

Index

A

Acceptance criteria, 8
 American Concrete Institute (ACI)
 ACI-214, 185
 ACI-318-71, 8, 12, 99, 100, 186
 ACI load factors, 103
 Airbag loading, 55
 Aircraft taxiway, 18, 21
 American Institute of Steel Construction (AISC), strength requirements, 15
 American National Standards Institute (ANSI)
 ANSI A58.1-1955, 158
 ANSI A58.1-1972, 53, 158
 ANSI A119.1, 135, 174
 American Railway Engineering Association (AREA), 183
 American Society of Civil Engineers (ASCE), 5
 Research Council on Performance of Structures, 45, 170
 Analysis, structural, 98, 171
 Anchoring for mobile homes, 59, 129
 Anchoring forces, 125
 American Society for Testing and Materials (ASTM)
 Committee E06, 45
 Joint ASCE-ASTM Committee on Full-Scale Structural Testing, 177
 Subcommittee E06.14, 169
 ASTM C 33-78, 104
 ASTM C 42-77, 186
 ASTM C 512-76, 74

ASTM C 597-71, 185
 ASTM D 245-74, 47
 ASTM D 2555-78A, 46
 ASTM D 2899-74, 50
 ASTM E 72-68, 51
 ASTM E 119-76, 51, 56
 ASTM STP 210, 61

B

Ballast, 10
 Battelle Memorial Institute, 126
 Bearing walls
 Concrete masonry, 35
 Wood exposed to fire, 51
 Box girders, post-tensioned, 70, 72
 Brick masonry, 114
 Brick prisms, 116
 Bridges
 Box girder, 64
 Concrete, 64
 Long span, 65
 Wood, 58
 Building codes
 Basic Building Code, 8
 Building Officials and Code Administrators (BOCA), 8
 Chicago, City of, 8, 14, 15
 Uniform Building Code (UBC), 8
 Building Research Advisory Board (BRAB), 176
 Buildings
 High rise, 65, 183
 Low rise, 149
 Chicago, 65
 Butler Research Center, 79

C

Change in occupancy, 7
 Chicago, City of
 Building codes, 8, 15
 O'Hare Field, 18
 Cold formed members, 78, 80
 Collapse, 183, 185
 Compatibility, 26
 Component tests, 50
 Composite action, 17
 Compressive strength of concrete,
 68, 74
 Computer, digital, 20, 165
 Columns, reinforced concrete, 65, 66
 Columns and walls, shortening, 68
 Concrete
 Compressive strength, 64
 Construction, 63
 In-place testing, 186
 Mix design, 104
 Slab, hollow core, 35
 Conference on Full-Scale Structural
 Testing, 177
 Confidence, public, 21
 Construction, low rise, 149
 Core testing, 186
 Coring, 98
 Corp of Engineers, 19
 Correlation
 Of material properties, 111
 With design, 91
 Corrosion of reinforcing steel, 10
 Crack study, 196
 Cracking, 10, 96
 Creep and shrinkage, 65
 Shortening of concrete, 75
 Creep tests, 74
 Criteria, American and European, 8
 Cyclic loading, 162
 Cylinders, concrete, 74, 104

D

Damage to mobile homes, 125
 Damaged structures, 9, 12

Data acquisition, digital, 54
 Data acquisition system, 164
 Data reduction, 32
 Defense Civil Preparedness Agency,
 126
 Deficiencies in construction, 12
 Deflection
 Horizontal, 168
 Load deflection curve, 144
 Maximum, 24
 Measurements, 49, 73
 Of walls, 52
 Residual, 136, 165
 Demolition of structures, 175
 Denny Creek Bridge, 65, 70
 Department of Housing and Urban
 Development (HUD), 51,
 136, 149, 174
 Deteriorated structures, 7, 9, 10, 53
 Dial gages, 164
 Diaphragm testing, 138
 Dikes, 22
 Displacement measurements, 151,
 153
 Displacements, vertical, 69
 Distribution of forces, 52
 Drag coefficients, 127
 Drexel University, 32, 38
 Drift, 149, 155, 168
 Drop panels, 99, 102
 Duration of loads, 47

E

Earthquake
 Loading, 35
 Response, 30
 Simulated conditions, 37
 Simulation, 41
 Earthquake-resistant design, 37
 Eccentricity, 114
 End fixity, 13
 Engineering Foundation Con-
 ference, 5, 169

