

LIST OF APPARATUS FOR ROAD Division & NH WORK DIVISION, RCD, BIHAR

(A) SOIL SECTION-

1. CBR test- IS : 2720 (Part-16)

CBR loading machine- 5 ton capacity with all accessories (including dial gauge, proving ring- 2.5 KN, 5 KN & 50 KN) calibrated by NPL

Mould (inside diameter- 150mm, height- 175mm, 2250 cc capacity)

With collar (50 mm height) & base plate (10mm thick)

Displacer block or spacer disc- Dia-148mm, height- 47.7mm

Perforated plate with stem in centre

Rammer- 2.6 kg, 4.89 kg

Surcharge weight- 2.5 kg (2nos.), dia- 147 mm and One annular metal disc of circular shape with 53 mm dia circular hole or slotted weight and each disc weighing 2.5 kg wt., dia- 53mm

IS Sieve- 4.75mm, 20 mm

Container, Spatula, Electronic balance, Butcher knife, Measuring cylinder, Coarse filter paper, Spirit level, Thermostatically electric oven, Thermameter (0°C to 100°C), Tongs

2. Proctor test- IS : 2720 (Part-7)

Light Compaction-

Compaction Mould (1000 cc)

With detachable base plate & collar- 60mm height

Rammer- 2.6 kg,

IS Sieve- 4.75mm

Heavy Compaction-

Compaction mould (2250 cc),

With detachable base plate & collar- 60mm height

Rammer- 4.89 kg,

IS Sieve- 4.75mm

Universal Automatic Compactor Machine

GI sheet tray (3' x 2' x 4")

Butcher knife

Measuring cylinder (50ml, 250ml, 500ml, 1000ml)

Wooden hammer

Electronic balance (20kg)

Container

Spatula

Straight edge

Trowel

Automatic thermostatically electric oven

Tongs

File

3. Atterberg limit test- IS : 2720 (Part-5)

Liquid limit-

Soil cone penetrometer

Cylindrical cup

Porcelain evaporating disc (dia-6")

Standard spatula

Electronic balance (600gm) sensitive to 0.01 gm

Wash bottle

Measuring cylinder

Table glass plate (36" x 18")

Thermostatically electric oven

Aluminum container (10 nos.) with lid

Enamel plate (dia- 6")

IS Sieve- 425micron

- Plastic limit- Casagrande apparatus with grooving tool
Grounded glass plate (36" × 18"),
Rod of 3mm dia, Table glass plate (13' × 15')
Thermostatically electric oven, Electronic balance (600gm),
Tongs
4. Moisture content- IS : 2720 (Part-II)
(a) Rapid moisture meter- Metallic pressure vessel,
Counterpoised balance,
Scoop, One bottle of the absorbent (calcium carbide), One
cleaning brush, Steel balls (3nos- dia 12.5mm, 1 ball- dia 25mm
(b) Oven dry method- Thermostatically electric oven, Containers, Electronic balance
(600gm capacity),
Wooden hammer
5. Soil gradation test- IS : 2720 (Part- IV)
IS Sieve (with lid & pan) - 4.75 mm
2.36 mm
2 mm
1.18 mm
600 micron
425 micron
300 micron
150 micron
75 micron
Electronic balance (600gm), Hair brush, Thermostatically
electric oven, Rubber pestle and mortar, Tray
6. Field density test-
(A) Core Cutter method- IS : 2720 (Part 29)
Cylindrical core cutter (dia- 100mm, height- 130mm)
Steel rammer- Wt.- 9 kg., overall length with foot & staff
(900mm),
Steel dolly- dia- 100mm, height- 25mm, Electronic balance,
knife, Straight edge, Container
(B) Sand replacement method- IS : 2720 (Part- 28)
Sand pouring cylinder (small- H- 380mm, capacity- 3 liters
large- H- 610mm, capacity- 16.5 liters)
Calibrating container (small- dia- 100mm, depth- 150mm
large- dia- 200mm, depth- 250mm)
Suitable tools for excavating holes
Glass plate (450mm square & 9mm thick or larger)
Metal container
Electronic balance or Barranger balance (10kg capacity) with
5kg, 2kg, 1kg, 500gm, 200gm, 100gm, 50gm and small weight
box
Cylindrical steel core cutter 127.4mm long & 100mm dia
Tray- 300mm square, 40mm deep with a hole of 100mm dia at
the centre for small pouring cylinder
450mm square, 50mm deep with a 200mm dia hole in the
centre for large pouring cylinder

