

4.1 PROPERTIES OF STRUCTURAL MATERIALS

Material	Modulus of elasticity, E (kN/mm ² or GPa)	Shear modulus (units of E)	Poisson's ratio	Thermal expansion ($\times 10^{-6} \text{ K}^{-1}$)	Density
Concrete, $f_{cu}=35$	21 to 33 (at 28 days)	0.42 E	0.20	7 - 12	24
Concrete, $f_{cu}=40$ (e.g. prestressed)	22 to 34 (at 28 days)	0.42 E	0.20	7 - 12	24
Steel	205	0.38 E	0.30	12	78.5
Aluminium alloy	70	0.37 E	0.33	23	27.2
Stainless steel	See section 4.9				
Aluminium bronze	105	0.42 E	0.30	16 - 19	
Cast iron	65 - 95	0.4 E	0.25	11 - 13	70.7
Wrought iron	150 - 220	0.4 E	0.25	11 - 12	75.4
Timber C18 (softwoods) C24 C30	6.0 (min) 7.2 (min) 8.2 (min)	0.06 E 0.06 E 0.06 E	- - -	- - -	~3.8 ~4.2 ~4.6
Masonry	$900 \times f_k$ (f_k in kN/mm ² or GPa)	-	-	4-8 (clay) 11-15 (CaSi)	
Water	-	-	-	60	9.8

Note: The values given for concrete above are typical and vary with age, shrinkage and creep