

Laboratory **Infra Test Investigation and Research Centre, 1st Floor, 174/4, Smart Tower Link Road, Colonels Enclave, Roorkee, District Haridwar, Uttarakhand**

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

Certificate Number **TC-8176**

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Validity **06.12.2018 to 05.12.2020**

Last Amended on --

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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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MECHANICAL TESTING

I.	BUILDING MATERIAL			
1.	Cement	Consistency	IS 4031 (Part 4)	20 % to 40 %
		Initial Setting Time	IS 4031 (Part 5)	5 minute to 500 minute
		Final Setting Time	IS 4031 (Part 5)	30 minute to 700 minute
		Compressive Strength (72 ± 1) Hours (168 ± 2) Hours (672 ± 4) Hours	IS 4031 (Part 6)	5 N/mm ² to 80 N/mm ²
		Soundness by Le-Chatelier method	IS 4031 (Part 3)	0.05 mm to 10 mm
		Soundness by Autoclave method	IS 4031 (Part 3)	0.01 % to 2 %
		Density	IS 4031 (Part 11)	1 g/cc to 4 g/cc
		Fineness by Blaine air permeability	IS 4031 (Part 2)	100 m ² /kg to 600 m ² /kg
		Drying shrinkage	IS 4031 (Part 10)	0.01 % to 1.0 %
2.	Fly ash	Fineness by Blain Method	IS 1727	100 m ² /kg to 600 m ² /kg
		Residue retained on 45 µm (Wet Sieving)	IS 1727	0.1 % to 80 %
		Compressive strength	IS 1727	1 N/mm ² to 60 N/mm ²
		Soundness Autoclave expansion	IS 1727	0.01 % to 2 %
		Specific Gravity	IS 1727	1 to 3
3.	Pozzolonic material (Silica Fume)	Compressive Strength	IS 1727	1 N/mm ² to 60 N/mm ²
		Material retained on 45 µm sieve	IS 1727	1 % to 90 %

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4.	Burnt Clay Brick, Fly ash Brick & Fly ash lime Brick, Acid Resistance Brick, Sewer Brick	Dimension	IS 13757, IS 12894, IS 1077, IS 4885, IS 4860	3000 mm to 5000 mm 1500 mm to 3000 mm 1200 mm to 2000 mm
		Length		
		Width		
		Thickness		
		Water absorption	IS 3495 (Part 2)	1 % to 50 %
Efflorescence	IS 3495 (Part 3)	Qualitative		
Compressive Strength	IS 3495 (Part 1)	1 N/mm ² at 30 N/mm ²		
5.	Coarse Aggregate	Particle Size (Sieve analysis)	IS 2386 (Part 1)	0.1 % to 100 % (75 µm to 125 mm)
		Flakiness Index	IS 2386 (Part 1)	1 % to 50 %
		Elongation Index	IS 2386 (Part 1)	1 % to 50 %
		Deleterious Materials Clay and Lumps	IS 2386 (Part 2)	0.1 % to 30 %
		Specific Gravity	IS 2386 (Part 3)	1 to 4
		Water Absorption	IS 2386 (Part 3)	0.1 % to 6 %
		Bulk Density	IS 2386 (Part 3)	1 kg/L to 3 kg/L
		10 % Fines Value	IS 2386 (Part 4) BS 812 (Part 111)	0.1 Ton to 50 Ton
		Crushing Value	IS 2386 (Part 4)	1.0 % to 50 %
		Impact Value	IS 2386 (Part 4)	1 % to 50 %
		Organic Impurities	IS 2386 (Part 2)	Qualitative
6.	Fine Aggregate	Particle Size (Sieve analysis)	IS 2386 (Part 1)	0.1 % to 100 % (75 µm to 10 mm)
		75 micron passing materials	IS 2386 (Part 1)	0.01% to 6 %
		Deleterious Materials Clay and Lumps	IS 2386 (Part 2)	0.1 % to 30 %
		Specific Gravity	IS 2386 (Part 3)	1 to 4
		Water Absorption	IS 2386 (Part 3)	0.2 % to 6 %
		Bulk density	IS 2386 (Part 3)	1 kg/L to 3 kg/L

