



## **WSDOT Test Method T 810**

### **Method of Test for Determination of the Density of Portland Cement Concrete Pavement Cores**

#### 1. Scope

- a. This method of test is intended for use in determining the density of Portland cement concrete pavement cores. The object of this test is to determine the in place density of the concrete as it exists. This density is the value desired for comparison to the density of freshly mixed portland cement as determined by AASHTO T 121 or by the densities on the mix design.

#### 2. Equipment

- a. Balance – Capacity sufficient for the masses required by the test procedure, accurate to 0.1 percent of the sample mass or better and conforms to the requirements of AASHTO M 231.
- b. Wire Basket – A wire basket of appropriate size, constructed of wire mesh.
- c. Container – A container suitable for immersing the wire basket in water, and an apparatus for suspending the wire basket from the center of the scale pan of the balance. Maintain a constant water level when weighing under water.
- d. Absorbent towels.
- e. Thermometer – The Thermometer shall be verified and readable to 1°F (0.5°C). Thermometers having a range of 0 to 120°F (-18 to 49°C) are satisfactory. Other thermometers of the required accuracy, including the metal immersion type and conforming to ASTM E 1, are acceptable.

#### 3. Procedure

- a. Density determinations are made as soon as practicable after coring and with a minimum change in moisture content from the condition as taken. Where on-site determination is not practicable within one hour, cores are stored in airtight plastic bags or completely immersed in water until weighed. Core densities shall be determined within 24 hours after coring.

| Temperature °F | Pounds Per Cubic Foot | Temperature °F | Pounds Per Cubic Foot |
|----------------|-----------------------|----------------|-----------------------|
| 65             | 62.336                | 74             | 62.269                |
| 66             | 62.329                | 75             | 62.261                |
| 67             | 62.322                | 76             | 62.252                |
| 68             | 62.315                | 77             | 62.243                |
| 69             | 62.308                | 78             | 62.234                |
| 70             | 62.301                | 79             | 62.225                |
| 71             | 62.293                | 80             | 62.216                |
| 72             | 62.285                |                |                       |
| 73             | 62.277                |                |                       |

**Unit Mass of Water  
Table 1**

- b. Wash thoroughly to remove dust or other coatings from the surface of the core. Place the sample in the wire basket and determine its mass in water. Determine this and all subsequent weights to the nearest gram. Determine the temperature of the water to the nearest degree.
- c. Remove the sample from the water and roll it in a large absorbent cloth until all visible films of water are removed, although the surfaces still appear to be damp. Take care to avoid evaporation from aggregate pores during the operation of surface drying. Obtain the weight of the sample in the surface dry condition.

#### 4. Calculation

- a. Calculate the density as follows:

$$\text{Density (surface – dry basis)} = \frac{A}{A - B} \times d_w$$

Where:

- A = Mass in grams of the surface-dry sample in air
- B = Mass in grams of the sample in water
- $d_w$  = Density of the water at the test temperature (see [Table 1](#))

Calculate the density to the nearest 0.1 lb per ft<sup>3</sup> (1 kg per m<sup>3</sup>).

#### 5. Reproducibility of Results

- a. Duplicate determinations should check to within 0.1 lb per ft<sup>3</sup> (3 kg per m<sup>3</sup>).

#### 6. Reports

- a. The test results will be reported on the appropriate test data sheet.

## Performance Exam Checklist

### *Method of Test for Determination of the Density of PCC Pavement Cores (WSDOT TM 810)*

Participant Name \_\_\_\_\_ Exam Date \_\_\_\_\_

#### **Procedure Element**

**Yes No**

1. The tester has a copy of the current procedure on hand?
2. All equipment is functioning according to the test procedure, and if required, has the current calibration/verification tags present?
3. Finished pavement cored after a minimum of 24 hours of curing?
4. Core's moisture content preserved in bags or by immersion?
5. Density determined within 24 hours of coring?
6. Core washed thoroughly?
7. Weight in water determined to nearest gram?
8. Temperature of water determined to nearest degree?
9. Core rolled on absorbent towel removing visible films of water but still appearing damp?
10. Core not over-dried or allowed to evaporate?
11. Weight of surface-dry core determined to nearest gram?
12. All calculations performed correctly?

First Attempt: Pass      Fail                      Second Attempt: Pass      Fail

Signature of Examiner \_\_\_\_\_

Comments:

