CERTIFICATE OF ACCREDITATION

This is to attest that

ARAB COMPANY FOR LABORATORIES AND SOIL (ACES-KHOBAR)

AL SAADAH STREET, AL THAWN AREA, P.O. BOX 70156, BUILDING NO. 7028
AL-KHOBAR (EASTERN PROVINCE) 34632, SAUDI ARABIA

Testing Laboratory TL-512

has met the requirements of AC89, *IAS Accreditation Criteria for Testing Laboratories*, and has demonstrated compliance with ISO/IEC Standard 17025:2017, *General requirements for the competence of testing and calibration laboratories.* This organization is accredited to provide the services specified in the scope of accreditation.

Expiry Date August 1, 2025
Effective Date August 22, 2024

International Accreditation Service
Issued under the authority of IAS management

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SCOPE OF ACCREDITATION

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ARAB COMPANY FOR LABORATORIES AND SOIL (ACES-KHOBAR)

www.aces-int.com

Contact Name Rashad A. Al Kilani **Contact Phone** +966-3-881-1941

Accredited to ISO/IEC 17025:2017 *Effective Date August 22, 2024*

Aggregate	
ASTM C29/C29M	Standard test method for bulk density (“unit weight”) and voids in aggregate
ASTM C40	Standard Test Method for Organic Impurities in Fine Aggregates for Concrete
ASTM C88	Standard test method for soundness of aggregates by use of sodium sulfate or magnesium sulfate
ASTM C117	Standard test method for materials finer than 75-µm (no. 200) sieve in mineral aggregates by washing
ASTM C123	Standard Test Method for Lightweight Particles in Aggregate
ASTM C127	Standard test method for relative density (specific gravity) and absorption of coarse aggregate
ASTM C128	Standard test method for relative density (specific gravity) and absorption of fine aggregate
ASTM C131/C131M	Standard test method for resistance to degradation of small-size coarse aggregate by abrasion and impact in the Los Angeles machine
ASTM C136/C136M	Standard test method for sieve analysis of fine and coarse aggregates
ASTM C142/C142M	Standard test method for clay lumps and friable particles in aggregates
ASTM C373	Standard test method for water absorption, bulk density, apparent porosity, and apparent specific gravity of fired whiteware products, ceramic tiles, and glass tiles
ASTM C535	Standard test method for resistance to degradation of large-size coarse aggregate by abrasion and impact in the Los Angeles machine
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM C702/ C702M	Standard Practice for Reducing Samples of Aggregate to Testing Size
ASTM D75/D75M	Standard practice for sampling aggregates
ASTM D2419	Standard test method for sand equivalent value of soils and fine aggregate
ASTM D2434/D2434M	Standard test method for permeability of granular soils (constant head)

ASTM D4791	Standard test method for flat particles, elongated particles, or flat and elongated particles in coarse aggregate
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
BS 812: Part 111	Rock ten percent value as crushing resistance
BS 812: Part 112	Method for determination of aggregate impact value (AIV)
BS EN 933-3	Tests for geometrical properties of aggregates, Part 3: Determination of particle shape - Flakiness Index
BS EN 933-7	Tests for geometrical properties of aggregates, Part 7: Determination of shell content - Percentage of Shells in Coarse Aggregate
Asphalt	
ASTM D5/D5M-20	Standard Test Method for Penetration of Bituminous
ASTM D36/D36M	Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
ASTM D92-18	Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
ASTM D113-17	Standard Test Method for Ductility of Asphalt Materials
ASTM D140 Cl 16	Sampling Asphalt Materials Cl 16. Sampling Crushed or Powdered Materials
ASTM D402/ D402M	Standard Test Method for Distillation of Cutback Asphalt
ASTM D546	Standard Test Method for Sieve Analysis of Mineral Filler for Bituminous Paving Mixtures
ASTM D979/D979M	Standard Practice for Sampling Bituminous Paving Mixtures
ASTM D1188	Bulk specific gravity and density of compacted bituminous mixtures using coated samples
ASTM D2041/D2041M	Standard test method for theoretical maximum specific gravity and density of bituminous paving mixtures
ASTM D2042-22	Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene or Toluene
ASTM D2172/D2172M	Standard test methods for quantitative extraction of bitumen from bituminous paving mixtures
ASTM D2726/D2726M	Standard test method for bulk specific gravity and density of non-absorptive compacted bituminous mixtures
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3203/ D3203M	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures

ASTM D3549/D3549	Standard test method for thickness or height of compacted bituminous paving mixtures specimens
ASTM D4402	Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361/ D5361M	Standard Practice for Sampling Compacted Bituminous Mixtures for Laboratory Testing
ASTM D6752/ D6752M	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Asphalt Mix Specimens by Means of the Superpave Gyratory Compactor
ASTM D6926	Standard practice for preparation of bituminous specimens using Marshall apparatus
ASTM D6927	Standard test method for Marshall stability and flow of asphalt mixtures
ASTM D6931	Standard Test Method for Preparation and Determination of the Relative Density of Asphalt Mix Specimens by Means of the Superpave Gyratory Compactor
BS EN 12697-39:2012 (Method B only), ASTM D6307 (Method B only)	Bituminous mixtures. Test methods for hot mix asphalt. Binder content by ignition
Cement	
ASTM C109/C109M	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens)
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C143/C143M	Standard test method for slump of hydraulic-cement concrete
ASTM C151	Standard Test Method for Autoclave Expansion of Hydraulic Cement
ASTM C187	Standard Test Method for Amount of Water Required for Normal Consistency of Hydraulic Cement Paste
ASTM C188	Standard Test Method for Density of Hydraulic Cement
ASTM C191	Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
ASTM C204	Standard Test Methods for Fineness of Hydraulic Cement by Air-Permeability Apparatus
ASTM C311/ C311M CL 20	Standard Test Method for Fineness of Hydraulic Cement by the 45-µm (No.325) Sieve – Cl 20 Fineness, Amount Retained When Wet-Sieved on A45-Mm (No. 325) Sieve
ASTM C430	Standard Test Method for Fineness of Hydraulic Cement by the 45-µm (No.325) Sieve

