THE ONE-STOP-SOURCE FOR
PAVEMENT PRODUCTS & EQUIPMENT

SealMaster® has all the pavement maintenance products, equipment and tools you need – Under One Roof – to help you get the job done fast and right. And we’ve got the best trained professionals in the business to provide unmatched service and guidance to help your business grow and succeed. Contact us today and find out why more pavement professionals turn to SealMaster than any other brand.

SPORT SURFACING PRODUCTS AND MORE

LOCATIONS NATIONWIDE
CALL TODAY!
(800) 395-7325
www.sealmaster.net

See us at Booth #301
NATIONAL PAVEMENT EXPO 2015
Two in One: The WR 240i from Wirtgen makes a convincing impression when it comes to soil stabilization and cold recycling. In addition to perfect ergonomics and operation, clever automatic functions and outstanding terrain accessibility, the efficient engine and powerful milling and mixing performance ensure optimal results. You too can benefit from the technology leader’s solutions.
Add Crafco Quality Below Your Surface Treatment To Get The Best Performance

Prepare The Surface Prior To Treatment

Crafco crack sealing operation: crack routing creates a sealant reservoir, Crafco crack vac cleans the crack, Crafco Melter/applicator applies the sealant.

Use Crafco Sealant and Filler
The FHWA-RD-99-143 Treatment Experiment proved:
- Cracks that are routed and sealed perform more than twice as long as non-routed cracks
- Crafco sealant demonstrated the longest service life and >50% of non-Crafco sealants “failed” the experiment
- Crafco crack sealant demonstrated the lowest average annual cost per linear meter of crack
- Crafco crack filler demonstrated the lowest average annual cost per linear meter of crack

Use Mastic One and PolyPatch for Patching
- Flexible
- Waterproof
- Bonds to AC & PCC pavement
- Long-term solution (5 years + performance)
- Engineered design in premeasured package for consistency and maximum performance; no field blending
- Easy installation
- Reduce crew and equipment, and no compaction compared to hot mix asphalt

Get the most out of pavement preservation when you use Crafco products.

Call Crafco and order your products or schedule a demonstration today!

1-800-528-8242 - www.crafco.com
EMBRACING THE FUTURE while HEEDING THE PAST

THE LARGEST ASPHALT, POLYMER AND EMULSIONS OPERATOR IN THE UNITED STATES

With over 30 years of success, Ergon Asphalt & Emulsions has a history of creating products you trust, now with a fresh new look. While our brand has evolved, our unwavering passion for protecting the people on the road will always be our first priority.

Learn more at ErgonAsphalt.com
# Contents

## Features

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>NCAT, MnROAD Partnership - New Era in Preservation Study</td>
</tr>
<tr>
<td>15</td>
<td>R26 Workshop: Breakout for High Volume Highway Preservation</td>
</tr>
<tr>
<td>21</td>
<td>Penetrating Emulsion, Double Chip Seal Saves Unpaved Road</td>
</tr>
<tr>
<td>25</td>
<td>Open Graded Warm Mix Boosts County Dirt Roads</td>
</tr>
<tr>
<td>31</td>
<td>You’ll Benefit from PPRS Paris 2015</td>
</tr>
<tr>
<td>32</td>
<td>CIR, Thin Seal Work Wins Norjohn Ontario Green Award</td>
</tr>
<tr>
<td>35</td>
<td>Digging PCC ‘Buried Treasure’ Beneath Asphalt Overlays</td>
</tr>
</tbody>
</table>

## Columns

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>President’s Message</td>
</tr>
</tbody>
</table>

## Centers

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>Polymer-Based Materials for Unpaved Road Maintenance</td>
</tr>
</tbody>
</table>

## Also

<table>
<thead>
<tr>
<th>Page</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>38</td>
<td>Index of Advertisers</td>
</tr>
</tbody>
</table>

---

*On the cover: Delegates to SHRP2 R26 Workshop on Preservation of High Traffic Volume Roadways inspect thin bonded wearing course placed on I-94 at MnROAD test facility; see article pp 15-19. IMAGE CREDIT: Tom Kuennen*
LOWEST COST per square foot

Hot Applied Flexible Repairs for Concrete and Asphalt
FIX IT and FORGET IT

Before

AFTER

Before

AFTER
Meet the Sponsors Who Make Possible

GOLD

FP² Inc. is a non-profit trade association organized under the Internal Revenue Code Section 501(c)6, and is supported by the pavement preservation industry, contractors, material suppliers and equipment manufacturers.

Formerly known as the Foundation for Pavement Preservation, FP² supports the adoption of pavement preservation at all levels of government, and works to ensure that pavement preservation becomes a part of road programs from coast-to-coast. It also supports valuable research in pavement preservation, and works in close cooperation with the Federal Highway Administration (FHWA), the National Center for Pavement Preservation (NCPP), and regional pavement preservation partnerships and state-based pavement preservation centers.

FP² also sponsors key promotional activity events, such as international and national pavement preservation conferences. It supports distribution of promotional information to support pavement preservation, such as brochures and the quarterly magazine Pavement Preservation Journal.

Please consider joining the leading-edge businesses and national associations above in making a financial commitment to the future of pavement preservation by supporting FP². For more information, contact executive director Jim Moulthrop, P.E. (PA, AZ), (512) 979-8865, jimmoulthrop@gmail.com.

SILVER

BRONZE
With the 2014 season over in most parts of North America, now is the time to look ahead to the opportunities and the exciting times ahead for FP² and the pavement preservation industry.

As we go to press, the 2012 cycle of the NCAT pavement preservation treatments on the Test Track and Lee Road 151 are near the end of the cycle. The final report and outcomes will be presented March 3-5, 2015 in Auburn, Ala. I hope you can join us there; see more information in the advertisement, p 36.

The initial performance of the treatments on the track and Lee Road look very encouraging and will go a long way in defining the life extension potential of pavement preservation treatments. Monitoring of the current sections will continue in the next cycle until the sections return to their previous condition.

Planning for the 2015 NCAT cycle is well underway. We may place many of the current treatments and additional techniques on a higher volume Alabama DOT pavement. These would be placed in one-tenth-mile sections rather than the current 100 ft. sections on Lee Road. The details are yet to be worked out, but FP² is deeply involved and will continue to support the research.

The other exciting ongoing discussion is the potential collaboration of NCAT and MnRoad to do pavement preservation on high volume roads in warm and cold climates (see article pp. 10-13). MnRoad is administered by Minnesota DOT in conjunction with other states through pooled funds. At the recent Midwest PPP meeting and R26 workshop in Minneapolis, attendees had the opportunity to visit the MnRoad facility (see article pp. 15-19). Needless to say, it was very impressive, and practical as well.

MnRoad has a very impressive setup in that its facility has two separate traffic testing facilities. One section is a dual-lane pavement off of I-94 where all the northbound interstate traffic (28,000 vpd) can be diverted onto sections where various treatments have been placed. Placement of the treatments is easily accomplished when traffic is placed back on the main line. The second section is a closed loop track representing low volume roads.

The benefit of the joint research from an industry point of view is that the treatments will be placed in entirely different environments and traffic conditions. In addition, the MnRoad sections also evaluate concrete surfaces and pavement noise. The current sections at MnRoad include many of pavement preservation treatments, including chip seals, microsurfacing and thin overlays, and its research already is underway. The next MnRoad cycle begins in 2016.

Right now the MnRoad and NCAT teams – with FP²’s input – are trying to work out the details of the partnership. As the organizations, funding and objectives of MnRoad and NCAT are different, there are many issues to be resolved. There have been several initial discussions and the joint collaboration seems doable.

That’s not all that’s exciting! The upcoming Pavement Preservation & Recycling World Summit (PPRS Paris) will be held in just a few months and will bring delegates from around the world to France, where so many of our advanced surface treatments have originated. We hope you will join us there; find out more on p. 27.

As you likely know, our federal surface transportation legislation, MAP-21, has been extended through May. Working with our D.C. representatives, Williams & Jenson, we continue to have a very active presence in Washington to ensure pavement preservation is included in whatever replaces MAP-21.