(B) SAND SECTION-

1. Zone, grading of sand & fineness modulus- IS : 383
IS Sieve- 10mm, 4.75mm, 2.36mm, 1.18mm, 600 micron,
300micron, 150 micron with lid & pan
Tray
Electronic balance (600gm and 10kg capacity), Brush

(C) AGGREGATE SECTION-

1. Aggregate Impact Value- IS : 2386 (Part-IV)
 AIV machine, cylindrical steel cup- dia 102mm, H- 50mm,
 Measuring cylindrical cup- dia- 75mm, H- 50mm
 IS Sieve- 12.5mm, 10mm & 2.36mm
 Tamping rod- Cross section- 10mm in dia, Long- 230mm,
 rounded at one end, Electronic balance (600gm), Stop watch,
 Enamel plate
2. Flakiness & Elongation test- IS : 2386 (Part-I)
 Flaky & Elongation gauge
 IS Sieve- 63mm, 50mm, 40mm, 31.5mm, 25mm, 20mm, 16mm,
 12.5mm, 10mm & 6.3mm
 Electronic balance, Pan
3. Gradation test - IS : 2386 (Part-I)
 IS Sieve- G.I. sheet frame (450mm dia) from 125mm to 6.3mm,
 90mm, 80mm, 75mm, 63mm, 53mm, 50mm, 40mm, 31.5mm,
 25mm, 20mm, 16mm, 12.5mm, 10mm, 6.3mm & brass frame
 size (250mm dia) 5.6mm to 4.75mm, 3.35mm, 2.36mm,
 1.18mm, 600mic., 300mic., 150mic., 75mic. With lid & pan
 Sieve shaker- For 450mm dia & 200mm dia
 Electronic balance (20kg capacity), Barranger balance
 (10 kg capacity)
 Wts- 10kg, 5kg, 2kg, 1kg, 500gm, 200gm, 100gm, 50gm, small
 wt. box
4. Specific gravity- IS : 2386 (Part-3)
 A wire basket of not more than 6.3mm mesh, tray, balance,
 pycnometer,
 IS Sieve- 40mm, 10mm, 4.75mm, Thermostatically electric oven,
 watertight container in which basket may be freely suspended,
 Soft cloth (75 × 45 cm)
5. Water absorption test- IS : 2386 (Part-3)
 IS Sieve- 40mm, 10mm, 4.75mm,
 Enamel plate, Electric oven, Electronic balance (10kg capacity)
6. CBR test-
 All apparatus are as stated in the soil section

CONCRETE SECTION-

1. Compressive strength of concrete- IS : 516
 Cube mould (15cm × 15cm × 15cm)
 Tamping bar (dia- 16mm, L- 0.6m)
 Curing tank
 Compression testing machine (2000KN capacity)
 (Hand & Electrically operated)
 Trowel, Tray, Grease, Jute, Electric vibrator
 Electronic balance (10kg capacity)
2. Slump Test- IS : 1199
 Mould- Bottom dia- 20 cm, Top dia- 10cm, Height- 30cm
 Tamping rod- dia- 16mm, L- 0.6m
3. Fineness of cement- IS : 4031
 IS sieve- 90 micron with lid & pan
 Trowel
 Brush
 Electronic balance (600gm capacity, L.C.- 0.01gm)

(D) BRICK SECTION-

1. Water absorption test- IS : 3495 (Part- II)
 Hair brush (dia-4")

- Electronic balance (10kg capacity)
Curing tank
Thermostatically electric oven
2. Crushing strength of bricks- IS : 3495 (Part-I)
Trowel
Compression Testing Machine
Electronic balance
Plywood (10" × 5" × 3")
Scale

(E) BITUMEN SECTION-

1. Percentage of bitumen in total mix (Bitumen content test)-
Wooden hammer
Enamel plate
Electronic balance (10kg & 600mg capacity)
Aluminium container
Beaker (250ml, 600ml)
Funnel (15cm dia)
Flask (1000ml)
Bitumen extractor
Thermostatically oven & hot plate
Whatman filter paper no.-1, coarse filter paper for extractor
Big pan
Stirrer
Copper & nylon brush
Chemical solvent (Trichloroethylene)
Tongs
2. Grade of Bitumen- IS : 1203
Penetrometer, Metallic container- Internal dia- 55mm, depth- 35 or 57mm
Needle, Transfer dish, 30micron IS sieve, Thermometer (0°c to 100°c & 0°c to 300°c), Water bath, Stop watch, Hot plate (24" × 18")
3. For mixture temperature at the time of mixing in plant & laying temperature
Rotto thermometer & Electronic thermometer


20.12.16
Deputy Director
Testing & Research Institute
Road Construction Department
Govt. of Bihar, Patna