Overview: Create layout profiles using various profile creation tools within an existing Profile View. Edit profiles using commands on the Profile Layout Tools.

Software: AutoCAD Civil 3D 2016, NRCS C3D 2016 template

Prerequisite: A Profile View needs to exist in order for a Layout Profile to be created. Usually a Profile View has already been made in the process of creating a Surface Profile.

Creating a new Layout Profile

Profile creation options are found on the ribbon via *Home… Create Design... Profile...*
Profile Creation Tools and *Create Profile from File* are 2 of the options.
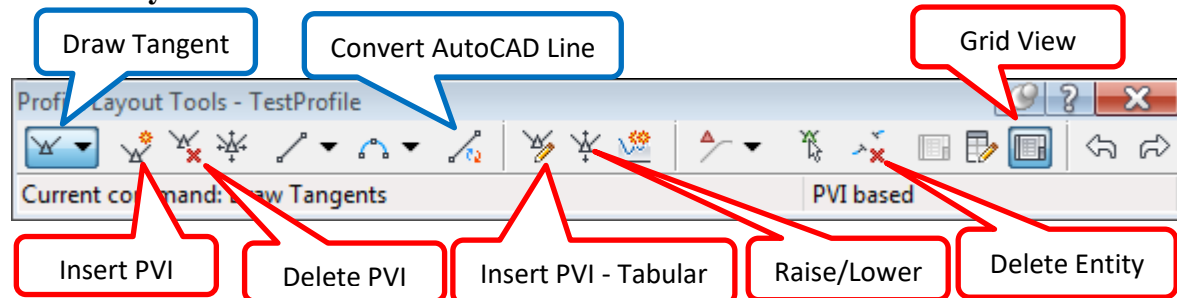
Profile Creation Tools

Start the *Profile Creation Tools* to create a new profile.
Select an existing Profile View that you want to draw in.
Input a Name for the profile and set the Style of the profile line.
Click Ok and the Profile Layout toolbar will open up.

Profile Layout Toolbar

Draw Tangents

Use *Draw Tangents* to start drawing your profile. (You need to draw from left to right.) It will be asking you to click to the starting point of your new profile. You can do that by clicking or snapping in the profile view or you can use Transparent commands.

Transparent Commands
You can select a Profile transparent command to set the points more easily or accurately than clicking into the profile view.

You can only have one transparent command going at a time. If you want to switch to a different one you need to press ESC to quit out of the active transparent command before going to another one.
You can tell that you have a transparent profile command running by looking at the command line where you will see ">>" to the left of the command that is active.
E.g **PSE** >>*Specify Station:*
You should ESC out of the transparent commands first in order to quit out of the Draw Tangent command.

Four of the transparent commands that might be most useful.

Profile: Station & Elevation

Profile: *Grade & Station

Profile: *Grade & Elevation

Profile: *Grade & Length

> *These can't be used for the first point of a profile.

Description-

Profile: Station & Elevation – For this point of the profile: Input the profile station, then the elevation either by keyboard input or graphically clicking or snapping.

Profile: *Grade & Station – For the next reach of the profile: Input the grade, then the ending station.

Profile: *Grade & Elevation – For the next reach of the profile: Input the grade, then the ending elevation.

Profile: *Grade & Length – For the next reach of the profile: Input the grade, then the distance.

There are some more advanced transparent commands for Profiles too.

Profile: Station from Plan

Profile: Station & Elevation from Plan

Profile: Station & Elevation from COGO point

These let you "reach" into the plan view of the drawing in order to grab stations and elevations for your new profile.

Convert AutoCAD Line

The *Profile Layout Tools* toolbar has a Convert AutoCAD Line tool. It works on Lines but not polylines or 3D polylines. You can convert 2D and 3D polylines to lines by exploding them.
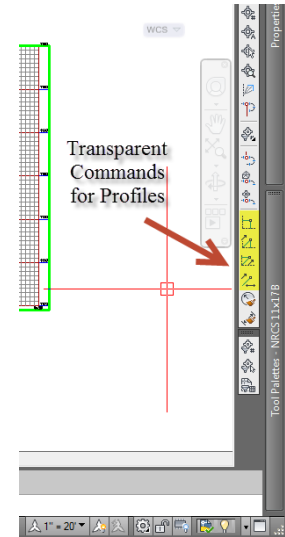
Profile from an external file

There is also an option to *Create a Profile From a File* .

This requires a space delimited file with no header and a series of station and elevations of the profile. The stations must be in ascending order. The file needs to have a .txt extension.

> Sample file:
> 0 1140.3
> 200 1136.3
> 700 1129.3

Editing a Profile

Surface profiles are dynamically linked back to the surface that they were created from and can't be edited unless you change the update mode to *static*.
To do this, <u>select</u> the profile. <u>Right-click... click</u> *Profile Properties*. On the *Profile Data* tab set the Update Mode to *Static*. <u>Click Ok</u>.
Note: If you later set the Update Mode back to *Dynamic* you will lose all edits that you made to the geometry.

Layout profiles are able to be edited.

When you select a profile you can edit it by using the grips or by using <u>right-click</u> *Edit Profile Geometry* to bring up the Profile Layout Tools toolbar.

The **Raise/Lower** lets you shift the elevation of the entire profile or a portion of it.

In the **Grid View** an individual point can be locked so that its location can't be changed. E.g. Lock the inlet and outlet elevations for a waterway in order to keep it tied in to original ground.

No.	PVI Station	PVI Elevation	Grade In	Grade Out	Profile Curve Type	Lock
1	2+21.75'	1082.350'		-10.26%		🔓
2	2+98.87'	1074.440'	-10.26%	2.50%		🔒

For unlocked points there are 4 items that can be edited:
- Station
- Elevation
- Grade In (changes the elevation of the previous PVI)
- Grade Out (changes the elevation of the next PVI)

Use the Grid view to edit grades so that they are at constructible values for the contractor.

