2016 PAPA REGIONAL PARTNER MEETINGS

March 14, 15 and 16, 2016

Committed to:

- Safe, Smooth, Sustainable, Long Lasting Pavements!

PA Asphalt Pavement Association

- Gary Hoffman, Director of Technical Services

New Tack Coat Specification Requirements Section 460

Neal Fannin P.E.
Pavement Materials Engineer
PENNDOT

Change in Tack material

- New Tack is similar to CSS-1h emulsified asphalt.
  - The Minimum residual asphalt is 57% instead of 28%
  - The application temperature is 90F to 150F (AET - 75F to 140F)
- Non-tracking Tack is also an option now.
  - Minimum residual asphalt is 50%.

Change to Application Rate

Surface Type	Uniform Asphalt Residue Rate (RR) (Gallons per square yard)
New Bituminous Paving	0.03 to 0.05
Existing Bituminous Paving	0.04 to 0.07
Milled Surface (Bituminous & PCC)	0.04 to 0.08
Portland Cement Concrete	0.04 to 0.07

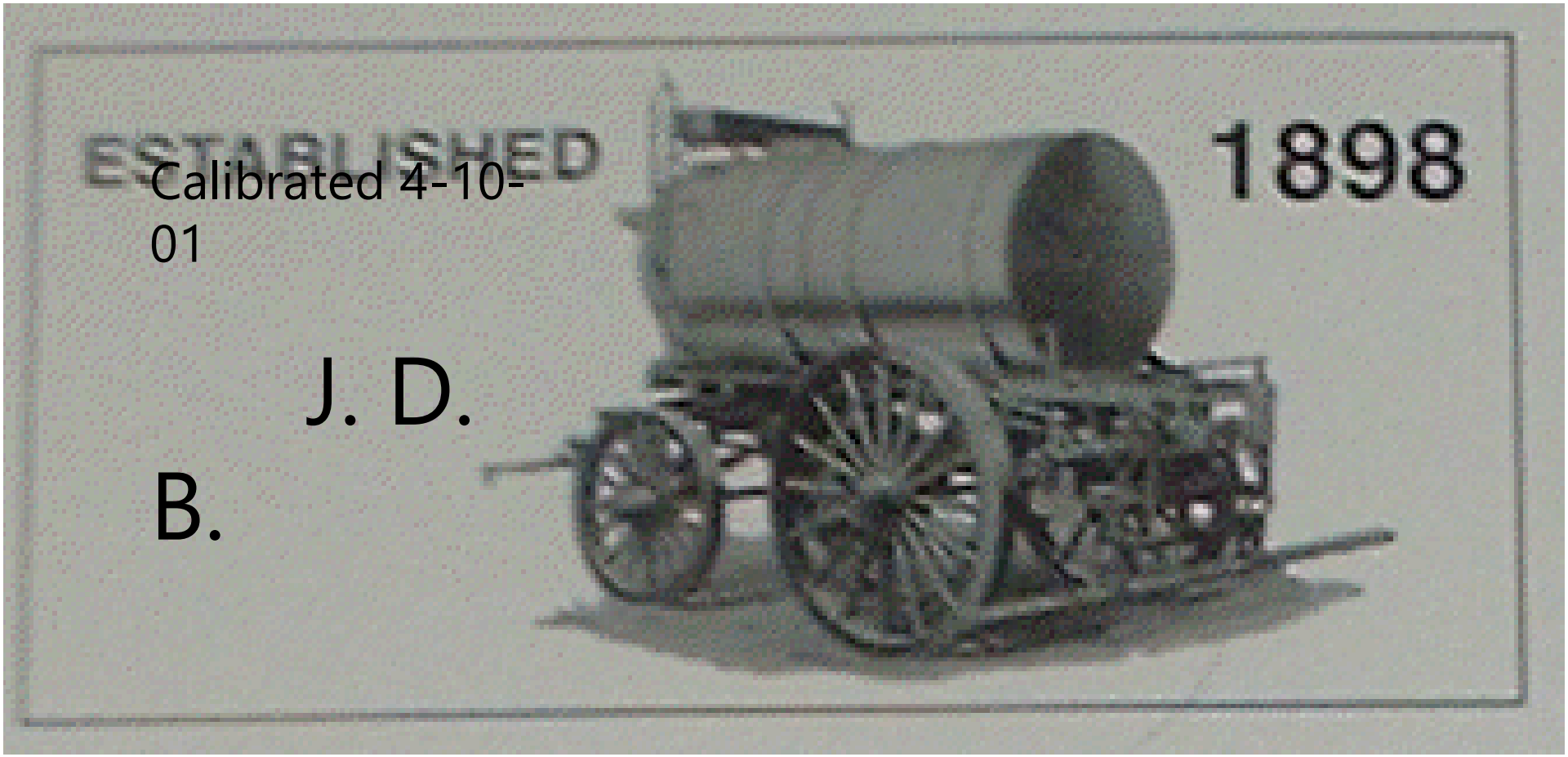
Test Section

- The specification includes a test section.
  - 100 Ft. test section required to ensure the proper application is being applied.

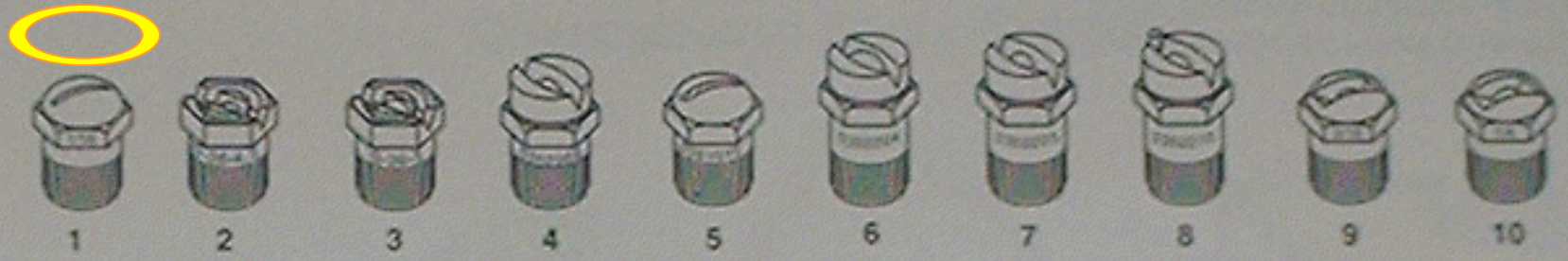
Implementation

- CT1 comments addressed.
- CT 2 should be out in a week or 2
- Specification should be approved by July 1.
- Change should be in Change 1 of 2016 Pub. 408.
  - Change 1 effective date is October 7, 2016.

Equipment Operation



Etnyre Spray Bar Nozzles



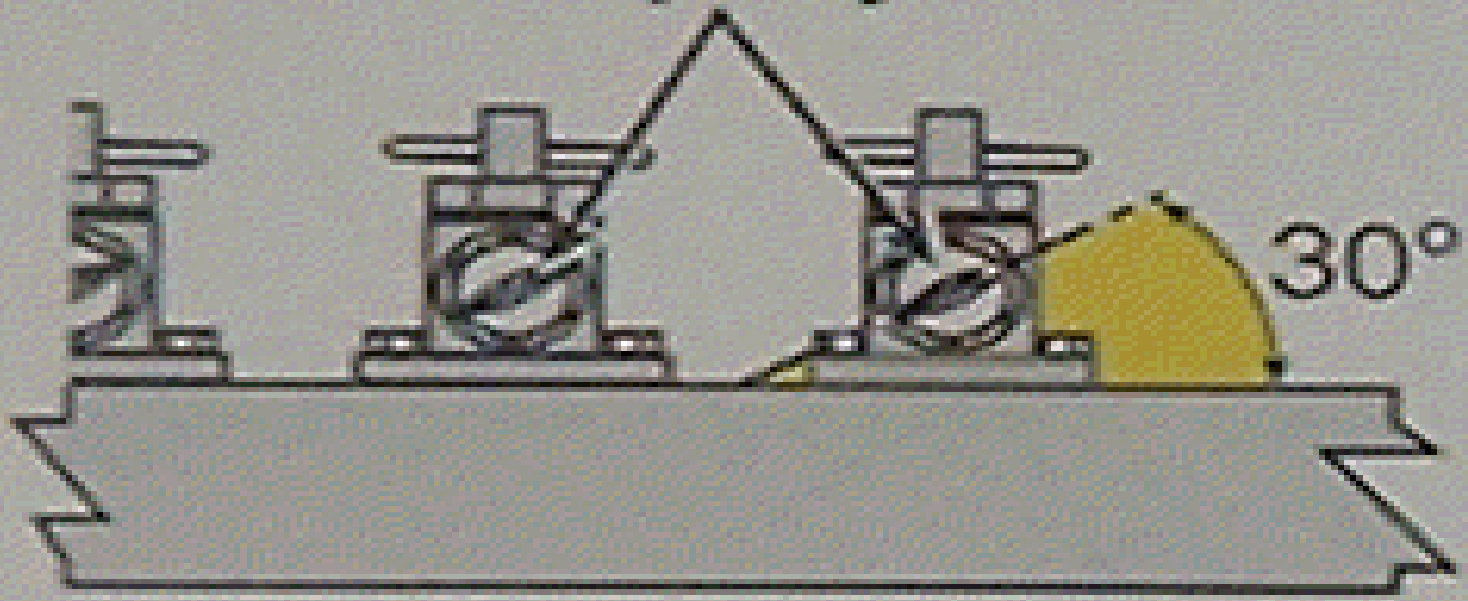
1	2	3	4	5	6	7	8	9	10
3351013	3351008	3351009	3352368	3351015	3352204	3352205	3352210	3351014	3351010

