



Great River Road

FHWA Wisconsin Division

Quality Assurance Update WisDOT Spring Training 2021



JAMES PFORR

Pavement and Materials / Asset Management Engineer



Learning Objectives

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- What is Quality Assurance
- History of Quality Assurance Specifications
- Core elements of a Quality Assurance Program





Quality Assurance Definition

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AASHTO R10 & TRB Circular E-C235

Quality Assurance (QA) – All those planned and systematic actions necessary to provide confidence that a product or facility will perform satisfactorily in service





Early Days

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- Method type specs
- Late 1950s-early 1960s AASHO Road Test
- 1960s Blatnik Investigations
 - Fraud/corruption
 - Procedures not followed
 - NBC Nightly news
 - Proposed to give interstate program administration to USACE
- Program and Procedures Manual Federal Regulation
 - Progress record samples
 - Final record samples





1970's

- Experimentation with QA specs
- Federal-Aid Highway Program Manual
 - Delete final record samples
 - Replace progress record samples with Independent Assurance
 - Certification Acceptance



1990's



- 1991 Federal-Aid Highway Program Guide
 - Require central laboratory to be inspected
 - Require Acceptance testing to be performed by State or representative
- Early 1990's
 - Some Upper Midwest States began to use contractor QC test results
- 1995 New QA Federal Regulations (23 CFR 637)
 - Allow use of validated contractor QC test results as part of agency acceptance decision
 - Central laboratory accredited
 - Labs qualified
 - Personnel qualified





QA Program

23 CFR 637

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- §637.205 Policy.
 - Each STD shall develop a quality assurance program to assure conformance with approved specifications
 - Materials
 - Workmanship
 - Each QAP must provide:
 - Acceptance Program of finished product
 - Independent Assurance Program





QAP Core Elements

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Increasing Risk

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- QA Regulations largely unchanged since 1995
 - Increasingly difficult to find experienced construction staff
 - Reluctance to spend money on engineering / testing
 - Increasing volume of projects / workload
 - Increasing use of consultants
- Increasing Risk → Risk-Based Stewardship and Oversight (RBSO)



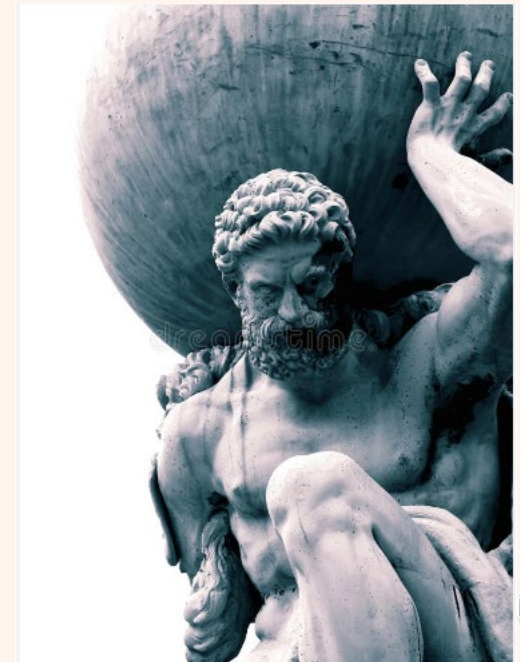


Why is QA Important?

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Approximately 50% of the construction dollar is spent for the PURCHASE of materials.

