

Contents

CPT Correlation	1
Unit Weight	1
Relative Density	1
Friction Angle	2
Small Strain Stiffness G_0	2
Liquefaction Assessment	2
Dissipation Tests	2
To-dos	2

CPT Correlation

This document presents the correlation implemented in the current code. ## Basic Engineering Properties

Unit Weight

Robertson (2010) refer to eq:g1

$$\gamma/\gamma_w = 0.27[\log(R_f)] + 0.36[\log(q_t/p_a)] + 1.236$$

- γ = unit weight of soil
- γ_w = unit weight of water
- R_f = friction ratio, the ratio of f_s over q_t , i.e, $\frac{f_s}{q_t} \times 100\%$
- q_t = corrected cone resistance
- P_a = atmospheric pressure

Relative Density

Jamiolkowski (2003), Table 5 on Page 9. The original form of relative density can be expressed as

$$D_R = \frac{1}{C_2}$$

$$D_r = \frac{1}{3.10} \cdot \ln \left[\frac{q_t/P_a}{17.68 \cdot (\sigma'_{v0}/P_a)^{0.5}} \right]$$

Friction Angle

$$\varphi'_p = 17.6 + 11 \cdot \log_{10} \left[\frac{q_t/P_a}{(\sigma'_{v0}/P_a)^{0.5}} \right]$$

Small Strain Stiffness G_0

$$G_0 = 50 \cdot \sigma_{atm} \left[(q_t - \sigma_{v0}/\sigma_{atm}) \right]^{m^*}$$

where:

$$m^* = \begin{cases} 0.6 & \text{sand} \\ 0.8 & \text{silt} \\ 1.0 & \text{clay} \end{cases}$$

Liquefaction Assessment

Dissipation Tests

To-dos

- ☐ check Gamma