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On the Cover: Micro surfacing is applied as “scratch” course.
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Right Treatment
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2011: New Year for Preservation, FP²

Next year, A.D. 2011, will be a new year, and we hope a great year, for pavement preservation. That's because in 2010, not a day goes by that we don't hear or see something new in pavement preservation or asset management.

On the government side, more and more state departments of transportation, and more and more of America’s counties and cities, are realizing that in an age of greatly restricted budgets, they have got to use maintenance dollars to prolong the life of their streets, and pavement preservation principles articulated by FP², Inc., and its supporters are the way to make it happen.

It’s a lesson that the city of Los Angeles learned early in the last decade, when cash flow problems related to California’s Prop 13 — which dramatically cut taxes, including resources used for street repairs and paving — meant L.A. had no choice but to incorporate pavement preservation principles into its program.

As a result, Los Angeles incorporated two strategies into its long-term pavement preservation program: rubberized asphalt slurry seals to prolong the life of its good pavements, and foamed asphalt and asphalt emulsion base recycling for failed pavements.

PRESERVATION TECHNOLOGY IN FOCUS

FP² will keep the technologies of pavement preservation in focus in 2011. For example, building on the strengths and success of the first International Conference on Pavement Preservation held in California in April, FP² is still on track to quarterback a national pavement preservation conference for 2012, and a second international conference in 2014. Proposals continue to roll in for both of these events.

Along those same lines we look forward to attending FP² founding member International Slurry Surfacing Association’s 7th ISSA World Congress held in Lyon, France.

At the April conference, over 400 participants from 21 countries and 40 states attended the conference, which was dedicated to the late Jim Sorenson, senior construction and system preservation engineer, Office of Asset Management of the Federal Highway Administration. The conference was organized by FHWA, Caltrans and FP², Inc.

If you didn’t have a chance to attend, be sure to see our extensive coverage of the conference in the Fall 2010 Pavement Preservation Journal, pp 24-31. Also, all the papers or presentations can be found on the conference website at www.pavementpreservation.org/icppl.

And our industry members continue to tweak and improve the application methodologies and materials technologies of micro surfacing, about which you may read in this issue.

REAUTHORIZATION INCHES FORWARD

Finally, as we look forward to 2011, with the $50 billion infrastructure plan released by the Obama administration in September, the administration has recognized the need for an infrastructure-based surface transportation program reauthorization.

We in the transportation industry have long known that for every $1 invested in infrastructure, there is a $4 return to the economy. Our advocacy group in Washington, D.C., Williams & Jensen, is working hard on our behalf to have pavement preservation recognized in program reauthorization. We are cautiously optimistic that we will prevail with favorable language in the bill when it is finally passed.

Regional pavement preservation partnerships continue to grow, and their convocations are well attended. For example, a new partnership has been formed in Florida in conjunction with the National Center for Pavement Preservation. Regional partnerships are a vital way for industry and DOT partners to interact, educate each other, and disseminate the good word of pavement preservation.

Finally, FP² needs your support. All of these efforts don’t just happen. Our efforts “inside the Beltway” — as well as support for research, symposia and regional partnerships — is expensive. We appreciate those supporters who have stepped up to the plate to make this all possible, and we will be encouraging those that haven’t to do so. Your support will help make 2011 a success!
Micro Surfacing Scores High Points in Ecological Sustainability, Efficiency

By Paul Fournier

An independent standards development organization has verified the findings of an eco-efficiency analysis (EEA) of asphalt pavement technologies which shows micro surfacing using a styrene-butadiene-rubber (SBR) latex polymer to be more economical, and to cause less environmental impact, than “mill and fill” utilizing hot mix asphalt.

(Editor’s Note: While micro surfacing was determined by the research to be more economical than mill and fill as a surfacing, micro surfacing does not provide the structural enhancement to the pavement than does a mill and fill with HMA overlay.)

NSF International, a not-for-profit, non-governmental organization that develops national standards and provides third-party conformity assessment services, has verified a report submitted by BASF Corporation detailing the methods and findings of its Micro Surfacing Eco-Efficiency Analysis. Established in 1944, NSF is accredited by the...
American National Standards Institute (ANSI) to develop standards and serves clients in 80 countries from 26 offices and laboratories worldwide.

**EXACTING CERTIFICATION**

Eco-efficiency is a term first coined by the World Business Council for Sustainable Development in 1992. BASF technical development leader Arlis Kadrmas, a member of the group that prepared the EEA report, explained that eco-efficiency is “a broad measure of sustainability, which calculates the environmental and economic impact of products or processes over their entire life cycle.” This approach goes beyond the current International Organization for Standardization (ISO) standard for life cycle assessment, which only considers environmental impacts.

Certification of the Micro Surfacing EEA indicates the NSF has determined the EEA complies with its Protocol P352: Validation and Verification of Eco-Efficiency Analyses. NSF developed this protocol to help provide an independent, third-party guideline for conducting an eco-efficiency analysis as well as provide a framework for verifying the conformity, quality and transparency of completed studies.

Headed by Bruce Uhlman, BASF senior sustainability specialist, a group of BASF and external experts conducted the study over a nine-month period and submitted its final report for verification. The full report is posted online by NSF at [www.nsf.org/business/eco_efficiency](http://www.nsf.org/business/eco_efficiency).

The study findings were presented at the March 2010 annual convention of the International Slurry Surfacing Association (ISSA), which was held in conjunction with the annual meetings of the Asphalt Emulsion Manufacturers Association (AEMA) and the Asphalt Recycling & Reclaiming Association (ARRA). The combined event was attended by representatives of 145 companies involved in pavement preservation and rehabilitation. ISSA also planned to present the study findings at its 7th annual congress scheduled for Lyon, France on Oct. 13, 2010.
MILL AND FILL VERSUS MICRO SURFACING

The BASF EEA compares total life cycle environmental impacts and costs of a 2-in. mill and fill asphalt overlay with those of a cold mix, polymer modified asphalt emulsion-based micro surfacing, with a defined customer benefit as a goal. For purposes of establishing a common unit of comparison between the alternatives, the customer benefit is developed and defined as the pavement preservation of a 1-mile stretch of a 12-ft. lane on an urban road using the two technologies to produce similar profiles and performances over a 40-year period.

These two alternatives were chosen because they are among the most common technologies used for extending the service life of existing pavements across the U.S., and constitute a substantial share of the market.

Micro surfacing is a pavement preservation method employing cold mix slurry made on the job site by mixing aggregate, mineral filler such as portland cement, water, and a polymer-modified asphalt emulsion. The polymer used for the analysis is styrene-butadiene-rubber (SBR) latex. Suitable for heavily traveled roads, micro surfacing can accept traffic in an hour, and is used for wearing courses, leveling surfaces and filling wheel ruts. For the analysis, ISSA quantity guidelines, i.e., 20 lbs. of material per square yard for wheel rut filling, and 25 lbs. per square yard for surface treatment, were used. Micro surfacing was assumed to have a durability of six years.

