R & F ASPHALT UNLIMITED INC.

WARM MIX ASPHALT
PROJECTING INTO THE FUTURE

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INTRODUCTION

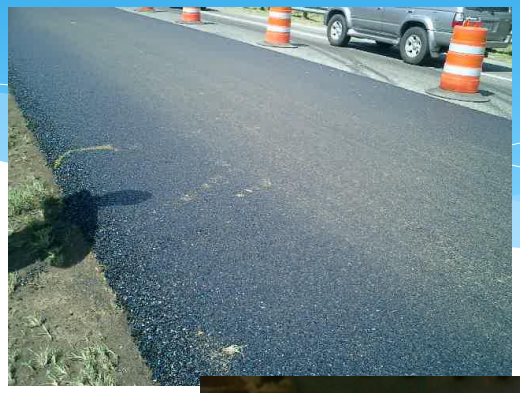
* Company founded in 1997 as part of the acquisition with what was previously known company INABON, located in Coto Laurel Ponce. The Installation is a 5,000 Lb. Barber-Greene Asphalt Batch Plant Featuring the Stansteel®

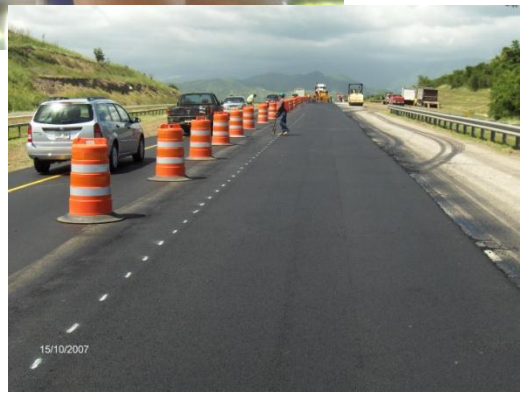
Since its inception our company focused on production and deposit of hot mixtures asphalt throughout the southern area of the island. Established as main market of local government and private projects.

In 2006 is the first project of SUPERPAVE and from That Moment They begin to create Conditions for asphalt Mixtures are Redefined According To the Changes and revisions of the 401 and 959 Specifications.

As part of the effort of the Highway Authority to Improve These mixtures our company agree to Participate in the process of Improving technical and industrial.

EXPERIENCE





* 1997 - 2005
Marshall Mix

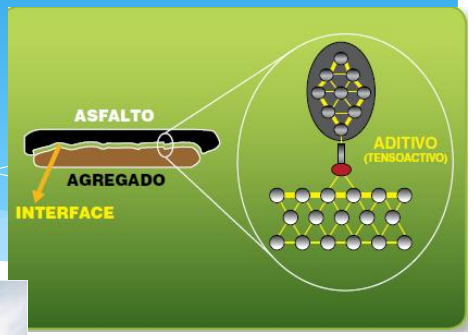
* 2005 – 2010
Marshall, Superpave
and Rubberized

* 2010 – Actual
Mixtures Marshall, Superpave,
and Rubberized , Glassphalt and
WMA

Problems in the Production Asphalt Mixtures

* Use of the High Mixing Temperature
* High efforts in the compaction in Field
* Difficult to cover the Aggregates, especially wet,
* Promoting the use of asphalt in Excess Occasionally to Achieve a good appearance.
* Consumption in Excess of asphalt and fuel for heating the Aggregates during drying process.
* One of the main Problems of Pavements asphalt is the gravel of the folder and training detachment potholes, which are you cause of road accidents and Injuries vehicles. This is due to the loss of binder among the asphalt and aggregate

PROJECTIONS OF ALTERNATIVES AND SOLUTIONS



Mechanical foaming technologies

Double Barrel Green
Terex Warm Mix Asphalt System
Gencor

Stansteel

Foaming additives

LEA
Aspha-min
Advera WMA
WAM Foam

Chemical additives

Evotherm
Evotherm DAT
REVIX
Rediset WMX
Cecabasa RT

Organic additives

Sasobit

Kaoamin 14

EXPERIENCE WITH KAOAMIN 14

What is the KAOAMIN 14?