Ref.	Part No.	Description	Application Per Square Yard	Application (Metric) Liters Per Square Meter	Flow Gallons Per Minute Per Foot
1	3351013**	1/16" Coin Slot	.05 - .20	.19 - .75	3.0 to 4.5
2	3351008	S36-4 V Slot	.10 - .35	.38 - 1.30	4.0 to 7.5
3	3351009	S36-5 V Slot	.18 - .45		7.0 to 10.0
4	3352368	Multi-Material V Slot	.15 - .40	.57 - 1.50	6.0 to 9.0
5	3351015	3/32" Coin Slot	.15 - .40	.57 - 1.50	6.0 to 9.0
6	3352204*	Multi-Material V Slot	.35 - .95	1.30 - 3.60	12.0 to 21.0
7	3352205*	Multi-Material V Slot	.20 - .55	.75 - 2.08	7.5 to 12.0
8	3352210	End Nozzle (3352205)	.20 - .55	.75 - 2.08	7.5 to 12.0
9	3351014	3/16" Coin Slot	.35 - .95	1.30 - 3.60	12.0 to 21.0
10	3351010	1/4" Coin Slot	.40 - 1.10	1.50 - 4.16	15.0 to 24.0

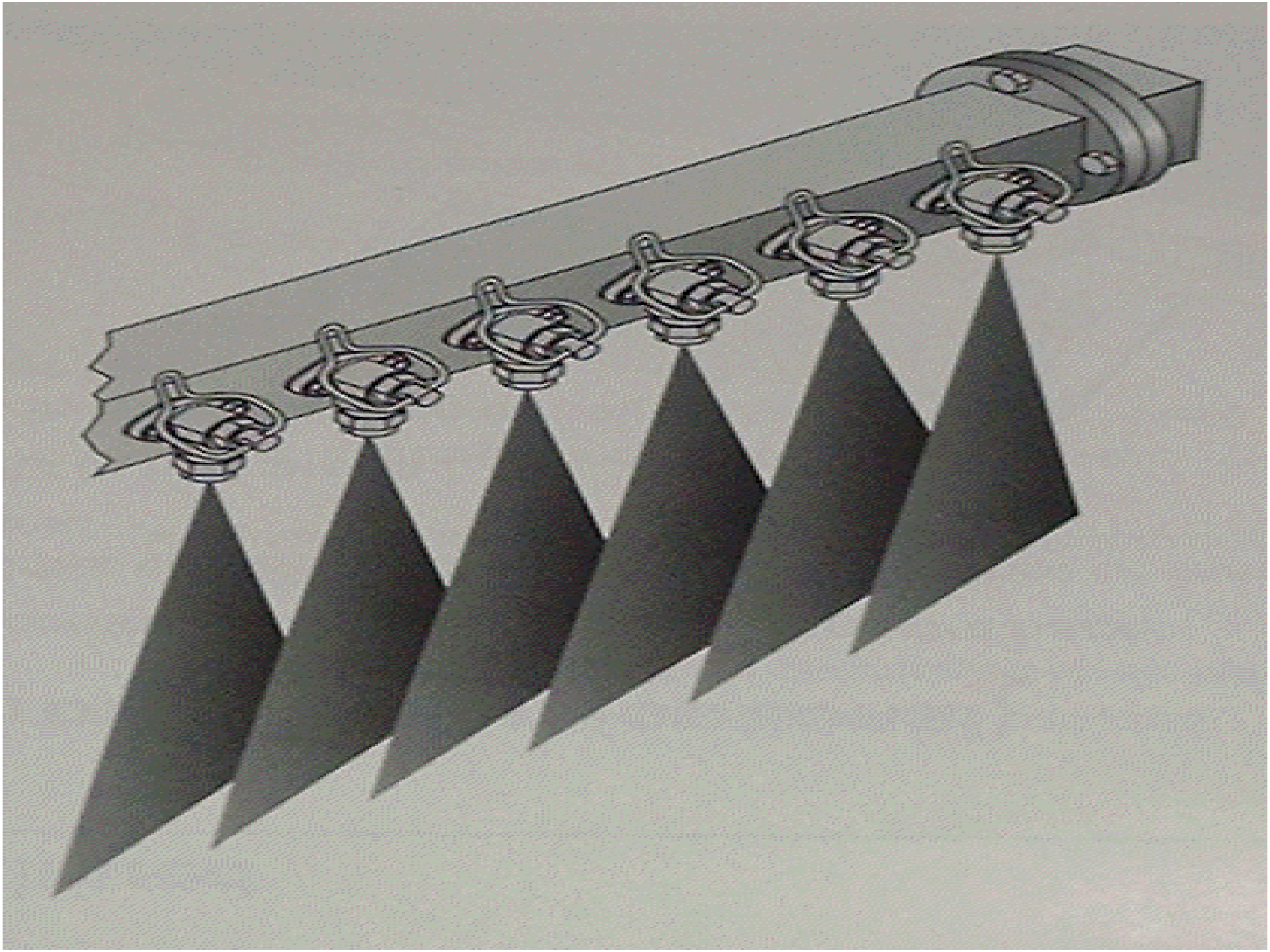
* Recommended nozzles for seal and chip with emulsified asphalts.

