Advanced Channel Design 2012 – Part II: 3D Editing

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3D editing is supported in the “Faces” tool bar. Its primary purpose is to allow you to create faces by connecting nodes. Additionally, you can create new faces combining existing ones.

ADDING TOES

The first method allows you to select a polyline and create faces like “toes" adjacent to this polyline. You will select the toe orientation (left/right), vertical or horizontal by clicking the corresponding icon in the tool bar. In any case, a dialog allows you to select the toe parameters.

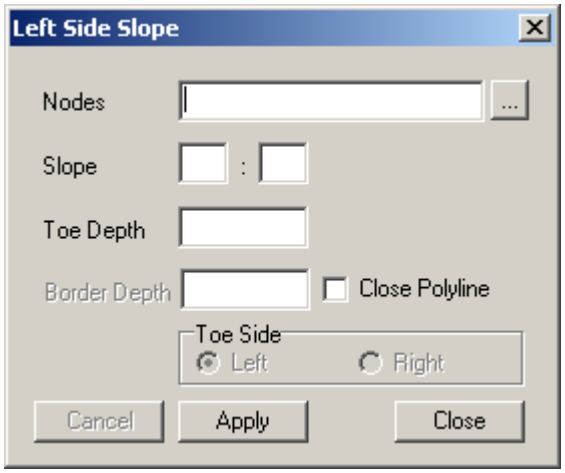
FIGURE 1. *Faces Tool Bar*

The most important items are the **toe nodes** entered by typing the node IDs. You can also import nodes from a border file, but in this case, you must enter the border file depth because border files only contain XY points.

For vertical and horizontal toes, a slope ratio is not required.

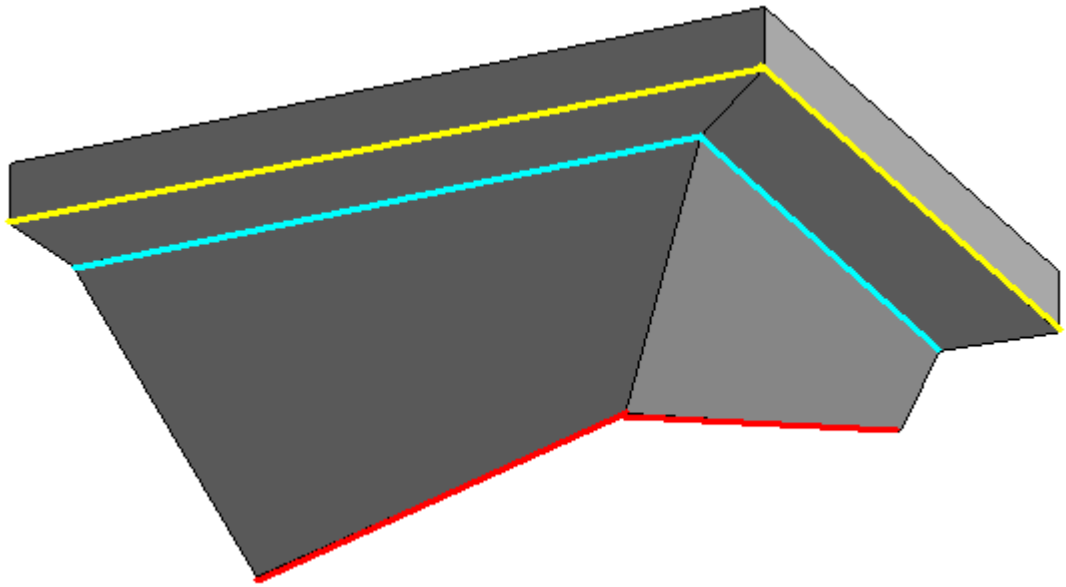
The **toe depth** for vertical toes is the toe top level. For horizontal toes, it is the toe width. The toe base line is not necessarily coplanar (all points in the same geometric plane) unless we are looking for horizontal toes.

FIGURE 2. *Left Side Slope Dialog*



In Figure 3, I started with the red line which contains 3 points on different levels (0, 10 and 30). Then, I created left toe with a slope ratio of 1:1 and top level of 40. I then started from the toe top (blue line) and I created a horizontal toe with length of 20. Finally, I created a vertical toe from the yellow line at the top level of 50.

FIGURE 3. Sample Complex Channel



Combining Existing Faces

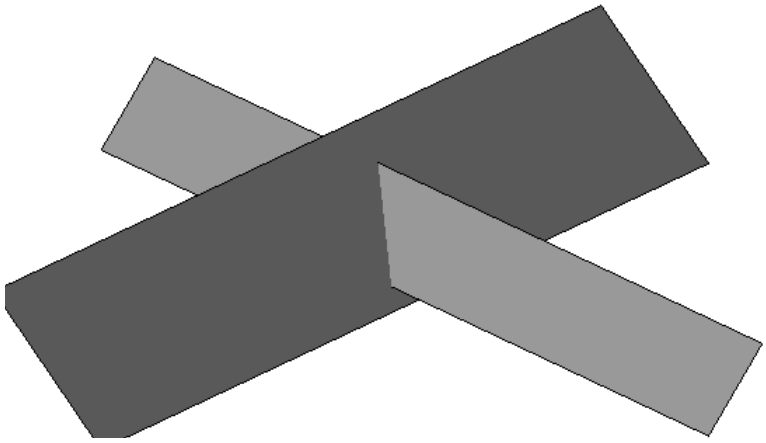
ADVANCED CHANNEL DESIGN also enables you to select existing faces and use the data to calculate new nodes that will help you to create new faces.

