NCSC Staff Grows

The NCSC is pleased to announce that two new staff members have joined the team. Linda Pitstick joined the staff in December as the new Editor and Resource Specialist. Eyal Levenberg also came on board in December as our new post doctoral research fellow; he will be working on accelerated pavement testing and recycling studies for the next two years.

As Editor and Resource Specialist, Linda will be responsible for much of the outreach of the center. She will design and layout the newsletter, design and maintain the website, and be the voice on the other end of the phone when you call. Linda will also coordinate meetings and other activities for the North Central Asphalt User Producer Group.

In 1983, Linda obtained her Bachelor of Science in Business Education, with a Data Processing Endorsement from Ball State University. She received her Master of Science in Business Education, with Vocational Education Endorsement from Indiana University in 1986. She taught high school for six years and also taught for Indiana Vocational Technical College and did part-time computer training for county agencies.

In 1989, Linda began working as a computer instructor for Alverno Administrative Services in Beech Grove, Indiana. A couple years later she accepted a position at Indianapolis Life Insurance Company in the Human Resource Department as a Training and Development Professional.

In 1995, she started working at Purdue University for the HERPICC program, now known as Indiana LTAP.

Eyal was born in Israel in 1971 but spent most of his childhood in Nigeria. In 1993 he received his B.Sc. in Civil Engineering from the Technion - Israel Institute of Technology. From 1993 to 1999, Eyal served as a civil engineer in the Israeli air-force. In 1999, Eyal received his M.Sc. from Tel Aviv University in the field of management - information systems. Since 1999 Eyal has been working as a self-employed pavement/geotechnical consultant with offices in the city of Haifa (Israel). Also, during the period 2000 - 2006 Eyal studied for his Ph.D. at the Technion under the supervision of Dr. Jacob Uzan. His dissertation includes the development and calibration of a 3D viscoelastic-viscoplastic constitutive model for asphalt-aggregate-mixes including the effects of damage and healing.

Eyal is married to Lihi and has three children: Tom (10), Jonathan (6) and Shira (2).
NCAUPG Sets Records
By Rebecca McDaniel

The 2007 Hot Mix Technical Conference, sponsored by the North Central Asphalt User Producer Group (NCAUPG), was a record-setting meeting. Nearly 200 people attended the meeting, and 24 exhibitors displayed their wares—both were records.

Mike Kvach, NCAUPG Industry Co-Chair, opened the conference and introduced the keynote speaker, Charles Potts. Potts started working in the highway construction industry in 1961 as an equipment operator. After college, he worked for the Florida Department of Transportation, eventually becoming State Materials Engineer and later Director of Operations. He has also worked for APAC and Heritage Construction and Materials. Potts has seen an evolution in Quality Control over the years. Improvements have been made, but there are still some problems, including misunderstanding the real variability in materials and in testing. Potts noted that we need to work on improving all aspects of construction, not quality control alone. “If you have a bad design or bad specifications, but the best QC in the world, you’ll have a well controlled failure. If you have a great design or specification and poor QC, you may or may not have a failure.” Warranties, percent within limits specifications and other tools will help, but are not a panacea.

Next, King Gee, Associate Administrator for Infrastructure for the Federal Highway Administration, spoke about FHWA’s plans for the future. He noted the recent 50 year anniversary of the interstate system; now we need to look forward at the next 50 years. Some of the program issues FHWA is working on include quantifying pavement service life, clarifying QC/QA responsibilities and risk, energizing and using Pavement Management Systems, and embracing pavement preservation as a tool. Lastly, Gee thanked everyone for their continued partnership; FHWA is committed to continuing to partner with PWL specifiers from the point of view of the region. The NCAUPG was formed in 1996 when they implemented Superpave. Since Superpave is routine now in the region, the NCSC has broadened its scope to cover hot mix asphalt in general. She briefly highlighted the NCSC’s current research in the areas of friction, noise, recycling and pavement performance.

Quality Control
Ron Walker, Manager of the Indiana Department of Transportation’s Office of Materials Management, discussed HMA acceptance issues and Indiana’s round robin study looking at variability. Walker reported that INDOT and contractor results in a round robin agreed very well despite differences in the compactors used. INDOT introduced PWL specifications in 2006 on binder content, air voids, VMA and density. They will do three PWL projects in each of six districts in 2007 and have a final specification in 2008.

