

**Standard Method of Test for
Methods of Sampling Coarse Aggregates
SCDOT Designation: SC-T-1 (11/18)**

1. SCOPE

- 1.1. These methods are intended to apply to coarse aggregates of gravel and crushed stone that have been sized and processed for use in construction items of work.
- 1.2. This standard may involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. SUMMARY OF TEST METHOD

- 2.1. A sample of coarse aggregate is obtained by combining portions taken from a conveyor belt, storage bin, stockpile, sample pad, or truck dump.

3. SIGNIFICANCE AND USE

- 3.1. Sampling is equally as important as the testing, and the sampler must use every precaution to obtain samples that will show the true nature and condition of the materials that they represent.

4. APPARATUS

- 4.1. Round or square point shovel, large sample bags, board (optional), sample ring (optional). When sampling aggregate base from the roadway, a small metal scoop or large metal spoon may be used to make sure that all of the material is removed from the sampling hole since it may be difficult to reach all areas of the hole with a shovel.

5. TEST SPECIMENS

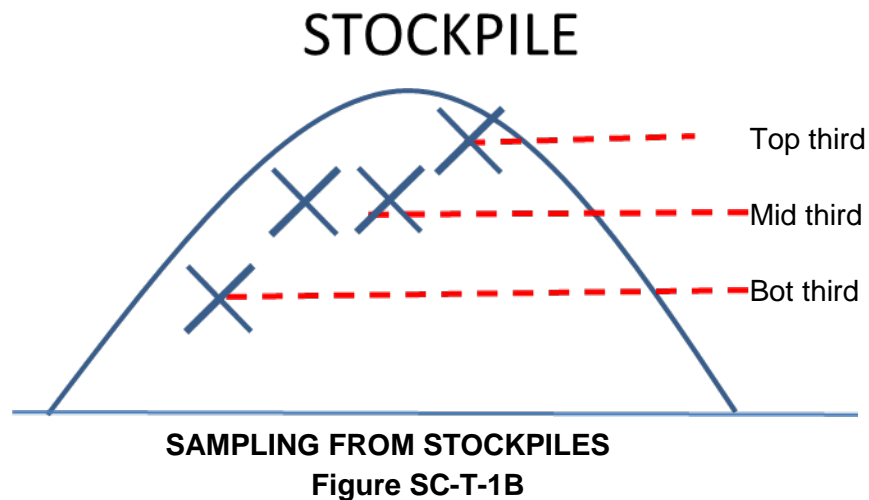
- 5.1. The minimum size of sample shall conform to the requirements shown in Figure SC-T-1A.

Product Sampled	MINIMUM WEIGHT OF FIELD SAMPLES (pounds)
Coarse Aggregate (5, 57, 67, 789, etc.)	40
Aggregate Base (Macadam, MLBC, RPCC)	70

