LATEST AND THE GREATEST

LATEST AND GREATEST

Materials Management Section

Approved for fill;

Still Needed

Lab Unit 1?

Approved for fi

Vacant Feb 21; Pete Kemp

John Rublein started Feb 16

MK started Feb 23

Materials Management

016611	10-15-07-00-00	
Krebs, Steve	SWB	
	DOT Eng Chief	

ratory Unit

	07-05-00	
86	SWB	100
e, Barry	CE Trans S	
422	SWB	100
ant-A	CE Trans	
700	SWB	100
a, Zelalem	CE Trans Sr	
0 838	SWB	100
Ryan, Judith	ES Trans Adv 2	
022262	SWB	100
Andreini, Matth	ES Trans Adv 2	
006977	SWB	100
Barden, Richa d	ETT Adv 2	
021110 (Tracy)	SWB 100	
	ETT Adv	

017067		
Parry, James	s Supv	
001355		100
Nwankwo, Kenneth	rans Adv	
001328	B	100
Bischoff, Debra	E Trans Adv	
338655	SWB	100
Kemp, Peter	CE Trans Adv	
005917 (Kemp)	SWB 100	
Vacant	CE Trans Adv	
018117	SWB WAU	100
Lundin, Keith	ES Trans Adv 2	
032721	SWB- WIS	100
Bohn, Michael	ES Trans Adv 2	
000219	SWB	100
Wilson, Joe	ES Trans Adv 2	
001656	SWB	100
Carlson, Gary	ETT Sr	
018780	SWB	100
Fitzgibbon, Patrick	ETT Adv	

aver		
628		
Stoikes		
338656	B	100
Fenley, Laura	E Trans Adv	F180
008006 (Bischoff)	SWB 100	
Vacant	CE Trans	
001680	SWB	60
Hanna, Paulette	CE Trans Adv	
019380	SWB	100
Merine, Girum	CE Trans Sr	
031595	SWB	100
Ruda, Joel	ETT Adv	
021991	SWB	100
Hunter, Steven	ETT	
018107	SWB	100
Eilbes, Loren	ETT Jrny	
036968	SWB	100
Skolos, Paul	ETT Jrny	

LATEST AND GREATEST
QMP STSP Status

- WisDOT currently has 3 QMP STSPs
- STSP moved to Standard Specs 2016 Edition
  - 440.4410 QMP Ride; Incentive IRI Ride
- STSPs to move into Standard Specs 2017 Edition
  - 460-020 QMP HMA Pavement Nuclear Density
  - 301-010 QMP Base Aggregate

LATEST AND GREATEST

PAVEMENT RIDE IRI STSP

- Profiling mainline pavements >1500’ in continuous length
- Quality Control Plan; Certified Personnel & Equipment
- QC testing: Each wheel track of each lane

LATEST AND GREATEST

PAVEMENT RIDE IRI STSP

- Prepare ProVal Ride Quality Module Reports showing
  - Localized Roughness
    - 25’ segment length
    - 200 in/mi threshold
  - Segment IRI
    - 500 standard segment
    - 140 in/mi threshold
- Document and field-locate localized roughness
- Submit electronic ProVAL project files into MRS

LATEST AND GREATEST

PAVEMENT RIDE IRI STSP

- Corrective Actions for Localized Roughness
  - Engineer rides, reviews, and directs
- Re-profile to verify localized roughness IRI < 140”/mile
- Submit to the reference documents section of the MRS as supporting documentation

LATEST AND GREATEST

PAVEMENT RIDE IRI STSP

- Corrective Actions for Excessive IRI >140”/mile
  - The engineer may require contractor to correct segment
  - After-correction threshold IRIs decrease based on category of pavement 60 – 85
  - Re-profile and resubmit ride quality module report

LATEST AND GREATEST

PAVEMENT RIDE IRI STSP

- Dispute Resolution
- Pay Adjustment
  - Adjust pay based on **initial** IRI for each segment
  - Corrected areas are subject to disincentives based on IRI after correction
  - Payment thresholds differ based on pavement category
  - No disincentives on HMA III or PCC III (segments containing bridges, approaches, or RRs)

