Warm Mix Asphalt at MnROAD

Tim Clyne
Mn/DOT

13th Annual Minnesota Pavement Conference

Benefits of WMA

Environmental

- ★Lower greenhouse gas emissions
- ★Lower fuel consumption
- ★Reduced exposure of workers to fumes

Performance

- ★Reduced binder aging
- ★More time for mixture compaction
- ★Cold weather paving
- ★Longer haul distances

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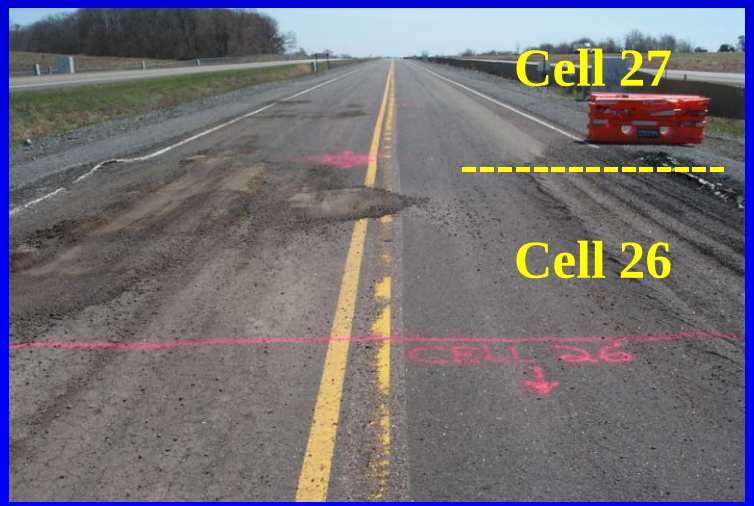
Early WMA Trials at MnROAD (Oil Gravel)

Cell 32 (1998) – Cold Mix Paving Practice
Cell 27 (1999) – Chip Seal / Large Stone Base
Cell 28 (1999) – Oil Gravel (luke warm mix) / Large Stone Base
Cell 26 (2000) – Oil Gravel (warm mix) / Reclaimed Base
Cell 27 (2000) – Oil Gravel (warm mix) / Large Stone Base
Several County Roads throughout Minnesota



- ★Oil Gravel requires solid base
- ★No Transverse Cracking or Rutting
- ★Some Fatigue and Rough Ride
- ★Similar to current WMA development

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After 12 years and a catchy name…

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Warm Mix Asphalt

WMA – Mathy Process

- ★Olmsted & Goodhue Counties July 2007

2008 Planned Projectes

- ★Bituminous Roadways
- ★Crow Wing County
- ★MnROAD Mainline – 6 Cells, 1 process