**TABLE OF MINIMUM SAMPLES SIZES
Figure SC-T-1A**

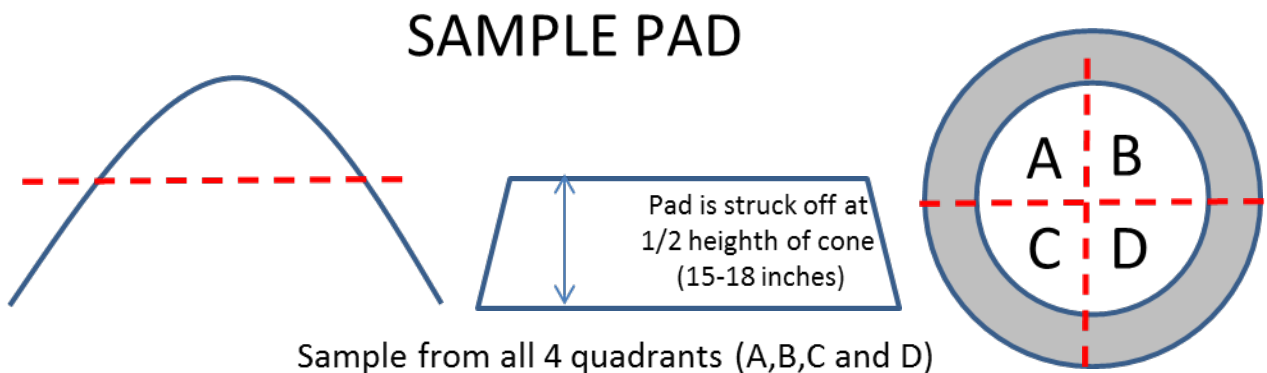
6. PROCEDURE

- 6.1. *Sampling from Conveyor Belts* — Conveyor belts furnish a good point for sampling. It is necessary to stop the belt before taking a portion of the sample. Scrape clean at least 2 feet of the belt for the entire width and depth. Take at least three (3) portions from the belt and combine them into one sample. Allow the conveyor belt to make at least two (2) revolutions between the taking of each sample portion.
- 6.2. *Sampling from Storage Bins* — If samples are taken from a bin, take them from the entire cross-section of the flow of material as it is being discharged. At the beginning of the discharge from the bins, permit sufficient material to flow to insure normal uniformity before the sample is selected.
- 6.3. *Sampling from Stockpiles* — It is extremely difficult to obtain a representative sample of coarse aggregate from a stockpile and this method of sampling should be avoided whenever possible. When it is necessary to obtain samples from a stockpile, take a sample by combining approximately equal portions of materials taken from four (4) or more different locations care being taken to avoid sampling a segregated area of coarse-grained material that is likely to exist at the base of the pile. When sampling smaller stockpiles, one portion should be obtained from the upper third of the stockpile. Two portions should be obtained by moving diagonally across the stockpile and to approximately the vertical midpoint of the pile to represent the middle third of the stockpile. Each of these portions must be obtained from a separate location. An additional portion should be obtained from the bottom third of the stockpile by again moving diagonally across the face and being careful to avoid the segregated material at the very bottom of the stockpile (see Figure SC-T-1B). If the stockpile is too large for all areas to be accessed safely, the sample should be obtained from the loading face



of the stockpile by taking diagonal portions from the upper, middle and lower third of the loading face. Before obtaining the material at each sampling point, remove the aggregate to a depth of 1 foot and then, with a round or square point shovel, obtain one shovel full from the bottom of the hole. Care should be taken to minimize pieces of aggregate falling off the shovel when transferring the material to the sample bag. To help in preventing further segregation during sampling, a board may be shoved into the pile just above the point of sampling. The separate portions of material taken from the different holes must be combined to form a composite sample. If additional material is needed to make the minimum sample size requirement, take an additional portion from the middle third of the stockpile or loading face.

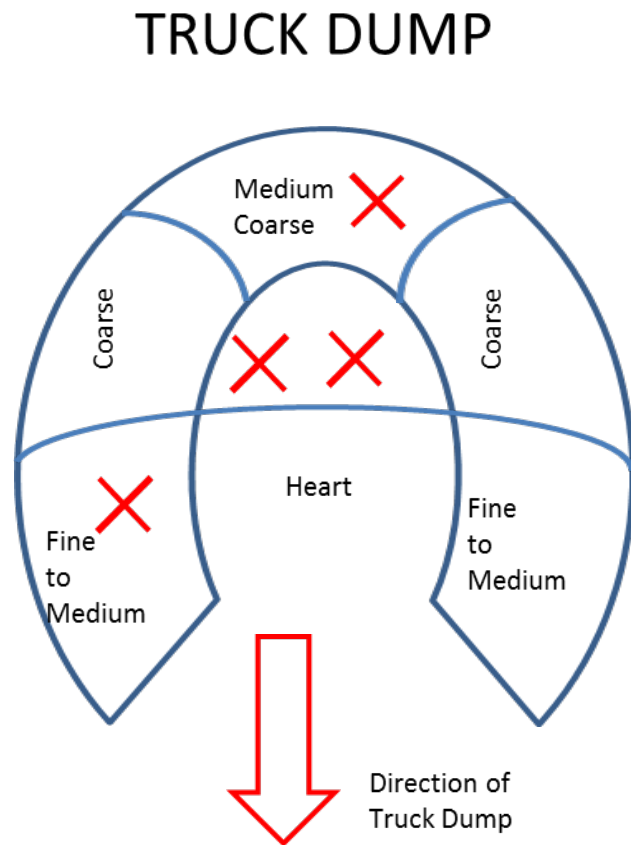
- 6.4. *Sampling from Mini-stockpiles/ Sample Pads* – Whenever possible, take samples from a stockpile using the sample pad (also known as mini-stockpile) technique. To form a sample pad, the loader operator will either: a) discard two (2) buckets of material from the loading face of the large stockpile or b) mix the face of the pile. In either case the loader operator should keep the loader bucket at least 12 inches above the bottom of the stockpile when making the sample pad to avoid segregated material at the bottom of the stockpile. The loader operator will then take a minimum of two (2) buckets of material and place it onto the ground near the large stockpile by gently rolling the material out of the bucket. The loader operator should take care not to drop the material from any higher than necessary to prevent segregation of the material in the sample pad. The sample pad will then be struck off to approximately half its original height (about 15 to 18 inches) by back dragging with the loader bucket in the dumped position. As shown in Figure SC-T-1C, take the required amount of material for the sample from the exposed surface of the sample pad by sampling with a shovel taking care to minimize the amount of material falling off of the shovel. Sample material by inserting the shovel vertically into the surface of the pad. Make sure the shovel is driven completely into the pad (but being careful not to remove any of the substrate material). Collect material from each of the four quadrants in order to obtain the minimum field sample size required for the type of aggregate being sampled. If additional material is needed to meet the minimum sample requirement, take additional portions from the center of the sample pad. Care should be



