*.job).
- Batch print to PDF files.

### Lab 23.1 - Select Files to Batch Print

1. Select **Batch Print** in MicroStation from the file pull down menu.

	l] - Batch Print		
<u>File</u> <u>E</u> dit	Spe <u>c</u> ifications		
11 📂	🖯 🌭 🖧 🖊 🖪	🔁 💅 🕒	
Specification	ns Controlling Printing		
Printer:	11x17 Printer		
	SHEET_Plot-Boundary		
	Maximize		
Display:	As-Is Display		
# ^ File		Model	Description
•	III		F.

Note: You can be in any MicroStation file when you run the Batch Print process.

2. In the **Batch Print** dialog box, select **Edit > Add Files**.

Note: Add Active File adds the design file that is open in MicroStation.

- 3. Navigate to the C:**Projects****12345****Design****Drawings** folder. Select the following files to add to the batch process (you can hold down the **Ctrl** or **Shift** key to select multiple files):
  - 12345DES_GenNote.dgn
  - 12345DES_PnP01.dgn 12345DES_PnP19.dgn
  - 12345DES_StdPlanList.dgn
  - ♦ 12345DES_TitleSheet.dgn
  - 12345DES_TyplSect01.dgn

4. Select **Done**.

Look in:	📗 Drawings		-	G 🌶 📂 🛄 -	3	*
(Ana	Name		Date modified	Туре	Size	
2	🕺 12345DES_Pn	P12.dgn	4/7/2010 9:38 AM	Bentley MicroStati		
cent Places	🕺 12345 DES_Pn	P13.dgn	4/7/2010 9:38 AM	Bentley MicroStati		
	🕺 12345DES_Pn	P14.dgn	4/7/2010 9:38 AM	Bentley MicroStati		
·	🔏 12345DES_Pn	P15.dgn	4/7/2010 9:38 AM	Bentley MicroStati		
Desktop	🔊 12345DES_Pn	P16.dgn	4/7/2010 9:38 AM	Bentley MicroStati		
<b>1</b>	🔏 12345DES_Pn	P17.dgn	4/7/2010 9:38 AM	Bentley MicroStati		
	🔊 12345DES_Pn	P18.dgn	4/7/2010 9:38 AM	Bentley MicroStati		
CDOT User	🔊 12345DES_Pn	019.dgn	4/7/2010 1:48 PM	Bentley MicroStati		
	🔏 12345DES_Pn	^p ##.dgn	4/7/2010 1:08 PM	Bentley MicroStati		
	🕺 12345DES_Pro	f##.dgn	11/20/2007 8:46 AM	Bentley MicroStati		
Computer	🕺 12345DES_SA	Q01.dgn	11/20/2007 8:46 AM	Bentley MicroStati		
	🕺 12345DES_SA	Q##.dgn	11/20/2007 8:46 AM	Bentley MicroStati		-
	🔏 12345DES_Std	PlanList	11/20/2007 8:46 AM	Bentley MicroStati		=
Network	🔏 12345DES_SW	MP.dgn	11/20/2007 8:46 AM	Bentley MicroStati		
	🔏 12345DES_Tab	Conc##	11/20/2007 8:46 AM	Bentley MicroStati		
	🔏 12345DES_Tab	Misc01	11/20/2007 8:46 AM	Bentley MicroStati		
	🕺 12345DES_Tab	Misc##	11/20/2007 8:46 AM	Bentley MicroStati		
	🔏 12345DES_Tab	Rem##	11/20/2007 8:46 AM	Bentley MicroStati		
	🕺 12345DES_Titl	eSht.dgn	4/7/2010 1:53 PM	Bentley MicroStati		
	A TOTAL T	10 144	11 (20 (2007 0 46 414	5 0 M 0 0	•	
	File name:	"12345DES	_TitleSht.dgn" "12345DI	ES_PnP01 -	Done	
	Files of type:	CAD Files (*.	dgn;*.dwg;*.dxf)	<b>-</b>	Cancel	
	<b>~</b>				Options	

