Laboratory	**B. S. Envi-Tech Private Limited, 12-13-1270/71/73, Amity Ville, 4th Floor, St. Ann's Road, Tarnaka, Secunderabad, Telangana**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**TC-5233** **Page 1 of 15**
Validity	**14.11.2018 to 13.11.2020** **Last Amended on 23.05.2019**

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection

BIOLOGICAL TESTING

I.	**WATER**			
1.	**Drinking Water; Ground Water/ Surface Water**	Standard Plate Count	IS 1622 Cl 3.2, Pg.No.8 to 9 APHA 23rd Edn; 9215 B, Pg.No: 9-53 & 9-56	≥1 CFU/ml
		Total Coliforms	IS 1622; Cl 3.3.2 Pg. No.12 to 13	>1CFU/100ml (1 CFU to 80 CFU per membrane)
			APHA 23rd Edn-9222B, Pg. No. 9-81 to 9-87	
			IS 1622 Cl 3.3.1 method, Pg.No. 9-12	< 2 to >1600 MPN/100 ml
			APHA 23rd Edn- 9221 B Pg. No. 9-69 & 9-72	<1.8 to >1600 MPN / 100 ml
		Feacal Coliforms/ E. coli	IS 1622; Cl 3.3.2 Pg. No.12-13	Qualitative Presence/ Absence/ 100ml
			APHA 23rd Edn.-9222 B,E,F Pg.No 9-81 to 9-87	
			IS 1622:1981 Cl 3.3.1 Pg. No.9 to 13	< 2 to >1600 MPN/100 ml
			APHA 23rd Edn.-9221 E,F Pg. No 9-77 to 9-79	<1.8 to >1600 MPN / 100 ml
		Enterococci	APHA 23rd Edn- 9230 C (3a) Pg.No. 9-119 to 9-121	≥ 1cfu / 100 ml (1 cfu to 100 cfu Per membrane)
			APHA 23rd Edn.-9230 B Pg.No 9-118 to 9-119	<1.8 to >1600 MPN / 100 ml
		Faecal Streptococci	IS 1622 Cl 3.4.1 method. Pg.No.14-15	≥ 1cfu / 100 ml
			IS 1622 Cl 3.4.2 Pg.No.15	< 2 to >1600 MPN/100 ml

Iti Saxena
Convenor

Alok Jain
Program Manager

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
II.	**POLLUTION AND ENVIRONMENT**			
1.	**Effluents/ Waste Water/sewage water**	Total Coliforms	APHA 23rd Edn.-9221B, Pg. No. 9-69 to 9-72	<1.8 to >1600 MPN / 100 ml
		Feacal Coliform / E. Coli	APHA 23rd Edn.- 9221 E,F Pg. No: 9-77 to 9-79	<1.8 to >1600 MPN / 100 ml
		Enterococci	APHA 23rd Edn.-9230 B Pg.No.9-118 to 9-119	<1.8 to >1600 MPN / 100 ml
		Faecal Streptococci	IS 1622 Cl 3.4.2 method Pg. No.15	< 2 to >1600 MPN/100 ml

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Certificate Number	**TC-5233** **Page 3 of 15**
Validity	**14.11.2018 to 13.11.2020** **Last Amended on 23.05.2019**

