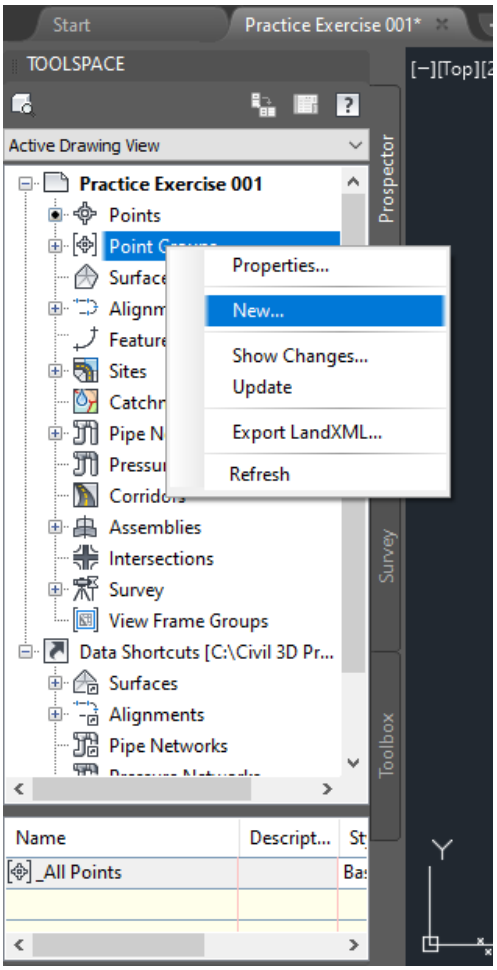
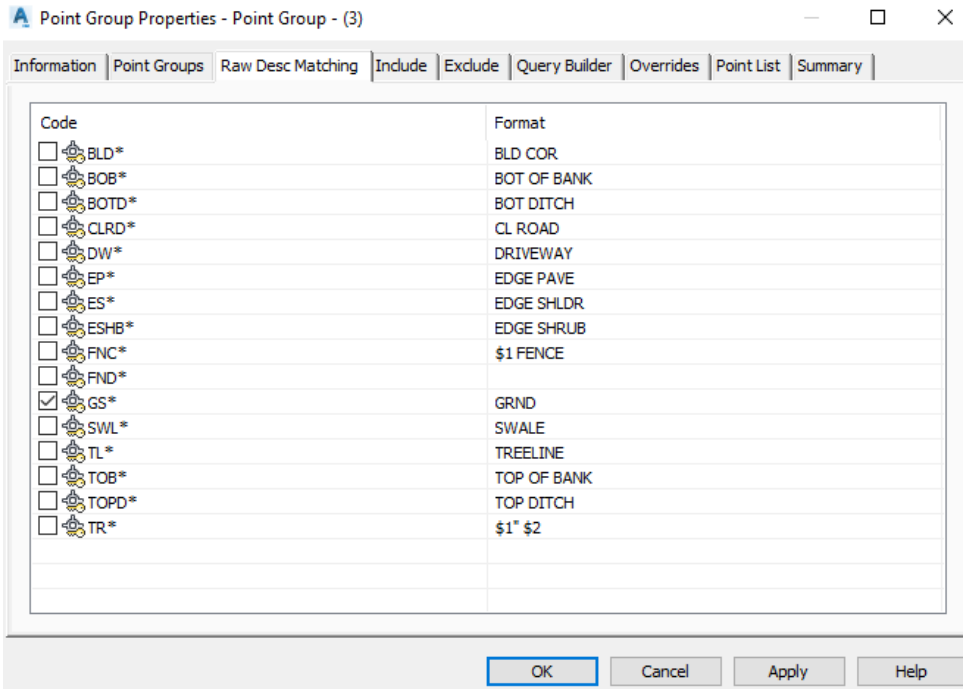
Solution Exercise 2
Create a Grading Group and TIN Volume Surface

