



Remediation Pit Template in Advanced Channel Design

By Bob Glover

Sometime "advanced" doesn't always mean more difficult. I had the opportunity to assist a client in making a very small dredge pit for a remediation project. The client was struggling with how to build the pit using CHANNEL DESIGN, knowing that all four sides of the pit would have to be sloped to a grade of 4:1. This would not have been all that difficult, had it only been two side slopes and using CHANNEL DESIGN would work quite well. Adding the slopes to four sides, however, just wasn't working for him, so I explained that this would be easily accomplished using ADVANCED CHANNEL DESIGN.

The information that was given to the client was the four points which would represent the base of the pit and the depth that needed to be achieved. Our points would be as follows:

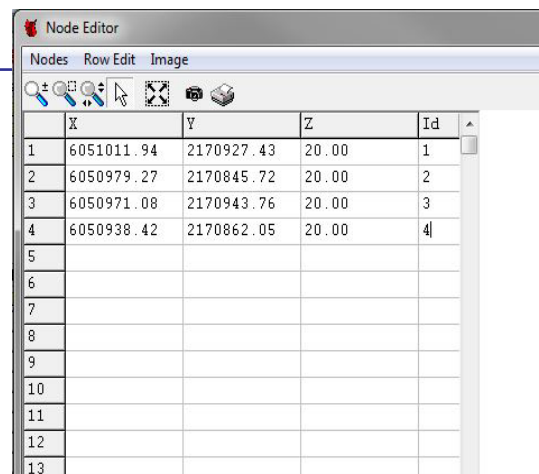
	Easting	Northing
Left Toe	6051011.94	2170927.43
	6050979.27	2170845.72
Right Toe	6050971.08	2170943.76
	6050938.42	2170862.05

For all points, the base depth will be 20 feet.

1. **Open ADVANCED CHANNEL DESIGN** from the main HYPACK® shell.
2. **Select FILE-NEW.**
3. **Enter your Nodes.** These nodes will form the base of our pit once we make a face by connecting them together.

FIGURE 1. *Entering the Nodes in ADVANCED CHANNEL DESIGN*

- a. **Open the Nodes window..** (Select WINDOW-NODES.)
 - b. **Input our points along with a depth and assign an ID to each created the node.**
 - c. **Save the node information** by selecting NODES-SAVE.
4. **Verify your nodes and close the Node window.** Click the zoom extents button and you should see the nodes that you created. It's now safe to close the nodes window
 5. Create the faces and slopes.
 - a. **Open the Faces window** (WINDOW-FACES).
 - b. **Define the faces.** With the Faces window open there are two ways to create the faces:
 - We can type the node numbers directly into the faces list separated by a space

