

OEDOMETRIC SETTLEMENT OF TRIANGULAR SLOPES



TASHFEEN

ENGINEERING SOLUTIONS

Required parameters for settlement calculation

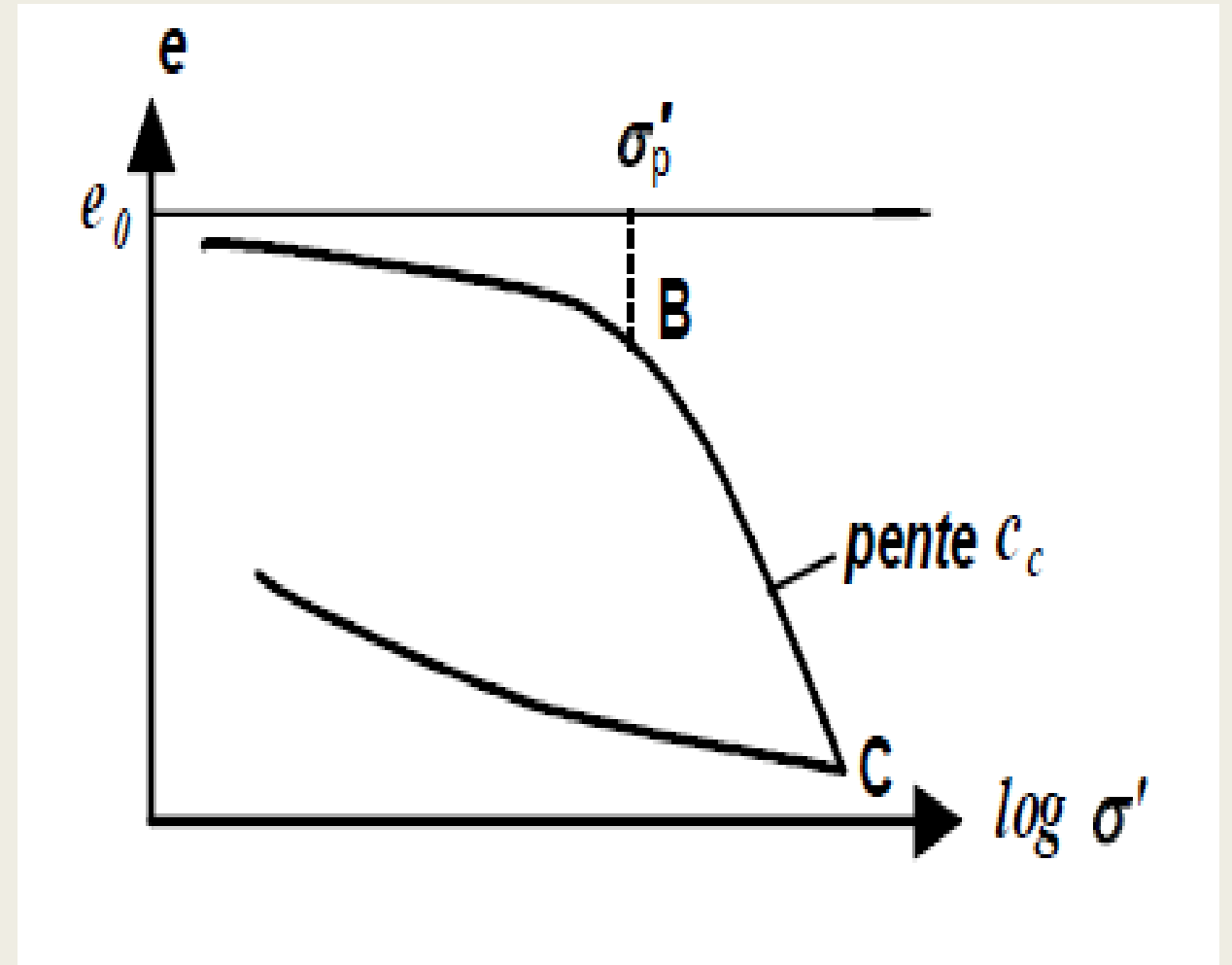
C_s : Swelling Index

C_c : Compressibility Index


e_0 : Initial Void Index

σ'_{v0} : Initial Effective Stress

σ'_p : Pre-Consolidation Pressure



Normally Consolidated Soil : $\sigma'_{v0} = \sigma'_p$



$$S_{oed} = \frac{C_c}{1+e_0} H \log \left(\frac{\Delta\sigma + \sigma'_{v0}}{\sigma'_{v0}} \right)$$

