

# OHIO ASPHALT

THE JOURNAL OF OHIO'S ASPHALT PROFESSIONALS

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OHIO  
ASPHALT  
EXPO

MARCH 30 & 31, 2016

Your Path to a Successful  
Construction Season...  
pages 16 & 17



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- 6 THE PRESIDENT'S PAGE
- 10 CONGRESS PASSES LONG-AWAITED TRANSPORTATION FUNDING BILL
- 12 ODOT 2016 SPECIFICATIONS PLACE INCREASED  
IMPORTANCE ON JOINT DENSITY, MAT UNIFORMITY
- BEST PRACTICES:
  - 13 LONGITUDINAL JOINT CONSTRUCTION
  - 14 ENSURING UNIFORM MAT TEXTURE
- 16 2016 OHIO ASPHALT EXPO SET FOR MARCH 30 & 31
- 18 LEGAL CORNER
- ALWAYS INCLUDE A TIME FOR PERFORMANCE  
BY PETER BERG, ESQ.
- 20 DESIGN GUIDANCE FOR PARKING LOT PAVEMENTS
- 24 MARK YOUR CALENDARS
- 25 OBITUARY: DON BARBER
- 25 NEW MEMBERS
- 26 INDEX TO ADVERTISERS

CONNECT ON



ON THE COVER: FOLLOW THE PATH TO A SUCCESSFUL CONSTRUCTION SEASON BY ATTENDING THE 2016 OHIO ASPHALT EXPO, MARCH 30 & 31. FOR MORE ABOUT "THE REGION'S PREMIER ASPHALT PAVEMENT EVENT," SEE PAGES 16 & 17.



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## THE PRESIDENT'S PAGE



CLIFFORD URSICH, P.E.  
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**“Thinlay’ is a nationally established term for the newest addition to the family of asphalt treatments ... Thinlays are a pavement preservation treatment for preserving pavement assets ... The benefits received are the attributes of an overlay but at a reduced cost per square yard of pavement area. A thinlay provides attenuation of surface distresses, a modest improvement in pavement strength, smoothness and safety enhancements. Use of recycled asphalt, both in initial construction and future restoration projects, are additional sustainable benefits.”**



If you're a parent you likely remember the anticipation and excitement that came with the birth of your children. I remember my wife, Mary Ann, and I making those preparations. Seemed like the anticipation of the new member of the family launched us into another phase of a home remodeling project we just had to get done in preparation for our new arrival. We laugh and say if it weren't for the children coming along we wouldn't have ever gotten "this old house" up to livable standards. I wonder what new projects grandkids will bring?



Well, here at FPO we're getting excited about a new asphalt mix specifically designed to add a little competition in the pavement preservation market. Like a parent, we've already got a name for this baby. The head is crowning and when it is born we'll announce ... "It's a Thinlay!" The much-anticipated date of the stork's delivery of our newest member of the asphalt treatments family is March 31st at the OHIO ASPHALT EXPO. Sorry, there'll be no cigars but plenty of technical information on how this baby can work for you.

### Conception

The gleam in Dada's eye came last fall when FPO was challenged to develop a new asphalt mixture that could position the asphalt industry more competitively in a pavement preservation market where asphalt has to compete with chip seals and micro surfacing. The FPO board thought surely asphalt could be competitive using a thinlay asphalt pavement vs. chip sealing and micro surfacing, given the average treatment lives for these materials are rather short, at least that's what research<sup>1</sup> indicates — five years for microsurfacing, four years for chip seals. That's the number of years on average the treatments actually survive as a surface. Roll in the fact that the fall in crude oil is finally taking pressure off asphalt contractors, there's no time better than now for the asphalt industry to put forward a thinlay preservation material that is cost effective and provides the same desired attributes and value received from traditional asphalt overlays.

"Thinlay" is a nationally established term for the newest addition to the family of asphalt treatments ... Overlay, Inlay, "Thinlay." The

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term “thinlay” connotes a thin layer of asphalt pavement.

Thinlays are a pavement preservation treatment for preserving pavement assets. They are for use on structurally sound pavements (no fatigue failure evident). Ohio’s thinlay will have a placement thinness of  $\frac{3}{4}$  inch to 1 inch. Where existing pavement profile has excessive wobble, a thicker course can be used or fine-milling should be considered. Achieving this thinness requires asphalt technicians to develop mixes tending to be higher in sand-sized aggregate and richer in asphalt binder. It’s these mix characteristics that facilitate paving and compacting such thin courses. The benefits received are the attributes of an overlay but at a reduced cost per square yard of pavement area. A thinlay provides attenuation of surface distresses, a modest improvement in pavement strength, smoothness and safety enhancements. Use of recycled asphalt, both in initial construction and future restoration projects, are additional sustainable benefits.

## The Gestation Stage

Since last November, members of the FPO Technical Committee have been hard at it innovating this new asphalt mix. They’ve been determining the necessary ingredients and the properties that will ensure a thinlay asphalt pavement that meets our customers’ performance expectations. The thinlay must perform well on all traffic levels – with no signs of rutting, raveling or premature cracking. The aggregate composition and the gradation must ensure good friction qualities for the purpose of driver safety. The mixture needs to be of a tighter matrix, such that it is impermeable, durable and long-lasting. In the lightest of traffic levels (UltraLT) the thinlay asphalt pavement must be composed to facilitate self-healing attributes known to occur when asphalt is latent. As for constructability, this material must be placed smooth, be resistant to texture variation leading to segregation, and must retain a high level of ride quality. That sounds like a lot to ask of a mix – and it is. However, it isn’t unprecedented. “Smoothseal,” a preservation asphalt mix too, was once little more than a gleam in the eye. Today, Smoothseal is regularly used on pavement facilities ranging from rural, two-lane pavements, to interstate highways, to multi-use paths.

In case you’re wondering, FPO’s thinlay asphalt mix is in the gestation stage (draft form). Mixtures have been developed and tested. To achieve the varied performance demands, multiple binder types of varying flexibility will be employed. Mix parameters will be for HY (heavy traffic), MED/NOR (medium/normal traffic), LT (lightly traveled pavements), and UltraLT (the very lightest traffic <500 vehicles per day). Aggregate requirements call for proportioned amounts of crushed and naturally fractured aggregates. Mix design verification is underway.