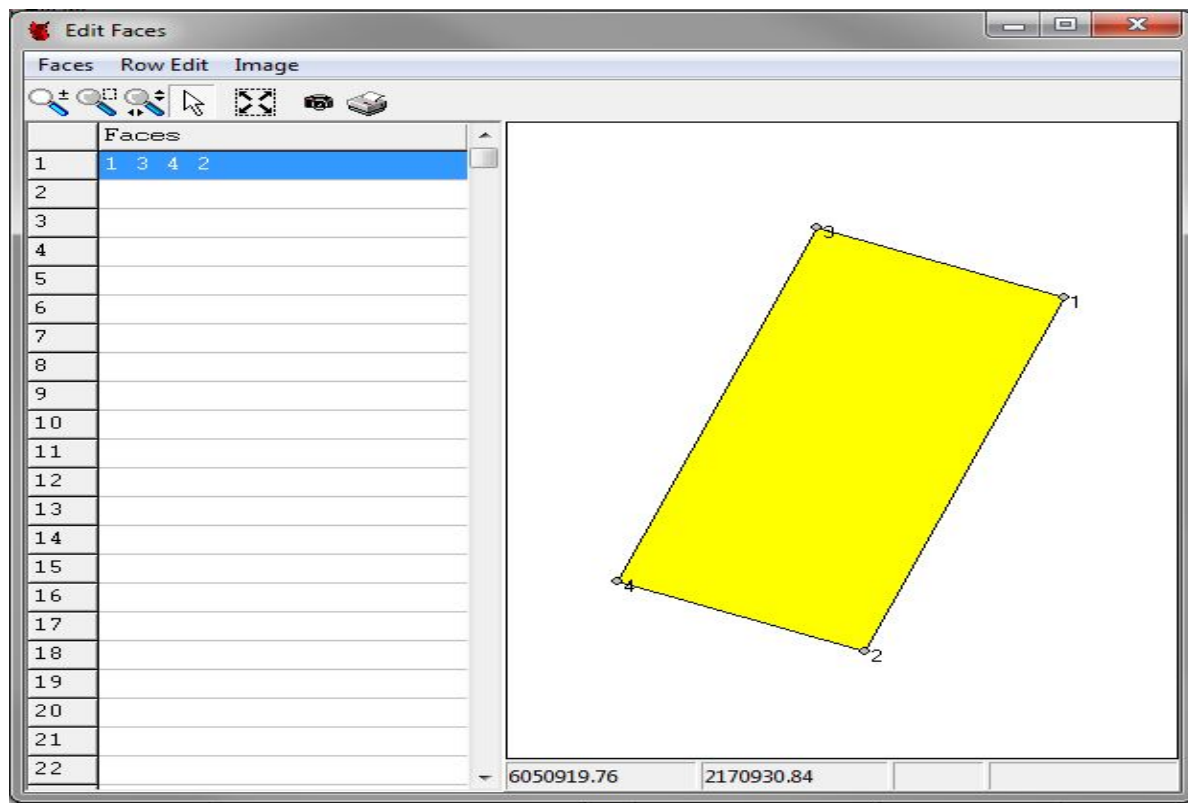


- We can hold the shift key while clicking on the node number in the plan view and the faces list will populate with the nodes selected.

There are, however, some rules to building faces that must be followed in order to correctly join nodes into faces:

- **Nodes must be joined in the counterclockwise order**, an easy way to remember this is to select nodes in the same manner that you run the bases in baseball. Joining nodes is like running the bases.
- **All faces must be convex shapes**. If you can have two points anywhere inside your face and connect these points with a straight line and that line goes outside of your face, then your face is NON-CONVEX and is not a valid face. ADVANCED CHANNEL DESIGN has the ability to check your faces for you, and we will discuss this a little further down in this article. Now that we have our nodes connected into a face we should have something that looks like the picture shown above.

