

Putting The Rubber “In” The Road

I-78 Crumb Rubber Modified Asphalt Project



An **HK** Group Company

THE **HK** GROUP

www.hkgroup.com



Project Awarded to Reading Materials, Inc.

- Reading Materials, Inc. (*member of The H&K Group Family of Companies*)
- Headquartered in Skippack, Pennsylvania



PennDOT Approved Pilot Project

- First in PA to utilize Asphalt Rubber Gap Graded Friction Course
- ECMS #87631
- Actual Bid Date: 6/28/12
- Award Date: 7/10/12
- Notice to Proceed: 8/21/12
- Completion Date: 11/30/12



PennDOT Approved Pilot Project ECMS #87631



Seven-mile Stretch of I-78; (*Berks County; Section "20-M" between Frystown & Rehrersburg*)

Project Requirements:

- Milling
- Concrete Repair & Patching
- Asphalt Paving including both leveling and wearing courses of Crumb Rubber Modified Asphalt (CRM)

Specs & Quantities

- Reading Materials' *Windsor Service* paving crews completed the overlay portion on October 12, 2012
- All paving was performed at night
- 240,000 SY of milling
- Diamond Grinding: 77,774 SY
- 16,000 tons of CRM leveling course (2 inches)
- 15,000 tons of CRM wearing course (1.5 inches)
- 12.5mm Asphalt Rubber Gap Graded Friction Course

Section “20-M” Prior to Repave



Equipment Utilized

- Roadtec Shuttlebuggy
- CAT Paver BT415
- Three Rollers: Hamm Roller, CAT DD90 and CAT DD118



Challenges of CRM

- Slightly Sticky Texture; material had a tendency to adhere to paving equipment
- Determined that Downy[®] Fabric Softener acted as lubricating agent (*prevented sticking*) when applied to rollers and spray bar system
- Compaction on leveling course
- Tight/condensed schedule
- High asphalt content contributed to reduced-sized batches; reduced max load capacity in trucks