1. Open Practice Exercise 002.dwg.

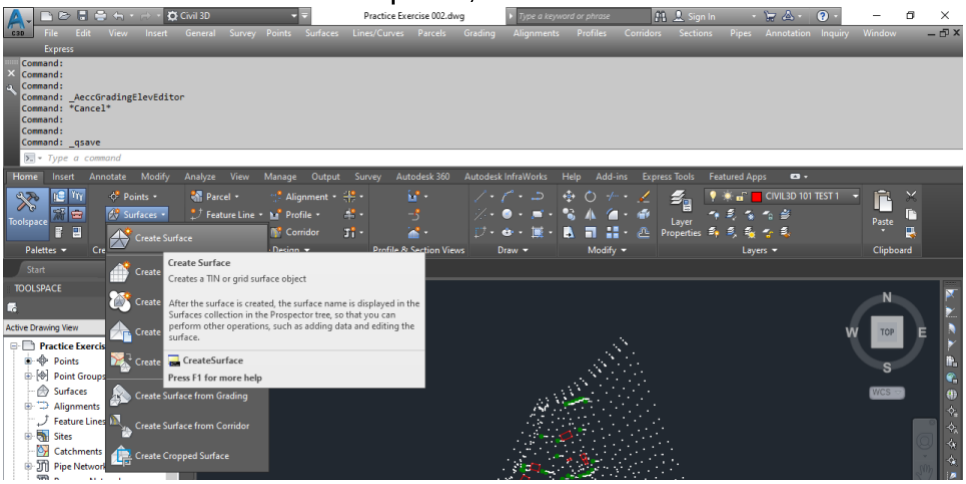
2. Navigate to the Prospector tab of the Toolspace, right-click Point Groups, and choose New.



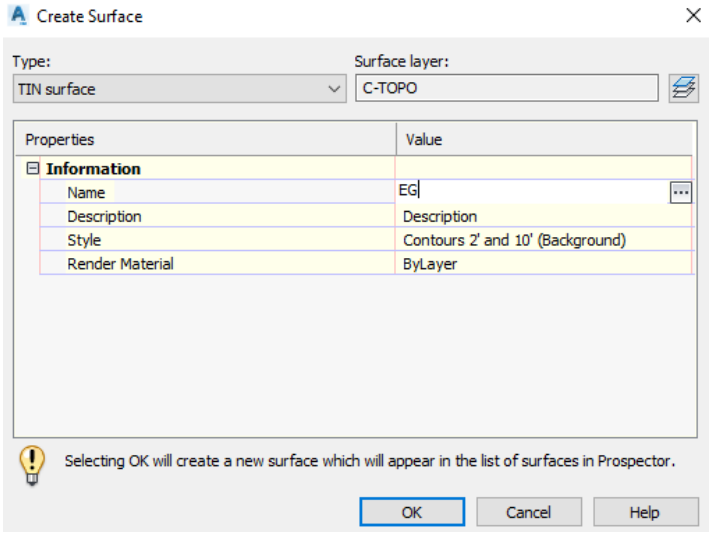
3. Rename the group to GS. Select the Raw Desc Matching tab, select GS*, and click OK.



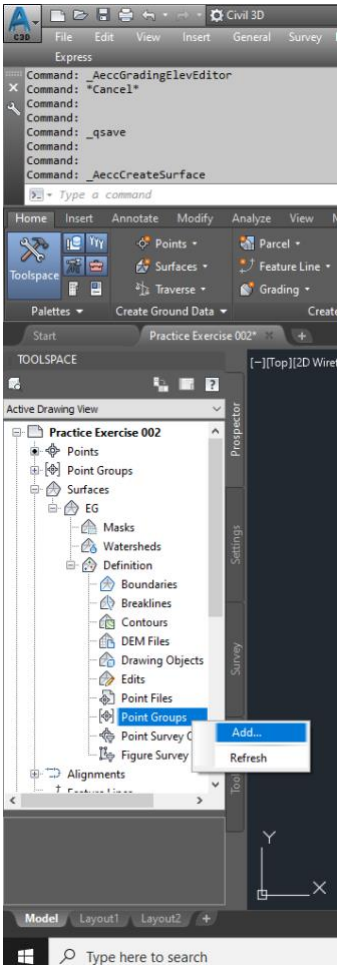
4. In the Create Ground Data panel, click Surfaces and choose Create Surface.



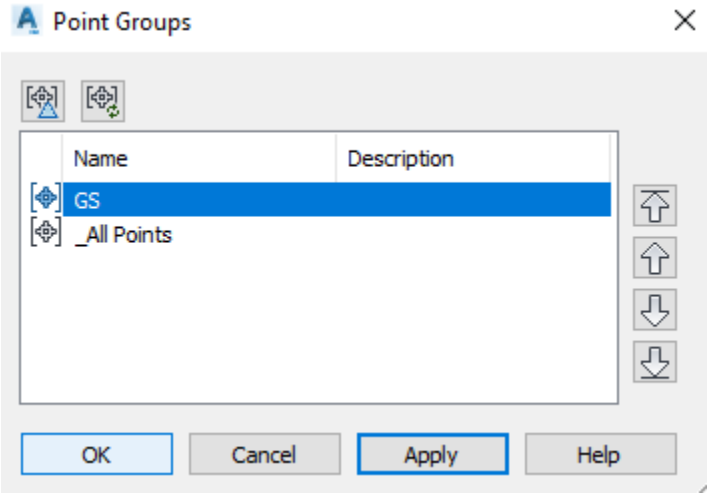
5. Rename the surface EG and click OK.