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.	**WATER**			
1.	**Ground Water, Surface Water, Industrial Water, Drinking water, Swimming Pool Water and Irrigation water**	Color	IS 3025 (Part-4) 2120 B, APHA 23rd Edn.	2 to 100 Hazen units
		Turbidity	IS 3025 (Part-10) 2130 B, APHA 23rd Edn.	1 to 100 NTU
		Total Dissolved Solids (TDS)	IS 3025 (Part-16) at 105^0C	10 to 10000 mg/l
		pH	IS 3025 (Part-11) 4500-H+ B, APHA 23rd Edn.	2 to 12
		Conductivity / Total Salt Concentration as Electrical Conductivity	IS 3025 (Part-14) 2510 B, APHA 23rd Edn.	2 to 20000 µS/cm
		Iron as Fe	IS 3025 (Part-53)	0.05 to 10.0 mg/l
			3111 B, APHA 23rd Edn	0.06 to 100 mg/l
		Nitrate as NO_3	4500-NO_3 B, APHA 23rd Edn	0.1 to 200 mg/l
		Nitrite as NO_2	IS 3025 (Part-34) 4500-NO_2 B, APHA 23rd Edn	0.01 to 1.0 mg/l
		Chloride as Cl	IS 3025 (Part-32) 4500-Cl- B, APHA 23rd Edn	2 to 2000 mg/l
		Fluoride as F	4500-F^- D, APHA 23rd Edn	0.1 to 10 mg/l
		Sulphate as SO_4	IS 3025 (Part-24) 4500-SO_4 E, APHA 23rd Edn	4 to 1000 mg/l
		Total Alkalinity as $CaCO_3$	IS 3025 (Part-23)	2 to 1000 mg/l
			2320 B, APHA 23rd Edition 2017	
		Calcium as Ca	IS 3025 (Part-40) 3500-Ca B, APHA 23rd Edn	1 to 1000 mg/l
		Total Hardness as $CaCO_3$	IS 3025 (Part 21) 2340 C, APHA 23rd Edn	5 to 2000 mg/l
		Magnesium as Mg	IS 3025 (Part-46)	1 to 400 mg/l