Calculating Points at the Intersection of Two Faces

The “Connect” method is designed to calculate connection points between two faces.

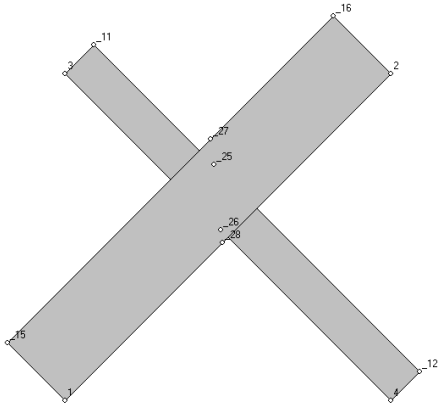
The following example shows two faces that intersect each other. We want to trim them along the intersection line. In order to do that, we have to calculate the intersection points along face edges.

FIGURE 4. Intersecting Faces—3D View (left), 2D View (right)



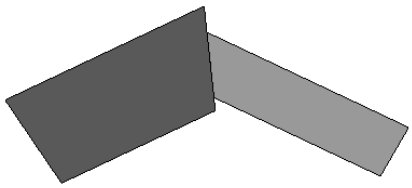
1. In the Faces tab, **for each face, right-click and choose “select” in the popup menu**. The selected faces will turn dark gray.
2. **Generate new points where the planes intersect**. Right-click and select “Connect”. This generates a point along the intersection at each edge of each plane.

FIGURE 5. *2D View of Intersecting Faces. "Connect" .*



3. **Use the new points to define your required abutting faces.** The final result is presented in the following picture:

FIGURE 6. *Resulting Abutting Faces*



GET POINT

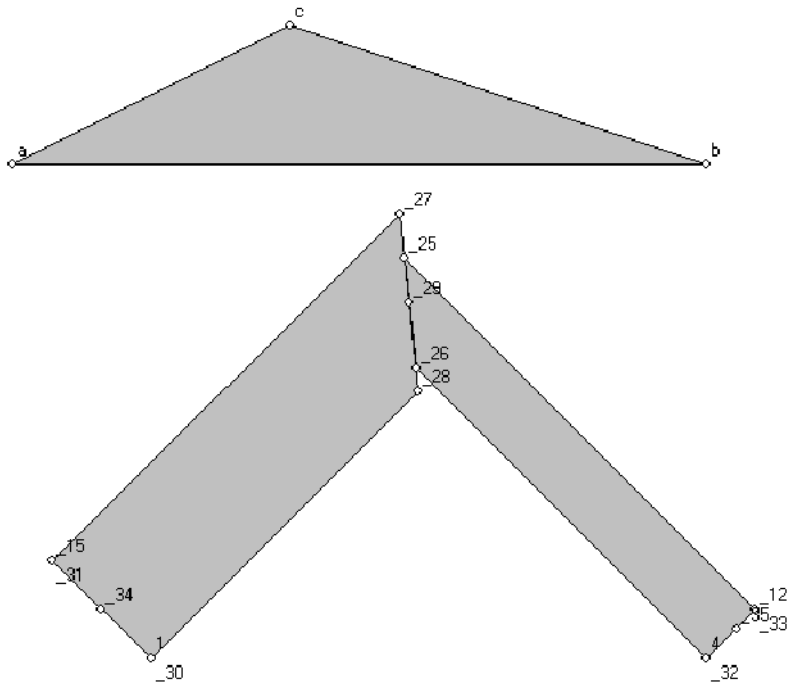
The "Get Point" option generates the point where three selected faces intersect.

Suppose you wanted to trim the faces in Figure 6 to a depth of 25.

1. **Create a horizontal plane (a b c) at the level at which I want to trim all faces (25).** The program will extend this level to cover the area of your other two faces.
2. **For each of the three faces, right-click and choose ‘Select’.** Each selected face becomes dark gray.
3. **Right-click and select ‘Get Point’.** The program creates a node along common edge at level 25 (_29) where all three planes intersect.

   This point will enable you to accurately trimsegments (_27_28) and (_25_26). You also have to trim segments (1_15) and (2_12) so you will use the ‘Get Point’ process to generate a node at level 25 on each segment.

FIGURE 7. *Three Faces for the Get Point Routine*



4. **For each segment (1_15) and (2_12) do the following**:
   a. **Create a vertical toe**.
   b. **Select faces (abc), (1_15_27 _28) and the vertical toe at (1_15).**

   Note: Looking from the top, a vertical face shows as a segment. To select a vertical face, click within 5 pixels from the segment. When the vertical face is selected, the segment will be painted with a thick dark gray line.

   c. **Right-click and select 'Get Point'. It created node (_34)**.
   d. **Node (_33) is created in similar way selecting faces (abc), (4 12 25 26), and the vertical toe at (4 12)**.

FIGURE 8. *the final result after removal of all supporting faces and points above level 25.*