Bituminous PWT  
(Percent Within Tolerance)  

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Spec Limits and Goal Posts are Similar
Quality Measure: Percent Within Tolerance (PWT)

- Estimates the percentage of material within specification limits
  - Assumes normal distribution
  - Area equals 1.0 or 100%
Standard Deviation

- A measure of the variability (i.e. spread) of data
PWT

• Efficiently captures mean and standard deviation in one quality measure

\[ \overline{X} - \text{mean} \]

\[ s - \text{standard} \]
Number of States using PWT for Hot Mix Asphalt

Source
FHWA QA Assessment
What Does PWT Drive?

- Tighter adherence to producing job mix formula
- Tighter adherence to field density spec. requirements
Advantages of PWT

• Well suited for low bids to achieve quality

• Contractors = **bonuses** for tighter adherence to targets

• Contractors = **reduced payments** for loose adherence to targets

• Moves focus to targets (NOT minimums)
What’s different with PWT spec?

• Adds **bonus** structure (maximum 4%)

• Adds **mix gradation** (PCS) as part of payment

• Modifies current “goal posts” approach for 100% payment (good or no good)

• Results in many fewer 100% payments and spreads these out (bonus and penalty)
Payment Equation Changes

- **Current** specification (50% mix, 50% density)
  - 25% asphalt content
  - 25% #200 sieve
  - 50% field density

- **PWT** specification (50% mix, 50% density)
  - 30% asphalt content
  - 10% #200 sieve
  - **10% primary control sieve (new)**
  - 50% field density
Common to All PWT Specs

• **Defective lots** can be left in place at 70% pay by DE (previously 50% pay)

• **Allows contractor to terminate lot**
  - Allows contractor to limit risk when early QC results indicate an issue
  - Must stop paving
  - 90% maximum pay
  - Must R&R if defective by test results
• **Three (3) methods thru CT process:**

1. **PWT-LTS (Laboratory Testing Section)**
   - Fully approved (includes FHWA)
   - Acceptance at LTS
   - PWT-LTS Use Guidelines/District Memo

2. **PWT-HOLA (Hands On Local Acceptance)**
   - Fully approved (includes FHWA)
   - Department Acceptance, Contractor Lab

3. **PWT-LA (Local Acceptance)**
   - Contractor Results, Department Verification, F-test and t-test (Not Practical)
• **Very similar** to current process

• Allows a **contractor option** to **expedite sample delivery** to Harrisburg
  - Inspection staff secures samples
  - Secure samples given to contractor
  - Contractor delivers to LTS at his cost
  - LTS verifies security prior to testing
  - Priority given to expedited samples
    - 2 Standard Work Day Turnaround Goal at LTS
• HMA/WMA Material samples collected as usual

• Acceptance testing performed at:
  • Proficient producers lab
  • or another mutually acceptable lab

• No LTS acceptance testing (except for dispute resolution situation)
Mixture Sample Collection

- Contractor Pulls Sample
- Representative Secures Sample
- Contractor Transports Sample
- Representative Tests Sample Locally
- Representative Splits Sample
- LTS Tests IA Sample
Gmm Verification Testing

- Federal Aid Projects & Projects on the NHS
- **Local** Testing
Staffing LA Testing

- Districts will need to allocate certified plant inspectors to perform testing
- Shortage in qualified staff
  - Use Consultants?
- May need to coordinate testing for out of District sources
Contractor’s Lab Assessment

• Local acceptance lab will need AMRL on-site proficiency assessment
• Every two years
• Assessment on the equipment to be used for acceptance
Independent Assurance

• Required by 23 CFR 637
• First lot and randomly once for every ten thereafter
• Performed at the LTS on split samples
• Ensures sampling and testing is performed correctly
• Ensures testing equipment used is properly calibrated and operating correctly
Local Acceptance QC Plan

• Separate LA QC Plan required to detail specifics
• 3 weeks before paving
• Must identify lab and equipment for testing
Local Acceptance Equipment Requirements

• Dedicated equipment for Department use
• Representative reviews equipment
• Can remove equip. not meeting requirements from service
• Department Acceptance
• Accessibility to local lab
Sample Transportation and Security

- Tamper proof coolers with clasps and unique, unopened padlock
- Must be capable of relocking for storage
Sample Transportation and Security

• Alternative: Coolers with uniquely numbered security tags
• Only one lot per container
Sample Security

• Sealed containers first inspected for security. Upon opening, samples and paperwork to be examined.

• If evidence of compromised security, Dept. may reject for testing, suspend paving operations and require additional samples to be taken
Sample Paperwork

• Paperwork (TR-447) is the same
• Worksheets keep records of test results
• Paperwork to be retained for 3 years
Lot Testing

• Testing to begin once lot is complete

• LA testing takes priority over other testing

• Contractor’s technician may be present to witness, but not required

• Contractor may saw cut density cores for testing
2016 Construction Season

• Projects advertised after October 13, 2015 (considered)

• PWT-HOLA available as of January 15, 2016

• PWT-LTS Incentive/Disincentive Spreadsheet
Challenges

- Budget
- Test Turnaround Time (PWT-LTS)
- Oven Correction Factor (PWT-LTS)
- Manpower/Equipment (PWT-HOLA)
- AMRL (PWT-HOLA)
- Standard Deviation
Taking on the Challenge

• Expedited Sample Delivery (PWT-LTS)

• Dispute Resolution

• Training (PWT-HOLA)

• AMRL (PWT-HOLA)

• Standard Deviation
Questions?