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Carlson 2008 - Creating Roadway Templates

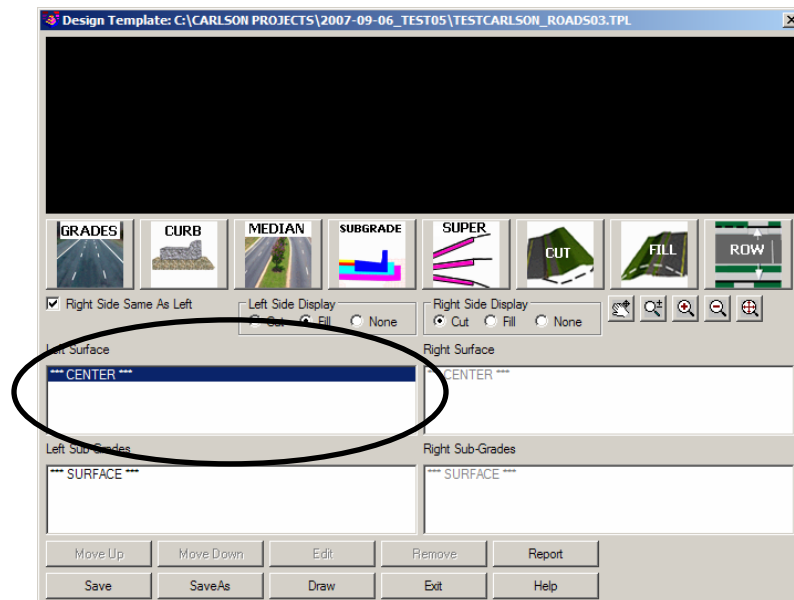
Defining roadway templates can be done in any of three ways:

- Roads> Design Template
- Roads> Process Road Design> Design Template Series
- Through the Road Network palette by selecting the road and then clicking on the Edit button

1. After starting the command by one of the three methods listed above, select the "New" tab.
2. Select a folder and specify a file name for the new Template (.tpl) file
3. Open the .tpl file for editing in the Design Template Editor.
 - a. If you have used the Roads> Design Template method to access this command, the template file will automatically be opened for editing as soon as you assign the file name and click on "Open"
 - b. If you have used either the Process Road Design or Road Network methods to access this command you will have to pick on the "Edit" button to open the file for editing.
4. Establish template as symmetrical or asymmetrical
 - a. If the template is exactly symmetrical about the centerline, select the check box next to "Right Side Same as Left" to apply all template components to both sides at once.
 - b. If the template is NOT exactly symmetrical, uncheck the box next to "Right Side Same as Left". Every template component must now be added to the right and left sides independently.

*** These notes assume a symmetrical template

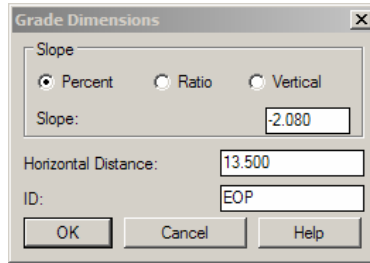
5. Add surface template components. The template is created from the centerline out, so the first component to add to the template will be the pavement at the centerline. Surface template components affect the top surface only, not subgrade elements
 - a. Create pavement component of template
 - i. In the "Left Surface" area of the Design Template Editor, left click once on ***CENTER*** to that new components will "attach" to the centerline point of the template.



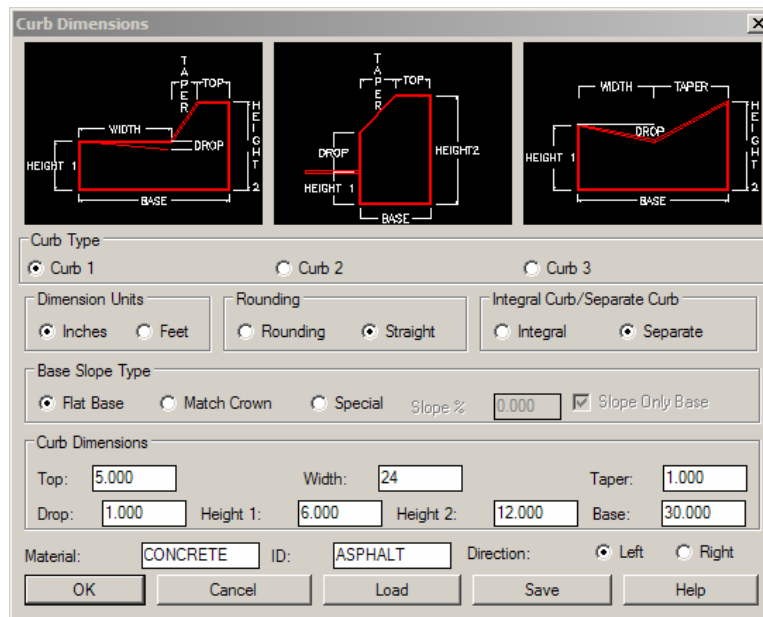
Carlson 2008 - Creating Roadway Templates

