

Accreditation Scope

Arab Center for Engineering Studies, NAL 062
Testing Laboratory, (ISO/IEC 17025:2017)

Industrial City of Abu Dhabi (ICAD-1), Abu Dhabi, UAE

Issue Date: 07-04-2020

Expiry Date: 23-01-2023

Issue No: 09

Testing Field	Materials/ Products tested	Type of test/ Test parameter/ Properties measured/Range of measurement	Test Method (Standard, Internal Procedure, Technique)	Permanent lab (P) / Client-site (S)
Chemical	Food & Food Products	Determination of Total Ash in Foods	SOP062, rev.1 based on AOAC methods, 20 th edition (by Ashing)	P
		Determination of Moisture & Total Solids in Foods	SOP065, rev.1 based on AOAC methods, 20 th edition (Air Oven Method)	
		Determination of total Nitrogen & Protein in Food	SOP067, rev. 1 based on AOAC Official Methods, 20 th edition (Kjeldahl Method & Calculation)	
		Total Acidity in Food	AOAC 947.05, 20 th edition	
		Determination of pH Value of Acidified Foods	SOP066, rev.0 based on AOAC 981.12, 20 th edition	
		Determination of Crude & Total Fat Content By Soxhlet Extraction Method	SOP064, rev.0 based on AOAC Official Methods, 20 th edition (Soxhlet Extraction Method)	
		Carbohydrates & Energy Value in Food	SOP077, rev.0 based on AOAC methods, 20 th edition (by Calculation)	
		Minerals in Fortified Food Products Fe, Cu, Zn, Ca, Mg, Na, K, P, Mn by ICP-OES after Microwave Digestion	AOAC 2011.14, 20 th edition	
		Determination of Heavy Metals - As, Cd, Pb, Sn, Hg	SOP083, rev.2	

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Chemical	Food & Food Products	Pesticide Residues in Fruits & Vegetables; Organochlorine: <ul style="list-style-type: none"> • alpha-BHC • gamma-BHC (Lindane) • beta-BHC • delta-BHC • Heptachlor • Aldrin • Heptachlor epoxide (isomer B) • gamma-Chlordane (trans) • Endosulfan I • alpha-Chlordane (cis) • 4,4'-DDE • Dieldrin • Endrin Endosulfan II • 4,4'-DDD • Endrin aldehyde • Endosulfan sulfate • 4,4'-DDT • Endrin ketone • Methoxychlor 	SOP079, rev.1 based on AOAC 985.22- 970.52, 20 th edition	P

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Chemical	Food & Food Products	Pesticide Residues in Fruits & Vegetables; Organophosphorous: <ul style="list-style-type: none"> • Dichlorvos (DDVP) • Mevinphos (Phosdrin) • Demeton (O&S) • Mocap (Ethoprophos) • Sulfotep • Phorate • Dimethoate • Diazinon • Disulfoton • Methyl parathion • Ronnel (Fenchchlorphos) • Malathion • Dursban (Chlorpyrifos) • Fenthion • Parathion (Ethyl parathion) • Trichloronate • Tetrachlorvinphos (Stirofos) • Tokuthion (Prothiofos) • Fensulfotion • Bolstar (Sulprofos) • EPN (Phosphonothioic acid) • Azinphos methyl (Guthion) 	SOP079, rev.1 based on AOAC 985.22- 970.52, 20 th edition	P

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Chemical	Food & Food Products	<p>Fatty Acid Profile Analysis Saturated Fatty Acid (SFA):</p> <ul style="list-style-type: none"> • Caproic acid methyl ester (C6:0) • Caprylic acid methyl ester (C8:0) • Capric acid methyl ester (C10:0) • Lauric acid methyl ester (C12:0) • Myristic acid methyl ester (C14:0) • Palmitic acid methyl ester (C16:0) • Stearic acid methyl ester (C18:0) • Arachidic acid methyl ester (C20:0) • Behenic acid methyl ester (C22 :0) • Lignoceric acid methyl ester (C24:0) <p>Mono Unsaturated Fatty Acid (MUFA):</p> <ul style="list-style-type: none"> • Myristoleic Acid Methyl Ester (C14:1 cis) • Palmitoleic acid methyl ester (C16:1 cis) • Petroselinic acid methyl ester (C18:1 Cis) • Elaidic acid methyl ester (C18:1trans) 	SOP080, rev.1 based on AOAC, 20 th edition (GC FID method)	P

