



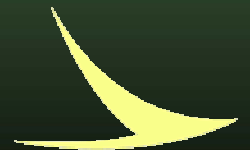
Ohio Department of Transportation Hot Mix Specifications Update

Flexible Pavements of Ohio
45th Annual Meeting

March 2007

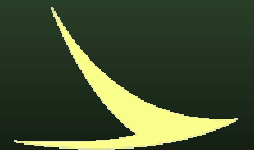
Dave Powers, P.E.

Ohio Department of Transportation



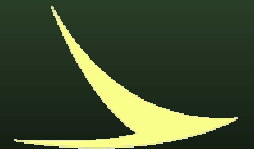
2006 Review

- ODOT Strategic Initiative 5
- 401.12 Paver Changes
- Field Quality Control Supervisor
- Smoothness
- Joint Density
- Wedge Joint
- 403 Sampling



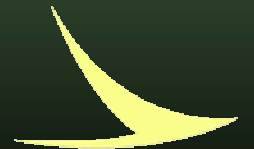
2007 New Items

- 448 Density Requirements
- RAP Management
- 441 Update
- Tack Coat
- HMA Aggregate Changes
- Night Paving
- 2008 Specification Book



2007 Specification Items

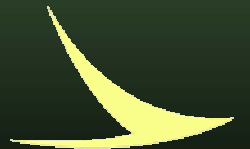
- 448 Density Requirements
 - Strategic Initiative 5 item
 - ODOT/Industry Committee
 - User Friendly for ODOT and Contractor Personnel
 - Uniform Surface and Intermediate Courses
 - Projects Over 1 Lane Mile
 - Use nuclear or non-nuclear gauges



2007 Specification Items

- 448 Density Requirements

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
SUPPLEMENT 1055
ASPHALT MAT DENSITY BY GAUGE TESTING**



2007 Specification Items

■ 448 Density Requirements

Operation –

Nuclear density gauge operation & calibration

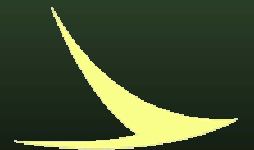
PQI electronic density gauge operation & calibration

Forms –

TE – Min Density Target Nuclear

TE – Min Density Target Elec Gauge

TE – Mat Density QCQA



2007 Specification Items

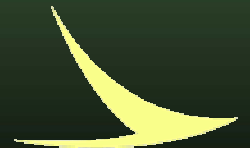
■ 448 Density Requirements

Nuclear Gauge Readings (PCF)				
Location	1	2	3	Average
PCF				

a

Core Density Test Results (see TE-199 for detail)				
Location	1	2	3	Average
% Density				

b



2007 Specification Items

■ 448 Density Requirements

Apply the following to obtain the nuclear gauge Minimum Density Target:

Minimum Density Target (PCF) = 93 X Gauge Reading Average PCF / Average % Density of cores.

Minimum Density Target = 93 X



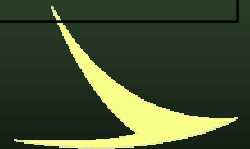
2007 Specification Items

- 448 Density Requirements

DAILY MAT DENSITY QCQA REPORT

Gauge Readings (contractor QC)

#	Longitudinal Location	Transverse Location (circle)	Actual Gauge Reading (<u>d</u>), pcf	% Density = $\frac{d}{c} \times 93$
		L C R		
		L C R		
		L C R		
		L C R		



2007 Specification Items

- 448 Density Requirements

DAILY MAT DENSITY QCQA REPORT

		L	C	R				
		L	C	R				
ODOT QA TESTS		PCFs	L	C	R	AVE	% Density*	ODOT INITIALS
		/	/	/				
		/	/	/				

* Ave Gauge PCF / Minimum Density Target PCF X 93 = % Density

Tests performed by:

Date Submitted:



2007 Specification Items

- **RAP Management**

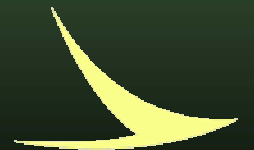
Problems:

Two Specs, 401 and 441

Many Policies

Lack of consistency

2006 QARs and lack of control



2007 Specification Items

- **RAP Management**

Proposed:

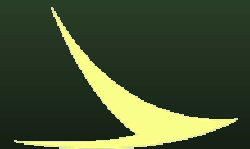
Consolidate into one spec – 401

Table of usage allowances

Add JMF policies

Add stockpile policies – ID and integrity

Add QC Plan requirements

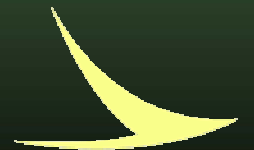


2007 Specification Items

- **RAP Management**

Proposed:

‘Determine RAP properties from multiple samples taken from stockpiles meeting the below stockpile management requirements or from the roadway for concurrent RAP grinding of one mix type. Report all RAP test results and an average in the JMF submittal. ‘



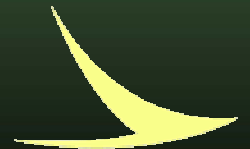
2007 Specification Items

■ RAP Management

Proposed:

‘Include in the Contractor Quality Control Plan (403.03) methods to be used to meet the following requirements:

Process by crushing and blending and test RAP stockpiles to assure uniformity of gradation and asphalt binder content. Ensure uniform stockpile properties match the JMF submitted RAP data. Uniformity will be determined by the following method.’