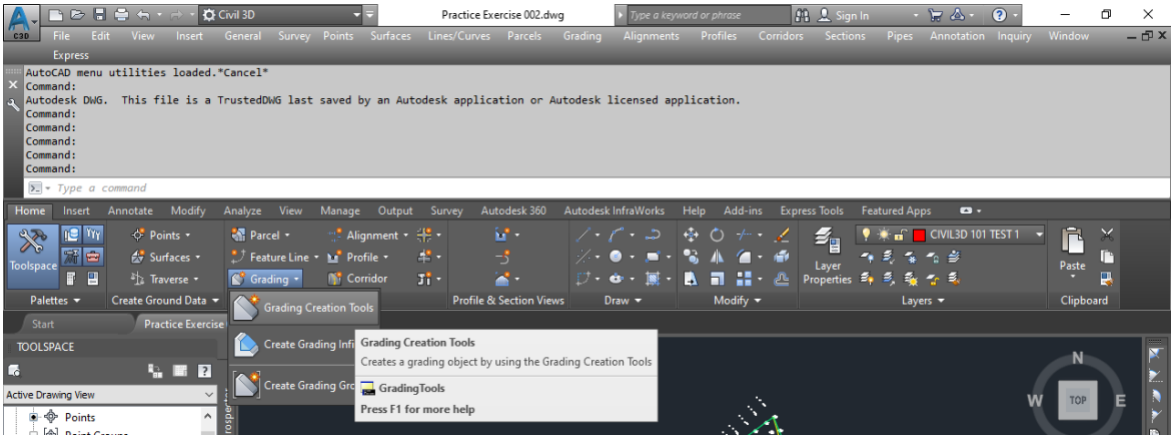
6. Navigate to the Prospector tab of the Toolspace. Expand Surfaces, EG, and Definition. Right-click Point Groups and choose Add.



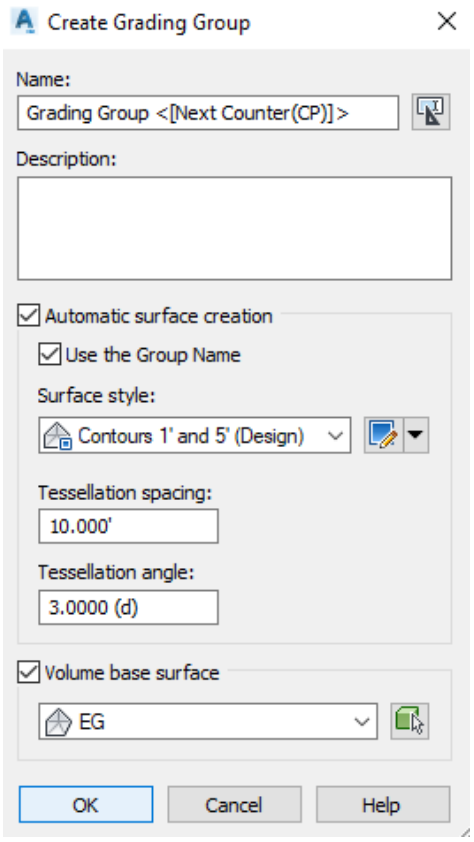
7. Select the GS point group and click OK.



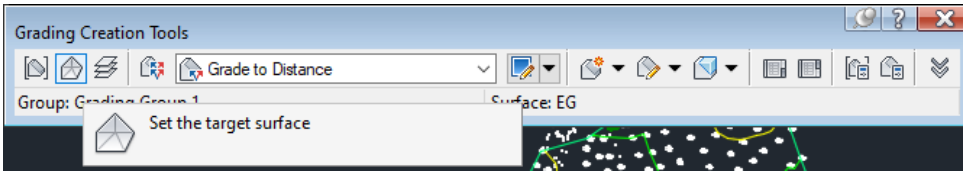
8. In the Create Design panel, click Grading and choose Grading Creation Tools.



