

www.apai.net

Reducing Storm Water Runoff with "Porous" Asphalt Pavement

Stacie Johnson, FAIR By Design

With EPA funding Stacie Johnson has formed a technical advisory group in Linn County to establish infiltration-based stormwater management policy.

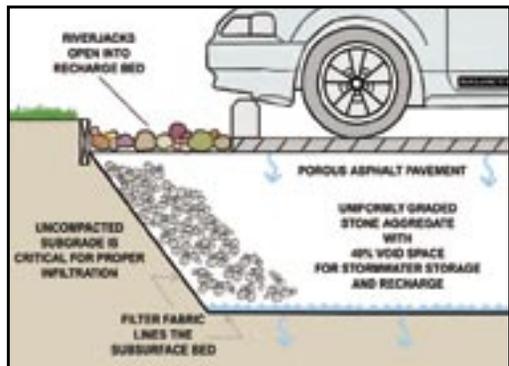
Although new to Iowa the concept of porous asphalt has been around since the late 60s. Its time has come! Due to Phase II of the federal regulations, National Permit Discharge Elimination System (NPDES) there are over 40 Iowa communities that are struggling with how to improve water quality. Although a complex issue, the current direction to meet these regulations is to greatly reduce the runoff generated

by hard surfaces in urbanizing areas. One solution is found within the asphalt industry and porous asphalt pavement.

A typical porous asphalt pavement consists of porous asphalt course, a top filter course, a reservoir course (designed for runoff detention frost penetration and structural capacity), an optional bottom filter course, filter fabric, and existing soil or subgrade material. A properly designed porous asphalt pavement under the right conditions prevents storm water runoff problems for as the rain or water (it could be a car lot washing their cars) hits the pavement it drains into the underground reservoir. The reservoir is sized for a given storm event everything above that is released at a pre-determined rate, typically the post 100 year storm released at the pre 5 year storm rate.

While Iowa hasn't installed porous asphalt on a large scale, the Iowa Heartland Resource Conservation and Development (RC&D) in Ankeny worked with Grimes Asphalt and the Metro Waste Authority in Des Moines to lay a porous asphalt trail near a wetland area at the Household Hazardous Waste Collection site in Bondurant. In order to gain "traction" and increase the use of porous asphalt in the state, the Asphalt Paving Association of Iowa in partnership with the National Asphalt Pavement Association is hosting a Porous Pavement workshop on October 11, 2005 in Cedar Rapids, Iowa.

Similar to the workshop held in Kansas City, MO late last year this will be an in-depth look at the challenges, opportunities and design criteria associated with porous asphalt use as it relates to preventing storm water runoff and improving the quality of water in Iowa. This is a tremendous learning opportunity that may lead to increased business opportunities for those in Iowa's asphalt industry. We hope to see you there! ■



Porous Pavement Seminar

The Asphalt Paving Association of Iowa will host the Porous Asphalt Seminar October 11th, 2005 in Cedar Rapids! This technical conference will be of interest to public works officials, consulting engineers, land developers, contractors, environmental engineers and others with an interest in minimizing the impact of development on the environment. Porous asphalt pavement

technology is attracting attention because of the roll it can play in sustainable site design and storm water management. Speakers will explore every aspect of porous pavements, from the initial evaluation of the site, to design, construction, and maintenance of the pavement. For program and registration details go to www.apai.net. ■

From the Desk of the E.V.P.

There is no contest when comparing the advantages of a full-depth, Hot Mix Asphalt pavement, designed using Perpetual Pavement Technology, to Portland Cement Concrete pavements. Only Hot Mix Asphalt offers the engineer the ability to custom tailor each layer within the pavement structure to resist specific stresses. Limiting the pavement distresses to the top layer allows for the main structure to remain intact permanently, while only periodic surface rehabilitation is required. The public tax dollars saved can be staggering. This edition of HMA Notes takes a closer look at just how a Perpetual Pavement achieves these advantages.



Mike Kwach, APAI Executive Vice President

Over 94% of our nation's roadways and byways can't be wrong. Hot Mix Asphalt: smooth, quiet, durable and economical. For more information on the Asphalt Advantage, please visit our web site at www.apai.net. ■

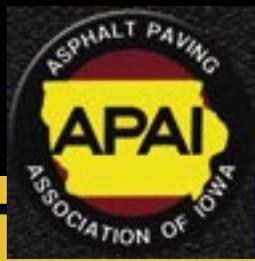
Second HMA Hall of Fame Inductee Announced

The Iowa HMA Hall of Fame represents our association's highest honor to be bestowed upon any one individual. After soliciting nominations from the association's members, the APAI Board of Directors named Mr. Robert Nady as the 2004 inductee.

Mr. Nady earned his BS in Civil Engineering at Iowa State University in 1949 and his MS in Highway Engineering in 1952 with a thesis on Hot Mix Asphalt. This man instructed many of Iowa's senior engineers as he taught in the BSCE program from 1952 until 1960 and in the Construction Technology program until 1973 at ISU. Even some of the younger engineers were taught by him, when he was called back to ISU in 1996 to teach HMA and materials in the Civil Engineering Department through the Spring of 2002.

