

Together, We are Taking Care of Surface Scaling

KEVIN McMULLEN, P.E. - PRESIDENT

Fifteen years ago when I came to work for the Wisconsin Concrete Pavement Association (WCPA), a wise old counterpart from another state gave me some advice about how to promote concrete. His advice was that "the best promotional tool we have for concrete pavement is providing the best technical advice and support possible", which is what we continue to strive for today. In the spring of 2008 we were coming out of the worst winter in Wisconsin's history and the association was getting reports of scaled concrete surfaces on projects built the previous construction season. Obviously, we were all concerned. As the reports of effected concrete increased, the more concerned we became.

Like the good engineers and scientists that we like to be, WCPA, cities, consultants and the Wisconsin DOT all starting collecting data and assessing the

possible cause. But, when we began analyzing the data from a global perspective, it was very evident that a common cause was not apparent. That is when WCPA made the decision to go back to the basics and make some rational judgments on the possible causes and make some recommendations on how to move forward. The result was a document that we produced titled "Concrete Scaling and Deicing Position Statements". The complete document can be found on the WCPA website at <http://www.wisconcrete.org/pdfs/news/Surface%20Distress%20and%20Deicing%20Salt%20Info%20Sheets%20FINAL%2010August2010.pdf>

A lot of good things have been happening and it is time we start talking about it. The bottom line is that the reports of surface distress issues have literally disappeared.

The first position statement titled "Know the concrete you are buying" has prompted a lot of discussion across the state on what we want to achieve in terms of concrete properties. This has led to improved specifications and increased awareness of quality concrete. Most notably, WCPA worked with several municipalities across the state in the development of a municipal concrete specification guide. Some municipalities began using this specification during 2009 construction and many more began using it in 2010. This can also be found on our website at <http://www.wisconcrete.org/specifications.html>

Finishing (Position Statement #2) and curing (Position Statement #3) are key elements to durable concrete surfaces. The WCPA contractors all took a very hard look at their operations to improve both of these construction processes. In particular, the issue of over finishing and driving out the air in the surface was a priority. WCPA training in 2009 and 2010 concentrated on the fundamentals of finishing, the timeliness and quality of curing and implementing the use of higher quality curing compounds. After decades of the same standard, the preferred curing compounds have been modified to linseed oil based cures and poly alpha

methyl styrene based cures for exterior concrete. These compounds are significant improvements in maintaining moisture in the concrete for surface durability.

Through efforts of the academic community and the Wisconsin DOT we reaffirmed the valuable role that the supplementary cementitious materials of fly ash and slag cement play in the durability of concrete surfaces. The explanation is long and the chemical reactions take us back to our advanced college chemistry days, but the bottom line is that we need these materials in order to prevent the new and more aggressive deicing methods and materials from reacting with concrete.

Research conducted by Michigan Tech University identified that the more aggressive calcium chloride and magnesium chloride salts do indeed react with concrete. They also reported that if a deicing practice is needed the traditional sodium chloride salts are exactly what we want to be using. In addition, their report reinforced the importance of removing snow and ice completely on all surfaces during the winter months. Concrete that is allowed to dry during the winter months can withstand the impacts of freeze thaw cycles without issues.

We must stay vigilant on the issue of deicing salts. We understand the issue of public safety and winter driving is a priority for the public. We can work very effectively together on state, county and city roads to eliminate the impacts of these deicing salts. However, we must continue an education process with the general public that are buying these aggressive salts by the bag at the gas stations, hardware stores and big box stores across Wisconsin for use on their private concrete areas. These products can damage new and old concrete. We need to focus them on the sodium chloride crystals that are commonly used in their water softeners.

Improved specifications, higher quality construction practices and better winter maintenance practices are making a difference. Together, along with the public, we are making a difference.