- 2019 WisDOT Construction = \$1.18 Billion
- Materials = \$590 Million

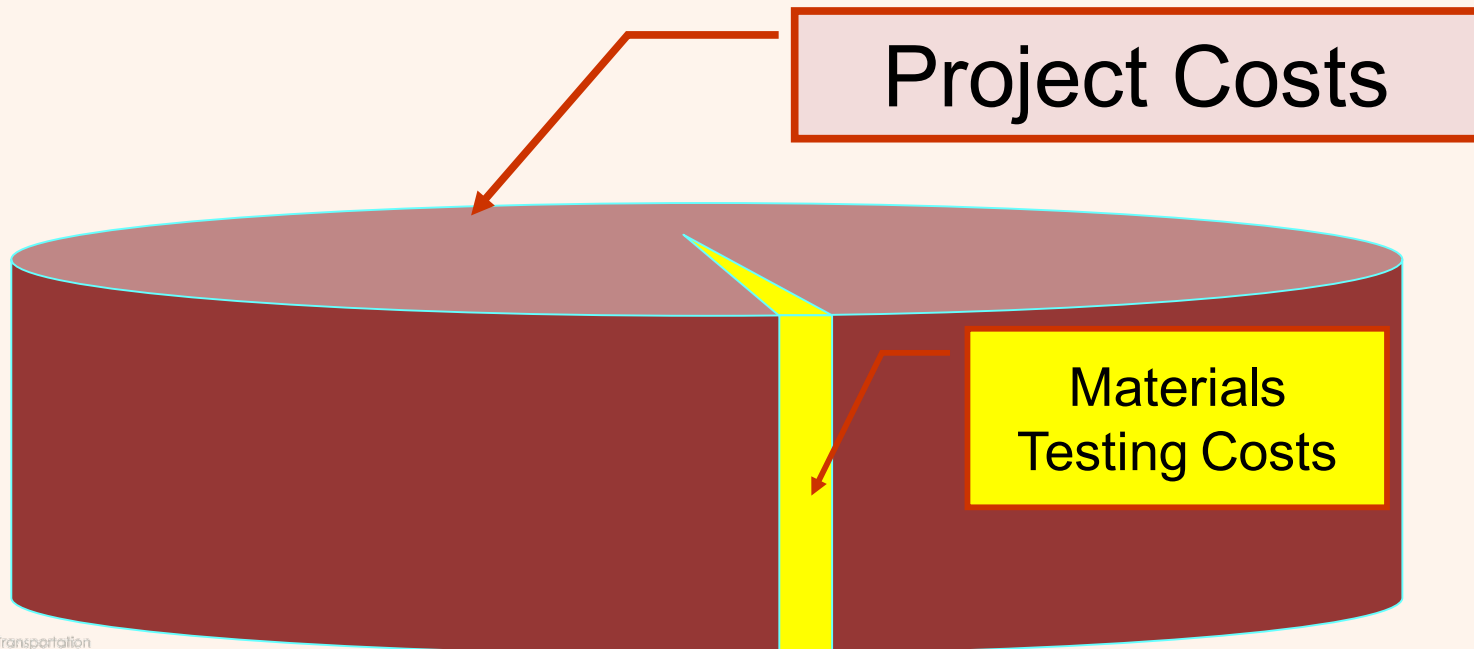




Need for Testing

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Materials Testing Costs are Small Yet
Critically Impacts the Quality of the
Whole Project





Quality Control (QC)

The system used by a contractor to monitor, assess and adjust their production or placement processes to ensure that the final product will meet the specified level of quality.





Contractor Responsibility for QC

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- QC responsibility/risk is assigned completely to contractor under QA
- Party producing/placing the product best to exercise QC
- Agency responsible for assuring QC takes place





Acceptance Program

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- Acceptance Program. All factors that comprise the Agency determination of the quality of the product as specified in the contract requirements.
- These factors include:
 - verification sampling
 - testing
 - inspection





Acceptance Function

- Acceptance is not focused on directing the methods used to achieve conformance
- The primary objectives of agency acceptance are:
 - Measure the Quality of all materials produced and placed by the contractor
 - Determine the corresponding payment the contractor should receive



Acceptance Function

- Quality measurement is achieved through three general acceptance activities:
 - Monitoring the adequacy of contractor QC activity
 - Performing acceptance inspection to identify visually deficient work
 - Performing Acceptance sampling and testing for key quality characteristics
- Agency is obtaining information to confirm that all products meet the specified quality level