* Derived from Fats polyamines (similar to the Licomont)
* Reduce the effect of oxidation of asphalt.
* Prolongs the usefull life of the asphalt.
* Better coverage of the aggregate.
* Greater resistance of the effect of the water.
* Reduce the aging of asphalt.

* Objective:

Determine through chemical modifiers for to obtain a mixture of the WMA type

EXPERIENCE WITH KAOMIN 14 (Chemical Modifier)

1 - Depending on the Dose of the additive can Be Reduced the production temperature below 30 ° F of the conventional temperatures.

2 – Reduce the CO_2 Emissions and at the Same time it assumes a fuel saving.

3 - Obtain mix with better adhesion and cohesion among asphalt and aggregate.

4 - The blend is more resistant to moisture damage.

5 - The Greater manageability and mix shows as well as fluency in brighter aspect.

6 - The percent voids is notably lower in Optimal Conditions that design blends the conventional.

7 - Asphalt Consumption is optimized by Having a Highest Percentage of coating on the added, is not so at an additional cost incurred.

8 - Allows the transportation of the mixture by distance more prolonged.

9 - Allows for better performance of the asphalt mix in testing.

POTENTIAL BENEFITS

Contractor

- Money saved on fuel costs could offset additional material

Costs

- Could lead to longer paving season
- Longer haul distances open up new markets

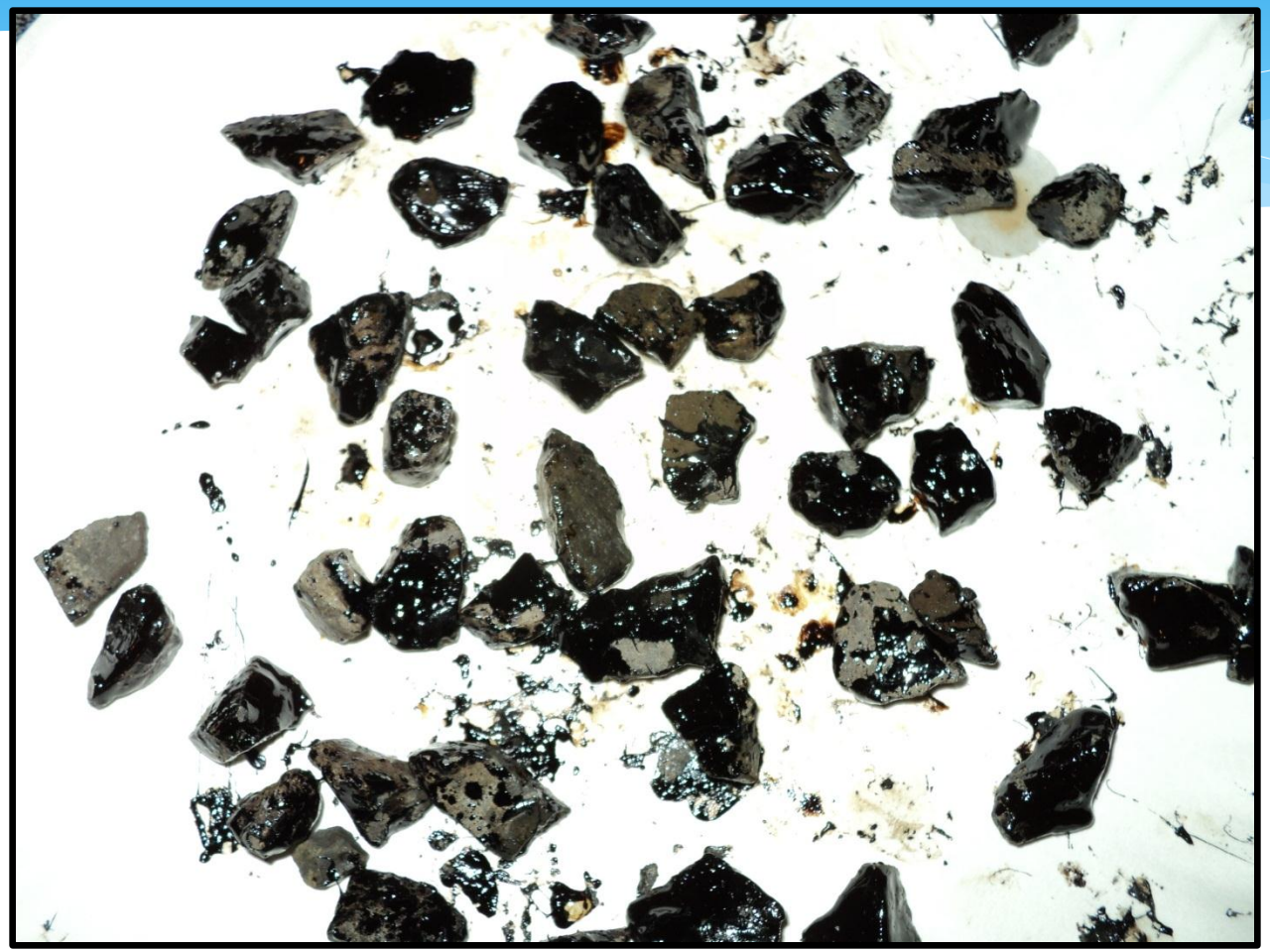
Client

- Longer-lasting asphalt
- Fewer rehabs

Public

- Fewer cracks = smoother pavement
- Fewer rehabs = fewer delays
- Better for the environment

MOISTURE DAMAGE



Lost of Asphalt Film without Kaoamin 14

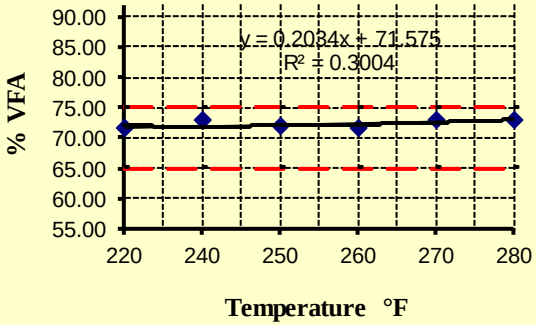
RESISTANCE AT MOISTURE DAMAGE

Preservation of Asphalt Film with kaoamin 14

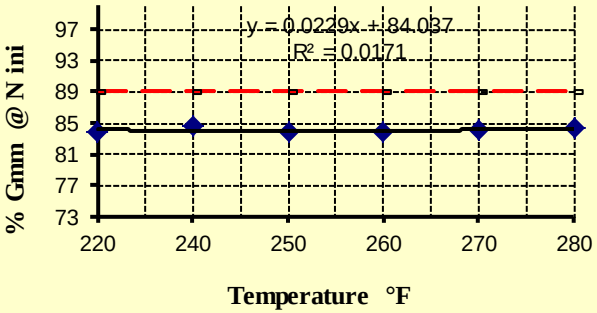
WMA MIX DESIGN (KAOAMIN 14 @ 1.2 %)

Mix Volumetric Properties

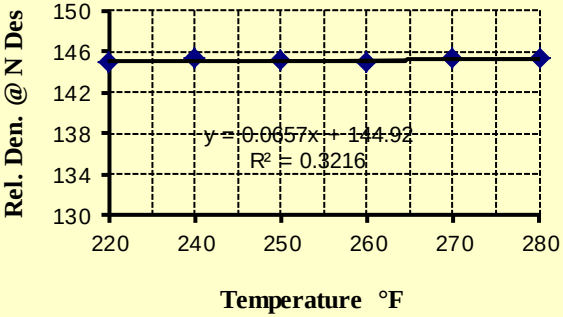
% VFA vs Compact. Temp.