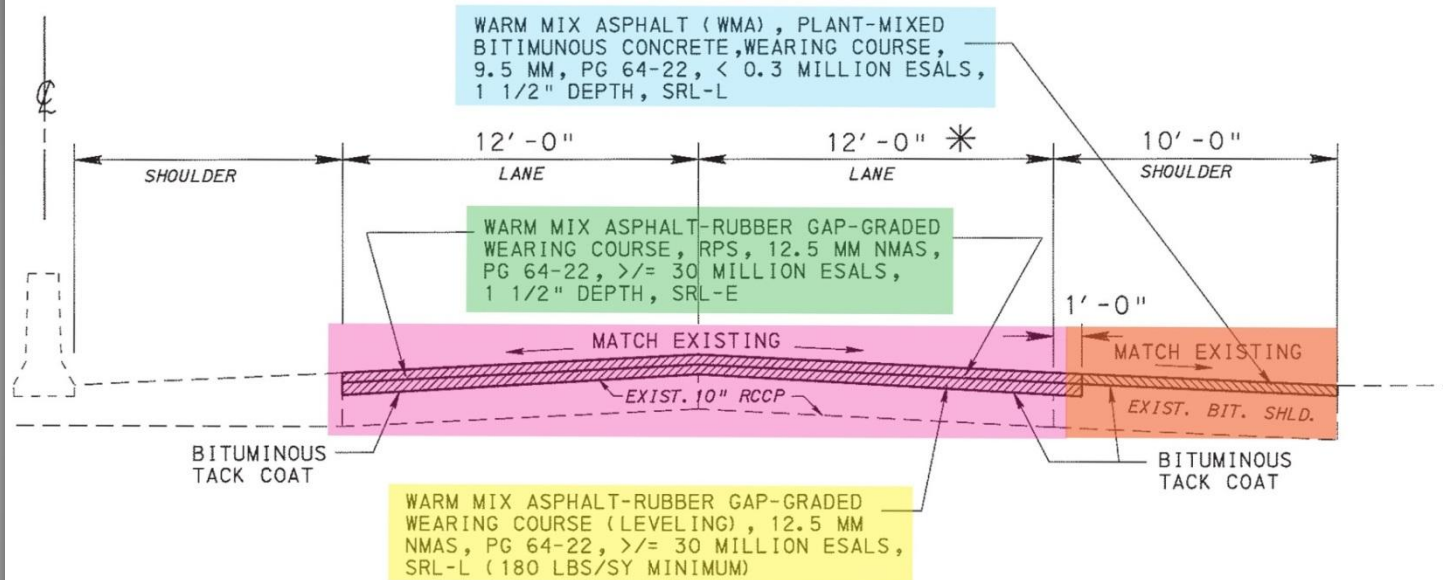
Project Successes

- IRI: 52.64
- Two Bonuses Received on Project:
 - Ride Quality Incentive
 - Joint Density
- No Raveling of Exposed Wedge Joint
- Completed by deadline despite a new material and tough spec
- Worked jointly with several PennDOT Districts to complete project

SR-78 Cross Section Detail

BERKS COUNTY
SR 78 SECTION 20M
ECMS NO. 87631

SHEET 6 OF 15



TYPICAL SECTION

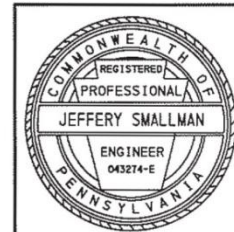