5. When finished adding files, select **Done**.

📕 [untitled] - Batch Print		
File Edit Specifications		
눱 📂 見 🍓 🛍 🗙 🗖	🖹 🚰 🗈	
Specifications Controlling Printing		
Printer: 11x17 Printer		
Print Area: SHEET_Plot-Boundary		
Layout: Maximize		
Display: As-Is Display		
# ^ File	Model	Description A
1 C:\Projects\12\12345DES_TypIS	ect01.dgn CDOT Default	Master
2 C:\Projects\12\12345DES_GenIN	lote01.dgn CDOT Default	Master =
3 C:\Projects\12345\D\12345DES	PnP01.dg CDOT Default	Master
4 C:\Projects\12345\D\12345DES_	_PnP02.dg CDOT Default	Master
5 C:\Projects\12345\D\12345DES	PnP03.dg CDOT Default	Master
6 C:\Projects\12345\D\12345DES		Master
7 C:\Projects\12345\D\12345DES		Master
8 C:\Projects\12345\D\12345DES		Master
9 C:\Projects\12345\D\12345DES		Master
10 C:\Projects\12345\D\12345DES_	_PnP08.dg CDOT Default	Master 🛫
<		4

# Lab 23.2 - Set Batch Process Specifications

- 1. The batch process default specifications are:
  - Printer: 11x17 Printer
  - Print Area: SHEET_Plot-Boundary
  - + Layout: Maximize
  - Display: As-Is Display
- 2. Select **Specifications > Manage** to change the default specifications.

Types	Specifications	
Printer	11x17 Printer	Properties
Print Area Layout	8.5x11 Printer PDF Printer	<u>R</u> ename
Display		<u>N</u> ew
		<u>C</u> opy

- 3. Under Types, select Printer and PDF Printer
  - Select Properties

🖇 Batch Print S	pecification Manager	
Types Printer Print Area	Specifications 11x17 Printer 8 5x11 Printer	Properties
Layout Display	PDF Printer	<u>R</u> ename <u>N</u> ew
		Copy Delete

- Select *Driver* and select CDOT-PDFDraftQuality_XM.pltcfg and select OK
- Toggle off Print document set to single file
- Set the Directory to c:\projects\12345\Plot_Sets\

PDF Printer Properties	
Printer	<u>о</u> к
Driver: river\CDOT-PDFDraftQuality_XM.pltcfg Browse	Cancel
Stop on error	
Paper Size and Orientation	
Size: 17x11	
<u>Y</u> : 11.000 <u>Y</u> : 11.000 Portrait	
Output and Post Processing	
Print to:	
Directory: C:\Projects\12345\Plot_Sets\ Browse	
Print <u>C</u> md: (Use %f to represent print file)	
Print document set to single file Default document set output filename (optional):	
Browse	

# *Note:* To print all these sheets to a single PDF, the toggle for **Print document set to** single file must be **ON**

- Select **OK**
- Under Types, select **Print Area** and then select **Properties**.

📕 Batch	Print Specification Manager	
Types Printer Print Area	Specifications SHEET_Plot-Boundary	Properties
Layout Display	SHEET_Plot-Boundary Properties	Rename
	Reference View	QK Cancel
	Print Boundary Method: Shape  V Level: SHEET_Plot-Boundary  Style: 0 Weight: 0	Search Files <u>Master File</u> <u>References</u>
	☑ Process Multiple Boundary Elements	

**Note:** The printable area defaults to the outer boundary of the standard CDOT sheet border (the yellow shape on level **SHEET_Plot-Boundary**).

Just Master File is checked ON under Search Files.

If **References** is toggles **ON** and the level **SHEET_Plot-Boundary** is not found in the **Master File** as a cell, it will search for the level in the Reference files associated with the sheet file. This might cause blank sheets to be generated.

- 4. Cancel the **Properties** box.
- 5. Under Types, select Layout and then select Maximize.

