2015 Design Training Expo

FDOT Subassemblies Essentials

FDOT State Kit for AutoCAD Civil 3D

Mike Racca
CADD APPLICATIONS SUPPORT
Florida Department of Transportation (ECSO)
Email: Mike.Racca@dot.state.fl.us

Engineering/CADD Systems Office

Centennial FDOT 1915 ★ 2015

Celebrating 100 Years of Innovation, Mobility and Economic Development

FDOT Subassemblies Essentials

This topic is focused on the FDOT Subassemblies. We'll create assemblies and edit parameters specific to FDOT subassemblies. We will also examine how to organize and work with tool palettes.

Software prerequisites:

- The most current/latest version of the FDOT Civil 3D State kit should be installed. This will ensure you are using the latest subassemblies developed specific for FDOT roadway modeling Design Standards.

User prerequisites:

- Should have a good understanding of AutoCAD and a basic understanding of AutoCAD Civil 3D.

FDOT Subassemblies Essentials

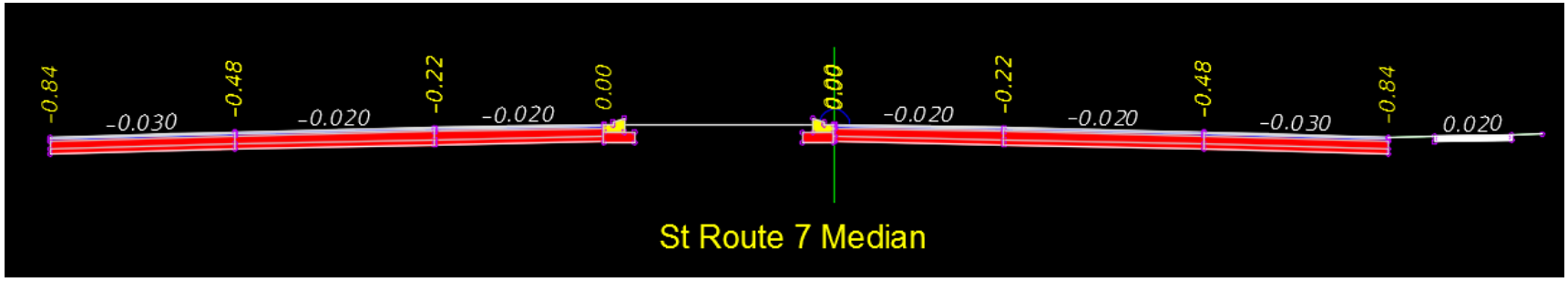
Session Objectives:

- **What are Subassemblies?**
- **How to Access Different Subassembly from Civil 3D Tool palettes.**
- **What are the Elements of a Subassembly?**
- **Creating a Road Assembly** – Piece together a road assembly with FDOT lanes, FDOT curbs, FDOT Traffic Separator, and FDOT Simple Daylight.
  - **Examine multiple ways to edit an assembly and its parameters.**
  - **How to access and read the help files.**
  - **Change the appearance of an assembly by changing the Code Set Styles.**
  - **Look at options to correct mistakes like Move, Insert, Replace, Delete, or changing AutoCAD Properties parameters.**

FDOT Subassemblies Essentials

What are Subassemblies?

- A subassembly is a building block of a typical section, known as an assembly. Examples of subassemblies include lanes, curbs, sidewalks, railing, trenches, daylighting, and any other component required to complete a typical corridor section.
- FDOT has created many subassemblies that are specific to FDOT Design Standards.

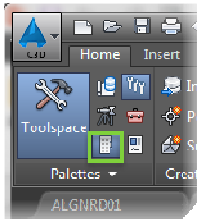


FDOT Subassemblies Essentials

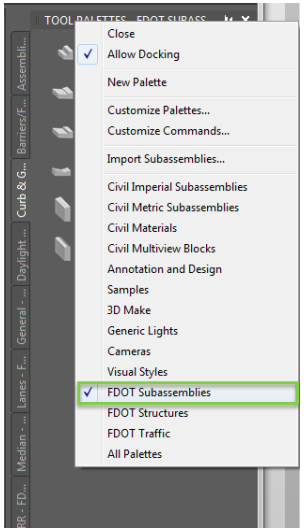
How to access different Subassembly from Civil 3D Tool Palettes

➢Tool Palettes

- You add various subassemblies to a design by clicking on them from the subassembly tool palette. You access the tool palettes from the Home tab by clicking on the palettes panel or by pressing Ctrl+3.



- FDOT Civil 3D State kit has its own unique set of tool palettes, specifically created for FDOT roadway modeling.
- Right click on the Tool Pallet to title menu to access FDOT custom subassemblies.

