Review of the New A115 Specification Guideline For Polymer Modified Slurry

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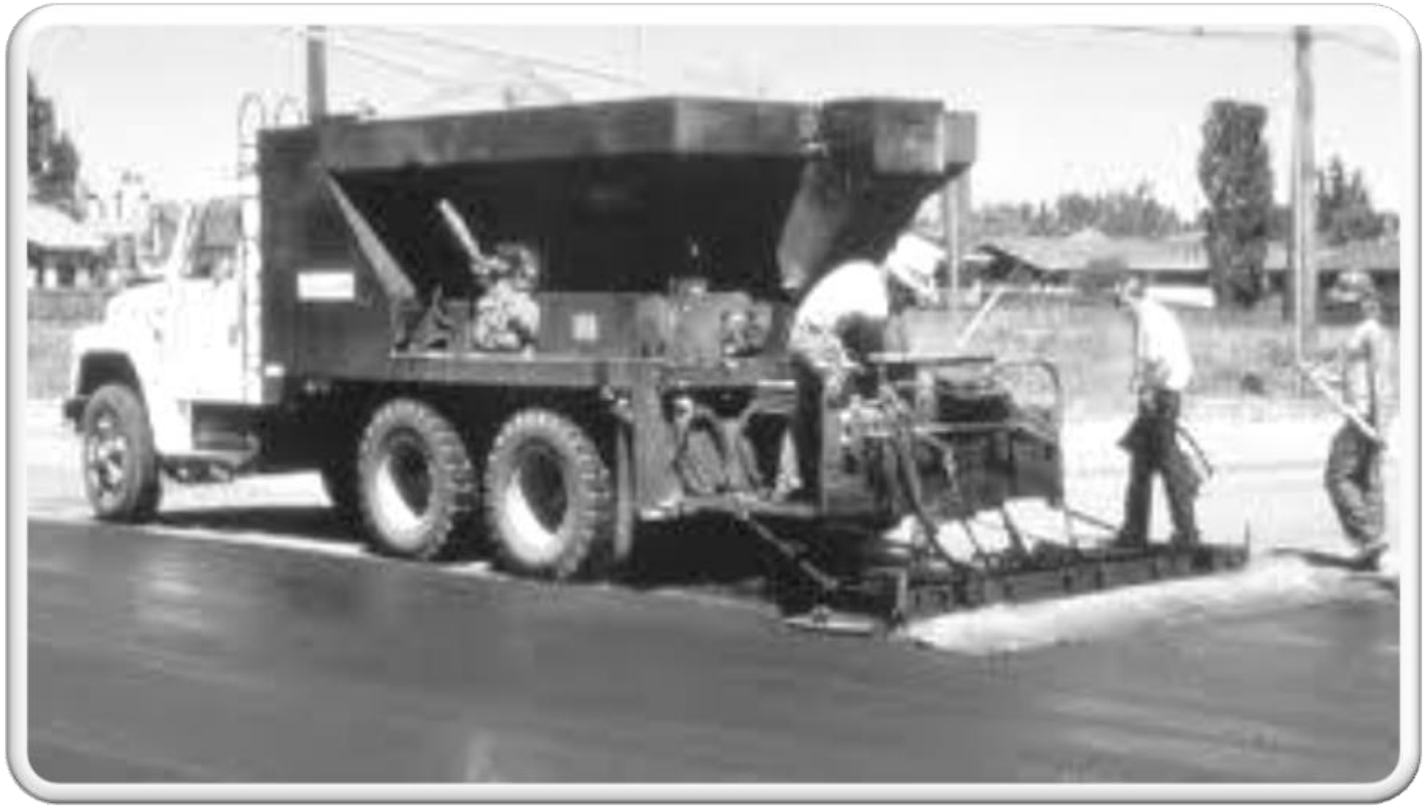
Outline

- Brief history of slurry surfacing systems
- Why develop a new Specification Guide
- Compare Slurry seal / P-M Slurry seal / Micro Surfacing
- Where should I use this product?
- Next Steps

Ancient history

- Prior to 1980, slurry seal was generally a lower tech version of what we use today.
- Basic emulsions
- Finer aggregates
- Thinner applications
- Evaporative cure



Ralumac® changes the game

- In 1981, Raschig Corporation, a German company, introduced Ralumac into the US market.
- Ralumac changed the face of slurry surfacing systems in the US. Ralumac required 100% crushed aggregate, engineered emulsions, premium base asphalt, 3% natural latex and specialized application equipment.
- Ralumac was designed for rut filling and high traffic. Traffic time went from being measured in hours to measured in minutes. The future was here.
- To avoid using the trade name Ralumac, the generic product was called Micro Surfacing.

