



# TEX-110-E, PART I

## Particle Size Analysis of Soil



### Why

Particle size is a requirement for soil classification, compaction assessment, geotechnical engineering, and pavement design.



### When

Retaining wall, untreated/treated base materials and when the specification requires:

- Specification 247 - Flexible Base
- Specification 423 - Retaining Walls



### How

- Stack the required sieves in descending order from largest to smallest on top of a pan.
- Pour the material through the stack of sieves.
- Shake in a mechanical shaker for five minutes.
- After shaking remove the top sieve and place over a clean pan.
- Hand sieve until no more than one percent by weight passes through in a one-minute shake. Combine material that passed through to the sieve on the next smaller size sieve.
- Weigh and record the material retained on the first sieve.
- The sieve size sieve is hand sieved. The material retained on the sieve is to be added to the portion from the first sieve and record the weight as W1.
- Continue hand sieving and recording the combined weight as W2, W3 .... until all sieves have been done.
- Weigh and record the material passing the No.40 sieve in the catch pan.




**QUICK FACTS: SB 101 DRAFT**

**Action**

- Calculations
  - Calculate the total weight of the sample:
  - $WT = WS + W$ 
    - $WT$  - Total weight of sample, g.
    - $WS$  - Weight of material passing the No.40 sieve, g.
    - $W$  - combined weight of smallest sieve size, g
  - Calculate cumulative percent retained for each sieve:
  - Cumulative percent retained first sieve -  $100 \times W1 \div WT$
  - Cumulative percent retained on second sieve -  $100 \times W2 \div WT$
  - Calculate the individual percent retained on each sieve by subtracting the cumulative percent from the cumulative percent of the sieve one larger.
  - Individual percent retained sieve the second sieve =  $\text{Cum.\% } W2 - \text{Cum.\% } W1$
  - Individual percent retained sieve the third sieve =  $\text{Cum.\% } W3 - \text{Cum.\% } W2$ , etc.

Sieve Size	Cumulative Weight Retained (g)	Cumulative Percent Retained	Individual Percent Retained
½ in.	108.4	2.8	2.8 = 3
3/8 in.	412.5	10.8	8.0 = 8
No. 4	2285.0	59.6	48.8 = 49
No. 8	3523.0	91.9	32.3 = 32
Pan - Total material including the minus No. 40	3832.0	100.0	8.1 = 8

- Report the individual percent retained on each sieve to the nearest whole number.