Construction Update

2024 Flexible Pavement Committee Meeting

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Proposed Specification Changes
FY 2025-26 Workbook

- 330 & 338
  - Adding IRI Incentive/Disincentive Smoothness Specifications for Limited Access & Non-Limited Access Roads
  - Removing Ride Number Specifications - Separates Straightedge from Laser-Tested Areas
- 330 & 334
  - Industry Suggestion to Clarify Roundabout Limits Regarding Straightedge & Density Testing Exceptions in Intersections

Proposed Specification Changes
FY 2025-26 Workbook

- 283 RAP Base
  - Proposed using 85% of RAP's Gmm as density target instead of 95% of Modified Proctor Density
  - 95% of Modified Proctor Density results in densities in 70%'s when viewed from a % Gmm perspective
  - Provides Better Compaction, Improved Performance, Potential Increased Use of RAP base
  - Additional Changes Made After Discussion with SMO Geotechnical & Asphalt Sections, & Industry
- 285 Optional Base Course
  - Minor Changes Needed Due to 283 Changes in RAP Base Use
- 234 Superpave Asphalt Base
  - Raised Spreadrate Tolerance to +/-10% to Match 10% Pay Quantity Tolerance
- 286 Driveway Base
  - Clarified Plan Quantity Tonnage Determination

2022 – Limited Access IRI Project Overview

- 18 Projects
  - Lowest Average Project IRI = 31
  - Highest Average Project IRI = 66
  - (Average) Average Project IRI = 43
- 14 Projects Received Incentive
  - Average Incentive/Disincentive = $575 per lane mile
  - Highest Average Incentive = $2,187 per lane mile
  - Greatest Average Disincentive = -$2,344 per lane mile
- No Project Received 3% Consistency Bonus
  - All LOTs ≤ 55

2023 – Limited Access IRI Project Overview

- 30 Projects
  - Lowest Average Project IRI = 32
  - Highest Average Project IRI = 64
  - (Average) Average Project IRI = 47
- 15 Projects Received Incentive
  - Average Incentive/Disincentive = $298 per lane mile
  - Highest Average Incentive = $1,901 per lane mile
  - Greatest Average Disincentive = -$2,183 per lane mile

2024 (so far) – Limited Access IRI Project Overview

- 37 Projects
  - Lowest Average Project IRI = 35
  - Highest Average Project IRI = 69
  - (Average) Average Project IRI = 49
- 22 Projects Received Incentive
  - Average Incentive/Disincentive = $233 per lane mile
  - Highest Average Incentive = $1,874 per lane mile
  - Greatest Average Disincentive = -$2,797 per lane mile
- 1 Project Received 3% Consistency Bonus
  - All LOTs ≤ 55

Non-Limited Access IRI Smoothness Projects

Smoothness Class	FIN	District	SR	Avg IRI	Min IRI	Max IRI	Total Incentive	Total Lane Miles Tested	Avg Incentive per Lane Mile	Pilot Project, IRI Added Later, etc.
2	43775815201	3	369	35	30	58	$4,407	3.24	$1,360	Pilot Project
3	44290615201	5	400	38	26	54	$11,614	6.23	$1,864	Pilot Project
3	44381515201	5	40	38	24	66	$45,970	24.50	$1,876	Pilot Project
4	44609715201	4	710	59	44	85	$4,823	5.08	$949	Pilot Project
3	43914215201	5	44	46	29	68	$10,584	8.95	$1,183	Pilot Project
3	44620915201	1	710	52	36	77	$1,996	4.71	$424	Pilot Project
3	44125915201	2	26	57	102	33	*-$2,615*	12.87	*-$203*	Pilot Project
4	44540215201	2	47	56	101	32	$27,864	25.57	$1,090	Pilot Project
4	44611215201	4	76	57	35	85	$4,454	7.39	$603	Pilot Project
3	44543615201	2	121	43	32	70	$28,013	15.79	$1,775	Pilot Project
2	44520815201	5	600	45	30	88	$876	4.48	$195	Pilot Project
4	44717615201	2	21	44	29	68	$10,986	5.91	$1,858	Pilot Project
4	44622815201	1	25	45	31	61	$12,246	6.53	$1,874	Pilot Project
3	42450125201	7	55	48	29	76	$1,919	2.21	$870	IRI Added Project
3	44163115201	4	25	66	33	140	*-$57,416*	50.40	*-$1,139*	IRI Added Project
3	44529415201	5	40	52	30	82	$5,644	11.92	$473	IRI Added Project
5	43914215201	3	44	46	29	68	$10,584	8.95	$1,182	IRI Added Project
4	44519015201	5	35	53	34	80	$5,450	6.31	$863	IRI Added Project
5	44381515201	5	40	38	24	66	$31,121	24.50	$1,271	IRI Added Project

