Quality Control
Friend or Foe?

California Chip Seal Association
February 6, 2012
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What is Quality Control?

- Documentation, inspection, observations or sampling that increases the understanding of the final product, individual components, and production variability
Why Quality Control?

- Increase probability of contract compliance
- Protect Agency, Contractor and Material Supplier
- Better understand performance issues over time
- Provide improved basis for future project design
Quality Control v. Failure Investigation

- Proactive Quality Control
  - Inspection
  - Quality Control
  - Record keeping
  - Long term follow up/data retrieval
Quality Control v. Failure Investigation

- Reactive production examination
  - “Failure” review
  - Record review
  - Forensic Investigation
  - Assess probable cause
  - Determine corrective action
  - Fight over payment
Proactive Quality Control

• Preliminary Documents
  – Project specifications
  – Product specifications
    • Identify suppliers
  – Material mix designs
    • Material compatibility
Proactive Quality Control

- Construction Documentation
  - Material source confirmation
    - Aggregate
    - Binder
      - Emulsion
      - Asphalt cement
      - Modified binder
  - Material quantities
    - Mixture proportions
    - Spread rate
      - Binder
      - Aggregate mixture
Proactive Quality Control

– Date and Location of work (street and limits)
– Construction equipment
  • Size
  • Number
  • Operating condition
– Weather conditions
– Existing surface conditions
– Set/cure time
– Rolling patterns (where applicable)
Proactive Quality Control

- Surface loss rate
  - Sweeping stockpile
  - Routine field review
- Time of opening to traffic
  - Chip loss
  - Complaints
Proactive Quality Control

- Post construction inspection
  - Initial Performance review
  - Identify required corrective action
  - Comparison with quality control information
  - Long term performance review
  - Provide input relative to material or construction changes for future work
MATERIAL TESTING

- AGGREGATES
  - SIZE
    - GRADATION
  - CLEANLINESS – CONTAMINATION
    - SAND EQUIVALENT
    - CLEANNESS VALUE

- BINDER
  - CONSISTENCY
    - VISCOSITY
    - PENETRATION
    - PARTICLE CHARGE
MATERIAL TESTING

- COMPLETED PRODUCT
  - CONSISTENCY
  - RESISTANCE TO ABRASION
  - MIXTURE PROPORTIONS
    - EMULSION
    - ADD WATER
    - RESIDUAL ASPHALT CEMENT
ARGUMENTS AGAINST QC

• Time
• Staff shortages
• Little perceived value
• Cost
ALTERNATIVE TO QC

• TRUST EVERYTHING WILL BE ALL RIGHT

• ACCEPT PERFORMANCE WITHOUT EXPLANATION

• ACCEPT PERFORMANCE WITHOUT POTENTIAL FOR IMPROVEMENT
ALTERNATIVE TO QC

- EXPENSIVE AND INEFFECTIVE FORENSIC INVESTIGATIONS
- LAWSUITS
- SAMPLING IMPOSSIBILITIES
- SAMPLING COSTS
- LIMITED AND INCONCLUSIVE FINDINGS
- UNANSWERED QUESTIONS
CONCLUSIONS

• MAINTENANCE MAY BE PROACTIVE (PREVENTATIVE) OR REACTIVE
  – PROACTIVE (PREVENTATIVE) MAINTENANCE IS EFFECTIVE

• QC MAY BE PROACTIVE OR REACTIVE
  – PROACTIVE QC IS EFFECTIVE