

FDOT Civil 3D Drainage Design & Resources



All Presentations and Downloads will be available online
A link will be emailed to all class registrants

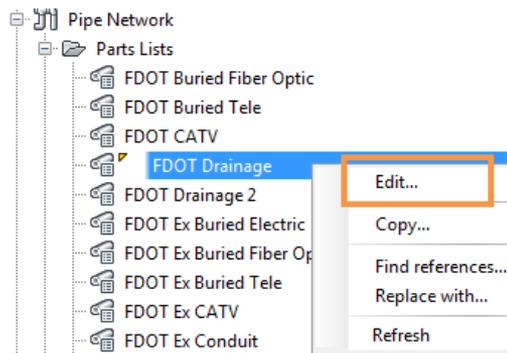
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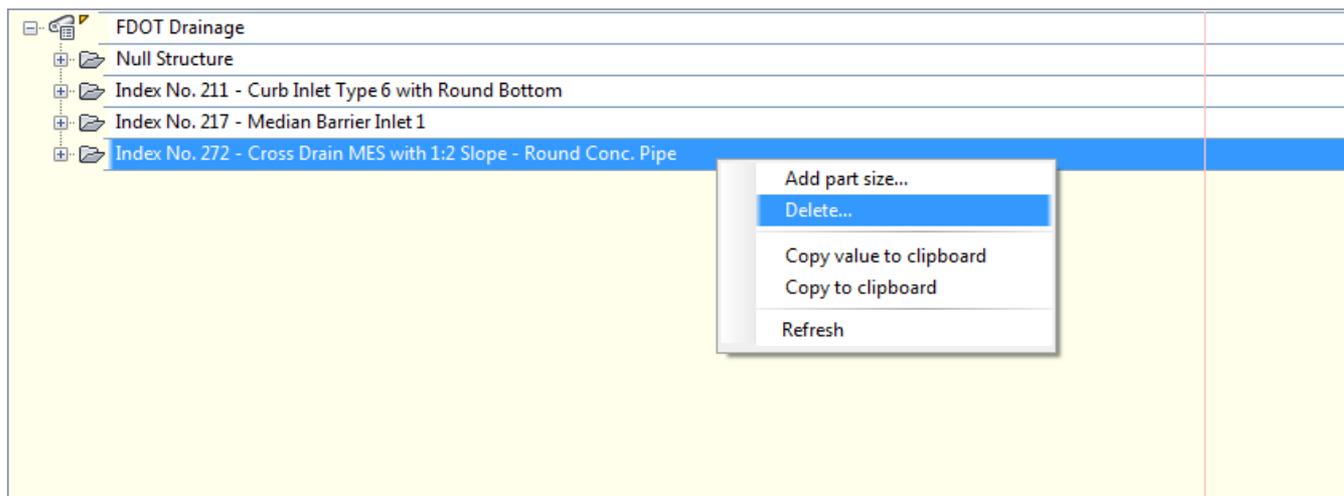
Required Data for Pipe Networks

- ◆ Surfaces – Existing & Proposed
- ◆ Alignment – Road Centerline or Baseline
- ◆ Modeled Corridor
- ◆ FDOT Parts List (Truncated)

Editing the “FDOT Drainage” Parts List

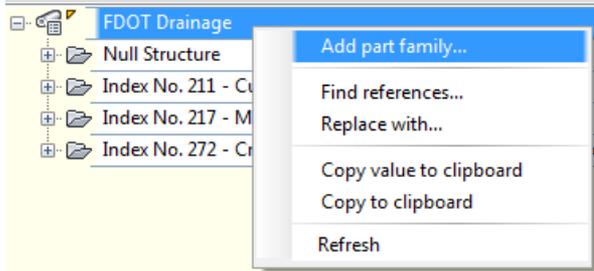


To delete parts right click on the FDOT Drainage parts list and select Edit then browse to the desired part family or part size and right click and select delete.

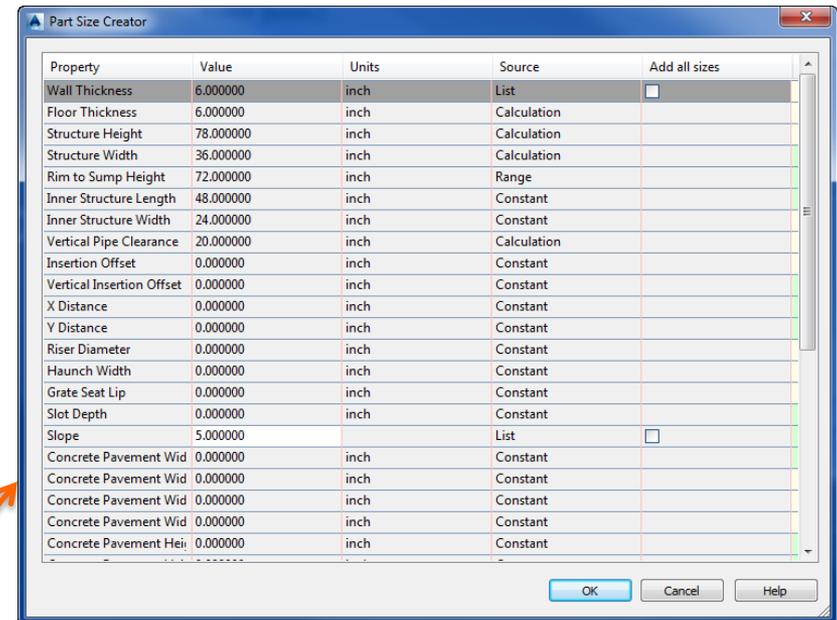
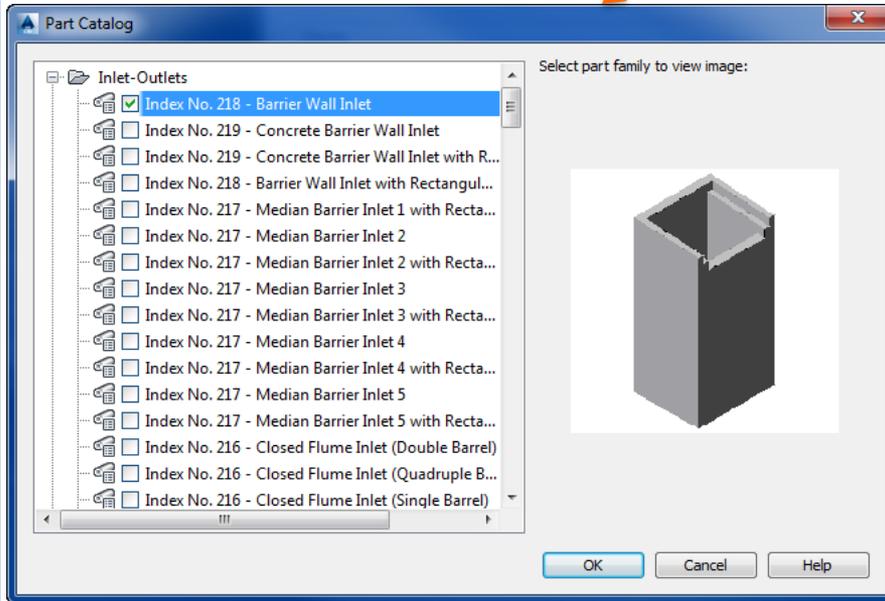


