



**INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS**

**SAMPLING HMA
ITM No. 580-18**

1.0 SCOPE.

- 1.1 This method covers the procedures for sampling HMA from the pavement by a plate or core, or from a truck. The random quantity or location of the sample shall be determined in accordance with ITM 802. Samples obtained for moisture content determination shall be immediately placed in an oven bag and sealed.
- 1.2 This procedure may involve hazardous materials, operations and equipment and may not address all of the safety problems associated with the use of the test method. The user of the ITM is responsible for establishing appropriate safety and health practices and determining the applicability of regulatory limitations prior to use.

2.0 REFERENCES.

2.1 ITM Standards.

- 802 Random Sampling
- 587 Reducing HMA Samples to Testing Size

3.0 TERMINOLOGY. Definitions for terms and abbreviations shall be in accordance with the Department's Standard Specifications, Section 101.

4.0 SIGNIFICANCE AND USE. This ITM is used to obtain HMA samples for testing purposes.

5.0 APPARATUS.

- 5.1 Sampling plate with a hole of approximately 3/8 in. diameter. The plate shall be square and have a minimum size of 8 in. The corners of the plates may be rounded (maximum radius of 1 in.) to accommodate placement of the mixture into a container. The plate can be made nonstick by the application of PAM® Original cooking spray or an approved anti-adhesive material that is diluted and used per the manufacturer's recommendations. The anti-adhesive material shall not contain any solvents or petroleum-based products that could affect asphalt binder properties.
- 5.2 No. 18 mechanics wire or equivalent

- 5.3** Masonry nail or equivalent
- 5.4** Round mold. The mold shall have a height greater than the mixture thickness. The diameter of the mold may vary; however, the mold diameter shall be less than the width of the plate. The mold will be approved by the Engineer.
- 5.5** Pitchfork
- 5.6** Square Bit Shovel, appropriate size to obtain the required sample
- 5.7** Sample container for truck sampled material. A non-absorbent cardboard or paperboard for plate sampled material. Both containers shall be of sufficient stiffness to support the sample and allow safe handling of the material
- 5.8** Oven bag
- 5.9** Coring device capable of obtaining a 6.00 ± 0.25 in. core
- 5.10** Plastic cylinder mold container, with lid, to allow safe transport of the core samples
- 6.0 SAMPLING.** When samples from the pavement are used for acceptance of the HMA, the Department will determine the test site in accordance with ITM 802. The Contractor shall obtain the sample in the presence of the Engineer and shall supply all of the necessary equipment to obtain the sample.

7.0 SAMPLE SIZE.

7.1 Plate Samples.

7.1.1 The minimum size of sample for the plate sample shall be as follows.

Size of Sample				
Mixture Designation	Minimum Weight of Sample, g			
	Moisture	MSG and Binder Content	Gyratory Specimens	Aggregate Bulk Specific Gravity
4.75 mm	1,000	3,000	11,000	N/A
9.5 mm	1,500	11,000	11,000	11,000
12.5 mm	2,000	11,000	11,000	11,000
19.0 mm	3,000	11,000	11,000	11,000
25.0 mm	4,000	11,000	11,000	11,000
OG 19.0 mm	3,000	5,500	11,000	N/A
OG 25.0 mm	4,000	7,000	11,000	N/A

The following table may be used to estimate the approximate yield of sample material from a plate sample for varying plate sizes and lift thicknesses for all mixtures except the 4.75 mm mixture:

Approximate Sample Yield for Various Lift Thicknesses and Plate Sizes								
Lift Thickness	Lay Rate	Plate Size, Inches						
Inches	lb/yd²	8	9	10	11	12	14	16
		Sample Weight (g)						
1.25	137.5	3100	3900	4800	5900	7000	9500	12400
1.5	165	3700	4700	5800	7000	8400	11400	14900
1.75	192.5	4300	5500	6800	8200	9800	13300	17300
2.0	220	5000	6300	7700	9400	11100	15200	19800
2.25	247.5	5600	7100	8700	10500	12500	17100	22300
2.5	275	6200	7800	9700	11700	13900	19000	24800
2.75	302.5	6800	8600	10600	12900	15300	20900	27300
3.0	330	7400	9400	11600	14100	16700	22800	29700
3.25	357.5	8100	10200	12600	15200	18100	24700	32200
3.5	385	8700	11000	13500	16400	19500	26600	34700
3.75	412.5	9300	11800	14500	17600	20900	28500	37200
4.0	440	9900	12500	15500	18700	22300	30300	39600
4.25	467.5	10500	13300	16400	19800	23600	32100	41900
4.5	495	11100	14000	17300	21000	25000	34000	44400
4.75	522.5	11700	14800	18300	22100	26400	35900	46900
5.0	550	12300	15600	19300	23300	27700	37800	49300
5.25	577.5	12900	16400	20200	24500	29100	39700	51800
5.5	605	13600	17200	21200	25600	30500	41500	54300
5.75	632.5	14200	17900	22200	26800	31900	43400	56700
6.0	660	14800	18700	23100	28000	33300	45300	59200

The following table may be used to estimate the approximate yield of sample material from a plate sample for varying mold sizes and lift thicknesses for all mixtures except the 4.75 mm mixture:

Approximate Sample Yield for Various Lift Thicknesses and Mold Sizes						
Lift Thickness	Lay Rate	Mold Size, Inches				
Inches	lb/yd²	8	10	12	14	16
		Sample Weight (g)				
1.25	137.5	2400	3800	5400	7400	9700
1.5	165	2900	4500	6500	8900	11600
1.75	192.5	3400	5300	7600	10400	13600
2.0	220	3900	6100	8700	11900	15500
2.25	247.5	4400	6800	9800	13300	17400
2.5	275	4800	7600	10900	14800	19400
2.75	302.5	5300	8300	12000	16300	21300
3.0	330	5800	9100	13100	17800	23200
3.25	357.5	6300	9800	14200	19300	25200
3.5	385	6800	10600	15300	20800	27100
3.75	412.5	7300	11300	16300	22200	29100
4.0	440	7700	12100	17400	23700	31000
4.25	467.5	8200	12900	18500	25200	32900
4.5	495	8700	13600	19600	26700	34900
4.75	522.5	9200	14400	20700	28200	36800
5.0	550	9700	15100	21800	29700	38700
5.25	577.5	10200	15900	22900	31100	40700
5.5	605	10700	16600	24000	32600	42600
5.75	632.5	11100	17400	25100	34100	44500
6.0	660	11600	18200	26100	35600	46500

The following table may be used to estimate the approximate yield of sample material from a plate sample for varying plate sizes and lift thicknesses for the 4.75 mm mixture:

Approximate Sample Yield for Various Lift Thicknesses and Plate Sizes							
Lift Thickness	Lay Rate	Plate Size, Inches					
Inches	lb/yd²	18	20	22	24	26	28
		Sample Weight (g) *					
0.5	55	6200	7700	9300	11000	13000	15000
0.625	69	7800	9600	11600	13900	16300	18900
0.75	82.5	9300	11500	13900	16600	19500	22600
0.875	96	10800	13400	16200	19300	22700	26300
1	110	12400	15400	18600	22100	26000	30100
1.125	124	14000	17300	21000	24000	29000	34000

*Sample weights were obtained by including a plate thickness of 1/8 in.

7.1.2 Two plate sample boxes representing the 4.75 mm mixture shall be combined in the laboratory and reduced to testing size in accordance with ITM 587. The sample shall be reduced in accordance with ITM 587 section 7.0 for the gyratory specimens. The remaining sample shall be reduced in accordance with ITM 587 section 5.0 for the moisture, MSG, and binder content samples.

7.2 Truck Samples. The size of sample for the truck sample shall meet the minimum sample size requirement for the appropriate test method.

