

6.3mm Thin Asphalt Overlay (Thin Hot Mix Asphalt Overlay or Thinlay)

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Research Project on THMAO

- **Four Year Project: June 2012 – June 2016**
- District 8-0, Dauphin County, SR 0022
- District 8-0, Lancaster County, SR 0230
- District 3-0, Lycoming County, SR 0220

Specification features

- New Section 412 in Pub. 408
 - **SUPERPAVE MIXTURE DESIGN, CONSTRUCTION OF PLANT-MIXED HMA/WMA 6.3MM THIN ASPHALT OVERLAY COURSES**
- Pub 242 changes
 - Usage guidance in chapter 5.
 - Changes to add this new material to chapters 9, 10, 11, & 12.

Specification features

- Aggregates: Changes to Section 703
 - SRL
 - Coarse Aggregate – SRL as listed in Bulletin 14.
 - AASHTO #89 and #9 aggregate gradations being added to Pub. 408, Section 703.
 - AASHTO #9 aggregate will need to be sampled and pass quality and SRL testing to be used in 6.3mm asphalt.
 - AASHTO #89 aggregate will be approved based on the AASHTO # 8 aggregate quality test results.
 - Fine aggregate –
 - **Manufactured fine aggregate** must be manufactured from the same parent rock as SRL rated coarse aggregate.
 - **Natural Fine Aggregate** – Must be sent for SRL determination.

Specification features

- Aggregates:
 - Consensus properties:
 - Same as superpave except:
 - Flat and Elongated Maximum 10 percent for 1:5 ratio, **and** Maximum 20 percent for 1:3 ratio.
- Can make WMA or HMA.
- RAP & RAS
 - No RAP or RAS allowed

Specification features

- Design Gyration for all roadways = 75
- Design VMA = 16.5% minimum
- Drain down test (AASHTO 305) required for mixes with greater than 7.0% asphalt content.
- Binder grade is PG 76-22 only. Possible future inclusion of PG 64-22.

Specification features

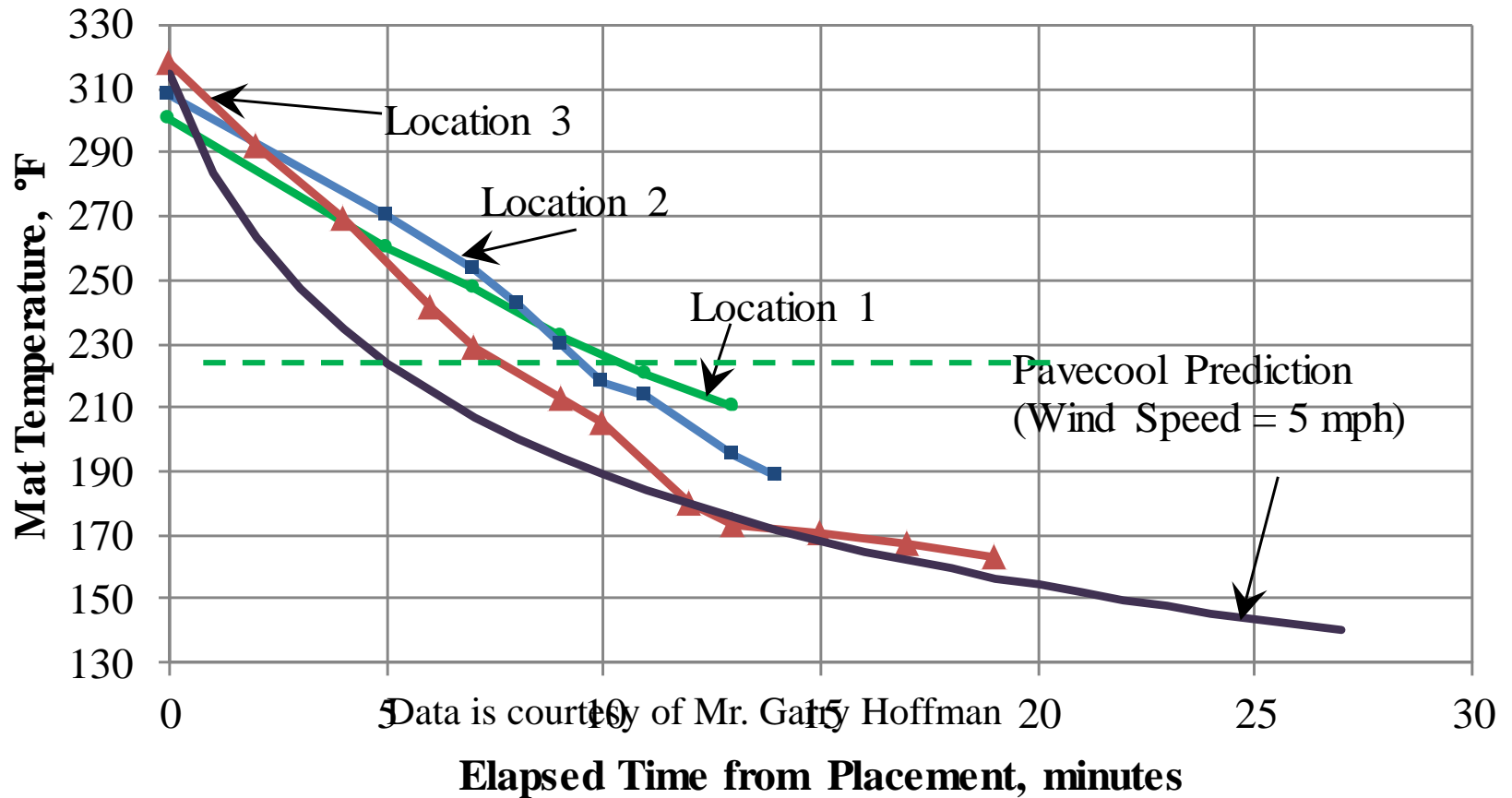
- Mixture Acceptance:
 - Certification or Lot.
 - Lot acceptance includes
 - Asphalt content.
 - Percent passing 200 sieve.
- Density Acceptance:
 - Optimum rolling pattern

