

State of Nevada
Department of Transportation
Materials Division

**METHOD OF TEST FOR REDUCING A REPRESENTATIVE TEST SAMPLE OF SOIL AND
AGGREGATE**

SCOPE

This test method describes the process of reducing soil and aggregate samples for required tests from larger field samples obtained from Test Method Nev. T200.

APPARATUS

1. Splitter, device which will divide the sample into representative portions (Figure 1, 2 and 3).
2. Sample Containers, glass pyrex dish, metal sample pan, metal bowl, metal dog dish, porcelain bowl etc.
3. Quartering Canvas, wooden stick, pipe, paint brush
4. Crusher, which can be adjusted to produce material passing the 4.75 mm (No. 4) sieve. A sledge hammer may be used to reduce oversize particles enough to permit the material to be fed into the crusher.

SAMPLE IDENTIFICATION

Each sample shall be properly labeled to easily identify the type of material, contract number, date, source and tests required.

SECURING REPRESENTATIVE SAMPLE

Refer to the respective test methods and specifications for the quantity of material needed.

Split or quarter the sample into representative portions for various tests. The riffle type splitter is preferable to hand quartering, however, hand quartering is acceptable, if carefully performed. Do not scoop or pour material directly from sample container without properly reducing for testing.

Split or quarter material in a damp condition, to avoid the loss of fine material (to dry) and to avoid clumping of wet material (to wet), ensuring a representative split sample is being obtained.

1. Mechanical device (Riffle Splitter)

The splitting device should have openings sufficiently wide enough to permit easy passage of the largest particles in the sample and yet not so wide that a non-representative separation is obtained. Generally, the width of openings should be approximately 50 percent larger than the largest particles in the sample to be split.

- a. Thoroughly mix the sample and spread it evenly across the pan or hopper. The pan or hopper used with a riffle type splitter shall be equal in width to the overall width of the chutes so that the material will pour in equal amounts into each chute. Do not pour samples directly into chutes from anything other than the pan described above.
- b. Holding the pan in a horizontal position in regards to the riffle splitter, dump the pan in a horizontal twisting motion into the top of the riffle splitter, allowing the material to slowly slide into the catch pans under the riffle splitter. If there is a hopper pull the lever and allow the material to slowly slide into the catch pans under the riffle splitter.
- c. Take one pan and place it in the original sample container. Place the two empty pans back under the riffle splitter. Take the pan with material still in it and dump the pan in a horizontal twisting motion into the top of the riffle splitter, allowing the material to slowly slide into the catch pans under the riffle splitter. If there is a hopper pull the lever and allow the material to slowly slide into the catch pans under the riffle splitter.
- d. Repeat this procedure until the desired sample size is obtained for the various tests.

NOTE: To increase the accuracy of the splitting method ensure a representative sample for testing, “double split” the samples. This procedure involves quartering the original sample into four equal parts, then combining opposite quarters.

2. Hand quartering of samples weighing over 45 kg (100 lb).

- a. Mix and pile the sample onto a level quartering canvas. Shovel the material into the center to form a cone. Place each shovelful so that the material spills over the cone equally in all directions to mix the sample. Dampen samples (except samples for moisture) that tend to segregate before proceeding with the following steps.
- b. Flatten the cone with a shovel, spreading the material into a circular layer of uniform thickness.
- c. Insert a device that will aid in the lifting of the canvas such as a stick, pipe or other suitable device. Place the device beneath the canvas and under the center of the pile, and then lift both ends of the device, dividing the sample into two equal parts. Remove the device, leaving a fold of canvas between the divided portions.
- d. Insert the device under the center of the pile perpendicular to the first division and again lift both ends of the device, dividing the sample into four parts.

- e. Remove two diagonally opposite quarters, being careful to clean the fines from the canvas.
 - f. Remix the remaining material by taking alternate shovelfuls from each remaining quarter and placing it in the center so that a cone is formed as before. Repeat the quartering process until the sample is reduced to the desired size.
3. Hand quartering of samples weighing 11 kg to 45 kg (25 to 100 lb).
 - a. Pile the sample on the canvas and mix by alternately lifting each corner of the canvas and pulling it over the sample toward the diagonally opposite corner, causing the material to be rolled. Dampen materials that tend to segregate.
 - b. Flatten and quarter as specified above.
 4. Hand quartering of samples weighing less than 11 kg (25 lb).
 - a. Place the sample on a clean canvas, clean table, clean sheet of heavy paper or other suitable surface. Mix thoroughly with a trowel and form the material into a conical pile. Dampen materials that tend to segregate.
 - b. Flatten the cone by pressing it down with a trowel.
 - c. Separate into quarters with the trowel and remove diagonally opposite quarters.
 - d. Repeat the above process until the sample is reduced to the desired size.

After the required test samples have been removed, save the remainder of the sample for possible future tests.

PRECAUTIONS

1. Once a sample splitter is used for plantmix, it shall be used for plantmix exclusively.
2. Examination of splitters should be done periodically. If the pans are excessively dented and misshaped, replacement should be considered.
3. If the chutes on a riffle splitter are excessively deformed, replacement should be considered.
4. Splitting operations should be conducted outside. Hearing protection, eye protection, dust masks and gloves are provided and are highly recommended to be used during the splitting operation – it is your responsibility to use them and replace them when needed.

5. Proper lifting methods are important to be used when splitting samples – it is your responsibility to use them.

REPORT

Record the wet weight of the reduced material obtained from this test method on the appropriate NDOT form that is associated to that specific test.



Figure 1
Adjustable Riffle Splitter



Figure 2
Riffle Splitter



Figure 3
Mini Riffle Splitter