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		Bulking	IS 2386 (Part 3)	0.1 % to 15 %
		Organic Impurities	IS 2386 (Part 2)	Qualitative
7.	Concrete Cube, Core, Beam	Compressive strength	IS 516	5 N/mm ² to 80 N/mm ²
		Flexural Strength	IS 516	2 N/mm ² to 10 N/mm ²
8.	Concrete (fresh & harden) Admixture	Slump	IS 1199, IS 9103	1 mm to 300 mm
		Test for bleeding	IS 9103	0.2 % to 10 %
9.	Hollow and Solid Autoclave Aerated Concrete Block (AAC)	Block Density	IS 2185 (Part 1) IS 2185 (Part 2) IS 2185 (Part 4) IS 6441 (Part 1)	10 kg/m ³ to 3000 kg/m ³
		Compressive Strength	IS 6441 (Part 5) IS 2185 (Part 1) IS 2185 (Part 2) IS 2185 (Part 4)	1 N/mm ² to 50 N/mm ²
		Water absorption	IS 2185 (Part 1) IS 2185 (Part 2) IS 2185 (Part 4)	2 % to 20 %
		Dimension Length Width Thickness	IS 2185 (Part 1) IS 2185 (Part 2) IS 2185 (Part 3) IS 2185 (Part 4)	200 mm to 600 mm 200 mm to 400 mm 20 mm to 200 mm
10.	Concrete Block for Paving (Paver Block)	Compressive Strength	IS 15658	5 N/mm ² to 75 N/mm ²
		Water Absorption	IS 15658	0.2 % to 20 %
		Visual inspection	IS 15658	Qualitative
		Dimension Length Width Thickness	IS 15658	100 mm to 300 mm 100 mm to 300 mm 40 mm to 120 mm
		Aspect Ratio (L/T)	IS 15658	1 mm to 10 mm
		Arris / Chamfer Depth	IS 15658	1 mm to 10 mm
		Arris / Chamfer Width	IS 15658	1 mm to 10 mm

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		Thickness of Wearing Layer	IS 15658	1 mm to 100 mm
		Plan Area (A _{SP})	IS 15658	0.001 m ² to 10 m ²
		Wearing Face Area (A _{SW})	IS 15658	0.001 m ² to 10 m ²
		Squareness	IS 15658	1 mm to 50 mm
		Flexural Strength / Breaking Load	IS 15658	1 N/mm ² to 10 N/mm ²
11.	Glazed Tile, Unglazed Tile, Vitrified Tile, Vitreous Acid Resistance Tiles	Dimension (Length, Width, Thickness)	IS 13630 (Part 1) IS 15622, IS 4457	100 mm to 1000 mm
		Modulus of rupture	IS 13630 (Part 6)	1 N/mm ² to 80 N/mm ²
		Breaking Strength	IS 13630 (Part 6), IS 4457	10 N to 8000 N
		Scratch Hardness	IS 13630 (Part 13)	1 Mohs to 9 Mohs
12.	Cement Concrete Flooring Tiles	Dimension Length Width Thickness	IS 1237	20 mm to 500 mm 10 mm to 500 mm 2 mm to 25 mm
		Flatness of tile surface	IS 1237	0.01 mm to 10 mm
		Perpendicularity	IS 1237	0.01 % to 10 %
		Straightness	IS 1237	0.01 % to 10 %
		Water absorption	IS 1237	0.01 % to 25 %
		Wet Transverse strength	IS 1237	0.01 N/mm ² to 20 N/mm ²
		Thickness of wearing layer	IS 13801	0.01 mm to 15 mm
13.	Chequered Cement Concrete Tiles	Dimension Length Width Thickness	IS 13801	20 mm to 500 mm 10 mm to 500 mm 2 mm to 25 mm
		Flatness of tile surface	IS 13801	0.01 mm to 10 mm
		Perpendicularity	IS 13801	0.01 % to 10 %