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Reconstruction With a Green Twist

TOM RACH, P.E. - MUNICIPAL ENGINEER

Municipalities, counties and other agencies are increasingly looking to reconstruct roads that are more durable, less costly and environmentally friendly. They are looking for alternatives that save our natural resources and are more acceptable to the public. The City of South Milwaukee Department of Public Works, Collins Engineers and the Wisconsin Concrete Pavement Association came up with an improvement for 15th Avenue that addresses these concerns.

The proposed improvement provided for the rehabilitation of the pavement on 15th Avenue from Rawson Avenue to College Avenue in South Milwaukee, Wisconsin. The posted speed limit on the one mile segment of this minor arterial urban street is 25 mph. This is a residential area with a middle school/high school campus located on the project. A recently reconstructed bridge crossing over the Oak Creek is located south of West College Avenue.



The existing typical section has a 40 foot face to face concrete pavement, including two driving lanes, and parking lanes with curb and gutter. Constructed in 1978, the pavement was in poor condition with the concrete in the driving lanes showing deterioration. The main pavement distresses requiring attention include: full depth transverse cracking, corner breaks with material loss, and locations of sunken and/or distressed curb and gutter. There were also faulted joints at various locations in the driving lane resulting in a poor ride while driving the posted speed limit.

The existing 32 year old street was an un-doweled, non-reinforced, jointed plain concrete pavement. For the most part, the street consisted of its original construction sections built in 1978. However, there was about 300 feet of south bound concrete drive lane adjacent to the school that had been replaced and the bridge approaches crossing Oak Creek were in good condition. The average daily traffic is about 5,000 vehicles per day with 4% trucks. Small increases in these numbers are expected over the design life of this new project.

Several alternatives for improvement of 15th Avenue were considered and analyzed. They included total concrete pavement replacement, rubblize and overlay, and diamond grinding with a dowel bar retrofit. The option that was selected was a modification of the total concrete pavement replacement option.

The final design included replacing the driving lanes with 8-inch jointed plain concrete pavement with dowels and spot repair of the curbs and parking lanes as needed. The contract called for sawing the parking lanes 12 inches from the existing longitudinal joint which eliminated many of the corner breaks that existed between the driving lanes and the parking lanes.

This option provided for a very good riding pavement in the driving lanes by eliminating the joint faulting in the original pavement.

In addition, this option saved the removal and replacement of about 7,000 sq yards of concrete in the parking lanes and approximately 8000 lineal feet of curb and gutter. It resulted in a reduced project cost. This alternative had a shorter construction time and less public inconvenience. Another major benefit of incorporating the existing parking lane and curb and gutter into the new project was that it minimized the property access issues and there was no landscaping restoration to deal with.

The newly constructed pavement is expected to last at least as long as the original pavement and perhaps longer because of the minimal disturbance of the original subgrade and base material. Using this alternative meant that fewer raw materials were used to build the pavement and fewer pollutants went into the air, soil and water. Longer lasting pavements also save energy because they do not have to be replaced as often.

This alternative pavement reconstruction saved the best parts of the existing roadway structure while replacing the driving lanes that were in poor condition. This reconstruction project in the City of South Milwaukee also saved raw materials, time, and energy making it a pavement repair with a green twist.

Thanks to Collins Engineering and South Milwaukee DPW for their support in developing this project and reviewing this article.

PRESIDENT'S COLUMN: Staying Committed to Concrete Pavement Research

KEVIN McMULLEN, P.E. - PRESIDENT

Steven Cramer, Civil and Environmental Engineering Professor and Associate Dean for Academic Affairs for the College of Engineering at the University of Wisconsin, has more than 20 years of experience in research of concrete materials. He has completed more than 15 projects with the Wisconsin Department of Transportation and the Wisconsin Concrete Pavement Association (WCPA). He recently started on his largest research effort to date. The project is titled "Laboratory Study of Concrete Properties to Support Implementation of the New AASHTO Mechanistic-Empirical Pavement Design Guide". The Wisconsin Department of Transportation is in the process of implementing the new national pavement design procedure. Professor Cramer's efforts will define the properties of concrete produced in Wisconsin. The project includes the production of 125 different concrete mixtures utilizing 15 predominant coarse aggregates used in Wisconsin, 2 predominant sand types, 3 Portland cements, 3 fly ash sources and 3 slag cement sources. Nine concrete properties will be measured in order to make recommendations for implementation.

