# 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.

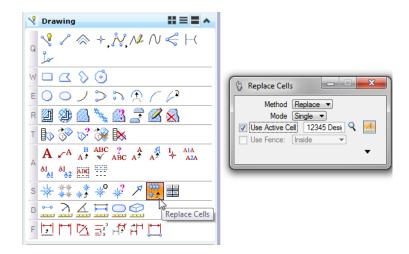
Cell Library: [\12345DesignPlanBorder.cel]				
File				
Use Shared Cells	Display All Cells In Path	<u>D</u> isplay	Wireframe 🔹	
Name	Description	Ту		
12345 Design Plan Border	Project Border Cell	Gr		
•		- P		
Active Cells				
Placement 12345 Design	n F Point Element	<u>E</u> dit.	Delete	
Terminator NONE	Pattern NONE	Create	e S <u>h</u> are	

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.



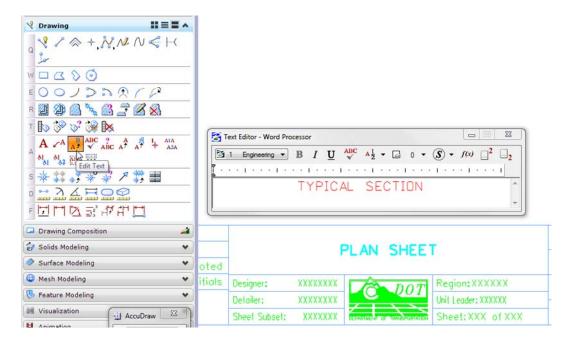
- 2. In the Tool Settings box
  - Set Method to Replace
  - Set Mode to Single
  - Toggle on Use Active Cell
- 3. When prompted to Identify Cell, <D> on the Typical Section Border.
- 4. **<D>** to accept.

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.

	TYPICAL SECTION						
٦	Designer:	CU	Structure	X-XX-XX			
-	Detailer:	CU	Numbers	X-XX-XX			
	Sheet Subset: XXXXXXX Subset Sheets: XXX of XXX			eets: XXX of XXX			

#### Lab 15.4 - Check Model Properties

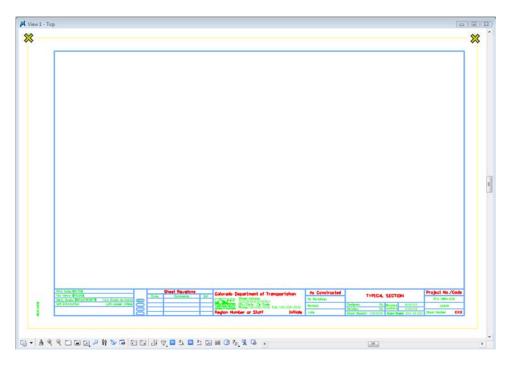
- 1. Select File > Models from the menu (or select the Models icon from Primary Tools).
- 2. Select the Edit Model Properties icon

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.

- 🧏 Drawing Q ٢ w 🗆 📿 📎 🎯 r 🔟 🎱 🙆 🍾 🙆 📑 🗭 😣 т b 🤣 😽 脉 23 Measure Distance  $A \checkmark^{A} \overset{B}{\xrightarrow{}} \overset{ABC}{\xrightarrow{}} \overset{?}{\xrightarrow{}} \overset{A}{\xrightarrow{}} \overset{A}$ Method: Between Points Ŧ AI AI ADC About: Global Z • s 🔆 🗱 🚓 🌾 🍕 🖉 🖉 🏭 Projected True <u>. ) ( H O </u> Distance D Total: F Measure Distance
- 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 Change Text Case	Proposed ?
Hydraulics Landscape E	County Sheet Composer	
Materials Ged ROW Survey Traffic ITS Utilities	Edit Text Along gINT Translator Levels Off Measure XY Distance Misc. Tools ModElev	Ib Boundary ▲   Aatch Line Lility Revision Cloud   border (Plan 11"x17")   border (Plan 11"x8.5") Portrait   border (Plan 11"x7")   border (Plan 11"x17")   border (Plan 11"x17")
	Redlines Roughen SignCAD Steel Stratify Survey	order (Profile 11'x17") order (Ttile 11'x8.5") Portrait order (Typical Section 11'x1 order Limits (11'x17") all 811 Stamp (Formerly UNC DOT Logo oth Arrow Skier
Setting	Text to Node Traffic Accident Traffic Stripmap	
	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.