- Evaluation
 - Analytical, 15
 - Of performance, 5
- Evidence of failure, 8
- Examples of full-scale tests, 9
- F**
- Federal Highway Aid Program, 173
- Federal Housing Administration, 51, 150
- Field instrumentation, 63
- Field tests, 55, 98, 101
- Finite element method, 100
- Fire research, 55
- Flat slab, 92, 97
- Forest Product Laboratory, U.S., 50, 55
- Forest Service, Alaska Region, 58
- Full-scale testing, 1, 5, 169, 171
- G**
- General Services Administration (GSA), 176
- Glue laminated members, 50
- Grade of wood, 47
- Grumman Aerospace Corporation, 35
- H**
- Hardwoods, 46
- Highway bridges, performance of, 172
- House, full-scale, 52, 54, 55
- Housing, 52, 55
 - Modules, 158
- Hurricane Donna, 125, 131
- Hydraulic jacks, 17, 142, 151
- Hydraulic jack, center hole, 10, 11
- Hydraulic loading system, 10
- I**
- Impact load, 21
- Increase in loading, tests for, 18
- Inelastic structural behavior, 28, 32
- Insect attack, 48
- Instrumentation, 20, 32, 42, 68, 80, 114, 120
- Integrity, structural, 174
- Iowa State University, 58
- J**
- Japan, Tsujuba Science Center, 50
- K**
- Kishwaukee River Bridge, 65, 72
- L**
- Laboratory tests, 25, 54, 73
 - Versus field tests, 101
- Lakepoint Tower, 65, 66
- Lateral displacement, 149
- Lateral forces on roof/ceiling structure, 136
- Lateral load, 162
- Legal problems, 170
- Lehigh University, 35
- Leveling, precise, 65, 68
- Liability
 - Claims, 171
 - Insurance premiums, 170
 - Professional, 170
- Lift coefficients, 127
- Linear variable differential transformer (LVDT), 49, 81, 151, 190
- Live loads, floor, 114
- Load cell, 56
- Load
 - Deflection curve, 164
 - Distribution, 18
 - Duration, 47
 - Testing, 15, 91, 186
 - Test to destruction, 12
 - Uniform, 15

Loading
 Dynamic, 29
 Earthquake, 29, 35
 Frame, portal, 116
 History, 65
 Medium, water, 15, 79, 188
 System, 151
 Log bridge, testing of, 50, 58

M

Manometer, liquid, 85, 127
 Manufactured Housing Institute (MHI), 126
Masonry
 Model materials, 31
 Models of, 35
 Structure, full scale, 114
 Unreinforced, 29
 Walls, loadbearing, 114
Mass
 Distributed, 29
 Lumped, 29
 Massachusetts Institute of Technology (MIT), 33
 Material compatibility, 26
 Measurements on actual structures, 65
 Membrane, waterproof, 188
 Micro-concrete, 30
 Minimum Property Standards of FHA, 150
 Missiles, tornado borne, 173
 Mobile homes, 125
 Installation, 133
 Roof/ceiling assemblies, 135, 141
 Mobile Home Construction Safety Standard, 136
Models
 Analytical, 172
 As design aids, 25
 Concrete, 31, 195
 Half-scale, 102
 Materials, choice of, 29, 30

Small-scale, 25
 Structural, 25, 31, 32
 Substitute for steel, 31
 Theory of, 26
 Modulus of elasticity, 46, 74, 116, 194
 Modulus of rupture, 46
 Moisture, 10, 48

N

National Academy of Sciences (NAS), 176
 National Aeronautics and Space Administration (NASA), 37
 National Bureau of Standards (NBS), 176
 National Conference of States on Building Codes and Standards (NCSBCS), 174
 National Fire Protection Association (NFPA) 501.B, 135
 Nondestructive test, 186
 Nonlinearity, 26, 32
 Nonlinear structural analysis, 38
 Nuclear power design, 174
 Nuclear Regulatory Commission (NRC), 173

O

Occupational Safety and Health Administration (OSHA), 175
 Operation Breakthrough, 149
 Opportunities for full-scale testing, 175
 Overstress, 9

P

Panel buildings, precast concrete, 32, 38
 Parking garage, underground, 92
 Performance related, full-scale testing, 6, 15, 24, 173