One of the new properties being measured as part of this project is the coefficient of thermal expansion (CTE). This is new in the design process and CTE is very sensitive to the final thickness design, joint spacing and life prediction of the pavement design procedure. At the time that Professor Cramer was awarded this project, CTE had never been measured in Wisconsin and a commercially manufactured CTE testing device was not available. In order to assure the most accurate measurement possible for this very important design parameter, the WCPA made the commitment to Professor Cramer to donate the \$25,000 needed to purchase the equipment. It has been purchased and is now an integral part of the research effort. WCPA is proud to be a committed partner in this important research effort and assuring



The UW Research Team of Master's Students Jake Effinger and Ruipeng Li, Professor Steve Cramer and Material Science PhD Student Jessica Silva gather around the new CTE testing device in the UW concrete lab.

that the University of Wisconsin has a concrete laboratory that can compete with any university in the United States.

One more thing. How committed is Professor Cramer to concrete research? He recently completed a concrete research project that was started at the University of Wisconsin in 1910. Steve believes this is the only concrete in the world that has a 100 year strength curve. So, yes, WCPA believes Steve Cramer is committed to concrete research. But, there is nothing I can write that will do this project justice. We encourage you to go to the following YouTube link and see for yourself: http://www.youtube.com/engineeringuw#p/c/4F9191D61951F957/4/tCWF7_-FORw

This is GREAT stuff.



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Rough Roads Cost Motorists in Added Repair and Maintenance

Almost a quarter of the nation's roads in major metropolitan areas are in poor condition, costing the average driver \$402 each year in extra vehicle maintenance and repair costs, according to a new report released on September 22, 2010 by the nonprofit transportation research organization, TRIP.

While the percentage of roads in poor condition decreased slightly from 2007 to 2008, the TRIP report, [*Hold the Wheel Steady: America's Roughest Rides and Strategies to Make our Roads Smoother*](#), points out a number of issues that will likely make maintaining pavement conditions difficult. These issues include: continuing fiscal crisis at the state level, the lack of a long-term federal surface program reauthorization, significant projected increases in travel, and insufficient current state and federal funding.

The TRIP report recommends transportation agencies reduce pavement life cycle costs by adopting a pavement preservation approach that emphasizes making early initial repairs to pavement surfaces while they are still in good condition and the use of higher-quality paving materials, which reduces the cost of keeping roads smooth by delaying the need for costly reconstruction.

The only two Wisconsin cities – Madison and Milwaukee – included in the report were rated as having pavement conditions slightly better than the national average. However, rough roads are still estimated to cost the average motorist each year \$385 in Milwaukee and \$364 in Madison. Two California cities led the nation with San Jose at \$756 and Los Angeles at \$746. Atlanta, GA was the lowest with \$75.

Concrete Pavement Preservation and Partial Depth Repair

Demonstration a Success

HEATH SCHOPF, P.E. - DIR. OF CONSTRUCTION ENGINEERING

The WCPA sponsored a demonstration event along USH 153 in Mosinee on Tuesday, October 12th, 2010. The demonstration took place on a WisDOT roadway repair project along STH 153 consisting primarily of concrete pavement partial depth and full depth repair. The contractor performing the work is CPR, Inc., a member of the Wisconsin Concrete Pavement Association.

The demonstration started out with a short presentation on concrete pavement preservation techniques by Kevin McMullen followed by a question and answer session and lunch. After lunch, participants toured the project and were able to see the contractor perform the partial depth repair process from start to finish. Special thanks to Tom Bonness Jr., owner of CPR Inc., for volunteering the project and participating in the demonstration.

The following pictures are from the demonstration depicting the repair process from start to finish:



Sandblasting the repair



Vermeer used to grind the deteriorated concrete from the repair.