ASTM C511	Standard specification for mixing room, moist cabinets, moist rooms, and water storage tanks used in the testing of hydraulic cements and concretes
ASTM C1107/C1107M	Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C1585	Standard test method for measurement of rate of absorption of water by hydraulic-cement concretes
BS EN 196-1	Determination of strength
BS EN 196-1	Flexural Strength of hydraulic cement and mortar
BS EN 196-7	Taking and Preparing Samples of Cement
BS EN 413-2	Normal consistency of masonry cement and mortar
Chemical (Admixtures)	
ASTM C494	Standard specification for chemical admixtures for concrete, Cl. 18.0 – Determination of dry material content
Chemical (Aggregate)	
ASTM D1757	Standard Test Method for Sulfate Sulfur in Ash from Coal and Coke
ASTM D3042	Standard test method for insoluble residue in carbonate aggregates
BS 1744-1:2009 + A1	Tests for chemical properties of aggregates. Chemical analysis, Cl. 4.2, 4.3, 4.4, 5.3, 5.5, 7.0, 9.0 & A.2 – Method for determination of water-soluble chloride salts (water extracted)
BS 1744-1:2009 + A1	Tests for chemical properties of aggregates. Chemical analysis, Cl. 4.5, 5.6, 10 & A.4 – Methods for determination of sulfate content (water extracted)
BS 1744-1:2009 + A1	Tests for chemical properties of aggregates. Chemical analysis, Cl. 4.7, 12 & A.6 – Determination of acid-soluble sulfate content
BS 1744-1:2009 + A1	Tests for chemical properties of aggregates. Chemical analysis, Cl. 4.8, 5.9 & 14.2 – Determination of light weight contaminator
BS 1744-1:2009 + A1	Tests for chemical properties of aggregates. Chemical analysis, Cl. 16.0 – Determination of water solubility of aggregate
BS 1744-1:2009 + A1	Tests for chemical properties of aggregates. Chemical analysis, Cl. 17.0 – Determination of loss on ignition
BS 1744-5	Tests for chemical properties of aggregates – Determination of acid soluble chloride salts
Verhoef	Methylene Blue Adsorption. The use of methylene blue adsorption test to assess the clay content of the cappadocian tuff
Chemical (Cement)	
ASTM C150	Standard specification for Portland cement: Annex A1 – Determination of alkalies, tricalcium silicate, dicalcium silicate, tricalcium aluminate, tetracalcium aluminoferrite, solid solution
BS EB 196-2	Method of testing cement. Chemical analysis of cement, Cl. 4.4.1 – Determination of loss on ignition

BS EN 196-2	Method of testing cement. Chemical analysis of cement, Cl. 4.4.3 – Determination of the insoluble residue
BS EN 196-2	Method of testing cement. Chemical analysis of cement
Chemical (Concrete)	
BS 1881-124	Testing concrete. Methods for analysis of hardened concrete, Cl. 6.0 – Determination of cement content
BS 1881-124	Testing concrete. Methods for analysis of hardened concrete, CL 6.0 & 7.0 – Determination of aggregate content
BS 1881-124	Testing concrete. Methods for analysis of hardened concrete, Cl. 12.1 – Determination of chloride content
BS 1881-124	Testing concrete. Methods for analysis of hardened concrete, Cl. 12.2 – Determination of sulfate content
Chemical (Limestone)	
ASTM C1271	Standard test method for X-ray spectrometric analysis of lime and limestone
ASTM C25	Standard test methods for chemical analysis of limestone, quicklime and hydrated lime, Section 19 – Determination of loss on ignition
ASTM C1271	Standard test method for X-ray spectrometric analysis of lime and limestone
ASTM STP1356	Analysis of limestones and dolomites by X-ray fluorescence factor
ASTM C25	Standard test methods for chemical analysis of limestone, quicklime and hydrated lime, Section 33 – Determination of calcium carbonate equivalent
Chemical (Fly Ash& Micro silica)	
ASTM C311	Standard test methods for sampling and testing fly ash or natural pozzolans for use in Portland cement concrete; loss on ignition
ASTM C311	Standard test methods for sampling and testing fly ash or natural pozzolans for use in Portland cement concrete; moisture content
ASTM E1621	Standard guide for elemental analysis by wavelength dispersive X-ray fluorescene spectrometry – Elemental analysis of fly ash
ASTM E1621	Standard guide for elemental analysis by wavelength dispersive X-ray fluorescence spectrometry – Elemental analysis of silica fume
Chemical (Fertilizer)	
ASTM E1621	Standard guide for elemental analysis by wavelength dispersive X-ray fluorescene spectrometry – Elemental analysis of fertilizer
Chemical (Oil)	
ASTM D5558	Standard test method for determination of the saponification value of fats and oils
Chemical (Soil)	
BS 1377-3+A1	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical tests, Cl. 4 – Loss on ignition

