Keys to Quality PCC Paving

JOHN HART
PCC FIELD ENGINEER
BUREAU OF CONSTRUCTION AND MATERIALS – IOWA DOT
Topics

- Traffic Control and Safety
- Mix Design
- Plant
- Steel
- Consolidation
- Jointing
- Texture and Curing
Traffic Control

- Drive the work zone in day and night
- Review skids, complaints, crashes
- Communicate deficiencies to Contractor/Inspector (ongoing)
- Be timely in repairs and adjustments
- Document
Safety

- Be aware of backing vehicles
- Proper gear for visibility
- Leave yourself an out
- Have awareness and don’t become complacent
- Limit distractions
- Never assume operators see you
- Don’t walk under spreader belt
Safety

- Be aware of project and roadway traffic
- Limit haul road dust by watering
- Park vehicles out of the way (operation and traffic)
Safety

- Safely sample
- Check in
- Be aware of flow
- Acknowledgement with operators
- Follow rules of Contractor
- Production vehicles have ROW
Mix Design

- Workability – Proper for placement method
- Durability - Air, w/c ratio, materials
- Economy – Optimized cement content and locally available materials
- Well graded aggregates – limits paste and shrinkage potential and responds to vibration
- Production gradations in design
- Design is starting point
- Todd Hanson – covering PEM on Friday
Plant

- Loader operator important job - batch to batch consistency
- Minimize segregation
- Uniform moisture
- Limit contamination
Minimize Segregation

- Avoid high cone shape piles
- Pile should be no higher than end loaders dump
- Build pile outward
- Limited space use 4ft. tall lifts
Plant

Uniform Moisture

- Stable and well drained foundation underneath stockpiles
- Place a separation layer on top of soil
- Draw from areas of known moisture content
- Mix the pile to create a uniform moisture
Plant

Limit Contamination

- Don’t comingle aggregates
- Mud on tires
- Don’t dig too deep
Plant

Adequate Mixing Time

- Uniformity
- Air entrainment
- Strength
- Workability
Steel

Dowel Baskets

- Correct number and placement of pins
- Up to 3 tie wires may remain uncut
- Proper coating and no damage
Steel

Dowel Baskets

- Inspect level and alignment across joint
- Sight down grade
- Locate joint for sawing
- Adjust as needed to match side roads, crossovers, etc...
- Proper alignment ensures working joint
Steel

Tie Bar

- Depth should be approximately $T/2$
- Reasonably level
- Perpendicular to centerline
- Approximately 18 inches from transverse joint
- Visual for construction joints
- NDT or probing during construction for contraction joints
Consolidation

- Vibration is needed to fluidize the concrete and remove large voids.
- Excessive vibration should not be used to resolve other issues.
- Excessive vibration can cause segregation, vibrator trails, and low air contents.
- Frequency should match mix workability and paver speed.
- Monitor vibrators electronically or manually.
Jointing

- Timing
- Depth
- Width
- Layout
- Straightness
- Spacing
- Edge blowouts
- Raveling/spalling/tearing
Jointing

**Depth**

- Improper depth and can lead to random cracking
- Transverse joints
  - Early entry - 1" to 1 ½" depth
  - Conventional – T/3
- Longitudinal joints
  - Conventional or early entry - T/3
Jointing

Layout

► Match joints on side roads
► Joints must be at least 2 feet long
► Joint angles should be 90 degrees or greater
► Joint angles must be a minimum of 70 degrees
► No more than four joints should intersect
Jointing

Straightness

- Verify that transverse and longitudinal joint form 90° angle
Jointing

Edge Blowout

- Stop ½” to ¾” short of the edge of pavement with saw cut
- Also prevents sealant from running out
Jointing

Raveling/spalling/tearing

- Too early
- Dull blades
- Saw moving too fast
- Skid plate wear
- Combinations of the above
Texture and Curing

Micro Texture

- Adequate contact area
- Burlap drag produces better texture and smoothness with lower noise levels
- Made moist (sparingly)
- Keep clean

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Texture and Curing

Macro Texture

- Longitudinal tining produces less noise
- Shallow produces less noise than deep
- Adjust tine angle and length for desired depth (consistency)
- Minimize positive texture by keeping tines straight and clean
- Don’t stop the tine rake in down position
- Some hand work areas can be excluded
Texture and Curing

Curing

- Material meets specification
- Well agitated
- Applied as close behind the paver as possible
- Even and complete coverage - no puddles or blotchy areas
- Adjust for wind
- Edge covered as well
Closing

- High level overview
- More items in greater depth
- PCC Paving Field Inspection 3/25/20
  - 3/25/20
  - 0$
  - https://iowadot.gov/training/ttcp/registration
  - https://iowadot.gov/training/ttcp/training_manuals/PCCField.pdf
- Offer prior to 2021 Concrete Paving Workshop
Questions?

John Hart
PCC Field Engineer
John.Hart@iowadot.us
515-290-2867