It is imperative that you not rename the parts list as you delete unneeded structure part families. The name is needed for round tripping purposes to and from SSA.

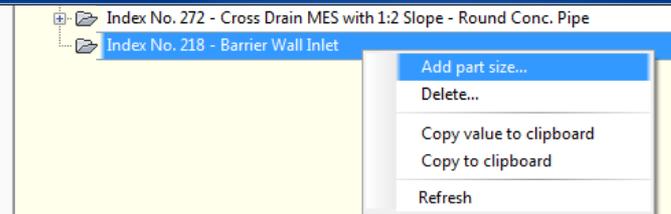
Editing your Parts List



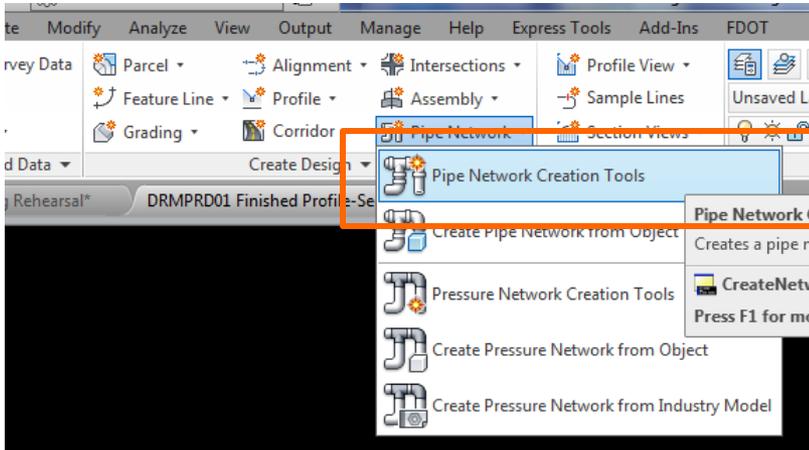
To add back a deleted part simply right click on the Parts list and select Add part family.



Once a part family is added browse to the bottom of the list and right click on the just added part family and select Add part size.

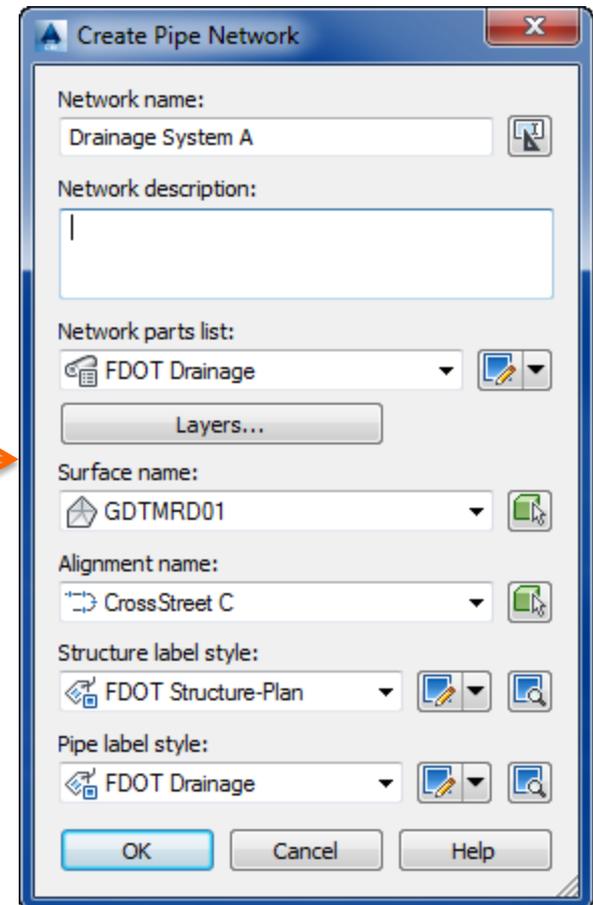


Laying out a Sample Drainage System

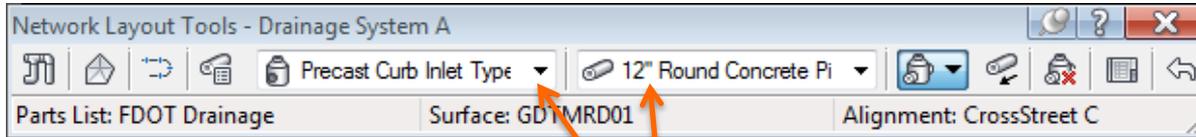


Launches the Pipe Creation Tools to start the process of designing a drainage system based on the FDOT Drainage parts list

