

LIST OF TESTING SERVICES CHEMICAL

Sr. No	Description of Test	Test Method
CHEMICAL-MATERIAL		
A. Soil		
1	Water Soluble Chloride Content in Soil	BS 1377 Part 3
2	Acid Soluble Chloride Content in Soil	BS 1377 Part 3
3	Water Soluble Sulphate Content in Soil	BS 1377 Part 3
4	Acid Soluble Sulphate Content in Soil	BS 1377 Part 3
5	pH of Soil	BS 1377 Part 3
6	Carbonate Content in Soil	BS 1377 Part 3
7	Organic Matter Content in Soil	BS 1377 Part 3
8	Electrical Conductivity	APHA - AWWA 2510 A
9	Gypsum Content	BS 1377 Part 3
10	Sodium Adsorption Ratio (SAR)	IHTP - 19
11	Water Soluble Salts	IHTP - 39
12	Acid Soluble Material	BS 812 Part 119
13	Chemical Analysis of Agricultural / Sweet Soil	BS / ASTM / APHA - AWWA
B. Ground Water		
1	Chloride Content of Ground Water	BS 1377 Part 3
2	Sulphate Content of Ground Water	BS 1377 Part 3
3	pH of Groundwater	BS 1377 Part 3
C. Aggregates		
1	Chloride Content of Aggregates Using a Nitric Acid Extract for Aggregates Containing Chloride Not Extracted by Water	BS 812 Part 117
2	Water Soluble Chloride Content in Aggregates	BS 812 Part 117 BS EN 1744 Part 1
3	Total Sulphate by Acid Extraction Method	BS 812 Part 118 BS EN 1744 Part 1
4	Water Soluble Sulphate Content in Aggregates	BS EN 1744 Part 1 BS 812 Part 118

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5	Organic Impurities in Fine Aggregates for Concrete	ASTM C 40
6	Light Weight Particles in Aggregates	ASTM C 123
7	Potential Alkali Reactivity of Aggregates- Chemical Method	ASTM C 289
8	Alkali Content in Aggregates	BS EN 1744 Part 1 BS 8500 Part 2 AAS (for Concrete)
9	Methylene Blue Adsorption	Ciria SP 83 – A.2 10.5
D. Concrete		
1	Chloride Content in Concrete	BS 1881 Part 124
2	Sulphate Content in Concrete	BS 1881 Part 124 :1988 Cls. 10.3 DM Addendum 06
3	Alkali Content in Concrete	BS 1881 Part 124
4	Water Soluble Chloride in Concrete / Mortar	ASTM C 1218
5	Determination of Cement Content	ASTM D 806
6	Depth of Carbonation for Freshly Fractured Surface in Concrete	IHTP – 32
E. Water Concrete		
1	Concrete Water Suitability Test	BS 3148 / BS EN 1008
2	Total Dissolved Solids	BS 1377 Part 3
3	pH & Electrical Conductivity	ASTM D 1293
4	Chloride Content	ASTM D 512
5	Sulphate Content	ASTM D 516
6	Total Alkalinity, Carbonate, Bicarbonate	ASTM D 513
F. Admixture		
1	pH Value	ASTM D 1293
2	Chloride Content	IHTP - 28
3	Total Solids	ASTM C 494

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4	Specific Gravity	APHA – AWWA 2710 F
5	Alkali Content in Admixture	BS EN 480 Part 12
G. Steel Products		
1	Chemical Analysis including Carbon, Manganese, Sulphur, Molybdenum, Copper, Vanadium, Silicon, Phosphorus, Chromium, Nickel, Niobium, Nitrogen, Iron and Carbon Equivalent Value (CEV)	IHTP – 21 (Optical Emission Spectrometer)
2	Determination of Coating Mass	ASTM A 90
3	Chemical Analysis of Stainless Steel (SS316, SS316L)	ASTM A 240
4	Chemical Analysis of Aluminum Alloys	ICP – OES / ASTM E 34
5	Chemical Analysis of Copper Alloys / Bronze	ICP – OES / ASTM B 584
H. Asphalt Products		
1	Chemical Analysis of Penetration Grade Asphalt (Bitumen 60-70, Bitumen 40-50)	ASTM D 946 AASHTO M 20
2	Chemical Analysis of Cut Back Asphalt - Medium / Rapid Curing Asphalt (MC-70,MC-30,RC-30,etc)	ASTM D 2027 AASHTO M82
3	Chemical Analysis of Emulsified Asphalt (SS-1h)	ASTM D 977 AASHTO M 140
4	Specific Gravity @ 60/60°F (Hydrometer Method)	ASTM D 1298 IP 60
5	Density / Specific Gravity of Semi-Solid Bituminous Material (Pycnometer Method)	ASTM D 70
6	Penetration (25°C, 5s, 100g)	ASTM D 5
7	Flashpoint (Cleveland Open Cup)	ASTM D 92
8	Flashpoint (Close Cup)	ASTM D 93
9	Ductility at 25 °C, 5cm/min	ASTM D 113
10	Solubility in Trichloroethylene	ASTM D 2042
11	Thin Film Oven Test – Loss on Heating	ASTM D 1754
12	Penetration of Residue as % of Original	ASTM D 5 BS 2000 Part 50
13	Ductility of Residue at 25°C, 5cm/min	ASTM D 113