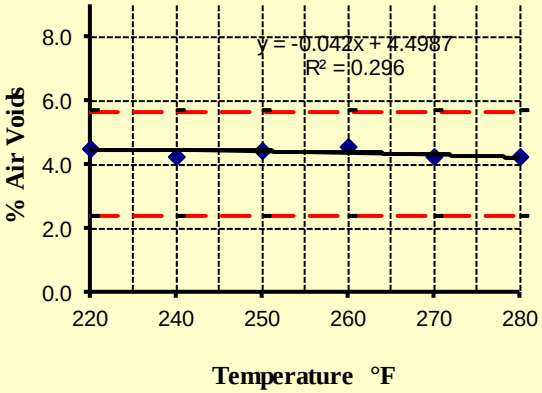
% Gmm @ N ini vs Compact. Temp.



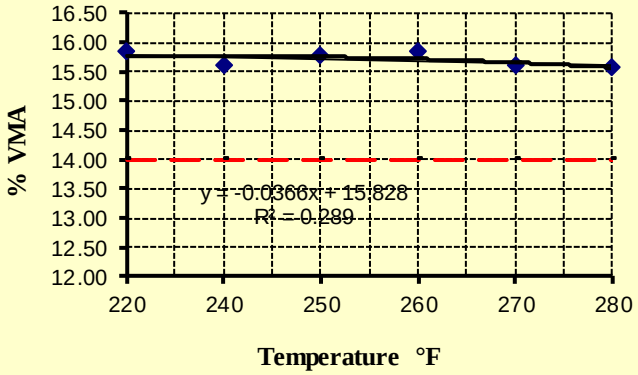
Relative Density @ N Des vs Compact. Temp.



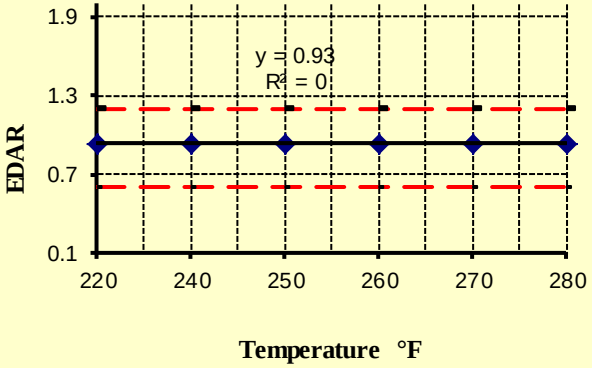
% Air Voids vs Compact. Temp.