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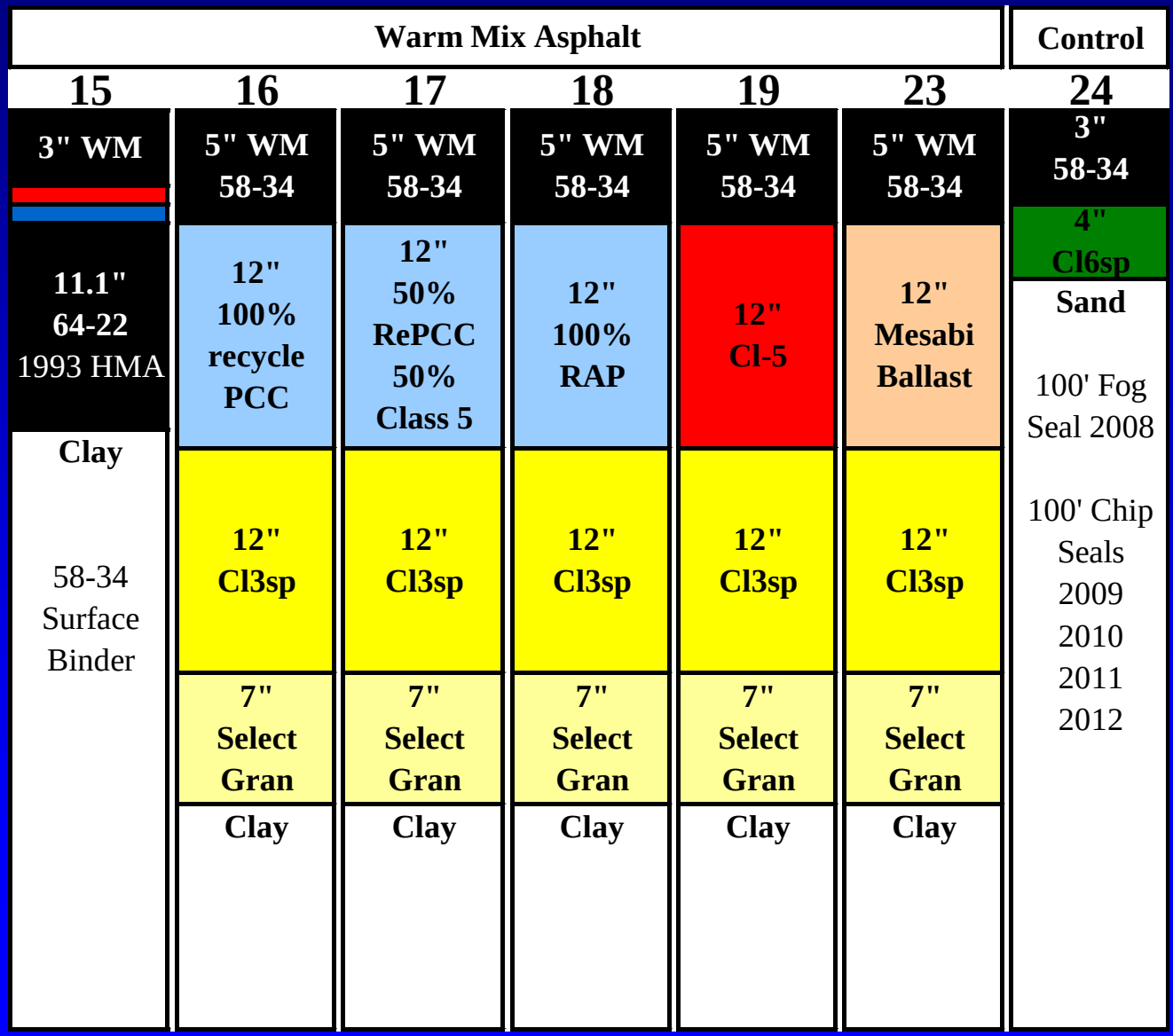
2008 MnROAD Construction



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- WAM-Foam
- Low Emission Asphalt
- Aspha-Min
- Advera
- Sasobit
- REVIX
- Evotherm
- Cecabase RT
- Rediset WMX
- Gencor
- Terex
- Stansteel
- Double Barrel Green

Mathy Tech. & Eng. Services and Paragon Technical Services, Inc

Thanks to Matt Corrigan, FHWA

U.S. Department of Transportation
Federal Highway Administration

FHWA does not endorse any particular proprietary product or technology.

Evotherm 3G – Revix

WATERLESS, REDUCED TEMPERATURE MIX TECHNOLOGY

NOT WARM MIX
BUT
HOT MIX AT A COOLER TEMPERATURE

Thanks to Gerald Reinke, Mathy Construction

Process Development

- Process is a co-development of Mathy Technology & Engineering Services and Paragon Technical Services, Inc
- A patent application has been filed on the technology

"It was our belief that if you could coat the aggregate you could compact the mix given current roller technology"