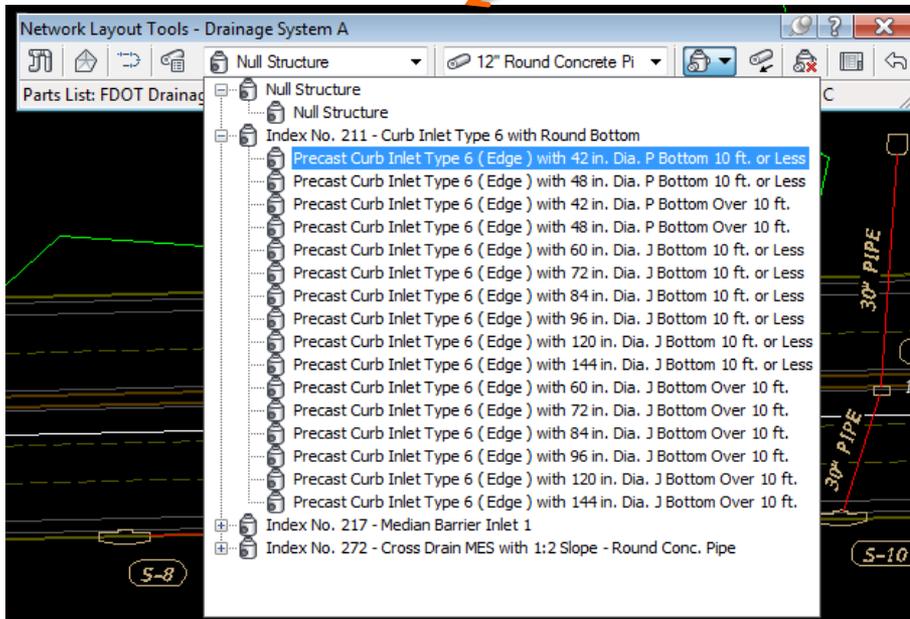
From top to Bottom fill in the information such as Network name, parts list, surface, etc.



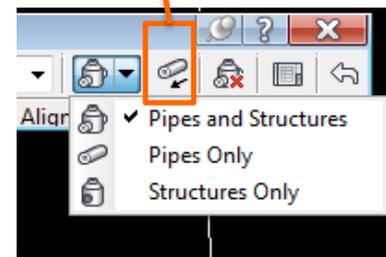
Network Layout Tools Toolbar



Structure pull down allows you to select various structures from the designated parts list you are using. The pipe pull down operates similar.

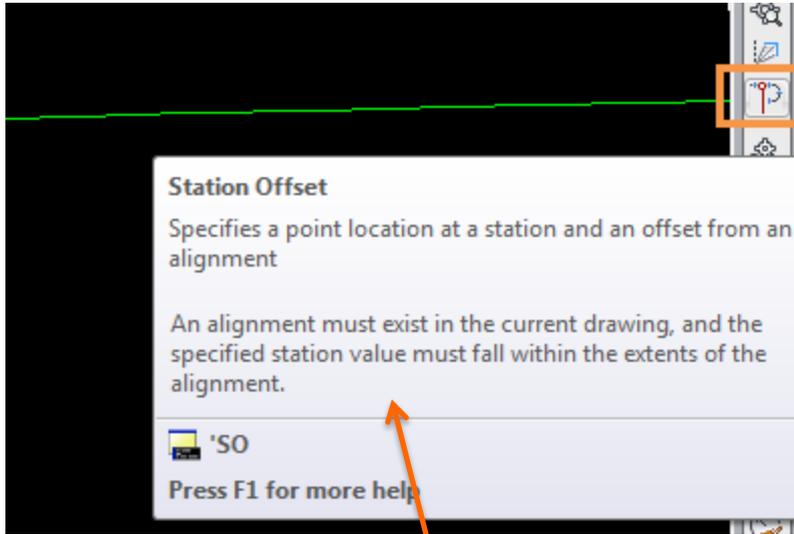


Upslope/Down slope Toggle. Make sure you are aware of which direction you are laying out your system it will make editing easier



You can insert both Pipes and Structures or each separately

Transparent Commands



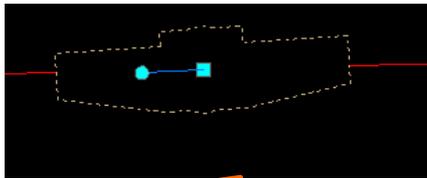
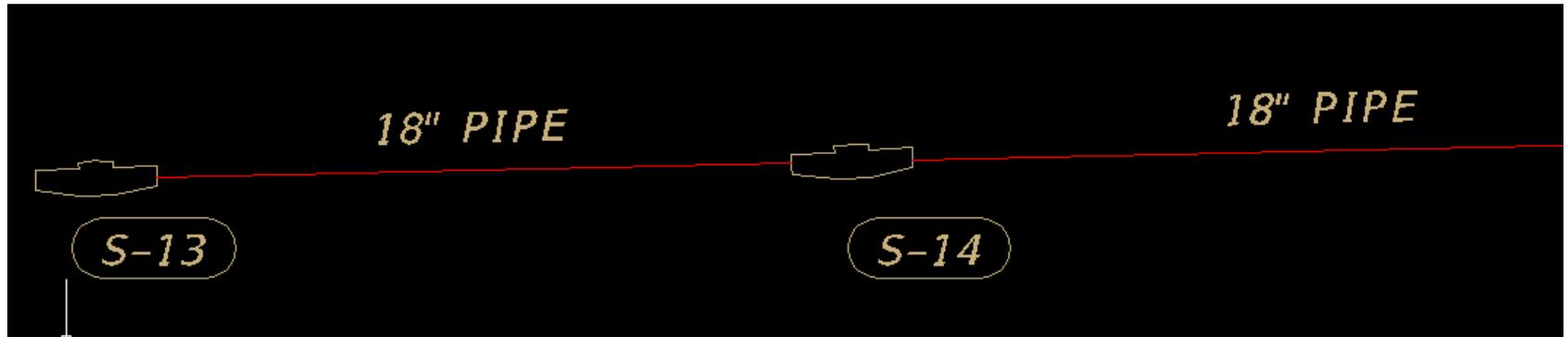
The Transparent Command Toolbar is located on the right side of your screen



Using the Station Offset Transparent command while laying out your system allows you to place your structures precisely.