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Chemical	Food & Food Products	<ul style="list-style-type: none"> • cis- Vaccenic acid methyl ester(C18;1 cis) • Oleic acid Methyl Ester(C18:1cis) • cis-11-Eicosenoic acid methyl ester (C20:1cis) • Erucic acid methyl ester (C22:1cis) • Nervonic acid methyl ester (C24:1 cis) Poly Unsaturated Fatty Acid (PUFA): <ul style="list-style-type: none"> • Linolelaidic acid methyl ester (C18:2trans) • Linoleic acid methyl ester (C18:2 cis) • Linolenic acid methyl ester (C18:3 cis) • Arachidonic acid methyl ester(C20:4cis) • Methyl Cis-4,7,10,13,16,19-Docosahexaenoate(C22:6) 	SOP080, rev.1 based on AOAC, 20 th edition (GC FID method)	P
Chemical	Food & Food Products	Determination of sugars in food By HPLC-RID method: Fructose Glucose Sucrose Maltose Lactose Total Sugar	SOP090, rev.0 based on AOAC: 980.13 , AOAC: 977.20, AOAC SMPR 2018.001, 20 th edition	P

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Chemical	Materials in Contact with Foodstuff	Overall Migration by total Immersion and article Filling using Aqueous Simulants	SOP 081A, SOP081B & SOP081C based on BS EN 1186-1:2002; BS EN 1186-3:2002; BS EN 1186- 9:2002	P	
		Heavy Metals Migration -Ba, Co, Cu, Fe, Li, Mn, Zn	SOP082, rev.0 based on HS1003	P	
	Concrete	Determination of Chloride Content of Hardened Concrete	BS 1881-124:2015; Cl. 12.1	P	
		Determination of Sulphate Content of Hardened Concrete	BS 1881-124:2015; Cl. 12.2		
	Aggregate	Determination of Chloride Content (Acid Soluble)	BS EN 1744-5: 2006	P	
		Determination of Sulphate Content (Acid Soluble)	BS EN 1744-1-2009+A1- 2012		
		Organic Impurities in Fine Aggregates	ASTM C40-16		
	Soil	Determination of pH Value of Soil	BS 1377-3:2018 Cl.12	P	
		Determination of the Sulphate Content of Soil (Water Extract & Acid Extract)	BS 1377:2018 Part 3 Cl. 7.3 / 7.6 ; BS 1377:2018 Part 3 Cl. 7.9 / 7.6		
		Determination of the Chloride Content of Soil (Water Extract & Acid Extract)	BS 1377-3:2018; Cl. 9.2.2- 9.2.5, 9.2.7;		
		Determination of Carbonate Content	BS 1377-3:2018; Cl. 9.3		
		Determination of Organic Matter Content	BS 1377-3-2018 Clause 4		
	Chemical	Soils & Sediment	Determination of Metals by ICP-OES: Ag, Al, As, Ba, Be,	SOP005, rev.1 & SOP004, rev.1, based on	P

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		Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, V, Zn, Hg	APHA3120 (B) 23 rd edition & USEPA 3050B	
	Soils & Sediment	Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry (GC MS): <ul style="list-style-type: none"> • Acetone • Acetonitrile • Acrylonitrile • Allyl chloride (3- chloropropene) • Benzene • Bromobenzene • Bromochloromethane • Bromodichloromethane • Bromoform • Bromomethane • Carbon disulfide • Carbon Tetrachloride 	SOP013, rev.2 & SOP015, rev.0, based on USEPA 8260C & USEPA 5035A	P

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Chemical	Soils & Sediment	<ul style="list-style-type: none"> • Chlorobenzene • Chloroethane • Chloroform • Chloromethane • Chloroprene (2-chloro-1,3-butadiene) • cis-1,2-Dichloroethene • cis-1,3-Dichloropropene • cis-1,4-Dichloro-2-butene • Dibromochloromethane • Dibromomethane • Dichlorodifluoromethane • Diethyl ether • Ethyl methacrylate • Ethylbenzene • Hexachlorobutadiene • Iodomethane (methyl iodide) • Isopropylbenzene • m & p- Xylene • Methacrylonitrile • Methyl acrylate • Methyl methacrylate • Methylene chloride (dichloromethane) 	SOP013, rev.2 & SOP015, rev.0, based on USEPA 8260C & USEPA 5035A	P

