

	ACCREDITATION DOCUMENT	F-06/02 Issue Date: 10/08/15 Rev. No: 07 LAB 129
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Accreditation No: LAB 129

Awarded to

**RESOURCE INSPECTION CANADA INCORPORATED CO.
(Construction Material Testing Laboratory and Calibration
Laboratory)
Office 44, Building 2126, Road 1529, Block 115, Hidd,
Kingdom of Bahrain**

The scope of accreditation is in accordance with the standard specifications outlined in the following page(s) of this document. The accredited scope shall be visible and legible in areas such as customer service, sample-receiving section etc and shall not mislead its users.

The accreditation was first time granted on **27-12-2017** by Pakistan National Accreditation Council.

The laboratory complies with the requirements of **ISO/IEC 17025:2005**.

The accreditation requires regular surveillance, and is valid until **26-12-2020**.

The decision of accreditation made by Pakistan National Accreditation Council implies that the organization has been found to fulfill the requirements for accreditation within the scope.

The organization however, itself is responsible for the results of performed measurements/tests.

PAKISTAN NATIONAL ACCREDITATION COUNCIL

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Director General

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Testing Laboratory.

Accreditation Scope of Resource Inspections Canada Incorporated Co
(Construction Material Testing Laboratory)
Office 44, Building 2126, Road 1529, Block 115, Hidd, Kingdom of Bahrain

Permanent laboratory premises

Materials/Products tested	Testing field (e.g. environmental testing or mechanical testing)	Types of test/ Properties measured	Reference to standardized method (e.g. ISO 14577-1:2003)/ Internal method reference
Concrete	Construction (Civil) Material Testing	Sampling Fresh Concrete and Temperature	BS EN 12350-1
		Slump of Fresh Concrete	BS EN 12350-2
		Density of Fresh Concrete	BS EN 12350-6
		Air Content of Fresh Concrete by Pressure Method	BS EN 12350-7
		Making and Curing Concrete Test Specimens in the Field	BS EN 12390-2
		Dimension Requirements of Concrete Specimens	BS EN 12390-1
		Density of Hardened Concrete	BS EN 12390-7
		Specification for Water Storage Tanks Used in the Testing of Concretes	ASTM C 511
		Practice for Capping Cylindrical Concrete Specimens	ASTM C 617
		Compressive Strength of Concrete Specimens	BS EN 12390-3

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Aggregate	Construction (Civil) Material Testing	Obtaining and Testing Drilled Cores of Concrete	BS EN 12504-1
		Rebound Number of Hardened Concrete	BS EN 12504-2
		Sampling of Aggregates	BS EN 932-1
		Reducing Samples of Aggregate to Testing Size	BS EN 932-2
		Aggregate Moisture Content	BS 812-109
		Particle Size Distribution	BS EN 933-1
		Clay Lumps and Friable Particles in Aggregates	ASTM C142
		Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine	ASTM C131
		Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine	ASTM C535
		Soundness of Aggregates	BS 812-121
		Particle Density and Water Absorption of Aggregate	BS EN 1097-6
		Elongation Index and Flakiness Index	BS EN 933-3 BS 812-105.1 BS 812-105.2
Sand Equivalent Test	BS EN 933-8		

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Soil	Construction (Civil) Material Testing	Water (Moisture) Content of Soil Oven Drying Method	BS 1377-2 (3.2)
		Particle-Size Analysis of Soils, Wet Sieving Method	BS 1377-2 (9.2)
		Particle-Size Analysis of Soils, Dry Sieving Method and Hydrometer Method	BS 1377-2 (9.3 & 9.5)
		Determination of Liquid Limit by Casagrande Apparatus Method and Plastic Limit and Plasticity Index	BS 1377-2 (4.5 & 5.0)
		Determination of Particle Density	BS 1377-2 (8.3)
		Classification of Soil	BS 5930
		Laboratory Compaction of Soil Using 2.5 kg and 4.5 kg Rammer	BS 1377-4 (3.3, 3.4, 3.5, 3.6)
		CBR (California Bearing Ratio) of Laboratory-Compacted Soils	BS 1377-4 (7.0)
		In-situ Density Test by Nuclear Density Method	BS 1377-9 (2.5)
		In-situ Density Test by Sand Replacement Method	BS 1377-9 (2.1 & 2.2)
Asphalt	Construction (Civil) Material Testing	Sampling Bituminous Paving Mixtures	ASTM D 979
		Quantitative Extraction of Bitumen from Bituminous Paving Mixtures	ASTM D 2172

