

Report on Modified Binder Meeting

NEAUPG Annual Meeting
Portsmouth, NH
10-20-04

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Connecticut Transportation Institute
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Meeting was Sponsored by:

- NEAUPG
- Association of Modified Asphalt Producers
- Connecticut Department of Transportation
- CAP Lab

Background

- As a region, the Northeast has been very slow to adopt the use of modified asphalts
- High quality neat asphalts generally meeting the climatic requirements are available in the Northeast
- Specific projects may benefit from the use of modified asphalts in the region

March 2004 NEAUPG Steering Committee Meeting

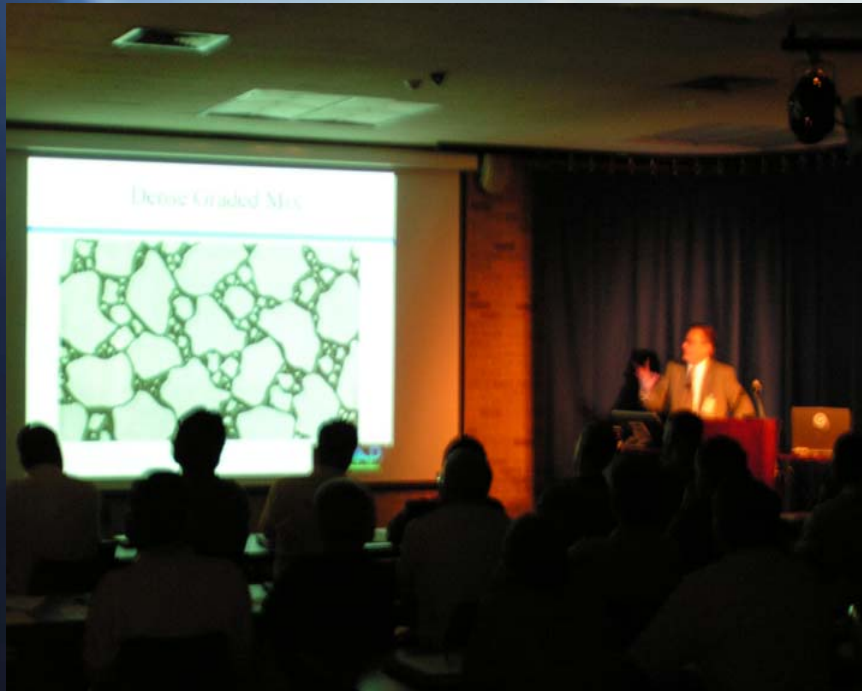
- Modified asphalts became major focus of discussion
 - Many States expressed an interest in using modified asphalts but have some reservations
- During the discussion, the need for increased knowledge of asphalt modification was realized
- The CAP Lab was charged with organizing this informational meeting

Meeting Objectives

- Provide general understanding of asphalt modification
- Encourage discussions between Suppliers and Transportation Agencies regarding modified asphalts

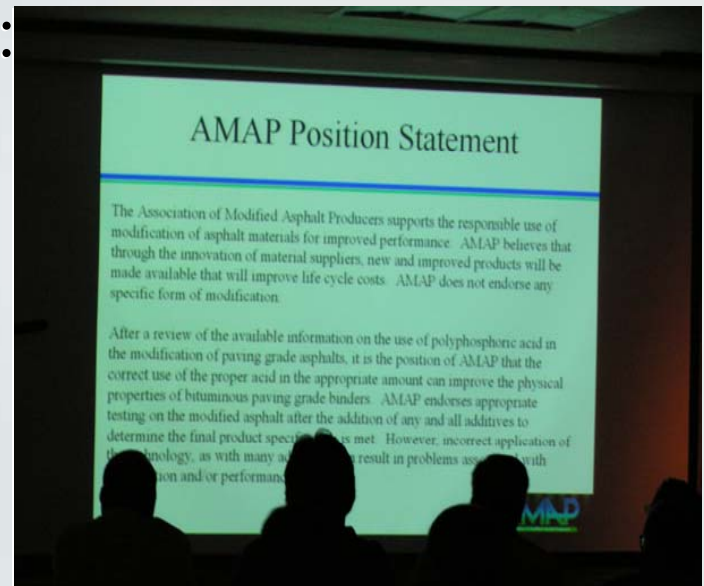
Modified Asphalt Meeting

- Held July 15, 2004
- Conducted at the Connecticut DOT Research and Materials Facility



Modified Asphalt Meeting

- Presentations were made by:
 - Laurand Lewandowski
 - John Casola
 - Ron Corun
 - Karissa Mooney



Participants

- 44 Attendees
 - 9 States were represented
 - 8 Modified Asphalt Suppliers
 - The Asphalt Institute and FHWA were also represented

Modified Asphalt Meeting

- Meeting was also available via a simultaneous live web-cast
 - Web-cast part of a Connecticut DOT research project: *Feasibility of Streaming Media for Transportation Research and Implementation*
- 14 people connected to view the web-cast
 - Web-cast viewers were able to send questions via email

Modified Asphalt Meeting

- The web-cast was also recorded
- Can be viewed by anyone at the following address:

<http://www.ct.gov/dot/AMAP>

- Works on both PC and Mac
 - Must have the most recent version of Windows Media Player installed

Coordination of Pavement Activities in the Northeast

A Proposal for
Continuation TPF-5(062)



