

## 1. Laboratory Equipment

Every laboratory equipment has its own calibration certificate and is operated-maintained according to its manual guide. The equipment of the laboratory is listed below. The laboratory tests are conducted according to the national and international specifications.

### GENERAL EQUIPMENT

No	Apparatus
1	Drying oven 55 lt
2	Drying oven 111 lt
3	Electronic analytical balance (320gr capacity - 0,001gr readability)
4	Electronic analytical balance (4100gr capacity - 0,01gr readability)
5	Electronic balance (10100gr capacity - 0,1gr readability)
6	Electronic balance (30.000gr capacity - 1gr readability )
7	Desiccator
8	Hand held digital thermometer, -75 to +1200°C
9	Digital thickness gauge
10	Digital time stoper
11	Sample reduction device
12	Sieve shaker
13	Measuring cylinders, beakers, funnels and flasks, stirring rod, evaporating dishes, wash bottles, trays
14	PC, Printers

## SOIL & ROCK MECHANICS EQUIPMENT

No	Apparatus
1	Woven wire mesh sieves 12" (ISO 3310-1,2)
3	Liquid limit device (Casagrande)
4	Plastic limit set
5	Constant temperature and circulating water bath
6	Specific gravity hydrometer 151H
7	High speed stirrer
9	Proctor moulds (101,6 mm)
10	Proctor moulds (152,4 mm)
11	CBR equipment (ASTM)
12	CBR equipment (BS)
13	Automatic Proctor and CBR compaction machine
14	CBR - Testing Machine (50kN)
15	Proctor Penetrometer
16	One-dimensional consolidation apparatus (3pcs)
17	Direct / Residual shear apparatus
18	Autonomous Data Acquisition Unit (ADU) Software connected with shear displacement machine, one-dimensional consolidation apparatus and CBR machine
19	Unconfined compression machine
20	38 mm hand-operated extruder
21	Falling head apparatus
22	Permeability cell 4"

### **AGGREGATES EQUIPMENT**

<b>No</b>	<b>Apparatus</b>
1	Woven wire mesh sieves 8" (ISO 3310-1,2)
2	Woven wire mesh sieves 12" (ASTM E11)
3	Flakiness sieve set
4	Aggregate shape gauge
5	Efflux index apparatus
6	Sand absorption cone and tamper
7	Bulk density basket 200mm
8	Specific gravity frame
9	Sand equivalent set
10	Sand replacement set
11	Basket 3,35 opening
12	Basket 1,18mm opening
13	Basket 0,6mm opening
14	Basket 0,150mm opening
15	Hydrometer 1,200-1,300g/ml
16	Container

### **CONCRETE EQUIPMENT**

<b>No</b>	<b>Apparatus</b>
1	Slump test device
2	Cube moulds for concrete (15x15x15cm)
4	Curing tank for concrete specimens (1000lt capacity)
5	Automatic Compression testing machine 2000kN capacity

## 2. Laboratory testing

The laboratory tests are conducted according to the national and international specifications. A list of the tests is presented below.

### SOIL & ROCK MECHANICS

No	Lab Test	Specifications
1	Determination of water content of soil	E 105-86 (par. 2), ASTM D 2216
2	Determination of liquid limit	E 105-86 (par. 5), ASTM D 4318, AASTHO T 89
3	Determination of plasticity limit and plasticity index	E 105-86 (par. 6), ASTM D 4318, AASTHO T 90
4	Determination of bulk density of cohesive soil	E 105-86 (par. 3)
5	Determination of specific gravity of soil	E 105-86 (par. 4), ASTM D 854
6	Determination of specific gravity of coarse aggregate	E 105-86 (par. 4), AASHTO T 85
7	Sieve analysis of fine and coarse aggregate – dry method	E 105-86 (par. 7), AASHTO T 27
8	Determination of material finer than sieve No. 200	E 105-86 (par. 8) ASTM D 422
9	Particle size analysis by hydrometer	E 105-86 (par. 9), ASTM D 422
10	Unconfined compression test	E 105-86 (par. 14), ASTM D 2166
11	One dimensional consolidation test	E 105-86 (par. 13), ASTM D 2435
12	Direct shear test (UU)	E 105-86 (par. 16), ASTM D 3080
13	Direct shear test (CU)	E 105-86 (par. 16), ASTM D 3080
14	Direct shear test (CD)	E 105-86 (par. 16), ASTM D 3080
15	Falling head permeability test	E 105-86 (par. 18)
16	In situ permeability test	E 106-86 (par. 6)
17	Unconfined compression strength in rock samples	E 103-84 (par. 4) ASTM D 2938

## AGGREGATES

No	Lab Test	Specifications
1	Determination of sand equivalent	AASHTO T 176
2	Determination of optimum density after compaction with weight (Standard Proctor Test)	E 105-86 (par. 10), ASTM D 4318, AASTHO T 99
3	Determination of optimum density after compaction with weight (Modified Proctor Test)	E 105-86 (par. 10), ASTM D 4318, AASTHO T 99
4	Determination of California bearing ratio	E 105-86 (par. 12), ASTM D 1883
5	Specific gravity and absorption of coarse aggregates	ASTM C 127
6	Specific gravity and absorption of fine aggregates	ASTM C 128
7	Determination of in situ density by sand replacement method	E 106-86 (par. 12), AASTHO T 191
8	Soundness of aggregates by use of magnesium sulfate	EN 1367-2
9	Flakiness index of aggregates	EN 933-3
10	Flow coefficient of aggregates	EN 933-6

## CONCRETE

No	Lab Test	Specifications
1	Sampling fresh concrete	ΣK-350
2	Preparation and maintenance of concrete specimens	ΣK-303
3	Compressive strength of cubic concrete specimens	ΣK-304
4	Determination of fresh concrete slump	ΣK-309