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*<sup>1</sup> EFFECTIVENESS OF CHIP SEALING AND MICRO SURFACING ON PAVEMENT SERVICEABILITY AND LIFE, Arudi Rajagopal, Ph.D., INFRAME, State Job No. 134299, Sec. 9.1 Chip Seal – Service Life from Historic Data, Secs. 10.1 and 11.1 Micro Surfacing (General and Priority Systems) – Service Life from Historic Data*

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# CONGRESS PASSES LONG-AWAITED TRANSPORTATION FUNDING BILL

## FAST ACT FUNDING (2015-2020)

Federal Fiscal Year	Dollars (billions)
2015 (actual)	\$41.0
2016	\$43.1
2017	\$44.0
2018	\$45.0
2019	\$46.0
2020	\$47.1

total transportation funding throughout the life of the bill and increases the annual federal highway investment from \$41 billion in federal Fiscal Year (FY) 2015 to \$47.1 billion by FY 2020. The adjacent table details the annual total investment of the FAST Act.

The FAST Act continues to distribute nearly 93 percent of the dollars allocated directly to the states, with all states receiving a 5.1-percent increase in funding the first year and between a 2.1-percent to

In December of 2015, Congress passed the first, long-term federal transportation funding bill in more than a decade. The “Fixing America’s Surface Transportation Act” (FAST Act), provides five years of predictable funding for the planning and construction of the nation’s transportation infrastructure. According to Federal Highway Administration (FHWA) data, the FAST Act authorizes \$305 billion in

2.4-percent increase in each subsequent year. Ohio’s federal transportation funding will modestly increase from \$1.3 billion in 2015 to \$1.5 billion in 2020. In total, Ohio will receive approximately \$7.1 billion over the life of the bill.

The FAST Act provides a direct investment of \$226.3 billion for highways throughout the five years of the bill. The remaining funds are directed to federally controlled discretionary and grant programs, research and technology development and the administrative expenses of the FHWA.

Although funding has been authorized by this legislation, it is subject to an annual appropriation by Congress to allow the money to be spent. This could be especially problematic if revenue does not meet the projected spending levels structured in the bill. It should also be noted that funding for this legislation is dependent on the transfer of \$70 billion in non-transportation revenue from the General Fund and a variety of one-time cost savings to support the increased levels of investment during the next five years. This is important, as the next federal transportation bill in 2021 will require larger sources of non-transportation revenue, a gas tax increase, or other form of transportation user fee to maintain these levels of investment.

The FAST Act contains many new changes to the federal transportation program and places a major emphasis on freight investment. The FAST Act creates two, new programs dedicated to improving freight flow



throughout the nation. The National Highway Freight Program (NHFP) is funded at approximately \$1.2 billion annually, and the dollars are distributed directly to each state based on a funding formula. The NHFP is predominantly focused on freight improvements for highways; however, these funds are only available to states with federally approved state freight plans. Ten percent of these funds have been designated as eligible to be used on rail projects, intermodal or port facilities. The Fast Act also creates a new federally administered discretionary program titled the Nationally Significant Freight and Highway Projects funded at \$900 million annually. State departments of transportation, certain regional planning organizations and local government agencies may apply directly to FHWA for funding. Projects that improve freight movement on highways, rail or, intermodal and port facilities are eligible.

Another major change of the FAST Act is the conversion of the popular Surface Transportation Program (STP) into the new Surface Transportation Block Grant Program (STBGP). Funds under this program are less restrictive than in previous bills, which allocated

these dollars primarily for use on the interstate system, and U.S. and state routes. Now, funds may be used not only for highway projects but also ferries, capital transit expenditures, recreational trails and many other nontraditional transportation projects. The funding for this program is divided between the state departments of transportation and municipalities to ensure greater local control on how these federal highway dollars are spent.

The FAST Act also dramatically reduced funding for the Transportation Infrastructure Financing and Innovation Act (TIFIA) program. TIFIA provides low-interest loans or loan-guarantees typically for public-private partnership projects, such as toll roads that produce revenue over time. The FAST Act slashed funding for TIFIA by 70 percent and changed some of the program eligibility requirements.

The FAST Act contains many other programmatic and provisional changes. For more detailed information regarding the FAST Act, including the full text of the bill, fact sheets, funding tables and related documentation, go to FHWA's webpage at <https://www.fhwa.dot.gov/fastact/index.cfm>.



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# ODOT 2016 SPECIFICATIONS PLACE INCREASED IMPORTANCE ON JOINT DENSITY, MAT UNIFORMITY



**The newly released 2016 ODOT Construction & Material Specifications (C&MS), along with Supplemental Specification (SS) 806, place new requirements on construction practices to improve density at cold longitudinal construction joints and for eliminating segregation on asphalt concrete placed.**

SS 806, Asphalt Concrete With Joint Density For Multi-Lane Highways, is a complete asphalt concrete specification that includes acceptance provisions for coring and measuring density at cold longitudinal joints. Trials have shown that the joint density requirements in SS 806 are difficult to meet. As a result, following best practices in constructing cold longitudinal joints is a must.

Item 401.01 of the C&MS has long required uniform composition of the mat. For 2016, Item 401.12 has been changed to require the use of anti-

segregation equipment (MTV, MTD or re-mixing paver) when specified. These new specification requirements necessitate the use of best paving practices to ensure good joint performance and uniform mats that are free from segregation. To aid in achieving these requirements, Flexible Pavements of Ohio's (FPO) Field Operations and Technical committees collaborated on the development of two guidance documents on construction best practices. These documents, "Longitudinal Joint Construction Best Practices" and "Best Practices for Ensuring Uniform Mat Texture," outline best practices to build better performing cold longitudinal joints and to produce mats with uniform surface texture that are free from segregation.