Everyone in the pool

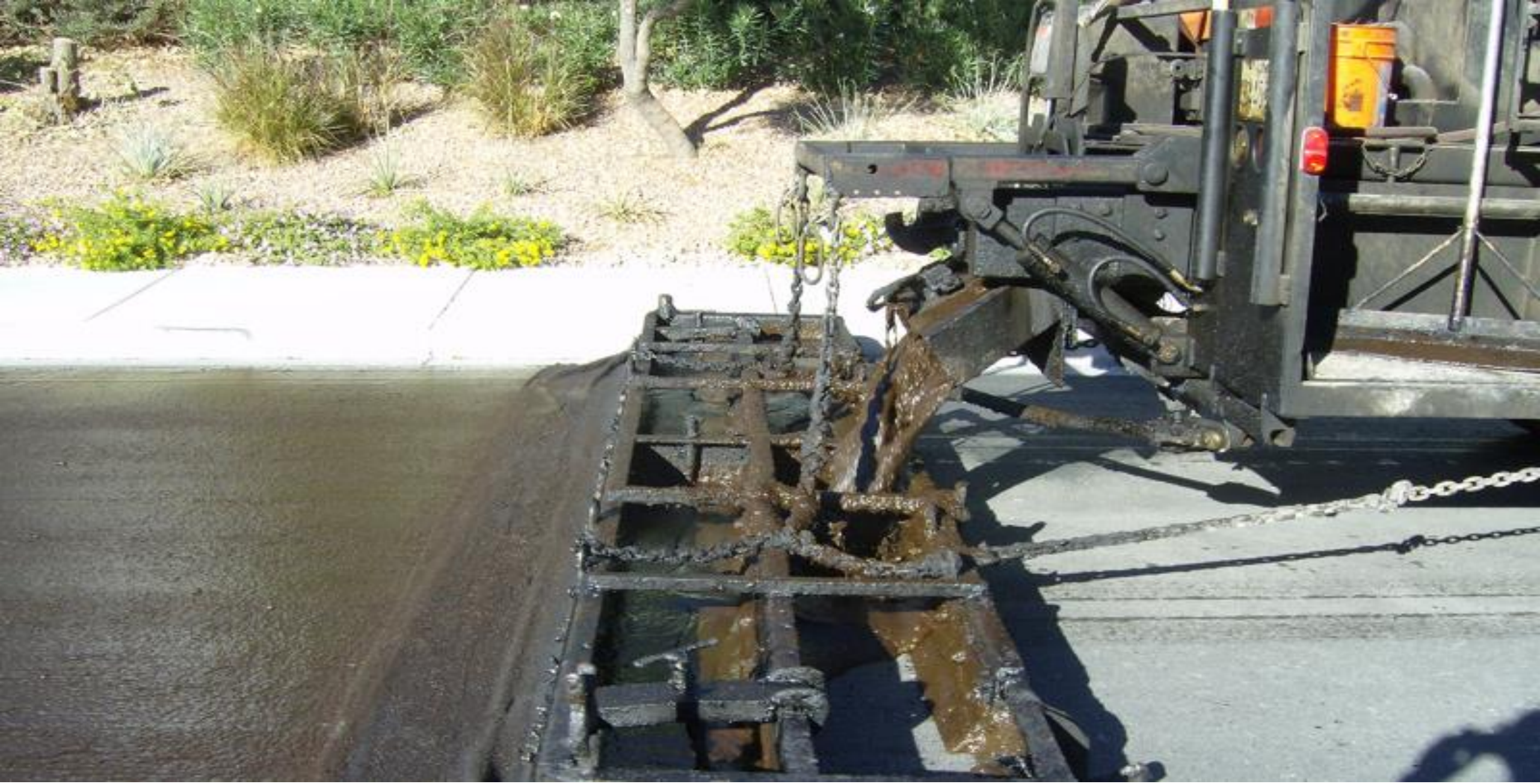
- **Soon, everyone wanted micro surfacing but few wanted to pay the price of admission.**
  - Emulsion / Aggregates / Licensing
  - True Ralumac required extra people, time and equipment to get right
- **State DOTs required open bidding and lower cost products.**
- **Emulsion suppliers designed their own systems.**
- **Polymer-modified cationic quick-set (CQS-LM, CQS-1HP) slurry seals became the new micro surfacing with varying degrees of success.**
- **What happened to Ralumac?**

Why Develop a New Spec Guide?