Lastly, I want to congratulate Charleston County, S.C., as the 2014 winner of our James B Sorenson Award for Excellence in Pavement Preservation. Via its very progressive pavement management system, it’s implemented a very successful preservation program; read about one aspect of it on pp. 25-29. The award will be presented at the Southeast PPP meeting in Charleston this spring.

Be a part of the exciting times ahead! If your firm is not a supporter of FP², I encourage you to join the blue-ribbon firms that contribute to make FP² possible. See our new contributor list on the preceding page for more information, and thanks.

Jonna Rae Epps. Asphalt paving and pavement preservation stakeholders are mourning the passing of Jonna Rae “Jonni” Evans Epps, long-time spouse of Dr. Jon Epps, P.E., who passed at her home in Cypress, Tex., Oct. 21. Dr. Epps, now associate administrative director at Texas Transportation Institute, is renowned as one of the magisterial figures of the asphalt industry, and as one of the “fathers” of Superpave. Mrs. Epps was known throughout the asphalt industry as well. We at FP² Inc. express our condolences to Dr. Epps and his family.
A growing partnership between the National Center for Asphalt Technology in Alabama and the MnROAD research facility of the Minnesota DOT will advance research in preservation techniques for high-volume roadways.

It will do so by providing research in preservation techniques for both flexible [bituminous] and rigid [portland cement concrete] pavements, and supplying real world accelerated pavement preservation performance testing in both hot and cold climates.

And by leveraging economies of scale, it may deliver research products for a larger base of supportive agencies and private sector clients at lower buy-in costs. The partnership has the potential to play a much larger role in the national effort to validate pavement performance.

This new collaboration was a major theme of the SHRP2 R26 Workshop for the Preservation of High Traffic Volume Roadways, held in Minneapolis in early September (see article pp. 15-19). There it was announced that MnROAD and NCAT are partnering to advance pavement preservation research.

Sharing resources and expertise will improve coordination of experiments and expand evaluation of pavement performance in both northern and southern climates.

“Working together will help validate what’s done at our facilities both north and south,” said Benjamin Worel, P.E., MnROAD operations engineer. “MnROAD has built test pavements in the north and obtained results which southern states sometimes say do not pertain to them, because we’re in a northern climate. The same thing goes for the northern states utilizing results from NCAT. But working together will allow more states to accept and use our combined research results and get more involved with both facilities. That will help implement pavement preservation techniques and boost how agencies go about implementing these types of results in more states than just those adjoining Alabama or Minnesota.”

The collaboration also permits testing of PCC pavements and the inclusion of the results in comprehensive research products, which is not possible when NCAT works on its own.

“Our focus at the National Center for Asphalt Technology is flexible pavements,” said Dr. Buzz Powell, P.E., assistant director, NCAT Test Track, Auburn, Ala. “The partnership with MnROAD can provide us the two things that we don’t have at NCAT, the two Cs of climate and concrete. In the Deep South we have a very limited climate for testing pavement performance, and as Ben says, our clients are primarily in the southern half of the United States, and we don’t have any concrete.
test sections. A partnership with MnROAD lets us leverage their cold weather conditions and concrete pavements that constitute a big part of the preservation picture."

**TRACKS NORTH AND SOUTH**

MnROAD and NCAT are full-scale test tracks that use real-world pavement construction, full-scale test trucks, and in the case of MnROAD, live interstate traffic on I-94 northwest of the Twin Cities, all under actual climate conditions that affect pavement performance. The combination of traffic loading types and the range in climate conditions provide unique opportunities to address pavement performance issues.

The National Center for Asphalt Technology was established in 1986 as a partnership between Auburn University and the National Asphalt Pavement Association Research & Education Foundation.

NCAT has 46 different test sections on its 1.7-mile oval track. Sections are sponsored on three-year cycles by state DOTs, the Federal Highway Administration, and private industry. Sponsors have specific research objectives for their sections, and shared objectives for the whole track. The focus of research at the track has logically grown in conjunction with NCAT’s expanding mission from just mix performance in the original 2000 research cycle, to both structural performance and pavement preservation in the just-ended (2012) fifth research cycle.

More recently, pavement preservation research has been a big part of NCAT’s mission. Pavement preservation research at NCAT began in the facility’s fifth cycle in summer 2012, and was initiated and sponsored by seven state DOTs, plus FP2 Inc. and its supporters. In addition to the track, pavement preservation test sections were placed on nearby Lee Road 159, with Dr. Mary Robbins serving as the principal investigator of the integrated research effort. While the fifth cycle of track tests has ended, preservation group research on Lee Road 159 will continue through March 2015, with the sixth cycle of testing at the track itself to begin later that year. NCAT researchers are optimistic that the 2012 Preservation Group study will continue as the “PG 15” study in the coming research cycle beginning in summer 2015.

Unlike NCAT, MnROAD is owned and operated by the Minnesota DOT near Albertville, some 40 miles northwest of Minneapolis. Established in 1994, the test track consists of a 3.5-mile interstate (I-94) high-volume roadway, and a 2.5-mile closed loop low volume road simulating rural roads. The interstate

---

Dr. Buzz Powell, P.E., assistant director, NCAT Test Track, and Benjamin Worel, P.E., MnROAD operations engineer, anticipate research partnership during High-Volume Roadway Workshop in Minneapolis in early September.

Minnesota DOT’s MnROAD facility track consists of a 3.5-mile interstate (I-94) high-volume roadway, and a 2.5-mile closed loop low volume road simulating rural roads.
diverts live traffic for its loadings, and the low volume track utilizes a fully loaded 80K five-axle semi driven five days a week.

MnROAD has 50 different test sections of both rigid and flexible composition. Research is sponsored by state DOTs, the Minnesota Local Road Research Board, FWHA and private industry. MnROAD is in its second phase of research, and is developing its third phase, scheduled for 2016. Phase II research includes performance of concrete overlay designs, recycled unbound pavement materials, full depth reclamation stabilized with engineered emulsions, composite pavements, pervious/porous pavements, diamond grinding of concrete surfaces, warm mix asphalt, and timing of pavement preventive maintenance. MnROAD also has been active in placement of pavement preservation treatments for high volume pavements and has tested them on I-94.

Both test tracks monitor pavement performance routinely for rutting, fatigue cracking, roughness, texture, friction, noise and structural capacity. All test sections have instrumentation to measure dynamic vehicle load or environmental response. The data generated from the physical measurements and instrumentation are used for the development of pavement response models and, ultimately, improved mechanistic-empirical design procedures.

PRESERVATION AT NCAT, MNROAD

Accelerated testing at MnROAD and NCAT provides unique opportunities to determine the field performance of breakthrough materials and pavement preservation concepts without the risk of failure that local and state agencies are unwilling to accept.

Each facility has a history of evaluating the performance of pavement preservation treatments, including chip sealing, microsurfacing, crack sealing and thin overlays. To address needs in both northern and southern climates, similar test sections currently are being discussed at each facility to address national issues.

Recognizing the long-term nature of measuring the impact of some pavement preservation treatments, both MnROAD and NCAT also are pursuing off-site test locations on existing roads and highways that can be easily monitored near each facility.

“State DOTs are at a point where each agency has more roads classified as having a lower remaining life than they did in the past,” said MnROAD’s Worel. “That is, the ride quality has declined on a greater percentage of our roadway system since we haven’t had enough money to effectively keep all those pavements at an acceptable level of serviceability. So, with limited funding and increasing costs, it’s now more important than ever to find the right short and long term fixes to improve the system in the most cost-effective manner.”
But this will take the financial participation of state DOTs and other entities – the “buy in” – to make it happen. This could take the form of pooled fund projects, or individual underwritings, or funds from other sources.

“There have been research sponsors that have done work at MnROAD, then separately done work at the NCAT Pavement Test Track,” Powell said. “This is an opportunity to collaborate on one project. There will be financial benefits or synergies that will come from it, as there won’t be any duplication of effort. I see this as a full partnership, regardless of the form that funding and the projects take. Our intention is to be a complete, full partnership.”