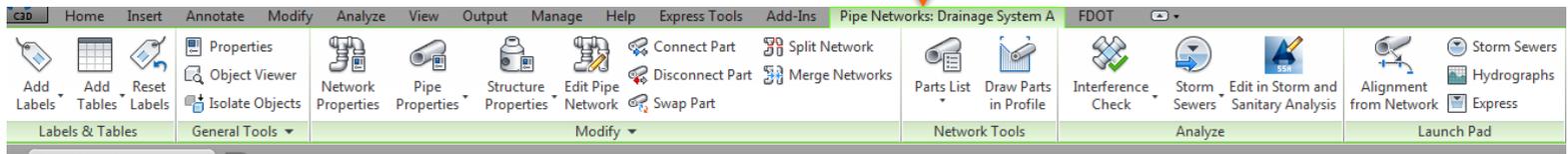
***Tip- There are many other useful transparent commands that you can utilize in your everyday Civil 3D use. Explore away!!**

Editing your System

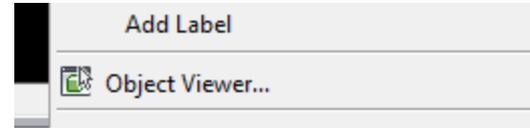
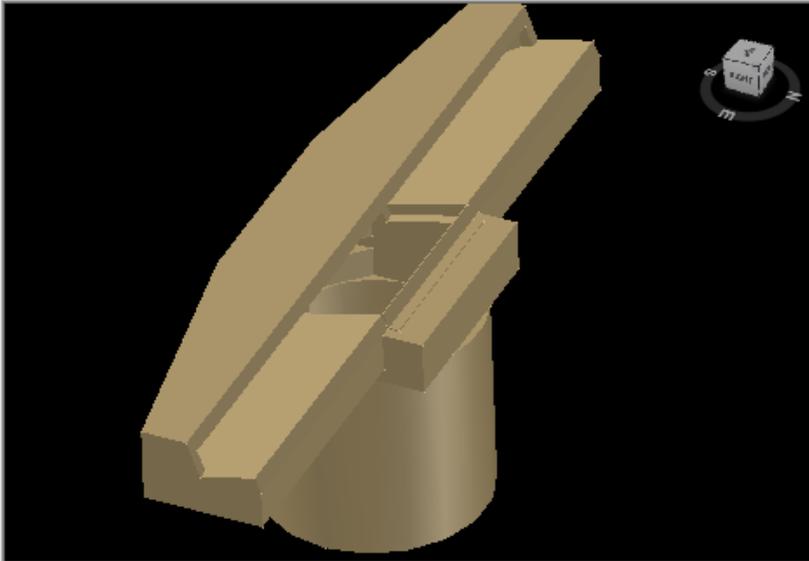


When you select a part a ribbon appears along the top for editing purposes

After system layout you can edit by grip editing your structures to either move or rotate them. As you move the structure around the pipe stays attached.



