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Becoming an "Asphalt Man"



Cerebral Palsy and experience difficulty walking. Gwen requires a walker to help her get around. The family lives on an acreage and like most six year olds, Gwen and Nick love the outdoors. With an idea to give greater access for the twins to the outdoors, Gwen and Nick's mother Saren, contacted the L.L. Pelling Company to discuss the feasibility of building a small asphalt walking trail on the property. The trail would wind its way around the acreage and through their apple orchard allowing Gwen and Nick easier access through much of the property. After a short conversation, Saren commissioned the L.L. Pelling Company to construct the trail.

As the L.L. Pelling Company began to form the trail, the twin's parents were struck by the paving crew's intense attention to detail. No doubt, after introducing the crew members to Gwen and Nick, the crew's sense of purpose heightened for these hardened construction workers.

In a follow-up conversation months later, Saren reports the children love the asphalt path and use it nearly every day. Nick, who has spoken of becoming a doctor when he grows up, told his mother recently, he was thinking of becoming an "asphalt man".

There are times where what we do as HMA contractors, day in and day out, life suddenly shows us a clear picture of how our efforts touch the lives of the many, and the few. It's the special project that gives us the feeling of purpose and overwhelming satisfaction. This was the case for the North Liberty based, L.L. Pelling Company, Inc. What was to be another simple walking path project for a paving crew that over the years had constructed hundreds of trails and parking lots, became a life changing endeavor for the lives of two young children with Cerebral Palsy. Gwen and Nick are six year old twins with

APAI Recommends New Strength Coefficient Values

By: John Bellizzi, P.E.

Hey, Iowa local system paving designers. Today's Hot Mix Asphalt (HMA), developed under SuperPave criteria and tested under quality management asphalt (QM-A), is stronger and more durable than ever before. Properly designed HMA is not expected to require major maintenance for at least 20 years when a thin (1.5") mill and fill can rehabilitate the surface with the balance of the structure considered perpetual. Design of modern HMA requires adjustment of past strength determinations last made in the 1970s.

Your local paving association of Iowa contractor and the Asphalt Paving Association of Iowa (APAI) personnel will assist you in determining equivalent full-depth asphalt paving for various thickness of Portland Cement Concrete (PCC).

When evaluating strength, HMA and PCC are not equal on an inch-to-inch basis. The American Association of State Highways and Transportation Officials (AASHTO 1972 Interim Guide) included after test results structural coefficients per inch of pavement for use in design of roadway thicknesses. The structural coefficient for PCC was determined to be 0.50. Type A asphaltic concrete 0.44 and Type B asphaltic concrete 0.40.

APAI recommends changes in the asphalt strength coefficients based on the following: HMA utilized for intermediate and surface layers using aggregate crushed to 60% from a Type A aggregate source will continue to be a structural coefficient of 0.44. HMA for surface and intermediate courses using 75% crushed aggregate from a Type A aggregate source is recommended to be assigned a structural coefficient of 0.46. HMA base courses using 45% crushed aggregate from a Type B aggregate source is recommended to be a structural



60% Crushed, Type "A" Aggregate



75% Crushed, Type "A" Aggregate

coefficient of 0.42.

The AASHTO tests performed in the early 1970s recommended a structural coefficient of 0.44 for HMA with 65% crushed material. APAI continues to recommend a structural coefficient of 0.44 for HMA with 60% crushed materials from a Type A aggregate source. The improvements in the shear strength of binder and in construction and testing methods compensates for the reduction of 5% crushed material.

HMA with 75% crushed aggregate from a Type A aggregate source increases the internal friction of the HMA mix and it is recommended that the structural coefficient be increased to 0.46.

HMA base courses with 45% crushed Type B aggregate exceeds by 15% in crushed content over

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From the Desk of the E.V.P.

