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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 MATERIALS**			
1.	**Cement (OPC, PPC, Slag)**	Silica (SiO_2)	IS 4032:1985 (RA 2009)	10 % to 40 %
		Loss of Ignition	IS 4032:1985 (RA 2009)	0.1 % to 10 %
		Insoluble residue	IS 4032:1985 (RA 2009)	0.1 % to 50 %
		Total Sulphur (as SO_3)	IS 4032:1985 (RA 2009)	0.1 % to 5 %
		Calcium Oxide (as CaO)	IS 4032:1985 (RA 2009)	30 % to 70 %
		Magnesia (as MgO)	IS 4032:1985 (RA 2009)	0.5 % to 10 %
		Alumina (as Al_2O_3)	IS 4032:1985 (RA 2009)	1.0 % to 15 %
		Iron Oxide (as Fe_2O_3)	IS 4032:1985 (RA 2009)	1 % to 15 %
		Chloride (as Cl)	IS 4032:1985 (RA 2009)	0.005 % to 1 %
		Sulphide Sulphur (as S)	IS 4032:1985 (RA 2009)	0.01 % to 1.5 %
2.	**Fly Ash**	Silica (as SiO_2)	IS 1727:1967 (RA 2008)	25 % to 70 %
		(Alumina + Iron oxide)	IS 1727:1967 (RA 2008)	5 % to 45 %
		Magnesia (as Mgo)	IS 1727:1967 (RA 2008)	0.1 % to 10 %
		Total Sulphur (as SO_3)	IS 1727:1967 (RA 2008)	0.1 % to 1 %
		Loss on Ignition	IS 1727:1967 (RA 2008)	0.1 % to 15 %
		Available Alkalis (as Na_2O)	IS 3812:2013	0.05 % to 2 %
		Chloride (as Cl)	IS 4032:1985 (RA 2009)	0.005 % to 1 %
3.	**Water Proofing Compound**	Chloride Content	IS 6925:1973 (RA 2008)	0.01 % to 5.0 %
4.	**Admixture**	Dry Material Content	IS 9103:1999 (RA 2008)	10 % to 70 %
		Ash Content	IS 9103:1999 (RA 2008)	1.0 % to 20 %
		Relative Density	IS 9103:1999 (RA 2008)	1.00 to 1.500
		Chloride Content	IS 6925:1973 (RA 2008) (Volumetric Method)	0.001 % to 1 %
		pH Value	IS 9103:1999 (RA 2008)	4 to 12
5.	**Aggregate**	Alkali Reactivity	IS 2386 (Part 7): 1963 (RA 2011)	
		Reduction in alkalinity		5 millimoles/ltr to 500 millimoles/ltr

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		Dissolved silica		5 millimoles/1ltr to 500 millimoles/1ltr
		Organic Impurities	IS 2386 (Part 2): 1963 (RA 2011)	Qualitative
		Chloride	IS 4032:1985 (RA 2009)	0.005 % to 1.0 %
		Sulphate (as SO_3)	IS 4032:1985 (RA 2009)	0.1 % to 5.0 %
6.	**Concrete & Cement Mortar**	Chloride as Cl	IS 4032:1985 (RA 2009)	0.005 % to 1.0 %
		Sulphate (as SO_3)	IS 4032:1985 (RA 2009)	0.05 % to 2.0 %
	Ceramic Tiles	Resistance to staining of glazed Tiles	IS 13630 (Part 8): 2006 (RA 2011)	Qualitative
		Resistance to household chemicals and swimming Pool water cleaners	IS 13630 (Part 8): 2006 (RA 2011)	Qualitative
		Resistance to acids and alkalis	IS 13630 (Part 8): 2006 (RA 2011)	Qualitative
7.	**Bentonite**	P^H	IS 6186:1986 (RA 2010)	4 to 12
		Loss on Ignition	IS 6186:1986 (RA 2010)	0.1 % to 20 %
		Matter Soluble in water	IS 6186:1986 (RA 2010)	0.1 % to 20 %
8.	**Bitumen**	Solubility in Trichloroethylene	IS 1216:1978 (RA 2014)	70 % to 100 %
II.	**METALS & ALLOYS**			
1.	**Low Alloy Steel**	Carbon (as C)	IS 228 (Part 1): 1987 (RA 2008)	0.05 % to 1 %
		Sulphur (as S)	IS 228 (Part 9): 1987 (RA 2009)	0.01 % to 0.05 %
		Phosphorous (as P)	IS 228 (Part 3): 1987 (RA 2008)	0.01 % to 0.05 %
		Manganese (as Mn)	IS 228 (Part 2): 1987 (RA 2008)	0.1 % to 2 %
		Silicon (as Si)	IS 228 (Part 8): 1987 (RA 2009)	0.1 % to 1.0 %