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14	Kinematic Viscosity of Asphalt	ASTM D 2170
15	Kinematic Viscosity of Transparent and Opaque Liquid	ASTM D 445
16	Distillation 225°C, 260°C, 316°C (% of Total Distillation to 360°C) Residue from Distillation to 360°C	ASTM D 402
17	Water Content (%vol)	ASTM D 95
18	Saybolt Furol Viscosity @ 25°C (77°F)	ASTM D 88
19	Storage Stability	ASTM D 6930
20	Softening Point (Ring and Ball)	ASTM D 36 BS EN 1427 BS 2000
21	Mixing and Compacting Temperature	ASTM D 2493
22	Volatile content (coatings / bitumen emulsion)	ASTM D 2939
I. Cement		
1	Chemical Analysis of OPC	BS EN 197 Part 1 ASTM C 150
2	Chemical Analysis of SRC	BS 4027 ASTM C 150
3	Chemical Analysis of MSRC	ASTM C 150
4	Chemical Analysis of GGBS	BS 6699
5	Chemical Analysis of Fly Ash	ASTM C 618

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Sr. No	Description of Test	Test Method	
6	Silicon Dioxide, as SiO ₂	BS EN 196 Part 2 ASTM C 114	
7	Insoluble Residue, (IR)		
8	Chloride, as Cl ⁻		
9	Sulphate, as SO ₄		
10	Loss on Ignition, (LOI)		
11	Calcium Oxide, as CaO		
12	Magnesium Oxide, as MgO		
13	Ferric Oxide, as Fe ₂ O ₃		
14	Aluminum Oxide, as Al ₂ O ₃		
15	Tricalcium Aluminate, (C3A)		
16	Sodium Oxide, as Na ₂ O		
17	Potassium Oxide as K ₂ O		BS EN 196 Part 2 ASTM C 114
18	Moisture Content @ 105°C		
19	Manganese Oxide, as Mn ₂ O ₃		
20	Total Alkali		
21	Chemical Moduli		
J. Siliceous Materials			
1	Chemical Analysis of Microsilica	ASTM C 1240	
2	Chemical Analysis of Limestone	ASTM C 141	
3	Chemical Analysis of Silica Sand	ASTM C 114	
4	Silicon Dioxide	ASTM C 114	
5	Loss on Ignition	ASTM C 311	
6	Moisture Content	ASTM C 311	

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Sr. No	Description of Test	Test Method
7	Bulk Density	BS 812 Part 2
K. Petroleum Products (Diesel, Engine Oil, Lube Oil, etc.)		
1	Specific Gravity @ 60/60°F (Hydrometer Method)	ASTM D 1298 IP 60
2	Water Content (% vol)	ASTM D 95 IP 74 ASTM E 203
3	Sulphur Content (% wt)	ASTM D 129
4	Kinematic Viscosity of Transparent and Opaque Liquid	ASTM D 445
5	Flashpoint (Cleveland Open Cup)	ASTM D 92
6	Wear Metals	APHA – AWWA 3120 B / ICP - OES
7	Strong Acid Number	ASTM D 974
L. Glass Reinforced Plastics (GRP)		
1	Loss on Ignition / Glass Content	ASTM D 2584
2	Acetone Sensitivity	ASTM D 543
3	Chemical Resistance of GRP	ASTM D 543
4	Suitability of GRP in Contact with Water for Human Consumption	BS 6920
M. Ceramic Tiles		
1	Chemical Resistance of Tiles	BS EN ISO 10545–13
2	Stain Resistance of Tiles	BS EN ISO 10545–14
N. Paint and Sealants		
1	Volume Solids / Non-Volatile Matter	ASTM D 2697
2	Density / Specific Gravity	ASTM D 1475
O. Joint Filler Board		
1	Bitumen Content	ASTM D 545
2	Resistance to Boiling HCl	ASTM D 545

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Sr. No	Description of Test	Test Method
P. Road Marking Materials		
1	Softening Point	ASTM D 36 BS 2000 – 58
2	Binder Content	BS 3262 Part 1

