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The Asphalt Interlayer: Rehabilitation's "Magic Bullet"

Iowa's cities have a tremendous backlog of aging Portland Cement Concrete (PCC) streets that need rehabilitation. With dwindling resources and buying power, city and consulting engineers are being tasked with getting longer life and better performance from their rehabilitation strategies. The recently-introduced asphalt interlayer may be the "magic bullet" that will provide a longer life for the traditional hot-mix asphalt (HMA) overlay and protect

layer of hot-mix asphalt produced in an asphalt plant and placed through a traditional asphalt paver. The interlayer is designed at 0%-2% air voids utilizing a PG58-34E asphalt binder. This design increases the asphalt cement content to >8% to make it impermeable and the 58-34E binder makes the resulting mix both extremely flexible and stiff at the same time. The Asphalt Interlayer can be placed directly on top of a PCC pavement or after the PCC pavement

has been leveled with a thin HMA overlay to decrease tonnage overruns. The interlayer is placed through a paver with ambient air temperatures greater than 60 degrees and static rolled. Due to the low voids, traditional cores are not cut. The interlayer is then overlaid with 3"-4" of a traditional HMA overlay. The Asphalt Interlayer should not be used on PCC pavements with severe joint movement. In

those cases, a crack and seat or modified Rubblization rehabilitation method should be used. The Asphalt Interlayer creates a flexible relief layer to withstand and retard

(Continued Page 4)



Aspro Inc. paving the Asphalt Interlayer for the City of Waterloo.

the underlying PCC from further damage from outside moisture.

The Asphalt Interlayer Defined

The Asphalt Interlayer is a highly-polymerized, fine-graded, one-inch thick

Tales from the Road



Hard Work Never Hurt Anyone

- Proverb

When my son Henry was a young fella, he would follow me out into the yard to help with whatever project I might be working on. If it happened to involve digging a hole, or getting dirty, all the better. Times have changed. Now, at the age of 10, it is more appealing to sit inside in the air conditioning and play video games, or read a book, or do just about anything besides work. This doesn't fly with me. My father taught me to work at a very young age and I have always felt that the willingness to work hard has been one of my greatest strengths in life. Doing hard physical work to complete a job is a measurable thing. Asphalt construction is unsparing – long hours of hot work coupled with tight time frames and high expectations will test a person's mettle. It also develops a pride in yourself and in the team of people you work with. The hard-working men and women of Iowa's asphalt industry know this pride. Henry needed to learn about this pride, and I had just the project to teach him.

The wood decking on my deck needed to be replaced. I had considered hiring it done after some of my previous failed woodworking projects, but I determined that it would cost nearly three times as much as just the materials and my labor to accomplish the task. Luckily, my father-in-law from New Zealand, Alan, was

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Upcoming Events

(Click event for more information)

Open House: Crawford County High RAP Project Utilizing an Innovative No Rejuvenator

Date: August 28, 2017
(Monday); Rain Date:
August 30, 2017
(Wednesday)

Time: 10:30 a.m. – 1:30 p.m.

Location: Meet at Tri-State Paving plant site ½ mile west of Vail, IA on US 30.
[Click here to register.](#)

2017 Western Iowa APAI Golf Outing

Date: August 29, 2017
Location: Majestic Hills Golf Course, Denison, IA

SAC Field Trip 2017

Date: September 12-13, 2017
Location: Southwest Iowa
Overnight stop at Hilton Garden Inn Omaha East/Council Bluffs, IA
[Click here to register.](#)

APAI 62nd Annual Convention

Date: November 29 – 30, 2017
Location: West Des Moines Marriott

County Engineers Conference

Date: December 5-7, 2017
Location: Scheman Bldg., ISU, Ames

APAI 2017 Holiday Open House

Date: December 14, 2017
Location: APAI Offices
(116 Clark Ave., Ste C; Ames)

2018 Greater Iowa Asphalt Conference & Equipment Expo

Date: Feb 28 – March 2, 2018
Location: Des Moines Airport Holiday Inn Conference Center