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			3500-Mg B, APHA 23rd Edn	
		Sodium as Na	IS 3025 (Part-45)	2 to 1000 mg/l
			3500-Na B, APHA 23rd Edn	
		Potassium as K	IS 3025 (Part-45)	1 to 400 mg/ l
			3500-K B, APHA 23rd Edn	
		Free Residual chlorine	IS 3025 (Part-26)	0.1 to 5.0 mg/l
			Iodometric Method	1 to 10 mg/l
		Boron as B	4500-B, B, APHA 23rd Edn	0.1 to 5.0 mg/l
		Silica as SiO_2	IS 3025 Part-35-	0.1to 60 mg/l
			4500 SiO_2 C, APHA 23rd Edn	
		Oxygen Absorbed in 4 hrs. at 27^O C	IS 3025 (Part – 63)	0.1to 10 mg/ l
		Residual Sodium Carbonate (RSC)	IS 11624 (By Calculation)	0.1 to 20 meq/ l
		Sodium Absorption Ratio (SAR)	IS 11624 (By Calculation)	1 to 50
2.	**Water for Construction**	pH	IS 3025 (Part-11)	2 to 12
			4500-H+ B, APHA 23rd Edn	
		Total Dissolved Solids (TDS)	IS 3025 (Part-16) at 105^0C	10 to 10000 mg/l
		Total Suspended Solids (TSS)	IS 3025 (Part-17)	10 to 1000 mg/l
			2540 D, APHA 23rd Edn	
		Alkalinity: (Volume (ml) of 0.02N H_2SO_4 required to neutralize 100 ml sample using mixed indicator)	IS 3025 (Part-23)	0.1to 50 ml of 0.02N H_2SO_4 for 100 ml sample
			2320 B, APHA 23rd Edn	
		Acidity: (Volume (ml) of 0.02NNaOHrequired to neutralize 100 ml sample using phenolphthalein indicator)	IS 3025 (Part-22)	0.1 to 10 ml of 0.02N NaOHfor 100 ml sample
			2310 B, APHA 23rd Edn	
		Organic Solids	IS 3025 (Part – 18)	10 to 2000 mg/l
		In Organic Solids	IS 3025 (Part - 18)	10 to 5000 mg/l
		Chloride as Cl	IS 3025 (Part-32)	2 to 2000 mg/l
			4500-Cl- B, APHA 23rd Edn	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Sulphate as SO_3 / as SO_4	IS 3025 (Part-24)	4 to 1000 mg/l
			4500-SO_4 E, APHA 23rd Edn	4 to 1000 mg/l
II.	**POLLUTION AND ENVIRONMENT**			
1.	**Waste Water (Effluents / Sewage), ETP Water / STP Water, Liquid Effluents and Aeration Tank Water**	pH	IS 3025 (Part-11)	2 to 12
			4500-H+ B, APHA 23rd Edn	
		Total Dissolved Solids (TDS)	IS 3025 (Part-16) at 105^0C	10 to 10000 mg/l
		Total Suspended Solids (TSS)	IS 3025 (Part-17)	10 to 1000 mg/l
			2540 D, APHA 23rd Edn	
		Mixed Liquor Suspended Solids (MLSS)	IS 3025 (Part-17)	100 to 5000 mg/l
			2540 D, APHA 23rd Edn	
		Total Volatile Suspended Solids (TVSS)	IS 3025 (Part-18)	10to 1000 mg/l
			2540 E, APHA 23rd Edn	
		Mixed Liquor Volatile Suspended Solids (MLVSS)	IS 3025 (Part-18)	100 to 5000 mg/l
			2540 E, APHA 23rd Edn	
		Temperature	2550 B, APHA 23rd Edn	20 to 50°C
		Hexavalent Chromium as Cr^{6+}	3500-Cr B, APHA 23rd Edn	0.05 to 10 mg/l
		Free Residual Chlorine	Iodometric Method	1 to 10 mg/l
		Chloride as Cl	IS 3025 (Part-32)	10 to 5000 mg/l
			4500-Cl- B & C APHA 23rd Edn	
		Sulphide as S^{2-}	4500-S^{2-}, D- APHA 23rd Edn	0.1to 5.0 mg/l
			4500 – S^{2-},F-APHA 23rd Edn. Iodometric Method	1.0 to 20 mg/l
		Ammonical Nitrogen as N	IS 3025 (Part-34)	0.5 to 50 mg/l
			4500-NH_3 C, APHA 23rd Edn.	
