STATE OF CALIFORNIA—BUSINESS AND TRANSPORTATION AGENCY

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METHOD OF TEST FOR THE MICRO-RECOVERY OF ASPHALT FROM BITUMINOUS CORE SLICES AND SMALL SAMPLES OF LOOSE ASPHALT-AGGREGATE MIXTURES

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read "**SAFETY AND HEALTH**" in Section G of this method. It is the responsibility of whoever uses this method to consult and use appropriate safety and health practices and determine the applicability of regulatory limitations before any testing is performed. Users of this method do so at their own risk.

A. SCOPE

A rapid procedure using a solvent to recover the asphalt from bituminous core slices and small samples of loose asphalt-aggregate mixtures is described in this test method.

B. APPARATUS

1. Glass Plates, of window glass, 101.6 mm x 127 mm, free of scratches.

2. Flasks, Erlenmeyer design, 250 mL capacity, of red low actinic glass.

3. Tube, pear shaped 100-mL capacity oil tubes.

4. Centrifuge (Figure 1), electric oil testing, International Model H, as designated in ASTM D-96 with four place heads with trunnion rings and aluminum cups.

5. Evaporation Box (Figure 2), of metal with inlet tube entering on one end near bottom and outlet tube exiting near top on opposite end. It should be approximately 254 mm x 127 mm and 152 mm deep with a lid that is air tight when closed. It should contain a rack for holding the 101.6 mm x 127 mm glass plates in a vertical position baffling the flow of the nitrogen.

6. Flow meter, capable of measuring a flow of 1,500 mL and 3,000 mL of nitrogen per minute.

7. Balance, at least 200-g, capacity accurate to 1-g.

8. Nitrogen bottle with pressure gauges.

9. Hammer or other battering instruments.

C. MATERIALS

1. Razor blade, single edge type.

2. Solvent, trichloroethylene (Reagent grade or double distilled).

3. Cork stoppers for 250 mL Erlenmeyer flask and 100-mL pear-shaped tubes.

4. Hardwood applicators for spreading solution on evaporation plates.

D. PREPARATION OF SAMPLE

1. Prepare the bituminous core slices or loose asphalt-aggregate mix sample in the following manner before placing in 250 mL (red low actinic glass) Erlenmeyer flasks.

   a. If the sample is a bituminous core, saw or break the core into slices as desired to properly evaluate the core. (For a 101.6 mm core, the minimum thickness of a sawed slice should be approximately 6.4 mm to ensure enough material. The saw will waste approximately 2.2 mm between slices.) Use a hammer to break the slices into small pieces.

Weigh approximately 60 g (see note) of each slice into a 250 mL (red low actinic glass) Erlenmeyer flask and stopper the flask.

b. If the sample is a loose asphalt-aggregate mixture, weigh approximately 60 g (see note) of the sample into a 250 mL (red low actinic glass) Erlenmeyer flask and stopper the flask.

NOTE: If the asphalt-aggregate mixtures have an asphalt content of approximately 5 % to 6 %, the 60-g will provide a sufficient amount of recovered asphalt. Adjust the amount of sample used if the asphalt content varies substantially from the 5 % to 6 %.

2. Pour 30 mL of solvent into the 250-mL Erlenmeyer flask and let the content soak for one hour. Agitate the flask approximately six times during the soaking period.

3. Decant the solvent-asphalt solution into a pear-shaped 100-mL tube and centrifuge for 20 minutes at about 400 g. The decanted solution will contain approximately 2.5-g of asphalt. (There is some holdup of asphalt in the flask.)

4. Purge the evaporation box with 3,000 mL nitrogen per minute.

5. Pour a spot, about 50 mm in diameter, of the solvent-asphalt solution on a clean 101.6 mm x 127 mm glass evaporation plate (see Figure 3). Spread the solution evenly on the plate with a hardwood applicator (see Figure 4); let set for 15 seconds; then place the plate immediately in the nitrogen evaporation box.

