

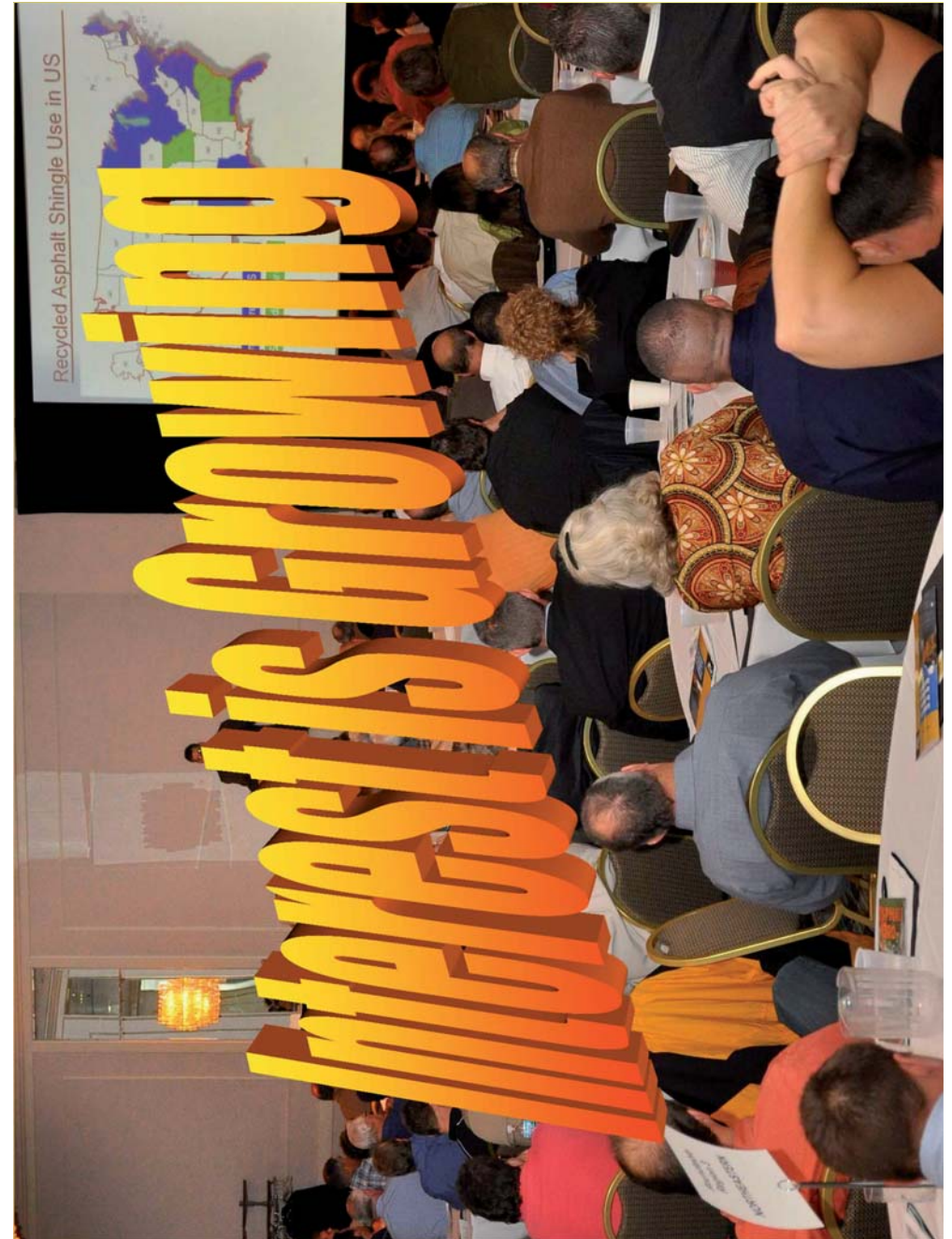


Technical
Committee
Meeting

Recycled Asphalt Shingles

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Heritage Research Group

Washington, DC
January 23, 2011



Current FHWA Involvement

- Pooled Fund Study for RAS



- Engineering Properties of Recycled Asphalt Shingles



- Asphalt Shingle Recycling Forums



- FHWA

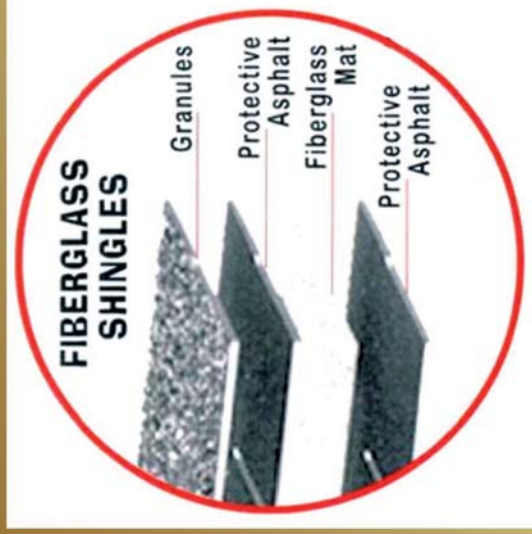
Asphalt Roofing Shingles

- **13 million tons of waste asphalt roofing shingles are generated in the US per year.**
 - Manufacturing Waste ~ 1 million
 - Roofing tear-offs ~ 12 million



- **Reclaimed Asphalt Shingles - RAS**
 - Crushed/ground and screened
 - Used in hot mix asphalt
 - High beneficial reuse

What Are Shingles Made of?



- 35% granules
- 25% asphalt
- 20% fiberglass
- 20% mineral filler



