Learning Objectives

Monday, March 20, 2023 1:48 PM

The workbooks used for L8 to L12 are found in the files folder of Canvas. Lecture 10 will use Workbook 7. The drawings used are found in

https://my.civil.utah.edu/~bartlett/CVEEN%201400/Drawings/

CVEEN 1400 Computer Aided Design
Assignment 10

1. Finish Exercise 1 – Exercise 1: Reviewing Grading Settings from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. No file submission is required for this exercise.

2. Finish Exercise 2 – Exercise 2: Creating Grading Criteria from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-1.dwg Exercise 2 lastname first name.pdf*. Upload this file to Canvas.

3. Finish Exercise 3 – Exercise 3: Creating Grading Styles from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-1.dwg Exercise 3 lastname first name.pdf*. Upload this file to Canvas.

4. Finish Exercise 4 – Exercise 4: Creating Feature Lines from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-1.dwg Exercise 4 lastname first name.pdf*. Upload this file to Canvas.

5. Finish Exercise 5 – Exercise 5: Assigning Feature Lines from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-1.dwg Exercise 5 lastname first name.pdf*. Upload this file to Canvas.

6. Finish Exercise 6 – Exercise 6: Creating a Grading from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-1.dwg Exercise 6 lastname first name.pdf*. Upload this file to Canvas.

7. Finish Exercise 7 – Exercise 7: Editing the Grading Elevation from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-4.dwg Exercise 7 lastname first name.pdf*. Upload this file to Canvas.

8. Finish Exercise 8 – Exercise 8: Balancing Cut and Fill Volumes from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-4.dwg Exercise 8 lastname first name.dwg*. Upload this file to Canvas.

9. Finish Exercise 9 – Exercise 9: Editing the Grading Criteria from WorkBook 7 -AutoCad_Civil_3D_Grading tutorial file. Save the file from this exercise as *Grading-3A.dwg Exercise 9 lastname first name.pdf*. Upload this file to Canvas.

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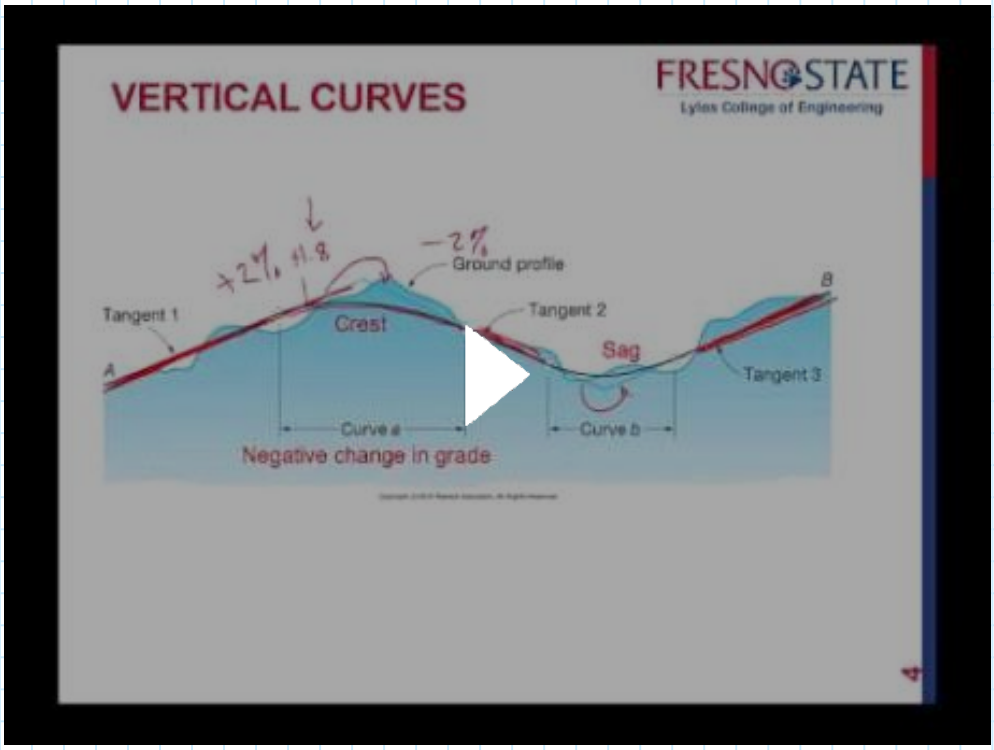
Introduction to Grading

