



THE CONCRETE conveyor

Taxpayer Alert!

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Smooth and Quiet Concrete

#2 in The Series by Brad Skow, P.E.

In the last issue of the CONCRETE Conveyor, I started the article by asking the question, "Why choose concrete?" Besides the economic reasons (covered in the May 2006 issue), I'd like to explore some of the other "concrete" reasons to choose concrete over any other pavement material.



Engineers, transportation officials and government agencies face many choices when planning a roadway. Choosing a pavement type is perhaps the most critical decision they'll make. So, in this issue we'll focus on smoothness and quietness. Fortunately, concrete pavements help make their choice easier.

Smooth Concrete

Years ago pavements were constructed without specific requirements for surface smoothness. Today state and local transportation agencies specify smoothness with ride specifications and incentives. Many agencies have placed smoothness at the top of their ride quality goals list.

Concrete's smooth surface also translates into financial benefits. Research has shown that because of concrete's rigid structural properties and smoother pavement, it makes it easier for wheels to roll across the surface. This allows cars and larger transport vehicles a better ride and

increased fuel efficiency. Research has also shown that, on average, trucks improve fuel consumption by as much as 10-20% when traveling on concrete pavements. And a smoother ride also means fewer accidents, less congestion and a more comfortable and secure environment for those on the road.

Smooth pavements are quieter pavements. The rigid nature of concrete keeps the pavement surfaces smooth long after construction; and while other materials are deteriorating, concrete is getting smoother. With an average life span of more than 30 years, concrete pavements easily outlast and outperform the competition.

Recent surveys show that the public thinks smoothness is one of the most important qualities of a good road surface. Concrete pavements can provide the longest lasting smooth surface solution. As concrete ages, the original ride can be restored by concrete pavement rehabilitation such as diamond grinding and concrete overlays.

Both existing and new concrete pavements can be diamond ground. Diamond grinding can create a surface texture that can meet and exceed the original ride specification for the roadway, or upgrade the ride specification to today's standards. It will also add another 20

Smooth and Quiet Concrete

(Continued from page 1)

years or more to the life of your pavement. But not only does diamond grinding create smoother roadways, it also makes travel quieter, both inside the car and in nearby communities.

Deteriorated pavements are easily rehabilitated with concrete overlays, which can make old roads new again in as little as 24 hours. Overlays like whitetopping provide the same durability and strength as new concrete pavement and offer an equally smooth and quiet ride.

So remember:

- Concrete's durability guarantees a smooth, long lasting pavement that outlasts the competition.
- Specify smoothness; contractors have the tools available to ensure they can meet the specifications.
- A smooth ride translates into financial benefits for the community – from fuel savings, fewer accidents, and less maintenance.
- Diamond grinding and overlays can rehabilitate old pavements, giving them a new smoothness that will last for years.

Quiet Concrete

Fact: Studies have shown that the majority of highway noise at low to moderate speeds (< 50 mph) comes from car, truck and bus engines, not from the contact of tires on

pavement. ("Highway Traffic Noise Analysis and Abatement Policy and Guidance," FHWA, June 1995.) Still, the concrete industry is doing its part to keep the environment surrounding roadways as quiet as possible. Recent research has shown that concrete pavements are well within government and industry noise standards and when properly constructed and textured, show that concrete pavements are just as quiet as asphalt pavement.

A 2005 study sponsored by the Minnesota Department of Transportation and performed by the National Center for Asphalt Technology (Auburn University), "Evaluation of the Noise Characteristics of Minnesota Pavements," compared noise levels of MN highways and test sections at MnROAD. The summary of this report stated that Hot Mix Asphalt (HMA) pavements had an average noise level of 98.6 dBA. Mn/DOT's current specifications for Turf/Broom drag Portland Concrete Cement Pavement (PCCP) pavements provided an average noise level of 99 dBA.

A study sponsored by the Wisconsin Department of Transportation and performed by Marquette University compared noise levels of concrete and asphalt pavement. The study found that of the four lowest decibel pavements for exterior noise, three were concrete.