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Chemical	Soils & Sediment	<ul style="list-style-type: none"> • MTBE (Methyl-tert-butyl ether) • Naphthalene • n-Butylbenzene • n-Propylbenzene • o-Xylene • Pentachloroethane • p-Isopropyltoluene (p-Cymene) • Propionitrile • sec-Butylbenzene • Styrene • tert-Butylbenzene • Tetrachloroethene • Tetrahydrofuran • Toluene • trans-1,2-Dichloroethene • trans-1,3-Dichloropropene • trans-1,4-Dichloro-2-butene • Trichloroethene • Trichlorofluoromethane • Vinyl chloride • 1,1,1,2-Tetrachloroethane • 1,1,1-Trichloroethane 	SOP013, rev.2 & SOP015, rev.0, based on USEPA 8260C & USEPA 5035A	P

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Chemical	Soils & Sediment	<ul style="list-style-type: none"> • 1,1,2,2-Tetrachloroethane • 1,1,2-Trichloroethane • 1,1,2-Trichlorotrifluoroethane (CFC-113) • 1,1-Dichloroethane • 1,1-Dichloroethene • 1,1-Dichloropropene • 1,2,3-Trichlorobenzene • 1,2,3-Trichloropropane • 1,2,4-Trichlorobenzene • 1,2,4-Trimethylbenzene • 1,2-Dibromo-3-Chloropropane • 1,2-Dibromoethane (EDB) • 1,2-Dichlorobenzene • 1,2-Dichloroethane • 1,2-Dichloropropane • 1,3,5-Trimethylbenzene • 1,3-Dichlorobenzene • 1,3-Dichloropropane • 1,4-Dichlorobenzene • 2,2-Dichloropropane • 2-Butanone (MEK) • 2-Chlorotoluene • 2-Hexanone • 4-Chlorotoluene • 4-Methyl-2-pentanone (MIBK) 	SOP013, rev.2 & SOP015, rev.0, based on USEPA 8260C & USEPA 5035A	P
		Petroleum Hydrocarbons Diesel Range Petroleum Hydrocarbons (DRO)	USEPA 8015D & USEPA 3550C	P

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Chemical	Soils & Sediment	Petroleum Hydrocarbons Gasoline Range Petroleum Hydrocarbons (GRO)	USEPA 8015D & USEPA 5035A	P
		Moisture, Total Solids, Fixed Solids, Volatile Solids	APHA 2540 G, 23 rd edition	P
	Ground Water	pH	USEPA 9045 D	P
		Determination of the Sulphate Content of Ground Water	BS 1377-3:2018 Cl. 7.8.3 / 7.6	
		Determination of the Chloride Content of Ground Water	BS 1377-3:2018; Cl. 9.2.7	
	Ambient Water, Drinking Water, Waste Water	Determination of Metals by ICP-OES: Ag, Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, V, Zn and Hg(waste water only)	SOP005, rev.1 & SOP003, rev.1, based on APHA 3120 (B) 23 rd edition & APHA 3030 B & F 23 rd edition	P
		Drinking Water	Determination of Mercury in Drinking Water	SOP012, rev.0
	Ambient Water, Drinking Water, Waste Water	Volatile Organic Compounds by Gas Chromatography / Mass Spectrometry (GC MS): <ul style="list-style-type: none"> • Acetone • Acetonitrile • Acrylonitrile • Allyl chloride (3- chloropropene) • Benzene • Bromobenzene • Bromochloromethane • Bromodichloromethane 	SOP013, rev.2 & SOP014, rev.0 based on USEPA 8260C & USEPA 5030C	P

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Chemical	Ambient Water, Drinking Water, Waste Water	<ul style="list-style-type: none"> • Bromoform • Bromomethane • Carbon disulfide • Carbon Tetrachloride • Chlorobenzene • Chloroethane • Chloroform • Chloromethane • Chloroprene (2-chloro-1,3-butadiene) • cis-1,2-Dichloroethene • cis-1,3-Dichloropropene • cis-1,4-Dichloro-2-butene • Dibromochloromethane • Dibromomethane • Dichlorodifluoromethane • Diethyl ether • Ethyl methacrylate • Ethylbenzene • Hexachlorobutadiene • Iodomethane • Isopropylbenzene • m & p- Xylene • Methacrylonitrile • Methyl acrylate • Methyl methacrylate • Methylene chloride (dichloromethane) • MTBE (Methyl-tert-butyl-ether) • Naphthalene • n-Butylbenzene • n-Propylbenzene • o-Xylene 	SOP013, rev.2 & SOP014, rev.0 based on USEPA 8260C & USEPA 5030C	P