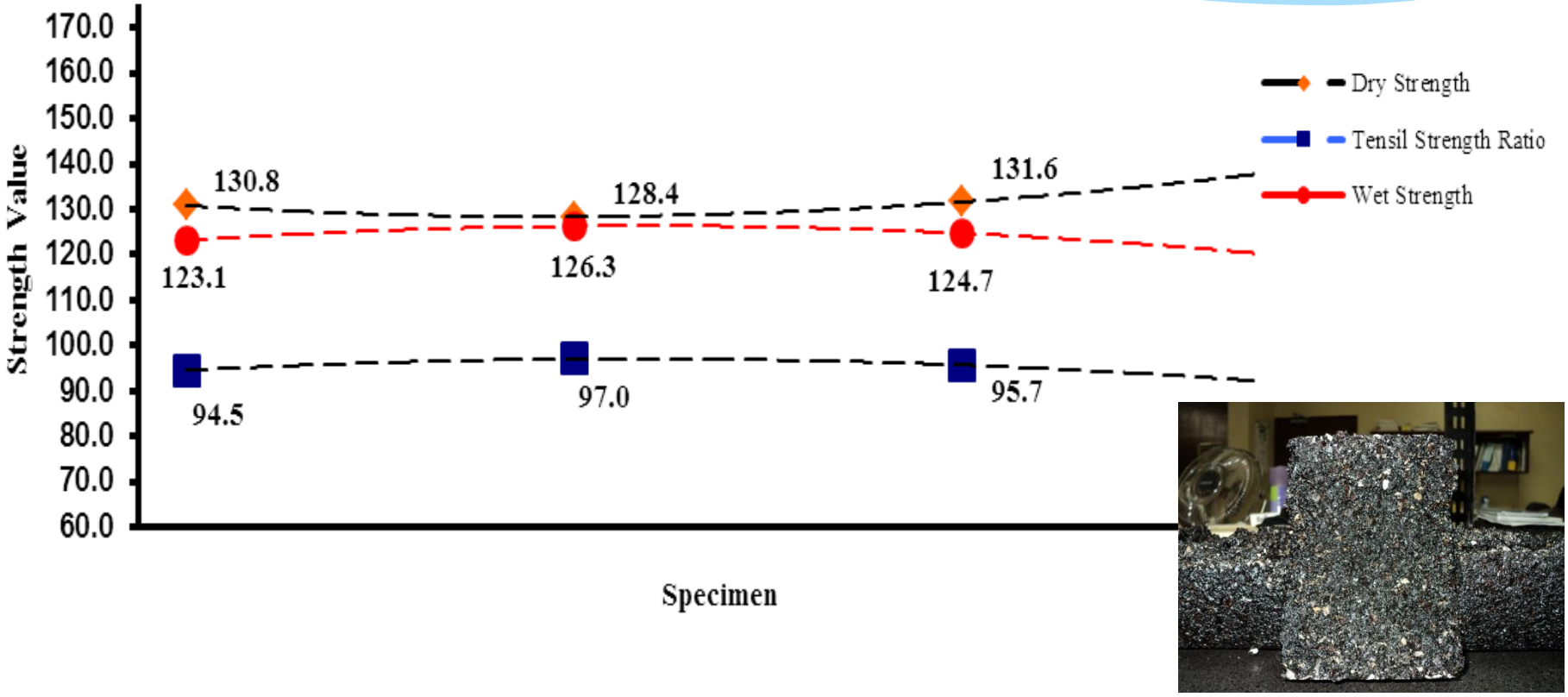
% VMA vs Compact. Temp.



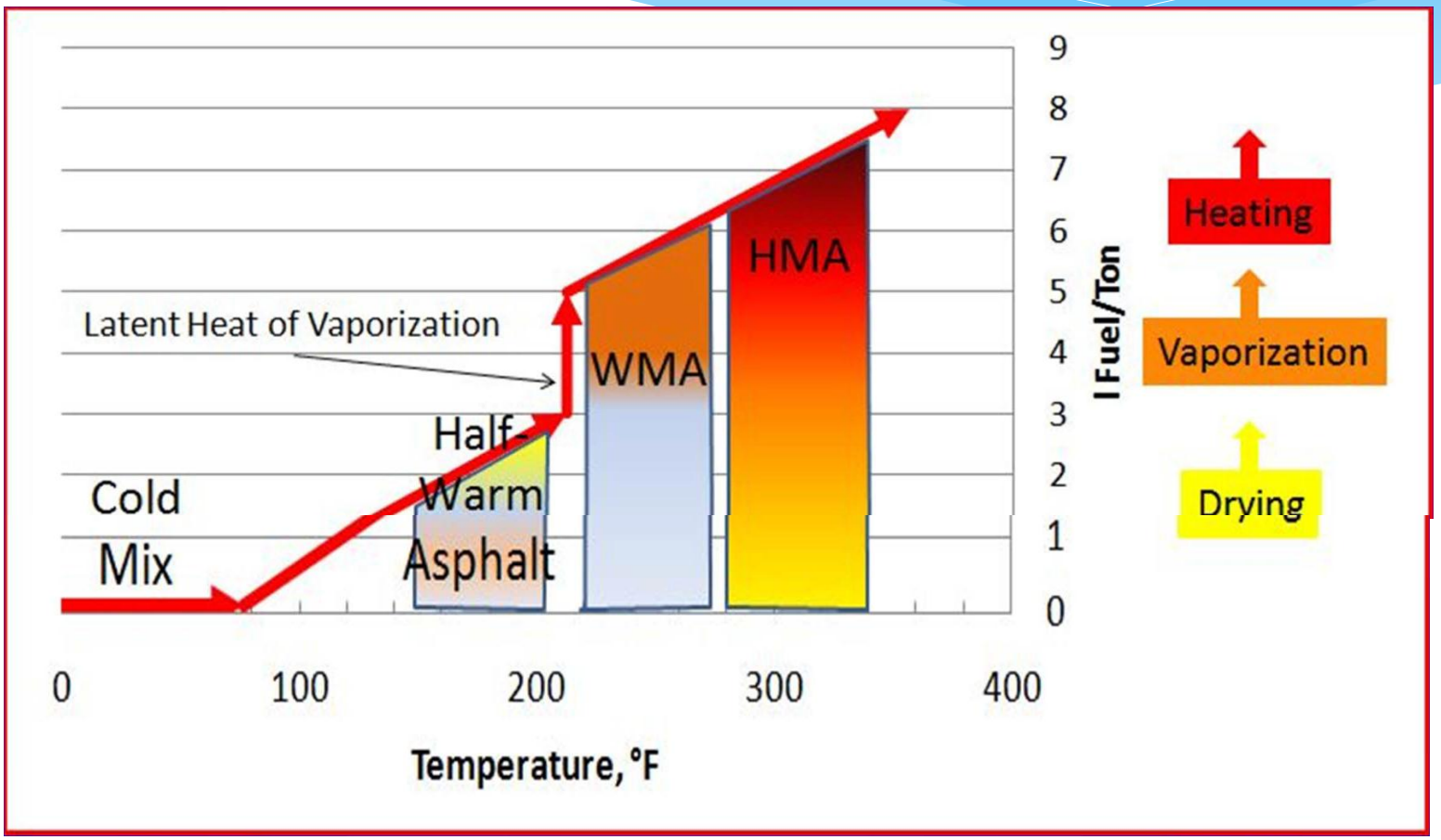
EDAR vs Compact. Temp.