CONNECTICUT TRANSPORTATION INSTITUTE

Objectives:

- Develop and Implement region-wide asphalt binder database
- Provide data analysis to compare AASHTO MP1A to M320
- Provide Focused Laboratory Visits
- Improve Communication
 - Develop internet communication tool
 - Conduct Asphalt Roundtable Discussions

Proposed Work Plan: Task One

Management of Asphalt Binder Database

- ✓ Develop Internet client-server database
 - ✓ Preliminary investigation underway
- ✓ Makes updates to database transparent
- ✓ Would speed transmission of results between users and producers
- ✓ Would only require Internet browser software
- ✓ Data would be secured using passwords

Proposed Work Plan: Task Two

Direct Tension Data Analysis

- ✓ Evaluation intended to provide guidance for requirement of direct tension testing
- ✓ Data collection for this task is underway - Sept. 2004
- ✓ CT, ME, NH and NY DOTs are participating by requiring testing as part of their QC Plans
- ✓ Currently using a version of the database developed by NECEPT for data collection
- ✓ After analysis data will be sent to FHWA to be incorporated into their database

Proposed Work Plan: Task Three

Focused Laboratory Visits

- ✓ Each participating state's central laboratory will be included in the visit schedule.
- ✓ The focus area will be chosen by the advisory committee.
- ✓ All results will be blinded to ensure that laboratory results remain confidential
- ✓ A pre-survey will be done within all participating states to focus the visit topic.

Proposed Work Plan: Task Four

Asphalt Roundtable Discussions

- ✓ Two sets of roundtable discussions will be conducted. The first for technicians, the second for engineers.
- ✓ Each roundtable will be a full day.
- ✓ Information gathered during the technician roundtables will be included as discussion material for the engineering roundtables.
- ✓ The roundtables will be held at two centralized locations in the region.

Proposed Work Plan: Task Five

Development of an interactive internet-based communication tool

- ✓ Ask the Expert - estimated reply time of 2 business days.
- ✓ Electronic discussion forum – open to all interested parties. Opportunity to pose technical questions/problems to benefit from others experiences.

Proposed Work Plan: Task Six

Administrative and Support Services

- ✓ Organization of advisory committee meetings
- ✓ Financial Accounting
- ✓ Progress Report Preparation
- ✓ Preparation of Final Report
- ✓ Project Evaluation Survey and Analysis

Additional Activities

This project would be an excellent conduit for conducting regional activities for the calibrations required for the new pavement design guide.

Connecticut Advanced Pavement Laboratory

- 10,000 Square foot research and testing facility for Hot-Mix Asphalt.
- Accredited under the AASHTO Accreditation program for Aggregate, Performance Graded Binder and HMA Testing.
- Experienced Research and Technical Staff
- Members of the Board of Directors of NETTCP who serve on many certification committees.

Connecticut Technology Transfer Center

- Has served the educational and technical assistance needs of the Connecticut Transportation Community for 20 years.
- The center is one of a national network of 58 LTAP/TTAP Centers.
- Currently training an average of 3,500 participants annually
- Serving on national committees to address technology transfer issues for the future.



Pooled Funds Project

- States interested in participating are encouraged to contact their Research Advisory Counsel member
- Full Proposal is available on-line at:
- <http://www.pooledfund.org/projectdetails.asp?id=882&status=1>

Thermal Imaging of Bituminous Concrete Pavements during Construction

Project was Sponsored by
the Connecticut Department
of Transportation and the
Federal Highway
Administration

Over 3 Construction Seasons
thermal imaging conducted
on 40 paving projects

In Addition to Thermal Imaging at Projects:

- Collected a limited number of visual images
- Locations of most images recorded using a handheld GPS receiver
- Performed Nuclear Density Tests through selected sections

Thermal Images

- Collected using a ThermaCam 575PM Camera
- Taken in the direction of paving
- Images taken at “screed stops”
 - GPS coordinates taken at this point
 - Difficult to determine where this occurs with Material Transfer Vehicle (MTV)
- Images processed using software
- Data logged into a Database

