QMP and the Wisconsin DOT

An Overview of HMA Quality Management
(the first decade)

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Wisconsin HMA Time Capsule

- Late 1980s – *fix it, it’s broke!*
- Early 1990s – *while you’re fixing it, make sure you can track it, define it, and fix it faster if we think it’s getting broke again*
- 2000 + – *after you’ve fixed it again, be able to control it enough to not only improve it, but also “predict the future” (performance)*
Age of Science

- Technology presents more interest than just for computers and space travel.

- If you can’t bring the road to the lab, then take the lab out to the roadway
HMA Testing

Rotavapor Recovery

Dynamic Shear Rheometer

Research Studies

HMA Design

0.45 Power Chart

Sieve Size (mm)

% Passing

100
90
80
70
60
50
40
30
20
10
0
Lab & Materials Quality Assurance

Calibration Compliance

Nuclear Density

Materials Tracking System
First Years Challenges

- Statewide Training Program
- Increase Testing Experience and Proficiency
- Additional Cost to Equip Field Labs
- Documentation
- “Find” Some Experts or ... Create Them
Specification Impacts

- Dedicated Plant Staff Personnel
- Additional Department Presence On-Site
- Better Communications
- Contractor Quality Control
- Product Payment Evaluation Process
- Standardized Test Methods and Procedures
Mix Designs

- Equipment
- Test Methods
- New Terminology
- Evaluation of Aggregate Structures
- Contractor Responsibility
- Mix Design Review (Verification Process)
Field Production

- Laboratories
  - Plants
  - Districts

- Common Language
- Wider Troubleshooting Knowledgebase

- Capability to Limit Production of Substandard or Non-Compliant Materials
Database

- Materials Tracking System
- Department/Contractor Comparisons
  - Mix Designs (starting point)
  - Quality Control (production)
  - Pre-season “round robins” (Tune Up) involving contractors, department Central Office and Regional labs, independent consulting labs, etc.
Value - Data Analysis

- We know where we’ve been (tracked our history)
- We’ve gathered, calculated and documented
- So now what?
Verification

- Mix Designs
  - Logical progression to change old system
  - Shift Responsibility from Department to the Contractor (1990-1993)
  - Previously a 14 day process, now a next day turn-around
  - Spot check, Occasional Random Comparison Testing – Emphasis on field production

Production Mix? Can we use the same model?
Evolution

- Relate analysis results to performance
- Define critical mixture properties affecting performance
- Develop guidance for defining, producing and troubleshooting “quality product”
- Warranty
- Design Build?
. . . On the Horizon

- Performance Evaluation Equipment
- Real Time Quality Control
- Defining product in new terms
  - Ride
  - Noise
  - Surface Texture
    - Mixture Stiffness
    - Permeability
Future Troubleshooting?

I told you using grass to prevent drain-down probably wouldn’t work!
Happy Birthday !!

Celebrating being 10 years young

... and bracing for the next 10
For Further Information

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