Types	Specifications	
Printer	Maximize	Properties
Print Area		
Layout		<u>R</u> ename
Display		<u>N</u> ew
		Сору
		Delete

- 6. Under Types, select Display
  - Select As-Is Display

<ul> <li>Select</li> </ul>	Properties
----------------------------	------------

As-Is Display Proper	ties			
Print Attributes Constructions: Data Fields: Dimensions: Displayset: Fast Cells: Fast Curves: Fence Boundary: Fill: Level Symbology:	Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis Asis A	-	Asis V Asis V Asis V Asis V Asis V Asis V Asis V Asis V	QK Cancel
Pen Table Filename: bal\Mic Additional Options Color mode: <u>As-is</u> Plot to 3D: <u>As-is</u>	3	s\Pen\CDOT-PenTable.tbl	Browse	

**Note:** The **As-Is Display Specification** sets up the print properties for various elements. The **As-Is** setting reads MicroStation's View Attributes setting for each design file.

The Pen Table defaults to **CDOT-PenTable.tbl**, which is the table used for blackand-white printing.

- 7. Cancel out of the Properties box.
- 8. **Close** the *Batch Print Specification Manager* box by selecting the **X** in the upper-right corner.

Your changes are shown in the main **Batch Print** dialog box.

File Edit Specifications		
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Specifications Controlling Printing		
Printer: PDF Printer		
Print Area: SHEET_Plot-Boundary		
Layout: Maximize		
Display: As-Is Display		
# ^ File	Model	Description 4
1 C:\Projects\12\12345DES_T	yplSect01.dgn CDOT Default	Master
2 C:\Projects\12\12345DES_G	GenINote01.dgn CDOT Default	Master
<ol> <li>C:\Projects\12\12345DES_G</li> <li>C:\Projects\12345\D\12345I</li> </ol>		Master Master
	DES_PnP01.dg CDOT Default	
3 C:\Projects\12345\D\12345	DES_PnP01.dg CDOT Default DES_PnP02.dg CDOT Default	Master
3 C:\Projects\12345\D\12345 4 C:\Projects\12345\D\12345	DES_PnP01.dg CDOT Default DES_PnP02.dg CDOT Default DES_PnP03.dg CDOT Default	Master
3         C:\Projects\12345\D\12345I           4         C:\Projects\12345\D\12345I           5         C:\Projects\12345\D\12345I	DES_PnP01.dg CDOT Default DES_PnP02.dg CDOT Default DES_PnP03.dg CDOT Default DES_PnP04.dg CDOT Default	Master Master Master
3         C:\Projects\12345\D\12345I           4         C:\Projects\12345\D\12345I           5         C:\Projects\12345\D\12345I           6         C:\Projects\12345\D\12345I	DES_PnP01.dg CDOT Default DES_PnP02.dg CDOT Default DES_PnP03.dg CDOT Default DES_PnP03.dg CDOT Default DES_PnP04.dg CDOT Default DES_PnP05.dg CDOT Default	Master Master Master Master
3         C:\Projects\12345\D\12345           4         C:\Projects\12345\D\12345           5         C:\Projects\12345\D\12345           6         C:\Projects\12345\D\12345           7         C:\Projects\12345\D\12345	DES_PnP01.dg CDOT Default DES_PnP02.dg CDOT Default DES_PnP03.dg CDOT Default DES_PnP04.dg CDOT Default DES_PnP05.dg CDOT Default DES_PnP06.dg CDOT Default	Master Master Master Master Master
3 C:\Projects\12345\D\12345 4 C:\Projects\12345\D\12345 5 C:\Projects\12345\D\12345 6 C:\Projects\12345\D\12345 7 C:\Projects\12345\D\12345 8 C:\Projects\12345\D\12345	DES_PnP01.dg CDOT Default DES_PnP02.dg CDOT Default DES_PnP03.dg CDOT Default DES_PnP04.dg CDOT Default DES_PnP05.dg CDOT Default DES_PnP06.dg CDOT Default DES_PnP07.dg CDOT Default	Master Master Master Master Master

### Lab 23.3 - Save the Specifications to a Job file (*.job)

1. From the Batch Print dialog box, select File>Save As...

2. Navigate to the project's ... Plot_Sets folder.

**Note:** You should select one of the subfolders (FIR, FOR, etc.) for the appropriate plot set. For training purposes, you'll plot to the upper level Plot Sets folder.

