

GRADING – DAM EXAMPLE

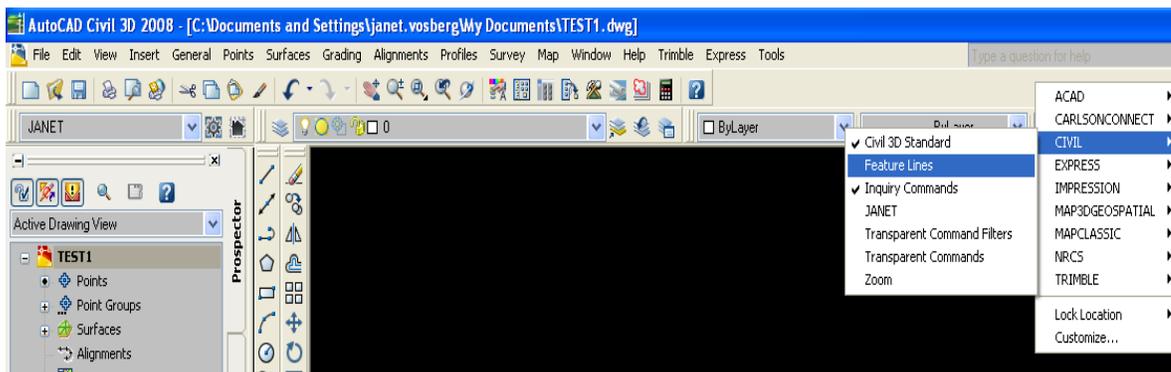
Proceed to this section after you have created the existing ground contours described in other help sheets.

I. DRAWING THE TOP OF THE DAM

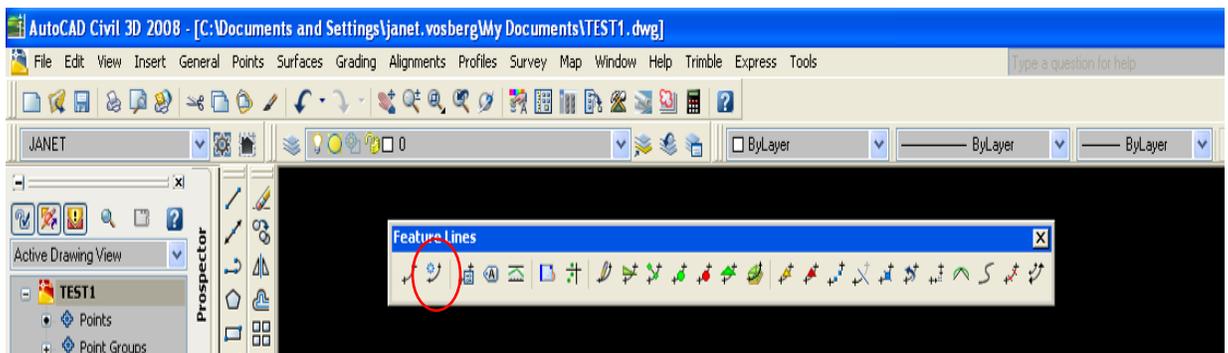
Now we are going to work with Feature Lines. A feature line is a 3d line, meaning it has an x, y, z dimension and is a special line type that grading commands recognize and use as a footprint and surfaces can use as a breakline. You can draw feature lines, create them by converting existing objects, or export feature lines from corridors. A feature line represents an object in the drawing from which you want to grade, such as a swale or a top of dam. In order to obtain volumes, we need to create a grading group and for that we need Feature Lines.

