National Concrete QA Program

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Why

• 23CFR637
• States move to QA
• No existing leadership for concrete QA
• FHWA National QA reviews
• MaineDOT QA evaluation

• Inspector General Report: June 2007
  – Quality Assurance in Materials and Construction
  – Development of guidelines
  – Results from Central Artery Tunnel Project
Common Measurables

Concrete
- Strength
- Air
- Cover
- Chloride Permeability
- w/c ratio

HMA
- Density
- AC content
- Volumetric properties
- Rideability
Some Non-measurables

- Curing
- Cold weather practices
- Hot weather practices
- Consolidation
- Stockpile management
- Workmanship
Quality Assurance for Concrete

--Issues--

• Non-measurables; impact on quality
• Industry issues
• Statistical issues
National Concrete QA Program Team

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Objectives

• Provide agencies/contractors with guidelines for QA programs, including QC and acceptance procedures
• Utilize pooled fund Testing Guide
• Develop companion Inspection Guide
• Maximize use of FHWA Mobile Concrete Lab
• Promote concept that QA is more than just testing
• Increase knowledge base of both agency and contractor personnel
Testing Guide

- National Concrete Pavement Technology Center (Iowa St.)
- 17-state pooled fund
- Issued in 2008
- Extensive QC program guidance
- Suggested acceptance program
Inspection Guide

- Elements of the concrete paving process
- What do you check
- What do you test
- Trends and control charts
- Using test results to avoid problems
- Quality is everyone's job
National Concrete QA Program

Ensuring Quality in the Concrete Paving Process

• Not details of all aspects of a QA program
• But it is-
  – Why should you care
  – What’s in it for the agency
  – What’s in it for the contractors
  – Promoting use of concrete pavements
Program Elements

• FHWA Mobile Concrete Lab
  – Testing on an active project for 2 weeks

• Executive Briefing
  – Agency Administrators
  – Contractor Owners

• 2 Day Concrete QA Seminar
  – Reference/guidance materials

• Follow up assistance
FHWA Mobile Concrete Lab

• Comes to an active project before the seminar
• Spend about 2 weeks
  – Running tests on production concrete
  – Demonstrating new equipment
• Data used to illustrate QC and acceptance principles during the seminar
  – Real time data from project
  – Correlated to local materials
  – Statistical analysis provided
  – Spec limits evaluated
Executive Summary

• Day before the seminar
• Agency top management
• Contactor owners, presidents, etc.
• Outline the principles and benefits
• Draw on project data where possible
Concrete QA Seminar

- Two days
- Six modules
- **Free to a state**
- State furnishes the facilities
- Agency engineers, inspectors, and technicians
- Contractor personnel
Module 1
Quality Concepts

• Introduction to QA Concepts
• Define the terminology
• Emphasize that everyone has a stake in quality
  – Real world examples
• Benefits of a comprehensive quality program
  – To agencies and contractors
Module 1
Quality Concepts

- PWL, random sampling, and control charts
  - Concepts, not details
- Link between consistency and quality (performance and service life)
Module 2
How to Achieve Durable Concrete Pavements

• What is needed to achieve durable concrete pavements
• What do we test and inspect
• Why do we test and inspect
• Handouts
  – Testing Guide
  – Inspection Manual
  – Comprehensive list of resources
Module 3
Quality Assurance Program

- Elements of a QA Program
- Specification limits vs. engineering/action limits
- Limits vs. targets
- “Bad” test results vs. bad concrete
- Agency acceptance plan
- Elements of a QC plan
- Maine Specification
MaineDOT’s QC Plan

• Submitted and approved prior to any construction of QA spec items
• Includes all the components of a traditional plan

PLUS

• Contractor’s method of complying with specs for non-measurables that significantly affect quality

Financial penalties for violating QC Plan
Module 3
Quality Assurance Program

- Reliable test data is critical
  - Tester qualification
  - Tester diligence
  - Test procedures
  - Testing equipment
- Communication
- Pre-placement meeting
- Checklists will be discussed and provided
Module 4
Quality Concepts for Mixture Production

- Selecting materials, stockpile management, combining materials, mixing, etc.
- Importance of a good mix design
- How managing risk affects bidding
- How control of the operation gives the contractor competitive advantages
- Project construction planning
Module 5
Quality Concepts for Paving Operations

• Constructing and inspecting concrete pavements
  – Machine set up, stringline, vibrators, curing, sawing, etc.
• ACPA’s Concrete Pavement Field Reference Pre-Paving
• HIPERPAV
• Field Inspection Manual (Text)
Module 6
State Field Data

• Data from mobile lab on local project
• Project quality assessment
  – Testing data
  – Inspection
• Specification analysis
• Feedback to agency and contractor
  – Quality
  – Costs
  – Efficiencies
Resources Provided

- References provided to attendees
  - Testing Guide
  - ACPA: Concrete Pavement Field Reference *Pre-Paving*
  - Inspection Guide
  - Others
Implementation Timeframe

• Program hits the road: Summer 2010
  – State DOT’s can request
  – **Free** of charge

• ACPA Chapters
  – Available next winter
Book now while plenty of good seats still remain!!
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Go Red Sox!