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		Nickel (as Ni)	IS 228 (Part 5): 1987 (RA 2009)	0.1 % to 1.5 %
		Chromium (as Cr)	IS 228 (Part 6): 1987 (RA 2009)	0.1 % to 1.5 %
III.	**METALLIC COATING & TREATMENT SOLUTION**			
1.	**Metallic Coating**	Zinc Coating	IS 6745:1972 (RA 2010)	5 gm/m^2 to 1000 gm/m^2
		Powder Coating	IS 101 (Part 3 & Sec-2): 1989 (By Micrometer method)	7 micron to 500 micron
IV.	**WATER**			
1.	**Potable Water**	Acidity	IS 3025 (Part 22): 1986 (RA 2009)	1 mg/l to 200 mg/l
		Alkalinity	IS 3025 (Part 23): 1986 (RA 2009)	2 mg/l to 500 mg/l
		Hardness	IS 3025 (Part 21): 2009	2 mg/l to 5000 mg/l
		Total Solids	IS 3025 (Part 15): 1984 (RA 2009)	2 mg/l to 10000 mg/l
		Dissolved Solids	IS 3025 (Part 16): 1984 (RA 2012)	2 mg/l to 6000 mg/l
		Suspended Solids	IS 3025 (Part 17): 1984 (RA 2012)	2 mg/l to 1000 mg/l
		Aluminum	IS 3025 (Part 55): 2003 (RA 2009)	0.01 mg/l to 20 mg/l
		Calcium	IS 3025 (Part 40): 1991 (RA 2009)	2.0 mg/l to 500 mg/l
		Chromium	IS 3025 (Part 52): 2003 (RA 2009)	0.01 mg/l to 10 mg/l
		Iron	IS 3025 (Part 53): 2003 (RA 2009)	0.01 mg/l to 10 mg/l

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Magnesium	IS 3025 (Part 46): 1994 (RA 2009)	2 mg/l to 500 mg/l
		Potassium	IS 3025 (Part 45): 1993 (RA 2009)	1 mg/l to 200 mg/l
		Sodium	IS 3025 (Part 45): 1993 (RA 2009)	1 mg/l to 1000 mg/l
		Boron	IS 3025 (Part 57): 2005 (RA 2010)	0.01 mg/l to 20 mg/l
		Residual Chlorine	IS 3025 (Part 26): 1986 (RA 2009)	0.1 mg/l to 5 mg/l
		Chloride	IS 3025 (Part 32): 1988 (RA 2009)	2 mg/l to 5000mg/l
		Fluoride	APHA 23rd Ed 2017, 4500-FD.	0.05 mg/l to 10mg/l
		pH	IS-3025 (Part 11): 1983 (RA 2012)	2 to 12
		Phosphorous	IS 3025 (Part 31): 1988 (RA 2009)	0.05 mg/l to 100 mg/l
		Nitrogen (Nitrate)	IS 3025 (Part 34): 1988 (RA 2009)	0.05 mg/l to 50 mg/l
		Ammonia Nitrogen	IS 3025 (Part 34): 1988 (RA 2009)	0.05 mg/l to 50 mg/l
		Sulphate	IS 3025 (Part 24): 1986 (RA 2009)	0.1 mg/l to 1000 mg/l
2.	**Waste Water (Effluent)**	Total Solids	APHA 23rd Ed 2017, 2540B	2 mg/l to 10000mg/l
		Dissolved Solids	APHA 23rd Ed 2017, 2540C	2 mg/l to 6000 mg/l
		Suspended Solids	APHA 23rd Ed 2017, 2540D	2 mg/l to 1000 mg/l
		Dissolved Oxygen	APHA 23rd Ed 2017, 4500-OB	0.1 mg/l to 10 mg/l
		Oxygen absorbed in 4 Hours	IS-3025 (P-63)-2007, R-2013	0.1 mg/l to 5 mg/l
		Sulfite	APHA 23rd Ed 2017, 4500-$SO_3$2-B	0.2 mg/l to 100 mg/l