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		Mechanical Size Analysis of Extracted Aggregate	ASTM D 5444
		Preparation of Bituminous Specimens using Marshall Apparatus	ASTM D 6926
		Marshall Stability and Flow of Bituminous Mixtures	ASTM D 6927
		Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures	ASTM D 2041
		Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures	ASTM D 2726
		Thickness or Height of Compacted Bituminous Paving Mixture Specimens	ASTM D 3549
		Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures	ASTM D 3203
		Estimating Application Rate of Bituminous Distributors Mixtures	ASTM D 2995

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Calibration Laboratory.

Accreditation Scope of Resource Inspections Canada Incorporated Co
 (Calibration Laboratory)
 Office 44, Building 2126, Road 1529, Block 115, Hidd, Kingdom of Bahrain

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Field of measurement:			
Measured quantity	Range/ Resolution of UUC	Calibration & Measurement Capability (CMC) expressed as an uncertainty (±)	Brief description of measurement and equipment used
Calipers Dial, Vernier & Digital	0.5 to 300mm/0.01mm	7.3 µm	BS/EN/ISO 13385-1, gage blocks BS/EN/ISO 13385-1, gage blocks
	300 to 1000mm/0.01 mm	15.8 µm	
	1000 to 2000mm/0.01 mm	29.8 µm	
Plunger Type Indicators Dial Digital	0.0002 to 25mm/0.01mm	6 µm	BS 907, Dial Gage Calibrator
	0.0002 to 25mm/0.001mm	1.6 µm	
Outside Micrometers Plain Anvil	0.5 to 25mm/0.01mm	6 µm	

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& Digital	0.5 to 25mm/0.001mm	0.7 μm	BS/EN.ISO 3611, Gage blocks
	25 to 150mm/0.001mm	2.3 μm	
	150 to 1000mm/0.001mm	14.7 μm	
Height Gauges	0.5 to 300mm/0.001mm	4.4 μm	Gage Blocks
	300 to 1000mm/0.001mm	14.6 μm	
	1000 to 2000mm/0.001mm	29.2 μm	
Depth Gauges	0.5 to 300mm/0.001mm	4.4 μm	Gage Blocks with accessories
Snap Gauges	0.5 to 500mm	7.4 μm	Gage Blocks with accessories
Thickness Gauge	500 to 1000μm/1μm	0.64 μm	Gage Blocks
	0.5 to 5mm/1μm	0.64 μm	
	0.5 to 10mm/1μm	0.7 μm	
	0.5 to 50mm/0.1mm	0.06 mm	
	0.5 to 100mm/0.1mm	0.06 mm	
Bevel/Digital			
Protractors	0.05 to 90°/ 0.05°	0.031°	Angle Gage Block Set
Angle Gauges	0.05 to 90°/ 0.05°	0.031°	Angle Gage Block Set
Force			
* Compression	0.01 to 3000kN/0.01kN	0.13% Reading	BS/EN/ISO 7500, Load Cells

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*Balances	0.001 to 210g 201g to 2.1kg 2.1kg to 8kg 8kg to 30kg 30kg to 100kg 100kg to 500kg	See NOTE	SASO 524, Weights, Class F1 Weights, Class M1
Pressure Gages	-1 to 10 bar/0.1 bar 0.1 to 60 bar/0.1 bar 0.1 to 100 bar/0.2 bar 0.1 to 600 bar/1 bar 0.2 to 1400 bar/1 bar	0.08 bar 0.19 bar 0.15 bar 0.65 bar 0.73 bar	BS/EN 837-1, Dead Weight Tester, Test Pump with Reference Pressure Gauge
*Pressure Transmitter	-1 to 10 bar/0.1 bar 0.1 to 60 bar/0.1 bar 0.1 to 100 bar/0.2 bar 0.1 to 600 bar/1 bar 0.1 to 1400 bar/1 bar 4 – 20 mA	0.08 bar 0.19 bar 0.15 bar 0.65 bar 0.73 bar 0.011 mA	Dead Weight Tester, Test Pump with Reference Pressure Gauge, Process Calibrator, HART/Fieldbus Communicator, Reference Multi-meter
Pressure Chart Recorder	-1 to 10 bar/0.1 bar 0.1 to 60 bar/0.1 bar 0.1 to 100 bar/0.2 bar 0.1 to 600 bar/1 bar 0.1 to 1400 bar/1 bar	0.08 bar 0.19 bar 0.15 bar 0.65 bar 0.73 bar	Dead Weight Tester, Test Pump with Reference Pressure Gauge