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- ii. Select the button for "Grades" to establish the surface grade of the asphalt pavement and open the Grade Dimensions dialog box.
- iii. Set the type and value of the slope - the slope value is FROM the centerline. Therefore, a downhill slope from the centerline to the edge of pavement will have a negative slope
- iv. Set the horizontal distance - This is the absolute value of the distance from the centerline to the edge of pavement. Whether entering this value for both left and right sides on a symmetrical template or for either the left or right on an asymmetrical template, this value is always positive.
- v. Set the ID for the new point. This is a description of the outside point of this template component. In this example, we have used an ID of "EOP" to designate this point as the Edge of Pavement.



- vi. Click OK to finish and close the dialog box and return to the Design Template Editor
- b. Next, add the curb component to the template.
 - i. In the Design Template Editor, select the "Grade" component that was just created so that the next component (curb) will be placed below the "Grade" component in the list. By being below the Grade component, it will be placed to the outside, moving away from the centerline.
 - ii. Select the button for "Curb" to open the "Curb Dimensions" dialog box.
 - iii. Select the desired curb type
 - iv. Specify the curb dimensions based on the selected curb type
 - v. Specify the material (for quantity calculations) of the curb.
 - vi. Specify the ID for the new connection point.
 - vii. See example below.

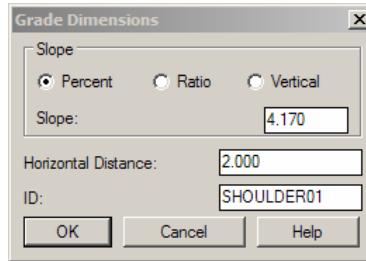


- viii. Click on the OK button to finish and close the dialog.

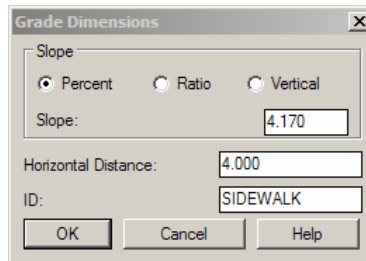
Carlson 2008 - Creating Roadway Templates

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- c. Add Shoulder template component - For detailed explanation of items below, refer to section 5a of this document.
 - i. In the "Left Surface" area of the Design Template Editor, left click once on the CURB component that we've just created so that the shoulder will be added to the outside of the curb.
 - ii. Select the button for "Grades" to open the Grade Dimensions dialog box.
 - iii. Set the type and value of the slope
 - iv. Set the horizontal distance
 - v. Set the ID for the new point.
 - vi. See example below.



- vii. Click OK to finish and close the dialog box and return to the Design Template Editor
- d. Add Sidewalk template component - For detailed explanation of items below, refer to section 5a of this document.
 - i. In the "Left Surface" area of the Design Template Editor, left click once on the SHOULDER01 component that we've just created so that the sidewalk will be added to the outside of the shoulder section.
 - ii. Select the button for "Grades" to open the Grade Dimensions dialog box.
 - iii. Set the type and value of the slope
 - iv. Set the horizontal distance
 - v. Set the ID for the new point.
 - vi. See example below.

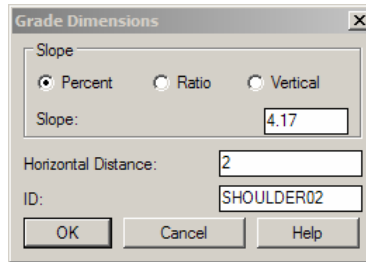


- vii. Click OK to finish and close the dialog box and return to the Design Template Editor

