

Measurement of Surface Irregularity

Lab Test Reference 605

Test Method Reference

DTp Clause 702 and TRRL SR 290

Principal Apparatus:

Rolling Straight Edge - Lab Inventory

No.xxx Calibration Strips

1.

Preliminaries

Equipment Checks

- 1.1 Before use, and prior to assembling the three sections of the straightedge, the following preliminary checks should be made:-
- (i) Check that each of the three sections of the straightedge has the same manufacturer's serial number. Each straightedge is set up and calibrated as a complete unit and sections from different models should not be interchanged. This should be particularly noted where more than one straightedge is owned or where more than one straightedge is being used on the same site.
 - (ii) Examine the 40 fixed supporting wheels and also the central sensing wheel. Ensure that the surfaces of the wheels are free from mud, stones and other deposits and that each wheel is able to rotate freely on its shaft. Instances have arisen where 'flats' have been worn on wheels due to seizure.
 - (iii) On the middle section of the straightedge, check that vertical movement of the sensing wheel is being transmitted to the pointer on the indicating head and that there is no sticking of the vertical shaft.
 - (iv) Rotate the sensing wheel to check that the distance meter is functioning correctly. During transit, the driving chain for this unit sometimes becomes detached from the gear wheel.
 - (v) While the head of the middle section is hinged open, check the battery leads and connections and the operation of the electric bell or buzzer for selected depression sizes as follows:-

Most models have a facility for lifting and locking the sensing wheel. Ensure that this mechanism is fully released. Close the hinged lid making sure that it fits squarely and securely onto its base and that the two locking catches fit tightly. Lock both of these simultaneously to avoid distortion in the side walls of the lid. Then, selecting each depression size in turn and with the power switched on, carefully tilt the straight edge middle section sideways to allow the sensing wheel to move downwards. In this way, check that the bell or buzzer operates as the pointer exceeds each selected size in turn. After checking, switch the power off, lift and lock the sensing wheel and secure the hinged lid.

- (vi) The three separate sections of the straightedge can then be assembled. Note that the mating surfaces of the two outside sections are marked and that there are corresponding marks on the faces of the middle section to assist correct assembly. Make sure that the mating faces are clean before assembling. Check that all 6 locking clamps are tight and that the sections butt together squarely.
- 1.2 Obtain test worksheet 605 from Cabinet A in the soils laboratory.
- 1.3 Carry out calibration check on site as follows:
- 1.4 Place two strips of accurately finished timber (eg marine ply), approximately 200mm wide x 3mm thick x 1.5m in length, longitudinally on a flat and even surface such as an office or laboratory floor, or a bench top. Leave a gap of about 0mm between the ends of the strips as shown in Fig 1. Stand the assembled straightedge on the timber strips so that the central sensing wheel can be lowered into the gap of 3mm depth. Check the position of the pointer relative to the 3mm mark on the graduated scale. By adding further 3mm strips, the 6mm and 9mm positions can be checked in a similar manner. Alternatively, by using 2 pairs of the 3mm thickness and 1 pair of 4mm thickness (this being a standard size and readily obtainable) it will be possible to check the readings for 3, 4, 6, 7, and 10mm depressions. The 4, 7 and 10mm depressions are the most important as these are the tolerances referred to in the Specification. It would also be advisable to check the zero position by butting the ends of the two strips together.
- 1.5 It is recommended that this simple calibration check be carried out before the start of each day's testing. The equipment should be expected to give the correct reading to within approximately $\pm 0.5\text{mm}$. If it fails to do so, it should be returned to the manufacturer for service and accurate recalibration.
- 2. Standard Test Method
- 2.1 The road surface must be reasonably free from loose or extraneous materials before testing can commence.
- 2.2 Set the dial pointer to 4mm and switch on the bell ringer.
- 2.3 Walking at a steady slow walking speed, the rolling straight edge is pushed along the road parallel to the edge of the pavement, generally in the nearside wheel path.
- 2.4 When an irregularity of 4mm, 7mm or greater is indicated on the display, the worksheet is marked in the appropriate test length section. Where irregularities greater than 7mm the magnitude and location are also entered on the worksheet.
- 2.5 The reason, if apparent, for such high irregularities is noted on the worksheet.