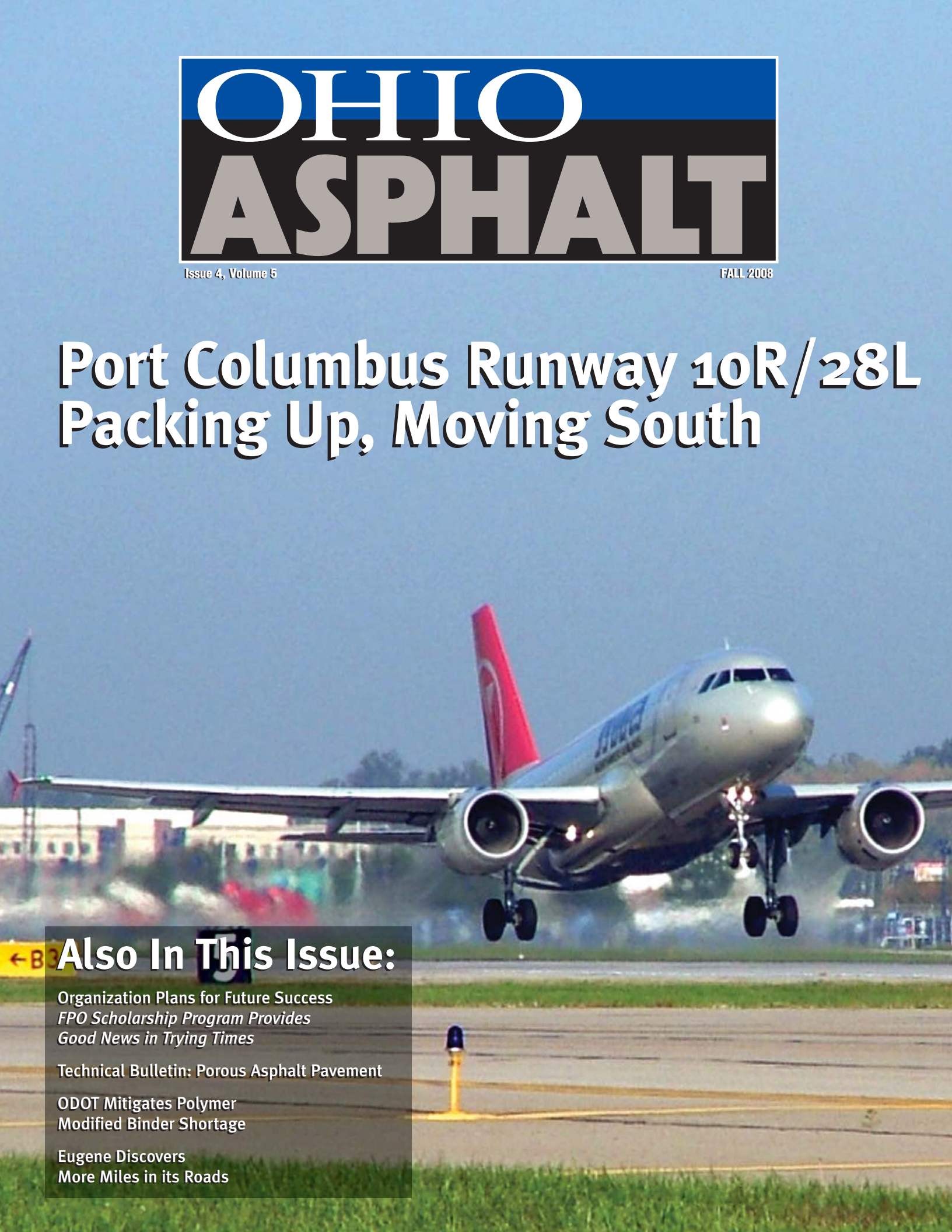
OHIO ASPHALT
Issue 4, Volume 5 FALL 2008

Port Columbus Runway 10R/28L Packing Up, Moving South



Also In This Issue:

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USING A SMALL MACHINE DOESN'T HAVE TO COMPROMISE PRODUCTIVITY OR PERFORMANCE.

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OHIO ASPHALT

FALL 2008

ON THE COVER: ***Port Columbus International Airport's Runway 10R/28L has had an illustrious history since it originated 80 years ago. See page 15 to find out how this award-winning strip of asphalt has dutifully served various ages of aviation, as well as what plans are in store for Runway 10R/28L.***

Flexible Pavements OF OHIO

Flexible Pavements of Ohio is an association for the development, improvement and advancement of quality asphalt pavement construction.

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Thank You for Your Business!

Clifford Ursich
President &
Executive Director

The 2008 Paving Season is coming to a close, and it is appropriate that the asphalt industry says … thank you for your business!

As in past paving seasons, 2008 saw placement of millions of tons of quality asphalt pavement providing Ohioans smooth travel as they enjoyed Ohio's highways and byways. Pavement owners from around the state selected asphalt as their material of choice for cost, convenience and comfort. The asphalt industry thanks you for selecting our product, and we salute you for understanding the value received when purchasing asphalt pavement.

2008 has been both a challenging and stimulating season. Faced with rising costs of construction materials, many agencies have sought innovative ways of stretching their money. Many drew on one of the greatest benefits asphalt pavements provides – ease of maintenance. When money is "tight" it's nice to have options, and asphalt provides the most options to maintain your pavement. Thin asphalt overlays, like Smoothseal (ODOT 424 Type B), chip seals, surface treatments, and now newly introduced 404-LV, are viable low-cost maintenance strategies – and all are made possible when a pavement is first constructed using asphalt.

"You get what you pay for"

We've all heard the adage: "You get what you pay for." It conveys the thought that quality is associated with cost; that is, better quality is going to cost you more money. For many years, asphalt was the exception to the rule. Asphalt cost had been low and its associated performance very high. Today, the cost of asphalt has nearly caught up with its high worth. Getting smooth pavement costs money, and asphalt pavements are the smoothest. Getting long-lasting pavement costs money, and asphalt pavements are the only pavement that has consistently demonstrated long-term durability. Getting quiet and comfortable pavement costs money; and asphalt pavements are the quietest and most comfortable – the data show it so! Though we don't relish the thought of high asphalt prices, we do wish to affirm that asphalt pavements are worth the price tag.

Customers – A Business' Greatest Asset

Our customers are our greatest asset, and our desire is to provide to you the highest-quality asphalt pavement at the lowest cost. As of the writing of this message in mid-October, the NYMEX Light Sweet Oil Price has fallen to $70 from its high of $147 just three months ago, the same month asphalt binder price rose to its historical high. The September ODOT asphalt binder index, for the first time since November '07, stabilized and even dipped a "tad." In October it dropped an additional $30. What the future holds we do not know. We are hopeful that asphalt binder prices will begin a steady retreat, but what we are learning as we pass through this refining fire is that we must innovate and that we can conserve our resources even better than we previously had thought. Here are some examples.