(Tales from the Road – Cont. from Pg. 1)

visiting and he is unafraid to tackle any project. I called in all my chips from my friends that I had helped in the past, ordered the materials, and on a beautiful, bright Saturday morning in June, we got underway. It was 100° by 11 a.m. My friends started to drift away as the day progressed, but two people stuck it out, Alan and Henry. He was pulling screws, toting lumber, shagging drinks, and basking in the respect of his grandfather and his Dad. It took us nearly two full weekends to remove and replace the decking (it is a big deck)



and Henry was always the first one next to me and the last one to quit. My father was never one to throw around praise, but I clearly remember him telling me how proud he was of me after we worked together on a big project. I was proud of how hard my son worked for those four days, and I told him so over a cold pop in the shade. His eyes shone with pride and I knew he understood the satisfaction of a job well-done.

During my career in asphalt, (thirty-three years this summer), I have done nearly every job on an asphalt crew – flagger, laborer, string line man, tail gunner, raker, paver operator, just to name a few, and I found one thing

to be universally true – every one of those jobs is hard work. The lessons my father taught me – to work hard and take pride in your work – have never left me. The APAI represents the best asphalt contractors in the nation, because the men and women who work in

Iowa's asphalt industry work hard and take pride in their work. I want to say thank you. Thank you for your hard work and thank you for the pride you put into every project.

Smoother is Better,

A handwritten signature in black ink, appearing to read 'Bill Rosener'.

Bill Rosener

A promotional poster for the APAI 62nd Annual Convention. It features the APAI logo (Asphalt Paving Association of Iowa) at the top. The text reads: '62ND APAI ANNUAL CONVENTION', 'NOVEMBER 29 - 30, 2017', and 'WEST DES MOINES MARRIOTT HOTEL WEST DES MOINES, IOWA'. The background is a dark asphalt road with yellow lines receding into the distance.

ASPHALT PAVING
APAI
ASSOCIATION OF IOWA

62ND APAI ANNUAL CONVENTION

NOVEMBER 29 - 30, 2017

WEST DES MOINES MARRIOTT HOTEL
WEST DES MOINES, IOWA

SAVE THE DATE

2017 APAI SUMMER MEETING *“Some Like it HOT”*



The 2017 APAI Summer Meeting took place at the Bridges Bay Resort in Okoboji on July 27-28 with over fifty people attending the event. The summer meeting welcomed new attendees from the Asphalt Comprehensive Training (ACT) Program. The ACT group was invited to attend and present at the APAI Board of Directors meeting as part of the program's initiative to introduce the APAI's new leaders to all aspects of the industry. In addition, the Summer Meeting featured a luncheon with presentations by Wade Weiss, Greene Co. Engineer and President of the Iowa County Engineers Association, and Dr. Scott Schram, Iowa DOT District 4 Engineer. The group enjoyed a sunset cruise around West Okoboji Lake and a beautiful

outdoor patio dinner at the Waterfront restaurant. The next day featured six teams competing for the "Championship of the World" at the Summer Meeting golf outing. The beautiful Championship trophies were won by the team of Chris Jessen (Heartland Asphalt), Randy Holladay (Flint Hills Resources), Ken Geoghegan (Murphy Tractor & Equipment), and Royce Fichtner (APAI). "The APAI Summer Meeting was developed in an effort to insure that the fellowship of Iowa's Asphalt industry and its partners remains strong. The inclusion of the ACT members to this event will help insure that the future leaders of our industry will understand the importance of these relationships," said Bill Rosener, APAI Executive Vice President.

The APAI would like to thank our sponsors for their generosity:

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(The Asphalt Interlayer Continued from Page 1)

the PCC joint from reflecting through the HMA overlay. In addition, the impermeable nature of the interlayer will help protect the underlying PCC from more moisture damage from any top-down cracking.

