

NTTA Projects	Original Issue Date: 12/11/2009	CRV-04
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Title: Test Results Analysis, Dispute Resolution and Reporting		

### 1.0 PURPOSE:

The purpose of this procedure is to establish the process for analysis of the results of Project Tests, when performed by the Contractor, through use of NTTA's Owner Verification (OV) testing activities, to establish the methods of dispute resolution to form the basis of the NTTA's Acceptance Decision of the materials incorporated into NTTA's Projects, and to establish reporting requirements to NTTA.

### 2.0 RESPONSIBILITIES

- 2.1 NTTA, or its designated representative, is responsible to designate material categories for statistical validation to be classified as either Level 1, 2 or 3 upon completion of a project specific risk analysis workshop. When federal funds or future rights and responsibilities related to the project are part of the project agreement(s), approval of TxDOT and FHWA may be required.
- 2.2 The NTTA's designated representative, as defined within their scope of work, and personnel shall be responsible for:
  - 2.2.1 collaboration with the project testing laboratory, NTTA and its designated representative in joint investigations of the Project with OV test results.
  - 2.2.2 ensuring actions are taken in accordance with QM-10, Corrective and Preventive Action, as required to realign sampling and testing operations when needs become apparent for corrective or preventive action(s).
  - 2.2.3 observation verifications of Project Test performance.
  - 2.2.4 review of the completed observation verifications and initiate preventive action requests, corrective action requests or non-conformance report recommendations as determined necessary.
  - 2.2.5 evaluation of Project and OV split sample (QA/OV SS) test results.
  - 2.2.6 When contractually required by NTTA;
    - A) perform statistical analysis validation of Contractor-performed Project Tests with OV test results using statistical analysis methodologies contained within the applicable approved QAP;
    - B) perform non-validation investigations; and,
    - C) assembly and submittal of project specific quarterly reports to NTTA.
- 2.3 The Project testing laboratory and personnel are responsible for:
  - 2.3.1 collaboration with the OV laboratory, NTTA and its designated representative in joint investigations; and
  - 2.3.2 ensuring actions are taken in accordance with QM-10, Corrective and Preventive Action, as required to realign sampling and testing operations when needs become apparent for corrective or preventive action(s).

### 3.0 SCOPE/APPLICABILITY:

This procedure applies to NTTA construction projects when Contractor-performed Project Test results are to be considered in the NTTA Acceptance Decision.

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#### 4.0 REFERENCES:

- [TxDOT Manual of Testing Procedures](#)
- [23 CFR 637\(B\)](#)
- [FHWA T 6120.3](#)
- [NTTA Construction Manual, Appendix C, QC Guide Schedule](#)
- NTTA Quality Assurance Program (QAP) approved for the project
- [QM-09, Control of Nonconforming Materials – Construction](#)
- [QM-10, Corrective and Preventive Action](#)