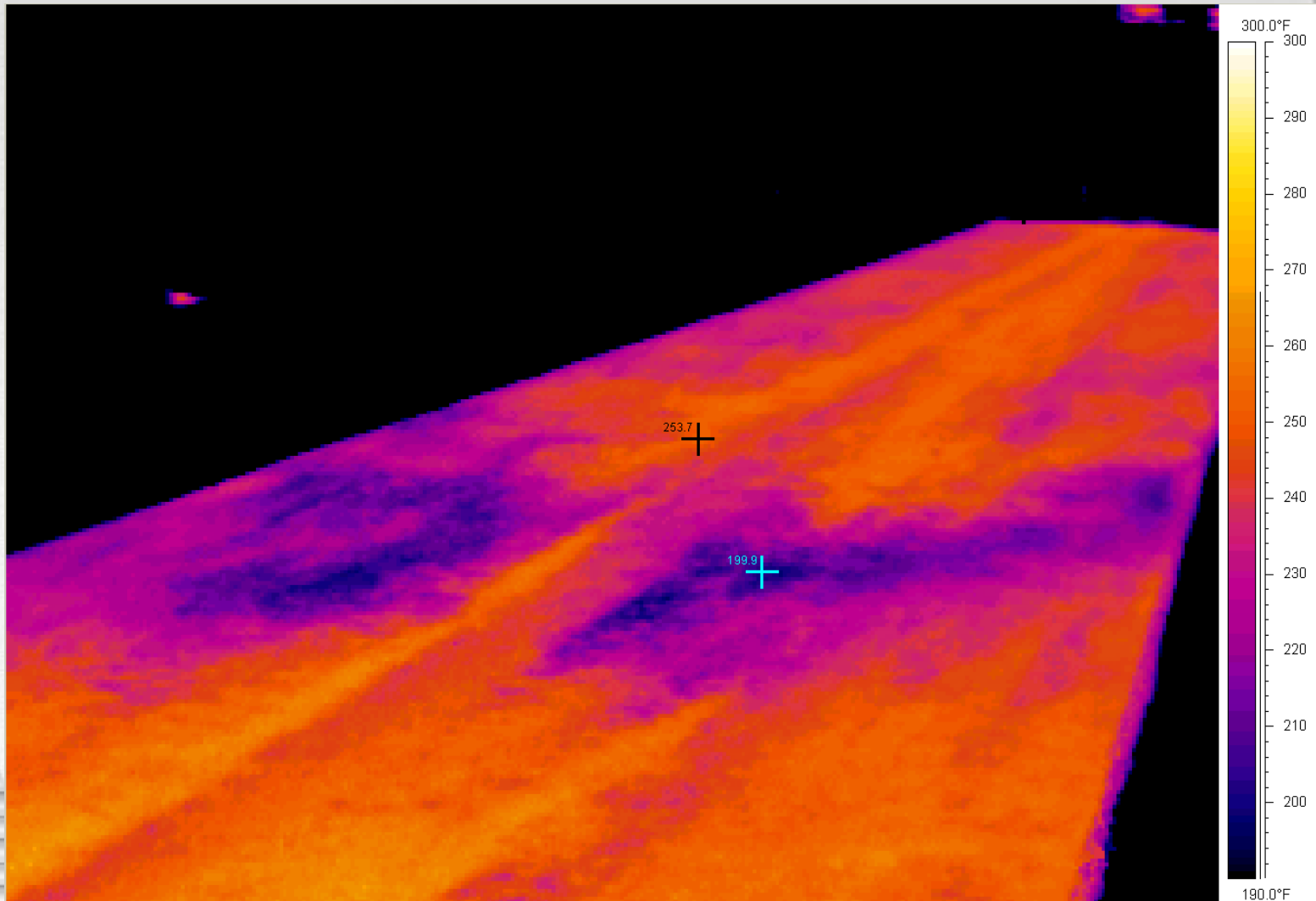
Density Measurements

- Locations marked during placement with a dot of temporary paint prior to compaction
- Measurements taken after compaction
- Series of measurements taken through “cold” spot in the longitudinal direction
- 5 measurements were taken before the “cold” spot and 5 taken after the “cold” spot typically spaced 3 feet apart