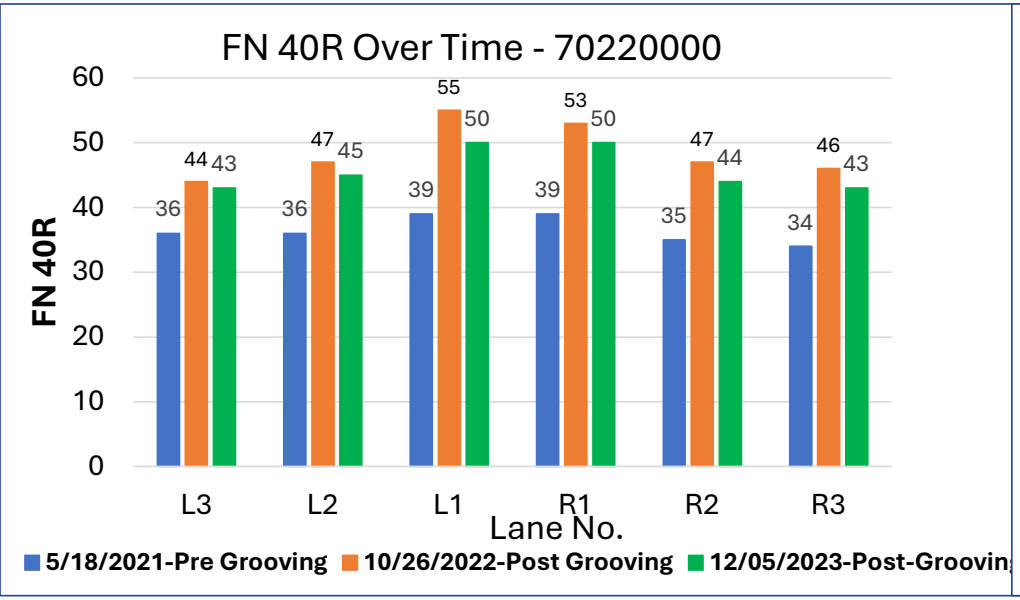
New Ideas, Equipment, Methods, & Technologies

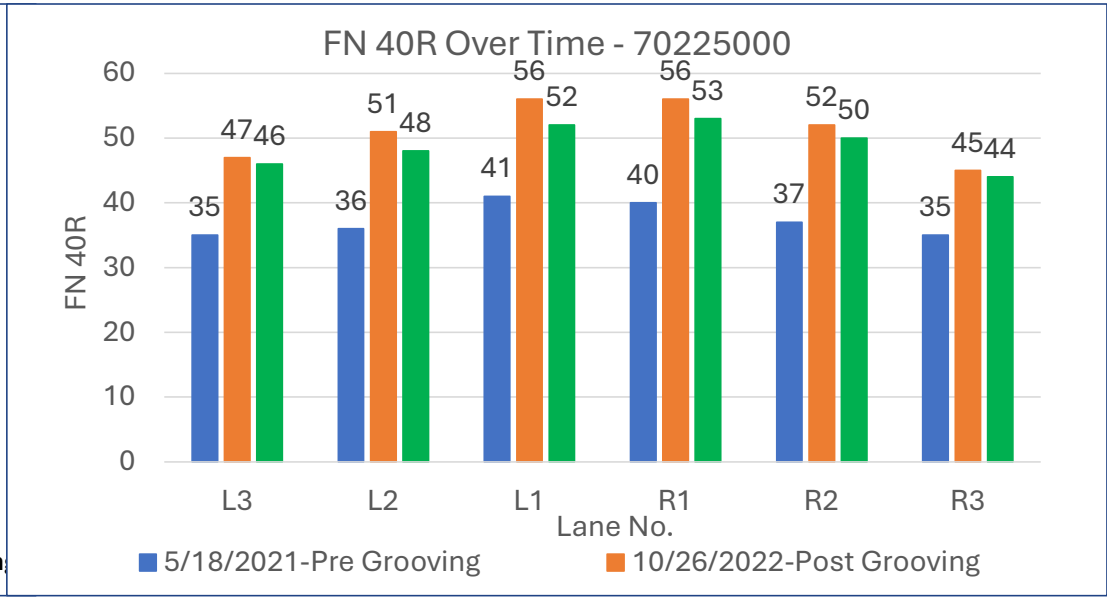
Longitudinal Grooving
Dense-Graded Friction Course