Tuesday, January 29, 2019 1:48 PM

Vertical Curves-Part 1



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Introduction to Grading

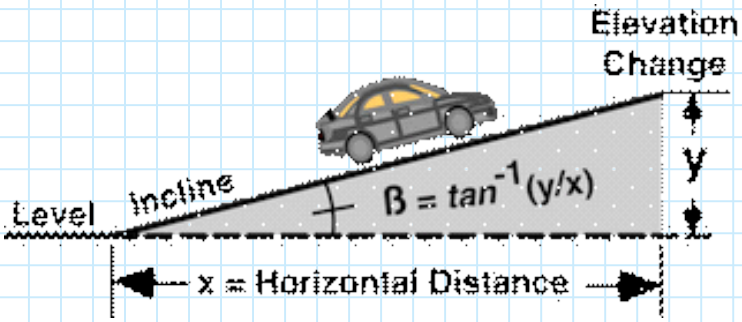
Tuesday, January 29, 2019 1:48 PM

Introduction to Grading (cont.)

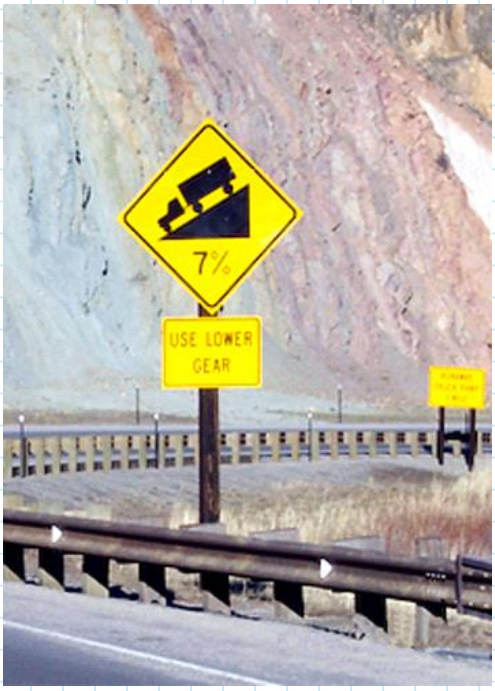
"**Grading**" a **road** means to smooth out the roadbed with earthmoving equipment during the construction phase. In this article, the **grade** of a **road** is defined as a measure of the **road's** steepness as it rises and falls along its route. In other words, it is the magnitude of its incline or slope.

Grades, Highway | Encyclopedia.com

https://www.encyclopedia.com/education/news-wires-white-papers.../grades-highway



% Grade = y/x * 100



When downhill grades are too steep is can cause problems with breaks overheating.

When uphill grades are too steep, then heavy trucks have problems climbing the hill or mountain.

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Grading (continued)

Tuesday, January 29, 2019 1:48 PM

Smoking brakes are a visiual indicator that a truck's brakes are hot and the trucker is driving downhill improperly.

