

Typical Field Laboratory Equipment List

General Laboratory Equipment				
Sl. No.	Equipment Name	Min. Quantity	Reference Indian Standard for Test/ Equipment	Brief Specifications
1	Digital Weighing Balance	As required	IS 9281	Capacity: Minimum 2000g, Readability: 0.1g
2	Digital Weighing Balance 5kg, 10kg, 30kg & 100 kg	As required	IS 9281	Readability: 1g
3	Drying Oven & Crucibles/Sample Containers	As required	-	Chamber size - 24" x 24" x 36" Temp. range: Up to 200°C Container sizes: 25 mm dia; 50 mm dia; 75 mm dia; 80 mm dia; 100 mm dia.
4	Hot Plate	As required	IS 2720	
5	Water Bath/Automatic temperature control curing tank	As required	IS 516 / Ref. IS 9013	Temperature control: $\pm 1^\circ\text{C}$ for curing of Cement cube.
6	Marsh Cone	As required	D6910	MOC: Steel
7	Sieve Set (IS)	As required	IS 460, IS 383, IS 2386	Complete set of standard sieves
8	Sieve Shaker	As required	-	Electric, with adjustable time and amplitude
9	Measuring Jars: Borosilicate glass	As required	-	Graduated, 50 ml, 100 ml, 250 ml, 500 ml, 1000 ml capacity
10	Spatulas	As required	-	Stainless steel
11	Wash Bottles	As required	-	Plastic, with distilled water
12	Funnels	As required	ISO 4798	Borosilicate Glass, dia. 25mm, 50mm, 75mm, 100mm
13	Filter Paper	As required	-	Qualitative, different grades
14	Digital thermometer	As required	-	-50 °C to 300 °C
15	Stop Watches	As required	-	Digital, with lap timer function
16	Outside Micrometer	As required	-	Range: 0-25mm Accuracy: $\pm 0.002\text{mm}$ Resolution: 0.001mm
17	Vernier Caliper	As required	-	Range: 0-600mm & 0-300mm Accuracy: $\pm 0.02\text{mm}$

				Resolution: 0.02mm
18	Mercury Thermometers	As required	IS 2480 P-1	Glass, -10°C to 250°C
19	Inside Micrometer	As required		Range: 25-100mm & 100-750mm Accuracy: ±0.002mm Resolution: 0.001mm
20	Splitting Machine	As required	IS 516	Capacity: Suitable for splitting concrete cubes
21	Glass Rods	As required	-	Stirring rods
22	Glass / Poly carbonate sheet	As required	-	15mm Thk.
Soil Testing Equipment				
23	Rapid Moisture Meter	As required	IS 12175	
24	Liquid Limit Apparatus	As required	IS 2720 (Part 5)	Complete set including casagrande cup
25	Plastic Limit Apparatus	As required	IS 2720 (Part 5)	Glass plate and porcelain dish
26	Compaction/Proctor test Apparatus (Standard and Modified Proctor)	As required	IS 2720 (Part 8)	Complete set including rammer, moulds, and other accessories
27	For relative density / density index of cohesion less soil	As required	IS 2720 (Part 14)	Electrically heated, temperature control
28	Sand Replacement Mould / Sand Pouring Cylinder	As required	IS 2720 (Part 28)	To check Dry density by sand replacement method
29	Pycnometer / Specific Gravity Bottles	As required	IS 2720 (Part 3)	Glass, calibrated, 01L capacity
30	California Bearing Ratio (CBR) Apparatus	As required	IS 2720 (Part 16)	Complete set including mould and loading frame
31	Hydrometer: 1.2 -1.3 Hydrometer: 1.0 -1.2 Hydrometer: 1.0 -1.1	As required	-	For specific gravity check of liquid.
32	Soil permeability test apparatus.	As required	IS 2720 (Part 17)	For permeability test of soil.
33	Core Cutter	As required	IS 2720 (Part 29)	Various sizes for different soil samples
Concrete Testing Equipment				
34	Le Chatelier Flask & mould	As required	IS 4031 (Part 3) / IS 5514.	Glass, 50 ml
35	Pan Type Concrete Mixer	As required	-	Min. 40L capacity
36	Cube Moulds (150 mm)	As required	IS 516/ 10086	Steel/ PVC, with tight-fitting lids
37	Cube Moulds for cement testing (70.6mm)	As required	IS 4031/ 10086	Steel/ PVC, with tight-fitting lids