A promising area of innovation is Ground Tire Rubber (GTR) asphalt. Marketed by Seneca Petroleum, GTR asphalt is a process that converts scrap tires to an asphalt binder modifier. The technology innovates in two ways. First, because scrap tires are 35- to 40-percent latex or natural rubber, GTR imputes these polymeric properties to a mix. Secondly, it reduces the waste stream of scrap tires. As this technology becomes more prevalent, and the price becomes even more competitive with conventional binders, its use will become widespread. Who knows, maybe within the decade asphalt plants will be using this technology regularly as a low-cost binder. If you think about environmental sustainability, GTR offers huge benefits. GTR asphalt binder uses approximately one scrap tire for each ton of asphalt. When you consider the millions of tons of asphalt sold in Ohio, that's millions of scrap tires evaporating from the waste stream every year.

Another innovator is Erie Blacktop. Recycling shingles and recycled asphalt pavement (RAP) into new asphalt mix has become Erie's way of weathering the storm of high binder prices. It makes perfect sense to use the value in these asphalt-rich recyclable products. Erie has a lot of experience with the successful construction of asphalt pavements that use shingles. Shingles are composed of about 30-percent asphalt

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binder, have very high-quality aggregate and include a fiber that introduces helpful mechanical resistance to pavement deformation. Other contractors, like Erie, are making due with what they have by using recyclable materials more efficiently. From fractionating RAP to including roofing shingles, contractors are innovating and streamlining operations to hold costs down and provide competitive prices to their customers.

Warm Mix Asphalt (WMA) is an innovation whose timing is right. Not only are we seeing better emission numbers with WMA, we are also seeing energy savings and a greater ability to introduce higher amounts of RAP into new mix. Though we haven't completely arrived with WMA – and a lot of work remains with quantifying how WMA will perform under various traffic conditions – it is a breakthrough technology that gets us beyond the barriers we once had with conventional Hot Mix Asphalt. As of this writing, Flexible Pavements of Ohio is participating in discussions with ODOT to help it meet its strategic initiative to enhance the use of recyclable products. WMA is one of the technologies ODOT targets in its business plan to accomplish this initiative. From it, we anticipate the ability to produce ODOT mixes at even higher levels of RAP, facilitating even greater efficiency of raw materials.

Being True to Our Word

In the last edition of *Ohio Asphalt*, I compared our present hardship with the days of the Oil Embargo. I predicted that "*out of this current refiner's fire, there will be new innovations that catapult the industry forward.*" Though the examples I cite above are in large part not "new" technologies, they are certainly ones that have been the engine for new and innovative thought. Being true to our word the industry is incorporating these new ideas, and the fruit of which will be improved economy and better resource utilization. As I said earlier, our customers are our greatest asset. As such, the industry will continue to innovate and deliver affordable and durable pavements for your convenience and comfort. THANKS FOR YOUR BUSINESS!

OA

By Jerry Marks, TRIAD, Inc.

ORGANIZATION PLANS FOR FUTURE SUCCESS

FPO Scholarship Program Provides Good News in Trying Times

In this time of federal bailouts, record-high motor-fuel and material costs, tensions overseas, weather-related disasters and seemingly endless political blather and party partisanship, isn't it time for something positive?

How about "Organization Plans for Future Success," as an eye-catching – and eye-pleasing – headline?

That "organization" is Flexible Pavements of Ohio, which for the 2008-09 academic year is helping 25 Ohio college students through its 2008 Hot Mix Asphalt (HMA) Scholarship Program. In its 13th year, the scholarship program is helping students pursue their scholastic goals at one of Ohio's nine educational institutions offering HMA courses.

While begun in 1995 as a promotional tool for the HMA industry at Ohio schools – that offered civil engineering and construction management degrees but at the time didn't offer coursework in flexible pavements – today, the scholarship program is a celebration.

MISSION ACCOMPLISHED

The FPO HMA Scholarship Program originated with four goals, which have previously been reached but continue to drive the program's success. Here are those program objectives:

- Provide an incentive for students to gain knowledge in HMA by requiring each scholarship recipient to take at least one course in HMA
- Provide an incentive for colleges/universities to offer training in HMA by creating a student demand for the course
- Establish close ties between the asphalt industry and universities, to raise the awareness of HMA in the academic community and foster HMA-related research
- Provide a workforce trained in asphalt technology

The FPO HMA Scholarship Program is administered through the National Research and Education Foundation of the National Asphalt Pavement Association.

The celebration not only recognizes the best and brightest of students currently pursuing degrees and careers in construction and asphalt pavement technology, but it also celebrated the more than 30 FPO member companies and members supporting the industry's future and the nine state college/universities offering educational opportunities in HMA technology. In all, it's a collective celebration of striving for improved quality in Ohio's asphalt pavement industry.

Included in the 2008-09 program, and celebration, were several firsts.

For the first time, the Erie Blacktop Mixture Design Competition awarded two, $1,000 prizes; one $1,000 prize to the winning school's Civil Engineering or Construction Management department, and another $1,000 to be split among members of the winning student team. This year's Erie Blacktop Mixture Design Competition prize money went to Ohio University and students Eric Biehl and Jared Perry.

Also awarded was the inaugural FPO Graduate Student Scholarship, which recognizes a student whose post-graduate major field of study relates to asphalt pavement technology. The first recipients of the scholarship – each receiving $2,200 – were the University of Akron's Mohammed Khasawneh and the University of Cincinnati's Anastasios Karahalios, both Ph.D. candidates.

Another first for the FPO Scholarship Program was the awarding of the Fred and Teresa Frecker Scholarship, which went to Justin Stone of Ohio Northern University. The namesake of the $1,100 scholarship honors the dedication to the association and industry by the Frecker Family; Fred served as FPO's President/CEO for 15 years before retiring in 2007.

Also highlighting this year's program was the awarding of the second Dine Comply, Inc. Environmental Scholarship. Received by Ohio State University's Amanda Guenther, the scholarship is designed to encourage students to consider a career in environmental compliance or regulation within the asphalt industry or regulatory agency.

In all, more than $30,000 was awarded through FPO's 2008 Hot Mix Asphalt Scholarship Program, bringing the 13-year total to more than 200 scholarships and $300,000.

Now, that's good news in a time of federal bailouts, record motor-fuel and material costs, etc.