1. Draw a Feature Line

- a. Draw a Polyline representing the centerline of the dam using three points; end-middle-end.
- b. Bring up the Feature Lines toolbar by right clicking in the gray area by the other toolbars
- c. Select CIVIL, then FEATURE LINES

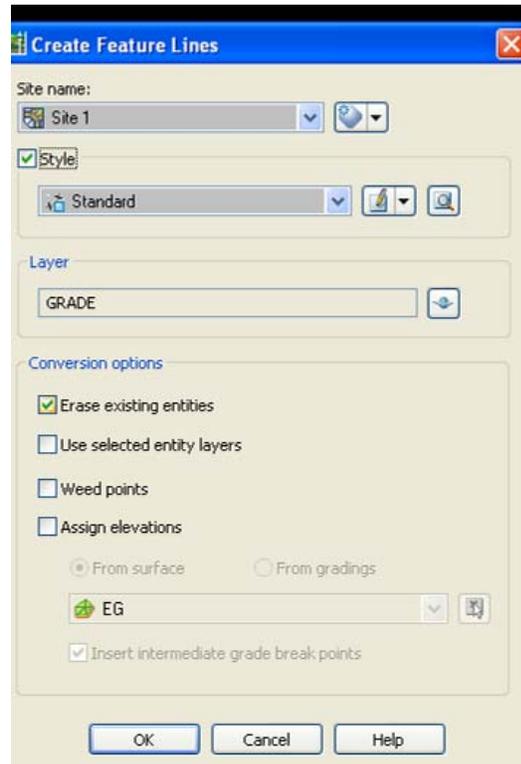


- d. From the Feature Lines toolbar, Click on the 2nd icon from the left, CREATE FROM OBJECTS

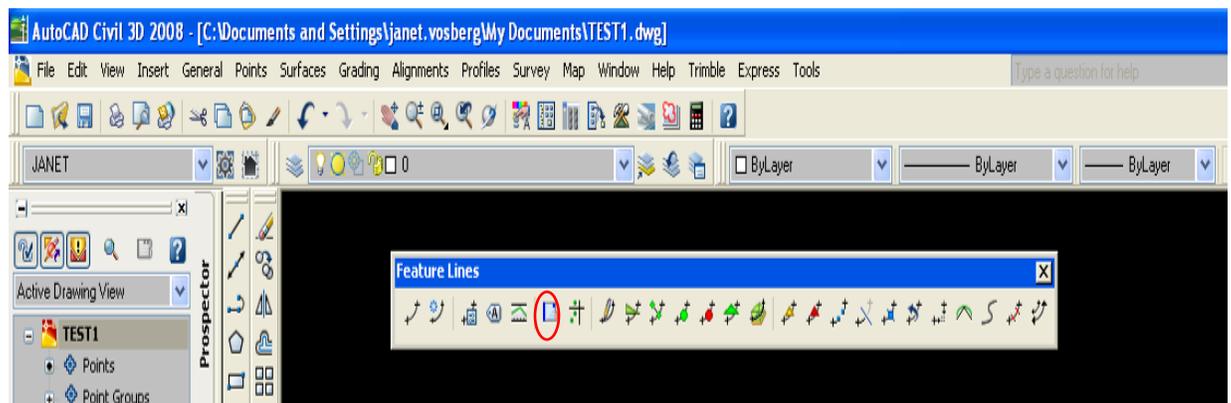


GRADING – DAM EXAMPLE

- e. Select the Polyline representing the centerline of your dam and hit ENTER. In the window that pops up, select Site 1. Sites are just a way to stay organized within Civil 3D. Check the “Style” box and leave “Standard”, and click ok.

