

Laboratory **Structwel Designers and Consultants Pvt. Ltd., "Structwel",
Plot No. 15, Sector-24, Off. Sion-Panvel Highway, Turbhe,
Navi Mumbai, Maharashtra**

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

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Validity **19.12.2016 to 18.12.2018** **Last Amended on 17.03.2017**

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CHEMICAL TESTING

I. BUILDING MATERIALS				
1.	Cement			
a.	OPC	Loss on Ignition	IS: 4032 :1985 Reaffirmed 2014	1.0 % to 10.0 %
		Silica (SiO ₂)	IS: 4032 :1985 Reaffirmed 2014	15 % to 30 %
		Ferric oxide (Fe ₂ O ₃)	IS: 4032 :1985 Reaffirmed 2014	3.0 % to 10 %
		Aluminum oxide (Al ₂ O ₃)	IS: 4032 :1985 Reaffirmed 2014	3.0 % to 10 %
		Calcium oxide (CaO)	IS: 4032 :1985 Reaffirmed 2014	40 % to 70 %
		Magnesia (MgO)	IS: 4032 :1985 Reaffirmed 2014	1.0 % to 10 %
		Sulphuric Anhydride (SO ₃)	IS: 4032 :1985 Reaffirmed 2014	1.0 % to 5.0 %
		Insoluble Residue	IS: 4032 :1985 Reaffirmed 2014	0.5 % to 10.0 %
		Total Alkali as Sodium Oxide (Na ₂ O)	IS: 4032 :1985 Reaffirmed 2014	0.05 % to 3.0 %
		Free lime	IS: 4032 :1985 Reaffirmed 2014	0.2 % to 10 %
		Chloride	IS: 4032 :1985 Reaffirmed 2014	0.01 % to 1 %
b.	PSC	Loss on Ignition	IS: 4032 :1985 Reaffirmed 2014	1.0 % to 15 %
		Silica (SiO ₂)	IS: 4032 :1985 Reaffirmed 2014	10 % to 50 %
		Ferric oxide (Fe ₂ O ₃)	IS: 4032 :1985 Reaffirmed 2014	1.0 % to 10 %

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		Chloride	IS:3025:1988Part- 32 (Argenometric method) Reaffirmed 2014	10mg/l to 2000mg/l
		Total Alkalinity (To neutralize 100 ml water sample, 0.02N, H ₂ SO ₄ required)	IS 456:2000 Reaffirmed 2016 (Indicator method)	0.1ml to 50ml
		Total Acidity (To neutralize 100 ml water sample, 0.02N, NaOH required)	IS 456 2000 Reaffirmed 2016 (Indicator method) Reaffirmed 2014	0.1ml to 5ml
		Total Hardness as CaCO ₃	IS:3025:2009 Part -21 (EDTA method) Reaffirmed 2014	1 mg/l to 10000 mg/l
		Volatile Residue & Fixed Residue	IS:3025:1984Part -18 Reaffirmed 2012	1 mg/l to 1000 mg/l
		Total Suspended solid	IS:3025:1984Part -17 Reaffirmed 2012	10 mg/l to 1000 mg/l

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MECHANICAL TESTING

I.	BUILDING MATERIALS			
1.	Coarse Aggregate	Aggregate Abrasion value	IS 2386 (Part 4) - 1963, Reaffirmed 2016	5 to 50 %
		Specific Gravity	IS 2386 (Part 3) - 1963, Reaffirmed 2016	1 to 4
		Bulk Density	IS 2386 (Part 3) - 1963, Reaffirmed 20116	1 kg/lit to 2 kg/lit
		Ten Percent Fines Value.	IS 2386 (Part 4) - 1963, Reaffirmed 2016	40 kN to 400 kN
		Particle Size Distribution	IS 2386 - 1963 (Part 1), Reaffirmed 2016	125 to 4.75 mm
		Water Absorption	IS 2386 - 1963 (Part 3), Reaffirmed 2016	0.1 % to 10 %
		Impact Value	IS 2386 - 1963 (Part 4), Reaffirmed 2016	5 % to 50 %
		Crushing Value	IS 2386 - 1963 (Part 4), Reaffirmed 2016	5 % to 50 %
		Elongation / Flakiness Index	IS 2386 - 1963 (Part 1), Reaffirmed 2016	5 % to 50 %
		Soundness by a) MgSO ₄ b) Na ₂ SO ₄	IS 2386 - 1963 (Part 5), Reaffirmed 2016	1 % to 20 % 1 % to 15 %
2.	Fine Aggregate	Specific Gravity	IS 2386 - 1963 (Part 3), Reaffirmed 2016	1 to 4
		Determination of Bulkage	IS 2386-1963 (Part 3), Reaffirmed 2016	1 % to 50 %
		Materials Finer than 75 Micron	IS 2386 -1963 (Part 1), Reaffirmed 2016	0.1 to 25 %
		Bulk Density	IS 2386 - 1963 (Part 3), Reaffirmed 2016	1 kg/lit to 2 kg/lit