#### 5.0 DEFINITIONS & ACRONYMS

- 5.1 Acceptance Decision – NTTA's decision to accept the work based on the results and effective implementation of the Quality Assurance Program.
  - 5.2 Acceptance Program – all factors that comprise the NTTA's program to determine quality of the product as specified in the contract requirements. These factors include verification sampling, testing, and inspection and may include results of contractor-performed sampling and testing in the determination of NTTA's Acceptance Decision.
  - 5.3 Level 1 –Materials or product tests identified as highest risk to the NTTA, within the Risk Assessment Workshop.
  - 5.4 Level 2 – Materials or product tests identified as medium risk to the NTTA, within the Risk Assessment Workshop.
  - 5.5 Level 3 – Materials or product tests identified as lowest risk to the NTTA, within the Risk Assessment Workshop.
  - 5.6 Contract Documents – documents related to a specific project by contract between the NTTA and a Contractor or Design-Build entity.
  - 5.7 Contractor – legal entity entering into an agreement/contract with NTTA through the Design-Bid-Build or Design-Build project delivery methods.
  - 5.8 CVL, Controlled Vocabulary List – the list of agreed-upon nomenclature used to uniquely identify the sampling and testing activities.
  - 5.9 EDMS – Electronic Data Management System – system to electronically store data, documents and/or images for retention communication, and/or analysis.
  - 5.10 Independent Assurance (IA) Program – all activities that are included in an unbiased and independent evaluation program of all the sampling and testing procedures, personnel, and equipment used as part of the Acceptance Decision.
  - 5.11 Independent Verification – comparing the random independent OV test results with a group of Contractor-performed Project Test results as an independent check of the Contractor performed Project test results, as applied to Category 2 test items.
  - 5.12 Owner Verification (OV) – inspections, observations, auditing, sampling, testing and other activities performed by the NTTA, or performed on behalf of NTTA, to validate or verify the quality of the work.
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- 5.13 Owner Verification Program – document established to define the OV processes and procedures to be implemented by the Owner, as part of the Quality Assurance Program.
- 5.14 Project Tests – the tests listed in [NTTA Construction Manual, Appendix C](#). These tests are described in the table(s) listed there-in for the “Material or Product” indicating the “Test For” using the “Test Number”, at the “Location or Time of Sampling” at the “Frequency of Sampling” as listed therein and includes any specific tests required to be performed as prescribed within specifications as part of the Contract Documents.
- 5.15 QA/OV SS, Quality Acceptance/Owner Verification Split Sample – split samples between the Project testing firm (Quality Acceptance on Design-Build projects) and the Owner Verification firm.
- 5.16 Quality Assurance Program (QAP) – the program for quality management and control of the Project and Work, as described in the Contract Documents.
- 5.17 Quality Control Program (QCP) – program detailing the Contractor’s internal systematic processes, procedures, and documentation for delivery of quality control and ensure that the Work is delivered in accordance with the Contract Documents.
- 5.18 Risk Assessment Workshop – a workshop attended by technical experts, assigned by NTTA, and agencies with investment and/or future ownership or maintenance responsibilities. The workshop is held to identify project specific risks associated with material characteristics, contractual requirements, or other specific issues that affect the risk to NTTA and other agencies with investment and/or future ownership or maintenance responsibilities.
- 5.19 Start-up Operation – a start of a new construction operation where new material tests will be performed that haven’t yet been performed on the project or where the material design has changed (e.g. new concrete mix design in use, new source of aggregate, or gradation there of, in pavement structure, etc.)

## 6.0 PROCEDURE

### 6.1 Level 1 Test Results Analysis: Statistical Analysis

- 6.1.1 Perform the Statistical Analysis on Level 1 Project and OV test results as described within the approved QAP and the project specific Appendix D, using the level of significance ( $\alpha$ ), which is developed following the completion of the project specific risk analysis workshop.
  - A) Include valid Project and OV test results that represent materials that have been incorporated into the work. Include failing test results in the statistical analyses. Replace those failing results in an updated statistical analysis with the re-testing results upon completion of the corrective action(s). Do not include test results provided by TxDOT, such as, but not limited to test results performed on materials accepted by NTTA through TxDOT’s AQMP, within the statistical analysis.
- 6.1.2 If validation of Project Tests is not achieved, the Project Testing firm, Contractor or Design-Build entity, and NTTA designated representatives, as applicable, jointly investigate causes of non-validation.
- 6.1.3 Initiate [QM-09](#) Control of Nonconforming Materials – Construction, or [QM-10](#) Corrective and Preventive Action, as appropriate to the causes for non-validation.

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## 6.2 Level 2 Test Results Analysis: Split Samples with Independent Verification

- 6.2.1 Analyze Split Sample test results (QA/OV SS) between the Project Tests and OV Tests for comparison and Independent Verification as described within the project specific Appendix D which is developed following the completion of the project specific risk analysis workshop.
- 6.2.2 If the comparison between Project and OV test results do not fall within the tolerance limits, the Project Testing firm, Contractor or Design-Build entity, and NTTA designated representatives, as applicable, jointly investigate causes of testing outside tolerance limits.
- 6.2.3 Initiate [QM-09](#) Control of Nonconforming Materials – Construction, or [QM-10](#) Corrective and Preventive Action, as appropriate for inability to validate using approved QAP tolerance limits.

