

Laboratory **Marshal Geo Test Laboratory, P.S. City Road, Chhatrawas  
Khubchand Baghel Ward, Ring Road-1, Raipur, Chhattisgarh**

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

Certificate Number **TC-6402**

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Validity **12.10.2017 to 11.10.2019**

Last Amended on **01.02.2019**

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.	<b>BUILDING MATERIALS</b>			
<b>1.</b>	<b>Cement (OPC/PPC/PSC)</b>	Standard Consistency	IS 4031 (Part 4)	20 % to 40 %
		Initial Setting Time	IS 4031 (Part 5)	30 minutes to 300 minutes
		Final Setting Time	IS 4031 (Part 5)	100 minutes to 600 minutes
		Compressive Strength	IS 4031 (Part 6)	5 N/mm <sup>2</sup> to 70 N/mm <sup>2</sup>
		Soundness (auto clave)	IS 4031 (Part 3)	0.01 % to 10 %
		Soundness (Le-Chatelier)	IS 4031 (Part 3)	0.50 mm to 10 mm
		Fineness by Specific surface area by Blaine	IS 4031 (Part 2)	100 m <sup>2</sup> /kg to 500 m <sup>2</sup> /kg
		Fineness by Sieving	IS 4031 (Part 2)	0.005 % to 1.0 %
<b>2.</b>	<b>Harden Concrete</b>	Compressive Strength	IS 516	5 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup>
		Flexural strength	IS 516	2.5 N/mm <sup>2</sup> to 8 N/mm <sup>2</sup>
<b>3.</b>	<b>Concrete Paver block</b>	Compressive Strength	IS 15658	5 N/mm <sup>2</sup> to 80 N/mm <sup>2</sup>
		Water absorption	IS 15658	1 % to 25 %
		Resistance to wear	IS 15658	4000 mm <sup>3</sup> to 15000 mm <sup>3</sup>
<b>4.</b>	<b>Burnt clay ,Bricks &amp; Fly ash bricks</b>	Compressive Strength	IS 3495 (Part 1)	1 N/mm <sup>2</sup> to 25 N/mm <sup>2</sup>
		Water Absorption	IS 3495 (Part 2)	1 % to 50 %
		Efflorescence	IS 3495 (Part 3)	Qualitative
<b>5.</b>	<b>Coarse Aggregate</b>	Sieve Analysis	IS 2386 (Part 1)	2.36 mm to 63 mm
		Water absorption	IS 2386 (Part 3)	0.1 % to 15%
		Specific Gravity	IS 2386 (Part 3)	2 to 4
		Flakiness Index	IS 2386 (Part 1)	5 % to 60 %
		Elongation Index	IS 2386 (Part 1)	5 % to 60 %
		Crushing Value	IS 2386 (Part 4)	5 % to 50 %
		Impact Value	IS 2386 (Part 4)	5 % to 50 %
		Los angles abrasion value	IS 2386 (Part 4)	5 % to 50 %
		Bulk Density	IS 2386 (Part 3)	1 g/cc to 3 g/cc

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		Deleterious Material	IS 2386 (Part 2)	0.01 % to 5 %
6.	Fine Aggregate	Sieve Analysis	IS 2386 (Part 1)	0.075 mm. to 4.75 mm.
		Water absorption	IS 2386 (Part 3)	0.1 % to 15 %
		Specific Gravity	IS 2386 (Part 3)	2 to 4
		Bulk Density	IS 2386 (Part 3)	1 g/cc to 3 g/cc
7.	Bitumen	Ductility at 25 °C	IS 1208	5 cm to 100 cm
		Softening point	IS 1205	10 <sup>0</sup> C to 100 <sup>0</sup> C
		Penetration at 25 <sup>0</sup> C	IS 1203	0.1 mm to 8 mm
8.	Bituminous Concrete Mix	Binder Content	IRC SP 11	0.5 % to 20 %
II.	<b>METAL &amp; METAL ALLOYS</b>			
1.	Reinforcement Steel	Ultimate Tensile Strength	IS 1608	200 N/mm <sup>2</sup> to 800 N/mm <sup>2</sup>
		Yield Stress	IS 1608	200 N/mm <sup>2</sup> to 700 N/mm <sup>2</sup>
		% of Elongation	IS 1786	2 % to 45 %
		Mass per Meter	IS 1786	0.222 Kg/m to 10 Kg/m
		Bend Test	IS 1599	Mandrel Size (mm) 16,20,24,30,32,36 40,48,50,60,64,75, 80,100,125,128,150 & 192
		Re-Bend Test (Reinforcement steel)	IS 1786	Mandrel Size (mm) 32,40, 56,60,70,72,84, 96,112,120,140,160,175, 192,224,& 256
III.	<b>SOIL &amp; ROCK</b>			
1.	Soil	Moisture Content	IS 2720 (Part 2)	1 % to 40 %
		Liquid Limit	IS 2720 (Part 5)	10 % to 90 %
		Plastic Limit	IS 2720 (Part 5)	5 % to 60 %
		Specific Gravity	IS 2720 (Part 3/Sec 2)	2 to 4
		Grain Size Analysis	IS 2720 (Part 4)	10 mm to 75 micron
		Free Swell Index	IS 2720 (Part 40)	1 % to 200 %

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		Direct Shear Test	IS 2720 (Part 13)	C: 0.1 to 3.0 Kg/Sq.cm Φ: 1 to 45
		Tri-axial Test (UU)	IS 2720 (Part 11)	C : Up to 3.0 kg/cm <sup>2</sup> Ø : 5 ° to 40°
		Light Compaction	IS 2720 (Part 7)	MDD:0.5 g/cc to 2.5 g/cc OMC: 5 % to 40 %
		Heavy Compaction	IS 2720 (Part 8)	MDD: 1.2 g/cc to 3 g/cc OMC: 4 % to 30 %
		CBR	IS 2720 (Part 16)	1 % to 60 %
<b>2.</b>	<b>Rock</b>	Unconfined compressive strength	IS 9143	1 N/mm <sup>2</sup> to 200 N/mm <sup>2</sup>

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**NON - DESTRUCTIVE TESTING**

I.	<b>BUILDING MATERIALS - REINFORCED CONCRETE STRUCTURES</b>			
<b>1.</b>	<b>Rebound Hammer Test</b>			
<b>a.</b>	<b>Concrete Cube</b>	Rebound Hammer	IS 13311 (Part 2)	10 N/mm <sup>2</sup> to 100 N/mm <sup>2</sup>
<b>b.</b>	<b>RCC Structures</b>	Rebound Hammer	IS 13311 (Part 2)	10 N/mm <sup>2</sup> to 100 N/mm <sup>2</sup>
<b>c.</b>	<b>PCC Structures</b>	Rebound Hammer	IS 13311 (Part 2)	10 N/mm <sup>2</sup> to 100 N/mm <sup>2</sup>
<b>2.</b>	<b>Ultrasonic Pulse Velocity Tests</b>			
<b>a.</b>	<b>Concrete Cube</b>	Ultrasonic Pulse Velocity	IS 13311 (Part 1)	1 km/sec to 10 km/sec
<b>b.</b>	<b>RCC Structures</b>	Ultrasonic Pulse Velocity	IS 13311 (Part 1)	1 km/sec to 10 km/sec
<b>c.</b>	<b>PCC Structures</b>	Ultrasonic Pulse Velocity	IS 13311 (Part 1)	1 km/sec to 10 km/sec