

Laboratory **MCB Testing Laboratory, Plot No. 1715, M.I.E., Part-B, Bahadurgarh, Haryana**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-7950** (in lieu of T-2261 & T-2373)

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Validity **22.09.2018 to 21.09.2020**

Last Amended on **26.09.2018**

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 AND ALLOYS			
1.	Ferro Steel (Low Alloy Steel)	Carbon	IS228 (Part 1)	0.05% to 2%
		Sulphur	IS 228 (Part 9)	0.02% to 1%
		Phosphorous	IS 228 (Part 3)	0.02% to 1%
		Manganese	IS 228 (Part 2)	0.1% to 3.0%
		Silicon	IS 228 (Part 8)	0.1% to 2%
II.	BUILDING MATERIALS			
1.	Cement (OPC/PPC)	CaO	IS 4032	10% to 70%
		Al ₂ O ₃	IS 4032	1 % to 20 %
		Fe ₂ O ₃	IS 4032	1 % to 20 %
		SiO ₂	IS 4032	5 % to 30 %
		Insoluble residue	IS 4032	1 % to 40 %
		Magnesia	IS 4032	1 % to 10 %
		Total Sulphur (as SO ₃)	IS 4032	0.1 % to 5 %
		Sulphur (as S)	IS 4032	0.1 % to 1 %
		Loss on Ignition (LOI)	IS 4032	1 % to 10 %
		Chloride	IS 4032	0.005 % to 1 %
	Alkali Contents	IS 4032	0.01 % to 2 %	
2.	Fly ash/ Micro Silica	CaO	IS 1727	1 % to 30 %
		SiO ₂	IS 1727	15 % to 50 %
		Al ₂ O ₃	IS 1727	3 % to 30 %
		Fe ₂ O ₃	IS 1727	1 % to 10 %
		Magnesia	IS 1727	1 % to 5 %
		Total Sulphur (as SO ₃)	IS 1727	0.1 % to 2.5 %
		Loss on Ignition (LOI)	IS 1727	0.5 % to 20 %
		Chloride	IS 4032	0.005 % to 1 %
		Alkali Contents	IS 4032	0.01 % to 2 %
		Available Alkali	IS 3812 (Part 1 & Part 2)	1 % to 40 %

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3.	Aggregate	Chloride	IS 4032	0.005 % to 1 %		
		Sulphate	IS 4032	0.01 % to 1 %		
		Organic impurities	IS 2386 (Part 2)	Qualitative		
		Alkali Contents	IS 4032	0.01 % to 2 %		
4.	Concrete	Chloride	IS 14959 IS 4032	0.005 % to 1 %		
		Sulphate	BS 812 (Part 118) IS 2317	0.01 % to 1 %		
		Alkali Contents	IS 4032	0.001 % to 2 %		
5.	Admixture	Dry Material Content	IS 9103	5 % to 50 %		
		Ash content	IS 9103	1 % to 20 %		
		Relative Density	IS 9103	1 to 1.5		
		pH	IS 9103	2 to 12		
		Chloride ion content	IS 6925	0.005 % to 1 %		
		Alkali Contents	IS 4032	0.01 % to 2 %		
II.	WATER					
1.	Construction Water	Acidity-neutralize 100 ml of water using 0.02N NaOH & Phenolphthalein indicator	IS 3025 (Part 22)	0 to 100 mg/l		
		Alkalinity- neutralize 100 ml of water using 0.02N NaOH & Mixed indicator	IS 3025 (Part 23)	5 mg/l to 500 mg/l		
		Organics Solids	IS 3025 (Part 18)	5 mg/l to 300 mg/l		
		Inorganics Solids	IS 3025 (Part 18)	10 mg/l to 8000 mg/l		
		Total Suspended Solids	IS 3025 (Part 17)	10 mg/l to 2000 mg/l		
		Sulphate as SO ₃	IS 3025 (Part 24)	1 mg/l to 500 mg/l		
		Chloride	IS 3025 (Part 32)	5 mg/l to 5000 mg/l		
		pH	IS 3025 (Part 11)	1 to 14		
		2.	Drinking Water	Acidity	IS 3025 (Part 22)	0 to 100 mg/l
				Alkalinity	IS 3025 (Part 23)	5 mg/l to 500 mg/l
Organics Solids	IS 3025 (Part 18)			5 mg/l to 300 mg/l		