History

The history of the asphalt interlayer in Iowa has a proven track record of success. In 2000, an interlayer product developed by Koch Materials called Strata™, was tested in a municipal environment on 1st Avenue in Cedar Rapids from 6th St. to 10th St. SW. The section was paved utilizing one inch of the Strata™ and three inches of traditional HMA. In 2001, a control section

of the asphalt interlayer's performance are impressive. The use of the interlayer has been added to the rehabilitation "tool box" for the Iowa DOT and has already seen a significant increase in usage by engineers across the state." The Asphalt Interlayer DS was replaced in October of 2016 with Iowa DOT specification SS-15006.

distress, the Strata™ section would project 10-15 years from needing rehabilitation. The original project designer, Bob Tobin of Shoemaker-Haaland, reviewed the current state of the First Avenue project and said, "Although this was originally designed as just a test section to determine the value and viability of the interlayer process, it is clear that it works. The 1st Ave project clearly shows significantly improved performance of the HMA overlay when using the interlayer. I am a believer and I will continue to specify its use on PCC rehabilitation projects in the future."

In 2014, the then Iowa DOT Pavement Management Engineer, Dr. Scott Schram,

Iowa Municipalities Lead the Interlayer Revolution

City of Dubuque

One of the first cities in Iowa to utilize an asphalt interlayer was the City of Dubuque in 2011. Faced with huge costs to reconstruct hundreds of deteriorated PCC joints on Central Avenue, city staff and River City Paving decided to try a new rehabilitation method utilizing a 1" asphalt interlayer. Both entities felt that the rehabilitation should utilize the asphalt interlayer to reduce the reflective cracking of the asphalt overlay over the deteriorated concrete roadway. Central Avenue from 21st Street to 32nd Street is a busy arterial street in downtown Dubuque with high visibility. The project used about 2000 tons of HMA Interlayer and was a success in reducing the reflective cracking of the asphalt overlay from the old PCC below. In 2016, a project was undertaken to rout, clean, and seal those cracks that had reflected through. Greg Doeden, Dubuque Civil Engineer, stated, "We saw a significant decrease in both the number and severity of reflective cracks compared to our traditional asphalt overlays. The crack sealing performed last summer will add additional life to the pavement which has been performing well." That project was so successful that in 2014 the City decided to use the same rehabilitation method on White Street, Central Avenue's one-way counterpart downtown. The White Street project from 11th Street to 21st Street used about 850 tons of HMA Interlayer and was also constructed by River City Paving. On both streets, the joint repair was completed by milling the existing transverse and longitudinal joints, cleaning, tacking, and placing HMA mix in the milled joint. Greg also said "The reflective cracking on both streets has been

Iowa DOT IM 510 Appendix A Table 3

Performance Requirements for HMA Interlayer (2)

| TEST | REQUIREMENT | NOTES |
|---|-----------------------------------|-------|
| AASHTO T-321 | Minimum 100,000 cycles to failure | 1 |
| (1) Failure criterion at 2,000 microstrain shall be 50% of the initial flexural stress measured at the 200th load cycle. (2) Use a PG 58-34E. (Hint: Past experience indicates at least 80%-90% recovery is needed for successful test results). Testing may be verified by the Engineer on field produced mix. Do not open to traffic until mat has cooled to below 200°F | | |

of four inches of traditional HMA was paved from 1st Street to 6th St SW and in 2003, the section from 10th Street to 15th Street SW was crack and seated followed by a four inch HMA overlay. Three sections were paved over deteriorated, but structurally sound PCC pavements. The results seventeen years later are dramatic. The control section that was paved with three inches of traditional HMA has severe reflective cracking and the street will need to be rehabilitated in the next five years. The crack and seat section shows noticeable improvement over the control section with more moderate reflective cracking. This section would appear to be viable for another 7-10 years before rehabilitation.

The final section utilizing the one-inch Strata™ interlayer with a three inch HMA overlay shows dramatically different results. Not only are there roughly 40% less reflective cracks in this section. The cracks that have reflected are much less severe than the crack and seat and traditional overlay sections. At the current levels of

revisited the use of asphalt interlayers as a means to promote improved performance of the IDOT composite pavements. Working with Dr. Chris Williams of Iowa State University, they were able to develop a design specification that created a strong, highly-flexible asphalt interlayer that is flexible enough to absorb the sheer force of the PCC slab's movement and create an impermeable barrier to water infiltrating the deteriorated PCC from above. The DS 15024 was created and the first asphalt interlayer with a three inch HMA overlay, placed was on the passing lane of I-35 north of Mason City. The control section was a traditional four inch HMA overlay in the drive lane of the same section. While both sections are performing brilliantly, the interlayer section has only a few reflective cracks throughout the mile long test section. In several areas, cracks in the control section do not continue across the interlayer test section. Mark Callahan, IDOT District 2 Design Engineer said, "The early results

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(Asphalt Interlayer Continued from Page 4)

reduced significantly and considering the amount of truck traffic on these streets, the pavement is performing well.”

