Achieving Homogeneity in Paving Work

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Aggregates Stored On-Site

- Handling and Stockpile Issues
  - Segregation
    - Big rocks separate themselves from the little rocks
Delivering Aggregate
Building Horizontal Stockpiles
Aggregates Stored On-Site

- Handling and Stockpile Issues
  - Segregation

  - Contamination
    - Unwanted material is mixed in
Contamination, keeping stockpiles separate
Label Stockpiles to Prevent Confusion
Label the Bins Too
Truck Being Loaded From A Silo
Truck Load to Truck Load Segregation
Loading Procedure

Tandem and Single Axle Loads Will Be Adjusted By Plant Operator.
- Receives mix and moves it to back
- Spreads in front of screed
Correct Level for Mix
Too Much Mix
Reverse Augers
Paver Segregation
Shortened Life

- Reverse Augers
- Poor Joint Construction
Auger Speed Too Fast
Auger Segregation
Between Trucks

Keep Mix in Hopper
Segregation from Dumping
Mix Moves in Mass
Flood the Hopper
Result of Tail Gate Banging

Cold
Low density
Future Pothole
Low Density at Joint
Rolling An Unconfined Edge

Gets maximum possible density here
Rolling a Confined Edge

Gets maximum possible density here

Second Lane

First Lane

Longitudinal Joint

150 mm (6 in.) approx.
TOOLS

- Quality Systems
- Manufacturing process
- Quality can not be inspected in, it must be built in

HMA is a manufacturing process
Experience

- Ramping Up to Quality
  - Mixed rocks with asphalt
  - Learned mix design
  - Learned quality control
  - Learn quality systems

Looking Back
Certified Hot Mix Plant

- Certified equipment
- Certified laboratories
- Certified technicians
Quality Control

- Stockpile layout and control
- Feeding
- Plant operation
- Silo operation

- Truck loading Delivery to paver
- Spreading
- Roller operation
- Testing
Production QC – Misperception

- It’s not just *mixture* testing!
  - Yes, Mix Test Results = Pay
  - But, what happens when parameters aren’t met?
- Many **QC** labs are overwhelmed!
  - Lot’s of samples to test
  - Often Under staffed
  - Sometimes Under equipped
  - Sometimes Under trained
- **Someone** has to step back and look at the **BIG** picture......
Production QC

- Stockpile Management
  - Sample & test aggregate as it arrives!
  - Build them right!
  - Load out of them right
  - Use as many cold feeds as possible
Production QC (Cont’d)

- **Plant Calibration**
  - Do it accurately and often
  - Cold feeds
  - AC/Binder
  - Additives
  - Scales used to measure any of the above

- **Plant Operation**
  - Production rate
  - Temperature consistency
  - Use and level of silos, surge bins, hot bins
  - Maintenance
    - Regularly scheduled items
    - If it’s broke, fix it!
• It’s not *just* sample testing!
• Inspection, Analysis and Action
  – When action is needed, it has to occur at a point in the process *before* the sample is taken
  – Way to often, we are *reacting*, which is typically due to a lack of being *proactive*
  – Don’t *assume* the owner’s *minimal* requirements will meet your needs
• QC personnel seldom have time to test *and* oversee the process
• QC Managers are a MUST!
Placement QC – Misperception

- It’s not just *density and smoothness* testing!
  - Yes, Results = Pay
  - But, what happens when parameters aren’t met?
- Many Field QC techs are overwhelmed!
  - Lot’s of locations to test
  - Often utilized for NON-QC tasks
  - Sometimes Under trained
- **Someone** has to step back and look at the BIG picture……
Placement QC (Cont’d)

- **Unloading Trucks**
  - Timely, efficiently and safely
  - Effects:
    - Paver operation
    - Mat consistency
    - Flow of the entire paving train

- **Lute and Shoveling Personnel**
  - Do they improve imperfections or make them worse?

- **Paver Operation**
  - In working order?
  - Speed
    - Consistent?
    - Match production rate?
    - Keep rollers in sight!
  - Screed
    - Properly adjusted?
    - Extensions in use?
  - Augers
    - Turning 90% of time?
    - Mix at mid-depth?
  - Overall mat uniformity
    - Segregation issues?
Placement QC (Cont’d)

- Rollers = Placement rate?
- Is each one operating properly?
- Operator familiarity with equipment
  - Amplitude & frequency settings
  - Water in drums
  - Tire pressure

- Rolling Pattern
  - Number of passes?
  - Pattern layout?
  - Speed?
  - Pattern length?
  - Compaction temperature range for roller position?
Placement QC (Cont’d)

- **Field** sampling & testing
  - Loose mix samples
    - Take them right!
    - Identify them clearly and get them sent in!
  - Density – Gauge
    - Is it working, and being used properly and frequently?
    - Has it been calibrated?
  - Density – Cores
    - Use the right equipment, and remove them carefully
    - Identify them clearly and get them sent in!
  - Other Items – Smoothness, Mat thickness, Mat temperature, etc.
How Much QC Is Necessary?

- It’s not always the same amount
  - Owner requirements vary
  - Materials vary from source to source
  - Plants vary
  - Mixes vary
  - Projects vary
  - People vary in knowledge, experience and desire!
Good Performance is No Accident

- Paved October 1998
- Photo taken October 2, 2009