EVALUATION AASHTO T-283



PLANS OF INVESTMENT IN THE SHORT TERM



PLANT PRODUCTION

video warm mix plant production 03-22-11.3GP

PLANS OF INVESTMENT IN THE SHORT TERM

OBJECTIVE

- **Modification of R & F Asphalt Unlimited's Existing 5,000 Lb. Barber-Greene Asphalt Batch Plant Featuring the Stansteel® Continuous Rotary Mixer Conversion Package with Optional Recycle System**

PROJECTIONS

- WMA
- USE RAP
- USE OF FOAMING TECHNOLOGY
- MARSHALL , SUPERPAVE AND RUBBERIZED MIXES WITH BETTER PERFORMANCE
- COMPETETIVE PRICES

PLANS OF INVESTMENT IN THE SHORT TERM

ACCU-TRACK™: Total Plant Control

Designed to maximize the operation of your continuous drum mixing asphalt plant!

DRUM/DRYER

Fuel and Material Monitoring

- Burner Fuel Usage Rate and Totals
- Individual AC On/Off Times for each mix design - reduces waste!

BELT SCALES

Stop Scale Drift

- Internal Scale Calibration to meet or exceed state specifications
- Dual Scale Capabilities
- Scale Bypass Feature - Reduces Plant Downtime
- 2 Point Scale Calibration

BAGHOUSE

Regulate Dust Precisely

- B/H Pulse Control
- High Temperature Alarm and Shutdown
- B/H Screw Zero Speed Alarm

INTEGRATES ALL OF YOUR PLANT'S SYSTEMS

COLD FEEDS

Verify Rate and Flow

- Material No-Flow Alarm
- Automatic Bin Vibrator Control
- Individual Feeder Stop/Start Times
- Reduces Waste
- Calibrate Feeder in Minutes
- Feeder Zero Speed Indication
- Control up to 15 feeders standard
- Multi Point Feeder Calibration - Improves Gradation Accuracy
- Pre-calibrate up to 4 materials per feeder

PUMP SKID

Stop Wasting Liquid AC

- Calibration Accuracy to 2/10 of 1%
- Back up AC Meter Feature - Reduces Plant Downtime
- AC No-Flow Indication
- Automatic AC Line Fill - Reduces Waste
- Mix and AC changes "on the fly"