38	Compression Testing Machine with Automatic Pace Rate Controller	As required	IS 516/ 14858	Capacity 2000 kN, suitable for 50, 70.6, 100 mm and 150 mm cubes
39	Slump Cone	As required	IS 1199/7320	Metal, complete set/with tamper
40	Digital Rebound Hammer	As required	IS 5816	Suitable for concrete surface hardness testing
41	Vicat Apparatus with Deskpot	As required	IS 4088/ 5513	Complete set for determining Cement consistency/setting time.
42	Vibrating Machine for Cement Cube	As required	IS: 4031 & 10080	For Cement cube sampling for compressive strength check.
43	Cube Moulds for concrete testing (100mm)	As required	IS 516/ 10086	Steel/ PVC, with tight-fitting lids
44	Cube Moulds for sand mortar testing (50mm)	As required	IS 516/ 10086	Steel/ PVC, with tight-fitting lids
45	Alkali Mortar Bar Moulds	As required	IS 2386 P-7	Steel, with tight-fitting lids
46	Mould for Flexure Test of concrete (150x150x700) mm	As required	IS: 516	Mould to cast concrete beam for Flexure strength check.
47	Flexure Test Machine	As required	IS: 516	For Flexure strength check.
48	Concrete Penetrometer	As required	IS: 8142	For concrete setting time test
49	Concrete permeability test apparatus	As required	IS: 3085	For permeability test of concrete
50	Accelerating Curing Tank	As required	IS: 9013	To check rapid compressive strength of concrete equivalent to 28 days.
51	Alkali mortar bar testing equipment as per ASTM-1260 including digital length comparator scale.	As required	ASTMC-1260	To check ASR content.
52	Compaction Factor Apparatus	As required	IS 1199/ 5515	Complete set for determining concrete workability
Road Testing Equipment				
52	Specific Gravity Balance	As required	IS 2386/ ASTM D-70	For determining specific gravity of bitumen
53	Impact Value test Equipment	As required	IS: 2386- P4	For Impact Value test of Aggregate
54	Aggregate Crushing Value Apparatus	As required	IS: 2386 P-4	
55	Los Angeles Machine	As required	IS: 10070 & IS 2386	For Abrasion value check of Aggregate.
56	Liquid limit – Cone penetrometer	As required	IS: 2720 (Part-5)	For liquid limit check of cohesion less soil.
57	Penetration Apparatus	As required	IS 1203	Complete set for determining bitumen penetration
58	Softening Point Apparatus	As required	IS 1205	Ring and ball type

59	Ductility Apparatus	As required	IS 9381	Complete set for determining bitumen ductility
60	Marshall Stability Apparatus	As required	ASTM D1559-T-62	Complete set for determining bitumen mix stability
61	Bitumen Extractor	As required	ASTM D 2172/ IRC:SP 11	Soxhlet type Centrifuge type (electric operated- for field/lab tests) with Benzene/similar fluid.
62	Length & Thickness Gauge	As required	IS: 2386 P-1	For Elongation & Flakiness index check of Aggregate
63	DLC Vibrating Hammer	As required		For DLC Cube filling
64	Concrete cube mould Vibrating Table	As required	IS: 2514	For Compaction of concrete in moulds.
65	Density Cylinder (5 kg, 10kg, 15kg, 20 kg , 30kg)	As required		For Density check of aggregates
Other Equipment				
66	UPV Machine	As required	IS 13311/ 516	For determining concrete quality through UPV
67	Pile Integrity Tester (PIT)	As required	IS 14893	
68	Paint Thickness Gauge (DFT, WFT)	As required		Digital, with various measurement ranges (upto 4mm)
69	pH Meter	As required	pH Meter/ IS: 2711	Accuracy: ± 0.02 pH units Resolution: 0.01 pH units Probe material: Glass
70	RT Film Viewer	As required	As per ASTM E1390 or equivalent	For RT film interpretation
71	UCI Hardness Tester	As required	UCI test as per ASTM A1038-19, DIN 50159 1,2-2021	repeatability 5% uncertainty max. 4%
72	Portable PMI Machine	As required	Portable X-Ray fluorescence type	Analysis of Stainless and Alloy Steels
73	Digital Torque Wrench	As required	for up to M36 class 10.9 bolts	for up to M36 class 10.9 bolts
74	Bolt Tension Indicator / Calibrator	As required	for up to M36 class 10.9 bolts	for up to M36 class 10.9 bolts
75	L-Box, V-Box, Screen, etc	As required		

- All brands shall be BHEL/Customer approved brands.
- As per Requirement (APR)