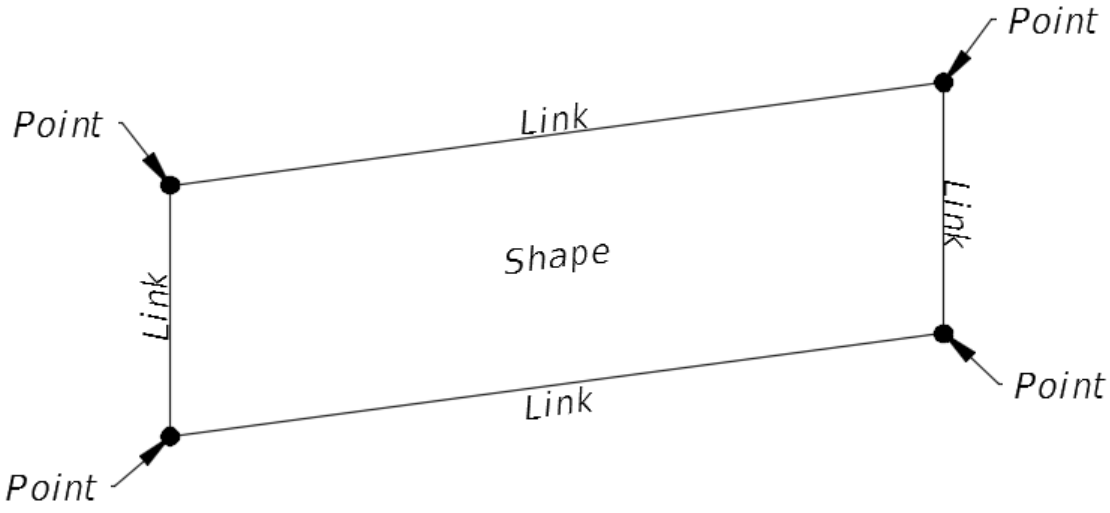


What are the elements of a Subassembly?

- Subassembly is made up of thee basic parts.
  - Points
  - Links
  - Shapes

Each piece is used for different purposes at each stage of your design process.

Schematic showing parts of a subassembly

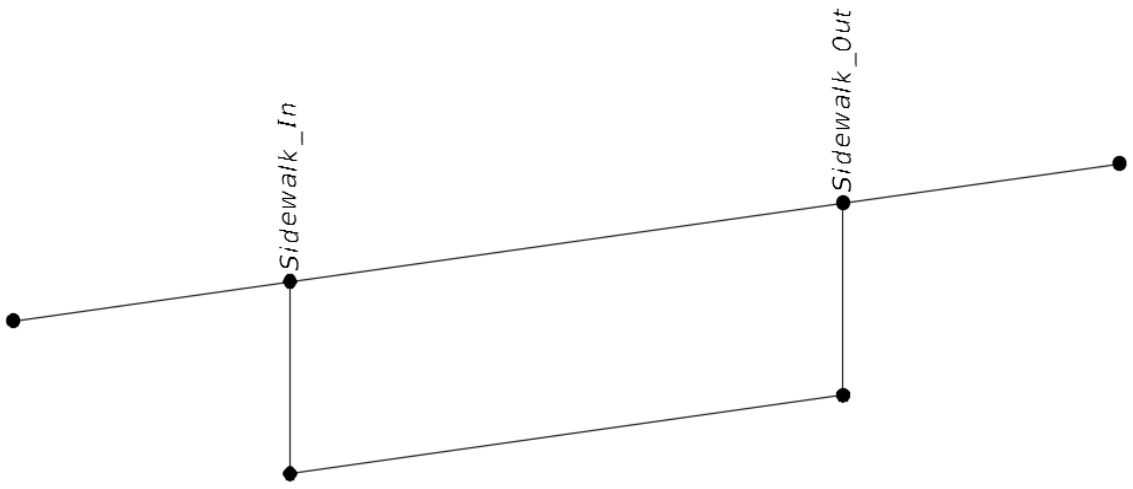


What are the elements of a Subassembly?

➢ **Point**

- Marker points are located at the endpoints of every link.
- Used to “click” subassemblies together or “hook” to alignments and/or profiles known as targets.
- Controls automatic labeling.
- Coded points are used to connect the dots between each occurrence/frequency of the assembly.
- Creates feature lines which can then be used almost anywhere.

Points and point codes on the FDOT Sidewalk subassembly

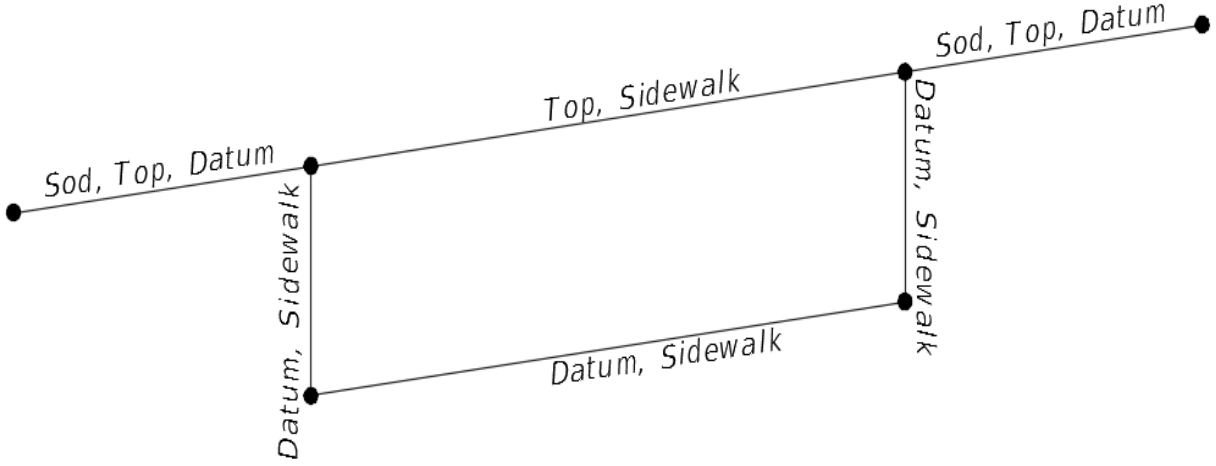


What are the elements of a Subassembly?

➢Link

- Linear components that usually represent the outer edges of an assembly.
- Links have codes assigned to them that identify stratum materials and shapes.
- Controls automatic labeling.
- Simplifies surface creation. Top and datum codes are used to build surfaces

Links and link codes on the FDOT Sidewalk subassembly

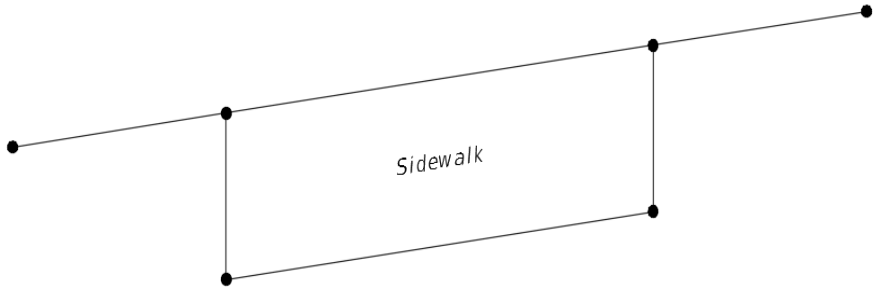


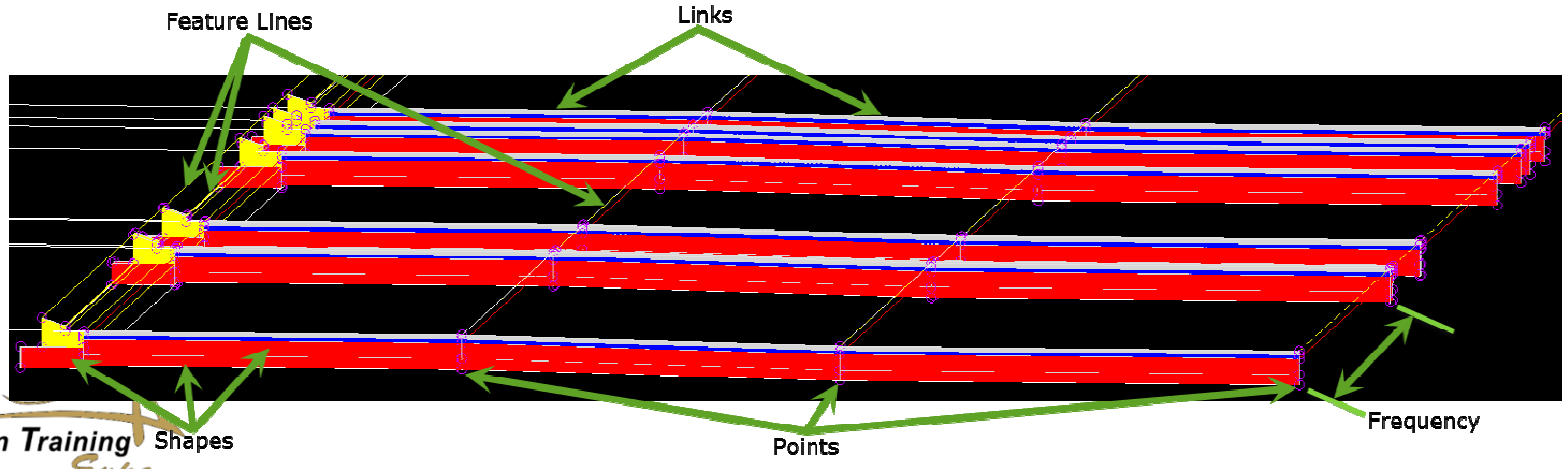
What are the elements of a Subassembly?