Steep Downhill grades cause problems with braking for large trucks

Emergency Runaway Truck Ramps

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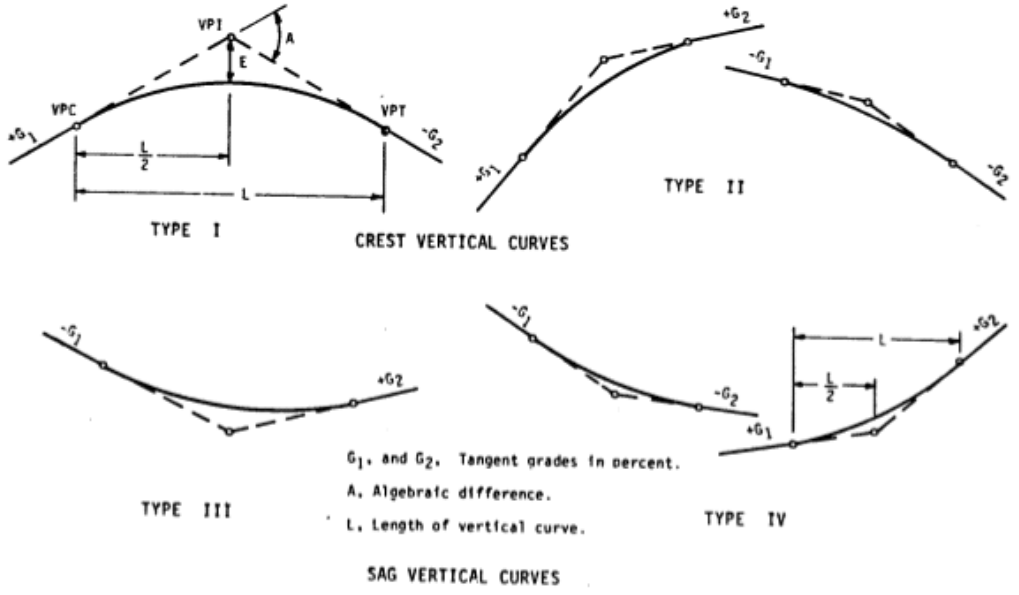
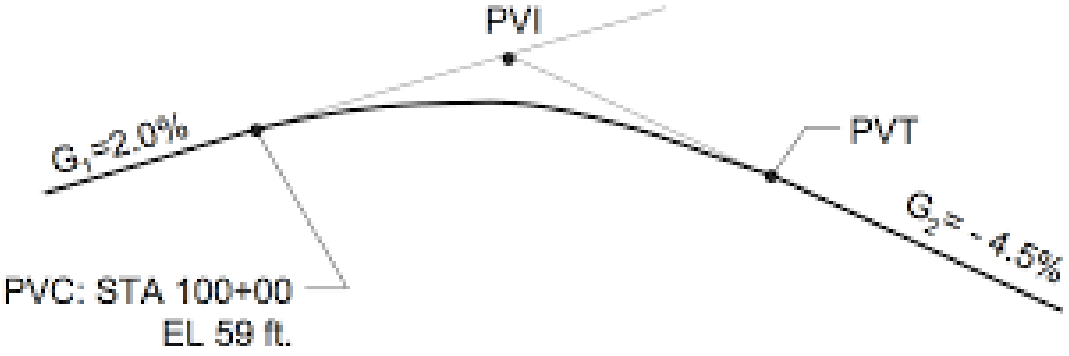
Crest Curves

Types of Vertical Curves



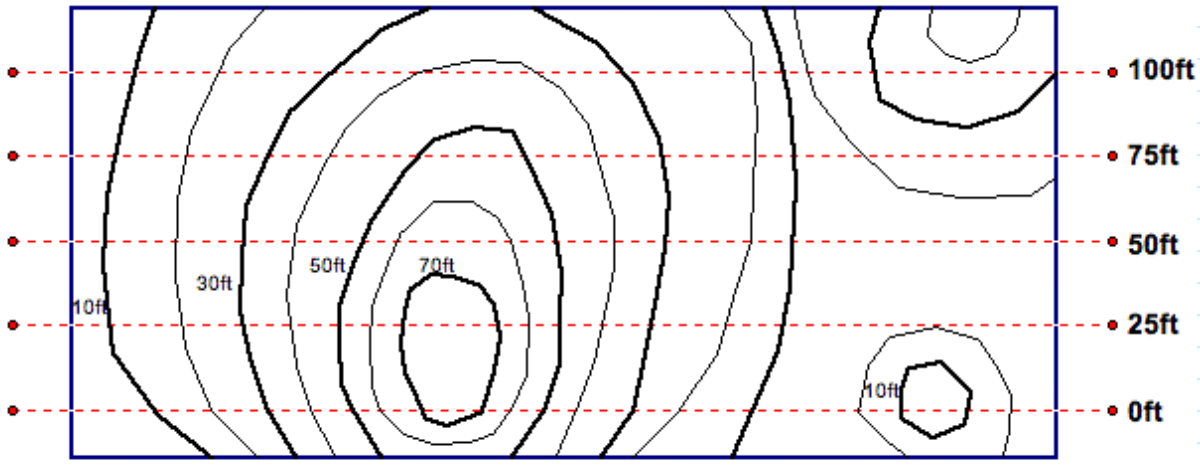
A 400 ft. equal tangent crest vertical curve has a PVC station of 100+00 at 59 ft. elevation. The initial grade is 2.0 percent and the final grade is -4.5 percent. Determine the elevation and stationing of PVI, PVT, and the high point of the curve.