OA

2008-09 OHIO ASPHALT SCHOLARSHIP PROGRAM

Recipients & Sponsoring Members

Barrett Paving Materials, Inc.

Lydia Buehrer
Ohio Northern U.

Barrett Paving Materials, Inc.

Greg Saylor
U. of Cincinnati

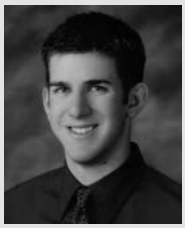
Dine Comply Inc. Environmental Scholar

Amanda Guenther
Ohio State U.

Erie Blacktop, Inc. Mixture Design Competition

Jared Perry
Ohio U.

Flexible Pavements of Ohio



Joshua Slaga
U. of Akron

Fred & Teresa Frecker

Justin Stone
Ohio Northern U.

Flexible Pavements of Ohio Graduate Student Scholar

Anastasios Karahalios
U. of Cincinnati

Flexible Pavements of Ohio Graduate Student Scholar

Mohammed Khasawneh
U. of Akron

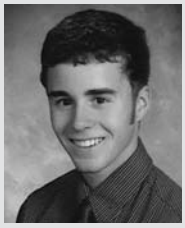
Flexible Pavements of Ohio

Rachel Louis
Ohio State U.

Gerken Paving, Inc.

David Dibling
Ohio State U.

Gerken Paving, Inc.



Paul Lewis
Ohio Northern U.

John R. Jurgensen Co.

Sara McDonald
Ohio Northern U.

John R. Jurgensen Co.

Dominic Trucco
U. of Cincinnati

Kokosing Construction Co.

Jeremiah Hoeflich
U. of Toledo

Kokosing Construction Co.

Nicholas Piazza
Ohio State U.

Martin Marietta Materials
Erie Blacktop, Inc.
Mixture Design Competition

Eric Biehl
Ohio U.

Martin Marietta Materials

Andrew Richlen
U. of Akron

Northstar Asphalt Inc./
Kenmore Construction Co.

Ryan Grady
U. of Akron

Northstar Asphalt Inc./
Kenmore Construction Co.

Stuart Jacob
U. of Akron

Ohio CAT

Joclyn Hunter
U. of Akron

Ohio CAT

Andrew Rieck
U. of Akron

The Shelly Co.

Daniel Freedman
U. of Akron

The Shelly Co.

Donna Orellana
U. of Akron

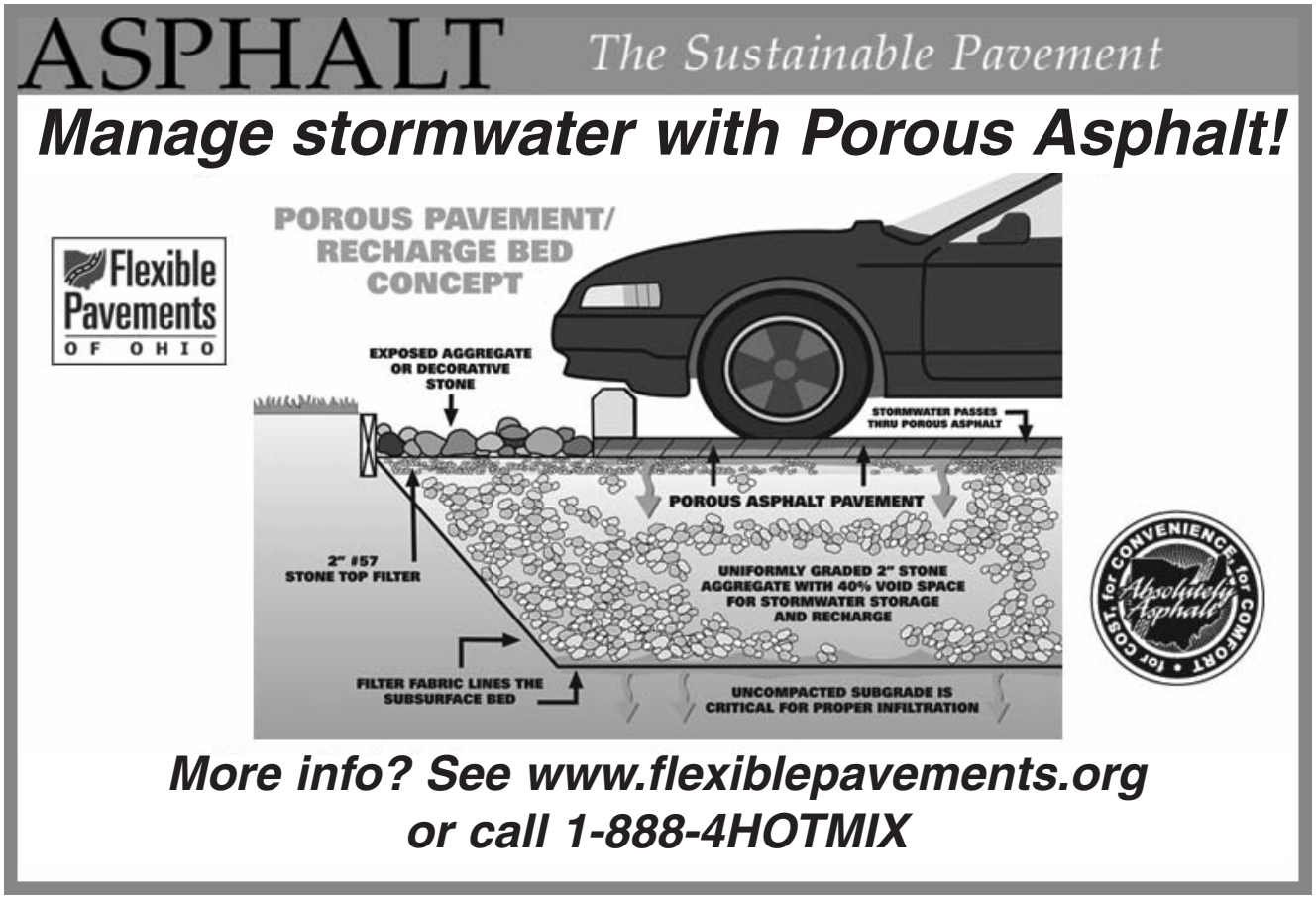
The Shelly Co.-Findlay

Bradley Holman
Ohio Northern U.

The Shelly Co.-Findlay

Lindsey Staley
Ohio Northern U.

Technical Bulletin: Porous Asphalt Pavement



A four-page Technical Bulletin on Porous Asphalt Pavement is included as an insert in this issue of *Ohio Asphalt*. The Technical Bulletin includes an overview of all the issues a designer must consider when deciding to use a porous asphalt pavement for storm water management, as well as construction and maintenance considerations. The insert is designed and three-hole punched, so that it can be removed and saved for future guidance.

