



National Concrete Consortium (NCC) E-News August 2016

In association with the CP Road Map Program

The **NCC E-News** is the newsletter of the Long-Term Plan for Concrete Pavement Research and Technology ([CP Road Map](#)), a national research plan developed and jointly implemented by the concrete pavement stakeholder community. If you'd like to find out more about the CP Road Map or learn how you can get involved, contact Program Manager Steve Klocke (sklocke@snyder-associates.com, 515-964-2020) or Dale Harrington (dharrington@snyder-associates.com, 515-964-2020).

Moving Advancements into Practice (MAP) Brief

Moving Advancements into Practice (MAP) Briefs describe promising research and technologies that can be used now to enhance concrete paving practices.

The August 2016 MAP Brief, "Real Time Smoothness Measurements for PCC Pavements," explains the current technology available to measure pavement smoothness immediately behind the paving machine. This allows the contractor to make necessary adjustments to the paver or corrections during finishing.

[Download the August 2016 MAP Brief.](#)



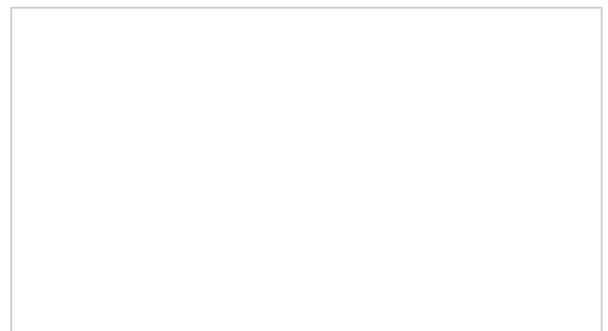
NCC State Survey Summaries



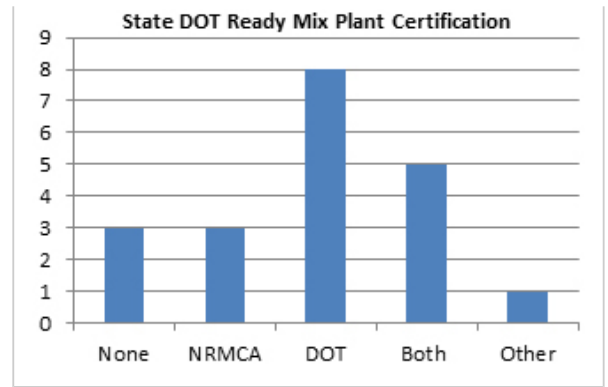
Member states of the National Concrete Consortium (NCC) have the ability to poll other member states regarding specifications, materials, construction, research, or other issues related to concrete paving. This section highlights some of the questions posed and answers received through the NCC's ListServ feature.

Ready Mix Plant Certification

The Nebraska Department of Roads polled the NCC group to inquire if states certify ready mix plants through the National Ready Mixed Concrete Association (NRMCA) or if they have their own certification program. Twenty states responded to the question. Three states indicated that they do not have a ready mix certification program, though they do require scales to be certified/calibrated. Three states require ready mix plants to have NRMCA certification, eight states have



their own independent certification program, and five states utilize a combination of their own program and NRMCA's program. One state does not certify ready mix plants, but does inspect them. The full results of this survey may be found [here](#).



News from the Road

News from the Road highlights research around the country that is helping the concrete pavement community meet the research objectives outlined in the CP Road Map.

City of West Des Moines Seeks Improved Concrete Pavement Performance

Many northern states have experienced premature deterioration of concrete at the joints in concrete pavements. Previous research suggests this deterioration is a result of freeze-thaw damage in the saturated concrete at the joint. Recommendations for limiting this type of deterioration include the use of a low water-to-cement (w/cm) ratio to reduce permeability, use of appropriate supplementary cementitious materials, and ensuring adequate air content behind the paver.

To study the effectiveness of these recommendations, the City of West Des Moines, Iowa, implemented a research project that utilized a modified mix design for five paving projects in the fall of 2015. The mix design called for a maximum w/cm ratio of 0.42, a minimum air content behind the paver of 5%, and 30% to 35% fly ash substitution to mitigate calcium oxychloride formation.

This study also investigated several innovative test methods in an effort to develop more effective specifications, which base acceptance on measurement of critical properties of the mixture. Test methods investigated included VKelly, Box Test, Microwave w/cm ratio, Super Air Meter (SAM), Semi-Adiabatic Calorimetry, and Ultra-Sonic Pulse Velocity.

Test results indicate the modified concrete mix is less permeable and exhibits slower expansion than the standard control mixtures. Overall performance to date has shown the modified mixture is performing as intended, including improved resistance to deicing salts.

Evaluation of the developmental test methods show that they appear to provide some useful information, though not all are ideal for field application.

This research was sponsored by the City of West Des Moines and completed at the National Concrete Pavement Technology Center at Iowa State University by Wang, Taylor, and King. [Click here to access the full document](#).

This research is contributing to objectives identified in [CP Road Map Track 1: Materials and Mixes for Concrete Pavements](#).

Surface Characteristics for New Concrete Pavement

The objective of this study was to evaluate how new concrete surfaces performed over time with respect to



VKelly test apparatus

friction, noise, texture, faulting, and smoothness.

Texture characteristics such as the width, wavelength, orientation, and direction, affect not only friction, but also the pavement's ride quality, durability, and level of noise generated from tire-pavement interactions. Optimizing texture properties is an important priority for transportation agencies for both safety and economic reasons. Greater skid resistance means safer roads, few crashes and reduced loss of life and property. Significant reductions in tire-pavement noise could result in significant savings if sound barriers could be eliminated.

For this study, MnDOT conducted a series of experiments at the MnROAD pavement research facility to evaluate the effects of various concrete pavement surface characteristics on pavement performance. Researchers evaluated various concrete surface textures including transverse tine, longitudinal tine, turf and broom drag, pervious concrete, exposed aggregate surface, and diamond grinding.



The research concluded that most texture types can be optimized to provide good friction with low noise by adjusting their configuration. For example, the research found there is no frictional advantage to use of a quicker draining, but noisier, transverse drag.

This research was sponsored by the Minnesota Department of Transportation and completed by Bernard Izevbekhai. [Click here to access the full document.](#)

This project is contributing to objectives identified in [CP Road Map Track 4: Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements.](#)

Precast Concrete Pavement Bedding Support Systems

The use of precast concrete pavement (PCP) is growing in the U.S. due to the ability to repair concrete pavements with minimal downtime. Numerous panel systems are currently available; these plant-fabricated panels provide excellent concrete strength and durability. In order to take full advantage of the high quality of these precast systems, adequate bedding and support under the panels is essential. With this in mind, the FHWA has issued a Tech Brief describing the latest means and methods for precast concrete pavement bedding support systems.



This technical brief explains that developing uniform support below a PCP system presents challenges. Because the panels are precast, they cannot conform to irregularities in the subbase like a poured-in-place repair would. Because of this, the panels require an "interlayer" of material between the base and the bottom of the panel to fill voids so uniform support is provided. The interlayer material may consist of flowable grout, which the panel is set into or which is pumped under the panel after installation, or high-density foam, which is injected under the panel after placement.

This project was sponsored by the Federal Highway Administration and completed by Shiraz Tayabji and Wouter Brink with Applied Research Associates, Inc. [Click here to access the full document.](#)

This project is contributing to objectives identified in [CP Road Map Track 8: Concrete Pavement Construction, Reconstruction, and Overlays.](#)

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