

Laboratory	L&T Construction Research & Testing Centre, Larsen & Toubro Construction, TCTC Building, Ground Floor, Mount Poonamallee Road, Manapakkam, Chennai, Tamil Nadu		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Mechanical Testing	Issue Date	05.02.2015
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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I. MECHANICAL PROPERTIES OF MATERIALS				
1.	Reinforcing Bar	Nominal mass of HSD rebar Tensile Test of HSD rebar Percentage of elongation Tensile stress Yield stress	IS 1786: 2008 (RA 2013) IS 1608:2005 (RA 2011)	0.075 kg/m to 15 kg/m 0.075 kg/m to 15 kg/m 0.3 % to 30 % 200 N/mm ² to 1000 N/mm ² 200 N/mm ² to 1000 N/mm ²
2.	Strands	Tensile Test of Strands Breaking Load Yield load Percentage of elongation	IS 14268 : 1995 (RA 2013)	50 kN to 300 kN 50 kN to 300 kN 0.25% to 10 %
II. BUILDING MATERIALS				
1.	Timber	Moisture content Glue Shear strength of plywood Static Bending Strength	IS 1708 (Part 1):1986 (RA 2010) IS 1734 (Part 4) : 1983 (RA 2013) IS 1734 (Part 11) : 1983 (RA 2013)	0.1% to 20% 100 N to 5000 N 100 N to 5000 N
2.	Bricks	Compressive Strength of Bricks Water absorption Efflorescence	IS 3495 (Part 1) : 1992 (RA 2011) IS 3495 (Part 2) : 1992 (RA 2011) IS 3495 (Part 3) : 1992 (RA 2011)	1 N/mm ² to 40 N/mm ² 0.1 % to 50 % Qualitative (Visual)

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3.	Cement	Standard consistency of cement paste	IS 4031 (Part 4): 1988 (RA 2014)	20 % to 35 %
		Setting time	IS 4031 (Part 5) : 1988 (RA 2014)	10 min to 720 min
		Compressive Strength of hydraulic cement other than Masonry Cement	IS 4031 (Part 6) : 1988 (RA 2014)	5 N/mm ² to 100 N/mm ²
		Density	IS 4031 (Part 11): 1988 (RA 2014)	2.5 to 3.5
		Fineness of cement by dry sieving	IS 4031(Part 1): 1996 (RA 2011)	1 % to 100 %
4.	Admixtures	Relative density of liquid admixture	IS 9103:1999 (RA 2013)	1.00 to 1.30
		Dry material content of liquid admixture	IS 9103:1999 (RA 2013)	1 % to 100%
5.	Hardened Concrete	Compressive strength of accelerated cured concrete specimen	IS 516: 1959 (RA 2013)	5 N/mm ² to 120 N/mm ²
		Compressive strength of cubical specimen	IS 516: 1959 (RA 2013)	5 N/mm ² to 120 N/mm ²
		Compressive strength of cylindrical specimen	IS 516: 1959 (RA 2013)	5 N/mm ² to 100 N/mm ²
		Flexural strength of moulded flexure test specimen	IS 516: 1959 (RA 2013)	5 N/mm ² to 25 N/mm ²

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	Hardened Concrete	Water permeability of hardened concrete	DIN: 1048 (Part 5): 1991 (RA 2006)	1mm to 125mm
		Electrical indication of concrete's ability to resist chloride ion penetration	ASTM: C 1202-09 (RA 2012)	100 Coulombs to 10000 Coulombs
6.	Fresh Concrete	Setting time	IS 8142: 1976 (RA 2011)	30 min to 1440 min
		Workability of concrete by slump test	IS 1199: 1959 (RA 2013)	5 mm to 300 mm
		Water bleeding	IS 9103: 1999 (RA 2013)	0.50 % to 10 %
7.	Concrete Blocks	Dimension	IS 2185 (Part 1) : 2005 (Third revision) (RA 2010)	50 mm to 600 mm
		Density		100 kg/m ³ to 3000 kg/m ³
		Water Absorption		1% to 30%
		Compressive strength		5 N/mm ² to 40 N/mm ²
8.	Fine Aggregate	Sieve analysis	IS 2386 (Part 1) :1963 (RA 2011)	1 % to 100 % 1 % to 100 %
		Organic impurities in sand	IS 2386(Part 2) : 1963 (RA 2011)	Qualitative (Visual)
		Specific gravity	IS 2386 (Part 3) :1963 (RA 2011)	1.0 to 3.5
		Water absorption		0.1 to 20 %
		Bulk density		1 kg /L to 3 kg /L