Revix Summary

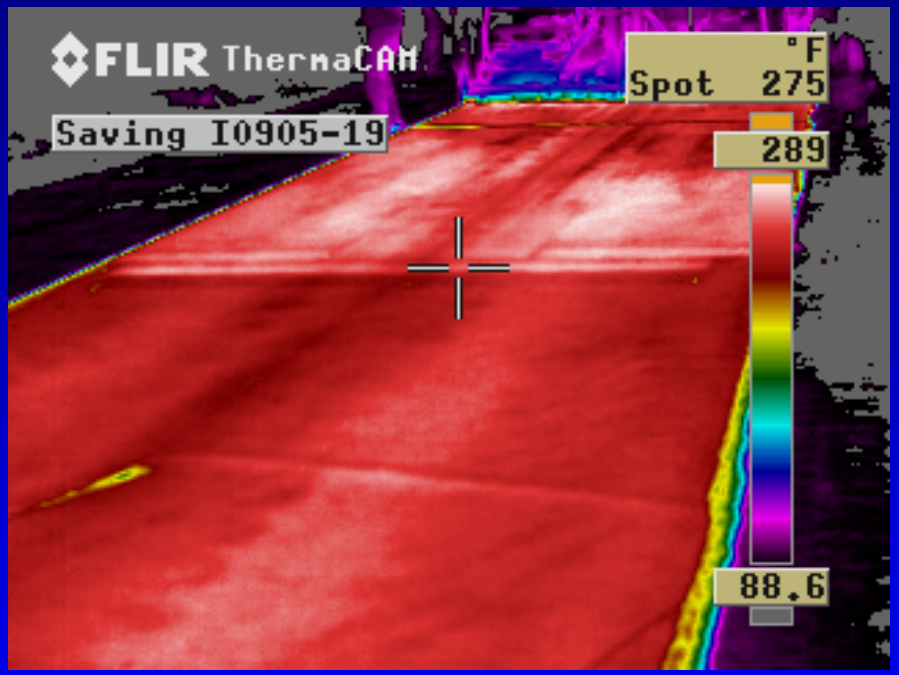
- Several different additives evaluated in the field, more in the lab.
- Temperature reductions range from 60 to 80°F below typical hot mix temperatures for the same mix.
- All additives necessary to produce the mix are typically added at the asphalt terminal.
  - ★ Additives can be added at the HMA plant.
  - ★ Binder preferably comes to contractor ready to use—all he does is run the plant as he normally does but at a lower temperature
- A mix design is necessary to adjust additive loading and check TSR properties
- Mathy demonstrated that irrespective of plant type or possible moisture content left from aggregate and/or RAP that this approach would work

Construction Experiences – Plant

- Hardrives plant in Becker
- Wear & Non Wear
- Level 4 Superpave mixes
- Used 20% RAP from MnROAD millings
- Binder shipped from Mathy with WMA chemical package already added

Construction Experiences – Paving

- Reduced fumes and emissions
- Equal compaction to HMA with less effort
- Easy to work with for the paving crew
- Still slightly tender the following morning