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Vacuum Gages	0.1 to 30 in Hg/1 in Hg (0.1 to 30in Hg/0.2in Hg)	0.6 in Hg 0.12 in Hg	BS/EN 837-1, Test pump and master gage
Safety Relief Valve	14.5 to 10,000 psi	5.8 psi	API 526 and API 527, Test Pump with Reference Pressure Gauge
Multi Gas Detectors	Methane: 50% LEL, O2: 20.9%, H2S: 25 ppm, CO: 100 ppm	5.03% of reading	Standard Span Calibration Gases
*Ovens	0.01 to 400°C	0.31°C	ASTM E 145, RTDs, Temperature Calibrator
Thermometers Dial & Digital	-40°C to 140°C >.140°C to 650° C >650° C to 1200° C	0.06°C 0.13° C 0.82° C	ASME B 40.200, RTD, Dry Block, Oil Bath, ASTM E 2877, Temperature Calibrator
RTD	-40°C to 140°C >.140°C to 650° C	0.06°C 0.13° C	ASTM E 1137, Universal Calibrator,

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*Water Baths	>650° C to 1200° C	0.82° C	Dry Block, Oil Bath, Comparison to Standard RTD
	0.01° C to 90° C	0.2° C	ASTM E 77 and ASTM E 715, RTD, Temperature Calibrator
*Furnaces	0.01° C to 1200° C	0.86° C	ASTM E 145, Reference Thermocouple, Temperature Calibrator
*Autoclaves	0.01 to 150° C	0.16° C	RTDs, Temperature Calibrator
*Incubators	10 to 100 ° C	0.16° C	RTDs, Temperature Calibrator
*Hot Plates	0.01 to 300 ° C	0.62 ° C	Reference Surface Probe, Temperature Calibrator
*Freezers/Refrigerators	-80 to 100 ° C	0.12 ° C	RTDs, Temperature Calibrator
*Temperature			

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Transmitter	-40°C to 140 °C >140°C to 650 °C >650 to 1200 °C 4 to 20 mA	0.06°C 0.13° C 0.82° C 0.011 mA	RTD, Dry Block, Oil Bath, Process Calibrator, HART/Fieldbus Communicator, Reference Multimeter
Temperature Recorder	-40°C to 140 °C >140°C to 650 °C >650 to 1200 °C	0.36 °C 0.97 °C 1.5 °C	RTD, Dry Block, Oil Bath, Temperature Calibrator
Holiday Detector	0.1Vdc to 99.9 kVdc	0.12kVDC	ASTM D 5162, High Voltage Probe
DC Voltage –Generate	(0.01 to 220) mV (220mV to 2.2V) (2.2 to 11) V (11 to 22) V (22 to 220) V (220 to 1100) V	0.00054 mV 0.0024 mV 0.0081 mV 0.0254 mV 0.3221 mV 0.0017 V	EA-10/15, EA-4/02 Multi Function Calibrator Fluke 5730A
DC Voltage – Measure	0.01-200 mV 200 mV-2 V 2V-20 V 20V-200 V 200V-1000 V	0.46 uV 0.0016 mV 0.015 mV 0.23 mV 0.0013 V	EA-10/15, EA-4/02 Reference Multi-meter Fluke 8508A
DC Current – Generate	(0.01 to 220) µA (220 µA to 2.2 mA)	0.0035 uA 0.028 uA	EA-10/15, EA-4/02