## 6.3 Level 3 Test Analysis: Observation Verification

- 6.3.1 Observe and review the Project sampling and testing operations as described within the approved QAP and the project specific Appendix D which is developed following the completion of the project specific risk analysis workshop.
- 6.3.2 Document the observation verifications by using Form [CRV-04-F1](#) and enter data within the EDMS.
- 6.3.3 Perform a review of the completed observation verifications.
- 6.3.4 Initiate preventive action requests, corrective action requests or non-conformance report recommendations, if deficiencies are determined.

6.4 **Dispute Resolution** - will be performed as stated within the approved QAP applicable to the project.

## 6.5 Quarterly Statistical Validation Report, when contractually required

- 6.5.1 Review the results, of the statistical analysis and non-validation investigations performed during the quarter.
- 6.5.2 Meet with designated representatives of the Project and OV testing laboratory prior to development of each draft quarterly report. Invite collaboration among the parties to agree upon action items and opportunities for continual improvement. Identify agreements to adjust the testing frequency and process control improvements of the Project and/or OV sampling and testing activities within the report.
- 6.5.3 Initiate any opportunities for improvement (OFI) agreed upon during the meeting with the Project and OV testing laboratories as a Preventive Actions in accordance with [QM-10](#) Corrective and Preventive Action.
- 6.5.4 Prepare draft quarterly reports for submittal to the NTTA. Present the quarterly report to be consistent with the following content and timelines:

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- A) Introduction
- B) Discussion on Statistical Validations and Observation Verifications for:
 

Embankment and General Backfills	Selected Retaining Wall Backfills
Treated Subgrade	Virgin and Recycled Base Materials
Treated and Untreated Base Course – Field Tests	Asphalt Treated Base Course
Surface Treatment Aggregates	Structural and Paving Concrete Aggregates
Non-Structural Concrete	Structural Concrete
Paving Concrete	Hot Mixed Asphalt Concrete – Aggregates
Hot Mixed Asphalt Concrete (QC/QA Specifications)	Hot Mixed Asphalt Concrete(Method Specification)
- C) Conclusion of validation and non-validation, including any steps taken and/or planned to reach validation.
- D) Attachment A - Statistical Analysis Summary Tables
- E) Attachment B - Report Figures
- F) Attachment C Engineering Decision Log
- G) Attachment D - Failure Log
- H) Attachment E - Monthly Material Certification Letters
- I) Provide the quarterly reports in accordance with the following schedule:
  1. January through March report by June 15<sup>th</sup>.
  2. April through June report by September 15<sup>th</sup>.
  3. July through September report by December 15<sup>th</sup>.
  4. October through December report by March 15<sup>th</sup>.

**6.5.5** Conduct quarterly meetings, arranged at the time and with personnel representation at NTTA's discretion, to discuss the contents of the draft reports.

**6.5.6** Prepare final quarterly reports and submit to the NTTA for final review, acceptance/concurrence, and further transmission.

**7.0 REGULATORY REQUIREMENTS:**

Code of Federal Regulations 23 CRF 637(B), where contractually applicable  
<http://www.fhwa.dot.gov/legsregs/directives/fapg/cfr0637b.htm>

FHWA Technical Advisory T6120.3, where contractually applicable  
<http://www.fhwa.dot.gov/legsregs/directives/techadvs/t61203.htm>

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8.0 RELATED BOARD POLICY:

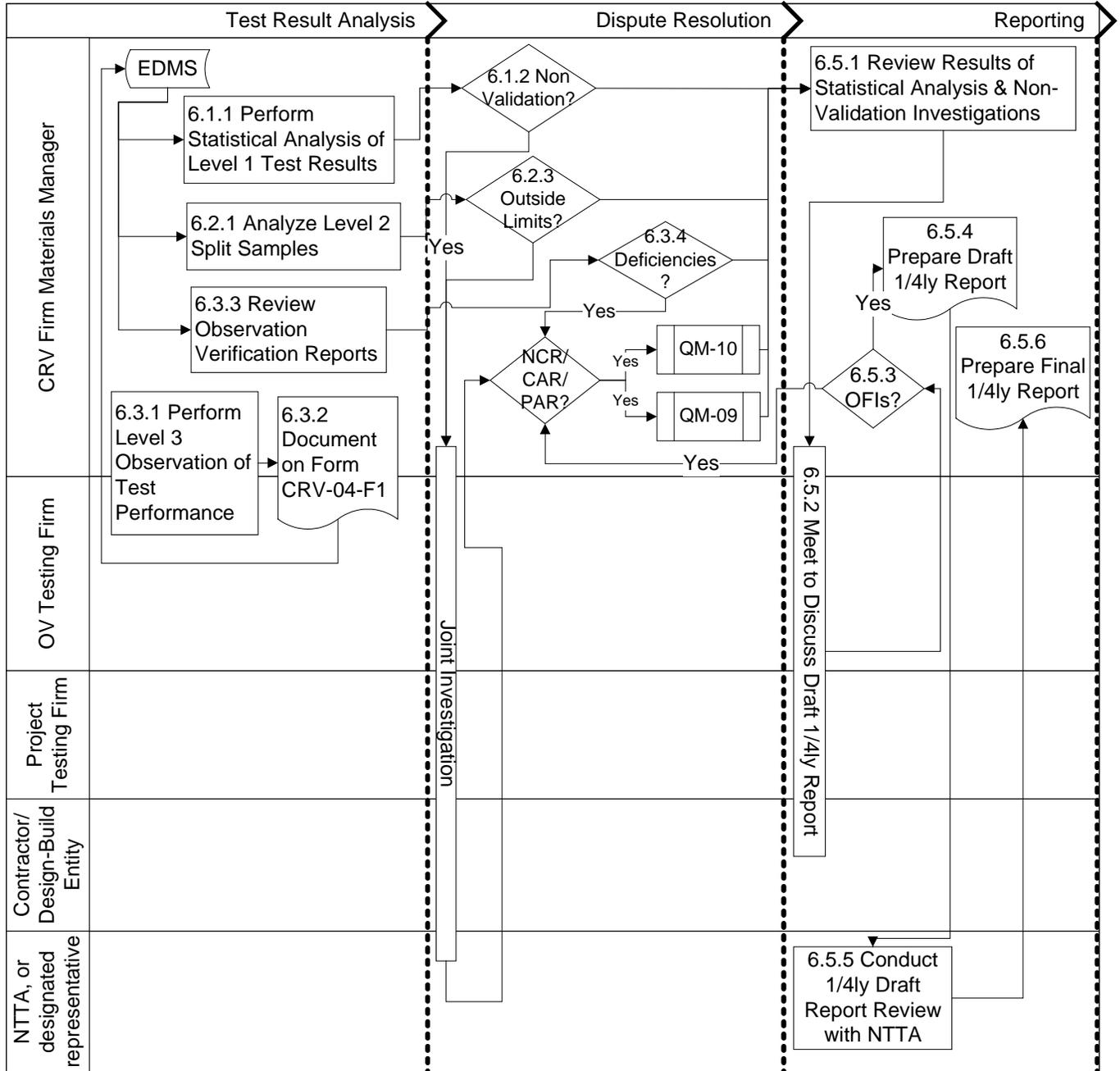
N/A

9.0 COMPONENT DOCUMENTS:

[CRV-04-F1 Level 3 Test Observation Report](#)

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10.0 FLOWCHART:



11.0 REVISION HISTORY:

Revision	Revised by	Date Issued	DRN#	Reason for Revision
0	John Roberts	12/11/2009	10067	Original Issue