

Laboratory Metro Laboratories, B-10, Nand Dham Industrial Estate, Marol
Maroshi Road, Andheri (East), Mumbai, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7959

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Validity 10.10.2018 to 09.10.2020

Last Amended on --

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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MECHANICAL TESTING

I.	BUILDING MATERIALS			
1.	Aggregate Coarse	Sieve Analysis	IS 2386 (Part 1)	0.1 % to 100 % (Sieve Size: 4.75 mm to 40 mm)
		Flakiness Index	IS 2386 (Part 1)	1 % to 50 %
		Elongation Index	IS 2386 (Part 1)	1 % to 50 %
		Specific Gravity	IS 2386 (Part 3)	1.5 % to 3.5 %
		Water Absorption	IS 2386 (Part 3)	0.1 % to 15 %
		Bulk Density	IS 2386 (Part 3)	1 kg/lit to 3 kg/lit
		Crushing Value	IS 2386 (Part 4)	1 % to 60 %
		10 % Fines Value	IS 2386 (Part 4)	2 T to 50 T
		Impact Value	IS 2386 (Part 4)	1 % to 60 %
		Abrasion Value - Los Angeles	IS 2386 (Part 4)	5 % to 50 %
		Soundness - Na ₂ SO ₄	IS 2386 (Part 5)	1 % to 20 %
		Soundness - MgSO ₄	IS 2386 (Part 5)	1 % to 20 %
2.	Aggregate Fine	Sieve Analysis	IS 2386 (Part 1)	0.1 % to 100 % (Sieve Size: 75 µm to 4.75 mm)
		Material Finer than 75 Micron	IS 2386 (Part 1)	1 % to 30 %
		Specific Gravity	IS 2386 (Part 3)	1.5 % to 3.5 %
		Water Absorption	IS 2386 (Part 3)	1 % to 50 %
		Bulk Density	IS 2386 (Part 3)	1 kg/l to 3 kg/l
		Soundness - Na ₂ SO ₄	IS 2386 (Part 5)	1 % to 18 %
		Soundness - MgSO ₄	IS 2386 (Part 5)	1 % to 18 %
3.	Granular Sub Base/ Wet Mix Macadam/ Water Bound Macadam	Sieve Analysis	IS 2386 (Part 1)	0.1 % to 100 % (Sieve Size: 75 µm to 75 mm)
		Flakiness Index	IS 2386 (Part 1)	1 % to 35 %

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		Elongation Index	IS 2386 (Part 1)	1 % to 35 %
		Impact Value	IS 2386 (Part 4)	1 % to 60 %
		Water Absorption	IS 2386 (Part 3)	0.1 % to 2.5 %
		Liquid Limit	IS 2720 (Part 5)	5 % to 30 %
		Plastic Limit	IS 2720 (Part 5)	5 % to 30 %
		California Bearing Ratio	IS 2720 (Part 16)	1 % to 50 %
4.	Bitumen	Specific Gravity	IS 1202	0.90 to 1.1
		Penetration	IS 1203	1 mm to 9.5 mm
		Softening Point	IS 1205	40 °C to 80 °C
		Ductility	IS 1208	2 cm to 100 cm
		Flash Point	IS 1209	180 °C to 290 °C
		Fire Point	IS 1209	180 °C to 290 °C
5.	Bituminous Mix	Marshall Stability	ASTM D 6927	1 kN to 50 kN
		Marshall Flow	ASTM D 6927	1 mm to 10 mm
		Binder Content	IRC SP-11	2 % to 10 %
		Sieve Analysis	IS 2386 (Part 1)	0.1 % to 100 % (0.075 mm to 40 mm)
6.	Bitumen Mastic	Hardness Number	IS 1195	2 to 50
7.	Bricks (Burnt Clay / Pulverised Fuel Fly Ash)	Compressive Strength	IS 3495 (Part 1)	1 N/mm ² to 35 N/mm ²
		Water Absorption	IS 3495 (Part 2)	1 % to 50 %
		Efflorescence	IS 3495 (Part 3)	Qualitative
8.	Precast Concrete Paving Block	Compressive Strength	IS 15658	10 N/mm ² to 70 N/mm ²
		Water Absorption	IS 15658	1 % to 25 %
		Abrasion Resistance	IS 15658	2000 mm ³ to 30000 mm ³
9.	Autoclaved Cellular (Aerated) Concrete Blocks	Bulk Density	IS 6441 (Part 1)	400 kg/m ³ to 2000 kg/m ³
		Moisture Content	IS 6441 (Part 1)	1 % to 25 %
		Drying Shrinkage	IS 6441 (Part 2)	0.01 % to 0.5 %
		Compressive Strength	IS 6441 (Part 5)	0.5 N/mm ² to 15 N/mm ²
10.	Ceramic Tiles	Water Absorption	IS 13630 (Part 2)	4 % to 25 %
11.	Cement (OPC / PPC)	Fineness by Dry Sieving	IS 4031 (Part 2)	1 % to 20 %
		Soundness by Le-Chatelier Method	IS 4031 (Part 3)	0.1 mm to 10 mm

