

**OHD L-38
METHOD OF TEST FOR
DETERMINING SOFT PARTICLES IN COARSE AGGREGATES**

I. SCOPE.

- A. This method of test covers a procedure for determining the quantity of soft particles in coarse aggregates on the basis of scratch hardness. It is intended to be used to identify materials that are soft, including those which are so poorly bonded that the separate particles in the piece are easily detached from the mass. The test is not intended to identify other types of deleterious materials in aggregates, separate mention of which should be made in the specifications.
- B. In case of question, the scratch test should be made on a freshly broken surface of the aggregate particle. If the particle contains more than one type of rock and is partly hard and partly soft, it should be classed as "soft", (only if the soft portion is one-third ($\frac{1}{3}$) or more of the volume of the particle). Scratch hardness tests can be made on the exposed surface of a particle provided consideration is given to softening of the surface due to weathering. A particle with a thin, soft and weathered surface and a hard core should normally be classed as "soft."

- II. **APPARATUS.** Brass Rod, 1/16 inch (1.6 mm) in diameter, with a rounded point, mounted in a device so that a load of 2 ± 0.1 pounds (0.91 ± 0.04 Kg) is applied to the specimen tested. The brass rod shall be of suitable hardness so that when filed to a sharp point, it will scratch a copper penny (U.S. Lincoln design) but fail to scratch a nickel (U.S. Jefferson design). For use in the field, brass rod of the specified size and hardness can be mounted into the wooden shaft of an ordinary lead pencil.

III. SAMPLES.

- A. Coarse aggregates for the test shall consist of material from which sizes finer than the $\frac{3}{8}$ inch (9.5mm) sieve have been removed and shall consist of aggregate in proportion to the design mix required for the respective ODOT project. The sample shall not consist of less than 1000 grams nor more than 3000 grams.
- B. The requirements given in III, A cover aggregates composed of a mixture of different types of rock. When the aggregate is composed of only one type of rock, the weight of the sample tested may be reduced to an amount considered appropriate by the Engineer.

- IV. **PROCEDURE.** Subject each particle of aggregate under test to a scratching motion of the brass rod, using a pressure of 2 pounds (8.9 N). Particles are considered to be soft, if during the scratching process, a groove is made in them without deposition of metal from the brass rod, or if separate particles are detached from the rock mass.

NOTE: In the case of some sandstones, brass fragments may be deposited on hard individual grains, while at the same time, separate particles are detached from the mass due to a weak binding medium. Such particles are to be considered as soft.

- V. **CALCULATION AND REPORT.** The report shall include the percentage of test sample classified as soft by weight.