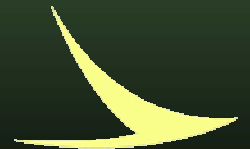


2007 Specification Items

■ RAP Management

Proposed:

‘Stake or otherwise provide stockpile identification at the actual pile for processed and tested RAP piles and at collector piles of non-uniform, unprocessed RAP. Provide the date the stockpile processing was completed and the stockpile estimated size in tons on the stockpile stake. Do not add to a stockpile once it is tested and staked. Provide clear communication to trucks that processed piles are not to be added to.’

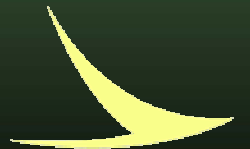


2007 Specification Items

- RAP Management

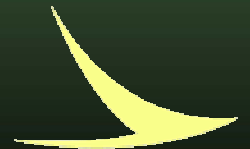
Proposed:

‘Stockpiles and processing are subject to inspection and approval by the DET at any time. Rejection of stockpiles can occur for lack of uniformity, incomplete mixing in the mix JMF, adding to piles after staking or otherwise moving RAP in a way not traceable thru the Contractor QCP records and methods.’



2007 Specification Items

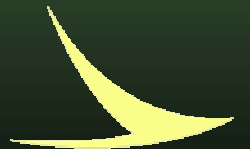
- 441 Update (proposed)
 - Language not updated in over 10 years
 - Remove extraneous and consolidate
 - Remove running average
 - Add new total range of 3 tests
 - Clarify responses to tests past limits
 - Add section for handling mixture deficiencies and/or QC deficiencies



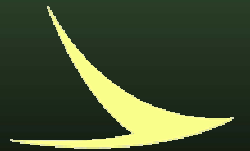
2007 Specification Items

- Tack Coat

- Two main problems
 - Lack of uniform application
 - Too much water



2007 Specification Items




2007 Specification Items

■ Tack Coat

➤ Two main problems

➤ Lack of uniform application

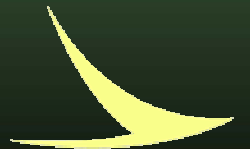
Solution: 407.06, If application is non uniform and not corrected the total square yardage of non uniform application will be considered non specification material. The Engineer will determine the number of gallons (Liters) for non payment by using the approved rate of application times the total square yards (square meters) of non uniform application.



2007 Specification Items

- Tack Coat

- Too much water
 - No control on how much
 - Does not break well
 - Little tacking once broke
 - Still not uniform much of time



2007 Specification Items

■ Tack Coat

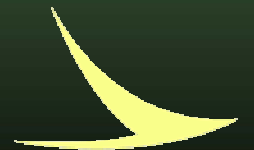
➤ Too much water

Solution: Uniformly apply the asphalt material with a distributor having clean nozzles functioning properly. The Engineer must approve dilution with water if desired to achieve a more uniform application. Diluted tack used without approval will not be paid for. In no case will any diluted asphalt material used for tack have a viscosity less than 20 s Saybolt Furol (702.04).



2007 Specification Items

- HMA Aggregate Changes
 - Micro Deval
 - SIO₂
 - Fracture



2007 Specification Items

- Micro Deval



2007 Specification Items

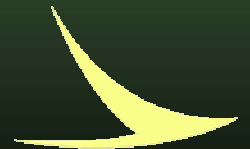
- **Micro Deval**

703.04.B

Micro-Deval Abrasion Loss, % maximum
(for coarse aggregate gravel only) 22

703.05.B

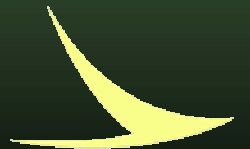
Micro-Deval Abrasion Loss, % maximum
(for gravel only) 20



2007 Specification Items

- **SIO2 in 424 (smoothseal)**

‘Use natural sand with at least 50 percent silicon dioxide by weight according to ASTM C 146. Include with a JMF submittal certified test data from an AASHTO accredited laboratory showing conformance to the 50 percent silicon dioxide requirement. Ensure data is no more than one year old at time of submittal. ‘



2007 Specification Items

- **Fracture** (ASTM D5821- one standard method)

703.04 B, 703.05 B 2,

On Page 668, Replace the line:

Percent of fractured pieces, minimum 40
with

Percent of fractured pieces (one or more
faces), minimum 40



2007 Specification Items

■ Night Paving

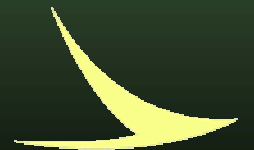
➤ Part of SI 5 from 2006- Improve overall quality and consistency by:

➤ Consistent lighting requirements

➤ Use of thin lift smoothness

➤ MTV in specific applications

➤ Guidance to District designers

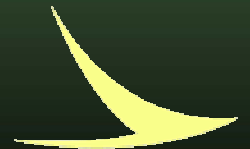


2007 Specification Items

- **Night Paving**

 - Consistent lighting requirements**

 - PN 462 – 10/20/2006 – Nighttime Asphalt Paving Work Site Lighting Requirements, ODOT QC Check

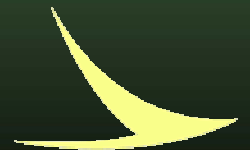


2007 Specification Items

■ Night Paving

Consistent lighting requirements

Provide an illuminated zone around all operating machinery. Provide an illuminated zone of at least 5 Foot-candles (55 lux) of lighting luminance in the immediate vicinity of pavers, rollers, grinding equipment, material transfer vehicles etc and at least 1 Foot-candle (10 lux) at 25 feet (7.6 m) from this equipment.