BS 1377-3+A1	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical tests, Cl. 5.2 and 5.5 – Acid soluble sulphate
BS 1377-3+A1	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical tests, Cl. 5.3 and 5.5 – Water soluble sulphate
BS 1377-3+A1	Methods of test for Soils for civil engineering Purposes, Part 3: Chemical and electro-chemical Tests, Cl. 6.0 - Carbonate content
BS 1377-3+A1	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical tests, Cl. 7.2 – Water soluble chloride
BS 1377-3+A1	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical tests, Cl. 7.3 – Acid soluble chloride
BS 1377-3+A1	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical tests, Cl. 8.0 – Total Dissolved Solids
BS 1377-3+A1	Methods of test for soils for civil engineering purposes. Part 3: Chemical and electro-chemical tests, Cl. 9.0 – pH
Chemical (Steel)	
ASTM E572	Standard test method for analysis of stainless and alloy steels by wavelength dispersive X-ray Fluorescence spectrometry
Chloride	
NT Build 492-1999-11	Concrete chloride migration coefficient
Concrete	
ASTM C31/C31M	Standard practice for making and curing concrete test specimens in the field
ASTM C39/C39M	Standard test method for compressive strength of cylindrical concrete specimens
ASTM C42/C42M	Standard test method for obtaining and testing drilled cores and sawed beams of concrete
ASTM C78	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C94 Annex A1	Standard Specification for Ready-Mixed Concrete
ASTM C138/C138M	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C172/C172M	Standard practice for sampling freshly mixed concrete ASTM C187
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C231/C231M	Standard test method for air content of freshly mixed concrete by the pressure method
ASTM C232/ C232M	Standard Test Method for Bleeding of Concrete
ASTM C403	Standard Test Method for Time of Setting of Concrete Mixtures by Penetration Resistance

ASTM C470/C470M	Standard Specification for Molds for Forming Concrete Test Cylinders Vertically (except cl 5)
ASTM C495	Standard Test Method for Compressive Strength of Lightweight Insulating Concrete
ASTM C579	Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes (Test Method B)
ASTM C597	Standard test method for pulse velocity through concrete
ASTM C617/C617M	Standard practice for capping cylindrical concrete specimens
ASTM C642	Standard test method for density, absorption, and voids in hardened concrete
ASTM C689	Standard test method for modulus of rupture of unfired clays
ASTM C805	Standard test method for rebound number of hardened concrete
ASTM C856	Standard Practice for Petrographic Examination of Hardened Concrete
ASTM C876	Standard test method for corrosion potentials of uncoated reinforcing steel in concrete
ASTM C1064/C1064M	Standard test method for temperature of freshly mixed hydraulic cement concrete
ASTM C1074	Standard practice for estimating concrete strength by the maturity method
ASTM C1202	Standard test method for electrical indication of concrete's ability to resist chloride ion penetration
ASTM C1231	Standard Practice for Use of Unbonded Caps in Determination of Compressive Strength of Hardened Cylindrical Concrete Specimens
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM C1611	Standard Test Method for Slump Flow of Self-Consolidating Concrete
ASTM D4541	Standard test method for pull-off strength of coatings using portable adhesion testers
BS 1881 Part 107 Amd 6722-91, BS EN 123050-6	Method for determination of density of compacted fresh concrete
(ISAT) BS 1881 Part 122 Amd. 6108-89	Method for determination of water absorption
BS 1881-204	Testing concrete- recommendations on the use of electromagnetic cover meters
BS 1881 Part 208	Recommendation for determination of initial surface absorption
BS EN 12390-8	Depth of Penetration of Water Under Pressure

BS EN 12504-1	Testing concrete in structures. Cored specimens. Taking, examining and testing in compression
BS EN 14630	Determination of carbonation depth in hardened concrete by the phenolphthalein method
DIN 1048 Part 5	Water Permeability of Hardened Concrete
Concrete Masonry Units	
ASTM C140	Determination water absorption (hollow/solid)
ASTM C140, Clause 7	Clause 7 only: Determination of compressive strength of concrete masonry units
Environmental (Air)	
Aerocet 831 Mass Profiler	Particulate matter in indoor air
BS EN 60079-29-2	Explosive Atmospheres. Gas Detectors, Selection, Installation, Use and Maintenance Of Detectors For Flammable Gases and Oxygen 1. Nitrogen dioxide NO2 2. sulfur dioxide SO2 3. Volatile organic compounds VOC 4. Carbon monoxide CO 5. Carbon dioxide CO2 6. Hydrogen sulfide 7. Particulate matter PM1, PM2.5, PM10 8. Formaldehyde 9. Oxygen O2 10. Ozone O3 11. Ammonia
MS-129 (ACES)	Tests for Air Quality (Emissions from stationary combustible sources, boilers and incinerators) using TESTO Model 350 to determine: NO, NO2, CO, CO2, SO2, CxHy and O2
US EPA section 01, 08, 09	SECTION 01 81 09 "TESTING FOR INDOOR AIR QUALITY 1. Nitrogen dioxide NO2 2. sulfur dioxide SO2 3. Volatile organic compounds VOC 4. Formaldehyde 5. Carbon monoxide CO 6. Carbon dioxide CO2 7. Hydrogen sulfide 8. Oxygen O2 9. Ozone O3 10. Ammonia
US EPA 40 CFR 58	Ambient Air Quality Surveillance Siting Criteria for Open Path Analyzers 1. Nitrogen dioxide NO2 2. sulfur dioxide SO2 3. Volatile organic compounds VOC 4. Carbon monoxide CO 5. Carbon dioxide CO2