Profiler Training

- HTCP Profiler class – March 18, 2015

LATEST AND GREATEST

BRIDGE RIDE SPV

LATEST AND GREATEST

BRIDGE RIDE SPV

- Bridge Ride
  - Committee to create SPV
  - Several Meetings
  - SPV Target Date: 1 April 2015
  - Pilot projects in 2015-2016

LATEST AND GREATEST
BRIDGE RIDE SPV

- Project selection criteria (taken out for pilots)
  - New bridges or new bridge decks
  - Posted speed limit of at least 55 miles per hour
  - AADT ≥ 3500
  - Min. 100' of new pavement on each end of the approach slab
  - Exclude slab span bridges and bridge overlays
  - Minimum bridge encounter (approaches, bridges plus pavement) length – 250'

LATEST AND GREATEST
BRIDGE ENCOUNTER

- 25 foot of entry pavement
- Entry approach slab
- Bridge deck
- Exit approach slab
- 25 foot of exit pavement

LATEST AND GREATEST

BRIDGE RIDE SPV

- IRI Standard segment lengths 500’ ≤ 250
- Rolling 25’ base length for localized roughness
- Thresholds same as pavement IRI
- SPV provides incentive
- No disincentive for pilot projects

LATEST AND GREATEST

BRIDGE RIDE SPV

- Corrective actions
  - Not to exceed ½” on bridge deck
  - Not within 1.5’ of steel armor joints
- Payment
  - Costs for profiling and documentation incidental
  - Corrective action on bridge deck and structural approach, if applicable, are incidental
  - Department pays separately for corrective actions in other areas of bridge encounter

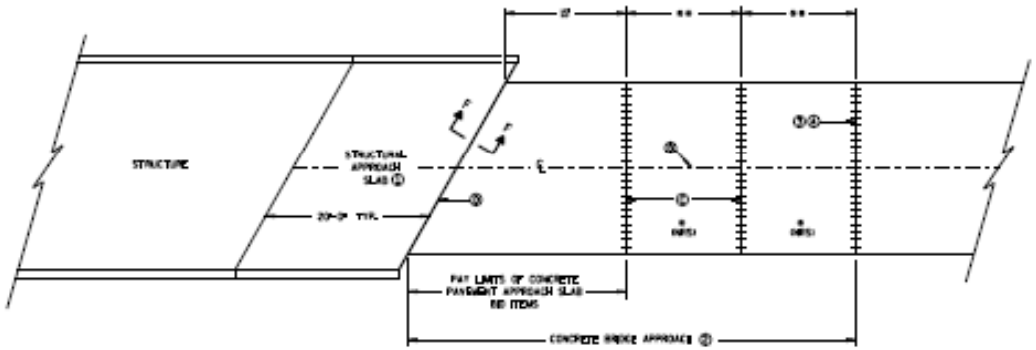
LATEST AND GREATEST

BRIDGE APPROACH DESIGN

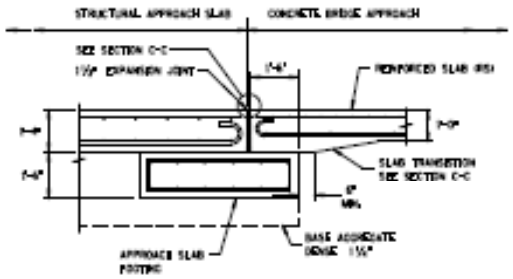
- June 2014 SDD 13B2, FDM 14-10-15, Bridge Manual Chapter 12 drawings revised
- Structural approach slab with footer
- WHRP study
- Final presentation Feb 6, 2015

