METHOD OF SAMPLING AND TESTING
MT 316-04
METHOD OF SAMPLING RECYCLED PAVEMENT AND FIELD CONTROL OF RECYCLE PAVING

1 General

1.1 This method is divided into four sections which are as follows:

1.2 Section A: Sampling pavement for Cold Recycling

1.3 Section B: Field Control of Cold Recycle Paving

1.4 Section C: Sampling Pavement for Hot Recycling

1.5 Section D: Field Control of Hot Recycle Paving

Each section of this method is to be used specifically for its respective purpose related to recycle paving.

SECTION A – SAMPLING PAVEMENT FOR COLD RECYCLING

2 Sampling Pavement for Cold Recycling

2.1 Scope

2.1.1 This section describes the procedure for sampling roadways for cold mix recycling. The first portion describes sampling procedures for design information to determine if recycling is possible. The second portion describes sampling procedures for mix design purposes.

3 Procedure

3.1 Preliminary Sampling for Proposed Recycled Pavement

3.1.1 The project should be divided into at least three areas from which milled or cored samples are obtained. A minimum of three representative sample locations should be visually selected in each area. Samples weighing approximately sixty pounds and representative of the lifts to be recycled should be obtained from each location. If maintenance patches or other intermittent treatments occur within the area, the locations that samples were taken should be recorded and the samples properly labeled. The proposed depth for recycling the pavement should be recorded.

3.1.2 Sampling a Cold Recycled Pavement for Mix Design: Milled Sampling

3.1.2.1 The project should be divided into at least three areas from which samples are obtained. A minimum of three locations should be used for each area of sampling. Submit approximately one hundred pounds of milled plant mix from each location. Three core samples should be taken to correspond with each milled area. The core samples should be placed into sealed containers at the job site so that in-place moisture contents may be determined.

3.1.3 Submitting Samples

3.1.3.1 Samples from different locations are to be kept separate and submitted to the Materials Bureau for testing. Pertinent information such as locations at which samples were taken and depth to which milling was performed should be submitted with the samples.

SECTION B – FIELD CONTROL OF COLD RECYCLE PAVING

4 Field Control of Cold Recycle Paving

4.1 Scope

4.1.1 This section describes the procedure for field control of cold recycle paving. The test procedure utilizes standard 50 blow Marshall specimens. The Marshall specimens will be fabricated at the job site and then transported to the Materials bureau for compression testing.

4.1.2 Material should be secured from either the feed hopper of the laydown machine or the windrow, depending on the paving operation. Enough material (at least 25 lbs.) should be obtained for both the molding of briquettes and moisture determination.

5 Procedure

5.1 Determination of Moisture Content

5.1.1 For moisture determination, a representative sample of 2000 grams shall be weighed and placed in a 140°F oven.

5.1.2 The sample shall be weighed at intervals with weight losses recorded until a stabilized condition is achieved. A moisture loss of less than 1.0 gram in one hour should be considered a stabilized condition. Moisture content may be determined by:

$$Moisture\ Content\ (\%) = \frac{WT(Initial) - WT(Final)}{WT(Final)} \times 100\%$$

5.2 Briquette Fabrication

5.2.1 Apparatus

5.2.1.1 Scoops

5.2.1.2 Thermometer - capable of measuring - 50° to 150°F, complying with AASHTO M 339.

5.2.1.3 Balance – 2 kg. Capacity for weighing batch samples and briquettes

5.2.1.4 Mixing spoons

5.2.1.5 Spatulas

5.2.1.6 Standard Marshall compaction pedestal – with molds and compaction hammer

5.2.1.7 Extrusion jack

5.2.1.8 Gloves and marking crayons

5.2.1.9 Pans for holding and warming specimens

5.2.1.10 Oven – capable of maintaining 140°F ±5°F

6 Preparation of Test Specimens

6.1 Prepare three specimens for each test.

6.2 Thoroughly clean molds and hammer face. Place paper disk in bottom of molds. Warm molds and hammer to remove chill.

6.3 Weigh out individual briquette samples. It is recommended that a trial briquette, approximately 1140 grams, be molded initially to determine height. Weight of material should then be adjusted to produce 2-1/2" ±0.05" specimens.

6.4 Warm individual specimens in 140°F oven for two hours. Note: This process has been found to develop a density of mix equal to the roller compaction on the roadway.

6.5 Mold briquettes using standard Marshall procedures (i.e., 50 blows applied to each face).

6.6 Curing specimens in molds for up to 24 hours before extruding may be necessary if distortion occurs at an earlier extrusion time. Molds should be placed on their sides to permit equal ventilation of both ends (remove paper disks).