Another research project completed for the Michigan Department of Transportation measured noise levels on nine types of pavement and found that the widest disparity of noise level between the asphalt and concrete sections was only 3dBA, which most people would not be able to notice. In fact, some of the concrete pavements in this test were quieter than the asphalt pavements in the same test.

New techniques have been, and are being used to, deliver even quieter concrete pavements, including longitudinal tining, astro-turf drag, pervious concrete, and diamond grinding. According to recent research, the surface noise of diamond ground pavements is within 1.5 to 3dBA of the most competitive alternatives.

So remember:

- Concrete starts out quiet and gets quieter over time.
- Concrete's long lasting nature leads to less maintenance and rehabilitation, reducing the noise and congestion generated by frequent roadway maintenance and lane closures.
- Concrete can restore or improve existing pavements and make them quieter by whitetopping asphalt roadways, overlaying concrete roadways, or diamond grinding.

Next newsletter:

SAFE and COOL CONCRETE

County Officials!

Visit the CPAM Booth at the AMC Annual Conference !!!



Don't strike out with your taxpayers due to the lack of a reliable 10-ton highway system. . . .

We can help you
"Bat 1.000"
in finding your
long-term pavement solution!

Concrete Whitetopping Huge Success

A review and tour on June 29 focused on Mn/DOT's and CPAM's success at using concrete whitetopping overlays as a low cost solution for a deteriorating HMA pavement.

More than 55 engineering staff from various Mn/DOT districts, South Dakota DOT, and county and city officials attended the presentation and bus tour of the TH 30 concrete whitetopping overlay project. The TH 30 project was constructed in 1993 and is located near Amboy in Blue Earth and Watonwan counties. The original project was a test section for Mn/DOT. (See chart below.)

"The tour provided participants with the hands-on opportunity to



Seminar participants examine the whitetopping on TH 30.

look for pavement failures and see how the pavement has stood up to traffic after 13 years," said Bob McPartlin, P.E., CPAM Field Promoter. "We had a hard time finding any failures."

Presentations also addressed the pre-design of whitetopping; how the concrete whitetopping compared to asphalt overlay and complete reconstruction in a life-cycle cost analysis for the TH 30 project; and how research on whitetopping at the MnROAD test facility has proven its use as a rehabilitation solution.

Presenters were Tom Burnham, MnDOT Research Project Engineer; Lee Anderson, who was involved with the pre-design work with District 7; and Jim Swanson, Mn/DOT D7 District Engineer.

"Whitetopping has proven to be a success, based on this project and other research performed at MnROAD," said McPartlin. "The era of the experiment is over. Whitetopping is a tool everyone can use."

For more information, contact Bob McPartlin at 651.762.0402.

TH 30 Test Sections

Test Section	Pavement Type	Thickness (minimum)	Bonded	Doweled
1	HMA	3"	NA	NA
2	HMA	5"	NA	NA
3	PCC	5"	YES	NO
4	PCC	5"	YES	YES
5	PCC	6"	YES	NO
6	PCC	5"	NO	NO
Control	PCC	5"	YES	NO

Save the Date!

46th Annual CPAM Concrete Paving Workshop

March 15-16, 2007

To be held at the St. Cloud Civic Center with hotel accommodations at the adjoining Kelly Inn.

Minne-ALF Now Available for Pavement Studies

By Mark B. Snyder, Ph.D., P.E.

In 1993, the Minnesota Department of Transportation (MnDOT) commissioned the University of Minnesota to construct a laboratory-based accelerated load test facility for pavements. This facility, dubbed “Minnesota Accelerated Loading Facility” or “Minne-ALF,” was designed to be useful for a wide variety of structural and environmental response studies for both asphalt and concrete pavements. It safely simulates the linear passage of wheel loads moving at speeds of 40 mph or more without mobilizing a heavy mass.

MnDOT has used the results of Minne-ALF tests to approve alternate dowel materials for high-performance concrete pavements and for evaluating different retrofit dowel construction parameters.

This device is now available for contract research studies.

The Minne-ALF can be configured in many different ways to address various test parameters. Load, deflection and other instrumentation data are collected automatically at user-specified intervals.

