# Index

A Abboud, B., 151 ACI (see American Concrete Institute) Admixtures, 5, 6, 14, 34, 190 Blast furnace slags, 5, 33 Clay and clay-shale, 5, 34 Colloidal silica, 5, 34 Aggregates, 5, 6, 8, 14, 165 (see also ASTM C 144 and C 404) Air entrainment, 212, 218 Alkalis, 33, 89, 92, 97, 98, 214, 215 American Concrete Institute, 63, 70, 71, 75 American National Standards Institute (A 10.9-170), 114 ASTM committees C-7 on Lime, 1 C-12 on Mortars, 1 C12.02 on Research and Methods of Test, 29	C 62, 79, 167, 191, 192, 198, 216 C 67, 30, 191, 198, 209, 211, 217 C 85, 6-7 C 91, 4, 217 C 126, 192, 198 C 129, 192 C 144, 4, 41 C 150, 4, 41, 217 C 207, 4, 41 C 216, 79, 135, 182, 187, 216 C 270, 3, 34, 90, 92, 192 C 404, 41 C 476, 40, 192 C 699, 207 C 780, 3 C 856, 8 E 447, 44 E 514, 68, 194 Atmospheric pollutants, 69, 204, 205
C-15 on Manufactured Masonry Units, 1, 110	В
E-6 on Performance of Building Constructions, 3  ASTM proposed standards For determining the coefficient of thermal expansion of brick, 110-112  For linear coefficient of thermal expansion of natural building stone with bonded strain gage extensometers, 112  ASTM standards A 153, 82 B 227, 82 C 33, 216	Bagnariol, D., 15 Beam tests, 16, 23, 44, 46, 48, 54, 55, 63, 66, 168 BIA (see Brick Institute of America) Bond wrench tests, 17, 20, 24 Brick Institute of America, 71, 75 Technical Notes on Brick Construction, 189, 199 British standards BS 3921, 213 BS 5628, 80 Building codes, 69, 82, 115, 140, 151, 167, 200 (see also specific codes and standards organizations)

 $\mathbf{C}$ 

Calcium chloride (CaCl<sub>2</sub>), 191 Calcium oxide (CaO), 6, 7, 9, 14 Calcium sulfate (see gypsum) Canadian Standards Association (CAN3-S304-M78), 18 Capillarity, 203, 209-211 Carbonation, 8, 9, 33, 86, 214 Carr, R., 114 Carrasquillo, R., 102 Chanprichar, B., 38 Chemical migration, 2, 9 Chlorides, 86, 213, 215 Coefficient of thermal expansion, 205, 212 (see also ASTM proposed test for determining the coefficient of thermal expansion of brick and ASTM proposed test for linear coefficient of thermal expansion of natural building stone with bonded strain gage extensometers) Compressive strain, 46-48, 54 Compressive strength, 5, 17, 39, 40, 127, 129, 135, 158, 160, 163, 164, 211 (see also ASTM E 447) Computerized tests, 14 Concrete, 86, 153, 183, 187 Condensation (see moisture) Contaminants (in masonry materials), 69, 70 Conway, J. T., editor, 1, 235 Cracking, 68, 102, 136, 144, 148, 149, 171, 188, 193, 200, 204, 205, 209, 212, 218 Crazing, 128, 130, 209 Creep, 205 Creosote burnout, 142, 146 Cryptoflorescence (see florescence) Cube strength, 24, 26 Curing, 19, 154

D

Dimensional analysis, 152 Driving rain index, 68 Drysdale, R., 15, 167

## $\mathbf{E}$

Efflorescence, 136, 181, 183, 187, 191, 193, 198, 199, 203, 204, 212-215, 217, 219 (see also Florescence)

Elastic modulus (see modulus of elasticity)

Energy efficiency, 151

Evaporation, 32-34, 36, 215

#### F

Ferrous oxide (FeO), 7
Flashing, 183, 185, 188-190, 193, 194, 200, 216, 219
Florescence, 204, 212-217 (see also efflorescence)
Flue gases, 138-144
Fly ash, 8
Freeze-thaw effects (see moisture)
Frost dilatometry, 211

# G

Gazzola, E., 15 Grimm, C., 67, 201 Grogan, J. C., editor, 1, 235 Grout, 152, 154, 160, 163, 164, 167–169, 171, 173, 175, 183, 219 (see also ASTM C 476) Gypsum (calcium sulfate), 213, 214 Gypsum cement, 156, 169, 170