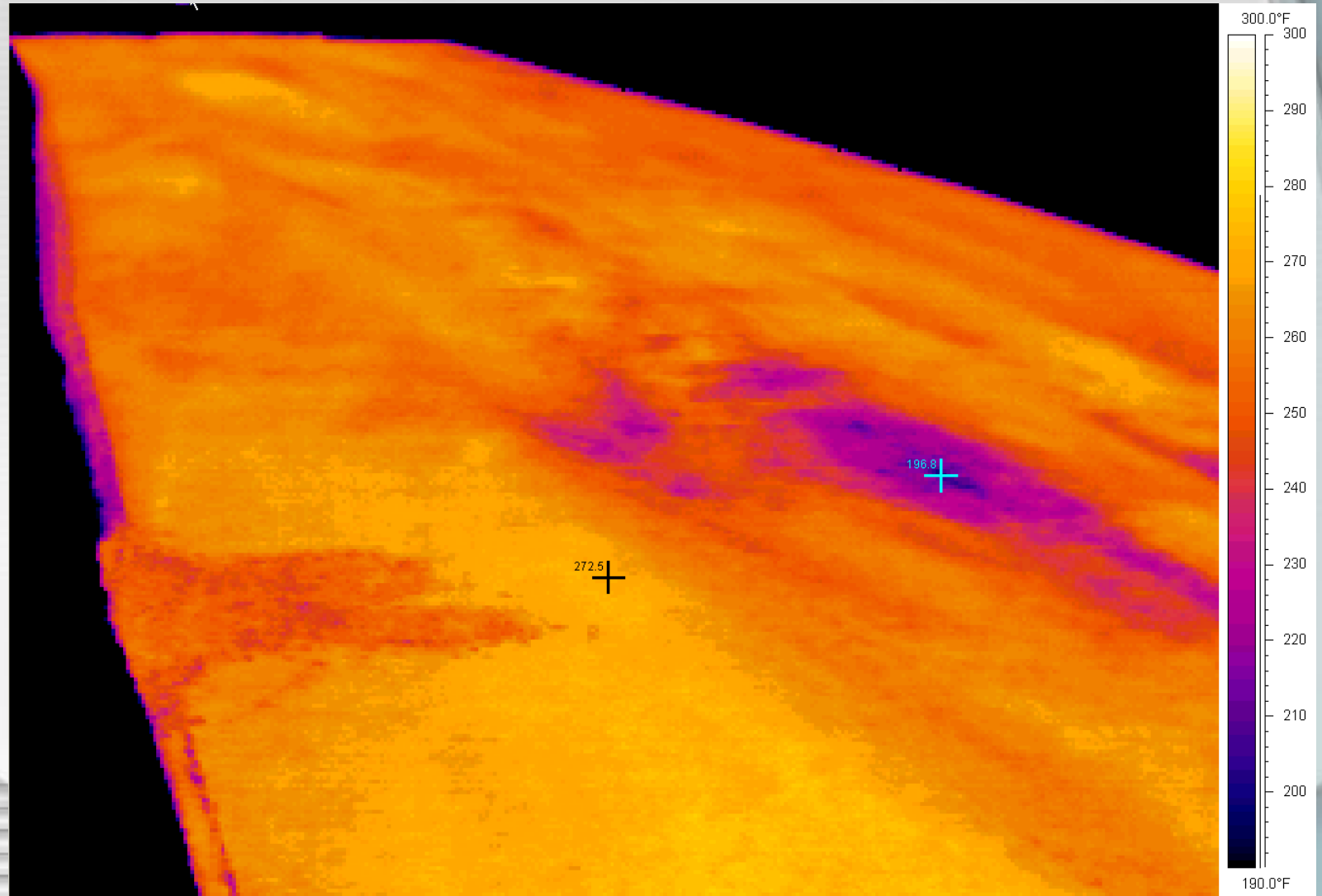
Two Types of Conditions

- End dump transfer of material to paver hopper
- Material Transfer Vehicle

Typical V-Shaped Cold Spot End Dump $\Delta t = 60$ F



Non V-Shaped Cold Spot End Dump $\Delta t=76$ F



Density Plot for Previous Slide

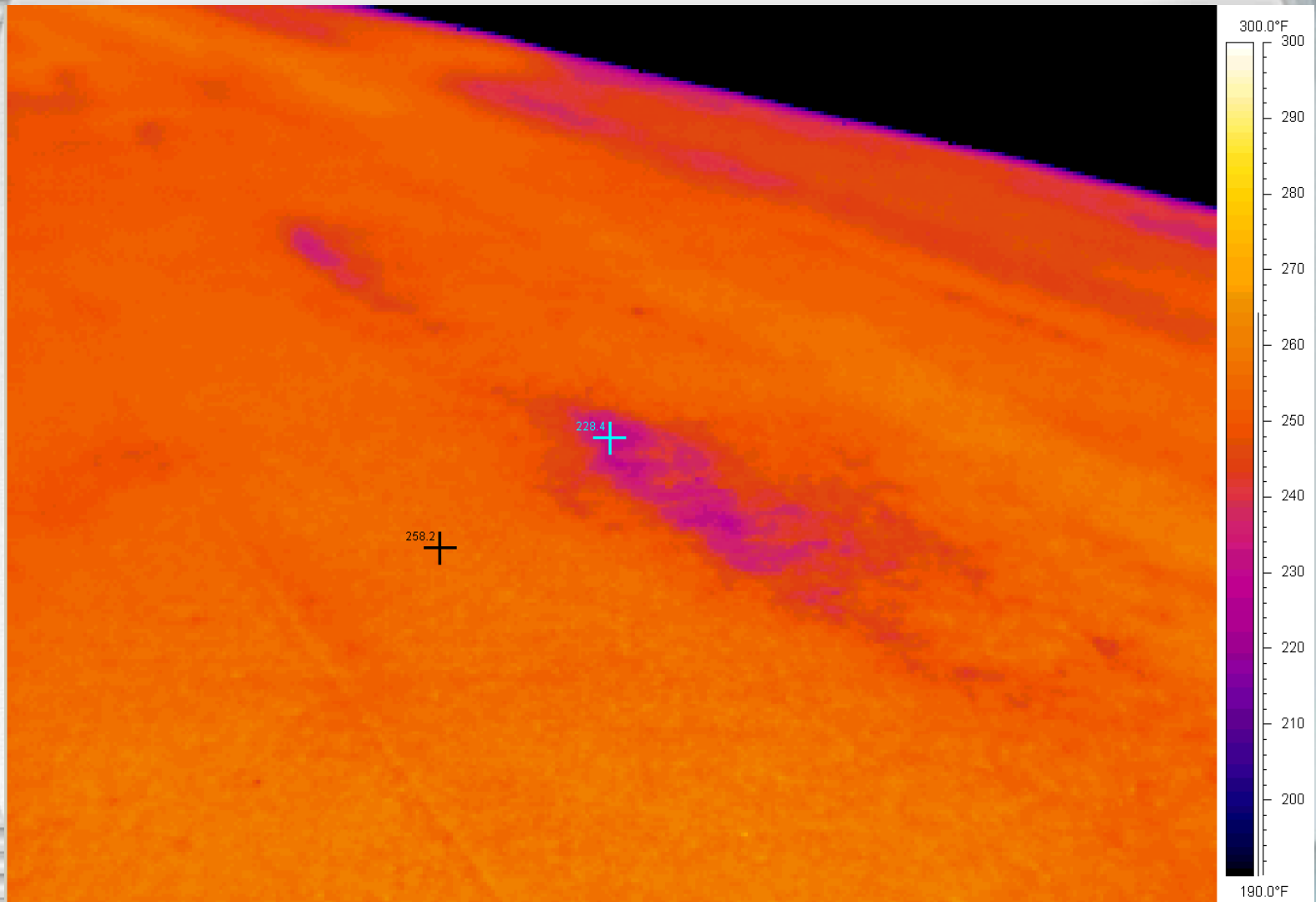
Typical Density Plot Through Cold Spot (Image 296)



End Dump Cold Spots

- Occur with almost every truck change
- Are located approximately 20-30 feet from “screed stop”
- Appear to be caused by cooler material out last from haul unit combined with cool material first out of haul unit along with material from sides of paver hopper

Thermal and Visual Image



Thermal and Visual Image Cont.



