Earthres Group, Inc.
toll free 800-264-4553

www.earthres.com

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HEADQUARTERS / PHILADELPHIA REGION
P. O. Box 468, Pipersville, PA 18947
phone 215-766-1211

APPALACHIAN REGIONAL OFFICE
P. O. Box 794, Morgantown, WV 26505
phone 304-212-6866

December 19, 2018

Michael J. Menghini, District Mining Manager
Department of Environmental Protection
Pottsville District Mining Office
5 West Laurel Boulevard
Pottsville, PA 17901-2454

SUBJECT: Revised NOA One-Time Background Site Operations Sampling Plan
Rock Hill Quarry Operation
SMP No. 7974SM1
East Rockhill Township, Bucks County
EarthRes Project No. 061003.051

Dear Mr. Menghini:

On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson) and in follow-up to our joint meeting on December 14, 2018 with the Pennsylvania Department of Environmental Protection (PA DEP), Lehigh Hanson, Compliance Plus Services, and R.E. Pierson personnel, please find the below one-time background sampling plan. The plan has been revised to incorporate additional details of the sampling methodology.

As directed by PA DEP, the samples proposed to be collected are targeted to assess the presence of Naturally Occurring Asbestos (NOA) at several current site operation locations per your request.

SAMPLING LOCATIONS

The proposed sampling locations include four (4) water samples and six (6) aggregate samples as described below:

Water sampling (4 samples):
- One sample from each sediment pond (2 samples)
- Main Quarry Pit
- NPDES 001 Outfall

Aggregate sampling (6 samples):
- Two (2) samples collected from the fines under the portable crusher
- One (1) aggregate sample from the 2A stone pile
- One (1) aggregate sample from the screenings pile
- One (1) aggregate sample from the 1B stone pile
- One (1) aggregate sample from the 2B stone pile

SAMPLING AND ANALYSIS

Water samples will be grab samples collected in laboratory supplied 1 liter bottles. The bottles will be rinsed three (3) times with grab samples of the water to be sampled, and then filled with the grab sample to be analyzed. The containers will be sealed and placed on ice for transport to the laboratory.

Aggregate samples will be collected as material composites using AASHTO R90. The samples will be mixed and reduced in size prior to transmittal to the laboratory per AASHTO T248. Samples will be transmitted to the laboratory in 1 gallon sealed plastic bags. The specified AASHTO methods are attached to this plan.

A blind duplicate water sample and aggregate sample will also be collected.

Two (2) fines samples from beneath the portable crusher conveyors (1 each) will be collected. A hand shovel/scoop will be used to collect a sample from each found pile. Depending on the documented number of piles and the size of each collected composite, the sample will be reduced in size prior to transmittal to the laboratory per AASHTO T248. Samples will be transmitted to the laboratory in 1 gallon sealed plastic bags.

Aggregate and fines samples will be analyzed using Polarized Light Microscopy (PLM) via EPA 600/R-93/116 method with Milling Prep Level A (400 point count, resulting in a minimum detection limit [MDL] of 0.25%). If NOA is detected at or above the MDL, the sample results will be confirmed using Transmission Electron Microscopy (TEM) analysis via EPA 600/R-93/116. Water samples will be analyzed using TEM via EPA Method 100.2 for asbestos fibers.

The samples will be transported directly to EMSL Laboratory in Cinnaminson, NJ using standard chain-of-custody procedures. Samples will be submitted for a 24 hr. turnaround time.

SAMPLE SCHEDULE AND REPORTING

Upon approval, we are prepared to commence sampling at the site immediately. The Department will be notified of the sampling results within 24 hours of receipt.

If you have any questions or concerns regarding the proposed sampling please feel free to contact me at (215) 766-1211.

Sincerely,
EarthRes Group, Inc.

Louis F. Vittorio, Jr., P.G.
Vice President

cc: Mark Kendrick, Hanson*
Andrew Gutshall, Hanson*
Curt Mitchell, R.E. Pierson
Mike Logan, CPS*
Mike Kutney, PA DEP*
Gary Latsha, PA DEP*
Amiee Bollinger, PA DEP*
(*via electronic mail)

Attachments: AASHTO R90 and T248

SAMPLING AGGREGATE PRODUCTS
FOP FOR AASHTO R 90

Scope

This procedure covers sampling of coarse, fine, or a combination of coarse and fine aggregates (CA and FA) in accordance with AASHTO R 90-18. Sampling from conveyor belts, transport units, roadways, and stockpiles is covered.