Over-Consolidated Soil : $\sigma'_{v0} < \sigma'_p$

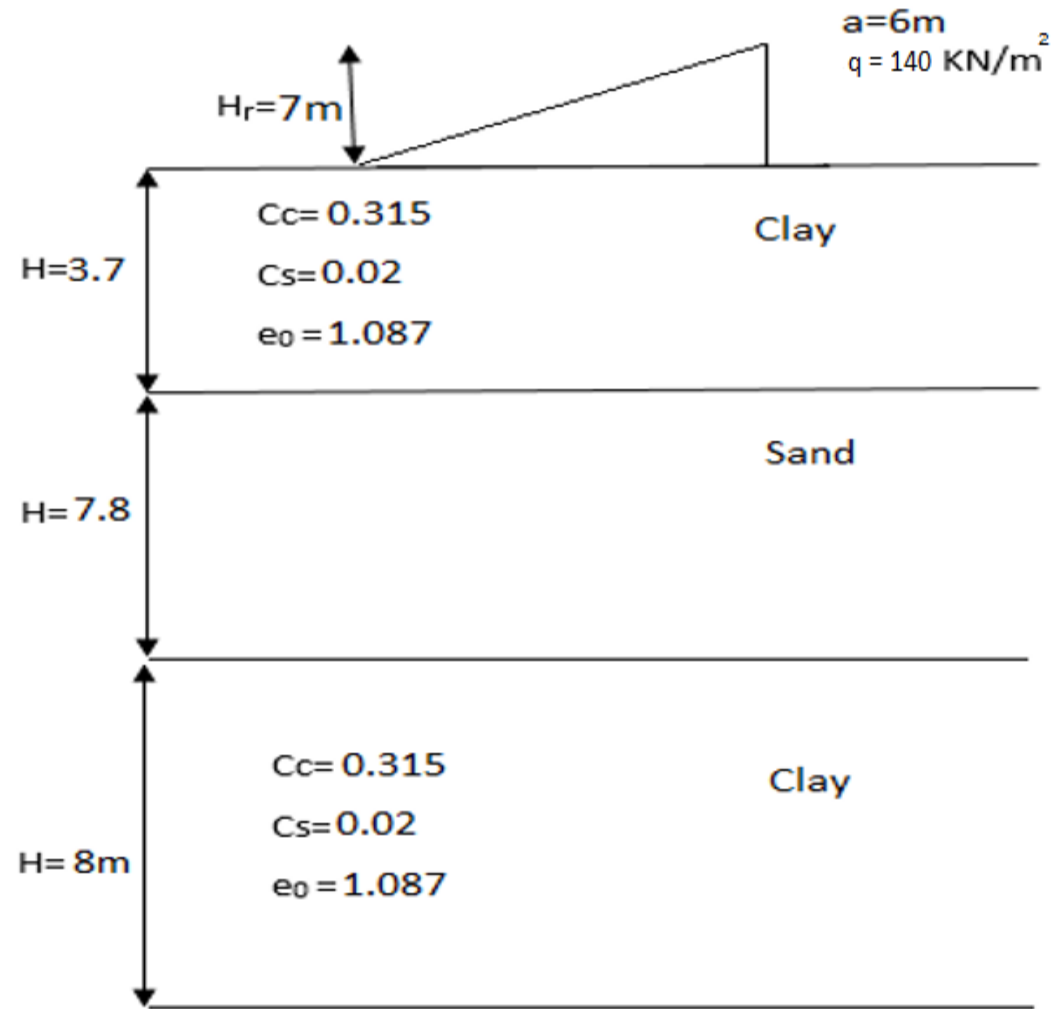
If $\Delta\sigma + \sigma'_{v0} > \sigma'_p$ then :
$$S_{oed} = \frac{C_s}{1+e_0} H \log \left(\frac{\sigma'_p}{\sigma'_{v0}} \right) + \frac{C_c}{1+e_0} H \log \left(\frac{\Delta\sigma + \sigma'_{v0}}{\sigma'_{v0}} \right)$$

If $\Delta\sigma + \sigma'_{v0} < \sigma'_p$ then :
$$S_{oed} = \frac{C_s}{1+e_0} H \log \left(\frac{\Delta\sigma + \sigma'_{v0}}{\sigma'_{v0}} \right)$$

Under-consolidated Soil : $\sigma'_{v0} > \sigma'_p$


$$S_{oed} = \frac{C_c}{1+e_0} H \log \left(\frac{\Delta\sigma + \sigma'_{v0}}{\sigma'_{v0}} \right)$$

Example :