The best practices documents on pages 13 and 14 are intentionally brief, one-page, bullet-point guides to serve as a handy first reference for focusing the attention of paving crews to improving longitudinal joints and producing uniform texture mats. Additionally, each document lists references where in-depth guidance may be obtained. With these guides as a starting point, it is expected that contractors will be able to meet the new requirements of the ODOT specifications.



# Longitudinal Joint Construction Best Practices of the FPO Field Operations Committee

18 Feb. 2015

## Placing and compacting the unconfined edge

- Place the tack coat wider than the first pass to help hold the unconfined edge.
- Pave a straight joint using a string line layout or other control as a guide for the paving operator.
- Ensure joints constructed on curves uniformly follow the centerline of the road.
- Plan joint construction to make sure that with the variables in paving widths, cross slopes and joint staggers you are able to match your joint correctly, especially on 2-lane resurfacing with thin lift surface courses.
- Use auger and tunnel extensions.
- Ensure a uniform flow of material to the end of the auger extensions to ensure the mix placed at the joint is uniform in mix composition – a homogeneous mix.
- Keep the level of asphalt in front of the screed to the height of the auger shaft.
- Maintain a consistent paver speed.
- Use the vibrating screed and/or a pre-compaction device on the screed to pre-compact the unconfined edge.
- Roll the unconfined edge with a steel wheel roller operated in static mode for the first pass. Position the roller with the roll hanging over the unconfined edge approximately 6 inches to set the edge of the mat.
- Complete rolling the unconfined edge to obtain maximum achievable density without displacing the mat edge.

## Placing and compacting the confined edge

- Regardless of joint type, broom cold joint before subsequent paving.
- Seal the joint face with binder (PG 64-22) or joint adhesive with ½-inch overlap.
- When matching a cold joint, overlap the adjacent mat ½ inch to 1-½ inches to ensure a sufficient amount of material at the joint.
- When matching joint, place material 25% higher than first pass to account for roll down. Do not lute or rake this extra material away from the joint.
- Roll the joint directly behind the paver to ensure compaction while the material is hottest.
- Once compacted, a slight elevation difference in the 2 lanes is desirable.
- Over-compaction as evidenced by crushed aggregate is unacceptable.
- Do quality control with a density gage to ensure maximum achievable density is obtained.

## References:

**NAPA:** <http://store.asphaltpavement.org/index.php?productID=775>

QIP-121E, Longitudinal Joints: Problems and Solutions

QIP-112E, Constructing Quality HMA Pavements - A Troubleshooting Guide

PH-1, Hot-Mix Asphalt Paving Handbook 2000 2nd Edition

**Asphalt Institute:** <http://www.asphaltinstitute.org/best-practices-for-construction-and-specifying-hma-longitudinal-joints/>

Final Report – Best Practices for Constructing and Specifying HMA Longitudinal Joints  
MS-22, Construction of HMA Pavements

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# Best Practices for Ensuring Uniform Mat Texture of the FPO Field Operations Committee

18 Feb. 2015

## Production & Hauling

- Manage the aggregate at the plant to ensure uniform gradation is maintained during stockpiling and transferring aggregate to cold feeds.
- Observe mix discharge from the drum to the drag for uniform composition in terms of mix gradation and binder coating.
- Confirm batchers and deflector plates are operating properly to deliver material unsegregated into the silo.
- Load trucks with three or more drops, with trucks repositioning between drops. When loading end-dump trucks, load near equal increments of mix in the following sequence: (1) against bulkhead, (2) against tailgate, (3) mid-bed. After loading, check for signs of segregation.
- At the paving site, prior to discharging mix from end-dump haul trucks into the paver, follow this sequence: (1) raise truck bed causing mix to shift against tailgate, (2) back into paver with bed elevated, (3) trip gate to deliver asphalt mix in a mass into the hopper.

## Paving

- Ensure the paver is in good working order and is equipped to prevent paver-induced segregation at the centerline or edges of the conveyors.
- Ensure that flow gates, tunnel extensions, screed extensions and auger extensions are in place, operational and adjusted to ensure a completely uniform texture across the full width of the mat.
- Ensure mix delivery rate to the auger results in near-constant auger movement and a consistent level of mix in the auger chamber (to approximately the center of the auger shaft).

- Maintain a consistent paver speed as dictated by mix delivery, mix temperature and weather. Adjust paver speed to allow truck exchanges without running out of mix.
- Keep hopper greater than half full at all times.
- Don't fold the hopper wings. Use fillets in hopper corners to keep all mix mobile.
- Constantly check the trucks, paver hopper and mat for signs of mix non-uniformity. Take immediate corrective action if mat texture uniformity is compromised. (Note: "shading" in the mat is evidence of non-uniformity and requires correction.)
- Use a re-mixing transfer device if all else fails. (Note: A transfer device will not correct paver-induced segregation.)

## References:

**NAPA:** <http://store.asphaltpavement.org/index.php?productID=775>

QIP-110E, Segregation, Causes and Cures for Hot Mix Asphalt

QIP-112E, Constructing Quality HMA Pavements - A Troubleshooting Guide

PH-1, Hot-Mix Asphalt Paving Handbook 2000 2nd Edition

**Alberta Transportation:** Paving Guidelines and Segregation Rating Manual

<http://www.transportation.alberta.ca/Content/docType233/Production/pavsegman.pdf>

**Ohio Asphalt:** <http://www.flexiblepavements.org/ohio-asphalt> Segregation: Causes and Cures, 3-part article, Spring/Summer 2010, Fall 2010, Winter/Spring 2011.