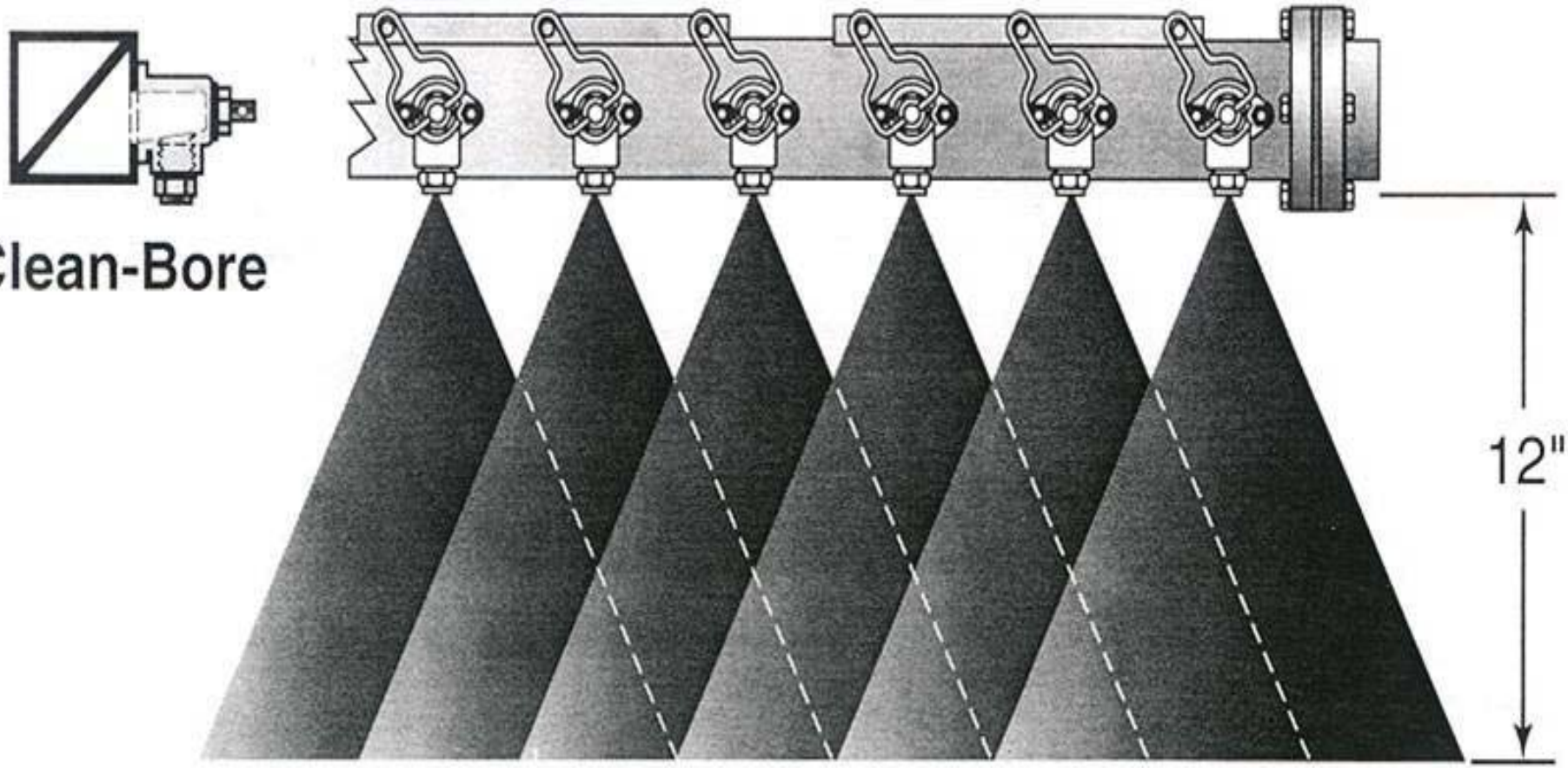
** For application prior to laying a hot mat.

Nozzle Slot 30°
from Spray Bar



Spray Bar (bottom view)





Triple-Lap Coverage

With nozzles on 4" centers, material sprayed from each nozzle overlaps two other sprays.

Tack Applications

- Is this a proper tack application
- Potential issues with this application
- Do you notice any tack near the paving joint?


Good Spray Pattern
Uniform Coverage
No Streaking

Effects of Tack on Pavement Performance

- Construction practices necessitate driving on the tack coat to place the mix
- Tracking of the tack from the surface may result