http://priodeep.weebly.com/uploads/6/5/4/9/65495087/geometric_design.pdf

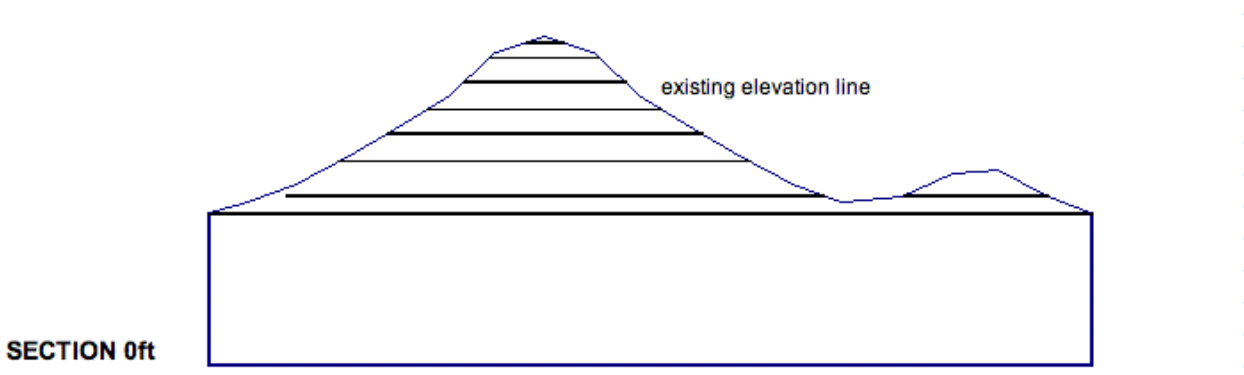
Cut and Fill

Tuesday, January 29, 2019 1:48 PM



topography map

http://jwilson.coe.uga.edu/EMAT6680/Parsons/MVP6690/Essay3/cutfill.html



Cross-Sectional View (Not Profile View)