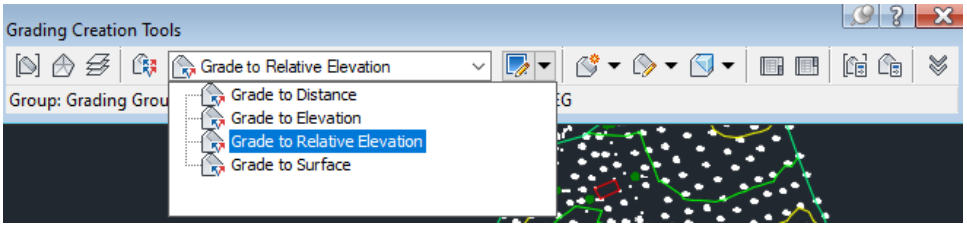
9. Select the grading group. Select automatic surface creation and volume base surface. Set the tessellation factors per the prompt and click OK. Click OK for the grading group surface creation.



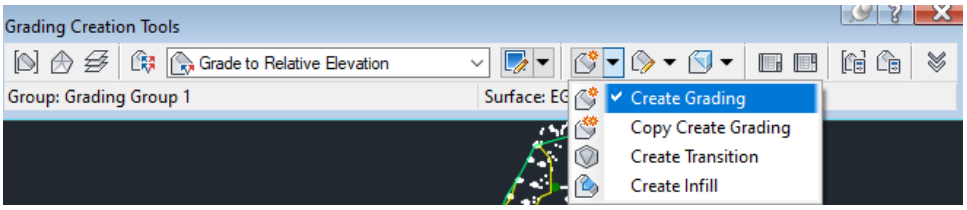
10. Set the target surface to EG.



11. In the criteria drop-down menu, choose Grade to Relative Elevation.

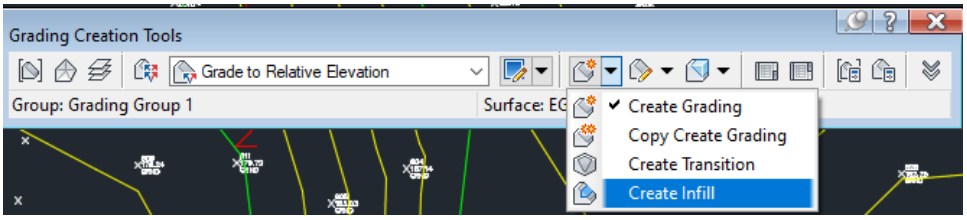


12. Choose Create Grading.

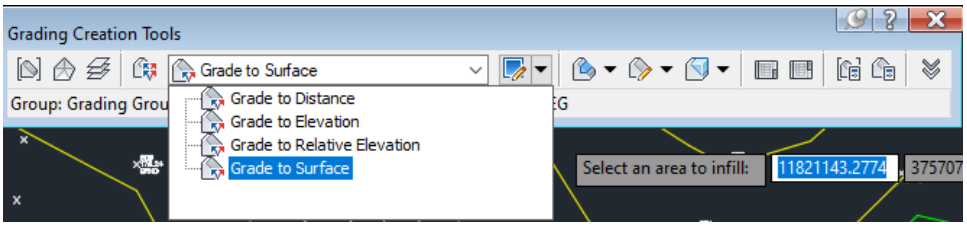


13. Select the feature line. Pick the inside of the feature line and choose Yes for apply to the entire length. Enter the relative elevation of –3 choose to grade via slope at a ratio of 3:1.

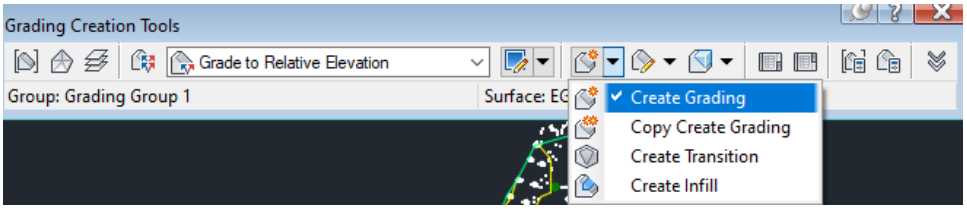
14. Choose Create Infill and pick to the inside of the relative elevation grading criteria.



