

### **Ohio Welcomes HIPERPAV II into New Construction Specifications**

In 2005, the Ohio DOT began specifying the use of HIPERPAV in all PCC pavement construction. To brief contractors on these new specifications, three one-day workshops were recently offered at the Ohio DOT office, the Division Office, and at a local highway contractor's office. Angel Correa of the FHWA Resource Center and Concrete Quality Engineer Gary Crawford of the FHWA Office of Pavement Technology led the workshops, showing contractors how to predict the early-age and long-term

behavior of concrete pavements, and how to adjust the materials, mix design, pavement design, and construction operation before construction begins. "It gives the states a real tool to predict the effects of environment on the performance of the pavement. We've seen HIPERPAV help avoid expensive problems such as slab replacements," said Crawford. With the incorporation of HIPERPAV into the specs, contractors will be able to maximize concrete performance and build a better, longer-lasting road.

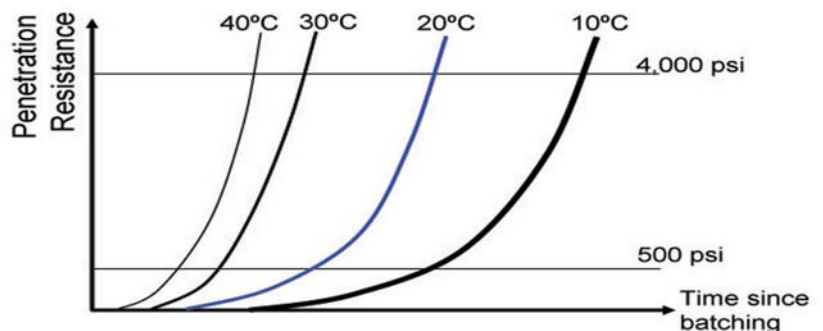
### **HIPERPAV Adapts to the Wisconsin Pavement System for Easier Implementation**

In the past, the state of Wisconsin has used HIPERPAV for some of their pavement construction needs, but recently expressed the need for a more specific system that adapts to local material types and properties. Since HIPERPAV was developed under FHWA sponsorship, only national-level subbase types, concrete mix constituents, and curing methods are included in the software. However, the HIPERPAV Team is working to create software inputs that use the terminology and designations employed by the Wisconsin DOT and the Wisconsin concrete pavement industry. Technical documentation detailing proper use of HIPERPAV and the selection of input values will also be added to make the implementation process smoother. The HIPERPAV Team plans to have the software ready for use during a Paving Training Course in Wisconsin in October 2005.

### **Technical Corner: The Effects of Temperature on Setting Times**

Information on time of setting in the field may be used to estimate windows of time for construction operations such as finishing, curing, and joint sawcutting. HIPERPAV predicts the time of setting of concrete as a function of the predicted degree of hydration and the water-to-cementitious materials ratio for a particular concrete mixture. Since the degree of hydration is predicted at a standard reference temperature, the predicted time of setting is then adjusted for the prevailing concrete temperature conditions in the field using the equivalent age concept. This concept may be used to predict time of setting in the field based on time of setting results in the laboratory under standard conditions of temperature via ASTM C 403.

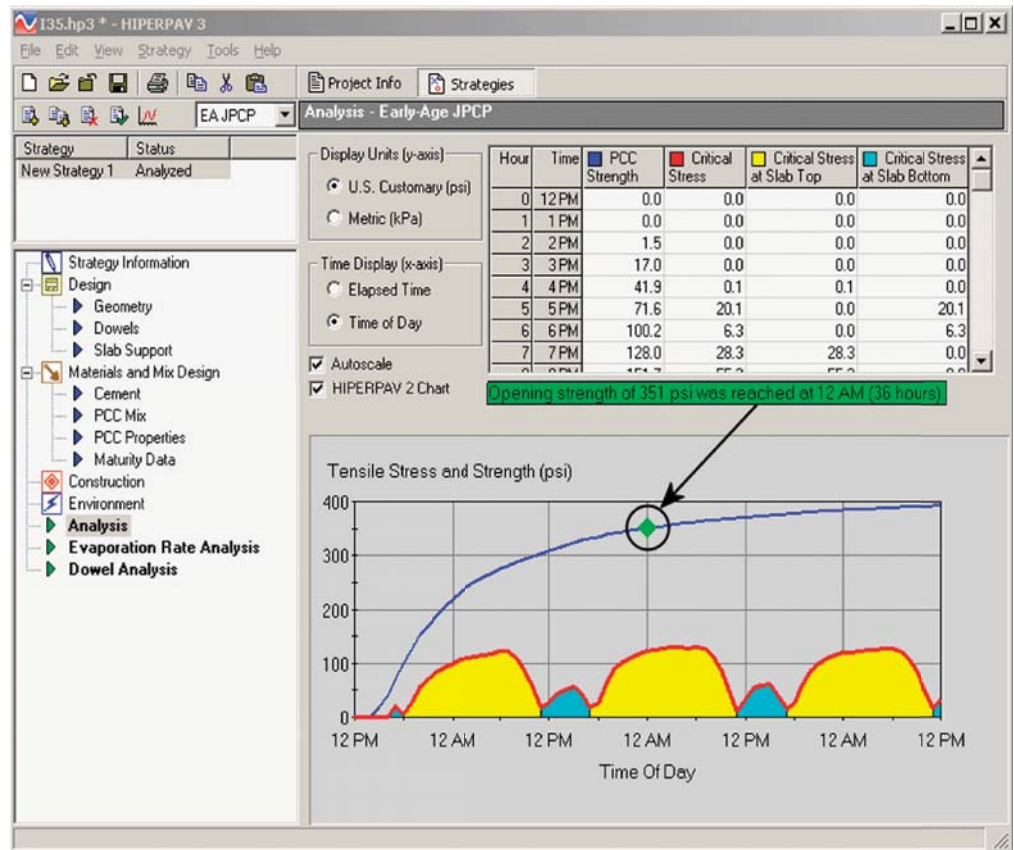
### **Temperature effect on Time of Set**



Pinto, R., Hover, K. "Application of Maturity Approach to Setting Times." *ACI Materials Journal*. V.96, No. 6, pp. 686-691, Nov.-Dec. 1999.

## **Sneak Preview: HIPERPAV II Offers New Tools for Users**

After three years of development, the HIPERPAV Team completed the latest generation of its software line, HIPERPAV II. This new software expands the utility of HIPERPAV by giving the user the ability to predict the effect of early-age factors on the long-term performance of Jointed Concrete Pavements (JCP). HIPERPAV II also includes an early-life Continuously Reinforced Concrete Pavement (CRCP) Module. The FHWA approved the software, which is scheduled to be released this month.



## **HIPERPAV Predicts Setting Time in Cold Temperatures**

The frigid, early November temperatures significantly altered the concrete setting time at the Highway 401 reconstruction project in Canada last fall. With the assistance of The Transtec Group, the Cement Association of Canada used HIPERPAV to predict the time frame for sawcutting the concrete. HIPERPAV was able to predict a setting time of 15 hours by using the mix variables along with a low forecast temperature. The contractor was skeptical

of the estimate, and arranged to have the sawcutting subcontractor test the concrete throughout the night. The tests, however, confirmed the accuracy of HIPERPAV, with the results showing only a 15 minute difference between the predicted time and actual time of setting. Pleased with HIPERPAV's accuracy, Rico Fung of the Cement Association of Canada said, "This verifies the benefits of HIPERPAV in providing valuable construction information, especially in extreme paving conditions."

## **Contact Information**

**Fred Faridazar, PE**  
 Research Engineer  
 FHWA TFHRC  
 6300 Georgetown Pike  
 McLean, Virginia 22101  
 (202) 493-3076 voice  
 (202) 493-3161 fax  
[fred.faridazar@fhwa.dot.gov](mailto:fred.faridazar@fhwa.dot.gov)

**Tom Harman, PE**  
 Team Leader  
 FHWA TFHRC  
 6300 Georgetown Pike  
 McLean, Virginia 22101  
 (202) 493-3072 voice  
 (202) 493-3161 fax  
[tom.harman@fhwa.dot.gov](mailto:tom.harman@fhwa.dot.gov)

**J. Mauricio Ruiz, PE**  
 Project Manager  
 The Transtec Group, Inc.  
 1012 East 38½ Street  
 Austin, Texas 78751  
 (512) 451-6233 voice  
 (512) 451-6234 fax  
[mauricio@thetranstecgroup.com](mailto:mauricio@thetranstecgroup.com)

**Robert Rasmussen, PhD, PE**  
 Vice President  
 The Transtec Group, Inc.  
 1012 East 38½ Street  
 Austin, Texas 78751  
 (512) 451-6233 voice  
 (512) 451-6234 fax  
[robotto@thetranstecgroup.com](mailto:robotto@thetranstecgroup.com)

Email us: [ask@hiperpav.com](mailto:ask@hiperpav.com)  
 Visit: [www.hiperpav.com](http://www.hiperpav.com)

Call us Toll-free:  
 (877) HIPERPAV or (877) 447-3772

Publication Editor/Writer: Jenn Gbur  
[jenngbur@thetranstecgroup.com](mailto:jenngbur@thetranstecgroup.com)