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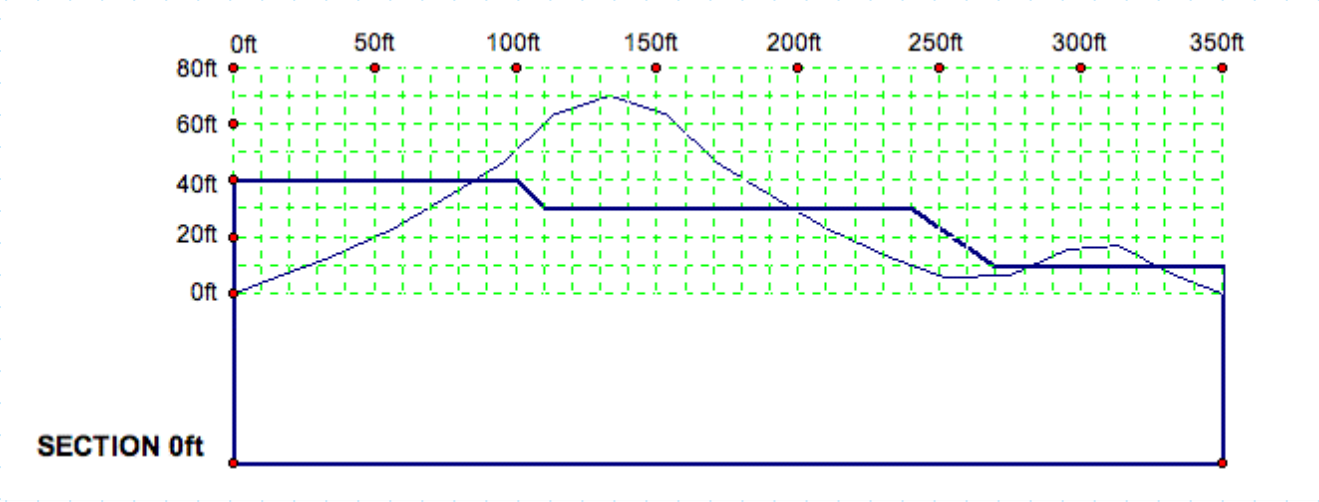
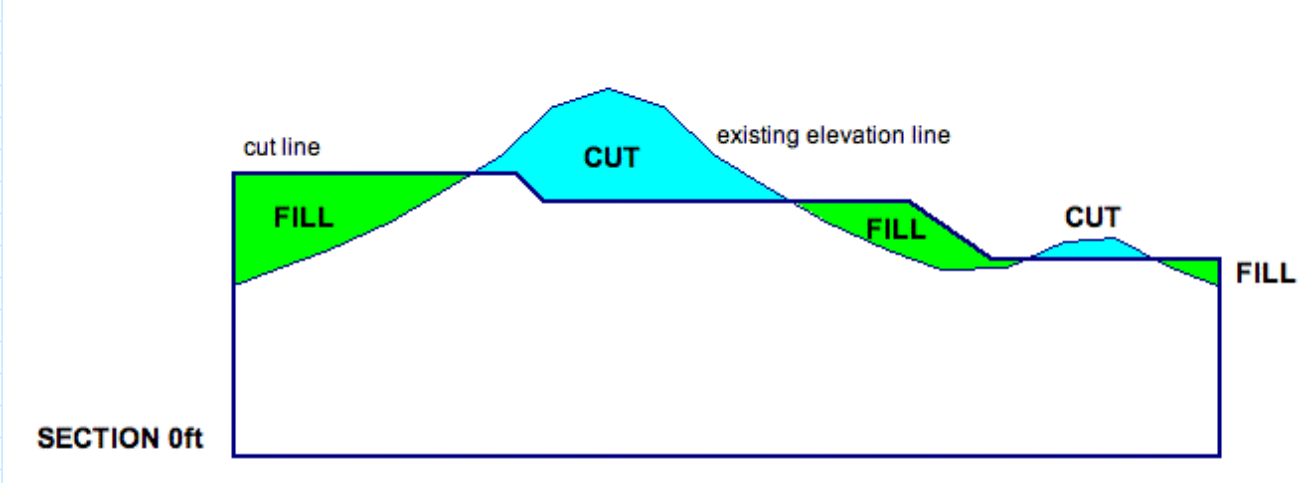
Cut and Fill (continued)

Tuesday, January 29, 2019 1:48 PM





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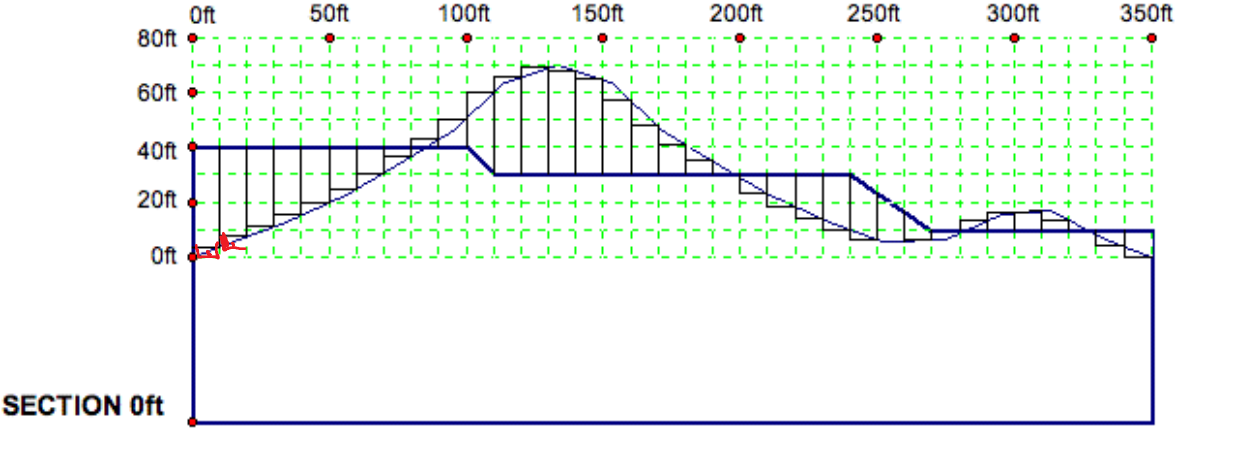
Cut and Fill (continued)

