

# NOTATIONS

|                                |                                                                                     |
|--------------------------------|-------------------------------------------------------------------------------------|
| $\sigma_1$                     | Major principal stress                                                              |
| $\sigma_2$                     | Intermediate principal stress                                                       |
| $\sigma_3$                     | Minor principal stress                                                              |
| $\sigma_n$                     | Normal stress                                                                       |
| $\tau$                         | Shear stress                                                                        |
| $\sigma_{oct}$                 | Octahedral normal stress                                                            |
| $\tau_{oct}$                   | Octahedral shear stress                                                             |
| $\sigma_t, T_0$                | Maximum tensile stress                                                              |
| $J_1$                          | $\sigma_1 + \sigma_2 + \sigma_3$ first stress invariant                             |
| $J_2$                          | $\sigma_1 \sigma_2 + \sigma_2 \sigma_3 + \sigma_3 \sigma_1$ second stress invariant |
| $J_3$                          | $\sigma_1 \sigma_2 \sigma_3$ third stress invariant                                 |
| $E$                            | Young's modulus of elasticity                                                       |
| $G$                            | Shear modulus                                                                       |
| $\nu$                          | Poisson's ratio                                                                     |
| $\epsilon_1$                   | Axial strain                                                                        |
| $\epsilon_2, \epsilon_3$       | Lateral strain                                                                      |
| $\frac{\Delta v}{v}$           | $\epsilon_1 + \epsilon_2 + \epsilon_3$ Volumetric strain                            |
| $\alpha$                       | Joint orientation w.r.t. major principal plane                                      |
| $\beta$                        | Critical orientation w.r.t. major principal plane                                   |
| $D$                            | Dilatancy parameter                                                                 |
| $\phi_f$                       | Coulomb's internal friction angle                                                   |
| $\mu, \mu_o, \phi_\mu, \phi_j$ | Basic physical friction angle                                                       |
| $c$                            | Coulomb's apparent cohesion                                                         |
| $c^*$                          | Dilatancy incorporated apparent cohesion                                            |
| $\psi, \chi$                   | Constants in Coulomb's failure equations                                            |
| $\psi^*, \chi^*$               | Dilatancy incorporated constants in Coulomb's failure equation                      |
| $\lambda, K$                   | Constants in Drucker-Prager approximation to failure equation                       |