Funding for the partnership also may solve problems specific to a state or region. “Ben and I have a very good feel for what the big needs of the industry are, and what the common practices of the industry are in the preservation industry, but we learn a little bit more every time,” Powell said. “There will be problems that are unique to a specific state DOT. And if a state wants to have a specific treatment or treatment combination scoped into an experiment, then they need to be a funding partner.”

“What NCAT and MnROAD have done is to show that further implementation is really key to getting results out there and used by practitioners,” MnROAD’s Worel said. “Another thing is that MnROAD and NCAT both have had a high return on investment, with MnROAD a documented 9-to-1 ratio. MnROAD and NCAT have established histories of producing cost-effective research findings with a national impact. We invite agencies to consider our partnership when they solicit organizations to conduct research. Our combined strength will provide the most cost-effective solutions to the national issues that public agencies are facing.”
We create chemistry that makes old roads love new asphalt.

Pavement Preservation through systematic scheduled maintenance programs utilizing Butonal® SBR polymers from BASF can help to protect and extend pavement service life, promote safer road conditions, and prevent structural failures. Whether you make products for microsurfacing, chip seals, thin-lift overlays or other eco-efficient pavement preservation applications, BASF can help asphalt roads perform better and last longer even in the toughest conditions.

Learn more at basf.com/asphalt or call 1-800-395-5152.
R26 Workshop: Breakout for High Volume Highway Preservation

By Tom Kuennen

The next era of pavement preservation – that of high volume pavements, like dual lane highways and interstates – is underscored by two recent publications from the second Strategic Highway Research Program (SHRP2).

The two publications—Guidelines for the Preservation of High-Traffic-Volume Roadways and its companion report, Preservation Approaches for High-Traffic-Volume Roadways provide a snapshot of where high volume pavement preservation is now, and highlight a path to the future.

These publications represent the first methodical and wide-ranging elaboration of the process of pavement preservation for high traffic roads, and provide technical details and a structure for implementation of preservation for high volume highways.

These important documents were the underpinnings for an exciting workshop in Minneapolis in early September, the SHRP2 R26 Workshop for the Preservation of High Traffic Volume Roadways, held in conjunction with the annual meeting of the Midwest Pavement Preservation Partnership.

Some 165 delegates from 30 states and Canada attended the three-day workshop and learned of ongoing research in preserving high-traffic volume roadways, and the reliability of existing applications in states from coast-to-coast.

The highlight of the workshop was a field trip to the sprawling MnROAD pavement test track some 40 miles northwest of Minneapolis. MnROAD is composed of a 3.5-mile mainline interstate highway (I-94) that carries 29,000 vehicles per day with 13 percent trucks; a 3.5-mile bypass interstate for live traffic diverted off the main line when it is undergoing construction and analysis; and a 2.5-mile closed-loop, low volume roadway served by an 80,000 lb., five-axle tractor-trailer for live loadings.

There, the delegates saw the durability of certain preservation treatments placed on the portion of the MnROAD facility which carries actual interstate traffic, which had been diverted to the bypass for work on the test sections and for the visit. Minnesota DOT is one of 14 road agencies that received funding for the initial testing implementation of R26 methods.

“MnROAD is a long-term pavement testing facility that gives researchers a unique, real-life laboratory to study and evaluate the performance of materials used in roadway construction,” said Jerry Geib, P.E., metro pavement and materials engineer, Minnesota DOT, at the workshop. Preservation treatments seen by delegates at MnROAD included flexible micro surfacing, ultra thin bonded wearing course, thin warm mix asphalt overlays, chip seals, and the Next Generation Concrete Surface of specialized concrete pavement diamond grinding.

HIGH VOLUME PRESERVATION

For a number of reasons, preservation of high traffic pavements is not as widespread as for local roads, said Jim Moulthrop, P.E., executive director of FP2 Inc. “The practice of pavement preservation on high-traffic volume roadways is not as common as on lower-traffic volume roadways,” Moulthrop said, adding the specific treatments used on low volume roads may not be as effective on high volume pavements.

“The benefits of high volume roadway pavement preservation are not as readily recognized as..."
for lower volume roads,” he said. “But preservation of high-traffic volume roadways is just as important as for low traffic volume roadways. States have limited resources, and preservation makes those resources go farther.”

The benefits of enhanced safety and smoother pavements via preservation can be attained more rapidly with high volume pavements than through rehabilitation, he said, adding challenges of high volume pavement preservation include a smaller tool box of treatments, and greater difficulty due to the prevalence of night work and shorter closure times.

Implementation of R-26 project findings needs to take place, Moulthrop said. “The benefits outweigh the challenges of practicing preservation on high traffic volume roadways,” he said. “It’s worth taking the steps to increase or improve preservation practices on these roadways.”

The issues, challenges and risks associated with pavement preservation treatments on high traffic volume roadways can be mitigated by applying the findings of the SHRP2 R26 study, he added.

**R26 OBJECTIVES, FINDINGS**

Objectives of the R26 project were to develop preservation guidelines for high traffic volume roads, and to identify promising preservation strategies for these pavements.

“Use of pavement preservation on high traffic volume roadways is not as widely accepted, nor as well documented,” said David Peshkin, P.E., Applied Pavement Technology, Inc., and one of the authors of the documents. “Formal preservation guidelines being developed by many agencies do not include pavements with higher average daily traffic (ADT).”

Key findings, according to Peshkin, are that most preservation occurs on low traffic volume roads, but in 2004 a National Cooperative Highway Research Project (NCHRP) survey found that most agencies apply...
preservation treatments to both low and high traffic volume roads. “Concerns about pavement preservation on high traffic volume roads include durability, performance, negative public perception, and risk,” he said.

Yet each preservation treatment has unique capabilities and functions that enable it to prevent or delay occurrence of new distresses, or slow development of existing distresses, restore pavement integrity and functionality, and improve its surface characteristics, he said.

On bituminous-surfaced high volume pavements, equal to or greater than 20,000 ADT, widely used treatments today include crack seals, crack filling and preservation of drainage. Treatments with limited use in the field today on these pavements include cape seals, scrub seals, chip seals, cold in-place recycling, and ultra-thin whitetoppings, Peshkin noted.

Keys to greater use of pavement preservation practice for high volume pavements, he added, include the need to identify and publicize successful practices, to promote research and test sections, and to document and publicize the benefits of pavement preservation.

MORE TO COME FROM R26

The SHRP2 program that produced the two publications is a nine-year program, for which the research is 90 percent complete, said Thomas Van, FHWA pavement management engineer. The $130 million budget provides for implementing over 60 products in the future.

The implementation is being led by FHWA’s Office of Infrastructure, and one focus will be on products that provide minimum disruption to highway users, he said. Ultimately 135 projects in 38 states will be included, with a goal of extending service life of high traffic volume highways, and identifying suitable techniques and methods.

Currently 13 states – Minnesota, Wisconsin, Massachusetts, Maine, Washington State, Missouri, Pennsylvania, Arizona, Kentucky, Tennessee, Georgia, Delaware and Rhode Island, plus the District of Columbia – are participating in R26 projects. A toolkit is being developed, and more technology workshops,
In 1965, Earl Cutler’s vision of a cost saving, high quality method of recycling asphalt pavement materialized into technology that set the standard for hot in-place recycling, and tackles even today’s energy and environmental issues.

Cutler Repaving, with its unique Single Machine, Single Pass Repaver, keeps roads and highways in top shape. Our method of hot in-place recycling gets the job done quickly, uses less raw materials, uses less fuel, and adds nothing to landfills.

Cutler has been the future of pavement preservation for over 45 years. So, we didn’t just jump on the “green” bandwagon. We are the bandwagon.

Video and PowerPoint presentations of the R26 workshop may be downloaded at https://tsp2pavementpavementpreservation.org/midwestern-mppp/annual-meetings/2014-2/.

For more information on pavement technologies and other SHRP 2 solutions, visit SHRP2.transportation.org or www.fhwa.dot.gov/goshrp2.

For information on MnROAD, visit www.mndot.gov/mnroad.