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		Inorganics Solids	IS 3025 (Part 18)	10 mg/l to 8000 mg/l
		Total Suspended Solids	IS 3025 (Part 17)	10 mg/l to 2000 mg/l
		Sulphate	IS 3025 (Part 24)	1 mg/l to 500 mg/l
		Chloride	IS 3025 (Part 32)	5 mg/l to 5000 mg/l
		pH	IS 3025 (Part 11)	1 to 14
		Total hardness	IS 3025 (Part 21)	5 mg/l to 7000 mg/l
		Turbidity	IS 3025 (Part 10)	1 NTU to 500 NTU
		Iron	IS 3025 (Part 53)	0.01 mg/l to 5 mg/l
		Fluoride	IS 3025 (Part 60)	0.01 mg/l to 5 mg/l
		Residual Chlorine	IS 3025 (Part 26)	0.01 mg/l to 100 mg/l
		Oil & Grease	IS 3025 (Part 39)	0.01 mg/l to 100 mg/l
		Colour	IS 3025 (Part 04)	Qualitative
		Odour	IS 3025 (Part 05)	Qualitative
		Taste	IS 3025 (Part 07)	Qualitative
		Sodium	IS 3025 (Part 45)	0.01 mg/l to 500 mg/l
		Potassium	IS 3025 (Part 45)	0.01 mg/l to 300 mg/l

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Reinforcement Steel, Structural Steel, Mild Steel, H.T.S Wire, Coupler	Dimension	IS 1786	1 mm to 5000 mm
		Mass/unit length	IS 1786	0.005 kg/m to 16 kg/m
		Tensile strength	IS 1608	1 MPa to 2500 MPa
		Yield stress	IS 1608	1 Mpa to 2000 MPa
		0.2% proof Stress	IS 1608	1 MPa to 2000 MPa
		Reduction in area	IS 1608	1 % to 80 %
		% Elongation	IS 1608	1 % to 50 %
		Bend test	IS 1599	Qualitative Diameter of mandrels: 30.59,35.83,48.06,59.9, 99.87,110.7,125.16, 140.50
		Re bend test	IS 1786	Qualitative Diameter of mandrels: 30.59,43.52,71.87,95.9 3,120.13,150.09,160.3, 191.46
			Ribs Area	IS 1786
	Flattening Test	IS 2329	Qualitative >50 mm	
	Slip Test	IS 16172	0.002 mm to 5 mm	
II.	BUILDING MATERIALS			
1.	Aggregate Coarse	Sieve Analysis	IS 2386 (Part 1)	0.1 % to 100 % (0.075 to 125mm)
		Flakiness Index	IS 2386 (Part 1)	1 % to 60 %
		Elongation Index	IS 2386 (Part 1)	1 % to 60 %

Nitin Gupta
Convenor

Alok Jain
Program Manager

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		Material Finer than 75 Micron IS Sieve	IS 2386 (Part 1)	0.1 % to 10 %
		Clay & Lumps	IS 2386 (Part 2)	0.01 % to 2 %
		Light Weight Pieces (Coal & Lignite)	IS 2386 (Part 2)	0.01 % to 2 %
		Specific Gravity	IS 2386 (Part 3)	0.1 to 3
		Water Absorption	IS 2386 (Part 3)	0.1 % to 10 %
		Bulk Density	IS 2386 (Part 3)	1 kg/l to 3 kg/l
		Impact Value	IS 2386 (Part 4)	1 % to 50 %
		Crushing Value	IS 2386 (Part 4)	1 % to 50 %
		10% Fine value	IS 2386 (Part 4)	1 tonne to 50 tonne
		Abrasion Value - Los Angeles	IS 2386 (Part 4)	1 % to 70 %
		Soundness- Na ₂ SO ₄	IS 2386 (Part 5)	1 % to 30 %
		Soundness- MgSO ₄	IS 2386 (Part 5)	1 % to 30 %
2.	Aggregate Fine	Sieve Analysis	IS 2386 (Part 1)	0.1 % to 100 % (0.075 to 10 mm)
		Material Finer than 75 Micron IS Sieve	IS 2386 (Part 1)	0.5 % to 40 %
		Clay & Lumps	IS 2386 (Part 2)	0.01 % to 2 %
		Clay , Fine Silt & Fine Dust	IS 2386 (Part 2)	0.1 % to 10 %
		Light Weight Pieces (Coal & Lignite)	IS 2386 (Part 2)	0.01 % to 2 %
		Specific Gravity	IS 2386 (Part 3)	0.1 to 3
		Water Absorption	IS 2386 (Part 3)	0.1 % to 10 %
		Bulk Density	IS 2386 (Part 3)	1 kg/l to 3 kg/l
		Bulking	IS 2386 (Part 3)	0.1 % to 20 %
		Soundness- Na ₂ SO ₄	IS 2386 (Part 5)	1 % to 30 %
		Soundness- MgSO ₄	IS 2386 (Part 5)	1 % to 30 %
3	Admixture	Water content	IS 9103 Cl.7.2.5	5 % to 50 %
		Setting time	IS 8142	1 hrs to 20 hrs
		Compressive Strength	IS 516	5 N/mm ² to 80 N/mm ²
		Flexural Strength	IS 516	0.5 N/mm ² to 20 N/mm ²

