Laboratory	**Laboratory Division - Dr. Ghuman and Gupta Geotech Consultants, F-81, Industrial Focal Point, Phase-VII, (SAS) Nagar, Mohali, Punjab**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-5045**	**Page 1 of 9**	
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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

CHEMICAL TESTING

I.	**BUILDING MATERIAL**			
1.	**OPC**	Aluminium Oxide	IS 4032:1985 (RA2014) Cl 4.6.2	0.5 % to 10 %
		Calcium Oxide	IS 4032:1985 (RA2014) Cl 4.7.2	0.1 % to 70 %
		Insoluble Residue	IS 4032:1985 (RA2014) Cl 4.10	0.5 % to 15 %
		Iron Oxide	IS 4032:1985 (RA2014) Cl 4.5.2	0.1 % to 10 %
		Loss on Ignition	IS 4032:1985 (RA2014) Cl 4.2	0.5 % to 10 %
		Magnesium Oxide	IS 4032:1985 (RA2014) Cl 4.8.2	0.1 % to 10 %
		Silica	IS 4032:1985 (RA2014) Cl 4.3	0.5 % to 30 %
		Sulphuric anhydride as SO_3	IS 4032:1985 (RA2014) Cl 4.9	0.1 % to 5 %
2.	**PPC**	Insoluble Residue	IS 4032:1985 (RA2014) Cl 7.4 & 4.10	5.0 % to 60 %
		Loss on Ignition	IS 4032:1985 (RA2014) Cl 7.1 & 4.2	0.5 % to 10 %
		Magnesium Oxide	IS 4032:1985 (RA2014) Cl 7.2.2	0.5 % to 15 %
		Sulphuric anhydride as SO_3	IS 4032:1985 (RA2014) Cl 7.3 & 4.9	0.1 % to 5 %
		Calcium Oxide	IS 4032:1985 (RA2014) Cl 4.7.2	1.0 % to 70 %

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II.	**METALS AND ALLOYS**			
1.	**Low Alloy Steel & Plain Carbon Steel**	Carbon	IS 228 (Part 1): 1987 (RA 2012)	0.05 % to 2.5 %
		Sulphur	IS 228 (Part 9): 1987 (RA 2014)	0.01 % to 0.30 %
		Phosphorus	IS 228 (Part 3): 1987 (RA 2012)	0.01 % to 1.0 %
		Manganese	IS 228 (Part 2): 1987 (RA 2012)	0.10 % to 5.0 %
III.	**WATER**			
1.	**Construction Water**	pH value	IS 3025 (Part 11): 1983 (RA 2012)	1 to 14
		Chloride as Cl	IS 3025 (Part 32): 1988 (RA 2014)	1.0 mg/L to 5000 mg/L
		Sulphate (as SO_3)	IS 3025 (Part 24): 1986 (RA 2014)	1.0 mg/L to 2000 mg/L
		Acidity	IS 3025 (Part 22): 1986 (RA 2014)	0.1 mL to 200 mL
		Alkalinity	IS 3025 (Part 22): 2003 (RA 2014)	0.1 mL to 250 mL
		Organic Solids	IS 3025 (Part 18): 1984 (RA 2012)	1.0 mg/L to 2000 mg/L
		Inorganic Solids	IS 3025 (Part 18): 1984 (RA 2012)	1.0 mg/L to 10000 mg/L
		Suspended Matter	IS 3025 (Part 17): 1984 (RA 2012)	1.0 mg/L to 4000 mg/L
2.	**Drinking Water**	PH value	IS 3025 (Part 11): 1983 (RA 2012)	1 to 14

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		Colour (Hazen)	IS 3025 (Part 4): 1983	1 Hazen Unit to
			(RA 2012)	50 Hazen Unit
		Odour	IS 3025 (Part 5): 1983 (RA 2012)	Qualitative
		Turbidity	IS 3025 (Part 10): 1984 (RA 2012)	1 NTU to 1000 NTU
		Total Dissolved Solids	IS 3025 (Part 16): 1984 (RA 2012)	1.0 mg/L to 5000 mg/L
		Calcium (as Ca)	IS 3025 (Part 40): 1991 (RA 2014)	1.0 mg/L to 2000 mg/L
		Chloride (as Cl)	IS 3025 (Part 32): 1988 (RA 2014)	1.0 mg/L to 2000 mg/L
		Total Alkalinity (As $CaCO_3$)	IS 3025 (Part 23): 1986 (RA 2014)	1.0 mg/L to 2000 mg/L
		Total Hardness (As $CaCO_3$)	IS 3025 (Part 21): 2009 (RA 2014)	1 mg/L to 3000 mg/L
		Magnesium	IS 3025 (Part 46): 1994 (RA 2014)	5 mg/L to 400 mg/L
		Sulphate	IS 3025 (Part 24): 1986 (RA 2014)	5 mg/L to 600 mg/L