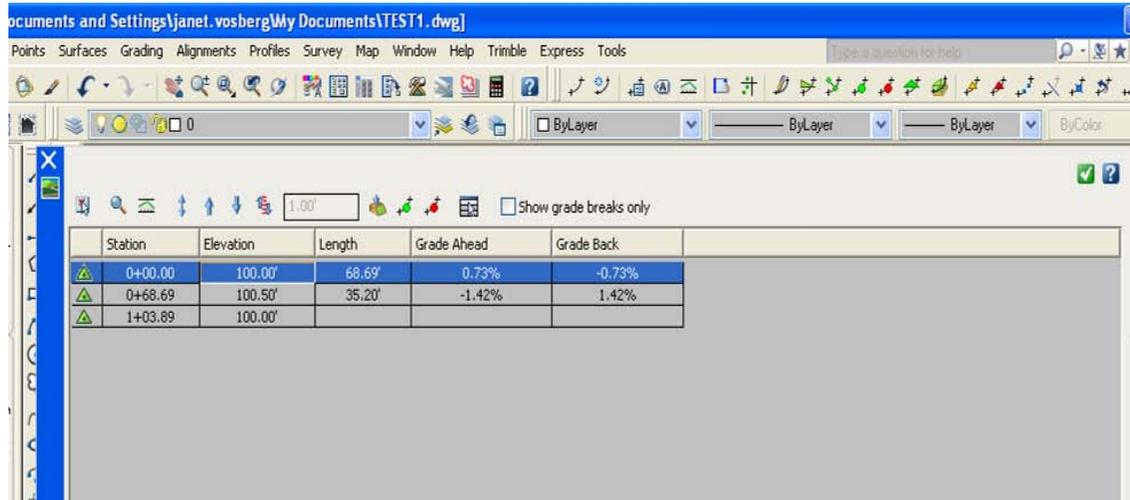


- f. Now, click on the 6th icon from the left, ELEVATION EDITOR.

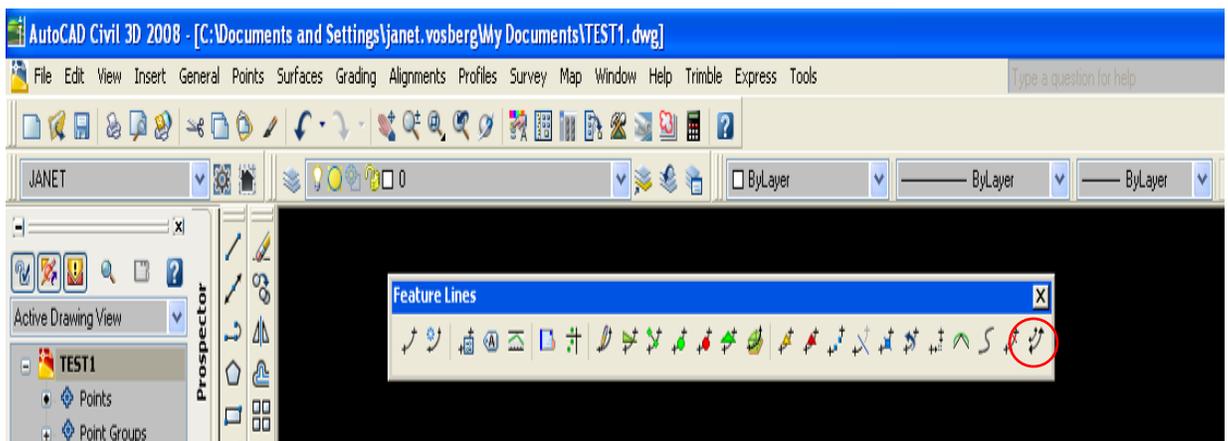


GRADING – DAM EXAMPLE

- g. A window pops up showing stations, elevations, length and so forth of that particular line. Change the elevations of your feature line (centerline) to what you want and when done, select the green arrow in the upper right corner.



- h. Now we will offset the centerline to create the top of the dam. From the Feature Lines toolbar, click on the 1st icon from the right called STEPPED OFFSET. Select the Feature Line (centerline) and follow the command line instructions. When it asks “Specify slope or [grade/elevation/difference/variable]<0>:”, select “d” for “difference” and hit ENTER, then enter a value of zero (0), then ENTER. Repeat this step for the other side of the top of dam.