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		Silica	APHA 23rd Ed 2017, 4500-SiO_2C	0.1 mg/l to 200 mg/l
		Sulfide	APHA 23rd Ed 2017, 4500-S^2F/IS 3025 (P-44)-1993, R-2009	0.2 mg/l to 100 mg/l
		BOD (5 days 20^0C)	APHA 23rd Ed 2017, 5210B	5 mg/l to 8000 mg/l
		COD	APHA 23rd Ed 2017, 5220B	5 mg/l to 15000 mg/l
		Oil & Grease	APHA 23rd Ed 2017, 5220B	4 mg/l to 100 mg/l
		Phosphorous	APHA 23rd Ed 2017, 4500-P, D	0.05 mg/l to 100mg/l
		Ammonia Nitrogen	APHA 23rd Ed 2017, 4500-NH_3C	0.05 mg/l to 50 mg/l
		pH	APHA 23rd Ed 2017, 4500-H^+, B	2 to 12
		Nitrate	IS-3025 (P-34)-1988, R-2009	0.05 mg/l to 50 mg/l
		Nitrite	APHA 23rd Ed 2017, 4500-NO_2,B	0.03 mg/l to 30 mg/l
		Fluoride	APHA 23rd Ed 2017, 4500-FD	0.05 mg/l to 10 mg/l
		Aluminum	APHA 23rd Ed 2017, 3500-Al, B	0.01 mg/l to 20mg/l
		Chromium	APHA 23rd Ed 2017, 3500-Cr, B	0.01 to 10mg/l
3.	**Water for Construction**	Acidity	IS 3025 (Part 22): 1986 (RA 2009)	1 ml. to 200 ml.
		Alkalinity	IS 3025 (Part 23): 1986 (RA 2009)	2 ml. to 700 ml.
		Total Solids	IS 3025 (Part 15): 1984 (RA 2009)	2 mg/l to 10000 mg/l
		Organic Solids	IS 3025 (Part 18): 1984 (RA 2012)	1 mg/l to 500 mg/l
		Inorganic Solids	IS 3025 (Part 18): 1984 (RA 2012)	2 mg/l to 4000 mg/l

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Chloride	IS 3025 (Part 32): 1988 (RA 2009)	0.2 mg/l to 2000 mg/l
		Sulphate	IS 3025 (Part 24): 1986 (RA 2009)	0.1 mg/l to 1000 mg/l
		pH	IS 3025 (Part 11): 1983 (RA 2012)	2 to 12
V.	**SOIL & ROCK**			
1.	**Soil**	P^H	IS 2720 (Part 26): 1987 (RA 2007)	4 to 12
		Moisture Content	IS 2720 (Part 2): 1987 (RA 2007)	1 % to 15 %
		Sulphate (as Na_2SO_3)	IS 2720 (Part 27): 1987 (RA 2007)	0.1 % to 5 %
		Organic Matter	IS 2720 (Part 2): 1987 (RA 2007)	0.1 % to 1 %

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MECHANICAL TESTING

I.	**MECHANICAL PROPERTIES OF METALS**			
1.	**Reinforcement and Structural Steel**	Tensile strength	IS 1608:2005 (RA 2017)	100 N/mm^2 to 800 N/mm^2
		Elongation	IS 1608:2005 (RA 2017)	5 % to 50 %
		Yield stress	IS 1608:2005 (RA 2017)	100 N/mm^2 to 600 N/mm^2
		Bend Test	IS 1608:2005 (RA 2017)	Qualitative
		Re-bend Test	IS 1786:2008 (RA 2013)	Qualitative
		Mass	IS 1786:2008 (RA 2013)	0.1 kg/m to 25 kg/m
		Hardness (HRB/HRC)	IS 1586 (Part 1): 2012 (RA 2017)	20 HRB to 100 HRB 20 HRC to 100 HRC
II.	**BUILDING MATERIAL**			
1.	**Water Proofing Compound**	Initial Setting Time	IS 4031 (Part 5): 1988 (RA 2014)	10 min. to 300 min.
		Final Setting Time	IS 4031 (Part 5): 1988 (RA 2014)	30 min. to 700 min.
		Compressive Strength	IS 4031 (Part 6): 1988 (RA 2014)	10 MPa to 70 MPa
2.	**Stones**	Compressive Strength	IS 1121 (Part 1): 2013 (RA 2017)	10 MPa to 250 MPa
		Specific Gravity	IS 1122:1974 (RA 2017)	1.5 to 3.5
		Water Absorption	IS 1124:1974 (RA 2017)	0.1 % to 10 %
		Transverse Strength	IS 1121 (Part 2): 2013 (RA 2017)	2 MPa to 50 MPa
		Moisture Content	IS 13030:1991 (RA 2016)	0.01 to 0.5
		Hardness (Mohr`s)	IS 13630 (Part 13): 2006 (RA 2017)	1 to 9
3.	**Admixture**	Setting Time	IS 8142:1976 (RA 2016)	100 min. to 900 min.
		Compressive Strength	IS 516:1959 (RA 2013)	2 MPa to 80 MPa

