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Continuing Education Course #227
Earthwork Basics
and a Traditional Calculation Method

1. What is the document that typically describes the existing conditions?
 - a. Site Plan
 - b. Topographic Survey
 - c. Proposed Grading Plan
 - d. Survey Monkey
2. True or False, soil is generally classified as consisting of a combination of silt, sand, and dirt?
 - a. True
 - b. False
3. True or False, fill is typically placed in "lifts", which is generally defined as the maximum thickness of the layers of soil to be placed?
 - a. True
 - b. False
4. True or False, a site where soil must be taken away from, or exported, is referred to as a balanced site?
 - a. True
 - b. False
5. In SI units, what is the commonly used metric of volume associated with land development earthwork analysis?
 - a. Square inches
 - b. Cubic Yards
 - c. Gallons
 - d. Cubic Feet per Minute
6. How many cubic feet are in nine (9) cubic yards?
 - a. 27
 - b. 270
 - c. 243
 - d. 3
7. What is the average of the following elevations: (27.30', 32.20' 19.00', 26.40')?
 - a. 104.90'
 - b. 27.934'
 - c. 419.60'
 - d. 26.225'
8. True or False, the engineer must use the traditional cut-fill analysis methods as presented in this course in order to accurately determine the earthwork needs of a project site?

- a. True
- b. False

9. True or False, in the traditional hand method of surface cut-fill analysis as presented in this course, a grid is overlain onto a plan of the existing and proposed topographic conditions?

- a. True
- b. False

10. True or False, As outlined in this course in Method 1 of surface cut-fill analysis, averaging the elevations at four existing nodes and comparing them to an average of the four proposed elevations at the same nodes can give an approximate difference in elevation for said quadrant?

- a. True
- b. False

11. Assuming a quadrant has existing node elevations of: (27.30', 32.20' 19.00', 26.40'); and the proposed nodes are each respectively 28.50', under Method 1, what is the difference in Quadrant elevations?

- a. 2.275'
- b. 0'
- c. 10'
- d. 3.825'

12. True or False, Using Method 1, if an existing quadrant has an average elevation of 26.225' and the corresponding proposed average elevation is 28.50' then a net cut in the quadrant is required to achieve the proposed grade?

- a. True
- b. False

13. If a 50'x50' grid is used on a project, and one of the quadrants under Method 1 has a difference in elevation between existing (lower) and proposed (higher) of 2.275', what is the anticipated earthwork to balance the quadrant?

- a. ~5,687.5 CY Fill
- b. ~210.65 CY Fill
- c. ~209.15 CY Cut
- d. ~5688 CF Cut

14. Assuming a quadrant has existing node elevations of: (27.30', 32.20' 19.00', 26.40'); and the proposed nodes are each respectively 28.50', under Method 2, what is the average difference in elevation between the Quadrant's nodes?

- a. -2.9'
- b. +2.275'
- c. +2.9'
- d. +9.10'

15. If a 100'x100' grid is used on a project, and one of the quadrants under Method 2 has a average difference in elevation of -0.725' (between proposed and existing), what is the anticipated earthwork to balance the quadrant?

- a. ~10,000 CY Fill
- b. ~500 CY Cut
- c. ~268.5 CY Cut
- d. ~7250 CY Cut

16. True or False, the larger the spacing of the grid lines in the earthwork grid, the more accurate the results because more area is covered?

- a. True
- b. False

17. True or False, when setting up a grid under the Methods presented in this course for surface cut-fill analysis, it is ideal to set a column and row beyond the limit of disturbance in each direction?
- a. True
 - b. False
18. If 540 CY of Export is needed to balance a site, and 30 Yard container dump trucks are assumed to be utilized to perform the export work, how many trips to the disposal site are anticipated?
- a. 16,200 Trips
 - b. 18 Trips
 - c. 16 Trips
 - d. 1.6 Trips
19. If 5400 Cubic **Feet** of select fill "export" is needed to balance a site, how much will it cost to deliver the needed soil if 20 Yard dump trucks will import the soil at \$600.00 per load?
- a. \$6,000
 - b. \$162,000
 - c. \$60,000
 - d. \$1.62
20. True or False, if an existing house with a basement of a volume of 450 CY is being demolished, and finished floor elevation was used for the existing grade in the surface cut-fill analysis, then 450 CY of "assumed fill" should be added to the surface cut-fill analysis in order to adjust the earthwork analysis for this sub-surface feature?
- a. True
 - b. False
21. How much "assumed cut" should be added to the surface cut-fill analysis result in order to adjust for a proposed underground detention basin, the outside dimensions of which the pipe and stone measure at 100' x 400' x 6'?
- a. 20,000 CY Cut
 - b. 3,000 CY Cut
 - c. 24 CF Cut
 - d. 8,888.88 CY Cut
22. True or False, on a site without major steep slopes, a scraper is a good piece of equipment to use to perform rough grading?
- a. True
 - b. False
23. True or False, an excavator's bucket head can typically be interchanged with other components such as a hammer or a grabber?
- a. True
 - b. False
24. The purpose of a ripper is to?
- a. tear the design plans in half
 - b. break up hard packed and rocky soil so that the bull dozer can relocate it.
 - c. it is a storage facility for compact discs.
 - d. it keeps the operator's hands warm.
25. True or False, a crane can be used for compaction and/or consolidation on a site?
- a. True
 - b. False