Colorado Procedure 17-22

Standard Practice for

Hot Mix Asphalt Test Result Verification and Dispute Resolution

1. SCOPE

1.1 The purpose of this Hot Mix Asphalt (HMA) Test Result Verification and Dispute Resolution Procedure is to establish a process to address questions over acceptance test result differences between the Contractor and the Colorado Department of Transportation (CDOT) in the properties and pay for HMA. Outliers will be addressed using the 2v process listed in the Revision of Sections 105 and 106 of the Standard Special Provisions.

2. REFERENCED DOCUMENTS

2.1 CDOT Field Materials Manual
2.2 CDOT Laboratory Manual of Test Procedures
2.3 AASHTO Test Procedures
2.4 ASTM Test Procedures

3. DEFINITIONS

3.1 Check Testing – as defined in CP 13.

3.2 Blind Split Sample – Sample submitted by the Engineer to the CDOT Central Materials Laboratory (administratively the Materials and Geotechnical Branch) to resolve differences in test results between OA testing and PC testing per this procedure. This sample shall be a split sample per procedure in CP 55. The Method from CP 55 to be utilized will be established in the Pre-Pave Meeting.

4. REQUIRED CONDITIONS

4.1 The Check Testing provisions of the Contract must have been satisfactorily completed per CP 13.

4.2 If the Check Testing has not been satisfactorily completed per the contract, no challenge of the QA results will be allowed.

TABLE 17-1: Required Test Result Differences to Qualify for Dispute Resolution Testing

Element	Type of Test	Difference Between Test Results
Gradation: #8 and larger Sieves #16 to #100 Sieves #200 Sieve	 CP 31 CP 31 CP 31	 ≥ 5 % ≥ 3 % ≥ 2.0 %
Asphalt Content	CP 85 CP-L 5120	≥ 0.27 % ≥ 0.27 %
Asphalt Compaction	CP 81 CP 44	≥ 1.5 % ≥ 1.5 %
Asphalt Compaction Longitudinal Joints	CP 44	≥1.5%
Air Voids	CP-L 5115	≥ 0.7 %
Voids in Mineral Aggregate	CP 48	≥ 0.7 %

4.3 Test result differences shall be larger than the tolerances listed in Table 17-1 or no dispute will be allowed.

4.4 If a documented split sample for dispute resolution is not submitted to the Engineer, dispute resolution testing will not be allowed. The Engineer shall store and maintain all split samples submitted for disputes, including CP85 correlation split samples.

4.5 For any disputed property, the CP 17 Process Documentation Worksheet (CDOT Form 417) shall be used for guidance and the following steps will be followed:

4.5.1 Level 1 – Test Result Questioned Affected parties will immediately notify the Engineer and describe the issue in writing.

- Project and Contractor personnel will perform an investigation, review data, and possibly retest samples.
- All Level 1 tasks must be completed within 3 working days from the time a written notification is presented to the Engineer.

4.5.2 Level 2 – Issue Not Resolved by Level 1

Engineer and Contractor personnel will perform an investigation and review data to determine if the questioned sample is isolated (test differences outside of multi-lab precision).

- PC and OA must be complete and up-to-date.
- If the dispute is a result of a bias between the PC and Acceptance test results, then the project will perform a new round of check testing (CP 13) before determining if Level 3 should be used. The check test at this level is performed only on the item(s) being disputed. If volumetric properties are being disputed, retain a set of check testing samples for the dispute lab.
- All Level 2 tasks must be completed within 8 working days from the time a written notification is presented to the Engineer.