	6. Hydrogen sulfide 7. Particulate matter PM1, PM2.5, PM10
EPA/600/R-14/159	Air Sensor Guidebook 1. Nitrogen dioxide NO2 2. sulfur dioxide SO2 3. Volatile organic compounds VOC 4. Carbon monoxide CO 5. Carbon dioxide CO2 6. Hydrogen sulfide 7. Particulate matter PM1, PM2.5, PM10
Environmental (Noise)	
ISO 1996-2	Acoustics Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels
Environmental (Water/Soil)	
APHA 2110	Appearance
APHA 2120 C	Color (Spectrophotometric Method)
APHA 2120 C	Color, True and Apparent (Platinum-Cobalt Standard Method)
APHA 2130 B	Turbidity (Nephelometric Method)
APHA 2150 B	Standard methods for the examination of water and wastewater, 22nd edition, Determination of odor
APHA 2160 B	Standard methods for the examination of water and wastewater, 22nd edition, Determination of taste
APHA 2310	Acidity
APHA 2320	Standard methods for the examination of water and wastewater, 22nd edition, Determination of T-alkalinity, P-alkalinity; carbonate, bicarbonate & hydroxide
APHA 2320 B	Total Alkalinity (Titration Method)
APHA 2320 B	M-Alkalinity (Titration Method)
APHA 2320 B	P-Alkalinity (Titration Method)
APHA 2320 B	Bicarbonate HCO3 (Titration Method)
APHA 2320 B	Carbonate CO32 (Titration Method)
APHA 2320 B	Hydroxide OH (Titration Method)
APHA 2340 A	Carbonate Hardness
APHA 2340 A	Non-carbonate Hardness
APHA 2340 B	Total Hardness (Hardness by Calculation)
APHA 2340 C	Standard methods for the examination of water and wastewater, 22nd edition, Determination of hardness
APHA 2510	Conductivity (Laboratory Method)

APHA 2510	Resistivity
APHA 2510 B	Standard methods for the examination of water and wastewater, 22nd edition, Determination of conductivity
APHA 2520 B	Salinity (Electrical Conductivity Method)
APHA 2520 B	Standard methods for the examination of water and wastewater, 22nd edition, Determination of salinity
APHA 2540 B	Standard methods for the examination of water and wastewater, 22nd edition, Determination of total solids dried at 103-105°C
APHA 2540 C	Standard methods for the examination of water and wastewater, 22nd edition, Determination of TDS
APHA 2540 C	Total Dissolved Solids Dried at 180°C
APHA 2540 D	Standard methods for the examination of water and wastewater, 22nd edition, Determination of total solids suspended solids dried at 103-105°C
APHA 2550	Temperature (Laboratory and Field Methods)
APHA 3500 B	Hexavalent Chromium
APHA 3500-Ca B	Standard methods for the examination of water and wastewater, 22nd edition, Determination of calcium
APHA 3500-Ca B	Calcium Hardness (EDTA Titrimetric Method)
APHA 3500-Mg B	Standard methods for the examination of water and wastewater, 22nd edition, Determination of magnesium
APHA 3500-Mg B	Magnesium Hardness (Calculation Method)
APHA 4110 D	Ion Chromatographic Determination of Oxyhalides and Bromide
APHA 4500 B	Nitrite NO2- (US EPA Diazotization Method)
APHA 4500 C	Ammonia (Salicylate Method)
APHA 4500-CL G	Standard methods for the examination of water and wastewater, 22nd edition, Determination of total residual chlorine
APHA 4500-CL G	Standard methods for the examination of water and wastewater, 22nd edition, Determination of free residual chlorine
APHA 4500-Cl G & HACH 8021	Free Chlorine (DPD Colorimetric Method)
APHA 4500-Cl G & HACH 8167	Total Chlorine (DPD Colorimetric Method)
APHA 4500 CN - B&E	Cyanide, Colorimetric Method
APHA 4500 CO2 C.	Titrimetric Method for Free Carbon Dioxide
APHA 4500-CO2 D	Carbon Dioxide and Forms of Alkalinity by Calculation
APHA 4500 D	Fluoride F- (US EPA SPADNS Method)
APHA 4500 D	Phosphate PO43- , Reactive, Orthophosphate (Ascorbic Acid Method)

APHA 4500 D	Sulfide S2- (US EPA Methylene Blue Method)
APHA 4500 H	Standard methods for the examination of water and wastewater, 22nd edition, Determination of pH
APHA 4500 H+	pH (Electrometric Method)
APHA 4500 Norg	Nitrogen (Organic) Macro-Kjeldahl Method
APHA 4500 NH3 B&C	Nitrogen (Ammonia) Preliminary Distillation and Titrimetric method
APHA 4500-NO2- B	Nitrite NO2- (Colorimetric Method)
APHA 4500-O G	Dissolved oxygen (Membrane Electrode Method)
APHA 4500-S2- F	Sulfide S2- (Iodometric Method)
APHA 5210 B	Biochemical Oxygen demand BOD (5-Day BOD Test)
APHA 5220 D	Colorimetric Method)
APHA 5220 D &	Chemical Oxygen Demand COD (Closed Reflux,
APHA 5520 B	Oil& Grease (Partition-Gravimetric Method)
APHA 5520 F	Petroleum Hydrocarbons
APHA 5530 C	Total phenols Chloroform Extraction Method
ASTM D512	Standard test methods for chloride ion in water
ASTM D512	Chloride Cl (Argentometric Method)
ASTM D516	Standard test method for sulfate ion in water
ASTM D516	Sulfate SO42- (Turbidimetric Method)
HACH 8140	Residual Oxygen Scavenger
HACH 10248	Sulfate SO42- (Turbidimetric Method)
HACH PHM-002	Chlorophyll a
US EPA 3015A	Microwave Assisted Acid Digestion of Aqueous Samples and Extracts
US EPA 3051A	Microwave Assisted Acid Digestion of Sediments, Sludges, and Oils
US EPA 3510 C	Separatory funnel Liquid-Liquid Extraction
US EPA 3550 C	Ultrasonic Extraction
US EPA 5030 C	Purge-and-Trap for Aqueous Samples
US EPA 5035 A	Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples
US EPA 6010 D	Determination of Metals and Trace Elements by Inductively Coupled Plasma-Atomic Emission Spectrometry: 1. Calcium (Ca) 2. Magnesium (Mg) 3. Sodium (Na) 4. Potassium (K) 5. Aluminum (Al)

