

TH 73  
WMA/HIGH RAP





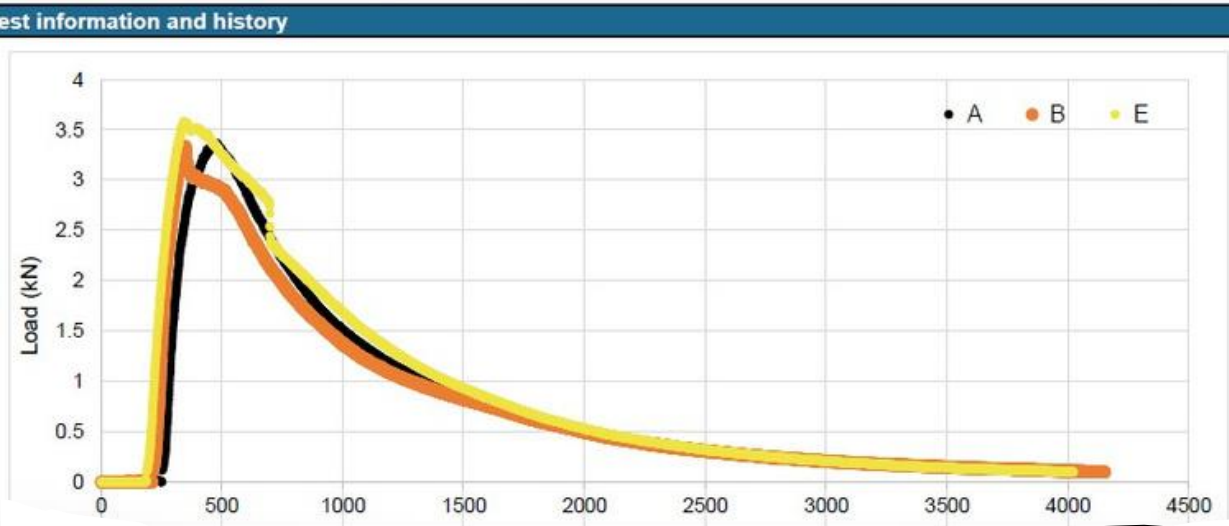
## MIX DESIGNING FOR WMA/HIGH RAP

IT WAS RECOMMENDED THAT WE CREATE A CONTROL BLEND WITHOUT ADDITIVES TO EVALUATE THE NATURAL PERFORMANCE OF OUR MIX. THE VOID CONTENT REMAINED CONSISTENT WHEN USING ADDITIVES AT A LOWER TEMPERATURE.



THE CONTROL MIX CAUSED MORE RESIDUE IN THE BATCH-  
OUT PAN COMPARED TO THE ADDITIVE BLEND, AND OUR  
FIELD TECHNICIANS REPORTED THAT THE EQUIPMENT  
REMAINED CLEANER WHEN USING THE ADDITIVE BLEND.

Specimen information								
Spec ID	Diameter (mm)	Thickness (mm)	Initial Ligament (mm)	Fracture Energy (J/m <sup>2</sup> )	Peak Load (kN)	Time @ Peak (s)	Test Temp (C)	Smoothed CMOD/Time (mm/s)
A	150.0	50.3	81.2	524	3.4	9.1	-24.0	0.0170000
B	150.0	51.5	83.2	491	3.3	5.3	-24.0	0.0170000
E	150.0	50.6	82.4	579	3.6	6.2	-24.0	0.0170000