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4.	**Bricks**	Compressive Strength	IS 3495 (Part 1): 1992 (RA 2016)	3 MPa to 50 MPa
		Water absorption	IS 3495 (Part 2): 1992 (RA 2016)	1 % to 30 %
		Efflorescence	IS 3995 (Part 3): 1992 (RA 2016)	Qualitative
		Dimension	IS 1077:1992 (RA 2016)	Length 4300 mm to 5000 mm
				Width 2100 mm to 2500 mm
				Height 1300 mm to 1600 mm
5.	**Fine Aggregate**	Sieve Analysis	IS 2386 (Part 1): 1963 (RA 2016)	0.075 to 4.75 mm
		Fineness Modulus	IS 2386 (Part 1): 1963 (RA 2016)	1 to 4
		Deleterious Material	IS 2386 (Part 2): 1963 (RA 2016)	0.01 % to 10 %
		Specific Gravity	IS 2386 (Part 3): 1963 (RA 2016)	1 to 3.5
		Water Absorption	IS 2386 (Part 3): 1963 (RA 2016)	0.2 % to 6 %
		Moisture Content	IS 2386 (Part 3): 1963 (RA 2016)	0.1 % to 10 %
		Soundness	IS 2386 (Part 5): 1963 (RA 2016)	0.01 % to 20 %
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2016)	1 kg/ltr to 3 kg/ltr
6.	**Cement (OPC, PPC, Slag)**	Fineness by Air Permeability	IS 4031 (Part 2): 1999 (RA 2013)	100 m^2/kg to 500 m^2/kg
		Consistency	IS 4031 (Part 4): 1988 (RA 2014)	20 % to 40 %
		Setting Time Initial	IS 4031 (Part 5): 1988 (RA 2014)	30 min. to 300 min.

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Setting Time Final	IS 4031 (Part 5): 1988 (RA 2014)	50 min. to 600 min.
		Soundness by Le-Chatelier	IS 4031 (Part 6): 1988 (RA 2014)	0.5 mm to 10 mm
		Soundness by Autoclave	IS 4031 (Part 6): 1988 (RA 2014)	0.8 Max
		Compressive Strength	IS 4031 (Part 6): 1988 (RA 2014)	10 to 70 MPa
		Density	IS 4031 (Part 11): 1988 (RA 2014)	1 g/cc to 3.5 g/cc
7.	**Coarse Aggregate**	Sieve Analysis	IS 2386 (Part 1): 1963 (RA 2016)	4.75 mm to 125 mm
		Crushing Value	IS 2386 (Part 4): 1963 (RA 2016)	10 % to 50 %
		Impact Value	IS 2386 (Part 4): 1963 (RA 2016)	10 % to 50 %
		Abrasion Value	IS 2386 (Part 4): 1963 (RA 2016)	10 % to 50 %
		10% fines value	IS 2386 (Part 4): 1963 (RA 2016)	5 T to 30 T
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2016)	1.0 kg/ltr to 3.0 kg/ltr
		Water Absorption	IS 2386 (Part 3): 1963 (RA 2016)	0.01 % to 5 %
		Elongation Index	IS 2386 (Part 1): 1963 (RA 2016)	5 % to 50 %
		Flakiness Index	IS 2386 (Part 1): 1963 (RA 2016)	5 % to 50 %
		Total Deleterious Materials	IS 2386 (Part 2): 1963 (RA 2016)	0.01 % to 20 %
		Specific Gravity	IS 2386 (Part 3): 1963 (RA 2016)	1 to 3.5
		Moisture Content	IS 2386 (Part 3): 1963 (RA 2016)	0.01 % to 10 %