City of Waterloo

In the winter of 2015, the City of Waterloo was designing a rehabilitation project on West Ridgeway Avenue from West 4th Street to Sergeant Road (Highway 63). They wanted to do something to reduce the reflective cracking that would occur when overlaying the deteriorated PCC arterial roadway. They had heard about the asphalt interlayer and were wondering if this street would be a good candidate. The staff contacted the Asphalt Paving Association of Iowa (APAI) for technical assistance on whether to use crack and seat, the asphalt interlayer, or both to reduce reflective cracking prior to placing the overlay. Following the APAI review, staff decided to go with the asphalt interlayer. The project was constructed in the summer of 2015 by ASPRO and used about 1,000 tons of HMA interlayer. There were no problems in producing and placing the mix and the City staff gained confidence in the method. Because of the confidence gained on West Ridgeway Avenue, the next year Waterloo staff utilized the asphalt interlayer on four of the streets in their annual resurfacing program; Jefferson Street from 4th Street to 6th Street, Commercial Street from 4th Street to 6th Street, Robin Road from Wren Road to Scott Avenue, and Easton Avenue from Kimball Avenue to Baltimore Street.

Two of the streets are in downtown Waterloo and one of them, Easton Avenue is located in front of Jamie Knutson’s (Civil

“The Asphalt Interlayer is a perfect mixture of strength, economy and sustainability for pavement management engineers.”

Engineer for Waterloo) house. He will be able to closely monitor the performance of the interlayer and be able to identify when reflective cracking first appears. “Our oldest interlayer has only been through two winters but to this point, the amount of reflective cracking is considerably less than compared to a traditional crack and seat and overlay. If the interlayer proves out over the long haul, it will be a great tool for overlaying concrete streets,” said Knutson.



Des Moines Asphalt and Paving placing the Asphalt Interlayer for the City of Clive.

City of Bettendorf

Bettendorf’s engineering staff had seen several presentations over the past year at various APAI events highlighting the use of the asphalt interlayer prior to resurfacing concrete roadways. After Brian Schmidt, the Public Works Director, and the Bettendorf engineering staff attended the APAI Road Show in the Quad Cities in April of 2107, they decided that this would be a great tool for them to utilize on some upcoming projects. The plans and specifications for the Middle Road Resurfacing from 53rd

Avenue to Hopewell Avenue were already on the street with the bid date only a week away. Because of the reduction in reflective cracking

they believed the asphalt interlayer would provide, the staff jumped into action and issued an addendum the next day to include it in the project. The low bidder on the project was Tri-City Blacktop who completed the resurfacing project in July. The City was pleased that they were able to include this new rehabilitation method in the project. That project was also immediately south of a similar resurfacing project done last year without the interlayer which will provide a nice test case for them.