6. Continue with the nitrogen flow at 3,000 mL/min for 10 minutes after the evaporation box is loaded, then reduce the flow to 1,500 mL/min for an additional 1 hour and 50 minutes.

7. Remove the plates from the evaporation box as they are used, and with a razor blade scrape all of the asphalt from all of the evaporation plates used for a sample (see Figure 5). Divide the asphalt for testing (see Figure 6). (Three evaporation plates per sample will usually provide a sufficient amount of asphalt for micro-viscosity and micro-ductility testing.)

E. TESTING AND REPORTING

1. Use the recovered asphalt to prepare test specimens within 30 minutes after removal from the evaporation plates.

2. Report the results of tests performed on the recovered asphalt as values representative of the asphalt in the parent asphalt-aggregate mix.

F. PRECAUTIONS

1. Care should be taken that the solution be exposed to the air on the evaporation plates for exactly 15 seconds prior to placement in the evaporation box so that all plates will have the same film thickness and the effect of the drying in air will be the same.

2. All operations should be performed in subdued light as much as possible.

G. SAFETY AND HEALTH

Directions for the use of the solvent should be carefully observed; i.e., do not breathe fumes or have repeated body contact. Work in hood or properly ventilated areas. Note warnings and instructions on label.

Prior to handling, testing or disposing of any waste materials, Caltrans testers are required to read: Part A (Section 5.0), Part B (Sections: 5.0, 6.0 and 10.0) and Part C (Section 1.0) of Caltrans Laboratory Safety Manual. Users of this method do so at their own risk.

REFERENCE:
ASTM D-96

End of Text (California Test 365 contains 5 Pages)