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		Standard Consistency	IS 4031 (Part 4)	25 % to 40 %
		Initial Setting Time	IS 4031 (Part 5)	30 minutes to 600 minutes
		Final Setting Time	IS 4031 (Part 5)	60 minutes to 600 minutes
		Compressive Strength	IS 4031 (Part 6)	5 N/mm ² to 85 N/mm ²
		Density	IS 4031 (Part 11)	1 gm/cc to 4 gm/cc
12.	Fly Ash	Fineness by Dry Sieving	IS 1727	5 % to 40 %
		Soundness by Le-Chatelier Method	IS 1727	0.5 mm to 10 mm
		Initial Setting Time	IS 1727	10 minutes to 300 minutes
		Final Setting Time	IS 1727	100 minutes to 600 minutes
		Compressive Strength	IS 1727	5 N/mm ² to 80 N/mm ²
		Lime Reactivity	IS 1727	1 N/mm ² to 15 N/mm ²
		Drying Shrinkage	IS 1727	0.05 % to 0.5 %
		Specific Gravity	IS 1727	1 to 5
13.	Concrete	Compressive Strength - (Cube / Core)	IS 516	5 N/mm ² to 80 N/mm ²
		Flexural Strength	IS 516	1 N/mm ² to 10 N/mm ²
		Compressive Strength by Boiling Water Method	IS 9013	5 N/mm ² to 80 N/mm ²
14.	Cast Iron & FRP Manhole Covers and Frames	Load Test	IS 1726 BS EN 124-6	2 T to 50 T
15.	Precast Concrete Manhole Cover and Frame	Load Test	IS 12592	20 kN to 200 kN
II.	SOIL & ROCK			
1.	Soil	Water Content (Oven Drying)	IS 2720 (Part 2)	1 % to 50 %

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		Specific Gravity	IS 2720 (Part 3)	2.0 to 3.0
		Grain Size Analysis	IS 2720 (Part 4)	0.1 % to 100 % (75 µm to 19 mm)
		Liquid Limit	IS 2720 (Part 5)	15 % to 160 %
		Plastic Limit	IS 2720 (Part 5)	15 % to 50 %
		Shrinkage Limit	IS 2720 (Part 6)	1 % to 50 %
		Light Compaction	IS 2720 (Part 7)	OMC= 5 % to 30 % MDD=1.5 gm/cc to 2.5 gm/cc
		Heavy Compaction	IS 2720 (Part 8)	OMC= 5 % to 30 % MDD=1.5 gm/cc to 2.5 gm/cc
		California Bearing Ratio	IS 2720 (Part 16)	1 to 80 %
2.	Rock	Unconfined Compressive Strength	IS 9143	1 N/mm ² to 250 N/mm ²
		Water Content	IS 13030	0.1 % to 25 %
		Porosity	IS 13030	0.02 % to 20 %
		Density	IS 13030	1.5 gm/cc to 2.75 gm/cc
		Specific Gravity	IS 13030	1 to 4
III.	MECHANICAL PROPERTIES OF METALS			
1.	High Strength Deformed Steel Bars	Mass per meter	IS 1786	0.1 kg/m to 10 kg/m
		Ultimate Tensile Strength	IS 1608 (Part 1)	30 kN to 1000 kN
		0.2% Proof Stress	IS 1608 (Part 1)	30 kN to 100 kN Load, 100 N/mm ² to 900 N/mm ²
		Yield Stress	IS 1608 (Part 1)	900 N/mm ²
		Elongation	IS 1608 (Part 1)	5 % to 80 %
		Bend Test	IS 1786 IS 1599	Qualitative (Mandrel Diameter: 16, 20, 24, 30, 32, 36, 40, 48, 50, 60, 64, 75, 80, 96, 100, 120, 125,

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				128, 150, 160, 192, 200, 240 mm)
		Rebend Test	IS 1786	Qualitative (Mandrel Diameter: 32, 40, 48, 50, 56, 60, 70, 72, 84, 96, 112, 120, 128, 140, 150, 160, 175, 192, 200, 224, 240, 256, 280, 320 mm)

Deepak Kumar Sharma
Convenor

Anuja Anand
Program Manager

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NON - DESTRUCTIVE TESTING

I.	BUILDING MATERIALS - REINFORCED CONCRETE STRUCTURES			
1.	Reinforced Concrete Structures	Ultrasonic Pulse Velocity	IS 13311 (Part 1)	1.5 km/sec to 5.0 km/sec
		Rebound Hammer	IS 13311 (Part 2)	10 R to 80 R
		Half-Cell Potential Difference	ASTM C 876	(-) 100 mV to (-) 650 mV
		Carbonation	DIN EN 14630	1 mm to 50 mm

Deepak Kumar Sharma
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