

Document Release Notice

Document Number:	CRV-01	Title:	Sampling, Testing and Reporting Requirements	
Current Revision #:	1	Type of Change:	<input type="checkbox"/> ORIG RELEASE <input checked="" type="checkbox"/> REVISION <input type="checkbox"/> ARCHIVE <input type="checkbox"/> OBSOLETE	
New Revision #:	2	DRN Number:	10319	<input type="checkbox"/> MAJOR <input checked="" type="checkbox"/> MINOR <input type="checkbox"/> ADMIN
Date Submitted:	4/28/2011	Document Type:	QMS Document - CRV	Choose from Drop Down Menu - left

Summary of Proposed Changes:

- Include paragraph numbers or other references & attach a copy of the new or revised documents)
- For new documents, indicate "Original Release"

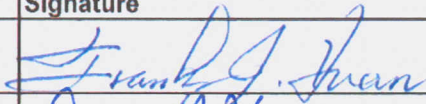
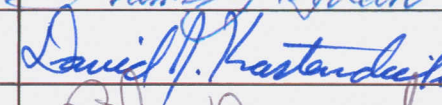
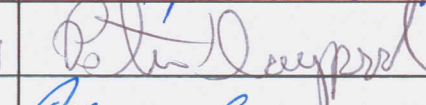
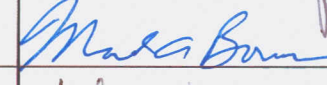
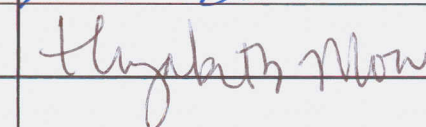
(1) Original Release: CRV-01-F31 and CRV-01-F32
 (2) Added references of new forms CRV-01-F31 and F32 into CRV-01 Section 9.0: Component Documents.
 (3) Revised the title of CRV-01-F26 in CRV-01 Section 9.0: Component Documents.
 (4) Extended laboratory testing form CRV-01-F26 to include ASTM C142 test method for concrete fine aggregate deleterious material testing and reporting.
 (5) Added field testing form CRV-01-F31, Determining Bridge Deck/Culvert Top Slab Concrete Thickness and Reinforcement Cover by Direct Measurement (Tex-413-A Part II).
 (6) Added laboratory testing form CRV-01-F32, Determining Moisture Content-Density Relationship (ASTM D698/D1557).
 7) Updated references to new CON-07 for Construction NCRs.
 8) Changed Construction Manager to read Construction Manager or Resident Engineer.

*DAVID,
I THOUGHT WE DECIDED NOT TO TRACK CRV-01-F31 IN ELVIS? AMGB*

Reason for New Release / Revision / Obsolescence:

(1) TxDOT specifications require the use of ASTM C142 test method for determining the deleterious materials of concrete fine aggregate. The current form CRV-01-F26 is good only for Tex-413-A testing for coarse aggregate. (2) TxDOT test procedure Tex-423-A Part II, bridge deck depth and steel cover measurement became effective in January 2010 while the frequency requirements for bridge deck and steel cover measurements are stipulated in TxDOT guide schedules (both 2007 and 2010 versions). (3) The use of ASTM D698 or D1557 proctor curves is required by NTTA Special Specification Item 856, Moisture Treated Subgrade and Item 857, Treated Subgrade.

Required Signatures:

Title	Printed Name	Signature	Date
Originator	Frank Yuan		4/29/2011
Process or Content Owner	David Kastendick		5/9/11
Quality Manager	Troy Federspiel PETER CLAYPOOL		7/8/2011
NTTA Manager	Mark Bouma		7/14/11
Department Director	Elizabeth Mow		10-3-11
Document Control	Md Omar Faruk		

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 1 of 14
Title: Sampling, Testing and Reporting Requirements		

1.0 PURPOSE

The purpose of this procedure is to describe the sampling, testing and reporting requirements necessary to provide consistency in documenting material testing required by Contract Documents.

2.0 RESPONSIBILITIES

- 2.1 Laboratory designated Supervisors – Laboratory supervisors are responsible for assigning competent personnel, as evidenced by current certifications, to perform sampling and testing and data entry into the EDMS; reviewing and signing all completed testing forms; and providing technical review of test data and results through the EDMS workflow. In addition, Laboratory Supervisors are responsible for alerting the Contractor and Construction Management personnel immediately upon failing material test results. *Front or Resident Engineer*
- 2.2 Sampling and Testing Technicians – Technicians are responsible for determination of the random locations of samples and tests in accordance with the project specific random sampling procedure if one exists ,or by applying randomness as defined in the NTTA Construction Manual, Appendix C, Guide Schedule of Sampling and Testing, or by using random number tables when directed in writing by NTTA ; performing sampling and testing in accordance with established test procedures referenced within the contract; identifying samples or tests; and documenting sampling and testing results in the NTTA provided sampling and testing forms listed in Section 9.0. In addition, Technicians are responsible for alerting Laboratory Supervisors, Contractors, and potentially Construction Management personnel immediately upon failing material test results. *Front or Resident Engineer*
- 2.3 Data Entry Personnel - Data entry personnel are responsible for entering data into EDMS from the sample and test forms provided by the technicians.
- 2.4 Laboratory Engineers – Laboratory engineers are responsible for authorizing test reports through the EDMS workflow and forwarding, through the EDMS workflow, test reports that deviate from the specification requirements but have been accepted by Construction Manager and/or NTTA Engineer based on engineering judgment . *Front or Resident Engineer*
- 2.5 Construction Manager – Construction Manager is responsible for authorizing, through the EDMS workflow, the test reports forwarded to him/her by the Laboratory Engineers based on engineering judgment in accordance with the Construction Manager Acceptance Decision Delegation, ~~QM-09-A4~~ *CON-07-A3* authorized by NTTA, and forwarding test reports to the NTTA Engineer for NTTA Engineer’s acceptance decision, under conditions when the acceptance decision by the Construction Manager is not authorized. Accordingly when failing material tests occur such that specifications do not allow additional provisions to rectify, the Construction Manager shall generate an NCR in accordance with ~~QM-09~~ *CON-07*. *Front or Resident Engineer*