Known throughout the world, Mr. Nady has worked for various engineering firms worldwide from India to Haiti to Kuwait to Saudi Arabia and Turkey. In 1957 he founded his own testing service.

Continued online at www.apai.net



www.apai.net

HMA Notes

By: Bob Nady, P.E.

This NOTE compares some aspects of materials used for HMA with the same considerations for PCC. A few construction items are also reviewed.

HMA pavements are built in layers. A page from the Perpetual Pavement book shows that by this layered system, the layers in a Hot Mix pavement can be specifically designed for the stresses acting on that layer. The critical stress in the bottom-most layer is fatigue. A mixture can be designed to accommodate those fatigue stresses. The next zone above the fatigue zone is the zone of a strong base. The stresses in this zone are the result of the applied traffic loads using the pavement. This zone must be designed to resist those stresses and to spread the loads (reduce the stresses) so that lower layers including the subgrade are not overloaded. Finally, the surface zone must resist the concentrated stresses of the applied loads (trucks, concentrated since this zone is in contact with the wheel load). Also, the pavement layer at this level must resist the wide seasonal temperature changes as well as wet/dry, freeze/thaw stresses of the environment. Do not forget that the grinding, damaging effects of ice control chemicals and abrasives must be resisted by this layer. Again, the HMA material for this exposure can be specifically selected, and built, to do this. The layers in the HMA pavement can be composed of materials specifically selected and designed for the job each layer must perform to be characterized as a Perpetual Pavement.

Now consider the PCC pavement. The full depth of the slab is cast in one gob. The mix design for that concrete can only be a compromise, since different stresses occur at different depths in the pavement. PCC strength can be controlled in the mix design. But what about the other damaging stresses? If strength is controlled, other stresses may not be considered, or at least, the consideration must be compromised since the full depth of the slab is cast at one time. There is no possibility of tailoring the mix for stresses occurring at different depths.

Consider for a moment the construction operations. A precisely controlled asphalt paver is used to construct each layer in the HMA pavement. Each lift of the pavement not only addresses the stresses which must be resisted, but the accuracy of the surface of each layer improves as the paving operations progress. When the top layer is constructed the result is a very smooth pavement which rides well and will resist the pounding of heavy trucks. By contrast, the PCC pavement is constructed as a single layer. There is only one chance to remove any roughness in the finished slab. Any residual roughness is literally "cast in concrete". ■

**There is only one Perpetual Pavement.
Hot Mix Asphalt - Smooth, Quiet, Perpetual**

Perpetual Pavement Open House and Workshop

The Asphalt Paving Association of Iowa, in conjunction with Brower Construction Co., the Iowa Department of Transportation, and the HMA associations of Minnesota and the Dakotas, will be hosting an Open House / Workshop on Iowa's first Perpetual Pavement.

Date & Time: October 5, 2005
Workshop: 10:00 am to 2:00 pm
Project view: 2:00 pm to 3:00 pm

Location: Cedar Cabin Restaurant
Highway 60
Ashton, IA 51232



Technical speakers from the National Asphalt Pavement Association, the Asphalt Institute, and Iowa Department of Transportation will be discussing the Perpetual Pavement design concept and construction-related issues.

There is NO CHARGE for this workshop. Registration can be done by calling the APAI office at 515-233-0015 or E-mail at apai@apai.net. ■

Consecutive Diamond Achievement Awards

Since our last Asphalt Report the following companies have applied for and received their Diamond Achievement Awards. The following members' plants have received the Diamond Achievement for the following locations for consecutive years.

Cessford Construction Co.
Plant 2 - 2002-2004

Heartland Asphalt, Inc.
Riverview Plant - 2004

Des Moines Asphalt & Paving Co.
North Plant #2 - 1999-2005
Portable Plant #3 - 2003 - 2005
South Plant #3 - 1999 - 2005

L. L. Pelling Co., Inc.
Base 16 - 2001-2003
Plant 15, J Street - 2003-2004

Fred Carlson Co., Inc., L. L. C.
Decorah Plant - 1999-2004

Manatt's, Inc.
Ames Division - 1999-2004
Newton Division - 2002-2004

Grimes Asphalt & Paving Corp
Grimes, Iowa Plant - 2002 - 2004

Our congratulations go out to these members for their efforts to continue to be good neighbors and we encourage them to continue to apply for those "Diamonds". ■

Calendar of Events

APAI Golf Outing
August 30, 2005
Bent Tree Golf Course
23579 Highway 6
Council Bluffs, IA 51503
712-566-9441
10:00 A.M. Shotgun start

Workshop: 10:00 A.M. to 2:00 P.M.
Project View: 2:00 P.M. to 3:00 P.M.
Cost: Free
Contact APAI to register

**Perpetual Pavement
Open House/Workshop**
October 5, 2005
Cedar Cabin Restaurant
Highway 60
Ashton, IA 51232

Porous Asphalt Pavement Seminar
October 11, 2005
Clarion Hotel & Convention Center
525 33rd Ave. SW
Cedar Rapids, IA 52404
319-366-8671
8:00 A.M. start