Apparatus

- Shovels or scoops, or both
- Brooms, brushes, and scraping tools
- Sampling tubes of acceptable dimensions
- Mechanical sampling systems: normally a permanently attached device that allows a sample container to pass perpendicularly through the entire stream of material or diverts the entire stream of material into the container by manual, hydraulic, or pneumatic operation
- Belt template
- Sampling containers

Procedure – General

Sampling is as important as testing. The technician shall use every precaution to obtain samples that are representative of the material. Determine the time or location for sampling in a random manner.

1. Wherever samples are taken, obtain multiple increments of approximately equal size.

2. Mix the increments thoroughly to form a field sample that meets or exceeds the minimum mass recommended in Table 1.

TABLE 1
Recommended Sample Sizes

Nominal Maximum Size* mm (in.)		Minimum Mass g (lb)	
90	(3 1/2)	175,000	(385)
75	(3)	150,000	(330)
63	(2 1/2)	125,000	(275)
50	(2)	100,000	(220)
37.5	(1 1/2)	75,000	(165)
25.0	(1)	50,000	(110)
19.0	(3/4)	25,000	(55)
12.5	(1/2)	15,000	(35)
9.5	(3/8)	10,000	(25)
4.75	(No. 4)	10,000	(25)
2.36	(No. 8)	10,000	(25)

* One sieve larger than the first sieve to retain more than 10 percent of the material using an agency specified set of sieves based on cumulative percent retained. Where large gaps in specification sieves exist, intermediate sieve(s) may be inserted to determine nominal maximum size. Maximum size is one size larger than nominal maximum size.

Note 1: Sample size is based upon the test(s) required. As a general rule, the field sample size should be such that, when split twice will provide a testing sample of proper size. For example, the sample size may be four times that shown in Table 2 of the FOP for AASHTO T 27/T 11, if that mass is more appropriate.

Procedure – Specific Situations

Conveyor Belts

Avoid sampling at the beginning or end of the aggregate run due to the potential for segregation. Be careful when sampling in the rain. Make sure to capture fines that may stick to the belt or that the rain tends to wash away.

Method A (From the Belt)

1. Stop the belt.
2. Set the sampling template in place on the belt, avoiding intrusion by adjacent material.
3. Remove the material from inside the template, including all fines.
4. Obtain at least three approximately equal increments.
5. Combine the increments to form a single sample.

Method B (From the Belt Discharge)

1. Pass a sampling device through the full stream of the material as it runs off the end of the conveyor belt. The sampling device may be manually, semi-automatic or automatically powered.

2. The sampling device shall pass through the stream at least twice, once in each direction, without overfilling while maintaining a constant speed during the sampling process.

3. When emptying the sampling device into the container, include all fines.

4. Combine the increments to form a single sample.

Transport Units

1. Visually divide the unit into four quadrants.

2. Identify one sampling location in each quadrant.

3. Dig down and remove approximately 0.3 m (1 ft.) of material to avoid surface segregation. Obtain each increment from below this level.

4. Combine the increments to form a single sample.

Roadways

Method A (Berm or Windrow)

1. Obtain sample before spreading.

2. Take the increments from at least three random locations along the fully-formed windrow or berm. Do not take the increments from the beginning or the end of the windrow or berm.

3. Obtain full cross-section samples of approximately equal size at each location. Take care to exclude the underlying material.

4. Combine the increments to form a single sample.

Note 2: Obtaining samples from berms or windrows may yield extra-large samples and may not be the preferred sampling location.

Method B (In-Place)

1. Obtain sample after spreading and before compaction.

2. Take the increments from at least three random locations.

3. Obtain full-depth increments of approximately equal size from each location. Take care to exclude the underlying material.

4. Combine the increments to form a single sample.

Stockpiles

Method A– Loader sampling

1. Direct the loader operator to enter the stockpile with the bucket at least150 mm (6 in.) above ground level without contaminating the stockpile.

2. Discard the first bucketful.

3. Have the loader re-enter the stockpile and obtain a full loader bucket of the material, tilt the bucket back and up.

4. Form a small sampling pile at the base of the stockpile by gently rolling the material out of the bucket with the bucket just high enough to permit free-flow of the material. (Repeat as necessary.)