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Chemical	Ambient Water, Drinking Water, Waste Water	<ul style="list-style-type: none"> • Pentachloroethane • p-Isopropyltoluene (p-Cymene) • Propionitrile • sec-Butylbenzene • Styrene • tert-Butylbenzene • Tetrachloroethene • 1,2,4-Trimethylbenzene • 1,3,5-Trimethylbenzene • Tetrahydrofuran • Toluene • trans-1,2-Dichloroethene • trans-1,3-Dichloropropene • trans-1,4-Dichloro-2-butene • Trichloroethene • Trichlorofluoromethane • Vinyl chloride • 1,1,1,2-Tetrachloroethane • 1,1,1-Trichloroethane • 1,1,2,2-Tetrachloroethane • 1,1,2-Trichloroethane • 1,1,2-Trichlorotrifluoroethane (CFC-113) • 1,1-Dichloroethane • 1,1-Dichloroethene • 1,1-Dichloropropene • 1,2,3-Trichlorobenzene • 1,2,3-Trichloropropane • 1,2,4-Trichlorobenzene 	SOP013, rev.2 & SOP014, rev.0 based on USEPA 8260C & USEPA 5030C	P

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Chemical	Ambient Water, Drinking Water, Waste Water	<ul style="list-style-type: none"> • 1,2,4-Trimethylbenzene • 1,2-Dibromo-3-Chloropropane • 1,2-Dibromoethane (EDB) • 1,2-Dichlorobenzene • 1,2-Dichloroethane • 1,2-Dichloropropane • 1,3,5-Trimethylbenzene • 1,3-Dichlorobenzene • 1,3-Dichloropropane • 1,4-Dichlorobenzene • 2,2-Dichloropropane • 2-Butanone (MEK) • 2-Chlorotoluene • 2-Hexanone • 4-Chlorotoluene • 4-Methyl-2-pentanone (MIBK) 	SOP013, rev.2 & SOP014, rev.0 based on USEPA 8260C & USEPA 5030C	P
Chemical	Ambient Water, Drinking Water, Waste Water	Petroleum Hydrocarbons: Diesel Range Petroleum Hydrocarbons (DRO)	USEPA 8015D & USEPA 3510C	P
		Petroleum Hydrocarbons: Gasoline Range Petroleum Hydrocarbons (GRO)	USEPA 8015D & USEPA 5030C	
		pH	APHA 4500 H+B 23 rd edition	
		Chloride Content	APHA 4500 CI-B 23 rd edition	
		Sulphate Content	APHA 4500 S04 2- C 23 rd edition	
		Total Dissolved Solids	APHA 2540 C 23 rd edition	

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Chemical	Ambient Water, Drinking Water, Waste Water	Total Suspended Solids	APHA 2540 D 23 rd edition	P
		Biological Oxygen Demand, 5 Days BOD Test	APHA 5210 B 23 rd edition	
		Total & Dissolved Organic Carbon (TOC) By High Temperature Combustion Method	APHA 5310 B 23 rd edition & SOP018	
	Ambient Water, Drinking Water	Total Alkalinity to pH 4.4	APHA 2320 B 23 rd edition	P
		Carbonates & Bicarbonates	APHA 2320 B 23 rd edition	
		Chemical Oxygen Demand (COD)	APHA 5220 B 23 rd edition	
		Oil & Grease	APHA 5520 B 23 rd edition	
		Calcium	APHA 3500 Ca B 23 rd edition	
		Magnesium	APHA 3500 Mg B 23 rd edition	
		Total Hardness as CaCO ₃	APHA 2340 C 23 rd edition	
		Electrical Conductivity @ 25 °C	APHA 2510 B 23 rd edition	
		Fluoride	APHA 4500 F- D 23 rd edition	
		Determination of Inorganic Anions in Water by Ion Chromatography: PO ₄ , Cl, F, NO ₂ , NO ₃ , SO ₄ , Br	APHA 4110B, 23 rd edition	
		Determination of Inorganic Anions in Water by Ion Chromatography: Bromate, Bromide, Chlorite, Chlorate	APHA 4110 D, 23 rd edition	