		Total Kjeldahl Nitrogen as N	IS 3025 (Part-34)	1 -100 mg/l
			4500-N(org) B,	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			APHA 23rd Edn	
		Phosphorous as P	4500-P D & E, APHA 23rd Edn.	0.1 to 50 mg/l
		Sulphate as SO_4	IS 3025 (Part-24)	5 to 5000 mg/l
		Biochemical Oxygen Demand for 3 days @ 27 ^{0}C (BOD_3)	IS 3025 (Part-44)	2 to 2000 mg/l
		Chemical Oxygen Demand (COD)	IS 3025 (Part-58)	4 to 6000 mg/l
			5220 B, APHA 23rd Edn.	
		Oil and Grease	IS 3025 (Part-39)	1 to 1000 mg/l
			5520 B, APHA 23rd Edn	
		Phenolic Compounds	IS 3025- Part 43	1.0 to 10 mg/l
			5530 B, C & D APHA 23rd Edn	
		Cyanide as CN	4500 CN E, APHA APHA 23rd Edn	0.02 to 1.0 mg/l
		Boron as B	4500-B, B, APHA 23rd Edn	0.1 to 5.0 mg/l
		Iron as Fe	IS 3025 (Part-53) 1-10 Phenanthroline	0.05 to 10.0 mg/l
			3111 B, APHA 23rd Edn	0.06 to 100 mg/l
		Manganese as Mn	3111B, APHA 23rd Edn	0.02 to 100 mg/l
		Fluoride as F	4500-F^- D, APHA 23rd Edn	0.1 to 10 mg/l
		Total Arsenic as As	3114C , APHA 23rd Edn	0.01 to 10 mg/l
		Mercury as Hg	3112 B APHA 23rd Edn	0.002 to 1.0 mg/l
		Lead as Pb	3111 B & C , APHA 23rd Edn	0.1 to 10 mg/l
		Cadmium as Cd	3111B APHA 23rd Edn	0.02 to 10 mg/l
		Total Chromium as Cr	3111B APHA 23rd Edn	0.1 to 10 mg/l
		Copper as Cu	3111B APHA APHA 23rd Edn	0.05 to 10 mg/l
		Zinc as Zn	3111B APHA 23rd Edn	0.02 to 10 mg/l
		Selenium as Se	3114 C APHA 23rd Edn	0.05 to 10 mg/l
		Nickel as Ni	3111B APHA 23rd Edn	0.10 to 10 mg/l
		Vanadium as V	3500 V B APHA 23rd Edn	0.01 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
2.	**Soils**	pH	BSET/SOP/SS-06, Issue – 02, Date: 22-04-2016 FAO Method, 2007, 6.2.2 –Page No.41to 42	1 to 14
		Conductivity	BSET/SOP/SS-04, Issue – 02, Date: 22-04-2016 FAO Method, 2007- 6.3.1 – Page No.43 to 44,	2 to 5000 µS/cm
		Moisture	BSET/SOP/SS-05, Issue – 02,Date: 22-04-2016 FAO Method, 2007 Moisture, Page No.23 to 24	5 to 50%
		Organic Carbon	BSET/SOP/SS-07, Issue – 03,Date: 22-04-2016	0.1 to 5 %
		Organic Matter	BSET/SOP/SS-14. Issue – 03,Date: 22-04-2016	0.2 to 20 %
		Exchangeable / Available Sodium as Na_2O	BSET/SOP/SS-08, Issue – 02,Date: 22-04-2016	2 to 1000 mg/kg
		Exchangeable / Available Potassium as K_2O	BSET/SOP/SS-09 Issue – 02, Date: 22-04-2016	10 to 1000 Kg/ha
		Exchangeable / Available Calcium as Ca	BSET/SOP/SS-01, Issue – 02, Date: 22-04-2016	10 to 5000 mg/kg
		Exchangeable / Available Magnesium as Mg	BSET/SOP/SS-02. Issue – 02,Date: 22-04-2016	10 to 2000 mg/kg
		Sodium Absorption Ratio (SAR)	By Calculation: BSET/SOP/SS-17, Issue – 01, Date: 19-07-2016	0.05 to 5.0
		Mineralized / Available Nitrogen as N	BSET/SOP/SS-13, Issue – 02, Date: 22-04-2016	10 to 1000 Kg/ha
		Exchangeable / Available Phosphorous as P_2O_5	BSET/SOP/SS-11 BSET/SOP/SS-10-Bray's method. , Issue – 02, Date: 22-04-2016 FAO Method, 2007: Available Phosphorus (Olsen's Method) 12.6 –Page No.75 to 76	2 to 1000 Kg/ha