Mill and fill consists of removing existing surface pavement with a milling machine and hauling the filled material to a storage site. New asphalt plant mix, often containing some recycled asphalt pavement (RAP), is installed to replace the milled-out material. The EEA assumed RAP content to be 10 percent for the primary study case, but also examined another scenario where 40 percent RAP was assumed. A 2-in. compacted depth was assumed for the overlay, with a durability of 11 years. At a thickness of two inches, mill and fill is considered a structural pavement fix. The EEA also studied a second scenario, one assuming a durability of 17 years for the same thickness.

LIFE CYCLE COSTS

The life cycle costs analyzed in the EEA were those occurring in manufacture, delivery and installation of each product over the life cycle of the road, together with disposal costs. The study considered the time value of money and calculated the net present value of all future costs.

The research found that, in general, mill and fill uses about 2.5 times as much aggregate, and more than twice as much asphalt binder, than micro surfacing, in order to produce the same customer benefit over a 40-year life cycle. These facts contribute to the finding that micro surfacing has the lowest overall material and...
labor costs. Life cycle costs for micro surfacing were more than 25 percent lower than mill and fill, despite the fact micro surfacing lane striping costs were higher due to more frequent applications. Table 1 shows the component costs.

**THE ENVIRONMENTAL BURDEN**

Examination of life cycle environmental impact, or “environmental burden” as sometimes referred to in the analysis, considered six main categories: primary energy consumption, raw material consumption, emissions (air, water and solid waste), land use, toxicity potential and risk potential.

**Energy and Resource Consumption.** As mill and fill using hot mix asphalt requires hotter production and application rates, and uses more asphalt and aggregate than micro surfacing, micro surfacing consumes about 40 percent less primary energy than mill and fill over the life cycle.

The bulk of raw material consumption — the most relevant environmental impact category for the study — is attributable to the asphalt binder, aggregate, road markings, end-of-life disposal and transportation of products. Even when considering the use of RAP in the asphalt mix overlay, the study found that micro surfacing uses over 50 percent less resources by mass.

**Air, Water and Solid Waste Impacts.** Air emissions — the most significant emissions category in the study — include greenhouse gases, photochemical ozone creation potential (summer smog), acidification potential, and ozone depletion potential.

Greenhouse gases (GHG), which trap heat in the atmosphere, include carbon dioxide and methane, entering the atmosphere primarily through the combustion of fossil fuels such as oil, natural gas and coal. The highest carbon fingerprint determined in the EEA occurred in the mill and fill alternative, with...
micro surfacing GHG emissions lower by almost 45 percent.

Photochemical ozone creation potential caused principally from methane and non-methane volatile organic compounds emitted from combustion of transportation fuels was lowest for micro surfacing. It was higher for mill and fill because that alternative requires over twice the amount of material to be shipped to and from manufacturing and job sites.

Acidification potential resulting primarily from nitrous and sulfur oxides emissions during the burning of fuel oil to heat aggregate and asphalt was greatest for mill and fill, which requires higher manufacturing and application temperatures.

Ozone depletion potential coming predominately from materials used to manufacture thermoplastic striping material used in lane striping was the least relevant air emission for both micro surfacing and mill and fill.

With regards to water emissions, micro surfacing has the highest critical water volume requirement, attributed primarily to the manufacture of lane striping materials. Excluding the impact of road markings, the remaining water emissions for each alternative are about the same.

Solid waste emissions included those from municipal, special, construction and mining wastes. They are principally the result of sending materials to landfills for disposal. Even when considering the perpetual use of RAP content, the study finds that mill and fill still has the highest impact in this category due to the much greater quantity of materials.

Taken together, the analysis showed the cumulative effects of air, water and solid waste emissions on the environment were greatest for mill and fill.

LAND USE, HUMAN HEALTH AND RISK

With respect to the impact caused by the two technologies on the biodiversity of our ecosystems, the EEA found that energy required to produce and apply mill and fill is the largest contributor to land use. Mining wastes as generated from aggregate production as well as solid waste disposal of un-recycled materials also contribute to the impact on land use.

How human health is directly impacted by the toxicity potential of the two technologies is investigated in depth in the EEA, with specific weighting percentages assigned to the production, use and disposal phases of the 40-year life cycle. The use phase has the highest weighting since the applications of the technologies subject people to the greatest exposure to the materials. Since mill and fill requires more than twice the amount of materials, it scores highest in this category.

Risk potential, the last major category of environmental burden examined by the EEA, considers the
number of working accidents, fatalities, illnesses and diseases associated with the production, use and disposal of materials. The risk potential for occupational illnesses and accidents for both technologies is highest for the aggregate materials, and since mill and fill employs much greater amounts of aggregate than micro surfacing, it also scores much higher in risk potential.

In commenting on this section of the EEA report, Tim Harrawood, a member of the study group and current president of ISSA, pointed out there are social benefits of micro surfacing for both construction workers and motorists: “High production rates lead to less time on the project, fewer traffic delays and reduced exposure to construction zone accidents,” Harrawood said.

SUMMATION OF EEA FINDINGS

Evaluating the individual environmental impact categories, the EEA finds that mill and fill has the highest environmental impact on a weighted basis in all main categories. Micro surfacing performs best in all main categories on a weighted basis because it requires less than 50 percent of materials than that for mill and fill, while maintaining the desired customer benefit.

Furthermore, although applied more frequently, micro surfacing scores lowest in resource consumption — the most relevant environmental impact for the study — because of its significant reduction in the amount of binder and aggregate used. This materials reduction also benefits micro surfacing in toxicity potential and risk potential.

Micro surfacing also scores lowest in energy requirement — the second most relevant environmental impact — because of its lower overall consumption of asphalt binder, lower manufacturing and application temperatures, and reduced logistical impacts due to shipping less material to and from the job site.

The BASF EEA methodology combines the six individual environmental impact categories into a single relative environmental score, and balances that with the life cycle cost for each alternative in order to determine its relative eco-efficiency. The study findings support that micro surfacing is the more eco-efficient alternative for urban road pavement preservation due to its combination of lower environmental burden and lower life cycle cost.

Edited by Pavement Preservation Journal from material contributed by the International Slurry Surfacing Association and BASF Corp. The BASF Corporation Eco-efficiency Analysis report was prepared by Bruce Uhlman, senior sustainability specialist; Jim Andrews, marketing manager; Pete Montenegro, marketing manager; Arlis Kadrmas, technical development lead; Luke Egan, technical service manager; BASF; and Tim Harrawood, manager, Vance Brothers, Inc. Fournier is a freelance writer in the construction industry.
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Chips, Polymers, Emulsion and Fibers Provide New Crack-Absorbing Membranes for Texas Roads

Texans know that chip seals are a very cost-effective pavement preservation treatment for all types of streets and highways, from residential subdivisions to rural farm-to-market roads, to heavily trafficked interstates.

Texan cities and counties, as well as the Texas Department of Transportation, regularly protect their pavements with chip seals in climates ranging from very hot to cold, and from very dry to humid. They use conventional emulsion, polymer modified emulsion, hot applied and crumb rubber modified chip seals, selecting the process that works best for their local conditions.