FIGURE 1
APPARATUS FOR MICRORECOVERY OF ASPHALT MIXES

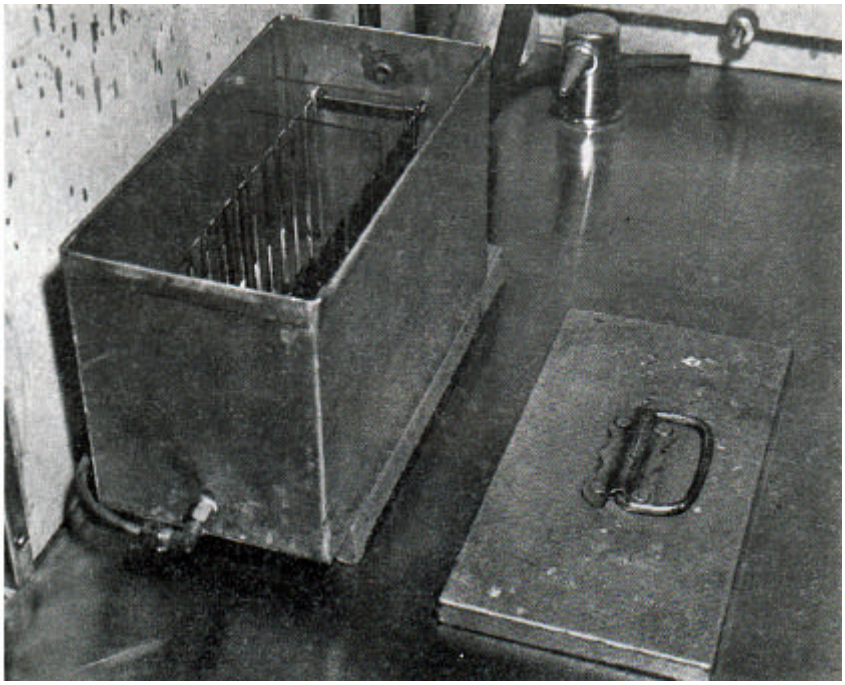

FIGURE 2
EVAPORATION BOX WITH EVAPORATION PLATES

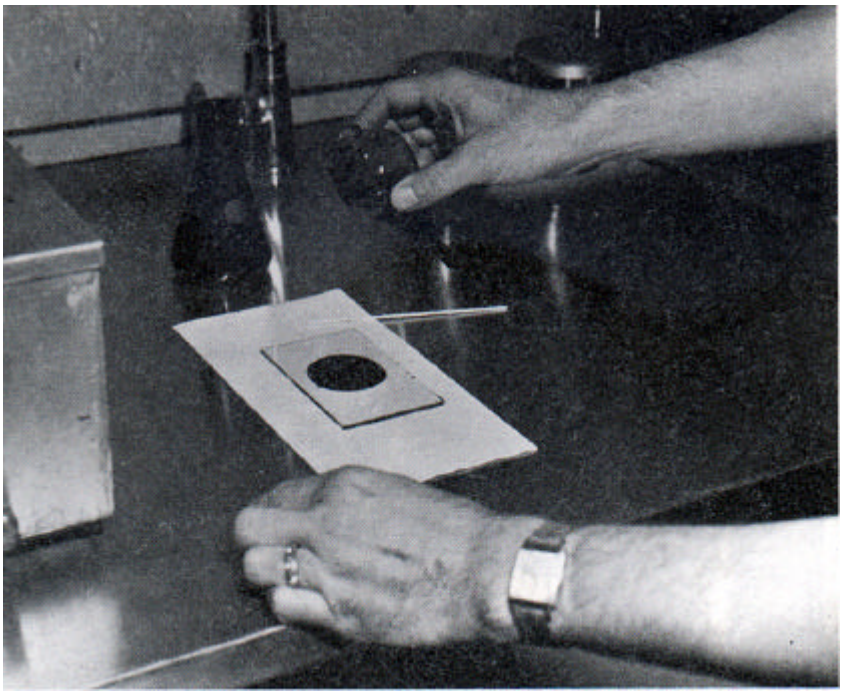

FIGURE 3
50 MM DROP OF ASPHALT-SOLVENT SOLUTION
ON EVAPORATION PLATE