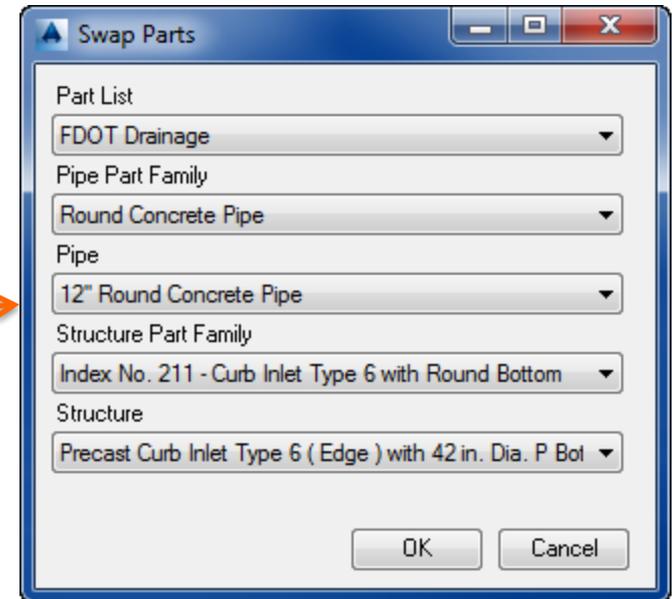
Editing your System



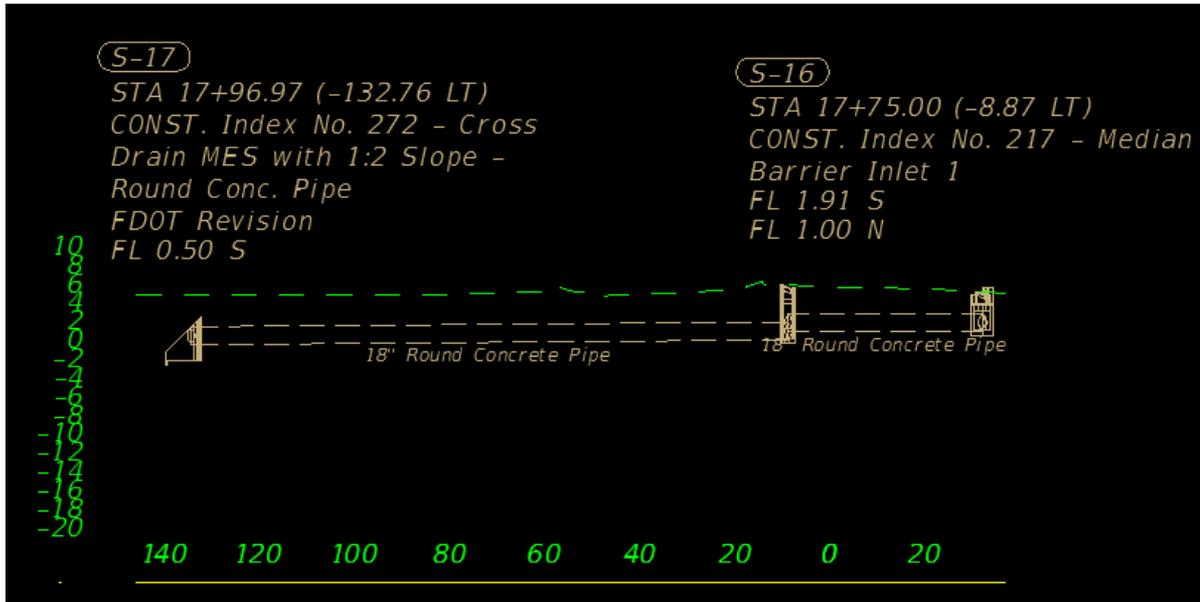
To view a part(s) in 3D select it and right click > Object Viewer



On the FDOT Ribbon there is a tool called Swap Parts that will allow you to swap multiple parts (structures and pipes) to a single part size

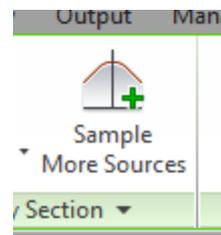


Sections and Profiles

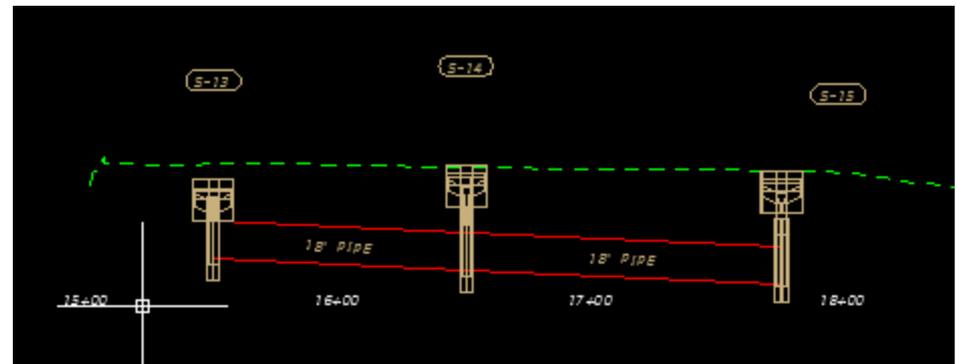


A section view of our sample drainage system

*Tip- If you create more drainage systems or other utilities you can project them to the section view by selecting a section and on the ribbon select "Sample More Sources"

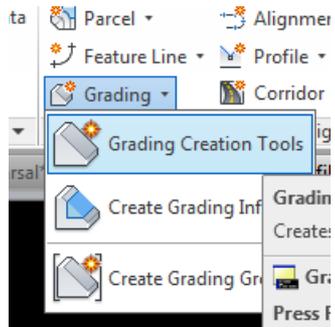


A Profile view along the Alignment

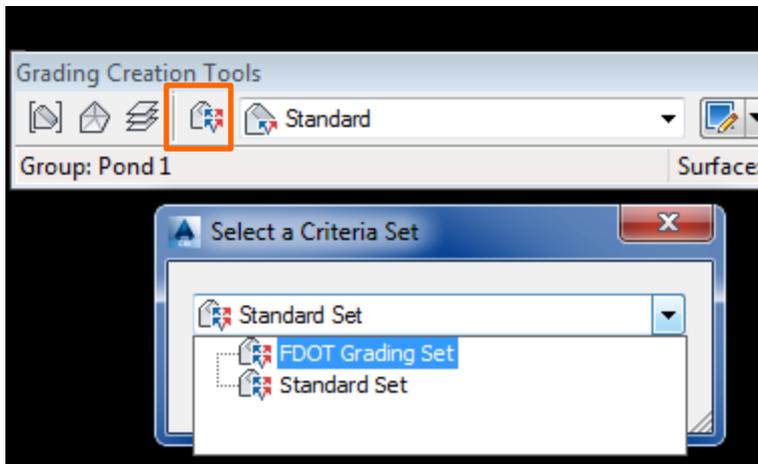


Grading a Detention Pond

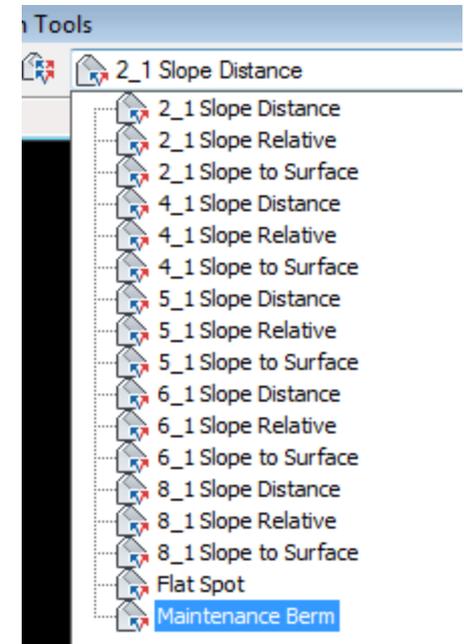
On the Home Ribbon select Grading > Grading Creation Tools