But chip seals remain effective only as long as they continue to seal the pavement against moisture, and retain their skid resistance. When there is visible cracking, it’s time for crack sealing or another chip seal. Extending the time before cracks appear also extends the life of the seal, lowering user delays and improving life cycle costs.
TEXAS DEMONSTRATION PROJECTS

Four recent demonstration projects added an exciting new crack-absorbing membrane technology to the "pavement preservation toolbox" in Texas. Colas Solutions Inc. recently introduced to Texas an innovative blend of asphalt emulsion, polymers and fiber reinforcement for a durable, crack resistant surface treatment known as FiberMat Type A.

During a one-week period in June 2010, the process was applied on highways in two different TxDOT districts, as well as on several residential city streets, and a county road project. These were all roads originally scheduled for chip sealing.

The agencies decided to try the product reputed to extend the lives of surface seals. “We wanted to explore the possibility of getting a longer service life out of a seal coat surface treatment by delaying reflective cracking, compared to the service life of a conventional chip seal,” said Brad Haugh, Atlanta District maintenance administrator, TxDOT, in northeast Texas.

The FiberMat process is a surface treatment applied much like a chip seal, but it replaces the emulsion distributor spray bar with a purpose-built, trailer-mounted machine. This machine uniformly applies polymer asphalt emulsion, fiberglass strands, and another layer of modified emulsion, in a single pass.

The machine cuts the integrated fibers into the desired length during the application, and travels along the roadway at speeds in excess of 200 feet per minute. The chip spreader follows immediately, covering the fiberglass reinforced emulsion membrane. The new surface is then rolled to seat the aggregate into the surface membrane.

Surface preparation, curing and traffic return are the same as for conventional chip seals. Prior to construction of the Texas projects, the road surfaces were broomed, and some were crack-sealed. Ergon Asphalt and Emulsions, in collaboration with Colas Solutions Inc., supplied the modified emulsions according to Colas specifications for the project.

“I was pleasantly surprised at the ease of placement,” said Cary Brownlee, Ergon regional marketing manager. “The city, county and state workforces all did a great job, and had no problems. It was not that much different from
Extending the time before cracks appear also extends the life of the seal, lowering user delays and improving life cycle costs.

a normal chip seal. There were controls for the projects, and the comparative performance over time will be the true test.”

For the Texas projects, Colas Solutions Inc. provided its FiberMat technology, which has been applied in about 25 states and provinces in North America since 2003, covering nearly 10 million square yards of pavement.

Colas representatives provided the expertise, machine and fiber and the agencies used their own crews, chip spreaders and rollers to help complete the project. Ergon Asphalt and Emulsions, the local emulsion supplier manufactured and provided the modified emulsion meeting FiberMat specifications for the projects. Colas Solutions Inc. worked with Ergon's local Texas emulsion marketing staff and agency officials to set up the projects and arrange for the demonstrations.

Colas Solutions develops and promotes innovative solutions for building, maintaining, and preserving infrastructure. The company focuses on adapting and developing its global solutions and technologies for local needs, emphasizing innovation, and protecting the environment while providing fiscally and environmentally responsible solutions. The FiberMat surface treatment and interlayer systems is just one of the many proven global technologies Colas Solutions is bringing to American roadways.

**LOOP 390 IN HARRISON COUNTY**

The first project was on Texas Loop 390 in Marshall, Harrison County, Texas, just west of its intersection with U.S. 59. The major loop around Marshall provides access to U.S. 80 west and I-20 east and west, and is a major four-lane highway, with high-speed local traffic, as well as heavy cross-country truck traffic.

The 5,700 vehicles it carries per day include 7.8 percent trucks, carrying everything from construction and farm equipment to logs. Several trucks loaded with wind turbine propellers passed by during the job. TxDOT’s Atlanta District let the project, which included their standard chip seal control. The road structure included 10 in. of lime-treated base, and had been covered with three or four seal coats in the past.

The next project was also on a TxDOT highway, but this time in the Lufkin District. U.S. 287 in the Village of
Groveton is a heavily trafficked, two-lane highway that runs through the center of the town.
This road was heavily cracked, with stress cracks evident from the heavy loads. While portions of this road may have been too damaged for the preventive maintenance treatment, the road was scheduled for a chip seal, and should be an extreme test for the crack resisting membrane. A chip seal control was placed on the southbound lane, while the FiberMat seal was placed on the northbound lane.

Both state DOT projects were chipped with Texas Grade 4 (3/8 to 1/2 inch) Type L (lightweight) aggregates. Many agencies have found that lightweight aggregates help prevent vehicle damage by loose chips. The large, angular chips TxDOT uses for chip seals on highways give durable skid resistance.

MEMBRANES IN CENTRAL TEXAS

The FiberMat machine then moved to Bexar County. Beech Trail is a residential road, just outside of San Antonio. Its surface had moderate to severe alligator cracking with no crack sealing. The county chose Texas Grade 5 (1/4 inch) trap rock; a smaller rock is usually preferred for residential areas where there are bicycles, rollerbladers and skateboarders.

A conventional chip seal was placed at each end of the FiberMat section as controls. Ergon again supplied the modified cationic emulsion meeting FiberMat specifications for this, as well as the first two projects.
The last stop was the City of Austin, with projects on Granberry and Courtney Streets, both narrow residential streets. Prior to construction, both streets had light to moderate cracking with most of the cracks sealed.
The city’s emulsion of choice for chip seals is HFRS-2P, and a lot which was adjusted to meet FiberMat specifications for anionic emulsion was used on these projects. A smaller, Grade 6 (nominal sieve number 4) trap rock was used for these residential streets.

This combination of fiberglass sandwiched between layers of highly modified asphalt residue creates a powerful matrix that fills and seals the cracks while absorbing stresses in the pavement structure and delaying further cracking.

Unlike conventional geotextile reinforced interlayers, FiberMat membranes are easily constructed, later easily recycled, and save time and labor on application for the user without the usual wrinkles, rips and tears associated with fabrics.
The Texas demonstrations were attended by many spectators, each looking to see this new technique in person; each looking for new ways to preserve their roads as economically as possible.

“We’ve placed numerous projects in the northeast, with many agencies finding that FiberMat doubles the life expectancy of their chip seal type surface treatments,” said Nelson Wesenberg, Colas Solutions Inc. eastern territory sales manager. “Tests at leading universities have shown FiberMat will resist cracking 30 percent longer than standard treatments.”

FIBERMAT IN EUROPE

The FiberMat process has been used in Europe for many years, and was introduced to America in 2003. It’s appropriate for structurally sound, well-drained pavements with aged or distressed surfaces.
The FiberMat chip seal waterproofs and seals cracked and distressed surfaces, restoring skid resistance and enhancing appearance. It is ultra-thin and can be used to help preserve bridge clearances and curb reveal. And perhaps best of all it is recyclable.
Further, not only can the FiberMat membrane be used as a chip seal as in these projects, it can also serve as a stress absorbing membrane interlayer (SAMI) under a final surface course such as HMA overlays or microsurfacing.