- **Most Slurry Contractors have moved well past the A105 Guidelines.**
  - Polymer Modification
  - Emulsions and Aggregates
  - Equipment
- **An Agency, using the A105 could get a basic slurry when what they wanted was something else**
- **There is a place for the A105 both domestically and internationally. It was not time to retire the specification.**
- **Not every job needs the A143 Micro spec.**
  - Traffic Volumes
  - Application Rate
  - Higher up on the Preservation Curve.
- **The differences between A105, A143 and A115 required a new Spec Guide.**

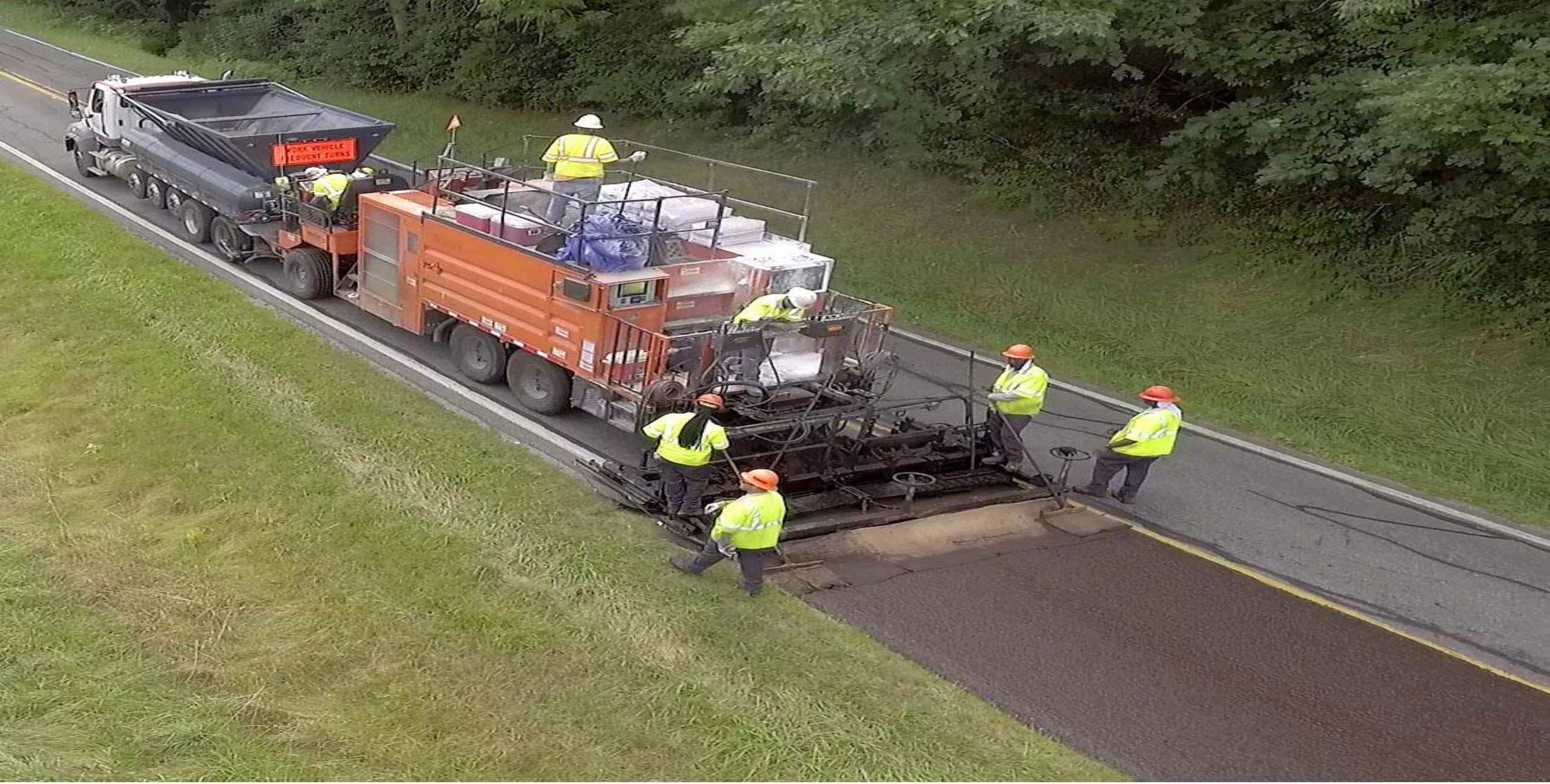
Slurry systems

- **Slurry seal – A105**
  - Aggregate –
    - Should be 100% crushed –
      lower sand equivalent values (SEV), lower quality, higher fines
  - Emulsion
    - SS, CSS, CQS – some may be polymer-modified
    - Currently, many slurry seals use a polymer-modified CQS emulsion
  - Equipment
    - Lightweight spreader box, no augers needed
  - Performance
    - Single stone lift, no ruts, lower traffic, may be slower return to traffic readiness
  - Use
    - Residential and collector streets, highways (seal only), top of the preservation curve



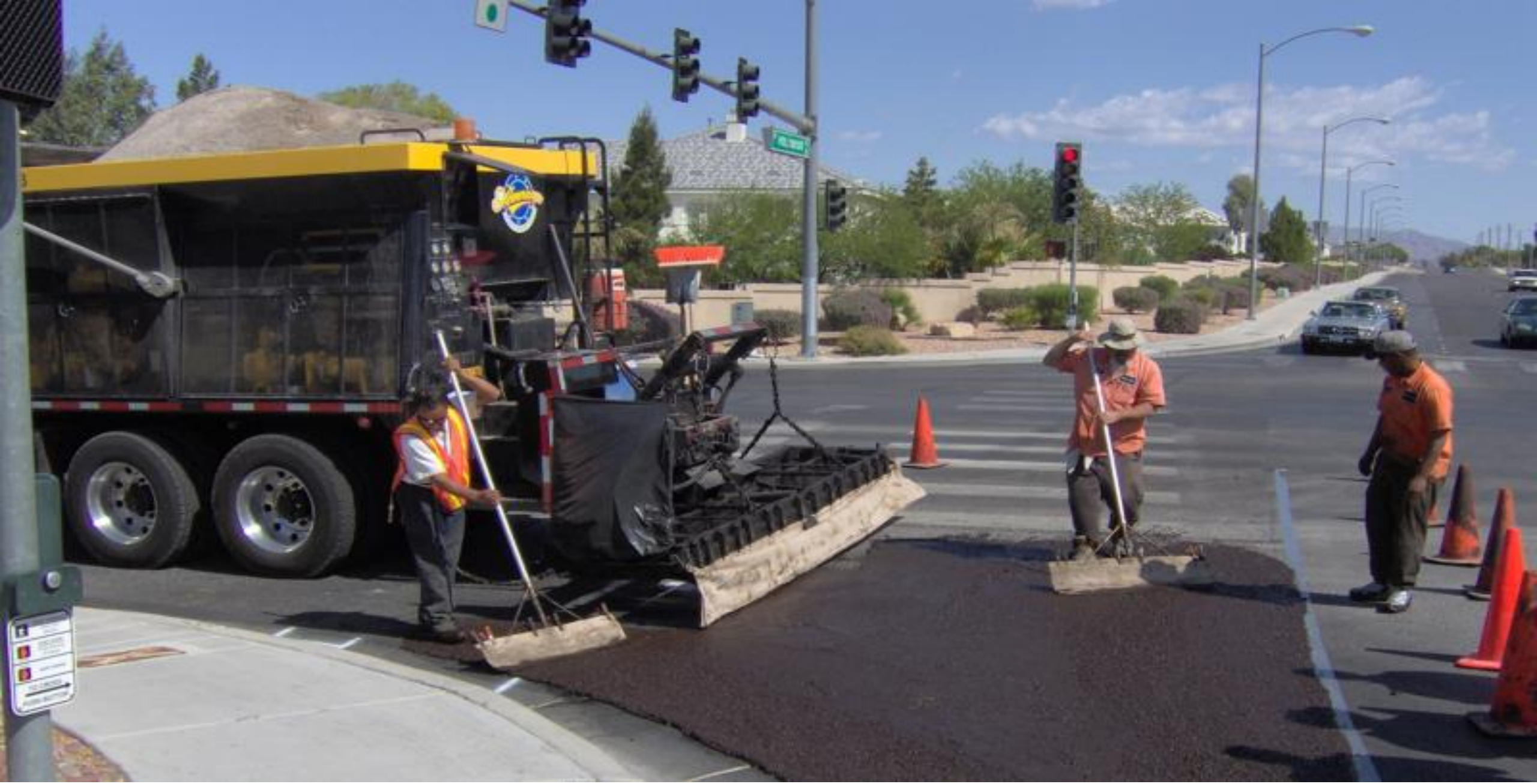
Slurry systems

- **Micro surfacing – A143**
  - Aggregate
    - 100% crushed
    - higher SEV, high quality, controlled fines
  - Emulsion
    - Engineered cationic Micro surfacing emulsion
    - Minimum 3% polymer solids by weight of asphalt content
  - Equipment
    - High horsepower pugmill, heavier spreader box with augers
  - Performance
    - multi stone lifts, 1 ½” ruts, heavy traffic, full chemical reaction through break/set/cure, traffic ready within 1 hour
  - Use
    - Residential and collector streets, highways, rut filling, night work, tougher conditions, farther down the preservation curve