OTHER FEATURES & BENEFITS:

- Automatic Stop/Start of all material handling
- Raw Materials Inventory
- Plant Data Trending Screens
- Diagnostic Screens
- Industrial PC Design
- Off-the-Shelf Components
- Proven Software - 30 years in the making
- Standard or Custom I/O Enclosure
- Manual Backup Control
- Motor Overload Alarm and Shutdown
- 24/7 Technical Support
- Complete Parts Backup

ADDITIVES - RAP - SHINGLES - DUST/ FINES

- Meter or weigh any ingredients
- Easily modified system to meet state specifications or changing conditions
- Unique timing features help minimize waste

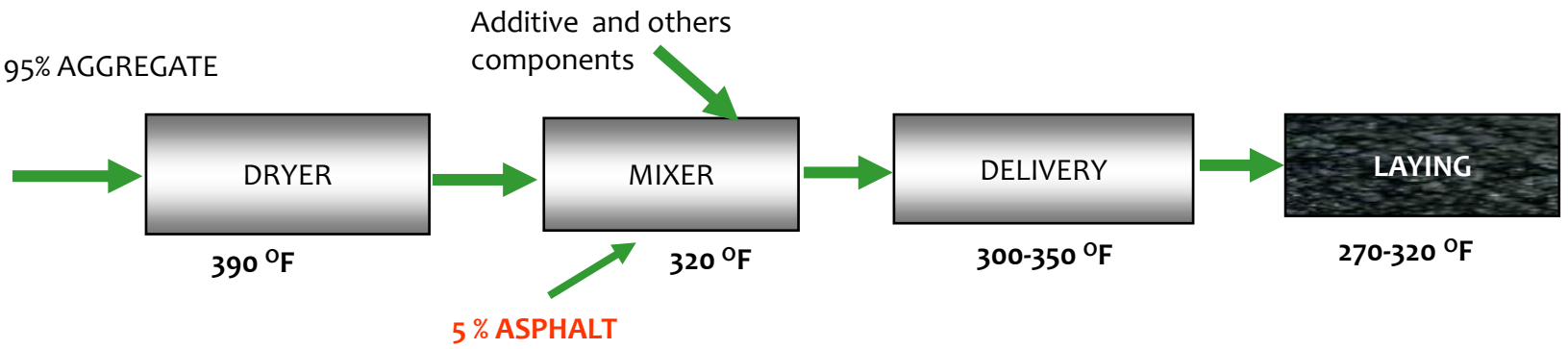
SILOS

Makes Switching Silos Easy

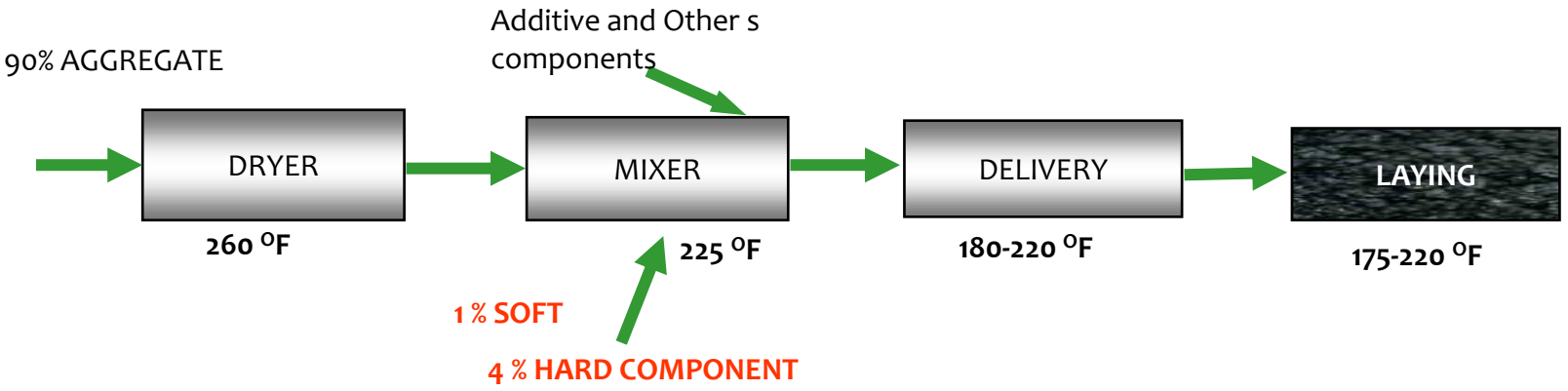
- Automatic Bintop Conveyor and Batcher Control
- Drag Slat & Bintop Zero Speed Alarm
- High Silo Alarm & Shutdown
- Change Mix Time Countdown
- Silo Inventory Output Pulse - Provides Silo Level Monitoring