5. Create a flat surface by having the loader back drag the small pile.

6. Visually divide the flat surface into four quadrants.

7. Collect an increment from each quadrant by fully inserting the shovel into the flat pile as vertically as possible, take care to exclude the underlying material, roll back the shovel and lift the material slowly out of the pile to avoid material rolling off the shovel.

Method B – Stockpile Face Sampling

1. Create horizontal surfaces with vertical faces in the top, middle, and bottom third of the stockpile with a shovel or loader.

2. Prevent continued sloughing by shoving a flat board against the vertical face. Sloughed material will be discarded to create the horizontal surface.

3. Obtain sample from the horizontal surface as close to the intersection as possible of the horizontal and vertical faces.

4. Obtain at least one increment of equal size from each of the top, middle, and bottom thirds of the pile.

5. Combine the increments to form a single sample.

Method C – Alternate Tube Method (Fine Aggregate)

1. Remove the outer layer that may have become segregated.

2. Using a sampling tube, obtain one increment of equal size from a minimum of five random locations on the pile.

3. Combine the increments to form a single sample.

Note 3: Obtaining samples at stockpiles should be avoided whenever possible due to problems involved in obtaining a representative gradation of material.

Identification and Shipping

- Identify samples according to agency standards.
- Include sample report (below).
- Ship samples in containers that will prevent loss, contamination, or damage of material.

Report

- On forms approved by the agency
- Date
- Time
- Sample ID
- Sampling method
- Location
- Quantity represented
- Material type
- Supplier

REDUCING SAMPLES OF AGGREGATE TO TESTING SIZE

AASHTO T 248

GLOSSARY

Nominal Maximum size - The smallest sieve opening through which the entire amount of the aggregate is permitted to pass.

Saturated Surface Dry (SSD) - An aggregate is considered to be in a saturated surface dry condition when there is no free moisture present but the aggregate is in a nonabsorbent state.

Air Dry - When the aggregate appears to be dry but still has some absorbed moisture in the pore structure.

SCOPE

The field samples of aggregate must generally be reduced to an appropriate size for testing to determine physical characteristics, such as, sieve analysis, soundness, hardness, etc. The methods described in this test method are intended to minimize variations in the aggregate characteristics between the smaller test sample and the larger field sample.

Several methods of sample reduction will be described. The technician must be sure to use the appropriate technique dependent on such factors as aggregate size and moisture content.

The reduction methods include:

Method A - Mechanical Splitter

Method B - Quartering

Method C - Miniature Stockpile

In some circumstances, reducing the field sample prior to testing is not recommended. Substantial differences may unavoidably occur during sample reduction, i.e., in the case of an aggregate having relatively few large size particles in the sample. These few particles may be unequally distributed among the reduced size test samples. If the test sample is being examined for certain contaminants occurring as a few discreet particles in a small percentage, the reduced test sample may not be truly representative of the total aggregate as produced. In these cases, the entire original field sample should be tested.

Failure to carefully follow the procedures in these methods of sample reduction may result in providing a nonrepresentative sample for subsequent testing, resulting in inaccurate test results, and ultimately, failure of the aggregate to perform as intended.

SUMMARY OF PROCEDURE

Aggregate and other materials sampled in the field need to be reduced to appropriate sizes for testing. It is, therefore, necessary to reduce field samples while minimizing the chance of variability during handling. In some instances a few particles on a given sieve might effect a gradation significantly enough to alter an interpretation of the field sample and subsequently the entire material's compliance with specifications.

The appropriate field sample reduction method is dependent chiefly on the nominal maximum size of the aggregate, the amount of free moisture in the sample, and the equipment available.

The following chart should be used in selecting the appropriate reduction method for the aggregate to be tested.