- Longitudinally Grooved Concrete Pavement Project Resulted in Increased Friction, Macrotexture, & Hydroplaning Resistance
- Same can occur with dense-graded friction course
- Potential Option to FC-5, to Eliminate Raveling & Shorter Pavement Life of FC-5
- Keep Eye Out for Pilot Projects

Longitudinal Grooving - Pavement Friction Improvement

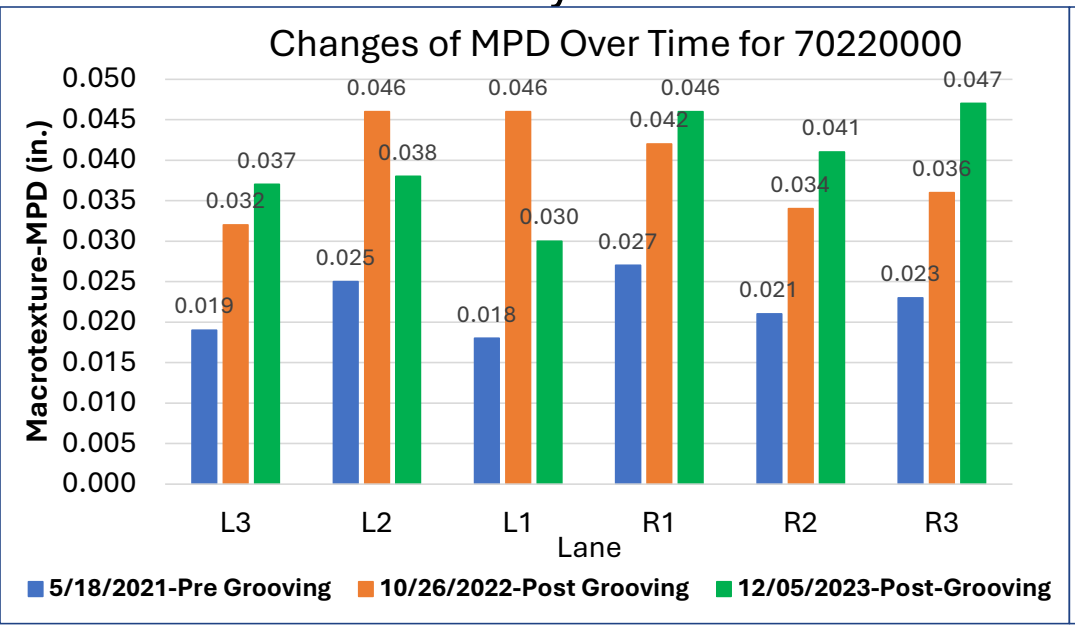
- Pre-Grooving - Friction Mostly 30's
- Post-Grooving - Friction 40's & 50's!
- 35% Increase in Friction Initially, Slight Decrease After 1 Year