Schematics of the Typical Process Conditions

TRADITIONAL HOT MIX ASPHALT



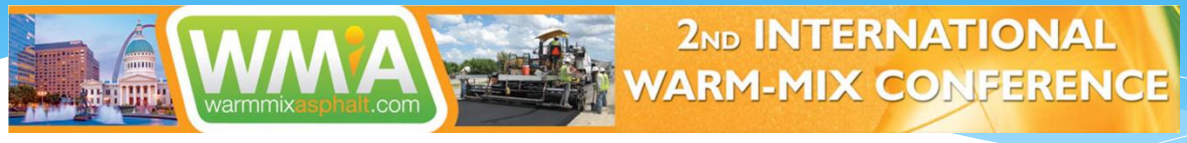
WMA ASPHALT MIX PROCESS

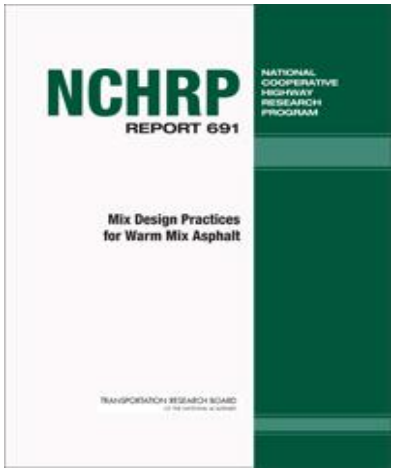


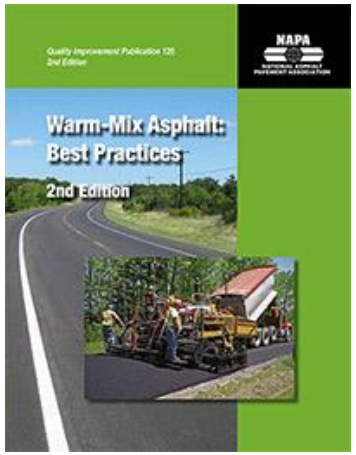
CONCLUSSION

* SPEED OF DEPOSIT AND COMPACTED.
* THE INTRINSIC PROPERTIES OF THE ASPHALT MIX IS POSSIBLE AT RANGE OPERATING TEMPERATURE AND MANAGEMENT BELOW OF 290 °F
* IT IS POSSIBLE DEVELOP THIS TYPE OF MIX IN THE OPERATING EXISTING CONDITIONS.
* THE CONCEPT OF WMA IS A DESIGN AND MANAGEMENT OF MIXTURE AND IS NOT STRICTLY DEFINED IN A SPECIFIC PRODUCT
* IT IS NOT THE INTENT OF THIS PRESENTATION TO RECOMMEND, PROMOTE, OR ENDORSE ANY PARTICULAR WMA TECHNOLOGY

REFERENCES







warmmixasphalt.com

* Mix Design Practices for Warm Mix Asphalt – NCHRP Report 691, 2011 – AASHTO R 35 Draft Appendix – Special Mixture Design Considerations and Methods for Warm Mix Asphalt (WMA) .
* Warm Mix Asphalt: Best Practices (2nd edition) – National Asphalt Pavement Association (NAPA) (QIP 125) – 2011.
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GRACIAS