FROM SEG. 0104 OFFSET 2396 TO SEG. 0160 OFFSET 2116
FROM SEG. 0115 OFFSET 2530 TO SEG. 0161 OFFSET 2109

* INCLUDES ADDITIONAL 0 TO 14' - 0" AND VARIABLE ACCELERATION AND DECELERATION LANES THROUGH INTERCHANGES.

 MILLING OF BITUMINOUS PAVEMENT SURFACE, 1 1/2" DEPTH, MILLED MATERIAL RETAINED BY CONTRACTOR

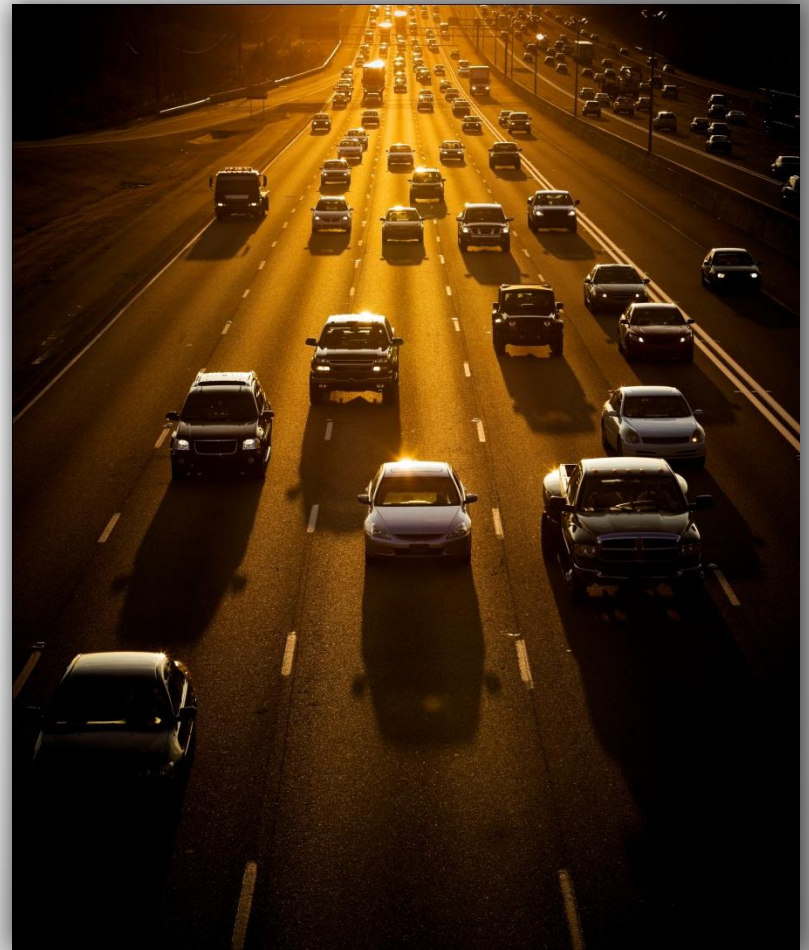
 MILLING OF BITUMINOUS PAVEMENT SURFACE, VARIABLE DEPTH, MILLED MATERIAL RETAINED BY CONTRACTOR (TO CONCRETE (3 1/2" ±))

