

Laboratory **Shri Krishna Aqua Engineering Works, H.No.3&4, Limbuwala Building,
1st Cross, Pragati Colony, Vidyanagar, Hubli, Karnataka**

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

Certificate Number **TC-8137 (in lieu of T-3051)**

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Validity **16.11.2018 to 15.11.2020**

Last Amended on **26.11.2018**

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

I.	WATER			
1.	Surface Water/ Ground Water/ Drinking Water/	Acidity as CaCO ₃	APHA 23rd Edition-2017 2310B	2 mg/L to 1000 mg/L
		Alkalinity as CaCO ₃	APHA 23rd Edition-2017 2320B	2 mg/L to 1000 mg/L
		Nitrate Nitrogen as NO ₃ -N	APHA 23rd Edition-2017 4500-NO ₃ ,E	0.1 mg/L to 50 mg/L
		Nitrite Nitrogen as NO ₂ -N	APHA 23rd Edition-2017 4500-NO ₂ ,B	0.1 mg/L to 10 mg/L
		Boron as B	APHA 23rd Edition-2017 4500-B,B	0.05 mg/L to 10 mg/L
		Chloride as Cl	APHA 23rd Edition-2017 4500-Cl,B	0.5 mg/L to 1000 mg/L
		Chromium Hexavalent as Cr ⁺⁶	APHA 23rd Edition-2017 3500-Cr,B	0.02 mg/L to 10 mg/L
		Electrical Conductivity	APHA 23rd Edition-2017 2510-B	1 μS/cm to 10000μS/cm
		Dissolved Oxygen	APHA 23rd Edition-2017 4500-O,C	0.10 mg/L to 8 mg/L
		Fluoride as F	APHA 23rd Edition-2017 4500-F,D	0.02 mg/L to 10 mg/L
		Calcium as Ca	APHA 23rd Edition-2017 3500-Ca,B	2 mg/L to 1000 mg/L
		Total Hardness as CaCO ₃	APHA 23rd Edition-2017 2340-C	2 mg/L to 1000 mg/L
		Iron as Fe	APHA 23rd Edition-2017 3500-Fe,B	0.02 mg/L to 10 mg/L
		Magnesium as Mg	APHA 23rd Edition-2017 3500-Mg,B	1 mg/L to 1000 mg/L

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		Cadmium as Cd	APHA 23rd Edition-2017 3500-Cd	1 mg/L to 5.0 mg/L
		Copper as Cu	APHA 23rd Edition-2017 Cu-B,C	1 mg/L to 5.0 mg/L
		Manganese as Mn	APHA 23rd Edition-2017 3500-Mn,B	1 mg/L to 5.0 mg/L
		Nickel as Ni	APHA 23rd Edition-2017 3500-Ni	1 mg/L to 5.0 mg/L
		Zinc as Zn	APHA 23rd Edition-2017 3500-Zn,B	1 mg/L to 5.0 mg/L
		Cobalt as Co	APHA 23rd Edition-2017 3500-Co	1 mg/L to 5.0mg/L
2.	Irrigation water	Potassium as K	APHA 23rd Edition-2017 3500-K,B	2 mg/L to 1000 mg/L
		Sodium as Na	APHA 23rd Edition-2017 3500-Na,B	2 mg/L to 1000 mg/L
		Total Dissolved Solids (TDS)	APHA 23rd Edition-2017 2540 C	4 mg/L to 15000 mg/L
		Sulphate as SO ₄	APHA 23rd Edition-2017 4500-SO ₄ ²⁻ ,E	1 mg/L to 1000 mg/L
		Calcium as Ca	APHA 23rd Edition-2017 3500-Ca,B	2 mg/L to 2500 mg/L
		Magnesium as Mg	APHA 23rd Edition-2017 3500-Mg,B	1 mg/L to 2500 mg/L
		pH @25°C	APHA 23rd Edition-2017 4500 H ⁺ ,B	2 to 12
		Chloride as Cl	APHA 23rd Edition-2017 4500-Cl,B	2 mg/L to 2500 mg/L
		Alkalinity as CaCO ₃	APHA 23rd Edition-2017 2320B	2 mg/L to 5000 mg/L
		Boron as B	APHA 23rd Edition-2017 4500-B,B	0.1 mg/L to 10 mg/L
		Copper as Cu	APHA 23rd Edition-2017 Cu-B,C	1 mg/L to 5.0 mg/L