	6. Antimony (Sb) 7. Arsenic (As) 8. Barium (Ba) 9. Beryllium (Be) 10. Bismuth (Bi) 11. Boron (B) 12. Cadmium (Cd) 13. Chromium, total, trivalent (Cr) 14. Cobalt (Co) 15. Copper (Cu) 16. Tellurium (Te) 17. Iron (Fe) 18. Lead (Pb) 19. Lithium (Li) 20. Manganese (Mn) 21. Mercury (Hg) 22. Molybdenum (Mo) 23. Nickel (Ni) 24. Phosphorus (P) 25. Selenium (Se) 26. Silicon (Si) 27. Silver (Ag) 28. Strontium (Sr) 29. Sulfur (S) 30. Tin (Sn) 31. Titanium (Ti) 32. Vanadium (V) 33. Zinc (Zn) 34. Zirconium (Zr)
US EPA 8015 D	Nonhalogenated Organics Using GC/FID 1. TPH (C5-C10) 2. TPH (C10-C14) 3. TPH (C15-C28) 4. TPH (C29-C36) 5. TPH (C37-C40) 6. Aliphatic >C5-C6 7. Aliphatic >C6-C7 8. Aliphatic >C7-C10 9. Aliphatic >C10-C12 10. Aliphatic >C12-C16 11. Aliphatic >C16-C21 12. Aliphatic >C21-C35 13. Total Aliphatics >C12-C35 14. Aromatic >C5-C7 15. Aromatic >C7-C80 16. Aromatic >C8-C10 17. Aromatic >C9-C12 18. Aromatic >C12-C16 19. Aromatic >C16-C21 20. Aromatic >C21-C35

	21. Total Aromatics >C12-C35 22. Total Aliphatics & Aromatics >C5-C35
US EPA 8260 D	Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS): 1. Tert-butanol 2. Methyl-tert-butyl ether MTBE 3. Allyl chloride (3-chloropropene) 4. Benzene 5. Bromobenzene 6. Bromochloromethane 7. Bromodichloromethane 8. Bromoform 9. n-Butylbenzene 10. sec-Butylbenzene 11. tert-Butylbenzene 12. Carbon disulfide 13. Carbon tetrachloride 14. Chlorobenzene 15. 2-Chloroethanol 16. Chloroform 17. Chloroprene (2-chloro-1,3-butadiene) 18. 2-Chlorotoluene 19. 4-Chlorotoluene 20. Dibromochloromethane 21. 1,2-Dibromo-3-chloropropane (DBCP) 22. 1,2-Dibromoethane (EDB) 23. Dibromomethane 24. 1,2-Dichlorobenzene 25. 1,3-Dichlorobenzene 26. 1,4-Dichlorobenzene 27. cis-1,4-Dichloro-2-butene 28. trans-1,4-Dichloro-2-butene 29. 1,1-Dichloroethane 30. 1,2-Dichloroethane 31. 1,1-Dichloroethene 32. cis-1,2-Dichloroethene 33. trans-1,2-Dichloroethene 34. 1,2-Dichloropropane 35. 1,3-Dichloropropane 36. 2,2-Dichloropropane 37. 1,1-Dichloropropene 38. cis-1,3-Dichloropropene 39. trans-1,3-Dichloropropene 40. Diethyl ether (ethyl ether) 41. Ethylbenzene 42. Ethyl methacrylate 43. Hexachloro-1,3-butadiene 44. Iodomethane (methyl iodide) 45. Isobutyl alcohol (2-methyl-1-propanol) 46. Isopropylbenzene (cumene)