**Asphalt Institute:** <http://www.asphaltinstitute.org/>

MS-22, Construction of HMA Pavements

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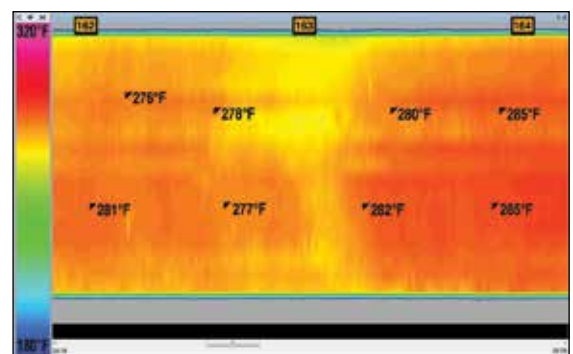
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## WHY YOU SHOULD ATTEND:

- The Ohio Asphalt Expo is “The Region’s Premier Asphalt Pavement Event”
- 14 educational sessions, including two new tracks, with information YOU need
- Area’s largest collection of asphalt paving equipment, service providers and vendors, with more than 30 exhibitor displays and equipment dealers expected
- One of 2016’s best networking opportunities, as the Ohio Asphalt Expo brings all the industry’s major players to the Hilton Columbus/Polaris

## WHO’LL BE THERE:

The OHIO ASPHALT EXPO serves a wide variety of audiences across the asphalt paving industry. If you are a contractor, producer, specifier, plant operator or public official, the Ohio Asphalt Expo is for you.

- 
- Government • **18%**
  - Additive Supplier • **2%**
  - Aggregate Producer • **2%**
  - Asphalt Binder Supplier • **4%**
  - Asphalt Contractors • **65%**
  - Engineering Consultant • **1%**
  - Equipment Manufacturer Supplier • **8%**

## WORKSHOP TOPICS:

- Construction Financial Management
- Health & Safety Issues Update
- Environmental Issues for Ohio Asphalt Producers
- Use of Rejuvenators in High RAP Mixes
- Introducing Ohio’s Thinlay Asphalt Concrete
- Recycled Shingles in Asphalt Pavement Demo
- Work Zone Intrusion Safety
- NEW! Asphalt Plant & Paving Operations Tracks
- And more!


## WHAT YOU WILL GAIN:

- Expert knowledge from industry professionals
- Information on latest asphalt technology, equipment
- Professional development credits for certain presentations
- Enthusiasm for 2016 asphalt season



## 2016 EDUCATIONAL SESSIONS AND CALENDAR OF EVENTS\*

The Equipment Exhibition and Trade Show runs during both days of the Expo concurrently with our educational sessions and other events. As always, it is free and open to all attendees. \*Program and featured speakers are subject to change.

DATE	TIME	GEMINI BALLROOM A	GEMINI BALLROOM B	GEMINI BALLROOM C	POLARIS BALLROOM C	POLARIS BALLROOM F
WEDNESDAY, MARCH 30					NEW! Asphalt Plant Track	NEW! Paving Operations Track
	7:30 am		FPO Member Breakfast & Business Meeting	Public Agency Forum	20 Common Production Mistakes – 20 Best Practices of Production <i>T.J. Young, T2ASCO LLC</i>	Fundamentals of Paving <i>Terry Humphrey, Caterpillar Inc.</i>
	8:30 am					Understanding Mat Defects <i>Terry Humphrey, Caterpillar Inc.</i>
		EDUCATION SESSION 1	EDUCATION SESSION 2	EDUCATION SESSION 3	EDUCATION SESSION 4	EDUCATION SESSION 5
	9:30 am	The Nuts + Bolts of Construction Financial Management <i>Stephanie Union and Peter Berg, Kegler Brown Hill + Ritter</i>	Proper Pavement Milling Practices <i>Tom Chastain, Wirtgen America</i>	National Health & Safety Issues Update <i>Howard Marks, NAPA</i>	Managing Baghouse Fines Return for Effective Voids Control <i>T.J. Young, T2ASCO, LLC</i>	Vibratory Compaction: Frequency/Amplitude/Speed <i>Terry Humphrey, Caterpillar Inc.</i>
	10:15 am		Segregation: Thermal & Material, Quality Paving Techniques <i>Laikram Narsingh, Wirtgen America</i>	Air, Water & Oil Compliance Information <i>Shara Kay Hayes, Dine Comply</i>		How Compaction Affects Smoothness <i>Terry Humphrey, Caterpillar Inc.</i>
	Noon	Quality Asphalt Pavement Paving Awards Luncheon ( <i>Polaris Ballrooms A, B, C, D, E &amp; F</i> )				
		EDUCATION SESSION 6	EDUCATION SESSION 7	EDUCATION SESSION 8	EDUCATION SESSION 9	EDUCATION SESSION 10
	2:30 pm	Use of Rejuvenators in High RAP Mixes <i>Dr. Walaa Mogawer, UMass Dartmouth</i>	Segregation Cause & Effect <i>John Hood, Bomag</i>	Work Zone Intrusion Safety <i>Lee Cole, Oldcastle</i>	Five Habits of Highly Effective Producers <i>T.J. Young, T2ASCO LLC</i>	Parking Lot Paving – A Guide to Success <i>Terry Humphrey, Caterpillar Inc.</i>
	3:15 pm		Intelligent Compaction <i>Jim Preston, Topcon Positioning Systems</i>			Paving Up, Down, & All Around <i>Terry Humphrey, Caterpillar Inc.</i>
	5:00 pm	Quality Paving Celebration ( <i>Polaris Ballrooms B, C, E &amp; F</i> )				
THURSDAY, MARCH 31	7:30 am	Prayer Breakfast ( <i>Polaris Ballrooms A, B, D &amp; E</i> )				
		EDUCATION SESSION 11	EDUCATION SESSION 12	EDUCATION SESSION 13	EDUCATION SESSION 14	<div>2016 KEYNOTE ADDRESS “ASPHALT OPPORTUNITIES IN THE FAST ACT”</div> <div></div> <div>Jay Hansen, Executive Vice President, National Asphalt Pavement Association</div>
	9:30 am	Performance Tests of Asphalt Mixtures <i>Dr. Louay Mohammad, Louisiana State Univ.</i>	City of Columbus Recycled Shingles in Asphalt Pavement Demo <i>Randy Bowman, P.E., City of Columbus</i>	Considerations When Choosing Thin-lift Asphalt Pavements <i>Dave Newcomb, Texas A&amp;M Transportation Institute</i>	Mix Design for Durability <i>Dr. Randy West, NCAT</i>	
	10:15 am	Break				
	10:25 am	Properties of Foamed Asphalt for Warm Mix Asphalt Applications <i>Dave Newcomb, Texas A&amp;M Transportation Institute</i>	Processing Asphalt Shingles for Viable Use as Asphalt Additive <i>John Lambert, Asphalt Shingle Grinding Service LLC</i>	Introducing Ohio's Thinlay Asphalt Concrete <i>Cliff Ursich, Flexible Pavements of Ohio</i>	Process Control to Ensure Pavement Density <i>Scott Quire, P.E., Bluegrass Testing Laboratory</i>	