LATEST AND GREATEST

BRIDGE APPROACH DESIGN



BRIDGE APPROACHES



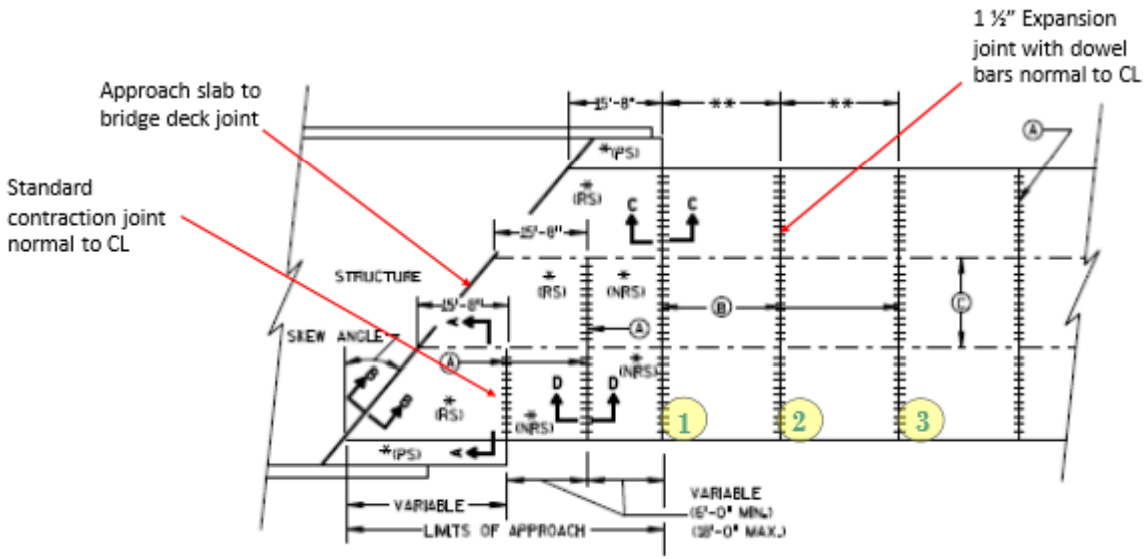
SECTION F-F

FOOTING DETAIL

STRUCTURAL APPROACH SLAB TO CONCRETE BRIDGE APPROACH

LATEST AND GREATEST

BRIDGE APPROACH DESIGN



SDD 13B2

LATEST AND GREATEST

BRIDGE APPROACH DESIGN

- Recommendations
  - One expansion joint; size dependent on bridge
  - Continued use of structural approach slab and footer
  - Flood current backfill material
- Meetings
- Revisions coming soon

LATEST AND GREATEST
QMP SPV Status

- QMP Bridge Ride SPV Under Development
- QMP BAD 1 ¼-inch Compaction, Item SPV.0195.xx
- QMP Mill/Pulverize and Relay Compaction, Item SPV.0195.xx
- Cold-in Place Recycling (CIR) SPV