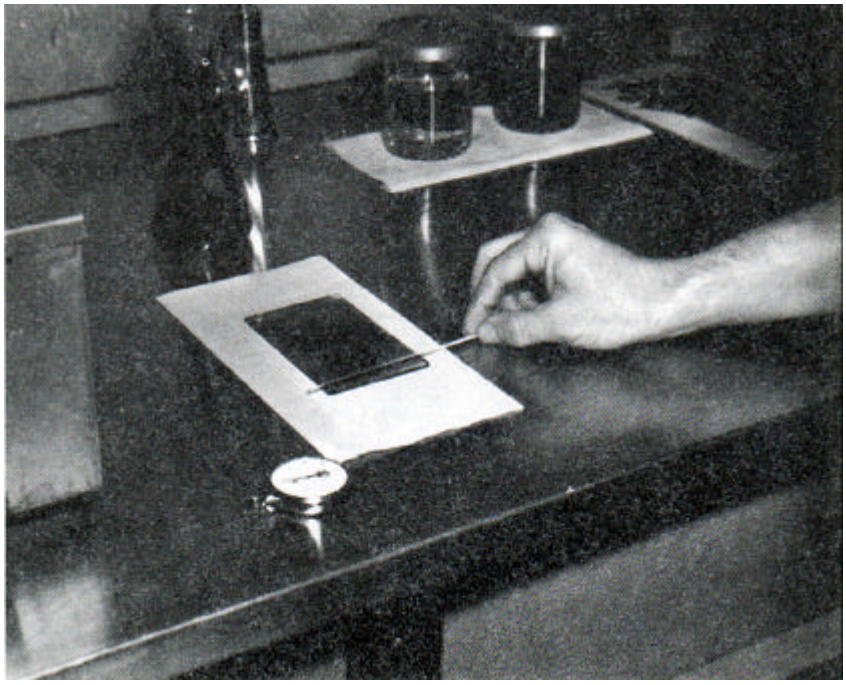

FIGURE 4
SPREADING SOLUTION ON EVAPORATION PLATE

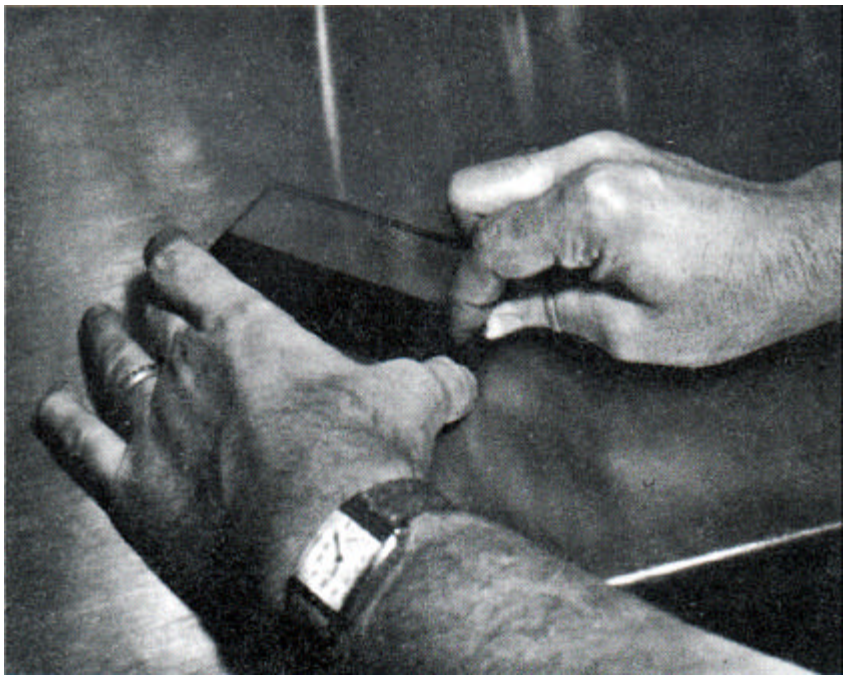

FIGURE 5
SCRAPING RECOVERED ASPHALT FROM EVAPORATION PLATE

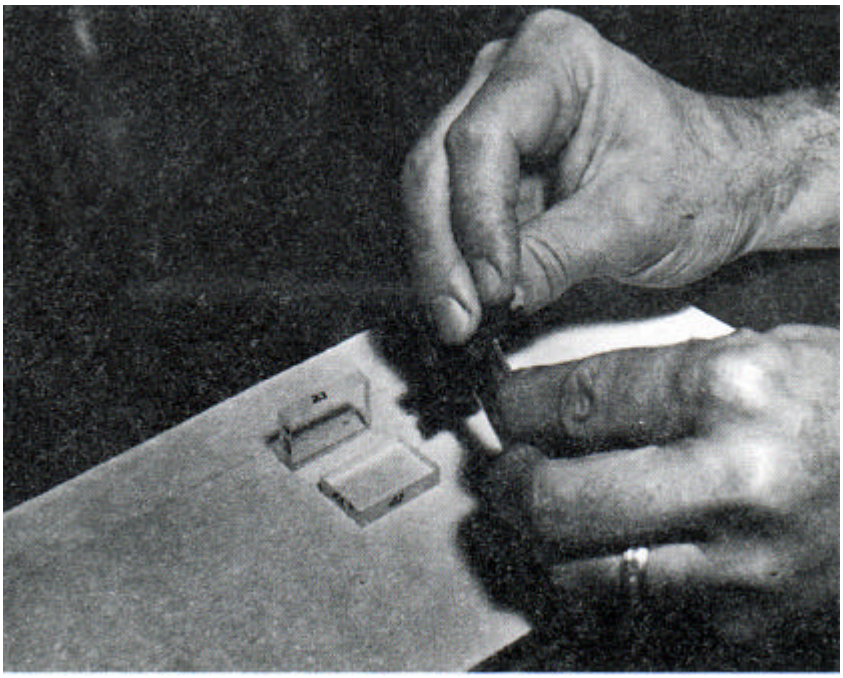

FIGURE 6
REMOVING RECOVERED ASPHALT FOR TESTING