**MIDDLE EAST TECHNICAL UNIVERSITY**

**Department of Civil Engineering**

**CE353 Principles of Transportation and Traffic Engineering**

**Step 5**

**CROSS SECTIONS, VOLUME SHEET AND MASS DIAGRAM   
Report**

**Group 522**

**DemirBerkayYılmaz 1737469**

**BugraYuksel 1737477**

**SerkanGokmen 1193226**

**M. SedatGozlet 1550706**

**HassanOuzzine 1848928**

**Introduction**

In this part of the project we draw the cross sections of the stations at every 90m (group of 5) and the cut and fill sections of the corresponding station cross sections are calculated. Finally we were able to prepare the volume sheet and the mass diagram.

**Procedure**

We identified 31 stations which include 90m intervals and PC PT points of our horizontal curves and draw cross sections of these stations with Autocad. Cross sections are of the same scale and presented on same sheet. We draw the cross sections as instructed in the guideline and calculate the cut and fill sections by utilizing Autocad area functionality although for manual process, the cross method is available as:

A=1/2\*∑[y(i)(x(i-1)-x(x+i))] CCW  
*A* = cross sectional area;

*yi*= vertical coordinate of point of interest,

*xi+1* = horizontal coordinate of point after the point of interest,

*xi-1*= horizontal coordinate of point before the point of interest.

The corresponding data of volume details is available on the volume sheet and the coordinates of the cut and fill sections are presented on the drawings and the mass diagram is also presented in the Autocad file.

**Discussion of Results**

In step 3 of the project we set the vertical curve according to the standards required in the guideline, to keep the grade difference at a certain value we elevated the road at the station A which resulted in massive amount of fill section. In such a project the cumulative fill amount of ~434.000m3 barrow is not feasible. In similar conditions we would think of utilizing viaducts as a more feasible alternative.

There might be errors in the project due to using fever number of decimals during calculations and human factor during the drawing process.

**Conclusion**

During the term project we have learned the basics of constructing a road and application of standards. Also to work as a team was a positive side of the term project.