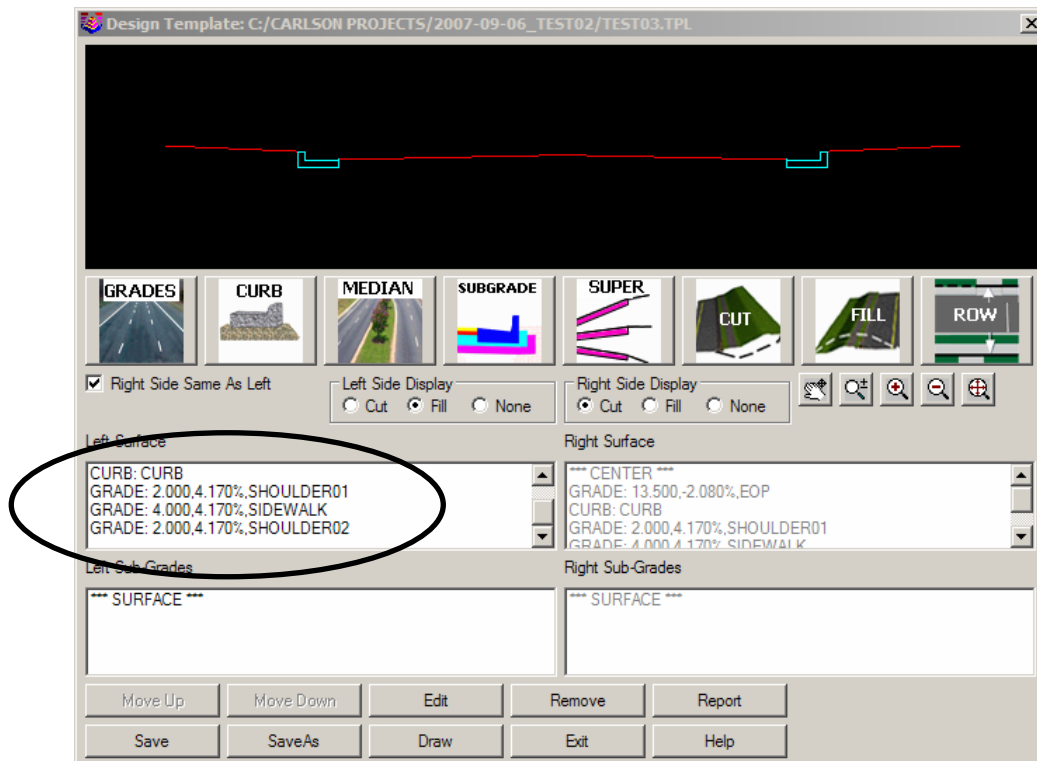
Carlson 2008 - Creating Roadway Templates

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- e. Add a second Shoulder template component - For detailed explanation of items below, refer to section 5a of this document.
 - i. In the "Left Surface" area of the Design Template Editor, left click once on the SIDEWALK component that we've just created so that the new shoulder will be added to the outside of the SIDEWALK.
 - ii. Select the button for "Grades" to open the Grade Dimensions dialog box.
 - iii. Set the type and value of the slope
 - iv. Set the horizontal distance
 - v. Set the ID for the new point.
 - vi. See example below.



- vii. Click OK to finish and close the dialog box and return to the Design Template Editor
6. After defining all template surface components, the results in the Design Template Editor should be similar to that shown below with the "Left Surface" and "Right Surface" areas populated.



Carlson 2008 - Creating Roadway Templates

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7. Add subgrade template components by assigning Asphalt, Stone Base and Sidewalk depths.
 - a. Add Asphalt subgrade component
 - i. Pick the button for "Subgrades"
 - ii. Set the Slope Type to either Match the surface component directly above the subgrade or Special to assign a different slope
 - iii. Select the method to be used to Intersect the Surface above. You will most likely use "Straight Up" or "Wrap Around" methods. If you choose "Wrap Around", you will have access to the "Wrap Height" entry
 - iv. Enter the Horizontal Offset - This is the distance left or right of the centerline where the subgrade starts. Leave this value at 0 or empty to have asphalt or stone under the entirety of the pavement section.
 - v. Enter the Vertical Offset - Set the appropriate units to either Feet or Inches. This is the depth component of the subgrade.
 - vi. Enter the Distance - This is the width of the subgrade, measured from the centerline to the outermost point.
 - vii. Enter the Material - This is the type of material being defined as subgrade.
 - viii. See example below for creating the Asphalt subgrade

The screenshot shows the "Sub-Grade Dimensions" dialog box with the following settings:

- Slope Type:** Match Surface, Special. Slope (%): 0.000
- Direction:** Out, In
- Intersect surface:** Straight Up (dropdown). Wrap Height: 0.000. Tie Slope(%): 0.000
- Horizontal Offset:** [Empty text box]
- Vertical Offset:** 2. Units: Feet, Inches
- Distance:** 13.5. Material: ASPHALT

- ix. Click OK to finish and close the dialog box and return to the Design Template Editor.