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Environmental	Indoor Air Quality	Determination of Particulate Matter in Indoor Air	SOP044, rev.1 using AEROCET 831 Mass Profiler	S
		Nitrogen Dioxide (NO ₂)	SOP084, rev.3 based on USEPA SECTION 01 81 09 & BS EN 60079-29-2: 2015	
		Sulphur Dioxide (SO ₂)		
		Volatile Organic Compounds (VOC)		
		Formaldehyde – HCOH		
		Carbon Monoxide (CO)		
		Carbon Dioxide (CO ₂)		
		Hydrogen Sulphide (H ₂ S)		
		Oxygen (O ₂)		
		Ozone (O ₃)		
		Ammonia (NH ₃)		
		Temperature		
	Relative Humidity			
Air Quality (Emissions from Stationary & Combustion Sources, Boilers & Incinerators)	Determination of Nitrogen Oxides (NO, NO ₂ , NO _x), CO, CO ₂ , SO ₂ , O ₂ , & C _x H _y Emissions from Stationary & Combustion Sources, Boilers & Incinerators Using Portable Flue Gas Analyzer	SOP046, rev.2 based on USEPA CTM 34; USEPA Method 1; USEPA Method 7E; USEPA Method 6C; USEPA Method 20; ASTM D6522-11		
Outdoor Air Quality	Ambient Air Quality Monitoring for SO ₂ , CO, NO ₂ , NO _x , O ₃ and particulate matter (TSP, PM ₁ , PM _{2.5} and PM ₁₀)	SOP042, rev.2 based on BS EN 60079-29-2:2015, EPA/600/R-14/159 & USEPA 40 CFR 58 Appendix E		

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Environmental	Air Quality	Total Suspended Particulate Matter (TSPM, Respirable Suspended Particulate Matter (RSPM-PM10, 4, 2.5 & 1)	SOP043, rev.1 based on USEPA CFR40, Part 50 & 53	S
	Noise	Occupational & Environmental Noise	SOP047, rev.2, based on ISO 1996: Part 1:2016 & ISO 1996: Part 2:2017,	
	Industrial Premises & other Workplaces	Determination of Heat Stress at Work Place	BS EN ISO 7243:2017, SOP086, rev.0	
Sampling / Microbiology	Indoor Air Quality	Sampling by Impaction, Detection & Enumeration of Yeast, Mould & Total Bacterial Count	SOP085, rev.0 based on NIOSH 800:1998, ISO 16000-18:2011 & Method 2.2.1, Manual of Hygiene Methods for the Food & Drink Industry, Campden & Chorelywood for Research Association, Guideline No.45:2003	P/S
	Drinking Water, Potable & Non-Potable Water	Microbiological Sampling of Water	SOP073, rev.0 based on APHA 9060A & APHA 9213 B, 23 rd edition	
	Water	Sampling for Legionella Bacteria in Water System	BS 7592:2008	
	Food & Swab	Sampling of Food	SOP034, rev.0 based on US FDA BAM Chapter 1, 2003 & CMMEF Chapter 2, 5 th edition	

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Sampling / Microbiology	Food & Swab	Swab Sampling for Microbiological Analysis	SOP074, rev.3 based on ISO 18593:2018 & CMMEF Chapter 3, 5 th edition	P/S
Microbiology	Food & Swab	Enumeration of Staphylococcus Aureus	SOP053, rev.1 Method 3.5.1, Manual of Microbiological Methods for the Food & Drink Industry, Campden & Chorelywood for Research Association, 5 th edition 2007	P
	Swab	Total Aerobic Plate Count	US FDA BAM Chapter 3, SOP074, rev.3 based on ISO 18593:2018 & CMMEF Chapter 3, 5 th edition	P/S
	Swab	Enumeration of Total Coliforms	CCFRA 2.2.1:2007, SOP074 , rev. 3 based on ISO 18593:2018 & CMMEF Chapter 3, 5 th edition	
	Food & Food Products	Enumeration of Yeast & Mould	Method 2.1.1, Manual of Microbiological Methods for the Food & Drink Industry, Campden & Chorleywood for Research Association, 5 th edition 2007	P

