

GULF COAST, MACREBUR MRS, & RECYCLED PLASTIC MIX



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Background

- GULF COAST WAS ASKED BY AN INDUSTRIAL CUSTOMER TO PROVIDE A MIX THAT INCLUDED A WASTE PLASTIC PRODUCT
- CHALLENGED BY PLASTIC SUPPLIER TO INCREASE RAP
- PRODUCED STANDARD DENSE-GRADED MIX WITH & WITHOUT PLASTIC AT 20% RAP & 40% RAP





What Happened Next...






What Happened Next...

- WITNESSED IMMEDIATE (BLACKER & RICHER APPEARANCE) AT THE PLANT
- ADDITIONAL TESTING ON PLANT-PRODUCED & LAB-PRODUCED MIX SHOWED IMPROVED PERFORMANCE OVER STANDARD DENSE-GRADED MIX





What Happened Next...

- RESULTS FOR PLANT PRODUCED MIX

	Current 340 Spec	Without Plastic	RPM	Without Plastic	RPM	Performance Mix w/ SAC A & 76-22
RAP %	20	20	20	40	40	0
Hamburg	10,000	8,500	11,000	14,171	> 20,000	> 20,000
Overlay Test	N/A	N/A	356	N/A	454	200

- PROCEEDED WITH FOLLOW UP LAB DESIGNS & PERFORMANCE BASED TESTING
- 50% RAP YIELDED 20,000 PASSES ON THE HAMBURG & 1000 CYCLES ON THE OVERLAY!




What Happened Next...

- SHIPPING TO SELECT CUSTOMERS & PROVIDING FIELD SUPPORT
- CUSTOMERS LIKE THE WORKABILITY & EASE OF COMPACTION (94% - 96% IN-PLACE DENSITY WITH LIGHT-WEIGHT ROLLER!)






What Happened Next...

- PRODUCED BLACK BASE WITH 40% RAP % 30% CRUSHED CONCRETE
- CUSTOMERS LIKE THE WORKABILITY, EASE OF COMPACTION (94% - 9% IN-PLACE DENSITY WITH 3-TON ROLLER)




What Happened Next...

- CUSTOMERS REALLY LIKE HOW CLEANLY THE MIX LEAVES EQUIPMENT!




What Happened Next...

- TESTING ON EXTRACTED BINDER WITH 40% RAP

PROPERTY	TEST METHOD	SPECIFICATIONS	RESULTS
AS-RECOVERED SAMPLE			
Asphalt Content, %	SS172	Report	4.3
AS-RECOVERED RESIDUE			
Sample AASHTO M 301 / M 332 Requirements			
Dynamic Shear (25°C), 10 rad/sec, 1.0Pa	T 316	2.2 min	3.35
Dynamic Shear (25°C), 10 rad/sec, 1.0Pa	T 316	4.0 min	3.812
USCR (25°C)	T 300	75 min	12.22
USCR (25°C)	Report	Report	8.83
PRESSURE AGING RESIDUE (PAR) - 300 (90) 30 hours			
Sample AASHTO M 301 / M 332 Requirements			
Dynamic Shear (25°C), 10 rad/sec, 1.0Pa	T 316	6.000 min	4.360
Dynamic Shear (25°C), 10 rad/sec, 1.0Pa	T 316	300 min	1.17
Creep Stiffness (25°C), 100 (200) 1.0Pa	T 316	3,300 min	0.338
Creep Stiffness (25°C), 100 (200) 1.0Pa	T 316	300 min	263
Creep Stiffness (25°C), 100 (200) 1.0Pa	T 316	3,300 min	0.247
RT, °C			17.8
AASHTO M 301, Type I Performance Binder Grade, PG			76.42
AASHTO M 301, Type I Performance Binder Grade, PG			76.52
AASHTO M 301, Continuous Grade, PG			71.24.5

DISCUSSION: The sample material met the AASHTO M 301 Requirements for PG 76-22 and AASHTO M 301 Requirements for PG 76-22 with a Continuous Grade of PG 71.5-24.5.



Why does RPM matter?

- THE USE OF MR8 ALLOWS INCREASED RAP USAGE...
- CONSERVES NATURAL RESOURCES - THERE IS A REDUCTION IN THE AMOUNT OF MATERIAL THAT IS MINED
- REDUCTION IN GREENHOUSE GAS EMISSIONS
- REDUCTION IN TRANSPORTATION COSTS
- RAP IS A COST EFFECTIVE ALTERNATE TO VIRGIN AGGREGATES, WHICH WOULD ALLOW AGENCIES TO ADD ADDITIONAL ROADWAYS TO ITS ANNUAL PAVEMENT PRESERVATION PROJECTS
- NEUTRAL CHARGE - NO STRIPPING IN MIX - STAYS BLACKER LONGER!




Why does RPM matter?

- TRADITIONAL PRODUCTION / CONSTRUCTION METHODS TEND TO BE WASTEFUL
- THE USE OF RPM PROMOTES A CIRCULAR ECONOMY
- PRODUCTS MADE OF RENEWABLE, REUSABLE, OR RECYCLABLE MATERIALS
- SUPPORTS SUSTAINABILITY
- SUPPORTS CARBON NEUTRALITY




Why does RPM matter?

- MR8 ALLOWS AN INCREASE IN RAP FROM 20% TO 40% WITH IMPROVED PERFORMANCE
- 20% INCREASE IN RAP DECREASES GLOBAL WARMING POTENTIAL BY 7.34 KG OF CO2 EQUIV. PER EACH TON OF MIX PRODUCED!
- THIS IS LIKE TAKING 1.4 VEHICLES OFF THE ROADWAY & REDUCING EMISSIONS BY OVER 16,000 MILES DRIVEN
- EACH TON ALSO KEEPS APPROX. 180 PLASTIC BOTTLES OUT OF LANDFILLS!




Questions?