Vivek Vardhan
Convenor

Alok Jain
Program Manager

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		Turbidity in NTU	APHA 23rd Edition-2017 2130 B	1 NTU to 50 NTU
		Sodium Absorption Ratio	SKAEW/IP/01 Issue Date:01.02.2013 Issue No:01	1 m.equ/L to 25 m.equ/L
		Residual Sodium Carbonate	SKAEW/IP/02 Issue Date:01.02.2013 Issue No:01	1 to 20
3.	Construction water	Organic Solids	IS 3025 (Part 18) (RA 2014)	2 mg/L to 200mg/l
		In Organic Solids	IS 3025 (Part 18) (RA 2014)	2 mg/L to 3000mg/l
		Sulphate as SO ₃	IS 3025 (Part 24) (RA 2014)	2 mg/L to 400mg/l
		To neutralize 100 ml Sample of water with 0.02 N NaOH	IS 3025 (Part 22) (RA 2014)	2 ml to 50 ml
		To neutralize 100 ml Sample of water with 0.02 N H ₂ SO ₄	IS 3025 (Part 23) (RA 2014)	2 ml to 50 ml
		Chloride as Cl	IS 3025 (Part 32) (RA 2014)	2 mg/L to 2000mg/l
		Suspended Solids	IS 3025 (Part 17) (RA 2014)	2 mg/L to 2000mg/l
4.	Demineralized Water	Electrical Conductivity @25°C	APHA 23rd Edition-2017 2510-B	1 µS/cm to 20 µS/cm
		pH@25°C	APHA 23rd Edition-2017 4500 H,B	2 to 12
		Total Solids	APHA 23rd Edition-2017 2540 B	2 mg/L to 100 mg/L
		Silica as SiO ₂	APHA 23rd Edition-2017 4500-SiO ₂	1.0 mg/L to 5.0 mg/L
		Colour retention of KmnO ₄ @27°C	IS 1070 Annex. A:1992 3 rd Rev. (RA 2008)	1 min to 80 min

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II.	ENVIRONMENT POLLUTION			
1.	Waste water	Ammonical Nitrogen as NH ₃ -N	APHA 23rd Edition-2017 4500-NH ₃ ,C	1 mg/L to 1000 mg/L
		Total kjeldhal Nitrogen as N	APHA 23rd Edition-2017 4500-Norg,C	1 mg/L to 1000 mg/L
		Biochemical Oxygen Demand (BOD ₅)	APHA 23rd Edition-2017 5210 B	2 mg/L to 25000 mg/L
		Boron as B	APHA 23rd Edition-2017 4500-B,B	0.1 mg/L to 10 mg/L
		Chemical Oxygen Demand(COD)	APHA 23rd Edition-2017 5220 B	4 mg/L to 100000 mg/L
		Chloride as Cl	APHA 23rd Edition-2017 4500-Cl,B	2.0 mg/L to 10000 mg/L
		Chlorine Residual as Cl ₂	APHA 23rd Edition-2017 4500-Cl,B	1 mg/L to 500 mg/L
		Chromium Hexavalent as Cr ⁺⁶	APHA 23rd Edition-2017 3500-Cr,B	0.02 mg/L to 100 mg/L
		Electrical Conductivity @25°C	APHA 23rd Edition-2017 2510-B	1 to 100000 µS/cm
		Iron as Fe	APHA 23rd Edition-2017 3500-Fe,B	0.02 mg/L to 10 mg/L
		Oil & Grease	APHA 23rd Edition-2017 5520 D	1 mg/L to 1000 mg/L
		pH	APHA 23rd Edition-2017 4500 H,B	2 to 12
		Sludge volume index	APHA 23rd Edition-2017 2710 D	10 mg/L to 1000 mg/L
		Total Suspended Solids (TSS)	APHA 23rd Edition-2017 2540 D	2 mg/L to 1000 mg/L
		Turbidity in NTU	APHA 23rd Edition-2017 2130 B	1 mg/L to 400 mg/L
		Colour	APHA 23rd Edition-2017 2120 B	5 Hazen Units to 70 Hazen Units

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		Odour	APHA 23rd Edition-2017 2150 B	
		Biochemical Oxygen Demand(BOD ₃)	IS 3025(Part 44):1993 (RA 2014)	1 mg/L to 250000mg/L
		Cadmium as Cd	APHA 23rd Edition-2017 3500-Cd	1 mg/L to 5.0 mg/L
		Copper as Cu	APHA 23rd Edition-2017 3500-Cd	1 mg/L to 5.0 mg/L
		Manganese as Mn	APHA 23rd Edition-2017 3500Pb-B	1 mg/L to 5.0 mg/L
		Nickel as Ni	APHA 23rd Edition-2017 3500-Mn,B	1 mg/L to 5.0 mg/L
		Zinc as Zn	APHA 23rd Edition-2017 3500-Ni	1 mg/L to 5.0 mg/L
		Cobalt as Co	APHA 23rd Edition-2017 3500-Co	1 mg/L to 5.0mg/L
2.	Soil/Sediments	pH@25°C	IS 2720(Part 26)-1987	1 to 14
		Electrical Conductivity@25°C	IS 14767:2000	1 µS/cm to 40000 µS/cm
		Moisture Content	IS 2720(Part II)-1997	0.5 % to 18 %
		Organic Matter	IS 2720 (part 22):1972 (RA 2010)	0.10 % to 10 %
		Organic Carbon	IS 2720 (part 22):1972 (RA 2010)	0.31% to 100 %
		Dissolved Sulphur	IS 14685:1999	0.2 mg/kg to 100 mg/kg
		Ammonical Nitrogen as NH ₃	IS 14684:1999	0.2 mg/kg to 500 mg/kg
		Dissolved Phosphorous as P	SKAEW/IP/04 Issue Date:01.08.2016 Issue No:01	0.6 mg/kg to 500 mg/kg
		Sodium as Na	SKAEW/IP/06 Issue Date:01.08.2016 Issue No:01	1 mg/kg to 100 mg/kg