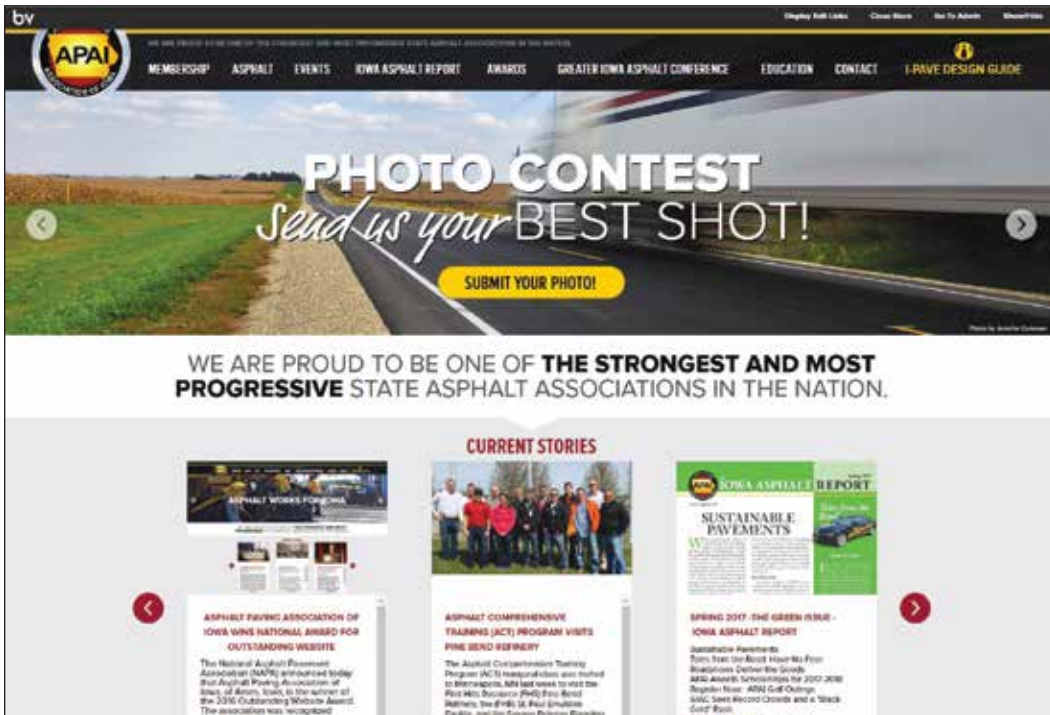
Coming up for bids shortly after the Middle Road Resurfacing project was the Spruce Hills Drive Resurfacing Project from Woodland Lane to 18th Street. The asphalt interlayer was included in this project during the design and fully incorporated into the plans. Once again, Tri-City Blacktop was the low bidder and the resurfacing on Spruce Hills Drive has recently been completed. Both projects went very well and there were no difficulties related to the use of the asphalt interlayer. Brent Morlok, Bettendorf City Engineer, believes that including the asphalt interlayer in these resurfacing projects provided a large benefit at a minimal additional cost. “The asphalt interlayer should provide a significant reduction in the reflective cracking that occurs over the PCC, reducing maintenance costs and greatly extending the life of the overlay,” said Morlok.

City of Clive

The City of Clive was receiving a lot of complaints about the condition of the streets in a portion of the Indian Hills Subdivision. The complaints were concentrated in a neighborhood between 100th Street and 104th Street from Clark Street to Lincoln Avenue. Public Works crews had patched the worst areas in these

(Continued Page 6)

Asphalt Paving Association of Iowa Wins National Award for Outstanding Website



The National Asphalt Pavement Association (NAPA) announced today that Asphalt Paving Association of Iowa, of Ames, Iowa, is the winner of the 2016 Outstanding Website Award. The association was recognized Monday, July 17, at a ceremony honoring the Operational Excellence Award recipients during the NAPA Midyear Meeting in Chicago.

Talking about next steps to make the website even more valuable for visitors, Rosener said, “Our goals are constantly evolving and expanding. We would like to improve our store function further and increase the usage of our pavement design program, I-Pave.”

(The Asphalt Interlayer Continued from Page 5)

PCC streets but the complaints continued to come in. Jim Hagelie, Clive City Engineer, found that there were really bad groundwater problems in the area contributing to the pavement deterioration. During the summers of 2013 and 2014, Hagelie had subdrains installed on these streets, which were very effective in reducing the groundwater issues. In the fall of 2016, Jim was ready to move ahead with the design of the rehabilitation for these roadways. He had used crack and seat in the past, but had heard about the asphalt interlayer and was interested in trying it. The APAI met with Hagelie and reviewed the streets to determine the best method to construct the rehabilitation. The design included PCC patching of the deteriorated concrete roadway and milling 1 inch deep at the gutter tapering to 0 inches in 6 feet. A 1 inch thick asphalt interlayer was then placed followed by an overlay that was 2 inches thick in the gutter and 3 inches thick at centerline.