CHEMICAL-ENVIRONMENTAL		
Sr. No	Description of Test	Test Method
1	Chemical Analysis of : Waste Water, Waste Chemical Waste Sludge, Contaminated Soil Waste Solid, Dewatering Water Waste Oil, Treated Water	APHA – AWWA (as per EPSS Requirements)
2	Chemical Analysis of Drinking / Potable Water	APHA – AWWA (as per Gulf Standard (GSO) / World Health Organization (WHO) Requirements)
3	Chemical Analysis of Swimming Pool Water	APHA – AWWA (as per DM Guideline No. 69)
4	Chemical Analysis of Irrigation Water	APHA – AWWA
5	Chemical Analysis of Marine / Creek Water	APHA – AWWA
6	Chemical Analysis of Ground Water	APHA – AWWA
7	Chemical Analysis of Water (Domestic / Chiller / Cooling Tower / Boiler Feed / Grey)	APHA – AWWA
8	pH	APHA – AWWA 4500 H ⁺
9	Electrical Conductivity	APHA – AWWA 2510 A
10	Total Dissolved Solids	APHA – AWWA 2540 C
11	Total Suspended Solids	APHA – AWWA 2540 D
12	Total Solids	APHA – AWWA 2540 B
13	Chemical Oxygen Demand (COD)	APHA – AWWA 5220 B, 5220 C, 5220 D
14	Biochemical Oxygen Demand (BOD) at 5 days incubation @ 20°C	APHA – AWWA 5210 B
15	Oil & Grease	APHA – AWWA 5520 B, 5520 C, 5520 D

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16	Chloride as Cl ⁻	APHA – AWWA 4500 Cl ⁻
17	Hydrocarbons	APHA – AWWA 5520 F
18	Sulphate as SO ₄	APHA – AWWA 4500
19	Calcium Hardness, Magnesium Hardness, Total Hardness	Titremetric / APHA – AWWA 2340 B
20	Carbonate, Bicarbonate, Total Alkalinity	APHA – AWWA 2320
21	Salinity	APHA – AWWA 2520 B
22	Saturation Index	WI – 05 : 2009 (Langelier Index)
23	Water / Moisture Content	KF Titrator / ASTM E 203
24	Fixed Solids, Volatile Solids, Total Solids of Waste Sludge	APHA – AWWA 2540 G
25	Specific Gravity of Waste Sludge	APHA – AWWA 2710 F

Colorimetric Analysis

26	Aluminum Species (Al ³⁺ , Al ₂ O ₃)	Aluminon Method
27	Boron (B)	Carmine Method
28	Bromine (Br ₂)	DPD Method
29	Chlorine Dioxide (Cl ₂ O ₂)	DPD Method
30	Free Chlorine (Cl ₂)	DPD Method
31	Total Chlorine (Cl ₂)	DPD Method
32	Color (True and Apparent)	Pt- Co Standard Method
33	Turbidity	Absorptometric Method
34	Cyanide (CN ⁻)	Pyridine - Pyrazalone Method
35	Cyanuric Acid	Turbidimetric Method
36	Flouride (F ⁻)	SPADNS Method
37	Iodine (I ₂)	DPD Method

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Sr. No	Description of Test	Test Method
38	Total Iron (Fe)	Ferover Method
39	Chromium Species (Cr6+, CrO4 ²⁻ , Cr2O7 ²⁻ , Na2CrO4)	1,5-diphenylcarbohydrazine Method
40	Molybdenum Species (Mo6+, MoO4 ²⁻ , Na2MoO4)	Mercaptoacetic Acid Method
41	Nitrate Species (NO ₃ ⁻ , NO ₃ ⁻ -N,)	Cadmium Reduction Method
42	Nitrite Species (NO ₂ ⁻ , NO ₂ ⁻ -N,)	Ferrous Sulphate Method
43	Total Kjeldahl Nitrogen	Nessler Method
44	Ammonia Species (NH ₃ , NH ₄ ⁺ , NH ₃ -N)	Salicylate Method
45	Dissolved Oxygen	HRDO Method
46	Organophosphonates	Ascorbic Acid Method
47	Phosphorus Species (P, P ₂ O ₅ , PO ₄ ³⁻)	Ascorbic Acid Method
48	Total Phosphorus (P)	Acid Persulfate Digestion / Ascorbic Acid Method
49	Silica Species (Si, SiO ₂)	Silicomolybdate Method
50	Sulfide (S ²⁻)	Methylene Blue Method
51	Sulfate (SO ₄ ²⁻)	Sulfaver 4 Method
52	Surfactants - Anionic (Detergents)	Crystal Violet Method
53	Total Petroleum Hydrocarbon	Immunoassay Method
54	Total Kjeldahl Nitrogen	Nessler Method
55	Total Nitrogen	Nessler / Cadmium Reduction / Ferrous Sulphate Method
56	Total Organic Carbon (TOC)	Persulphate (Photometric)
57	Phenols	Palintest
58	Metal Analysis : Aluminum (Al), Magnesium (Mg), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Bismuth (Bi), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Gallium (Ga), Iron (Fe), Lead (Pb), Lithium (Li), Ma	APHA – AWWA 3111 Atomic Absorption Spectrophotometer (AAS) APHA-AWWA 3120B Inductively Coupled Plasma-Optical Emission Spectrometer (ICP-OES)
59	Volatile Organic Compounds (VOC)	USEPA 8260 B (GC/MS)

