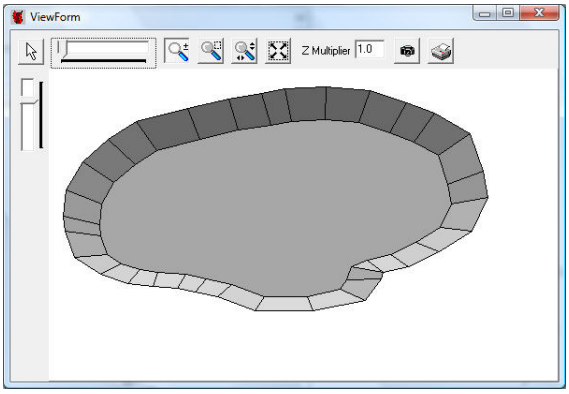
Creating a Digging Plan from a BRD File

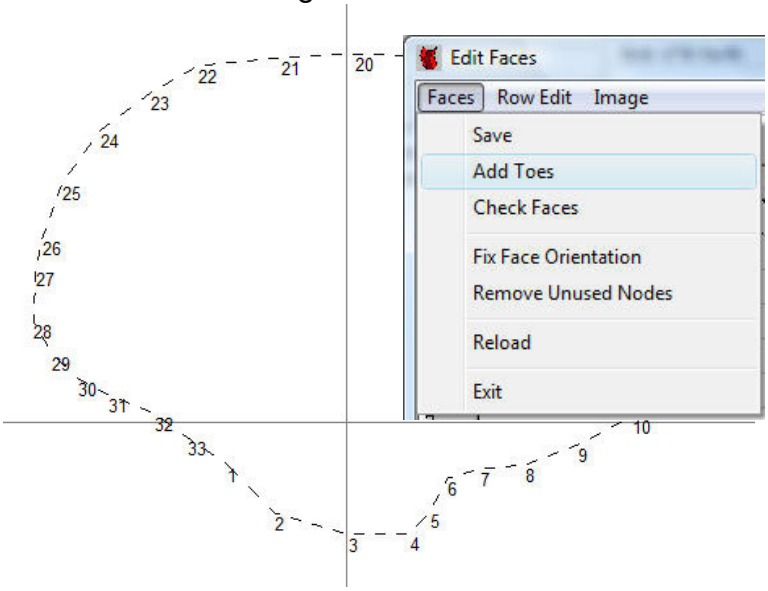
By Pat Sanders



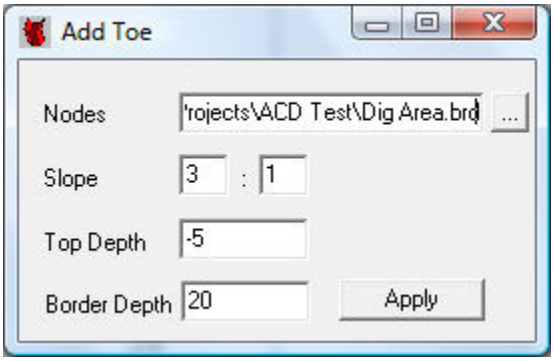
As we gain more experience dredges working in gravel pits, it became apparent that HYPACK® and DREDGEPACK® needed an easier way for the operators to create their digging plan. They would usually have a good idea of the boundary of the 'Dig To' depth and wanted to create a side slope coming up from the boundary at a specified horizontal-to-vertical ratio. The screen capture (right) shows a typical digging plan.

You could make this plan in HYPACK®'s ADVANCED CHANNEL DESIGN (ACD) program, provided you had a day of free time, a calculator and plenty of patience. I talked with Lazar Pevac, our resident mathematical genius and asked him to see what he could do. He modified ACD to accept a Border (*.BRD) file and we were off and running!

1. **Make a Border File:** In the HYPACK® shell, use the Border Editor to define the bottom of the pit's 'Dig To' area. In the example (right), I defined an irregular area using the 'Cursor' feature and saved it to a BRD file. If you define your polygon in a counter-clockwise route, it will save you a step later on in ACD.