Adding slurry to repair area to promote bond



Picture of a ground out repair section: Tom Bonness Jr. of CPR, Inc. explains to the group the finer points of removals for partial depth repairs by the Vermeer wheel.



Volumetric mixer used to place concrete in repair

Continued on next page...

Update: WCPA Concrete Pavement Specification Guide

for use by Wisconsin Municipalities and Counties

HEATH SCHOPF, P.E. - DIR. OF CONSTRUCTION ENGINEERING

The WCPA *Concrete Pavement Specification Guide* has been adopted by several communities and implemented on concrete pavement projects throughout Wisconsin since its release last fall. The *WCPA Concrete Pavement Specification Guide* is primarily intended for guidance in the development of concrete pavement project specifications for local roads, streets and county highways. The goal of this guide is to assist contracting agencies with the development of concrete pavement specification that incorporates current industry standards and best practices in the construction of a concrete pavement and to provide a baseline for consistency between contracting agencies in Wisconsin.

WCPA is continuously encouraging contracting agencies to adopt the WCPA Portland Cement Concrete Pavement Specification provided within the guide and modify it for local conditions,

preferences and construction practices via contract special provisions. It is preferred that any changes or modifications to the specification be performed with a special provision within the contract. This will allow contracting agencies and contractors a baseline for uniformity with changes to the specification being addressed via a contract special provision.

As the current construction season begins to start slowing down we are currently working on revisions to the existing specification guide for the upcoming construction season and are asking for your comments or suggestions regarding possible improvements. Over the course of the year we have received a few comments regarding possible revisions and are asking contracting agencies and industry partners to take the time to inform us on any issues you may have encountered with the current specification. If you adopted the

specification and modified it via special provision we are also interested in obtaining a copy of the special provision to see if it is something we could incorporate into the specification or provide as a standard special provision for those who are interested in a similar modification for local conditions and preferences. Please send all correspondence regarding the specification to the attention of Heath Schopf. It is our intent to review this guide on an annual basis and incorporate any revisions deemed necessary in order to meet the evolving needs of our contractor members, industry partners and contracting agencies.

Look for the revised specification guide to be released on our website by December in order for contracting agencies to incorporate any changes for the 2011 construction season.



Vibrating Repair



Brooming slurry around edge of repair



Finishing Repair



Curing of completed repair

GUEST EDITORIAL

CRAIG THOMPSON - TDA EXECUTIVE DIRECTOR

What Did We Learn From the Racine Vote?

As many of you are aware, Racine County placed the advisory referendum regarding constitutionally protecting transportation user fees on its September ballot. The other 53 counties that acted to place the advisory referendum question on the ballot opted for the November general election ballot.

The vote in Racine was overwhelmingly positive. Seventy-four percent of the voters said “yes” to support amending the constitution to protect the transportation fund. So what does this mean for the other 53 counties that will be placing the question on the November 2nd ballot?

I would say, we really don’t know. The demographics of voters in a primary are different from those of a general election.

What we do know – from polling and from simply listening to frustrated citizens across the state – is that people have lost confidence that their gas tax and vehicle registration fees are going to be used to improve Wisconsin’s transportation system. But this does not necessarily translate into people voting in favor of a constitutional amendment. Voters in Wisconsin tend to be wary of amending the constitution and really need to be convinced that they have all the facts and that there won’t be any unintended consequences. Garnering a statewide vote at or near the numbers we saw in Racine would be an extremely tall order.

For these reasons, we are not taking anything for granted, and we ask that you do not, either. The members of the Finding Forward coalition continue to be extremely active in communicating with their respective memberships and reaching out to opinion leaders.

We will be working with our Finding Forward partners over the next three weeks to continue to educate the voting public on the importance of this issue in every way we can. I ask that any of you who are in one of the 53 counties that will have this question on the November ballot get actively involved. Go to www.FindingForwardWisconsin.org and share the information on that site with employees, co-workers, friends and neighbors. Encourage them to vote “yes” on November 2nd.