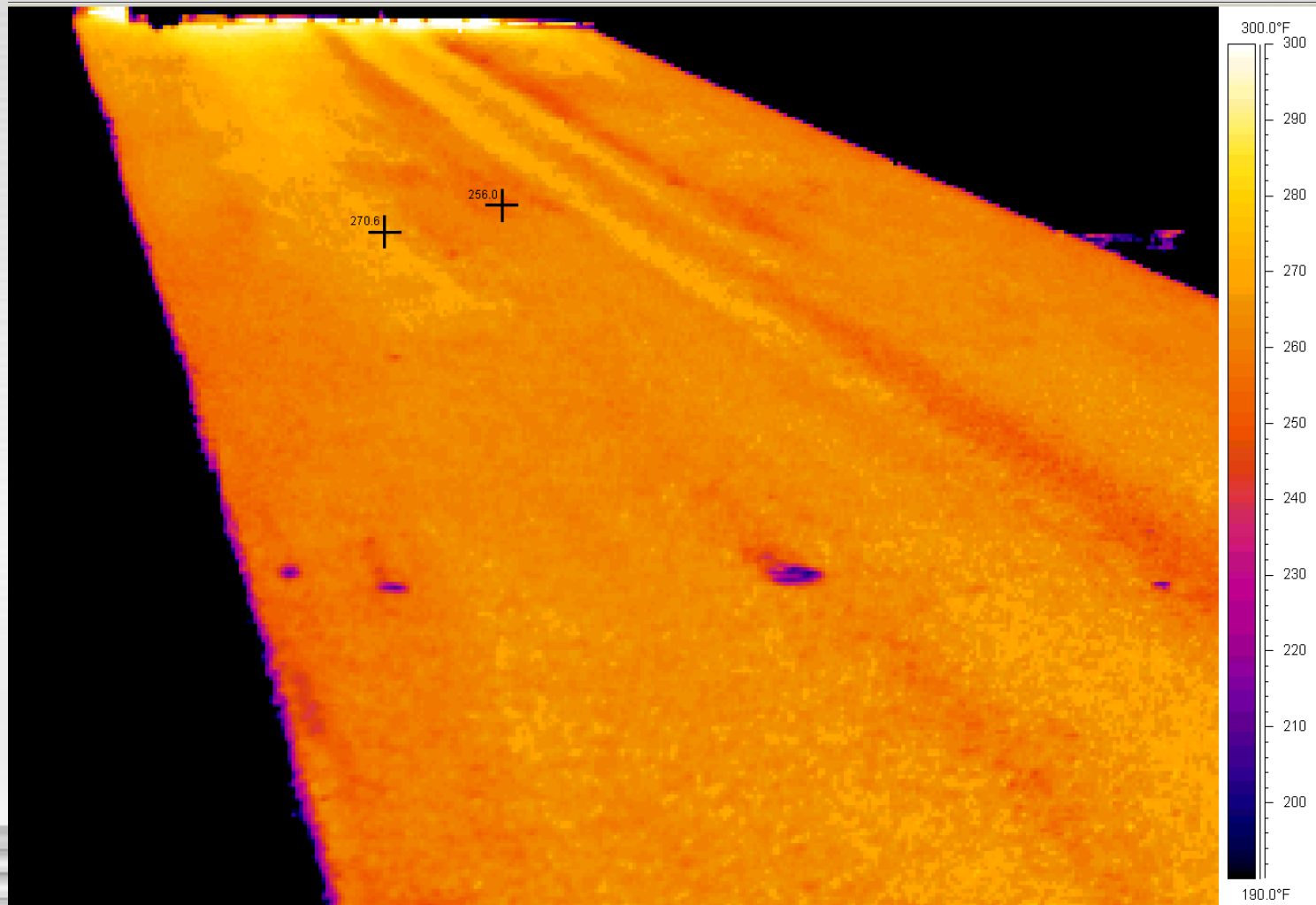
Material Transfer Vehicles

- Remixing MTV
 - Greatly reduces temperature differentials
- Non-remixing MTV
 - Reduces temperature differentials but not as much as Remixing MTV

