

Laboratory Millennium Consultants & Technocrats, 33, Nalanda Vihar, Maharani Farm, Durgapura, Jaipur, Rajasthan

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7833

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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CHEMICAL TESTING

I.	METALS & ALLOYS			
1.	Steel	Carbon (C)	IS 228 (Part 1)	0.05 % to 2.5 %
		Manganese (Mn)	IS 228 (Part 2)	0.25 % to 2.0 %
		Phosphorus (P)	IS 228 (Part 3)	0.02 % to 0.05 %
		Silicon (Si)	IS 228 (Part 8)	0.1 % to 5.0 %
		Sulphur (S)	IS 228 (Part 9)	0.01 % to 0.25 %
II.	BUILDING MATERIALS			
1.	Cement (OPC & PCC)	Silica (as SiO ₂)	IS 4032	10 % to 35 %
		Loss on Ignition		0.1 % to 10 %
		Insoluble Residue		0.1 % to 35 %
		Iron (as Fe ₂ O ₃)		0.2 % to 10 %
		Alumina (as Al ₂ O ₃)		0.2 % to 10 %
		Sulphur Anhydride (as SO ₃)		0.2 % to 7 %
		Magnesia (as MgO)		0.5 % to 10 %
		Calcium (as CaO)		20 % to 70 %
		Chloride (as Cl)		0.005 % to 2 %
2.	Admixture	pH	IS 9103	1 to 12
		Relative Density		1.000 to 1.500
		Ash Content		1.0 % to 50 %
		Dry Material Content		1.0 % to 80.0 %
III.	WATER			
1.	Construction Water	pH	IS 3025 (Part 11)	2 to 12
		Suspended Matter	IS 3025 (Part 17)	5.0 mg/l to 5000 mg/l
		Organic Solid	IS 3025 (Part 18)	10 mg/l to 2000 mg/l
		Inorganic Solid	IS 3025 (Part 18)	20 mg/l to 5000 mg/l

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		Volume of 0.02N NaOH Required to Neutralize 100 ml Sample of Water (Acidity)	IS 3025 (Part 22)	0.1 ml to 100 ml
		Volume of 0.02N H ₂ SO ₄ Required to Neutralize 100 ml Sample of Water (Alkalinity)	IS 3025 (Part 23)	0.1 ml to 100 ml
		Sulphate	IS 3025 (Part 24)	10 mg/l to 500 mg/l
		Chloride as Cl	IS 3025 (Part 32)	10 mg/l to 5000 mg/l

Neeraj Verma
Convenor

Birendra Prasad Murmu
Program Manager

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MECHANICAL TESTING

I.	BUILDING MATERIAL			
1.	Cement (OPC & PCC)	Standard Consistency	IS 4031 (Part 4)	20 % to 40 %
		Initial Setting Time	IS 4031 (Part 5)	10 minute to 400 minute
		Final Setting Time		10 minute to 600 minute
		Soundness (Le-Chatelier Method)	IS 4031 (Part 3)	1.0 mm to 15 mm
		Compressive Strength 3 Day's (72±1h) 7 Day's (168±2h) 28 Days (672±4h)	IS 4031 (Part 6)	3N/mm ² to 80 N/mm ²
		Density	IS 4031 (Part 9)	2.8 g/cm ³ to 3.5 g/cm ³
	Fineness (By Blain Air Permeability)	IS 4031 (Part 2)	150 m ² /kg to 500 m ² /kg	
2.	Fly Ash	Fineness (By Blain Air)	IS 1727	100 m ² /kg to 800 m ² /kg
		Soundness (Le-Chatelier Method)		0.1 mm to 10.0 mm
		Residue on 45 micron		1 % to 100 %
3.	Concrete (for Fresh & Hardened)	Compressive Strength (Cube & Core)	IS 516	10 N/mm ² to 80 N/mm ²
		Workability by Slump Test	IS 1199	0 to 250 mm
		Compressive Strength by Accelerated Curing	IS 9013	10 N/mm ² to 80 N/mm ²
4.	Coarse Aggregate	Sieve Analysis	IS 2386 (Part 1)	0 to 100 % (4.75 mm to 125 mm)
		Los Angles Abrasion	IS 2386 (Part 4)	3 % to 60 %
		Impact Value		3 % to 50 %
		Crushing Value		3 % to 50 %
		Water Absorption	IS 2386 (Part 3)	0.2 % to 10 %
		Flakiness Index	IS 2386 (Part 1)	1 % to 60 %