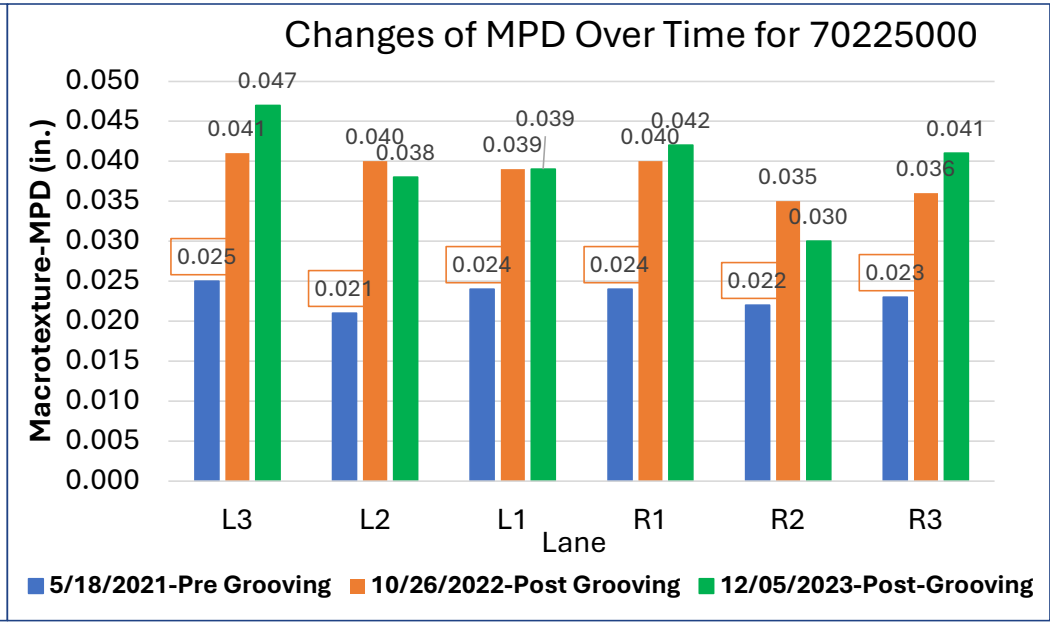




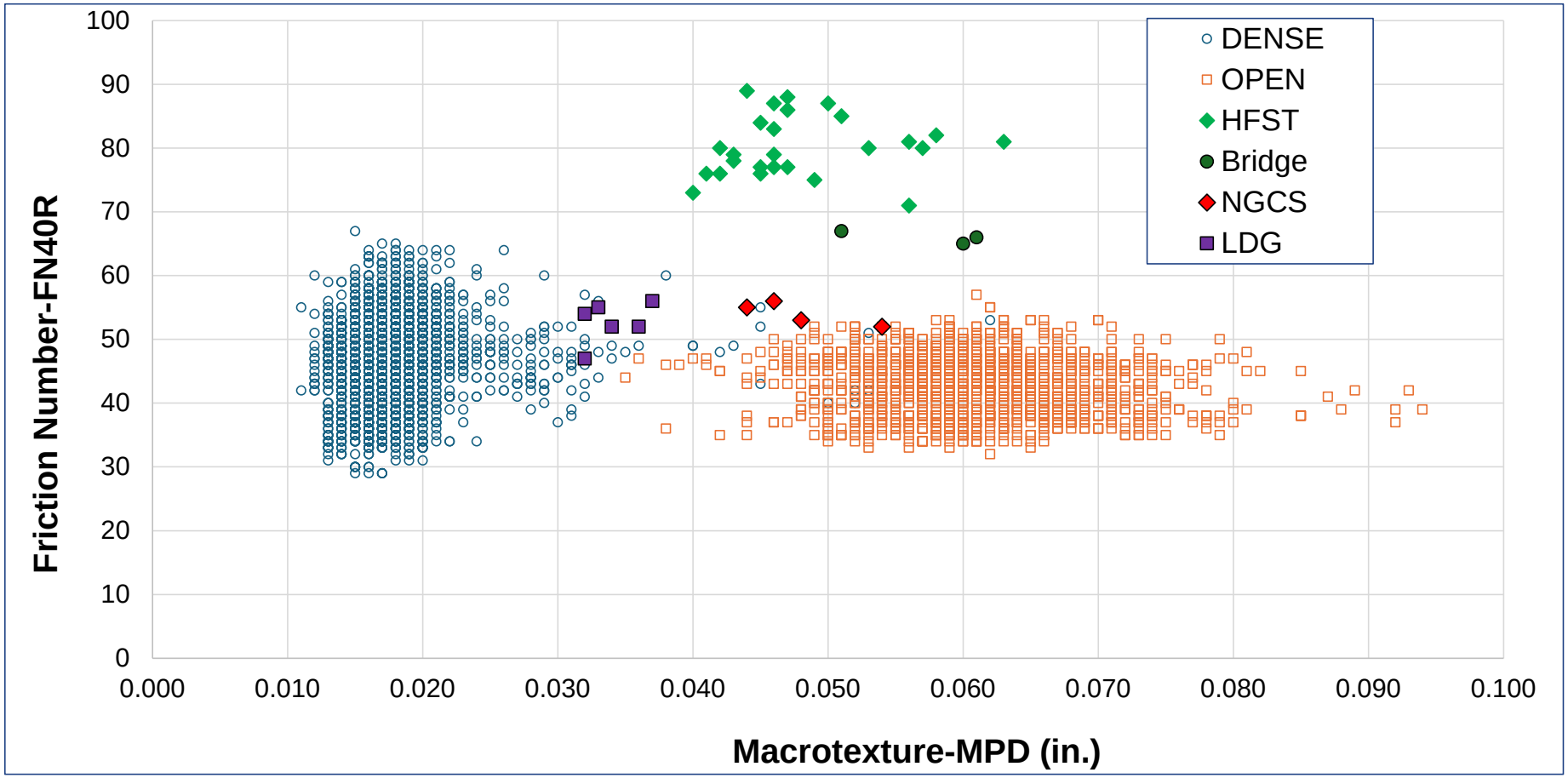
Longitudinal Grooving - Macrotexture

- Longitudinal Grooving Significantly Increased Macrotexture
  - i.e. Improved Resistance to Hydroplaning
- After 1 Year: 7 Lanes Increased, 1 Remained Same, 4 Decreased,
  - All Still Greatly Exceed Pre-Groove Condition