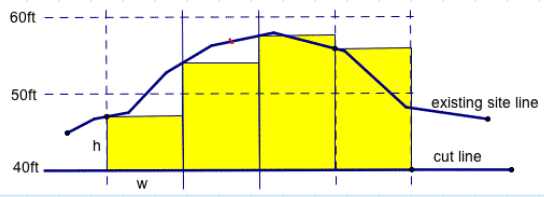
Tuesday, January 29, 2019 1:48 PM

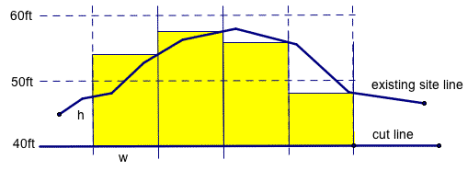


The diagrams below represent two different ways rectangles can be drawn between the existing elevation line and the cut line. The process of left and right estimation indicate the direction in which the rectangles that meet the curve and are drawn.

From <http://jwilson.coe.uga.edu/EMAT6680/Parsons/MVP6690/Essay3/cutfill.html>

Area = Σ H * I where H is the height of each rectangle and I is the interval spacing. For X-section above I = 10 feet.





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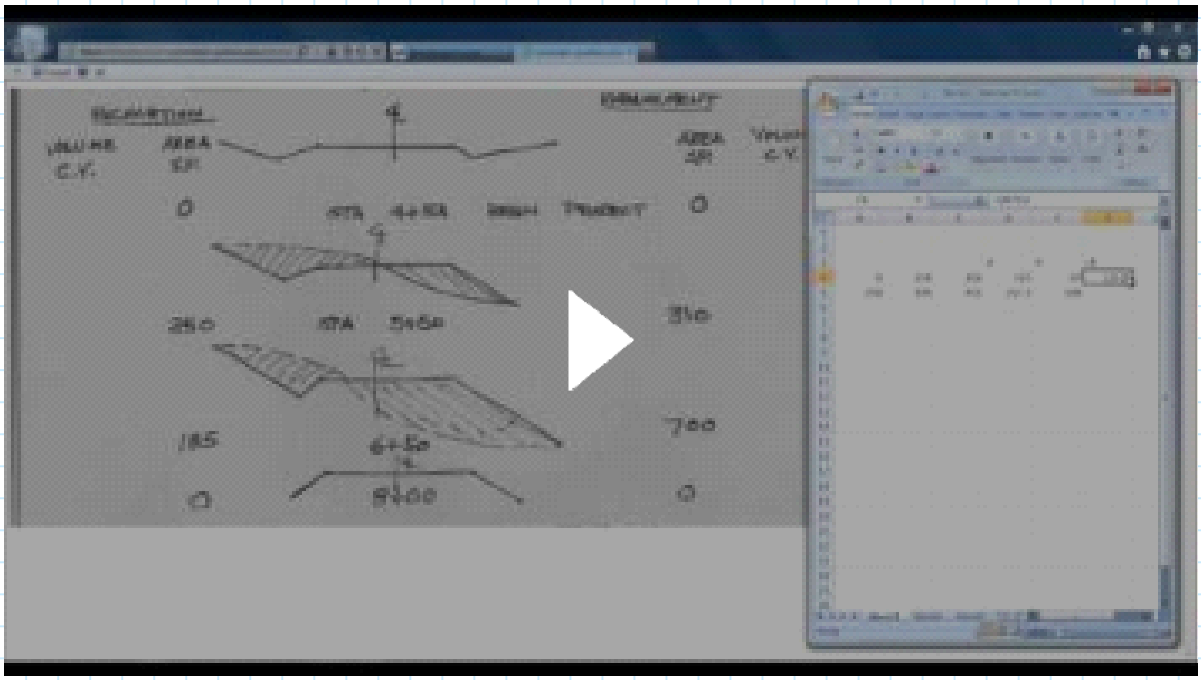
Cut and Fill Calculations

Tuesday, January 29, 2019 1:48 PM

Average End Area Method

Daniel Trujillo



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