EXHIBITORS MAKE WORKSHOP POSSIBLE

A host of equipment and materials manufacturers, and consultants, made the Midwest Pavement Preservation Partnership meeting and SHRP2 R26 Workshop on Preservation of High Traffic Volume Roadways possible. Please take note of these esteemed businesses:

Agile Assets Inc.
All States Asphalt
Applied Pavement Technology Inc.
Asphalt Systems Inc.
BASF Corporation
Blastrac
Colas Solutions, Inc.
Convergent Technologies
Corrective Asphalt Materials, LLC
Crafo, Inc.
Deighton Associates Ltd.
Dustrol Inc.
Ergon Asphalt & Emulsions, Inc.
Fibrecrete Technologies LLC
Flint Hills Resources
Fora Corp.
FP Inc.
Fugro Roadware
Gallagher Asphalt Corp.
International Grooving & Grinding Association
Kraton Polymers LLC
National Asphalt Pavement Association
Pathway Services, Inc.
Pavement Technology Inc.
Phoscrete Concretes
Road Science LLC
Strawser Construction, Inc.
The Fort Miller Co., Inc.
Unique Paving Materials Corp.
Uretek
Wright Asphalt Products Co.
Pavement Texturing for Skid Resistance

Uniform Consistent Surface
Works on all Pavements
Markings Can Be Left Intact
Retexturing Possible

Reduces Groove Steering
Eliminates Road Glare
Bond Enhancer
Restores OGFC

30 Years Experience in USA & Canada

1-800-342-4174
www.skidabrader.com
Penetrating Emulsion, Double Chip Seal Saves Unpaved Road

By Thomas J. Wood and Melissa K. Cole, P.E.

When a Minnesota township couldn’t afford the conventional bituminous overlay it wanted to upgrade a failing gravel road, Minnesota DOT tested an alternative light surfacing technique that resulted in a smooth and dust-free surface at a fraction of the cost of the overlay.

Silver Creek Township had a gravel roadway that was becoming too costly to maintain. Annual recurring problems included dust generation, re-grading to remove corrugation or washboarding, and the need to place new gravel each year to maintain strength of the roadway.

The township wanted to upgrade to an HMA surface. The roadway was re-graded in preparation for paving with a 3-in. overlay, but with a bid of $760,000 for the 4.3 mile roadway, or $12.55 per sq. yd., the township budget could not support this expenditure on a single project.

The Minnesota DOT sought an alternative to the 3-in. overlay, and wanted to test a method of lightly surfacing to see if it would solve the township’s problems. After some study Silver Creek decided to apply a prime and double chip seal, the goals of which were to eliminate dust, washboarding, muddy conditions, and reduce annual re-graveling, grading and shaping.

PLAN FOR PRIMING

The new plan called for priming with penetrating emulsion prime (PEP) at 0.40 gal./sq. yd., to be followed with a chip seal with 0.35 gal./sq. yd. of CRS-2p and 3/4 in. minus granite chip at the rate of 16 to 18 lbs. per square yard.

This would then be followed with 0.10 gal./sq. yd. of CSS-1h diluted fog seal with 4 to 5 lbs/sq. yd. of crusher dust. The crusher dust was minus No. 8 basalt. The quoted price for the project was $160,000 or $2.50 per sq. yd.

The original plan was modified. The prime had been reduced, they wanted an extra layer of polymer modified asphalt to enhance the performance of project. The contractor agreed to do the extra work for an additional $10,000 for the 4.3 miles.

Township personnel re-graveled the roadway with MnDOT Class 5 surfacing gravel. The cross slope was increased from 2 to 4 to 5 percent to aid in drainage. Construction of the prime and chip seal began July 1, 2013. The first step was to apply water to the dry gravel surface to help the PEP penetrate into the gravel surface.

Next, the PEP was applied. PEP was specified to be applied at 0.40 gal./sq. yd. The decision was made to start the application rate at 0.30 gal./sq. yd. as this was the first time the contractor had applied PEP.

Approximately 1,000 ft. of PEP was applied at 0.30 gal./sq. yd., and it was noted that there was some run off of the PEP. The application rate was reduced to 0.25 gal./sq. yd.
which solved the run off issues. After 20 minutes the PEP had not completely penetrated into the surface.

Personnel onsite decided to apply some sand to blot the surface of the PEP in order to allow traffic on the primed surface during the curing process. Approximately 6 to 8 lb./sq. yd. of Dresser trap rock minus No. 8 material were applied after the PEP had cured for 15 to 20 minutes. It then was rolled in with pneumatic rollers.

CHIP SEAL SAME DAY

After the application of the sand the PEP was then allowed to cure for a minimum of three hours before it was swept and the chip seal applied according to MnDOT Specification 2356. The chip seal was placed with 0.35 gal./sq. yd. CRS-2P emulsion followed by 16 to 18 lb./sq. yd. of FA-3 (3/8 in. minus chips).

This layer was swept and then received a second application of CRS-2p at rate of 0.23 gal./sq. yd., followed another application of crusher sand at 6 to 8 lb./sq. yd.

All the areas primed were chip-sealed the same day to protect the prime surface from damage caused by traffic.

As a test section to compare performance to the second layer of CRS-2p and sand, the first 1,500 ft. of an adjoining road received only a fog seal with Css-1h diluted placed at 0.10 gal./sq. yd. with no sand added.

DUST-FREE DRIVING

After one winter of traffic, the prime- and chip-sealed surfaced gravel roadway is meeting the goals set out by the township. It is an improved gravel roadway.
that is dust-free and smooth for the traveling public.

The township will use a snow removal method similar to that used for gravel surfaced roadways. In general the township must treat the roadway as an improved gravel road, not an asphalt paved road.

Areas damaged by agricultural equipment driving out of the ditch were easily fixed by pouring asphalt emulsion in damaged areas followed with layer of chip seal.

As should be expected, we found good drainage will be very important to long term performance, with a 4 to 5 percent cross slope shaped in the crown.

We had to make sure the roadway was designed to carry traffic. Any doubt on the structural capabilities of the roadway should be dealt with before the start of the project.

Ride quality will depend on the condition of the roadway at the time of application of the prime and chip seal. Final shaping should happen close to application of the prime and chip.

If the roadway is dry and very tight, apply water to dampen the road before priming. Treat PEP prime similar to MC70 and plan on blotting with sand to allow traffic on the prime while curing. Our application rate was 0.25 gallons per square yard and we used 4 to 8 lbs. of clean sand to blot. An FA-3 (3/8 in. minus) chip was used for the chip seal; this allows a heavier asphalt membrane to be applied. If you need smoother surface for walkers, then sand the fog seal to tighten the surface.

Cole is research project engineer, and Wood is research project supervisor, Office of Materials and Road Research, Physical Research Section, Minnesota DOT, Maplewood.
Ultrapave provides a variety of products and technical services that significantly improve asphalt paving.

Polymer Modification for New Construction, Pavement Preservation and Rehabilitation

Ultraceote Polymeric Aggregate Treatment

John Murphy
706-618-3625 | jmurphy@trcc.com

www.ultrapave.com
Charleston County, S.C., has a relatively high number of low-volume, unpaved earth roads within its jurisdiction. In fact, in the county, 380 rural dirt roads currently demand regular maintenance, which is taxing the budget beyond its limits.

“We need to pave these roads because the regular maintenance is very expensive,” said Matthew Fountain, engineering manager of Charleston County Public Works. “Traditional paving methods are not economically feasible. New regulations make the permitting process cumbersome and working the drainage system around protected trees and driveways can be bothersome for residents, not to mention the expense. We need something that is economical, constructible, and sustainable.”

To improve access and safety for residents, the county has turned to pervious paving as a solution. Pervious, or porous, paving is a technique that features open graded friction course (OGFC) asphalt with 20 percent air voids as an alternative to the dense asphalt used on most roads, which may have air voids in the 4 to 5 percent range. The mix quickly drains water from the pavement, reducing hydroplaning and water spray, and suppresses pavement noise at the pavement/tire interface. The technology has been around for decades but developing the right mix for the right price can be a challenge to a road agency with limited funds.