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 2 of 14
Title: Sampling, Testing and Reporting Requirements		

2.6 NTTA Engineer -- this professional engineer designated by NTTA is responsible for making final acceptance decisions on materials or work deviating from specification requirements, when the deviation is beyond the Construction Manager Acceptance Delegation authorized by NTTA, in accordance with ~~QM-09-A4~~.

CON-07-A3

3.0 SCOPE/APPLICABILITY

This procedure shall apply to those NTTA construction projects, executed in the Project Delivery department, when Contractor-performed Project Test results are to be considered in the NTTA Acceptance Decision, and to any other NTTA Construction Projects when contractually specified or otherwise directed in writing by NTTA. It applies to all laboratories and personnel performing sampling and testing during construction that is considered for use in NTTA's Acceptance Decision on these applicable projects.

4.0 REFERENCES

- TxDOT Manual of Testing Procedures
- Contract Documents
- NTTA Construction Manual, Appendix C, Guide Schedule of Sampling and Testing
- CRV-01-A1 Sample and Test Identification System
- CRV-02 Random Number Table-Based Random Sampling Requirements
- ~~QM-09~~ NCR Control of Nonconforming Product - Construction
- ~~QM-09-A3~~ Guiding Principles for Construction Management Acceptance Decision Delegation
- ~~QM-09-A4~~ Construction Manager Acceptance Decision Delegation
- ~~QM-09-A5~~ Contractor Performed Material Testing Disposition Protocol

CON-07

CON-07-A2

CON-07-A3

CON-07-A4

Items During

Construction Manager

DBK 5-9-11

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 approved for the project.
- 5.2 Acceptance Program – all factors that comprise the NTTA's program to determine quality of the product as specified in the contract requirements.
- 5.3 CFR – Code of Federal Regulations

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 3 of 14
Title: Sampling, Testing and Reporting Requirements		

- or Resident Engineer (RE)*
- 5.4 Construction Manager (CM) – NTTA’s designated representative responsible for the management of the construction, cost, time, quality, contract administration, and monitoring the Contractor and/or Design-Build entity’s performance to its contractual obligations.
 - 5.5 Construction Manager Acceptance Decision Delegation – the authority and guiding principles delegated by NTTA to the Construction Manager for the use of engineering judgment in acceptance of material or work not meeting specification requirements, documented within ~~QM-09-A3~~ and ~~QM-09-A4~~.
 - 5.6 Contract Documents – documents related to a specific project by contract between the NTTA and a Contractor or Design-Build entity. *CON-07-A2 CON-07-A3*
 - 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 – shall mean the list of agreed-upon nomenclature used to uniquely identify each testing report generated by Contractor performed or OV sampling and testing activities.
 - 5.9 EDMS, Electronic Data Management System – system to electronically store material test results and data, documents and/or images for retention, communication, and/or analysis.
 - 5.10 Fixed Samples - Fixed samples are defined as those samples selected in order to verify or validate an area of suspicious quality and/or those samples selected at locations pre-determined by using patterned sampling routines. These fixed samples shall not be used to fulfill the NTTA Construction Manual, Appendix C, Guide Schedule of Sampling and Testing but rather will be over and above the quantity and frequency of testing required by said Guide Schedule, however this fixed test shall constitute an acceptance test, and a failing result shall be addressed in a manner similar to that of a random test.
 - 5.11 Independent Assurance Program – shall mean all activities that are included in an unbiased and independent evaluation program for all the sampling and testing procedures, personnel, labs, and equipment used as part of the Acceptance Decision.
 - 5.12 Laboratory Engineer – the professional engineers designated by Project testing laboratory and, when OV sampling and testing is required by the Contract Documents, the OV testing laboratory responsible for making acceptance decisions on sampling and testing results based on the requirements of specifications and other Contract Documents.
 - 5.13 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.
 - 5.14 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.
 - 5.15 Project Tests – the tests listed in the NTTA Construction Manual, Appendix C, Guide Schedule of Sampling and Testing. These tests are described in the table(s) listed there-in for the “Material of 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.

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 4 of 14
Title: Sampling, Testing and Reporting Requirements		

- 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 Random Samples - Random samples are defined as those samples either selected and documented through the method defined within a project specific random sampling procedure , or selected by applying randomness by avoiding patterned sampling routines, as defined in NTTA Construction Manual, Appendix C Guide Schedule of Sampling and Testing. Random samples also include those samples selected when the next planned random sample is not feasible or practical, i.e. in the case when the use of a random number table selects a sample that does not materialize within the days production and the closest feasible or practical sample must be selected instead.

