



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

**DETERMINING THE POTENTIAL OF WATER  
STRIPPING IN HMA PAVEMENTS  
ITM No. 573-21**

**1.0 SCOPE.**

- 1.1** This test method helps to determine the presence or likeliness of water stripping issues within the HMA pavement section by analyzing cores.
- 1.2** This ITM 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 AASHTO Standards.**

- R 35 Superpave Volumetric Design for Hot Mix Asphalt  
T 166 Bulk Specific Gravity of Compacted Hot Mix Asphalt Using Saturated Surface-Dry Specimens  
T 209 Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt Paving Mixtures

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

- 3.1 Preservation Treatment.** Treatments used to improve the surface of the roadway and/or extend the service life of the pavement. Treatments can include 4.75 mm HMA overlay, Ultra-thin Bonded Wearing Course (UBWC), Microsurface and Chip Seal/Seal Coat.

**4.0 SIGNIFICANCE AND USE.** This ITM is used to determine the possibility of water stripping issues within any layer of the pavement section through core analysis. Any candidates found with high water stripping potential will be reevaluated for an alternative treatment.

**5.0 APPARATUS.**

- 5.1** Coring machine capable of obtaining  $6 \pm 0.25$  in. diameter cores.
- 5.2** Wet saw capable of cleanly and evenly cutting cores into separate layers

## **6.0 SAMPLING.**

- 6.1** Cores shall be taken at locations as determined by the Engineer. Generally, cores shall be taken in the wheel path of the driving lane only.
- 6.2** All cores shall be taken in the right or left wheel path.
- 6.3** Cores shall be taken at a minimum of 1 core per mile. For roadway sections less than 3 miles, a minimum of 3 cores shall be taken.
- 6.4** All cores shall be 6 in. in diameter.
- 6.5** The entire HMA portion of the core shall be retrieved, to include a portion of whatever is below the HMA (concrete, stone, dirt).
- 6.6** If a core is damaged during the coring operation or removal process, another core shall be taken by adding one foot longitudinally to the core location.
- 6.7** If the coring operation indicates a layer has stripped or is damaged, ensure the location is recorded and it is documented with photos.
- 6.8** Proposed coring plans shall be reviewed by the District Pavement Asset Engineer prior to coring operations.

## **7.0 CORE LABELING AND PHOTOS.**

- 7.1** Latitude and longitude of each core location shall be documented.
- 7.2** Photos shall be taken of the roadway approaching each core location.
- 7.3** Photos shall be taken of each pavement core. An example is shown in Figure 1.
- 7.4** The photos shall be clear and not taken at an angle.
- 7.5** Core photos shall include a label and a measuring tape for reference.
- 7.6** Labels shall include, but are not limited to:
  - Roadway Name
  - Direction (NB, SB, EB, WB)
  - Date
  - RP #
  - Core #
  - Location taken (Left Wheel Path, Right Wheel Path, Distressed Area)



Figure 1: Example of an acceptable core photo

## 8.0 PROCEDURE.

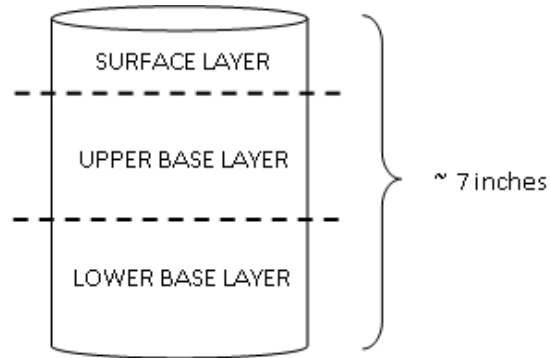
8.1 Testing shall be completed on the top 7 in. of all cores.

8.1.1 For HMA sections less than 7 in., consult with the District Pavement Asset Engineer for recommended core sectioning.

8.1.2 For HMA sections that are greater than 7 in., but less than or equal to 8 in., consult with the District Pavement Asset Engineer for recommend core sectioning.

8.2 Cut the core into 3 sections: surface layer (last paved complete lift), and two equal base layers. The base layers do not necessarily correspond to paving lifts. For example, if the top 1.5 in. is 9.5 mm surface, the remaining 5.5 in. is cut into two equal 2.75 in. layers.

If the pavement has a surface preservation treatment, include the preservation treatment as part of the surface layer with the underlying HMA surface course.



**8.2.1** Take a photo of the “top face” of each core section.



Figure 2: Example photo of "top face"

**8.3** Complete the following tests on each layer.

**8.3.1** Determine the bulk specific gravity and calculate the % absorption in accordance with AASHTO T 166.

**Note 1** - If the percent water absorbed exceeds 2.0 percent, it is not necessary to refer to AASHTO T 331 unless directed by the District.

**8.3.2** Determine the maximum specific gravity, mass determined in water, in accordance with AASHTO T 209, except minimum sample size shall not apply.

**Note 2** – It is not necessary to use the supplemental procedure for mixtures containing porous aggregate, unless directed by the District.

**8.3.3** Calculate % Air Voids in accordance with AASHTO R 35

**9.0 DATA COLLECTION AND REPORT.**

- 9.1** All location data, photographs, core and section measurements, and test results shall be summarized in a core report. All data shall be appropriately uploaded to the Department's ArcGIS database using the Collector Pavement Coring Application. Data uploaded within the application shall be in accordance with the requirements of the core Collector guidance document.
- 9.2** All data will be analyzed by the District Pavement Asset Engineer to determine the potential for water stripping.

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