Next, a panel of representatives from DOTs (Iowa, Kansas and Michigan) and industry (Indiana and Michigan) spoke of their experiences with PWL specifications. Brad Cruea, of Milestone Contractors in Indiana, reported on two projects his company did in 2006. Cruea offered a number of keys to success at the plant and in the field. At the plant, know what is in your stockpile, keep your mix temperature constant, calibrate your plant, do not let your silos run empty and communicate with the field crew. In the field, keep the paver, transfer device and rollers moving at a consistent speed, keep the hopper full, reject bad loads, sample properly and communicate with the plant.

Mike Heitzman outlined Iowa’s current Quality Management of Asphalt program and changes being proposed. QMA was developed in the early 1990’s using 1990’s technology and issues. The Iowa DOT is now working with the FHWA and industry to update their program. The new program will offer incentives and disincentives for aging, lab and field voids and smoothness, while the current one only has incentives for smoothness.

Next, Rick Barezinsky summarized the use of PWL specifications in Kansas, which began in 2000. Kansas had previously implemented QC/QA in 1996 when they implemented Superpave. PWL specifications on density and air voids have encouraged contractors to exercise tighter production control and reduce variability. Barezinsky cautioned, however, that nothing in QC/QA or PWL specifications replaces the need for inspection.

Pete Capon, of Rieth-Riley, then offered a contractor’s view from Michigan. He noted that PWL requires a new way of thinking and a better understanding of what affects material variability. Tweaking mixes to adjust the properties could lead to “chasing your tail.” Consistency is key, so the company set policies on when to make adjustments.

Lastly, Curtiss Bleech addressed the use of PWL specifications from the point of view of the Michigan DOT. Bleech said that Michigan’s QC/QA program was rather cumbersome and was inconsistently enforced statewide. A joint MDOT, FHWA and industry committee developed a PWL specification that was used on eight projects in 2004 and has grown and been refined since then. Bleech added that PWL may not give you a better performing roadway, but it will perform more consistently.

HMA Economics 101
Joe Schroer, Missouri DOT, reported on their work with recycling shingles. MoDOT was approached by Pace Construction and a landfill to consider allowing shingles. The DOT was concerned about low temperature properties of the blend and the possible presence of deleterious material like wood, nails and asbestos. They found very small amounts of deleterious materials in a field trial. They also showed in lab testing that it took more shingles to affect the low temperature grade of the binder than the high temperature grade.

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Similar results were presented by Dusty Ordorff, Bituminous Roadways. In 11 years of shingle use in Minnesota, his company has had success using ground manufacturing waste. They usually see a one grade increase in the high temperature grade and no change on the low temperature side. He also reported good consistency in the ground material. He still sees a need to promote education about recycling because some agencies have misconceptions about the quality at the local level.

Dan Gallagher, Gallagher Asphalt, discussed RAP usage in Illinois. When RAP use decreased with the implementation of Superpave in the early 1990s, RAP piles began to grow; some are still accumulating, especially in urban areas. He noted that in the Chicago area, “if you are not recycling, you are not going to be competitive.” The cost savings that have benefited Illinois taxpayers through the use of RAP are staggering and the pavement quality has not been compromised.

Next, Bill Haverland, from ConocoPhillips, discussed asphalt pricing and supply. Asphalt represents about 3% of the oil produced in the US, and we are consuming about as much asphalt as we produce domestically. The increase in asphalt prices in 2006 made it less attractive for some oil companies to make major capital investments inokers to extract more lighter fuels. This means that as long as asphalt keeps pace economically with other petroleum products, we will have the supply we need.

Hot in-place recycling is another rehabilitation technique with economic advantages in the right applications. Jason Johnson, from Sem Materials, and Brian Hansen, from Dustrol—a hot in-place recycling and HMA contractor—outlined one hot in-place recycling system. They showed examples of where it had been used and appropriate applications for its use.

Gerry Huber, Heritage Research Group, discussed the history of gyratory compaction and efforts to develop, then refine, a reasonable N<sub>60</sub> table. He also reviewed the effects of changing N<sub>60</sub> on mixture properties. Huber concluded that the current table is reasonable, but basing gyrations on test strip density might be a more rational approach if we were to invest in the research to support it.

Wayne Jones, of the Asphalt Institute, reviewed the Bailey method—a tool for efficient selection of the aggregate gradation. It is based on principles of aggregate packing. The method can help you hone in on an aggregate grading that will produce an acceptable, economical mix without a lot of trial and error.

Dudley Bonte, Reith-Riley Construction Co., then shared ten tips for managing risk through Quality Control. One of the keys is remembering the basics. Understanding the specifications, trying out new mixes in low risk situations, being creative, looking for the root cause of problems, and providing the proper tools for the right people are other keys. Lastly, Bonte said you need to know when to stop and regroup.