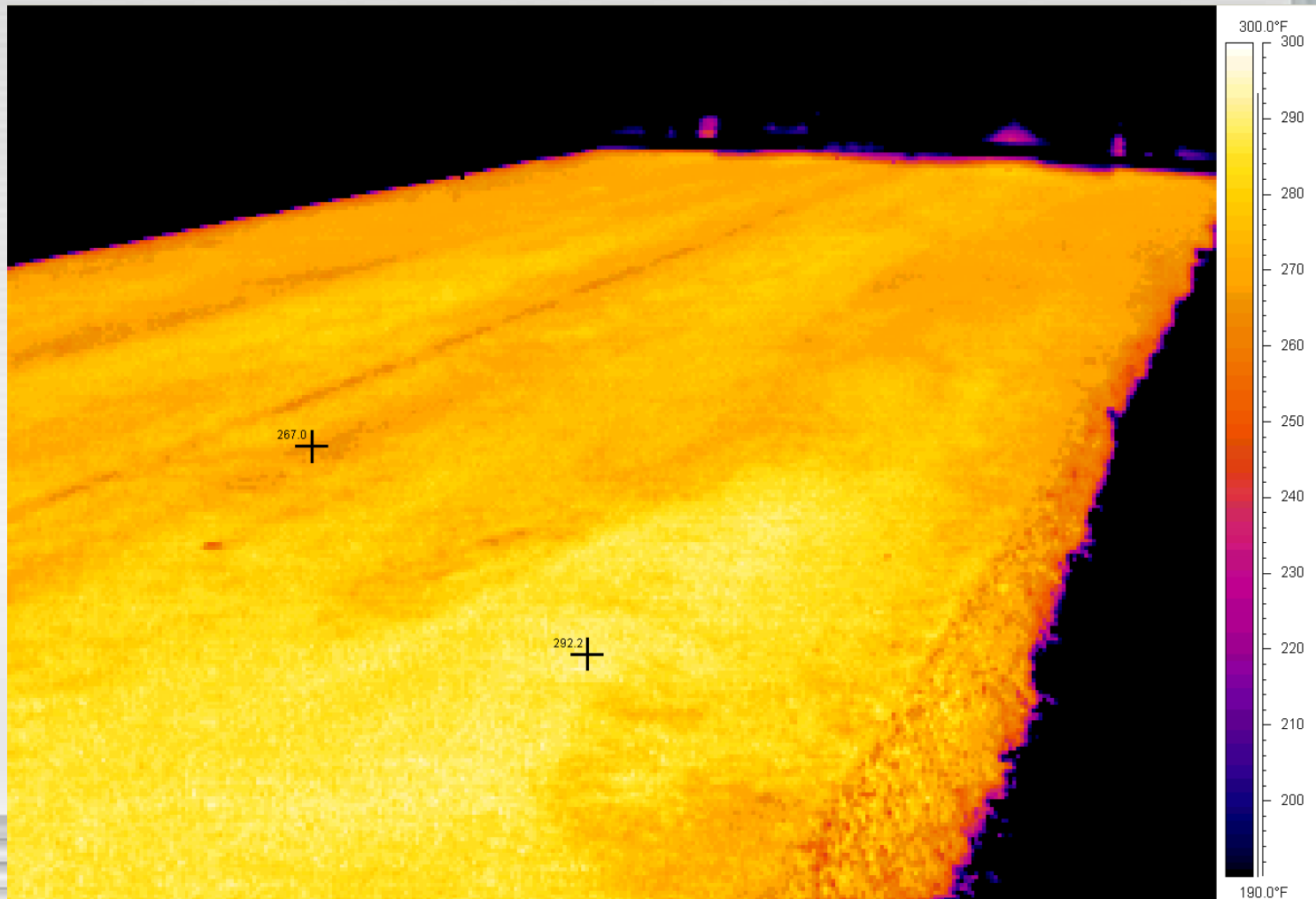
Average Temperature Differential for Transfer Methods