Porous Asphalt Pavement systems are being considered more frequently to manage storm water runoff quantity and quality, especially for redevelopment sites where land restrictions preclude more traditional storm water best management practices. Another benefit of a porous asphalt pavement is the elimination of water standing on the surface. Imagine never having to walk through a puddle again! Clients are going to love it.

More information on porous asphalt pavements and materials is available through the Flexible Pavements of Ohio Web site on the sustainable pavement page. Visit http://www.flexiblepavements.org/sustainable_pav.cfm.

OA

FLEXIBLE PAVEMENTS OF OHIO

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Technical Bulletin: **Porous Asphalt Pavement,** 30 September, 2008

Introduction

Porous asphalt pavements are being used to reduce or eliminate storm water runoff from parking lots and other such facilities. A porous asphalt pavement is constructed over a stone-filled reservoir to collect and store storm water and to allow it to infiltrate into the soil between rainfalls. Where low soil permeability is not conducive to infiltration, a similar design can be used as a detention facility or an exfiltration solution that filters pollutants from the first flush and improves the water quality of the runoff. These designs can reduce pollution and replace expensive detention and treatment facilities. Porous pavement systems are rapidly gaining favor with designers and regulators as an economical approach to storm water management for sustainable or low-impact development. As the NPDES permit requirements have become more widely applicable, it has become necessary that developers find more innovative means of compliance. Porous pavement systems are commonly being used as part of a strategy to obtain Leadership for Energy and Environmental Design (LEED®) certification for green building projects. Another benefit of porous pavement for parking lots is the absence of ponded water on the pavement during and after rainfall. Patrons never have to step in a puddle again!

While detention basins are often used to collect and slow the rate of runoff from the impervious surfaces of roofs and pavements and are effective, they require additional land. Especially on re-development sites, additional land may not be available or may be prohibitively expensive. The porous pavement/recharge bed design may be the solution to the problem.

Figure 1: Parking Facility of the Sand Run Metro Park, Summit County, Ohio

The "Porous Pavement" concept was conceived in the Franklin Institute Research Laboratories in 1968 and was developed there under a grant from the U.S. Environmental Protection Agency during 1970 and 1971. After the final report on the project was issued, interest in the concept prompted Edmund Thelen and Leslie Fielding Howe to prepare a book about its development that included a design guide. The publication, *Porous Pavement,* was published by the Franklin Institute Press in 1978. The book is out of print; but, is still available in some technical libraries (2).

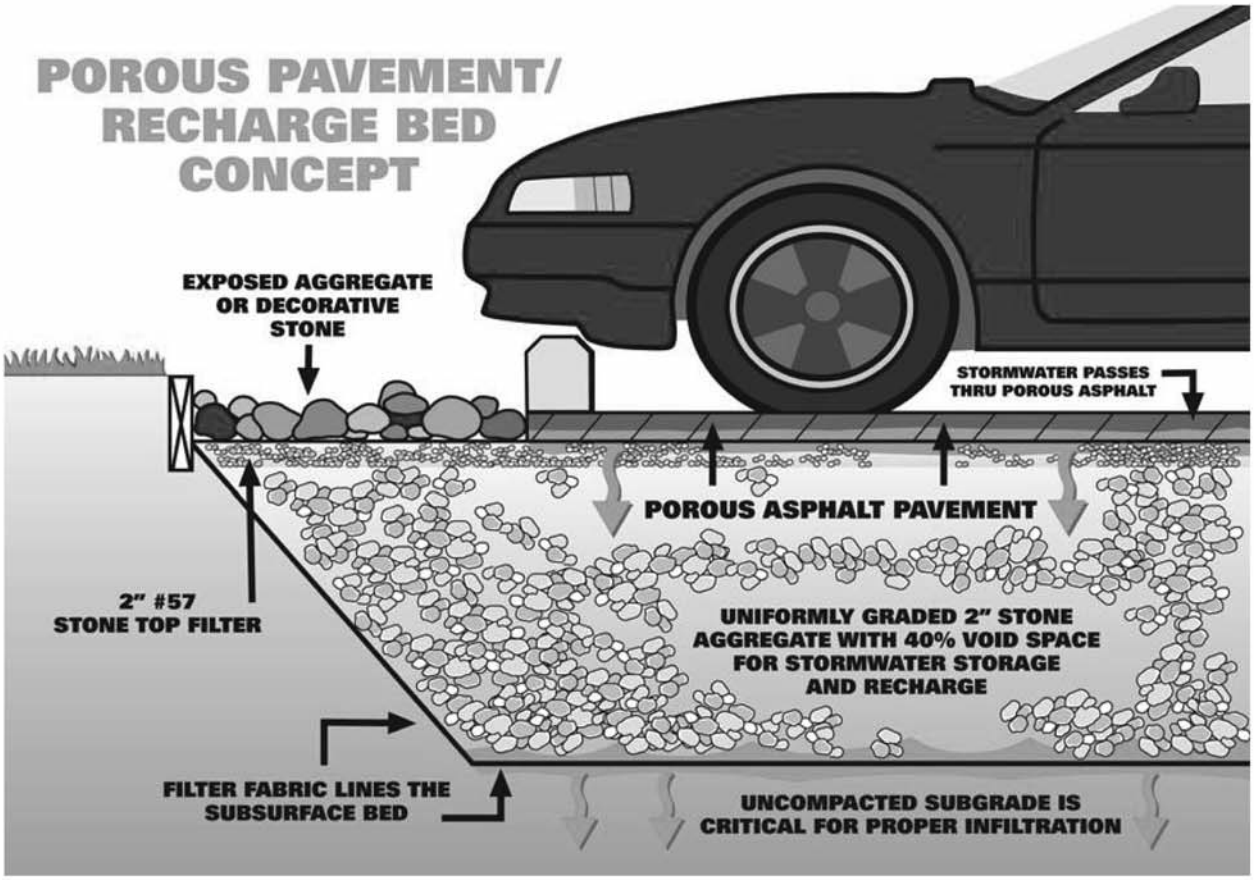
Design Considerations:

In considering a porous pavement recharge bed, designers must consider some key

factors: soil percolation characteristics, local topography and climate, the proposed uses of the site, the traffic-loading factor, storm water regulations, site runoff and storm water quality requirements. Frost penetration depth is also a factor in determining reservoir course thickness.

The soils investigation will include a reconnaissance to determine the soil types on the site and one (or more) standard percolation test(s) to determine the average permeability of the site.