	47. 4-Isopropyl toluene (p-cymene) 48. Methyl acrylate 49. Methyl methacrylate 50. Methylene chloride (dichloromethane) 51. Naphthalene 52. Nitrobenzene 53. 2-Nitropropane 54. n-Propylbenzene 55. Styrene 56. 1,1,1,2-Tetrachloroethane 57. 1,1,2,2-Tetrachloroethane 58. Tetrachloroethene 59. Toluene 60. 1,2,3-Trichlorobenzene 61. 1,2,4-Trichlorobenzene 62. 1,1,1-Trichloroethane 63. 1,1,2-Trichloroethane 64. Trichloroethene 65. 1,2,3-Trichloropropane 66. 1,1,2-Trichlorotrifluororethane (CFC-113) 67. 1,2,4-Trimethylbenzene 68. 1,3,5-Trimethylbenzene 69. m-Xylene 70. o-Xylene 71. p-Xylene 72. Dichlorodifluoromethane (CFC-12) (75-71-8) 73. Chloromethane (methyl chloride) (74-87-3) 74. Vinyl chloride (75-01-4) 75. Bromomethane (methyl bromide) (74-83-9) 76. Chloroethane (ethyl chloride) (75-00-3) 77. Trichlorofluoromethane (CFC-11) (75-69-4) 78. Acetone (67-64-1) 79. Methyl acetate (79-20-9) 80. Acetonitrile (75-05-8) 81. Acrylonitrile (107-13-1) 82. Vinyl acetate (108-05-4) 83. Diisopropyl ether (DIPE) (108-20-3) 84. Ethyl-tert-butyl ether (ETBE) (637-92-3) 85. 2-Butanone (MEK) (78-93-3) 86. Propionitrile (Ethyl cyanide) (107-12-0) 87. Ethyl acetate (141-78-6) 88. Methacrylonitrile (126-98-7) 89. Tetrahydrofuran (109-99-9) 90. Isopropyl acetate (108-21-4) 91. tert-Amyl methyl ether (TAME) (994-05-8) 92. Propyl acetate (109-60-4) 93. 4-Methyl-2-pentanone (MIBK) (108-10-1) 94. 2-Hexanone (591-78-6) 95. Butyl acetate (123-86-4) 96. n-Amyl acetate (628-63-7)

	97. Pentachloroethane (76-01-7) 98. 1,4-Dioxane
US EPA 8270 E	Semi Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS) 1. Aldrin 2. α-BHC 3. β-BHC 4. δ-BHC 5. γ-BHC (Lindane) 6. cis-Chlordane 7. trans-Chlordane 8. 4,4'-DDD 9. 4,4'-DDE 10. 4,4'-DDT 11. Dieldrin 12. Endosulfan I 13. Endosulfan II 14. Endosulfan sulfate 15. Endrin 16. Endrin aldehyde 17. Endrin ketone 18. Heptachlor 19. Heptachlor epoxide (isomer B) 20. Methoxychlor 21. Acetophenone 22. Aramite 23. Atrazine 24. Benzaldehyde 25. Biphenyl 26. ε-Caprolactam 27. Chlorobenzilate 28. 1-Chloronaphthalene 29. Diallate 30. Dibenz(a,j)acridine 31. 2,6-Dichlorophenol 32. 7,12-Dimethylbenz(a)anthracene 33. 1,4-Dioxane 34. Diphenyl ether 35. Ethyl methacrylate 36. Ethyl methanesulfonate 37. Hexachloropropene 38. Isodrin 39. Isosafrole (cis & trans) 40. Kepone 41. 3-Methylcholanthrene 42. Methyl methanesulfonate 43. 1,4-Naphthoquinone 44. 4-Nitroquinoline-N-oxide 45. Pentachlorobenzene 46. Pentachloroethane

	47. Pentachloronitrobenzene (quintozene) 48. Phenacetin 49. Propyzamide 50. Safrole 51. 1,2,4,5-Tetrachlorobenzene 52. 1,3,5-Trinitrobenzene 53. Benzidine 54. 3,3'-Dichlorobenzidine 55. 2-Acetylaminofluorene 56. 4-Aminobiphenyl 57. p-Dimethylaminoazobenzene 58. 3,3'-Dimethylbenzidine (o-tolidine) 59. α,α-Dimethylphenethylamine 60. 1-Naphthylamine (1-aminonaphthalene) 61. 2-Naphthylamine (2-aminonaphthalene) 62. N-Nitrosodibutylamine 63. N-Nitrosodiethylamine 64. N-Nitrosomethylethylamine 65. N-Nitrosomorpholine 66. N-Nitrosopyrrolidine 67. 5-Nitro-o-toluidine 68. 1,4-Phenylenediamine 69. 2-Picoline 70. o-Toluidine 71. Methapyrilene 72. Acenaphthene 73. Acenaphthylene 74. Aniline 75. Anthracene 76. Azobenzene 77. Benz(a)anthracene 78. Benzo(a)pyrene 79. Benzo(b)fluoranthene 80. Benzo(ghi)perylene 81. Benzo(k)fluoranthene 82. Benzyl alcohol 83. Benzyl butyl phthalate 84. Bis(2-chloroethoxy)methane 85. Bis(2-chloroethyl)ether 86. Bis(2-ethylhexyl)adipate 87. Bis(2-ethylhexyl)phthalate 88. 4-Bromophenyl phenyl ether 90. Carbazole 91. 4-Chloroaniline 92. 4-Chloro-3-methylphenol 93. 2-Chloronaphthalene 94. 2-Chlorophenol 95. 4-Chlorophenyl phenyl ether 96. Chrysene 97. Dibenz(a,h)anthracene 98. Dibenzofuran

