Core Trench

Overview: Create the core trench for a pond embankment. A surveyed site with a surface model covering the footprint of the dam is needed. Final elevations of the normal pool, auxiliary spillway, and top of settled dam have already been computed.

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

Notation: Button to Press Displayed Text Icon Action {Text to Enter} Menu Item...

Prerequisite
Create an Ognd Surface and Stripping surface. Create user defined contours as described in Pond Embankment to identify the limits of the core trench.

Core Trench

Placing the Core Trench bottom

Draw the centerline of the core trench using a 2D Polyline.
1. Tool Palette>NRCS 11x17B… Click Plan Commands… Alignment Generic
2. Draw a line that represents the centerline for the core trench, starting and ending at the contour line of the normal pool. (Use shift + right-click. Click Apparent intersection… if needed)

Create a feature line for the core trench.
3. Click Home… Create Design… Feature Line… Create Feature Line from Object s…
4. Click on the Core Trench alignment. Press Enter.
5. In the Create Feature Lines dialog box:
   set the Site to Core Trench,
   set Style to Core Trench Feature Line.
   check Erase Existing Entities,
   check Assign Elevations,
   uncheck Weed points,
6. Click OK
7. In the Assign Elevations box: select From Surface and set the Surface to Ognd, checkmark Insert Intermediate grade break points.
8. Click OK and the feature is created.

Lower the core trench CL to the correct depth below ground.
9. Select the core trench feature line. Verify that the line has vertices at the ground grade breaks in addition to the end points.
10. Right-click Raise/Lower…
11. Input the amount to lower the core trench below ground. E.g. {-4} Press Enter.

Create the US & DS edge of the core trench.
12. Click Home… Create Design… Feature Line… Create Feature Line from Stepped Offset…
13. Input the ½ bottom width distance to offset. E.g. {6} Press Enter.
14. Select the Core Trench CL. Click upstream of the Core Trench CL.
15. Input the relative elevation \{0\}. Press Enter.
16. Select the Core Trench CL. Click downstream of the Core Trench CL.
17. Input the relative elevation \{0\}. Press Enter. Press Enter.

Close the ends of the core trench bottom
18. Set osnap to use endpoints: Right Click the Osnap Status. Click Settings... and checkmark only End Point and Object Snap On. Click OK.
19. Click Home… Create Design… Feature Line… Create Feature Line...
20. In the dialog box set the Site to Core Trench. Click OK
21. Click to the left end of the US edge of core trench. Press Enter to accept the elevation.
22. Click on the left end of the DS edge of core trench. Press Enter. Press Enter.
23. Click Home… Create Design… Feature Line… Create Feature Line...
24. In the dialog box set the Site to Core Trench. Click OK
25. Click to the right end of the US edge of core trench. Press Enter to accept the elevation.
26. Click on the right end of the DS edge of core trench. Press Enter. Press Enter.
27. Select the Upstream feature line. Use Feature Line… Edit Geometry…Join...
28. Select the right end of the core trench, then the downstream edge of the core trench, then the left end of the core trench. Press Enter and they will be joined.

Placing the Cut Slopes and Infill of the Core Trench

29. Save the drawing.
30. Click Home… Create Design… Grading… Grading Creating Tools...

31. Click Set the Grading Group.
32. Set the Site to Grade Stabilization-Core Trench. Click OK
33. If needed click Create a Grading Group.
34. Input a Grading Group Name as \{Core Trench\}, Checkmark Automatic Surface Creation. Set the Surface Style to Grid Magneta (5x5). Click OK
35. Verify the Surface name and Style to be used by the Core Trench surface. Click OK
36. Click Set the Target Surface. Select Strip. Click OK
Core Trench Cut slopes
37. Pulldown the **Select a Grading Criteria** to **Slope or Grade to Surface (Cut)**
38. Click **Create Grading**.
39. Select the Core Trench feature line. Click outside of the core trench.
40. Apply to entire length? **Input Y** Press Enter
41. Slope or grade? **Input S** Press Enter.
42. Cut Slope? **Input 1.5.** Press Enter
43. Press ESC to exit the command

Core Trench Infill
44. Click the pulldown by **Create Grading** and switch to **Create Infill**
45. Click inside of the core trench bottom and Press Enter.
46. The final Core trench surface will be displayed.
47. Close the Grading Creations Tools toolbar.
48. Select the **Core Trench** slope grading. In Properties: Set Style=**Core Trench Grading**
49. Select the **Core Trench** catch line. In Properties: Set Style=**Core Trench Catch Line**
50. Save the drawing.

Verify the surface & lock it
51. Select the Core Trench surface. Right-Click, **Click Object Viewer**.
52. Press ESC when done visually reviewing the surface.
53. **Home… Palettes… Coordinate Tracker…** will track elevations.
54. **Toolspace> Prospector… Surfaces… Right-Click Core Trench… Click Lock…**

**Computing the Earthwork Volume for the Core Trench**

Compute core trench volume
55. Click **Analyze… Volumes and Materials… Volumes Dashboard**
56. In Panorama click **Create new Volume Entry**
57. Input a Name E.g. {V Core Trench - Strip}
58. Set the Style = **<off>** Click **Ok**
59. Set the Base Surface = **Strip.** Set the Comparison Surface = **Core Trench**
60. Click **Ok**
61. A volume surface gets created and the **Cut** column will show the volume.
62. Save the drawing.

63. Use **Generate Cut/Fill Report** to create a report. It can be saved or information can be copied from the report into Word or Excel Document
64. In Civil 3D click dismiss to close the **Volumes Dashboard** Panorama.

Hide the Core Trench grading and surface.
65. Select the **Core Trench** surface. Right-Click, **Click Surface Properties…Information.** Set the Surface Style to **<off>**.