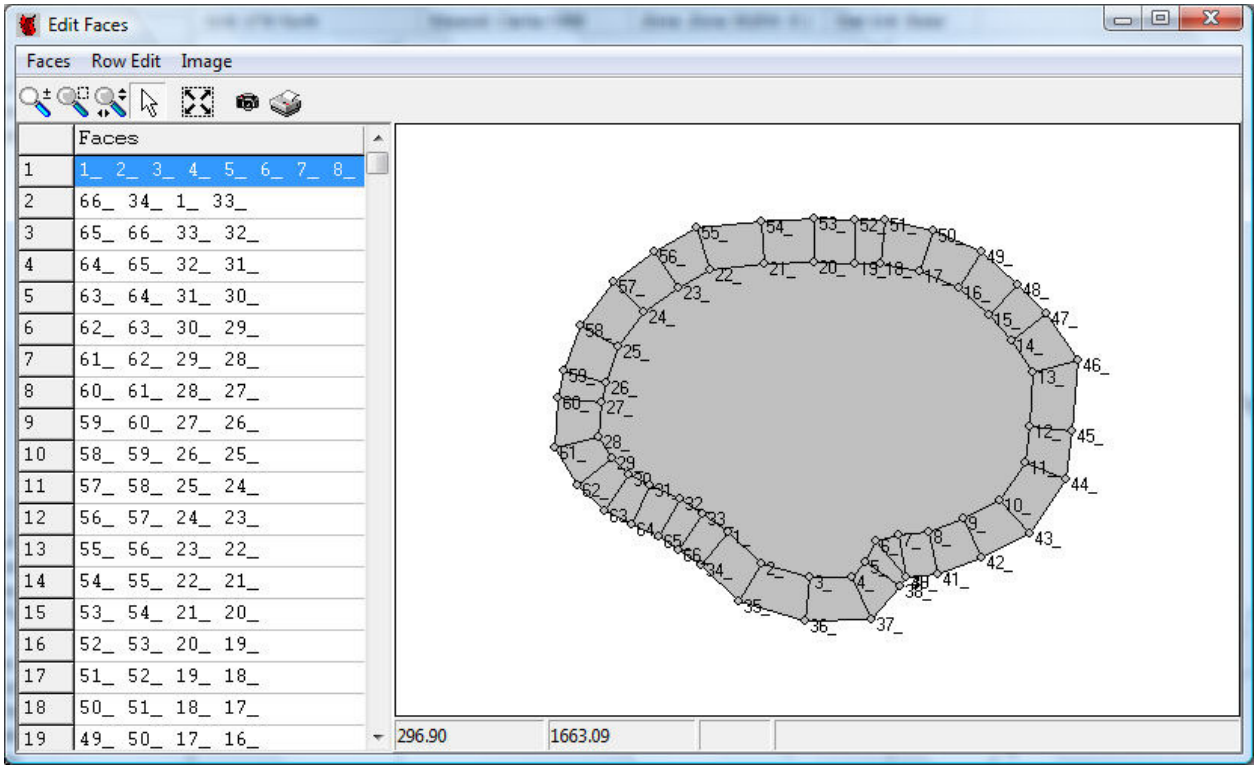
2. **Start up ACD, go to 'Faces' and load the BRD File:**
   a. **Start up ACD from the icon and immediately go to the 'Faces' window**.
   b. **Click 'FACES – ADD TOES'**.
   c. Instead of listing the nodes, **enter the name of your BRD file** (use the '…' search button). In previous versions, you had to enter the node numbers and could then generate a side slope area off of those nodes. Lazar modified it so that you can now enter a BRD file. ACD converts the vertices of the BRD file into 'Nodes',



numbers them sequentially and saves them into the 'Node' list of ACD.

d. **Enter the Side Slope ratio** (Horizontal Change : Vertical Change). I have entered a 3:1 **side slope** for my example.
   - The '**Top Depth**' represents the z-value for the top of the side slope.
   - The '**Border Depth**' represents the z-value for the bottom of the pit design.

e. **Click the 'Apply' button**, the program computes additional node points for the top of bank and then intelligently combines the nodes into 'Faces'.