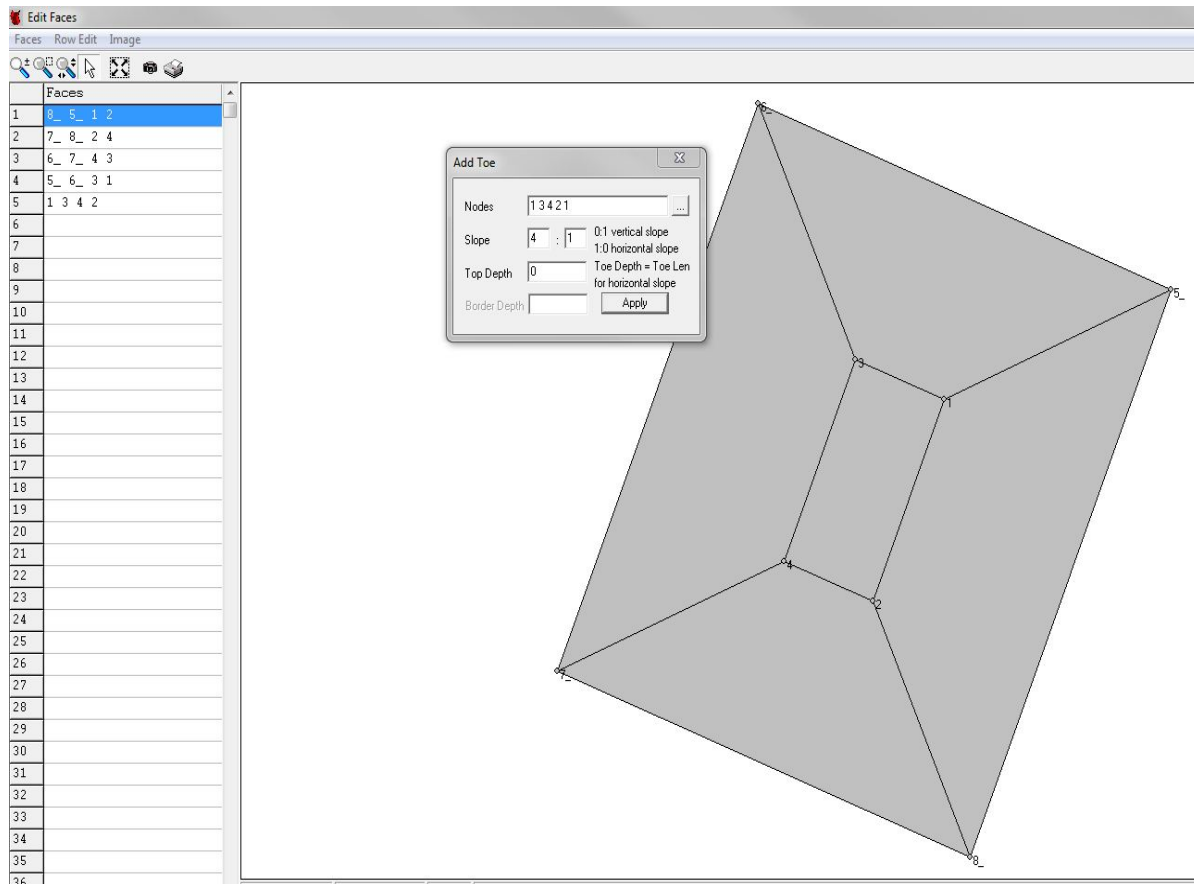
FIGURE 2. Defining the Bottom Face



- c. Let's be sure to **save our faces** by selecting FACES- SAVE.
Now we have the bottom of our pit and we can create the slopes needed for our dig.
6. **Create the slopes for our pit.**
 - a. **Select Faces-Add Toes.** This will open the Toes dialog box.
 - b. **Enter the node points, the slope and the desired depth at the top of the slope.**
In this example the client needs a 4:1 slope up to water surface. Again remember to add toes the same as creating a face— "run the bases". This time we must come back

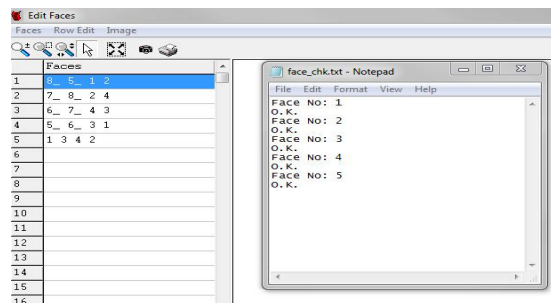
around to our first point in order to add the slope on all four sides of our pit. ADVANCED CHANNEL DESIGN creates our slope faces as well as the necessary nodes and adds them to the faces list and will also include the new nodes into the nodes list. Please see Figure 3.

FIGURE 3. Adding the Side Slopes to the Pit



7. **Save your faces (FACES-SAVE).**
8. **Check to make sure the faces are all valid** by simply selecting FACES-CHECK FACES. This preforms a check to determine should we have any problems with orientation or non-convex faces.

FIGURE 4. Checking the Faces



Once we have checked our faces and found that there are no errors, the faces window can be closed.

9. It's now time to **have a look at our pit, complete with side slopes**. Open the 3D window by clicking WINDOW-3D. Once opened we can zoom in and rotate our pit around and get a good visual of what we have created.
10. **If we are satisfied, save the channel**, from the main ADVANCED CHANNEL DESIGN window, select FILE-SAVE. This will store the file into the Channel Plan folder with a .CHN extension.

The newly created channel can now be used as a template for our remediation dig. Most likely it took longer to read this than the actual time to build this pit, sometimes "advanced" really doesn't mean more difficult. .Should anyone have any questions, please feel free to contact Bob@HYPACK.com