AFoLABi Boluwatife 17/ENG08/006

Chainage (m)	0	30	60	90	120	150	180	210	240	270
Offsets length (m)	0	0.65	3.80	3.75	4.65	3.60	5.00	5.80	6.10	5.85
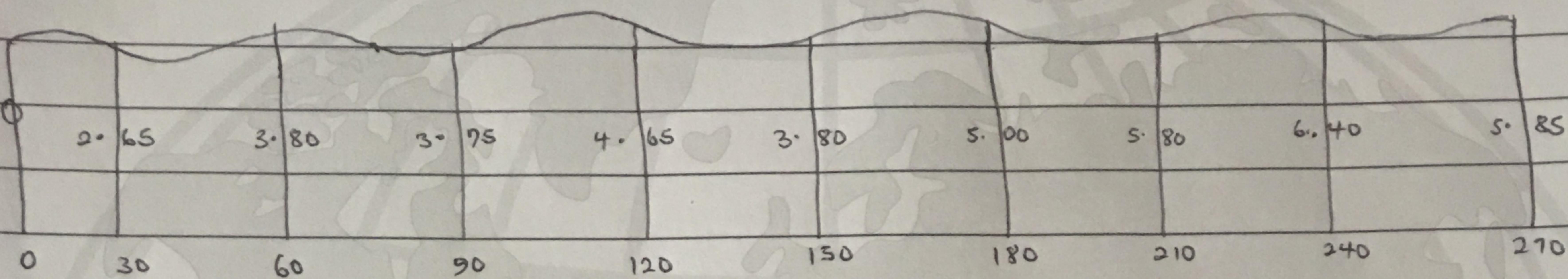
Using Mid-ordinate rule

$$A = \Sigma hd$$

$h_1 = \dfrac{0 + 2.65}{2} = 1.325m$

$h_2 = \dfrac{2.65 + 3.80}{2} = 3.225m$

$h_3 = \dfrac{3.80 + 3.75}{2} = 3.775m$

$h_4 = \dfrac{3.75 + 4.65}{2} = 4.200m$

$h_5 = \dfrac{4.65 + 3.60}{2} = 4.125m$

$h_6 = \dfrac{3.60 + 5.00}{2} = 4.300m$

$h_7 = \dfrac{5.00 + 5.80}{2} = 5.400m$

$h_8 = \dfrac{5.80 + 6.00}{2} = 5.900m$

$h_9 = \dfrac{6.00 + 5.85}{2} = 5.925m$

$\Sigma h = 1.35 + 3.225 + 3.775 + 4.20 + 4.125 + 4.3 + 3.4 + 5.9 + 5.925$

$\Sigma h = 38.175m$

$d = 30$

$A = \Sigma hd$

$= 38.175 \times 30$

$A = 1145.25 m^2$

Using Average ordinate rule

$A = \dfrac{nd \Sigma 0}{n+1}$; $n = 9$; $d = 30$;

$\Sigma 0 = 0 + 0.65 + 3.80 + 3.75 + 4.65 + 3.60 + 5.00 + 5.800 + 6.10 + 5.85$

$\Sigma 0 = 41.2m$

$\therefore A = \dfrac{9 \times 30 \times 41.2}{9+1}$

$A = 1112.4 m^2$

Using Trapeziodal Rule.

$A = d \left[\dfrac{a + 0_n}{2} + 0_2 + 0_3 + \cdots 0_{n-1} \right]$

$d = 30$ $\therefore A = 30 \left[\dfrac{0 + 5.85}{2} + 2.65 + 3.80 + 3.75 + 4.65 + 3.80 + 5.00 \right]$

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$A = 30 [38.275]$

$A = 1148.25 m^2$

Using Simpsons rules

$A = \frac{d}{3} [(O_1 + O_n) + 4(O_2 + O_4 + \cdots + O_{n-1}) + 2(O_3 + O_4 + O_5 + O_6 + \cdots O_{n-0})]$

$d = 30$

Note : chainage and offset was removed because the offsets are equal

$\therefore \quad \frac{30}{3} [(0 + 6.10) + 4(2.65 + 3.75 + 3.60 + 5.80) + 2(3.80 + 4.65 + 5.00)]$

$A = 962 m$

Calculating for offsets and chainage 10 using trapizodial rule

$A = d [\frac{O_1 + O_n}{2} + O_0 + O_3 \cdots O_{n-1}]$

$A = 30 [\frac{0.4 + 5.85}{2}]$

$A = 183.75 m^2$

$\therefore \quad A = 962 + 183.75$

$A = 1145.75 m^2$