

Steel bar weight ($W = D^2/162 \text{ kg/m}$)

Dia (mm)	kg/m	12 m bar (kg)
6	0.222	2.66
8	0.395	4.74
10	0.617	7.40
12	0.888	10.66
16	1.580	18.96
20	2.470	29.64
25	3.850	46.20
32	6.310	75.72

IS 456 Table 5: RCC durability

Exposure	Max w/c	Min cement	Min grade
Mild	0.55	300 kg/m ³	M20
Moderate	0.50	300 kg/m ³	M25
Severe	0.45	320 kg/m ³	M30
Very severe	0.45	340 kg/m ³	M35
Extreme	0.40	360 kg/m ³	M40

IS 456 nominal cover (Table 16)

Exposure	Nominal cover
Mild	20 mm
Moderate	30 mm
Severe	45 mm
Very severe	50 mm
Extreme	75 mm
Footings (min)	50 mm
Columns (min)	40 mm

Unit weights (IS 875 Part 1, approx.)

Material	kN/m ³
Reinforced concrete	25
Plain concrete	24
Brick masonry	19 - 20
Steel	78.5
Water	9.81

Nominal mix: cement per m³ (dry vol. 1.54)

Grade	Mix	Cement
M10	1 : 3 : 6	222 kg (4.4 bags)
M15	1 : 2 : 4	317 kg (6.3 bags)
M20	1 : 1.5 : 3	403 kg (8.1 bags)

Plaster per 100 m² (incl. 20% + x1.27)

Thickness	Mix	Cement	Sand
6 mm	1:3	6.6 bags	24.2 cft
12 mm	1:6	7.5 bags	55.4 cft
12 mm	1:4	10.5 bags	51.7 cft
15 mm	1:6	9.4 bags	69.2 cft
20 mm	1:4	17.6 bags	86.1 cft

Formwork removal, OPC (IS 456 cl. 11.3)

Member	Strip after
Vertical faces (walls, columns)	16 - 24 hours
Slab soffit (props left)	3 days
Beam soffit (props left)	7 days
Props: slab span up to 4.5 m	7 days
Props: slab span over 4.5 m	14 days
Props: beam span up to 6 m	14 days
Props: beam span over 6 m	21 days

Building thumb rules (per sq ft built-up)

Material	Quantity
Cement	0.4 bag
Steel (residential RCC)	3.5 - 4.5 kg
Sand	1.8 cft
Aggregate	1.35 cft
Bricks	8 nos

Handy conversions and rules

$1 \text{ m}^3 = 35.315 \text{ cft}$ · 1 bag cement = 50 kg = 0.0347 m³ · cement density 1,440 kg/m³
 Dry volume factor: concrete 1.54, mortar/plaster 1.27 · steel plate = 7.85 kg per m² per mm
 Curing (IS 456): min 7 days for OPC, 10 days with mineral admixtures or blended cement
 Modular brick 190 x 90 x 90 mm: about 500 bricks per m³ of brickwork (10 mm joints)