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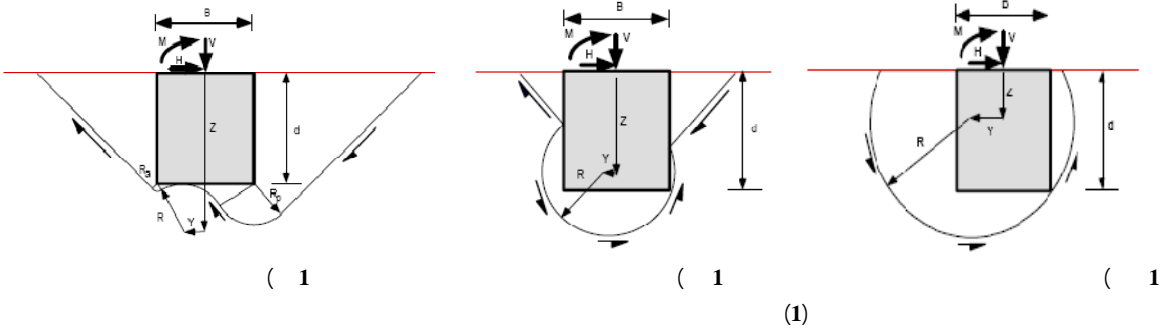
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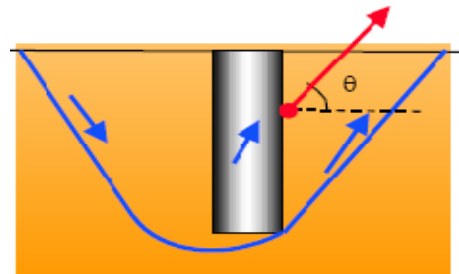
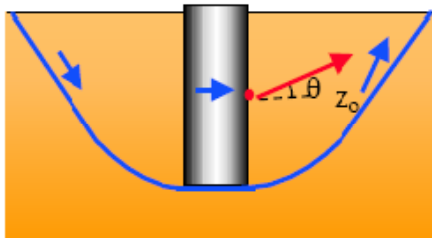
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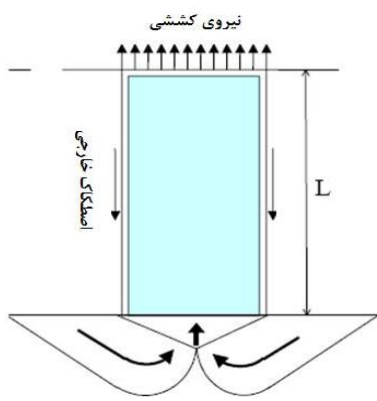
Deng

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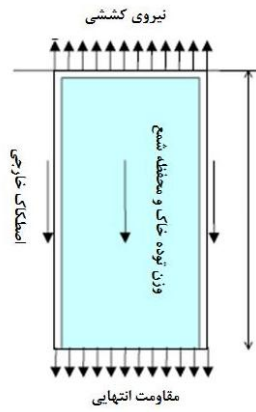
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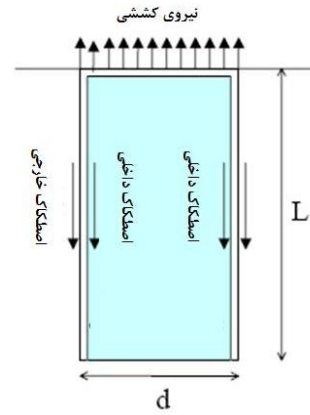
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$$P_{u(net)} = N_p \xi_{ce} \xi_{cs} S_{u(tip)}$$

$$N_p = 7.9 \left(\frac{L}{D}\right)^{-0.18}$$

$$\xi_{ce} = 1 + 0.4 \left(\frac{L}{D}\right)$$

$$\xi_{cs(circular)} = 1.2$$

نیروی $P_{u(net)}$ uplift ایجاد

در این رابطه L عمق نفوذ شمع، D قطر شمع، ξ_{ce} ضریب عمق، ξ_{cs} ضریب شکل شمع، N_p شده در واحد سطح مهار، $S_{u(tip)}$ مقاومت زهکشی نشده خاک در نوک شمع می‌باشند.

$$P_{u(net)} = N_f P_{u(drain)} + N_b S_{u(tip)}$$

$$N_b = \{1.3 - 0.446 L n T_k\} * 1.6 \frac{L}{D}$$

$$N_f = 0.632 - 0.091 \ln\left(\frac{L}{D}\right)$$

$$T_k = \frac{k}{v}$$

T_k

v

K

$N_f \text{ uplift}$

N_p

⋮ (

$$P_{u(net)} = 8\eta\left(\frac{L}{D}\right)K_0 \tan\phi \sigma_{v(bottom)}$$

$$K_0 = (1 - \sin\phi)(OCR)^{\sin\phi}$$

$$\rightarrow P_{u(net)} = 9.1\left(\frac{L}{D}\right)^{0.537} (1 - \sin\phi)(OCR)^{\sin\phi} \tan\phi \sigma_{v(bottom)}$$

$$P_{u(net)} = \frac{F_s}{A} = \frac{\int_{A \text{ side}} f_s dA}{A}$$

OCR uplift

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$$T = \frac{\pi D^2}{4} P_s + \pi D c d + \pi D K \left(\gamma' + \frac{P_s}{d} \right) \frac{d^2}{2} \tan\delta + W' + \frac{\pi D^2}{4} d \gamma'$$

D قطر شمع، P_s مکش در زیر شمع، d عمق نفوذ شمع، γ' وزن واحد غوطه‌وری، K ضریب فشار جانبی خاک، δ زاویه اصطکاک بین خاک و شمع، W' وزن غوطه‌ور شمع، C چسبندگی خاک می‌باشند.

Iskander

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$\bar{\gamma}$ K

⋮ (

$$Q = Q_{so} + Q_b + W_c + W_s$$

$$Q_{so} = \pi D_0 \int_0^H K (\bar{\gamma}z + i\gamma_w) \tan \delta dz \quad \text{ماسه}$$

$$Q_{so} = \int_0^H \alpha S_u \pi D_0 dz \quad \text{رس}$$

$$Q_b = S_u N_c f \left(\frac{\pi}{4} \right) D_0^2$$

Q_{so} اصطکاک جداره خارجی شمع، Q_b ظرفیت باربری کششی خاک بستر، W_c وزن غوطه‌ور شمع، W_s وزن غوطه‌ور خاک درون شمع، S_u مقاومت برشی زهکشی نشده خاک، α ضریب اصطکاک، N_c ضریب ظرفیت باربری، f ضریب تصحیح باربری می‌باشند.

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$$Q = W_c + Q_s$$

$$Q_s = \pi(D_0 + D_i) \int_0^H Z \bar{\gamma} K \tan \delta dz$$

D_i, D_0 قطر خارجی و قطر داخلی شمع می‌باشد.

Deng

Maeno

Maeno

Iskander

$\bar{\gamma}$ K

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