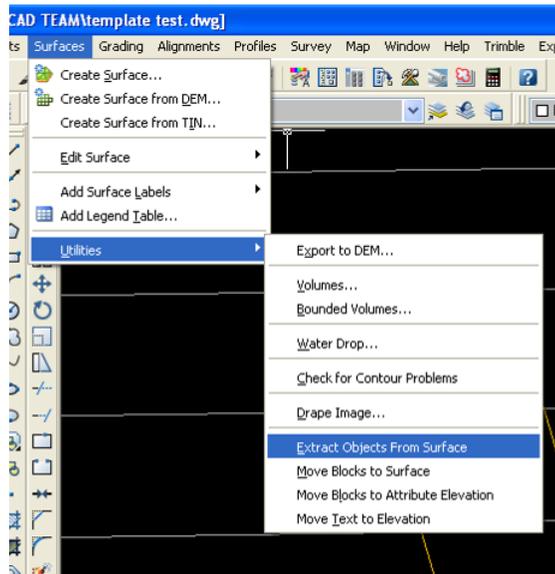
GRADING – DAM EXAMPLE

- i. You can now delete the centerline if you want using the erase command. Next you have to move the endpoints of the lines representing the edges of the top of dam to your design elevation (or contour line). There are 2 ways to do this:

1) METHOD 1 - Trim/Extend to a Contour Line

- a. From the pull down menu, select

SURFACES→UTILITIES→EXTRACT OBJECTS FROM SURFACE

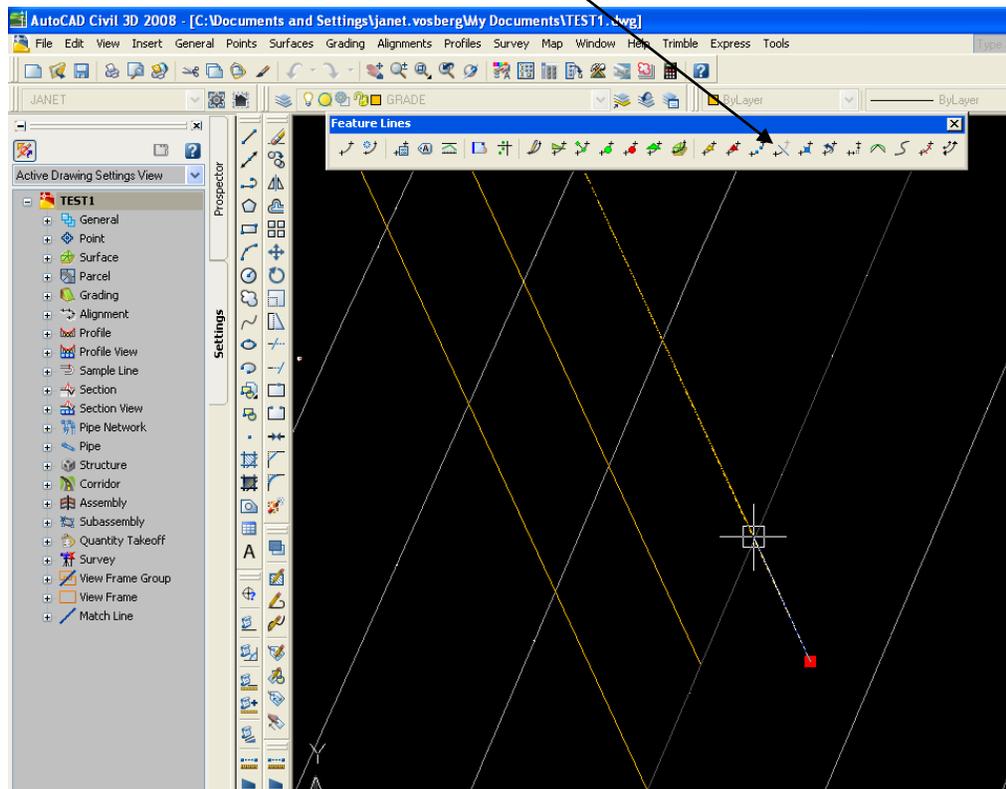


- b. Select the contour lines by clicking on one of them
- c. A window pops up – If you want to trim/extend to a minor contour, uncheck “Major Contour” and leave “Minor Contour” checked

GRADING – DAM EXAMPLE

f. Now you can use the EXTEND command to extend your feature lines to the extracted contour line. To trim the feature lines, select the TRIM icon from the Feature Lines toolbar.

2) METHOD 2 - Drag the ends of the line with the cursor to the contour line or elevation you want. It will not be exact but will be very close.