15. In the criteria drop-down menu, choose Grade to Surface.



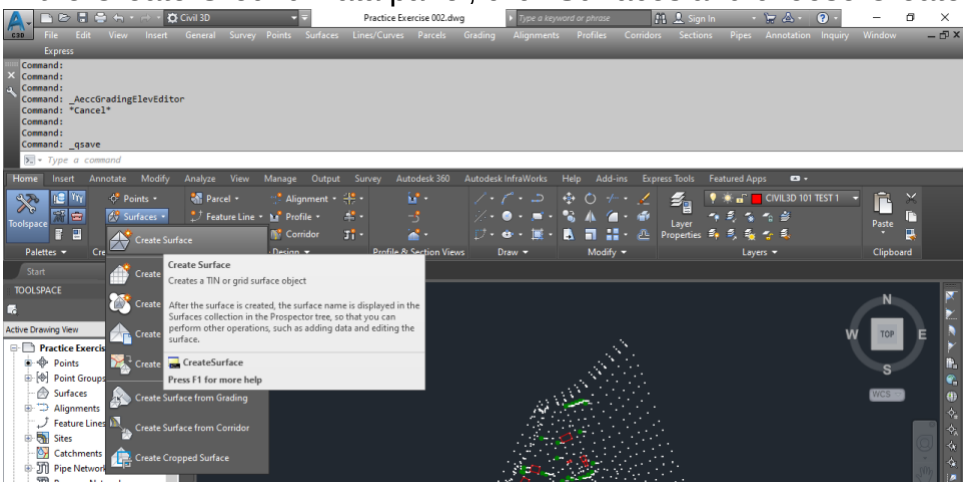
16. Choose Create Grading.



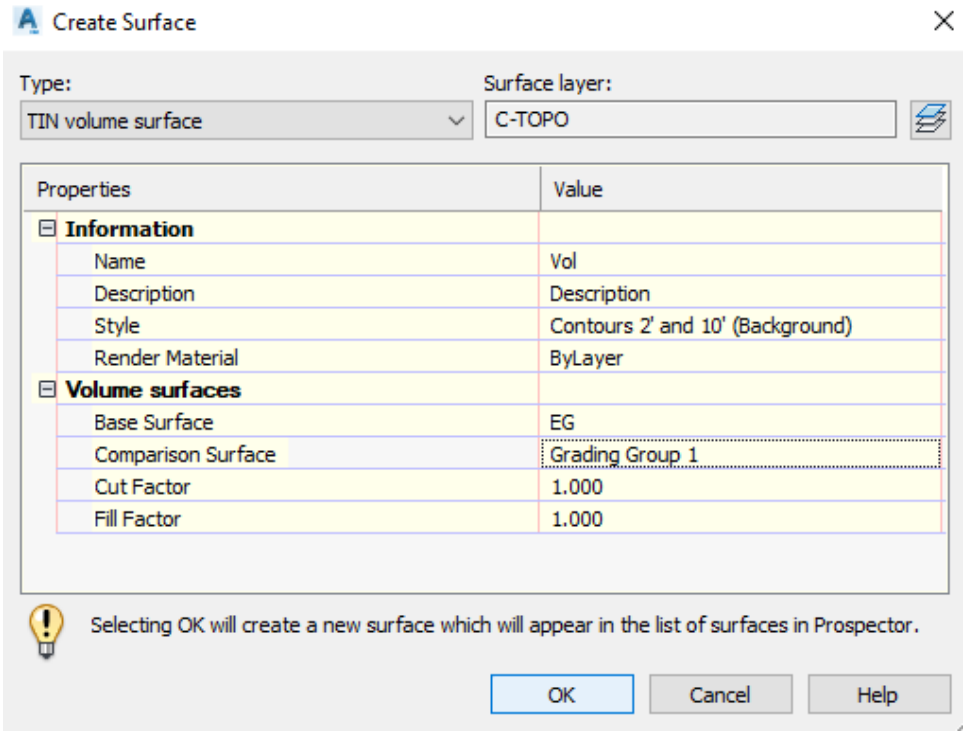
17. Select the feature line. Pick the outside of the feature line and choose Yes for apply to the entire length. Enter the cut grading method choose to grade via

slope at a ratio of 5:1. Enter the fill grading method choose to grade via slope at a ratio of 5:1.

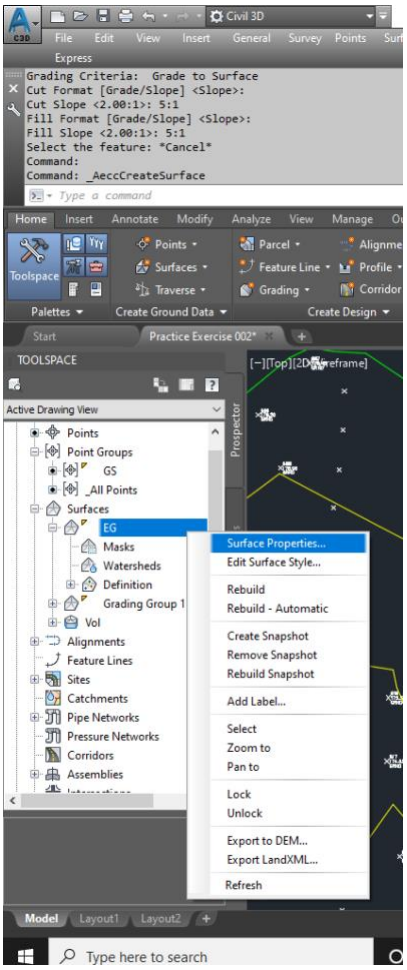
18. In the Create Ground Data panel, click Surfaces and choose Create Surface.