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		Bleeding Test	IS 9103 Annex D	0.2 % to 20 %
		Slump	IS 1199	25 mm to 300 mm
		Air Content	IS 1199	0.2 % to 20 %
		Loss of Workability	IS 9103 Cl.7.2.1.2	10 to 180 minutes
4.	Bitumen	Specific Gravity	IS 1202	0.5 to 2
		Softening Point	IS 1205	20 °C to 80 °C
		Solubility in Trichloroethylene	IS 1216	5 % to 100 %
5.	Bituminous Mix	Density	ASTM D 2726	1 g/cc to 3 g/cc
		Binder Content	IRC SP-11Appendix 5 Clause C	2 % to 20 %
6.	Bricks (Burnt Clay/Fly Ash)	Dimensions - Burnt Clay Bricks	IS 1077	L: 3500 mm to 4000 mm W: 1600 mm to 1950 mm H: 1600 mm to 1950 mm
		Dimensions - Fly Ash Bricks	IS 12894	L: 4000 mm to 5000 mm W: 2100 mm to 2400 mm H: 1300 mm to 1600 mm
		Compressive Strength	IS 3495 (Part 1)	3 N/mm ² to 30 N/mm ²
		Water Absorption	IS 3495 (Part 2)	5 % to 50 %
		Efflorescence	IS 3495 (Part 3)	Qualitative
7.	Precast Concrete Paving Block	Water Absorption	IS 15658 Annex C	0.1 % to 30 %
		Compressive Strength	IS 15658 Annex D	10 N/mm ² to 80 N/mm ²
8.	Ceramic Tiles	Dimension	IS 13630 (Part 1)	L: 100 mm to 600 mm W: 25 mm to 600 mm T: 2 mm to 20 mm
		Water absorption	IS 13630 (Part 2)	0.005 % to 40 %
		Bulk Density	IS 13630 (Part 2)	1 g/cc to 3 g/cc
		Thermal Shock Resistance	IS 13630 (Part 5)	Qualitative
		Modulus of Rupture	IS 13630 (Part 6)	1 N/mm ² to 100 N/mm ²

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		Scratch Hardness	IS 13630 (Part 13)	1 to 9 Mhos Scale
		Crazing resistance	IS 13630 (Part 9)	Qualitative
		Chemical resistance	IS 13630 (Part 8)	Qualitative
9.	Cement Concrete Flooring Tiles	Water Absorption	IS 1237 Annex B	2 % to 20 %
		Wet Transverse Strength	IS 1237 Annex F	1 N/mm ² to 30 N/mm ²
		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	0.1 % to 5.0 %
10.	Cement (OPC / PPC)	Fineness by Blaine's Air Permeability	IS 4031(Part 2)	50 m ² /kg to 600 m ² /kg
		Soundness by Le-Chatelier Method	IS 4031 (Part 3)	0.1 mm to 10 mm
		Soundness by Autoclave Method	IS 4031 (Part 3)	0.01 % to 2 %
		Standard Consistency	IS 4031 (Part 4)	1 % to 50 %
		Initial Setting Time	IS 4031 (Part 5)	30 minutes to 300 minutes
		Final Setting Time	IS 4031 (Part 5)	60 minutes to 500 minutes
		Compressive Strength	IS 4031 (Part 6)	10 N/mm ² to 70 N/mm ²
		Density	IS 4031 (Part 11)	1 g/cc to 4 g/cc
11.	Fly ash	Fineness by Blaine's Air Permeability	IS 1727	100 m ² /kg to 600 m ² /kg
		Particle Retained on 45 μ Sieve (Wet Sieving)	IS 1727	1 % to 100 %
		Compressive Strength	IS 1727	10 % to 90 %
		Soundness by Autoclave Method	IS 1727	0.01 % to 3 %
		Specific Gravity	IS 1727	1 to 4
		Lime Reactivity	IS 1727	1 N/mm ² to 10 N/mm ²
12.	Silica Fume	Oversized percent retained on 45μm sieve	IS 1727	1 % to 30 %
		Compressive Strength at 7 days as percent	IS 1727	10 % to 95 %