4.5.3 Level 3 – Issue Not Resolved by Level 2

- Engineer shall submit Blind Split Sample to the CDOT Central Materials Laboratory within 18 working days from the time a written notification is presented to the Engineer. Engineer shall coordinate directly with CDOT Central Materials Laboratory Asphalt Program Manager (303) 398-6576.
- The blind split sample shall be confidentially submitted only to the CDOT Central Materials Laboratory, Asphalt Program Manager by the Engineer using a CDOT Form 1304 and the completed CP Process Documentation Worksheet. Samples shall be submitted only when the decision has been formally made at the project to conduct dispute testing. The CDOT Form #1304 shall contain the following information:

- Contract ID (Project Code)
- Form 43 number for the sample
- Date of Form 43
- Name and title of sample submitter
- Project contact information for reporting test results.
- List of disputed tests
- Independent lab who will perform the test (either "Central Lab" or "Private Lab")
- Witness information, if applicable (see Subsection 7.1)
- Sample testing shall be completed by the CDOT Central Materials Laboratory or third-party lab within 10 working days of sample receipt.

5. DISPUTE LAB PROCEDURES

Items to consider:

1. Engineer and Contractor shall confirm that Level 1 and Level 2 have been completed. Through the use of the CP 17 Process Documentation Worksheet detail the Level 1 and 2 investigations, and provide dates and personnel involved in the Level 1 and 2 investigations.
2. For Volumetric Properties require new check testing process be completed that includes the dispute lab. The contractor shall provide all materials for check testing. When volumetric properties are being disputed, the dispute lab's bulk-specific gravity will be corrected to the OA lab bulk specific gravity.

5.1 The blind split samples will either be tested by the CDOT Central Materials Laboratory or forwarded to a consultant laboratory by the selection made by the contractor. The test results from the blind split samples will be used in the pay factor calculation in place of the test results that are questioned.

5.2 When a volumetric property is questioned, all volumetric properties (including asphalt content, which affects VMA) shall be retested and the new values used for the re-calculation of pay factors. Recent PC data for aggregate bulk specific gravity may also be requested and evaluated during dispute testing.

5.3 When a gradation result is questioned, the percent passing <u>all</u> specified sieves shall be retested and included in the calculation of dispute resolution pay factors. If acceptance gradations are based on post-burn ignition oven samples, asphalt content will also be re-tested by the dispute lab and the new result will be used for the re-calculation of pay factors.

5.4 All properties will be tested using the method used for project acceptance. For example, if acceptance testing for percent AC content is based on the nuclear AC gauge, the dispute resolution sample shall be tested using a nuclear AC gauge. The nuclear AC correlation method shall be the same for all labs in the dispute process.

5.5 The Project Engineer indicated on Form 1304 shall be the only contact point for information and test result distribution by the CDOT Asphalt Program Manager.

6. DENSITY DISPUTES

6.1 As addressed in the Specification, disputes involving mat and longitudinal joint density, shall be resolved using roadway cores. The cores shall be taken by the Contractor within the time required by the specification.

6.2 Where cores are used for density acceptance, for example, SMA or Longitudinal Joints, dispute resolution will not be allowed unless companion PC cores were taken at the same time and with the edge of the core within six inches of the acceptance cores. Dispute resolution cores will also be taken within six inches of the edge of the acceptance cores.

6.3 Where acceptance for density was made using a nuclear density gauge, dispute resolution cores will be taken at the same location as the nuclear gauge density measurements.

7. WITNESSING SAMPLE TESTING

7.1 The Contractor or his representative may witness the testing of the disputed sample if tested by the CDOT Central Materials Laboratory. One testing witness will be allowed and shall be identified in writing along with his qualifications before the testing. The CDOT Asphalt Program Manager will schedule the testing time and will notify the designated witness. Witnessing of testing shall be by visual observation only, no comments or discussion of the testing with the technicians performing the tests will be allowed. Questions on the testing procedures shall be directed to the CDOT Flexible Pavement Laboratory Manager after the completion of testing. If the witness has any formal comments on the tests, they shall be submitted in writing to the Engineer with a copy also sent to the CDOT Asphalt Program Manager before the scheduled distribution of the test results.

8. RESPONSIBILITY FOR TESTING EXPENSE

8.1 For single property disputes such as asphalt content on a gradation acceptance project, the lab whose result is furthest from the dispute resolution lab will pay for testing.