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60	BTEX Components (Benzene, Toluene, Ethylbenzene, Xylene)	USEPA 8260 B (GC/MS)
61	Semi-volatile Organic Compounds (SVOC)	USEPA 8270 D (GC/MS)
62	Polynuclear Aromatic Hydrocarbon	USEPA 8270 D (GC/MS)
63	Suitability of Non-metallic Material in Contact with Water for Human Consumption (Ambient and High Temperature Test) Odour and Flavour Color Turbidity Dissolved Oxygen Metals Analysis	BS 6920
64	In-situ Water Quality Monitoring pH Conductivity Total Dissolved Solids Turbidity Dissolved Oxygen Salinity Redox Potential Temperature Depth Secchi Disk (Depth)	Direct Instrumental Method of Analysis
65	Air Quality Monitoring (Indoor) : Temperature Relative Humidity Wet Temperature Black Globe Temperature Air Velocity Carbon Dioxide (CO ₂) Ozone (O ₃) Carbon Monoxide (CO)	Direct Instrumental Method of Analysis
66	Air Quality Monitoring (Indoor) - Wireless Temperature Relative Humidity Formaldehyde Total Volatile Organic Compounds (TVOC) Carbon Monoxide (CO) Carbon Dioxide (CO ₂) Nitrogen Dioxide (NO ₂) Sulfur Dioxide (SO ₂) Ammonia (NH ₃) Ozone (O ₃)	Direct Instrumental Method of Analysis

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67	Air Quality Monitoring (Ambient) : Meteorological Data Nitrogen Dioxide (NO ₂) Oxides of Nitrogen (NO _x) Ozone (O ₃) Carbon Monoxide (CO) Sulfur Dioxide (SO ₂) Hydrogen Sulfide (H ₂ S) Volatile Organic Compounds (Non-methane) Carbon Dioxide (CO ₂) Particulate Matter (PM ₁₀) / (PM _{2.5})	Direct Instrumental Method of Analysis
68	Air Quality Monitoring (Ambient) : Meteorological Data Nitrogen Oxide (NO) Nitrogen Dioxide (NO ₂) Oxides of Nitrogen (NO _x) Ozone (O ₃) Carbon Monoxide (CO) Sulfur Dioxide (SO ₂) Hydrogen Sulfide (H ₂ S) Particulate Matter (PM ₁₀) / (PM _{2.5}) Hydrocarbons -BTEX -Methane / Non-Methane	40 CFR 2011 Part 50 Direct Instrumental Method of Analysis (Flame Ionization Detector-FID)
69	Stack / Flue Gas Monitoring Carbon Monoxide – low / high (CO) Carbon Dioxide (CO ₂) Oxygen (O ₂) Nitrogen Monoxide (NO) Nitrogen Dioxide (NO ₂) Sulfur Dioxide (SO ₂) Hydrogen Sulfide (H ₂ S) Hydrocarbons	Direct Instrumental Method of Analysis

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70	Stack Gas Monitoring (Isokinetic Sampling) -Stack Velocity -Stack Temperature -Moisture -Particulate Matter (Total, PM ₁₀) -O ₂ -CO ₂ -NO _x -SO ₂	USEPA Method 1 & 2 USEPA Method 4 USEPA Method 5 / 201 USEPA Method 3 USEPA Method 7 USEPA Method 6
71	Dust Monitoring Particulate Matter (1.0,2.5,7.0,10.0) Total Suspended Particulate	Direct Instrumental Method of Analysis
72	Ambient Air Quality Total Suspended Particulate PM ₁₀	USEPA 40 CFR 2011 Volume 2 Part 50 Appendix B
73	Indoor Air Quality Total Volatile Organic Compounds	Direct Instrumental Method of Analysis
74	Air Velocity	Direct Instrumental Method of Analysis
75	Noise Monitoring	Direct Instrumental Method of Analysis
76	Heat Stress Monitoring	Direct Instrumental Method of Analysis
77	Illuminance	BS 667