Test Procedure for

SAMPLING FLEXIBLE BASE, STONE, GRAVEL, SAND, AND MINERAL AGGREGATES

TxDOT Designation: Tex-400-A

Effective Date: January 2010

1. SCOPE

1.1 This method describes procedures for sampling flexible base material, stone, gravel, sand, and synthetic aggregates including shell, slag, riprap, and mineral filler.

1.2 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

2. SECURING REPRESENTATIVE FIELD SAMPLES

2.1 Obtain samples that show the true nature and condition of the materials that they represent. Do not combine materials that apparently differ in property or character to make a composite sample. Differences may be indicated by color or texture. Samples taken from a quarry or pit for a source investigation may be taken from various existing layers or strata, and the samples should be combined in proper proportion to represent the entire pit face that will be processed in the same operation.

2.2 Use sampling tubes where experience has indicated representative samples cannot be obtained otherwise. Sample fine aggregates (sands) with tubes of at least 31.5 mm (1-1/4 in.) diameter and coarse aggregates up to 19.0 mm (3/4 in.) with tubes of 100 mm (4 in.) diameter.

Note 1—The method of sampling will depend on the place, the quantity of the material, and the proposed treatment and tests to be performed in the laboratory. Where practical, take samples of the finished product from commercial plants.

3. RECORD FORM

3.1 Identify samples on Form 202, "Identification of Material Samples." In addition to the general information accompanying all samples, show the:

- name of the producer,
- name of the pit or quarry,
- producer code number,
- location of the stockpile sampled (pit, HMAC or concrete plant, project, etc.),

- approximate quantity of the material in the stockpile or unit sampled, and
- specification item number.

4. SAMPLE SIZE

4.1 The required sample size depends upon the maximum aggregate size and the number and types of tests to be performed. Use Table 1 to determine the minimum size sample required. Use a sample splitter or quartering cloth to reduce the field sample to laboratory test size.

5. SAMPLING PROCEDURES

5.1 *Riprap:*

5.1.1 Obtain four to six pieces of riprap representative of the proposed material.

5.1.2 Reduce the entire sample to a maximum particle size of 150 mm (6 in.)

5.1.3 Submit approximately 50 kg (110 lb.) of the material retained on the 4.75 mm (No. 4) sieve.

5.2 *From Bins or Belts:*

5.2.1 For preliminary investigation work, sample aggregates in their natural condition prior to plant processing.

5.2.2 If the materials are being fed to the plant from bins, obtain the sample from the collector belt after materials have passed the scalping screen.

5.2.3 The preferred method of sampling from the belt is a mechanical belt sampling device approved by the Engineer. This method does not require the belt to be stopped, but simply diverts the flow of aggregate for a designated period where the sample is collected.

5.2.4 When mechanical devices are not used, stop the belt prior to sampling, and take the sample from the entire width of the belt and at least one meter of the length, using a square-nosed scoop.

5.2.5 After removing the aggregate, brush all fines from the exposed section of the belt using a stiff bristled brush and add to the sample.

5.3 *From Stockpiles that Contain Coarse and Fine Aggregate:*

5.3.1 Identify locations around the perimeter of the stockpile that represent the approximate quarter-points of the stockpile. Clean and level the ground at these locations to prevent contamination of the sampling pile.

5.3.2 Sample each quarter-point of the stockpile using the following steps.

5.3.2.1 Using a front-end loader large enough to cut into the stockpile from bottom to top in one continuous cut, make enough cuts into the stockpile at the quarter-points so that the cut at ground level is perpendicular to the top edge of the stockpile at that quarter-point. If available, the blade of the loader bucket must be straight and flat, without teeth. Only use a loader with a bucket containing teeth when a loader with a bucket that is straight, flat, and without teeth is not available. Make the cuts from the bottom to the top to expose a clean, interior vertical face representing the full height of the stockpile. Clean out the cut as needed to leave a minimal amount of material on the ground before obtaining the sample.

5.3.2.2 Discard this material.

5.3.2.3 Using the front-end loader, cut into the exposed interior face to a depth equal to approximately half the depth of the loader bucket, taking care not to overload the bucket in the bottom half of the stockpile. Make the cut from the bottom to the top in one continuous motion.

5.3.2.4 Lower the bucket until it is as close as possible to the surface of the ground, and empty the entire contents of the bucket onto the ground in one motion without having to raise the bucket before all contents are emptied. Repeat this process three more times, each time emptying the loader bucket next to the last load. (See Figure 1.)