8.2 For disputes where more than a single property is affected by the retest, the lab furthest from the dispute resolution lab on the property questioned will pay for the testing, but the entire test result will be entered into the pay calculations for the material represented by that sample. For example:

8.2.1 Gradation - The test results for the disputed sieve will be used to determine who is the furthest, but the entire gradation will be entered into the pay formula.

8.2.2 Volumetric properties - VMA, Air Voids, and percent AC will be entered into the formula, while payment for testing will be determined based on the results for the single property disputed.

8.3.1 In the case of a tie, the testing cost will be divided equally between both parties.

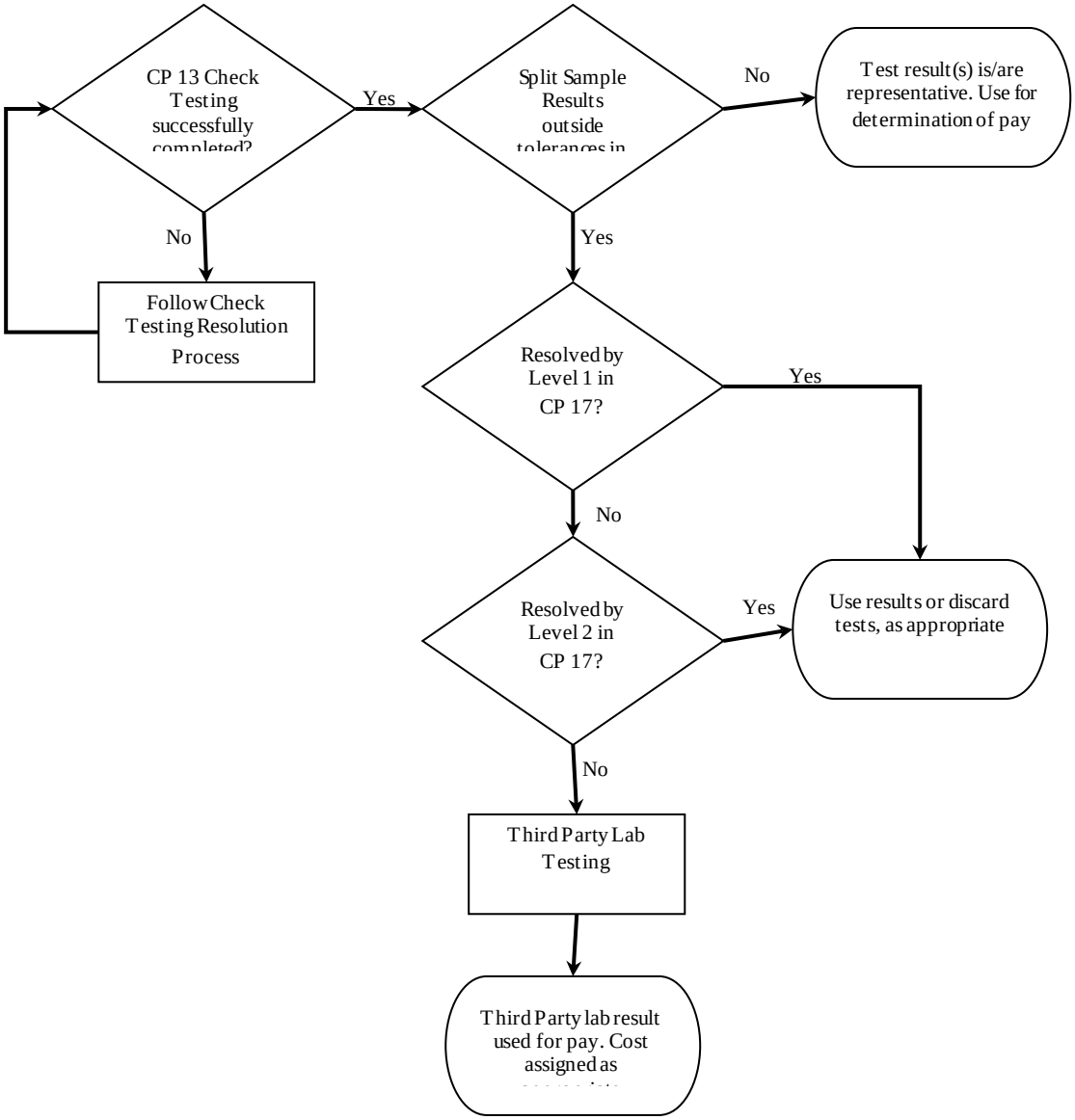
8.4 The costs for third-party testing are shown in Table 17-2. An administrative cost of $230 per sample will be charged in addition to the costs shown.

