

CSIR Licensed Products

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 RCCD in the kit ensure 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.

Benefits and Function

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

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 back up of a soils laboratory.

How does it work?

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

Installation requirements

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

No special equipment or tools are needed for installation.

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)



OPTION 1

- Canvas sheet for quartering sample
- 5 test sieves with pan and cover
- Balance with levelling platform and windshield
- 2 stiff and 2 soft brushes
- 5 pans
- 3 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

Tretton hammer plus option 1

OPTION 3

RCCD plus option 2

General calibration procedure

No calibration or date acquisition system is required. All data measured is logged onto the supplied worksheets.

Operational limitations

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

Standard documentation supplied

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

The specifications for the RCCD should be read in conjunction with specifications.

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Rapid Compaction Control Device (RCCD)



The Rapid Compaction Control Device is a non-destructive quality control instrument developed primarily for evaluating the compaction of trench reinstatements in the urban environment. The RCCD is an impulse penetrometer with a trigger system that can be operated by a semi-skilled operator.

The RCCD penetration depth is correlated with the CBR and soil classification of the backfill material. It therefore provides the user with a quick reference control value on the state of compaction of the reinstated material. The RCCD can also be used for the determination of the CBR and material category of thin (< 80 mm) pavement layers.

Dimensions of RCCD: 35x12x12in (90x30x30cm)

Approx mass of RCCD: 13lb (6kg)

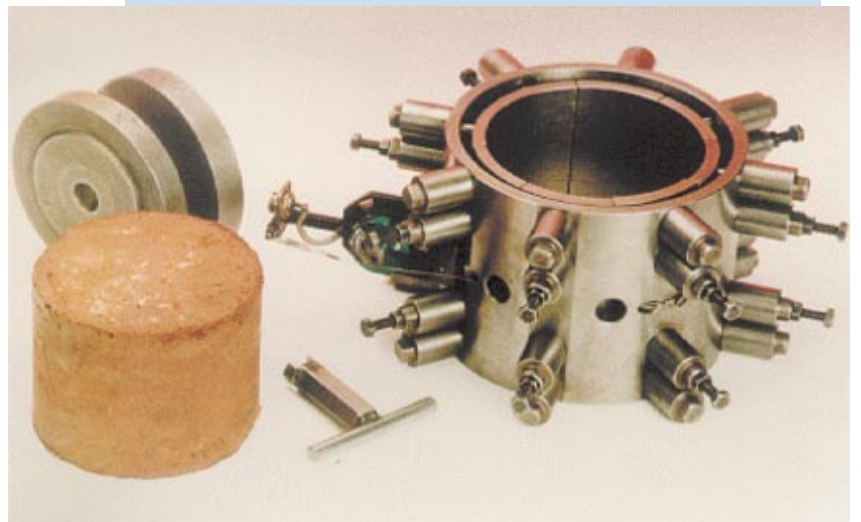
K-MOULD

In normal layers in a road pavement, the material in each layer is usually subjected to an increase in the vertical stress during traffic loading. This stress increase may cause the material to expand slightly in a horizontal direction. However, the surrounding layer material resists this expansion, resulting in an increase in the horizontal stress σ_3 .

The K-mould-test system is designed to simulate this condition in the laboratory, and may be described as a mechanical device in which the lateral restraint is automatically increased as the soil or asphalt specimen is vertically loaded.

The K-mould is used to determine the elastic (i.e. E_{sec} , v) and shear properties (c and ϕ) of road-building materials at similar conditions as expected in the pavement (i.e. dry density, moisture or binder content, and vertical stress level), in order to design the pavement structure optimally.

It is also used to determine the materials resistance to permanent deformation. It uses samples with a height: diameter ratio of less than one and has been used to evaluate granular materials with a maximum particle size of up 2.1in (53mm) although the normal particle size is usually 1.5in (37.5mm).



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