6.0 PROCEDURE

6.1 For Design-Build projects, or in other situations when the contractor’s tests are considered for project acceptance, Random samples must be selected and documented via the method defined in project specific random sampling procedures. However it is important to note that it may also be necessary to include those samples selected when the next planned random sample is not feasible or practical, i.e. in the case when the use of a random number table selects a sample that does not materialize within the days production and the closest feasible or practical sample must be selected instead.

6.1.1 For traditional Design-Bid-Build projects where the sampling and testing performed by the owner or the owner’s representative are used for acceptance, Random samples may be selected through applying randomness by avoiding fixed patterns, as defined in the NTTA Construction Manual, Appendix C, Guide Schedule of Sampling and Testing, or by using Random Number Tables when directed in writing by NTTA.

6.2 Personnel Assignment

6.2.1 A Laboratory designated Supervisor assigns sampling and testing technicians meeting the requirements of TxDOT or NTTA’s Independent Assurance Program to perform sampling and testing.

6.3 Identify Sample and Test - Sampling and Testing Technicians shall:

6.3.1 Follow the project-specific random sampling procedures if they exist or, apply randomness by avoiding patterned sampling routines as defined in NTTA Construction Manual, Appendix C, Guide Schedule of Sampling and Testing, or use Random Number Tables when directed in writing by NTTA to determine the random sample or test location. Note, said guide schedule shall be fulfilled with **Random** samples. Any **Fixed** samples used to test an area of suspect materials or construction shall be above and beyond said guide schedule compliance.

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 1 ² Issue Date: 08/25/2010 ^{TBD}	Page 5 of 14
Title: Sampling, Testing and Reporting Requirements		

- 6.3.2 Select the fixed sample or test location through visual observation, based on sampling or testing personnel's judgment, and/or based on a patterned sampling routine.
- 6.3.3 Identify the random sample or test independently performed by a testing entity as the Random-Independent (RI) sample or test.
- 6.3.4 Identify the fixed sample or test independently performed by a testing entity as the Fixed-Independent (FI) sample or test.
- 6.3.5 Identify the random sample or test performed as a split between two testing entities as the Random-Split (RS) sample or test.
- 6.3.6 Identify the fixed sample or test performed as a split between two testing entities as the Fixed-Split (FS) sample or test.
- 6.3.7 Identify the sample or test performed for the purpose of internal review, training, calibration check, proficiency testing, etc. as the Internal sample or test.
- 6.3.8 Perform field, source, or stockpile sampling.
 - A) Perform the sampling in accordance with the corresponding sampling procedure, as defined by contract documents.
 - B) Complete a Sample Identification Form using the established CVL and follow the directions provided in CRV-01-1A, "Sample and Test Identification System" to populate the required fields with sample information.
 - C) Deliver the sample, together with the complete Sample Identification Form, to the laboratory for processing and testing.
- 6.3.9 Perform field testing.
 - A) Use the established CVL and follow the directions provided in CRV-01-1A, "Sample and Test Identification System" to identify the field test and populate the field test information in the applicable field testing forms as listed in Section 9.0 "Component Documents".
 - B) Perform field tests in accordance with the required test procedures.
 - C) If a field test fails, immediately notify the lab supervisor and the designated quality representative(s) of the Contractor of the failed test results.
 - D) If the materials or work represented by the failing test is accepted by the Construction Manager, or his or her authorized designee, ~~such as a Resident Engineer~~, by the use of engineering *or Resident Engineer*

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 6 of 14
Title: Sampling, Testing and Reporting Requirements		

judgment in accordance with Construction Manager Acceptance Decision Delegation authorized by NTTA, ~~QM-09-A4~~, document Construction Manager's acceptance decision, along with basis for same within the field test form.

CON-07-A3

E) If the materials or work represented by the failing test is rejected by the Construction Manager, when specifications do not allow any additional provisions to rectify, the Construction Manager shall create an NCR in accordance with ~~QM-09~~.

CON-07

6.4 Perform Laboratory Testing – Testing Technicians perform test on material in accordance with the required test procedure.

6.4.1 Process the sample delivered to the laboratory.

6.4.2 The lab supervisor shall assign the laboratory technicians who meet the requirements of the Independent Assurance Program described in the project Quality Assurance Program to perform laboratory testing.

6.4.3 The assigned technician shall perform the assigned laboratory tests in accordance with the required test procedures.

6.4.4 If a laboratory test fails, immediately notify the lab supervisor, and the designated quality representative(s) of the Contractor of the failed test results.

or his or her authorized designated designee

6.4.5 If the materials or work represented by the failing test is accepted by the Construction Manager, ~~or his or her authorized designee, such as a Resident Engineer,~~ by the use of engineering judgment in accordance with the Construction Manager Acceptance Decision Delegation authorized by NTTA, ~~QM-09-A4~~, document Construction Manager's acceptance decision, along with basis for same within the laboratory test form.

CON-07-A3

6.4.6 If the materials or work represented by the failing test is rejected by the Construction Manager, when specifications do not allow any additional provisions to rectify, the Construction Manager shall create an NCR in accordance with ~~QM-09~~.

or Resident Engineer

CON-07

6.5 Document Test Data and Results – The Testing Technician shall:

6.5.1 Record test data and results on the appropriate form listed in Section 9.0 "Component Documents" for the test performed.