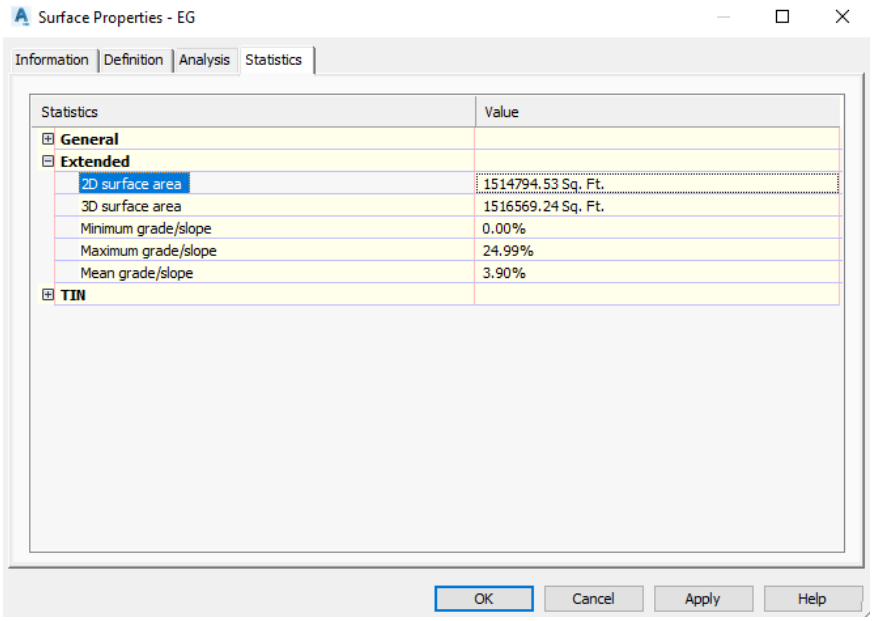
19. Change the type to TIN volume surface. Rename the surface Vol. Set the Base Surface as EG and the Comparison Surface as the grading surface. Set the Cut Factor and Fill Factor as 1. Click OK.



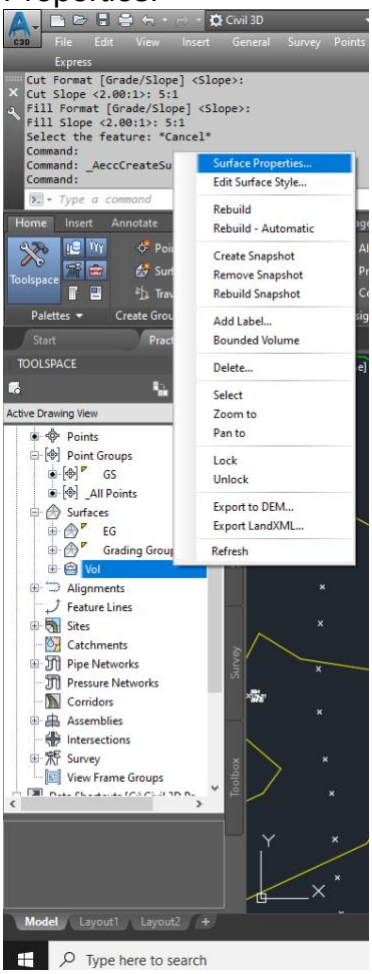
20. Right-click the EG surface in the Prospector tab and choose Surface Properties.