Use **Delete PVI** if you have too many grade breaks in your profile.

**Insert PVI** lets you insert profile breaks graphically. You can use the transparent commands with this.
Insert PVI Tabular – lets you type in the station and elevation of profile breaks.

Delete Entity allows you to remove a segment of the profile and leave a gap.

Other

Profiles can consist of multiple of disconnected segments. Note: Only the PVIs of the profile *prior to a gap* will show up in the Profile Grid View box. Adding PVIs using the Tabular method will connect a line from a point prior to the leftmost gap to the new point.

See the **Profiles & Sections** document for adding labels.
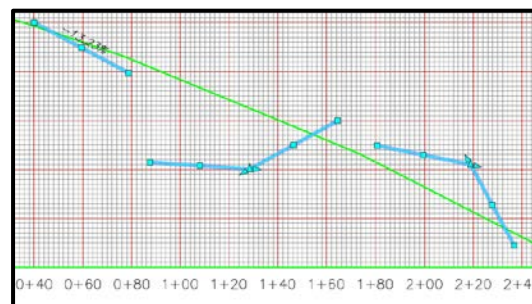
Create the Profile of a Pond Pipe

1. Create a profile view of the Embankment, Ground, and Core Trench along the CL Pipe alignment using the **Profiles & Sections** document.

Determine the station and elevation of the CL of the dam, and downstream toe of the dam.
Use Profile View labels to label stations & elevations manually in a profile view.
2. Click *Annotate… Labels & Tables… Add Labels▼… Profile View… Station Elevation..*
3. Click the Profile View grid.
4. Shift + Right-click… *Midpoint* then click the station of the CL dam.
5. Shift + Right-click… *Midpoint* then click the elevation of the top of dam. The label appears.
6. Shift + Right-click… *Endpoint* then click the station of the toe of dam.
7. Shift + Right-click… *Endpoint* then click the elevation of the toe of dam. The label appears.
8. When done Press Enter
Verify that these elevations are consistent with the elevations used in the pond design software. (Eg. WinPond, SITES)

Use a spreadsheet or manually compute the station and elevation for the flowline of the pipe:

Pipe flowline	Station	Elevation
Inlet		
Elbow		
Outlet		

Create the Flowline of the Pond Pipe
9. Click *Home… Create Design... Profile... Profile Creation Tools*
10. Select the Profile View of *CL Pipe*. A Profile View is the grid holding the profiles.
11. Alignment = *CL Pipe*
12. Input Name = {*FL 12 inch pipe* }
13. General: Profile Style = *Flowline*
14. Label Set = *Standard*
15. Click OK

16. From the Profile Layout Tools click **Insert PVI**

17. From the Transparent Commands Toolbar click **Profile: Station & Elevation**
18. Select the Profile View of the CL Pipe.
19. Input the station value of the pipe inlet. Press Enter
20. Input the elevation value of the pipe inlet. Press Enter
21. Input the station value of the pipe elbow. Press Enter
22. Input the elevation value of the pipe elbow. Press Enter
23. Input the station value of the pipe outlet. Press Enter
24. Input the elevation value of the pipe outlet. Press Enter
25. Press ESC. Press ESC.

Copy the pipe flowline profile and raise to the top of pipe elevation.
26. Select the Profile of the Flowline of the pipe.
27. Right-click *Basic Modify Tools… Copy…*
28. Input {d} Press Enter

29. Input {*0,0*} Press Enter.
30. Select the copy of the flowline profile.
31. Right-click *Profile Properties*
32. On the Information tab change the name to { *Top of 12 inch pipe*} Click Ok.
33. Right-click *Edit Profile Geometry*
34. Click **Raise/Lower PVIs** ⚓
35. Input the *Elevation change* as the pipe diameter. E.g. {*12"*}
36. *PVI Range = All.* Click Ok.
37. Close the Profile Layout toolbar.

To switch a label below the profile line (optional)
38. Select a grade label. *Labels.. Modify… Flip Label…*
39. Select a grade break label. Right click *Edit Labels...*
40. Change the style for the Grade Break type to *Grade Break.* Click Ok.
41. Select a grade break label. *Labels.. Modify… Flip Label…*
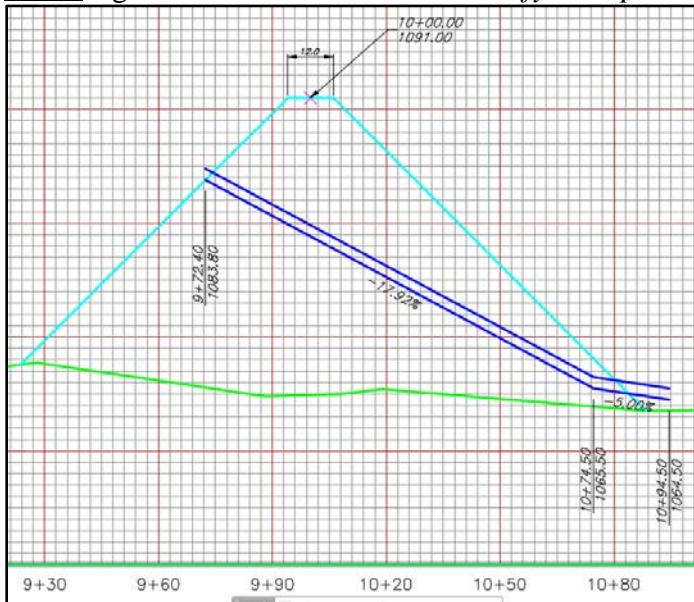
See the **Profiles & Sections** document for additional labeling options.