This interlayer crack resistant membrane process is known as FiberMat Type B. The Texas Transportation Institute at Texas A&M University reported in 2007 that specimens containing FiberMat SAMI improved cracking resistance in the TTI overlay tester in the laboratory three to four times more than the control samples. Test sections by the Pennsylvania Transportation Institute on the durability test track at Pennsylvania State University as well as laboratory tests led to their conclusion that FiberMat alleviates or delays the propagation of reflective cracks.
The Texas projects included control sections, all of which were done on another section of the same road (or on nearby roads that were in similar condition), with exactly the same emulsion and stone, by the same crews, with the same equipment, and at the same time as the FiberMat applications.

Therefore it should be very easy to compare the short and long term performance of FiberMat chip seal with the traditional seals. Wesenberg said.

“We’ll be visiting these projects over time to evaluate the performance,” he said. “We expect Texas will have the same outstanding results seen all over the world.”

Although initial costs for FiberMat chip seals are more expensive than conventional chip seals, FiberMat chip seals’ equivalent annualized cost is significantly lower. Because reflective cracking will be greatly delayed, roads treated with FiberMat technology will enjoy a much longer life, giving road professionals another important tool in their pavement preservation toolbox.

“This should be a very valuable process when used at the right time and place,” Brownlee said. “It definitely adds value in giving more life to surfaces with thin cracks. Age will be the true test.”

Information for this article contributed by Colas Solutions, Inc.
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For the past few years, the Utah Department of Transportation (UDOT) was regularly forced to patch and repair a 9-mile section of I-80 — going east and west — that begins at the top of the Wasatch Mountain summit and extends to Salt Lake City. This section is commonly used while traveling through the beautiful tourist attraction of Parley’s Canyon, and to the popular resort town of Park City. It was also a highly used route to the 2002 Winter Olympic Games, held in and around Salt Lake City.

Previously, the state used an open graded surface [friction] course (OGSC) that was made up of a thin layer of hot-mix asphalt which utilized 1/2-inch aggregate, and provided a smooth and attractive ride for motorists. An OGSC surface treatment is designed to have very small voids so precipitation seeps through it and drains off the side of the road.

This process usually works well, but not in this part of Utah. Extremely cold temperatures prevented the treatment from bonding correctly to the existing asphalt overlay. Each winter, precipitation froze before getting the chance to drain and then created major potholes upon thawing. So, the UDOT looked at other surface options.

**MICRO SURFACING TO RESCUE**

“The OGSC lasted only two years and it was failing,” said Deryl Mayhew, UDOT resident engineer, and overseer of the project. “We were patching potholes constantly because the surface was cracking severely. We have many freeze and thaw cycles here because it might be in the 20s in the morning, and then up into the 50s by the afternoon. The OGSC really takes a beating during these cycles, so we decided to see if micro surfacing could do better because of its history of being a good product.”

Utah-based Intermountain Slurry Seal won the Parley’s Canyon I-80 micro surfacing bid. It consisted of six total lanes — three going east and three going west — over a stretch of nine miles. Intermountain Slurry Seal milled the previous surface and then used Bergkamp Inc.’s M1 full-size continuous micro surfacing paver to apply two layers, or a total of over 1.2 million square yards, of Type III micro surfacing treatment. Mayhew drives the route every day to work and said the results have been favorable.

“Last winter we only observed about seven total potholes going both east and west,” Mayhew said. “And honestly, those had more to do with the underlying asphalt surface that failed than the micro surfacing. With the OGSC, we had...”
more than 700 potholes per year for the last two years. The micro surfacing treatment has held up well and doesn’t have the cracking that we saw with the previous treatment.”

CHALLENGES FOR CONTRACTOR

Intermountain Slurry Seal took on many challenges when they executed this high-profile job.

The existing surface was one complication. Micro surfacing is ideal for protecting roads in the early stage of deterioration, and serves as a surface treatment that extends the life of the existing asphalt. But it doesn’t provide structural stability to the road.

With the previous surface in such bad shape, Intermountain Slurry Seal performed a 1 1/2-inch mill to remove the unstable OGSC layers before applying the micro surface. A fine-head mandrel with milling tools, or teeth, only 1/4-inch apart, was used to create a smooth milling surface that appeased ongoing traffic and provided a better bond between the existing asphalt and the new micro surfacing treatment.

UDOT restrictions also were a challenge. With an average traffic volume of 51,000 vehicles going in each direction per day, the UDOT and Intermountain Slurry Seal set up general guidelines to keep traffic moving as efficiently as possible. During rush hours, the contractor was allowed only a single-lane closure, while off hours allowed for a double-lane closure to do the necessary milling and surfacing. Failure to comply with any of these lane closure limitations would result in a penalty of $1,500 for every 15-minute violation.

“We did all of the milling work at night due to traffic restrictions,” said Rusty Price, general manager for the Utah-based Intermountain Slurry Seal branch. “We cut the road the full width every night so it would be ready for motorists the next day. That meant backing up the mills and doing smaller stretches than normal. On an average night, we would cut between 4,500 to 5,000 feet.”

Due to temperature fluctuations, and the considerable amount of snow the Parley’s Canyon area receives, proper bonding of the new micro surface to the existing asphalt was crucial. Intermountain thoroughly cleaned the surface so the pavement would adhere directly to the new treatment. Nearly all of the micro surfacing was done during the day because it adheres better in warmer temperatures, so the contractor was forced to keep a concise schedule.

Intermountain Honored by ISSA Four Straight Years

In recognition of the obstacles it overcame to successfully preserve I-80, Utah-based Intermountain Slurry Seal was honored for a fourth straight year with the International Slurry Surfacing Association’s President’s Award for 2010.

The President’s Award is presented to the contractor that exhibits the highest quality of workmanship, while complying with the best standards of practice. Each candidate is judged on overall customer satisfaction, innovation of the project, appearance of the road, completion time and safety. For more information on the award, visit ISSA’s web site at www.slurry.org.

“This is very important to the crew that performed the work on I-80 and motivates them to continue to raise the bar,” said Rusty Price, general manager for the Utah-based Intermountain Slurry Seal branch. We’ve had an opportunity to do some complicated and challenging jobs over the past four years, and this is an excellent way to pat them on the back for the excellent work and attention to quality they have shown.”
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And environmental concerns were an issue. Half of the job included work around the water shed reservoir that supplies drinking water to area residents. All mill tailings had to be cleaned from the road each day to prevent water contamination. Micro surfacing is a green product and is environmentally safe, but letting it get into the area drinking water was not an option. Parley’s Canyon draws a lot of pop-up rain showers, so the crew watched the weather constantly to ensure the rain didn’t wash anything into the reservoir.

**PRESERVING I-80 FOR LONG HAUL**

The Parley’s Canyon section of I-80 is steep with eight percent grades, is windy, and has limited visibility at night. The project also was unique because the micro surfacing treatment was put on top of a milled asphalt surface, as in most cases, it is laid over the existing asphalt.

Micro surfacing mixtures use four main ingredients, including a polymer-modified emulsion that produces a chemical reaction to force the moisture out, and allows it to set in less than an hour, so traffic can return.