Carlson 2008 - Creating Roadway Templates

Continued

- b. Add Stone Base as subgrade component - For detailed explanation of items below, refer to section 7a of this document.
 - i. Pick the button for "Subgrades"
 - ii. Set the Slope Type
 - iii. Select the method to be used to Intersect the Surface above.
 - iv. Enter the Horizontal Offset
 - v. Enter the Vertical Offset
 - vi. Enter the Distance - Note that, due to the wrap around nature of the Stone Base, the Distance component extends 1.0' beyond the back of curb.
 - vii. Enter the Material
 - viii. See example below for creating the STONE BASE subgrade component

The screenshot shows the 'Sub-Grade Dimensions' dialog box. The 'Slope Type' section has 'Match Surface' selected and 'Slope (%)' set to 0.000. The 'Direction' section has 'Out' selected. The 'Intersect surface' dropdown is set to 'Wrap Around', with 'Wrap Height' set to 5 and 'Tie Slope (%)' set to 0.000. The 'Horizontal Offset' is empty. The 'Vertical Offset' is set to 8. The 'Units' section has 'Inches' selected. The 'Distance' is set to 16. The 'Material' dropdown is set to 'STONE BASE'.

- ix. Click OK to finish and close the dialog box and return to the Design Template Editor.
- c. Add Sidewalk as subgrade component - For detailed explanation of items below, refer to section 7a of this document.
 - i. Pick the button for "Subgrades"
 - ii. Set the Slope Type
 - iii. Select the method to be used to Intersect the Surface above.
 - iv. Enter the Horizontal Offset - Note that the Horizontal Offset must be set to the distance from the centerline to the nearest edge of sidewalk.
 - v. Enter the Vertical Offset
 - vi. Enter the Distance
 - vii. Enter the Material
 - viii. See example below for creating the SIDEWALK subgrade component

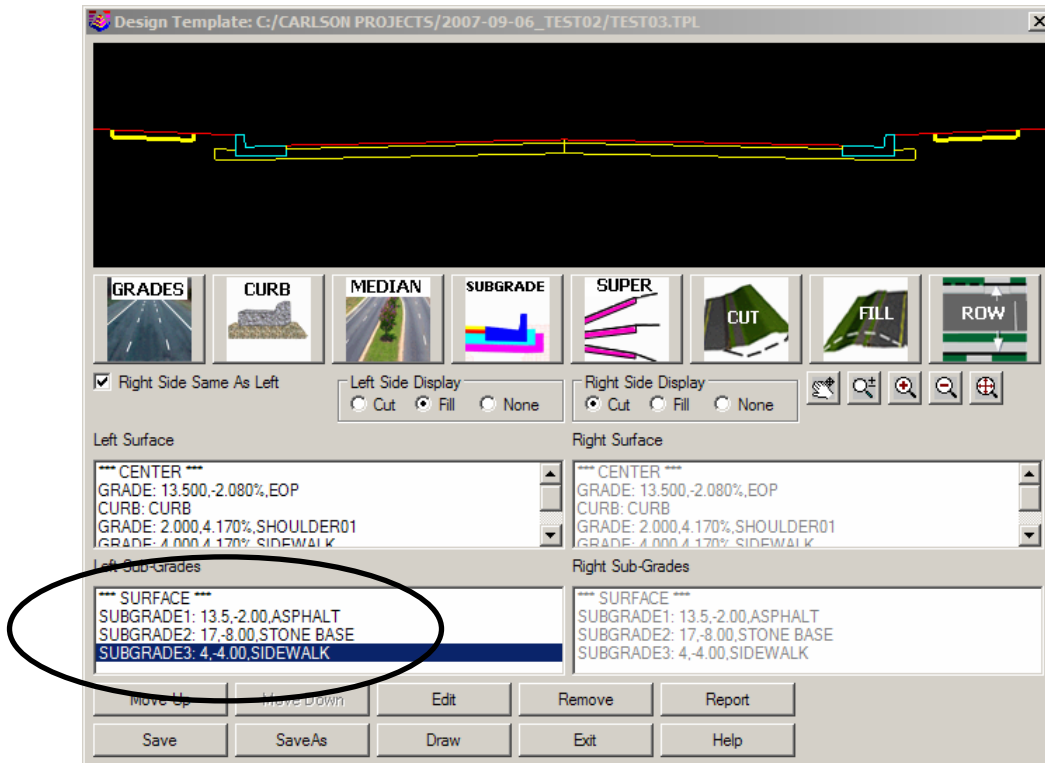
The screenshot shows the 'Sub-Grade Dimensions' dialog box. The 'Slope Type' section has 'Match Surface' selected and 'Slope (%)' set to 0.000. The 'Direction' section has 'Out' selected. The 'Intersect surface' dropdown is set to 'Straight Up', with 'Wrap Height' set to 0.000 and 'Tie Slope (%)' set to 0.000. The 'Horizontal Offset' is set to 18. The 'Vertical Offset' is set to -4.00. The 'Units' section has 'Inches' selected. The 'Distance' is set to 4. The 'Material' dropdown is set to 'SIDEWALK'.