6.5.2 Upon completing each test, review the test data, calculations, and results

6.5.3 Sign and date the completed worksheet and submit the completed worksheet to the designated supervisor.

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 7 of 14
Title: Sampling, Testing and Reporting Requirements		

6.6 Supervisor Review and Approval – The Laboratory designated Supervisor shall:

6.6.1 Review the completed test worksheet for completeness and accuracy of recorded data and CVL, compliance with material testing procedure, and comparison of the test results with the specification requirements. If errors are found, confer with the Testing Technician to determine correct data and have errors corrected on the form.

6.6.2 If errors are found, have the technician correct the form content.

6.6.3 Sign and date the completed form and give to data entry personnel.

6.7 EDMS Data Entry and Review

6.7.1 A data entry person shall use the supervisor approved test data located on the form, and enter all required data into the EDMS.

6.8 EDMS Test Report Technical Review - the Laboratory designated Supervisor shall:

6.8.1 Perform quality control review of the test data entered into the EDMS for completeness and accuracy, against the data entered on the form(s).

6.8.2 When errors are found, send the record with inaccurate or incomplete information through the EDMS correction workflow with comments necessary to accomplish the correction.

6.8.3 If no errors are found, perform technical review of sample and test data and results within the EDMS workflow.

6.8.4 If technical errors are found, send records through the EDMS correction workflow with necessary correction comments.

6.8.5 If no errors are found, send the record through the EDMS Engineering Authorization workflow with a workflow comment indicating compliance with specification requirements.

6.9 EDMS Test Report Authorization by Laboratory Engineer

6.9.1 Follow the EDMS workflow to perform an engineering review of test data and results.

6.9.2 Authorize the test report as pass or fail and close the EDMS workflow.

6.9.3 If a field or laboratory test deviates from the specification requirements but the work or materials represented by the test have been accepted by the Resident Engineer or Construction Manager by the use of engineering judgment, in accordance with Construction Manager Acceptance Decision Delegation authorized by NTTA, ~~QM-09-A4~~, or the failing test result has been accepted by the NTTA Engineer, forward the test report to the Construction Manager through the EDMS workflow.

or Resident Engineer
CON-07-A3

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 8 of 14
Title: Sampling, Testing and Reporting Requirements		

6.10 EDMS Test Report Authorization by Construction Manager or Resident Engineer

6.10.1 Follow the EDMS workflow to perform an engineering review of test data and results.

Construction Manager or Resident Engineer

6.10.2 If the ~~CM~~ decides not to accept the test deviating from the spec. requirements by using engineering judgment, authorize the test report with a "Fail" stamp code and close the EDMS workflow, if specifications do not allow any additional provisions to rectify the failing condition, then the Construction Manager shall also create an NCR in EPDS in accordance with ~~QM-09~~.

or Resident Engineer

CON-07

6.10.3 If a field or laboratory test deviates from the specification requirements but the work or materials represented by the test have been accepted by the Resident Engineer or Construction Manager by the use of engineering judgment in accordance with the Construction Manager Acceptance Decision Delegation authorized by NTTA, ~~QM-09-A4~~, document such engineering judgment decisions along with basis for same within the EDMS workflow, authorize the test report using an "Engineer Decision" stamp code, and close the EDMS workflow.

CON-07-A3

6.10.4 If the test deviating from the specification requirements is subject to the NTTA Engineer's final acceptance decision, forward the test report to the NTTA Engineer through the EDMS workflow.

6.11 EDMS Test Report Authorization by NTTA Engineer

6.11.1 Follow the EDMS workflow to perform an engineering review of test data and results.

6.11.2 If the NTTA Engineer decides not to accept the test deviating from contract requirements by using engineering judgment, authorize the test with a "Fail" stamp code and close the EDMS workflow, if specifications do not allow any additional provisions to rectify the failing condition, then the NTTA Engineer shall request the Construction Manager to also create an NCR in EPDS in accordance with ~~QM-09~~.

CON-07

or Resident Engineer

6.11.3 If a field or laboratory test deviates from the specification requirements but the work or materials represented by the test have been accepted by the NTTA Engineer by the use of engineering judgment authorize the test report using an "Engineer Decision" stamp code, document the basis for the engineer's decision in EDMS workflow, and close the EDMS workflow.

6.12 Nonconformance Management by Construction Manager

6.12.1 All tests authorized with "Fail" stamp code are automatically captured and compiled into the Failing Test Logs within the EDMS.

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 1 2 Issue Date: 08/25/2010 TBD	Page 9 of 14
Title: Sampling, Testing and Reporting Requirements		

- 6.12.2 Initiate, process and close, within EPDS, NCR's for failing tests in which specifications do not allow any additional provisions to rectify in accordance with ~~QM-09~~, *CON-07* NCR Control of Nonconforming ~~Product - Construction~~.
Items during
- 6.12.3 Upon the NCR closure, change the status of the failing test report from "Pending" to "Closed" in the EDMS Failing Test Logs.