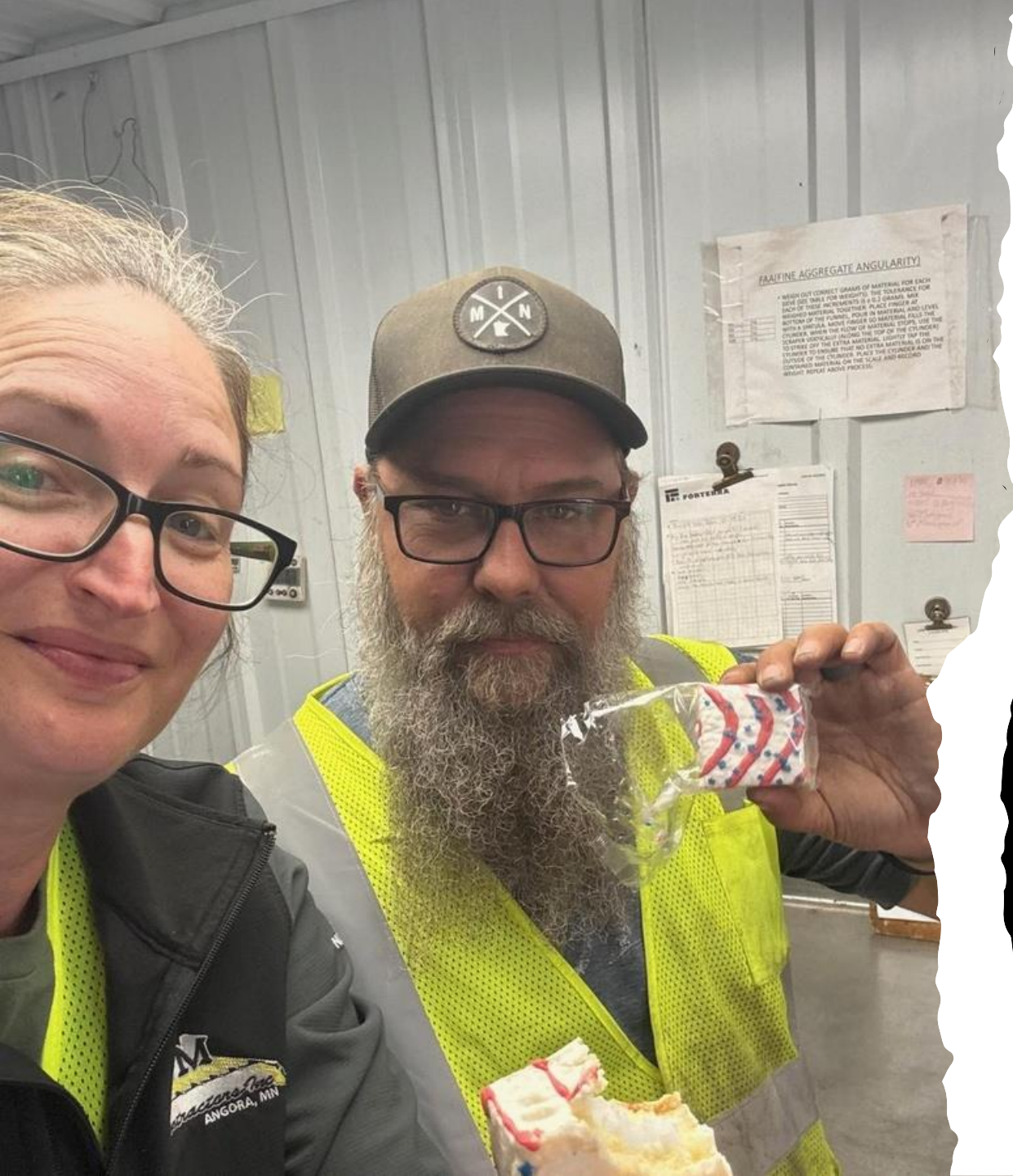


Rut depths (mm)		
Pass No.	Side 1	Side 2
5000	-3.72	-3.08
10000	-5.32	-4.26
15000	-6.85	-5.56
20000	-8.8	-7.76

Mix type: SPWEB340  
 Asphalt grade: C  
 HMA Production: Laboratory  
 Compaction method: SGC  
 Mix source: KGM  
 Test temperature (°C): 46.0  
 Mix depth (mm): 63.0  
 Average depth @ 5000 passes(mm): 3.4

# DCT AND HAMBURG RESULTS

531 FOR DCT  
 3.4MM RUT DEPTH@5000 FOR HAMBURG



CELEBRATORY  
SNACK-THE  
DESIGN PASSED!



## SETTING THE PLANT

WEATHER CONDITIONS WERE CHALLENGING DURING THIS SET. DUE TO DAILY RAIN EVENTS, WE HAD TO USE ADDITIONAL MATERIAL TO STABILIZE THE PLANT SITE.



## WARM MIX AND REJUVENATOR

IMPLEMENTING EVOTHERM AND EVOFLEX WAS A NEW PROCESS FOR OUR TEAM, BUT IT WAS MANAGED SUCCESSFULLY.

THERE WERE INITIAL CONCERNS ABOUT THE RAP BEING UNPROCESSED; HOWEVER, OUR PLANT IS EQUIPPED WITH A HONEY BADGER, WHICH CRUSHED THE RAP AS IT ENTERED THE PLANT WITH MINIMAL ISSUES.



# SAMPLING FOR RESEARCH

WE PARTNERED WITH MNDOT TO COLLECT RESEARCH SAMPLES THROUGHOUT THE PROJECT.

DESIGN-4.4 VOID, 8.3 AFT

PRODUCTION-4.0, 8.3 AFT



THE CREW REPORTED NO SMOKE OR ODOR DURING PRODUCTION AND OBSERVED EXCELLENT WORKABILITY AT THE REDUCED TEMPERATURES. THERMAL READINGS REMAINED CONSISTENT THROUGHOUT THE PROCESS.

LOWERING THE MIX PRODUCTION TEMPERATURE PROVIDED SIGNIFICANT BENEFITS: SMOKELESS ASPHALT, REDUCED EMISSIONS, DECREASED FUEL CONSUMPTION, MINIMIZED THERMAL SEGREGATION, EXTENDED BINDER LIFE, AND ELIMINATED ODOR. ADDITIONALLY, PRODUCTION EFFICIENCY IMPROVED, ALLOWING US TO RUN MORE TONS PER HOUR.



OFF TO NEXT LOCATION "Nature does not hurry, yet  
everything is accomplished" -  
Lao Tzu