

WEST VIRGINIA DEPARTMENT OF HIGHWAYS  
DIVISION OF HIGHWAYS  
MATERIALS CONTROL, SOIL AND TESTING DIVISION

MATERIALS PROCEDURE

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METHOD FOR ACCEPTANCE OF COMPACTION TESTING

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1.0 PURPOSE

1.1 To provide a procedure for the acceptance of compaction testing.

2.0 SCOPE

2.1 This procedure is applicable to all materials that require evaluation of compaction tests.

3.0 TESTING

3.1 The minimum frequency for acceptance testing shall be 10% of the contractor's individual tests. Five tests shall be performed in a lot for acceptance testing.

3.2 Acceptance testing shall be distributed throughout the placement of material.

3.3 The material should be categorized according to the base, subgrade, pipe backfill, embankment, etc.

4.0 EVALUATION

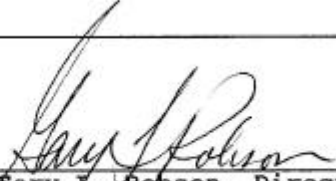
4.1 Calculations shall be rounded to the following significant digits according to AASHTO Method R-11.

|                    |      |
|--------------------|------|
| Average (X)        | 0.1% |
| Standard Deviation | 0.01 |
| Range              | 1%   |

4.2 Determine the number of lots tested by the contractor for a particular material since the last monitoring including the lot just tested. Record the percent relative densities on the attached form.

- 4.3 Calculate the standard deviation (S) for the percent relative densities.
- 4.4 Calculate the range (R) for plus and minus 1.65 standard deviations (S) from the average (X) for the contractor's tests ( $R = X \pm 1.65 S$ ).
- 4.5 Compare the acceptance tests to the calculated range.
  - 4.5.1 If all the acceptance tests are within the range, the testing is similar. When the testing is similar, the degree of compaction for the lots of material represented by the acceptance evaluation can be accepted.
  - 4.5.2 If any of the 5 acceptance tests are outside the range, calculate 3 standard deviations for the contractor's tests ( $R = X \pm 3 S$ ).
    - 4.5.2.1 If all acceptance tests are within the range, the testing is considered similar, however, the quality control practices by the contractor should be reviewed for possible problems.
    - 4.5.2.2 Any test outside the standard 3 deviation range indicates that there are probably problems with the quality control system and no additional material should be placed until the problem is resolved. The investigation would include checking such areas as equipment, test procedures, location of tests, variability of materials, compaction techniques, etc. The results of the investigation shall be documented in the project files.

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GLR:d

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ATTACHMENT 1

PROJECT NUMBER: \_\_\_\_\_

ITEM NUMBER (S): \_\_\_\_\_

TYPE OF MATERIAL: \_\_\_\_\_

DATE: \_\_\_\_\_

QUALITY CONTROL TESTS

| LOT NUMBER       |                |                                  |                       |                                            |
|------------------|----------------|----------------------------------|-----------------------|--------------------------------------------|
|                  | 1              |                                  |                       |                                            |
|                  | 2              |                                  |                       |                                            |
|                  | 3              |                                  |                       |                                            |
|                  | 4              |                                  |                       |                                            |
|                  | 5              |                                  |                       |                                            |
|                  | AVERAGE<br>(X) |                                  | STANDARD<br>DEVIATION |                                            |
|                  |                |                                  |                       |                                            |
| ACCEPTANCE TESTS |                |                                  |                       |                                            |
| TEST NUMBER      | 1              | $X + 1.65 (S) =$                 | YES<br>NO             | = UPPER LIMIT                              |
|                  | 2              | $X - 1.65 (S) =$                 |                       | = LOWER LIMIT                              |
|                  | 3              | WITHIN LIMITS                    |                       | (SIMILAR)<br>(DISSIMILAR)                  |
|                  | 4              |                                  |                       |                                            |
|                  | 5              |                                  |                       |                                            |
|                  |                | $X + + 3 (S) =$                  |                       | = UPPER LIMIT                              |
|                  |                | $X - - 3 (S) =$<br>WITHIN LIMITS | YES<br>NO             | = LOWER LIMIT<br>(SIMILAR)<br>(DISSIMILAR) |

EVALUATED BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_