Grading Creation Toolbar

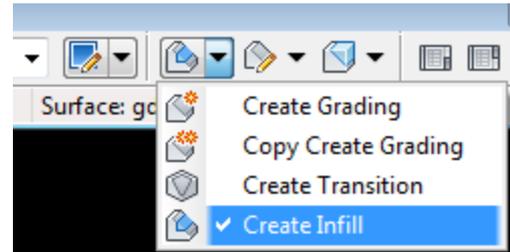
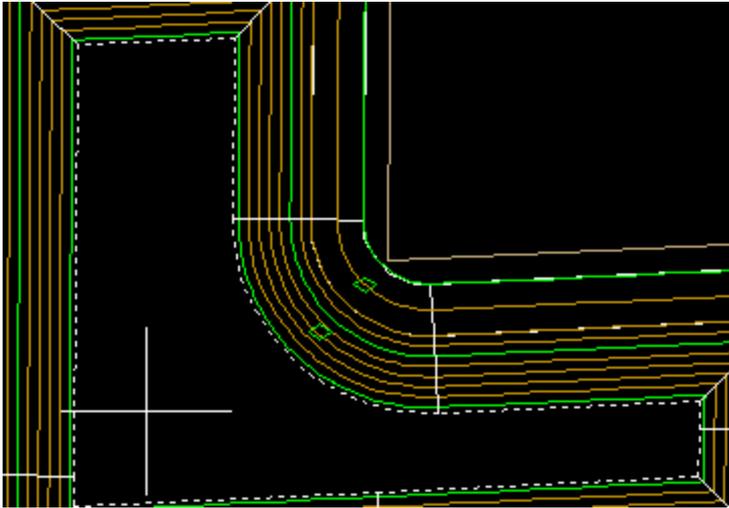


Select the FDOT Grading Criteria set



The FDOT Criteria set contains various grading styles that you can use to grade with

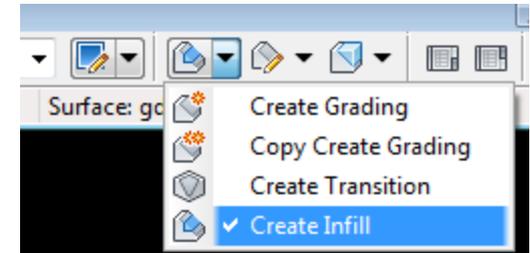
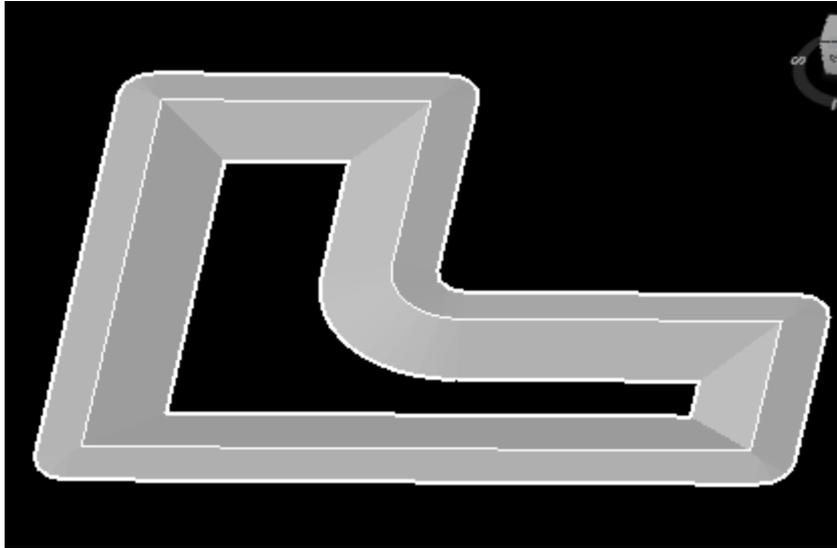
Grading a Detention Pond



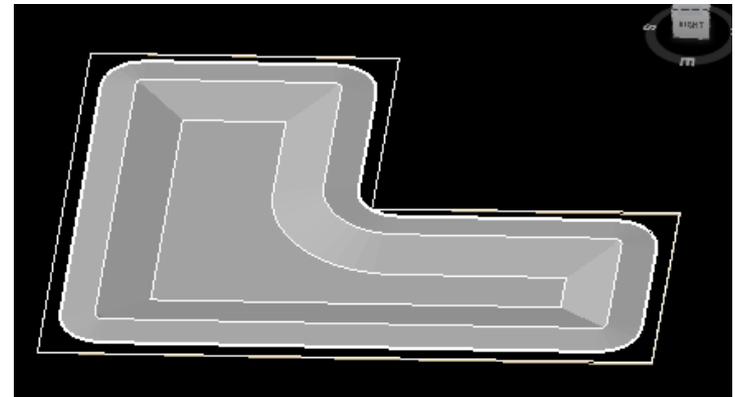
- Select your grading style and select Create Grading
- Pick the Feature Line and side to offset (Side of Grading)
- If you do not have a feature line established a create feature line dialog box will appear after you select a polyline
- If contours are not visible - right click on your Grading Group on prospector and select properties