MWV Specialty Chemicals, located in Charleston County, and Sanders Brothers Construction, worked with Charleston County to develop a unique, cost-effective warm mix asphalt using Evotherm warm mix additive, a mix designed specifically for the low-volume, sandy, soil-based roads of the South Carolina Low Country, most recently for Joseph White Road.

CUTTING COSTS IN LAB

The South Carolina DOT’s OGFC mix – designed to funnel water off of interstate highways – is the standard in the state for pervious paving, but was too expensive for the county. The permeable pavement works great for highways and interstates to prevent hydroplaning and overspray, but was a bit excessive for the dirt byways of southeastern South Carolina.

Instead, the state OGFC mix was adapted to include 5.5 percent PG76-22 virgin binder to create Evotherm 5.5 warm mix asphalt additive.
Performance Graded Tire Rubber Asphalt
Revolutionizing The Way You Pave !!!

Terminal Blends:
The Tire Rubber Technology
for Green, Longer Lasting and Quiet Roads...

Hot Applied Chip Seal

IHS Trackless Tack

Slurry Seal, CQS-1h TR

Hot Mix Overlay

Paramount Refinery
14700 Dornay Ave
Paramount, CA 90723
Phone: 562-531-2000

Flagstaff Terminal
840 E. Route 66
Flagstaff, AZ 86004
Phone: 520-778-6277

Long Beach Refinery
400 E. Artesia Blvd
Long Beach, CA 90803
Phone: 562-425-1465

Elk Grove Terminal
10999 Waterman Rd
Elk Grove, CA 95624
Phone: 916-685-9253

Bakersfield Terminal
500 China Grade Long
Bakersfield, CA 93308
Phone: 661-324-1200

Mojay Terminal
1874 Furse Rd
Mojay, CA 93081
Phone: 661-324-3177

Portland Terminal
5501 NW Front Ave
Portland, OR 97210
Phone: 503-273-4780

Seattle Terminal
20555 NW Richmond Beach Dr
Seaview, WA 98077
Phone: 206-542-0122

PG70-22TR Chip Seal, Pyramid Lake
64-22 asphalt supplied by Associated Asphalt, and Evotherm warm mix technology. Sanders Brothers supplied the county engineers with locally available aggregate in order to determine what gradation would work best to drain the water through asphalt layer, while also providing a stable driving surface.

Sanders Brothers worked to develop a mix design that would be close to a SC DOT mix, while minimizing overall costs. They removed No. 7 stone (1/2-in. to No. 4 nominal size), which is more expensive and available only by truck from 100 miles away, and replaced it with No. 67 stone (3/4-in. to No. 4 nominal size) that’s readily available locally, and much more reasonably priced. The Charleston County mix was engineered to perform as a 2-in. lift as the final surface course.

The warm mix additive allowed production temperatures at Sanders Brothers’ North Charleston plant to be lowered about 80 deg F, to 250 deg F, cutting back on the energy and emissions expelled at the plant. These lower temperatures also extend the overall life of the pavement by precluding premature aging.

With the lab work complete, Charleston County crafted a new porous asphalt spec, which eliminates fibers and lime from the OGFC mix, and replaces a PG 76-22 with a PG 64-22 – when using a chemical warm mix additive – to produce the material at temperatures lower than 275 deg F.

CHARLESTON COUNTY HONORED WITH 2014 SORENSON AWARD

Charleston County, S.C., – featured in this article – is the winner of the 2014 James B. Sorenson Award for Excellence in Pavement Preservation, presented by FP² Inc. The county will receive the award at the March meeting of the Southeast Pavement Preservation Partnership in Charleston, S.C.

Judges said the county is distinguished by “great use of media, particularly Comcast [cable] TV programming, and website,” and “mailers, presentations and signage.”

In addition to “effective implementation of its pavement management system,” the county has benefited from an “unusually high number of different technologies successfully introduced in [just] a few years.”

Last year, Charleston County was featured on the cover of this magazine; see Charleston County Melds Preservation with PMS, Fall 2013, pp 20-24, or visit http://naylornetwork.com/pp-nxt/. A detailed article on Charleston County’s program will appear in the Spring 2015 issue.

Jim Sorenson (1949-2009) was senior construction and system preservation engineer, FHWA Office of Asset Management, and he was a great champion of pavement preservation at the national level. The pavement preservation industry had no greater friend and it honors his memory with the Sorenson Award.

Intended to recognize agency pavement preservation, the Sorenson award is usually, but not always, presented to city and county agencies. Criteria used to evaluate candidate agencies include: process used to gain acceptance by elected officials, general public, employees, and industry (40 percent); how well the program relates to the theme of The Right Treatment, for the Right Road, at the Right Time (20 percent); tangible improvement in the system (20 percent); techniques used to keep public notified of what is being done and why (10 percent); and uniqueness of program (10 percent).

As a stakeholder in pavement preservation, you are invited to submit your nominees to FP² Inc. To nominate an agency, please include a brief write-up of how the agency gained acceptance and support for its pavement preservation program; how long the program has been in existence, any special or unique public awareness actions; press releases; the contact person in the agency; and the person or firm making the nomination.

Deadline for 2015 entries is July 1. For more information, or to submit nominations, please contact FP²’s executive director, Jim Moulthrop, at 8100 West Court, Austin, Tex., 78759, voice (512) 970-8865, email at jimmoulthrop@gmail.com.

Stretching your pavement dollars further.

Many factors influence your maintenance-preservation choices, including traffic volume, climate, budget constraints, and application types. Let GLC guide you through the process with our expertise and full line of innovative products:

- Ultra Thin Lift Overlays
- Micro/Slurry Seals
- Chip/Fog Seal
- Dust Suppressants

For your Atlantic Canadian solution, please contact GLC today. general-liquids.ca  |  902-835-3311  |  questions@general-liquids.ca
What?
The 3 themes of the Congress PPRS Paris 2015
- Socio Economic
- State of the Art
- Prospective & Innovation

Who?
- For the general public
- For decision-makers and policy-makers
- For companies and industries
- For equipment and plant manufacturers
- For network users, drivers

Where?
Paris, Convention Center
2 place de la Porte Maillot
75017 Paris

When?
22 – 25 February 2015

For more information please contact
Amaury.lefebvre@gl-events.com
Tel: + 33(0)4 78 17 62 85
The pavement structure in this new specification is existing subgrade, Class 1 non-woven geotextile filter fabric, 6 in. of No. 57 stone, 2 in. of No. 789 stone, and 250 lb. per yard of porous asphalt. This mix was tested on a nearby local road.

“This is a warm, open-graded friction course mix,” said Chris Davis, vice president, asphalt operations, Sanders Brothers Construction. “With warm mix asphalt, we save on fuel consumption at the asphalt plant by running the temperatures a lot lower. Placement at lower temperatures lets us haul it farther while retaining workability, with a long haul today of about 50 minutes.”

“When the process is easier for contractors, you get more competitive bids,” says Eric Adams, P.E., Charleston County’s project manager. “We focused on improving the constructability aspects of the roadway section to provide a reduced risk to the contractors and a lower overall price.”

These efforts resulted in a reduction of construction costs from an estimated $1.1 million to approximately $350,000 for the Joseph White Road project.

STILL TESTING PHASE

Though the mix is still in the observation phase, it’s being placed on some select rural roads throughout Charleston County. “We know this is a learning process,” Adams said. “We improved the constructability and reduced the costs, which were our short term goals. For right now it’s looking great and we’ll monitor the completed work while looking to competitively bid upcoming projects.”

Though the team will continue to improve the design as necessary, this low-impact type of construction is already recognized as a best management practice by the U.S. EPA. The county loses the headaches of environmental permitting and right-of-way problems, and saves time and funding for other projects.

“Evotherm is a chemical surfactant that enables contractors to place mix at temperatures lower than conventional hot mix,” said Dean Frailey, business development manager for MWV Specialty Chemicals. “It’s a true paradigm shift for an industry that is accustomed to adding more heat to a mix to attain similar levels of coating, workability and compaction.”