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DC Current – Measure	(2.2 to 220) mA	0.0035 mA	Multi Function Calibrator Fluke 5730
	(220mA to 2.2A)	0.072 mA	
	(2.2A to 20.5) A	0.072 mA	
	0.01-100 μ A	0.00069 μ A	EA-10/15, EA-4/02
	100 μ A-1 mA	0.007 μ A	Reference Multi-meter Fluke 8508A
	1mA-10 mA	0.043 μ A	
	10-mA-100 mA	0.56 μ A	
100mA-1 A	0.014 mA		
1-20 A	0.44 mA		
Resistance – Generate	0.01 – 1k Ω	0.0016 Ω	EA-10/15, EA-4/02
	1 - 10 k Ω	0.017 Ω	Multi Function Calibrator Fluke 5730A
	10 – 100 k Ω	0.17 Ω	
	100 k Ω – 1M Ω	0.0039 k Ω	
	1 - 10 M Ω	0.085 k Ω	
	10 - 100 M Ω	0.0038 M Ω	
	Resistance – Measure	0.01-1 Ω	0.003 m Ω
1-10 Ω		0.026 m Ω	
10-100 Ω		0.23 m Ω	
100 Ω -1 k Ω		2.2 m Ω	EA-10/15, EA-4/02
1 k Ω -10 k Ω		0.022 Ω	Reference Multi-meter Fluke 8508A
10 k Ω -100 k Ω		0.29 Ω	
100 k Ω -1 M Ω		5.7 Ω	
1 M Ω -10 M Ω		0.12 k Ω	

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<p>AC Voltage – Generate (1 to 2.2) mV (2.2 to 22) mV (22 to 220) mV (220mV to 2.2 V) (2.2 to 22) V (22 to 220) V</p>	<p>10 MΩ -100 MΩ</p> <p>Frequency</p> <p>10 – 20 Hz 20 – 40 Hz 40 Hz - 20 kHz 20 kHz - 50 kHz 50 kHz - 100 kHz 100 kHz - 300 kHz 300 kHz - 500 kHz 500 kHz - 1 MHz</p>	<p>4.4 kΩ</p> <p>@20Hz</p> <p>0.00062 mV 0.0025 mV 0.0069 mV 0.051 mV 0.43 mV 0.0053 V</p>	<p>EA-10/15, EA-4/02 Multi Function Calibrator Fluke 5730A</p>
<p>(220 to 1100) V</p> <p>AC Voltage – Measure 0.1-100 mV</p>	<p>15 – 50 Hz 50 Hz - 1 kHz</p> <p>1 Hz to 20 Hz 20 Hz to 40 Hz 40 Hz to 100 Hz 100 Hz to 2 kHz 2 kHz to 10 kHz 10 kHz to 30 kHz 30 kHz to 100kHz</p>	<p>@1kHz</p> <p>0.019 V</p> <p>@20Hz</p> <p>0.0044 mV</p>	<p>EA-10/15, EA-4/02 Reference Multi-meter Fluke 8508A</p>

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<p>100 mV-1 V</p> <p>1V-10 V</p> <p>10V-100 V</p>	<p>1 Hz to 10 Hz</p> <p>10 Hz to 40 Hz</p> <p>40 Hz to 100 Hz</p> <p>100 Hz to 2 kHz</p> <p>2 kHz to 10 kHz</p> <p>10 kHz to 30 kHz</p> <p>30 kHz to 100kHz</p> <p>100 kHz to 300kHz</p> <p>300kHz to 1MHz</p>	<p>@20Hz</p> <p>0.022 mV</p> <p>0.23 mV</p> <p>0.0036 V</p>	
<p>100V-1000 V</p>	<p>1 Hz to 10 Hz</p> <p>10 Hz to 40 Hz</p> <p>40 Hz to 10 kHz</p> <p>10 kHz to 30 kHz</p> <p>30 kHz to 100kHz</p>	<p>@55Hz</p> <p>0.05 V</p>	
<p>AC Current – Generate (1 to 220) μA (220 μA to 2.2 mA) (2.2 to 220) mA (220mA to 2.2A) (2.2A to 20.5) A</p>	<p>10 – 20 Hz</p> <p>20 – 40 Hz</p> <p>40 Hz - 1 kHz</p> <p>1 kHz - 5 kHz</p> <p>5 kHz - 10 kHz</p>	<p>@20Hz</p> <p>0.0084 uA</p> <p>0.085 uA</p> <p>0.011 mA</p> <p>0.13 mA</p>	<p>EA-10/15, EA-4/02</p> <p>Multi Function Calibrator Fluke 5730A</p>