➢Shape

- Shapes are the areas inside a closed formation of links.
- Shapes are used for creating volumes or end-area material quantity calculations.

Shape codes on the FDOT Sidewalk subassembly





Creating a Road Assembly.

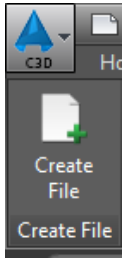
Piece together a road assembly with FDOT lanes, FDOT curbs, FDOT Traffic Separator, and FDOT Simple Daylight.

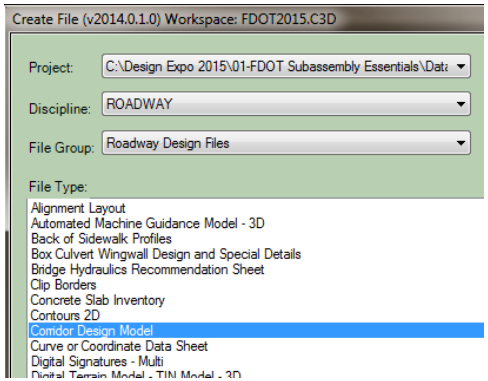
First decide what to design?

- Consider design feature details:
  - Typical divided, undivided road, railway…
  - Is there a need for Traffic separators?
  - Proper target alignments and objects in file? PGL left and right, EOP, edge of travel…
  - Do you need any Xref's? DSGNRD (Design file), TOPORD (Topo file)…
  - ….. just some things to consider.

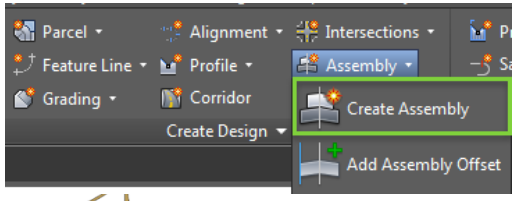
Creating a Road Assembly.

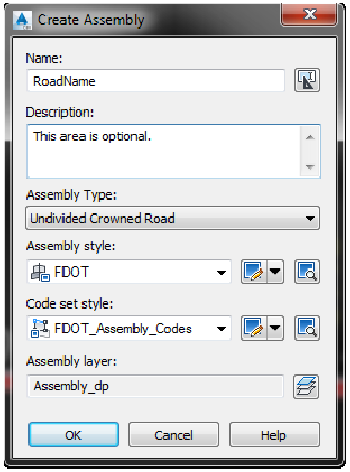
Use the Create File tool to start your new drawing. Be sure you are in the Corridor.dwg file when starting your new assembly. This will assure that you have the proper Styles, Code Sets, Layers, Text and such for your design.

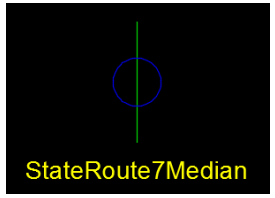




1. Click on the Create Assembly icon, Give the new assembly a name, for example the name of the street. The description is optional. For this exercise leave the Assembly type set to Undivided Crowned Road. Verify that Assembly Type is set to FDOT and FDOT_Assembly_Codes is selected.



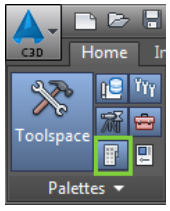




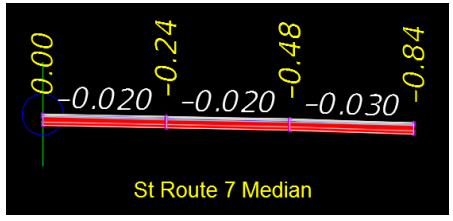
Creating a Road Assembly

Adding Subassemblies to your Assembly. (FDOT Lanes)

1. On the Home Tab located the Tool palettes icon.
2. The FDOT Tool Pallet should be current. If not, right-click on the title bar of the Tool Pallet and choose FDOT Subassemblies from the list.
3. On the Lanes-FDOT tab, locate and click on the FDOT_Lane subassembly.
4. When the PROPERTIES tool bar appears, match the following parameters shown in the screen capture below.
5. Place the lane two times on the right side of the assembly marker using the same parameters. The Super Elevation Type should be, RightInsideLane. The third time, change the slope parameter to -3.00% with a Super Elevation Type to RightOutSideLane.