Mechanical Splitter	Quartering	Miniature Stockpile
Fine Aggregates - Air Dry	Fine Aggregates –Free Moisture on the Particle Surface	Fine Aggregates – Free Moisture on the Particle Surface
Coarse Aggregates	Coarse Aggregates	Not Appropriate for Coarse Aggregates
Combined Aggregates	Combined Aggregates with Free Moisture on the Particle Surface	Not Appropriate for Combined Aggregates

METHOD A -- MECHANICAL SPLITTER

Apparatus

The mechanical sample splitter shall have an even number of equal width chutes, not less than eight for coarse or combined aggregate, or twelve for fine aggregate. The chutes shall discharge alternately to each side of the splitter. For coarse and combined aggregate the width of the individual chutes shall be approximately twice the largest size particle in the sample to be reduced. For dry fine aggregate in which the entire sample will pass the 3/8 in. (9.5 mm) sieve, the minimum width of the chutes shall be at least fifty percent larger than the largest particles in the sample with a maximum width of 3/4 in. (20 mm).

The splitter shall be equipped with at least two receptacles (catch pans) to hold the two halves of the sample during splitting. It shall also be equipped with a hopper or straight-edge pan with a width equal to or slightly less than the overall width of the assembly of chutes, by which the sample may be fed at a controlled rate into the chutes.

The splitter and accessories shall be designed to allow the sample to flow smoothly without restriction or loss of material.

Mechanical splitters are commonly available in sizes adequate for aggregate having the largest particle size not over 1 1/2 in. (37.5 mm).

Procedure

1. Place the original sample, or portion thereof, in the hopper or pan and uniformly distribute it from edge to edge being sure the sample appears homogenous (well-blended). Carefully introduce the sample into the chutes in a manner to allow the aggregate to flow freely through the openings and into the catch pans. Continue this procedure until the entire sample has been halved, being careful that catch pans do not overflow.

2. Remove the catch pans and set aside. Continue splitting one half of the material. Follow this procedure, being sure to split entire increments, until the desired test sample size is obtained. Retain the unused material until all desired tests are performed in case a retest is needed.

   Note: Sometimes a significant amount of fines may be lost in the splitting process if the sample is extremely dry and the action of pouring the sample through the splitter chutes creates a large dust cloud, suspending the fines in the air above the splitter. If this is a serious concern, then add a small amount of water to the original sample and mix thoroughly before splitting the sample. The extra moisture will prevent many of the fines from becoming suspended in the air and drifting off. Remember to not add so much water that the moisture content ends up being at or greater than the SSD condition, in which case the mechanical splitting method would no longer be valid. In any case, be sure to perform the splitting procedure in a well-ventilated area while wearing a suitable dust mask.