### 2016 KEYNOTE ADDRESS "ASPHALT OPPORTUNITIES IN THE FAST ACT"



**Jay Hansen**, Executive Vice President, National Asphalt Pavement Association

# LESSON FROM TENNESSEE ALWAYS INCLUDE A TIME FOR PERFORMANCE

By **Peter Berg**, Kegler Brown Hill + Ritter

A recent court case reminded all contractors, especially those working in the paving and asphalt industry, of the importance of conditioning bids and contract prices on a reasonable time to complete their work. A Tennessee appellate court held a paving contractor responsible for a bid it submitted to an owner almost a decade prior, despite a nine-year delay in the middle of a development project. The contractor had not included language in its contract limiting its contract price to a specific time for performance. Because of that oversight, the contractor was required to perform its work at loss and at a much lower price than the current market rate.

## THE PROJECT

The facts of the case might seem familiar to some. In 2003, Highways Inc., a Tennessee-based asphalt paving contractor, submitted a lump sum bid of \$46,000 to a subdivision developer for placement of an asphalt road consisting of a 6-inch base, 2-inch binder, and 1 1/2-inch top coat. The work was to be completed in two phases, with the base and binder work occurring in the first phase, and the topcoat of asphalt to be placed in the second. Highways Inc. installed the base and binder coat in 2003, and the developer paid the contractor a sum of \$37,200, or approximately 80 percent of the total contract price. An unpaid balance remained \$8,800 to install the final 1 1/2-inch topcoat of asphalt.

The second phase of the work was then postponed until 2012, or more than nine years at no fault of the contractor. When the project finally resumed, the asphalt contractor refused to provide the topcoat at the originally agreed-upon price of \$8,800. At 2012 prices, that work, according to the asphalt contractor, would cost \$38,000. Because Highways Inc. refused to place the topcoat of asphalt for the lower price, the developer sued the contractor for its cost overrun over the agreed-upon \$8,800 price.

## COURT HOLDS CONTRACTOR RESPONSIBLE FOR COST OVERRUNS

In a decision issued in early December 2015, the Tennessee court found the contractor responsible for the developer's cost overrun, awarding the developer a sum of \$29,200. The contractor argued that the developer should be prevented from holding the contractor responsible for a contract price submitted more than nine years in the past. Ultimately, however, the court rejected that argument, requiring the contractor to prove that the owner was negligent, or failed to exercise reasonable care, in postponing the project for nine years and then requesting that the contractor perform work at a much lower rate than current market prices.

The court concluded, however, that “[a] mere hiatus in seeking performance of a contract — here, one which did not have a stated term or deadline for performance — does not equate to negligence in seeking to enforce the right to recover for breach of the contract.” Because the contractor could not prove the developer failed to exercise reasonable care under its contract, the court concluded that the contractor must be held to its original price.

## SUGGESTED CONTRACT LANGUAGE

Important to the decision was the fact that the contractor could have easily protected itself through simple contract language. All construction bids and contract prices should be limited to a specific time for performance in which the contractor's prices are valid. At a very minimum, prices should be subject to adjustment in the event a project is delayed for a material length of time due to factors outside of the contractor's control. Some version of the following form contract language likely would have changed the result of the case:

- **Specific Time For Performance:** Owner and Contractor agree that Contractor's obligation to perform the Work under this Agreement shall expire after a time for performance of \_\_\_ years. Contractor will have no obligation to perform after that time for performance unless the Project is delayed as a direct result of the actions or inactions of Contractor or those under its control.
- **Adjustment To Contract Price:** Owner and Contractor agree that in the event the Work is materially delayed through no fault of the Contractor, the Contract Price will be subject to an adjustment to compensate Contractor for changes in its material costs, labor costs, and other costs incurred in completing the Work.

While it is far from certain that other courts, including courts in Ohio, would come to the same result as the Tennessee court did in *Avery Place, LLC v. Highways, Inc.*, 2015 Tenn. App. LEXIS 957 (Dec. 7, 2015), it is still a best practice to avoid the issue entirely by including basic language in bids and in all contracts limiting your time for performance.



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# DESIGN GUIDANCE FOR PARKING LOT PAVEMENTS

From time-to-time, Flexible Pavements of Ohio (FPO) receives requests for information regarding the design, materials and construction of parking lots that are not subject to design by conventional highway structural design methods. These types of light-duty pavements are typically based on catalogs of designs that have proven successful for such applications. Most asphalt pavement authorities have such catalogs of designs – and FPO is no exception. But, in addition, FPO provides guidance on selection of asphalt concrete materials that is specific to the Ohio market.

The document reprinted here, "Section 2.2 Parking Lots for Cars," was originally published in FPO's Asphalt Pavement Design and Construction Guide and is available on the FPO website. This document contains guidance on the structural build-up, materials selection and construction details needed for a good-performing, asphalt-concrete parking lot pavement.

This and other useful design information is found on the FPO website at [www.flexiblepavements.org](http://www.flexiblepavements.org) by choosing the Technical Resources/Pavement Design Resources menu buttons.

## SECTION 2.2 • PARKING LOTS FOR CARS

A convenient, attractive parking area is an important part of many kinds of business, industrial and other facilities. Flexible asphalt-concrete pavement is used extensively for this purpose. Properly designed and constructed, it stays smooth, sound and attractive in appearance for many years with little or no maintenance. Flexibility allows the pavement to conform to minor subgrade settlements and still retain a continuous surface, free of abrupt bumps.

The elements of proper design and construction are discussed in the following paragraphs. Special attention is given where oversight or neglect sometimes has led to less than satisfactory performance of parking lot pavement.