Grading a Detention Pond

Select and right click on your pond > select object viewer

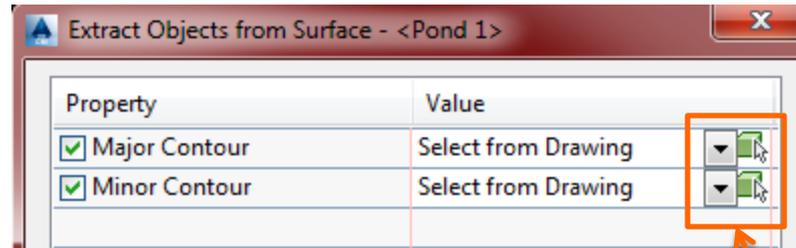
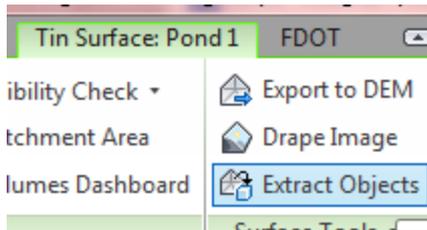


The bottom of your pond has a hole in it!
To fix this add a “Create Infill” to fill in
the bottom of your pond



Stage Storage Table

The final part of this equation is to create a Stage Storage Table for storage calculations and to import into SSA for further analysis

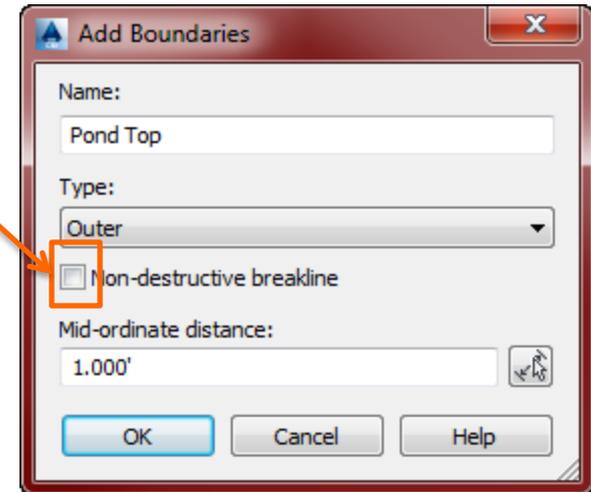


First we have to extract objects from the surface, in this case contour lines, this procedure will convert them to polylines with elevations.

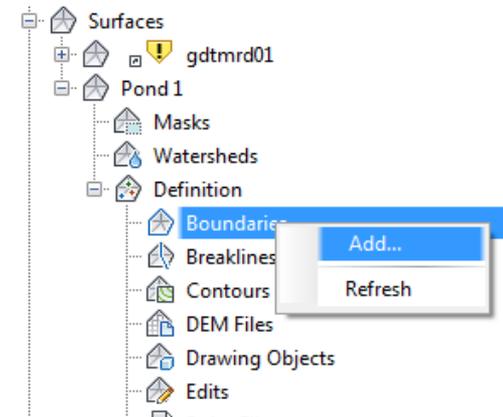
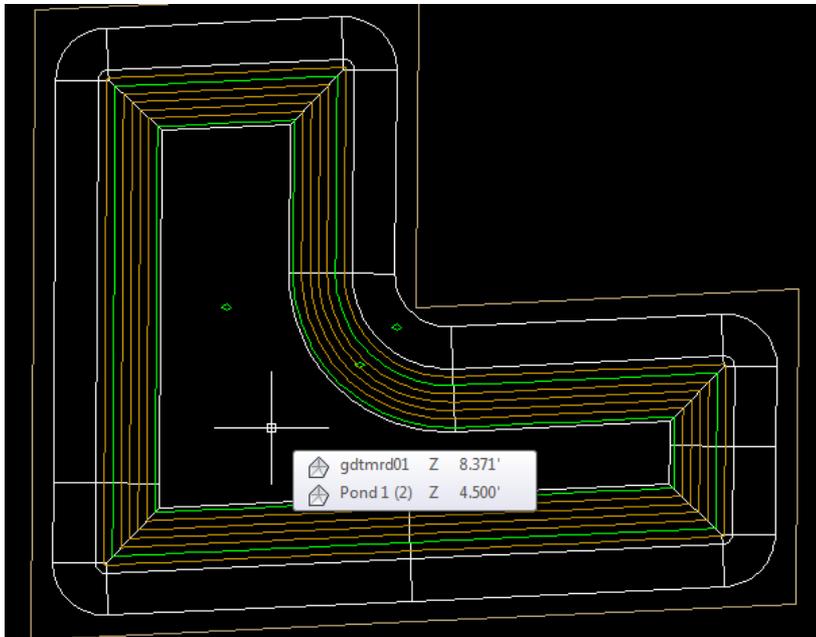
Select the contours manually by using the select button

Stage Storage Table

Then we need to create a Boundary designating the top of pond
Make sure you clear the Non-destructive breakline box.

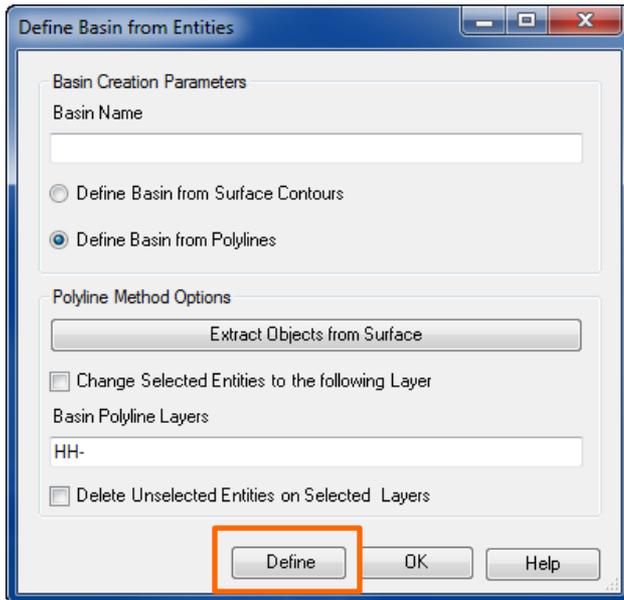
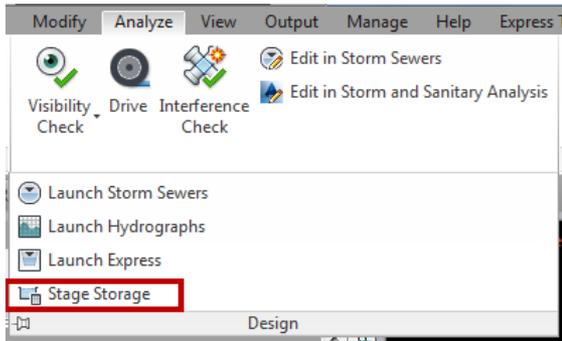


