OBSERVATION OF INTERNATIONAL IMPROVEMENTS OF ASPHALT PAVING

Observation of International Improvements in Quality of Asphalt Paving

LLM Asphalt Technology Consulting

OBSERVATION OF INTERNATIONAL IMPROVEMENTS OF QUALITY IN ASPHALT PAVING

Definition of Quality

International Traffic

Other Countries

Today in the US

The "QUALITY" Journey

Question?

LLM Asphalt Technology Consulting

Definition of Quality

DOT/FHWA
Meets and/or Exceeds All the Specification Requirements

The Contractor
The Best We Could Possibly Do Within The Project Specifications

Traveling Public
Smooth, Safe, Quiet, Maintenance Free

Other Customers
NASCAR, Airports, Ports, Parking Lots, Homeowners

Our Expectations of Performance has Changed Internationally!!!

LLM Asphalt Technology Consulting

Drastic Increase in Traffic Internationally

Permanent deformation
Fatigue
Moisture susceptibility
Durability

Marshal
Water Sensitivity
Fatigue
Stiffness

Workability
Water Sensitivity
Stiffness
Fatigue

Water sensitivity
Permanent deformation
Stiffness
Fatigue

Marshall- Flow, Stability
Water Sensitivity
Resistance to Load
(Hamburg test)

Hveem,
2015
Superpave

LLM Asphalt Technology Consulting

France

Early Leader in Mix Design Development

French Gyratory 1975

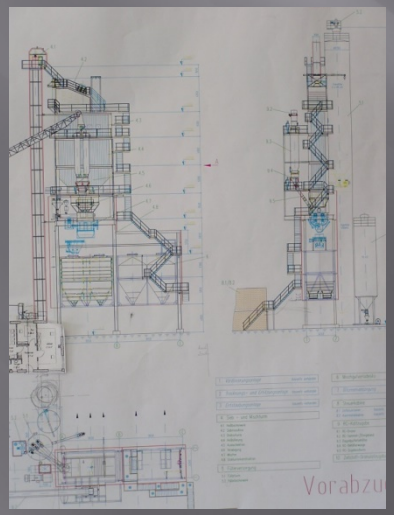
1990s

Identified:

Water Resistance
Resistance to Permanent Deformation
Stiffness
Fatigue

LLM Asphalt Technology Consulting

Germany SMA Tours



LLM Asphalt Technology Consulting

Germany-2015

A10 Autobahn around Berlin

Leveling and Surface Courses
Required to be Paved full width

LLM Asphalt Technology Consulting

Spain 2015

Paved B 40 orbital motorway around Barcelona using the Vogele Paver to pave wearing course in one pass.
(10.5-15.5m –35'-50.9')

LLM Asphalt Technology Consulting

Today in the US:

We can design, specify, and construct pavements to meet all our customers needs!

Traveling Public

Smooth, Quiet, Maintenance Free

Other Customers

NASCAR, Airports, Ports, Parking Lots, Homeowners

I 95 from New Brunswick Canada to Miami Florida

I 80 from New Jersey to California

This Just Didn't Happen, it has been a Journey!!

LLM Asphalt Technology Consulting

The U.S. "QUALITY" Journey!

1930s
Binders- Penetration Grading
Mix Designs Methods-Hubbard-Field, Hveem, Marshall

1940s & 50s
Binders -Penetration Grading
Mix Designs-Primarily, Marshall, Hveem
with continuous modifications and improvements

1960s & 70s
Binders -Viscosity Grading
Mix Designs- Primarily Marshall and Hveem
with continuous modifications and improvements

1980s
1987-1993 SHRP-Strategic Highway Research Program

1990s
Binders –Performance Based Graded +(Modified Binders)
Mix Designs-Performance Based

with continuous modifications and improvements

LLM Asphalt Technology Consulting

The Journey Continues:

1990s

Numerous NCHRP Projects:
QC/QA
NCHRP 1-37A M+E Designs
Test Tracks
SMA Projects based primarily on German technology
Pavement Management Systems
1990 Roadtec Shuttle Buggy

2000 and Beyond

Warm Mix Asphalt
Intelligent Compaction
New Equipment
New Tools
Plus!!

100s of research projects
AAPT, Asphalt Institute, TRB ,Universities
FHWA,NAPA,NCAT, States, Other
Countries, plus

And the Research Continues

LLM Asphalt Technology Consulting

Questions?

Why do we still see?

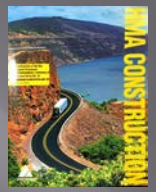
Potholes
Segregation
End of Load Segregation

Questions?

Are we using Design Guide to design and specify projects? Or budgets?