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		Sieve Analysis	IS 2386 - 1963 (Part 1), Reaffirmed 2016	4.75 mm to 75 µm
		Water Absorption	IS 2386 - 1963 (Part 3), Reaffirmed 2016	0.1 % to 10 %
		Soundness by a) MgSO ₄ b) Na ₂ SO ₄	IS 2386 - 1963 (Part 5), Reaffirmed 2016	1 % to 20 % 1 % to 15 %
3.	Concrete			
a.	Core/ Cylinder/ Cube	Compressive Strength (Including Extraction of core)	IS 456-2000, Reaffirmed 2016 IS-516-1959, Reaffirmed 2013	5 N/mm ² to 100 N/mm ²
		Splitting Tensile Strength	IS 5816 : 1999 Reaffirmed 2013	1 N/mm ² to 10 N/mm ²
b.	Cylinder	Modulus of Elasticity	ASTM C 469-02e1	5 GPa to 60 GPa
c.	Masonry blocks	Moisture Movement	IS 2185 (Part 1) - 2005 Reaffirmed 2010	0.001 % to 1 %
		Density	IS 2185 (Part 1) - 2005 Reaffirmed 2010	1800 kg/m ³ to 2500 kg/m ³
		Drying Shrinkage	IS 2185 (Part 1) - 2005 Reaffirmed 2010	0.001 % to 1 %
		Compressive Strength	IS 2185 (Part 1) - 2005 Reaffirmed 2010	1 N/mm ² to 40 N/mm ²
d.	Autoclaved Cellular Areated Concrete Block	Density	IS 2185 (Part 3) - 2005 Reaffirmed 2010	300 kg/m ³ to 900 kg/m ³
		Drying Shrinkage.	IS 2185 (Part 3) - 2005 Reaffirmed 2010	0.01 % to 1 %
		Compressive Strength.	IS 2185 (Part 3) - 2005 Reaffirmed 2010	1 kg/m ³ to 10 N/mm ²
e.	Concrete Tiles	Water Absorption	IS 13801 - 2013 & IS 1237-2012	0.1 % to 25 %
		Wet Transverse Strength	IS 13801 - 2013 & IS 1237-2012	0.5 kg/m ³ to 5 N/mm ²
		Flatness	IS 13801 - 2013 & IS 1237-2012	0.01 mm to 2 mm

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5.	Door shutter	Measurement of Dimension and Defects of Squareness	IS 4020-1998 (Part 2) Reaffirmed 2013	25 mm to 5000mm
		Measurement of Defects of general Flatness	IS 4020- 1998 (Part 3) Reaffirmed 2013	0.1 mm to 5mm
		Test to examine the general smoothness of the Surfaces	IS 4020-1998 (Part 4) Reaffirmed 2013	0.1 mm to 5mm
		Impact Indentation	IS 4020 -1998 (Part 5) Reaffirmed 2013	0.01 mm to 1mm
		Deflection due to Load applied at its Edge	IS 4020-1998(Part 7) Reaffirmed 2013	0.1 mm to 25 mm
		Resistance to Shock	IS 4020-1998 (Part 8) Reaffirmed 2013	Visual
		Resistance to Buckling	IS 4020-1998 (Part 9) Reaffirmed 2013	0.01 mm to 25 mm
		Resistance to misuse	IS 4020- 1998 (Part 11) Reaffirmed 2013	Visual
		Resistance to Slamming Actions	IS 4020 - 1998 (Part 10) Reaffirmed 2013	Visual
		Screw Holding Power	IS 4020-1998 (Part 16) Reaffirmed 2013	10 N to 5000 N
III.	SOIL AND ROCK			
1.	Soil	Lab Test		
		Free Swell Index	IS 2720 -1977 (Part 40) Reaffirmed 2011	1% to 100%
		Water Content	IS 2720 -1973 (Part 2) Reaffirmed 20105	1% to 50%
		Liquid Limit / Plastic Limit	IS 2720 -1985 (Part 5) Reaffirmed 2015	0 to 80%
		Shrinkage Limit	IS 2720 -1972 (Part 6) Reaffirmed 2011	0 to 50%