7.0 REGULATORY REQUIREMENTS

Code of Federal Regulations 23 CFR 637(B)
FHWA Technical Advisory T6120.3

8.0 RELATED BOARD POLICY

N/A

9.0 COMPONENT DOCUMENTS

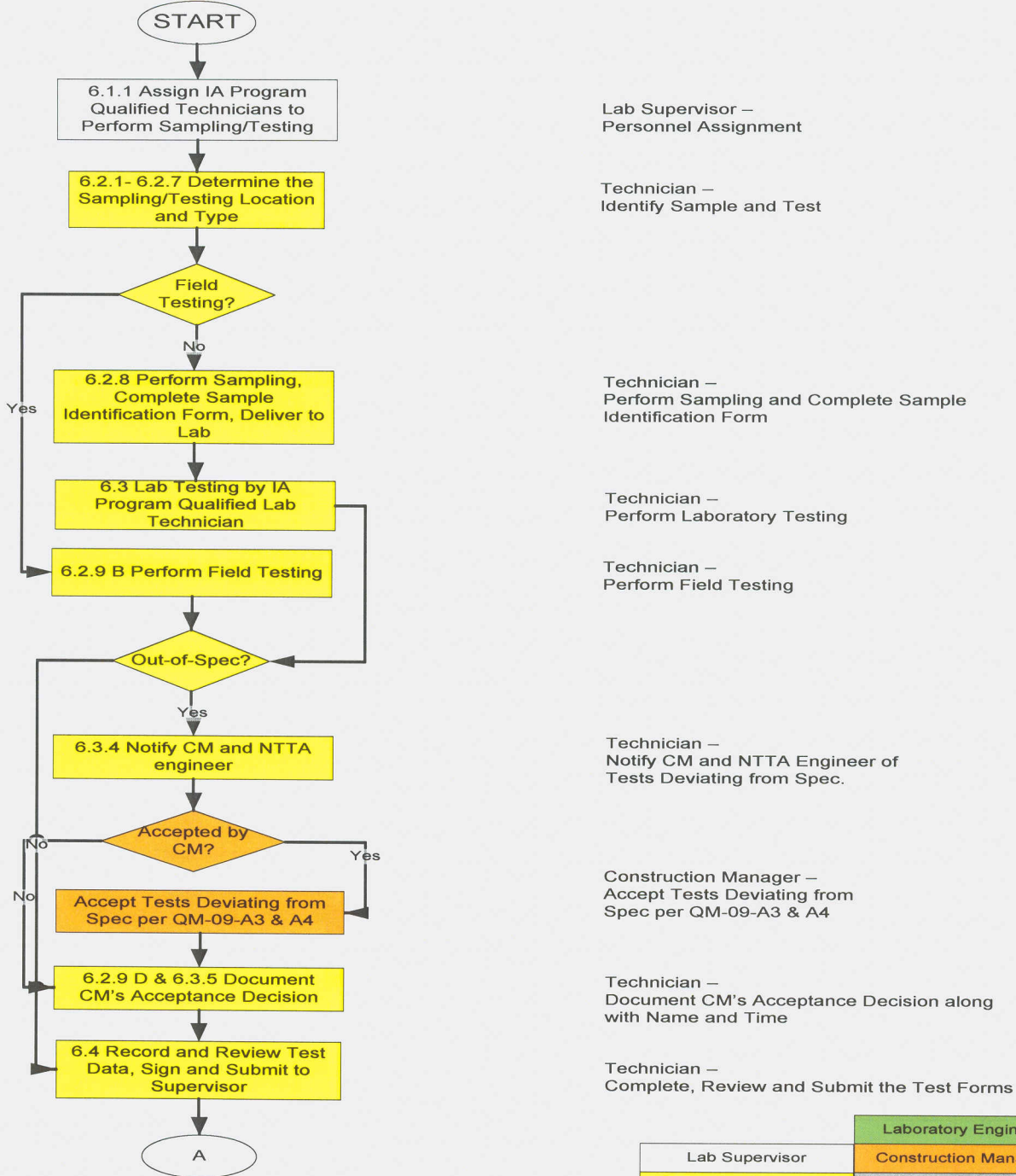
- CRV-02 Random Sampling Requirements
- CRV-01-A1 Attachment A Sample and Test Identification System
- CRV-01-F1 Sample Identification Form
- CRV-01-F2 Determining Moisture Content in Soils (Tex-103-E)
- CRV-01-F3 Atterberg Limits and Bar Linear Shrinkage (Tex-104, 105, 106, 107-E)
- CRV-01-F4 Particle Size Analysis of Soils and Base Materials (Tex-101, 110, 111-E)
- CRV-01-F5 Sieve Analysis of Select Retaining Wall Backfills (Tex-101, 110, 111-E)
- CRV-01-F6 Determination of Moisture-Density Relationship (Tex-113, 114-E)
- CRV-01-F7 Field Nuclear Density Form (Tex-115-E)
- CRV-01-F8 Wet Ball Mill (Tex-116-E)
- CRV-01-F9 Triaxial Compression for Soils and Base Materials - Molding & Triaxial Compression (Tex-117-E)
- CRV-01-F10 Triaxial Compression of Soils and Base Materials - Molding & Capillary Wetting (Tex-117-E)
- CRV-01-F11 Soil pH (Tex-128-E)
- CRV-01-F12 Measuring Soil Resistivity (Tex-129-E)
- CRV-01-F13 Determining Thickness by Direct Measurement (Tex-140-E)
- CRV-01-F14 Sieve Analysis HMA Coarse Aggregates (Tex-200-F)
- CRV-01-F15 Sieve Analysis HMA Fine Aggregates, Rap and Mineral Filler (Tex-200-F)
- CRV-01-F16 Sieve Analysis Surface Treatment Aggregate (Tex-200-F)
- CRV-01-F17 Sand Equivalent Test (Tex-203-F)
- CRV-01-F18 Density of Compacted Bituminous Mixtures (Tex-207-F, Parts I & VI)
- CRV-01-F19 Decantation Test for HMA Aggregate (Tex-217-F)

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 <u>TBD</u>	Page 10 of 14
Title: Sampling, Testing and Reporting Requirements		