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Water Extractable Chloride as Cl	BSET/SOP/SS-03. Issue – 02, Date: 22-04-2016	10 to 1000 mg/kg
		Available Sulphur	BSET/SOP/SS-15, Issue – 02,Date: 22-04-2016 FAO Methods, 2007:Sulphate (Page No.80 to 81)	1 to 500 mg/kg
		Hexavalent chromium as Cr^{6+}	SW-846 USEPA 7196 A - 1992, and USEPA 3060A - 1996	0.1 to 250 mg/kg
		Soil Texture: Sand Silt Clay	BSET/SOP/SS-16, ISSUE – 02, Date: 22-04-2016, Hydro meter method	 2 to 100% 2 to 100 % 2 to 100 %
III.	**RESIDUES IN WATER**			
1.	**Trace Metal Elements and Phenols**	Anionic Detergents (as MBAS)	Annexure K of IS 13428	0.1 to 10 mg/l
		Barium as Ba	IS 15302	0.1 to 10 mg/l
			3111 D APHA 23rd Edn	
		Copper as Cu	3111 B APHA 23rd Edn	0.02 to 10 mg/l
		Manganese as Mn	3111 B APHA 23rd Edn	0.02 to 100 mg/l
		Selenium as Se	3114 C APHA 23rd Edn	0.01 to 10 mg/l
		Silver as Ag	3111 B APHA 23rd Edn	0.02 to 10 mg/l
		Zinc as Zn	3111 B APHA 23rd Edn	0.02 to 10 mg/l
		Cadmium as Cd	3111 B & C APHA 23rd Edn	0.003 to 1.0 mg/l
		Cyanide as CN	4500 CN E, APHA 23rd Edn	0.02 to 1.0 mg/l
		Lead as Pb	IS 3025 Part : 47	0.01 to 10 mg/l
			3111 B & C APHA 23rd Edn	
		Mercury as Hg	3112 B APHA 23rd Edn	0.001 to 1.0 mg/l
		Nickel as Ni	3111 B & C APHA 23rd Edn	0.02 to 10 mg/l
		Total Arsenic as As	3114 C APHA 23rd Edn	0.01 to 10 mg/l
		Total Chromium	3111 B & C APHA 23rd Edn	0.02 to 10 mg/l
		Aluminum as Al	IS – 3025, Part – 55	0.02 to 1.0 mg/l
			3500 Al B APHA 23rd Edn	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Mineral Oil	Cl 6 of IS 3025 (P-39)	0.5 to 10 mg/l
		Phenolic Compounds	IS -3025 (P-43)	0.001 to 1.0 mg/l
			5530 B & C, APHA 23rd Edn.	
IV.	**ATMOSPHERIC POLLUTION**			
1.	**Source/Stack Emissions Monitoring**	Particulate Matter	IS 11255 (Part 1)	5 to 1000 mg/Nm^3
		Sulphur Dioxide (SO_2)	IS 11255 (Part 2)	5to 2000 mg/Nm^3
			BSET/SOP/SE-05, Issue NO: 02,Date: 27-04-2018 (Electro Chemical Sensor Method)	5to 13100 mg/Nm^3
		Oxides of Nitrogen (NO_x)	IS 11255 (Part-7) 2005 (RA 2014) BSET/SOP/SE-04, Issue – 02, Date: 27-04-2018	5 to 1340 mg/Nm^3
			BSET/SOP/SE-05, Issue NO: 02,Date: 27-04-2018 (Electro Chemical Sensor Method)	5 to 1407 mg/Nm^3
		Oxygen (O_2)	BSET/SOP/SE-05, Issue NO: 02,Date: 27-04-2018 (Electro Chemical Sensor Method)	2 to 25 %
		Carbon Monoxide (CO)	BSET/SOP/SE-05, Issue NO: 02,Date: 27-04-2018 (Electro Chemical Sensor Method)	5 to 11500 mg/Nm^3
		Nitric Oxide (NO)	BSET/SOP/SE-05, Issue NO: 02,Date: 27-04-2018	5 to 6700 mg/Nm^3