3. In the Files field, key in 12345 and select OK.

📕 Save Job Set Fi	ile - C:\Projects\12	345\Plot_Set	s\		
Save in:	Plot_Sets		•	G 🌶 🖻 🛄 -	😤 🖹
œ.	Name		Date modified	Туре	Size
	🜗 AD		12/14/2009 3:30 PM	File Folder	
Recent Places	퉬 FIR		8/4/2009 6:49 AM	File Folder	
	퉬 FOR		8/4/2009 6:49 AM	File Folder	
	퉬 ROWPR		8/4/2009 6:49 AM	File Folder	
Desktop					
CDOT User					
Computer					
	•				•
Network					
	File name:	12345.job		-	Open
	Save as type:	Batch Job S	et Files (*.job)	•	Cancel

The job file should be saved to the project in the appropriate folder under the **Plot_Sets**. The file is automatically assigned a .job extension. If you want to process this job again, select **File > Open** from the **Batch Print** dialog box and choose the **12345.job** file.

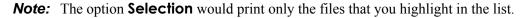
### Lab 23.4 - Create the Batch Prints

1. Select the **Print** icon to open the **Print Batch** dialog box.



2. In the Print Batch dialog box, set Print Range to All to print all the files selected

Print Batch
Print Range
Log File Filename: MS_PLTFILES.batchplt.log
Document Set Single File Output Filename: Browse Browse
QK Cancel

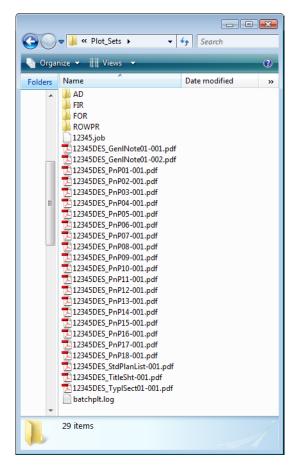


3. Select OK to start the batch process.

The process will take a few minutes to complete. If errors are encountered, open the error log **batchplt.log** in the **C:\Projects\12345\Plot_Sets** folder for more information.

## Lab 23.5 - Review the PDF files

- 1. In Windows, open My Computer.
- 2. Navigate to the C:\Projects\12345\Plot_Sets\ folder.

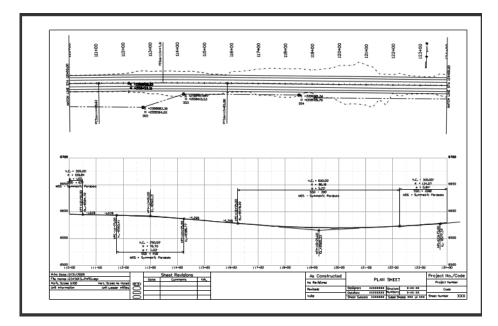


**Note:** The folder contains the all the individual pdf file sheets plus the **12345.job** file and batch log file.

3. Double-click on one of the **pdf** files to open.

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Notes within [ ] are designer directions - delete all directions prior to final plan The Contractor shall not park any weblicles or equipment in, or disturb any areas not approve		stes sites [ are des	igner s fills	direction of in by	z - delete the designed	all dis	rection: ;	prior to fi shama. If	nal plan	The Contractor sha	11 not park any vehic	les or equip	ent in, s	or d	listurb any areas	not approve	

4. Continue opening sheets as desired.



- 5. **Close** My Computer.
- 6. Return to MicroStation and **Exit**.

Index