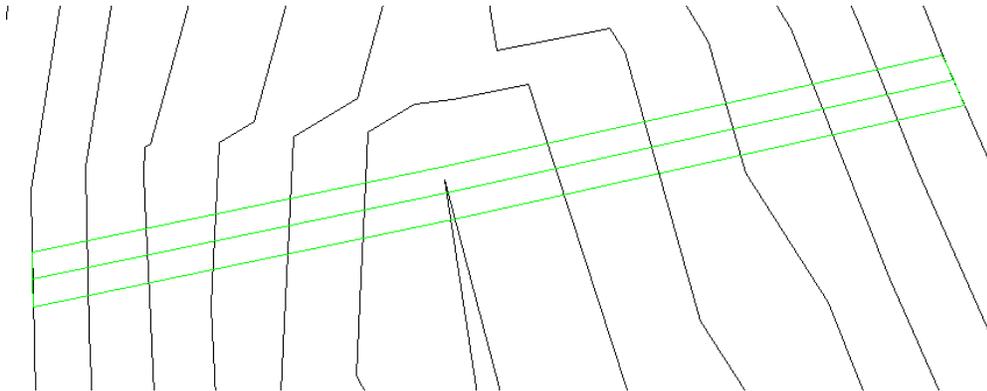


- j. Now check the elevations of the top edges of the dam by repeating step “g” above for both lines representing the top edges of the dam.
- k. Next we are going to connect the two edges with two Feature Lines. From the Feature Lines toolbar, select the 1st icon from the left named DRAW FEATURE LINE and the Create Feature Lines window pops up. Check “Style” and hit OK.

GRADING – DAM EXAMPLE



1. Follow the instructions at the command line. You will notice that a green “x” shows at the starting point, follow the command line instructions. When it asks: “Specify slope or [grade/elevation/difference/Surface/Transition]<0>:”, enter “d” for difference and then zero(0). Hit enter a couple of times and repeat for the other end of the dam.

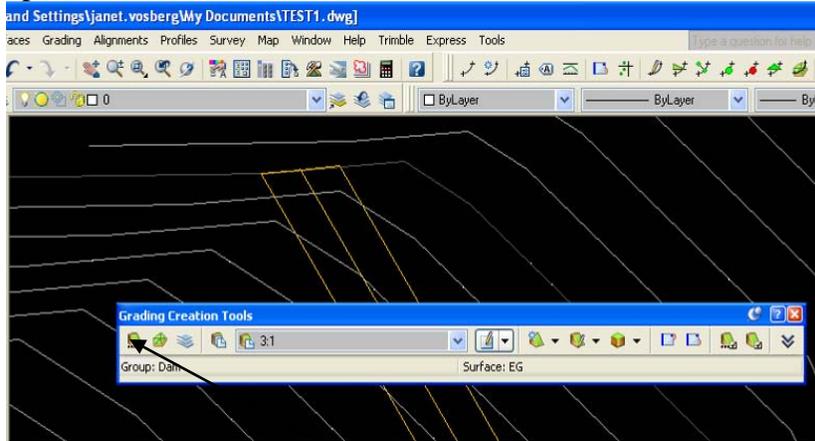


GRADING – DAM EXAMPLE

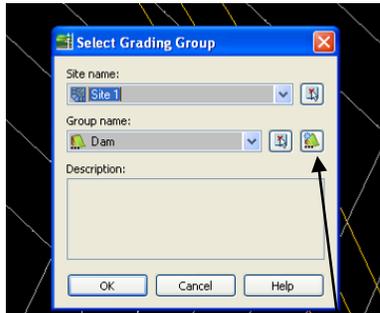
II. GRADING THE DAM

1. Creating a Grading Group

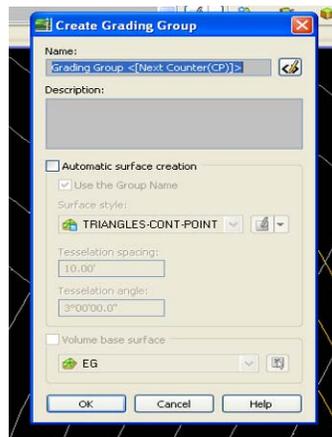
- a. From the pull-down menu, select GRADING then CREATE GRADING and a window pops up.