LATEST AND GREATEST

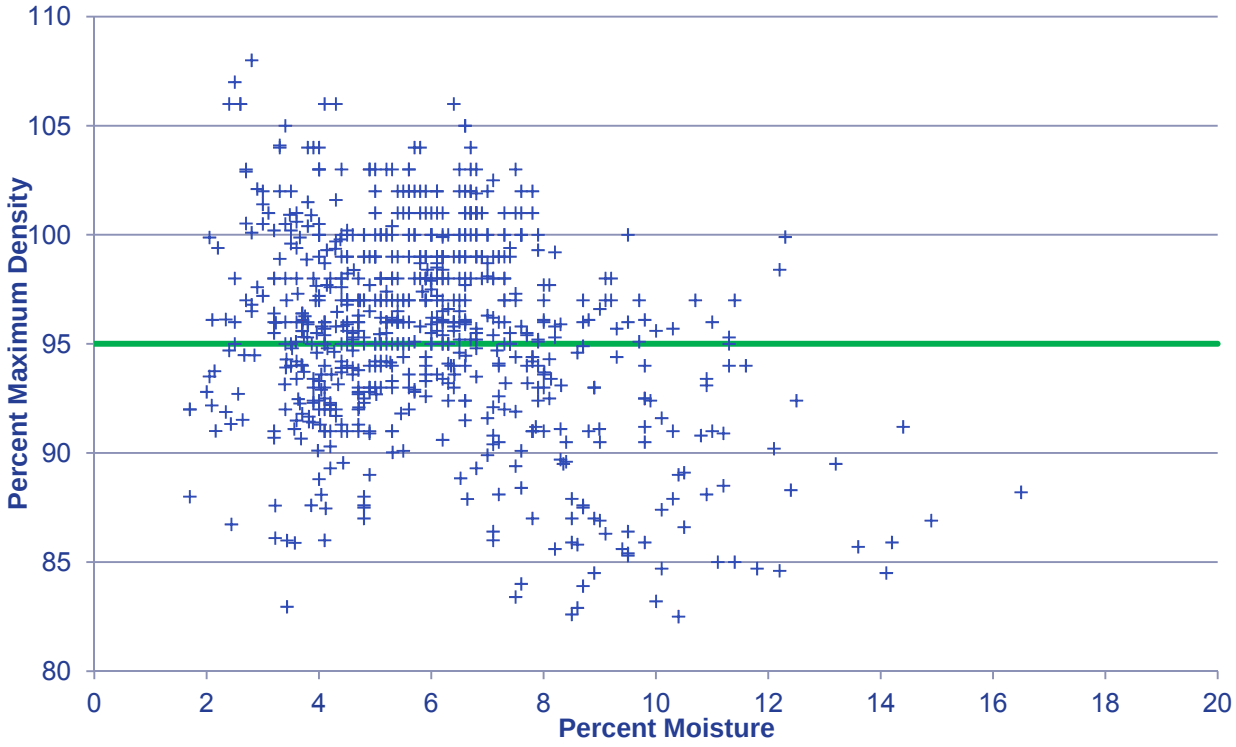
BASE COURSE COMPACTION SPV UPDATE

- 2012 WHRP study
  - Testing 11 existing and 10 new projects
  - High level of Spatial variability & non-uniformity
- 2013 Draft SPVs & Pilot Projects
  - 11 Projects (8 Base Aggregate & 3 Mill/Relay)

LATEST AND GREATEST

BASE COURSE COMPACTION SPV UPDATE

2013 Pilot Projects Results



LATEST AND GREATEST

BASE COURSE COMPACTION SPV UPDATE

- QMP BAD 1 ¼-inch Compaction, Item SPV.0195.xx

1. **QMP Base Aggregate Dense 1 1/4-inch Compaction, Item SPV.0195.xx**

A Description

(1) This special provision modifies the compaction and density testing documentation requirements of work done under the Base Aggregate Dense 1 1/4-inch bid items. Conform to standard specification section 305 as modified in this special provision and to the contract QMP Base Aggregate article.

(2) Provide and maintain a quality management program. A quality management program is defined as all activities, including process control, inspection, sampling and testing, and necessary adjustments in the process related to construction of dense graded base which meets all the requirements of this provision.

(3) Chapter 8 of the department's construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes sampling and testing procedures. The contractor may obtain the CMM from the department's web site at: http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm

- QMP Mill/Pulverize and Relay Compaction, Item SPV.0195.xx

1. **QMP Mill/Pulverize and Relay Compaction, Item SPV.0180.xx**

A Description

(1) This special provision modifies the compaction and density testing documentation requirements of work done under the Mill and Relay Pavement and Pulverize and Relay bid items. Conform to standard specification sections 325 and 330 as modified in this special provision.

(2) Provide and maintain a quality management program. A quality management program is defined as all activities, including process control, inspection, sampling and testing, and necessary adjustments in the process related to construction of a milled and re-laid and pulverized and re-laid base which meets all the requirements of this provision.

(3) Chapter 8 of the department's construction and materials manual (CMM) provides