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AC Current – Measure 1-100 μ A 100uA-1 mA 1mA-10 mA	20 Hz - 1 kHz		
	1 kHz - 5 kHz	@40Hz	
	5 kHz - 10 kHz	0.13 mA	
10-mA-100 mA	1 Hz to 10 Hz	@55Hz	EA-10/15, EA-4/02
	10 Hz to 10 kHz	0.0066 μ A	Reference Multi-meter
	10 kHz to 30 kHz	0.07 μ A	Fluke 8508A
	30 kHz to 100kHz	0.33 μ A	
100mA-1 A	1 Hz to 10 Hz	@55Hz	
	10 Hz to 10 kHz	0.0026 mA	
	10 kHz to 30 kHz		
1-20 A	10 Hz to 2 kHz	@55Hz	
	2 kHz to 10 kHz	0.047 mA	
	10 kHz to 30 kHz		
Electrical Calibration of	10 Hz to 2 kHz	@55Hz	
	2 kHz to 10 kHz	0.55 mA	

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Thermocouples – Generate and Measure Type B	(600 to 1820) °C	Generate: 0.12 °C Measure: 0.18 °C	EA-10/15, EA-4/02 Temperature Calibrator Fluke
Type C	(0.1 to 2316) °C	Generate: 0.12 °C Measure: 0.18 °C	525B, Druck Advance Modulator
Type E	(-250 to 1000) °C	Generate: 0.097°C Measure: 0.18 °C	
Type J	(-210 to 1200) °C	Generate: 0.12 °C Measure: 0.18 °C	
Type K	(-200 to 1372) °C	Generate: 0.12 °C Measure: 0.18 °C	
Type N	(-200 to 1300) °C	Generate: 0.12 °C Measure: 0.18 °C	
Type R	(0.1 to 1767) °C	Generate: 0.12 °C Measure: 0.18 °C	
Type S	(0.1 to 1767) °C	Generate: 0.12 °C Measure: 0.18 °C	
Type T	(-250 to 400) °C	Generate: 0.097 °C Measure: 0.18 °C	

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Type U	(-200 to 600) °C	Generate: 0.097°C Measure: 0.18 °C	
Type L	(-200 to 900) °C	Generate: 0.097°C Measure: 0.18 °C	
Electrical Calibration of RTD – Generate			
Pt 385, 100 Ω			
Pt 385, 200 Ω	(-200 to 800) °C	0.012 °C	EA-10/15, EA-4/02
Pt 385, 500 Ω	(-200 to 630) °C	0.012 °C	
Pt 385, 1000 Ω	(-200 to 630) °C	0.012 °C	Temperature
	(-200 to 630) °C	0.012 °C	Calibrator Fluke 525B
*Nuclear Density Gauges	Density: 1120 to 2723 kg/m ³	0.95 Kg/m ³	ASTM D 6938 Nuclear Validator Note: Models that will be calibrated: VPN Troxler (3411, 3430, 3440, 3440+) Humboldt
Torque Wrench	5-50 N-m 50-250 N-m 250-500 N-m 500-1000 N-m 1000-3000 N-m	0.31 N-m 1.2 N-m 1.2 N-m 3.07 N-m 6.2 N-m	ISO 6789 Torque Wrench Calibrator & Transducers

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Sound Level Meter	94-114 dB	0.31 dB	ANSI S1.4 Acoustic Calibrator
Vibration Meter	Up to 20 m/s ²	1.4 m/s ²	ISO 2954 Vibration Calibrator
*Hardness Testing Machines	HRA	0.82 HRA	ASTM E-18
	HRB	0.83 HRB	ASTM E-10
	HRC	0.84 HRC	
	HR15N	0.78 HR	Standard Test Blocks
	HR30N	0.82 HR	
	HR45N	0.77 HR	
	HB3000	4.2 HB	
	HB500	1.45 HB	
	HB 143	4.30 HB	
	HV 190	2.70 HV	
	HV 208	2.90 HV	
	HV 524	6.50 HV	
	HV 720	14.001 HV	
	HV 813	5.20 HV	

*Can be done on-site and off-site both

NOTE: Calibration parameters are performed primarily on-site at customer locations. The uncertainty of scale/balance calibration is highly dependent on local conditions, such as scale resolution and sensitivity, scale cleanliness, local gravity, temperature and humidity, dust, vibration, etc.; therefore, any statement of uncertainty is misleading. The class of the best weights used by the laboratory is shown in the Technique column. Use of weights in combination, whether in the same class or different classes, will increase measurement uncertainty resulting from the additive effect of weight tolerances, as defined in ASTM E 617.

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