NOTE: ACTUAL START WORK AND STOP WORK TO BE DETERMINED BY THE INSPECTOR.



Why Crumb Rubber Asphalt?

- High Performance
- Durable & Flexible
- Ideal for Highly-Traveled Interstates
- Similar mixes used in New Hampshire, Massachusetts & California have been proven successful



What is Crumb Rubber Asphalt?

- Comprised of recycled tire rubber (*Provided by Liberty Tire-Pittsburgh, PA*)
- Rubber is finely ground at ambient temperature
- Blended with liquid asphalt to create the finished product known as “asphalt rubber” (*Massachusetts-based All States Materials Group Assisted with Field Blending*)



**All States
Materials Group**®

Rubberized AC Products



**Asphalt-Rubber
Binder**



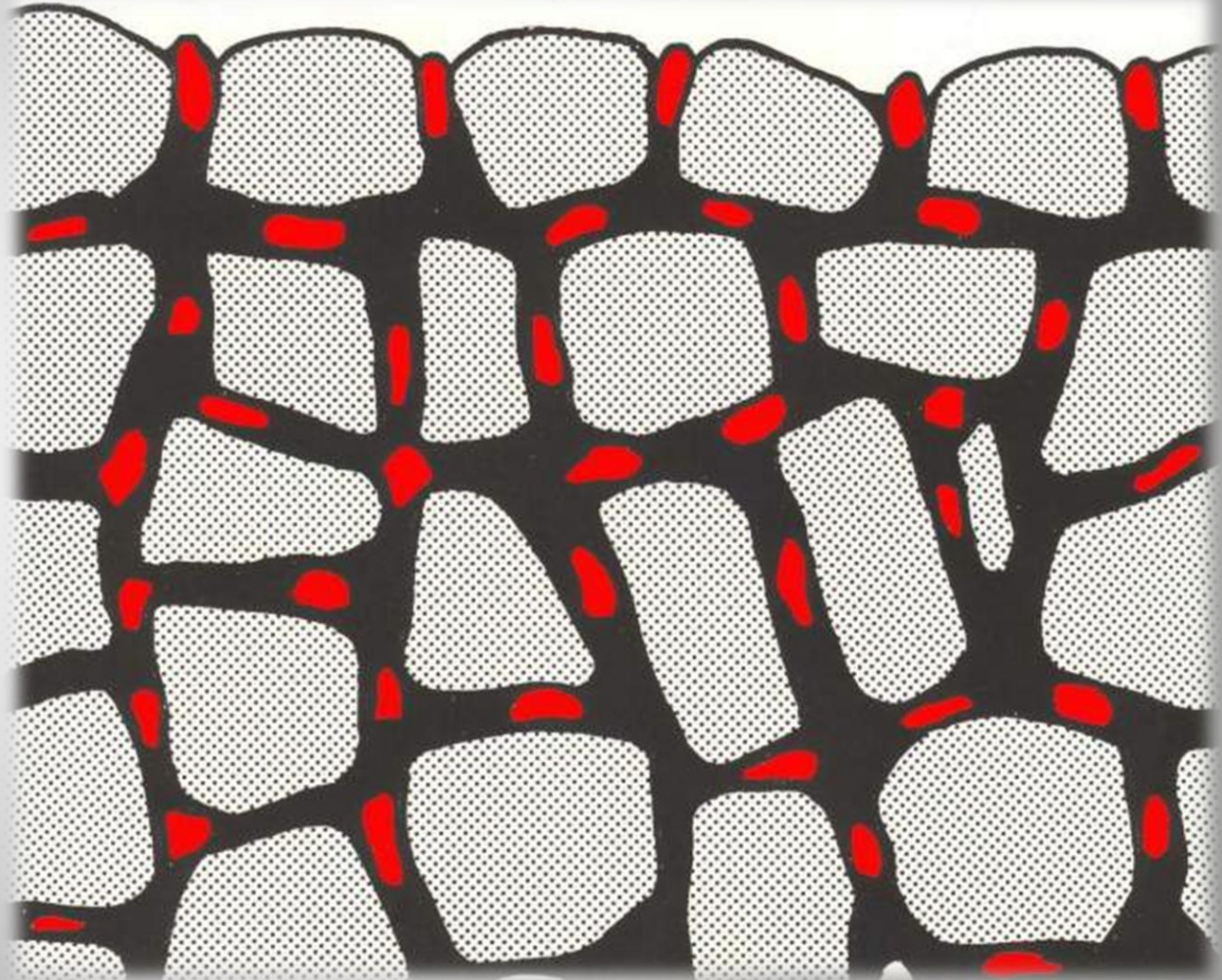
**Terminal Blend
Binder**

The Science Behind CRM...

- Rubber blended into asphalt at $>350^{\circ}$
- Rubber particles swell, absorb light ends of liquid asphalt binder
- The rubber contributes polymer, carbon black, and anti-oxidants to asphalt
- Creates a high-viscosity elastic binder which remains flexible at low temps and stiff at high temps when cured

How Asphalt Rubber Works

22,937,600
rubber
particles per
ton of mix
help fight
cracking



The Benefits of CRM

- Final product is adhesive & cohesive
- High film thickness on aggregates
- Improves durability & flexibility
- Resistance to oxidative aging, rutting, raveling, delamination, shoving & thermal and reflective cracking
- Uses recycled material; reducing scrap inventories
- Reduced HMA lift thickness; preserves curb reveal and overpass clearances