LATEST AND GREATEST

BASE COURSE COMPACTION SPV UPDATE

Facilities Development Manual — Wisconsin Department of Transportation

Chapter 19 Plans, Specifications and Estimates

Section 21 Quality Management Program

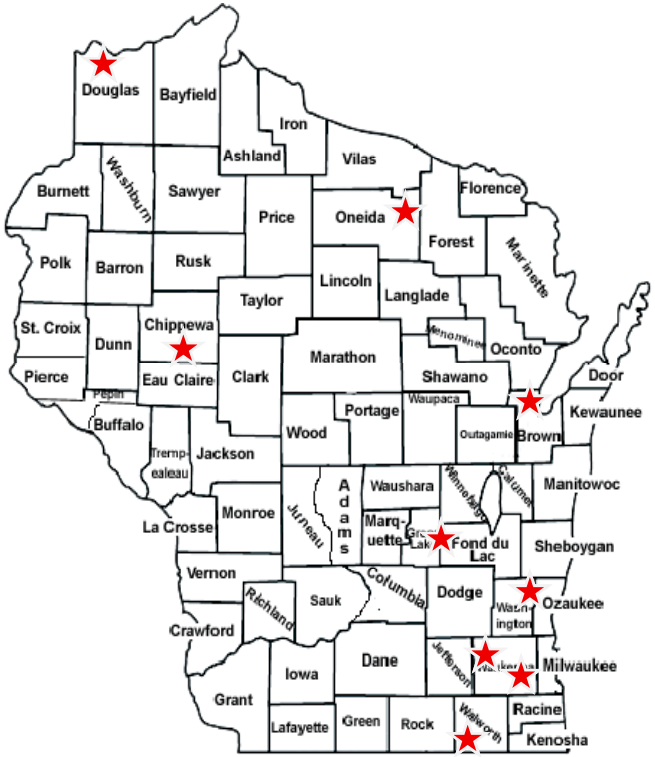
FDM 19-21-1 Overview — March 28, 2014

- ✓ Base Aggregate Dense 1-1/4”
  - HMA Travel lane
  - Planned Quantity ≥ 30,000 ton
  - QMP Subgrade and/or Improvement
- ✓ Mill/Pulverize and Relay
  - Planned Quantity ≥ 40,000 SY

LATEST AND GREATEST

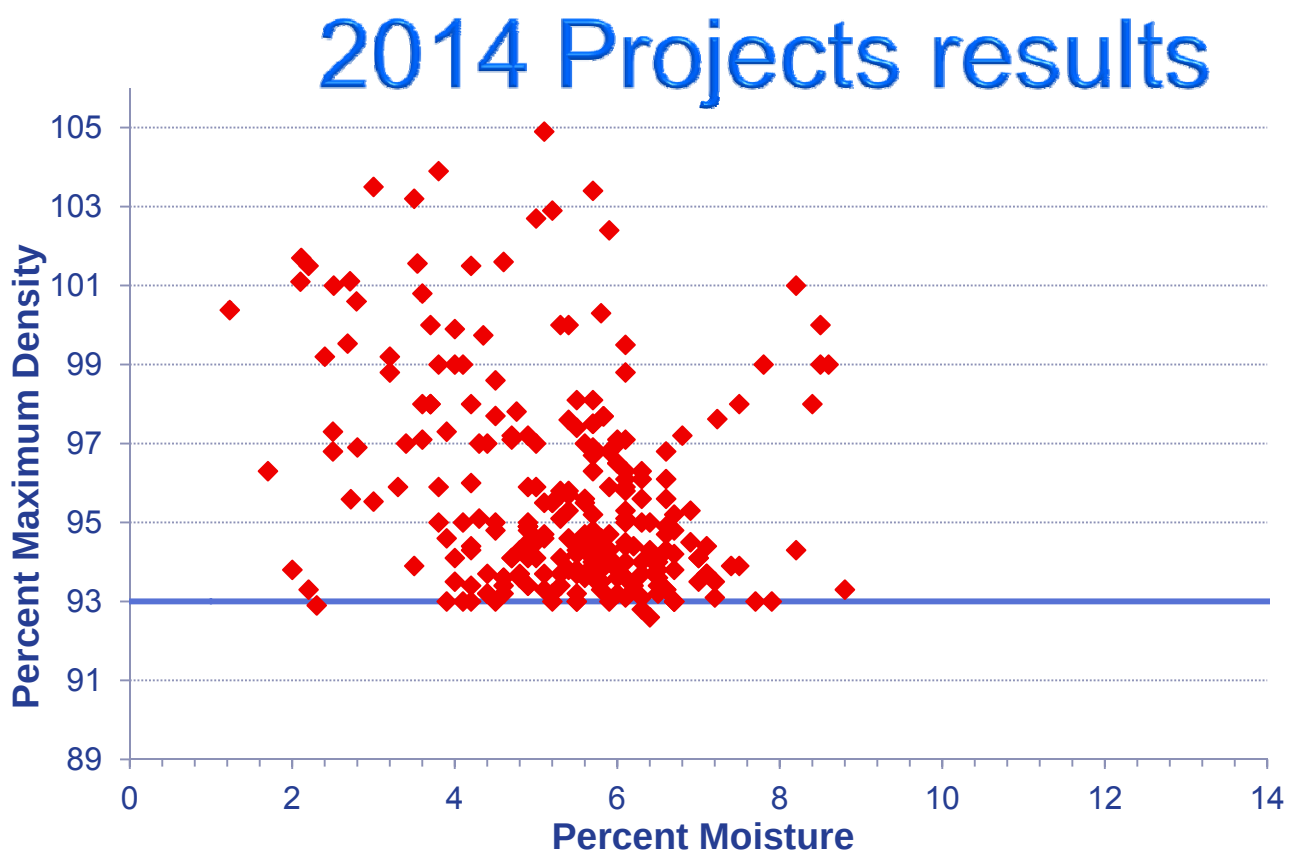
BASE COURSE COMPACTION SPV UPDATE

- 9 projects in 2014
  - ✓575, 847 Tons of Base Aggregate Dense 1-1/4”
  - ✓41,309 SY Mill and Relayed Placement