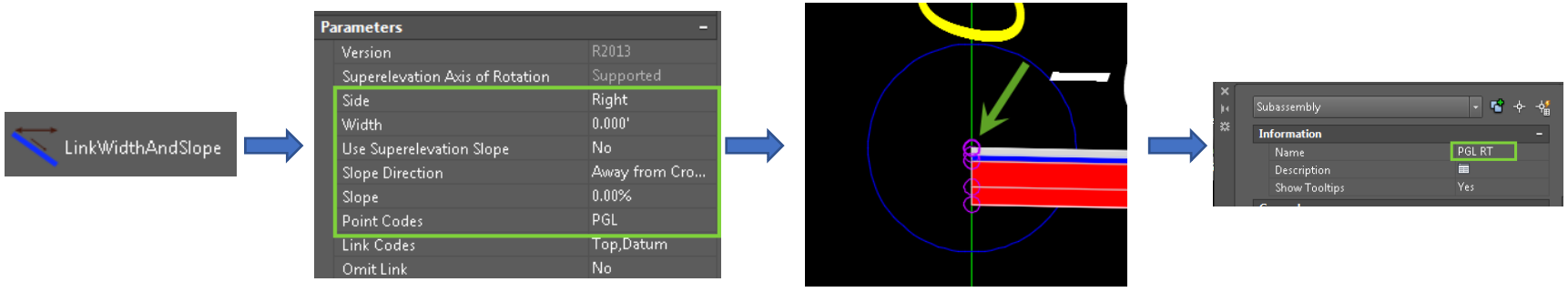
Parameters	
Side	Right
DepthPavement1	1.50"
DepthPavement2	1.50"
Slope	-2.00%
Super Elevation Type	RightInsideLane
WidthLane	12.000'
DepthBase	6.00"
DepthSubBase	12.00"
Extension Base Inside	0.00"
Extension Base Outside	0.00"



Creating a Road Assembly

Adding Subassemblies to your Assembly. (PGL Right Targets for Labels)

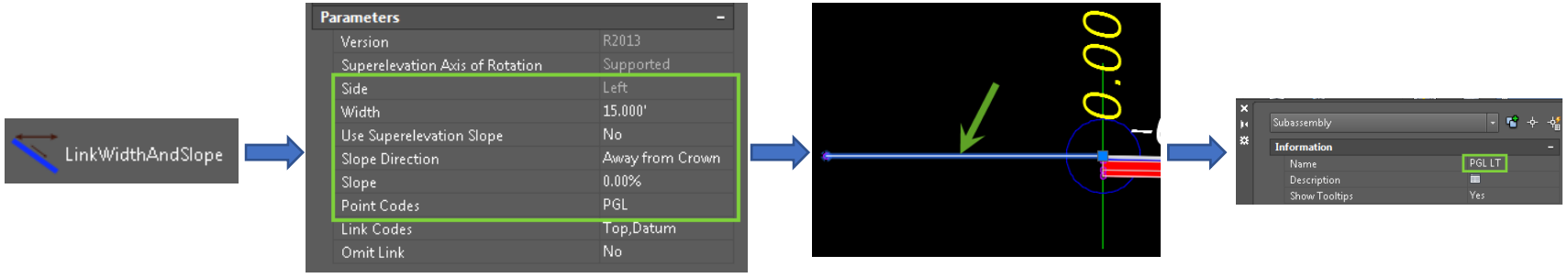
- For the Alignment labels to show up in your Cross-sections and Section editor, we will add the LinkWidthAndSlope subassembly to the Assembly.
  1. Right-click on the title bar of the Tool Pallet and choose **Civil Imperial Subassemblies** from the list.
  2. On the Generic tab choose **LinkWidthAndSLope**.
  3. Match the following parameters shown in the screen capture below.
  4. Place the LaneWidthAndSlope on the assembly marker.
  5. Click on the LaneWidthAndSlope marker in the Assembly. In the properties dialog box, rename the subassembly to **PGL RT**.



Creating a Road Assembly

Adding Subassemblies to your Assembly. (Add the PGL Left Alignment Target)

- For the left side PGL Alignment of our Assembly to move independently from the PGL right, we will add the LinkWidthAndSlope subassembly again to the Assembly using different paramenters.
  1. On the (Autodesk) **Civil Imperial Subassemblies** choose **LinkWidthAndSlope** subassembly.
  2. Match the following parameters shown in the screen capture below.
  3. Place the LinkWidthAndSlope on the assembly marker.
  4. Click on the LinkWidthAndSlope marker in the Assembly. In the properties dialog box, rename the subassembly to **PGL RT**.