avement Type	Pavement Thickne	ess		Median Type	Vertical Factor
Asphalt	Top Lift:	1.50	in	None	2.00 x Actual Vertical Distance
Concrete	Lift 3:	1.50	in	Barrier Curb	
Overlay	Lift 2:	1.50	in	Depressed	Roadway Cross Slope Cross Slope -2 00 %
Widening	Bottom Lift:	1.50	in	Mountable Curb	Closs Slope -2.00 %
	ABC:	12.00	in	Paved	Z-Slopes
	Subbase	12.00	in	Single Lane / Ramp	Dist: 12.00 ft
					Slope: 6.00 : 1
eft Side		Median			Right Side
Outside Shoulder Travel Lan	Inside e Travel Lane	Shoulder	Left Median	Right Median Shoulder	Inside Outside Travel Lane Travel Lane Shoulder
10.00 ft 0.00 ft	12.00 ft	0.00 ft	0.00 f	t 0.00 ft 0.00 ft	12.00 ft 0.00 ft 10.00 ft
.eft Curb			g Paveme		Right Curb
None		Left S	ide ft	Right Side	None
Barrier		0.00		0.00	Barrier
Mountable		Bench			Mountable
Sidewalk: 0.00	ft	Left S	ide ft	Right Side	Sidewalk: 0.00 ft

*Note:* Items that require input are shown in red.

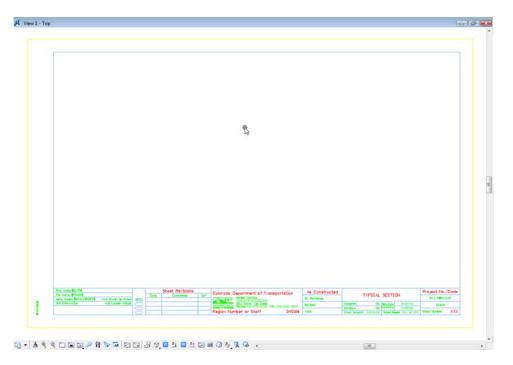
### **Create a 2-Lane Rural Typical Section**

- 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.

🚆 CDOT Create Typical Se	ections			
File Options Help				
Pavement Type Asphalt Concrete Overlay Widening	Pavement Thickness Top Lift Lift 3: Lift 2: Bottom Lift: ABC: Subbase	3.00     in       1.50     in       0.00     in       12.00     in	Median Type None Bamier 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 Sł	edian Left noulder Median 00 ft 0.00 ft	Right Median Shoulder t 0.00 ft 0.00 ft	Night Side Outside   Inside Outside   Travel Lane Travel Lane   12.00 ft   0.00 ft
Left Curb None Barrier 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 G	areater than 0.0)	Slope Away from Road	Slope Away 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**

1. Set the Typical Section Program options as shown.

CDOT Create Typical S File Options Help	ections			
Pavement Type Asphalt Concrete Overlay Widening	Pavement Thicknes Top Lift: Lift 3: Lift 2: Bottom Lift: ABC: Subbase	3.00     in       1.50     in       1.50     in       1.50     in       1.50     in       1.50     in       1.400     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	Median Left Shoulder Median 0.00 ft 0.00 ft	Right Median Shoulder t: 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: 6.00 ft	1	Existing Paveme Left Side 0.00 ft Bench Left Side	Right Side 0.00 ft Right Side	Right Curb None Barrier Mountable Sidewalk: 6.00 ft
Required Fields (Must be C	Greater than 0.0)	0.00 ft Slope Away from Road	0.00 ft Slope Away from Road	Apply Close

- 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.

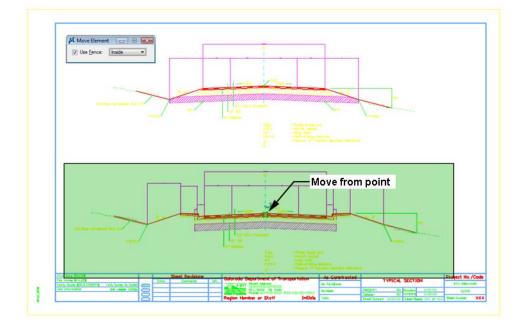
4. Close the Create Typical Section dialog box.

#### **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 💌

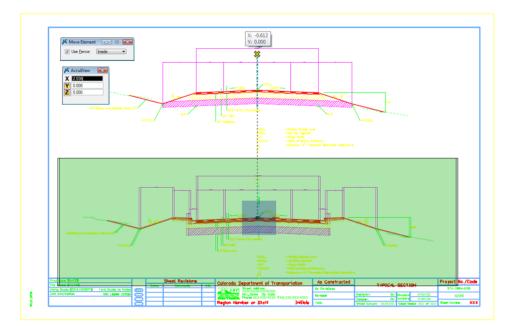


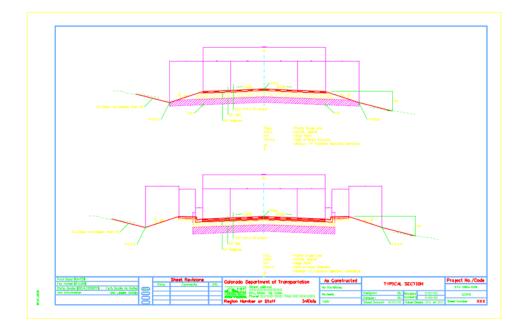
3. AccuSnap on the centerline of the urban section as shown for the move from point.

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.