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MECHANICAL TESTING

I.	**MECHANICAL PROPERTIES OF METALS**			
1.	**High Strength TMT Bars**	Weight per meter	IS 1786:2008 (RA 2013)	0.250 kg/m to 7.0 kg/m (1 mm to 1000mm/1mm) (10 gm to 3.0 kg)
		Tensile Strength	IS 1608:2005 (RA 2011)	150 N/mm^2 to 1000 N/mm^2 (20 to 950 KN/0.2 KN) (10-200 mm)
		Yield Strength	IS 1608:2005 (RA 2011)	150-1000 N/mm^2 (20-950 KN/0.2 KN) (10-200 mm)
		0.2% Proof Stress	IS 1608:2005 (RA 2011)	150 to 1000 N/mm^2 (20-950 KN/0.2 KN) (10-200 mm)
		Elongation	IS 1608:2005 (RA 2011)	5 % to 50 % (10-200 mm)
		Bend Test Fe 500 and Fe 500 D	IS 1599:2012	Qualitative-Visual angle at 180^0 Bar size 8 mm to 32 mm (Mandrel Size in mm) 24, 30, 32, 36, 40, 48, 60, 64, 80, 100, 112,125,128, 140,160
		Total Elongation (Fe 500 D)	IS 1608:2005 (RA 2011)	1 % to 25 %
		Rebend Test Fe 500 and Fe 500 D	IS 1786:2008 (RA 2013)	Qualitative-Visual angle at 180^0 Bar size 8 mm to 32 mm (Mandrel Size in mm) 32, 40, 50, 72, 84, 96, 112, 120, 140, 150, 168,

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II.	**BUILDING MATERIALS**			
1.	**Cement**	Fineness Dry Sieving method	IS 4031 (Part 1): 1996 (RA 2016)	0.1 % to 20 %
		Fineness Blaine air permeability method	IS 4031 (Part 2): 1999 (RA 2013)	100 m^2/Kg to 450 m^2/Kg
		Soundness Le-chatelier method	IS 4031 (Part 3): 1988 (RA 2014)	0.5 mm to 7 mm
		Soundness Autoclave method	IS 4031 (Part 3): 1988 (RA 2014)	0.01 % to 1.0 %
		Setting time (Initial)	IS 4031 (Part 5): 1988 (RA 2014)	10 minutes to 250 minutes
		Setting time (Final)	IS 4031 (Part 5): 1988 (RA 2014)	10 minutes to 650 minutes
		Compressive Strength	IS 4031 (Part 6): 1988 (RA 2014)	7 N/mm^2 to 75 N/mm^2
		Consistency	IS 4031 (Part 4): 1988 (RA 2014)	20 % to 45 %
		Density (specific gravity)	IS 4031 (Part 11):1988 (RA 2014	1.5 to 3.20
2.	**Bricks**	Dimensions Length (20 Bricks)	IS 1077:1992 (RA 2016)	3500 mm to 5000 mm
		Dimensions Width (20 Bricks)	IS 1077:1992 (RA 2016)	1500 mm to 2400 mm
		Dimensions Height (20 Bricks)	IS 1077:1992 (RA 2016)	1000 mm to 1600 mm
		Compressive Strength	IS 3495 (Part 1): 1992 (RA 2016)	5 to 45 N/mm^2 (60 KN to 2000KN/0.1KN)
		Water absorption (20 gm – 30 Kg/2g)	IS 3495 (Part 2): 1992 (RA 2016)	5 % to 40 %
		Efflorescence	IS 3495 (Part 3): 1992 (RA 2016)	Qualitative

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3.	**Coarse Aggregate**	Sieve Analysis	IS 2386 (Part 1): 1963 (RA 2016)	0.1 % to 100 % (Sieve size in mm 80, 63,40,20,10,4.75, 2.36)
		Impact value	IS 2386 (Part 4): 1963 (RA2016)	5 % to 60 %
		Crushing Value	IS 2386 (Part 4): 1963 (RA2016)	5 % to 50 %
		Flakiness Index	IS 2386 (Part 1): 1963 (RA 2016)	5 % to 60 %
		Elongation Index	IS 2386 (Part 1): 1963 (RA 2016)	5 % to 60 %
		Abrasion Value	IS 2386 (Part 4): 1963 (RA2016)	5 % to 60 %
		Specific Gravity	IS 2386 (Part 3): 1963 (RA 2016)	1.5 to 3.50
		Water Absorption (20 gm to 30 Kg/2g)	IS 2386 (Part 3): 1963 (RA 2016)	0.1 % to 10 %
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2016)	1.0 kg/L to 2.5 kg/L
		Soundness	IS 2386 (Part 5): 1963 (RA 2016)	0.1 % to 30 %
		Deleterious Material Clay Lumps & Soft Fragments	IS 2386 (Part 2): 1963 (RA 2016)	0 to 2 %
		Coal & Lignite	IS 2386 (Part 2): 1963 (RA 2016)	0 to 2 %
		Determination of material Finer than 75micron IS sieve	IS 2386 (Part 1): 1963 (RA 2016)	0 to 20 %
		10% Fines Value	IS 2386 (Part 4): 1963 (RA 2016)	100 KN to 400 KN