A typical porous asphalt pavement recharge bed design consists of one or more porous asphalt courses, a top filter course, a reservoir course, filter fabric and existing soil or subgrade material. In the case of a detention or exfiltration design, this typical may be modified by the inclusion of outlet or underdrain pipes as may be appropriate.



Stone-Filled Reservoir Recommendations

The reservoir for a porous pavement storm water management facility is constructed by first excavating into undisturbed and uncompacted soil to the depth needed to contain the design storm volume. To ensure year-round operation, the bottom of the reservoir should be below the normal frost depth. The reservoir is lined with a geotextile fabric (Recommendtion: geotextile material meeting ODOT specification 712.09, Type B). The reservoir is then filled with No. 2 (1½ to 2½ inch) size stone and topped with a top filter course consisting of a 2-inch thick layer of No. 57 (½ to 1-inch) size stone to provide a paving surface for the asphalt concrete layers. All aggregate must be 100 percent fractured material, and having quality meeting ODOT specification 703.04.

Permeability Considerations

The permeability of porous asphalt pavement (Open-Graded HMA) is often questioned. Various values have been reported in the literature. All are so high relative to the percolation values of the soil

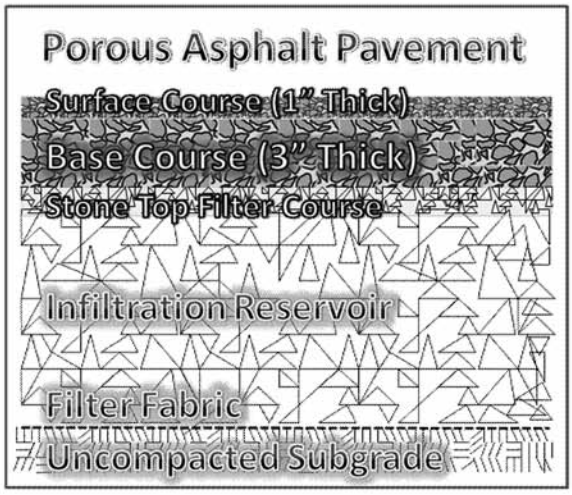
as to not present any limitation and are typically not considered in design. A permeability of 6000 ft/day is attributed to Lovering and Cedergren (1). Thelen and Howe report an asphalt permeability of 176 in/hr. (352 ft/day) (2). In any case, these values are orders of magnitude higher than the best soil permeability of about 6 inches per hour.

Figure 2 gives a visual indication of the porosity of a porous asphalt pavement surface course.

Figure 2: Permeability demonstrated

Asphalt Pavement Thickness and Material Recommendations

For light-duty pavements, intended primarily for cars, FPO suggests using a total of 4 inches of porous asphalt placed in 2 courses; a 3-inch base course and a 1-inch surface course. For the base course, use materials and methods meeting the requirements of FPO specification *Porous Asphalt Pavement Base Course*, dated Oct. 19, 2007 or later. For the surface, use FPO specification *Porous Asphalt Pavement Surface Course* of the same date. These specifications can be downloaded from flexiblepavements.org on the "Sustainable Pavement" page. For pavements that will need to support heavier loads, FPO recommends using a structural thickness of asphalt concrete based on an accepted pavement design protocol. The same porous asphalt materials can be used to make up the required structural thickness.



Cost

The cost of the porous surface material over conventional Type-1 material is estimated to be approximately 40% more. The porous base is approximately 30% more compared to a normal Type-2 material.

Construction

Construction methods are called out in the specifications. In general, construction equipment and methods used in placing porous asphalt pavement are the same as for conventional asphalt concrete construction with a couple of special considerations. As a result, users can expect the same levels of smoothness and speed of construction and use as with conventional asphalt pavement materials. The differences are that porous asphalt materials are not compacted to achieve maximum density and must be protected for contamination that would tend to plug the pores in the materials. Rolling is typically only done to smooth the surface and to seat the stones in the mix so that it doesn't consolidate under traffic. Care must be exercised in the scheduling of construction to protect the porous pavement from contamination that might tend to clog the pores of the system. It is best to build the porous pavement last, after grading and erosion control measures are complete.

Maintenance

Porous asphalt pavements are generally maintained like conventional asphalt pavements, except for a few exceptions. Sometimes cleaning is needed to remove contamination that will plug the pavement and reduce its porosity. In these cases the preferred method is sweeping with a vacuum-type street sweeper. Surface sealants should not be used as they would tend to plug the pores in the asphalt. For snow and ice control, the owner should avoid placing abrasives or grits that would tend to plug the pores of the pavement. Otherwise, snow and ice control is similar to that for conventional asphalt pavement. The owner will need to educate maintenance staff on these differences, as the porous pavement will not look substantially different from conventional pavement. Patching can be done with readily available materials without seriously impacting the operation of the porous asphalt pavement.

References: For more detailed information consult the following references:

(1) *Structural Section Drainage, Proceedings, International Conference on the Structural Design of Asphalt Pavements* , 1962 in the NAPA publication, *Asphalt Treated Permeable material – Its Evolution and Application*, QIP 117, Raymond Forsyth.
(2) *Porous Pavement*, Franklin Institute, 1978, (ISBN Number 0-89168-010-1)
(3) NAPA, Information Series 131, *Porous Asphalt Pavements*, 2003

View the many linked documents and resources at…
http://www.flexiblepavements.org/sustainable_pav.cfm
Which includes charts outlining possible LEED credits.

Port Columbus Runway 10R/28L
Packing Up, Moving South

After a life of dutiful service to Port Columbus International Airport, the asphalt surfaced runway 10R/28L is soon to be decommissioned and a new runway constructed. As part of the Columbus Regional Airport Authority's master plan to increase Port Columbus' capacity, the new runway will be moved 700 feet south, thereby allowing simultaneous arrivals and departures. The existing runway won't go away; rather, it will be downsized and converted into a taxiway.

Pavement History

Runway 10R/28L has an interesting history. It's basically a patchwork of asphalt and concrete depending upon when the various sections were built. In later years, the Airport Authority relied upon asphalt because of its ease of maintenance. Most notably is the construction of the north runway that was built entirely with deep-strength asphalt pavement. Built to its full length of 10,150 feet by 1958, the construction of 10R/28L encompassed three phases. The first phase of the south runway was completed in 1928, in an era when the "airliners" were small, propeller-driven aircraft – such as the Ford Tri-Motor – and aircraft didn't need a very long runway for take-offs and landings.