Shingle Sources

- Pre Consumer
 - Off Specification shingles
 - Switching Production Runs
- Post Consumer
 - Re-roofing at end of life
 - Storm damage



Black Mold



Mixed Waste



A New Roof

Landfill

What Happens to the Old Ones?



What Happens to the Old Ones?



5% (wt) of all landfill



Environmental Drivers

- Landfill Diversion
 - 10 million tons of post-consumer asphalt shingles to landfill each year.
- Reduced Green House Gas (GHG) Emissions
 - 1,600,000 tons of available asphalt.
 - Potential reduction of 145,632 tons of GHG Emissions.
- Value of Asphalt Binder
 - \$640,000,000 at \$400 per ton

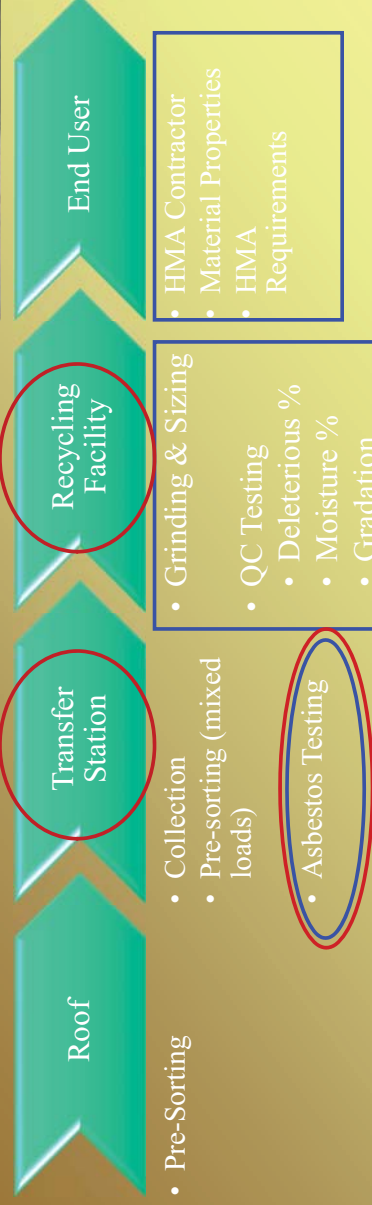


Processing Post Consumer Shingles

- Cleaning and sorting shingles
 - Asbestos Testing
 - Removing Deleterious Materials
 - Homogenous Product



