

FHWA Review on NDDOT's Quality Assurance Program

By

Gary Goff, Transportation Engineer
North Dakota Division of FHWA



Quality Assurance

Quality Assurance Program

- Required on all Federal-aid highway construction projects on the NHS (23 CFR 637).
- Implementation to begin by 1997.



The Elements of a QA Program

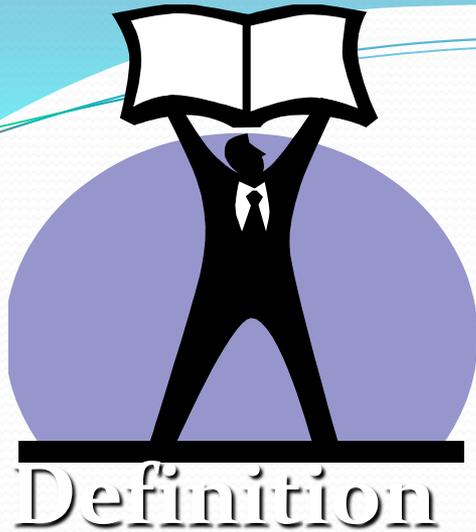
<http://www.fhwa.dot.gov/federal-aidessentials/catmod.cfm?id=16>

Quality Assurance Program

- Contractor QC
- Agency Acceptance
- Agency Independent Assurance
- Dispute resolution
- Laboratory accreditation and qualification
- Personnel qualification and certification

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Acceptance

Includes all factors used by the agency to:

- Evaluate the degree of compliance with contract requirements
- Determine the corresponding value for a given product

Agency Responsibility for Acceptance

- All Acceptance decisions must be made by the agency
- Contractor QC data **may be included** in the final Acceptance determination



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Independent Assurance



Unbiased and independent evaluation of all the sampling and testing (or inspection) procedures used in the Quality Assurance Program

Responsibility for IA



- IA is performed by the agency or its designated agents
- IA personnel and equipment are not directly involved in Acceptance activities

Scope of IA Activities

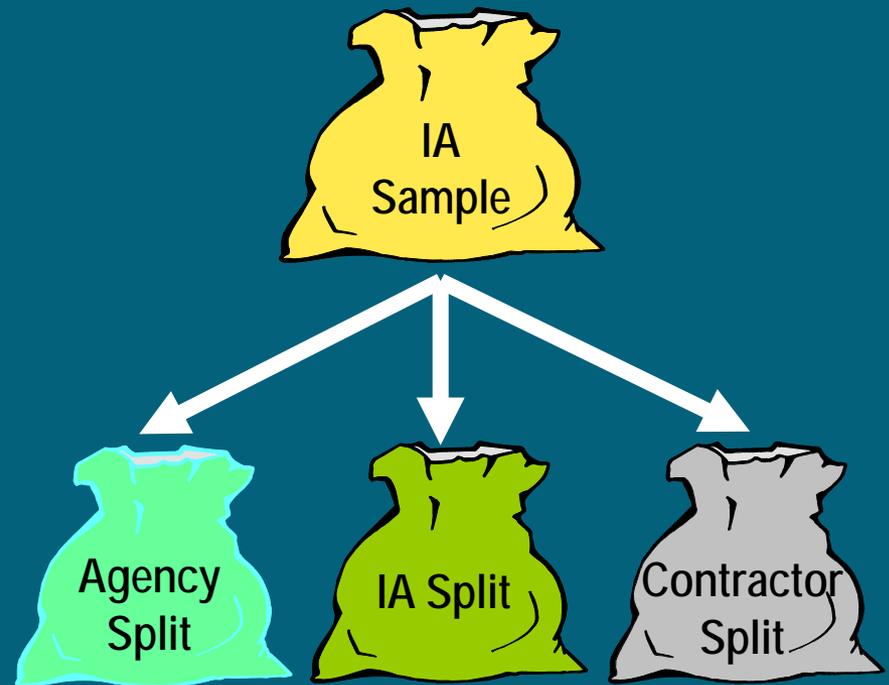
- Provide an assessment of personnel proficiency and equipment for both agency and contractor
- Traditionally focus on sampling and testing
- May also be applied to inspection activities



Use of Split Samples for IA

Using split samples for independent assurance:

- Identifies discrepancies or variability in sampling, testing, or equipment
- Eliminates other sources of inherent variability



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Quality Assurance Process Review 2014-2015

Selection of Projects for Review

- 53 Projects were selected for CAP (Compliance Assessment Program) in 2014
- Originally all 53 projects were to be reviewed using the Material Quality Review Guide
- Only 10 of the 53 projects were ultimately selected for review

10 Projects Selected for Review

1 – State Administered on the NHS

5 – State Administered on Non-NHS

4 – LPA Administered (1 of the 4 was an ER project)

*Note: Projects were constructed using 2008 NDDOT
Standard Specifications*

Quality Assurance Program Review

- There were 4 Observations based on 21 findings
- Most findings were based on source documentation and conversations with project staff in order to answer individual questions on the form
- Final answers to the individual questions on the form did not necessarily lead to a finding