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			(Electro Chemical Sensor Method)	
		Nitrogen Dioxide (NO_2)	BSET/SOP/SE-05, Issue NO: 02, Date: 27-04-2018 (Electro Chemical Sensor Method)	5 to 2050 mg/Nm^3
		Carbon Dioxide (CO_2)	BSET/SOP/SE-05, Issue NO: 02,Date: 27-04-2018 (Electro Chemical Sensor Method)	2 to 20 %
		Mercury	USEPA 29	1.0 to 100 µg/ Nm^3
2.	**Ambient Air Monitoring**	Relative Humidity Percentage	IS 5182 (Part-4)	10 to 98 %
		Temperature	IS 5182 (Part-4)	10 to 50 °C
		Suspended Particulate Matter (SPM)	IS 5182 (Part-4)	5 to 1000 µg/ m^3
		Particulate Matter – 10 µm (PM_{10})	IS 5182 (Part-23)	5 to 1000 µg/ m^3
		Particulate Matter – 2.5 µm ($PM_{2.5}$)	BSET/SOP/AA-02, Issue No:02, Date:27-04-18 (CPCB guidelines)	2 to 500 µg/ m^3
		Sulphur Dioxide (SO_2)	IS 5182 (Part-2)	5 to 500 µg/ m^3
		Nitrogen di Oxide (NO_2)	IS 5182 (Part-6)	4 to 500 µg/ m^3
		Ozone (O_3)	IS 5182 (Part-IX)	5 to 200 µg/ m^3
		Ammonia (NH_3)	BSET/SOP/AA-06, Issue No:02,Date:27-04-2018 (Indophenol Blue Method)	1.0 to 1000 µg/ m^3
		Benzene	BSET/SOP/AA-07, Issue – 02, Date: 27-04-2018 Ref: IS 5182 (P-11) :2006 (RA 2017)	1.0 to 100 µg/ m^3
		Benzo (a)	BSET/SOP/AA-08,	1 to 100 ng / m^3