The response we have been hearing from candidates seeking office in the state capital has been very encouraging. With a strong mandate from the public in November, I am confident that the members of Finding Forward can work with the newly seated legislature to quickly pass the first consideration of a joint resolution to amend our state constitution and protect the transportation fund.

Thank you for all the work so many of you have put in thus far as well as for the efforts I know you will continue to make right up to November 2nd.



MARK YOUR CALENDAR

UP COMING EVENTS

DATE	EVENT	LOCATION
11/9	WisDOT Bid Letting	
11/10-11/12	APWA Wisconsin Fall Meeting	Lake Geneva, WI
11/17	Great Lakes Regional Work Plan Meeting	Columbus, OH
11/26	WCPA Office Closed	
11/29-12/3	ACPA 47th Annual Meeting	Bonita Springs, FL
12/4	WisDOT Bid Letting	
12/24	WCPA Office Closed	
12/31	WCPA Office Closed	
1/10/2011 - 1/12/2011	WCHA Winter Road School Conference	Wisconsin Dells, WI
1/11	WisDOT Bid Letting	
1/19-1/20	WTBAMWisDOT Contractor-Engineer Conference	Middleton, WI
1/23-1/27	Transportation Research Board Meetings	Washington D.C.
2/8	WisDOT Bid Letting	
2/9-2/10	WCPA Annual Concrete Pavement Workshop	Appleton, WI
2/17-2/18	WRMCA Technical Workshop	Wisconsin Dells, WI
3/8	WisDOT Bid Letting	
3/30-3/31	TDA Fly-In	Washington D.C
4/12	WisDOT Bid Letting	
5/2-5/4	Wisconsin Aviation Conference	Green Bay, WI
5/4-5/6	APWA Spring Conference	Racine, WI
5/10	WisDOT Bid Letting	
5/16-5/18	ACPA Chapter/State Mid-Year Meeting	Pittsburgh, PA
6/6-6/8	WCHA 100th Anniversary Celebration	Wisconsin Dells, WI
6/14	WisDOT Bid Letting	

2010 WCPA GOLF OUTING WINNERS

WINDWOOD GOLF COURSE

WINNERS

August 4, 2010

First Place: (61)

Dave Kepler
Nicholas Rivecca
Hogan Hughey
Kevin McMullen

Second Place: (63)

Mark Brinkman
Bill Francis
Christopher Schenk
Paul Schubert

Putting Contest: Roger Volden

50/50 Raffle: Mike Zignego

Closest to Pin on Drive:

Chris Schenk

Closest to Pin Tee Shot: Rich Lohr

Closest to Pin in 2: Chris Schenk

Closest to Pin in 3: Kurt Ewoldt

Long Drive in Fairway:

Vance Powers

Long Drive in Fairway:

Nicholas Rivecca

Long Putt: Doug Wittler

Long Putt: Roger Volden

WINDWOOD FIRST PLACE WINNERS:

*Dave Kepler, Nicholas Rivecca,
Hogan Hughey, Kevin McMullen*



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WINDWOOD SECOND PLACE WINNERS:

*Mark Brinkman, Bill Francis,
Christopher Schenk, Paul Schubert*



SHERWOOD GOLF COURSE

WINNERS

August 26, 2010

Yellow Ball Winning Team (42):

Ken Murphy
John Schuelke
Travis Lehrer
Joe McClone

50/50 Raffle: Jeff Elrick

Longest Putt: Len Heimerman

Closest to Pin on Drive:

Mike Malcolm

Longest Drive in Fairway:

Bob Depies

Closest to Pin in 2 Shots:

Jeremy Wusterbarth

Low Score (40): Joe McClone

High Score (63): Guy Peterson

Fewest Putts (12) : Len Heimerman

Most Putts (25): Rick Kinney

SHERWOOD YELLOW BALL WINNERS:

*Ken Murphy, John Schuelke,
Travis Lehrer, Joe McClone*





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Save the Date!

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Concrete Pavement
Workshop

February 9-10, 2011

Appleton, WI



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