

Index

A

Advance factor (AF) 243
 AN-FO (AMEX) explosives 164
 anisotropy 112
 AUTODYN code 225, 227, 235

B

basic fracture zones 226
 crushed zone 226, 229, 235
 incipiently cracked zones 226
 Blast Damage Index (BDI) 240
 blast design modification 173
 blasthole burden 175
 blast induced loading 189
 blast-induced overbreak 239, 246
 blast-induced rock damage (BIRD) model 238
 blast vibration 156, 160, 162, 164, 166, 169, 171-
 172, 185-186, 248
 borehole extensometers 135, 141-144, 146
 borehole inspection survey 148, 151
 Brazilian test method 188, 190
 brittle cracking model 212
 burden 173

C

Cable & Ventilation Tunnel (CVT) 138
 capable faults 27
 Centrifuge Modelling 85
 Characteristic State Line (CSL) 86
 clayey sand (SC) 22
 clays of intermediate plasticity (CI) 22
 Clean Sand 69, 72, 76-78, 80-82
 Coefficient of Consolidation 66-67, 74, 76, 82
 composite failure mechanism 44, 46, 55, 57, 60, 62
 Compressibility 66-67, 71-74, 77, 81-82

cone penetration test (CPT) 4
 confinement (C_n) 243
 continuous damage modelling (CDM) 209
 continuum approach 209
 controlling earthquake 28
 cyclic loading 29, 69, 71, 75, 78, 83, 103, 105, 108,
 137
 cyclic triaxial tests 102

D

deconvolution 30
 deep seismic sounding (DSS) 22
 Deep Stiff Soil Site 18
 design spectra 38
 Deterministic Seismic Hazard Analysis (DSHA) 9,
 26
 deviated burden 175, 180, 185
 deviator stress 103, 105
 DIANA-SWANDYNE-II (Dynamic Interaction and
 Nonlinear Analysis-SWANsea DYNamic ver-
 sion II) 90
 Digital Tritest machine 194
 discontinuous deformation analysis (DDA) 210
 discontinuum approach 209
 Discrete Element Method (DEM) 100-101
 discrete numerical simulation 102
 distinct element method (DEM) 210
 double probe 112
 Drift Condition Rating (DCR) 239
 dynamic centrifuge tests 88
 dynamic elastic modulus 110, 123-125, 127, 129-
 132
 dynamic loading range 189
 dynamic tensile strength 189

E

Eastern Dharwar craton (EDC) 6
 Eastern & Northern America (ENA) 9

element elimination technique (EET) 212

energy (E) 178

equation of state (EOS) 225, 227

Johns-Wilkins-Lee (JWL) 227

linear 7, 18-19, 29-30, 40-41, 145, 190, 195, 209-210, 213, 225, 227, 240, 243

shock 175-176, 190, 211, 215, 222, 225-227, 235-236

erosion criteria 229

Euler processor 227

experimental blasts 241

explosion gas pressure loading 226

Explosive Charge per Delay (W) 167

explosive engery 170, 204, 213

F

failure mechanisms 86

finite element analyses 85, 90, 98

finite element method (FEM) 45, 100-101, 203, 207, 210

flyrock 177

footing pressure 93-95

footwall haulage drifts 161

free face 175

free-field sites 86

G

Geological Society of India (GSI) 7

geophone 135, 141-144, 146, 166, 168

Geotechnical Earthquake Engineering 17, 22, 24, 26, 41-42, 63, 65, 83-84, 99-102, 108-109, 133, 159, 170, 187, 202, 224, 237, 248