- End dump = 50.2 F
- Non Remixing MTV = 32.1 F
- Remixing MTV = 13.5 F

Typical Mat Using a Remixing MTV $\Delta t = 15$ F

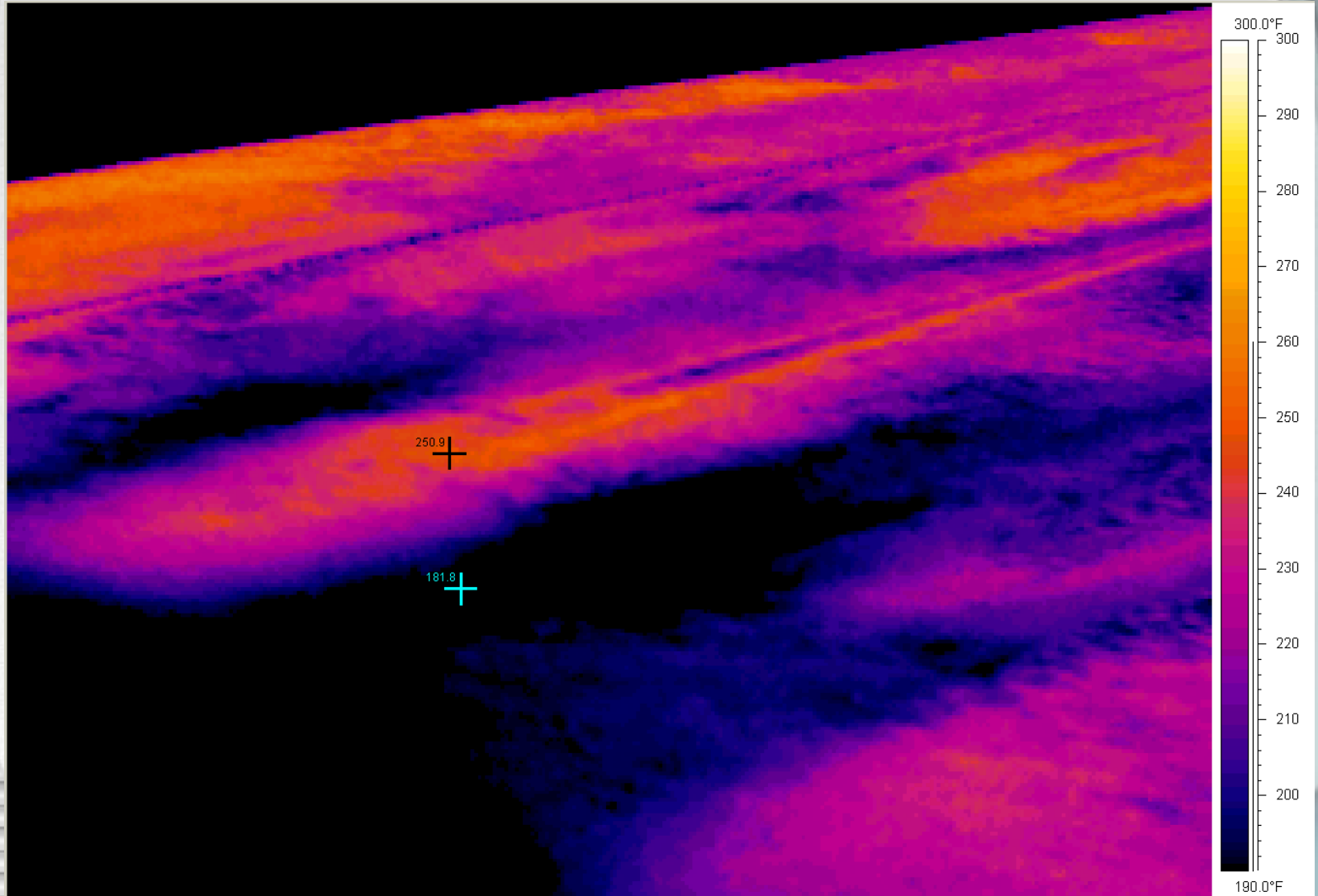


Typical Mat Using a Non Remixing MTV $\Delta t = 25$ F



The next slide was taken
after 45 minute wait for the
next load

End Dump 45 minute wait
 $\Delta t = 80 \text{ F}$

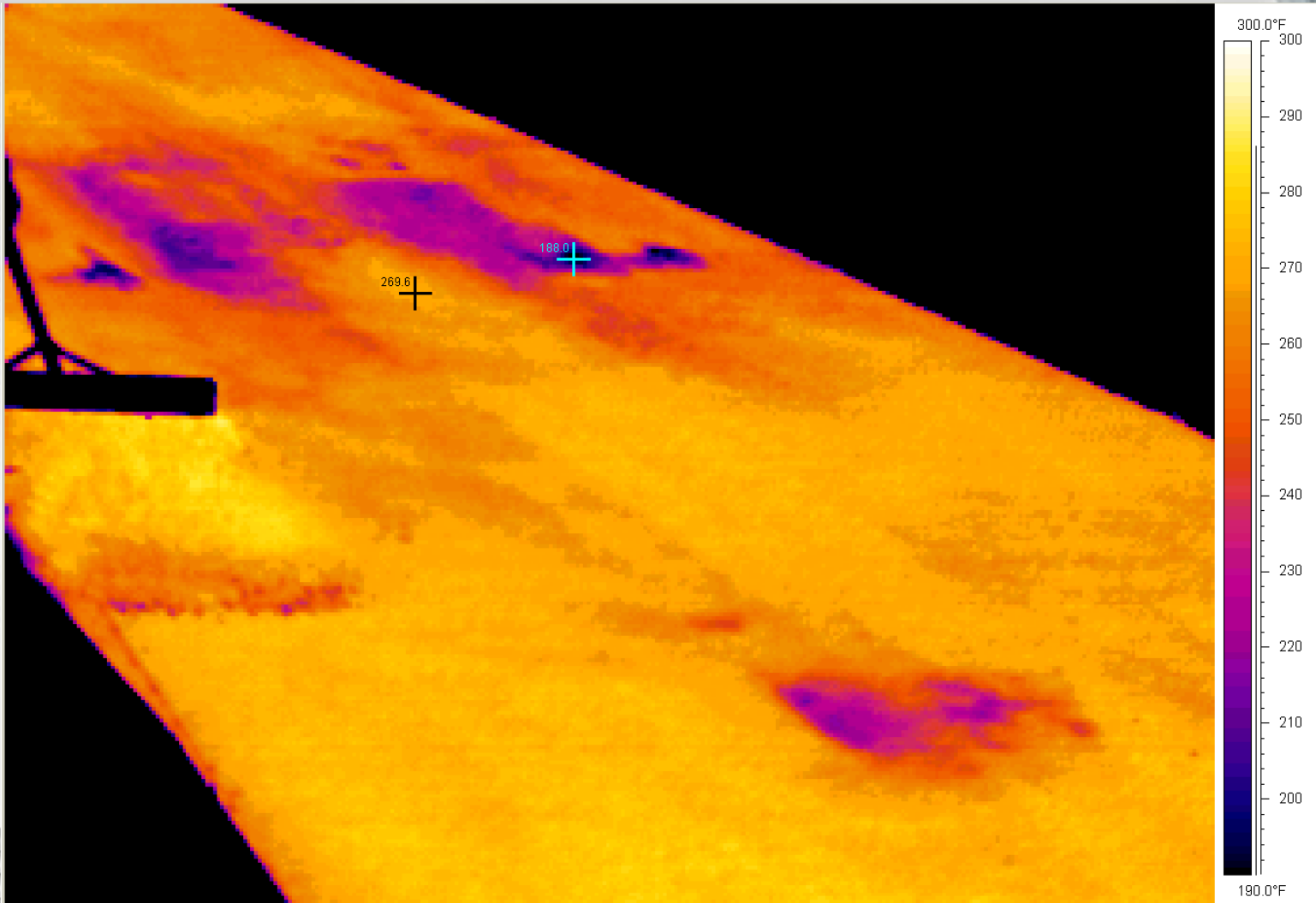


Longitudinal spots are typically the effect of spillage

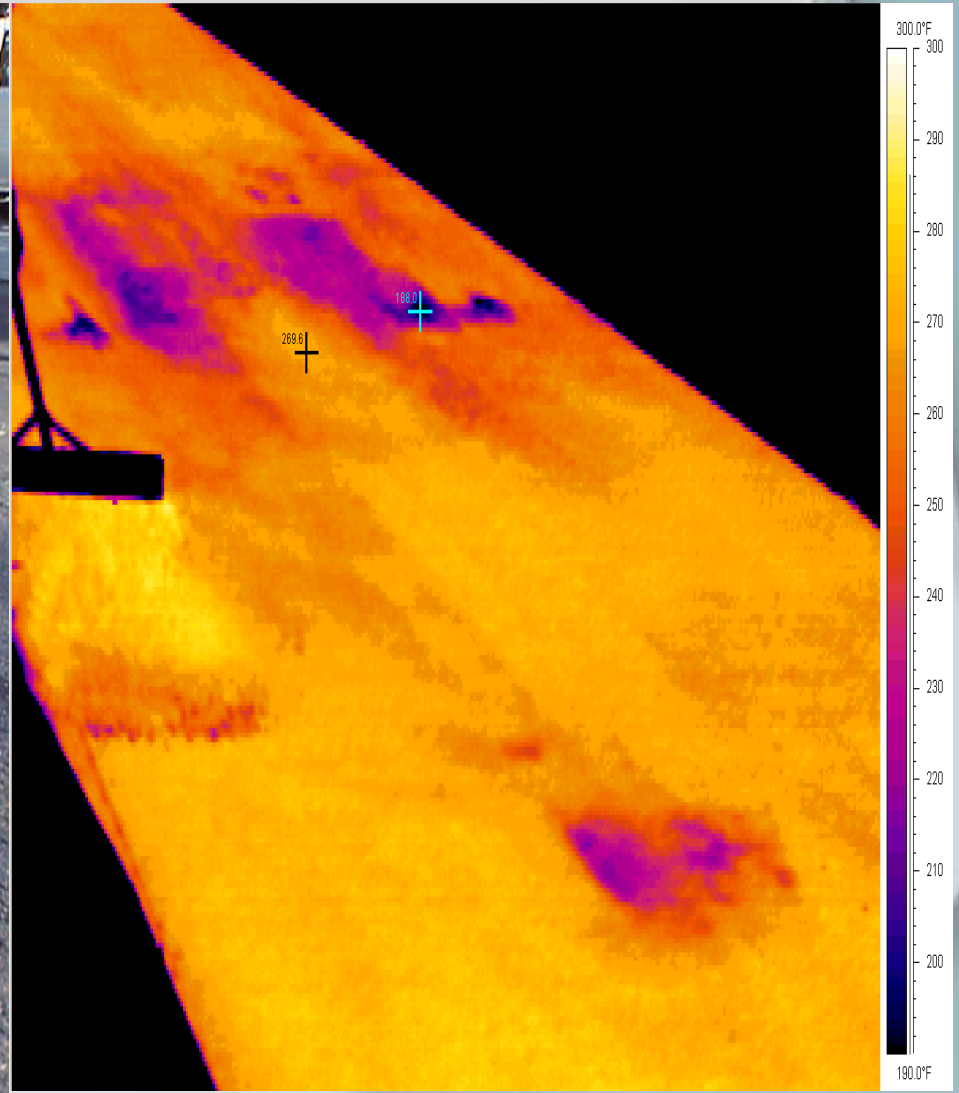
Material spilled and paving crew took 20 minute break



Thermal Image when Paving resumed



Images side by side



Reducing Temperature Differentials

- If available - use MTV
 - One project had MTV but chose not to use
- Maintain material in the paver hopper
 - Running material down in hopper pulls cold material from sides
- Significant spills should be removed if there is a delay before paver passing over them
 - Whenever possible, clean trucks in area not being paved

Where Do We Go From Here?

- Research in progress to document decrease of service life for pavement
 - Currently performing evaluation for pavements 2-3 years old
 - Plan to perform periodic evaluations throughout service life of the pavements
 - Goal is to determine level of temperature differential that shortens pavement life
- Will provide cost to benefit basis for MTVs

Questions?

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