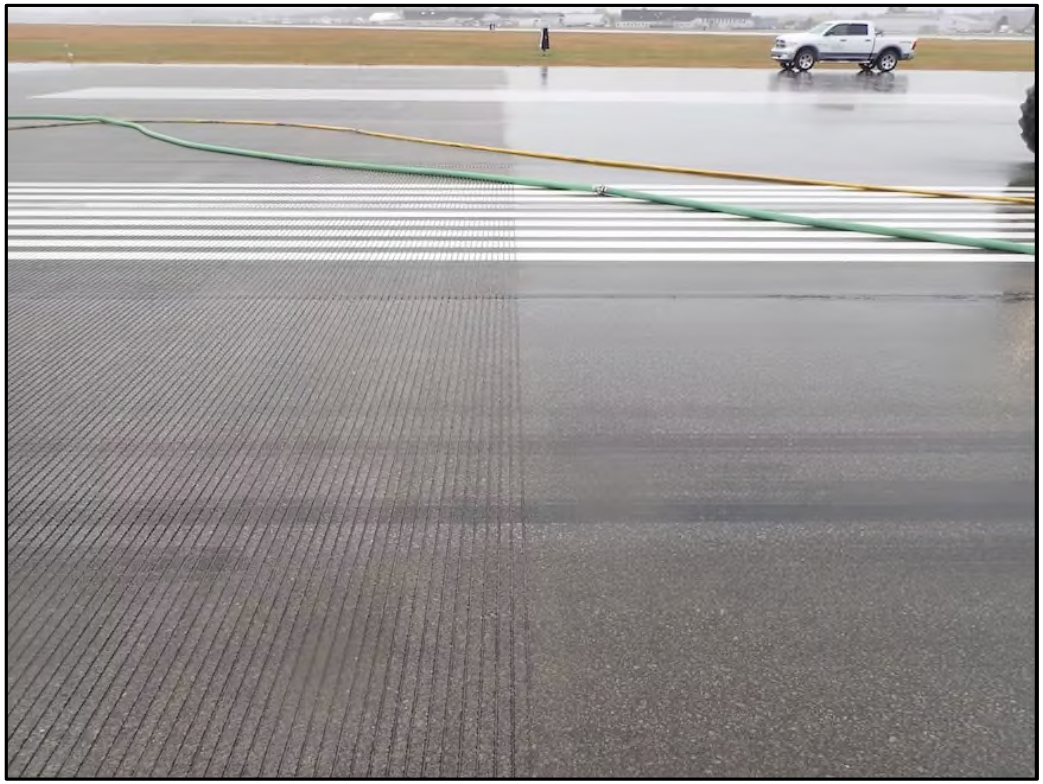


Pavement Surfaces: Macrotexture vs Friction



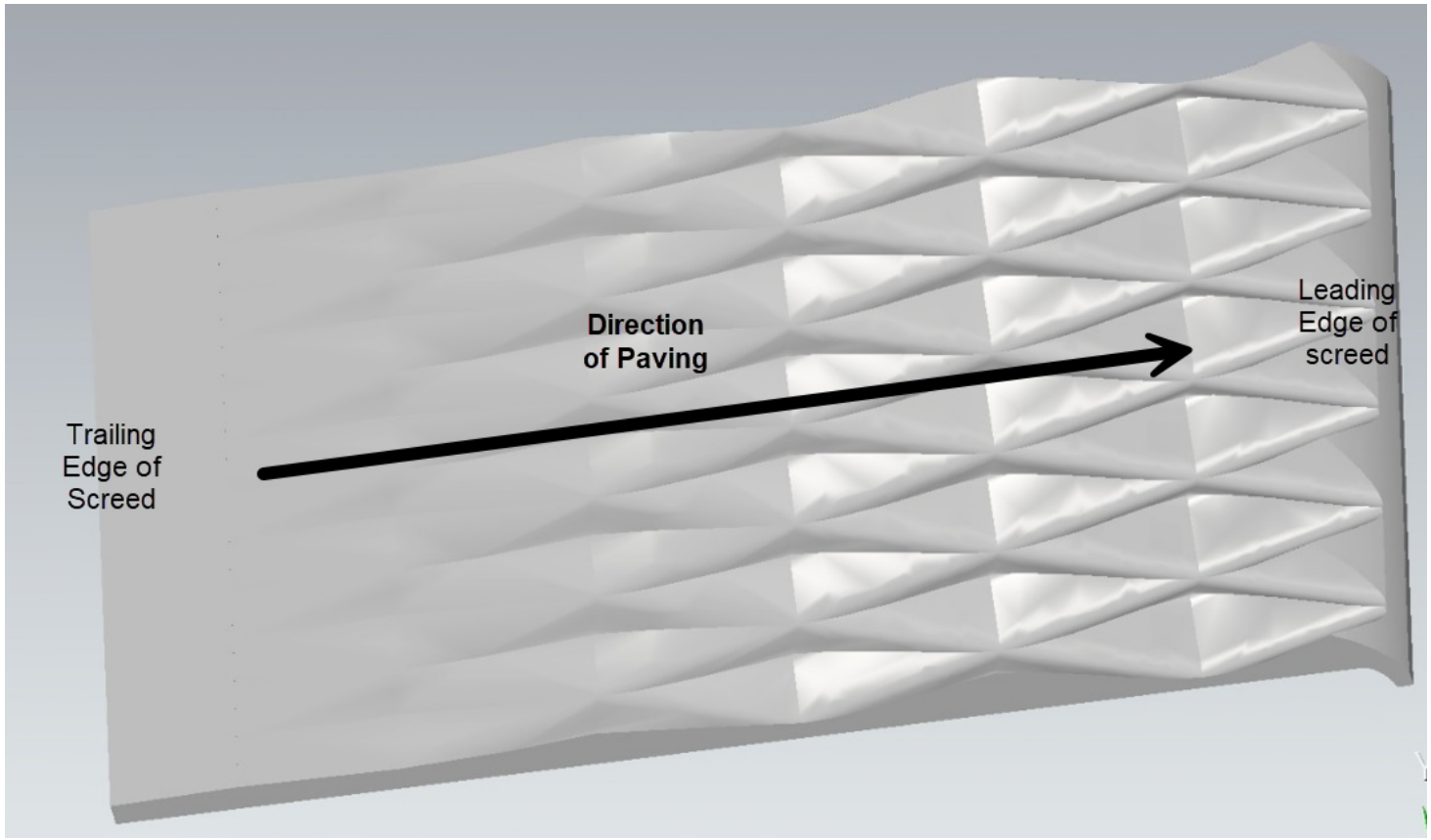
Longitudinal Grooving

- Used on Concrete Pavement
- Other States Have Longitudinally Grooved Dense-Graded Asphalt
  - Missouri, NY, Ohio
  - Reduced Crash Rates
    - Especially Wet Weather Crashes
- Florida
  - Transverse Grooving on Florida Airport Runways & Taxiways
  - Sections of Grooved Dense-Graded Asphalt Planned or Being Considered in D7, D4, D1, & D3



SDX Paver Screed

- SDX Screed's Texture Compacts Asphalt More Than Standard Screed



SDX Paver Screed on I-4

- 91% Density Behind Screed (Prior to Roller Compaction)
  - End of Low Density Failures?
- 92%-93% with Couple Static Compaction Coverages

SDX Paver Screed on I-4

- Half the Rolldown (~1/8” per inch)

SDX Paver Screed

- Slight Line Texture Initially, Typically Gone After 2-3 Roller Coverages
- Smooth Compacted Mat After Rolling