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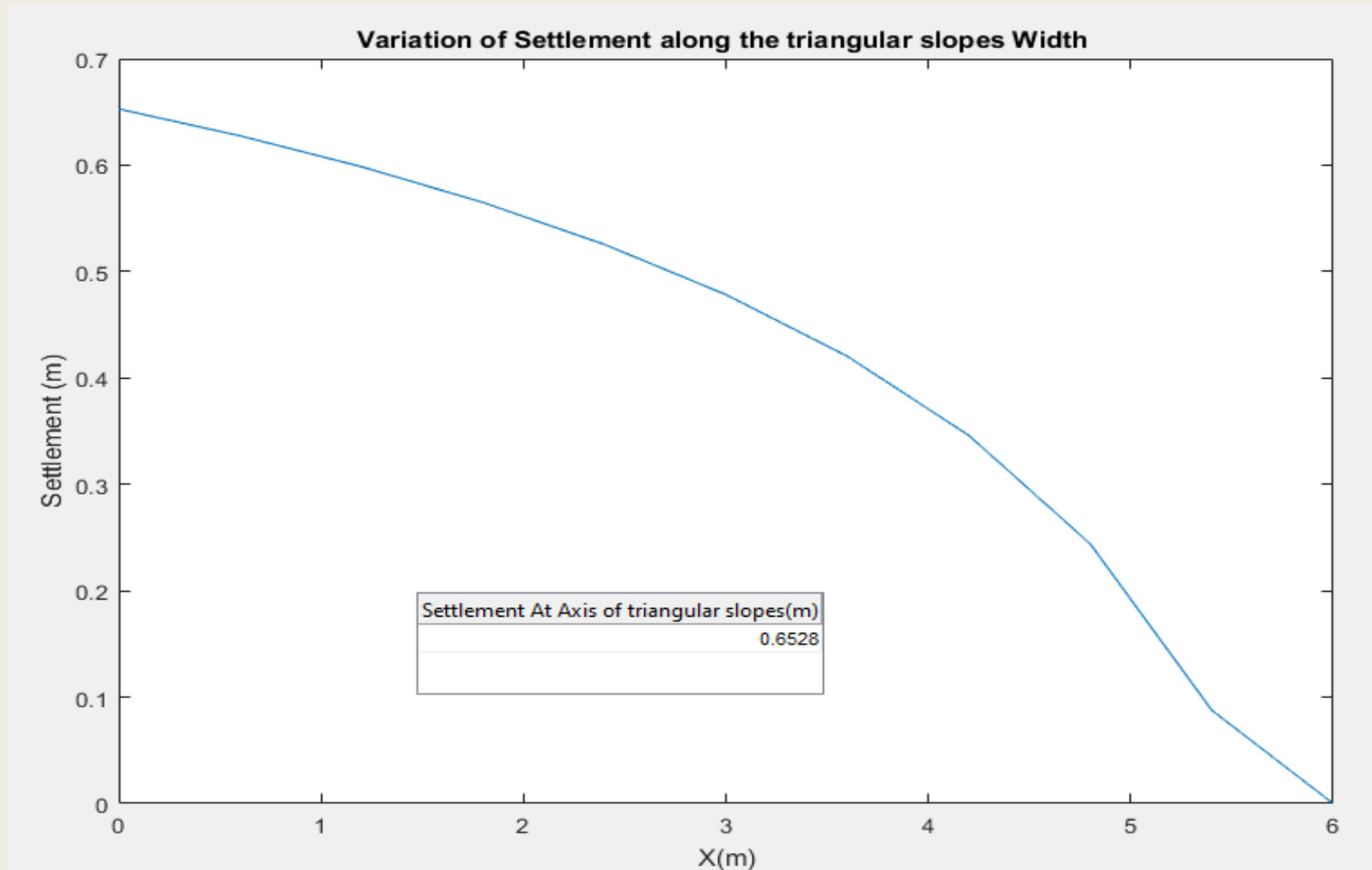
Layer	Height (m)	e_0	C_c	C_s	σ'_p (Kpa)
Clay	3.7	1.078	0.315	0.02	41
Sand	7.8	0.505	0.145	0.02	77
Clay	8	1.078	0.315	0.02	41

Oedometric Settlement :

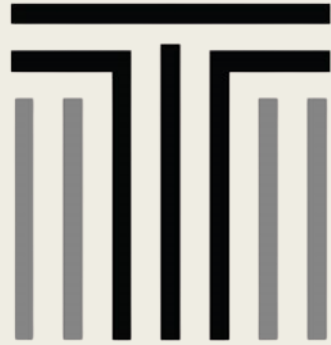
Layer	Height(m)	$\sigma'v0$ (Kpa)	$\sigma'p$ (Kpa)	$\Delta\sigma+\sigma'v0$ (Kpa)	Cc	Cs	e	Settlement (m)
Clay	3.7	14.8	41	135.2	0.315	0.02	1.078	0.3
Sand	-	-	-	-	-	-	-	-
Clay	8	61.6	41	117.6	0.315	0.02	1.078	0.34

$$S_{\text{oed}} = \sum S_{\text{oedi}} = 64 \text{ cm}$$

Oedometric settlement along the triangular slopes width (by Cosetta1.0)



For more details [click here](#)



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