The manufacturer saw in Charleston County a project model for how Evotherm could be used for other counties’ low volume roads, and welcomed the opportunity to put the technology to work. “By choosing Evotherm porous asphalt to pave its low volume roads, Charleston County is greatly reducing the time and expense of paving these roads in addition to practicing environmentally sustainable construction,” Frailey said. “It’s a win-win for all involved.”

“We are making paving unpaved roads more economical,” said Charleston County’s Adams. “It’s something we can roll out on a larger scale. The potential for savings is really exciting for us.”
The Pioneer in High Performance Cold Mix

UPM Cold Mix Asphalt Repair Material has been used to permanently repair more potholes than any cold asphalt mix or cold patch in the pavement repair industry.

UniquePavingMaterials.com
(800) 441-4880

America's leading provider of pavement maintenance products
You’ll Benefit from PPRS Paris 2015

Whether you are a contractor, equipment or material supplier, or agency end-user in the pavement preservation community, you will benefit from research in pavement preservation introduced to the world at February’s Pavement Preservation & Recycling Summit (PPRS Paris 2015).

And with the holiday season looming, time is running out to plan your trip to the first Pavement Preservation & Recycling Summit, Feb. 22-25, 2015, at the Palais des Congrès in Paris.

French road contractors build in the shadows of the great cathedrals, so they have a grand tradition to maintain. That’s why they are at the forefront of international research in building durable roads and in pavement preservation. That’s why PPRS Paris 2015 should be on your “bucket” list for this February!

So many of today’s high-performance thin surface treatments – like NovaChip™, for example – were originated in French labs and proven on French pavements long before they were brought to North America. You owe it to your customers – to see the next generation of pavement preservation surface treatments from France at PPRS Paris 2015.

The three day event will include conferences, workshops, an exhibition and technical visits. Co-sponsored by the Asphalt Emulsion Manufacturers Association, the Asphalt Recycling & Reclaiming Association, the International Slurry Surfacing Association, the Pavement Preservation & Recycling Alliance, International Bitumen Emulsion Federation, and FP² Inc., PPRS Paris 2015 constitutes a single international event and venue for all key players in pavement preservation.

BRING YOUR SPOUSE!

With a wealth of history, monuments and museums, and a shared history, Paris is the most popular destination for tourists from the United States. Paris is the cultural capital of France. Paris is the perfect place for tourism, with its monuments and museums, including the Eiffel Tower, Notre Dame Cathedral, Sacré-Coeur and so many more.

PPRS-bound pavement preservation stakeholders will be able to mix business with pleasure, and many are bringing spouses. And for U.S. citizens it’s tax-deductible!

A gala evening affair will be held at the Moulin Rouge, France’s most legendary cabaret. Its original Belle Epoque décor will welcome delegates for a traditional French dinner and an unforgettable show.

In addition to the international technical presentations and plenary sessions, the event will encompass the 6th World of Emulsions, the 42nd annual meeting of AEMA, the 39th annual meeting of ARRA, the 53rd annual meeting of ISSA, and the 2nd International Conference on Pavement Preservation.

PPRS Paris 2015 offers much more to the integrated annual meetings of AEMA, ARRA or ISSA than you will ever experience in a North American convention. Delegates to the AEMA, ARRA and ISSA meetings in February also will experience international technical presentations and plenary sessions, the 6th World of Emulsions exposition, and the 2nd International Conference on Pavement Preservation. Kill many birds with one stone via your trip to PPRS Paris 2015!

FP² SUPPORTS PPRS PARIS 2015

PPRS Paris 2015 is guided by an organizing committee composed of Etienne Le Bouteiller, executive director, IBEF; Jean-Claude Rothé, special advisor to the president, Colas S.A.; Mike Krissoff, executive director, AEMA, ARRA and ISSA; and Jim Moulthrop, executive director, FP².

An exhibition hall with a capacity of about 40 stands will be available. The exhibition will give manufacturers and suppliers of equipment and raw materials, design and research departments and the industries, companies and associations representing them an opportunity to present their specialties.

FP² Inc. strongly supports PPRS Paris 2015. It’s part of its mission! FP² was a driving force behind both the National Pavement Preservation Conference in Nashville in August 2012, and was a co-sponsor of the 1st International Conference on Pavement Preservation in September 2010 in Newport Beach. That’s why FP² is a co-sponsor of the Pavement Preservation and Recycling World Summit this February in Paris.


IMage CReDIT: WIKIMeDIA COMMONS

HOW FP² WORKS FOR YOU
CIR, Thin Seal Work Wins Norjohn Ontario Green Award

An Ontario roadbuilding contractor has been honored with an award for environmental leadership and sustainability for its work for Haldimand County, Ont.

Norjohn Contracting and Paving Limited, a subsidiary of Walker Industries, Thorold, Ont., was honored in April with the 2014 ORBA Green Leadership and Sustainability Award by the Ontario Road Builders’ Association, in partnership with the Ontario Ministry of Transportation and the Ontario Good Roads Association.

The 2014 award recognizes Norjohn Contracting and Paving Limited’s work in Haldimand County, where the company used alternatives to traditional paving methods to reduce the amount of energy and resources consumed during granular conversion and road resurfacing, while achieving an equivalent strength and improved seal over the traditional method.

The work involved the conversion of 139,000 sq. m. (166,242 sq. yd.) of gravel roads to hard surface, and using cold recycled mix for over 75,000 sq. m. (89,700 sq. yd.) of road resurfacing. Norjohn developed and placed an innovative cold in-place recycled asphalt mix, using recycled materials in place of traditional virgin aggregate for resurfacing, delivering a cleaner and more enjoyable ride for motorists and an upfront cost savings to the municipality.

For the gravel road conversion to hard surfacing, Norjohn placed a 70± mm base lift of cold recycled mix and a 10± mm surface treatment (single lift). Norjohn used 100 percent RAP in the cold recycled mix in Haldimand County, which was placed using a specialized mixing paver that blends the processed RAP with asphalt emulsion (HF 150M).

For the road resurfacings, Norjohn provided an alternate method, using a base lift of cold recycled mix and a thin layer of bonded wearing course that is comparable to hot mix asphalt in strength, drainage, and life span, the firm said, adding the method is lower cost, conserves virgin aggregate material, and produces fewer emissions both on and off-site.

A single pass paving process, the BWC consists of a heavy application of polymer modified asphalt emulsion membrane, followed by an ultra-thin hot mix asphalt surface, both placed by the same machine. A specialized spray paver incorporates a storage tank and distribution system, allowing the emulsion to be placed immediately in front of the hot mix.

The ORBA award was established in 2010 to recognize environmental leadership and sustainability measures in the construction of Ontario’s transportation infrastructure. It recognizes contractors who go beyond the scope of requirement on a specific project or develop or adopt innovative ways and means of carrying out business activities in support of the objective of environmental protection and sustainability.
ALL STATES MATERIALS GROUP LEADS THE INDUSTRY WITH INNOVATIONS IN PAVEMENT PRESERVATION TECHNOLOGY.

WITH THE SUBSTANTIAL RESOURCES OF ASMG BEHIND THEM, OUR TECHNICIANS ARE ENGINEERING THE USE OF TODAY’S RESOURCES TO BUILD AND PRESERVE AN EFFICIENT, HIGH-QUALITY, SUSTAINABLE INFRASTRUCTURE FOR TOMORROW.

AND, WITH ASMG’S EXTENSIVE MANUFACTURING, STORAGE, AND DISTRIBUTION NETWORK, THESE INNOVATIVE SOLUTIONS ARE DELIVERED COST-EFFECTIVELY THROUGHOUT THE NORTHEAST.
What Do You Expect?

