

Method of Sampling Gravel, Stone, Sand, Filler, and Clay

1. Scope:

These methods are for obtaining samples from pits, quarries, stockpiles, rail cars, conveyor belts, windrows, and trucks. Procedures for reducing samples to testing size are described in SD 213.

Other methods giving representative samples may be used, if approved by the Chief Materials and Surfacing Engineer.

Sampling from aggregate stockpiles or rail cars or trucks should be avoided whenever possible.

2. Apparatus:

2.1 Not specified.

3. Procedure:

3.1 Pits.

- A. Hole dug with auger.
Take material from the bottom of the auger representing each foot of depth as the hole is drilled. Sample approximately the same amount of material from each foot of depth. Take material from the auger only when it is going deeper and not just cleaning out the caved in material. Individual samples may be selected to represent material from each well-defined stratum.
- B Exposed faces.
Take the sample by channeling the exposed face vertically from bottom to top. Overburden and disturbed material shall not be included in the sample. Individual samples may be selected to represent material from each well-defined stratum.

3.2 Stockpile (Preliminary and quality samples).

- A. Cone shaped stockpile.

Take care to avoid sampling segregated areas of the pile. Take approximately equal portions from the base, midpoint, and top of the pile. Before obtaining the sample at each sampling point, remove the aggregate to an approximate depth of 1 foot, and then obtain sample from the bottom of the hole. A board may be shoved into the pile just above the point of sampling to prevent segregation.

B. Flat topped stockpile.

Dig three or more shallow trenches on top of the stockpile approximately 10 feet long and 1 foot wide. The bottom of the trenches shall be nearly level. Take equal portions from 3 equally spaced points along the bottom of each trench by pushing a shovel downward into the material and taking a shovel full from each point.

C. Stockpile (Loader method).

Sample the material from at least three different areas around the perimeter of the stockpile. Using a front-end loader dig into pile and set aside a small pile of approximately 10 to 15 tons. Material shall be removed from stockpile in same manner in which it will be removed for incorporation into project. The operator shall roll the material from the loader bucket to reduce the amount of free fall. The additional buckets shall be obtained and dumped in the same manner and placed uniformly over the preceding pile.

The small stockpile will then be struck off to approximately half of its original height by back dragging with the loader bucket. Take the required amount of material for the sample from the exposed surface of the stockpile with a shovel taking care not to let material fall off the shovel.

3.3 Conveyor belt.

A. Stop the conveyor belt while obtaining the sample. Insert 2 templates conforming to the width and shape of the belt into the aggregate stream on the belt. Scoop all material between the templates into a suitable container using a brush to collect the fines on the belt.

If templates are not available, care must be taken to prevent material from the upper side of the belt from sliding or rolling onto the section being sampled. Sample the full width of the belt.

B. A special device capable of obtaining an entire cross section of the material as it is being discharged from the belt may be used. This device must consist of a pan of sufficient size to intercept the entire cross section of the discharge stream and hold the required quantity of material without overflowing. A set of rails or another suitable device must be included so that a representative sample of the entire stream can be obtained. Obtain at least three approximately equal increments and combine to form the field sample.

3.4 Windrows.

Sample the material in windrows by shoveling through small windrows or removing material to the midpoint of the cross section of large windrows. Waste the material removed in both procedures. Shave material from one face of the cross sectional area for the sample.

3.5 Stockpile (Coarse and fine aggregate for concrete).

NOTE: Samples shall be taken from a belt whenever physically possible.

Sample the material from the area of the stockpile that is being incorporated into project. Using a front-end loader dig into pile and set aside a small pile of approximately 5 to 15 tons. Material shall be removed from stockpile in same manner in which it is being removed for incorporation into project. The operator shall roll the material from the loader bucket to reduce the amount of free fall. Any additional buckets shall be obtained and dumped in the same manner and placed uniformly over preceding pile.

The small stockpile will then be struck off to approximately half of its original height by back dragging with the loader bucket. Take the required amount of material for the sample from the top surface of the stockpile with a shovel taking care not to let material fall off the shovel.

3.6 Spreader.

NOTE: Samples shall be taken from a belt whenever physically possible.

Sample the material from 3 to 5 locations immediately behind the spreader (before roller compaction). Take the required amount of material for the sample from the surface with a flat blade shovel taking care not to obtain material from the subgrade or lower lift.

3.7 Rail cars and trucks.

Dig 3 or more shallow trenches the full width of the rail car or truck with the bottom of the trench nearly level and approximately one foot wide. Take equal portions from 3 equally spaced points along the bottom of each trench by pushing a shovel downward into the material and taking a shovel full from each point.

3.8 Quarries.

See AASHTO R 90.

4. **Report:**

None required.

5. References:

AASHTO R 90
SD 213