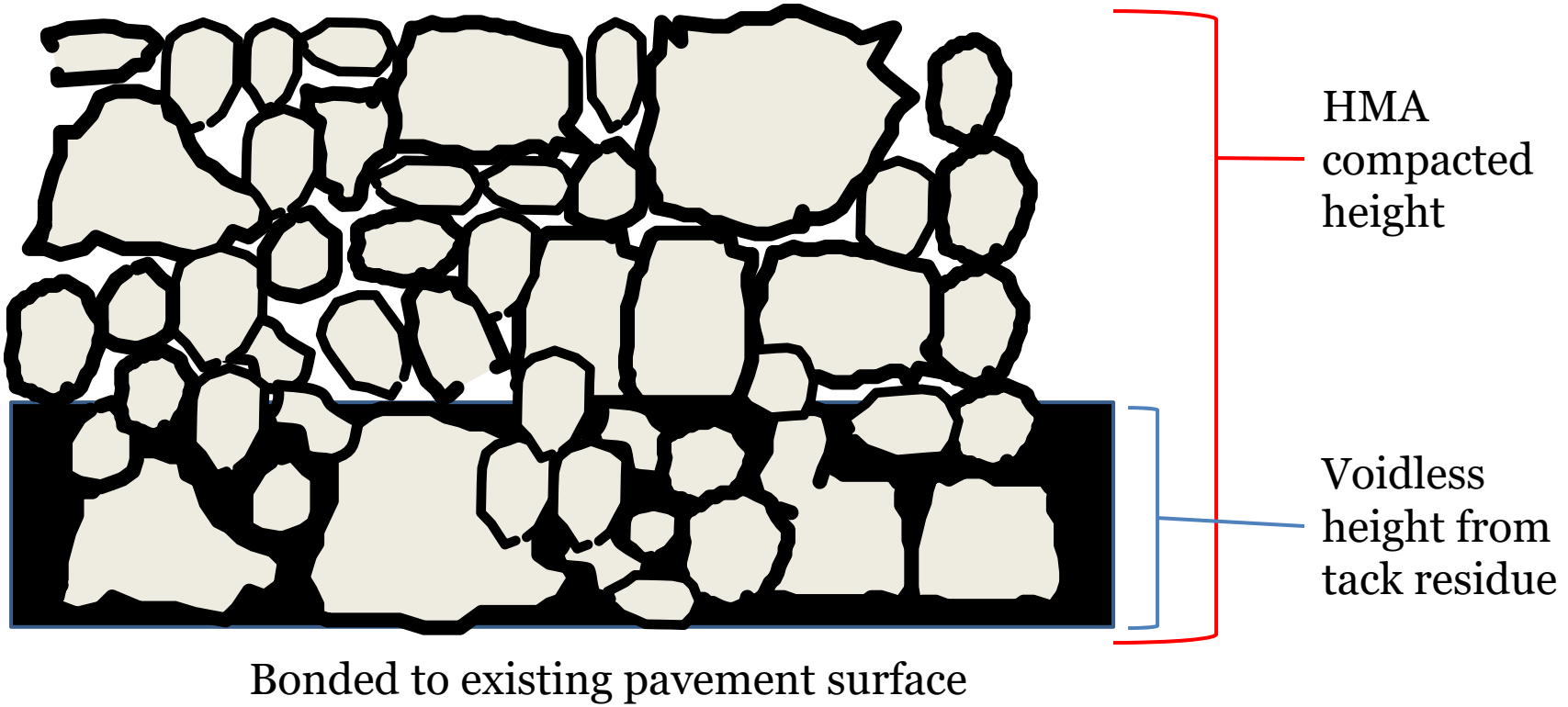
Light or Poor Tack Applications lead to Early Pavement Failure

- Longitudinal cracking near the wheel path

Plywood Example

Benefit of Higher Tack Applications

- Higher tack rate creates an asphalt rich interlayer at the interface with the existing pavement



Tack Application Rates

- Penn Dot Pub 408 Section 460
- Apply emulsified tack to leave a uniform asphalt residue from .02 to .07 gallons per square yard.
- AE-T application (30% residue) - .067 to .23 gals/sy
- New tack (58% residue)- .034 to .12 gals/sy
- Higher tack rates are better but tracking is a concern

Setting and Curing Factors

- Emulsion Reactivity
  - Emulsifier chemistry, concentration
  - Other additives
  - Asphalt viscosity
- Aggregate Reactivity
  - Surface area, surface charge, surface chemistry
  - Filler chemistry e.g. cement, lime
- Road and Air Temperature, Humidity, Wind Speed
  - Remove water from the system
- Mechanical Treatment e.g. compaction
  - Squeeze the droplets together and squeeze out water

What Were The Issues with Tack?

- Problem with tracking of tack coat materials
- Creates safety issues where build-up occurs

Non-Tracking Tack

- A specification is out on clearance transmittal
- All producers should have a non-tracking tack material available in 2016.
- The specification does not infringe on other material patents.
- No special equipment
- It is a good beginning but we have several challenges with the use of quick setting materials.

Handling Non-tracking tacks

- Material is designed to break quickly, storage stability may be limited.
- Current formulations are anionic, current tack materials have been cationic. Check with your supplier before mixing materials.
- Application rates are identical to conventional application rates.

Thank you!
Contact Information

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- Resources: Stephanie Hogendoorn
- Akzo Nobel Surface Chemistry LLC

Wes McNett- McTish, Kunkel

Happenings – www.pa-ashalt.org

- **2016 PENNDOT PAPA Eastern Regional Meeting**
  - **March 16, 2016 Holiday Inn, Lehigh Valley, Breinigsville**
- **2016 Bus Tour & T^2 Session**
  - **July or August 2016 in District 1-0**
- **2017 PAPA Annual Conference**
  - **January 16, 17 and 18, 2017**

Please Contact Tina Holtzman @ 717-657-1881 or tina@pa-asphalt.org for more Information!

Questions?? Thank you!!

To contact .....

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