New Technology, Performance Measures Lead to Longer-Lasting Pavements

The Challenge

Ensuring top quality asphalt pavement by applying new technologies, testing, and performance specifications

The SHRP2 Solution

Performance Specifications (R07) → Intelligent Compaction → Technologies to Enhance Quality Control on Asphalt Pavements (R06C):

Infrared (IR) Technology

How can Performance Specifications help?

Using performance-based specifications will motivate contractors to devise better ways to deliver products. By focusing on the outcomes instead of the methods employed, the specifications promote faster construction and improved quality in a wide array of project delivery methods.

How does Intelligent Compaction fit into the picture?

Intelligent Compaction is a series of processes and technologies to enhance asphalt quality. It uses special rollers, an integrated measurement system, onboard computers, Global Positioning System (GPS)-based mapping, and a feedback loop that allows for real-time compaction of pavements and adjustments to ensure high quality and uniform pavement materials.

How does Infared (IR) work to enhance this process?

Using the Infrared (IR) technology developed through Technologies to Enhance Quality Control on Asphalt Pavements (R06C) that focuses on thermal uniformity, inspectors and paving crews can measure real-time mat temperature and make adjustments to the production-construction process as the paver is laying down the asphalt.
Who’s Using These Technologies?

R06C | Alaska DOT
Alaska DOT and Public Facilities is planning to use IR to gain 100 percent test coverage of highway projects so that failure areas are detected and corrected early. Success will be defined as asphalt pavements that function well for 20 years.

R06C | Illinois DOT
IDOT is expanding its use of IR technology in an effort to attract and educate contractors on how to optimize their practices on IDOT’s new performance specifications, thereby maximizing their compensation. The IR equipment will also establish a meaningful way to verify the viability of using certain equipment on paving operations.

R06C | Missouri DOT
MoDOT is investigating the use of nondestructive testing methods to evaluate asphalt for a more uniform product. The technology will be utilized with Superpave projects with the goal of familiarizing the agency and contractors with the technology and encourage routine use.

R06C | Alabama DOT
ALDOT is improving quality in the control process and productivity through the use of Intelligent Compaction and the Every Day Counts initiative. The department is advancing implementation of Intelligent Compaction for either soils and/or asphalt materials.

R06C | North Carolina DOT
NCDOT will use IR technologies to gain valuable information on the temperatures during placement of asphalt mixtures to reduce degradation and raveling of the mat and future maintenance issues. The resulting information will allow for the location and repair of problem areas in the mat prior to placing traffic on the new surface.

R06C | Virginia DOT
VDOT is considering the IR technology as an integral part of a modified acceptance plan for asphalt as well as developing familiarity with more Virginia contractors.

R06C | New Jersey DOT
NJDOT is using IR technology first on smaller projects to produce a better product that achieves a longer service life. Use of the technology is expected to reduce issues associated with the construction aspect of paving projects.

R06C | West Virginia DOT
WVDOT is quantifying how activities upstream from the paver’s screed affect the thermal segregation of the mat. WVDOT will define success as production of pavements that have better performance than what is currently being experienced, along with the adoption of this technology by contractors.

R06C | Pennsylvania DOT
PennDOT is developing performance specifications for all elements of highway construction and tolling. This work will support a more reliable and consistent facility performance system.

R06C | Maryland DOT
MDOT is using IR technology to gain 100 percent test coverage of highway projects so that failure areas are detected and corrected early. Success will be defined as asphalt pavements that function well for 20 years.

R06C | Illinois DOT
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R06C | South Carolina DOT
SCDOT are expanding their use of IR technology in an effort to attract contractors and educate the agency on how to optimize their practices on SCDOT’s new performance specifications, thereby maximizing their compensation. The IR equipment will also establish a meaningful way to verify the viability of using certain equipment on paving operations.

R06C | Temple DOT
Temple DOT is investigating the use of IR technology in an effort to attract contractors and educate the agency on how to optimize their practices on Temple DOT’s new performance specifications, thereby maximizing their compensation. The IR equipment will also establish a meaningful way to verify the viability of using certain equipment on paving operations.

R06C | California DOT
The California Department of Transportation (Caltrans) is investigating the use of IR technology in an effort to attract contractors and educate the agency on how to optimize their practices on Caltrans’s new performance specifications, thereby maximizing their compensation. The IR equipment will also establish a meaningful way to verify the viability of using certain equipment on paving operations.

R06C | Montana DOT
Montana DOT is investigating the use of IR technology in an effort to attract contractors and educate the agency on how to optimize their practices on Montana DOT’s new performance specifications, thereby maximizing their compensation. The IR equipment will also establish a meaningful way to verify the viability of using certain equipment on paving operations.

R06C | Idaho DOT
Idaho DOT is investigating the use of IR technology in an effort to attract contractors and educate the agency on how to optimize their practices on Idaho DOT’s new performance specifications, thereby maximizing their compensation. The IR equipment will also establish a meaningful way to verify the viability of using certain equipment on paving operations.

R06C | Vermont Agency of Transportation
VTrans is developing performance specifications for reclaimed pavements and bases. Full Depth Reclamation specifications are anticipated to be included in an upcoming project for construction in 2016.

R07 | Missouri DOT
MoDOT is developing and refining grading specifications. The department is advancing implementation of Intelligent Compaction for either soils and/or asphalt materials.

R07 | Vermont Agency of Transportation
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R07 | Illinois DOT
IDOT is expanding its use of IR technology in an effort to attract and educate contractors on how to optimize their practices on IDOT’s new performance specifications, thereby maximizing their compensation. The IR equipment will also establish a meaningful way to verify the viability of using certain equipment on paving operations.

R07 | Maine DOT
MaineDOT is adopting performance specifications to meet several key goals. It is developing a performance-based mix design system for asphalt pavements. The department is advancing implementation of Intelligent Compaction for either soils and/or asphalt materials. Additional work with the Maine Department of Transportation includes the advancement of Performance Specifications for asphalt materials mix designs, and GPR evaluations on bridge decks.

R07 | Missouri DOT
MoDOT is developing and refining grading specifications. The department is advancing implementation of Intelligent Compaction for either soils and/or asphalt materials.

Who’s Using These Technologies?

States Using Both Technologies

Field Testing of Performance Specifications (R07)

Field Testing of Technologies to Enhance Quality Control on Asphalt Pavements (R06C) – Infrared Technologies

Why Not You?

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