Responsibilities



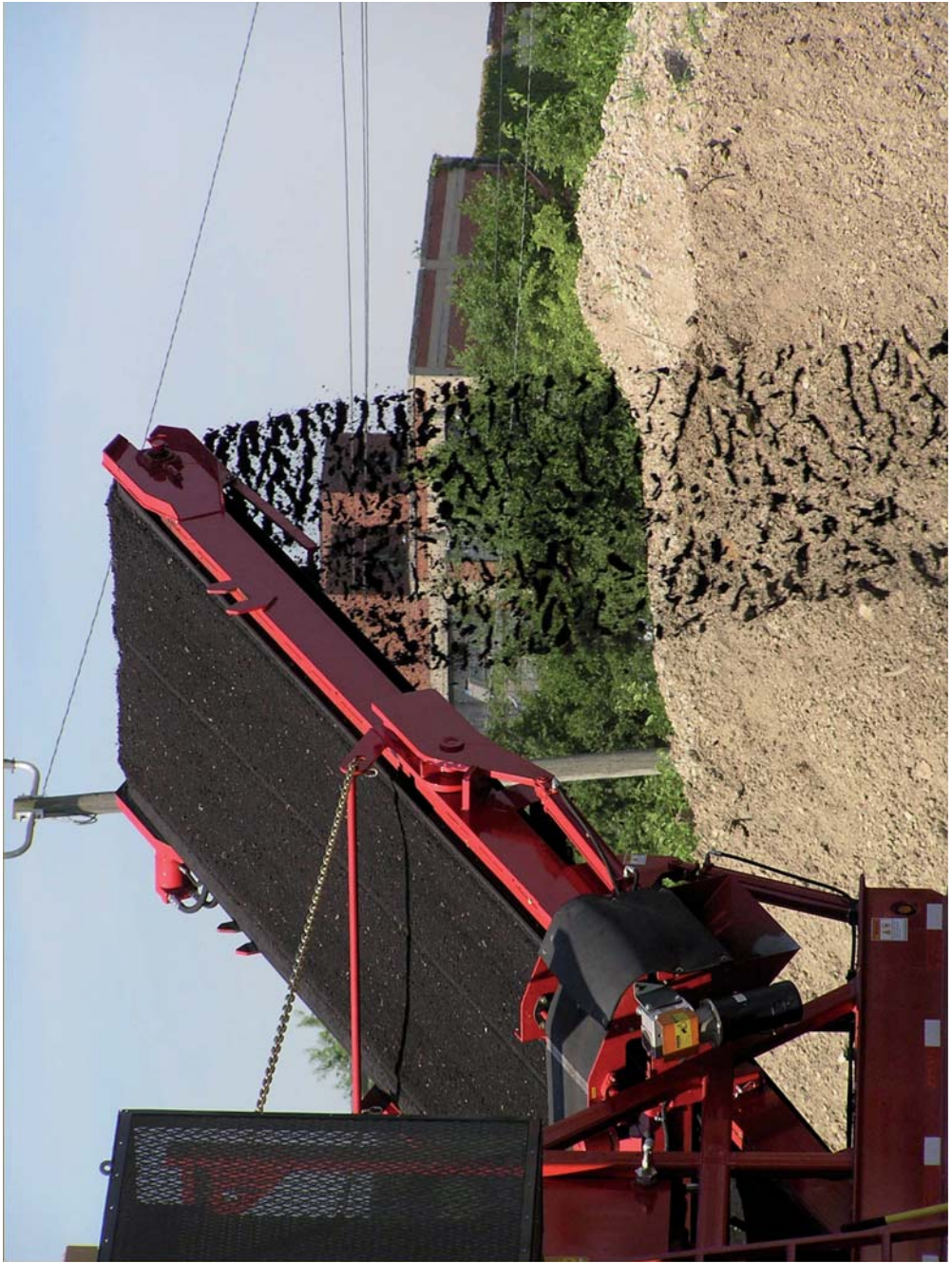
DOT

State/EPA





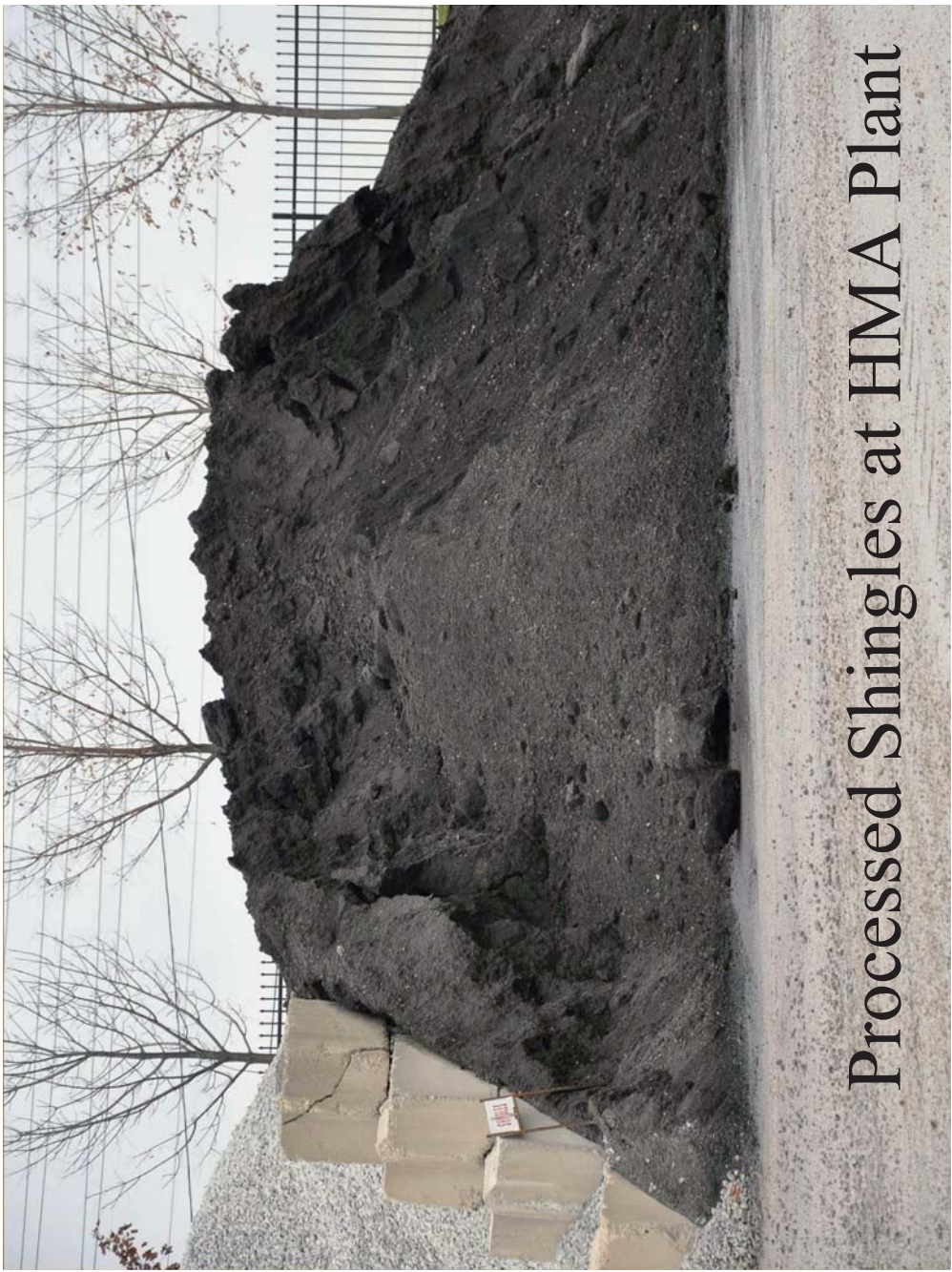






nails





Processed Shingles at HMA Plant









