

Subject Index

A

a-c impedance, 103, 143
 Aluminum conduit corrosion, 42–43
 ASTM Standards
 C 33–86, 39
 C 150–86, 39
 C 876–80, 54, 143
 C 876–87, 103
 Atmospheric corrosion, 1

B

Blast furnace slags
 influence on corrosion rate, 17
 Bridge decks, 1, 86

C

Calcium nitrite, 38
 Carbonation, 1
 Cathodic protection
 steel reinforcement in concrete construction, 52
 Cement type
 blended cements, 17
 chemical composition, 18
 chloride concentrations, 3, 7, 8
 Chloride concentration, 86
 Chloride intrusion
 in reinforced concrete structures, 38
 steel in concrete, 174
 Chloride ions
 in reinforced concrete, 38
 in steel, 1, 4
 Chloride
 diffusion, 3
 in concrete, 3–5, 86, 157
 Concrete
 blast furnace slags, 17
 composition, 68
 corrosion, 38, 66, 86, 118, 157

corrosion measurement, 134, 143, 180
 electrical resistivity, 180
 electrochemical impedance measurement, 118
 mix designs, 40
 polarization resistance versus macrocell corrosion, 38
 properties, 40
 reinforcement corrosion, 3
 reinforcing bars, 103
 steel in concrete, 174
 steel reinforcement corrosion, 86, 118, 157
 Corrosion behavior
 after repair, 52
 Corrosion intensity, 29
 Corrosion monitoring, 103
 Corrosion of metals
 test methods, 1, 4, 5, 40–41
 Corrosion of steel in concrete, 86, 118, 157, 174
 Corrosion potentials, 157
 Corrosion rates
 bridge decks, 86, 101
 chloride concentration, 3, 38
 electrochemical impedance measurement, 118
 influence of blast furnace slags, 17
 measurement, 86, 134, 137–139
 rebar durability measurement, 29
 reinforced concrete, 52, 86
 reinforcing bars, monitoring, 103
 repaired reinforced concrete, 52
 residual service life prediction, 29
 steel in concrete, 86, 143
 Corrosion, reinforcement, 3
 Corrosion testing, 38
 Cracks, 174
 Critical chloride concentration, 3
 Culverts, 66
 Curing time effect, 9
 Currents, 66

D

Damage levels
 reinforced concrete, 31
 Deicing salts, 174
 Deterioration levels
 residual service life prediction, 29
 Double counter electrode, 104

E

Electrochemical impedance measurement
 corrosion of concrete reinforcement, 118
 reinforcing bars in concrete, 103
 repaired reinforced concrete, 52
 Electrostatic resistivity of concrete, 143
 Evaporation, 66

F

Finite element method, 103
 Failure, structural
 caused by chloride ions, 38
 Fly ash cements, 12
 Furnace slags (*see* Blast furnace slags)

G

Galvanic corrosion
 reinforced concrete, 52
 steel in concrete, 143
 Galvanostatic pulse technique, 143

H

Half-cells, 157

I

Impedance measurement, corrosion
 concrete reinforcement, 118
 concrete slabs, 66
 reinforcing bars, 103
 steel in concrete, 143
 Inhibitors, 38
 iR error, 86

M

Macrocell corrosion, 38, 134, 143
 Marine environments, 1, 174
 Masonry, 174
 Mathematical model
 electrochemical impedance measurement, 118
 Metals corrosion
 test methods, 1
 Microsilica cements, 12
 Mortar, 174

N

Numerical simulation, 107

O

On-site corrosion rate, 134
 Oxygen concentration, 86

P

Parking decks, 1
 Passivity, 3, 174
 pH
 effect on corrosion of steel in concrete, 86, 174
 Piling, 66
 Polarization resistance
 compared to macrocell corrosion, 38
 steel in concrete rate of corrosion, 86
 steel reinforcing bars in concrete, 104, 134
 Pourbaix diagrams, 174
 Portland cement
 chloride in concrete, 5, 11
 blended with blast furnace slags, 17
 Potential mapping survey, 143
 Potential measurement
 corrosion, 157
 Potential pH (Pourbaix) diagrams, 174
 Potential wheel, 160–164
 Protective scales, 174

R

Rebar, 66
 Rebar analysis, 111
 Rebar durability
 corrosion rate measurements, 29, 134, 157
 electrochemical impedance measurement, 118
 galvanostatic pulse measurement, 143
 Reinforced concrete
 corrosion rates in repaired specimens, 52
 deterioration detection, 157
 Reinforcement corrosion, 3, 38
 Reinforcing bars, 38, 66
 Reinforcing steel in concrete, 86, 143
 Repair methods
 reinforced concrete structures, 52
 Residual service life prediction, 29

S

Salt contamination
 in repaired reinforced concrete, 52

Slags, blast furnace
 blended with portland cement, 17
 chemical composition, 18
 Steel rebar corrosion, 43
 Steel reinforced concrete, 1, 17
 Steels
 corrosion, 3, 29, 118, 134, 174
 electrochemical impedance measurement, 118
 imbedded chlorides, 3
 imbedded in portland cement mortars, 24
 in concrete, 17, 86, 103, 134, 143

 polarization resistance versus macrocell corrosion, 38
 potential wheel design, 157
 rebar, 66, 103
 reinforcing bars, 103
 residual service life prediction, 29
 Storage conditions
 influence on corrosion of steel, 17

W

Water/cement ratios, 3, 5, 10