Index

GLOSSARY

a = Amount (in kg/m^3) of SSD aggregate in 1 m^3 of concrete

a' = Percentage of air by volume of concrete

A_B = Bolomey coefficient

A_c = Cross sectional area of the concrete

A_d = Admixture dosage in % by weight of cement

a_m = Amount (in kg/m^3) of aggregate as received to be put into the mixer

A_s = Cross sectional area of steel reinforcing bars by percentage of the cross concrete structure

a_w = Water absorption

b = Solid volume (in L) of gravel (V_G) in 1 m^3 of concrete

b/b_0 = Bulk compacted volume of coarse aggregate in 1 m^3 of concrete

b_0 = Solid volume (in L) of gravel (V_G) in 1 m^3 of bulk compacted aggregate

c = Amount of cement in concrete volume in kg/m^3

C = Creep

C_B = Percentage of cement by weight of solids (aggregate + cement)

C_c = Specific heat of cement

C_{con} = Specific heat of concrete

C_d = Drying creep

CEM I = Portland cement

CEM II A/S-B/S = Slag Portland cements

CEM II A/D = Silica fume Portland

CEM II A/P-B/P-A/Q-B/Q = Natural (P) or industrial (Q) pozzolan Portland cements

CEM II A/V-B/V-A/W-B/W = Siliceous (V) or calcic (W) fly ash Portland cements

CEM II A/T-B/T = Calcined shale Portland cements

CEM II A/L-B/L = Limestone Portland cements

CEM IIA/M-B/M = Composite Portland cements

CEM III A-B-C = Blastfurnace slag cements

CEM IV A-B = Pozzolanc cements

CEM V A-B = Composite cements

C_G = Specific heat of gravel

C_p = Pure or basic creep

C_s = Specific heat of sand

C_w = Specific heat of water

d = size of aggregate passing to a sieve opening

D = Durability

d_a = Density of the SSD aggregate (in kg/L)

d_b = Bulk density of SSD compacted aggregate (in kg/m^3)

d_c = Density of cement in kg/L

D_c = Degree of compaction or degree of consolidation

D_{ht} = Degree of hardening at the time *t*

D_{max} = Maximum size of the aggregate

d_w = Density of water in kg/L

d_{con} = Density of the SSD concrete in kg/m^3

d_{fa} = Density of fly ash in kg/L

d_{fcon} = Density of the SSD fully compacted concrete in kg/m^3

d_G = Density of the SSD gravel in kg/L

d_s = Density of the sand (in kg/L) in the SSD condition

d_{sf} = Density of silica fume in kg/L

E = Elastic modulus

E_a = Elastic modulus of the aggregate

E_{con} = Elastic modulus of the concrete

$E_{con/t}$ = Elastic modulus of the concrete at the time *t*

E_{cp} = Elastic modulus of the cement paste

E_{cpt} = Elastic modulus of the cement paste at the time t

E_{is} = Initial static elastic modulus

E_{ss} = Secant static elastic modulus

F_c = Compacting factor

f_{ci} = Compressive strength of the individual specimen

f_{ck} = Characteristic strength

f_{cms} = Mean compressive strength at the end of the steam curing

f_{cmst} = Mean compressive strength at the time *t* of a steam cured concrete

f_{cms28} = Mean compressive strength at 28 days of a steam-cured concrete

f'_{cm28} = Mean compressive strength at 28 days of a concrete cured at 20°C

f_{cu} = Cube compressive strength

$f_{cu/ck}$ = Cube characteristic strength

f_{cyl} = Cylinder compressive strength

$f_{cyl/ck}$ = Cylinder characteristic strength

f_i = Shrinkage coefficients to relate the shrinkage of reinforced concrete structures with the standard laboratory shrinkage measured at 6 months (S_0)

f_{mc} = Mean compressive strength

f_{mc28} = 28-day mean compressive strength

G = Amount (in kg) of SSD coarse aggregate (gravel) in 1 m^3 of concrete

G' = Amount (in kg) of bone-dry coarse aggregate (gravel) in 1 m^3 of concrete

g_i = Creep coefficients to relate the creep of reinforced concrete structures with the concrete modulus of elasticity (E_{con}) and the applied compressive stress (σ_c)

G_m = Amount (in kg/m^3) of coarse aggregate (gravel) to be put into the mixer

h = Humidity of the aggregate (in % by bone-dry aggregate)

h_G = Humidity of the gravel (in % by bone-dry gravel)

h_m = Fictitious thickness

h_s = Humidity of the sand (in % by bone-dry sand)