Laying HMA Containing Shingles



Laying HMA Containing Shingles

Manufacturer Waste Shingles

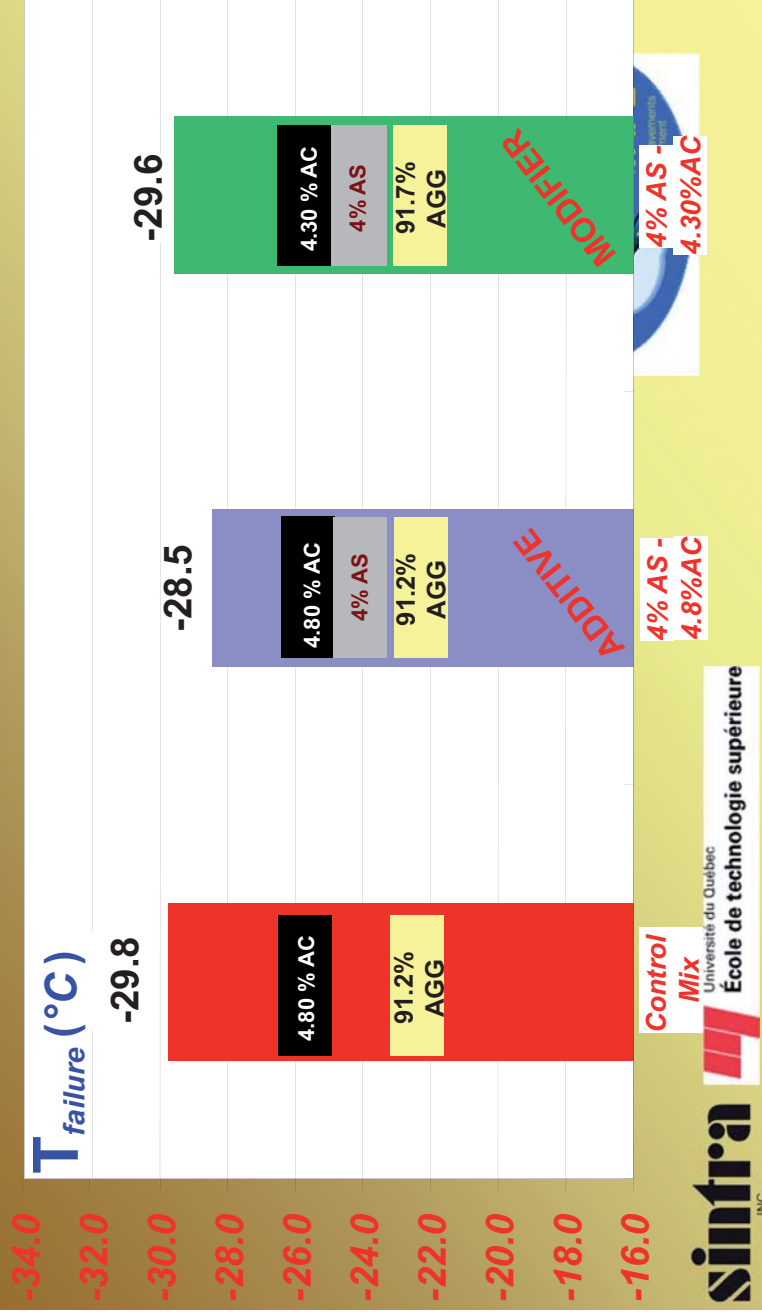
- Low Temperature Cracking
- Thermal Stress Restrained Tensile Test
- Study done by Colas
 - Reported in CTAA 2004



Virgin Binder 52-34



Virgin Binder PG 58-28



Where Are We At?