Ground Response PGA 18

H

Head Race Tunnel (HRT) 138

hole utilization factor 243

Holmberg-Persson model (H-P) 145

Hopkinson pressure bar (SHPB) 190

horizontal drivages 242

horizontal to vertical spectral ratio (HVSR) 2

I

intergranular contact density 66-67

intergranular void ratio 66-67

J

joint factor 110-111

joint properties 111, 131

joint frequency 110-111, 115, 117-118, 122, 131-132

joint inclination 110-111, 116-120, 122, 131-132

joint strength 110-111, 122, 131-132

K

kinetic energy 102

L

Lagrange processor 227

lateral stiffness 96, 98

level peak ground acceleration (PGA) 1-2, 11

logic tree 9

Log-Spiral Failure 43

Longitudinal Stopes 160, 163-164, 166, 168

Low energy cartridge explosives (Powersplit) 164

Lower density AN-FO explosives (AMEX K40) 164

low-strain tests 23

Low-strain tests

cross hole test 18, 23-25, 30, 40

down-hole test 23

suspension logger test 23

up-hole test 23

M

Main Access Tunnel (MAT) 138

Main Central Thrust (MCT) 139

Metal Mining 160

Mid-stope blastholes 164, 169

Mine to Mill concept 188-189

Moist Tamping Method 67

monotonic loading 102

monotonic strength 107

Multi Channel Analysis of Surface Waves (MASW)

23

N

Nag Pala Hydroelectric Power Project (LNPHPP)

137

Natural Silts 67, 71

near-field vibrations 242

nodal displacement information 92

numerical simulations 229

O

Okabe method 44-45
optimum burden 175-176, 178, 180-183, 185
ore deposit 160
Ottawa Sand-Silt Mix 69

P

passive earth pressure 44
peak ground acceleration 28
peak particle velocities and accelerations 241
peak particle velocity 136
Peak Particle Velocity (PPV) 167
peak transient stress 136, 172
perimeter charge factor (PCF) 240, 243
Phase Transformation Line (PTL) 86
Photron SA-1 high speed camera 195
physiography 21
planar failure 43-45, 55-56, 60, 62
plaster of Paris (POP) 111, 129
POP-cement mix 112, 114-116, 121, 123, 126-127, 129-132
Pore Pressure Generation 66-67, 69-70, 81, 86, 90, 108
pore water pressures 88
post-blast drivage 241
post-liquefaction dissipation 66-67, 74-75, 77, 81
Post-Liquefaction Volumetric Strain 78-82
Power House and Tail Race Tunnel (TRT) 138
pre-defined strain 229
Predictor Model 171
Probabilistic seismic hazard analysis (PSHA) 2, 9, 26
pseudo-dynamic methods 45
pseudo-static method 45
pulse shaping technique 193
punch type failure 87

Q

quasi-static loading range 189

R

Radial Distance (R) 167
Ratio of Response Spectral (RRS) 33
reflected (Re) stress waves 194
regression analysis 129

repeated blasting 135-137, 146, 151, 155, 158
retaining walls 45
rock fracturing 203
rock fragmentation 189
rock mass damage 137
Rock Quality Designation (RQD) 140
rotational displacements 52
rotational failure 87

S

sand boils 86
scaled distance (SD) 181
seismic design 44
seismic effects 44
SHAKE analysis 30
shear deformation 29, 103
SHPB technique 192
 incident bar 192-194
 strike bar 192-193
 transmitted bar 192-193
Silty sand (SM) 22
Singareni Collieries Company Ltd. (SCCL) 180
site classification 3
 geotechnical data 3, 5, 24
 surface geology 3, 24
site response 2
Site Specific Study 18, 40
sliding displacements 51
slippage 45, 102
soil liquefaction 85
Southern Granulite terrain (SGT) 6
Standard penetration test (SPT) 3-4, 22
static elastic modulus 110, 123-124, 129-132
static loading 103, 190
stope mining with delayed backfill method 161
 secondary stopes 162-163, 167, 169
stress anisotropy 207
stress-strain response 107
stress wave loading 226
superstructure stiffness 86

T

tensile failure zones 229, 232
 circumferential tensile failure zones 229, 232
 radial crack zones 229, 232
The deterministic seismic hazard analysis (DSHA) 9
transient load 207-208, 210-211, 213
transmitted (Tr) 194
triaxial geophones 166

U

undrained behavior 102
Undrained cyclic triaxial tests 66-67, 69
uniaxial compressive strength (UCS) 122
uniform hazard response spectrum (UHRS) 1, 11
United States Bureau of Mines (USBM) 136

V

vibration intensity 174

vibration prediction 172
virgin loading 74-75

W

wave propagation phenomena 207
wedge cut blasting pattern 140
Western Coalfields Ltd. (WCL) 180
Western Dharwar craton (WDC) 6