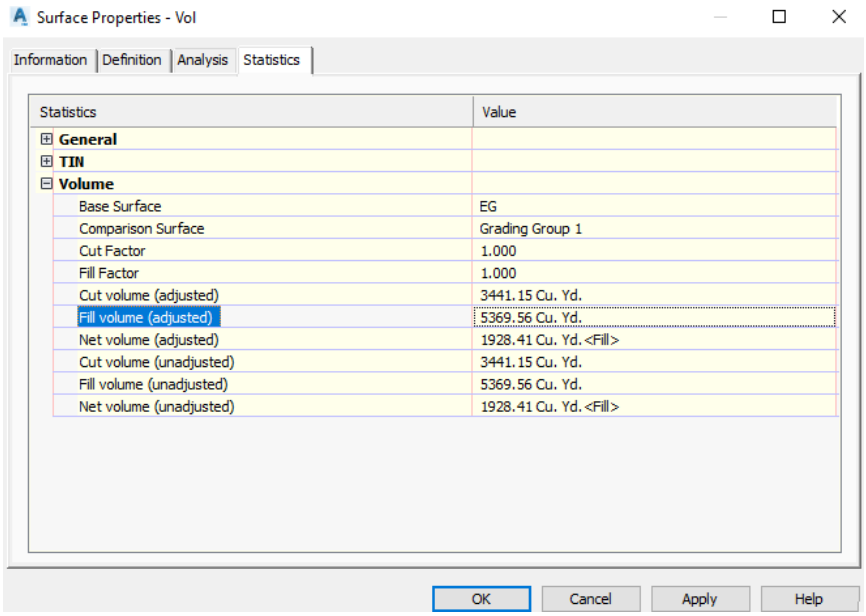
21. Select the statistics tab, expand the Extended section, and make note of the 2D surface area.



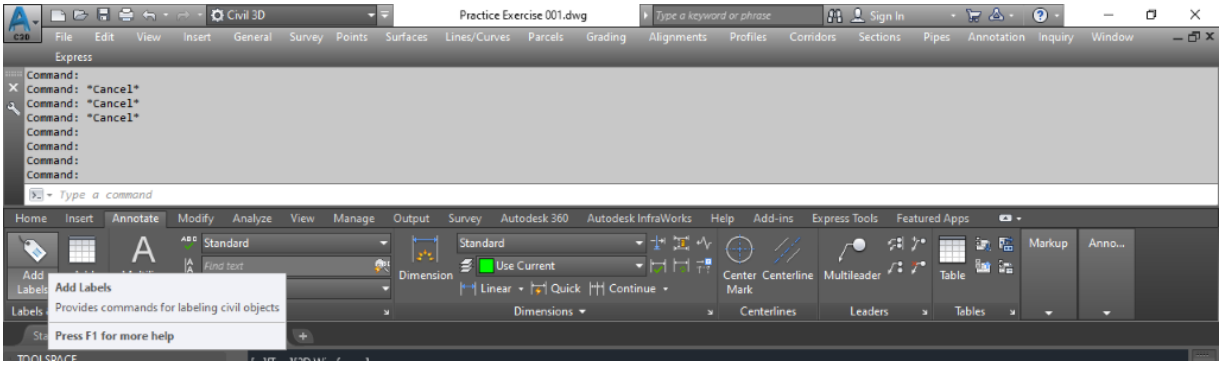
22. In the Prospector tab, expand Surfaces. Right-click Vol and choose Surface Properties.



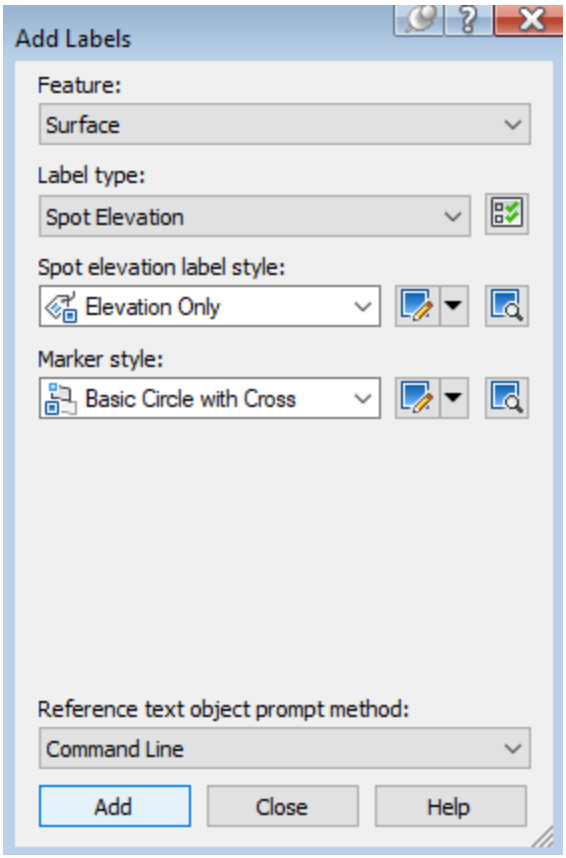
23. In the Statistics tab, expand the Volume section and make note of the Fill Volume (adjusted).