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Elongation Index	IS 2386 (Part 1)	1 % to 60 %
		Specific Gravity	IS 2386 (Part 3)	2 g/cm ³ to 4 g/cm ³
		10% Fines Value	IS 2386 (Part 4)	2 kN to 50 kN
		Bulk Density	IS 2386 (Part 3)	1.2 kg/l to 3.5 kg/l
		Stripping Value	IS 6241	1 % to 100 %
		Soundness	IS 2386 (Part 5)	0.1 % to 25 %
		Clay Lump	IS 2386 (Part 1)	0 to 5 %
		Soft Particles	IS 2386 (Part 1)	Qualitative
		Materials Finer than 75 micron	IS 2386 (Part 1)	0.1 % to 10 %
5.	Aggregate (Fine)	Sieve Analysis	IS 2386 (Part 1)	0 to 100 % (150 μm to 4.75 mm)
		Water Absorption	IS 2386 (Part 3)	0.2 % to 10 %
		Specific Gravity		2 to 4
		Bulk Density		1 g/cm ³ to 3 g/cm ³
		Materials Finer than 75 micron	IS 2386 (Part 1)	0.1 % to 20 %
		Soundness	IS 2386 (Part 5)	0.1 % to 25 %
		Bulking of Sand	IS 2386 (Part 1)	10 % to 35 %
		Clay Lumps	IS 2386 (Part 1)	0 to 5 %
6.	Bricks (Burnt Clay/ Fly Ash)	Compressive Strength	IS 3495 (Part 1)	3 N/mm ² to 50 N/mm ²
		Water Absorption	IS 3495 (Part 2)	1 % to 50 %
		Efflorescence	IS 3495 (Part 3)	Qualitative (Visual)
		Dimensions	IS 1077	
		Length		3500 mm to 4000 mm
		Width		1600 mm to 1950 mm
		Height		1600 mm to 1950 mm
7.	Bitumen	Softening Point	IS 1205	30 °C to 150 °C
		Ductility	IS 1208	10 cm to 100 cm
		Penetration	IS 1203	5 mm to 120 mm (1/10 th mm)
		Specific Gravity	IS 1202	0.5 to 1.5
		Solubility in Trichloroethylene	IS 1216	10 % to 100 %

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8.	Polymer Modified Bitumen	Flash Point	IS 1448 (Part 69)	150 °C to 350 °C
		Loss in mass	IS 9382	0.1 % to 20 %
		Increase in Softening point	IS 1205	1°C to 20°C
		Reduction in Penetration of Residue	IS 1203	5 % to 50 %
		Elastic Recovery at 25 °C	IS 15462	1 % to 100 %
		Elastic Recovery at 15 °C	IS 15462	1 % to 100 %
9.	Bitumen Emulsion	Storage Stability	IS 8887 Annexure D	0.1 % to 5.0 %
		Particle Charge	IS 8887 Annexure E	Qualitative
		Residue on 600 µ IS Sieve	IS 8887 Annexure B	0.01 % to 10.0 %
		Viscosity by Saybolt Furol Viscometer at 25 °C	IS 3117	10 s to 250 s
		Viscosity by Saybolt Furol Viscometer at 50 °C	IS 3117	10 s to 400 s
		Water Content	IS 1211	5.0 % to 30.0 %
		Miscibility with water	IS 8887 Annexure H	Qualitative
		Test on Residue Solubility in Trichloroethylene	IS 1216	10 % to 100 %
		Test on Residue Residue by Evaporation	IS 8887 Annexure J	0.01 % to 5 %
		Test on Residue Penetration	IS 1203	40 mm to 250 mm (1/10 th mm)
		Test on Residue Ductility	IS 1208	5 cm to 100 cm
10.	Bituminous Mix	Binder Content	IRC SP-11 1984 Appendix 5 Clause C	2 % to 15 %
		Marshall Stability	ASTM D 6927-15	5 kN to 20 kN

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		Marshall Flow	ASTM D 6927-15	1 mm to 10 mm
		Maximum Theoretical Specific Gravity (Gmm)	ASTM D 2041-11	2 to 2.90
11.	Ceramic Tiles	Scratch Hardness of Surface (Moh's Scale)	IS 13630 (Part 13)	1 to 9
12.	Cement Concrete Flooring Tiles	Water Absorption	IS 1237 Annex B	0.1 % to 20 %
		Wet Transverse Strength	IS 1237 Annex F	0.5 N/mm ² to 10 N/mm ²
		Resistance to Wear	IS 1237 Annex G	0.1 mm to 10 mm
		Straightness	IS 1237 Annex D	0.1 % to 5.0 %
		Flatness	IS 1237 Annex B	0.01 mm to 10.0 mm
		Perpendicularity	IS 1237 Annex C	0.01 % to 5.0 %
13.	Chequered/ Terrazzo Cement Concrete Tiles	Straightness	IS 13801 Annex D	0.1 % to 5.0 %
		Flatness	IS 13801 Annex B	0.01 mm to 10.0 mm
		Perpendicularity	IS 13801 Annex C	0.01 % to 5.0 %
		Water Absorption	IS 13801 Annex E	0.1 % to 20 %
		Wet Transverse Strength	IS 13801 Annex F	0.5 N/mm ² to 10 N/mm ²
		Resistance to Wear	IS 13801 Annex G	0.1 mm to 10 mm
14.	Concrete Block (Hollow/Solid)	Block Density	IS 2185 (Part 1) Annex C	1000 kg/m ³ to 3000 kg/m ³
		Compressive Strength	IS 2185 (Part 1) Annex D	2 N/mm ² to 50 N/mm ²
		Water Absorption	IS 2185 (Part 1) Annex E	0.1 % to 20.0 %
		Dimensions	IS 2185 (Part 1) Annex B	
		Length		200 mm to 600 mm
		Width		50 mm to 300 mm
Height		100 mm to 200 mm		
15.	Autoclaved Cellular (Aerated) Concrete Products	Bulk Density	IS 6441 (Part 1)	0.45 g/cm ³ to 1.0 g/cm ³
		Compressive Strength	IS 6441 (Part 5)	1 N/mm ² to 10 N/mm ²
		Moisture Content	IS 6441 (Part 1)	0.1 to 15 %
		Dimensions	IS 2185 (Part 3)	
		Length		350 mm to 650 mm
		Width		150 mm to 350 mm
		Height		50 mm to 250 mm

