**Example :- Given the following end area for cut & fill. Complete the earthworks using shrinkage of 90% then prepare the mass diagram. & find the following**

a) Limit of economical haul.

b) Free-Haul volume.

c) Over-Haul volume.

d) Waste volume.

e) Borrowing volume.

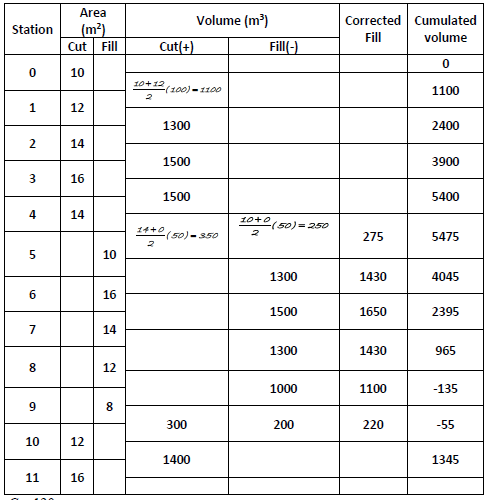
**Giving that :**

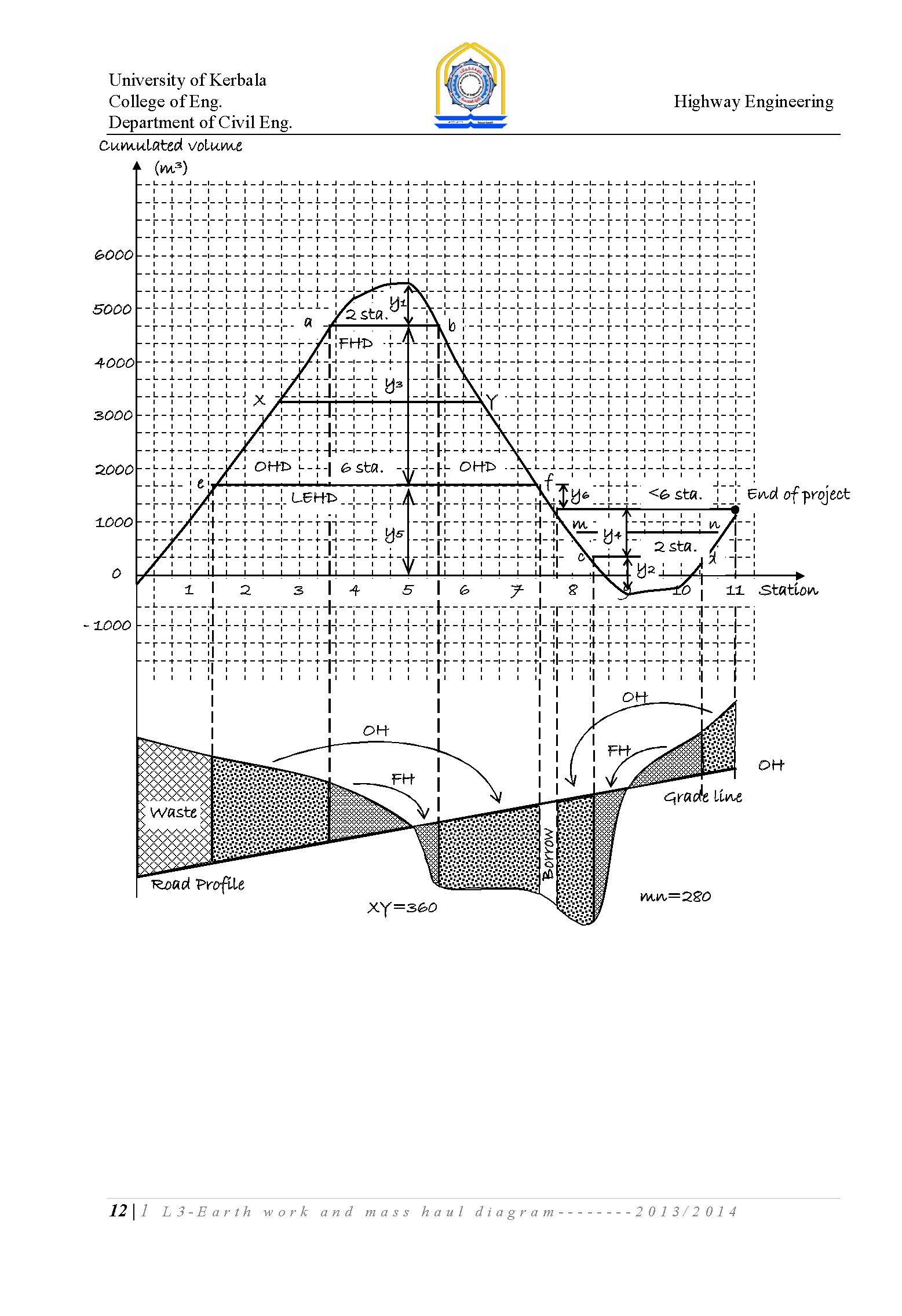
Cost of Over-Haul = 30 SR/m3.sta.

Cost of Free-Haul = 70 SR /m3

Cost of borrow = 120 SR/m3

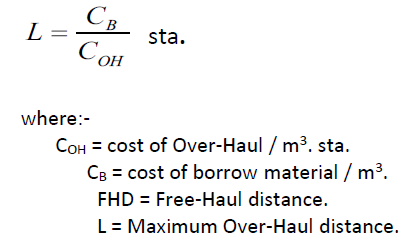
Free-Haul distance = 200 m.





**a) Limit of economical haul.**

Economic Haul Limit (LEHD) = FHD + L



L= 120 /30 = 4 Stations = 400 m.

Economic Haul Limit (LEHD) = 200 + 400 = **600 m**

**b) Free-Haul volume.**

From the chart

Free-Haul volumes = y1+y2 = 700+900 = 1600 m3.

**c) Over-Haul volume.**

From the chart

Over-Haul volumes = y3+y4 = 3000+800 = 3800 m3.

**d) Waste volume.**

From the chart

Waste volume = y5 = 1950 m3.

**e) Borrowing volume.**

Borrow volume = y6 = 600 m3.