Another panel discussion provided contractor and agency views on warm mix asphalt. Jack Weigel kicked off the discussion, sharing Payne and Dolan’s experiences with warm mix in Wisconsin and Michigan with Sasobit and Evotherm. All the mixes met all the normal DOT specifications. Weigel feels the warm mixes were successful and could possibly extend the paving season.

Dave Powers, Ohio DOT, described a warm mix trial using Sasobit, Evotherm and Asphalt as compared to a control section with 15% RAP. A research project will monitor the performance for three years and look at rutting of the mixes using accelerated loading. Emissions were monitored during production. Powers noted that the FHWA Warm Mix Technical Working Group will be meeting in April and is expected to issue some guidance on warm mix usage after that.

Joe Schroer, Missouri DOT, then reported on use of warm mix to solve a problem in Missouri. When paving over crack sealant, the hot mix seemed to slip, producing bumps in the mat. (See the article on page 8 for more details.) Use of warm mix prevented vaporizing of moisture and reduced the number of bumps while allowing easier compaction. Although MoDOT does not plan to specify warm mix, there are some applications where it could be used to advantage.

Testing and Performance

John D’Angelo updated the group on the status of the multi-stress creep recovery (MSCR or “Massacre”) test. This test has been studied as a more fundamental way to test polymer modified binder and is a potential replacement for many of the more empirical PG+ tests that many states have implemented. The MSCR test does a better job of identifying materials that will not perform in high stress situations but may pass tests like elastic recovery. An AASHTO test procedure is expected this year.

Lee Gallivan, FHWA, discussed intelligent compaction (IC) and its short and long term benefits. The importance of good compaction has been known for a long time, but now technological advances allow us to monitor compaction and make adjustments on the fly.

Fred Frecker, Flexible Pavements of Ohio, then summarized all the presentations made at the 2006 International Conference on Perpetual Pavements (see article on page 5). Research efforts and field trials in the US, Canada, Great Britain, Italy, China, Afghanistan and elsewhere were presented. The presentations are available online at www.ohio.edu/icpp/.

Next, Mihai Marasteanu from the University of Minnesota discussed ongoing research on low temperature cracking. Though the Indirect Tensile strength and stiffness test is used to estimate low temperature cracking, it is not a true fracture test. Other test methods, including the disk compact tension, single edged notched beam and semi-circular bend tests, may be more relevant. Cracking is dependent on the binder, but there are also effects from the aggregate and cooling rate.

Ayesha Shah then reported on work at the NCSC looking at the performance of typical mixes from the region in the dynamic modulus, flow time and Superpave shear tests. This study looked at seven Superpave mixes, one with 15% RAP; one Marshall mix; and three SMAs. The results generally showed the conventional mixes to have somewhat higher moduli than the SMAs. The study included a pair of mixes with the same gradation but different binder grades; the mix with the higher PG grade had a higher stiffness, as expected.

Dennis Dvorak, FHWA, discussed Quality Assurance next. He reviewed the evolution of QA specifications and where we are heading, plus resources that are available today. He noted that it is important to have incentives to help balance the disincentives and account for testing variability. States still need inspection even if they use contractors’ test results for pay. FHWA’s Advanced Quality Systems (AQS) implementation team is one resource that can help with implementation of improved systems to ensure quality.

Will Stalcup closed the meeting, announcing that next year’s meeting will be held in Springfield, Illinois, on January 8-10. He also thanked the exhibitors for their support, Mn/DOT and MAPA for hosting, and everyone for contributing to the success of the meeting.

Copies of the presentations are available on the NCAUPG website at http://cobweb.ecn.purdue.edu/~spave/NCAUPG/.
Calendar of Events

2007

March 12-14  Association of Asphalt Paving Technologists 82nd Annual Meeting
San Antonio, TX
Website: www.asphalttechnology.org

March 19-22  World of Asphalt 2007 Show and Conference
Atlanta, GA
Website: www.worldofasphalt.com

April 2-3  6th International Symposium on Asphalt Binder Rheology and
Pavement Performance
Tampa, FL
Website: www.asphalt-technology.com/sym.htm

April 16-18  New Directions in Airport Technology
Atlantic City, NJ
Website: www.airporttech.tc.faa.gov/naptf/att07/

June 24-27  9th International Conference on Low-Volume Roads
Austin, TX
Website: www.trb.org/conferences/9lvr/

Sept. 27-Oct. 2  AASHTO Annual Meeting
Milwaukee, WI
Website: www.transportation.org/aashto/calendar.nsf

2008

January 8-10  NCAUPG 2008 Hot Mix Asphalt Technical Conference
Springfield, IL
Website: http://bridge.ecn.purdue.edu/~spave/