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		Water Content - Dry Density relation using Light Compaction	IS 2720- 1980 (Part 7) Reaffirmed 2011	1200 kg/m ³ to 2200 kg/m ³ & 2 % to 30 %
		Grain Size Analysis	IS 2720 - 1985 (Part 4) Reaffirmed 2015	1% to 100%
		Direct Shear Test	IS 2720 -1986 (Part 13) Reaffirmed 2011	C=0.1 t/m ² to 10 t/m ² & $\phi=1$ to 40
		Laboratory California Bearing Ratio	IS 2720 -1987(Part 16) Reaffirmed 2011	2 % to 50%
		Oedometer test (Consolidation Test)	IS2720-19865 (Part 15) Reaffirmed 2011	$C_v = 2$ to 200 m ² /yr x10 ⁻²
		Water content - Dry Density Relation using Heavy compaction	IS 2720 - 1983 (Part 8) Reaffirmed 2015	1500 kg/m ³ to 2400 kg/m ³ & 1 % to 30%
		Swelling Pressure	IS2720 -1977 (Part 41) Reaffirmed 2011	1 T/m ² to 150 T/m ² 0.1 to 3.0
		Specific Gravity	IS2720 – 1980 (Part 3 Sec.1)Reaffirmed 2011	2 to 4
		Field Test		
		Field California Bearing Ratio	IS 2720 - 1990(Part 31), Reaffirmed 2015	5 % to 90%
		Field Density by Core Cutter method	IS-2720 -1975 (Part 29), Reaffirmed 2015	1000 kg/m ³ to 2000 kg/m ³ & 1 % to 30 %
		Plate Load Test	IS-1888 - 1982, Reaffirmed 2011	1 tonne to 15 tonne & 0.01 mm to 25mm
		Standard Penetration Test	IS - 2131 - 1981, Reaffirmed 2011	N Value1 to 50
		Dry Density by Sand Replacement method	IS-2720-1974 (Part 28), Reaffirmed 2015	1000 to 2500 kg/m ³ , 1% to 30 %
2.	Rock	Unconfined Compressive Strength	IS - 9143 - 1979, Reaffirmed 2016	1 to 100 N/mm ²
		Specific Gravity	IS 1122 - 1974, Reaffirmed 2013	1 to 4

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		Dry Density	IS 13030 - 1991, Reaffirmed 2016	1.5 g/cc to 5 g/cc
		Water Absorption	IS 13030 - 1991, Reaffirmed 2016	0.1% to 25%
		Porosity	IS 13030 - 1991, Reaffirmed 2016	0.1 % to 10 %
IV.	MECHANICAL PROPERTIES OF METAL			
1.	High Strength deformed Steel bars and wires for concrete reinforcement	Percentage Elongation	IS - 1786 - 2008, Reaffirmed 2013	5 % to 40%
			IS - 432-1982 (Part 1), Reaffirmed 2015	
		% Elongation at Maximum Force	IS - 1786 - 2008, Reaffirmed 2013 IS - 432-1982 (Part 1), Reaffirmed 2009	5 % to 40%
		Yield strength	IS - 1786 - 2008, Reaffirmed 2013 IS - 432-1982 (Part 1), Reaffirmed 2015	200 N/mm ² to 800 N/mm ²
		Ultimate Tensile strength	IS - 1786 - 2008, Reaffirmed 2013 IS - 432-1982 (Part 1), Reaffirmed 2015	200 N/mm ² to 900 N/mm ²
		Bend Test	IS -1599 - 2012	Mandrel dia.
		Rebend Test	IS -1599 - 2012	12,16,18,20,24,30, 32,36,40,42,48,50, 56,64,70,72,75, 80,84,96,100,112,120,125,128,140,150,160,175, 192,200,224,256 mm

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2.	Low, Medium & High Tensile Structural Steel	Percentage Elongation	IS 2062 - 2011 Reaffirmed 2016	5 % to 40%
		Weight per Meter	IS 2062 - 2011 Reaffirmed 2016	0.20 kg/m to 75 kg/m
		Yield strength	IS 2062 - 2011 Reaffirmed 2016	200 N/mm ² to 800 N/mm ²
		Ultimate Tensile strength	IS 2062 - 2011 Reaffirmed 2016	200 N/mm ² to 900 N/mm ²
		Bend Test	IS 2062 - 2011 Reaffirmed 2016	Visual

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NON-DESTRUCTIVE TESTING

I.	BUILDING MATERIALS – REINFORCED CONCRETE STRUCTURES			
1.	Concrete	Schmidt Rebound Hammer Test	IS -13311: 1992, Part 2 Reaffirmed 2013	5 N/mm ² to 50 N/mm ²
		Ultrasonic Pulse Velocity Test	IS -13311: 1992, Part 1 Reaffirmed 2013	0.50 km/s to 5.0 km/s
		Cover Meter Test	BS -1881: 1986 Part 204	1 mm to 100 mm
		Carbonation Test	BS -1881 : 1986 Part 201	1 mm to 50 mm
		Load Test	IS 456 – 2000 Reaffirmed 2016	0.01mm to 25mm
		Half cell potentiometer Test	ASTM C-876 : 2015	-100 mV to - 650 mV

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