The pond surface with the surface contours hidden

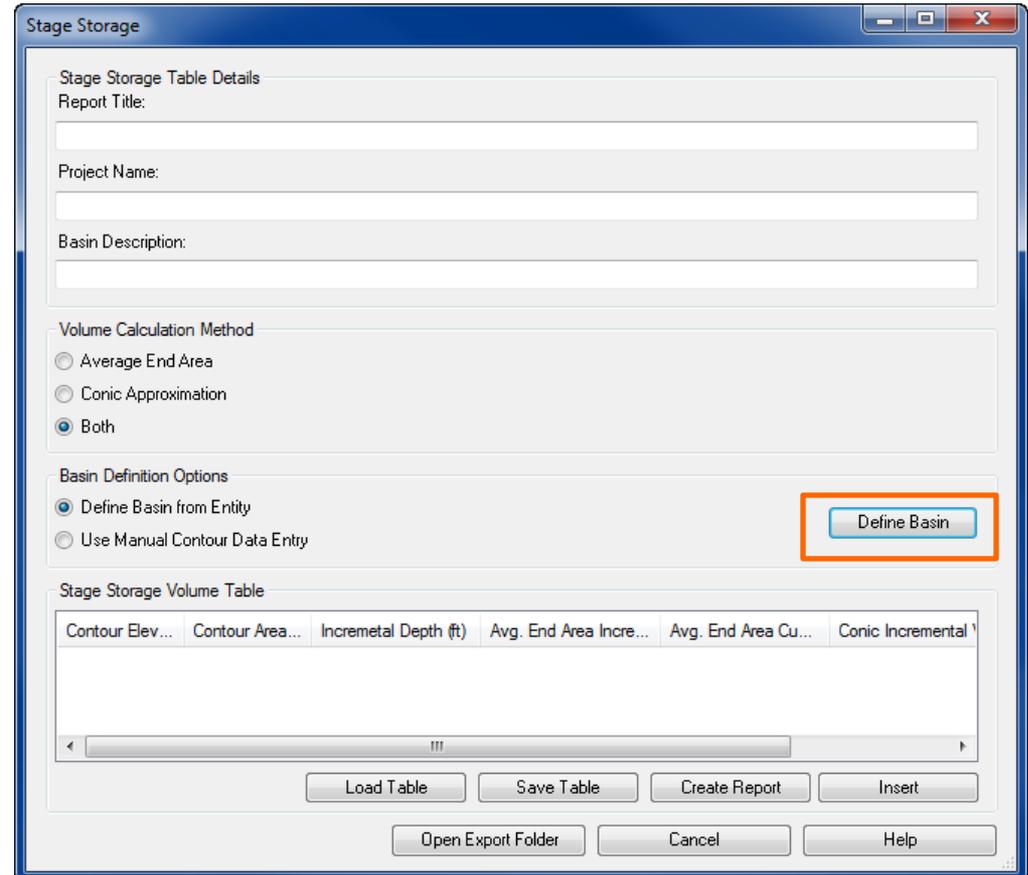


Stage Storage Table

1. Located on the Analyze tab select Stage Storage



3. Select Define to pick the contours from the drawing



2. Fill in the information from top to bottom, then click Define Basin

Stage Storage Table

Stage Storage Volume Table

Contour Elev...	Contour Area...	Incremental Depth (ft)	Avg. End Area Incre...	Avg. End Area Cu...	Conic Incremental
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Load Table Save Table Create Report Insert

Open Export Folder Cancel Help

With the data located in the dialog box you can execute several options located on the bottom.

<i>STAGE STORAGE TABLE</i>						
<i>ELEV</i>	<i>AREA (sq. ft.)</i>	<i>DEPT H (ft)</i>	<i>AVG END INC. VOL. (cu. ft.)</i>	<i>AVG END TOTAL VOL. (cu. ft.)</i>	<i>CONIC INC. VOL. (cu. ft.)</i>	<i>CONIC TOTAL VOL. (cu. ft.)</i>
5.000	18,891.51	N/A	N/A	0.00	N/A	0.00
6.000	22,258.50	1.000	20575.00	20575.00	20552.01	20552.01
7.000	25,761.82	1.000	24010.16	44585.17	23988.84	44540.84
8.000	29,401.46	1.000	27581.64	72166.81	27561.61	72102.45
9.000	33,177.42	1.000	31289.44	103456.25	31270.44	103372.89
10.000	37,089.70	1.000	35133.56	138589.81	35115.39	138488.28

The finished Stage Storage Table inserted in the drawing.

The next slide gives you some tips for working with SSA. In future classes we will explore the relationship between FDOT projects and SSA

Tips for working with SSA

- Make sure you download and install the Civil 3D 32-bit object enabler even if you are running a 64 bit system. SSA is a 32 bit application under the hood
- Unlike AutoCAD, SSA keeps you in a command until you press escape or click the select element tool from the toolbar
- Don't forget to save! There is no Auto-save
- Always work upstream to downstream
- There is no UNDO command in SSA, if you totally mess something up exit without saving