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quickly. In total, Intermountain Slurry Seal used approximately 16,000 tons of Type III aggregate, 1,850 tons of polymer-modified emulsion, 80 tons of portland cement, and 300,000 gallons of water.

To ensure a smooth and long-lasting surface, Intermountain Slurry Seal put the micro surfacing treatment down in two layers. The first layer was used as a scratch coat to smooth and level the milled road. It was applied thicker at about 27 lbs. of aggregate per square yard. The second coat was applied as the final driving finish to provide improved skid resistance and protection against the extreme weather conditions. It also was applied at 25 lbs. per square yard.

“When micro surfing east, we had a traffic control plan where the heavier trucks ran on the right shoulder and the other vehicles ran in the normal right lane,” said Price. “This allowed us to work in two lanes at one time and still meet the UDOT’s requirements. When going west, there wasn’t enough room to do this so we
had to perform most of the micro surfacing in one-lane increments and the center lane at night. With this micro surfacing treatment, I am confident it will hold up better and won’t delaminate from the pavement because it keeps precipitation out.”

**NEW TECHNOLOGY FOR INTERMOUNTAIN**

Intermountain Slurry Seal is a wholly owned subsidiary of Granite Construction, Co., one of the nation’s largest heavy civil contractors and construction materials producers. With a speciality in various pavement preservation methods, Intermountain Slurry Seal’s three branches in Utah, Nevada and California work together and cover most of the western United States.

As a company that prides itself on innovation, it decided to add Bergkamp’s new M1E continuous paver to its fleet, and used it to help complement the original M1 unit’s preservation of I-80. The difference between the two units is that the M1E uses the EMCAD (Electronic Mix Control And Diagnostic) System to simplify maintenance and calibration, and help the owner or operator better monitor production rates and costs. Intermountain Slurry Seal grew excited about the paver’s new technology and bought it after seeing how the technology performed on other Bergkamp pavers.

“We still like our other units, but we felt this was the direction in which the industry was going,” said Price. “This machine doesn’t have any chains or sprockets because it is all hydraulically driven, and it has cut our calibration time in half. And with this new technology’s computerized monitoring system, we know the percentage of each micro surfacing mix ingredient that goes onto the roadway at all times.”

This was the sixth job on which Intermountain Slurry Seal used the new paver, with other microsurfacing jobs in Utah, Wyoming and Idaho.

**PRESERVATION GROWS IN UTAH**

With the instability of the economy today, many states are turning to pavement preservation to prolong the life of their roads. The price is right. For example, in Utah a slurry seal costs about $1.30 per square yard, a chip seal with a fog seal flush is about $1.75, an OGSC treatment is about $5.00, and micro surfacing treatment is about $2.50 to $3. The section of I-80 in Parley’s Canyon was $4.50 per square yard when combined with the asphalt mill.

“The future for micro surfacing in Utah is very promising,” said Mayhew. “I like the product because the texture performs very well. It provides great skid resistance, is very durable, and goes down fast. In Utah, it is not uncommon for the elevation to rise 3,000 feet above sea level in a 10-mile stretch, so the cold weather takes a beating on the roads. The micro surfacing treatment has proven to work very well in both the low and high altitudes. For that reason, our use of micro surfacing has grown tremendously in the last year or two. I now have a micro surfacing treatment on almost every project that has a hot-mix asphalt component to it.”

The American Recovery and Reinvestment Act of 2009 has had a positive effect on pavement preservation contractors as well as other roadbuilders. Each state is handling its money differently. While some governments are using the money to do new asphalt overlays, a lot of the money is also going toward preservation.

“Looking at the past ten years, I fully expect pavement preservation to continue to grow,” said Price. “Whether it’s directly or indirectly related to the stimulus, people have definitely caught on to its benefits. The future looks good.”

Information for this article contributed by Bergkamp, Inc.
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Facing a reconstruction budget that far exceeded available funds, the Texas Department of Transportation did what other states and municipal agencies are having to do: Make informed decisions on alternative measures to preserve their infrastructure within increasingly tight budgets.

One particular project on I-10 was a prime example of this common dilemma. I-10, which is west of San Antonio, runs from just north of Comfort to the intersection of State Highway 16, otherwise known as Sidney Baker Street in beautiful Kerrville, Tex.

Faced with a scheduled mill and inlay with an estimated cost of approximately $4.5 million, TxDOT understood that they needed to evaluate other options. One of those options was a chip seal. It was clear that huge savings would be possible using this method, since the surface treatment could be placed for less than a quarter of the cost of the mill and fill; but could a chip seal perform in this environment?

**CHIP SEAL FOR INTERSTATE SERVICE**

Putting an emulsion chip seal on an Interstate route can be accomplished, but doing so is not without its challenges.

Issues included the need for the timely return of high-speed, high-volume traffic in excess of 14,000 ADT in some areas. The application needed to provide a strong sealed surface with maximum aggregate retention, and the potential for windshield damage had to be minimized.

To address these construction and performance related issues, Mike Coward, TxDOT area engineer, and...
Troy Witt, TxDOT area maintenance superintendent, opted to use a cationic high float emulsion (CHFRS 2-P), supplied by the Ergon Asphalt & Emulsions, Inc. manufacturing facility in Pleasanton, Tex. This product had been performing well in the district, and they felt it would provide the best probability for success for this high-profile project.

Coward chose a trap rock aggregate with a finer gradation (Gr. 5) than what is typically used for chip seal in Texas. Design procedures indicated that an asphalt emulsion application at a rate of 0.34 gal. per square yard would result in a residual rate of asphalt of approximately 0.22 gal. per square yard. According to Coward, the plan to use a smaller stone combined with cationic high float emulsion would not only address the construction issues, but would also provide a quieter riding surface.

Witt used his own experience and industry established “best practice” to monitor the emulsion shot rate and the travel speed of the chip spreader to ensure proper coverage amounts and aggregate orientation.

“We’ve found that by controlling the speed of the chip spreader, the stone-roll is minimized and the aggregate will stay in place better,” Witt said. Witt also had the assistance of Mike Felts, TxDOT district seal inspection, who monitored the shot rate and made minor adjustments on the inclines as I-10 makes its way through the Texas Hill Country.

The entire construction sequence was completed within the hour. The initial seating was accomplished with a 20-ton pneumatic roller, followed by the finish rolling with a 66-in steel drum roller. A rotary broom removed any excess aggregate, and traffic was returned in less than two hours.

“This particular material, CHFRS 2-P, has all the benefits of cationic chemistry’s quick setting properties, while retaining the benefits of a traditional high float emulsion,” said Myles McKemie, Ergon Asphalt & Emulsions vice president of marketing. “With our top-notch development partners at BASF, we have worked to go where no other emulsion chip seals have gone before. This polymer modification process promotes early chip retention for high-volume traffic, which is well suited for this particular application on I-10,” he said.

The project was completed with no outstanding issues, and the goals of a timely return of traffic, application of a good seal to keep water out of the base, maximum stone retention for safety, and minimum damage to windshields during construction were met.