The 1928 pavement is approximately 4,000 feet from the east end of the airport. Construction consisted of a 5-inch concrete base with a 1 ½ -inch asphalt surface course. Seventeen years later, in 1943 at the height of World War II, a 7-inch concrete overlay was placed over this area to support military aircraft. In 1952, deep-strength asphalt was used to lengthen the runway to approximately 7,500 feet (an additional 3,500 feet) to accommodate new and larger aircraft, such as the four-engine Lockheed Constellation. The new section consisted of an 18-inch aggregate base with an 8-inch bituminous base course and a 3-inch asphalt surface course. In 1958, when the start of the jet age was marked with the arrival of the Boeing 707 to Columbus, the runway was lengthened to its full length of 10,150 feet. That addition featured 11 inches of aggregate base with a 13-inch concrete surface.

Hot Mix Asphalt (HMA) became the material of choice for the airport's maintenance program. In the mid-1960s, the "old" sections of runway - the concrete overlay section - received a 3-inch asphalt overlay. In 1978, a 5 ½ -inch asphalt overlay was placed on the full length of the runway. In 1987, another 5 ½ -inch asphalt overlay was stacked on top. In 2004/2005, 17 years later, the runway had a 2-inch mill/fill with an FAA P-401 asphalt mixture and was shortened by 125 feet to meet FAA Safety Area requirements.

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Award Winning Pavement

The Columbus Regional Airport Authority has been the recipient of paving awards for the construction and performance of runway 10R/28L. In 1987, the National Asphalt Pavement Association honored the Airport Authority and work of Heffner Construction Company by awarding their work on the runway with a Quality In Construction Award. The project was crowned the "Outstanding Hot Mix Asphalt Airport Project for 1987." A Master Craftsman Award was presented in 2004 by Flexible Pavements of Ohio, recognizing the quality of construction as measured by pavement longevity.

Other Notoriety

If runway 10R/28L could talk, it would have much to say about the notable aircraft that landed on it. Air Force One is a frequent visitor, especially during election years, and in the mid-1990s Port Columbus was one of the few airports in the world to have Air Force One and Air Force Two visit at the same time, when President Clinton and Vice President Gore visited OSU for an economic summit. As well, the Concorde has stopped by a couple of times, for trips to Europe. The runway was also used by Geraldine "Jerri" Mock, who was the first woman to fly around the world in 1964. She departed and arrived at Port Columbus. The airport also handled more than 60 aircraft that were diverted on 9/11. The runway also "gave birth" to a couple of notable aviation ventures. In the early 1940s, the Curtis-Wright Company began production of the SB2C Helldiver on the south side of the airport that served as a fighter/bomber for the Navy during World War II. Hundreds were constructed in Columbus and departed for service on 10R/28L. The south airfield is also the birthplace of NetJets Inc., formerly Executive Jet Aviation; its flight headquarters was on the south side of Port Columbus from 1964 until its new facility on the north side of the airport was completed in 2000. NetJets literally "took flight" from runway 10R/28L.

What the Future Holds

The new "South" runway is in the early planning stages. The change in location will facilitate increased aircraft traffic by allowing simultaneous arrivals and departures. The relocation is part of a multi-million dollar airport renovation and expansion, the mission of which includes providing passengers, businesses and the community the highest level of safety, satisfaction and economic benefit. Once the replacement runway is commissioned in 2012, the "old" runway will have about half the pavement removed to make it 75' wide and will be converted to a taxiway to be completed in 2013. Material removed from the runway will be recycled.

Existing 10R/28L has served the Airport Authority well. The asphalt pavement on this runway has for many years been a significant contributor to the safe and efficient transportation of people and goods traveling through Port Columbus International Airport. Like the numerous other airports around the country, the asphalt runways at Port Columbus have consistently demonstrated the attributes so vital to air transportation – safety, smoothness and durability. OA

ODOT Mitigates Polymer Modified Binder Shortage

This summer the asphalt paving industry was unexpectedly hit with a shortage of certain grades of PG and polymer modified binders (PMA) that are commonly specified by ODOT – PG 58-28, PG 64-28, PG 70-22M and PG76-22M. The polymer-modified materials are produced by adding styrene-butadiene-styrene (SBS) or styrene-butadiene-rubber (SBR) to neat asphalt binder. A shortage of SBS made most usual sources of PMA unavailable.

A white paper prepared by the Association of Modified Asphalt Producers (AMAP) explained the causes of the shortage. In short, the AMAP white paper stated that the shortage was caused by a decrease in the production of butadiene when producers altered production as a result of higher petroleum prices. The long-term polymer supply picture is unpredictable because of competing market and manufacturing forces. The AMAP White Paper is available online at www.modifiedasphalt.com.

As soon as the supply shortage was confirmed, the Ohio Department of Transportation (ODOT), in consultation with the industry, moved quickly to implement a plan that would allow critical asphalt paving projects that needed to be completed in 2008 to keep moving forward. On July 18, 2008, William H. Lindenbaum, P.E., P.S., deputy director for the Division of Construction Management, issued a memo to the field districts, "District Guidance for Short Term Polymer PG Binder Availability Issues," which provided guidance on how to adjust contract requirements in the case of a documented inability to obtain the specified binders. The memo contained the following chart which laid out acceptable binder grade adjustments:

Specified PG Grade	Substitute PG Grade	Notes
PG 58-28	PG 64-22	Used in high RAP 302 or 301 only.
PG 64-28	PG 64-22	64-28 is used in heavy intermediate courses.
PG 70-22M	PG 70-22M with SBR PG 70-22 neat* or PG 64-22	The contractor must attempt to utilize SBR polymer injected at the HMA plant (post blend) before agreement is made to switch to lesser alternatives.
PG 76-22M	PG 76-22M made with 5.0% SBR and 64-22 or Supplement 857 Gilsonite added to a 12.5mm or Type 1H mix or PG 70-22M with SBR or PG 70-22 neat* or PG 64-22	The contractor must attempt to utilize SBR polymer injected at the HMA plant (post blend, see plan note below) before agreement is made to switch to lesser alternatives. Delaying placement should be considered.

In general, where the specified binder grade could not be obtained, it was suggested to make a change to an unmodified binder grade or to a binder made with a post-blended polymer, SBR, if available, or other additive, with a commensurate contract price adjustment.

On July 31, 2008, within two weeks of the ODOT action, the Federal Highway Administration (FHWA) issued guidance to all of its state Division Administrators on recommended steps for helping state DOTs deal with the increase in the cost of various construction materials and availability of other products. FHWA notes two issues that caused the shortage in SBS polymer additive:

1. Tight global supply due to unplanned cracker outages and raw material allocations of butadiene

2. Refiners have switched to lighter crude sources to produce more diesel and fuel oil products which have a better cost yield. This has caused a shortage of the base stock to produce C4 which is the basis for butadiene in SBS. FHWA notes that they are not currently aware of reported shortages of SBR latex modifiers, but SBR is a butadiene-based product.