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9.	Coarse Aggregate	Sieve analysis	IS 2386 (Part 1):1963 (RA 2011)	1 % to 100 %
		Specific gravity	IS 2386 (Part 3) :1963 (RA 2011)	1.00 to 4.50
		Water absorption	IS 2386 (Part 3) :1963 (RA 2011)	0.1 % to 20 %
		Bulk Loose density	IS 2386 (Part 3) :1963 (RA 2011)	1 kg /L to 4 kg/L
		Bulk Rodded density	IS 2386 (Part 3) :1963 (RA 2011)	1 kg /L to 4 kg/L
		Aggregate crushing value	IS 2386 (Part 4) :1963 (RA 2011)	5 % to 50 %
		Aggregate impact value		5 % to 50 %
		Aggregate abrasion value		5 % to 50 %
		Ten percent fines value		5 Ton to 50 Ton
		Flakiness index	IS 2386 (Part 1):1963 (RA 2011)	5 % to 80 %
	Elongation index	IS 2386 (Part 1):1963 (RA 2011)	5 % to 80 %	
10.	Bituminous Mixture	Asphalt content by Ignition method	ASTM D 6307-2010	1 % to 20 %
		Maximum specific gravity of the mix	ASTM D 2041- M11	1 to 3.5
		Marshall stability & flow	ASTM D 6927-2006	2 kN to 50 kN 0 to 25 mm

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11.	Bitumen	Specific gravity	IS 1202: 1978 (RA 2008)	0.5 to 1.5
		Penetration	IS 1203: 1978 (RA 2008)	5 dmm to 300 dmm
		Softening Point	IS 1205: 1978 (RA 2009)	1° to 150°C
		Industrial viscosity	IS 1206 (Part 1): 1978 (RA 2009)	5 s to 50 s
		Kinematic Viscosity	IS 1206 (Part 3): 1978 (RA 2009)	30 cSt to 3000 cSt
		Absolute Viscosity	IS 1206 (Part 2): 1978 (RA 2009)	360 poise to 10000 poise
		Brookfield Rotational viscosity	ASTM D 4402: 2006	10 cP to 100000 cP
		Elastic recovery	IS 15462 : 2009	1 % to 100 %
		Flash point	IS 1209 : 1978 (RA 2009)	100 °C to 350 °C
		Stripping value of aggregate	IS 6241: 1971 (RA 2008)	0 to 100 % (visual)
		Polished-stone value	BS 812 (Part 114): 1990	20 div to 80 div
		Separation	IS 15462 : 2009	0 to 50 °C
		Rolling Thin Film and Thin Film Oven tests on Residue		
Reduction in penetration of residue @25°C	IS 15462 : 2004 IS 1203: 1978 (first revision) (RA 2008)	5 dmm to 300 dmm		