Specification features

- Tack coat:
 - Proper application and adequate quantity's of tack are very important for thin asphalt layers.
 - New tack specification SOL 481-17-01.
- Weather limitations:
 - Air and Surface Temperatures 50° and rising.
 - For paving season extensions, compaction needs to be completed in less than 10 minutes.

Weather limitations

THMAO Project - N. Cameron Street, WB, Passing Lane
Mat Temperature (Spot Measurement) - 7/23/12 - 7/24/12



Data is courtesy of Mr. Gary Hoffman

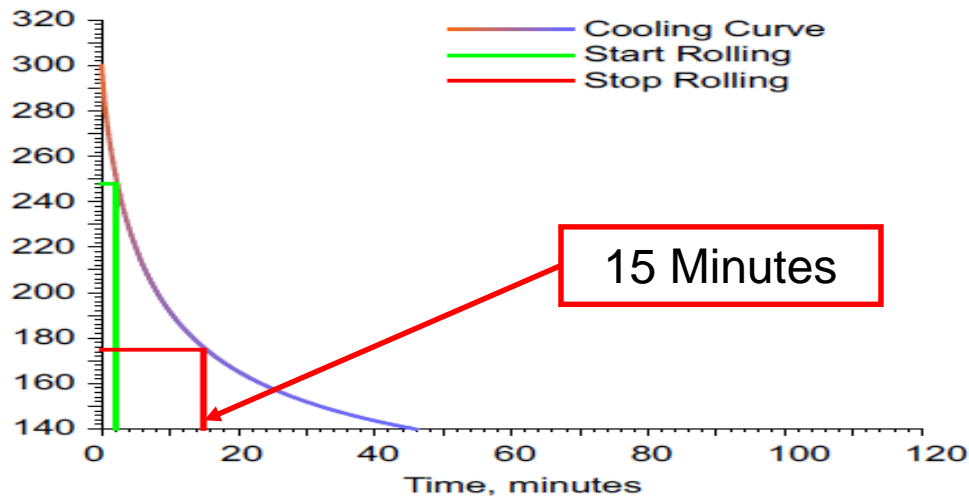
Thinlay Compaction

PaveCool 3.0 Report

Project: 6.3mm Thinlay

Date & Time		Start Rolling*	Stop Rolling*
1/3/2017 9:25 AM		2 minutes (248 °F)	15 minutes (175 °F)
Mix Type	Binder Grade	Thickness	Delivery Temp.
Fine/Dense	PG 76-22	1.00 in.	300 °F
Air Temp.	Wind Speed	Sky	Latitude
70 °F	5 mph	Clear & Dry	41 ° North
Existing Surface	Moisture	State	Surface Temp.
Asphalt			110 °F