FHWA reports…

"Industry sources say that either naphtha or propane can be used as a feedstock for ethylene production (of which butadiene is a byproduct). With the current market rates, propane has been the favored feedstock; however, it produces about 40% less butadiene than naphtha. As long as the price differential remains in favor of propane, SBS shortages may remain.

"Given the significant global demand for certain polymers, some industry sources indicate that SBS suppliers placed their customers on allocation, leading to spot shortages in the market. Some believe that the availability of SBS will ease beginning in September/October 2008."

FHWA adds the following caution when considering changing binder grades to remedy a shortage …

"… Care needs to be taken in reducing the binder grade. In some cases, a higher grade of binder was used as an insurance when the price/availability of modified binder was not an issue. However, there are some cases where the modified binder is called for due to traffic and temperature conditions. We should

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not arbitrarily reduce the binder in those conditions. There are other polymers which can be used to modify asphalt. These include ethylene ter-polymer (generic name for the brand name Elvaloy), EVA and crumb rubber. These other products should be evaluated before a blanket reduction of binder grade to non-polymer is considered."

ODOT leadership's quick action to implement the above guidelines has averted a substantial impact on the progress of asphalt paving and has provided a logical and reasoned response that ensures continued performance on Ohio's roadways. The asphalt paving industry applauds ODOT for its quick response to minimize the disruption caused by this supply problem.

OA

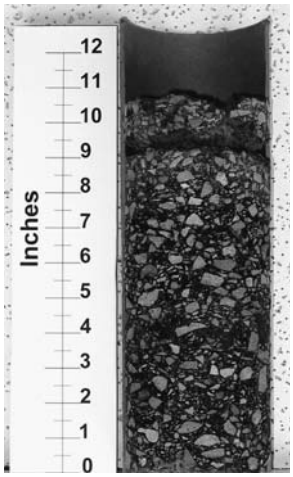
Eugene Discovers **More Miles** in its Roads

By Jim Huddleston, P.E., APA Oregon

(Editor's note: This article appeared in Iowa Asphalt *and is being reprinted in* Ohio Asphalt *with the permission of its author.)*

Though their engineers and contractors didn't realize it at the time, the City of Eugene, Ore., was making some groundbreaking advances in road construction during the 1960s and 1970s. Ironically, it took another 20-30 years for the discovery to surface.

"We became aware that our full-depth pavements were acting as long-lasting pavements in the early 1990s, when we hired a consultant to evaluate a main arterial," said Paul Klope, P.E. and principal engineer for the City of Eugene. "We expected an extensive repair, given all the pop-outs and raveling on the surface," he said, "but it turns out the pavement was 10-12 inches thick, requiring only two inches of milling and overlay. It's the first time I witnessed pavement failing from the top-down, rather than the bottom-up," he added.



More examples of long-lasting pavements were discovered in Eugene when a pavement preservation program was initiated in 2002. Though hard numbers are not available, Klope said there are "quite a few" full-depth pavements within the city's jurisdiction, proving that early discoveries of these pavements were not isolated occurrences. One of the city's streets originally constructed in 1952 is still in service, and has had only one structural overlay (in 1969). While the base is 55 years old, it is still functioning like new with no signs of deterioration.

> "… the bases were found to be in **"like-new" condition** with no signs of distress, even **after more than 30 years of service."**

Long-lasting or "perpetual" pavements are defined as those "built for long life without requiring major structural rehabilitation or reconstruction, and needing only periodic surface renewal in response to distresses confined to the top of the pavement." As defined, the "perpetual" label could easily be applied to these aging full-depth pavements in Eugene, most of which received no overlay treatments within their first 25 years of use.

According to Klope, the City of Eugene had several reasons for building full-depth pavements in the '60s and '70s. First, it was faster. Constructing full-depth pavement requires only one operation rather than two, since multiple paving layers are not involved. This minimizes traffic disruption and other impacts.

Full-depth pavements often require less excavation as well. This reduces the potential for disruption of (or conflict with) utility services and lowers construction costs.

Finally, full-depth pavements were found to be less expensive to construct – not only over the life of the pavement when lower maintenance costs are factored, but also at original installation (referred to as "first cost").

Klope said no hard figures have been calculated at the City of Eugene to quantify the cost benefits of constructing full-depth pavements, but notes that "milling and filling" the surface typically averages about one-fourth the cost of the complete reconstruction that would be required in pavements demonstrating full-depth failures.

Many lessons have been learned in Eugene from the city's experience with full-depth pavements. Beyond the fact that full-depth installations outlast traditional structures and cost less to rehabilitate, several other points came to light upon further examination.

One is that traditional gauges may not be the best method for assessment of pavement condition. The pavement condition index (PCI), for example, is based on surface deficiencies like cracking, rutting, raveling and shoving. Klope said that PCI is a fine method of assessment for applications involving traditional pavement structures that fail from the bottom-up, but can falsely signal poor conditions beneath the surface when pavement fails from the top-down.

This actually happened in Eugene. Pavements that showed typical surface distress, like raveling, pop-outs, and alligator or age-related cracking, required only surface rehabilitation, though the PCI figures based on these distress marks pointed to deficiencies beneath the surface that were not there. Upon further inspection, the bases were found to be in "like-new" condition with no signs of distress, even after more than 30 years of service.

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(Above left) This section, built in 1975, was recently rehabilitated (for the first time) with a four-inch mill and fill. (Above right) Full-depth pavements in Eugene have performed well, despite poor soils.

In this regard, the city also learned the value of testing to obtain accurate assessments of a pavement's true structural condition. Core samples and other methods are used to accomplish this, rather than relying too heavily on the conditions surface appearances might imply.

As for future construction, will the City of Eugene intentionally make full-depth pavements the structure of choice? "That's where I'm starting the discussion for debate," Klope said. "We should consider (full-depth pavements) because of how they've performed in the past, especially if first cost is competitive with that of other paving options." The city is also discussing changes to its design standards based on what's been learned. "We've been making practical changes along the way," Klope said, "but the concept of changing design standards has not been on the table until now."

As an aside, Klope mentioned the particularly poor quality of soils in Eugene, as it pertains to conductivity to paving. Most "r values" – measuring relative strength of the soil – fall in the poor to very poor range.

"Because the soils are so poor in Eugene, your inclination might be to avoid full-depth pavement. But with addition of some sub-base material ("We can't just work on mud," he said), the method actually worked quite well.