	99. 1,2-Dichlorobenzene 100. 1,3-Dichlorobenzene 101. 1,4-Dichlorobenzene 102. 2,4-Dichlorophenol 103. Diethylphthalate 104. 2,4-Dimethylphenol 105. Dimethylphthalate 106. Di-n-butyl phthalate 107. 1,2-Dinitrobenzene 108. 1,3-Dinitrobenzene 109. 1,4-Dinitrobenzene 110. 4,6-Dinitro-2-methylphenol (Dinitro-o-cresol) 111. 2,4-Dinitrophenol 112. 2,4-Dinitrotoluene 113. 2,6-Dinitrotoluene 114. Di-n-octyl phthalate 115. Diphenylamine 116. Fluoranthene 117. Fluorene 118. Hexachlorobenzene 119. Hexachlorobutadiene 120. Hexachlorocyclopentadiene 121. Hexachloroethane 122. Indeno(1,2,3-cd)pyrene 123. Isophorone 124. 1-Methylnaphthalene 125. 2-Methylnaphthalene 126. 2-Methylphenol (o-cresol) 127. 3-Methylphenol (m-cresol) 128. 4-Methylphenol (p-cresol) 129. Naphthalene 130. 2-Nitroaniline 131. 3-Nitroaniline 132. 4-Nitroaniline 133. Nitrobenzene 134. 2-Nitrophenol 135. 4-Nitrophenol 136. N-Nitrosodimethylamine 137. N-Nitroso-di-n-propylamine 138. 2,2'-Oxybis(1-chloropropane) 139. Pentachlorophenol 140. Phenanthrene 141. Phenol 142. Pyrene 143. Pyridine 144. 2,3,4,6-Tetrachlorophenol 145. 2,3,5,6-Tetrachlorophenol 146. 1,2,4-Trichlorobenzene 147. 2,4,5-Trichlorophenol 148. 2,4,6-Trichlorophenol 149. N-Nitrosopiperidine (100-75-4)

	150. Dichlorvos (DDVP) (62-73-7) 151. Mevinphos (7786-34-7)-Cis 152. Mevinphos (7786-34-7)-trans 153. Demeton, O (8065-48-3) 154. Naled (300-76-5) 155. Trifluralin (1582-09-8) 156. Monocrotophos (6923-22-4) 157. Phorate (298-02-2) 158. Dimethoate (60-51-5) 159. Demeton, S (8065-48-3) 160. Disulfoton (298-04-4) 161. Methyl parathion (298-00-0) 162. Malathion (121-75-5) 163. Fenthion (55-38-9) 164. Parathion (ethyl parathion) (56-38-2) 165. Tetrachlorvinphos (22248-79-9) 166. Fensulfothion (115-90-2) 167. EPN (2104-64-5) 168. Mirex (2385-85-5) 169. Coumaphos (56-72-4)
Geophysics	
ASTM D4428/D4428M	Standard Test Methods for Crosshole Seismic Testing
ASTM D5777	Standard Guide for Using the Seismic Refraction Method for Subsurface Investigation
ASTM D6431	Standard Guide for Using the Direct Current Resistivity Method for Subsurface Site Characterization (ERT)
ASTM D6432	Standard Guide for Using the Surface Ground Penetrating Radar Method for Subsurface Investigation (GPR)
ASTM D6760	Standard Test Method for Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing
ASTM D7400	Standard Test Methods for Downhole Seismic Testing
ASTM G57	Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method
Kansas Geological Survey	MASW Kansas Geological Survey - Multi-Channel Analysis of Surface Waves (MASW)
Grout	
BS EN 445, Only Method 3 Wick test method	Grout for prestressing tendons. Test methods – Bleeding test of grout for prestressing tendons
Piles Testing	
ASTM D1143/D1143M	Standard Test Methods for Deep Foundations Under Static Axial Compressive Load
ASTM D3689/D3689M	Standard Test Methods for Deep Foundations Under Static Axial Tensile Load

ASTM D3966/D3966M	Standard Test Methods for Deep Foundations Under Lateral Load
ASTM D4428/D4428M	Standard Test Methods for Cross hole Seismic Testing
ASTM D4945	Standard test method for high-strain dynamic testing of deep foundations
ASTM D5882	Standard Test Method for Low Strain Impact Integrity Testing of Deep Foundations
ASTM D6167	Standard Guide for Conducting Borehole Geophysical Logging: Mechanical Caliper
ASTM D8169	Standard Test Methods for Deep Foundations under Bi-Directional Static Axial Compressive Load
ASTM D8232	SHAPE Standard Test Procedures for Measuring the Inclination of Deep Foundations.
Rock	
ASTM C295	Standard Guide for Petrographic Examination of Aggregates for Concrete
ASTM D2216	Standard test methods for laboratory determination of water (moisture) content of soil and rock by mass
ASTM D5731	Standard test method for determination of the point load strength index of rock and application to rock strength classifications
ASTM D7012	Standard test methods for compressive strength and elastic moduli of intact rock core specimens under varying states of stress and temperatures
BS 13383-2, Cl. 8.0	Determination of particle density and water absorption (rock)
BS EN 1367-2	Magnesium sulfate test of rock material
BS EN 1926	Uniaxial compressive strength of intact rock core specimens
BS EN 1926	Rock unconfined compressive strength
BS EN 12390-3	Testing hardened concrete. Compressive strength of test specimens
BS EN 13383-2	Armourstone Testing
CIRIA SP83/ CR 154	Rock block integrity – Drop test
CIRIA SP83/ CR 154	Rock grading
CIRIA SP83/ CR 154, A2.3	Rock shape
CIRIA SP83 Appendix 2	Rock – Density & water absorption
Soil	
ASTM D422	Standard test method for particle - size analysis of soils
ASTM D698	Standard test methods for laboratory compaction characteristics of soil using standard effort (12,400 ft-lbf/ ft3 (600 kN-m/m3))
ASTM D854	Standard test methods for specific gravity of soil solids by water pycnometer
ASTM D891	Standard test methods for specific gravity, apparent, of liquid industrial chemicals