- CRV-01-F20 Rice Specific Gravity of Bituminous Mixtures (Tex-227-F)
- CRV-01-F21 Sieve Analysis of Concrete Coarse Aggregate (Tex-401-A)
- CRV-01-F22 Sieve Analysis and Fine Modulus of Concrete Fine Aggregate (Tex-401, 402-A)
- CRV-01-F23 Decantation Test for Concrete Aggregate (Tex-406-A)
- CRV-01-F24 Organic Impurities in Fine Aggregate for Concrete (Tex-408-A)
- CRV-01-F25 Soundness of Aggregate Using Sodium/Magnesium Sulfate (Tex-411-A)
- CRV-01-F26 Deleterious Material in Mineral Aggregate (Tex-413-A/ASTM C142)
- CRV-01-F27 Concrete Sampling and Testing Form
- CRV-01-F28 Determining Pavement Thickness by Direct Measurement (Tex-423-A)
- CRV-01-F29 Compressive Strength of Concrete Cores (Tex-424-A)
- CRV-01-F30 Bridge Deck and Mass Placement Truck Log
- CRV-01-F31 Determining Bridge Deck/Culvert Top Slab Concrete Thickness and Reinforcement Cover by Direct Measurement (Tex-423-A, Part II)
- CRV-01-F32 Determination of Moisture Content – Density Relationship (ASTM D698/D1557)

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 11 of 14
Title: Sampling, Testing and Reporting Requirements		

10.0_FLOWCHART

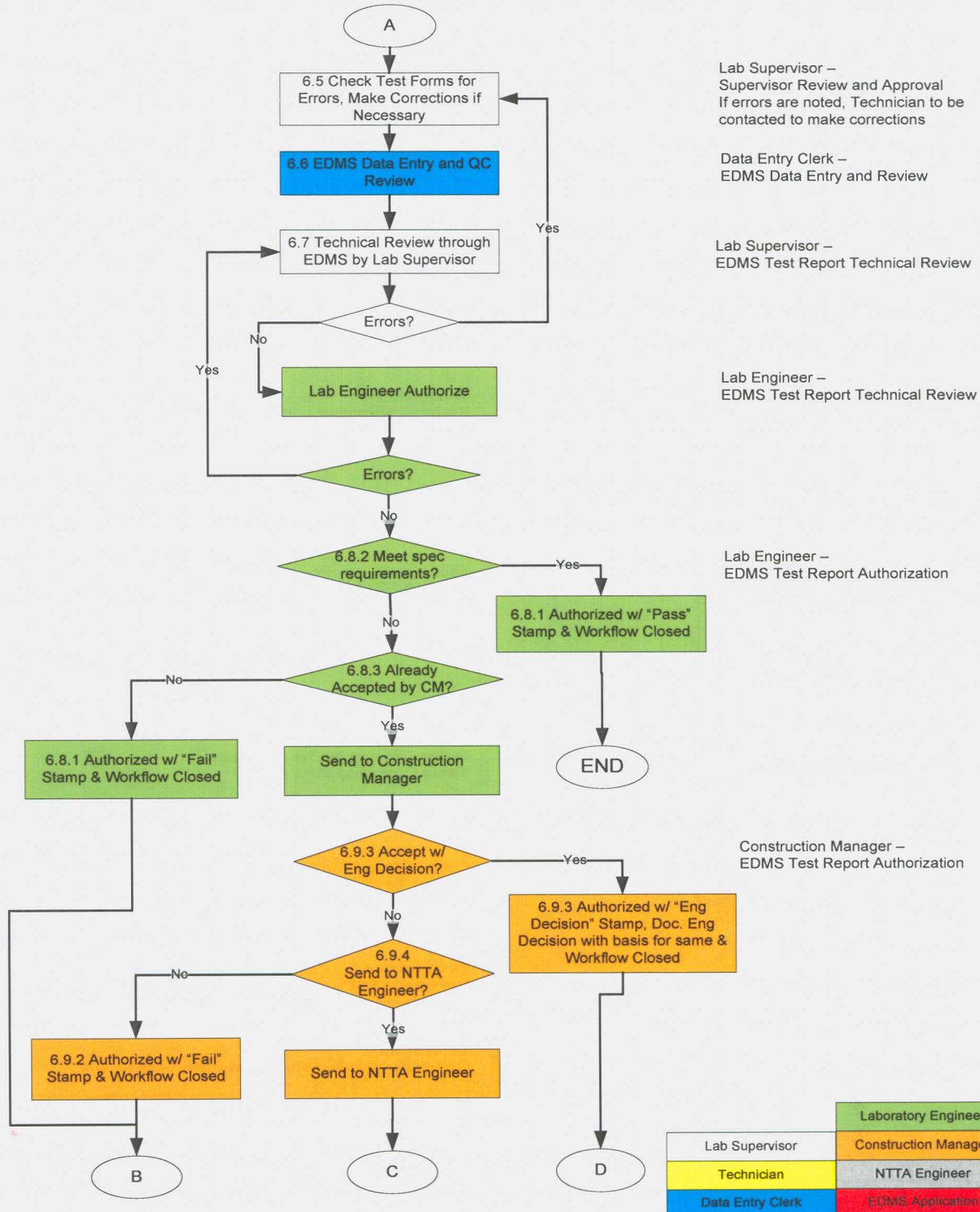


	Laboratory Engineer
Lab Supervisor	Construction Manager
Technician	NTTA Engineer
Data Entry Clerk	EDMS Application