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		of control Sample		
13.	Concrete Block (Hollow/ Solid)	Drying Shrinkage	IS 2185 (Part 1) Annex F	0.01% to 5%
		Moisture Movement	IS 2185 (Part 1) Annex G	0.01% to 5 %
14.	Concrete	Compressive Strength – Hardened (Cube & Core)	IS 516	5 N/mm ² to 80 N/mm ²
		Flexural Strength Hardened	IS 516	5 N/mm ² to 20 N/mm ²
		Water Permeability	Section 1717.7.5 & Appendix 1700-1 MORTH 5 th Revision 2013	1 mm to 50 mm
		Drying Shrinkage	IS 1199	0.01 % to 5 %
		Moisture movement	IS 1199	0.01 % to 5 %
		Rapid Chloride Permeability Test	ASTM C-1202	2 Coulomb to 2000 Coulomb
		Splitting Tensile Strength	IS 5816	0.5 N/mm ² to 20 N/mm ²
		Water Absorption	BS 1881-122	0.1 % to 20 %
III.	SOIL & ROCK			
1.	Soil	Specific Gravity	IS 2720 (Part-3/Sec-1)	1 to 3
		Sieve Analysis	IS 2720 (Part 4)	0.1% to 100 % (0.075 to 19mm)
		Liquid Limit	IS 2720 (Part 5)	1% to 80%
		Plastic Limit	IS 2720 (Part 5)	1% to 50%
		Heavy Compaction	IS 2720 (Part 8)	M.D.D 1 g/cc to 3g/cc OMC 5 % to 50 %
		California Bearing Ratio	IS 2720 (Part 16)	5 % to 80 %
		Free Swell Index	IS 2720 (Part 40)	1 % to 200 %
2.	Bentonite	Specific Gravity	IS 2720 (Part 3 & Sec-1)	1 to 3
		Liquid Limit	IS 2720 (Part 5)	50 % to 800 %
		Plastic Limit	IS 2720 (Part 5)	1 % to 250 %

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		Sand Content	IS 6186 Appendix A9	0.1 % to 20 %
		Free Swell Index	IS 2720 (Part 40)	1 % to 500 %
		Marsh Funnel Viscosity	ASTM D 6910	1 sec to 1200 sec
		pH	IS 2720 (Part 26)	2 to 12
3.	Natural Building Stone	Water absorption	IS 1124	0.01 % to 30 %
		Apparent Specific Gravity	IS 1124	1 to 5
		Apparent Porosity	IS 1124	0.1 to 5
		Compressive strength	IS 1121 (Part 1)	10 N/mm ² to 200 N/mm ²
		Dry Density	IS 13030	1.5 g/cc to 3.5 g/cc
		Moisture Content	IS 13030	0.05 % to 0.5 %
		Resistance to wear	IS 1706	0.2 % to 5 %
		Hardness (Mohs)	IS 13630 (Part 13)	1 to 9 Mhos Scale
		Durability	IS 1126	Qualitative
IV.	PLASTIC & POLYMERS			
1.	Plastic & Polymers	Tensile Strength@ break	IS 13360 (Part 5 & Sec-2 & 3)	1 N to 10000 N
		Elongation % @ break	IS 13360 (Part 5 & Sec-2 & 3)	5 % to 700 %
		Hardness (Shore-A)	IS 13360 (Part 5 & Sec-11)	10 to 100
		Water absorption	IS 15058	0.1 % to 2 %
		Accelerated Extraction Stability in effect of alkalis test (change in hardness and dimension)	IS 15058	0.1 % to 2 %