Either a full-depth asphalt or an asphalt with aggregate base design may be chosen. One may be more economical than the other depending upon the size, nature, or location of a project. Good quality in both is affordable and ensures lasting value.

### RECOMMENDED MINIMUM THICKNESS DESIGNS INCHES AND MILLIMETERS

SUBGRADE SUPPORT	FULL-DEPTH ASPHALT	WITH AGGREGATE BASE	
		AGGREGATE	ASPHALT
POOR (CBR 3)	6.5 (165)	6.0 (150)	4.5 (115)
FAIR (CBR 5)	5.5 (140)	6.0 (150)	3.5 (90)
GOOD (CBR 7)	5.0 (125)	6.0 (150)	3.0 (75)

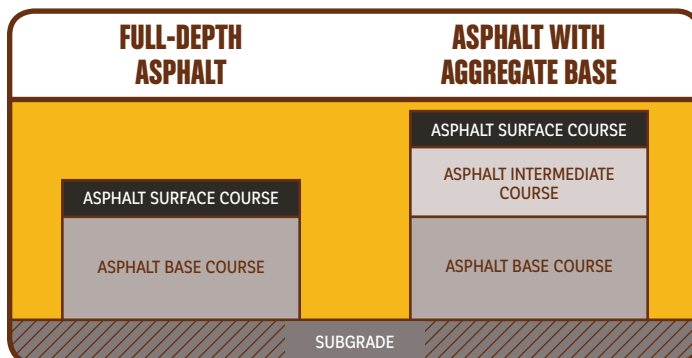
These designs are intended to ensure that only surface maintenance and not structural repair will be needed in the future. In addition to surface treatment options, it now is easy and economical to renew hot mix asphalt surfaces by milling and resurfacing. This has become a valuable option, especially where pavement surface must be kept at about the same elevation.

Where pavement elevation is not a constraint, conventional resurfacing (without milling) may be more appropriate. This not only provides a new surface but also adds structural strength.

### SUBGRADE SUPPORT CAPACITY

The subgrade is the prepared soil foundation for the pavement structure. Pavement thickness design starts with a realistic value for the load support capacity of the subgrade. The pavement then is made thick enough so that load pressures transmitted to the subgrade are reduced to a level consistent with subgrade support capacity.

Values in the table represent the support capacity of a range of fine-grained soils often encountered in Ohio. Coarse-grained soils (very sandy or gravelly soils) will have higher support capacities. The descriptions





indicate the relative firmness the soil retains after it has been compacted and then exposed to the influx of moisture. The CBR (California Bearing Ratio) value is a laboratory test measure of that quality.

A professional site investigation of soils and moisture conditions is recommended. The purpose is to identify conditions that may affect the overall design as well as to determine soil support capacity for pavement thickness design.

Preparation of the subgrade to ensure compaction at optimum moisture content and uniform support prior to placement of aggregate or asphalt concrete base is recommended. See the discussion below and ODOT specification Item 204, Subgrade Compaction and proof Rolling, for guidance.

### PAVEMENT THICKNESS & MATERIALS

**THICKNESS** – The recommended minimum pavement thickness designs in the table are appropriate for all cars and light trucks using parking areas intended for such vehicles.

Traffic lanes and other areas used frequently by heavy trucks or busses must be designed for those vehicles, see Section 2.3, Pavement For Heavy Truck Use.

**MATERIALS** – The asphalt-concrete mixtures recommended for use are ODOT standard construction specification Item 441, Asphalt Concrete Intermediate Course, Type 2 and Flexible Pavements of Ohio (FPO) specification 404LVT, Asphalt Concrete, for the surface course. These materials are described and some suggestions for specifying them are found in the FPO Technical Bulletin, "Specifying Asphalt Pavements in Ohio," on the FPO website, [www.flexiblepavements.org](http://www.flexiblepavements.org).

For full-depth designs, a 1.5-inch Item 404LVT, surface course, with one or more Item 441, Type 2 base courses (1.75 inches minimum and 3 inches maximum) are recommended.

For aggregate base designs, a surface course of a minimum of 1.25 inches (38 mm) of Item 404LVT and a base course of a minimum of 1.75 inches of Item 441, Type 2 are recommended.

The aggregate base recommended is ODOT Item 304. The material is a high-quality, dense-graded, crushed aggregate. The particle size gradation should be uniform from coarse-to-fine, and the upper limit on the very-fine fraction (passing

the No. 200 sieve) should not be exceeded. An excess of that fraction will weaken the base under wet conditions.

**METRIC LAYER THICKNESS** – Layer thickness in millimeters was converted from inches and then indicated according to the practice adopted by the Ohio DOT. That practice is to specify layer thickness less than 45 millimeters to the nearest millimeter and thickness greater than 45 millimeters to the nearest 5 millimeters.

### SUBSURFACE DRAINAGE

Failure to provide effective subsurface drainage is a common cause of poor performance of parking lot pavement. Pipe underdrains with porous backfill always should be installed beneath the pavement at critical locations.

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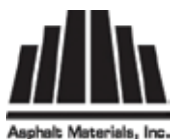
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For example, pavement often is sloped to drain surface water to the center of a traffic lane from parking stalls on each side. In this case, a continuous pipe underdrain should be installed beneath the centerline with the flowline about a foot (300 mm) below the subgrade surface. The pipe often can have an outlet into surface water inlet boxes. The subgrade as well as the pavement surface should be sloped to the centerline.

Precautions may be necessary to keep the porous backfill from becoming clogged by siltation between the time underdrains are installed and the time paving is done. When aggregate base is used, there should be a clean connection with porous backfill when the base is placed.

### SURFACE DRAINAGE

Both the subgrade and the pavement surface should slope not less than a quarter inch per foot (6 mm per 300 mm).

Large areas sometimes cannot be constructed in a single plane having that minimum slope. The solution then is to design the area in a series of planes. Solving the problem by reducing the slope is not recommended because, at some point, ponding would become inevitable.

In the event that local requirements limit the rate of surface water runoff, a detention basin should be considered as an alternative to reducing the slope to less than the recommended minimum.