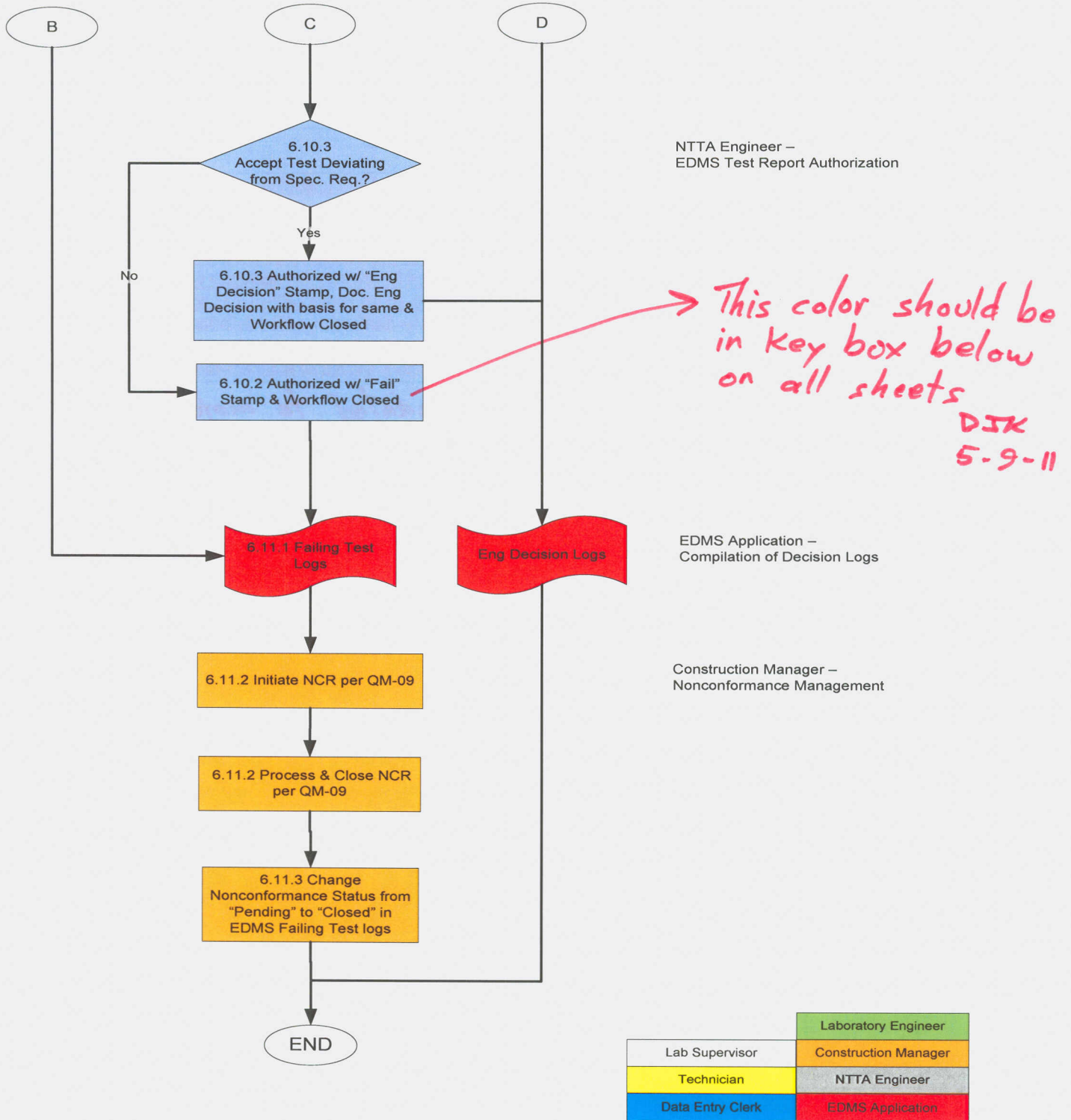
change to Construction Manager or Resident Engineer

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NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 12 of 14
Title: Sampling, Testing and Reporting Requirements		



NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 1 2 Issue Date: 08/25/2010 TBD	Page 13 of 14
Title: Sampling, Testing and Reporting Requirements		



NTTA Projects	Original Issue Date: 12/11/2009	CRV-01
Resource: Contract Requirements Verification	Revision 12 Issue Date: 08/25/2010 TBD	Page 14 of 14
Title: Sampling, Testing and Reporting Requirements		

11.0 REVISION HISTORY

Revision	Revised by:	Date Issued	DRN	Reason for Revision
0	John Roberts	12/11/2009	10067	Original Issue
<u>1</u>	<u>Frank Yuan</u>	<u>08/25/2010</u>	10232	<u>Added detail for clarification, added definitions of fixed and random samples, detailed Constr Mgmt requirements related to failing test reports and added linear flowchart.</u>
<u>21</u>	Frank Yuan ✗ <i>David Kestudik</i>	048/3025/20110 TBD	????? 10232 10319	Revised Form CRV-01-F26 to include ASTM C142 test method for concrete fine aggregate deleterious material testing, added Forms CRV-01-F31 and CRV-01-F32. Added detail for clarification, added definitions of fixed and random samples, detailed Constr Mgmt requirements related to failing test reports and added linear flowchart.