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Pyrene, (BaP) Particulate phase only	Issue – 02,Date: 27-04-2018 Ref: IS 5182 (P-12) :2004 (RA 2014)	
		Trace Metals		
		Arsenic (As)	BSET/SOP/AA-10 Issue – 02,Date: 27-04-2018 Ref: USEPA – IO – 3.2 – 1999, BY AAS - VGA	1 to 100 ng / m^3
		Lead (Pb)	BSET/SOP/AA-10 Issue – 02, Date: 27-04-18 Ref: USEPA – IO – 3.2	0.1 to 10 µg/ m^3
		Nickel (Ni)	BSET/SOP/AA-10 Issue – 02,Date: 27-04-18 Ref: USEPA – IO – 3.2-	2.0 to 100 ng/ m^3
		Mercury (Hg)	USEPA – IO – 3.2	1.0 to 100 ng/ m^3
		Carbon Monoxide	BSET/SOP/AA-09 Issue – 01,Date: 18-08-16	1.15 to 115 mg/m^3
3.	**Noise Level Monitoring**	LEQ (A)	IS 9989	30 to 110 dB(A)
V.	**ORES & MINERALS**			
1.	**Iron ores (Hematite & Magnetite)**	Moisture	IS 1493 (Part 1)	0.1 to 15.0 %
		Iron as Fe	IS 1493 (Part 1)	30 to 75.0%
		Silica as SiO_2	IS 1493 (Part 1)	0.5 to 30.0 %
		Alumina as Al_2O_3	IS 1493 (Part 1)	0.3 to 15.0 %
			IS 1493 (Part 4)	0.3 to 5.0 %
		Sulphur as S	IS 1493 (Part 1)	0.01 to 0.50 %
		Phosphorous as P	IS 1493 (Part 1)	0.03 to 0.50 %
2.	**Limestone & Dolomite**	Loss on Ignition	IS 1760 (Part 1)	5.0 to 50.0 %
		Silica as SiO_2	IS 1760 (Part 2)	0.1 to 50.0 %
		Ferric oxide as Fe_2O_3	IS 1760 (Part 3)	0.1 to 2.0 %
			BSET/SOP/O&M – 02 Issue No .1,Date:15.06.2017 (Titrimetric Method)	0.1 to 10.0 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Alumina as Al_2O_3	IS 1760 (Part 3)	0.1 to 10.0 %
		Calcium Oxide as CaO	IS 1760 (Part 3)	1.0 to 56.0%
		Magnesium as MgO	IS 1760 (Part 3)	0.2 to 30.0 %
		Free Silica	IS 1760 (Part 6)	0.1 to 10.0 %
		Chloride as Cl	IS 1760 (Part 5)	0.005 to 0.1 %
		Sodium as Na_2O	BSET/SOP/O&M – 03 Issue No .1,Date : 15.06.17	0.05 to 2.0 %
		Potassium as K_2O	BSET/SOP/O&M – 04 Issue No .1,Date: 15.06.17	0.05 to 2.0 %
3.	**Aluminum Ores (Bauxite)**	Loss on Ignition	IS 2000 (Part 1)	5.0 to 35.0 %
		Silica as SiO_2	IS 2000 (Part 2)	0.5 to 10.0 %
		Alumina as Al_2O_3	IS 2000 (Part 3)	2.0 to 65.0 %
		Ferric Oxide as Fe_2O_3	IS 2000 (Part 4)	0.5 to 30.0 %
		Titanium as TiO_2	IS 2000 (Part 5)	0.2 to 12.0 %
4.	**Silica Sands (Quartz/Quartzite Silica sand)**	Loss On Ignition	IS 1917 (Part 1)	0.05 to 5.0 %
		Silica as SiO_2	IS 1917 (Part 3)	80 to 99.9 %
		Iron as Fe_2O_3	IS 1917 (Part 5)	0.01 to 1.0 %
		Alumina as Al_2O_3	IS 1917 (Part 4)	0.05 to 2.0 %
		Sodium as Na_2O	IS 1917 (Part 2)	0.02 to 2.0 %
		Potassium as K_2O	IS 1917 (Part 2)	0.02 to 2.0 %
VI.	**SOLID FUELS**			
1.	**Coal, Coke, Lignite, Char Coal and Others**	Moisture	IS 1350 (Part 1)	0.1 to 30.0 %
		Ash	IS 1350 (Part 1)	1.0 to 70.0 %
		Volatile Matter	IS 1350 (Part 1)	1.0 to 70.0 %
		Fixed carbon	IS 1350 (Part 1)	NA
		Gross Calorific Value	IS 1350 (Part 2)	1000 to 8500 kCal/kg
		Sulphur as S	IS 1350 (Part 3)	0.05 % to 6.0 %
VII.	**BUILDING MATERIALS**			
1.	**Cement**			
	OPC 33,43,53,43 S	Loss in Ignition	IS 4032, Cl-4.2	0.1 % to 10.0 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	& 53S Grades WPC, PPC, PSC SRPC, Composite Cement	Silica as SiO_2	IS 4032, Cl- 4.3	15.0 % to 40.0 %
		Calcium as CaO	IS 4032, Cl 4.7.2 & 6.7.2 (EDTA Method)	20.0 % to 70.0 %
		Magnesia as MgO	IS 4032, Cl 4.8.2 & 6.8.2 (EDTA Method)	0.2 % to 12.0 %
		Alumina as Al_2O_3	IS 4032, Cl - 4.6.1 (Gravimetric Method)	0.5 % to 25.0 %
			IS 4032, Cl-4.6.2 (EDTA Method)	0.5 % to 25.0 %
		Iron as Fe_2O_3	IS 4032, Cl-4.5.1 (Potassium Permanganate Method)	0.1 % to 10.0 %
			IS 4032, Cl- 4.5.2 (EDTA Method)	0.1 % to 10.0 %
		Total Sulphur Calculated as Sulphuric anhydride (SO_3)	IS 4032, Cl- 4.9	0.1 % to 5.0 %
		Sulphur Trioxide as SO_3	IS 4032, Cl- 6.11	0.1 % to 5.0 %
		Insoluble residue	IS 4032, Cl- 4.10	0.1 % to 20.0 %
				0.1 % to 40.0 %
		Sulphide Sulphur	IS 4032, Cl- 6.12	0.1 % to 2.0%
		Sodium as Na_2O	IS 4032, Cl- 4.11	0.05 % to 2.0 %
			BSET/SOP/BM-01	0.05 % to 2.0%
		Potassium as K_2O	IS: 4032, Cl - 4.11	0.1 % to 2.0 %
			BSET/SOP/BM-02	0.1 % to 2.0 %
		Alkalies as Na_2O	By Calculation	0.2 % to 4.0 %
		Chlorides as Cl	IS 4032, Cl - 4.13	0.005 % to 1 %
		CaO- $0.7SO_3$ $2.8SiO_2+1.2Al_2O_3+0.65Fe_2O_3$	By Calculation as per IS: 269	0.5 to 1.10
		Ratio of percentage of alumina to that of iron oxide Al_2O_3 / Fe_2O_3	By Calculation as per IS: 269	0.8 to 2.0
2.	**GGBS**	Moisture	Annex B of IS 16714:2018	0.01 % to 5.0 %
		Loss in Ignition	IS 4032, Cl - 4.2	0.1 % to 2.0 %