LATEST AND GREATEST

BASE COURSE COMPACTION SPV UPDATE



LATEST AND GREATEST

BASE COURSE COMPACTION SPV UPDATE

- Benefits
  - Better pavement performance
  - Provide consistent method of acceptance
  - Increase information – more QC/QV
  - More uniformly compacted base
- What's next
  - Internal meeting with DOT Feb 18
  - Discussion/meeting with industry
  - Revise SPVs and convert to STSPs

LATEST AND GREATEST

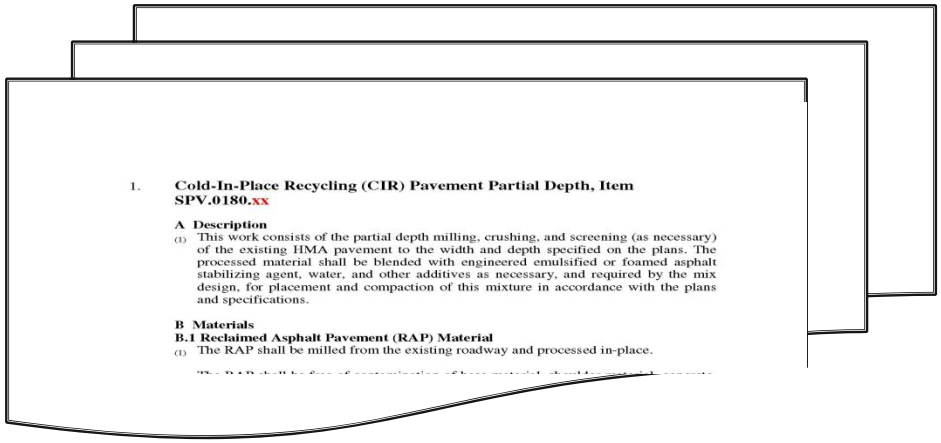
Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

Milling the existing HMA pavement to a specified depth (3-5 inches), sizing the milled material, adding various additives (emulsion, foam asphalt), mixing the RAP and additives, laying and compacting

LATEST AND GREATEST

Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

- Specifications and usage guidelines
  - Special Provision completed - room for improvement
  - Design/Usage guidelines in progress
- Only 2 projects in the last two years
- 2015 - 3 Pilot projects



1. **Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx**

A Description

(1) This work consists of the partial depth milling, crushing, and screening (as necessary) of the existing HMA pavement to the width and depth specified on the plans. The processed material shall be blended with engineered emulsified or foamed asphalt stabilizing agent, water, and other additives as necessary, and required by the mix design, for placement and compaction of this mixture in accordance with the plans and specifications.

B Materials

B.1 Reclaimed Asphalt Pavement (RAP) Material

(1) The RAP shall be milled from the existing roadway and processed in-place.

LATEST AND GREATEST

Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

- Materials
  - ✓ Reclaimed Asphalt Pavement (RAP) Material

Sieve Size	Percentage Passing
1 ½”	100 %
1”	95 to 100 %

  - ✓ Stabilizing Agent
    - Foam Asphalt
      - PG 46-34 or PG 52-34
    - Emulsion Shall be determined by the mix design
    - Property requirements for stabilizing agents
  - ✓ Mix design to be approved by Materials Management

LATEST AND GREATEST

Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

- Quality Management Program
  - ✓ Quality Control Plan
  - ✓ Personnel
    - ➢ Nuclear Density Technician I
    - ➢ ACT certified technician
  - ✓ Quality Control (QC) Testing
  - ✓ Quality Verification (QV) Testing (Min 10% of QC)
  - ✓ Independent Assurance (IA)
  - ✓ Dispute Resolution