H

Hamid, A., 151 Harris, H. A., 88 Harris, H. G., 151 Heslip, J., 114 Huizer, A., 138 Hydrostone (see gypsum cement)

#### I-J

Initial rate of absorption (IRA), 16, 17, 21, 23, 24, 40, 127, 128, 135, 192, 199, 207, 209

In-service exposure (of masonry construction), 27, 70, 135, 137 (see also Atmospheric pollutants and Driving rain index)

IRA (see initial rate of absorption)

Isberner, A., 3, 27

Johnson, B., 178

#### L

Lime, 5, 8, 16, 21, 24, 187, 212, 214 (see also ASTM C 207)

## M

Magnesium oxide (MgO), 7

Maleic acid, 7 Masonry cement, 5, 21, 24, 94, 95 (see also ASTM C 91) Masonry Institute of Michigan, 115 Masonry mortar, 30, 198 Matthys, J., 38 Modulus of elasticity, 173, 205 Moisture, 106-109, 111, 112, 136, 183, 184, 187, 189, 194, 198, 199, 205 Condensation, 68, 79, 80, 188, 216 Freeze-thaw effects, 127-130, 135-137, 139, 185–187, 198, 199, 202-204, 206-212, 216, 217, Saturation, 127-129, 187, 192, 203, 208, 210

Seawater, 215
Water migration, 28, 29, 32, 34, 136, 137, 138
Water retention, 5, 26, 137
Mortar
Composition, 4, 6, 14
Type M, 9
Type N, 9, 17, 21, 26, 158
Type O, 9
Type S, 9, 17, 20, 21, 26, 39, 40, 158, 168

# N

Naish, W., 126 National Bureau of Standards, 203, 211

#### 0

Osmotic pressure, 206
Oxide analysis (of masonry mortar),
6, 9, 37

#### P

Paint, 181, 219 Permeance, 36, 68, 86, 194, 196, 203, 211, 215-19 (see also ASTM E 514) Petrography, 14, 198 (see also ASTM C 856) Plant roots, effects of, 205 Plasticizing materials, 5 Porosity, 203, 207, 209, 211, 215 Portland cement, 5, 6, 8, 24, 27, 33, 41, 86, 94, 100, 153, 191, 212, 214 (see also ASTM C 150 and C 83) Prism tests, 17, 19, 20, 44, 45, 54, 55, 63, 66, 152–164, 168–171, 173, 175, 198 (see also ASTM E 447)

# Q

Quality control, 4, 127, 181, 218

#### R

Raths, C., 182
Ratio
Cement to aggregate, 4, 9, 92
Water to cement, 33, 34, 86, 169
Reinforced brick masonry, 39, 40, 54

# S

Salt deposits (see efflorescence) Sand, 5, 9, 21, 24, 41, 153, 154, 214 Sandblasting, 178 Saturation (see moisture) Scumming, 214, 215 Sealants, 193, 216, 218 Seawater (see moisture) Silica ( $SiO_2$ ), 6, 7, 9, 14 Sodium sulfate (Na<sub>2</sub>SO<sub>4</sub>), 206 Soil properties, 115-125 Soot, 138, 181 Spalling, 136, 185, 203, 209, 210, 218 Specimen geometry, 152, 154, 160, 163, 164 SSPC (see Steel Structures Painting Council) Statistical analysis, 24, 128 Steel (for masonry reinforcement) Compared to reinforced concrete, 79, 86 Corrosion of and corrosion protection, 67-87, 183, 191, 193, 194, 205 Grade 60, 40, 55 No. 3 bars, 79

Steel (for temporary bracing of masonry construction), 115, 116
Steel Structures Painting Council, 80, 81
Stress distribution, 41, 42
Subgrade reaction, 121, 122, 124

#### T

Thermal shock, 144 Toneff, J., 15

#### U

Ultimate strength, 151 Underwriters Laboratories (ULC-S629-M1981), 139, 140, 144, 146

# V

Vapor barriers, 190, 200, 216 Vinylidene chloride latex (as mortar additive), 69, 87

# W

Ward, M., 138
Water migration (see moisture)
Water retention (see moisture)
Weathering, 203, 206, 208, 209
Wet chemical analysis, 4, 29
Wind, 189, 201, 215
Wong, H., 167
Woods, R., 114

#### Y

Yi, F., 102