The Minne-ALF was originally used in a “rocker-beam” configuration to evaluate several design and construction parameters related to retrofit dowel installations in concrete pavements. A series of tests resulted in the development of improved specifications and materials for dowel bar retrofit operations in Minnesota without having to conduct lengthy field trials of test sections that might fail prematurely. The results of this application of the Minne-ALF are expected to save MnDOT millions of dollars in the long run.

In 2004, the rocker beam was replaced with two sequentially operated vertical actuators for lower maintenance costs and more rapid testing of joints in new concrete pavements. These tests resulted in the acceptance of zinc alloy-clad dowels and hollow stainless steel tubes as alternates to stainless steel-clad dowels for

“The results of this application of the Minne-ALF are expected to save MnDOT millions of dollars in the long run.”

high-performance pavements, which has resulted in substantial cost savings and has eliminated construction delays due to supply problems with stainless steel-clad dowels. This configuration could also be used for static and repeated load tests of asphalt pavement structures (e.g., deformation and settlement tests for parking lot mixtures and designs).



Photo of Minne-ALF in current configuration.

The Minne-ALF is currently being reconfigured to provide direct control over joint widths for tests of joints with misaligned dowels. It can also be used to investigate a wide range of other pavement design, rehabilitation and behavior issues for both concrete and asphalt pavements, including:

- Curl and warp studies;
- Effects of increased load limits and modified truck gear configurations;
- “Optimization” of dowel load transfer systems (i.e., material selection, dowel size, shape and location);
- Foundation pumping and drainage studies;
- Asphalt mix stability and deformation studies; and
- Load equivalency studies.

Some of these applications would require further test stand modifications.

The Minne-ALF is now available for contract research activities. Inquiries should be directed to Dr. Lev Khazanovich at khaza001@umn.edu. More complete descriptions of the test stand and results to date are available online at:

http://www.mrr.dot.state.mn.us/research/MnROAD_Project/MnROADReports/MnROADOnlineReports/minne.pdf

Keep Minnesota Moving

To keep Minnesota moving, we need more investments in roads and public transit. On Election Day — November 7, 2006 — Minnesotans can vote for Minnesota's Transportation Amendment, which will dedicate significant new revenue for the state's roads and transit system, without raising taxes.

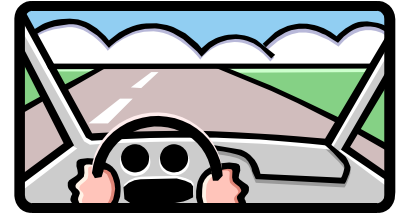
Concrete Paving Association of Minnesota has joined over

700 other organizations from around the state to lead a public campaign in support of passing Minnesota's Transportation Amendment this fall. Passing this constitutional amendment will ensure that all of our transportation tax dollars go to transportation projects. It just makes sense.

Your YES vote for Minnesota's Transportation Amend-

ment will ensure that 100 percent of the sales taxes we pay on new and used motor vehicles—an additional \$300 million per year — will go to improving our roads, bridges and public transit systems statewide.

Learn more about Minnesota's Transportation Amendment at <http://www.voteyesmn.org>



“Passing this constitutional amendment will ensure that all of our transportation dollars go to transportation projects. It just makes sense.”



Learn more about Minnesota's Transportation Amendment at <http://www.voteyesmn.org>



MSES Fall Outing September 13 - 15

www.mses.org/events/htm



Would you like to join the Minnesota Surveyors' and Engineers' Society in its 110th year? You don't have to be an engineer or surveyor to be a member — if you are involved with any aspect of transportation, you will be among your peers.

Please join us at our 84th Fall Outing on September 13-15, 2006 at Madden's Resort on Gull Lake near Brainerd. This event raises scholarship money for land surveying students at Saint Cloud State University, civil engineering students at Minnesota State University – Mankato, University of Minnesota, North Dakota State University, and a limited number of scholarships are awarded to midwest-regional engineering schools whose students qualify (2006-07 and 2005-06: Iowa State University and

University of North Dakota; 2004-05: Michigan Technological University and South Dakota School of Mines and Technology).