Des Moines Asphalt and Paving was the low bidder on the project. Construction began with the PCC patching and milling in the spring of 2017. In July, 1100 tons of asphalt interlayer was placed followed by 2700 tons of surface mix. According to Brian Beard, project manager with Des Moines Asphalt and Paving, “The project went smoother than anticipated with no issues in producing or placing the asphalt interlayer. The homeowners were very happy with the finished product and the speed with which it was accomplished.” Jim Hagelie also felt the project was a success and accomplished the goals that he had set for the rehabilitation. “We’ve used crack and seat prior to an asphalt overlay on past projects and went with the interlayer on this project so we can compare the long-term performance of both over time. An asphalt overlay was the best preservation method available as we needed to minimize inconvenience

and periods of no access to the over 150 residences in this neighborhood.”

The use of the interlayer by Iowa Municipalities, the Iowa DOT and Iowa’s county engineers has expanded exponentially in the past three years. The ability to both retard the reflective cracking of an asphalt overlay of PCC and protect the deteriorated PCC from moisture above, has provided the “Magic Bullet” that city, county, and consulting engineers have been trying to find for decades. “The Asphalt Interlayer is the most exciting thing to happen to the pavement rehabilitation industry since the advent of the milling machine,” said Bill Rosener, Executive Vice President of the Asphalt Paving Association of Iowa. “It is a perfect mixture of strength, economy and sustainability for pavement management engineers.” For more information on the Asphalt Interlayer, contact the APAI at apai@apai.net or call 515-233-0015.

APAI Welcomes New Members

APAI continues to add new members. At their last Board Meeting, the Board of Directors elected two Associate Members, and one Consulting Engineering firm to the Association. Thank you to those who have helped recruit these new members.

MayeCreate Design



MayeCreate Design, founded in 2005, is a niche web design and online marketing firm in Mid-Missouri dedicated to serving the marketing needs of the construction industry.

At MayeCreate, they concept innovative ways to communicate with their clients' audiences online. They offer competitive pricing and create local jobs. All of their website development and online marketing tasks are performed in-house by a **handpicked** team of project managers, designers and strategists to best fit each aspect of every project.

MayeCreate's services include: Website Design, Website Updates & Management, Online Marketing & Website Consulting. Social Media, and Online Advertising.

SHIVE-HATTERY ARCHITECTURE + ENGINEERING

Shive Hattery Architecture + Engineering

Founded in 1895 by T. R. Warriner and E.P. Boynton in Cedar Rapids, IA, Shive Hattery Architecture + Engineering is an employee-owned architecture and engineering firm. Shive-Hattery has offices in seven locations in Iowa, Illinois, and Indiana.

Shive-Hattery is a Client-intimate consulting firm that goes beyond traditional design. With deep knowledge of their Client's business, they offer customized solutions and provide support as an extension of your staff. They do not pursue one-time transactions; they cultivate relationships. To be your trusted advisor is the highest honor and their ultimate goal.

Natural Soy Products

Natural Soy Products

Natural Soy Products is a producer of environmentally friendly, bio-based products for commercial, industrial and residential applications. The goal is to identify solutions that are reliable, replenishable and safe for the people who use them and the environment that they are used in.

Natural Soy's **Asphalt Release Agent** is a highly advanced soy-based solution that has been specifically designed and created to keep asphalt from adhering to a wide variety of surfaces without damaging the surface. It is an approved product by the Iowa DOT, and is currently being used by the California DOT, New York DOT and the Maryland State Highway Authority. Their **Concrete Form Release** is designed to prevent adhesion of concrete to forms and molds and to facilitate the cleanup of concrete forms for further use. They offer a broad range of products to meet many needs.

Natural Soy Products is a veteran owned, certified Targeted Small Business by the Iowa Economic Development Authority. Please check out their full list of offerings at www.naturalsoyproducts.com and at www.cleanenvironmentco.com.

Please welcome these new members and show your support for them, by contacting them and utilizing their services. To find contact information for these members, go to <http://www.apai.net/associate-members.aspx>.

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