Slurry systems

- **Polymer modified CQS (PMCQS/LMCQS) slurry seal – A115**
  - Aggregate
    - 100% crushed
    - higher SEV, high quality, controlled fines
  - Emulsion
    - CQS with 3 % polymer minimum by weight of asphalt – may be engineered for conditions
  - Equipment
    - High horsepower pugmill, heavier spreader box with augers
  - Performance
    - 1.5 stone thickness , no rut filling, moderate traffic, traffic ready within 1 hour
  - Use
    - Residential and collector streets, highways, minor deformation



Materials

		A105 Slurry Seal	A143 - Micro surfacing	A115 - PM Slurry Seal
Aggregate				
	T176 - Sand Equivalent (SEV)	45 Minimum	65 Minimum	60 Minimum
	T96 - LA Abrasion	35 % Maximum	30 % Maximum	30 % Maximum
Emulsion				
	Emulsions Allowed	M140, M208, M316 Anionic, Cationic, C-PM	M316 Cationic Polymer Modified	M316 Cationic Polymer Modified
	Softer Asphalts Allowed?	No	No*	Yes (CQS-1hp vs. CQS-1P)

Mix Design Tests

	A105 Slurry Seal	A143 - Micro surfacing	A115 - PM Slurry Seal
Gradation	Type I, II and III	Type II and III	Type I, II and III
Mix Time - TB113	180 Sec. Minimum	120 Sec. Minimum	150 Sec. Minimum
Cone Consistency - TB106	Yes	No	No
Wet Cohesion - TB139	Yes	Yes	Yes
Wet Stripping - TB114	Yes	Yes	Yes
Wet Track - TB100			
One Hour Soak	75 g/ft²	50 g/ft²	60 g/ft²
Six Day Soak	N/A	75 g/ft²	N/A
Loaded Wheel -			
Sand Adhesion TB109	50 g/ft²	50 g/ft²	50 g/ft²
Lateral Displacement TB147	N/A	5 % Maximum	N/A
Classification - TB144	N/A	11 Grade Points	N/A

Other Differences between A115 and A105 / A143

- **Asphalt Emulsion is measured as Residual Asphalt rather than Emulsion.**
- **A115 Equipment section will match A143 except any reference to Rut Filling or Leveling equipment will be removed.**
- **A115 Specifically States "This is not a product to be utilized for reprofiling, leveling, or rut filling applications.**
  - Note – This statement should not preclude a double application of A115 material or A105 or A143 material over or under the Polymer Modified Slurry.
  - Proper cure time is required between lifts.

Where can I use a Polymer Modified Slurry Seal?

- **Anywhere you would use the A105 Specification but want to insure higher performance.**
- **Preservation Seals on streets and roadways up to and including rural interstates.**
  - Higher traffic volumes and night work should call for A143
  - The higher the traffic, the closer you should stay to single stone thickness.
- **Minor corrective maintenance on low volume streets and roadways.**
  - Minor means depths less than 1.5 times stone thickness.

What's Next?

- **The A115 has been released as a provisional specification guide.**
  - ISSA will take comments and suggestions through June of 2020
    - Note – Zero comments were received. Specification use appeared to be limited to the western and northwestern states.
  - Final A115 will be published after the February 2022 PPRA Annual meeting.
- **Agencies and Contractors need to use the A115 on projects.**
- **The Slurry and Micro surfacing committee will soon begin the process of updating the A143.**
- **An updated Inspectors Manual was published in October of 2021.**

Proposed Changes to ISSA A143 Micro Surfacing Guide

- **Language will be inserted that:**
  - provides guidance on designing a custom emulsion product based on climate and performance guidelines. Mixes must meet relevant mix design tests.
  - Asphalt content will be measured by residual asphalt percentage rather than emulsion percentage.
  - Larger projects and those that require level-up or rut filling will be measured by the ton rather than area.
  - Allows higher asphalt contents.
  - Recommends higher application rates
- **A matrix will be inserted that gives buyer agencies a method to adapt specifications to account for:**
  - Night Work
  - Rut Filling
  - High traffic volumes
  - Climate Conditions

Questions?