Asphalt Rubber Systems

OVERSIZE LOAD

TT-107
H&K
HAMES & KIBBLEHOUSE, INC.
QUARRY DIVISION
3257

Asphalt Rubber Binder – Blending System

- **Equipment:**

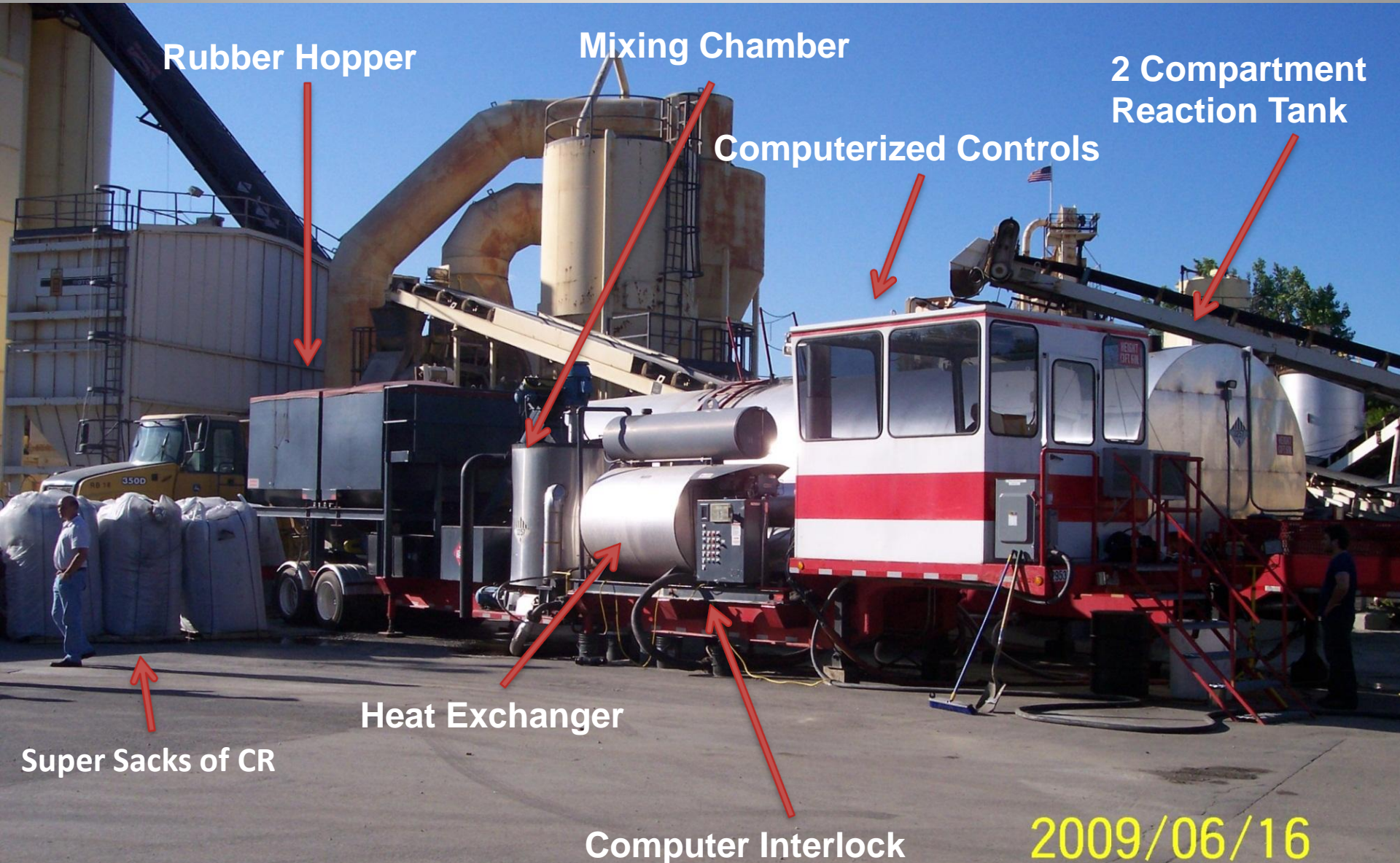
- Virgin oil storage
- Blender
 - Control Cab
 - Heat Exchanger
 - Hot Oil Heater
 - Mixing Tank
 - Hoppers
- Reaction Tank



Asphalt Rubber – Processed Tire Rubber #30 Mesh



Asphalt Rubber Binder –



The Mix Design

- PennDOT required minimum of 7.6% CRM asphalt (*>15% recycled tire rubber*)
- Final Mix Prepared by The H&K Group's Quality Control Team
- Produced at the Group's ***Lebanon Materials*** asphalt plant facility in Annville, PA (*25 mins. away from project*)



The Mix Design cont.

- Aggregate supplied by *Pennsy Supply* & The H&K Group's *PTR-Sanatoga* facility
- PennDOT approved warm-mix asphalt technology
- Warm-mix additive pre-blended in virgin asphalt binder
- Final CRM asphalt mix produced at lower temperature than standard mixes
- Classified as a warm-mix product
- PG64-22, w/ 0.5% Evotherm, 3G (NuStar)











Worker in high-visibility gear

Worker in high-visibility gear

WINDSON
AP 650C

Traffic cone







Rent this sign from SAM
Get your Business back on point
610 396 1273

Loves
Auto Wash
Wax
Detailing

FOR SALE
Call Dave



Acknowledgements