Slight Line Texture

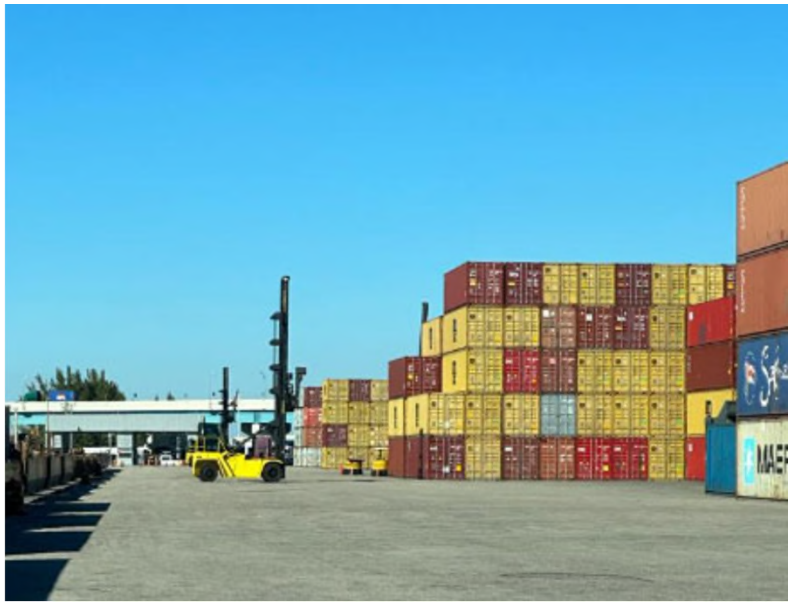
- Spoke to SDX Screed Inventors About Creating Screed To Place Grooves in Pavement (3/4” on Center, 1/4” to 3/8” deep)
- Use to Groove Dense-Graded Asphalt Friction Course & Provide Hydroplaning Resistance without Raveling Concerns of Open-Graded Friction Course
- If They Create It, We’ll Look to Use It on Some Projects

SDX Paver Screed Use on OGFC

- Slightly Visible Lines
- Smooth Pavement
- No Segregation or Texture Concerns

General Asphalt – RAP Base

- Used RAP as Pavement in Shipping Container Storage Yard
- Asphalt Pavement in Owner's Previous Yard Rutted, but RAP Pavement Has Not
- Why is This RAP Pavement Performing Well When RAP Base ?
- Why Has RAP Base Often Performed Poorly, Even Though It's Lower in Pavement Structure & Subject to Lower Stresses?



RAP Base - Current Acceptance

- Accepted if Minimum Density is 95% of Modified Proctor Density

> **283-4.4 Density Tests:** Meet the requirements of 200-7 with the exception of 200-7.2.1. Within the entire limits of the width and depth of the base, obtain a minimum density in any LOT of 95% of the maximum density as determined by FM 1-T180.

- What is Modified Proctor Density?
  - Test Developed For Soils, Imparts Given Amount of Energy
  - Simulates Earthwork Compaction Equipment
  - It is NOT %Density Relative to Gmm (Not %Gmm)
  - Likely Doesn't Set Adequate Relative Density Target (%Gmm) for RAP Base

RAP Base
%Gmm of Modified Proctor Density

- General Asphalt RAP Base Data
- 95% Modified Proctor Density Too Low for RAP Base Acceptance
  - When Viewed from %Gmm Perspective
  - %Gmm Density in 70% Range - Settlement, Creep, Rutting Expected

Report #	F15923 & F15924	F15729 & F15730	F15517 & F15518	F15346 & F15347
Modified Proctor Density of RAP (LB/CF)	113.90	118.60	119.10	121.70
Gmb of Modified Proctor Density	1.825	1.901	1.909	1.950
Gmm of RAP	2.396	2.396	2.396	2.396
%Gmm of Modified Proctor Density	**76.2%**	**79.3%**	**79.7%**	**81.4%**
%Gmm of 95% Modified Proctor Density	**72.4%**	**75.4%**	**75.7%**	**77.3%**

RAP Base

- Acceptance Target of 95% of Modified Proctor Is Too Low
  - In 70% Range (% of RAP Gmm)
  - Cause of Poor RAP Base Performance?

