



CLIENT NAME: TVA
PROJECT NAME: Kingston - Gypsum Disposal - Peninsula Site

JOB NO.: 51032301

STANDARD
CALCULATION
SHEET

SUBJECT: Settlement of Final stack

CALC NO.: FPGKIFFESC'D
X00030020050004

REVISION	0	1	2	3
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DATE:	12-08-05			

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$$\therefore W = 9,005,310 \text{ kips}$$

$$\text{Side Friction, } F = K_0 (0.5 \sum \gamma_i h_i) (\tan \delta) (940' - 760') (C)$$

$$\begin{aligned} \text{where, } \sum \gamma_i h_i &= 100 \text{ pcf} (940' - 900') + 113.4 \text{ pcf} (900' - 763') \\ &\quad + 126.4 \text{ pcf} (763' - 760') \\ &= 19.92 \text{ ksf} \end{aligned}$$

$$\begin{aligned} \tan \delta &= \text{say } \tan(3/4 \phi) \quad \text{--- } \phi = 36^\circ \\ &= 0.51 \end{aligned}$$

& K_0 is obtained as follows due to the negative back slope (β) of the stack surface:

$$K'_A = (1 - \sin \phi) / (1 + \sin \phi) \quad \text{--- } \text{if } \beta = 0; \phi = 36^\circ$$

$$= 0.26$$

$$K'_0 = (1 - \sin \phi)$$

$$= 0.41$$

$$K'_p = 1 / K'_A$$

$$= 3.85$$

$$K_A = \left[\cos \phi / (1 + \sin \phi (\sin \phi + \cos \phi \tan \beta)) \right]^2 \quad \text{--- } \beta = -17^\circ$$

Ref. 6, P. 72-64

$$= 0.23$$

$$K_p = \left[\cos \phi / (1 - \sin \phi (\sin \phi + \cos \phi \tan \beta)) \right]^2 \quad \text{--- } " "$$

$$= 2.14$$

$$\therefore K_0 = \left(\frac{2.14 - 0.23}{3.85 - 0.26} \right) (0.41 - 0.26) + 0.23$$

$$= 0.31$$