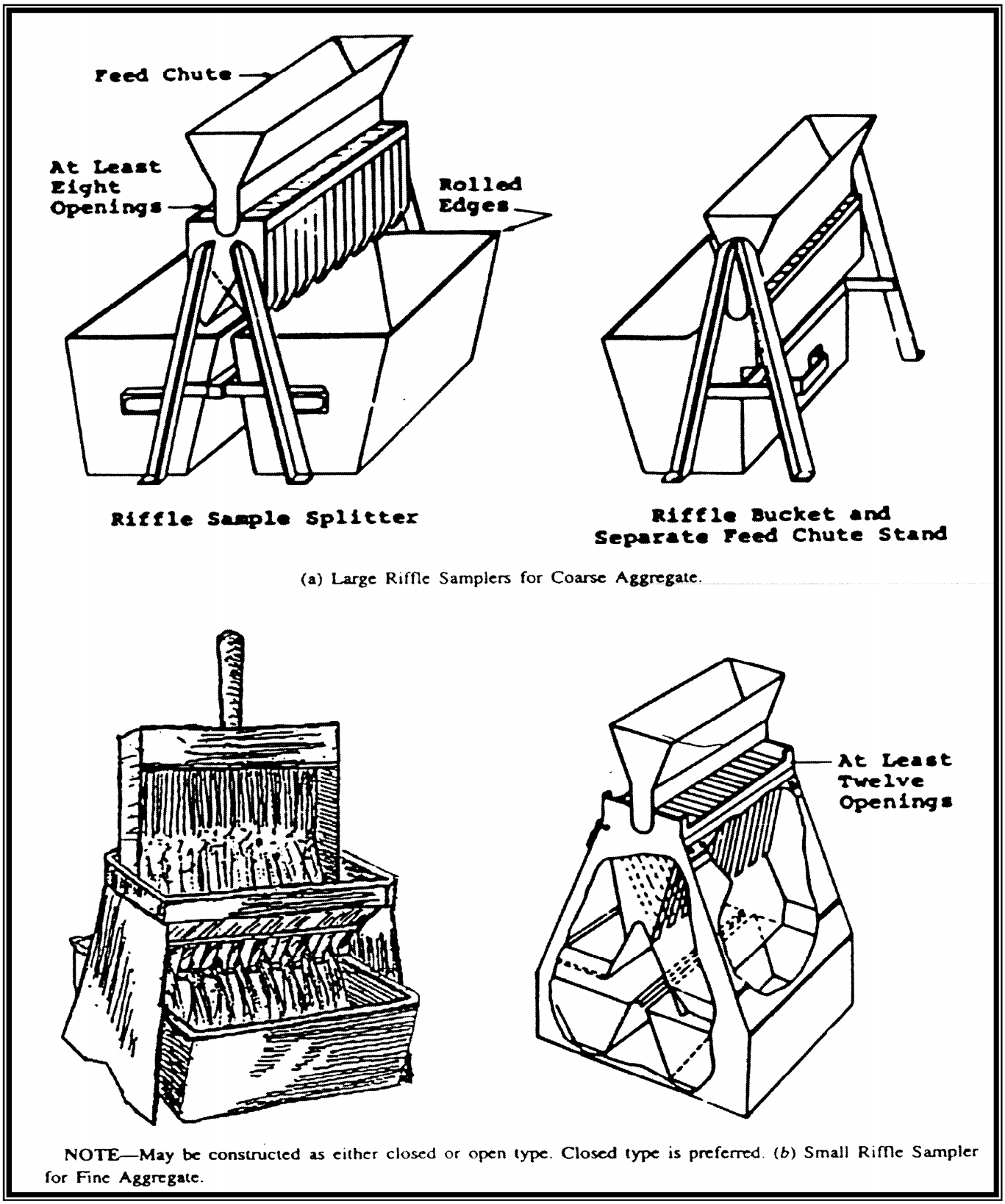


Figure 1
Sample Splitters

MECHANICAL SAMPLE SPLITTER

Mechanical Splitter

Sample in Splitter

Sample Being Split

METHOD B -- QUARTERING

Apparatus

Straight-edged scoop.

Flat-edged shovel or trowel.

Broom or brush.

Alternate method only - canvas blanket measuring approximately 6 ft. x 8 ft (2 m by 2.5 m).

Procedure

1. Place the original sample on a hard, clean, level surface. Mix the material thoroughly by turning the entire sample over with the shovel at least three times. With the last turning, shovel the entire sample into a conical pile by depositing each shovelful on top of the preceding one. Carefully flatten the conical pile to a uniform thickness and diameter by pressing down the apex with the shovel so that each quarter section of the resulting pile will contain the material originally in the pile. The pile diameter should be approximately four to eight times the thickness.

2. Divide the flattened pile into four equal quarters with the shovel or trowel. Remove two diagonally opposite quarters, including all fine material. Brush the cleared spaces clean. Successively mix and quarter the remaining material in the same fashion as the original sample. Continue this process until the desired quantity is obtained.

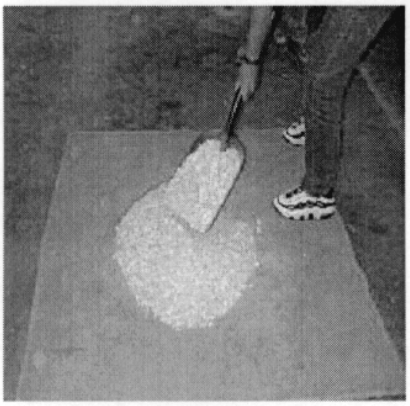
   Save the unused portion of the original field sample until all testing is completed in case a retest is needed.

METHOD B -- ALTERNATIVE

As an alternative to Method B, when the floor surface is uneven, the field sample may be placed on a canvas blanket and mixed with a shovel, or by alternatively lifting each corner of the blanket and pulling the blanket over the sample toward the diagonally opposite corner causing the material to be rolled. Flatten and divide the pile as described in Method B, or if the surface beneath the blanket is too uneven, insert a stick or pipe dividing the pile into two equal parts. Remove the stick leaving a fold in the canvas between the sample halves. Slide the stick under the canvas blanket again at a right angle to the first division and dissecting the two halves of the sample through their centers. Lift the stick evenly from both ends dividing the sample into equal quarters. Remove two diagonal parts including the fine material and clean the area. Successively mix and quarter the remaining material until the desired sample size is obtained.

