April 21, 2009 Matls. IM 336
Supersedes April 20, 2004

REDUCING AGGREGATE FIELD SAMPLES TO TEST SAMPLES

SCOPE

This method outlines the proper procedure for reducing an aggregate sample to the proper test sample size.

PROCEDURE

The sample for testing should be approximately of the mass (weight) desired, conforming to the sample size for the material as indicated by Office of Materials IM 301. The test sample must be the end result of the sample reduction method. Do not attempt to select a sample to an exact predetermined mass (weight).

I. SPLITTING METHOD

A. Apparatus

1. Sample splitter (conforming to equipment requirements of AASHTO T248-95).
2. Three catch pans
3. Wide, flat-edged scoop

B. Sample Preparation

1. The sample shall be dry enough to allow free flow of the aggregate through the chutes.

Note: A preliminary reduction of fine aggregate in a damp condition may be made using the 2 – inch riffle chute splitter. The resultant sample size shall be not less than 5,000 grams.

C. Test Procedure

1. Place the field sample on a hard, clean surface, such as a counter-top, concrete floor, or in a large, flat pan.
2. Thoroughly mix the field sample until it appears homogenous.
3. Place a catch pan under the chutes on each side of the splitter.
4. Place increments of the field sample on the wide, flat-edged scoop and uniformly distribute it from edge to edge, so when it is introduced into the chutes, approximately equal amounts will flow through each chute.

5. Repeat the above step until the entire field sample has been introduced into the chutes. It may be necessary to use a brush to collect the fine material of the sample for splitting.

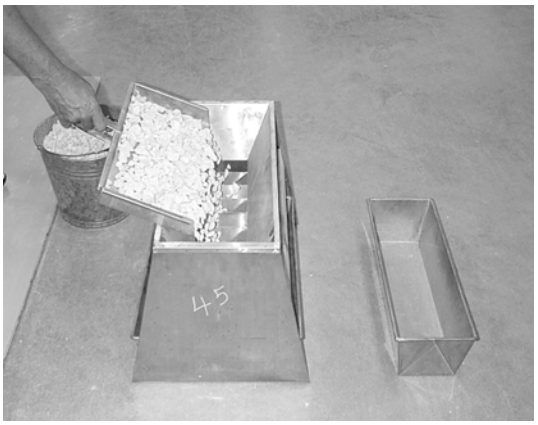
6. The rate at which the sample is introduced shall be such as to allow a free flow of material from the scoop and through the chutes into the catch pans below.

7. Use the material contained in one of the catch pans and repeat the previous steps until the sample is reduced to the desired size. Be sure to split entire increments during this procedure.

D. General Comments

1. If the catch pans are equal to, or slightly less, than the total combined width of the riffle chutes, they may be used to place the material through the splitter in lieu of using the scoop. Do not use containers longer than the combined width of the riffle chutes to avoid overloading the end chutes.

2. Use the size of sample splitter best suited for the maximum particle size of the aggregate to be tested. Generally use the splitters with 1 in. (25 mm) riffle openings for aggregates with a 3/4 in. (19 mm) maximum particle size, and the splitters with 2 in. (50 mm) openings for samples containing larger particle sizes 1 3/4 in. (45 mm). Samples of material with particles larger than 1 3/4 in. (45 mm) shall be quartered. (See IV. Below.)



II. MECHANICAL SPLITTER METHOD

A. Apparatus

1. Mechanical Sample Splitter

2. Ten Catch Pans

3. Buckets

4. Shovel

B. Sample Preparation

1. The sample shall be dry enough to allow free flow of the aggregate through the chutes.

C. Test Procedure

1. Place the ten small pans of the splitter in the appropriate area of the splitter.

2. Place the entire field sample in buckets. Turn on the splitter and pour material slowly into the top of the hopper.

3. Complete the pouring of the entire field sample into the hopper (catch pans will hold one bag without overflowing). If more than one bag is used, you will have to pour each catch pan into separate, larger containers and then resume splitting. It may be necessary to use a brush to collect the fine material of the sample.

4. Use all of the material contained in one or more of the catch pans to obtain the desired size.

III. MINIATURE STOCKPILE METHOD (Fine Aggregate Only)

A. Apparatus

1. Shovel

2. Small scoop

B. Sample Preparation

1. This sample reduction method is only for fine aggregate samples in moist condition. Fine aggregates, which are in a substantially surface-dry condition or drier, should be reduced with a sample splitter.

C. Test Procedure

1. Place the moist field sample on a hard, clean, level and non-absorbent surface. Thoroughly mix the sample with the shovel and form a “miniature stockpile.”

2. Obtain the test sample by selecting at least five increments of material at random locations from the miniature stockpile using the scoop.

IV. QUARTERING METHOD

A. Apparatus

1. Shovel (square-nosed)

2. Brush

3. Quartering Device (optional)

B. Test Procedure

1. Place the sample on a hard, clean, smooth surface where there will be neither loss of material from the sample, nor the accidental addition of foreign material.

2. Mix the sample thoroughly by turning the entire lot over three times with a shovel. With the last turning, shovel the entire sample into a conical pile by depositing each shovelfull on top of the preceding one.

3. Carefully flatten the conical pile to a uniform thickness and diameter by pressing down the apex with the shovel, so each quarter will contain the amount of material originally in it.

4. Mark the flattened mass (weight) into quarters (or use the quartering device) by two lines that intersect at right angles at the center of the pile.

5. Remove two diagonally opposite quarters and brush the cleared spaces clean, placing the brushed, fine aggregates into the removed quarters.

6. Sucessively mix and quarter the remaining materials as above, until the sample is reduced to the desired size, with the two remaining quarters giving the sample for the test.

C. General Comments

1. The quartering method is not recommended for sample reduction of coarse aggregate due to potential problems with segregation. This method should only be used when use of a sample splitter is not possible.