TxDOT expects years of performance out of this surface treatment, and will now to be able to use the nearly $4 million that was saved by selecting this treatment to address many of the other outstanding transportation needs of the district.

Information for this article was contributed by Ergon Asphalt and Emulsions, Inc.
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WHAT IS YOUR STRATEGY?

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The pavement preservation industry in California has gone through many changes over the past few years.

For example, we have introduced many pavement preservation tools that owners have used very successfully over the years. This tool box includes crack sealants, polymer modified emulsions, asphalt rubber and terminal blended rubberized asphalt chip seals, cape seals; scrub seals using a rejuvenating emulsion, slurry seals and micro surfacing treatments to name a few.

We also have two great organizations in California dedicated for the promotion and education of such treatments. They are the California Chip Seal Association and the Caltrans Pavement Preservation Task Group (PPTG), which is made up of state, local agency and industry experts.

Over the course of many years, challenged by ever-evolving specifications, the industry has resolved poor workmanship and product expectations, and now we have universal acceptance of these products.

Training was a big part of the resolution. That’s why Caltrans PPTG members Larry Rouen, Shawn Rizzutto, Erik Updyke, Vijay Sinha, Gary Hicks, Rich Burge, Doug Ford and Steve Olsen spearheaded a “just-in-time training” (JITT) effort to create a working module for the Micro Surfacing PPTG Task Group.

With regard to micro surfacing, many agencies reported poor workmanship such as bad joints, roughness, early raveling and cracking. JITT on micro-surfacing will be able to mitigate many of these types of problems.

The intent and purpose of the JITT training are to provide more in-depth training beyond equipment calibrations for the owner. JITT will help provide a full level of transparency on job expectations, in which the contractor provides a minimum of two hours of training that is job-specific, along with a working syllabus. This is done after the pre-construction and equipment calibrations are performed. This job specific JITT includes the key personnel from the owner and contractor alike.
JITT FOR MICRO SURFACING

The JITT developed for micro surfacing covers a broad spectrum of job specific items.

This includes topics such as project review, project document review, job site safety, general equipment review, stockpile management of handling of aggregates, emulsion deliveries, spreader box set-up, mix design review, weather, pre-seal inspections, surface preparation, micro surfacing application, rolling, brooming, finished surface texture, finished ride quality, project expectations for traffic times, expectation for aggregate spread rates, common problems and solutions, best construction practices for longitudinal and transverse joints, handling irregular road widths, drag marks, workmanship issues, traffic control of intersections, turn pockets, on-off ramps, post-reflective cracking, rut fill expectations, flushing that can occur due to pre-existing conditions, product shedding, post sweeping, and daily site review.

Delivering JITT will create more knowledge for the owner on product expectations. It will help to reduce common mistakes and extend pavement life. In fairness, and at times, many of us have seen our products used in a band-aid approach, and the industry goal should be to undersell and over-deliver.

One of the key benefits of this type of training is to provide a higher level of quality along with the owner understanding the expectations of the products used. JITT is another tool that goes beyond technical specifications. Here’s a link to one of the presentations on micro surfacing: www.ecst.csuchico.edu/cp2c/Microsurfacing_JITT_Module_4 comp. ppt.

Expected outcomes include a more knowledgeable work force, and better communication between the contractor and the agency. The result of the JITT has been positive. Agencies such as Los Angeles County and the City of Stockton have already included JITT as part of their specifications.

Field comments include “JITT is a great experience, it improved expectations and minimized problems”; “JITT brought a quality work of micro surfacing from the very beginning of the project”; and “JITT has really helped our inspection team and created more transparency to what happens on the grade.”

This movement now has moved to the Chip Seal Task Group, and is expected to include all the sub-groups of the PPTG.

Olsen is with Intermountain Slurry Seal, Inc., Rouen with Caltrans, and Cheng with the California Pavement Preservation Center, California State University-Chico
State highway agencies are often required to develop a set of intervention levels for pavement preservation treatment selection, according to our paper, "An Assessment of Procedures to Determine Intervention Levels for Pavement Preservation." Traditionally, intervention levels for specific project sites are based on measurements of pavement roughness, rutting on asphalt pavements, faulting on jointed or jointed reinforced concrete pavements, and pavement surface distresses.

Composite ratings representing the overall condition of pavement surfaces (for example, pavement condition ratings, PCRs) are often used as a means to trigger preservation treatments at the network level (Bekheet et al., 2005). However, the composite ratings may not be suitable for triggering preservation treatments which tend to be distress-specific. With improved automated pavement data collection technologies, it is now possible for agencies to collect network-level distress data reliably, making it possible to develop distress-specific intervention levels for system-wide pavement treatments.

Two different procedures are therefore considered to develop distress-specific intervention levels for pavement preservation treatments: historical practices and decision matrices obtained from expert opinions. Using Indiana as an illustrative example, the mean historical intervention levels and their standard deviation are developed, using information on in-house and contract maintenance/rehabilitation works, network-level pavement condition data, and highway pavement inventory data collected between 1998 and 2008. Decision matrices are also developed from a series of expert opinion surveys conducted in 2008.

Table 1 summarizes the proposed pavement preservation treatment guidelines for use by state highway agencies. Both historical and expert opinion-based procedures yield similarities in pavement treatment selection, albeit minor differences in the levels of severity at which a treatment is triggered. It is noted from Table 1 that for asphalt pavements, crack seals are preferred on pavements with low rut severity, excellent or fair IRI (International Roughness Index) and medium crack severity.

Micro surfacing is preferred when IRI is fair and rut severity is low or moderate. Chip seals are only used on non-Interstate pavements with poor friction and low or fair IRI. Thin overlays are used on pavements with fair IRI or on Interstate and non-Interstate pavements with poor friction (provided there is no significant structural deterioration).

While both methods are capable of producing intervention levels for pavement preservation purposes, the study found that distress-based decision matrices using expert opinions are better suited for implementation within a statewide pavement management system compared to intervention levels based on historical practices, especially for new and innovative treatments where sufficient data for analysis may not be available.

This study was conducted under the Joint Transportation Research Program with the support of the Federal Highway Administration and the Indiana Department of Transportation.

Ong is affiliated with the National University of Singapore, Department of Civil Engineering, Nantung with the Indiana Department of Transportation, Research and Development Division, and Sinha with Purdue University, School of Civil Engineering.

Table 1: Guidelines for Pavement Preservation Treatment Selection

<table>
<thead>
<tr>
<th>Condition</th>
<th>Treatment</th>
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<tbody>
<tr>
<td>Excellent</td>
<td>Thin overlays</td>
</tr>
<tr>
<td>Fair</td>
<td>Micro surfacing</td>
</tr>
<tr>
<td>Low</td>
<td>Thin overlays</td>
</tr>
<tr>
<td>Medium</td>
<td>Crack seal</td>
</tr>
<tr>
<td>Poor</td>
<td>Thin overlays</td>
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Contribute Your Technical Paper to Pavement Preservation Journal

Prospective authors are invited to present articles on original research on any topic relevant to pavement preservation, such as preservation techniques, materials, construction, testing, performance, recycling and pavement management to Pavement Preservation Journal.