Laboratory	**B. S. Envi-Tech Private Limited, 12-13-1270/71/73, Amity Ville, 4th Floor, St. Ann's Road, Tarnaka, Secunderabad, Telangana**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**TC-5233** **Page 14 of 15**
Validity	**14.11.2018 to 13.11.2020** **Last Amended on 23.05.2019**

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Granulated Slag UGGBS	Silica as SiO_2	IS 4032, Cl - 4.3	15.0 % to 50 %
		Iron as Fe_2O_3	IS 4032, Cl 4.5.1 (Potassium Permanganate Method)	0.1 % to 10.0 %
			IS 4032, Cl - 4.5.2 (EDTA Method)	0.1 % to 10.0 %
		Alumina as Al_2O_3	IS 4032, Cl - 4.6.1 (Gravimetric Method)	0.5 % to 30.0 %
			IS 4032, Cl - 4.6.2 (EDTA Method)	0.5 % to 30.0 %
		Calcium as CaO	IS 4032,Cl - 4.7.2 & 6.7.2 (EDTA Method)	15 % to 50.0 %
		Magnesia as MgO	IS 4032,Cl - 4.8.2 & 6.8.2 (EDTA Method)	0.5 % to 20.0 %
		Sulphate as (SO_3)	IS 4032,Cl - 4.9	0.1 % to 5.0 %
		Sulphide Sulphur	IS 4032,Cl - 6.12	0.1 % to 2.0 %
		Insoluble residue	IS 4032,Cl - 4.10	0.1 % to 10.0 %
		Chlorides as Cl	IS 4032,Cl - 4.13	0.005 % to 1.0 %
		Manganese oxide as MnO	IS 4032, Cl - 6.10	0.02 % to 5.0 %
			IS 12423 (Colorimetric Method)	0.02 % to 5.0 %
		$\frac{CaO+MgO+1/3Al_2O_3}{SiO_2+2/3Al_2O_3}$	By Calculation as per IS 16714	0.8 to 2.0
		$\frac{CaO+MgO+Al_2O_3}{SiO_2}$	By Calculation as per IS 16714	1.0 to 3.0
3.	**Fly Ash/ Bottom Ash/ Pulverized Fuel Ash**	Silica as SiO_2	IS 1727, Cl- 5.4	30 % to 70 %
		Loss on Ignition	IS 1727, Cl- 5.3	0.1 % to 5.0 %
		Alumina as Al_2O_3	IS 1727, Cl- 5.7	0.5 % to 50 %
		Iron as Fe_2O_3	IS 1727,Cl- 5.6	0.2 % to 10 %
		Calcium as CaO	IS 1727,Cl- 5.8 (Gravimetric Method)	0.2 % to 30 %
		Magnesia as MgO	IS: 1727,Cl- 5.9 (Gravimetric Method)	0.2 % to 10 %
		Total Sulphur as Sulphuric anhydride (SO_3)	IS 1727, Cl- 5.10	0.1 % to 5 %

Iti Saxena
Convenor

Alok Jain
Program Manager

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Available alkalies as Na_2O	IS 3812(Part-1), Annexure-C IS 3812(Part-2),Annexure- B	0.1 % to 5.0 %
		Chlorides as Cl	IS 4032,Cl - 4.13	0.005 % to 1 %
4.	**Concrete Admixtures**	Dry Material Content percent	Annex E of IS:9103	15 % to 60 %
		Ash Content percent	Annex E of IS:9103	0.50 % to 10 %
		Relative density	Annex E of IS:9103	1.0 to 1.40
		Chloride ion content percent	IS 6925 (Volumetric Method)	0.01 % to 3 %
		pH	Annex E of IS:9103	5 to 10