Acceptance System Approaches

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- Sufficient information needed to make acceptance determination
- The decision starts with agency acceptance tests
- Two general approaches applied to testing data:
 - Use agency acceptance test data only
 - Use contractor QC test if statistically validated by agency data
 - F-test for variances
 - t-test for means





Consultants for Testing and Inspection

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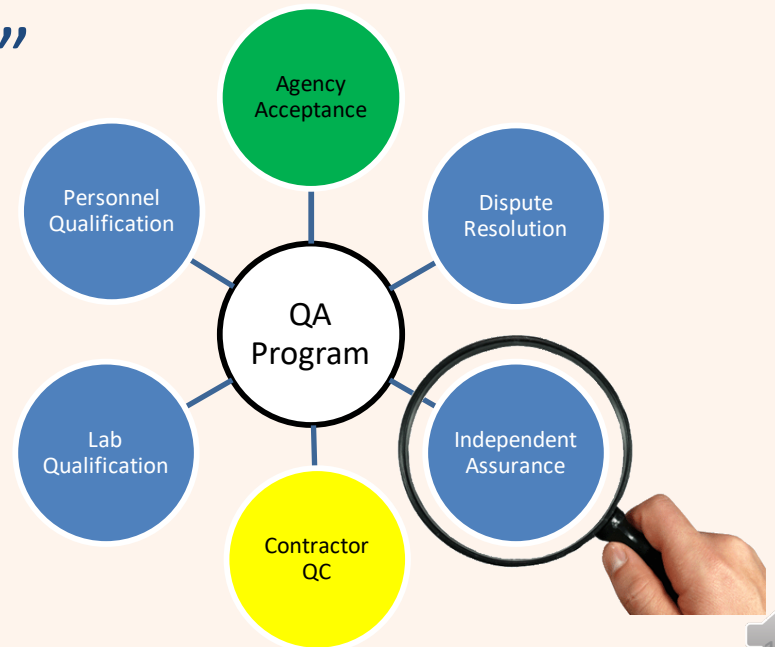
- Agency retains project responsibility
- Consultant conflict of interest – exclusive project roles
 - Agency verification
 - Independent assurance
 - Contractor QC
 - Dispute resolution



Independent Assurance

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Independent Assurance - “Activities that are an unbiased and independent evaluation of all the sampling and testing procedures used in the Quality Assurance Program”





Independent Assurance

- Performed by Agency or Designated Agent personnel who are not directly responsible for project Acceptance sampling and testing
- Provides periodic independent evaluation of QC and Acceptance personnel and their equipment
- **Not used to make a determination of work quality or acceptability**



Scope of IA Activities

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- Technician procedure evaluation
 - Observation
 - Split samples
 - Proficiency samples
- Testing equipment evaluation
 - Calibration checks
 - Split samples
 - Proficiency samples





Laboratory Accreditation/Qualification

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- Accreditation required
 - Agency central lab
 - Consultant labs
 - dispute resolution
 - independent assurance
- Qualification required
 - Testing labs used in acceptance decision
 - Agency verification testing
 - Contractor QC testing





Technician Qualification/Certification

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- Required for all sampling & testing in acceptance decision
- Qualification programs
 - State programs (HTCP)
 - Regional partnerships
 - National programs



Dispute Resolution

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- Formal system designed to address significant differences between agency and contractor data of such magnitude to impact payment
- Required when contractor data used in acceptance decision
- Can be performed
 - Entirely within the State DOT
 - Accredited third party laboratory





QA is a Contagious

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- Maintain a culture of quality
 - Lead by example
 - If you don't know, ask
 - Maintain open communication
 - If you see something, say something
 - Ensure accountability and transparency



Questions

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James Pforr

Pavement & Materials / Asset Management
Engineer

FHWA Wisconsin Division

(608) 829-7522

James.Pforr@dot.gov