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		Potassium as K	SKAEW/IP/06 Issue Date:01.08.2016 Issue No:01	2 mg/kg to 1500 mg/kg
III.	ATMOSPHERIC POLLUTION			
1.	Ambient Air Monitoring	Oxides of Nitrogen (as NO ₂)	IS 5182 (Part 6)-2006 (RA 2012)	7.0 µg/m ³ to 500 µg/m ³
		Particulate Matter (PM10)	IS 5182 (Part 23)-2006 (RA 2012)	5.0 µg/m ³ to 500 µg/m ³
		Particulate Matter (PM2.5)	(CTR 40 Part 50 Appendix L) SKAEW/IP/07 Issue Date:01.03.2013 Issue No:01	5.0 µg/m ³ to 250 µg/m ³
		Sulphur Dioxide as SO ₂	IS 5182(Part 2)-2001 (RA 2012)	5.0 µg/m ³ to 500 µg/m ³
		Carbon Monoxide	(Carbon Monoxide Analyser) SKAEW/IP/009 Issue Date:01.08.2016 Issue No:01	0.5 µg/m ³ to 500 µg/m ³
		Ammonia	SKAEW/IP/010 Issue Date:01.08.2016 Issue No:01	4. µg/m ³ to 50 µg/m ³
2.	Stack Emission Test	Velocity of flue gas discharge	IS 11255(Part 3)-1985 (RA 2014)	1.5 m/s to 60 m/s
		Particulate matter (PM)	IS 11255(Part 1)-1985 (RA 2014)	5.0 mg/Nm ³ to 500 mg/Nm ³
		Nitrogen Dioxide as NO ₂	IS 11255 (Part 7)-2005 (RA 2014)	4.0 mg/Nm ³ to 400 mg/Nm ³
		Sulphur Dioxide as SO ₂	IS 11255 (Part 2)-2005 (RA 2014)	4.0 mg/Nm ³ to 400 mg/Nm ³

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		Acid Mist	EPA part 8 SKAEW/IP/09 Issue Date:01.08.2016 Issue No:01	1.0 mg/Nm ³ to 10 mg/Nm ³
		Carbon Dioxide as CO ₂	SKAEW/IP/011 Issue Date:01.08.2016 Issue No:01	0.1 ppm to 20 ppm
		Carbon Monoxide	SKAEW/IP/011 Issue Date:01.08.2016 Issue No:01	0.1 % to 25 %
		Oxygen as (O ₂)	SKAEW/IP/011 Issue Date:01.08.2016 Issue No:01	0.1 mg/L to 20 mg/L
3.	Noise Monitoring	Noise in dB(A)	IS 9989-1981(RA 2001)	35 dB(A) to 135 dB(A)
4.	Light Intensity	Light Intensity	SOP:SKAEW/IP/018 Issue Date:01.08.2016 Issue No:01	0.1 Lux to 200000 Lux

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MECHANICAL TESTING

I.	BUILDING MATERIAL			
1.	Coarse Aggregate	Specific Gravity	IS 2386 (Part 3)-1963, (RA 2016)	2 to 4
		Bulk Density.	IS 2386 (Part 3)-1963, (RA 2016)	1 kg/l to 2 kg/l
		Sieve Analysis	IS 2386(Part 1)-1963, (RA 2016)	0.1% to 100 % (80 mm to 4.75 mm)
		Water Absorption	IS 2386(Part 3)-1963, (RA 2016)	0.1 % to 2.5 %
		Impact Value	IS 2386 (Part 4)-1963, (RA 2016)	5 % to 50 %
		Flakiness Index	IS 2386 (Part 1)-1963, (RA 2016)	2 % to 50 %
		Elongation Index		2 % to 50 %
2	Fine Aggregate	Specific Gravity.	IS 2386(Part 3)-1963, (RA 2016)	2 to 4
		Bulk Density.	IS 2386(Part 3),-1963 (RA 2016)	1 kg/l to 2 kg/l
		Sieve Analysis	IS 2386(Part 1)-1963 (RA 2016)	0.1% to 100 % (10mm to150 micron)
		Water Absorption	IS 2386(Part 3)-1963 (RA 2016)	0.1 % to 5 %
3	Concrete	Compressive Strength	IS-516-1959, (RA 2013)	10 N/mm ² to 40 N/mm ²
4.	Hollow & Solid Concrete Blocks	Compressive Strength	IS 2185 (Part 1)-2005 (RA 2010)	1 N/mm ² to 20 N/mm ²

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