- ix. Click OK to finish and close the dialog box and return to the Design Template Editor.

Carlson 2008 - Creating Roadway Templates

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8. After adding subgrade components to the template, you will see their definitions in the "Left Subgrade" and "Right Subgrade" area of the Design Template Editor and will see the depths added to the figure. See below.

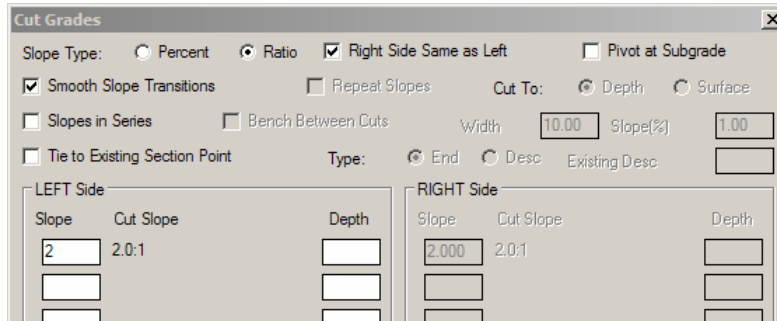


Carlson 2008 - Creating Roadway Templates

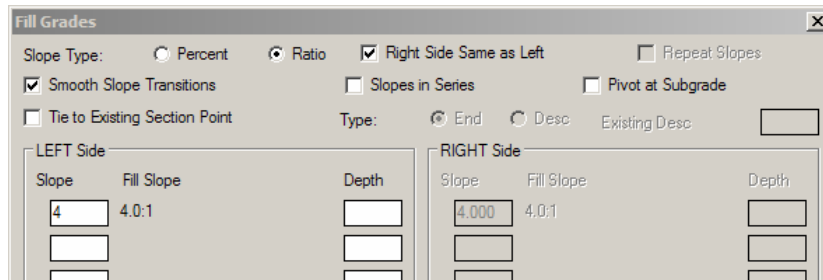
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9. Add cut and fill grades to template definition

- a. Set "Cut" grades
 - i. Pick the "Cut" button in the Design Template Editor
 - ii. Set the Slope Type
 - iii. Place a check in the box if the Right and Left sides are to have the same slopes applied to Cut sections
 - iv. In the LEFT Side of the dialog, set the desired slope
 - v. See example below for creating the Cut Grades



- vi. Click OK to finish and close the dialog box and return to the Design Template Editor.
- b. Set "Fill" grades
 - i. Pick the "Fill" button in the Design Template Editor
 - ii. Set the Slope Type
 - iii. Place a check in the box if the Right and Left sides are to have the same slopes applied to Fill sections
 - iv. In the LEFT Side of the dialog, set the desired slope
 - v. See example below for creating the Fill Grades