Typical Application

TRACKLESS TACK = THE RIGHT CHOICE

- Fast Drying
- "Ready-to-Use" No Time Consuming or Confusing Dilution Necessary
- Eliminates Tracking
- Environmentally Friendly - No Measurable PAH’s (Polycyclic Aromatic Hydrocarbons)
- Stops Slippage and Delaminating with Superior Bonding Strength
- Economical and Improved Stability
- Minimizes Equipment Clean up Time
- No Measurable VOC’s (Volatile Organic Compounds)
- Better Density With Less Compaction Effort

TRACKLESS TACK

Typical Application

"Ready-to-Use" No Time Consuming or Confusing Dilution Necessary
Environmentally Friendly - No Measurable PAH’s (Polycyclic Aromatic Hydrocarbons)
Economical and Improved Stability
No Measurable VOC’s (Volatile Organic Compounds)
Better Density With Less Compaction Effort

Moving Pavement Preservation Forward

- Overband Crack Seal
- Polyfil™
- Stress Absorbing Membrane Interlayer (SAMi)
- FiberMat™ Type A and B
- Slurry Seal
- Micro Surfacing
- Black Mat FC™
- Cape Seal

PROFESSIONALS DEDICATED TO PRESERVING AMERICA’S ROADWAYS

1595 Frank Road
Columbus, OH 43223
Tel 614.276.5501
Fax 614.276.0570
www.strawserconstruction.com
Digging PCC ‘Buried Treasure’ Beneath Asphalt Overlays

By Kristin Dispenza

Road agencies and contractors alike are “digging” the buried treasure that lies concealed under asphalt overlays.

The Buried Treasure approach to concrete pavement preservation (CPP) got its name because it reclaims assets that have been previously hidden below grade. It’s a pavement preservation strategy that uncovers and renews aged portland cement concrete (PCC) pavement which has been overlaid with asphalt due to non-structural issues such as poor ride quality and excess tire/pavement noise. The method has been gaining popularity due in part to paving material’s price escalation, as well as the need to minimize unnecessary traffic disruptions for today’s motorists.

Because it’s imperative to determine an underlying pavement’s viability before a project can be planned and executed, the advancement of Buried Treasure CPP has been predicated on the availability of modern non-destructive testing tools.

Ground penetrating radar, for example, can be useful in determining whether existing concrete pavements under an asphalt overlay are experiencing void problems. Alternatively, if concrete core samples are taken as part of the project scope, the core hole can be used as a pathway for a dynamic cone penetrometer to be used to measure the stiffness of the subbase material. Another option for determining the strength of underlying pavement is to compare falling weight deflectometer values from before and after placement of the asphalt overlay, if those data have been collected.

For example, New Jersey S.R. 21 – an urban freeway in Newark, N.J. – was 5.9 miles long and consisted partly of elevated roadway using curbs and gutters for storm water drainage, and partly of rural interstate design with paved shoulders and open ditch drainage.

By the early 1990s, this stretch of Highway 21 was experiencing a large number of wet weather accidents and had less than desirable skid numbers. To address the problem, a micro surfacing treatment was applied in 1993. Delamination of this treatment led to a second micro surfacing treatment in 2001, which also suffered from delamination, partially due to the condition of the underlying pavement. By 2008, major repairs were deemed necessary.

In addition to using precast panels for full depth repair on some areas and performing partial depth patching on other areas, the New Jersey DOT decided to try an innovative CPP approach: removing the asphalt overlay and diamond grinding the underlying concrete pavement.

Due to the potential for slab cracking, slab stabilization was included in the contract. The underlying soils were primarily unstabilized silts and sands and were therefore susceptible to washouts under the transverse concrete joints. Polyurethane grout was chosen for the slab stabilization work that was done at each joint along the 9.8 miles of roadway, totaling 400 joints in the northbound lane and 300 in the southbound lane.

The shallow placement of the steel reinforcing mesh in the original pavement had been a concern for project engineers from the outset of the job. In order to minimize contact with the steel mesh, the asphalt milling and removal operations had to be performed within tight tolerances in order to leave as much of the protective concrete cover as possible.

The diamond grinding contractor, Interstate Improvement, Inc. of Fairbault, Minn., requested that the asphalt milling contractor leave a thin layer of asphalt on the concrete surface. This remaining asphalt would be removed later by the diamond grinding equipment minimizing section removal and possible contact with the steel mesh.

Ride quality data collected at the completion of the project exhibited a big improvement over the pre-grind ride profile. In December 2007, the pavement had an average IRI of 160.94 inches per mile. After diamond grinding was completed on the underlying pavement, the final IRI was an average of 112.00 inches per mile – an improvement of 30 percent.

The bid price for the removal of the micro surfacing overlay was $784,245 for 266,720 sq. yd. at a unit price of $2.94. The bid price for the diamond grinding was $1.9 million for 266,720 sq. yd. at a unit price of $7.63. With the ever increasing cost escalation of paving materials, the value of the asphalt millings should be considered in the overall cost of a Buried Treasure CPP project. Using the bid tabs on the S.R. 21 project, it was determined that a one inch micro surfacing overlay generated approximately 0.05 tons of RAP per sq. yd. The value of the RAP can be taken into account at the time of bids.

The concrete pavement on New Jersey S.R. 21 is yet another example that an urban freeway with curb and gutter drainage can be rehabilitated with concrete pavement preservation techniques at a competitive cost in an environmentally friendly manner.

Edited from information submitted by the International Grooving & Grinding Association.
2015 Pavement Test Track Conference
March 3-5, 2015
The Hotel at Auburn University and Dixon Conference Center
Auburn, Alabama

› WMA & High RAP/RAS/GTR Mixes
› Open-Graded Friction Courses
› Pavement Preservation
› Optimized Structural Design

Official registration information is available at www.ncat.us

RECLAIM. REUSE. RECYCLE.
REMARKABLE.
Cold In-Place Asphalt Recycling
Full Depth Reclamation
Soil Stabilization
Crack Sealing
Micro-surfacing
Ultra Thin Hot Mix

E. J. BRENEMAN, LP
CORPORATE
1117 Snyder Road, West Lawn, PA 19609 • P 610-678-1913 • F 610-678-9691
FLORIDA
3748 Copeland Drive, Zephyrhills, FL 33542 • P 813-377-1157 • F 813-377-1158
mpolak@ejbreneman.com • cevers@ejbreneman.com • www.ejbreneman.com

BENEDICT
BASIC MANUAL COHESION TESTER
WET TRACK ABRASION TESTER
LOADED WHEEL TESTER

Benedict Slurry Seal
Dayton, OH 45403 • sales@benedictsllury.com
Ph.: 937-298-6647 • Fax: 937-254-2991
www.benedictsllury.com
Polymer-Based Materials for Unpaved Road Maintenance

By Yetkin Yildirim, P.E.

The University of Texas at Austin recently has developed polymer-based sealant materials intended for use on unpaved roadways. These materials, a dust control agent as well as a base stabilizer and sealant, have been evaluated and exhibit high-performance as an option for unpaved roadway maintenance. For example, oil drilling operations in Texas’ Permian Basin have resulted in extremely serious and even dangerous dust, visibility and particulate emissions problems, with dust clouds completely obscuring the rights-of-way.

When using the polymer-based dust control agent on an unpaved roadway, no washing out is observed. This will result in maintenance that is less expensive and labor intensive than water-based dust control.

The initial application and occasional maintenance applications are expected to provide a continuous and permanent accumulation of the polymer into the soil. Eventually, the dust particles will be overwhelmed by the presence of the control agent and the frequency between maintenance applications, and the cost of controlling dust pollution, is expected to be dramatically reduced.

For a more hearty treatment, UT has also developed an unpaved roadway base stabilizer and sealant. This polymer-based sealant is a liquid soil stabilizer and additive that binds and transforms the base into a solid, yet flexible mass that resists fracturing and moisture.

Its performance indicates that it should be expected to prevent base failure, dust pollution and soil erosion, as well as increasing soil strength and reducing permeability, therefore preventing water damage. Lab-testing the University of Texas has revealed that this polymer sealant’s strength is higher than cement stabilization. Other tests have shown that its resistance to moisture significantly exceeds EPA standards.

The polymer-based emulsion is suspended in water. As such, it is non-petroleum and evaporating only water during the curing process, emitting no volatile organic compounds. In laboratory use, it was observed to be easily applied, requiring the same equipment and handling procedures as other sealant materials.