- Proposed Spec Change (FY 2025-26)
  - Set RAP Base Acceptance Target at 85% of RAP Gmm
  - Convert to lbs/cf, so No Change to Field Testing Methods or Measurement Units
  - Additional Changes Added After Discussion with SMO Geotechnical & Asphalt Sections to Use 85% of RAP Gmm on Limited Access Shoulders & About 80% of RAP Gmm in other locations
    - Defined 85% of RAP Gmm as Calculated Proctor Maximum Density
    - Maintains a Proctor Density term for Earthwork

Automating Construction Inspection

- Obtain Construction Inspection Data from Construction Equipment
  - Started with Panel Discussion @ 2024 FTBA Construction Conference
  - Continuing with Automated Construction Inspection Team
- Phases
  - Collect Data & Location From Construction Equipment
    - Ex. Milled Cross Slope from Milling Machine
  - Provide Data in Report Format
    - Submit Instead of Current FDOT Form
  - View Data/Report on an App (Smart Phone, Tablet, Computer)
  - View Data in App in Real Time - As Milling & Paving occurs

Automating Construction Inspection

- Ajax, OnGrade, Caterpillar, Haul Hub, OnStation, & FDOT Working to Collect Milled Cross Slopes on a Project

- End Goal is to Reduce/Eliminate Manual Measurements
  - Increase Safety by Reducing Time Inspectors In Path of Equipment
- Real Time Inspection Data
  - Inspectors Can Evaluate Cross Slopes & More Quickly Communicate With Crew, Rather Than Spending All Their Time Measuring & Collecting Data
  - Allows Milling & Paving Crews to Check App & Make Corrections Sooner
  - Allows Off-Site Oversight

PrePave Meeting Agenda

- Concerns About
  - Time Spent at PrePave Meetings
  - Value of Some Agenda Items
- Worked with Districts & Contractors
- Ensure
  - PrePave Meeting Covers Project-Relevant Topics
  - Entire Meeting Has Value
  - Time Is Well Spent
- Remove Agenda Items
  - Covered in Standard Specifications
  - Means & Methods
  - Don't Impact Project or Project Decisions

(16) Asphalt Operations [Discuss the importance of constant communication between the Quality Control Manager, the Department's Project Administrator and Verification Technician for quality reporting, placement, and payment. Review Automated Quality Control Roadway Report. Inform the Contractor that prior to any paving operation another meeting must be held. The QC Plan, QA/QC specifications, core frequency and handling of the cores, frequency for covering the milled surface, cross slope correction, and smoothness will be discussed.

The Contractor will attend this meeting and present the following material:

(a) The proposed starting date of the paving operations

(b) The location of the asphalt plant(s) to be used

(c) Contact List / Escalation Matrix

While a Project Contact List/Matrix may already be established, ensure a Contact List/Escalation Matrix are shared for all paving operations, as well as plant mix production, sampling, & testing

(d) Discuss any project complexities, unique or challenging roadway geometry, MOT, or phasing, Non-Standard Milling, Non-Standard Paving, CSI's, any unique project conditions, etc.

(e) Discuss any Non-Standard Specifications (Dev Specs, SP's, MSP's, TSP's), Developmental Standard Plans, Pilot Project Documents (ex. new materials, new testing/acceptance methods, new construction equipment/operations, etc.)

Also discuss any recent changes to Standard Specifications

(f) Open Forum

Discuss any current topics or areas of concern not listed above that are worth mentioning

ex. end-of-load segregation, Safety

(g) **NOTE:** No paving operation will begin before a Pre-paving Conference is held to discuss the above items.]

Process Review Findings

- The Good
  - Tack Coverage
  - Overall Inspection Efforts
- The Not So Good
  - Seeing More End of Load Segregation
  - Some Missed Quality & Inspection Issues
  - Issues Created When Contractors Ignored CEI/FDOT Advice

Tack Coverage

- Seeing Much Better Tack Coverage in Recent Years
- Increased Tack Rates Resulting in Full Tack Coverage
- Leads to Longer Lasting Pavements

End-of-Load Segregation

- Seeing Increase Around State
- Continuous Trucking Is A Challenge
- Better to Stop Paver than Pave & Run Hopper Dry
- Bump from Stopping Paver Can Be Rolled Out
- Segregated Areas Have to be Removed & Replaced Full Depth

Ignoring CEI & FDOT Advice & Guidance

- Can’t Have Contractors Ignoring Warnings About Segregation Paving Over Standing Water, etc.
- Consider CEI & FDOT Advice & Avoid Resulting Additional Testing, Remove & Replace
- Often CEI & FDOT Recommendations Are Easily Accomplished
  - If Requests Are Unreasonable, Contact Me

Questions?

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