Laboratory	**V&G Industrial Testing Laboratories Pvt. Ltd., Plot No. 323 G Industrial Area Baikampady, Mangalore, Karnataka**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Discipline	**Mechanical Testing**	**Issue Date**	**24.05.2015**
Certificate Number	**T-2406**	**Valid Until**	**23.05.2017**
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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I.	**MECHANICAL PROPERTIES OF MATERIALS**			
1.	**Steel**	Tensile Strength	IS 1608: 2005 IS 3600 (Part3): 2009 IS 3600 (Part4): 1984 ASTM A-370: 2014 ASME (Sec IX)	150 N/mm^2 to 1300 N/mm^2
		Yield Stress	IS 1608: 2005 IS 3600 (Part3): 2009 ASTM A-370: 2014	150 N/mm^2 to 1100 N/mm^2
		Elongation	IS 1608: 2005 ASTM A-370: 2014	0.5 % to 60 %
		Mass Per Meter	IS 1786: 2008	0.050 kg to 10 kg
		Bend Test	IS 1786: 2008 IS 3600 (Part 5 & 6): 1983 IS 1599: 2012 ASME (Sec IX)	Qualitative (Mandrel Dia.: 12, 16, 20, 18, 24, 32, 44, 50, 64, 80, 100, 125, 150 & 175 mm)
		Re-Bend Test	IS 1786: 2008	Qualitative (Mandrel Dia.: 12, 16, 20, 18, 24, 32, 44, 50, 64, 80, 100, 125, 150 & 175 mm)
		Vickers Hardness	IS 1501: 2013	25 HV to 800 HV
		Brinell Hardness (HB)	IS 1500: 2013	100 HBW to 600 HBW
		Fracture Test	ISO 9017: 2001(E) IS 3600 (Part8): 1985 ASME (Sec IX)	Qualitative

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	Steel	Macro etch test	IS 3600 (Part9): 1985 ASME (Sec IX- QW472.4)	Qualitative
II.	**BUILDING MATERIALS**			
1.	**Cement**	Density	IS 4031 (Part 11): 1988 (RA 2014)	2 g/cc to 3.5 g/cc
		Consistency	IS 4031 (Part 4): 1988 (RA 2014)	10 % to 50 %
		Fineness Blaine	IS 4031 (Part 2): 1999 (RA 2013)	100 m^2/kg to 600 m^2/kg
		Setting Time i) Initial ii) Final	IS 4031 (Part 5): 1988 (RA 2014)	5 minute to 900 minute
		Compressive Strength	IS 4031 (Part 6): 1988 (RA 2014)	10 N/mm^2 to 100 N/mm^2
		Soundness (Le-chatelier)	IS 4031 (Part 3): 1988 (RA 2014)	0.5 mm to 20 mm
		Soundness (Autoclave)	IS 4031 (Part 3): 1988 (RA 2014)	0.02 % to 1 %
2.	**Coarse Aggregate**	Sieve Analysis	IS 2386 (Part 1): 1963 (RA 2011)	0.05 % to 100 %
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2011)	1 kg/l to 2 kg/l
		Abrasion Value	IS 2386 (Part 4): 1963 (RA 2011)	1.0 % to 60 %
		Crushing Value	IS 2386 (Part 4): 1963 (RA 2011)	1.0 % to 60 %
		10% Fines Value	IS 2386 (Part 1): 1963 (RA 2011)	2 Ton to 50 Ton
		Impact Value	IS 2386 (Part 4): 1963 (RA 2011)	1.0 % to 60 %
		Soundness a) With Na_2SO_4 b) With $MgSO_4$	IS 2386 (Part 5): 1963 (RA 2011)	 0.5 % to 30 % 0.5 % to 30 %

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	Coarse Aggregate	Flakiness Index	IS 2386 (Part 1): 1963 (RA 2011)	1.0 % to 100 %
		Elongation Index	IS 2386 (Part 1): 1963 (RA 2011)	1.0 % to 100 %
		Water Absorption	IS 2386 (Part 3): 1963 (RA 2011)	0.01 % to 20 %
		Specific Gravity	IS 2386 (Part 3): 1963 (RA 2011)	2.0 to 4.0
		Deleterious Material	IS 2386 (Part 2): 1963 (RA 2011)	
		a) Finer than 75 µ IS Sieve		0 to 5 %
		b) Clay Lumps		0 to 2 %
		c) Coal & Lignite		0 to 2 %
3.	**Fine Aggregate**	Sieve Analysis	IS 2386 (Part 1): 1963 (RA 2011)	0.05 % to 100 %
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2011)	1 kg/l to 2 kg/l
		Soundness	IS 2386 (Part 5): 1963 (RA 2011)	
		a) With Na_2SO_4		0.5 % to 30 %
		b) With $MgSO_4$		0.5 % to 30 %
		Water Absorption	IS 2386 (Part 3): 1963 (RA 2011)	0.01 % to 20%
		Specific Gravity	IS 2386 (Part 3): 1963 (RA 2011)	2.0 to 4.0
		Deleterious Material	IS 2386 (Part 2): 1963 (RA 2011)	
		a) Finer than 75 µ IS Sieve		0 to 5 %
		b) Clay Lumps		0 to 2 %
		c) Coal & Lignite		0 to 2 %
		Organic Impurities	IS 2386 (Part 2): 1963 (RA 2011)	Qualitative
		Silt Clay and fine Dust	IS 2386 (Part 2): 1963 (RA 2011)	0 to 20 %

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4.	**Fly-Ash**	Specific Gravity	IS 1727: 1967 (RA 2013)	1.0 to 3.0
		Soundness by (Autoclave)	IS 1727: 1967 (RA 2013)	0.02 % to 1 %
		Particle retained on 45 µm	IS 1727: 1967 (RA 2013)	0.05 % to 40 %
		Fineness (Specific Surface) Blaine's	IS 1727: 1967 (RA 2013)	200 m^2/kg to 600 m^2/kg
5.	**Building Bricks**	Compressive Strength	IS 3495 (Part 1): 1992 (RA 2011)	10 m^2/kg to 300 kg/cm^2
		Water Absorption	IS 3495 (Part 2): 1992 (RA 2011)	1 % to 30 %
		Efflorescence	IS 3495 (Part 3): 1992 (RA 2011)	Qualitative
		Dimension :Length :Width :Height	IS 3495 (Part 4): 1992 (RA 2011)	100 mm to 5000 mm 100 mm to 3000 mm 100 mm to 2000 mm
6.	**Concrete**	Compressive Strength	IS 516: 1959 (RA 2013)	1 N/mm^2 to 65 N/mm^2
III.	**SOIL & ROCK**			
1.	**Soil**	Light Compaction	IS 2720 (Part 7): 1980 (RA 2011)	1 g/cc to 3 g/cc 1 % to 30 %
		Heavy Compaction	IS 2720 (Part 5): 1985 (RA 2010)	1 g/cc to 3 g/cc 1 % to 30 %
		CBR Value	IS 2720 (Part 16): 1987 (RA 2011)	1 % to 50 %

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