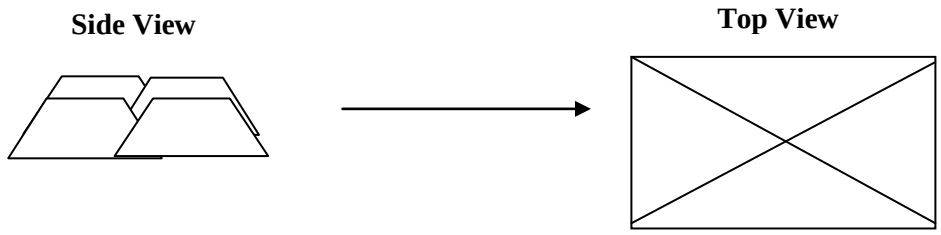

Figure 1—Placement and Sampling of Piles

5.3.2.5 Using the loader bucket, strike, and level the sample piles at mid-height in the direction the bucket was emptied (See Figure 1.)

5.3.2.6 Using a shovel, identify the approximate mid-point of each bucketload, and dig straight down to remove material for sampling. Deposit the material removed from the hole into sample containers (preferably 5 gal. buckets). Minimize loose material falling from the sides of the hole and loss of material from the shovel into the hole or adjacent ground while filling sample containers. Remove enough material from each hole to fill one sample container for each party who will receive a portion of the sample. This will give you four containers of sampled material for each quarter-point of the stockpile sampled.

5.3.2.7 Seal and label the sample containers. Include the quarter point location on the label.

5.3.3 Repeat Sections 5.3.2.1–5.3.2.7 at each of the stockpile quarterpoints identified in Section 5.3.1.

5.3.4 Department personnel will divide the total sample into three equal portions and offer one portion of the sample to the producer, retain one portion for district testing, and retain one portion for CST/M&P for referee and random blind samples.

5.4 *From Stockpiles that Contain Only Coarse or Only Fine Aggregate:*

5.4.1 Take samples from stockpiles near the top of the pile, near the base of the pile, and at an intermediate point.

5.4.2 Shove a board into the pile just above the point of sampling to prevent further segregation during sampling.

5.4.3 Do not use the aggregate on the surface of the stockpile as a part of the sample.

5.4.4 In each instance, dig a small trench or hole into the pile approximately 1 ft. deep and take the sample from the innermost part of the hole.

5.4.5 Take samples from these three points at several places around the stockpile and combine them to form a composite sample.

5.4.6 In lieu of using Section 5.4, steps outlined in Section 5.3 are acceptable.

5.5 *From Railroad Cars and Trucks:*

5.5.1 Excavate at least three trenches across the width, evenly spaced across the length of the bed.

5.5.2 Each trench bottom should be approximately 0.3 m (1 ft.) in width and 0.3 m (1 ft.) in depth.

5.5.3 Take samples from at least three locations equally spaced along the length of the trench, and combine all samples to create a single field sample as directed in Tex-100-E.

5.6 *From the Plant:*

5.6.1 Make a general inspection of the plant and a record of the screening facilities.

5.6.2 For a weigh-batching type plant, take samples from the aggregate bins that feed into the weigh-box.

5.6.3 For a continuous mix type plant, take samples from the aggregate bins that feed the proportioning mechanism.

5.6.4 For a drum type plant, take samples from the collector belt feeding the aggregate into the drum. When an aggregate flow diversion chute is not available, stop the feed belt prior to obtaining the sample.

5.6.5 Take samples from the entire cross-section of the flow of material from each individual bin as it is being discharged. Prior to sampling, permit the plant to produce a minimum of 4.5 Mg (5 tons) of mixture.

Table 1—Minimum Size of Samples

Nominal Maximum Size Of Particles[1]	Approximate Minimum Mass Of Field Samples, kg (lb.)
2.00 mm (No. 10)	10 (25)
4.75 mm (No. 4)	10 (25)
9.5 mm (3/8 in.)	10 (25)
12.5 mm (1/2 in.)	15 (35)
19.0 mm (3/4 in.)	25 (55)
25.0 mm (1 in.)	50 (110)
37.5 mm (1-1/2 in.)	75 (165)
50.0 mm (2 in.)	100 (220)
63.0 mm (2-1/2 in.)	125 (275)
75.0 mm (3 in.)	150 (330)

1. For processed aggregate, the nominal maximum size of particles is the largest sieve size listed in the applicable specification upon which any material is permitted to be retained.

Note 2—Obtain the test sample from the field sample by quartering or splitting.

6. ARCHIVED VERSIONS

6.1 Archived versions are available.