6.7 Carefully extrude specimens from molds.

6.8 If, when extruded, briquettes are sufficiently strong to enable handling, proceed to weigh in air, weigh in water and weigh saturated surface dry.

6.9 If, when extruded, briquettes are too tender to handle, curing will be required until they can be handled. The bulk specific gravities may then be determined.

Bulk specific gravity is calculated as follows:

$$BulkSpecificGravity\ (BSG) = \frac{WTinAir}{WT(SSD) - WTinWater}$$

6.9 Once bulk specific gravities have been determined, carefully transport the specimens to the Materials Lab for compression testing.

6.10 Report the specific gravities that were measured and the location represented by the samples. The samples must be protectively wrapped for shipping and they must be numbered sequentially to maintain control of their origin and history.

7 Utilization of Final Record Samples

7.1 The final record pavement core samples taken in accordance with MT 602 are designated for research. As soon as possible, these should be sent to the Materials Bureau,. The location and sample number are to be entered AASHTOWare and the wrapped cores are to be sequentially numbered.

SECTION C – SAMPLING PAVEMENT FOR HOT RECYCLING

8 Sampling Pavement for Hot Mix recycling

8.1 Scope

8.1.2 This section describes the procedure for sampling roadways for hot mix recycling. The first portion describes sampling procedures for design information to determine if recycling is possible. The second portion describes sampling procedures for mix design purposes.

9 Procedure

9.1 Preliminary Sampling for Proposed Recycled Pavement:

9.1.2 The project should be divided into at least three areas from which milled or cored samples are obtained. A minimum of three representative sample locations should be visually selected in each area. Samples weighing approximately sixty pounds and representative of the lifts to be recycled should be obtained from each location. If maintenance patches or other intermittent treatments occur within the area, the locations that samples were taken from should be recorded and the samples properly labeled. The proposed depth for recycling the pavement should be recorded.

To complete assessment of a potentially recyclable pavement, submit information about sources of aggregate used on the original project. In addition, send a minimum of 350 pounds of material to the Materials Bureau from a source which may be used as a virgin aggregate in the recycle mix.

10 Sampling a Hot Recycled Pavement for Mix Design

10.1 Milled Sampling:

10.1.1 The project should be divided into at least three areas from which samples are obtained. A minimum of three locations should be used for each area of sampling. Submit approximately one hundred pounds of milled plant mix from each location. Three core samples should be taken to correspond with each milled area.

11 Stockpile Sampling

11.1 Stockpiles of crushed reclaimed plant mix shall be sampled in accordance with MT 201, paragraph 10.

Note – Stockpile sampling requires particular care to avoid segregation. Samples should be taken from a near vertical face and should be secured by reducing the sample to 300-pounds by the quartering method or with a sample splitter. Due to the time required t extract and analyze the reclaimed plant mix, samples should be submitted as soon as one-third of the reclaimed mat stockpile has been produced.

11.2 To complete the mix design, 350 pounds of aggregate from the stockpiles of virgin aggregate, along with the appropriate forms, are required. The samples and documentation may be submitted when, in the judgment of the Project Manager, they are representative of the material to be incorporated into the recycled plant mix.

SECTION D – FIELD CONTROL OF HOT RECYCLE PAVING

12 Field Control of Hot Recycle Paving

12.1 Scope

12.1.2 This section describes the procedure for field control of hot recycle paving.

13 Procedure

13.1 The crushed reclaimed material shall be sampled in accordance with MT 201, paragraph 11: “Production sample shall be taken not less than every four hours. The sample shall be sieved and the percentage of oversize recorded. One sample of approximately 15 pounds shall be taken and submitted to the Materials Bureau every three days.”

13.2 The aggregate incorporated into the mix shall be subject to all of the controls of a normal plant mix operation. The output of the plant will be subjected t field control Marshall testing with the same frequency as a conventional mix.

13.3 Monitors of established production of recycled plant mix shall be taken the first three days and the first day of every week thereafter or until otherwise informed by the Materials Bureau.

13.4 The samples shall be placed in a new double paper bag. The bag should be securely tied and marked as to sample number, stationing, lane and lift. This same information shall be placed on each Daily Plant Mix Report. Several of these paper bags can be packed into a sample sack for transmittal to the laboratory. Care should be taken to see that no movement is possible, or broken bags and mixed samples will result.

14 Utilization of Final Record Samples

14.1 The final record pavement core samples taken in accordance with MT 602 are designated for research. As soon as possible, these should be sent to the Materials Bureau, accompanied The location and sample number are to be entered in AASHTOWare and the wrapped cores are to be sequentially numbered.

PAGE INTENTIONALLY LEFT BLANK