### SUBSURFACE PREPARATION

Topsoil, roots, boulders and the like always should be removed before starting subgrade preparation. Other soils having a maximum dry weight of less than 100 pounds per cubic foot (1,600 kilograms per cubic meter) are not suitable for pavement subgrade, and should be removed and replaced with suitable soil or granular material to a depth of 6 to 12 inches (150 to 300 mm).

Suitable subgrade soil should be compacted to at least 95 percent of its maximum dry weight. The moisture content during compaction should be at or very near optimum for compaction of the soil. Either aeration or adding and mixing water into soil is often necessary to bring it to optimum moisture content. The test method commonly used for maximum dry weight and moisture-density determinations is AASHTO T-99.

Because appearance can be misleading, the degree of compaction should be determined by testing. Most fine-grained soils are firm when dry, whether they are compacted or not. If not well compacted, they become very soft when wet.

Specifying that proof rolling be done soon after compaction is a good practice. A heavy roller or other heavy equipment can be specified to locate soft, yielding areas, which should be corrected before paving.

The subgrade surface should be at proper elevation and cross-slope before paving starts. There should be no loose material or low areas where water



would accumulate and soften the subgrade beneath the pavement rather than flow to the underdrains.

### AGGREGATE BASE CONSTRUCTION

Aggregate should be placed by means of a mechanical spreader, taking care to avoid separation of particle sizes. The base should be compacted thoroughly with the moisture content at optimum for compaction. At optimum moisture content, the aggregate is quite damp but there is no free water.

### ASPHALT CONCRETE CONSTRUCTION

Standard practice in Ohio is to place hot mix asphalt by weight per unit of area rather than to actual thickness. This makes it easy to check the rate of placing and the total quantity placed using load delivery ticket weights. For mixtures with gravel or stone aggregate, the specified weight to volume conversion is 4,000 pounds per cubic yard, or 111 pounds per square yard per inch of thickness (2,370 kilograms per cubic meter or 2.37 kilograms per square meter per millimeter of thickness).

Asphalt concrete should be placed by means of an asphalt paver. These are available in a range of sizes. Hand placing, although satisfactory when skillfully done, should be limited to small areas.

Both placing and compaction by rolling must be completed while the asphalt is hot and workable. Thin layers lose heat rapidly after spreading onto a cool surface, and the time available for effective rolling then may be less than 10 or 20 minutes. For that reason, placing and rolling always should be done as a continuous process.

The compaction requirements for ODOT Items 301, 441, Type 2 and Type 1 are found in ODOT specification Items 401.13 and .16.

### TACK COAT

Individual layers must be bonded together for the total thickness of asphalt to act as a structural unit. Unless a layer is placed upon a freshly placed layer, the surface of the previously placed layer should be cleaned of all foreign material and a liquid asphalt tackcoat should be applied.

0A

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# Mark Your Calendars



**Ohio Asphalt Expo**  
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The Asphalt Expo is Ohio's premier asphalt pavement event with multiple concurrent educational sessions and an indoor and outdoor trade show and exhibition. If you construct, inspect, manage or maintain local or private transportation infrastructure, the Ohio Asphalt Expo has the information you need to ensure a successful, long-lasting asphalt pavement.

Go to [www.ohioasphaltpexpo.org](http://www.ohioasphaltpexpo.org) for additional information or to register for this event.

**Level 2 Asphalt Quality Control Technician Training**  
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Flexible Pavements of Ohio (FPO) offers this training course to prepare individuals having basic lab familiarity to take the ODOT Level 2 Asphalt Technician Exam. After the training, students will have the opportunity to take the ODOT written examination for Level 2 Asphalt Concrete Technician approval. Individuals who pass the written test will be scheduled for the practical laboratory exam. Achieving Level 2 Asphalt Concrete Technician approval will also satisfy the requirement of newly revised ODOT specifications that individuals who take and handle cores hold an ODOT approval by being either FQCS or level 2 or 3 asphalt technicians.

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## Don Barber Passes

Well-known in the asphalt paving industry, Don David Barber died Jan. 29, 2016, at the age of 76 at his home in Newark. Don, was a 1957 graduate of Newark High School and received a civil

engineering degree from the University of Cincinnati. Don was a member of the Ohio Society of Professional Engineers & Surveyors and had worked as a civil engineer with the Asphalt Institute, Owens Corning Technical Center and ODOT.

Don began his career in engineering as a co-op in the Ohio Department of Highways (ODH) Division 5 office, while still a UC student. After graduation, he worked as an asphalt pavement specialist with the ODH in Division 8 and Central Office. As the department's Flexible Pavements Engineer, Don was influential in the launch of the Ohio Asphalt Paving Conference, which continues to be an important means of asphalt technology transfer to state and local governments, contractors and other stakeholders in the asphalt pavement industry. For a time, Don served with the Asphalt Institute as the Ohio District Engineer, until taking a job with the Owens Corning Company developing and promoting the use of pavement products. Later he returned to ODOT, serving as operations engineer and district deputy director for District 5-Jacksontown.

As an outdoor enthusiast, Don loved golfing, fishing and skiing. He enjoyed coaching his children's athletic teams and traveling with his family. Don was also known for making great wine and enjoying the fruits of his labor. He cherished the time he spent with his grandchildren, telling them great stories as only Don could do. Besides his professional accomplishments, Don is remembered as a happy go-lucky guy with a great sense of humor.

Don is survived by his wife of 52 years, Sherry (Poulton) Barber; his children, Timothy (Sandy) Barber, David (Tania) Barber, Sally (George) McKenzie and Michelle (Gaston) Harris; his grandchildren, Calvin, Spencer, Quinn, Hannah, Drew, Max, Greysun, and Nicholas; his sister-in-law, Nancy Barber; cousin, Linda Harmon; many nieces and nephews; and beloved in-laws and dear friends.

He was born in Granville on Sept. 26, 1939, to the late James and Anne (Jordan) Barber. In addition to his parents, Don was preceded in death by an infant son, Christopher, and his brother, James Barber.