Phosphor bronze, 33
 Planning aspects, 24
 Plastic behavior of steel structures, 33
 Polyethylene sheeting, 86
 Ponding, roof, 23
 Pools, 22
 Portland Cement Association (PCA), 33, 63, 110
 Post-tensioning, 95, 107
 Prediction of time dependent deformations, 66
 Prestressing
 BBRV system, 106
 Tendons, 31
 Unbonded strands, 106
 Prestressed Concrete Institute (PCI), 107
 Prince of Wales Island, 58
 Proof load, 139, 145
 Proof of performance, 7
 Public reaction, 101
 Pulley and cable system, 56, 59
 Punching shear, 99, 102
 Purlin sections, 79
 Pulse velocity test, 186
 Purposes of full-scale tests, 6

Q

Quadruple sheave block, 59

R

Racking, 17, 52, 149
 Racking distribution of walls, 153
 Racking tests, 159, 165
 Reasons for full-scale tests, 6, 50
 Recommendations for full-scale structural testing, 177
 Recorder, strip chart, 165
 Recovery of deflections, 8, 15, 165
 Reinforced concrete structure, 10
 Remote area, testing in, 58

Repairs, adequacy of, 21
 Repeated applications of load, 162
 Reproducibility, 156
 Research related full-scale testing, 6, 24
 Research testing, 6, 171
 Residential construction, 148
 River Plaza, 65, 68
 Roof
 Decking, 86
 Diaphragm, 138
 Panel stiffness, 79
 Ponding, 23
 Repaired, 21
 Systems, 78, 135
 Trusses, 136, 138
 Rotations, wall and slab, 120

S

Safety, 15
 Safety factors, test, 113, 145
 Salvageability of structures, 185
 Scale factor, 26, 30
 Serviceability, 15, 149
 Service life, 53
 Sequence of loading, 114, 118
 Shake table, 29, 38, 41
 Shear center, 78
 Shear load test, 190, 197
 Shear studs, 13
 Shell instability, 35
 Shell, stiffened cylindrical, 35
 Shop drawings, 98
 Shortening
 Differential, 66
 Vertical, 68
 Shrinkage, 65
 Shrinkage strains, 74
 Similitude, 30
 Similitude requirements, 30, 103
 Site examination, 95
 Skyline Plaza North, 182
 Slab, flat, 92, 97

- Society of Automotive Engineers (SAE), 34
- Soft woods, 46
- Soil anchors, 11
- Space truss, 21
- Spalling of concrete, 10, 95
- Species, 46
- Stadium, 9
- Steel frames, models of, 35
- Steel, structural, 29, 195
- Strain gages
 - Electrical resistance, 14, 19, 49, 143
 - Mechanical, 49, 65, 72, 121
 - Vibrating wire, 121
- Strain meter, internal, 65, 72
- Strains measured, 68, 72, 73.
- Stiffness, 49
- Strength evaluation of existing structures, 8
- Stress influence surfaces, 19
- Stresses, redistribution of, 71
- Structural
 - Investigations, 95
 - Models, 25, 31, 32
- Structure, repaired, 21
- Substandard structures, 7, 12
- Supercharger, 80
- Superposition, 158
- Sway, lateral, 119
- T**
- Television camera, 81
- Temperature
 - Concrete, 72
 - Surface, 68
- Tensile strength, splitting, 111
- Test
 - Load, 8, 14, 21
 - Results, 15
 - Vehicle, 19
- Testing, dynamic, 172
- Testing machine, universal, 50, 110
- Thermal expansion, coefficient of, 74
- Ties, mobile homes, 132
- Timber construction, 46
- Time dependence, 47, 65
- Time lapse studies, 85
- Transducers, displacement, 120, 151 154
- Tread testing, 12
- Truss, bowstring, 142
- U**
- Ultimate load, 139
- Ultimate load method, 145
- Unique design, 7, 15
- University of Michigan, 125
- Uplift, wind, 136
- U.S. Fire Administration (USFA), 176
- V**
- Vacuum chamber, 17, 55
- Validation of structural performance requirements, 148
- Validity of load tests, 193
- Video camera, 82
- Video tape recorder, 85
- Virginia Highway and Transportation Research Council, 53
- Volume change, 194
- W**
- Wall precompression, 114
- Wall stiffness, 52
- Water Tower Place, 65, 66, 174
- Whiffletree, 55
- Wind
 - Forces, 125, 127

Load, 15
Load, design, 136
Simulation, horizontal, 17
Windsor probe, 98
Wind tunnel test, 126, 172
Wood
Condition of, 47
Decay, 48

Frame construction, 149
Properties of, 47
Workmanship test, 13

X

x-y recorder, 164