State of Nevada
Department of Transportation
Materials and Testing Division

METHOD OF TEST FOR BULK SPECIFIC GRAVITY AND DENSITY OF COMPACTED BITUMINOUS MIXTURES (FIELD METHOD)

SCOPE

This method, which is a modification of AASHTO designation T166, covers a rapid determination of bulk specific gravity and density of specimens of compacted bituminous mixtures. It can be used for fabricated specimens (Marshall) and drilled cores obtained at the field level of testing.

A. APPARATUS

1. Balance - equipped with suitable suspension rod and holder to permit weighing of the specimen while suspended from the center of the balance pan into a water container. Sensitive to 1 gram, 2000 gram capacity minimum.

2. Water container - for immersing the specimen in water while suspended under the balance. A 20-inch diameter water tight (plastic) garbage can approximately 24-inches high is recommended.

3. Thermometer - for monitoring water and specimen temperatures; accurate to 1° F.

4. Oven - gas or electric temperature controlled or microwave.

5. Bench or table to support balance over water container.

B. TEST SPECIMENS

1. Test specimens may be either laboratory - molded bituminous mixtures or drilled cores from bituminous pavements.

2. Size of specimens - it is recommended, (1) that the diameter of molded or cored specimens, or the length of the sides of sawed specimens be at least equal to four times the maximum size of the aggregate; and (2) that the thickness of specimens be at least one and one-half times the maximum size of the aggregate.

3. Pavement specimens shall be taken from pavements with core drill with care being taken to avoid distortion. bending, or cracking of specimens during and after removal from the pavement.

4. Specimens shall be free from foreign materials such as tack coat, seal coat, soil, etc.

5. Specimens may be separated from other pavement layers by sawing, chiseling, or other suitable means.

C. PROCEDURE

1. Place the specimen in the sample basket, immerse in the water container for four minutes and record the immersed weight, (C). Both the water and specimen temperatures should be at 77° F. ± 5° F.

2. Remove the specimen from the water, surface dry by blotting with a towel and determine the surface-dry weight, (B).

3. Place the specimen in a large flat bottom drying pan (conventional oven) or on a paper plate (microwave oven). For microwave oven use refer to test method Nev. T306A. Place in oven until it can easily be separated to the point where the particles of the fine aggregate-asphalt portion are not larger than 1/4". Do not exceed 230° F. Dry to a constant dry weight with the temperature not to exceed 140 F. When a constant dry weight is obtained, allow the sample to cool to room temerature (77° F. ± 5° F.), weigh, and record the dry weight, (A).

D. CALCULATIONS

1. Calculate the Bulk Specific Gravity as follows:

$$\text{Bulk S.G.} = \frac{A}{B-C}$$

where A = weight in grams in air.

B = weight in grams, surface dry.

C = weight in grams in water.

Carry Bulk Specific Gravity to nearest .001

2. Density (PCF) = Bulk Specific Gravity x 62.4 pounds per cubic foot
Carry density to nearest 0.1 PCF

E. PRECAUTIONS

1. Mark the water level in the container and maintain that level within ± 1 inch for all weighings.

2. Check water temperature often.

3. Do not overheat or burn samples.

4. Cores or molded specimens must be at room temperature (77° F. ± 5° F.) for all weighings.