Mix Temperature, °F



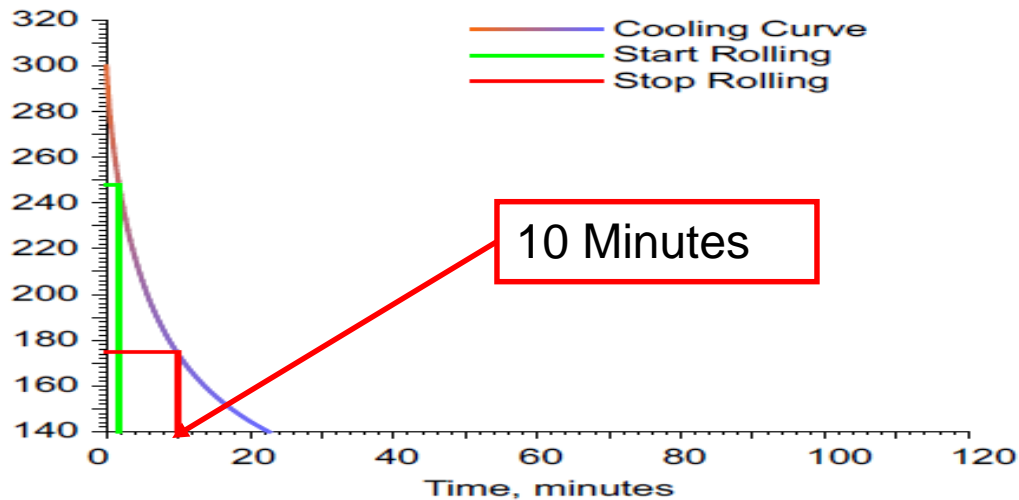
Thinlay Compaction

PaveCool 3.0 Report

Project: 6.3mm Thinlay

Date & Time		Start Rolling*		Stop Rolling*	
1/3/2017 9:25 AM		2 minutes (248 °F)		10 minutes (175 °F)	
Mix Type	Binder Grade	Thickness	Delivery Temp.		
Fine/Dense	PG 76-22	1.00 in.	300 °F		
Air Temp.	Wind Speed	Sky	Latitude		
70 °F	5 mph	Clear & Dry	41 ° North		
Existing Surface	Moisture	State	Surface Temp.		
Asphalt			70 °F		