SAMPLING FROM A MINI-STOCKPILE/ SAMPLE PAD
Figure SC-T-1C

taken to stay away from the edges of the pad where the material is subject to segregation. If multiple samples are to be taken at the same time such as a job control and two check samples, a separate sample pad must be made for each sample.

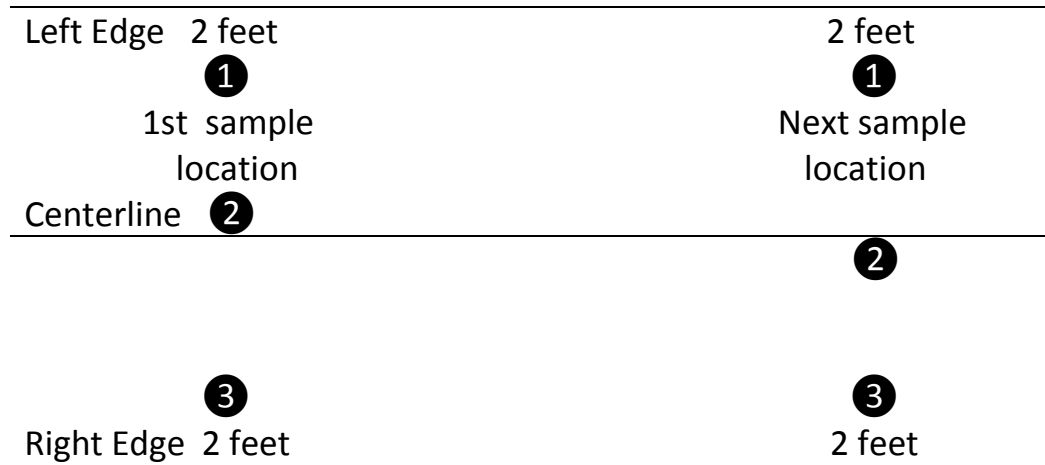
- 6.5. *Sampling from a Truck Dump.* Sampling from truck dumps should be avoided if possible. If a loader is available, then the truck dump should be remixed with the loader and struck off to form a sample pad that may be sampled by that procedure. If no other method is available and a truck dump must be sampled, obtain four (4) portions of material from locations across the truck dump, one portion from a front corner, one portion from the opposite back corner and two portions from the top of the dumped load (see Figure SC-T-1D). Before obtaining the material at each corner sampling point, remove the aggregate to a depth of 1 foot and then, with a round or square point shovel, obtain one shovel full from the bottom of the hole. Minimize the amount of pieces of aggregate falling off the shovel when transferring the material to the sample bag. To help in preventing further segregation during sampling, a board may be shoved into the pile just above the point of sampling. The separate portions of material taken from four



SAMPLING FROM A TRUCK DUMP
Figure SC-T-1D

(4) different locations must be combined to form a composite sample. Take additional material from the center of the dumped load if required to meet the minimum sample size. Do not sample a truck dump after any material has been removed from that dumped load.

- 6.6. *Sampling Graded Aggregate Base Materials from the Roadway:* Obtain Graded Aggregate Base samples after all mixing and shaping have been performed, but prior to initial compaction. Obtain three (3) portions of sample with a round or square point shovel at the station from which the sample is desired. Obtain one portion from the centerline and obtain the two remaining portions approximately two (2) feet from either edge of the base course. If the base material was placed with a joint at the centerline, then obtain that portion of the sample far enough off of the centerline that it does not come from the segregated area that may occur at the joint (See Figure SC-T-1E). Obtain portions for the full depth of the layer being sampled with care being taken not to contaminate the sample by going too deep and mixing subgrade soil with the base material. A sampling ring may be used to help isolate the sampling area and prevent material from falling into the hole. Use a small metal scoop or large metal spoon to remove material that cannot be reached with the shovel from the holes or from the ring. Combine the three (3) portions to form a composite sample.



SAMPLING GRADED AGGREGATE BASE MATERIALS FROM THE ROADWAY
Figure SC-T-1E