



Cooler Temperature Paving Using Modified Binders

**Presented to the
Association of Modified Asphalt
Producers**

January 29, 2001

Cooler Temperatures?

- 1.) Am I talking about paving in cooler weather? Or...
- 2.) Am I talking about reducing the temperature of the bituminous mixtures?

Please Choose Number

1.) Paving in Cooler Weather.

- Because that is what I am going to talk about.
- I am going to share what I have learned in Missouri and Illinois using mixes with modified binders early in the season and late in the season.



“Ask the binder producer what the mixing and laying temperatures should be.”

I say, “I’m sorry, I cannot make that decision but I will give you a series of criteria which will help you make that decision.”

“Ask the binder producer what the mixing and laying temperatures should be.”

- I think, “Why ask me? What the heck do I know about your job? Who did your mix design? I refuse to be the decision maker as to when to pave or not to pave. All that can do is cause me a lot of grief and possible law suits if the job goes south.”

Paving Conditions Are Not Always Ideal



Factors to Consider

- PG binder in mix (stiffness)
- The paving day(s)
- Job/Plant locations
- Transportation issues
- Plant performance
- Storage
- Paving train
- Worker's experience and attitude

PG Binder in Mix

- Modified binders generally require higher field mixing temperatures for good aggregate coating.
- The stiffer the binder, the higher the mix temperature will need to be on the job, BUT, do not SUPER elevate the temperature of the mix to allow more compaction time.

The Paving Day(s)

- Ambient temperature
- Paving hours
- Starting time
- Temperature of existing surface
- Weather report

Plant/Job Location

- What is the distance from the plant to the job?
- How long will it take per load?
 - In rush hour?
 - Regular hours?

Temperature of Existing Surface

- Measuring the temperature
- Color of surface
- Time of day
- Time of year
- Weather report
- Wind

Degradation Temperature of Modifier(s)

- Elvaloy manufacturers—never over 375F.
- SBR manufacturers—never over 375F.
- SBS manufacturers suggest never going over 380F.
- EVA manufacturers—never over 365F.
- Plastic manufacturers—N/A varies
- **BUT...MIXING SHOULD BE LESS THAN THE ABOVE NUMBERS**

Type of Asphalt Plant

- **Batch plant**
 - Usually older with less temperature control
 - Aggregates can be easily over heated
- **Drum mix plant**
 - Better temperature control

Liquid Storage Tank

- Producer loading temperature
- Distance to plant from producer
- Heater efficiency
- Mixers
 - Agitators
 - Re-circulate
- Horizontal or vertical

Transportation Issues

in addition to paving day issues, we need to know

- The number of trucks hauling.
- Do all the trucks have tarps?
- Are the trucks insulated?
- What kind and size truck will be hauling?
- Can the trucks be garaged at night?
- Where and how will the drivers remove the clumps?

Laydown Equipment

- Transfer device
- Paver—
 - Speed
 - Grade Controls
 - Mechanical Condition
- Rollers---
 - Vibratory Steel Wheel
 - Rubber tire



Compaction

- Changing compaction techniques
- Roller operator needs to be involved in the rolling plans
- Monitor the temperature of the mat behind the paver
 - Immediately behind
 - 100 feet behind
 - 250 feet behind

Workers Experience and Attitude



- Some old-timers know it all already
- Some newbies know it all already
- Problems with two breakdown rollers together
- Attitude-will they listen?

Berkley Guaranteed Compaction Kit

- Available by mail order.
- \$850 for two component kit
- Guaranteed to keep breakdown roller close to screen of the paver
- Adjusts attitude of operators who know more than you know

Component #1

- Consists of a 200 foot rope.
- Tie rope on screed
- Tell roller operator to never let the end of the rope get between she/he and the paver

Component #2

- A Glock
- If rope end gets between roller and paver
- Shoot the operator.

Conclusion

- As a modified asphalt producer you are not in position to make paving decisions
- The contractor knows much more about how and when to pave than you do, providing he has enough information
- But, be prepared to help answer critical questions about the jobs

Conclusions

- Know what temperature you need the mixture to be 20' behind the screed and then work backwards to the plant, figuring haul distance, hauling factors, equipment factors and other influencing factors.

Conclusions

- Follow proper compaction techniques
- Use good sense regarding incoming weather
- Be prepared to adjust starting times and ending times—possibly short days
- Keep abreast of all the data coming from research programs regarding mixing and laying temperatures

I-70 St. Clair County, IL

April 14, 2001—temp. at 6 a.m. , 43F.

Forecast, partly cloudy, expected high 60F. @ 3pm

Garaged, non-insulated, dump trailer trucks (21 tons each)

Distance from plant—11 miles, time per round trip-50-55
minutes

Expected tons per day-1500 tons per day

PG binder-modified PG 76-22

2 steel wheel vibratory breakdown rollers

1 rubber tire on site (if needed)

1 steel wheel finish roller

Starting time for first truck at paver—9:30 am

I-70 St. Clair County, IL

continued

Existing surface, newly constructed binder mix

Light tack coat with SS-1h diluted

Transfer machine required

300 ton per hour drum mix plant

Mix storage bins used— with limitations

Experienced crew with extra training

Temperature of surface at first load—approx. 50F.

Target temp 20 feet behind screed—305-310F.

Plant mix temperature—325-330F

I-70 Question

Based on the previous information, how many dump trailer trucks are needed to eliminate waiting time at the paver?

Answer: Contractor used 11 to start the job and dropped one off as traffic subsided.

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Thank You