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Microbiology	Food & Food Products	Enumeration of Bacillus Cereus	US FDA BAM Chapter 14,2001 (2012)	P
		Detection of Vibrio Parahaemolyticus	Method 3.8.2, Manual of Microbiological Methods for the food & Drink Industry, Campden & Chorleywood for Research Association, 5 th edition 2007	
		Enumeration of Clostridium Perfringenes	Method 3.6.1, Manual of Microbiological Methods for the Food & Drink Industry, Campden & Chorleywood for Research Association, 5 th ed. 2007	
		Detection of E.coli 0157-H7	SOP 075, rev.0 based on AOAC 2000.14, 20 th edition (Reveal test kit method)	
		Detection of Listeria sp.	SOP076, rev.0 (Reveal test kit method)	
		Aerobic Plate Count	Bacteriological Analytical Manual (BAM) - Ch. 3, USFDA	
		Enumeration of Enterobacteraceae	Method 2.3.1, Manual of Microbiological Methods for the Food & Drink Industry, Campden & Chorelywood for Research Association	

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Microbiology	Food & Food Products	Enumeration of Coliforms by Colony Count Method	Method 2.2.1, Manual of Microbiological Methods for the Food & Drink Industry, Campden & Chorelywood for Research Association	P
		Enumeration of Coliforms by MPN Method	Method 9.71, Compendium of Methods for the Microbiological Examination of Foods, 5 th edition	
		Enumeration of E-Coli by MPN Method	Method 9.91, Compendium of Methods for the Microbiological Examination of Foods, 5 th edition	
		Detection of Salmonella spp.	Method 3.1.2, Manual of Microbiological Methods for the Food & Drink Industry, Campden & Chorelywood for Research Association	
	Drinking Water	Total Coliforms (IDEXX Method)	SOP016, rev.5, based on APHA 9223B 23 rd edition by IDEXX COLILERT & COLILERT-18	
	Drinking Water, Potable & Non Potable Water	Detection & Enumeration of Legionella	ISO 11731:2017	
Enumeration of Pseudomonas Aeruginosa		ISO 16266:2006		

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Microbiology	Ambient Water, Drinking Water, Waste Water	Total Coliforms (Membrane Filtration M-d)	APHA 9222B 23 rd edition, SOP022 , rev. 2	P
		Fecal Coliforms (IDEXX Method)	SOP016, rev.5, based on APHA 9223B 23 rd edition by IDEXX COLILERT-18	
		Fecal Coliforms (Membrane Filtration M-d)	APHA 9222D 23 rd edition, SOP023, rev.2	
		E. coli (IDEXX Method)	SOP016 , rev. 5, based on APHA 9223B 23 rd edition by IDEXX COLILERT & COLILERT-18 (Drinking Water, Waste Water, Ambient Water)	
		E. coli (Membrane Filtration M- d)	APHA 9222B & APHA 9222H, 23 rd edition, SOP024 , rev. 2	
		Enterococci (IDEXX Method)	SOP017, rev.1, based on ASTM D6503-14 by IDEXX Enterolert	
	Water	Enumeration of Enterococci (MF Method)	APHA 9230 C 23 rd edition	P
		Heterotrophic plate count by Enzyme Substrate Method	APHA 9215 E 23 rd edition	
		Heterotrophic plate count by Pour Plate Method	APHA 9215 B 23 rd edition	
	Raw & Potable Water	Total Colony Count at 37 °C	CCFRA1.1.4:2007	P

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Microbiology	Field Sampling & Testing	Standard Penetration Test (SPT)	BS EN ISO 22476-3:2005 +A1:2011; BS 1377-9:1990, Cl. 3.3	S
		Soil Sampling	BS 5930:2015, CL. 25.6	
		Rotary Core Drilling	BS 5930:2015, Sec 6	
		Ground Water Level Measurement	BS 5930:2015, CL 52	
		Ground Water Sampling	BS 5930:2015 Cl. 26.4	
Geotechnical	Rock Cores	Unconfined Compressive Strength Including preparation of rock cores	ASTM D7012-2014 e1, Method C & ASTM D4543- 2008	P
		Determination of the Point Load Strength Index of Rock & Application to Rock Strength Classifications Point Load Strength Index	ASTM D5731-16	
		Determination of Water (moisture) Content of Soil & Rock by Mass	ASTM D 2216 -2019	
		Rock Quality designation	BS 5930:2015, Cl 36	
	Core Recovery	BS 5930:2015, Cl 36		
	Description & Classification	Description & Classification of Rocks	BS 5930:2015, Sec 6	P/S
		Soil Description	BS 5930:2015, Sec 6	
	Soil	Determination of Water Content of Soil	BS EN ISO 17892-1:2014; BS 1377-2:1990 Amd.9027: 96, Cl.3.2	P