Papers discussing best practices for pavement preservation treatments, including asphalt overlays, scrub and fog seals, crack sealing, chip seal, hot in-place recycling, micro surfacing, and slurry seals, would be welcome as well.

Authors must prepare their manuscripts in accordance with the guidelines outlined by the Pavement Preservation Journal. All articles should be submitted as an e-mail attachment to Dr. Yetkin Yildirim, P.E., at yetkin@mail.utexas.edu.

For more information, including style guidelines, please visit the Pavement Preservation Journal’s home page at www.fp2.org.
Diamond Grinding in Field Yields ‘Buried Treasure’

By John H. Roberts

With an unprecedented number of roadways in need of repair across the United States, the need for cost-effective pavement rehabilitation techniques remains one of the most pressing issues for roadway engineers and owners alike.

In the past, to improve the ride, friction or reduce tire pavement noise, many transportation agencies covered structurally sound concrete pavement with an asphalt overlay. With the recent increase in asphalt prices, the mill and overlay option is becoming far too expensive.

Instead, diamond-ground portland cement concrete pavements often meet and exceed the smoothness, friction and noise characteristics of the best asphalt surface treatments, and can be half the cost of an asphalt overlay. Provided that the underlying concrete pavement still is structurally sound, diamond grinding a previously overlaid pavement becomes a cost-effective solution and allows for the recycling of the asphalt millings as a gravel base or to be sold as reclaimed asphalt pavement (RAP) by the ton for a future asphalt project. We like to call this innovative process concept Buried Treasure.

HOW IT WORKS

The first step in implementing the Buried Treasure concept is to conduct a pavement evaluation to ensure that underlying concrete pavement is worth the investment. This is accomplished through the use of core samples and other technology as necessary to determine whether the underlying concrete is structurally functional.

Once the asphalt overlay is removed, a variety of concrete pavement restoration (CPR) options can be used. CPR is a series of engineered techniques used to manage the rate of pavement deterioration in concrete streets, highways and airports. It is a non-overlay option used to repair areas of distress in concrete pavement without changing its grade. This preventive procedure restores the pavement to a condition close to, or better than, original and reduces the need for major repairs in the future. It also lasts significantly longer than an asphalt overlay. Available CPR techniques include slab stabilization, full and partial depth repair, dowel bar retrofit, diamond grinding and joint resealing.

After the structural repairs have been completed, diamond grinding
begins. Diamond grinding is the removal of the thin surface layer of hardened portland cement concrete using closely spaced diamond saw blades. The process results in a smooth, level pavement that has a longitudinal texture with desirable friction and low noise characteristics.

By applying the Buried Treasure concept, the value of asphalt millings can be used to offset the cost of removal and some of the diamond grinding cost. Every inch of asphalt generates approximately 0.05 tons of RAP per square yard. Depending on the oil content of the RAP and the proximity to a project location, this equates to real value in these times of ever-increasing asphalt prices. Innovative owners and contractors alike can save money and help the environment at the same time.

**CASE-IN-POINT: NEW JERSEY**

Case-in-point is the busy McCarter Highway (New Jersey Route 21) in Newark, N.J. The pavement was between 50 and 80 years old and consisted of a jointed reinforced concrete pavement design composed...
of 73-ft. mesh reinforced panels utilizing stainless steel dowels.

In 1993, after a series of wet-weather accidents, a 9.8-mile stretch of the road received a micro surfacing treatment. By 2001, the treatment had begun to delaminate, and a second micro surfacing treatment was applied.

When this treatment failed in 2008, the New Jersey DOT decided to use CPR for a longer-term repair solution. Recognizing that the existing concrete pavement was structurally sound and in good condition, the NJDOT decided to remove the asphalt overlay and diamond-grind the underlying concrete pavement. To minimize traffic interruption, construction could only occur Monday through Saturday nights between the hours of 8 p.m. and 6 a.m.

Because the soil beneath the pavement was sandy and therefore susceptible to washouts under the transverse joints, the slabs had to be stabilized. Polyurethane grout was chosen to fill voids under suspect areas of roadway. Four small holes were drilled on each side of the transverse joint, and the polyurethane grout was pumped into the voids.

Where full-depth repairs were needed, precast panels were constructed in three standard sizes, with extra panels always on hand for flexibility. All of the precast panels were cast with 1/4-in.-thick strips of foam on the bottom so the panel could be embedded into the recycled granite sand sub-base material. The panels were lowered by a crane and the eye hooks were removed after placement of the panel.

Partial-depth repairs had to be able to carry traffic in a very short amount of time, so the design called for the use of a hot-pour patching material that bonds to the concrete surface, yet remains flexible to allow for movement without cracking or de-bonding. After the patching material was placed, a friction layer of black granite sand was added to the surface.

After all the repairs were complete, diamond grinding could begin on the pre-existing concrete pavement. Because of the proximity of the steel mesh to the surface of the concrete, all of the milling operations had to be exact, in order to leave as much of the old concrete as possible. After the asphalt overlay was removed, the drainage inlet structures were lowered. After all repairs and diamond grinding were complete, the joints were resealed with a hot-pour material.

**PROVEN SOLUTION**

Although the McCarter Highway project was just completed, the diamond grinding has already improved the ride on the roadway by approximately 30 percent. Not only is the ride superior to the previous micro surface treatments, but the concrete pavement still has the structural ability to carry today’s heavy traffic load. As long as the underlying pavement is structurally sound, CPR and diamond grinding can be cost-effective tools to restore ride and longevity to an old concrete pavement.

Roberts is executive director, International Grooving & Grinding Association
Pavement preservation methods include all those techniques which extend the life of the pavement by improving its surface condition without affecting its structural capacity. Therefore, it is useful only for those pavements that are structurally sound with good drainage and acceptable thickness.

Selection of the right pavement is essential for achieving positive results. It is a proactive approach, as opposed to the reactive maintenance approach, and includes maintenance techniques like crack filling and sealing, fog seals, slurry seals, scrub seals, micro surfacing, chip seals and thin HMA overlays. Research suggests that every $1 spent on preventive maintenance techniques saves $5 in future costs. The critical factor for a successful pavement preservation program is the application of the right treatment, to the right surface, at the right time.

PRESERVATION TRAINING

The Texas Pavement Preservation Center (TPPC) has been providing exemplary assistance and training to promote pavement preservation strategies in Texas (www.utexas.edu/research/tppc). Pavement preservation methods ensure that the traveling public gets the highest level of service at minimum cost.

TPPC’s mission is to make the practicing engineers and district officials aware of the available pavement preservation techniques. This would in turn result in better safety, quality and performance of state highways and also save large amount of taxpayer’s money.

The center identifies new research in the areas that could cater suitably to the state’s requirements and needs. Thus, TPPC serves as an information center that provides the engineers, managers and district officials with the most relevant and the latest up to date information in the area. TPPC conducts training courses, workshops, conferences and also online courses through The University of Texas at Austin. The target audience for each of the above is TxDOT officials, industry personnel and agencies within the highway community.