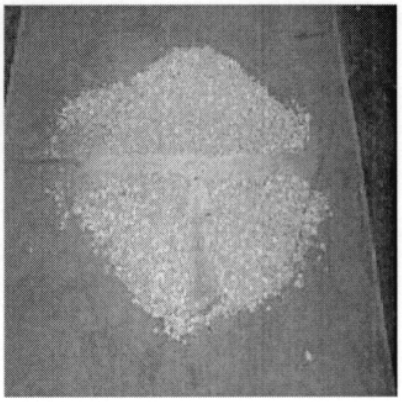
Note: The quartering method is fairly time intensive and thus is generally used in situations where an adequate mechanical splitter is unavailable. Diligence and care is required to ensure that the samples obtained by quartering remain representative of the entire field sample.

METHOD B



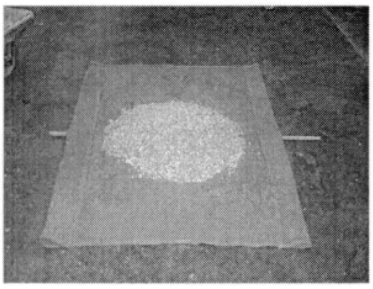
Mix by Forming New Cone

Flatten Cone

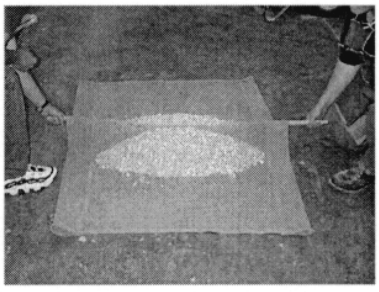


Divide Sample Into Quarters

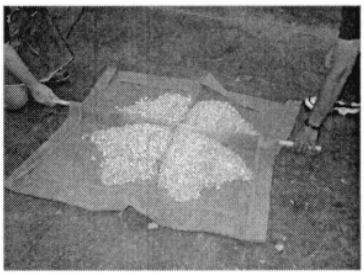
Method B (alternative)



Stick Placed Under Flattened Sample



Sample Divided in Half



Sample Divided Into Quarters

METHOD C -- MINIATURE STOCKPILE

Apparatus

Straight-edge scoop.

Shovel or trowel (for mixing the aggregate).

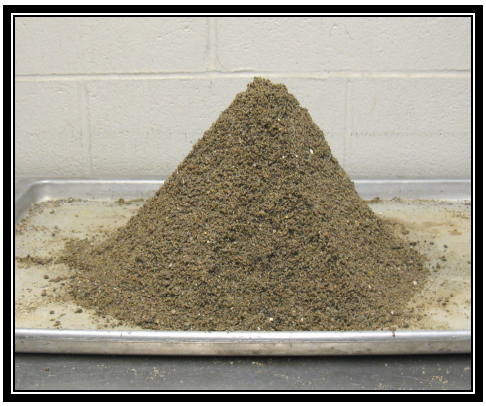
Small sampling thief, small scoop, or spoon.

Procedure

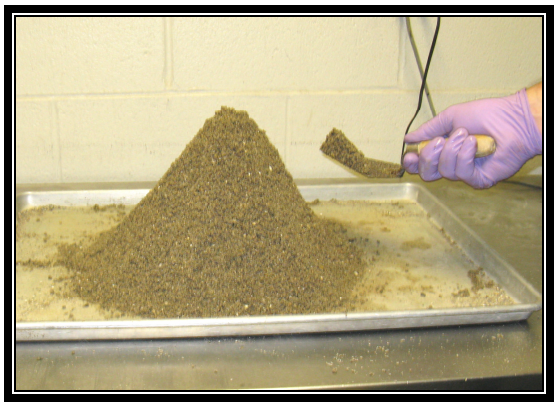
This method is for damp, fine aggregate only.

1. Place the field sample on a hard, clean, level surface where there will be no loss of material or contamination. Mix the sample by turning the entire sample over three times with a shovel. With the last turning, shovel the entire sample into a conical pile by depositing each shovelful on top of the preceding one.

2. Obtain a sample for each test to be performed by selecting at least five increments of material at random locations from the miniature stockpile using a sample thief, small scoop, or spoon.



Miniature Stockpile



Taking One of at Least Five Samples