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		Soundness	IS 2386 (Part 5): 1963 (RA 2016)	0.01 % to 20 %
8.	**Concrete**	Compressive Strength	IS 516:1959 (RA 2013)	5 to 80 N/mm^2
		Slump	IS 1199:1959 (RA 2013)	25 mm to 200 mm
9.	**Fly Ash**	Specific gravity	IS 1727:1967 (RA 2013)	1-3 g/cc
		Fineness	IS 1727:1967 (RA 2013)	100 m^2/kg to 500 m^2/kg
		Soundness (by Autoclave)	IS 1727:1967 (RA 2013)	0.01 % to 2.0 %
		Compressive strength	IS 1727:1967 (RA 2013)	10 MPa to 60 MPa
		Particle retained on 45µ IS Sieve	IS 1727:1967 (RA 2013)	5 % to 60 %
10.	**Concrete Tiles**	Wet Transverse Strength	IS 1237:1980 (RA 2017)	1 MPa to 10 MPa
		Resistance to wear	IS 1237:1980 (RA 2017)	0.2 mm to 10 mm
		Water Absorption	IS 1237:1980 (RA 2017)	0.1 % to 20 %
11.	**Ceramic Tiles**	Dimension	IS 13630 (Part 1): 2006 (RA 2017)	50 mm to 800 mm
		Water Absorption	IS 13630 (Part 2): 2006 (RA 2017)	0.01 % to 30 %
		Modulus of rupture	IS 13630 (Part 6): 2006 (RA 2017)	5 MPa to 60 MPa
		Breaking Strength	IS 13630 (Part 6): 2006 (RA 2017)	1 N to 5000 N
12.	**Granular Materials**	Heavy Compaction	IS 2720 (Part 8):1980 RA-2015	MDD 1.5 gm/cc to 3.5 gm/cc OMC 3 % to 10%
13.	**Bentonite**	Moisture	IS 6186:1986 (RA 2015)	0.1 % to 20 %
		Fineness by wet & Dry sieving	IS 6186:1986 (RA 2015)	10 % to 100 %
		Sand Content	IS 6186:1986 (RA 2015)	0.1 % to 10 %
14.	**Bitumen**	Absolute Viscosity	IS 1206 (Part 2): 1978 (RA 2014)	500 Poise to 8000 Poise
		Kinematic Viscosity	IS 1206 (Part 3): 1978 (RA 2014)	100 cSt to 1200 cSt

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		Softening Point	IS 1205:1978 (RA 2014)	10 °C to 80 °C
		Penetration	IS 1203:1978 (RA 2014)	20 mm to 150 mm
		Ductility	IS 1208:1978 (RA 2014)	3 cm to 100 cm
		Flash Point	IS 1448:1969 (RA 2013)	100 °C to 400 °C
III.	**SOIL & ROCK**			
1.	**Soil**	Light Compaction	IS 2720 (Part 7): 1980 (RA 2016)	OMC 3 % to 35 % MDD 1.5 gm/cc to 2.10 gm/cc
		Heavy Compaction	IS 2720 (Part 8): 1980 (RA 2015)	OMC 3 % to 35 % MDD 1.5 gm/cc to 2.10 gm/cc
		Grain Size Analysis	IS 2720 (Part 4): 1985 (RA 2015)	0 to 100 mm
		Plastic limit	IS 2720 (Part 5): 1985 (RA 2015)	10 % to 30 %
		Liquid limit	IS 2720 (Part 5): 1985 (RA 2015)	10 % to 50 %
		Plasticity Index	IS 2720 (Part 5): 1985 (RA 2015)	0.1 % to 50 %
		California Bearing Ratio	IS 2720 (Part 16): 1987 (RA 2016)	1 % to 50 %
2.	**Paver Block**	Compressive Strength	IS 15658:2006 (RA 2017)	10 N/mm^2 to 80 N/mm^2
		Water Absorption	IS 15658:2006 (RA 2017)	0.2 % to 10 %

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NON - DESTRUCTIVE TESTING

I.	**BUILDING MATERIALS-REINFORCED CONCRETE STRUCTURES**			
1.	**Building Materials-Reinforced Concrete Structures**	Rebound Hammer	IS 13311 (Part 2): 1992 (RA 2013)	10 R to 70 R
		Ultrasonic Pulse Velocity	IS 13311 (Part 1): 1992 (RA 2013)	1 km/sec to 5.0 km/sec
		Half Cell Potential Difference	ASTM C 876-15	(-) 10 mv to (-) 700 mv

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