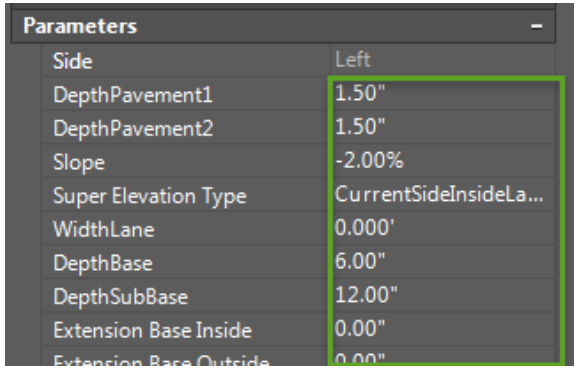


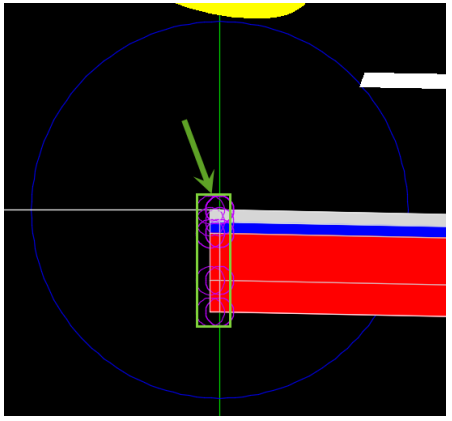
Creating a Road Assembly

Adding Subassemblies to your Assembly. (Add a Zero width FDOT Lane)

- We need to add a lane that will adjust to the MedianEdge_Right Alignment for the right turn lane.

1. The FDOT Tool Pallet should be current. If not, right-click on the title bar of the Tool Pallet and choose FDOT Subassemblies from the list.
2. On the Lanes-FDOT tab, locate and click on the FDOT_Lane subassembly.
3. When the PROPERTIES tool bar appears, match the following parameters shown in the screen capture below.
4. Place the lane one time on the left side of the assembly marker. You will only see a sliver of the lane in the Assembly even though you assigned a zero width value to the parameter.

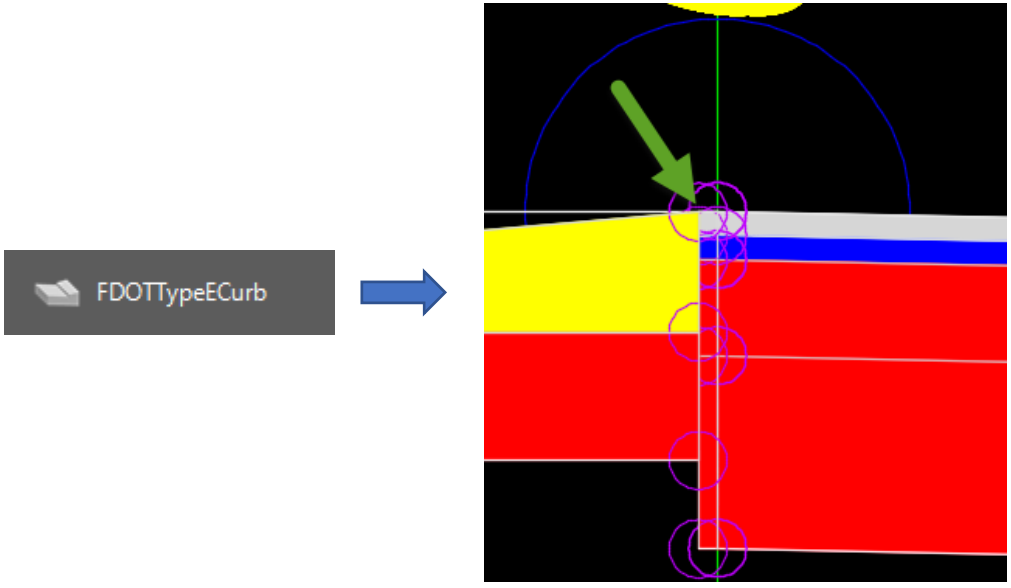




Creating a Road Assembly

Adding Subassemblies to your Assembly. (Curb and Gutter)

1. On the Curb & Gutter tab, locate the FDOTTypeE subassembly.
2. Place the curb one time on the left side of the assembly marker on the Zero width lane we added from the previous exercise.