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16.	Natural Stone (Marble/Granite/Slate/Quartz)	Compressive Strength	IS 1121 (Part 1)	50 kg/cm ² to 2000 kg/cm ²
		Water Absorption	IS 1124	0.1 % to 10 %
		Apparent Specific Gravity		2.0 to 4.0
		True Specific Gravity		1.0 to 4.0
17.	Paver Block	Water Absorption	IS 15658 Annex C	0.1 % to 20 %
		Compressive Strength	IS 15658 Annex D	5 N/mm ² to 80 N/mm ²
		Abrasion Resistance Test	IS 15658 Annex E	1000 mm ³ to 50000 mm ³
		Dimension	IS 15658 Annex B	
		Length		150 mm to 250 mm
		Width		100 mm to 200 mm
		Height		40 mm to 130 mm
18.	Door Shutters	Visual Inspection	IS 15658 Clause 7.1	Qualitative
		Glue Adhesion	IS 4020 (Part 15)	Qualitative
		End Emersion	IS 4020 (Part 13)	Qualitative
		Knife Test	IS 4020 (Part 14)	Qualitative
		Dimension & Squareness	IS 4020 (Part 2)	
		Height		1800 mm to 3000 mm
		Width		300 mm to 1000 mm
19.	Particle Board	Thickness		20 mm to 50 mm
		Water Absorption	IS 2380 (Part 16)	2 % to 70 %
		Moisture Content	IS 2380 (Part 3)	1 % to 30 %
		Density	IS 2380 Part 3)	200 kg/m ³ to 1500 kg/m ³
II.	MECHANICAL PROPERTIES OF METALS			
1.	Metal & Alloy High Strength Deformed Bars	Tensile Strength	IS 1608	250 N/mm ² to 800 N/mm ²
		Elongation		10% to 40%
		Yield Stress		250 N/mm ² to 700 N/mm ² (12 kN to 600 kN)
		Unit Weight	IS 1786	0.1 kg/m to 10 kg/m (10 gm to 10 kg)

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		Bend Test	IS 1599	Qualitative (Mandrel Diameter: 24, 30, 32, 36, 40, 44, 48, 60, 80, 100, 120, 125, 128, 140, 158, 220, 288 in mm)
		Rebend Test	IS 1786	Qualitative (Mandrel Diameter: 24, 30, 32, 36, 40, 44, 48, 60, 80, 100, 120, 125, 128, 140, 158, 220, 288 in mm)
III.	SOIL & ROCK			
1.	SOIL	Grain Size Analysis (by Wet & Dry Sieve Analysis)	IS 2720 (Part 4)	0 to 100 % (100 mm to 75 micron Sieve)
		Grain Size Analysis (by Hydrometer)		0 to 100 % (2 Micron to 75 Micron)
		Atterberg's Limit	IS 2720 (Part 5)	
		Liquid Limit		2 % to 400 %
		Plastic Limit		4 % to 100 %
		Shrinkage Limit	IS 2720 (Part 6)	4 % to 50 %
		Water Content	IS 2720 (Part 2)	1 % to 60 %
		Light Compaction	IS 2720 (Part 7)	
		Optimum Moisture Content		2 % to 50 %
		Maximum Dry Density		1.0 g/cm ³ to 2.5 g/cm ³
		Heavy compaction	IS 2720 (Part 8)	
		Optimum Moisture Content		2 % to 50 %
		Maximum Dry Density		1.0 g/cm ³ to 2.5 g/cm ³
		Free Swell Index	IS 2720 (Part 40)	Upto 400 %
		California Bearing Ratio (CBR)	IS 2720 (Part 16)	2 % to 100 %

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NON - DESTRUCTIVE TESTING

I.	BUILDING MATERIAL- REINFORCED CONCRETE STRUCTURE			
1.	Reinforced Concrete Structure	Ultrasonic Pulse Velocity Test	IS 13311 (Part 1)	1 km/s to 5 km/s
		Rebound Hammer Test	IS 13311 (Part 2)	20 to 55 (10 MPa to 70 MPa)
		Carbonation test	BS 1881 (Part 201)	Qualitative