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Geotechnical	Soil	Determination of Liquid Limit, Plastic Limit and Plasticity Index of Soil	BS EN ISO 17892-12: 2018, Cl. 5.3, 5.4, & 5.5; BS 1377-2:1990 Amd. 9027-96, Cl. 4.3, 4.5, 5.3 & 5.4	P
		Determination of Particle Size Distribution by Hydrometer Method	BS EN ISO 17892-4:2016, Cl. 5.3; BS 1377-2:1990 (Amd.9027:96), Cl.9.5	
		Determination of Particle Size Distribution Wet Sieving Method	BS EN ISO 17892-4:2016; BS 1377-2:1990 Amd. 9027- 96, Cl.9.2	
		Particle Size Distribution - Dry Sieving Method	BS EN ISO 17892-4:2016; BS 1377-2:1990 Clause 9.3 Amd. 9027-96	
	Reporting	Reporting	BS 5930:2015, Section 10	
	Soil / Rock	Water Permeability testing using open system - Falling Head	SOP096, rev. 0, based on BS EN ISO 22282-2:2012	S
		Standard Test Method For Prebored Pressure meter Testing in Soils and Rock - High Pressure Meter (OYO Elastmeter-2)	SOP092 , rev. 0 based on ASTM D4719-07	
		Electrical Cone and Piezocone Penetration Testing (CPTU)	SOP087, rev. 0 BS EN ISO 22476-1:2012	
		Water Pressure Testing Rocks - Packer Method	SOP093, rev. 0, based on BS EN ISO 22282-3:2012	

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Geophysical Testing	Soil Materials	Crosshole Seismic Testing	ASTM D4428-14	S
		Downhole Seismic Testing	ASTM D7400-19	
		Multi-channel Analysis of Surface Waves (MASW)	SOP094 , rev. 0	
		Electrical Resistivity Tomography (ERT)	SOP095 , rev. 0	
Mechanical/ Physical	Soil	Determination of Dry Density Moisture Content Relationship using 4,5kg Rammer	BS 1377-4:1990 Amd. 13925 -02, Cl. 3.5 & 3.6	P
		Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Efforts	ASTM D1557-12e1	P
		Determination of California Bearing Ratio (CBR)	BS 1377-4:1990 Amd. 13925 -02, Cl. 7.2. 3.2.	P
		Determination of In-situ Density by Sand Replacement Method (Large Pouring Cylinder)	BS 1377-9:1990 Amd. 8264-95, Cl. 2.2	P/S
		Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method	ASTM D 1556/ D1556M- 15e1	S
	Concrete	Compressive Strength of Cubes including curing	BS EN 12390-3:2009 & BS EN 12390-2:2009	P
		Density of Hardened Concrete	BS EN 12390-7:2009	
		Water Absorption of Concrete	BS1881-122:2011	
		Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration	ASTM C1202:2019	
		Water Permeability	DIN 1048-5:1991	

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Mechanical/ Physical	Concrete	Depth of Penetration of Water Under Pressure	BS EN 12390-8:2019	P
		Initial Surface Absorption of Concrete	BS 1881-208:1996	
	Aggregates	Determination of particle size distribution	BS 812-103.1:1985	P
		Sieve Analysis of Fines and coarse Aggregate	ASTM C136/C136M-14	
		Determination of particle size distribution — Sieving method	BS EN 933-1-2012	
		Finer than 75 -µm (No.200) Sieve in Mineral Aggregates by washing	ASTM C117-17	
		Flakiness index of coarse aggregate	BS 812-105.1:1989	
		Determination of particle shape -Flakiness Index	BS EN 933-3:2012	
		Elongation index of coarse aggregate	BS 812-105.2:1990	
		Determination of moisture content	BS 812-109:1990	
		Determination of particle densities & water absorption	BS 812-2: 1995 (Amd.10379 -99) Cl. 5.3, 5.4 & 5.5	
		Relative Density (Specific Gravity) and Absorption of Fine Aggregate	ASTM C128-15	
		Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate	ASTM C127-15	

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Mechanical/ Physical	Aggregates	Determination of Shell Content in Course Aggregates	BS EN 933-7:1998	P
		Soundness of Aggregates using Sodium Sulphate & Magnesium Sulphate	ASTM C88-18	
		Clay Lumps and Friable Particles	ASTM C 142-17	
		Ten Percent Fines Value	BS 812-111:1990	
		Aggregate Impact Value (AIV)	BS 812-112:1990	
		Determination of Aggregate Crushing Value (ACV)	BS 812-110:1990	
		Determination of Sand Equivalent	ASTM D 2419-14	
		Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine	ASTM C 131-14	
		Degradation of Large Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine	ASTM C535-16	
	Drying Shrinkage	BS EN 1367-4-2008		
	Cement	Compressive Strength of Cement	BS EN 196-1:2016	P
		Consistency of Cement	BS EN 196-3: 2016, Cl. 5	
		Setting Time of Cement	BS EN 196-3:2016, Cl. 6	