Are we using best practices in construction?

HMA Construction *MS 22*



Are we using all of our tools?

Are we getting uniform Density?

LLM Asphalt Technology Consulting

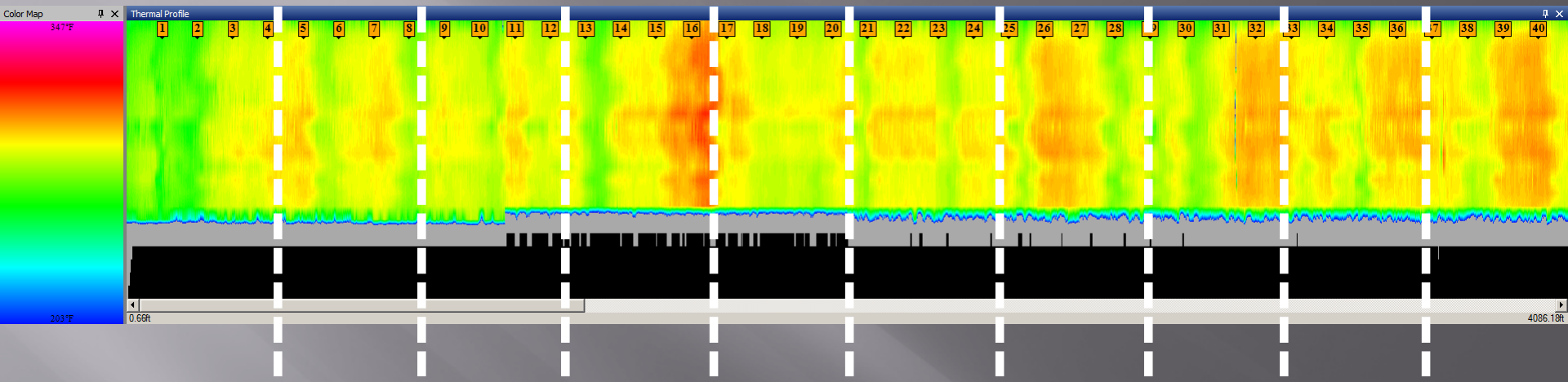
HMA Quality starts here:

LLM Asphalt Technology Consulting

Tack Coat

LLM Asphalt Technology Consulting

Are we using All Our Tools?



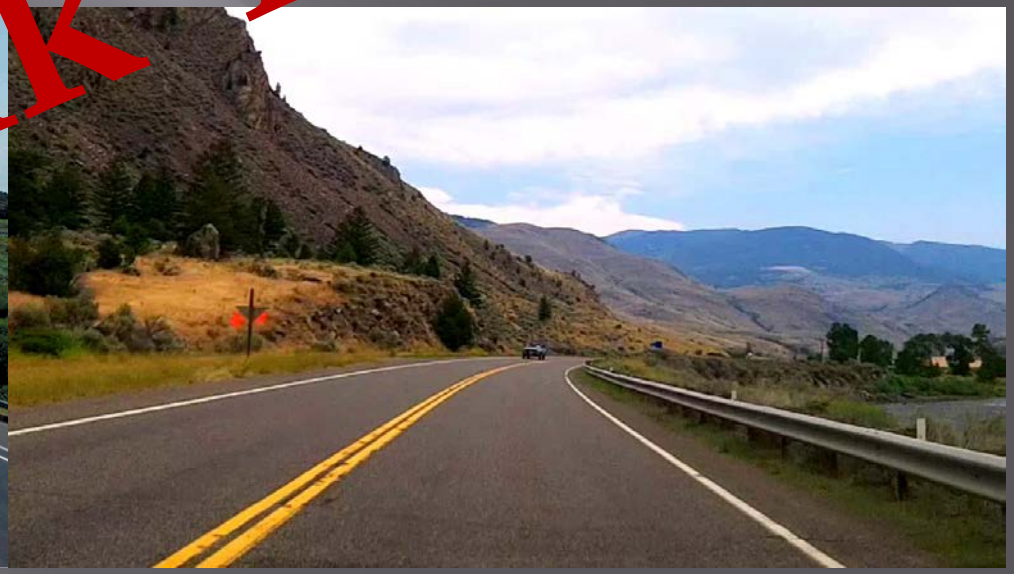
Truck #1 Truck #2 Truck #3 Truck #4 Truck #5 Truck #6 Truck #7 Truck #8 Truck #9

Pave-IR: Pavement Temperature

Things That "BUG" me!!

LEM Asphalt Technology Consulting

There are Beautiful High Quality Asphalt Roads Around the World!



Thank You!!

LLM Asphalt Technology Consulting