The strength and permeability properties of these polymer materials which make them ideal for unpaved roadway maintenance also make them ideal candidates in areas subject to heavy water damage, such as roadways in the flood plain or coastal roads.

The usage of a sealant material directly correlates to the life of an unpaved roadway. The material used on the unpaved roads needs to be of a high enough quality that it will be able to resist water damage, especially in regions expecting heavy water damage. In heavy rainfall or flooding situations, if the road materials fail to resist erosion, it is almost guaranteed that the rest of the road structure will also fail. Addition of even 1 percent sealants into the materials used for unpaved roads will improve the performance significantly. A research study conducted at the TPPC showed that 1 percent polymer stabilization can drastically prevent erosion.

Further investigating the benefits of polymer-based materials in unpaved roadway maintenance, the TPPC has proposed to evaluate the feasibility of using polymer materials on unpaved roadways in a recent research proposal for the Texas DOT, which will confront the financial implications of converting low volume surfaced roadways to un-surfaced roadways. Whether planned or unplanned, such conversions are typically required before, during or after resource management operations in rural areas, such as wind farm construction or oil drilling operations.

The study would examine the benefits and costs to Texas DOT and the state of such temporary conversions during resource management operations. Currently, the purposed conversions happen as a reactionary process after the roadway has already been severely damaged by heavy traffic. This project will provide methods, cost analysis and guidance in pre-planning conversion operations on low-volume roadways which are scheduled to receive heavy trafficking due to resource management operations such as natural gas extraction and wind farm construction.

With proper planning, the unexpected costs associated with low-volume roadway deterioration during resource management operations has the potential to be mitigated by preemptive conversions of low-volume roadways to un-surfaced roads, before the expected damages occur.

What’s more, polymer-based materials, such as those recently developed at UT, provide an attractive method for sealing such roadways prior to resource management operations. Results of this study will assist TxDOT in dealing with these issues with the most efficient and cost-effective approach.

Yildirim is director, Texas Pavement Preservation Center at the University of Texas-Austin.
# Index of Advertisers

## ASPHALT

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>All States Asphalt, Inc./DBA All States Material Group</td>
<td>33</td>
</tr>
<tr>
<td>Calumet Specialty Products Partners, LP</td>
<td>34</td>
</tr>
<tr>
<td>General Liquids Canada</td>
<td>27</td>
</tr>
<tr>
<td>National Asphalt Pavement Association</td>
<td>12</td>
</tr>
<tr>
<td>Paramount Petroleum</td>
<td>26</td>
</tr>
</tbody>
</table>

## ASPHALT ADDITIVES & MODIFIERS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASF Corporation</td>
<td>14</td>
</tr>
<tr>
<td>Calumet Specialty Products Partners, LP</td>
<td>34</td>
</tr>
<tr>
<td>Road Science, Division of ArrMaz</td>
<td>17</td>
</tr>
<tr>
<td>Ultrapave Corporation</td>
<td>24</td>
</tr>
</tbody>
</table>

## ASPHALT DISTRIBUTORS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>E D Etnyre &amp; Company</td>
<td>13</td>
</tr>
<tr>
<td>Calumet Specialty Products Partners, LP</td>
<td>34</td>
</tr>
<tr>
<td>Cleveland Asphalt Products</td>
<td>18</td>
</tr>
<tr>
<td>Ergon Asphalt &amp; Emulsions, Inc.</td>
<td>5</td>
</tr>
</tbody>
</table>

## ASPHALT EMULSIONS OR EMULSIFYING AGENTS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calumet Specialty Products Partners, LP</td>
<td>34</td>
</tr>
<tr>
<td>Cleveland Asphalt Products</td>
<td>18</td>
</tr>
<tr>
<td>Ergon Asphalt &amp; Emulsions, Inc.</td>
<td>5</td>
</tr>
</tbody>
</table>

## ASPHALT EQUIPMENT & SUPPLIES

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sealmaster</td>
<td>Inside Front Cover</td>
</tr>
</tbody>
</table>

## ASPHALT PRODUCTS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>McAsphalt Industries Limited</td>
<td>Inside Back Cover</td>
</tr>
<tr>
<td>Unique Paving Materials</td>
<td>30</td>
</tr>
<tr>
<td>TRICOR Refining, LLC</td>
<td>23</td>
</tr>
</tbody>
</table>

## COMPUTER HARDWARE & SOFTWARE

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colorado State University</td>
<td>19</td>
</tr>
</tbody>
</table>

## EMULSIONS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crafco, Inc.</td>
<td>4</td>
</tr>
</tbody>
</table>

## HOT-IN-PLACE RECYCLING

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dustrol, Inc.</td>
<td>13</td>
</tr>
</tbody>
</table>

## LAYDOWN CONTRACTORS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strawser Construction Inc.</td>
<td>34</td>
</tr>
</tbody>
</table>

## MAINTENANCE & REPAIR SERVICES

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skidabrader</td>
<td>20</td>
</tr>
</tbody>
</table>

## PAVEMENT MAINTENANCE PRODUCTS

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unique Paving Materials</td>
<td>30</td>
</tr>
</tbody>
</table>

## PAVEMENT PRESERVATION

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Materials, Inc.</td>
<td>18</td>
</tr>
<tr>
<td>Asphalt Systems, Inc.</td>
<td>29</td>
</tr>
<tr>
<td>E.J. Breneman LP</td>
<td>36</td>
</tr>
<tr>
<td>Fibrecrete Technologies, LLC</td>
<td>7</td>
</tr>
<tr>
<td>Malti.com</td>
<td>22</td>
</tr>
<tr>
<td>Tricon Refining, LLC</td>
<td>23</td>
</tr>
</tbody>
</table>

## PAVEMENT PRESERVATION CONTRACTOR

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norjohn Contracting &amp; Paving</td>
<td>19</td>
</tr>
</tbody>
</table>

## RECYCLING EQUIPMENT

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wirtgen America</td>
<td>3</td>
</tr>
</tbody>
</table>

## REPAVING

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutler Repaving, Inc.</td>
<td>18</td>
</tr>
</tbody>
</table>

## SPREADERS - STONE, SAND & CHIP

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>E D Etnyre &amp; Company</td>
<td>13</td>
</tr>
</tbody>
</table>

## TANKS - BULK STORAGE/TRANSPORT

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>E D Etnyre &amp; Company</td>
<td>13</td>
</tr>
</tbody>
</table>

## TESTING EQUIPMENT, MATERIALS & MEASUREMENT

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benedict Slurry Seal, Inc.</td>
<td>36</td>
</tr>
</tbody>
</table>
THE RIGHT MIX

From manufacturing to healthcare to education, roads are essential for providing access to the goods and services we need to ensure our quality of life.

That’s why, at McAsphalt, we specialize in providing asphalt products that go the extra mile. For more than 40 years, we’ve been the industry’s leading asphalt experts. Our customers trust us to be a partner and advisor. To deliver on our promises, “on time and on spec.” To engineer innovative asphalt products for everyday use and extreme conditions.

From technical support to training to R&D, we’re committed to delivering the asphalt products that keep Canada moving.

Visit us at mcasphalt.com to find out what we can do for you.
Asphalt emulsions have been used in roadway maintenance for over a century. In the past two decades, the industry has produced a variety of innovations to make emulsions more stable, user friendly, and environmentally safe.

Polymer modification of the asphalt is one such advance, giving the product increased ductility and toughness. The invention of PASS emulsions in the 1980’s was another significant advance. PASS was the first product to combine a premium latex polymer with a rejuvenator to create a tough yet flexible emulsion that seals cracking and helps restore the properties of asphalt that disappear with age and effects of extreme weather.

Only PASS emulsions offer an engineered solution for greater longevity of each treatment and a wider range of Pavement Management Strategies to allow agencies to stretch their maintenance dollars. Independent research shows PASS products last longer and work more effectively to preserve roadways.

Visit www.preventpotholes.com for technical details and videos on Pavement Preservation, Resurfacing and Recycling applications.

PASS is a registered trademark of Western Emulsions Inc. ©2013