

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

MATERIALS PROCEDURE

METHOD FOR ACCEPTANCE OF COMPACTION TESTING

1. PURPOSE

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

- 2.1 This procedure is applicable to all materials that require evaluation of compaction tests.
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3. 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.
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4. EVALUATION

- 4.1 Calculations shall be rounded to the following significant digits according to ASTM Method E29.

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 may 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 ($R = \bar{X} \pm 3 S$).
- 4.5.3 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.
- 4.5.4 Any test outside the standard 3 deviation range indicates that there may be problems with the quality control system and no additional material shall 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.

Michael Mance Digitally signed by Michael Mance
Date: 2025.01.02 18:06:19 -05'00'

Michael A Mance, PE
Director
Materials Control, Soils & Testing Division

MP 700.00.50 Steward – Laboratory Support Section
MM:W
ATTACHMENT

PROJECT NUMBER: _____

ITEM NUMBER (S): _____

TYPE OF MATERIAL: _____

DATE: _____

QUALITY CONTROL
TESTS

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

EVALUATED BY: _____

CHECKED BY: _____