

Specifications for field gravel roads test kit



The CSIR, in collaboration with the International Labour Organisation (ILO), has developed a field test kit to evaluate borrow materials for use as wearing course on unsealed roads and to ensure that the quality of the construction is appropriate. The field gravel road test kit allows materials grading, cohesion (liquid limit and linear shrinkage), compacted strength and aggregate strength of the borrow material to be determined. The thickness probe and Rapid Compaction Control Device (RCCD) in the kit ensures construction quality assurance. The kit is designed to make use of local water and solar energy (solar oven and calculator) and therefore does not require electricity and running water to be available. A manual describing the step-by-step test methods with result worksheets and practical guidelines is supplied with every kit.

Description and listing of components

Option 1

- Canvas sheet for quartering sample
- Five test sieves with pan and cover (37.5, 26.5, 13.2, 4.75, 2.00, 0.425 mm)
- Balance with levelling platform and windshield
- Two stiff and two soft brushes
- Five pans
- Three shrinkage moulds
- Steel rule
- Spatula
- Drop cone apparatus
- Silicone spray
- Water bottle
- Thickness probe
- Clip board with result worksheets and manual
- Solar oven in separate steel trunk

Option 2

- Option 1 plus:
 - Tretton hammer plus option 1
 - Additional two sieves:(19.00, 16.00 mm)

Option 3

- Option 2 plus:
 - RCCD
- Photos of product

Benefits of using product

The performance of a gravel road is primarily a function of the material selected, as well as the testing and control of constructed layer work. The field test kit enables the practitioner to evaluate borrow materials for use as wearing course on unsealed roads and to ensure that the quality of the construction is appropriate.

FUNCTION

Function of product

The function and objective of the gravel roads field kit is to enable the practitioner to perform certain basic tests on materials in the field, without the use of a soils laboratory.

Operational principle (how does it work)

The procedure for each of the tests incorporated in the kit is discussed in detail in the accompanying manual.

DIMENSIONS

Dimensions

Option 1: Size 700 x 385 x 295 mm

Option 2: Size 950 x 565 x 450 mm

Option 3: Size 950 x 565 x 450 mm

Size of solar oven in steel trunk: 800 x 650 x 400 mm

Approximate mass

Option 1: Mass = 32 kg and 16 kg

Option 2: Mass = 56 kg and 36 kg

Option 3: Mass = 56 kg and 45 kg

INSTALLATION REQUIREMENTS

General installation requirements for products

There are no installation requirements as all the components in the kit are already assembled and can be used immediately.

List of equipment and tools needed for installation: None.

OPERATIONAL REQUIREMENTS

General operational requirements

The methods for performing the various tests are all covered in detail in the operational manual. The following tests/properties can be performed/evaluated using the kit:

- Grading analysis
- Liquid limit test
- Linear shrinkage test
- Compacted strength (by RCCD)
- Aggregate strength (Tretton test)
- Construction quality (refer to RCCD specification)

Related equipment/products needed for operation: None.

General calibration procedure: None.

DATA ACQUISITION SYSTEM

Data acquisition system required for operating product: None. All data measured are logged onto the supplied worksheets.

OUTPUT

General description of data from product

The data from the kit is the standard output for each of the following tests:

- Grading analysis
- Liquid limit test
- Linear shrinkage test
- Compacted strength (by RCCD)
- Aggregate strength (Tretton test)
- Construction quality (refer to RCCD specification)

RESOLUTION

Resolution of measurement from product: Not applicable.

ACCURACY

Accuracy of measurement from product (where applicable). The accuracy of each of the tests incorporated in the kit is within its normal specifications.

OPERATIONAL LIMITATIONS

Operational limitations' description (i.e. what cannot be done with the product that can reasonably be expected based on the supplied information).

The kit has been developed specifically for evaluating gravel roads and therefore does not contain the required tests to evaluate bituminous surfacings. The layerwork underneath bituminous surfacings can be evaluated to an extent.

OPTIONAL HARDWARE

Any specific hardware needed apart from those specified and forming part of the product: None.

WARRANTY AND DOCUMENTATION

General description of standard warranty

The CSIR warrants that under normal use and service, the field gravel roads test kit shall be free from defects in material and workmanship, and the product will meet the specifications indicated for a period of one year from the date of delivery to the end-user.

List of standard documentation supplied with product

A manual describing the step-by-step test methods with result worksheets and practical guidelines is supplied with every kit.

RELATED SPECIFICATIONS

The specification for the RCCD should be read in conjunction with the relevant national specification.

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