Asphalt Costs Remain Competitive in Light of Oil Hikes



Mike Kvach, APAI Executive Vice President

As stated by the National Asphalt Pavement Association, contrary to what logic might suggest, recent increases in the price of oil have not forced asphalt paving costs beyond what could be considered a standard rate of inflation. In fact, asphalt has sustained one of the lowest cost increases of any building material over the last two years. According to a study by American Road and Transportation Builders Association research economist Alison Premo Black, the cost of HMA pavement material has risen only 10%, while ready-mix is up 18% and steel up 60% (ref.: www.roadbridges.com).

Hot Mix Asphalt continues to be the most economic value for pavements, in the initial cost to construct, in the total cost to maintain, and beyond the engineered analysis period. According to the Iowa Department of Transportation's "Price Trend Index for Highway Construction" report, the cost of Hot Mix Asphalt has increased at an average rate of 2.8% annually over the 20 year period. Looking beyond the standard pavement life analysis period, because an HMA structure ages from the top down, only the surface course ever requires periodic renewal, the main structure remains intact saving the tax paying public time and money.

Iowa Hot Mix Asphalt Hall of Fame

The Iowa HMA Hall of Fame represents our association's highest honor to be bestowed upon any one individual. This year two individuals were inducted during APAI's 50th annual convention in December held at the West Des Moines Marriott, Harold "Hy" Cessford and Larry Mattusch.

Harold "Hy" entered the Industry in the 1960's. He was very proactive in growing the HMA Industry in Iowa through promoting, not only his company, but the Asphalt Paving Association with integrity, honesty, and hard work. Those characteristics gained him respect amongst his peers and everyone who came in contact with him. Over his lifetime he would receive 42 smoothness awards and a national award for work performed on Interstate 80 in Adair County. (Read more at www.apai.net)



The IOWA ASPHALT REPORT

www.apai.net

HMA Notes

Lift Thickness - More Than Meets The Eye

By: Bob Nady, P.E.

Sure, you look at the typical cross section and you note the thickness of the lift you are about to place. On the road, you set the correct blocks under the screed, bring the screed onto the blocks and take off. Using your mat depth gauge, you monitor and adjust the thickness as indicated, so that you get the plan thickness after rolling.

But there is a bit more to it than that. How was the lift thickness determined? How about the relationship between lift thickness and mat quality, including density, permeability and maybe smoothness? How was that magic number selected?

In the past, there was lots of discussion about what the lift thickness should be. But there was no hard evidence to support the selection process, except past practice - we always use 1-1/2 inches for surface course, etc. Now we have the results of an important study to support these decisions.

The National Center for Asphalt Technology (NCAT) recently completed research project NCHRP 0-27, which included both a laboratory phase and a field phase and answers many of these questions.

To view a summary of the study's results log onto www.apai.net

Consecutive Diamond Achievement Commendations

Since our last Asphalt Report the following APAI members' plants have received the Diamond Achievement Commendation for consecutive years. Recipients of the Diamond Achievement Commendations were recognized at the National Asphalt Pavement Association's Annual Convention in Hollywood, FL, January 19-25, 2006.

Cessford Construction Co.
Plant 2 - 2002 - 2005

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

Fred Carlson Co., L.L.C.
Decorah Plant - 1999 - 2005

Heartland Asphalt, Inc.
Riverview Plant - 2004 - 2005

L. L. Pelling Co., Inc.
Base 16 - 2001 - 2005
Plant 15, J Street - 2003 - 2005

Manatt's, Inc.
Ames Division - 1999 - 2005
Newton Division - 2002 - 2005

Grimes Asphalt & Paving Corp
Grimes, IA Plant - 2002 - 2005

Our congratulations go out to all APAI members for their efforts in continuing to be good neighbors.

(Strength Coefficient Values Continued) which AASHTO tested for Type B asphaltic concrete base courses containing 30% crushed aggregate. Therefore the increase in structural coefficient is recommended from 0.40 to 0.42.