Memorials in Don's memory are being accepted toward the Blessed Sacrament Church Renovation Campaign, 394 East Main St., Newark, Ohio 43055; and the Licking County Humane Society, 825 Thornwood Drive, Heath, Ohio 43056.

On behalf of Ohio's asphalt paving industry, FPO expresses its sympathy to the Barber family.



## New Member Welcome

**Flexible Pavements of Ohio would like to welcome the following companies as new Associate Members of the association:**



### **RAP Management**

RAP Management is a recycled asphalt manufacturing firm based in Columbus.

RAP Management is a provider of Foam

Stabilized Base (FSB), which is an environmentally friendly pavement material made from 100-percent recycled aggregate. FSB is a substitute for traditional asphalt-base materials and works in conjunction with standard asphalt pavement structure materials.

### **Specialized Construction Inc.**



Headquartered in Cuyahoga Heights, Specialized Construction Inc. is contractor focused on site development and the performance of crack sealing, pavement surface treatments and Cold-In-Place asphalt recycling.

**Please join us in welcoming our new members.**



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# ADVERTISERS INDEX

Asphalt Materials Inc. .... 22  
 Asphalt Shingle Grinding Service LLC ..... 5  
 BOCA Construction ..... 22  
 Columbus Equipment Company ..... 3  
 Ebony Construction Company ..... 8  
 Frantz Ward LLP ..... 14  
 The Gerken Companies ..... 19  
 Highway Equipment Company ..... 5

JASA Asphalt Materials/  
 Russell Standard Corp. .... 26  
 J.C Equipment Sales & Leasing ..... IBC  
 John R. Jurgensen Company ..... 19  
 Kokosing Construction Company Inc. .... 23  
 The McLean Company ..... BC  
 Northstar Asphalt Inc. .... 11  
 Ohio CAT ..... 25

Petrowsky Auctioneers Inc. .... 8  
 ROADTEC ..... IFC  
 SealMaster ..... 21  
 The Shelly Company ..... 7  
 Shelly & Sands Inc. .... 24  
 Smith Challenger Inc. .... 13  
 Southeastern Equipment Company Inc. .... 15  
 Unique Paving Materials Corporation ..... 26



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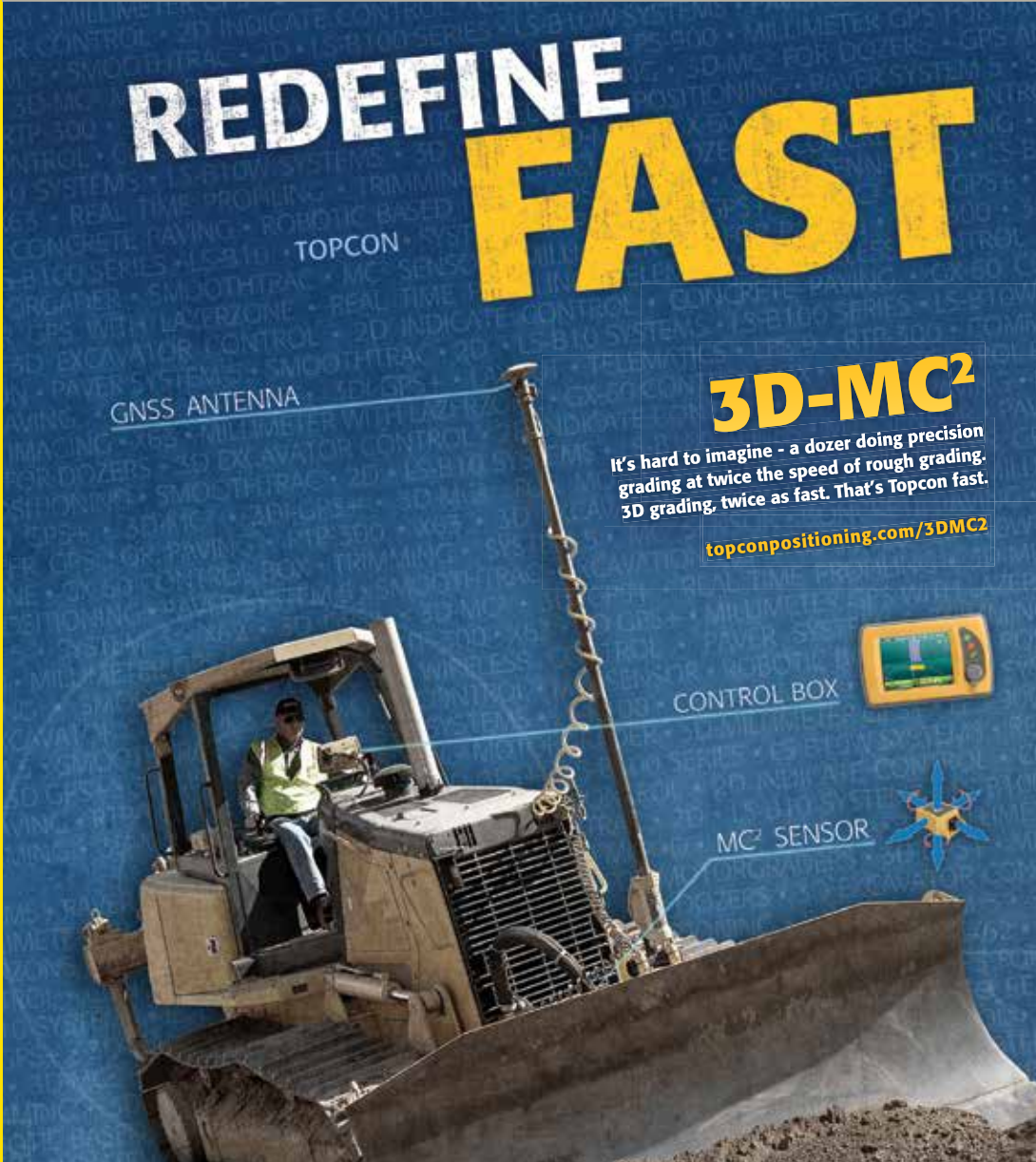
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