PURPOSE AND OBJECTIVE

To be successful in fulfilling its mission, it is essential for TPPC to be aware of the requirements and training needs in the highway community, especially at TxDOT. Also, it is essential to assess if the pavement preservation practices currently being used in the state are performing adequately and serving the needs of the state effectively. For this purpose, we at TPPC conducted a survey for the TxDOT personnel.

The purpose, objectives and methodology of the survey are covered in this article. The response analysis and results will be discussed at the TPPC web page.

The objectives of the survey were:

• To identify the pavement preservation strategies adopted by various districts in the state
• To evaluate the benefits of these strategies adopted
• To assess the requirement for training to improve the strategies, and
• To evaluate the need for training in the pavement preservation techniques not used by the district to-date.

Thus an online survey was circulated among TxDOT employees. The responses were collected over a two-month period from February-March 2010.

The survey consisted of 13 questions, three of which related to respondent’s details, and 10 assessed the status and potential needs of the pavement preservation program in a district. The survey was sent out to approximately 100 TxDOT employees who serve in responsible positions and are related to pavement preservation programs in their respective districts. In-all, 56 people responded.

The survey focused on crack sealing, seal coating, micro surfacing, slurry seals, thin asphalt overlays, and hot in-place recycling.

The survey responses were analyzed to understand the current practices being used by the districts in Texas and the future training needs. The same will be detailed at the TPPC webpage.

Yildirim is director, Texas Pavement Preservation Center
**ARRA, NAPA Collaborate to Double Tons Recycled**

In August, the leaders of the trade associations that represent 150 million tons a year of asphalt recycling signed a cooperative agreement aimed at doubling the rate of reuse/recycling of asphalt pavements within five years.

Principal signatories to the agreement were the National Asphalt Pavement Association (NAPA) and the Asphalt Recycling & Reclaiming Association (ARRA). Letters of support were provided by the Federal Highway Administration (FHWA) and the Environmental Protection Agency (EPA). FHWA officials said that the initiative is in keeping with the U.S. DOT’s recently unveiled *Official Policy on Recycling*.

Under the agreement, NAPA and ARRA pledge to support each other’s efforts to deal with common challenges and build on each other’s strengths regarding asphalt recycling issues.

“Asphalt pavement is America’s most recycled material,” said NAPA president Mike Acott. “There are more than 18 billion tons of asphalt pavement already in place on the roads, streets, and highways of this country. These same roads that Americans use every day are also a resource that future generations can use. Our goal is to increase the rate of recycling even further.”

“Reclaiming and recycling asphalt roads brings America the best possible pavements while conserving precious natural resources,” said Mike Krissoff, executive director of ARRA. “The members of both ARRA and NAPA are proud of the industry’s long track record of delivering quality and value.”

**New Slurry Systems Inspector’s Manual**

The International Slurry Surfacing Association (ISSA) has released its long-awaited inspector’s manual for slurry operations.

The new, 120-page *Inspector’s Manual for Slurry Systems* was published in September 2010 and contains the latest information covering slurry systems, materials, design, construction, contract administration, problem-solving, and special situations like cul-de-sacs, crack filling, thermoplastic markings, and more.

Produced by ISSA’s Slurry/Micro Committee and the ISSA Board of Directors, the manual is written in terminology common to the industry, in terms and practices that ISSA has been promoting for almost half a century. ISSA urges its members to put the manual in the hands of public agency officials, consulting engineers, and anyone else with an interest in slurry and micro surfacing.

To order copies, visit ISSA at [www.slurry.org](http://www.slurry.org).

**Fugro Integrates Geotechnical Services in North America**

Fugro announces the integration of its North American operations serving the geotechnical needs of onshore and near-shore projects.

As Fugro Consultants, Inc., the group operates from 30 offices located along all three coasts and in major metropolitan areas. The resources of Fugro West, Fugro Atlantic, Fugro William Lettis & Associates, Risk Engineering and LoadTest USA will be part of Fugro Consultants serving clients throughout the Americas and abroad.

With this change, the company streamlines client access to technical and project management services for complex assignments, including international projects of U.S. based firms. While broadening the base of traditional geotechnical services, the integration taps major markets and promotes the advancement of geo-consulting specialties, including geologic hazard and risk assessments, earthquake engineering, analysis of complex soil properties, site characterization, deep foundation testing, and near-shore exploration and engineering.

**NCHRP to Study Communication of Preservation Benefits**

Proposals were due in late October for a new National Cooperative Highway Research Program Project 14-24, *Guidance for Communicating the Value of Highway System Maintenance and Preservation*.

“The objective of this research is to develop guidance that state DOTs and other transportation agencies can use to develop and implement plans for communicating the role and importance of maintenance and asset preservation in sustaining highway system performance,” NCHRP said in its RFP.

“Enhancing transportation agencies’ ability to communicate effectively with stakeholders would increase understanding of the consequences of deferring maintenance and preservation effort,” NCHRP said. “Increased understanding would assist budget decision makers facing difficult resource-allocation choices. Research is needed to develop guidance for DOTs and other agencies on how to communicate more effectively the need for and value of transportation system maintenance and preservation and to build better understanding of these activities.”

The $250,000 project was to begin Feb. 28, 2011 and last 18 months. Andrew Lemer is the staff contact, alem@nas.edu.
Slurry Systems Workshop Planned for January


The Slurry Systems Workshop is a study course offering a challenging and informative program on slurry seal, micro surfacing, chip seals and crack treatments, with “hands-on” operation demonstrations and workshop-type discussions. Highly qualified professionals in the field will cover topics, including materials and equipment, specifications, hand mixes, calibration, quality control, and inspection.

Attendees will also be able to view state-of-the-art slurry, micro surfacing, chip seals and crack treatment equipment, independent of the paving demonstrations.

ISSA encourages all ISSA members, and non-members who are contractors, suppliers, engineers, and consultants — as well as government agencies — to attend this valuable workshop.

A certificate of achievement will be awarded to all participants at the completion of the workshop. Also, through a partnership with the National Center for Pavement Preservation at Michigan State University, Continuing Education Units (CEUs) will be awarded to qualified participants at the completion of the workshop. CEU information will be provided at the workshop.

For more information, please call 410-267-0023, e-mail cerone@slurry.org or visit www.slurry.org.

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Calendar of Events
2010
Nov. 2-3  Emulsion Technologies Workshop, Niagara Falls, Ont.
Nov. 8-9  ARRA Semi-Annual Meeting, Chicago
Nov. 17-18  Northeast Pavement Preservation Partnership, N.H.
Nov. 30-Dec. 2  Western Bridge Preservation Partnership Joint Meeting, Sacramento

2011
Jan. 23-27  Transportation Research Board 90th annual meeting, Washington, D.C.
Jan. 25-28  Slurry Systems Workshop, Orlando
Feb. 21-25  AEMA-ARRA-ISSA Annual Meeting, Phoenix
Mar. 22-26  Conexpo-Con/Agg 2011, Las Vegas
July 24-27  TRB 10th International Conference on Low-Volume Roads, Lake Buena Vista, Fla.

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