24. Select the Annotate tab in the ribbon bar and click Add Labels.

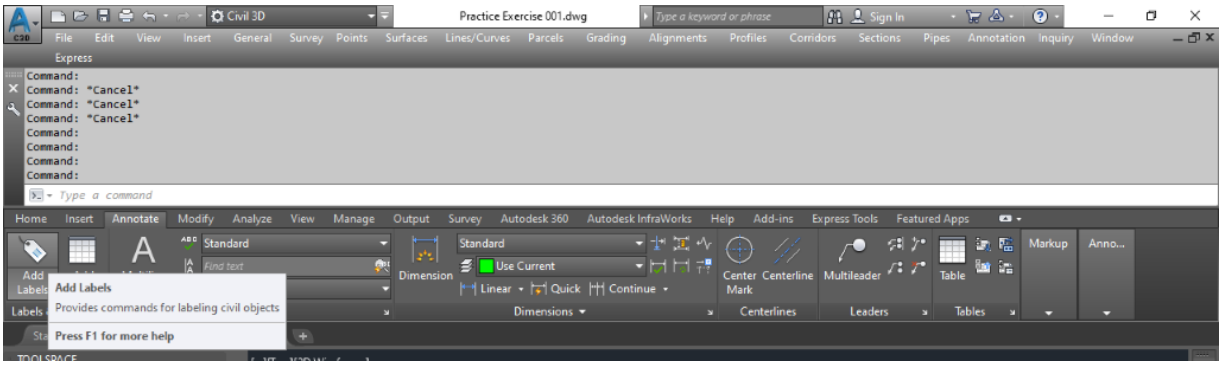


25. Change the Feature to Surface and the Label Type to Spot Elevation. Make sure a label with Elevation is selected for Spot Elevation Label Style and click Add.

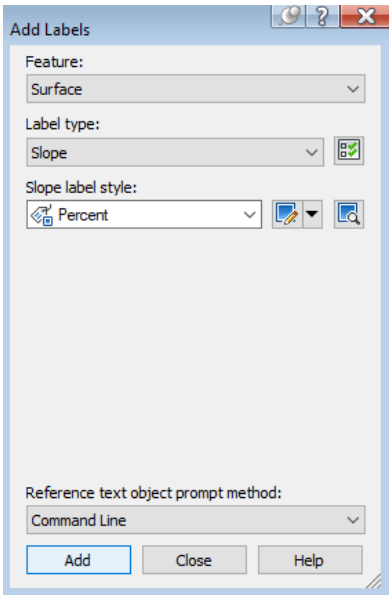


26. Select the surface you want to target (EG) and then select the center of circle A.

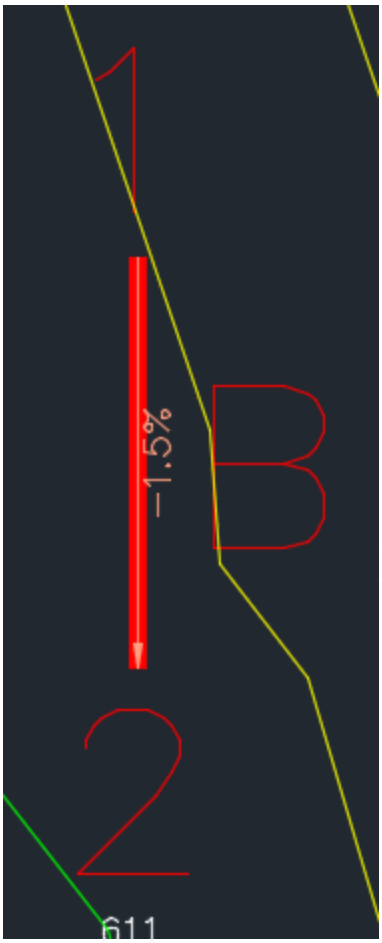
27. Select the Annotate tab in the ribbon bar and choose Add Labels.



28. Change the Feature to Surface and the Label Type to Slope. Make sure a label with Percent is selected for slope label style and click Add.



29. Select the surface you want to target (EG). Set the Type to Two-point. Pick the end of line B at 1 and then the end at 2.



ANSWERS

What is the 2D surface area of the EG surface? 1514794.53

With cut and fill factors of 1 what is the fill (adjusted) in cubic yards of the volume surface? 5369.56

What is the spot elevation on the EG surface at the center of circle A? 179.87

What is the percent slope along line B on the EG surface from 1 to 2? 1.5