

## SAND EQUIVALENT TEST

The sand equivalent provides a measure of the cleanliness of an aggregate and the relative proportion of detrimental clay-like particles in the aggregate.

A simple test that can be performed in a lab or in the field in approximately 40 minutes, the Sand Equivalent Test measures the volumetric proportion of clay-like particles in the sand size and smaller particles of a gravel. It is similar to the Mason jar test many people know, but is more accurate and consistent.

A sample of material is placed in a cylinder with a special solution (water, calcium chloride, and glycerin) and left to become saturated. Next, it is shaken and the tube filled with more of the solution while irrigating and mixing the sample with a special tube.

The sand sized particles settle out almost immediately. The clay particles settle out slowly, but faster than in plain water due to the nature of the *flocculating* agent in the special solution.

After twenty minutes, the clay-like particles have settled to a given level in the cylinder (Clay reading). The sand particles, which can support a weight, have settled to a lower value (Sand reading). The ratio of these two lines, reported as a percentage, is the Sand Equivalent.

Perfectly clean sand would have 100 percent sand and would have a sand equivalent of 100. A pure clay would have a sand equivalent of 0.

A good gravel for a *subbase* should have a sand equivalent of 35 or higher. For a base, 40 or higher is recommended. For a gravel *surface* the sand equivalent should be between 25 - 40.

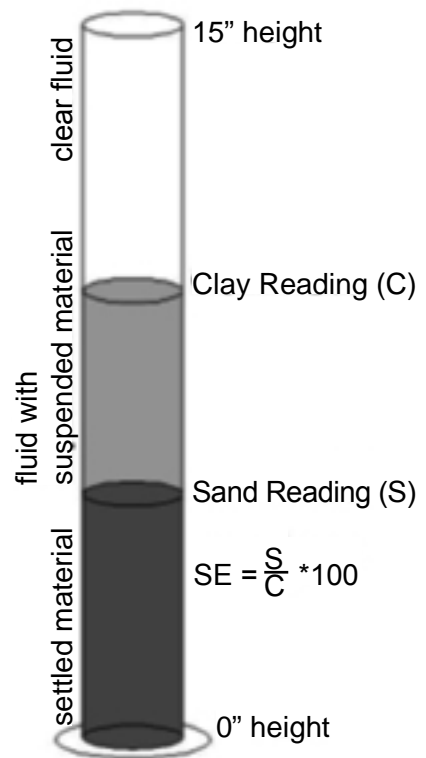


Figure 1: Sand Equivalent Test Cylinder

### CORNELL LOCAL ROADS PROGRAM

416 RILEY-ROBB HALL, ITHACA, NY 14853

PHONE: (607) 255-8033

FAX: (607) 255-4080

E-MAIL: [clrp@cornell.edu](mailto:clrp@cornell.edu)

INTERNET: [www.clrp.cornell.edu](http://www.clrp.cornell.edu)

*Tech Tips* are published by the Cornell Local Roads Program with support from the Federal Highway Administration, the New York State Department of Transportation, and Cornell University. The content is the responsibility of the Local Roads Program.

## References

Bridges, R.A., and Cedergren, H.R., *Soil Engineering: Street and Highway Applications*, The Institute of Transportation and Traffic Engineering, University of California at Berkeley, 1962.

AASHTO, *Standard Specifications for Transportation Materials and Methods of Sampling and Testing*, American Association of State Highway and Transportation Officials, Washington, 2001.



This work by the Cornell Local Roads Program (CLRP) is licensed under a [Creative Commons Attribution-NonCommercial-Share Alike 3.0 Unported License](https://creativecommons.org/licenses/by-nc-sa/3.0/).