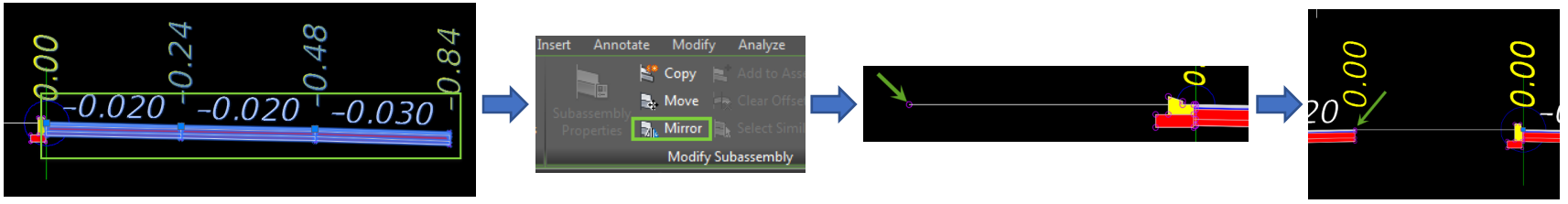


Creating a Road Assembly

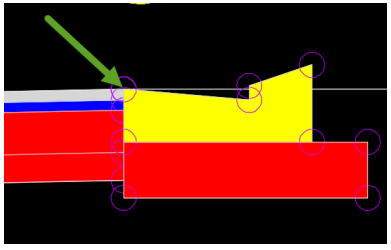
Adding Subassemblies to your Assembly. (Mirror the Assembly)

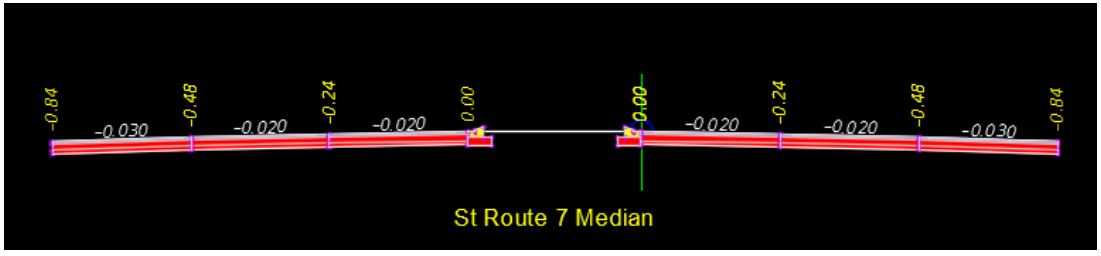
- Next we need to mirror the 3 lanes, curb and gutter to the left side of the Assembly.

1. First select the three lanes and in the Modify Subassembly contextual panel, select **Mirror**. (Do not select the zero width subassembly).
2. Then select the left side of the LaneWidthAndSlope subassembly marker point.



3. Perform the same steps to mirror the Curb and Gutter one time on the left side of the assembly marker on the Zero width lane we added from the previous exercise. Select yes when prompted to mirror assembly to the same side.