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
4.	**Fine Aggregate**	Sieve Analysis	IS 2386 (Part 1I): 1963 (RA 2016)	0.1 to 100% Sieve size 10mm, 4.75mm, 2.36mm, 1.18mm, 600mic, 300mic, 150mic
		Specific Gravity	IS 2386 (Part 3): 1963 (RA 2016)	1.5 to 3.20
		Water Absorption	IS 2386 (Part 3): 1963 (RA 2016)	0.1 % to 15 %
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2016)	1.0 kg/L to 2.6 kg/L
		Soundness	IS 2386 (Part 5): 1963 (RA 2016)	0.1 % to 45 %
		Deleterious Materials Clay Lumps	IS 2386 (Part 2): 1963 (RA 2016)	0 to 2 %
		Coal & Lignite	IS 2386 (Part 2): 1963 (RA 2016)	0 to 2 %
		Determination of material Finer than 75micron IS sieve	IS 2386 (Part 1): 1963 (RA 2016)	0 to 30 %
		Organic Impurities	IS 2386 (Part 2): 1963 (RA 2016)	Qualitative
5.	**Concrete**	Compressive Strength	IS 516:1959 (RA 2013)	5 N/mm^2 to 75 N/mm^2 (60 KN to 2000 KN/0.1 KN)
		Slump	IS 1199:1959 (RA 2013)	5.0 to 300 mm
6.	**Paver Block**	Dimensions	IS 15658:2006 (RA 2017)	40 to 300 mm
		Compressive Strength	IS 15658:2006 (RA 2017)	10 to 70 N/mm^2 (60 KN to 2000 KN/0.1 KN)
		Water Absorption	IS 15658:2006 (RA 2017)	0.5 % to 15 %
7.	**Bitumen**	Penetration (Tenths of a Millimetre)	IS 1203:1978 (RA 2013)	20 to 120(1/10mm)
		Softening Point	IS 1205:1978 (RA 2013)	30 °C to 90 °C

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III.	**SOIL & ROCK**			
1.	**Soil, Granular Material & Bentonite Clay**	Liquid Limit	IS 2720 (Part 5): 1985 (RA 2015)	10 % to 60 %
		Plastic Limit	IS 2720 (Part 5): 1985 (RA 2015)	10 % to 60 %
		Plasticity Index	IS 2720 (Part 5): 1985 (RA 2015)	1 % to 30 %
		Light Compaction Test.	IS 2720 (Part 7): 1980 (RA 2016)	MDD: 1.5 g/cc to 2.5 g/cc OMC: 5 % to 20 %
		Heavy Compaction Test	IS 2720 (Part 8): 1983 (RA 2015)	MDD 1.5 g/cc to 2.5 g/cc OMC 5 % to 20 %
		CBR (Soaked)	IS 2720 (Part 16): 1987 (RA 2016)	0.2 % to 40 %
		Water Content	IS 2720 (Part 2): 1973 (RA 2015)	1 % to 40 %
		Specific gravity	IS 2720 (Part 3): 1980 (RA 2016)	1.5 to 3.0
		Grain size distribution (4.75 mm to 0.002 mm)	IS 2720 (Part 4): 1985 (RA 2015)	0.1 % to 100 %
		Free Swell Index	IS 2720 (Part 40): 1977 (RA 2016)	Upto 30 %
		Shrinkage Index	IS 2720 (Part 6): 1972 (RA 2016)	10.0 % to 60 %

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NON – DESTRUCTIVE TESTING

I.	**BUILDING MATERIAL- REINFORCED CONCRETE STRUCTURES**			
1.	**Reinforced Concrete Structures/ Cement Concrete Structural Members**	Compressive Strength Rebound Hammer	IS 13311 (Part 2): 1992 (RA 2013)	20 RN to 60 RN (Approx. strength 12 N/mm^2 to 50 N/mm^2)

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