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		Straightness	IS 13801	0.01 % to 10 %
		Water absorption	IS 13801	0.01 % to 25 %
		Wet Transverse strength	IS 13801	0.01 N/mm ² to 20 N/mm ²
		Thickness of wearing layer	IS 13801	0.01 mm to 15 mm
14.	Bentonite	Sand content	IS 6186	0.1 % to 60 %
		Density	IS 2911 (Part 1, Section 2)	1 g/cc to 5 g/cc
		Marsh Viscosity	ASTM D 6910	10 s to 300 s
		Liquid Limit	IS 2720 (Part 5)	> 100 %
		Free Swell Index	IS 2720 (Part 40)	10 % to 700 %
15.	Bitumen & Allied Material, Modified Bitumen, PMB, CRMB, NRMB	Penetration	IS 1203	10 to 200 (1/10 th mm)
		Softening point	IS 1205	25 °C to 100 °C
		Ductility	IS 1208	1 cm to 100 cm
		Flash point	IS 1209	100 °C to 400 °C
		Fire point	IS 1209	100 °C to 400 °C
		Solubility in Trichloroethylene	IS 1216	10 % to 100 %
		Loss on heating	IS 1212	0.05 % to 5 %
		Specific gravity	IS 1202	0.5 g/cc to 5.0 g/cc
16.	Bitumen Mix Material	Gradation (Sieving)	IS 2386 (Part 1)	0.1 % to 100 %
		Binder/Bitumen content	ASTM D 2172	1 % to 50 %
		Density	ASTM D 2726	1 g/cc to 4 g/cc
		Marshal stability	ASTM D 6927	500 kg to 3000 kg
II.	SOIL & ROCK			
1.	Soil Earthwork Sub Grade Sub Base	Free Swell Index	IS 2720 (Part 40)	0.1% to 50%
		Grain size analysis (Sieve Analysis)	IS 2720 (Part 4)	0.1 % to 100 % (75 µm to 100 mm)

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	Non Bituminous, GSB, WBM, WMM	Moisture Content	IS 2720 (Part 2)	0.01% to 30.0%
		Bulk Density	IS 2720 (Part 3)	1g/cc to g/cc
		Shrinkage Limit	IS 2720 (Part 6)	5% to 80%
		Specific Gravity	IS 2720 (Part 3/ Sec-2)	1 to 4
		Heavy Compaction	IS 2720 (Part 8) IS 2720 (Part 2)	MDD: 0 to 6 g/cc OMC: 0 to 70 %
		Light Compaction	IS 2720 (Part 7) IS 2720 (Part 2)	MDD: 0 to 6 g/cc OMC: 0 to 70 %
		CBR	IS 2720 (Part 16)	1 % to 50 %
		Liquid and Plastic Limit	IS 2720 (Part 5)	0 to 70 %
		2.	Natural Stone	Specific Gravity
Apparent Specific Gravity	IS 1124			1.0 to 5.0
Compressive Strength	IS 1121 (Part 1)			50 N/mm ² to 800 N/mm ²
Moisture Content	IS 1124			0.01 % to 10 %
Water absorption	IS 1124			0.01 % to 30 %
Scratch Hardness	IS 13630 (Part 13)			1 Mohs to 9 Mohs
Transverse Strength	IS 1121 (Part 2)			5 N/mm ² to 50 N/mm ²
Durability	IS 1126			Qualitative
Porosity (True and Apparent)	IS 1124			0.1 % to 50 %
Tensile strength	IS 1121 (Part 3)			20 kg/cm ² to 500 kg/cm ²
Resistance to wear	IS 1706			0.1 mm to 10.0 mm

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AT- SITE				
I.	SOIL AND ROCK			
1.	Soil Earthwork	Field density by Core cutting method	IS 2720 (Part 29)	0.5 g/cc to 5 g/cc
	Sub Grade	Field density by Sand replacement method	IS 2720, (Part 28)	0.5 g/cc to 5 g/cc
	Sub Base	Standard Penetration	IS 2131	1 N to 100 N
	Non Bituminous, GSB, WBM, WMM			

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<u>NON-DESTRUCTIVE TESTING</u>				
AT SITE				
1.	BUILDING MATERIAL			
1.	Reinforced Concrete Structure	Compressive Strength (Rebound Hammer)	IS 13311(Part 2)	10 N/mm ² to 70 N/mm ²
2.	Cement concrete/ Structural Member	Ultra Sonic Pulse Velocity	IS 13311(Part 1)	1.0 km/s to 6 km/s
		Carbonation Test	BS 1881 (Part 201)	Qualitative