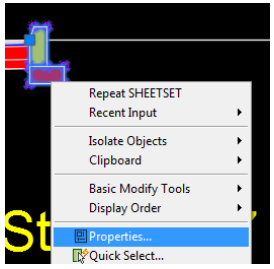


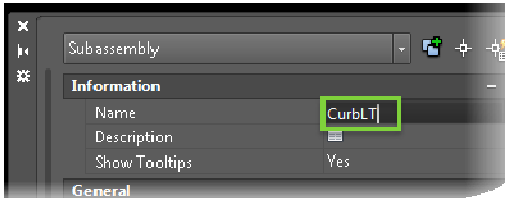


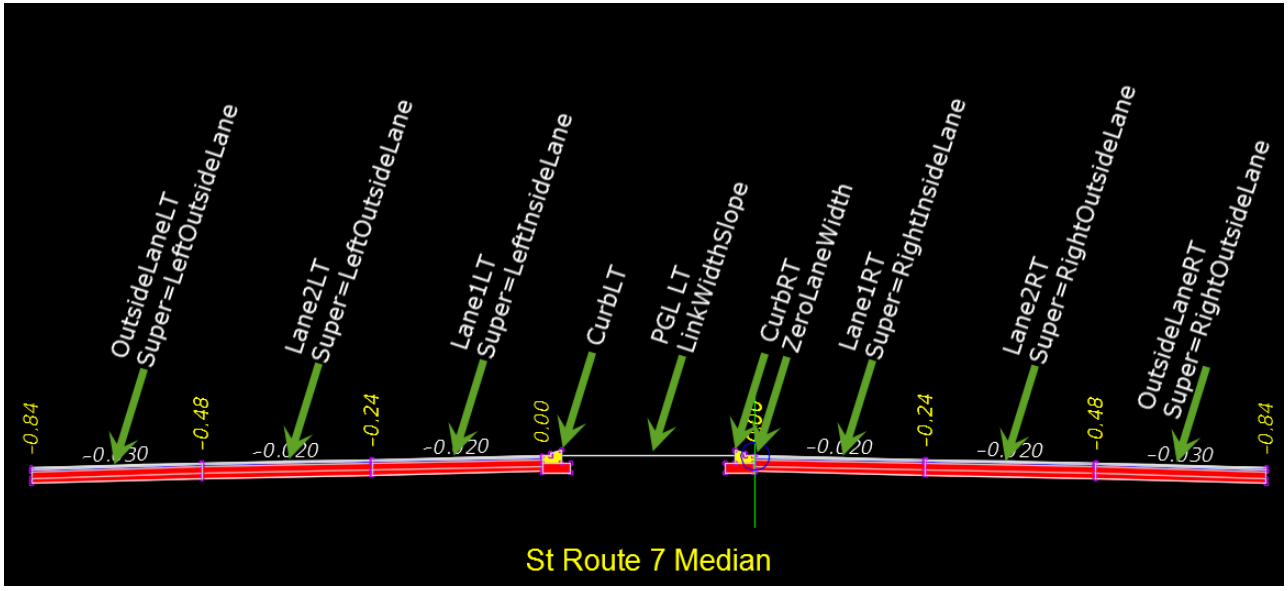
Creating a Road Assembly

Renaming your Subassemblies.

- Renaming your Subassemblies helps to match the proper Subassembly to the proper targets when construction your Corridor model.
  1. Select each assembly one at a time, right-click and select **Properties**. In the Properties dialog box assign the proper name according to the figure below.





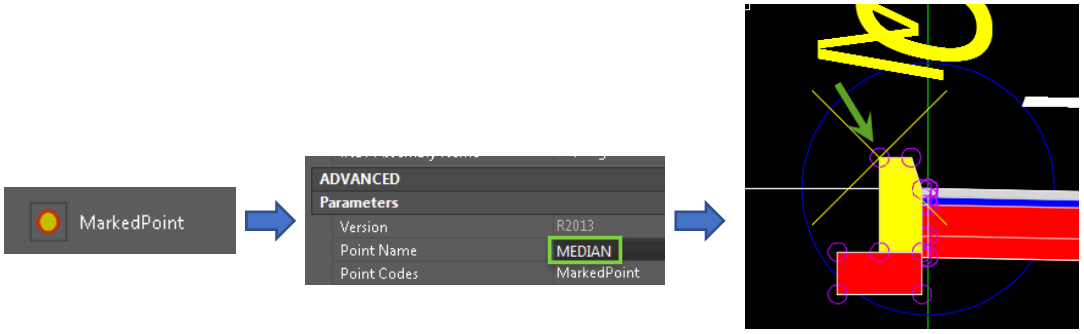


Creating a Road Assembly

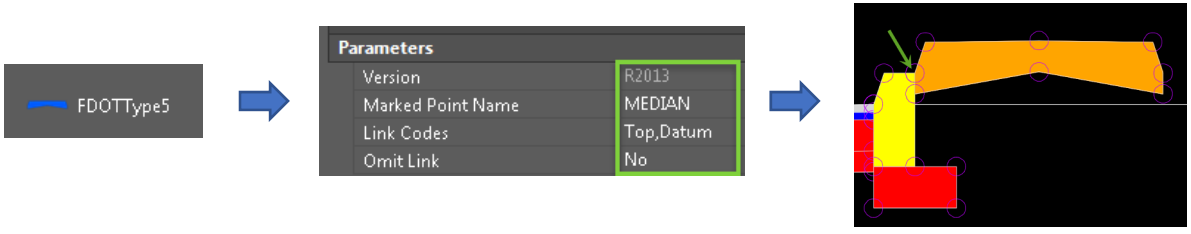
Adding a Traffic Separator using Marked Point

➢Add a Traffic Separator using Marked Point to close up the gap between the Left and Right Curb and Gutter.

1. On the General tab on the FDOT Subassemblies pallet , locate the MarkedPoint Subassembly.
2. On the Properties pallet change the Point Name to **MEDIAN**.
3. Place the Marked Point on the left corner of the CurbRT subassembly.



4. On the Traffic Separator-FDOT tab locate FDOTType5. Place on the top right corner of the CurbLT subassembly. Change the Marked Point Name to **MEDIAN** on the Properties pallet.



Notes:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

2015 Design Training Expo

FDOT Subassemblies Essentials

Thank You!

Questions?

Any comments to improve your experience?

Email me:

Mike.Racca@dot.state.fl.us

The Civil 3D FDOT State kit is available for download at:

http://www.dot.state.fl.us/ecso/downloads/software/FDOT2015CADDSoftware.shtm

MIKE RACCA

CADD Applications Support

Florida Department of Transportation (ECSO)

Email: Mike.Racca@dot.state.fl.us

FDOT Florida Department of TRANSPORTATION

Engineering/CADD Systems Office

2015 Design Training Expo