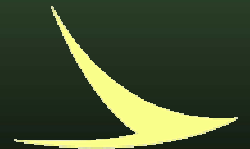


2007 Specification Items

■ Night Paving

Consistent lighting requirements

Provide an illuminated zone of at least 5 Foot-candles (55 lux) of lighting luminance in the immediate vicinity of coring equipment and at least 1 Foot-candle (10 lux) at 10 feet (3 m).

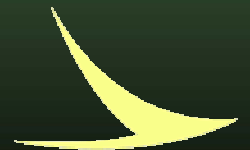


2007 Specification Items

■ Night Paving

Consistent lighting requirements

Obtain the Engineer's approval of the lighting at the beginning of the project and before starting the paving operation by measuring the luminance. Obtain the luminance level any time requested by the Engineer. Take luminance measurements at a height of 20 inches (500 millimeters) above the roadway.

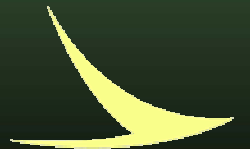


2007 Specification Items

- **Night Paving**

- **Use of thin lift smoothness**

**PN 470 - 7/21/2006 – Thin Lift Asphalt
Surface Smoothness Requirements**



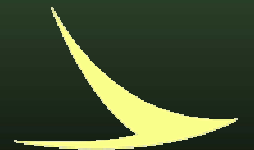
2007 Specification Items

- Night Paving

- **Use of thin lift smoothness**

- Designer Note

- Use this proposal note for all night paving projects where PN 420 cannot be used. PN 420 is limited to minimum of 2 1/4 inches (58 mm) of pavement thickness.



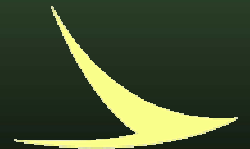
2007 Specification Items

■ Night Paving

■ Use of thin lift smoothness

Designer Note

Projects where this note may not be desired are projects with legal speeds less than 40 mph, projects with numerous intersections, small projects of less than 1 lane mile in length or projects with special nighttime time restrictions and traffic making obtaining smoothness data impractical.

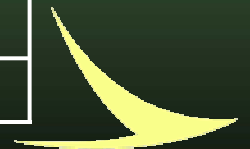


2007 Specification Items

■ Night Paving

Use of thin lift smoothness

Pay Schedule		
Profile Index (inches per mile per 0.10 mile section)	Price Adjust. Percent (1)	Mean International Roughness Index (inches per mile) (IRI per 0.10 mile section)
1 or less	105	45 or less
Over 1 to 2	103	Over 45 to 50
Over 2 to 3	102	Over 50 to 55
Over 3 to 4	101	Over 55 to 60
Over 4	100	Over 60

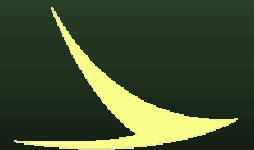


2007 Specification Items

- Night Paving

- **MTV in specific applications**

‘Only use this note for night paving projects over 1 lane mile in length and where designer and District have determined an MTD can be used.’



2007 Specification Items

- **Night Paving**

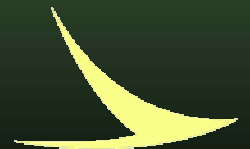
- **Guidance to District designers**

- **Nighttime Pavement Work Selection Considerations**

- **Daytime Lane Closures Not Allowed due to Traffic**

- **Municipal Concerns**

- **Other Exceptions**



2007 Specification Items

- **Night Paving**

- **Guidance to District designers**

- **Construction Bid Item, Plan or Proposal Note Considerations for a Quality Job**

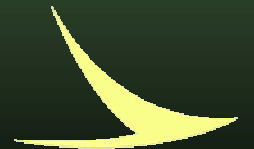
- **MOT setup and removal**

- **C&MS 446 Acceptance**

- **Material Transfer Device (MTD)**

- **Smoothness requirements**

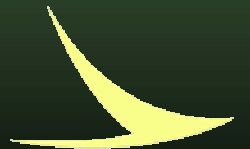
- **Joint repairs**



2007 Specification Items

■ 2008 Specification Book

- Starting in May – committees of ODOT and industry will be reviewing all sections of the 2005 book, 800 notes, proposal notes and supplements for additions
- For asphalt items- what I have covered here will be added.
- Please contact FPO with input you may have





Any Questions?
Thanks!

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<http://www.dot.state.oh.us/testlab>