Mix Temperature, °F

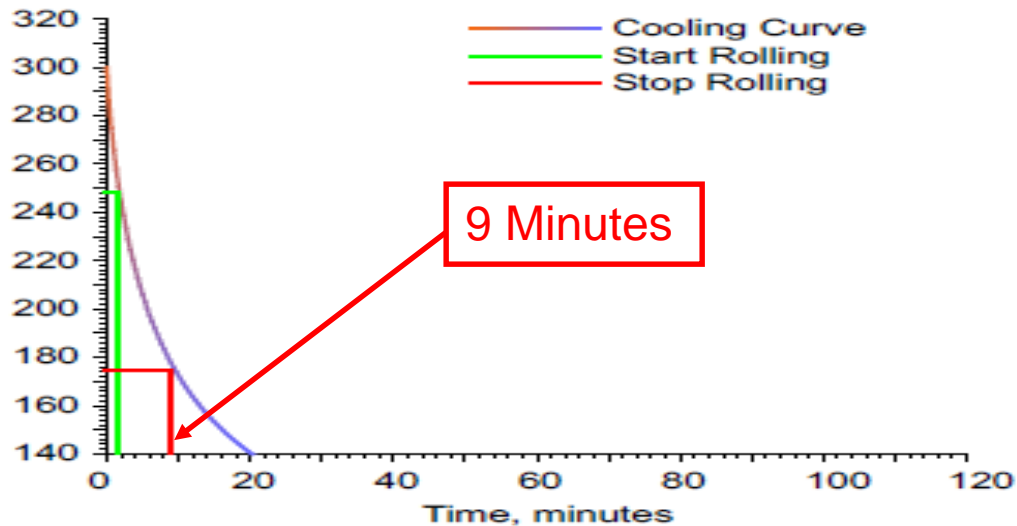


Thinlay Compaction

PaveCool 3.0 Report

Date & Time		Start Rolling*		Stop Rolling*	
1/9/2017 10:20 AM		2 minutes (248 °F)		9 minutes (175 °F)	
Mix Type	Binder Grade	Thickness	Delivery Temp.		
Fine/Dense	PG 58-34	1.00 in.	300 °F		
Air Temp.	Wind Speed	Sky	Latitude		
50 °F	5 mph	Clear & Dry	41 ° North		
Existing Surface	Moisture	State	Surface Temp.		
Granular Base	Dry	Unfrozen	50 °F		

Mix Temperature, °F

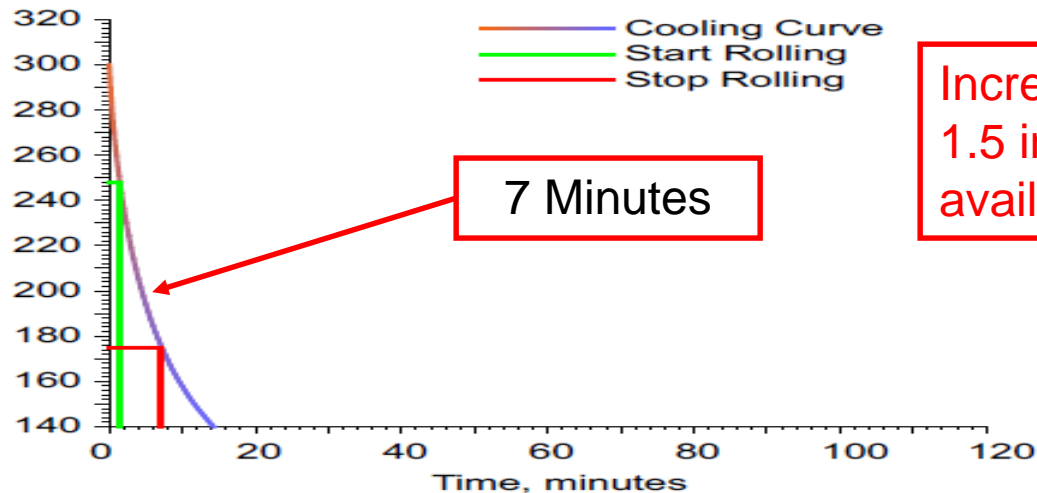


PaveCool 3.0 Report

Project: 6.3mm Thinlay

Date & Time		Start Rolling*		Stop Rolling*	
1/3/2017 9:25 AM		1 minutes (248 °F)		7 minutes (175 °F)	
Mix Type	Binder Grade	Thickness	Delivery Temp.		
Fine/Dense	PG 76-22	1.00 in.	300 °F		
Air Temp.	Wind Speed	Sky	Latitude		
40 °F	5 mph	Clear & Dry	41° North		
Existing Surface	Moisture	State	Surface Temp.		
Asphalt			40 °F		

Mix Temperature, °F



Increasing the thickness to 1.5 inches increases time available to 14 minutes.

Where Is Use of Thin Asphalt Appropriate?

- Roadway Conditions:
 - Good base condition, well repaired base,
 - Patched pavement in good condition
 - Minor base depressions
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- 6.3mm thin asphalt overlay can help with:
 - Excessive roughness,
 - Poor surface friction and polishing,
 - Bleeding and weathering,
 - Shoving/ low severity surface related rutting,
 - Minor/Moderate Raveling,
 - Bumps, settlements, and heaves.
 - Scratch / interlayer.

Where Is Thin Asphalt Use NOT Appropriate?

- Base problems
- Alligator cracking,
- High severity rutting,
- High severity longitudinal cracking,
- Active cracking.

Summary

- Thin Asphalt A Good Tool for Surface Treatment.
- Improved Ride and Friction.
- Minimal Rutting Observed.
- Reflective cracking will occur.

Summary

- Proper Base Repair is a MUST.
- Pay special attention to tack coat application.
- Thin layers loose heat faster and need to be compacted sooner. (Within 10 minutes.)

Current Status

- First round Clearance Transmittal comments where due 12/28/2016.
- Second round Clearance Transmittal will be out in a month or so.

Questions?