- b. Click on the 1st icon from the left named SET THE GRADING GROUP. A window pops up.

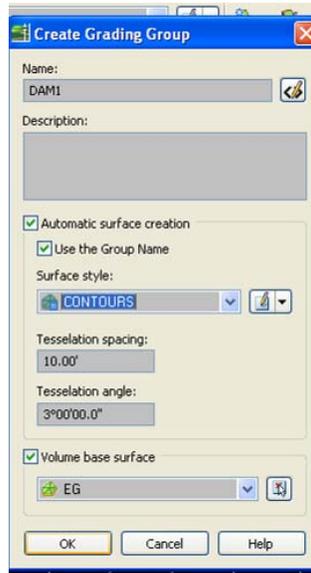


- c. Select your site if you have multiple sites, click on the “Create a Grading Group” icon , and another window pops up,



GRADING – DAM EXAMPLE

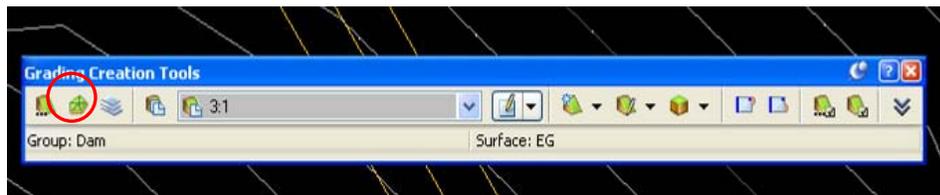
- d. Type or select a name for the grading group (the example uses “DAM1”. Check the box for Automatic surface creation. Select a “Surface Style” (usually CONTOURS is adequate). Check the “Volume Base Surface” and pick the surface you’re grading too (usually “EG”).



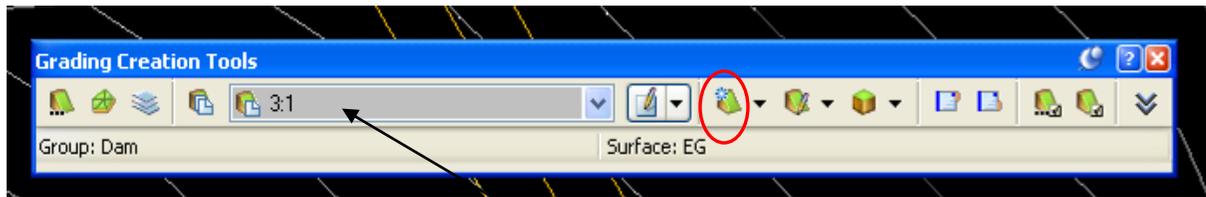
- e. Click ok three times.

2. Setting the Target Surface

- a. On the Grading Creation Tools, click the 2nd icon from the left named SET THE TARGET SURFACE, select EG and click ok.



- b. Grading the front and back slopes:
- i. On the Grading Creation Tools, click the down arrow for GRADING CRITERIA.
 - ii. Some of the more common ones have been created for you. However, you can select one and edit it with the 5th icon from the left. To grade the front slope of the dam, select 3:1 (or whatever slope you’re using) and click on the 6th icon from the left.

GRADING – DAM EXAMPLE

iii. It asks you for the feature so select the upstream side first. Follow the instructions at the command line. Hit enter after you're done. Repeat the previous step for the downstream side but be sure to change the grading criterion if using a slope other than 3:1.

c. Grading the top of the dam:

- i. From the Grading Creation Tools, click on the down arrow of the 6th icon from the left and select CREATE INFILL. Select the area in between and hit enter. Notice that a diamond shape figure and contours shows up in the middle of the area, this is letting you know that you have graded that area

III. COMPUTING VOLUMES

1. From the Grading Creation Tools, click on the 8th icon from the left and follow the instructions.