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	Bitumen	Increase in softening point	IS 15462 : 2004 IS 1205: 1978 (first revision (RA 2009))	1°C to 150°C
		Viscosity Ratio at 60°C	IS 73 : 2013 IS 1206 (Part 2): 1978 (RA 2009)	360 poise to 25000 poise
		Elastic recovery of half thread in Ductilometer at 25°C	IS 15462 : 2009 Annexure B	1 % to 100%
		Ductility at 25°C	IS 73 : 2013 IS 1208: 1978 (RA 2009)	1 cm to 100 cm
III. SOIL & ROCK				
1.	Rock	Unconfined compressive strength	IS 9143: 1979 (RA 2011)	0 to 400 N/mm ²
		Point load strength index	IS 8764: 1998 (RA 2014)	0.02 N/mm ² to 35 N/mm ²
		Tensile strength (indirect) Brazilian Method	IS 10082: 1981 (RA 2011)	4 MN/m ² to 100 MN/m ²
		Modulus of elasticity of rock	IS 9221: 1979 (RA 2011)	5 GPa to 100 GPa
		Poisson's ratio		0.01 to 0.50
		Rock triaxial	IS 13047: 1991 (RA 2011)	C:0: 20 N/mm ² Φ : 1 ° to 60 °
		Water absorption Specific gravity	IS 2386 (Part 3): 1963 (RA 2011)	0.10 % to 40 % 1 to 4

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	Rock	Porosity	IS 13030: 1991 Clause 6 (RA 2011)	0.1% to 20 %
		Density		1000 kg/m ³ to 4000 kg/m ³
2.	Soil	Water content	IS 2720 (Part 2):1973 (RA 2010)	1 % to 300 %
		Specific gravity	IS 2720 (Part 3): 1980 (RA 2011)	1 to 3
		Grain size analysis (Wet sieve)	IS 2720 (Part 4): 1985 Clause 4.3 (RA 2010)	0 to 100 %
		Grain size analysis (Hydrometer)	IS 2720 (Part 4) 1985 Clause 5.2 (RA 2010)	0 to 100 %
		Liquid limit	IS 2720 (Part 5): 1985 Clause 3 (RA 2010)	10 % to 600 %
		Plastic limit	IS 2720 (Part 5): 1985) Clause 7 (RA 2010)	5 % to 300 %
		Shrinkage limit	IS 2720 (Part 6):1972 (RA 2011)	1 % to 50 %
		Light compaction	IS 2720 (Part 7): 1980 (RA 2011)	MDD: 1.2 g/cc to 2.5 g/cc OMC: 1 % to 35 %
		Heavy compaction	IS 2720 (Part 8): 1983 (RA 2010)	MDD: 1.2 g/cc to 2.5g/cc OMC 1 % to 30 %
		Unconfined compressive strength	IS 2720 (Part 10):1991 (RA 2010)	0.01 N/mm ² to 5 N/mm ²

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	Soil	Triaxial UU (without pore pressure)	IS 2720 (Part 11): 1993 (RA 2011)	C:0: 2 N/mm ² Φ : 1° to 6°
		Direct shear test	IS 2720 (Part 13):1986 (RA 2011)	C:0: 20 kg/ cm ² Φ : 1° to 60°
		Density index of cohesion less soils	IS 2720 (Part 14): 1983 (RA 2010)	40 % to 85 %
		Consolidation properties	IS 2720 (Part 15): 1986 (RA 2011)	e ₀ : 0.01 to 3.0 Cc: 0.01 to 2.0
		CBR (Unsoaked) CBR (Soaked)	IS 2720 (Part 16):1987 ((RA 2011)	0.5 % to 150 % 0.5 % to 200 %
		Permeability (Falling head)	IS: 2720 (Part 17): 1986 Clause 6.0 (RA 2011)	10 ⁻³ to 10 ⁻⁷ cm/s
		Vane shear test	IS: 2720 (Part 30):1980 (RA 2011)	0.03 kg/cm ² to 0.5 kg/cm ²
		Direct shear test (Gravel)	IS 2720 (Part 39):1977 (RA 2011)	C:0: 20 kg/ cm ² Φ : 1° to 60°
		Free swell index	IS 2720 (Part 40): 1977 (RA 2011)	0 to 1200%
		Swelling pressure	IS 2720 (Part 41): 1977 (RA 2011)	0.01 kg/cm ² to 40 kg/cm ²

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