K = Probability factor to determine the characteristic strength

K_c = Factor of correlation between creep (*C*) and elastic strain (ε_{el})

K_E = Factor of correlation between elastic modulus (E_{con}) and compressive strength (f_c)

K_f = Factor of correlation between flexural (f_f) and compressive strength (f_c)

K_p = Permeability coefficient

K_t = Factor of correlation between tensile (f_t) and flexural strength (f_f)

I = Correction coefficient of thermal concrete conductivity (λ) as a function of the relative humidity (RH)

m_d = Mass of the bone-dry aggregate

M_f = Fineness modulus

M_{fB} = Fineness modulus of an ideal aggregate according to Bolomey

M_{fG} = Fineness modulus of the gravel

M_{fs} = Fineness modulus of the sand

m_h = Mass of the aggregate as received

m_{SSD} = Mass of the aggregate in the SSD condition

P_d = Percentage of aggregate passing of at the sieve opening d in mm

P_{sd} = Percentage of solids (cement + aggregate) passing at the sieve opening d (in mm)

P_{03} = Percentage of aggregate passing at the sieve opening of 0.3 mm

P_{015} = Passing of aggregate passing at the sieve opening of 0.15 m

q = Correction factor to determine b/b_0

Q = Heat of hydration

Q_t = Unitary heat of hydration (in kJ/kg) of cement at the time *t*

$Q_{TOT/t}$ = Heat of hydration (in kJ/m^3) developed in 1 m^3 of concrete at the time *t*

RH = Relative Humidity

s = Amount (in kg) of the SSD sand in 1 m^3 of concrete

S = Drying shrinkage

s' = Amount (in kg) of bone-dry sand in 1 m^3 of concrete

s_m = Amount of sand (in kg/m^3) to be put into the mixer

SSD = Saturated and surface-dry condition

S_0 = Standard shrinkage of concrete specimens measured at 6 months

S1 = Consistence class of stiff concrete : slump = 1-4 cm

S2 = Consistence class of stiff concrete : slump = 5-9 cm

S3 = Consistence class of stiff concrete : slump = 10-15 cm

S4 = Consistence class of stiff concrete : slump = 16-20 cm

S5 = Consistence class of stiff concrete : slump ≥ 21 cm

t = Time of curing

t' = Time after loading

t_c = Type of cement

T_c = Temperature of cement in °C

T_{con} = Temperature of concrete in °C

T_s = Temperature of sand in °C

t_{smax} = Time of steam curing at the maximum temperature

t_{s1} = Time of preliminary curing in a steam curing process

T_G = Temperature of gravel in °C

T_{max} = Maximum temperature in a steam curing process

T_w = Temperature of mixing water in °C

T_{wG} = Temperature of water in the gravel in °C

T_{ws} = Temperature of water in the sand in °C

v = Heating rate (in °C/hr) in a steam curing process

V_a = Volume of SSD aggregate (in L/m^3) in 1 m^3 of concrete

V_c = Volume of cement (in L/m^3) in 1 m^3 of concrete

V_{con} = Volume (in L) of 1 m^3 of concrete

V_G = Volume of SSD gravel (in L/m^3) in 1 m^3 of concrete

V_s = Volume of SSD sand (in L/m^3) in 1 m^3 of concrete

w = Amount of mixing water in 1 kg/m^3 of concrete

W = Workability of fresh concrete

w_a = Amount of water (kg/m^3) put in the mixer through wet aggregate

w_G = Amount of water (kg/m^3) put in mixer trough wet gravel

w_m = Amount of liquid water (in kg/m^3) to be put in the mixer

W_m = Workability after mixing

W_p = Workability at the placement time

w_s = Amount of water (kg/m^3) put in mixer trough wet sand

XA = Exposure class of concrete in a chemically aggressive environment

XC = Exposure class of concrete in contact with open air (carbonation)

XD = Exposure class of concrete in contact with chloride salts other than those of sea water

XF = Exposure class of concrete exposed to freezing-thawing cycles

XS = Exposure class of concrete exposed to sea water

XO = Exposure class of concrete in a dry closed environment

α = Degree of cement hydration

β = Coefficient of thermal dilatation

δ = Standard deviation

δ_T = Thermal diffusivity of concrete

Δ_{fc} = Strength decrease due to un-complete compaction (D_c < 1) or the presence of entrained air

ΔW = Workability loss

ΔT = Temperature change

ε = Unitary strain

ε_{el} = Elastic strain

λ = Coefficient of thermal conductivity of concrete

σ_c = Compressive stress

σ_f = Flexural stress

σ_t = Tensile stress