As most of the pavement designers are well aware, Iowa's local system's Statewide Urban Design & Specifications (SUDAS) will be the standard specifications for urban and county road design. In the new SUDAS specifications and design standards, the HMA mixture design criteria requires 60% crushed A quality aggregate in all intermediate and surface courses for all traffic loadings up to 300,000 ESALs. Also the SUDAS standards require 45% crushed B quality aggregate for all base courses for all traffic loading under 300,000 ESALs. For traffic loading above 300,000 ESALs SUDAS requires HMA surface courses to be 75% crushed A quality aggregate. These categories for traffic loading include most of the roadway pavement designs for local systems in Iowa. When comparing PCC and HMA the above APAI strength coefficient changes, outlined above, align with the SUDAS HMA mixture selection design requirements.

The structural coefficient changes recommended by APAI have been studied and reviewed by Dr. Brian Coree, P.E., former ISU assistant professor of Civil Engineering. Who has issued the following report in July of 2005:

"The traditional HMA layer coefficient derived from the AASHTO Road Test (1972) was based on pre-SuperPave mixtures that would not meet today's higher standards. Evaluating modern mixtures with modern techniques, including the mechanistic-empirical evaluation of resilient modulus and seasonal temperatures profiles, results in the conclusion that the values below are highly conservative for use in Iowa."

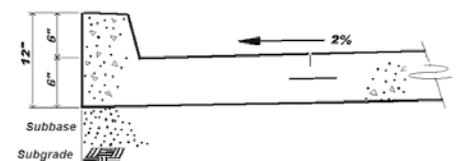
- 75% crushed, Type A aggregate
Layer coefficient = 0.46
- 60% crushed, Type A aggregate
Layer coefficient = 0.44
- 45% crushed, Type B aggregate
Layer coefficient = 0.42

Today's HMA performs in terms of strength and longevity with PCC when equivalent designs are determined. Slight modifications of the 1970s AASHTO strength coefficients

for HMA are recommended by APAI due to the modern mixtures, increased crushed aggregate content and the sheer strength of the aggregate binder. SUDAS established mixture selection criteria will require knowledge of the layer strength coefficient to determine equivalent designs. Although HMA and PCC are not equivalent on an inch-to-inch basis, the above recommendation and the next example illustrate how to compare PCC and HMA.

The following example of urban residential equivalent paving (<300K ESALS) utilizing the recommended structural coefficients (SC) determines structural numbers (SN).

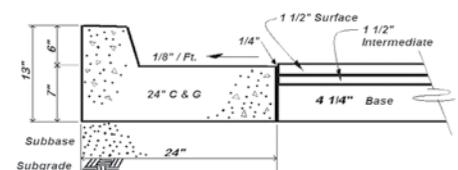
Cross Section: PCC Pavement



Portland cement concrete
6" PCC @ SC 0.50 = SN 3.00

Local system's survey results indicate 6" non-reinforced PCC with 6" integral curb is the predominate cross section design for paving of low volume (less than 300K ESALs) streets and roadways. PCC paving is typically supported by 4-6" of compacted modified aggregate sub-base.

Cross Section: HMA Pavement



Hot Mix Asphalt
4.25" base @ SC 0.42 = SN 1.78
3" inter./surface @ SC 0.44 = SN 1.32
Total SN 3.10

Equivalent HMA paving cross-section design consists of 7" thick 2' wide PCC curb and gutter (C&G) section with 6" integral curb and 7.25" of HMA paving. The advantages of the 2' wide, 6" thick C&G compared to 2'-6" wide, 7" thick C&G are that the sub-base or sub-grade can be prepared uniformly curb-to-curb and the tendency for the C&G to tilt is minimized by the shift center of gravity to the curbline.

Calendar of Events

APAI 2006 Golf Outings

June 27, 2006 - Centennial Oaks
19 Eagle Ridge Dr.
Waverly, IA 50677
319-483-1765

July 25, 2006 - Legacy Golf Club
400 Legacy Parkway
Norwalk, IA 50211
515-287-7855

August 29, 2006 - Lake Creek Country Club
1 Clubhouse Drive
Storm Lake, IA 50588
712-732-1548

Registration information will be available in the near future.