- Most State EPA have permitting
 - BUD (Beneficial Use Determination)
- Systems for Collection and Processing
- National Specifications Available



Guidance for Using Shingles

- Best Practices for Recycling Asphalt Shingles

- Source and Sorting
- Processing
- End Uses

- Uses of Waste Asphalt Shingles in HMA: State-of-the-Practice

- Sources
- Mix Design Considerations
- Equipment Modifications
- Studies



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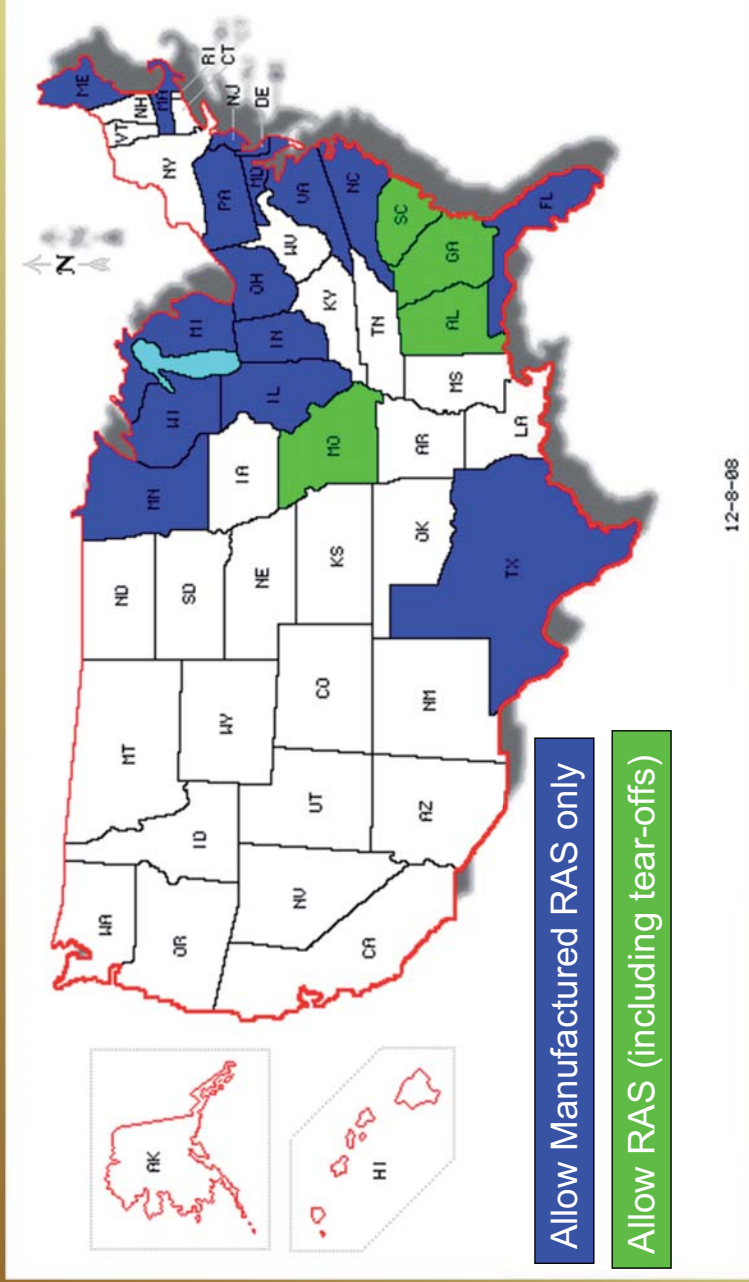
National Guidance for Using RAS in HMA

- AASHTO MP15 – Use of Reclaimed Asphalt Shingle as an Additive in HMA
- AASHTO PP53 – Design Considerations When Using Reclaimed Asphalt Shingles in New HMA



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Recycled Asphalt Shingle Use in US



THANKS