TABLE 17-2: Costs for Third Party Testing

Test	Cost
AC Ignition Correction	$318
AC Nuclear Correction	$373
AC Content by Ignition	$109
AC Content by Nuclear	$86
Gradation	$115
Mixture Volumetrics (Rice, Air Voids, VMA)	$338
Core Bulk Specific Gravity	$32
AC Content by Ignition (CTP)	$545
AC Content by Nuclear (CTP)	$430
Mixture Volumetrics (Rice, Air Voids, VMA) (CTP)	$1690

Note: Check Testing Program (CTP).

Dispute Resolution Flowchart



CDOT Form 417

Colorado Department of Transportation

Contract ID | Region | Date of Engineer's Notification

Project Number

Project Location

Colorado Procedure 17 - Process Documentation Worksheet

Hot Mix Asphalt Test Result Verification and Dispute Resolution

Sample Method (CP 41)

- ☐ Method A - Tube Sampler — Tube Dia. ____ Tube Length ____
- ☐ Method B - Point of Delivery
  - ☐ Auger
  - ☐ Windrow
- ☐ Method C - Behind Paver

Split Sample Method (CP 55)

- ☐ Method A - Selection by Scoop
- ☐ Method B - Quartering
- ☐ Method C - Mechanical Splitter
- ☐ Method D - Selection by Cross Section
- ☐ Method E - Quartermaster Mechanical Splitter

Element

- ☐ Gradation (CP 31)
- ☐ Asphalt Content (CP 85 / CP-L 5120)
- ☐ Asphalt Compaction (CP 81 / CP 44)
- ☐ Asphalt Compaction Longitudinal Joints (CP 44)
- ☐ Air Voids (CP-L 5115)
- ☐ Voids in Mineral Aggregate (CP 48)

Level 1

CP 17 (4.5.1) - Project and Contractor personnel will perform investigation, review data and possibly retest samples. Must be completed within 3 working days from the time written notification is presented to the Engineer. **In the space below, include detailed description of actions taken to resolve the dispute. Attach an additional page if necessary.**

Investigated by: Electronic signature required

Concurrence - Region Materials Yes ☐ No ☐ by: Electronic signature required

Level 2

CP 17 (4.5.2) - Issue not resolved by Level 1. Engineer and Contractor personnel will perform an investigation and review data to determine if the questioned sample is an isolated sample (test differences outside of multi-lab precision). All Level 2 tasks must be completed within 8 working days from the time written notification is presented to the Engineer. **In the space below, include a detailed description of actions taken to resolve the dispute. Attach an additional page if necessary.**

Investigated by: Electronic signature required

Concurrence - Region Materials Yes ☐ No ☐ by: Electronic signature required

Level 3

CP 17 (4.5.3) - Issue not resolved by Level 2. Project Engineer will submit Blind Split Sample to CDOT Central Materials Lab within 18 working days from the time written notification is received. The blind split sample shall be confidentially submitted only to the Materials and Geotechnical Branch, Asphalt Program Manager, by the Engineer, using **a CDOT Form #1304.** Samples shall be submitted **only** when the decision has been formally made at the project to conduct dispute testing.

Project Engineer:

Project Engineer E-Mail:

Project Engineer Cell Number:

CDOT Form #417 1/18

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