Acting on responses from the Fall Outing survey last December, we have added activities: a new “Casino Night” on Wednesday night from 7-10 p.m. to be run by professionals this first year, a sign-up for casual golfers on the 9-hole course, and an opportunity to use the Panache Spa. The three-day event also includes the familiar tournaments in golf, tennis, cribbage, shuffleboard, trapshooting, fishing, bocce ball, jarts and croquet. It's a chance to socialize with your friends and make new acquaintances. The informal Banquet, with valuable door prizes (including a weekend at

Madden's), will be held on Thursday the 14th at 7:00 p.m. Banquet tickets may be acquired at the Outing with a \$30 contribution.

Registration forms will be mailed (early-mid July) to current MSES members, and Banquet tickets will be mailed to over 100 corporations and organizations. If you are not an MSES member, you may join at the Fall Outing -- annual dues are \$30 (pays for membership through 2007) in addition to the \$15 registration fee.

If you need further information, go to www.mses.org/events.htm, email ann@mses.org. or call her at: **651-457-2347**.



Concrete Rehabilitation for City Streets and County Roads

The Center for Transportation Studies / Minnesota Local Technical Assistance Program is sponsoring a workshop which will cover all aspects of rehabilitation for concrete pavements, concrete curbs and gutters, and median or sidewalk pavements. The workshop includes two field sessions — one to determine what to repair, and the other to review actual concrete rehabilitation repairs made using a new Minnesota LRRB manual. Topics covered include:

- Introduction to concrete pavements and CPR plates
- Training with the standard plates
- Travel to local city street for field survey
- Field survey using standard plates
- Review of team reports of field survey
- Review of standard plates and LCC of team reports
- Field review of actual city street concrete repairs

INSTRUCTOR: Dan Frentress

CREDITS: 12 PDHs

FEE: \$100

(Includes lunch, breaks and program materials.)

The workshop is scheduled from 10 a.m. to 5 p.m. and will be held at the Currie Facility, 1200 Currie Avenue North, Minneapolis, MN. For more information or to register online, visit the Minnesota LTAP website at:

www.mnltap.umn.edu/workshops/roadway-bridge/roadway-bridge12.html

Registration contact: Mindy Carlson, 612-625-1813, Carlson@cts.umn.edu

World Travelers 'R US

Bob McPartlin, CPAM



Here is Bob, standing at "Kilometer Zero."
Where is he, and why is this photo important?

Email your guesses to rjmcpartlin@cpamn.com, and the answers will be revealed in the next issue of the Conveyor.



Typical street scene in Brugge, Belgium. Apparently, there is no incentive for smooth ride, nor are there any concerns regarding noise. Notice the cobblestone. However, the pavement is quite durable and has lasted for years.



Typical street scene in Moscow. 5 lanes of travel, 2 of parking — each direction. It is not unusual to see a vehicle using the sidewalk!



Delivering concrete on a Sunday with State-of-the-Art equipment in Moscow.



Calendar of Events

Local

Sept 13-15	MSES Fall Outing at Madden's	Brainerd, MN
Oct 3-4	CPR Class Offered by CTS / LTAP	Minneapolis, MN
Nov. 7	ELECTION DAY — Vote YES for Transportation Amendment	
Dec 8	CPAM Annual Membership Meeting	Vadnais Heights, MN
Mar 15-16, '07	CPAM Annual Concrete Paving Workshop	St. Cloud, MN

Mark your calendars for these up and coming events!

National

Nov. 29-Dec. 1	ACPA 2006 Annual Convention	Lake Buena Vista, FL
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Items in bold are sponsored or co-sponsored by CPAM.

If you have items you'd like to add to the calendar, please contact the CPAM office!



Visit us on our website at:

www.concreteisbetter.com

The Concrete Conveyor is published by the Concrete Paving Association of Minnesota for anyone involved or interested in concrete paving. It highlights industry activities and provides the latest information regarding concrete pavements and pavement options.

To subscribe or unsubscribe, please send an email message to Deb LaValle: dlavalle@cpamn.com

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