ASTM D1140	Standard test methods for determining the amount of material finer than 75-µm (no. 200) sieve in soils by washing
ASTM D1194	Standard test method for bearing capacity of soil for static load and spread footings
ASTM D1556	Standard test method for density and in place by the sand-cone method
ASTM D1557	Standard test methods for laboratory compaction characteristics of soil using modified effort (56,000 ft-lbf/ ft3 (2,700 kN-m/m3))
ASTM D1586	Standard test method for standard penetration test (SPT) and split-barrel sampling of soils
ASTM D1587/ D1587M	Standard Practice for Thin-Walled Tube Sampling of Fine-Grained Soils for Geotechnical Purposes
ASTM D1883	Standard test method for California bearing ratio (CBR) of laboratory-compacted soils
ASTM D2166/D2166M	Standard test method for unconfined compressive strength of cohesive soil
ASTM D2435/D2435M	Standard test methods for one-dimensional consolidation properties of soils using incremental loading
ASTM D2487	Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D2573/D2573M	Standard Test Method for Field Vane Shear Test in Saturated Fine-Grained Soils
ASTM D2850	Standard test method for Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils
ASTM D2974	Standard methods for determination of moisture, ash and organic matter of peat and other organic soil
ASTM D3080/D3080M	Standard test method for direct shear test of soils under consolidate drained conditions
ASTM D4044	Standard Test Method for (Field Procedure) for Instantaneous Change in Head (Slug) Tests for Determining Hydraulic Properties of Aquifers
ASTM D4253	Standard test methods for maximum index density and unit weight of soils using a vibratory table
ASTM D4254	Standard test methods for minimum index density and unit weight of soils and calculation of relative density
ASTM D4318	Standard test methods for liquid limit, plastic limit, and plasticity index of soils
ASTM D4429	Standard test method for CBR (California bearing ratio) of soils in place
ASTM D4648/D4648M	Standard Test Methods for Laboratory Miniature Vane Shear Test for Saturated Fine-Grained Clayey Soil
ASTM D4719	Standard Test Methods for Prebored Pressure Meter Testing in Soils
ASTM D4767	Consolidated Undrained Triaxial Compression Test for Cohesive Soils

ASTM D5334	Standard Test Method for Determination of Thermal Conductivity of Soil and Soft Rock by Thermal Needle Probe Procedure
ASTM D5778	Standard test method for electronic friction cone and piezocone penetration testing of soils
ASTM D6938	Standard test methods for in-place density and water content of soil and soil-aggregate by nuclear methods (shallow depth)
ASTM D6951/D6951M	Standard Test Method for Use of the Dynamic Cone Penetrometer in Shallow Pavement Applications
ASTM D7181	Consolidated Drained Triaxial Compression Test for Soils
ASTM D7380	Standard Test Method for Soil Compaction Determination at Shallow Depths Using 5-lb (2.3 kg) Dynamic Cone Penetrometer
ASTM D7698	Standard Test Method for In-Place Estimation of Density and Water Content of Soil and Aggregate by Correlation with Complex Impedance Method
BS 1377-2	British Standard methods of test for Soils for Civil Engineering Purposes Part 2. Classification Tests
BS 1377-4	British Standard methods of test for Soils for Civil Engineering Purposes Part 4. Compaction-related Tests
BS EN ISO 22282-2-12	Geotechnical investigation and testing — Geohydraulic testing— Part 2: Water permeability tests in a borehole using open systems
ISO 22476-1	Geotechnical investigation and testing -- Field testing -- Part 1: Electrical cone and piezocone penetration test
ISO 22476-3	Geotechnical investigation and testing -- Field testing -- Part 3: Standard penetration test
Special Project	
AASHTO T358	Standard Method of Test for Surface Resistivity Indication of Concretes' Ability to Resist Chloride Ion Penetration
ASTM C803	Standard Test Method for Penetration Resistance of Hardened Concrete
ASTM C900	Standard Test Method for Pullout Strength of Hardened Concrete
ASTM D4748	Standard Test Method for Determining the Thickness of Bound Pavement Layers Using Short-Pulse Radar
ASTM D5340	Standard Test Method for Airport Pavement Condition Index Surveys
ASTM D6087	Standard Test Method for Determining the Thickness of Bound Pavement Layers Using Short-Pulse Radar
ASTM D6433	Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys
ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling System
ASTM E1489	Standard Practice for Computing Ride Number of Roads from Longitudinal Profile Measurements Made by an Inertial Profile Measuring Device

ASTM E1703	Measuring Rut Depth of Pavement Surfaces Using a Straight Edge
ASTM E1845	Standard Practice for Calculating Pavement Macrotexture Mean Profile Depth
ASTM E1926	Standard Practice for Computing International Roughness Index of Roads from Longitudinal Profile Measurements
FAA AC 150/ 5380-9	Standard Test Method for Measuring Rut-Depth of Pavement Surfaces Using a Straightedge
Steel	
ASTM A370 (Cl 7-14 & Cl 15)	Standard test methods and definitions for mechanical testing of steel products (Cl 7-14 Tension Test, CL 15 Bend Test)
BS 4449 + A2 (Cl. 7.2.5 only)	Standard specification for deformed and plain carbon-steel bars for concrete reinforcement – Re-bend tests only
BS 4449 + A2 (Cl. 7.2.5 only)	Standard specification for deformed and plain carbon-steel bars for concrete reinforcement (bend part only)
ISO 15630-1	(Cl. 5. Tensile tests only) & BS ISO 6892-1:2016 (tensile tests only)
Tile	
BS 13748-1	Method for determination of water absorption of Terrazzo tiles
BS EN ISO 10545-3	Water absorption of ceramic floor and wall tiles
BS EN ISO 10545-4	Method for determination of modulus of rupture of ceramic floor and wall tiles