Updated to match new CON-07 procedure for construction NCRs; Added Construction Manager or Resident Engineer in place of CM



NORTH TEXAS TOLLWAY AUTHORITY

Original Release (Proposed)

QMS MANUAL

Form

NTTA Projects	Original Issue Date: 04/30/2011	CRV-01-F31
Resource: Contract Requirements Verification	Revision 0 Issue Date: TBD	Page 1 of 2
Title: Determining the Concrete Thickness and Depth of Reinforcing Steel in Fresh Hydraulic Cement Bridge Decks and Culvert Top Slabs (Tex-423-A Part II)		

Project: _____ Test Group: (Project) (OV) _____

Test ID: _____ Concrete Mix Code: _____

Bridge/Culvert # : _____ Sample Type: (RI) (RS) (FI) (FS) _____

Split Test ID: _____

Measurement #	Bent #		Transverse Location	Longitudinal Location	Alternate Location	Direct Measurement		Split Sample Measurement #
	Backward	Forward				Depth of reinforcing steel (in)	Thickness of Bridge Deck or Culvert Slab (in)	
1			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
2			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
3			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
4			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
5			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
6			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
7			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
8			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
9			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
10			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
11			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
12			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
13			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
14			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			
15			LCR	0 1/4 1/3 1/2 2/3 3/4 1	Yes			

Notes: (1) Use backward and forward bent #s to identify the bridge deck span. (2) Transversal Locations: L-Left side of the span, C-centerline of the span, and R - Right side of the span. Longitudinal locations are related to the span length. (3) If measurements occur at locations different from specified in Tex-423-A Part II, circle Yes in the corresponding Alternate Location cells and identify locations in the Remarks field. (4) Use Split Test ID and Split Test Measurement #'s to identify split measurements performed by the other laboratory. (5) Use Page 2 for measurements over 15.

Remarks:

Tested By: _____ Tested Date: _____

Reviewed By: _____ Reviewed Date: _____

NTTA Projects	Original Issue Date: 04/30/2011	CRV-01-F32
Resource: Contract Requirement Verification	Revision 0 Issue Date: TBD	1 page
Title: Determination of Moisture-Density Relationship (ASTM D698 or ASTM D1557)		

Sample Identification #: _____

Test Procedure (Check One): ASTM D698 ASTM D1557

Tex-101-E, Part II: Preparing Samples for Compaction and Triaxial Tests

Sieve Size	1-3/4" (Optional)	1-1/4" (Optional)	3/4"	3/8"	No. 4	Minus No. 4
Ind. Retained Wgt (lbs)						
Individual % Retained						% Minus No. 4
Cumulative % Retained						
Total Weight of Sample (lbs)						

Prepared By: _____ Date: _____

Laboratory Determination of Moisture - Density Relationship (Proctor Curve)

Compaction Method: Method A Method B Method C

Test Point #	1	2	3	4	5	6
Water Added (%)						
Wet Mass of Compacted Specimen + Mold (lbs)						
Tare Mass of Compaction Mold (lbs)						
Weight of Molded Specimen (lbs)						
Volume of Compacted Specimen (cf)						
Wet Density (pcf)						
Tested By						
Tested Date						
Can #						
Wet Mass of Compacted Sample + Can (g)						
Dry Mass of Compacted Sample + Can (g)						
Mass of Water (g)						
Tare Mass of the Can (g)						
Mass of Dry Sample (g)						
Moisture Content (%)						
Dry Density (pcf)						
Use This Point for Regression?	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No	Yes / No

Interpreted Maximum Dry Density (pcf) _____ Interpreted OMC (%) _____

Apply Oversize Aggregate Correction? Yes No If yes, the oversize aggregate size: No. 4+ 3/8"+ 3/4"+

Oversize Agg. Percentage (P_c, %): _____

Oversize Agg. Bulk Specific Gravity (G_m): _____

Oversize Agg. Absorption (A_c, %): _____

Corrected MDD (pcf):
 $(6240 * MDD * G_m) / [(MDD * P_c) + 62.4 * G_m (100 - P_c)]$

Corrected OMC (%):
 $[OMC * (100 - P_c) + A_c * P_c] / 100$

Tested By: _____

Tested Date: _____

Reviewed By: _____

Reviewed Date: _____

NTTA Projects	Original Issue Date: 12/11/2009	CRV-01-F26
Resource: Contract Requirements Verification	Revision 1 Issue Date: TBD	1 page
Title: Deleterious Material in Mineral Aggregate (Tex-413-A/ASTM C142)		

Sample ID: _____

Tex-413-A Method for a Single Determination (Samples Retained on the No. 4 Sieve)

Dry Mass of Total Test Sample Retained on the No. 4 Sieve, W_T (g)

Mass of Clay Lumps, W_1 (g)

Mass of Shale, W_2 (g)

Mass of Soft or Friable Particles, W_3 (g)

Mass of Laminated Particles, W_4 (g)

Percent Deleterious, $100(W_1+W_2+W_3+W_4)/W_T$

**ASTM C142 Method for Clay Lumps & Friable Particle Determination
(on Samples Retained on the No. 16 Sieve, Used for Fine Aggregates)**

Dry Mass of Total Test Sample Retained on the No. 16 Sieve, M (g)

Dry Mass of Particles Retained on the No. 20 Sieve After Washing, R (g)

Percent of Clay Lumps and Friable Particles, $[(M-R)/M \times 100]$ (%)

Remarks:

Tested By: _____

Tested Date: _____

Reviewed By: _____

Reviewed Date: _____