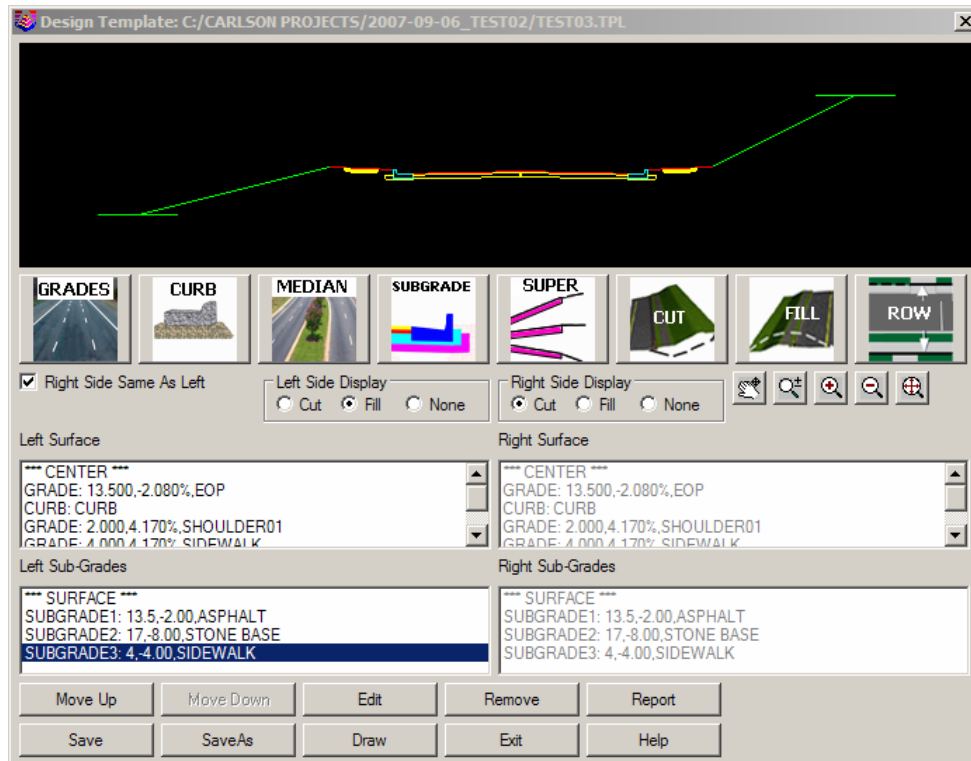


- vi. Click OK to finish and close the dialog box and return to the Design Template Editor.

Carlson 2008 - Creating Roadway Templates

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10. Back in the Design Template Editor, the finished diagram and surface and subgrade settings should look similar to the picture below.



11. To re-order components, select the component in the list of Surface or Subgrade components and then pick either the "Move Up" or "Move Down" buttons.
12. To edit an item, select the component in the list of Surface or Subgrade components and then pick the "Edit" button.
13. To remove an item, select the component in the list of Surface or Subgrade components and then pick the "Remove" button.
14. To save the template, click on the "Save" button.
15. To save the template as a separate file, click on the "SaveAs" button and you will be prompted to specify a new location and file name.
16. To finish the editing process, click on the "Exit" button.

Carlson 2008 - Creating Roadway Templates

Continued

Insert the Typical Section into the Drawing

1. Go to Roads> Draw typical template
2. On the Existing tab, Browse to the folder and select the desired .tpl file
3. To draw and label all template components, select the radio button next to "Normal".
4. To draw only a curb detail, select the radio button next to "Curb Detail".
5. To draw only a pavement detail, select the radio button next to "Pavement Detail".
6. Establish the proper settings to use in drawing the template. Refer to example below for settings that seem to work well.
7. Click on "Draw" and then pick a point in the drawing to place the typical section.

The image shows a screenshot of the "Typical Section" dialog box in Carlson 2008. The dialog is organized into several sections:

- Output Options:** Contains checkboxes for "Superelevation Left", "Normal" (checked), "Superelevation Right", "Detail of Left Super", "Pavement Detail", "Detail of Right Super", "Shoulder Detail", "Median Detail", and "Curb Detail".
- Dimensioning Options:** Includes a "Decimals" dropdown set to "0.00", checkboxes for "Drop Trailing Zeros" (checked) and "Text Above Line" (checked), and a "Label Slopes" section with radio buttons for "None", "Surface Only" (selected), and "Surface and Subgrades".
- Other Options:** Checkboxes for "Label Grade IDs" (checked) and "Hatch Subgrade" (checked), with a "Set Hatch Patterns" button.
- Scale and Layer:** "Drawing Scale" is set to "1.000", "Vertical Exaggeration" is "2.0", "Text Scaler" is "0.400", and "Layer" is "TEMPLATE".
- Super Elevation:** "Max Super Elevation" has radio buttons for "4%" (selected), "6%", "8%", "10%", and "Special". A "Super Elevation" field is set to "4.000".
- Treatment:** "Left Side Treatment" has radio buttons for "Fill" (selected), "Cut", and "None". "Right Side Treatment" has radio buttons for "Fill", "Cut" (selected), and "None".
- Buttons:** "Draw", "Colors", "Exit", and "Help".