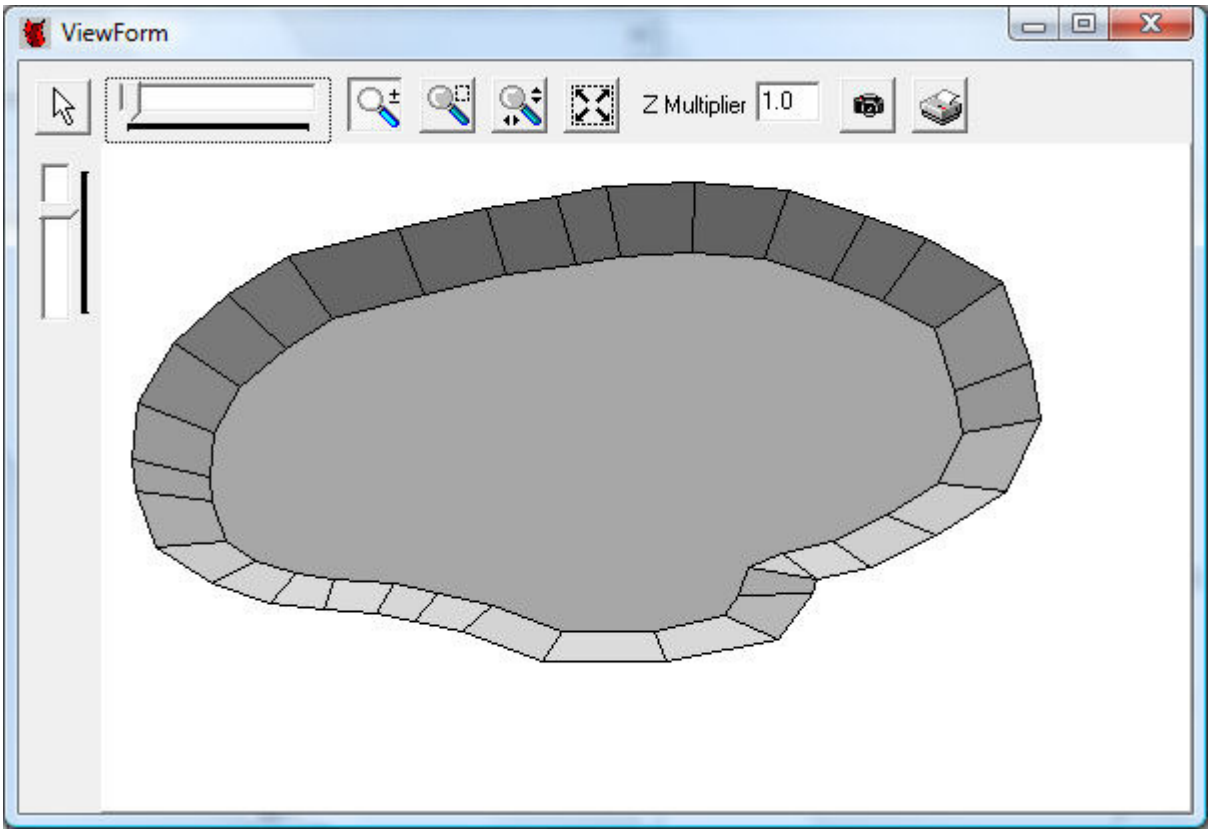


f. **If you plan to use this design for volume computations, check that there are no Non-Convex faces**. Click the 'Faces – Check Faces' menu item for a face-by-face report. In my example (above), the indentation along nodes 3_, 4_, and 5_ results in the center area being Non-Convex. I can right-click on the face to select it and then right-click again and tell the program to 'Split' the face into two faces. Sometimes, you may have to continue to split a face until you eliminate the Non-Convex face.

3. **Check your result in the 3D View of ACD.** Open up the 3D View menu of ACD and take a look at your result.

4. **Save it to a *.CHN file**. With your CHN file, you can:

- Use in DREDGEPACK® for a real time digging guide.
- Use in HYPACK®'s TIN MODEL to compute volume quantities.



Our final screen capture shows the resulting CHN file in the HYPACK® Shell.