"My point in bringing that up," Klope said, "is that if it worked here, it should work even better in locations with more conducive soils."

Jim Huddleston serves as the executive director of the Asphalt Pavement Association of Oregon.

Wayne U.S. 30 **Perpetual Pavement** Study Available

ODOT and Ohio University have completed their research project to evaluate the Wayne U.S. Route 30 perpetual pavement demonstration project. The final report is available on the ODOT research Web page at www.dot.state.oh.us/divplan/research, state job #14815.

The study concludes that the asphalt perpetual pavement is performing better than the criteria for which it was designed, and that perpetual pavements can be built as needed. Measured strains are below the design values. Analysis with the Mechanistic/Empirical Pavement Design Guide protocols developed under NCHRP 1-37A, shows a very high probability that the pavement will perform as expected.

The attempt to validate the Elastic Layer System (ELS) analysis by which the perpetual pavement was designed, verifies some weaknesses of the method in predicting the actual pavement response. Computed values show reasonable agreement with measured performance for loads moving at normal speeds; but, no agreement for slow-moving loads. It was concluded that the ELS is not entirely suitable and that alternative design methods should be investigated.

The researcher also recommended that it may be possible to determine that some existing asphalt pavements are already performing as perpetual pavements, and that others could be retrofitted with an overlay to meet the perpetual pavement criteria.

Member Spotlight: TesTech, Inc.

TesTech, Inc. is an S/D/MBE/EDGE-certified engineering firm specializing in geotechnical engineering/drilling, environmental, survey, construction and independent laboratory services. Included in its multidisciplinary services, TesTech's accredited asphalt laboratory operation – which along with its corporate office is located in Dayton – provides quality assurance testing of asphalt materials for pavement and construction. This is the primary reason for TesTech becoming a member of Flexible Pavements of Ohio.

Asphalt Lab - TesTech is accredited for quality assurance testing of asphalt materials.

TesTech was founded in 1997, by company President Sherif Aziz, PE, to support the construction and design activities of the local area market involving commercial and residential development and engineering. Since its inception, TesTech has aggressively expanded at the rate of 25 percent or more per year, and currently employs about 60 people. The staff is comprised of professional engineers and surveyors, environmental scientists and certified field and laboratory technicians, all of whom are experts in their respective fields.

TesTech's in-house laboratory operation holds accreditations/certifications with AASHTO, U.S. Army Corps of Engineers (USACE), and the department of transportations (DOT) for Ohio, Kentucky, Indiana and Michigan. TesTech is considered one of the top accredited labs in the state of Ohio. It is noteworthy that one of TesTech's areas of specialty/expertise is providing construction testing for airport pavements. This has resulted in consistent contracting opportunities with international and local airports in Ohio, Indiana and Michigan.

Field Truck - Just one of TesTech's fleet of work vehicles for field testing and sample gathering.

TesTech's official company motto, "Putting Our Experience to Work For You!," was developed with the operating principle that has fueled both its rapid growth and its continual flexibility in meeting their clients' changing needs. "Flexible," we like that; and it is the key component required to possess the capability in meeting its clients' project needs and demands, in a moment's notice. As a result, some areas of TesTech are virtually a 24/7 operation.

TesTech recently moved into a new contemporary office facility at 8534 Yankee Street in Dayton (45458), which offers ample room for continued growth. TesTech also operates satellite offices in Columbus, Lansing, Mich., and Indianapolis.

For further information about the company, contact TesTech Lab Operations Manager Sheila Sennet at (937) 435-3200, or visit its Web site at www.testechinc.com.

Educational Opportunities

Mark your calendars for these educational opportunities, seminars, conferences and workshops

February 9-13, 2009, Columbus
Comprehensive Asphalt Mix Design – This course meets the requirements for ODOT HT.306, Asphalt Level 3 training. It is designed to give the participants a working knowledge of the principles associated with asphalt concrete volumetric mix design. On the final day of the course, students will have the opportunity to take the ODOT examination for Level 3 Bituminous Concrete Technician approval. The training will be held at the ODOT Central laboratory.

February 10-11 & 24-25, 2009, Columbus
Jim Scherocman's Asphalt Construction Workshop – This course is required training for those who want to improve the quality and economy of their paving operations. The February 24-25 dates are contingent upon demand. The workshop will be held at the Ramada Plaza Hotel and Conference Center, 4900 Sinclair Road, Columbus, OH 43229, 614-846-0300. Rooms are available at the Ramada for the special rate of $84/night.

Feb 18, 2009, Dublin
Field Quality Control Supervisor Training (FQCS) – This training is required for ODOT QC plan approval as an FQCS. The seminar will be conducted at the Crowne Plaza Hotel, 600 Metro Place North, Dublin, OH 43017, 614-764-2200.

Feb 26, 2009, Dublin
Burner Tuning Workshop – This workshop is for asphalt plant managers, plant operators and service personnel who will supervise or perform asphalt plant burner tuning. The workshop will cover permit and reporting requirements for asphalt plant burner tuning and burner analysis, troubleshooting and tune-up. The seminar will be conducted at the Crowne Plaza Hotel, 600 Metro Place North, Dublin, OH 43017, 614-764-2200.

March 31 - April 1, 2009, Columbus
FPO Annual Meeting and Equipment Exhibition – This annual event returns to the Hilton Columbus Hotel at Easton. This convention of the asphalt paving industry in Ohio features excellent technical programs, awards and an equipment and trade show.

Other Important Educational Events:

NAPA NATIONAL ASPHALT PAVEMENT ASSOCIATION

January 17-21, 2009, San Diego, CA
NAPA 2009 54th Annual Meeting with committee meetings and educational sessions. For more information, go to www.hotmix.org or call 888-468-6499.

February 4, 2009, Columbus
The Ohio Asphalt Paving Conference (OAPC) moves to a new location with another outstanding program on asphalt pavement technology. With about 500 attendees at this year's show, the 2009 OAPC will be held at the Aladdin Shrine Center, 3850 Stelzer Rd, Columbus, OH, to accommodate the even larger expected crowd. Watch the FPO Web site calendar for registration and the program this fall.

World of Asphalt 2009 SHOW & CONFERENCE
SHOW March 10-12, 2009
CONFERENCE March 9-12, 2009
Orlando, FL
Orange County Convention Center

The World of Asphalt is the nation's largest conference and exhibition related to asphalt pavement. Check out the event in Orlando in 2009, and prepare for 2010, when the World of Asphalt comes to Cincinnati. Details at www.worldofasphalt.com.

To monitor the FPO calendar and register for these events on line, go to http://www.flexiblepavements.org/events.cfm for the latest information.

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