AGGREGATE SAMPLING & MINIMUM SIZE OF SAMPLES FOR SIEVE ANALYSIS

SCOPE

This IM sets forth approved sampling methods and the minimum amount of dry materials necessary for the determination of particle size distribution.

LOCATION FOR SAMPLING

Safety must be foremost when determining sample locations. The Contractor/Producer shall make adequate provisions, satisfactory to the Engineer, for the safety of personnel responsible to obtain representative samples of the aggregate.

Provisions shall include guards for moving belts, pulleys, and wheels near the sampling point, and a stable platform with adequate safety rails when sampling is to be done from an elevated location.

Stopped belt sampling locations must be equipped with an on-off switch near, and in plain view of the sampling location. This switch, when in the off position, must have full control of the belt.

1. Conveyor Belt/Template Method

A minimum of three locations is required when obtaining a sample using this method. Normally, the belt should be recharged for each location to help assure a representative sample. (Review section titled ‘Sampling Stockpiles For Gradation Confirmation’).

The ends of the template should be spaced to yield approximately one third of the total minimum required sample weight. More increments may be needed to achieve the required minimum weight.

Stop the belt and insert the template as illustrated. Remove all material from the belt contained within the template. A brush or whisk broom will be useful in capturing the finer particles.

The increments are combined together to make one field sample.

2. Stream Flow Method

When obtaining a sample by interception of the aggregate stream flow, care must be exercised, so the sampling device (See picture below.) passes quickly through the entire stream flow and does not overflow. At least three separate passes shall be made with the sampling device when obtaining a sample. Each pass is an increment of the sample. This is normally considered to be the best method to obtain a representative sample of coarse aggregate.

3. Stockpile Method (for fine aggregate only, or as directed by the District Materials Engineer)

   Stockpile sampling of fine aggregate may be accomplished by either using a shovel or a sand probe. When obtaining a field sample by the stockpile method, a minimum of three increments shall be taken at different locations around the stockpile. Avoid sampling in areas prone to segregation, such as along the bottom of cone stockpiles.

NOTE: Stockpile sampling of coarse ***or combined*** aggregate should be avoided. If it becomes absolutely necessary to obtain a sample from a ***production*** stockpile, consult the District Materials Engineer to help devise an adequate and proper sampling plan.

SAMPLING STOCKPILES FOR GRADATION CONFIRMATION

Stockpile sampling of coarse or mixed coarse and fine aggregate is difficult due to segregation. When sampling to determine gradation compliance of these materials, the Contractor, Producer or Supplier will supply equipment such as a sampling bin or flow-boy to provide a streamflow or stopped conveyor belt sampling location.

An end-loader will open the pile to be sampled in at least three locations. One end-loader bucket from each opened area is then placed into the sampling bin and sampled in a manner to assure representation of the entire quantity.

Alternately, material from each of the opened areas may be combined in a small stockpile, carefully blended to minimize degradation of the aggregate, and placed into the sampling bin.

Avoid obtaining sample increments at the beginning or end of bin discharge due to the natural tendency of segregation through the bin.

SHIPPING SAMPLES

Transport aggregate samples in bags or other containers constructed to preclude loss or contamination of the sample, or damage to the contents from mishandling during shipment.

Shipping containers for aggregate samples shall each have suitable identification attached and enclosed so that field reporting, laboratory logging and testing may be facilitated.

SAMPLE SIZES

Minimum sample sizes for sieve analysis of aggregates are based on the smallest sieve through which at least 95% of the sample will pass. The following table lists the required minimum field sample and test sample sizes:

SIEVE SIZE	FIELD SAMPLE (lbs/kg)	TEST SAMPLE (gms/kg)
1½ in.	50/23.0	5,000/5.0 ‹1›
1 in.	30/13.5	3,500/3.5
¾ in.	20/9.0	2,000/2.0
½ in.	20/9.0	1,500/1.5
⅜ in.	10/4.5	1,000/1.0 ‹2›
No. 4 sieve	10/4.5	500/0.5
No. 8 sieve	10/4.5	200/0.2

(Products with maximum sizes over 1½ in. (37.5 mm) are normally visually inspected. Contact the appropriate District Materials Engineer.)

(1) When testing 1½" aggregate for Special Backfill, Granular Subbase, or Modified Subbase the minimum test sample is 2500 grams.
(2) When testing fine aggregate with no more than 10% retained on the No. 4 sieve the minimum test sample is 500 grams.