Summary of results recorded on individual CAP Material Quality reports

Projects	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9	Question 10	Question 11
BRC-4613(052)	Yes	No	Don't Know	Yes	Yes	Yes	N/A	N/A	Yes	Yes	No
SU-5-983(049)049	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	Yes	Yes	No
NH-SHE-1-083(106)128	Yes	N/A	Yes	Yes	No						
CER-1039	N/A	N/A									
SC-2500(014)	N/A	No									
SS-1-036(026)000	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	Yes	N/A	Yes
SS-2-011(028)035	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A	Yes	N/A	No
SS-1-024(020)007	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No
AC-SU-SS-8-984(140)143	Yes	Yes	No	Yes	No	No	N/A	N/A	Yes	N/A	No
SC-5300(013)	Yes	No	No	Don't Know	Yes	Yes	N/A	N/A	Yes	Yes	No

Question 1	Is all sampling and testing data used in the acceptance decision for a major item of work executed by qualified sampling and testing personnel?
Question 2	Is all testing used in the acceptance decision for a major item of work performed by qualified laboratories?
Question 3	Are material samples used in the acceptance decision randomly selected based?
Question 4	Are the State's required IA activities being performed?
Question 5	Was all of the required testing used in the acceptance decision completed in accordance with the frequency guide schedule specified in the State's Quality Assurance Program?
Question 6	Did the required testing meet specification requirements?
Question 7	Are verification samples taken independently of the QC samples?
Question 8	For asphalt pavement was the required process completed to validate that the verification results compare to QC results?
Question 9	Are employees of the SHA or their designed agent performing verification sampling and testing?
Question 10	If a non-SHA laboratory for asphalt only is used for testing, did it perform only one type of testing (QC, QA, IA, or dispute resolution)?
Question 11	Were the manufactured materials incorporated into this project accepted using the methods in the approved QA program?

Observation #1

It was discovered that the NDDOT Field Sampling and Testing Manual approved by FHWA North Dakota Division on August 7, 2012 was not current with FHWA regulations as it pertains to the QA program. Therefore, the FHWA North Dakota Division shares responsibility of the NDDOT adopted procedures not fully satisfying the federal regulations in three main areas. The three main areas are deficiencies in documentation, inadequate sampling and testing verification through the IA process for NHS projects, and accepting materials by certification that do not meet the contract specification.

Observation #2

Three projects had sampling and testing procedures that were not in compliance with NDDOT procedures. These projects were all non-NHS projects. It was found that the NDDOT procedures were not followed for IA, collecting samples by random method, and conducting specified tests.

Observation #3

Based on the findings of this review some best practices that NDDOT should consider adopting are: consistent procedures for sampling bitumen (regardless of type of laboratory on the project), specify minimum number of verification tests, not using the average of test results from a single sample for acceptance, require sampling and testing on emergency repair materials that may be permanently incorporated into a project, and forming or joining a multi-state emulsion user group.

Observation #4

A couple of this review's findings have been resolved by the NDDOT and are or will be implemented in the 2015 construction year. The 2014 NDDOT Standard Specifications and revised section 430 of the FS&T manual resolved these findings.

Action Plan

Observation	Action	Recommendation	Responsible Party	Due Dates
1-A	Required	Document qualification of laboratories	NDDOT M&R	May 31, 2016
1-B	Required	FS&T manual updated to include IA for LPA NHS projects	NDDOT M&R	May 31, 2016
1-C	Required	Document random sampling by field personnel	NDDOT M&R	May 31, 2016
1-D	Required	Document sample with corresponding lot	NDDOT M&R	May 31, 2016
1-E	Required	Document validation of QC, QA, and IA results	NDDOT M&R	May 31, 2016
1-F	Required	Revise manufactured material certification procedure	NDDOT Const. Services and FHWA	May 31, 2016
1-G	Required	Revise IA procedure in section 420.02 of the FS&T manual	NDDOT M&R	May 31, 2016
1-I	Required	Revise IA procedure in section 210.1 of the FS&T manual	NDDOT M&R	May 31, 2016
1-J	Required	Revise section 550 of the FS&T manual to require random sampling	NDDOT M&R	May 31, 2016
1-K	Required	Revise IA procedure in section 550.02B of the FS&T manual	NDDOT M&R	May 31, 2016
2-A	Required	IA procedure if there is no field laboratory (section 410)	NDDOT M&R	May 31, 2016
2-C	Required	Validate uniformity of fresh concrete as specified in 802.01 F(5) of specifications	NDDOT M&R	May 31, 2016
3-A	Best Practice	Add requirement for sampling of bitumen in section 420.03 of the FS&T	NDDOT M&R	May 31, 2016
3-B	Best Practice	Section 420.1 of FS&T, minimum verification test per day	NDDOT M&R	May 31, 2016

Action Plan Summary

Documentation

- Qualification of field laboratories
- Random sampling
- Representative samples/test results for corresponding lots
- Validation of QC, QA, and IA results

Action Plan Summary (Cont.)

Revisions to Field Sampling and Testing Manual

- Include IA for LPA projects on the NHS
- IA procedure in Section 420.02 (require splitting of aggregate samples)
- IA procedure in Section 210.1 (require splitting of foundation fill)
- Add random sampling to Section 550
- IA procedures in Section 550.02B
- IA procedure in Section 410 (no field lab)
- Add requirement for sampling of bitumen in Section 420.03 (no field lab)
- Add minimum verification test per day in Section 420.1

Section 210 Structural Excavation/Fill/Foundation

Section 410 Superpave, Hot Bituminous Pavement

Section 420 Bituminous Seal Coat

Section 550 Rigid Pavement

Action Plan Summary (Cont.)

Changes to Specification

- Premanufactured material certification procedures (Section 106.01)
- Uniformity of fresh concrete Section 802.01 F(5)



Questions?