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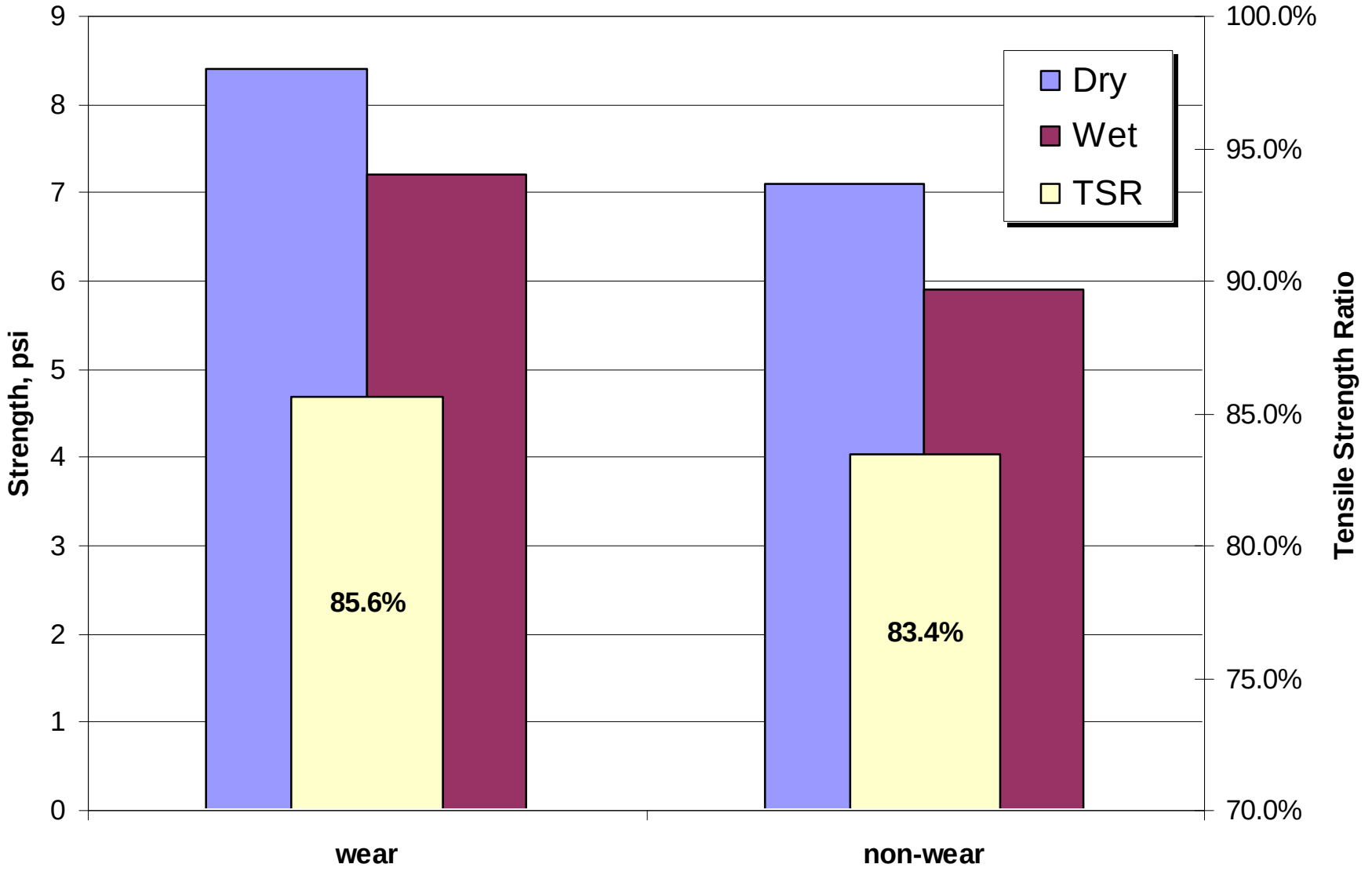
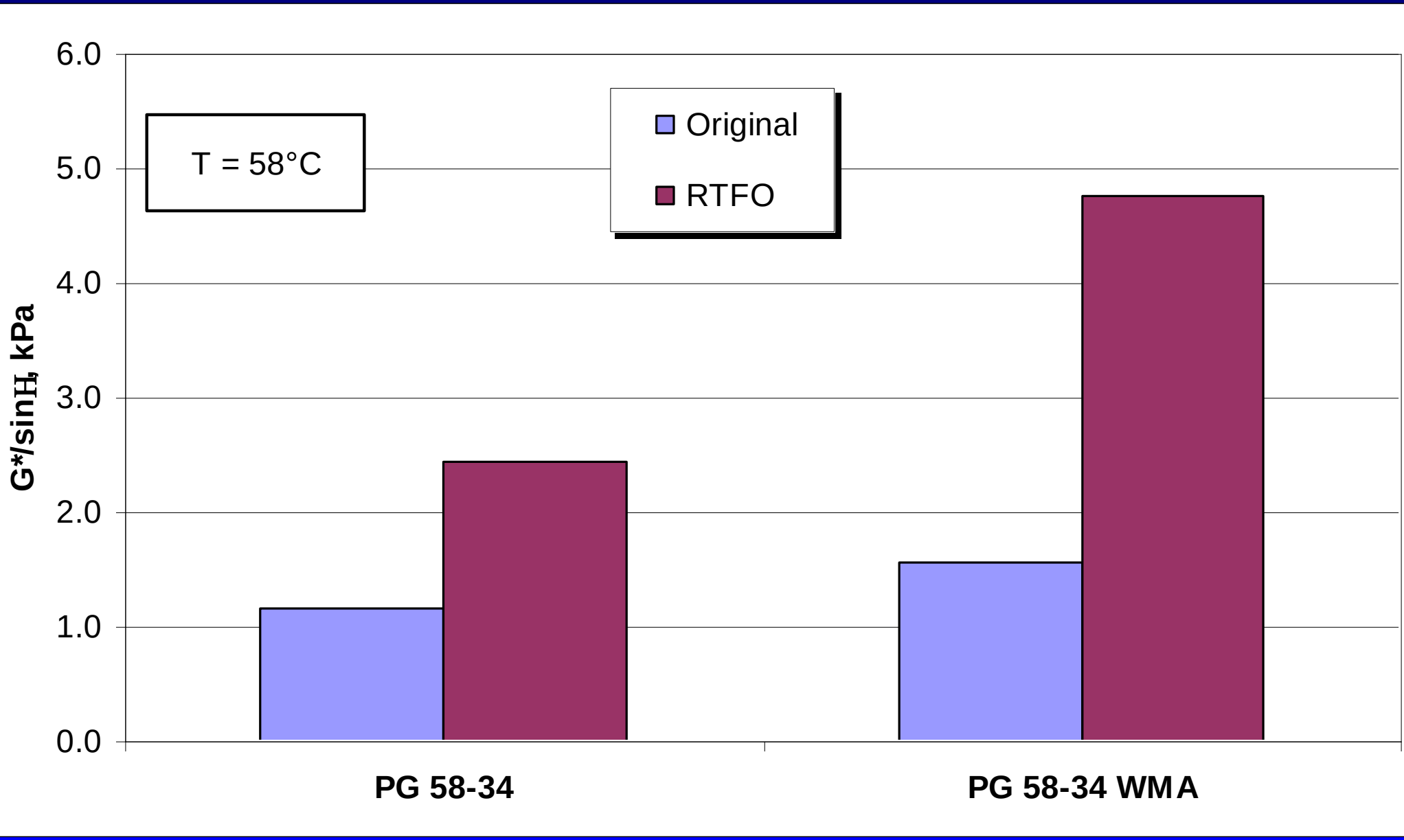