7.3 Cores. The number of cores taken from the pavement shall result in sufficient weight (mass) to meet the minimum weight requirement for the appropriate test method. A 6 in. diameter core has a weight of approximately 1100 g/in.

8.0 PROCEDURE.

8.1 Plate Samples without a Mold

8.1.1 Place the plate with wire attached at the designated location. If conditions on the project cause the plate to slip, drive a nail into the pavement and place the plate hole onto the nail.

8.1.2 Extend the wire tightly beyond the edge of the paving width. The wire shall not pass under a grade leveler attached to the paver. Trucks, pavers, and/or Material Transfer Devices shall be allowed to cross the plate and wire. If a windrow elevator is used, the paving operation shall

be stopped so that the plate may be placed at the designated location between the windrow elevator and the paver.

- 8.1.3** After the mixture is placed, locate the plate by use of the wire
- 8.1.4** Raise the plate slightly for insertion of a pitchfork or a shovel that is narrower than the plate
- 8.1.5** Lift the plate and sample, and place the entire sample into the sample container. Material remaining on the plate shall be removed and placed into the sample container.
- 8.1.6** Immediately refill the sample hole with HMA

8.2 Plate Samples with a Mold

- 8.2.1** Place the plate with wire in accordance with 8.1.1 to 8.1.3.
- 8.2.2** Push a clean mold, by means of a circular motion, down into the mixture directly over the plate. The mold shall not be pushed from side to side.
- 8.2.3** Raise the mold and plate together, and insert a pitchfork, or a shovel that is narrower than the plate
- 8.2.4** Lift the mold and plate, being careful to keep the two components tightly together
- 8.2.5** Discard any excess material on top of the plate that is outside of the mold by scraping the material from the plate
- 8.2.6** Place the sample inside of the mold into the sample container. Material remaining on the plate shall be removed and placed into the sample container.
- 8.2.7** Immediately refill the sample hole with HMA

8.3 Cores.

- 8.3.1** Using a coring device, cut a uniform 6 in diameter pavement sample
- 8.3.2** Remove the core from the pavement with a device that shall not damage the layer to be tested
- 8.3.3** Mark the mixture layer that is to be tested with a lumber crayon or permanent marker

8.3.4 The core hole shall be cleaned, dried and refilled with HMA of similar or smaller size particles within one work day of the coring operations.

8.4 Truck Samples, HMA 4.75 mm Mixtures.

8.4.1 Visually observe the mixture in the truck for determination of uniformity

8.4.2 Insert a shovel into various areas that appear uniform in texture, and place the mixture into the sample container.

8.5 Truck Samples, Open Graded HMA Mixture. Insert a shovel into the mixture between the center of the cone and the front of the truck to obtain one sample. Obtain another sample with the shovel from the mixture between the center of the truck and the back of the truck.

8.6 Truck Samples, Dense Graded HMA Mixture.

8.6.1 Insert a shovel horizontally into the mixture at the approximate mid section of the truck

8.6.2 Lift the shovel vertically to establish a horizontal plane in the mixture

8.6.3 Insert the shovel vertically to establish a vertical face below the horizontal plane

8.6.4 Insert the shovel horizontally into the vertical face at a depth of approximately twice the thickness of the maximum particle size of the material

8.6.5 Lift the shovel vertically to obtain the sample, and place the sample into the sample container

9.0 DOCUMENTATION. After the sample has been obtained, the sample location will be recorded. If the sample is obtained by the Contractor for the Department's acceptance testing, the Contractor representative who obtained the sample and the Department representative who witnessed the sample being taken will be identified on the transmittal information. The following information shall be on all box ends for plate samples and core cylinder containers:

1. A/B sample (A1, A2, A3, B1, B2, Core 1, Core 2)
2. Contract Number
3. DMF/JMF Number
4. Item (CLN) Number
5. Lot/Sublot
6. Material Description: Size, Course, ESAL Category, PG Grade
7. Sample Date
8. SiteManager ID Number