LATEST AND GREATEST

Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

- Quality Control Testing
  - ✓ Gradation– Number 4 sieve and larger
    - Frequency–1 per production lot (4000 lane feet)
  - ✓ Foaming property (Half life and Expansion ratio)
    - If applicable Min. Frequency 1 per Lot
  - ✓ Milling Depth
    - Minimum 1 per sublot
  - ✓ Stabilization Agent Temp. and application Rate
    - Minimum 1 per sublot
  - ✓ Density Testing – Minimum 3 Tests per sublot
    - Density Requirement – Min. 93% Target Density
    - Target Density – Control Strip Method

LATEST AND GREATEST

Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

- Construction
  - ✓ Between May 1 and October 1
  - ✓ Air Temperature > 50°F
- CIR Finish Surface Smoothness Requirement
  - ✓ < ½ inch – Using 10-foot straight Edge
- Curing Requirement
  - ✓ Moisture content of CIR layer should be < 2% before application of surface treatment.
  - ✓ If moisture content > 2% , surface treatment may be applied if the change in moisture < 0.1% for consecutive days.

LATEST AND GREATEST

Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

- Maintaining CIR Work
  - ✓ Opening to Traffic – determined by contractor after completion of compaction.
    - ✓ Contractor must maintain the CIR layer until surface placement.
- Measurement and Payment
  - ✓ CIR – (SY)
  - ✓ Asphalt Stabilizing Agent – (Ton)

LATEST AND GREATEST

Cold-In-Place Recycling (CIR) Pavement Partial Depth, Item SPV.0180.xx

What's Next

Facilities Development Manual guidance

Evaluation of Pilot Projects

SPV Revision/improvement

LATEST AND GREATEST

Optimized Gradation

- We were targeting 2016 specifications
- Only for concrete pavements
- Not required, but incentives for use
- Benefits of optimized mixes
  - ↑ aggregate volume and ↓ the volume of paste
  - Improve strength, durability, and sustainability

LATEST AND GREATEST

TIE BAR SPACING

- To accommodate thicker concrete pavements
- Simplified spacing table
- Affects numerous SDDs

LATEST AND GREATEST

MIT SCAN T2

Magnetic Imaging Tomography

LATEST AND GREATEST

MIT SCAN T2

- Department Concrete Thickness Acceptance Testing
- Target implementation Date: 2016 Edition of Standard Specs
- Training & metal plates will be provided
- Plates installed by contractor

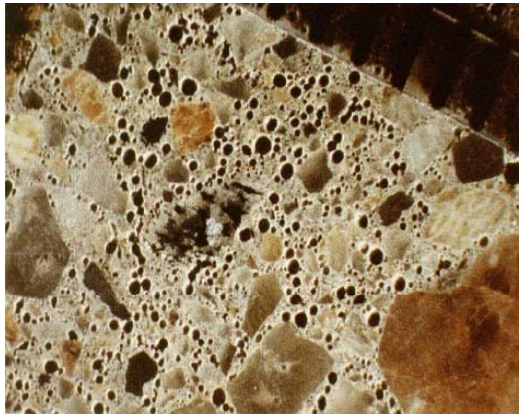
LATEST AND GREATEST

MIT SCAN T2

- Field Observations
  - Dowel/tie bars and start position affects readings
  - GPS coordinates vs. station and offset
  - Test results show high accuracy

LATEST AND GREATEST
Coming Soon

- Super Air Meter (SAM)
  - Air entrained bubbles are key to freeze-thaw durability
  - The volume of air does not equal freeze-thaw performance
  - The volume of air does not equal a quality air void system
  - Current air meters only measure volume
  - Hardened air void analysis is time consuming



LATEST AND GREATEST
Coming Soon

- Super Air Meter
  - Test takes 8-10 minutes
  - SAM number correlates to air void size distribution
  - A SAM number of 0.20 correspond to a spacing factor of 0.008”
  - The meter also measures air volume

LATEST AND GREATEST
Concrete Tensile Strength Testing

- Concrete is strong in compressive strength
- Tensile strengths are lower--usually 10-15% of compressive strength
- WisDOT concrete pavements are designed based on flexural/working stress (F_t = 490 psi)
- Testing will likely apply to concrete pavements, not structures

THANK YOU!

QUESTIONS?

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