

Index

A

- Acceleration, 15, 209
 - absolute, 209, 296
 - maximum, 11, 17
 - response, 244
- Alluvial layer, 68
- Average acceleration method, 246

B

- Base layer, 227
- Bedding error, 85, 102
- Block sampling, 74
- Blow count, 62
- Bulk modulus, 48, 51
 - of water, 65, 172

C

- Circular frequency, 201
- Coefficient of earth pressure at rest, 53, 54
- Complex wave number, 258
- Composite wave, 35
- Cone penetration test, 61
- Confining stress, 52
- Consistent mass matrix, 231
- Critical state, 55
- Cyclic
 - shear deformation characteristics, 75
 - tensional shear test, 75
 - triaxial test, 75

D

- Damage belt zone, 19–20
- Damping
 - coefficient, 76, 205
 - constant, 205
 - ratio, 76
 - external damping, 208, 278, 281
 - maximum damping ratio, 86, 129
- Dashpot, 225, 278, 292
- Deconvolution, 259, 315
- Deviatoric strain, 49
- Deviatoric stress, 49, 78
- Diamond core cutter, 149
- Dilatancy, 50–53
- Diluvial layer, 68
- Displacement, 209
 - relative displacement, 209, 296–297
- Downhole method, 65
- Drained condition, 94
- Dynamic deformation characteristics test, 75

E

- Earthquake motion
 - level 1, 39
 - level 2, 39
- Effective confining stress, 26–27
- Effective mean stress, 56
- Effective stress principle, 79
- Eigen mode, 284
- Elastic base, 33, 227
- Elastic bulk modulus, 169

Elastic shear modulus, 206
 El Centro, 36
 Engineering
 bedrock, 31
 seismic base layer, 3, 15, 31, 227,
 349
 strain, 45
 Equation of motion, 16, 205, 208
 Equation of vibration, 207
 Equivalent linear analysis, 272–273
 Equivalent linear method, 272–273
 Equivalent strain, 49
 Equivalent stress, 49
 Euler's formula, 200
 External displacement sensor, 148–149

F

Fast Fourier transform (FFT), 255
 Fines content, 28, 74–75
 Fourier series, 254
 Fresh test, 77
 Frozen sample, 82

G

GHE model, 87–89

H

Hachinohe, 37
 Hardin–Drnevich (H–D) model, 86, 145
 modified, 181
 Holocene, 68
 Horizontally layered ground, 216
 Hyperbolic model, 85–86, 178
 Hysteresis
 curve, 174
 loop, 75

I

Impedance, 32
 Incident wave, 258
 Incremental elasticity, 169
 Instrumental seismic intensity, 281
 Integral point, 216
 Internal damping, 208, 281
 Internal friction angle, 155

K

Kaihoku bridge, 37

L

Large mass method, 225–226
 Lateral stress, 78
 Level 1 earthquake motion, 39
 Level 2 earthquake motion, 39
 Linear acceleration method, 244–245
 Linear interpolation, 242
 Localization, 55
 Locking, volume, 234
 Love wave, 3
 Lumped mass, 231, 281

M

Masing's rule, 176
 Mass proportional damping, 281
 Mathematical model, 198
 Maxwell model, 200
 Modal damping, 338
 Multiple-support excitation, 211

N

Natural circular frequency, 9, 205
 Natural frequency, 205
 Natural period, 9–10, 205
 minimum natural period, 251
 Newmark's β method, 245
 Nonlinear analysis, 272
 Nonlinear method, 237–238, 272
 Numerical damping, 251
 Nyquist frequency, 255

O

One-dimensional rebound modulus, 50, 53
 Overburden stress, 17, 54

P

Plane strain, 52
 Plasticity index, 26–27, 75
 Pleistocene, 68
 Poisson's ratio, 50, 65, 169, 231, 234
 Pseudo velocity, 300, 302
 Pseudo velocity response spectrum, 281
 PS logging, 61
 P wave, 1

R

Radiation damping, 227
 Ramberg–Osgood (R–O) model, 178, 182–184
 modified, 185–186
 Rayleigh wave, 3
 Rebound modulus, 53

Reference strain, 86, 129, 179
 Reflected wave, 258
 Reloading, 174
 Rigid base, 35, 227

S

Sampler, 61
 Sea wave, 6–7
 Secant modulus, 75, 173
 Seismic bedrock, 3
 Seismic intensity, 17
 JMA instrumental seismic intensity, 299
 Shear
 deformation, 49
 modulus, 75, 170
 strain, 45
 strength, 15–16
 stress, 16, 45
 wave, 1
 Simple shear, 79
SI value, 17
 Skeleton curve, 173–174
 Soft ground, 11
 Soft rock, 148
 Soft soil site, 4
 Spectral intensity, 17
 SPT, 61
 N-value, 61, 156
 Stage test, 76
 Standard penetration test, 27, 61–62
 Stiffness proportional damping, 281
 Stress reduction curve, 77
 Suspension method, 65
 S-wave, 1
 Swelling index, 57

T

Table type, 85, 188
 model, 189, 198

Taft, 37
 Tensor strain, 45
 Time distance curve, 66
 Tokyo, 101, 37
 Toyoura sand, 177
 Trailing zeros, 256
 Triaxial test, 78
 Tripartite response spectrum, 303
 Triple tube sampler, 149
 Truly nonlinear method, 272

U

Unbalanced force, 336
 Undrained condition, 170, 234
 Unit weight, 160
 Unloading, 174
 Unstable phenomena, 249
 Upper bound acceleration, 17

V

Velocity, 209
 absolute, 209
 relative, 209
 Velocity proportional damping, 278
 Viscous damping, 278
 Void ratio, 27–28, 57, 125
 Voigt model, 200
 Volcaniclastic material, 103
 Volumetric strain, 48–49, 57

W

Wave
 equation, 207, 257
 length, 219
 Wilson's θ method, 245