

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
MATERIALS CONTROL, SOILS AND TESTING DIVISION

MATERIALS PROCEDURE

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METHOD FOR APPROVING DEVICES USED FOR DENSITY AND/OR MOISTURE  
CONTENT ACCEPTANCE TESTING OF IN-PLACE MATERIAL

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**1. PURPOSE**

- 1.1. The WVDOH has a long history of using nuclear moisture/density gauges and is familiar with the test procedures, reliability, maintenance, and calibration procedures of such devices. In recent years, more devices have come to the market that are low or non-nuclear. This MP is in place to establish procedures to approve the use of any testing devices for Density and/or Moisture for in-place material on WVDOH projects.

**2. SCOPE**

- 2.1. This MP applies to moisture and density testing devices used for acceptance testing, as well as any time such devices might be used when quality control testing results are used for acceptance.

**3. REFERENCED DOCUMENTS**

- 3.1. AASHTO T 355 - Standard Method of Test for In-Place Density of Asphalt Mixtures by Nuclear Methods
- 3.2. AASHTO T 310 – Standard Method of Test for In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- 3.3. ASTM D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- 3.4. ASTM D8167/D8167M - Standard Test Method for In-Place Bulk Density of Asphalt Soil and Soil-Aggregate by a Low-Activity Nuclear Method (Shallow Depth)
- 3.5. ASTM D7830/D7830M - Standard Test Method for In-Place Density (Unit Weight) and Water Content of Soil Using an Electromagnetic Soil Density Gauge
- 3.6. MP 207.07.20 – Nuclear Field Density - Moisture Test for Random Material Having less than 40% of +3/4 Inch Material
- 3.7. MP 700.00.24 – Nuclear Density Test by the Roller Pass Method
- 3.8. MP 717.04.21 – Guide for Quality Control of Compaction

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**4. APPROVAL REQUIREMENTS OF DEVICES FOR TESTING OF DENSITY AND/OR MOISTURE OF IN-PLACE MATERIAL**

- 4.1. The testing device must conform to the requirements of the applicable specification, AASHTO Standard, ASTM Standard, and/or Materials Procedure, as prescribed in this section.
- 4.2. Devices used for in-place density testing of asphalt mixtures shall meet the requirements of Section 5 of AASHTO T 355.
- 4.3. Devices used for in-place density testing of soils and aggregates shall meet the requirements of Section 5 of AASHTO T 310 or Section 6 of ASTM D8167/8167M. In addition, when a device is used meeting the requirements of ASTM D8167/8167M, which employs an external moisture measurement device, initial moisture comparisons shall be made following ASTM D4959.

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**5. APPROVAL PROCESS**

- 5.1. For consideration to be added to the list of approved devices, submit the device information and manufacturer's documentation to [dohcompaction@wv.gov](mailto:dohcompaction@wv.gov).
- 5.2. The WVDOH will evaluate each brand/model of moisture/density testing device, as needed. Evaluations shall be based on the requirements listed in Section 4 and compared to the manufacturer's documentation. WVDOH reserves the right to reject or remove any device from the approval list
- 5.3. Devices meeting all the requirements of this MP will be evaluated first as a QC device. Upon satisfactory field performance as a QC device, it will be listed as a QA device. The brand and model can be found on the appropriate approved list on the MCS&T website.

**Michael  
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