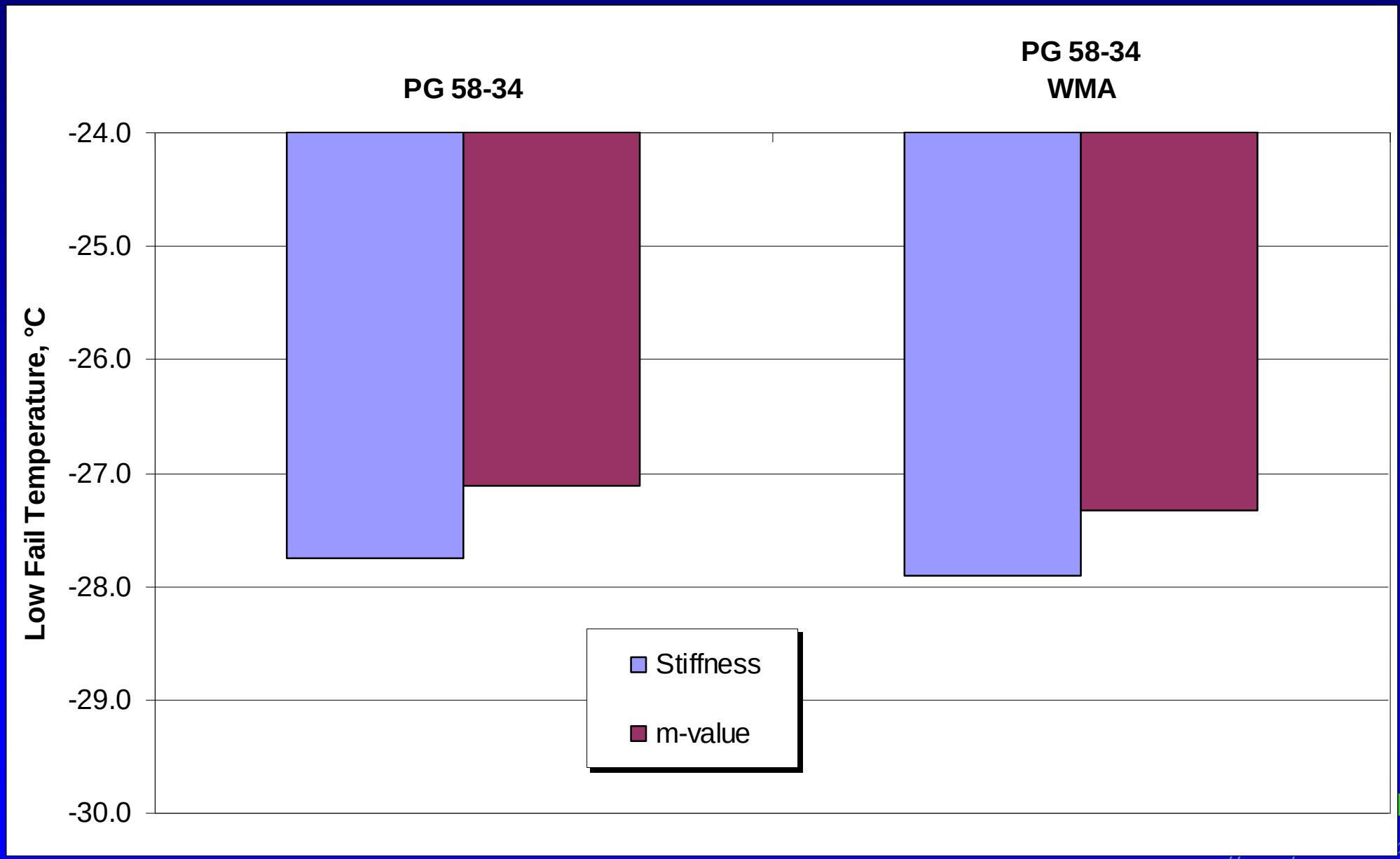
Stripping Potential



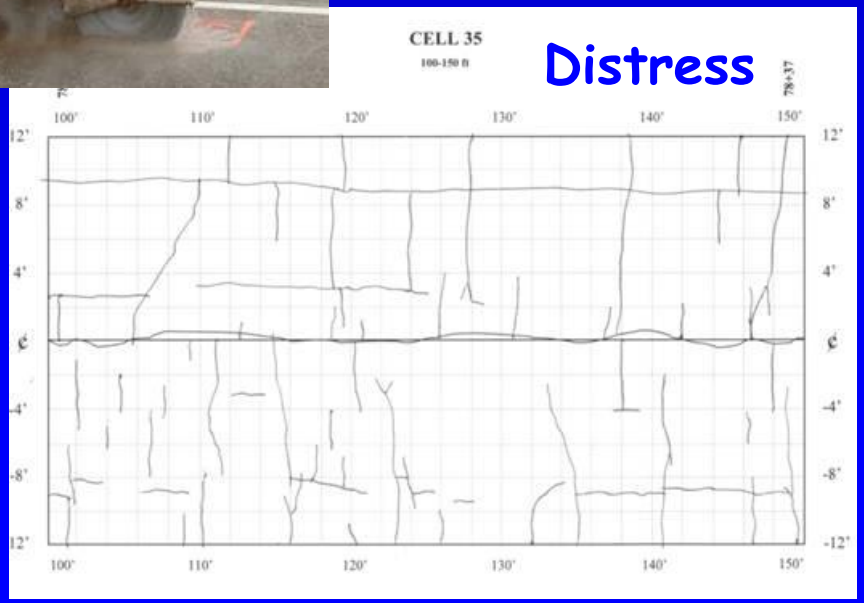
Binder DSR Testing



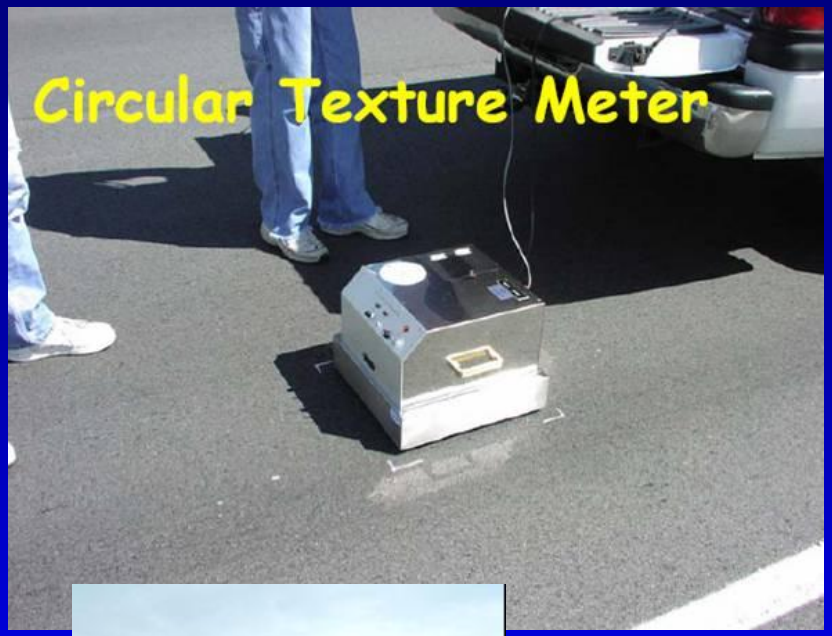
Binder BBR Testing



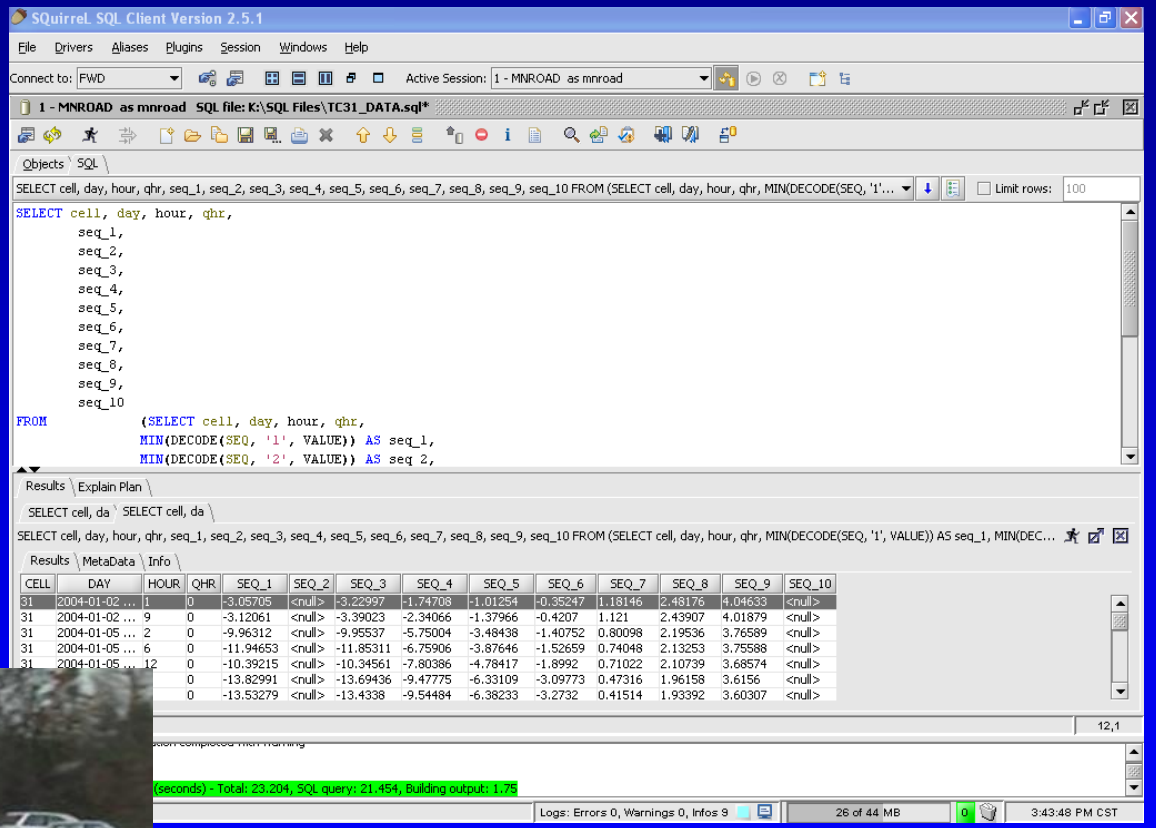
Performance Measures



Surface Characteristics



Load Testing, Sensor Monitoring



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Thank You!

Tim Clyne
MnROAD
651-366-5473
tim.clyne@dot.state.mn.us