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Mechanical/ Physical	Cement	Soundness of Cement	BS EN 196-3: 2016, Cl. 7	P
		Determination of fineness, Air Permeability method	BS EN 196-6:2018	
	Steel	Determination of Tensile Properties & Elongation for Reinforcing bars	BS EN ISO 15630-1:2010, BS EN ISO 6892-1:2016	P
		Bend Test, Carbon steel bars for the reinforcement of concrete	BS 4449:1988, App C, Cl. 1.6.1	
		Re-Bend Test	BS 4449: 2005+A3:2016, Cl. 7.2.5	
	Asphalt	Quantitative extraction of bitumen from bituminous paving mixture	ASTM D2172/D2172M-2017	P
		Quantitative extraction of bitumen from bituminous paving mixture	AASHTO T164-2014	
		Preparation of Asphalt Mixture Specimens Using Marshall Apparatus	ASTMD6926-16	
		Marshall Stability and Flow of Asphalt Mixtures	ASTM D6927-15	
		Resistance to plastic flow mixtures by bituminous apparatus	AASHTO T245-15	
		Specific Gravity, Density and Water Absorption of Non-Absorptive Compacted Asphalt Mixtures	ASTM D2726-19	

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Mechanical/ Physical	Asphalt	Specific Gravity of Compacted Hot Mix Asphalt (HMA) Using Saturated Surface Dry Specimens	AASHTO T166-16, Method A	P
		Thickness of Compacted Bituminous Paving Mixture specimens	ASTM D3549-18	
		Distillation of Cutback Asphalt	ASTM D402-2014	
		Distillation of Emulsified Asphalt	ASTM D6997-2012	
	Bitumen	Softening point of bitumen (Ring and ball apparatus)	ASTM D36/D36M-2014e1	P
		Penetration of Bituminous Material	ASTM D5-2013	
	Masonry Units	Measurement of Dimensions	BS EN 772-16:2011	P
		Determination of Compressive Strength	BS EN 772-1:2011 +A1:2015	
	Fresh Concrete	Sampling fresh concrete on site	BS EN 12350-1:2009	S
		Slump Test	BS EN 12350-2:2009	
		Slump Test	ASTM C143 / C143M - 15a	
		Temperature of Fresh Concrete	ASTM C1064/C1064M-17	
	GRP	Method for Tensile Properties of Plastic	ASTM D638-2014	P
	Geotextile	Geotextile wide width tensile test	BS EN ISO 10319:2015	P
		Determining Apparent Opening Size of a Geotextile	ASTM D4751-16	
Static puncture test (CBR-Test) for Geotextiles and geotextile-related products		BS EN ISO 12236:2006		

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Mechanical/ Physical	Geotextile	Determination of puncture resistance of geomembranes & related products	ASTM D6241-14	P
		Determination of Grab breaking load & elongation	ASTM D4632/D4632M-15a	
	Waterproofing membrane	Determination of tensile properties. Bitumen sheets for roof waterproofing	BS EN 12311-1:2000	P
		Tensile tear strength of bituminous roofing membranes	ASTM D4073-2006(2013)	
		Tear resistance of waterproofing membrane	ASTM D5147/D5147M-2018	
		Determination of resistance to tearing (Nail Shank)	BS EN 12310-1-2000	
		Determination of Mass per unit area	BS EN 1849-1-2000	
		Determination of water absorption of plastics	ASTM D570-98(2018)	
		Determination of puncture resistance of geomembranes & related products	ASTM E154-08a(2013)e1	

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Mechanical/ Physical	Deep Foundations	Standard Test Method for Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing	ASTM D6760-16	S
		Standard Guide for Conducting Borehole Geophysical. Logging: Mechanical Caliper	ASTM D6167 - 19	
		Standard Test Method for High- Strain Dynamic Testing of Deep Foundations	ASTM D4945-17	
		Standard Test Method for Low Strain Impact Integrity Testing of Deep Foundations	ASTM D5882-16	
END				